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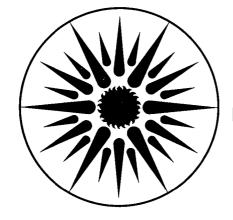
ENERGY & ENVIRONMENT DIVISION

Worldwide Status of Energy Standards for Buildings

Appendices

K.B. Janda and J.F. Busch

February 1993



ENERGY & ENVIRONMENT DIVISION



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WORLDWIDE STATUS

OF

ENERGY STANDARDS FOR BUILDINGS

Appendices

(supporting material for the authors' article of the same title, published in *Energy—The International Journal*, 19:1, 1994)

Kathryn B. Janda and John F. Busch

February 1993

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APPENDIX A

Cover Letter to Respondents and Mail Survey MS 90-4000; Berkeley CA 94720 USA

Lawrence Berkeley Laboratory Building Energy Standards Survey, 1992

Fax: +1 510-486-6996

Dear Respondent:

This is an informal survey designed to gain information about the worldwide status of energy efficiency standards for buildings, particularly for non-residential buildings including offices, schools, and hotels. Our project has three goals: 1) to understand and learn from the experience of countries with existing building energy standards; 2) to locate areas where these lessons might be applied and energy standards might be effectively proposed and developed; and 3) to share the information gathered with all participating countries.

About the term "standard"

We want to gain information about activities undertaken specifically for the purpose of INCREASING ENERGY EFFICIENCY in buildings and gather existing documentation on this subject. For the purposes of this survey, we will use the word "standard" to refer interchangeably to what also might be called codes, criteria, guidelines, norms, laws, protocols, provisions, recommendations, requirements, regulations, rules, or standards. Depending on the country, the "standard" may be contained in one document, be part of another larger document (such as a general building code), or be comprised of several documents.

We are sending this survey to contacts around the world who hold various positions in organizations ranging from government to academia to professional associations. Since we designed the survey to be answered by people with this breadth of background, it is likely that some of the questions on the following pages may lie outside your area of expertise. If you should find yourself uncertain about a particular question or set of questions, please answer the survey to the best of your knowledge, adding a question mark (?) or comment in the space provided. If you could suggest someone else who would know the answers to some of these questions about your country, please include their name(s) and contact information so we can solicit their input. If convenient, you may also photocopy this survey and give them a copy for their use.

Since overseas mail can often be time-consuming and uncertain, we would appreciate receiving your responses by telefax if possible.

Thank you for taking the time to participate in this survey. Please contact us if you have any questions that need immediate attention.

John Busch, Ph.D. Kathryn Janda

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MS 90-4000; Berkeley CA 94720 USA

Fax: +1 510-486-6996

STANDARDS FOR ENERGY EFFICIENCY IN BUILDINGS

IN_____(please fill in the name of your country)

The focus of our research is on ENERGY STANDARDS for NON-RESIDENTIAL BUILDINGS. This survey has been designed to solicit information about this particular subject, and some questions may not apply equally to all types of energy standards for buildings. Please respond as appropriate for the situation in your country.

SECTION I: GENERAL OVERVIEW OF BUILDING ENERGY STANDARDS

1. Does your country have BUILDING STANDARDS of ANY KIND (e.g., health, structural safety, fire prevention)?

a.	At the NATIONAL level?	🗋 Yes	🗋 No	□ ?
b.	At the STATE or regional level?	🗋 Yes	🗋 No	□ ?
c.	At the LOCAL or municipal level?	🗋 Yes	🗋 No	• ?

- d. There are no building standards of ANY kind at any level. (Go to Question 20.)
- Some countries have STANDARDS to INCREASE the ENERGY EFFICIENCY of BUILDINGS. Such standards can be voluntary or mandatory, and they are often developed, issued, and/or implemented by governments, electric utilities, industry groups, or professional associations.

To the best of your knowledge, are there any proposed or existing ENERGY EFFICIENCY STANDARDS for BUILDINGS in your country? (*Check EITHER a or b.*)

- a.
 Energy standards for buildings DO NOT EXIST at the national, regional or local level. (Go to Question 20.)
- b. D Energy standards for buildings DO EXIST (or have been proposed) at the national, regional, or local level.
 - Which building sectors are covered by these standards? (Check ONE of the following.)
 - 1. C Residential buildings ONLY (Go to Question 4)
 - 2. Non-residential buildings ONLY (e.g., commercial, institutional)
 - 3. BOTH non-residential and residential buildings
 - 4. Other: (*Please specify*.)

- 3. a. What is the status of energy standards for NON-RESIDENTIAL buildings at the NATIONAL level in your country? (*Check all that apply*.)
 - □ Mandatory compliance with standard legally required for construction approval
 - Uvoluntary compliance with standard recommended but not necessary
 - Proposed standard has been developed and is currently under consideration
 - □ None no building energy standard has been developed or proposed
 - Uncertain there may or may not be a standard at this level
 - Approximately how many voluntary or mandatory NATIONAL ENERGY STANDARDS apply to non-residential buildings in your country?
 - b. What is the status of energy standards for NON-RESIDENTIAL buildings at the STATE or REGIONAL level? (*Check all that apply.*)
 - 🗋 Mandatory 🗯
 - 🗋 Voluntary 🗰
 - Proposed
 - 🗖 None
 - 🔲 Uncertain
- Approximately how many MANDATORY or VOLUNTARY regional energy standards apply to non-residential buildings in your country? _____
- 2. What states or regions have adopted them?
- c. What is the status of energy standards for NON-RESIDENTIAL buildings in LOCAL AREAS or CITIES in your country? (*Check all that apply.*)

🗋 Mandatory 🗰	1.	Approximately how many MANDATORY or
🗋 Voluntary 🗯		VOLUNTARY local energy standards apply to
Proposed		non-residential buildings in your country?
🗋 None		
🗋 Uncertain	2.	What cities or municipal areas have adopted them?

- 4. Please use the following criteria to select a SINGLE energy standard (or set of standards) as a basis for answering Questions 5-19. (Check all that apply and identify standard below.)
 - 1. This energy standard applies to the largest number of non-residential buildings.
 - 2. I am most familiar with this energy standard.
 - 3. There is ONLY ONE energy standard for NON-RESIDENTIAL buildings.
 - 4. There are NO energy standards for NON-RESIDENTIAL buildings; this standard applies to ______ buildings.

Energy Standard Title:

Date (Specify adopted, effective, or published):

Issuing Organization:

a.

1

Geographic area covered:

□ Nation

□ Region(s): (*specify*)

□ City(ies): (*specify*)

SECTION II: DESCRIPTION OF SPECIFIED ENERGY STANDARDS

5. To what kinds of buildings does the standard specified in Question 4 apply?

Please indicate BUILDING TYPE(s): ((Check all that apply.)	
Offices	🔲 Restaurants	Retail stores
Hotels	🗋 Hospitals	Schools
Government facilities	Churches/mosques	🔲 Industrial Buildings
Residential (single-family)	🗅 Residential (multi-fa	mily)
ALL Buildings	Other: (Please specify	.)

b. Please indicate BUILDING VINTAGE: (Check one.)

□ New buildings

□ Existing buildings (through retrofits)

□ Both new and existing buildings

- c. Please indicate any ADDITIONAL BUILDING CHARACTERISTICS used to define the scope of the standard's applicability: (*Check all that apply*.)
 - 1. □ Physical size (e.g., floor area) → What size limit(s)?
 - 2. □ Amount of energy used (e.g., kilowatts) → What amount(s)?

 - 4.
 Air-conditioned
 - 5. Other: (*Please specify*.)
- 6. Which of the following terms best describes the basic approach of the standard(s) specified in Question 4? (*Check one.*)

Prescriptive (i.e. building materials or dimensions of some building elements are specified)

Performance-based (i.e. design flexibility is maintained within a specified level of performance of the building element, system, or building as a whole)

□ Both prescriptive and performance methods are used in the standard.

• Other (*Please describe*):

- 7. Are the following subjects INCLUDED in the energy standard identified in Question 4?
 - a. Whole-building ENERGY REQUIREMENTS/limitations: Yes No ? *If yes,* check all that apply below:
 - Energy target (e.g., total btu or kilowatt-hour/floor area)
 - Peak electricity demand (e.g., peak kilowatt-hours/floor area)
 - Energy cost target
 - Other (*Please specify*):

b. BUILDING ENVELOPE heat loss or heat gain provisions: \square No \square ? If ves, check all that apply below: □ Wall system (e.g., insulation, exterior surface color) Fenestration system (e.g., glass type, amount, placement of windows) □ Infiltration (e.g., air changes per hour) • Other (*Please specify*): c. LIGHTING provisions (interior or exterior): ☐ Yes \square No \square ? If yes, check all that apply below: Control requirements or credits (e.g., occupancy sensors, number of switches, time clocks) Installed lighting power density requirements (W/m^2) Illumination requirements (lux, footcandles) • Other (*Please specify*): d. MECHANICAL provisions: □ Yes **N**o \square ? If yes, check all that apply below: □ Air/water distribution efficiency Load calculations for equipment sizing (e.g., chillers, motors) Controls (e.g., energy management systems, time clocks) Ventilation **Equipment efficiency (e.g., motors, chillers, fans)** Other (*Please specify*):

e. Are there any OTHER major provisions included in the standard(s) that have not been described above? (e.g., electrical specifications, thermostat settings, duration of heating or cooling season)
If yes, please specify:

SECTION III: STANDARDS DEVELOPMENT PROCESS

8. Please list the names of the ORGANIZATIONS that played important roles in DEVELOPING the ENERGY standard specified in Question 4: (Attach additional pages if necessary.)

Types of Organizations:

- **G** = Government agency
- I = Industry group (e.g., equipment or material suppliers)
- **A** = Academic institution
- **R** = Research group (public or private)
- **L** = Local interest group
- **F** = Foreign development agency (or other non-local institution)
- **O** = Other (please describe)

a. Organization Name:	Type:(See list above)
b. Organization Name:	Type:(See list above)
c. Organization Name:	Type: (See list above)
d. Organization Name:	Type: (See list above)

- 9. Which one of the following two terms BEST describes the PROCESS involved in deciding what requirements the standard should contain? (*Check one and describe below*.)
 - a. Consensus several different organizations reached a compromise (If different from those listed in Question 8, please name organizations involved and comment below)
 - b. D Mandate a single organization or entity made most decisions (Please provide the name of this organization or entity below)

- 10. Standards are generally developed using information about physical attributes and energy use of existing buildings and climate data for the geographic area. What kind of information was used in developing the energy standard specified in Question 4? (*Check all that apply.*)
 - a. PHYSICAL CHARACTERISTICS of existing buildings (e.g., size, function, types of walls and windows)
 - 1. I Not available, and not used in standard.
 - 2. D Estimated using professional judgement.
 - 3. Gathered through audits or surveys for the purpose of the standard.
 - 4. Already available prior to standard development.
 - b. ENERGY USE of existing buildings (e.g., annual consumption, peak demand, load patterns)
 - 1. I Not available, and not used in standard.
 - 2. Estimated using professional judgement.
 - 3. Estimated through computer simulations.
 - 4. Gathered through audits or surveys for the purpose of the standard.
 - 5. Already available prior to standard development.
 - c. WEATHER data (e.g., direct and indirect solar radiation, temperature, humidity)
 - 1. In Not available, and not used in standard.
 - 2. D Estimated using professional judgement.
 - 3. Gathered through measurements for the purpose of the standard.
 - 4. Already available prior to standard development.
 - d. Other information: (*Please specify*)

11. Energy standards are often developed with reference to standards from other countries. Were standards or information from a DIFFERENT COUNTRY (i.e., other than your own) used in developing the energy standard specified in Question 4?

🗋 No

☐ Yes ➡ Please specify the country(ies) of origin and kind(s) of information used: (e.g. American: ASHRAE 90.1-1989; Jamaica: EEBC-90)

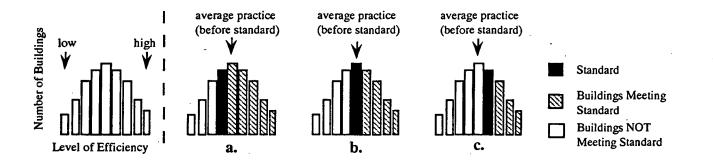
- 12. In developing the standard, computer simulations are sometimes used to determine energy and economic performance of different building designs. Were any COMPUTER PROGRAMS (e.g., DOE-2 or other building energy models) used in the development of the standard?
 - \Box No (Go to Question 13.)
 - \Box Yes \blacksquare a. Which programs?

b. Are computer simulations also used to attain COMPLIANCE with the standard?

🗋 Yes 🗋 No 🗋 Uncertain

If yes and different from above, please list:

- 13. Which of the following statements best describes the goal of the standard, as depicted in the graphs below? (*Check one.*)
 - a. The standard is set at a level LOWER THAN CURRENT PRACTICE to eliminate the most inefficient building designs.
 - b. The standard is set at a level approximately EQUAL TO CURRENT PRACTICE to encourage moderate levels of efficiency.
 - c. The standard is set at a level ABOVE CURRENT PRACTICE to promote highlyefficient buildings and encourage technological development.



14. Did the following considerations influence the inclusion or exclusion of certain measures in the standard? (Check one box for each consideration and comment below.)

a. Cost effectiveness	🗋 Yes	🗋 N o	🗋 Uncertain
 Market or local availability of energy efficient products 	🗋 Yes		🗋 Uncertain
c. Similarity/difference to local design practice	🗋 Yes	🗋 N o	🗋 Uncertain
d. Comfort	🗋 Yes	🗋 No	🔲 Uncertain
e. Other (Please specify below):			

COMMENTS:

15. Energy standards are often revised and updated to reflect technological improvements.a. Is the standard in your country scheduled for regular REVIEW and REVISION?

- □ No (Go to Question 16)
- □ Yes → Please describe process below:

- b. Does the revision process include procedures to MONITOR and EVALUATE the success of EARLIER VERSIONS of the standard?
 - □ No (Go to Question 16)
 - ☐ Yes → Please describe procedures below:

SECTION IV: IMPLEMENTATION AND COMPLIANCE

 In many cases, building energy standards are added to existing (non-energy) building standards. In other cases, governments have created new agencies to implement and enforce building energy standards.

How would you characterize the ENTITIES involved in IMPLEMENTING energy standards in your country? (*Check all that apply.*)

- a. An EXISTING agency, _______(please specify), was made responsible for implementing building energy standards. The agency's primary focus prior to assuming responsibility for standards was: (Check one)
 - 1. **D** Buildings
 - 2. 🗋 Energy
 - 3. Other: (please specify)
- b. A NEW and separate agency, ________ (please specify), was formed in ______(year) to implement energy standards for buildings.
- c. The standards are voluntary; there is no government agency designated to implement them.
- d. Other NON-GOVERNMENT entity(ies) (e.g., energy utility, professional association) issues or implements the standard. (*Please specify below*):
- 17. Has formal TRAINING or EDUCATION about the standard been provided for architects, engineers, and other professionals?
 - \Box No (Go to Question 18.)

□ Yes ➡ Please indicate all TRAINING/EDUCATIONAL aids used:

а.	Written guidelines to assist with compliance procedure	🗋 Yes	🗋 No	🗋 Uncertain
b.	Example calculations	🗋 Yes	🗋 No	🗋 Uncertain
C.	Compliance forms	🗋 Yes	🗖 No	🗋 Uncertain
	Workshop(s), seminars(s), or conference(s)	🗋 Yes	🗋 No	🗋 Uncertain
e.	Information or resource center	🗋 Yes	🗋 No	🗖 Uncertain
f.	Other (Please describe below):			

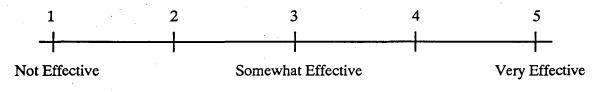
- 18. Both mandatory and voluntary standards often have mechanisms to encourage compliance. Such mechanisms can be designed as positive incentives and/or penalties, and they can apply at several different stages of the design and construction process.
 - a. What COMPLIANCE MECHANISMS are used in your country, and at what stage in the construction process are they directed? (More than one term may apply.)

Compliance Mechanisms:

- C = Certification/approval N = No mechanismI = Incentive (positive reward) O = Other policy mechanism
- **P** = Penalty (negative incentive) ? = Uncertain

Please CIRCLE all appropriate terms-- C, I, P, N, O, ?-- for each construction stage below:

- PRIOR to construction- (e.g., design stage analysis): C I P N O ? Approximately what percent of designs are checked?______ Comments:
- 2. DURING construction (e.g., on-site inspections): C I P N O ? Approximately what percent of sites are checked?______ Comments:
- 3. AFTER construction (e.g., inspection, energy analysis) C I P N O ? Approximately what percent of buildings are checked?_____ *Comments:*
- 4. Are there any OTHER procedures not related to a particular stage of the construction process (e.g., utility hook-up)? (*Please specify*.)
- b. Overall, how effective do you feel the combined compliance mechanisms are at gaining compliance with the standard? (*Circle one and comment below*.)



Why?

- 19. Have any of the following TYPES of ASSESSMENTS or audits of the impact from energy standards for buildings been conducted?
 - a. ENERGY SAVINGS POTENTIAL based on prototypical (not actual) buildings. (Check all that apply.)
 - 1. Completed Please give reference information for any published results:
 - 2. 🗋 In progress
 - 3. 🗋 Planned
 - 4. 🗋 None conducted
 - b. MEASUREMENTS OF ENERGY SAVINGS in actual buildings complying with standard as compared to typical buildings. (*Check all that apply.*)
 - 1. Completed Please give reference information for any published results:
 - 2. 🗋 In progress
 - 3. 🗋 Planned
 - 4. D None conducted
 - c. COST EFFECTIVENESS based on engineering economic CALCULATIONS (i.e., simulation and modelling). (*Check all that apply*.)
 - 1. Completed Please give reference information for any published results:
 - 2. In progress
 - 3. 🗋 Planned
 - 4. 🗋 None conducted
 - d. COST EFFECTIVENESS based on ACTUAL COSTS incurred and measured savings achieved (i.e., case studies). (*Check all that apply*.)
 - 1. Completed Please give reference information for any published results:
 - 2. In progress
 - 3. 🗋 Planned
 - 4. 🖸 None conducted

e. Other Assessments (please describe project goal and check current stage of completion):

1. Completed Please give reference information for any published results:

- 2. 🗋 In progress
- 3. 🖸 Planned

SECTION V: FURTHER INFORMATION ON ENERGY CONSERVATION

20. Are there EFFICIENCY TESTING FACILITIES and PROCEDURES established in your country for any of the following items? (*Circle all that apply*.)

a. Motors

b. Insulation

Yes No ? Yes No ?

- d. Ballasts Yes No ? e. Fixtures
 - Yes No ?

- c. Air conditioners/chillers/ other appliances
- Yes No ?
- f. Thermal properties Yes No ? of materials
- g. Other (*please specify*):
- 21. To provide further information about the context of building energy issues in your country, please describe what OTHER PROGRAMS or POLICIES (besides standards) have been developed to INCREASE ENERGY EFFICIENCY in BUILDINGS. (e.g., energy utility initiatives, energy awareness campaigns, utility rebates, free or subsidized energy audits) Please list program type(s) and identify supporting organization(s):

Please suggest up to three ADDITIONAL SOURCES of information (i.e., books, periodicals, newspaper reports, or journal articles) about ENERGY EFFICIENCY for BUILDINGS in your country that could help provide a context for understanding this topic: (Please specify language of suggested reference material, English is preferred.)

3.

1.

2.

- 22. If you answered Question 4, we would like to obtain a copy of the specified ENERGY STANDARD(s) itself and supporting documentation for it (in English if possible).
 - a. Whom should we contact to obtain a written copy of the ENERGY STANDARD(s) specified in Question 4? (Please provide name, mailing address, phone number, and fax number)

Name: Address:

Tel:

Fax:

b. Please describe the types of SUPPORTING DOCUMENTATION available for this standard(s) and whom we should contact to obtain them: (If different from above, please provide name, mailing address, phone number, and fax number)

Types of Documentation:

Contact Name: Address:

Tel:

Fax:

c. Are there any OTHER energy standard(s) for NON-RESIDENTIAL buildings in your country that were NOT specified in Question 4?

 \Box No (Go to Question 23.)

- ☐ Yes → Please specify OTHER energy standard(s) below and whom we should contact for more information: (Attach additional page if necessary)
 - Energy Standard Title: Issuing Organization: Contact Name: Address:

Tel:

Fax:

 Energy Standard Title: Issuing Organization: Contact Name: Address:

Tel:

Fax:

23. Are there OTHER PEOPLE or INFORMATION SOURCES in your country whom you feel should respond to the questions raised in this survey? If so, please list their names and/or titles and contact information below (attach additional page if necessary):

Contact Name: Address:

Tel:

Fax:

Contact Name: Address:

Tel:

Fax:

FINISH

Thank you for participating in this survey and contributing to our research. If you would like to receive a copy of our findings when we have compiled the results, check this box:

Survey completed by

Name: Title: Organization: Address: Tel: Date completed:

Fax:

PLEASE RETURN SURVEY (VIA TELEFAX OR AIR MAIL) TO: Kathryn Janda Lawrence Berkeley Laboratory Energy Analysis Program, MS 90-4000 Berkeley, CA 94720 USA Tel: +1 510-486-5793 Fax: +1 510-486-6996 e-mail: kbjanda@dante.lbl.gov

APPENDIX B

Input Key and Survey Data Table

This appendix abbreviates information gathered from all 59 surveys received.

INPUT KEY FOR SURVEY DATA TABLE

	Question	Letter Code = Description
	~	(Note: "-" = None exist and "?" = Not answered)
	TION I: GENERAL OVERVIEW OF BUILDING	
	Level at which country has building standards of any kind (e.g., health, structural safety, fire	N = National R = Regional
	prevention).	L = Local
	Building sectors for which energy efficiency	R = Residential buildings ONLY
	standards for buildings have been proposed or	N = Non-residential buildings ONLY (e.g., commercial, institutional)
	do currently exist.	B = BOTH non-residential and residential buildings
3.	Status of energy standards for NON-	O = Other (additional description requested) M = Mandatory: compliance with standard legally required for construction approval.
	RESIDENTIAL buildings at the national,	 V = Voluntary: compliance with standard recommended by not required.
	regional, and local levels.	P = Proposed: standard has been developed an is currently under consideration.
1		 = None: no building energy standard has been developed or proposed
	Voor (adapted affective or proposed) of	U = Uncertain: there may or may not be a standard at this level.
	Year (adopted, effective, or proposed) of energy standard .	No key necessary.
	TION II: DESCRIPTION OF SPECIFIED ENERG	
5a.	Building types covered by standard specified in Question 4.	
	Question 4.	C = Commercial/retail stores D = Hospitals
		E = Educational facilities (schools)
		F = Restaurants
		G = Government facilities
		H = Hotels I = Industrial Buildings
		M = Multi-family residential
		O = Offices
· ·		R = Religion-related buildings (churches/mosques)
		 S = Single-family residential X = Other (additional description requested)
5b.	Building vintage covered by standard.	N = New buildings
		E = Existing buildings (through retrofits)
	i	B = Both new and existing buildings
	Additional building characteristics used to	P = Physical size (e.g., floor area)
	define the scope of the standard's applicability.	E = Amount of energy (e.g., kilowatts) F = Type of fuel (e.g., electricity)
	appricating.	A = Air-Conditioned
	······································	O = Other (additional description requested)
6.	Basic approach of the standard.	Pr = Prescriptive (i.e. building materials or dimensions of some building elements are specified)
		Pe = Performance-based (i.e. design flexibility is maintained within a specified level of performance of the building element, system, or building as a whole)
		Bo = Both prescriptive and performance methods are used in the standard.
7a.	Whole-building energy requirements included	E = Energy amount target (e.g., total btu or kilowatt-hour/floor area)
	in standard.	P = Peak electricity demand (e.g., peak kilowatt-hours/floor area)
		C = Energy cost target O = Other (additional description requested)
76	Building envelope heat loss or heat gain	$\mathbf{R} = \text{Roof}$
	provisions included in standard.	W = Wall system (e.g., insulation, exterior surface color)
		F = Fenestration system (e.g., glass type, amount, placement of windows)
		I = Infiltration (e.g., air changes per hour)
70	Lighting provisions (interior or exterior)	O = Other (additional description requested) C = Control requirements or credits (e.g., occupancy sensors, number of switches, time clocks)
	included in standard.	\mathbf{P} = Installed lighting power density requirements (W/m ²)
		I = Illumination requirements (lux, foot-candles)
		O = Other (additional description requested)
7 d . 1	Mechanical provisions included in standard.	A = Air/water distribution efficiency
1		L = Load calculations for equipment sizing (e.g., chillers, motors) C = Controls (e.g., energy management systems, time clocks)
		V = Ventilation
		E = Equipment efficiency (e.g., motors, chillers, fans)
<u> </u>		O = Other (additional description requested)
7e.	Other provisions.	Y = Yes (additional description requested) N = No
SECT	TION III: STANDARDS DEVELOPMENT PROC	
	Types of organizations that played important	G = Government agency
	roles in developing energy standards.	I = Industry group (e.g., equipment or material suppliers)
		A = Academic institution
		R = Research group (public or private)
		L = Local interest group F = Foreign development agency (or other non-local institution)
		O = Other (additional description requested)
	Process involved in deciding what requirements the standard should contain.	C = Consensus - several different organizations reached a compromise M = Mandate - a single organization or entity made most decisions

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Survey Data Table (all 59 Respondents)

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Australia	Ø	NRL	В	P	P	Р	1993	0	N	A	во	E	RWFIO	-	-	-	GGA	с	G	Е	GA	-
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Australia		NRL	В	P	P	₽	-	-	N	-	-	?	?	?	?	-	G	с	?	?	?	-
Bangladesh		-	-	-	-	-	-	-	-	-	-	-	-	-	-	<u> </u>	-	-		- ·	-	
Belgium		NRL	R	v	v	v	1984	SM	N	-	Pe	E	0	-	-	-	GRAI	с	GA	ECGA	GA	-
Belgium		R	R	-	-	-	-	HSDMX	в	0	Pe	-	RWF	-	v	Y	GAR	с	A	A	A	-
Botswana		NL	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	
Brazil		NL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_	-	-	-		-
Canada		NRL	В	P	м	м	1983	A	N	AO	Pr	?	RWFIO	P	CVE	-	RRG	м	Е	Е	A	-
Chile		NRL	В	MV	-	-	1960	A	в	-	Pe	-	RWFI	-	-	Y	GAL	с	G	G	G	
China		NR	В	м	-	-	1993	Н	N	A	Во	E	RWFI	-	ALCVE	Y	GAA	с	EG	G	G	-
China		NRL	R		-	-	1986	м	N	P	во	E	RW	?	?		GA	?	EGA	ECGA	GA	<u> -</u>
Colombia	⊠	N	B	PM			199?	OHGCSM	N	PA	во	-	-	CPI	ALCVE	Y	GIAF	с	G	G	G	
Colombia		NL	В	м	-	-	-	A	N	P	Pr	?	?	I	-	-	GGIO	с	N	N	N	-
Costa Rica		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Czechoslovakia	Ø	N	в	м	-	-	1979	OHFDMX	в	PE	Ре	E	RWFIO	-	-	-	GAGO	с	EG	EG	EG `	<u> </u>
Czechoslovakia		NR	В	Ρ	Ρ	₽	1979	A	N	PF	Во	-	RWFI	0	-	Y	AR	с	Е	E	E	G
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Czechoslovakia		N	в	м	MV	-	?	A	в	PEO	œ	EPO	-	-	-	-	GIGG	с	N	Ň	G	-
Denmark	⊠	N	В	м	-	-	1982	A	N	P	Во	-	RWFI	-	cvo	-	GGR	с	-	-	-	в
Denmark		N	в	м	-	-	1982	A	N	-	Pe	E	RWFO	-	CVE	-	GG	м	A	A '	A	-
Djibouti			-				1991	s	N		Pr					-						-
England & Wales	Ø	N	в	-	м	-	1990	A	в	0	Во	EO	RWFO	-	cvo	-	GIAR	с	EGA	EA	A	Y
France	⊠	NL	в	м	-	-	1988	OHGFDC	N	F	Во	-	RWFIO	-	cv	Y	GGRG	с	GA	ECG	A	-
France		N	в	м	-	-	1988	OHGFDC	N	-	Pe	-	RWFIO	-	ALCVE	¥	GGGL	с	A	A	A	-
Hong Kong	⊠	N	N	P	P	P	1991	он	N	A	Pe	?	RWF	-	-	-	GRR	с	G	CG	A	-
Indonesia	⊠	NRL	N	VP	-	-	?	OHGDMI	N	A	Во	EPC	RWFI	CPIO	ALCVE	-	GARG	с	EG	ECG	GA	D
Israel	⊠	N	R	м	U	U	1989	SM	N	-	Pe	-	RWFI	-	-	-	GAA	с	EG	G	A	-
Israel		NL	R	м	-	-	1989	SM	N	0	во	0	RWIO	-			GALL	с	A	с	A	s
Ivory Coast		N	в	P	-	-	1992	A	в	AO	Bo	EC	RWF	CPI	ALCVE	Y	GAF	с	EGA	ECG	GA	<u> -</u>]
Jamaica	⊠	N	N	MV	-	-	1992	OHGFDR	в	PEA	Во	EC	RWF	CPI	ALCVE	Y	GLIA	с	EGA	ECA	G	Y
Japan	⊠	NL	в	MV	-	-	1980	0	N	P	Ре	-	RWFI	0	-	Y	600 [.]	м	A	A	A	<u> -</u>

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Survey Data Table (cont.)

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no. No. N	Information	Computer Programs Used	Computer Compliance?	Goal	Consideration	Regular Review	EMARNA ersion?	Implementing Entity	Former Focus	Training/ Education	Before	10000000000000000000000000000000000000	During	%	After	%	Effectiveness	Ene	тgy	ial C	st			Other Programs	surveys selected for further analysis (countri	
OMERNAN N P RASCO Y Y F V <	USA1 ASHRAR	DOE-2	N	A	EASC	Y	Y	Е	в	1			1		N			N	N	P	₽	P	MIAT	UBL	Australia	
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· • · · · · · · · · · · <th<< td=""><td>CEBO</td><td>BUNYIP</td><td>υ</td><td>E</td><td>EA</td><td>N</td><td>υ</td><td>E</td><td>в</td><td>-</td><td>-</td><td></td><td>-</td><td></td><td>-</td><td></td><td></td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>МАВ</td><td>ŬG</td><td>Australia</td><td></td></th<<>	CEBO	BUNYIP	υ	E	EA	N	υ	E	в	-	-		-		-			-	-	-	-	-	МАВ	ŬG	Australia	
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Consistent area Consistent		- None	?	A	ESC	Y	N	Е	Е	WES	C	10	₽	50	с	90	5	I.	с	I	I	?	MIAFTO	?	Czechoslovakia	
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U L E Y Y E B WECSI C - V - P - IAT - Israel M - MODE TARP N A EAS Y Y E B WECSI C - A - P P - IAT - Israel M Jamaica OASIS CODYBA Y A EASC U N E E WECSI C 15 N - 2 C N N ITT - Israel M Jamaica OASIS CODYBA Y A EASC U N E E WECSI C 15 P 15 N - 2 C N N ITT - Israel I I - - - - - - - - - - - 0 - Ivory Coast M M E B WECSI C ? C I	Singapore:		Y	A	EASC	Y	N	E	в	WESI	с	?		?		?	-	P	I	N	N	-	MIFT	IA	Indonesia	×
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CODYBA Y A EASC U N E E WECS - - - - I - - O - Ivory Coast M UBA1 ASERAR Melaysia ASEAM DOE-2.1D Y A EASC N N E B WECSI C ? C I C ? C A IG Jamaica M Uncertain Uncertain Incertain Incertain <t< td=""><td>- Hone</td><td></td><td>N</td><td>A</td><td>EAS</td><td>Y</td><td>Y</td><td>Е</td><td>в</td><td>WECSI</td><td>с</td><td>15</td><td>P</td><td>15</td><td>N</td><td>-</td><td>2</td><td>с</td><td>N</td><td>с</td><td>N</td><td>N</td><td>IT</td><td>-</td><td>Israel</td><td></td></t<>	- Hone		N	A	EAS	Y	Y	Е	в	WECSI	с	15	P	15	N	-	2	с	N	с	N	N	IT	-	Israel	
Maleysia DOE-2.1D Y A EASC N N E B WECSI C ? C A IG Jamaica Maleysia Uncertain Uncertain		CODYBA DOE-2	Y	A	EASC	ប	N	E	Е	WECS	-	-	-	-	-	-	-	I	-	I	-	-	0	-	Ivory Coast	X
Uncertain Uncertain Y A ES N Y E B WSI C 10 N N 5 N D MIAT I Japan	Malaysia	DOE-2.1D	Y	A	EASC	N	N	Е	в	WECSI	с	?						с	I	c	?	с	A	IG	Jamaica	
	Uncertain	Uncertain	Y	A	ES	N	Y	Е	в	WSI	c	10	N		N		5	N	-	-	-	D	MIAT	I	Japan	×

Survey Data Table (all 59 Respondents)

	I: OVERVIEW II: DESCRIPTION OF SPECIFIC STANDARD #1:]#2:]#3:]#4:]#5: Applicability]#6:]#7:															III: DE	VE	LOPM	ENT PR	OCES	560
#1: #2: #3: #4: #5: Applicability #												visions In	cluded	in Standa	#8:	#9		: formati	on Use	d	
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for further analysis (countries	Building ndards	y Sta Ing S	St	anda	rds	Year	Tumor	es Se	cteris	Approach	ing	ope	gui	anica	Other	nizati olved	n Pr	sical	Energy Use	er Da	
with standards)	Any Buildin Standards	Energy Standard Building Sectors	National	Regiona	Local			Vintage	Applicable Characteristics	App	Whole Building	Building Envelope	Lighting	Mechanical	Ð	Organizations Involved	Decision Process	Physical Characteristics	Ener	Weather Data	Other
Malaysia 🛛 🛛	1	1	v	v	v	1989	OHGFC	N	Е	Pe	-	RWFI	CPI	LCE	-	GA		G	GA	A	
Mexico 🗆	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands 🛛	NL	в	P	-	м	1992	OHSMDE	в		Pe	-	RWFI	-	0		GGRO	С	A	N	A	F
New Zealand	N	В	м	-	-	1982	OHGDCR	в	P	во	Е	RWFI	P	LCV	N	GR	м	GA	CG	A	E
New Zealand	NRL	B	v	v	v	1977	OHGSFC	N	-	во	-	RW	-	-	-	GGAI	с	A	G	A	<u> - </u>
New Zealand	N	R	-	-	-	1992	S	N	PO	во	Е	RWFIO	-	-	-	IAG	0	A	с	A	-
New Zealand	N	в	v	-	-	1982	OHGDCR	в	P	Bo	E	RWFI	P	LCV	_	GLIG	с	GA	CG	A	-
Northern Ireland	N	в	м	м	м	1991	A	в	PE	Pe	-	RWF	-	с	-	GGR	с	G	G	A	 -
Norway 🛛	N	в	м	-	-	1987	A	в	-	Во	-	RWFI	-	A	-	GRGI	м	G	с	G	
Pakistan 🛛	NRL	в	v	-	-	1990	OHGSFC	N	0	Во	Е	RWFI	со	ALCVE	Y	GG	с	Е	с	A	<u> -</u>
Philippines 🛛	N	N	VP	-	-	198?	OHGCDF	в	E	BO	P	RWFI	CPI	ALCVE	-	GAFO	с	G	G	G	-
Poland 🛛	N	в	м	-	-	1991	A	B	PA	Pe	E .	RWFIO	?	?	-	GR	?	A	?	A	
Poland	N	в	м	-	-	1991	A	в	-	Pe	-	RWFI	-	-	Y	GRG	с	E	Е	N	-
Portugal 🛛	N	в	м	-	-		A	в	0	Bo	E	RWFI	0	-	-	GGAA	С	A	E	A	-
Romania 🛛	NRL	в	v	-	-	?	A	в	PE	Pr	E	Y	-	?	-	GRI	м	Е	EG	G	-
Russia 🛛	ท	в	P	P	-	1991	A	в	E	Pe	E	RWFIO	-	-	-	RRRR	с	A	CG	A	-
Scotland 🛛	N	в	м	-	-	?	A	N	-	во	E	RWF	-	Y	Y	GIAR	м	?	?	?	-
Singapore 🛛 🛛	N	в	м			1980	Α -	N	EA	Во	-	RWFI	CPI	cv	Y	GAGL	с	G	Е	G	-
South Africa 🛛	NL	N	v	v	-	?	OGD	N	Е	Ре	Е	?	?	?	-	A	М	E	EC	A	-
South Africa	NRL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Korea 🛛 🖾	N	в	м			1992	OHGFDC	N	P .	Bo	E	RWFI	CPI	LCE	Y	GGR	С	EGA	ECGA	GA	-
Sweden 🛛	N	в	м	-	-	1989	λ	N	0	Pe	0	RWFI	10	v	H	G	м	-	EC	A	
Switzerland	N	в	м	м	м	1988	Α	в	PEF	Во	Е	RWFI	-	LE		GA	с	A	Ē	A	-
Switzerland	NRL	в	MV	м	м	88/9	A	N	EF	во	E	0	-	A	Y	GA	с	EĠ	CG	A	
Thailand 🛛	N	N	P	P	P	1987	OHGFDC	в	Ē	Pr	-	RWFI	CP	LVE	-	GGA	м	A	A	A	T
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Venezuela 🛛	N	-		-	-	-	-	_	-	-		-	-	-	-	-	-	-	-		-

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Survey Data Table (cont.)

III: DEVEL			_				IV:	IMI	LEMEN	ТАТ	101	ANI	DC	OMP	LIA	NC	8					V: OTHER	INFO.		
#11:	#12:			#14:	#1	5:	#16:		#17:	#1	8: C	ompli	ianc	e me	thod	.s			avi	0		#20:	#21:	M Indiantos 25	
Other Information Sources	Computer Programs Used	Computer Compliance?	Goal	Considerations	Regular Review?	EMARET OF Construction of Participation of Construction of Con	Implementing Entity	Former Focus	Training/ Education	Before	%	During Construction	%	After Construction	%	Effectiveness	Ene	rgy	Potential o	st	Other	Testing Facilities	Other Programs	Indicates 35 surveys selected for further analysis (countri with standards)	
Singapore: USA: ASBRAE	DOE-2 ASEAM-2	N	E	EAC	Y	N	v	-	ES	N		N		N			с	₽	с	с		MIAB	IAE	Malaysia	×
- Jone	- None	-	-	-	-	-	-	-	-	-		••• ·		-		-	-	-	-	-	-	MABT	AIB	Mexico	
- None	CEN TC 89 TCM ISSO pub.	N	E	EC	Y	N	E	в	WECI	c	10	P	10	N	0	4	с	N	с	N	P	IATO	IURA	Netherlands	X
USA: ASERAR UK: B6 5422:	SUSTEP	A	Е	ES	Y	N	Е	B	0	с	90	c :	ත	с	?	4	P	с	P	P	N	IT	υ	New Zealand	×
No	No	ប	A	EASC	Y	N	EN	в	-	CP	10	CP 7	2	СР	?	5	I	I	I	I	I	IT	G	New Zealand	
No	ALF	Y	-	0	N	N	0	?	-	с	10	N		N		3	I	I	N	N	N	IAT	U	New Zealand	
USA: ASBRAR UK: B8 5422:	Uncertain	υ	E	ES	Y	N	Е	в	-	с	90	с	ත	с	?	4	P	с	P	P	N	IT	U	New Zealand	
England and Wales:	BREDEM CIBSE	N	A	EASCO	Y	Y	E	в	WES	с	10	с	75	с	95	5	с	I	с	I	-	IT	I	Northern Ireland	
Denmark Sweden Finland	Yes	?	Е	Ē	Y	Y	Ē	0	WE	с	10	? 1	2	с	?	3	с	с	с	с	-	U	IR	Norway	×
US: US: ASERAE	- None	υ	A	EASC	Y	N	E	0	WECS	N		N -	-	N	-	-	с	P	I	P	N	MBF	AIB	Pakistan	×
Theiland:	DOE-2 ASEAM	N	E	EASC	Y	Y	Е	0	-	U		U		U		-	N	N	N	N	N	ABFO	IAR	Philippines	×
Yee	Uncertain	2	L	EASC	Y	Y	Ē	?	WEI	?	?	? 7	2	?	?	?	с	P	?	?	?	IBT	?	Poland	X
UK: Building Sweden:	MAIN Energy	Y	A	EAC	Y	N	Е	в	WES	с	U	сι	J L	N	0	2	P	I	P	P	N	IT	G	Poland	
France Spain	- None	υ	Е	S	N	-	Е	0	WECS	с	?	N 7	2	N	?	3.	с	P	P	N	₽	MIAFTO	I	Portugal	8
European	Uncertain	?	Е	EAS	Y	U	υ		WECS	P	?	?		?		2	I	I	I	I	I	MIT	I	Romania	X
ISO-9164 Germany: DIN Sweden: SBN	HEAT	Y	A	EAC	Y	N	E	в	-	-		-		с		3	P	I	I	N .		ITO	G	Russia	×
England and	Uncertain	?	?	EASC	Y	Y	E		WES	υ		U		U		-	-	-	-	-	-	-	-	Scotland	×
USA1 ABHRAE	- None	N	A	EASC	Y	Y	E	в	WECS	с	-	N		с		5	с	с	с	с	- :	IBT	I	Singapore	×
- None	QUICK	Y	Е	ESC	N	?	Е	B	- .	N	5	N C)	N	0	1	с	с	I	I	P	IT	AT	South Africa	X
- None	- None	-	1	-	-	-	-	1	-	-		-		-		-	-	-	-	-	-	IT	AT	South Africa	
USA: BEPS USA: ASHRAE Japan: PAL,	DOE-2 Trakload TRNSYS	Y	A	EASC	Y	Y	E	в	WECS	с	50	CO 5	50	CP	?	3	₽	P	P	P	P	MIABFT	GUIA	South Korea	×
- None	ENORM	Y	A	EC	Y	Y	Е	в	WESI	с	10	с ?	?	с	?	5	-	-	-	-	-	IAT	-	Sweden	×
Germany: DIN France:	- None	?	L	EC	Y	Y	?	?	ESI	С	10		-	-	-	-	I	I	I	I	~	IAT	в	Switzerland	X
- None	DOE-2	ប	L	EACO	Y	Y	Е	в	WECS	с	10	N -	•	N	-	4	с	с	с	c	N	IT	G	Switzerland	
Singapore USA: ASHRAE	DOE-2	Y	A	EASC	Y	-	E	Е	WE	P	10	P -	-	P	?	-	I	P	P	N	N	AB	UG	Thailand	X
- None	DOE-2	Y	A	AC	Y	N	ΕO	Е	WES	с	?	υ?	?	υ	?	5	с	с	N	N	N	MIAT	ΰG	USA	×
- None	- None	-	-	-	-	-	-		-	+				-	-	-	-	-	-	-	-	IBT	U	Venezuela	

APPENDIX C

Surveyed Details of Selected Energy Standards in 35 Countries

Country Name	Page Numbe
Australia	Ċ-2
Belgium	C-6
Canada	C-10
Chile	C-14
China	C-18
Colombia	C-22
Czechoslovakia (former)	C-26
Denmark	
England & Wales	C-34
France	C-38
Hong Kong	
Indonesia	
Israel	C-50
Ivory Coast	C-54
Jamaica	
Japan	
Malaysia	
Netherlands	C-70
New Zealand	
Northern Ireland	C-78
Norway	
Pakistan	
Philippines	C-90
Poland	
Portugal	C-98
Romania	C-102
Scotland	C-106
Singapore	C-110
South Africa	C-114
South Korea	C-118
Sweden	C-122
Sweden Switzerland	C-126
Thailand	C-130
U.S.S.R. (former)	C-134
United States	

In most cases only one survey from each country was received, but in cases where multiple surveys were returned we did not attempt to verify or "correct" discrepancies between respondents from the same country. To develop our comparative analysis set and this appendix, we selected the surveys which seemed to contain the most reliable information.

ERAL OVERVIEW OF I 1. General building standar 2. Proposed or existing EN 3. Status of Non-Residenti a. National level:	rds exist at the following g IERGY standards cover th	overnmental levels:	National		
 Proposed or existing EN Status of Non-Residential 	ERGY standards cover th		National		
3. Status of Non-Resident		a fallowing building		Regional	Local
		ie ioliowing building	gsectors: Both Res	sidential and Non-R	esidential
	ial Building Energy Stand Proposed	lards at the: b. Regional level	: Proposed	c. Local level: -	Proposed
4. Single energy standard Title, Organization:	selected for further desc Building Envelope, A		ards Association		
Year: <u>1993</u>	Geographic Coverage:	Nation	Abbreviated Title:	ASA-1993	
CRIPTION OF SPECIFI	ED ENERGY STAN	ARDS - ASA-	1993		
Offices	re included in the energy s	riptive and perfo	racteristics: Conditioned	visions:	
E- Energy amou	nt target		Roof Wall system Fenestration sys Infiltration Other: Thermal	tem mass, internal load	·
c. Lighting provisions: - None			d. Mechanical provisions		
e. Other provisions:					

AUSTRALIA 2

. Organizations involved in developing the standard:	
Government agency: Energy Research and Devel	opment Cooperation
Government agency: Standards Association, Au	
Academic institution: SOLARCH, University of	New South Wales
	······································
, Decision Process: Consensus Comment:	
0. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
	5 5
Gathered through audits and surveys	Estimated using professional judgment
·	
· · · · · · · · · · · · · · · · · · ·	-
· · · · · · · · · · · · · · · · · · ·	
c. WEATHER data	d. Other information
	- None
Gathered through measurements	
Already available prior to standard	-
1. Standards from a different country used as source material:	
2. COMPUTER programs used:	
2. COMPUTER programs used: a. In developing the standard: DOE-2	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
a. In developing the standard: DOE-2	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
a. In developing the standard: DOE-2	
a. In developing the standard: DOE-2	
a. In developing the standard: DOE-2 	s in the standard:
a. In developing the standard: DOE-2	s in the standard:
a. In developing the standard: DOE-2	s in the standard:
a. In developing the standard: DOE-2	s in the standard:
a. In developing the standard: DOE-2	s in the standard:
a. In developing the standard: DOE-2 B. Standard is set at a level: Above current practice B. Standard is set at a level: Above current practice B. Considerations influencing the inclusion or exclusion of measure E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design Comfort	s in the standard:
a. In developing the standard: DOE-2 B. Standard is set at a level: Above current practice B. Considerations influencing the inclusion or exclusion of measure E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design Comfort 5a. Standard scheduled for regular review and revision?	s in the standard: Comments:
a. In developing the standard: DOE-2 B. Standard is set at a level: Above current practice B. Standard is set at a level: Above current practice B. Considerations influencing the inclusion or exclusion of measure E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design Comfort	s in the standard: Comments:
a. In developing the standard: DOE-2 B. Standard is set at a level: Above current practice B. Considerations influencing the inclusion or exclusion of measure E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design Comfort 5a. Standard scheduled for regular review and revision? Yes: Standards Australia committees initiate the	s in the standard: Comments:
a. In developing the standard: DOE-2 B. Standard is set at a level: Above current practice B. Considerations influencing the inclusion or exclusion of measure E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design Comfort 5a. Standard scheduled for regular review and revision?	s in the standard: Comments:

3 AUSTRALIA

Existing agency: Standards A		
•••	onsible for implementation, its former focus was	s on buildings, energy, or another area:
Buildings		
•	architects, engineers and other professionals	
- None	·	· · · · · · · · · · · · · · · · · · ·
<u></u>	·····	· <u> </u>
		· · · · · · · · · · · · · · · · · · ·
Compliance mechanisms used at different	- .	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
No mechanism	<u>No mechanism</u>	No mechanism
Percent designs checked:	Percent sites checked:	Percent buildings checked:
Comment:	Comment:	Comment:
· · · · · · · · · · · · · · · · · · ·		
d. Other compliance procedures <u>Sou</u> e. Effectiveness of combined complian	me councils (local governments) are end	couraging use of standards.
d. Other compliance procedures <u>Son</u> e. Effectiveness of combined complian f. Explanation for effectiveness in par . Types of assessments or audits of energy	me councils (local governments) are end ce mechanisms (scale of 1-5): t e:	
d. Other compliance procedures <u>Som</u> e. Effectiveness of combined complian f. Explanation for effectiveness in par . Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba	me councils (local governments) are end ce mechanisms (scale of 1-5): t e: rgy standards' impact:	
d. Other compliance procedures <u>Sor</u> e. Effectiveness of combined complian f. Explanation for effectiveness in par . Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba None conducted	me councils (local governments) are end ce mechanisms (scale of 1-5): t e: rgy standards' impact:	
d. Other compliance procedures <u>Son</u> e. Effectiveness of combined complian f. Explanation for effectiveness in par . Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba <u>None conducted</u> b. MEASUREMENTS OF ENERGY SAV	me councils (local governments) are end ce mechanisms (scale of 1-5): t e: rgy standards' impact: sed on prototypical (not actual) buildings:	
d. Other compliance procedures <u>Som</u> e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba None conducted b. MEASUREMENTS OF ENERGY SAV None conducted	me councils (local governments) are end ce mechanisms (scale of 1-5): t e: rgy standards' impact: sed on prototypical (not actual) buildings:	
d. Other compliance procedures <u>Son</u> e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba <u>None conducted</u> b. MEASUREMENTS OF ENERGY SAV <u>None conducted</u>	me councils (local governments) are end ce mechanisms (scale of 1-5): t e: gy standards' impact: sed on prototypical (not actual) buildings: //INGS in actual buildings complying with stand	
d. Other compliance procedures Some e. Effectiveness of combined compliant f. Explanation for effectiveness in par Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL bas None conducted b. MEASUREMENTS OF ENERGY SAV None conducted c. COST EFFECTIVENESS based on e	me councils (local governments) are end ce mechanisms (scale of 1-5): t e: gy standards' impact: sed on prototypical (not actual) buildings: //INGS in actual buildings complying with stand	
d. Other compliance procedures Sor e. Effectiveness of combined compliant f. Explanation for effectiveness in par Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL bas None conducted b. MEASUREMENTS OF ENERGY SAV None conducted c. COST EFFECTIVENESS based on energy Planned	me councils (local governments) are end ce mechanisms (scale of 1-5):	
d. Other compliance procedures <u>Sor</u> e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba None conducted b. MEASUREMENTS OF ENERGY SAV None conducted c. COST EFFECTIVENESS based on e	me councils (local governments) are end ce mechanisms (scale of 1-5):	

AUSTRALIA 4

FURTHER INFORMATION ON ENERGY CONSERVATION - Australia

20. Efficie	ncy testing	facilities	and	procedures	established:
-------------	-------------	------------	-----	------------	--------------

Motors

Insulation Air conditioners/chillers/other appliances Thermal properties of materials

21. Other programs or policies developed to increase energy efficiency in buildings:

Utility initiatives

Building energy standards Labeling of appliances Comment: Building energy targets developed by B.D.M.A.

Country: Australia

Additional sources of information about energy efficiency for buildings in: Australia

1. E.R.D.C. Compendium (P.O. Box 629; Canberra, ACT. 2601, Australia)

- 2. A.N.Z.S.E.S. (Australia New Zealand Solar Energy Society) Proceedings of conferences.
- 3. AIRAH (Australian Institute of Refrigeration, Air-Conditioning, and Heating) Journal

22. Contact for written copy of energy standard specified in Question 4:

Name: Deo K. Prasad

Address: Associate Director, SOLARCH P.O. Box 1 Kensington 2033

Country: Australia

Tel: 61-2-697-4868

Fax: 61-2-662-1378

Types of supporting information available:

Other energy standards for non-residential buildings:

Survey completed by: Title:	Deo K. Prasad Associate Director, SOL, University of New Sout P.O. Box 1, Kensington	h Wale	25
	New South Wales	203	33 Country
Tel:	61-2-697-4868	Fax:	61-2-662-1378
Date completed:	4/14/92		

BUILDING ENERGY S rds exist at the following gov IERGY standards cover the ial Building Energy Standar Voluntary	vernmental levels following buildi		Regional	Local
IERGY standards cover the al Building Energy Standa	following buildi		Regional	Local
ial Building Energy Standa	-	ng sectors: Residen		
	rdo ot ihou	• itcondent	tial Only	
	b. Regional lev	el: Voluntary	c. Local level:	Voluntary
Réglementatin thermiq		gements neufs (K70	Be500). 1984. Minis	stere de la Regi
Geographic Coverage:	Regions	Abbreviated Title:	K70-BE500:1984	
ED ENERGY STAND	ARDS - K70	-BE500:1984		•
	- <u>New b</u> - c. Other ct	ouildings		
e included in the energy sta y provisions:		Other: performa	nce thermique de l'	envelope
			· · · · · · · · · · · · · · · · · · ·	
		d. Mechanical provision	s:	<u> </u>
	·	- None		
				, ,
	Réglementatin thermiq Wallonne Geographic Coverage: ED ENERGY STAND/ Question 4 applies to the foll ily residential ily residential ily residential etandard: Performance re included in the energy sta gy provisions: unt target	Wallonne Geographic Coverage: Regions ED ENERGY STANDARDS - K70 Question 4 applies to the following kinds of the	Réglementatin thermique pour les logements neufs (K70: Wallonne Geographic Coverage: Regions Abbreviated Title: ED ENERGY STANDARDS - K70-BE500:1984 Question 4 applies to the following kinds of buildings: bly residential b. Building vintage: May residential New buildings c. Other characteristics: - None	Réglementatin thermique pour les logements neufs (K70-Be500). 1984. Minis Wallonne Geographic Coverage: Regions Abbreviated Title: K70-BE500:1984 ED ENERGY STANDARDS - K70-BE500:1984 Question 4 applies to the following kinds of buildings: b. Building vintage: ily residential b. Building vintage: New buildings c. Other characteristics: - None - None Standard: Performance-based - None re included in the energy standard: b. Building envelope provisions: Other: performance thermique de l'a <

8. Organizations involved in developing the standard:	
Government agency: Ministere de la Région Wall	onne
Research group: C.S.T.C.	
Academic institution: U. Lg, U.C.L, U.M.S.	
Industry group: Ordre des architectes; COMITA	(isolants); verries etc.
), Decision Process: Consensus Comment:	
0. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Gathered through audits and surveys	Estimated using professional judgment
Already available prior to standard	Computer simulations used for estimates Gathered through audits and surveys
· · · · · · · · · · · · · · · · · · ·	Already available prior to standard
	Alleady available prior to standard
c. WEATHER data	d. Other information
Gathered through measurements	- None
Already available prior to standard	· · · · · · · · · · · · · · · · · · ·
	· · · · · · · · · · · · · · · · · · ·
2. COMPLITER programs used:	
	b. For complying with the standard: Yes
2. COMPUTER programs used: a. In developing the standard: Yes	b. For complying with the standard: Yes
2. COMPUTER programs used: a. In developing the standard: Yes	b. For complying with the standard: Yes
	b. For complying with the standard: Yes
	b. For complying with the standard: Yes
	b. For complying with the standard: Yes
a. In developing the standard: Yes	b. For complying with the standard: Yes
a. In developing the standard: Yes	
a. In developing the standard: Yes	
a. In developing the standard: Yes	
a. In developing the standard: Yes	
a. In developing the standard: Yes Standard is set at a level: Above current practice Considerations influencing the inclusion or exclusion of measures <u>E - Cost effectiveness Availability of energy efficient products </u>	
a. In developing the standard: Yes 	
a. In developing the standard: Yes 	
a. In developing the standard: Yes 3. Standard is set at a level: Above current practice 4. Considerations influencing the inclusion or exclusion of measures <u>E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design } }</u>	
a. In developing the standard: Yes	s in the standard: Comments:
a. In developing the standard: Yes	s in the standard: Comments:
a. In developing the standard: Yes	s in the standard: Comments:

3 BELGIUM

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If an existing agency was made responsible for implementation, its former focus was on buildings, energy, or another area: Energy 7. TRAINING & EDUCATION provided for architects, engineers and other professionals: Written guidelines to assist with compliance procedure Example calculations Compliance forms Seminars, workshops, or conferences Information or resource center 8. Compliance mechanisms used at different stages in construction process: a. PRIOR to construction: Penalty Percent designs checked: Comment: Comment: Comment: Compliance procedures Procent designs checked: Comment: Comment: Comment: Comment: Comment: Comment: Compliance procedures Procent designs checked: Comment: Compliance procedures Procent designs checked: Comment:			an ha italiana an an an aka
7. TRAINING & EDUCATION provided for architects, engineers and other professionals: Written guidelines to assist with compliance procedure Example calculations Compliance forms Seminars, workshops, or conferences Information or resource center B. Compliance mechanisms used at different stages in construction process: a. PRIOR to construction: Penalty Penalty Percent designs checked: Comment: Comment: Compliance procedures -None e. Effectiveness of combined compliance mechanisms (scale of 1-5): 2 f. Explanation for effectiveness in part e:		-	
Written guidelines to assist with compliance procedure Example calculations Compliance forms Seminars, workshops, or conferences Information or resource center	Energy		· · · · · · · · · · · · · · · · · · ·
Example calculations Compliance forms Seminars, workshops, or conferences Information or resource center	7. TRAINING & EDUCATION provided for	architects, engineers and other professionals:	:
Example calculations Compliance forms Seminars, workshops, or conferences Information or resource center 6. Compliance mechanisms used at different stages in construction process: a. PRIOR to construction: Penalty	Written guidelines to assist w	vith compliance procedure	
Compliance forms Seminars, workshops, or conferences Information or resource center	Example calculations		
Information or resource center	Compliance forms		
a. PRIOR to construction: b. DURING construction: C. AFTER construction: Penalty Penalty Penalty Percent designs checked: Percent sites checked: Percent buildings checked: Comment: Comment: Comment: Percent sites checked: d. Other compliance procedures -None	Information or resource center		
a. PRIOR to construction: b. DURING construction: c. AFTER construction: Penalty			
Penalty Penalty Penalty Percent designs checked: - Percent sites checked: - Percent buildings checked: Comment: Comment: Percent sites checked: - Percent buildings checked: d. Other compliance procedures -None - - e. Effectiveness of combined compliance mechanisms (scale of 1-5): 2 - f. Explanation for effectiveness in part e:	Compliance mechanisms used at different	-	
Percent designs checked: Percent sites checked: Percent buildings checked: Comment: Comment: Comment: Percent buildings checked: d. Other compliance procedures -None	a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Percent designs checked: Percent sites checked: Percent buildings checked: Comment: Comment: Comment: Percent buildings checked: d. Other compliance procedures -None	Penalty	Penalty	Penalty
Comment: Comment: Comment:			
Comment: Comment: Comment:	Percent designs checked: ~	Percent sites checked: -	Percent buildings checked:
d. Other compliance procedures -None e. Effectiveness of combined compliance mechanisms (scale of 1-5): 2 f. Explanation for effectiveness in part e:			-
d. Other compliance procedures -None e. Effectiveness of combined compliance mechanisms (scale of 1-5): 2 f. Explanation for effectiveness in part e:	oonnen.	CONTRACT.	
d. Other compliance proceduresNone e. Effectiveness of combined compliance mechanisms (scale of 1-5): _2_ f. Explanation for effectiveness in part e:			
d. Other compliance proceduresNone e. Effectiveness of combined compliance mechanisms (scale of 1-5): _2_ f. Explanation for effectiveness in part e:			
 e. Effectiveness of combined compliance mechanisms (scale of 1-5): _2			
	d. Other compliance proceduresN		
	d. Other compliance procedures <u>-N</u> e. Effectiveness of combined complian f. Explanation for effectiveness in par 9. Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba	one ce mechanisms (scale of 1-5): 2 t e:	
	d. Other compliance procedures <u>-N</u> e. Effectiveness of combined complian f. Explanation for effectiveness in par 9. Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba	one ce mechanisms (scale of 1-5): 2 t e: rgy standards' impact: sed on prototypical (not actual) buildings:	
b. MEASUREMENTS OF ENERGY SAVINGS in actual buildings complying with standard:	d. Other compliance proceduresN e. Effectiveness of combined complian f. Explanation for effectiveness in par 9. Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba Completed	one ce mechanisms (scale of 1-5): _2	
b. MEASUREMENTS OF ENERGY SAVINGS in actual buildings complying with standard: Completed	d. Other compliance proceduresN e. Effectiveness of combined complian f. Explanation for effectiveness in par 9. Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba Completed b. MEASUREMENTS OF ENERGY SAV	one ce mechanisms (scale of 1-5): _2	
• • • • •	d. Other compliance proceduresN e. Effectiveness of combined complian f. Explanation for effectiveness in par 9. Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba Completed b. MEASUREMENTS OF ENERGY SAV	one ce mechanisms (scale of 1-5): _2	
• • • • •	d. Other compliance proceduresN e. Effectiveness of combined complian f. Explanation for effectiveness in par 9. Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba Completed b. MEASUREMENTS OF ENERGY SAV	one ce mechanisms (scale of 1-5): _2	
Completed	d. Other compliance proceduresN e. Effectiveness of combined complian f. Explanation for effectiveness in par 9. Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba Completed b. MEASUREMENTS OF ENERGY SAV Completed	one ce mechanisms (scale of 1-5): _2	
Completed c. COST EFFECTIVENESS based on engineering economic CALCULATIONS:	d. Other compliance proceduresN e. Effectiveness of combined complian f. Explanation for effectiveness in par a. ENERGY SAVINGS POTENTIAL ba Completed b. MEASUREMENTS OF ENERGY SAV Completed c. COST EFFECTIVENESS based on e	one ce mechanisms (scale of 1-5): _2	
Completed	d. Other compliance proceduresN e. Effectiveness of combined complian f. Explanation for effectiveness in par 9. Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba Completed 	one ce mechanisms (scale of 1-5): _2	
Completed c. COST EFFECTIVENESS based on engineering economic CALCULATIONS:	d. Other compliance proceduresN e. Effectiveness of combined complian f. Explanation for effectiveness in par 9. Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba Completed 	one ce mechanisms (scale of 1-5): _2	
Completed Comple	d. Other compliance procedures -N e. Effectiveness of combined compliant f. Explanation for effectiveness in par a. Explanation for effectiveness in par a. ENERGY SAVINGS POTENTIAL bas Completed b. MEASUREMENTS OF ENERGY SAV Completed c. COST EFFECTIVENESS based on e Completed	one ce mechanisms (scale of 1-5): _2	
Completed C. COST EFFECTIVENESS based on engineering economic CALCULATIONS: Completed	d. Other compliance procedures -N e. Effectiveness of combined compliant f. Explanation for effectiveness in par a. Explanation for effectiveness in par a. ENERGY SAVINGS POTENTIAL bas Completed b. MEASUREMENTS OF ENERGY SAVINGS POTENTIAL bas Completed c. COST EFFECTIVENESS based on end Completed d. COST EFFECTIVENESS based or	one ce mechanisms (scale of 1-5): _2	

BELGIUM 4

20. Efficiency testing facilities and procedures establishe	IQ:
Insulation	
· · · · · · · · · · · · · · · · · · ·	
	<u> </u>
21. Other programs or policies developed to increase ener	my afficiency in huildings
Audits (free or subsidized)	existent); guichets de l'energie; A geela EPEE.
	logements soliare, ecoles-hopitaux, lieux de
	cultes (diagnostics thermiques)
	•
Additional sources of information about energy effic	siency for buildings in: Belgium
1. Bilan energetique de la Walemie. Tab	pleau de borol
· · · · · · · · · · · · · · · · · · ·	
2. Applicatin de la réglementatin K90-B	3e500
3. Ecrnotec: rentabilite des investissemen	nts URE pour le logement existant.
Name:	
Address: Ministere de la Région Wallonne direction de l'energie	D.G.T.R.
avenue Prince de Liege, 7	
5100 Namur (Jambes)	
Country: Belgium	
Tei: 32 81 321 541	Fax: 32 81 30 66 00
Types of supporting information available:	
-None	
Other energy standards for non-residential building	35:
-None	
-None	
-None	
Survey completed by:	H. Gleniur Architecte
	Architecte
Survey completed by:	Architecte Ministere de la Région Walernne D.G.T.R. Direction de l'energie; 7, avenue Prince de Liege
Survey completed by: Title:	Architecte Ministere de la Région Walernne D.G.T.R. Direction de l'energie; 7, avenue Prince de Liege 5100 Nomur Country: Belgium
Survey completed by:	Architecte Ministere de la Région Walernne D.G.T.R. Direction de l'energie; 7, avenue Prince de Liege

		CANA	ADA		
ENERAL OVERVIEW O	F BUILDING ENERGY	STANDARDS	Contracting and Proposition		
1. General building stan	dards exist at the following g	jovernmentai levels	: National	Regional	Local
2. Proposed or existing	ENERGY standards cover th	ne following buildin	ng sectors: Both Resid	ential and Non-H	Residential
3. Status of Non-Reside a. National level:	ential Building Energy Stand Proposed	dards at the: b. Regional lev	el: Mandatory	c. Local level: -	Mandatory
	ard selected for further desc	cription:			
Title, Organization:	Loi sur l'économie de l'énergie dans les nou travail. (National Re	veaux Bâtiment	ts. Ministeres de l'energ		
Year: 1983	Geographic Coverage:	Regions	·	NRCC-22432	
ESCRIPTION OF SPECI	FIED ENERGY STAN	DARDS - NRC	°C-22432		
	in Question 4 applies to the f				
a. Building types:		b. Building			
A - All Buildi	ings		ouildings		
		Other ek	aracteristics:		
			-Conditioned		
			ner: heating systems		
·		_			
	······································		······································		
		!			•
6. Basic approach of the	estandard: Prescriptiv	ve			
7. The following subjects	s are included in the energy s	standard:			
a. Whole building en		1	b. Building envelope provisi	ons:	
			• • •		
			Roof		
? - Uncertain			Roof Wall system		
			Wall system Fenestration system	n	
			Wall system Fenestration system Infiltration		
<u>? - Uncertain</u>			Wall system Fenestration system Infiltration Other: thermal pro		als
<u>? - Uncertain</u>			Wall system Fenestration system Infiltration Other: thermal pro d. Mechanical provisions:		als
<u>? - Uncertain</u>			Wall system Fenestration system Infiltration Other: thermal pro d. Mechanical provisions: Controls		als
<u>? - Uncertain</u>			Wall system Fenestration system Infiltration Other: thermal pro d. Mechanical provisions: Controls Ventilation	operties of mater	als
<u>? - Uncertain</u>		· · · · · · · · · · · · · · · · · · ·	Wall system Fenestration system Infiltration Other: thermal pro d. Mechanical provisions: Controls	operties of mater	als
<u>? - Uncertain</u>		· · · · · · · · · · · · · · · · · · ·	Wall system Fenestration system Infiltration Other: thermal pro d. Mechanical provisions: Controls Ventilation	operties of mater	als
<u>? - Uncertain</u> c. Lighting provision <u>Power density</u>	Y	· · · · · · · · · · · · · · · · · · ·	Wall system Fenestration system Infiltration Other: thermal pro d. Mechanical provisions: Controls Ventilation	operties of mater	als
<u>? - Uncertain</u> <u>.</u>	Y		Wall system Fenestration system Infiltration Other: thermal pro d. Mechanical provisions: Controls Ventilation	operties of mater	als
<u>? - Uncertain</u> c. Lighting provision <u>Power density</u>	Y		Wall system Fenestration system Infiltration Other: thermal pro d. Mechanical provisions: Controls Ventilation	operties of mater	als

Corganizations involved in developing the standard:	ouncil
Research group: Canadian National Research Co Research group: ASHRAE with the standard 90.	
Government agency: Bureau de l'efficacite Enèrg	
	· · ·
Decision Process: Mandate Comment:	
0. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Estimated using professional judgment	Estimated using professional judgment
c. WEATHER data	d. Other information
	- None
Already available prior to standard	
	- _
1. Standards from a different country used as source material:	
USA: ASHRAE 90A-1980	•
USA: ASHKAE 90A-1980	
· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
2. COMPUTER programs used:	
2. COMPUTER programs used: a. In developing the standard: - None	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
a. In developing the standard: <u>- None</u>	
a. In developing the standard: <u>- None</u>	
a. In developing the standard: <u>- None</u>	
a. In developing the standard: <u>- None</u>	s in the standard:
a. In developing the standard: <u>- None</u>	s in the standard: Comments:
a. In developing the standard:None	s in the standard: Comments:
a. In developing the standard: <u>- None</u> 	s in the standard: Comments:
a. In developing the standard: - None	s in the standard: Comments:
a. In developing the standard: <u>- None</u> 	s in the standard: Comments:
a. In developing the standard: - None	s in the standard: Comments:
a. In developing the standard: - None	s in the standard: Comments:

If an existing agency was made	responsible for implementation, its former focus wa	s on buildings, energy, or another area;
Buildings		
	d for architects, engineers and other professionals	- ·
•		5.
Seminars, workshops, or c	st with compliance procedure	
Information or resource ce		· · · · · · · · · · · · · · · · · · ·
	· · · · · · · · · · · · · · · · · · ·	
18. Compliance mechanisms used at a	different stages in construction process:	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
a. PRIOR to construction:	b. DURING construction:	
•	b. DURING construction:	
a. PRIOR to construction: Certification/approval	b. DURING construction: Other policy mechanism	Certification/approv
a. PRIOR to construction:	b. DURING construction: Other policy mechanism	Certification/approv
a. PRIOR to construction: Certification/approval Percent designs checked: ?	b. DURING construction: Other policy mechanism Percent sites checked: ?	Certification/approv Percent buildings checked:
a. PRIOR to construction: Certification/approval Percent designs checked: ?	b. DURING construction: Other policy mechanism Percent sites checked: ?	Certification/approv Percent buildings checked:
a. PRIOR to construction: <u>Certification/approval</u> Percent designs checked: ?	b. DURING construction: Other policy mechanism Percent sites checked: ?	Certification/approv Percent buildings checked:
a. PRIOR to construction: Certification/approval Percent designs checked: ?	b. DURING construction: Other policy mechanism Percent sites checked: ?	Certification/approv Percent buildings checked:

19. Types of assessments or audits of energy standards' impact:

- a. ENERGY SAVINGS POTENTIAL based on prototypical (not actual) buildings: Completed
- b. MEASUREMENTS OF ENERGY SAVINGS in actual buildings complying with standard: Completed
- c. COST EFFECTIVENESS based on engineering economic CALCULATIONS: Completed
- d. COST EFFECTIVENESS based on ACTUAL COSTS:
 - Completed

e. Other Assessments: None conducted

CANADA 4

	ncy testing facilities and procedures establish	ed:	
	bitors	··· · ··- ··	<u> </u>
	ulation		<u> </u>
	conditioners/chillers/other applian ermal properties of materials	ces	· · · · · · · · · · · · · · · · · · ·
	ermai properties of materials		······································
	programs or policies developed to increase en dits (free or subsidized)	•••	fings: Bureau de l'efficacite energetique, and
	peling of appliances		Hydro-Quebec.
	lity initiatives		
	vernment energy policy	I	
		— I	
Δdd	litional sources of information about energy eff	iciency for buildings i	in: Canada
		_	
1.			r la maîtrise de l'energie (AQME)
	•		Quebec. H3B 2G2 Canada
2.			
3			· .
	<u></u>		
Nam	e		
146811			
Address:			
	Les Publications du Québec		
Address:	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec	• · · ·	
Address:	Les Publications du Québec 3, Complexe des Jardins	•	
Address: Cour	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada	Far: 514 873-0)369
Address: Cour Tel:	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada 514 873 6101	Fax: 514 873-0	1369
Address: Cour Tel:	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada 514 873 6101 es of supporting information available:		· · · · · ·
Address: Cour Tel:	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada 514 873 6101 es of supporting information available:)369 : Autumn 1992 from les publications du Québe
Address: Cour Tel:	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada 514 873 6101 es of supporting information available:		· · · · · ·
Address: Cour Tel: Type	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada 514 873 6101 es of supporting information available: "Reglement Commenté" (New edition	n will be available	· · · · · ·
Address: Cour Tel: Type	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada 514 873 6101 es of supporting information available: "Reglement Commenté" (New edition er energy standards for non-residential buildir	n will be available	: Autumn 1992 from les publications du Québe
Address: Cour Tel: Type	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada 514 873 6101 es of supporting information available: "Reglement Commenté" (New edition	n will be available	: Autumn 1992 from les publications du Québ
Address: Cour Tel: Type	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada 514 873 6101 es of supporting information available: "Reglement Commenté" (New edition er energy standards for non-residential buildir	n will be available	: Autumn 1992 from les publications du Québe
Address: Cour Tel: Type	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada 514 873 6101 es of supporting information available: "Reglement Commenté" (New edition er energy standards for non-residential buildir	n will be available	: Autumn 1992 from les publications du Québe
Address: Cour Tel: Type	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada 514 873 6101 es of supporting information available: "Reglement Commenté" (New edition er energy standards for non-residential buildir Energy Efficiency of Electrical and H	n will be available 195: Iydrocarbon-Fuele	: Autumn 1992 from les publications du Québe ed Appliances Law.
Address: Cour Tel: Type	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada 514 873 6101 es of supporting information available: "Reglement Commenté" (New edition er energy standards for non-residential buildir Energy Efficiency of Electrical and H Survey completed by:	n will be available Igs: lydrocarbon-Fuele Jean-Pierre Rc	: Autumn 1992 from les publications du Québe ed Appliances Law.
Address: Cour Tel: Type	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada 514 873 6101 es of supporting information available: "Reglement Commenté" (New edition er energy standards for non-residential buildir Energy Efficiency of Electrical and H	n will be available Igs: Iydrocarbon-Fuele Jean-Pierre Ro Chef de Divis	ed Appliances Law.
Address: Cour Tel: Type	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada 514 873 6101 es of supporting information available: "Reglement Commenté" (New edition er energy standards for non-residential buildir Energy Efficiency of Electrical and H Survey completed by:	n will be available Igs: Iydrocarbon-Fuele Jean-Pierre Ro Chef de Divis Bureau de l'ef	ed Appliances Law.
Address: Cour Tel: Type	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada 514 873 6101 es of supporting information available: "Reglement Commenté" (New edition er energy standards for non-residential buildir Energy Efficiency of Electrical and H Survey completed by:	n will be available Igs: Iydrocarbon-Fuele Jean-Pierre Ro Chef de Divis Bureau de l'ef	ed Appliances Law.
Address: Cour Tel: Type	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada 514 873 6101 es of supporting information available: "Reglement Commenté" (New edition er energy standards for non-residential buildir Energy Efficiency of Electrical and H Survey completed by:	Jean-Pierre Rc Chef de Divis Bureau de l'ef 425 Ave. Viger	ed Appliances Law.
Address: Cour Tel: Type	Les Publications du Québec 3, Complexe des Jardins H5B 13E Quebec ntry: Canada 514 873 6101 es of supporting information available: "Reglement Commenté" (New edition er energy standards for non-residential buildir Energy Efficiency of Electrical and H Survey completed by: Title:	Jean-Pierre Ro Chef de Divis Bureau de l'ef 425 Ave. Viger Montreal, H22	ed Appliances Law. Py ion: Conseils ficacité énergétique r Ouest, Bureau 600 Z 1W9 Country: Canada

	CHII	ĽE		
OF BUILDING ENERGY ST	TANDARDS			
undards exist at the following gov	emmental levels:	National	Regional	Local
g ENERGY standards cover the f	ollowing building	sectors: Both Res	idential and Non-	Residential
dential Building Energy Standard Mandatory Voluntary			c. Local level:	
dard selected for further descrip n: <u>Nch 1029 y Wch1960</u>				
Geographic Coverage:	Nation	Abbreviated Title:	Nch 1029 y Wch1	960
CIFIED ENERGY STANDA	RDS - Nch 10	29 y Wch1960		
dings the standard: <u>Performance</u>	b. Building vin Both nev c. Other chara - None - None 	tage: v and existing acteristics: Building envelope prov Roof Wall system Fenestration syst		· · ·
ons:	d			
	andards exist at the following gov ng ENERGY standards cover the following standards dential Building Energy Standard <u>Mandatory</u> Voluntary dard selected for further descript n: Nch 1029 y Wch1960 Geographic Coverage: CIFIED ENERGY STANDA d in Question 4 applies to the follow dings the standard: <u>Performance</u> the standard: <u>Performance</u> the standard: <u>Performance</u> statemergy provisions: ons:	OF BUILDING ENERGY STANDARDS andards exist at the following governmental levels: ig ENERGY standards cover the following building dential Building Energy Standards at the: Mandatory b. Regional level: Voluntary dard selected for further description: m: Nch 1029 y Wch1960 Geographic Coverage: Nation CIFIED ENERGY STANDARDS - Nch 10 dings b. Building vin Both nev c. Other chara - None - - None - - Standard: Performance-based energy provisions: b ons: -	andards exist at the following governmental levels: National g ENERGY standards cover the following building sectors: Both Residential Building Energy Standards at the: Mandatory b. Regional level:	DF BUILDING ENERGY STANDARDS andards exist at the following governmental levels: National Regional ig ENERGY standards cover the following building sectors: Both Residential and Non- dential Building Energy Standards at the:

Government agency: Institute Nacional Normali	zacion
Academic institution: Universidades	
Local interest group	· · ·
	· · · · · · · · · · · · · · · · · · ·
9. Decision Process: Consensus Comment:	· · · · · · · · · · · · · · · · · · ·
10. Information used in developing the standard:	I
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Gathered through audits and surveys	Gathered through audits and surveys
c. WEATHER data	d. Other information
	- None
Gathered through measurements	
2. COMPUTER programs used: a. In developing the standard: <u>- None</u>	b. For complying with the standard: No
	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
a. In developing the standard: - None	
a. In developing the standard: <u>- None</u> 3. Standard is set at a level: <u>Lower than current practice</u> 4. Considerations influencing the inclusion or exclusion of measures	
a. In developing the standard: _ None	
a. In developing the standard:None 3. Standard is set at a level: Lower than current practice 4. Considerations influencing the inclusion or exclusion of measures: Availability of energy efficient products	; in the standard: Comments:
a. In developing the standard:None	
a. In developing the standard:None 3. Standard is set at a level: Lower than current practice 4. Considerations influencing the inclusion or exclusion of measures Availability of energy efficient products Similarity/difference to local design	s in the standard: Comments:
a. In developing the standard:None	s in the standard: Comments:
a. In developing the standard:None	s in the standard: Comments:

3 CHILE

If an existing agency was made respon	sible for implementation, its former focus was	on buildings, energy, or another area:
Buildings	· · · · · ·	
	white the engineers and other professionals	•
	rchitects, engineers and other professionals	
Written guidelines to assist wit	h compliance procedure	
Example calculations		
	ences	
Information or resource center		
Compliance mechanisms used at differen	t stages in construction process:	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval	No mechanism	No mechanism
Incentive		
Percent designs checked:	Percent sites checked:	Percent buildings checked
Comment:	Comment:	Comment:
d. Other compliance procedures	mechanisms (scale of 1-5): _5_	· ·
e. Effectiveness of combined compliance	e mechanisms (scale of 1-5): _5_	· · · · · · · · · · · · · · · · · · ·
e. Effectiveness of combined compliance		· · · · · · · · · · · · · · · · · · ·
e. Effectiveness of combined compliance	: 	· · · · · · · · · · · · · · · · · · ·
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e	y standards' impact:	· · · · · · · · · · · · · · · · · · ·
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e Types of assessments or audits of energy	y standards' impact: ed on prototypical (not actual) buildings:	· · · · · · · · · · · · · · · · · · ·
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base	y standards' impact: ed on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base	y standards' impact: ed on prototypical (not actual) buildings:	· · · · · · · · · · · · · · · · · · ·
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base	y standards' impact: ed on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base	y standards' impact: ed on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base	y standards' impact: ed on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base	y standards' impact: ed on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base ? b. MEASUREMENTS OF ENERGY SAVIN ?	y standards' impact: ed on prototypical (not actual) buildings: NGS in actual buildings complying with stand	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base ? b. MEASUREMENTS OF ENERGY SAVIN ? c. COST EFFECTIVENESS based on en	y standards' impact: ed on prototypical (not actual) buildings: NGS in actual buildings complying with stand	lard:
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base ? b. MEASUREMENTS OF ENERGY SAVIN ? c. COST EFFECTIVENESS based on en	y standards' impact: ed on prototypical (not actual) buildings: NGS in actual buildings complying with stand	lard:
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base ? b. MEASUREMENTS OF ENERGY SAVIN ? c. COST EFFECTIVENESS based on en	y standards' impact: ed on prototypical (not actual) buildings: NGS in actual buildings complying with stand	lard:
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base ? b. MEASUREMENTS OF ENERGY SAVIN ? c. COST EFFECTIVENESS based on en	y standards' impact: ed on prototypical (not actual) buildings: NGS in actual buildings complying with stand	lard:
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e fypes of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base ? b. MEASUREMENTS OF ENERGY SAVIN ? c. COST EFFECTIVENESS based on en ? d. COST EFFECTIVENESS based on A	y standards' impact: d on prototypical (not actual) buildings: NGS in actual buildings complying with stand gineering economic CALCULATIONS: ACTUAL COSTS:	lard:
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base ? b. MEASUREMENTS OF ENERGY SAVIN ? c. COST EFFECTIVENESS based on en ? d. COST EFFECTIVENESS based on A	y standards' impact: ed on prototypical (not actual) buildings: NGS in actual buildings complying with stand	lard:

CHILE 4

	Motors			
_	Insulation			-
7	Air conditio	ners/chillers/other applianc	es	_
	Ballasts			
Ī	Fixtures			_
-	Thermal pro	nortice of materials		_
_				_
_				_
21. Oth	er programs of	policies developed to increase ener	rav efficiency in buildings:	
		Ponoto		
-			Comment:	······
-				
-				
_]	· · · · · · · · · · · · · · · · · · ·
		ces of information about energy efficiency		
. 1	1			
			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
	2	······································	· · ·	
•				
	_			
			····	
				· · · · · · · · · · · · · · · · · · ·
N	lame:	· ·		
Addre	ss:			•
C	country:			
			· .	
Т	el:		Fax:	
-	where of current	ting information available:	•	
	ypes of suppor	ung mormation available.	•	· *
		···· · · · · · · · · · · · · · · · · ·		
	·	······································		
0	thar anaray et	andards for non-residential building	10·	
	ula chayysi		j o.	·
			· · · · · · · · · · · · · · · · · · ·	
			· · · ·	
		Survey completed by:	Cabriel Redriterer	· · · · · · · · · · · · · · · · · · ·
		Survey completed by: Title:	Gabriel Rodriguez	
	· •	, inte:	Engineer IDIEM, University of Chile	
			Beaucheff 850	
			Sequencii 000	Country: Chile
				would J. Child
		Tel·	562 608 2071 v 120 Em	E60 671 0700
		Tel:	562-698-2071 x 130 Fa	562-671-2799

a a lâ la	С	HIN	A		
ENERAL OVERVIEW O	F BUILDING ENERGY STAND	DARDS			
1. General building stan	dards exist at the following governme	ental levels:	National	Regional	
-	ENERGY standards cover the followi	-	ctors: Both Resid	lential and Non-F	esidential
			Bour Resid		
3. Status of Non-Reside a. National level:	ntial Building Energy Standards at t Mandatory b. Re	the: egional level: _ -	- None	c. Local level: - - -	- None
4. Single energy standa	rd selected for further description:	-			
Title, Organization:	"Energy Conservation Design Hotels," The National Techn 1992/93				
Year: 1993	Geographic Coverage: <u>Nati</u>	ion	Abbreviated Title:	NTSB-93	
ESCRIPTION OF SPECI	FIED ENERGY STANDARDS	- NTSB-9	3		
5. The standard defined in	n Question 4 applies to the following	kinds of buildi	ngs:		
a. Building types:	b.	. Building vinta	ge:		
H - Hotels		New build	lings		<u></u>
	c	. Other charac	teristics		
	["	A - Air-Co			
	•		· · · · · · · · · · · · · · · · · · ·		
		<u> </u>			
6. Basic approach of the	estandard: Both prescriptive	and perform	nance		
	are included in the energy standard:				
a. Whole building en	ergy provisions:	b. I	Building envelope provis	ions:	
E- Energy amo	ount target		Roof		<u></u>
<u> </u>	<u></u>	<u>. </u>	Wall system Fenestration system		
			Infiltration	<u>.</u>	
c. Lighting provision	~·	Ы	Mechanical provisions:	•	
- None	J.		Air/Water distrib	ution offician-	
- 110/10			Load Calculations		ng
	······································		Controls	equipment old	<u></u>
			Ventilation		
			Equipment efficier	ıcy	
e. Other provisions:					
T	s of insulation for pipe and du	ict. Thermo	stat_settings		
·			0	·	
					······································

).							

Academic institution:	Institute of Air Conditionir	ng
	Beijing Institute of Archite	ctural Design
Decision Process: Consensus		anzhou Institute of Architectureal Design; Middle uth-China Instititute of Architectural Design; East-Chin
0. Information used in developing a a. PHYSICAL CHARACTERIS		b. ENERGY USE of existing buildings:
Estimated using profe	ssional judgment	Gathered through audits and surveys
Gathered through au		
c. WEATHER data	· · · · · · · · · · · · · · · · · · ·	d. Other information
Gathered through me	asurements	- None
	······································	••••••••••••••••••••••••••••••••••••••
2. COMPUTER programs used: a. In developing the standard:	- None	b. For complying with the standard: ?
,	- None	b. For complying with the standard: ?
a. In developing the standard: 3. Standard is set at a level: <u>At</u>	pove current practice	· · · · · · · · · · · · · · · · · · ·
a. In developing the standard: 3. Standard is set at a level: <u>At</u> 4. Considerations influencing the in	pove current practice	in the standard:
 a. In developing the standard: 3. Standard is set at a level: <u>At</u> 4. Considerations influencing the in E - Cost effectiveness 	pove current practice	· · · · · · · · · · · · · · · · · · ·
 a. In developing the standard: 3. Standard is set at a level: <u>At</u> 4. Considerations influencing the in 	pove current practice	in the standard:
 a. In developing the standard: 3. Standard is set at a level: <u>At</u> 4. Considerations influencing the in <u>E - Cost effectiveness</u> <u>A - Availability of energy</u> 	pove current practice	in the standard:
 a. In developing the standard: 3. Standard is set at a level: <u>At</u> 4. Considerations influencing the in <u>E - Cost effectiveness</u> <u>A - Availability of energy</u> 	pove current practice	in the standard: Comments:
a. In developing the standard: 3. Standard is set at a level: <u>At</u> 4. Considerations influencing the in <u>E - Cost effectiveness</u> <u>A - Availability of energy</u> <u>C - Comfort</u> 5a. Standard scheduled for regula	pove current practice clusion or exclusion of measures ergy efficient products f review and revision?	in the standard: Comments:
 a. In developing the standard: 3. Standard is set at a level: <u>At</u> 4. Considerations influencing the in <u>E - Cost effectiveness</u> <u>A - Availability of ene</u> <u>C - Comfort</u> 5a. Standard scheduled for regula <u>Yes: The standard will</u> 	pove current practice clusion or exclusion of measures ergy efficient products f review and revision? be approved by the Burea	in the standard: Comments:

FUTUES UTADACO UT UNIT FEMILIALITAD CU	ergy standards:	
- None: the standard is propo	sed	
If an existing agency was made resp	onsible for implementation, its former focus was	on buildings, energy, or another area:
TRAINING & EDUCATION provided for Written guidelines to assist w	architects, engineers and other professionals	
Example calculations	AA	
Compliance forms		
Seminars, workshops, or confe	erences	
Compliance mechanisms used at differ		
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Percent designs checked:	Percent sites checked:	Percent buildings checked:
Comment:	Comment:	. Comment:
	· · · · · · · · · · · · · · · · ·	
	· · · · _ ·	[
d. Other compliance procedures		
d. Other compliance procedures e. Effectiveness of combined complian	ce mechanisms (scale of 1-5):	
e. Effectiveness of combined compliar	te: The Standard hasn't been approve	[
e. Effectiveness of combined compliar f. Explanation for effectiveness in par	te: The Standard hasn't been approve	[
e. Effectiveness of combined compliar f. Explanation for effectiveness in par Types of assessments or audits of ene	te: The Standard hasn't been approve	[
e. Effectiveness of combined compliar f. Explanation for effectiveness in par Types of assessments or audits of ene a. ENERGY SAVINGS POTENTIAL ba	te: <u>The Standard hasn't been approve</u> 	[
e. Effectiveness of combined compliar f. Explanation for effectiveness in par Types of assessments or audits of ene	te: <u>The Standard hasn't been approve</u> 	
e. Effectiveness of combined compliar f. Explanation for effectiveness in par Types of assessments or audits of ene a. ENERGY SAVINGS POTENTIAL ba <u>Completed: research report</u>	te: <u>The Standard hasn't been approve</u> 	· · · · · · · · · · · · · · · · · · ·
e. Effectiveness of combined compliar f. Explanation for effectiveness in par Types of assessments or audits of ene a. ENERGY SAVINGS POTENTIAL ba Completed: research report	te: The Standard hasn't been approve rgy standards' impact: sed on prototypical (not actual) buildings: (in Chinese)	· · · · · · · · · · · · · · · · · · ·
e. Effectiveness of combined compliar f. Explanation for effectiveness in par Types of assessments or audits of ene a. ENERGY SAVINGS POTENTIAL ba Completed: research report	te: The Standard hasn't been approve rgy standards' impact: sed on prototypical (not actual) buildings: (in Chinese)	· · · · · · · · · · · · · · · · · · ·
e. Effectiveness of combined compliar f. Explanation for effectiveness in par Types of assessments or audits of ene a. ENERGY SAVINGS POTENTIAL ba Completed: research report b. MEASUREMENTS OF ENERGY SA None conducted	te: The Standard hasn't been approve rgy standards' impact: sed on prototypical (not actual) buildings: (in Chinese)	· · · · · · · · · · · · · · · · · · ·
e. Effectiveness of combined compliar f. Explanation for effectiveness in par Types of assessments or audits of ene a. ENERGY SAVINGS POTENTIAL ba Completed: research report	te: The Standard hasn't been approve rgy standards' impact: Ised on prototypical (not actual) buildings: (in Chinese) VINGS in actual buildings complying with stand	· · · · · · · · · · · · · · · · · · ·
e. Effectiveness of combined compliar f. Explanation for effectiveness in par Types of assessments or audits of ene a. ENERGY SAVINGS POTENTIAL ba Completed: research report b. MEASUREMENTS OF ENERGY SA None conducted	te: The Standard hasn't been approve rgy standards' impact: ised on prototypical (not actual) buildings: (in Chinese) VINGS in actual buildings complying with stand engineering economic CALCULATIONS:	· · · · · · · · · · · · · · · · · · ·

	ncy testing facilities and procedures establish	ed:
Ins	ulation	
Air	conditioners/chillers/other applian	ces
The	ermal properties of materials	· · · · · · · · · · · · · · · · · · ·
		· · · · · · · · · · · · · · · · · · ·
		· · · · · · · · · · · · · · · · · · ·
21. Other	programs or policies developed to increase ene	erav efficiency in buildings:
<u>. </u>		
		I
Add	itional sources of information about energy eff	iciency for buildings in: China
1.		
2.		
,		
3.		· · · · · · · · · · · · · · · · · · ·
22. Contac	t for written copy of energy standard specifie	d in Question 4:
22. Contac Nam		d in Question 4:
Nam	<u>e</u>	d in Question 4:
Nam Address:	£	d in Question 4:
Nam	£	d in Question 4:
Nam Address:	£	d in Question 4:
Nam Address: Cour	£	d in Question 4:
Nam Address:	£	d in Question 4: Fax:
Nam Address: Cour Tel:	£	
Nam Address: Cour Tel:	e: ntry:	Fax:
Nam Address: Cour Tel:	e: ntry: es of supporting information available:	Fax:
Nam Address: Cour Tel: Type	e: ntry: es of supporting information available: <u>"Item_Explanation_of_the_Standard."</u>	Fax:
Nam Address: Cour Tel: Type	e: ntry: es of supporting information available:	Fax:
Nam Address: Cour Tel: Type	e: ntry: es of supporting information available: <u>"Item_Explanation_of_the_Standard."</u>	Fax:
Nam Address: Cour Tel: Type	e: ntry: es of supporting information available: <u>"Item_Explanation_of_the_Standard."</u>	Fax:
Nam Address: Cour Tel: Type	e: ntry: es of supporting information available: <u>"Item_Explanation_of_the_Standard."</u>	Fax:
Nam Address: Cour Tel: Type	e: http: es of supporting information available: "Item_Explanation_of_the_Standard." er energy standards for non-residential buildin 	Fax: ngs: Lang Siwei
Nam Address: Cour Tel: Type	e: http: es of supporting information available: "Item_Explanation_of_the_Standard." er energy standards for non-residential buildin	Fax: ngs: Lang Siwei Director, Institute of Air Conditioning
Nam Address: Cour Tel: Type	e: http: es of supporting information available: "Item_Explanation_of_the_Standard." er energy standards for non-residential buildin 	Fax: ngs: Lang Siwei Director, Institute of Air Conditioning China Academy of Building Research
Nam Address: Cour Tel: Type	e: http: es of supporting information available: "Item_Explanation_of_the_Standard." er energy standards for non-residential buildin 	Fax: ngs: Lang Siwei Director, Institute of Air Conditioning China Academy of Building Research P.O. Box 752
Nam Address: Cour Tel: Type	e: http: es of supporting information available: "Item_Explanation_of_the_Standard." er energy standards for non-residential buildin 	Fax: ngs: Lang Siwei Director, Institute of Air Conditioning China Academy of Building Research P.O. Box 752 Beijing 100013 Country: PR China

		OMBIA	
ENERAL OVERVIEW O	F BUILDING ENERGY STANDAR	IDS	
1. General building stan	idards exist at the following governmental	levels: National	
2. Proposed or existing	ENERGY standards cover the following I	building sectors: Both Residential and I	Non-Residential
3 Status of Non-Resid	ential Building Energy Standards at the:		
a. National level:	Proposed b. Region	nai level: c. Local	ievel:
-	Mandatory		
-	Voluntary	<u> </u>	
4. Single energy stand	ard selected for further description:		
Title, Organization	Proposed energy standard		
			······································
Year: 199?	Geographic Coverage: Nation	Abbreviated Title: PES	
SCRIPTION OF SPEC	IFIED ENERGY STANDARDS -	PES	
5. The standard defined	in Question 4 applies to the following kind	ls of buildings:	
a. Building types:		ilding vintage:	
O - Offices	<u>N</u>	lew buildings	
<u>H - Hotels</u> G - Governm	c. Ot	her characteristics:	
	cial/retail stores	- Physical size (10,000 sq. ft)	
······································		- Air-Conditioned	·····
	mily residential		
<u> </u>			
0 Dentis annuards ad th			
6. Basic approach of th	e standard: Both prescriptive and	l performance	
7. The following subjects	s are included in the energy standard:		
a. Whole building en	ergy provisions:	b. Building envelope provisions:	
- None		- None	
<u> </u>			
c. Lighting provisior	16'	d. Mechanical provisions:	
			ncy
<u>Control requir</u> Power densit	rements	Air/Water distribution efficient	
Control requi Power density Illumination	rements y	Load Calculations for equipment	
Power densit	rements y		
Power densit	rements y	Load Calculations for equipment Controls	
Power densit	rements y requirements	Load Calculations for equipmen Controls Ventilation	
Power densit	rements y requirements :	Load Calculations for equipmen Controls Ventilation	

COLOMBIA 2

Government agency: Comicion Nacional de Energ	gia
Industry group Academic institution	
Foreign development agency: World Bank	
Toreign development agency. World bank	
. Decision Process: Consensus Comment:	
0. Information used in developing the standard:	· · · · · · · · · · · · · · · · · · ·
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Gathered through audits and surveys	Gathered through audits and surveys
	·
c. WEATHER data	d. Other information
	- None
Gathered through measurements	-
·	-
1. Standards from a different country used as source material:	
USA: ASHRAE 90.1-89	
Jamaica: EEBC-90	······································
<u></u>	
	<u> </u>
·	
2. COMPUTER programs used:	· · · · · · · · · · · · · · · · · · ·
a. In developing the standard: <u>DOE-2</u>	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
a. In developing the standard: DOE-2	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
a. In developing the standard: DOE-2	
a. In developing the standard: DOE-2	
a. In developing the standard: DOE-2 B. Standard is set at a level: Equal to current practice Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness	s in the standard:
a. In developing the standard: DOE-2	s in the standard:
a. In developing the standard: DOE-2 B. Standard is set at a level: Equal to current practice Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness A - Availability of energy efficient products S - Similarity/difference to local design	s in the standard:
a. In developing the standard: DOE-2	s in the standard:
a. In developing the standard: DOE-2 B. Standard is set at a level: Equal to current practice Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness A - Availability of energy efficient products S - Similarity/difference to local design	s in the standard:
a. In developing the standard: DOE-2 B. Standard is set at a level: Equal to current practice B. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness A - Availability of energy efficient products S - Similarity/difference to local design C - Comfort	s in the standard:
a. In developing the standard: DOE-2 B. Standard is set at a level: Equal to current practice B. Standard is set at a level: Equal to current practice B. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness A - Availability of energy efficient products S - Similarity/difference to local design C - Comfort	s in the standard: Comments:
a. In developing the standard: DOE-2 B. Standard is set at a level: Equal to current practice B. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness A - Availability of energy efficient products S - Similarity/difference to local design C - Comfort	s in the standard: Comments:
a. In developing the standard: DOE-2 B. Standard is set at a level: Equal to current practice B. Standard is set at a level: Equal to current practice B. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness A - Availability of energy efficient products S - Similarity/difference to local design C - Comfort	s in the standard: Comments:
a. In developing the standard: DOE-2 B. Standard is set at a level: Equal to current practice B. Standard is set at a level: Equal to current practice B. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness A - Availability of energy efficient products S - Similarity/difference to local design C - Comfort	s in the standard: Comments:

3 COLOMBIA

Existing agency: utilities	ergy standards:	
If an existing agency was made resp	ponsible for implementation, its former focus was	on buildings, energy, or another area:
Energy		
TRAINING & EDUCATION provided fo	r architects, engineers and other professionals	· · · · · · · · · · · · · · · · · · ·
Written guidelines to assist v		
Example calculations		
Compliance forms		
Seminars, workshops, or conf	erences	
Information or resource center	r	
Compliance mechanisms used at differ	rent stages in construction process:	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Incentive	Incentive	Incentive
Percent designs checked:	Percent sites checked:	Percent buildings checked
Comment:	Comment:	Comment
Voliment.		Consticut
· · · · · · · · · · · · · · · · · · ·		
	new maskeniews (seels of 1 5).	
Types of assessments or audits of ene	rte:	
e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ene a. ENERGY SAVINGS POTENTIAL ban None conducted	rt e:	
e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ene a. ENERGY SAVINGS POTENTIAL ban None conducted	rt e: rgy standards' impact: ased on prototypical (not actual) buildings:	
e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ene a. ENERGY SAVINGS POTENTIAL band None conducted	rt e:	
e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ene a. ENERGY SAVINGS POTENTIAL ban None conducted	rt e:	
e. Effectiveness of combined complian f. Explanation for effectiveness in par f. Explanation for effectiveness in par f. Explanation for effectiveness in par f. Explanation for effectiveness in par a. ENERGY SAVINGS POTENTIAL base None conducted b. MEASUREMENTS OF ENERGY SA None conducted c. COST EFFECTIVENESS based on None conducted d. COST EFFECTIVENESS based on	rt e:	

20 Efficiency tecting to	cilities and procedures established	4.	
20. Eniciency cesting rat	·		
Ballasts			
		·	
	······································		
		<u>_</u>	
21. Other programs or p	olicies developed to increase energ	gy efficiency in buildings:	
- None		Comment:	·
	· · · · · · · · · · · · · · · · · · ·		
Additional source	s of information about energy effic	iency for buildings in: Colombia	
1. World Bar	nk preliminary report: Estud	liode Eficiencia Energetica en Colombia (Phase 18	&2, in Spanisł
<u> </u>			.
2			
3			
	· · · · · · ·	• ,	
22. Contact for written c	copy of energy standard specified	• ,	
	opy of energy standard specified	• ,	
Name: -	copy of energy standard specified	• ,	
Name: - Address:	opy of energy standard specified	• ,	
Name: -	opy of energy standard specified	• ,	
Name: - Address:	opy of energy standard specified	• ,	
Name: - Address:	copy of energy standard specified	• ,	
Name: - Address: Country:	opy of energy standard specified	• ,	
Name: - Address: Country: Tel:		in Question 4:	
Name: - Address: Country: Tel:	opy of energy standard specified ng information available:	in Question 4:	-
Name: - Address: Country: Tel:		in Question 4:	
Name: - Address: Country: Tel:		in Question 4:	
Name: - Address: Country: Tel: Types of supportin	ng information availab le :	in Question 4: Fax:	
Name: - Address: Country: Tel: Types of supportin	ng information available: ndards for non-residential building	in Question 4: Fax:	
Name: - Address: Country: Tel: Types of supportin	ng information available: ndards for non-residential building	in Question 4: Fax:	
Name: - Address: Country: Tel: Types of supportin	ng information available: ndards for non-residential building	in Question 4: Fax:	
Name: - Address: Country: Tel: Types of supportin	ng information available: ndards for non-residential building	in Question 4: Fax:	
Name: - Address: Country: Tel: Types of supportin	ng information available: ndards for non-residential building	in Question 4: Fax: IS:	
Name: - Address: Country: Tel: Types of supportin	ng information available: ndards for non-residential building	in Question 4: Fax: Is: Santiago Moreno Principal	
Name: - Address: Country: Tel: Types of supportin	ng information available: ndards for non-residential building Survey completed by:	in Question 4: Fax: Js: Santiago Moreno Principal W.J. Dannehy	
Name: - Address: Country: Tel: Types of supportin	ng information available: ndards for non-residential building Survey completed by:	Fax: Fax: Santiago Moreno Principal W.J. Dannehy 3717 Columbia Pike, Suite 200	
Name: - Address: Country: Tel: Types of supportin	ng information available: ndards for non-residential building Survey completed by: Title:	Fax: Fax: Santiago Moreno Principal W.J. Dannehy 3717 Columbia Pike, Suite 200 Arlington, VA 22204 Country:	
Name: - Address: Country: Tel: Types of supportin	ng information available: ndards for non-residential building Survey completed by:	Fax: Fax: Santiago Moreno Principal W.J. Dannehy 3717 Columbia Pike, Suite 200	

C - 25

ERAL OVERVIEW O	CZEC	STANDARDS			
	dards exist at the following go		National	1	
·		· ·		I	
2. Proposed or existing	ENERGY standards cover the	e tollowing building se	Both Resid	ential and Non-Re	sidential
	ential Building Energy Standa				- None
a. National level: _	Mandatory	b. Regional level:	- None	c. Local level:	
		- · _			
4. Single energy standa	ard selected for further descr	iption:			
Title, Organization:	CSN 73.0540 Thermo-1	echnical propertie	s of engineering str	uctures and building	gs
	Nomenclature. Requi		ia <u>. 1/1/79, Federal</u>	office for Standards	and
	Measurement, Prague				
Year: <u>1979</u>	Geographic Coverage:	Nation	Abbreviated Title:	CSN 73 0540	
CRIPTION OF SPEC	FIED ENERGY STAND	ARDS - CSN 73	0540	•	•
	n Question 4 applies to the fo				•
a. Building types:		b. Building vinta	-		
O - Offices			and existing		
H - Hotels		c. Other charac	toriotioo		
F - Restauran					
D - Hospitals			l size: volume		
	mily residential	<u>E - Amoun</u>	t of energy: depende	nt on size	
X - Other: ag	ricultural buildings	_			
			····		
		I		······································	
C Decis annuach of th	e standard. Doutours and	a based			
6. Basic approach of th	e standard: Performanc	e-based	·		
7. The following subjects	s are included in the energy st	andard:			•
a. Whole building en	ergy provisions:	b.1	Building envelope provis	ions:	
E- Energy am			Roof		
<u> 1 Liter</u> gy unit			Wall system	<u></u>	L
				n	
		· · · · · · · · · · · · · · · · · · ·	Fenestration system		
· · · · · · · · · · · · · · · · · · ·		······	Fenestration system Infiltration		
			Infiltration Other: floor		
c. Lighting provision	15:	d.	Infiltration Other: floor Mechanical provisions:		
c. Lighting provisio r - None	15:	d.	Infiltration Other: floor		
	15:	d.	Infiltration Other: floor Mechanical provisions:		
	15:	d.	Infiltration Other: floor Mechanical provisions:		
	15:	d.	Infiltration Other: floor Mechanical provisions:		
- None		d.	Infiltration Other: floor Mechanical provisions:		
		d.	Infiltration Other: floor Mechanical provisions:		
- None		d.	Infiltration Other: floor Mechanical provisions:		

CZECHOSLOVAKIA 2

Academic institution: Technical University, Pr	
Government agency: Ministry of Building Trade	
Other: design organzations	· · · · · · · · · · · · · · · · · · ·
<u> </u>	
Decision Process: Consensus Comment:	· · · · · · · · · · · · · · · · · · ·
0. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	h ENERCY LICE of existing buildings
	b. ENERGY USE of existing buildings:
Estimated using professional judgment	Estimated using professional judgment
Gathered through audits and surveys	Gathered through audits and surveys
·	- · [·
c. WEATHER data	d. Other information
Estimated using professional judgment	- None
Gathered through measurements	
	- · · · · · ·
1. Standards from a different country used as source material:	
Germany: DIN 4108 Wämeschutz im Hochban	• •
Austria: Onorm B 8110	· · · · · · · · · · · · · · · · · · ·
······································	
· .	
2. COMPUTER programs used:	· · · ·
a. In developing the standard: _ None	b. For complying with the standard: ?
	· · · · · · · · · · · · · · · · · · ·
· · · · · · · · · · · · · · · · · · ·	
3. Standard is set at a level: Above current practice	· · · · · · · _ · _ · _ · _ · · _ ·
4. Considerations influencing the inclusion or exclusion of measure	es in the standard:
E - Cost effectiveness	Comments:
Similarity/difference to local design	Cost effectiveness is dominant.
Comfort	
	_
5a. Standard scheduled for regular review and revision?	
-	y organizations that play important roles in developing
standards.	

3 CZECHOSLOVAKIA

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	for Standards	
••••	ible for implementation, its former focus was o	
7. TRAINING & EDUCATION provided for arc	•	
Written guidelines to assist with Example calculations		
Example calculations Seminars, workshops, or conferer	nces	
3. Compliance mechanisms used at different	stages in construction process:	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval	Penalty	Certification/approval
Beneral declarate de 100	Demark alter shades to 50	Description of the state of the
Percent designs checked: <u>100</u> Comment:	Percent sites checked: 50 Comment:	Percent buildings checked: 90 Comment:
Comman	Continent	
d. Other compliance procedures <u>- Non</u> e. Effectiveness of combined compliance r		
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based	nechanisms (scale of 1-5): _5_ Designers and realizers [builders] m standards' impact:	ust cooperate.
 e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING Completed: Rehanek, J. "Improv 	nechanisms (scale of 1-5): _5_ Designers and realizers [builders] m standards' impact: on prototypical (not actual) buildings:	rd:
 e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING Completed: Rehanek, J. "Improv In progress 	nechanisms (scale of 1-5): _5_ Designers and realizers [builders] m standards' impact: on prototypical (not actual) buildings: GS in actual buildings complying with standa rement of Thermo-Technical Propertie	rd:
 e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING Completed: Rehanek, J. "Improv In progress c. COST EFFECTIVENESS based on enging the progress based on	mechanisms (scale of 1-5): _5_ Designers and realizers [builders] m standards' impact: on prototypical (not actual) buildings: GS in actual buildings complying with standa vement of Thermo-Technical Propertion ineering economic CALCULATIONS:	rd: es of Building Structures. SNTL Pr
 e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING Completed: Rehanek, J. "Improv In progress c. COST EFFECTIVENESS based on enging the progress based on	nechanisms (scale of 1-5): _5_ Designers and realizers [builders] m standards' impact: on prototypical (not actual) buildings: GS in actual buildings complying with standa rement of Thermo-Technical Propertie	rd: es of Building Structures. SNTL Pr
 e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING Completed: Rehanek, J. "Improv In progress c. COST EFFECTIVENESS based on enging the progress based on	mechanisms (scale of 1-5): _5_ Designers and realizers [builders] m standards' impact: on prototypical (not actual) buildings: GS in actual buildings complying with standa vement of Thermo-Technical Propertion ineering economic CALCULATIONS:	rd: es of Building Structures. SNTL Pr
 e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING Completed: Rehanek, J. "Improv In progress c. COST EFFECTIVENESS based on engi In progress 	mechanisms (scale of 1-5): _5_ Designers and realizers [builders] m standards' impact: on prototypical (not actual) buildings: GS in actual buildings complying with standa vement of Thermo-Technical Propertion ineering economic CALCULATIONS:	rd: es of Building Structures. SNTL Pr

CZECHOSLOVAKIA 4

FURTHER INFORMATION ON ENERGY CONSERVATION - Czechoslovakia

20. Efficiency testing facilities and procedures established:

Motors

Insulation

Air conditioners/chillers/other appliances

Fixtures

?

Thermal properties of materials

Other: fire protection of materials

21. Other programs or policies developed to increase energy efficiency in buildings:

Additional sources of information about energy efficiency for buildings in: Czechoslovakia

- 1. Journal of Federal Office for Standards and Measurement (in Czech, Magazín CSN)
- Halabyja, M. et. al: "Building Thermal Technics, Acoustics, and Daylighting." Alfa Bratislava, 1985. (In Slovak, "Stavebna Tepelna Technika, Akustika a Osvetlenie.")

Comment:

3. Rehanek, J. 1982. Thermo-Technical Standards. (In Czech, "Tepelne Technicke Normy") Funm Prague.

22. Contact for written copy of energy standard specified in Question 4:

Name:

Address: Federal Office for Standards and Measurement Distribution of CSN Na Príkope 17 113 47 Prague

Country: Czechoslovakia

Tel: 235 2152

Fax:

Types of supporting information available:

Rehanek, J. 1982. Thermo-Technical Standards. (In Czech, "Tepelne Technicke Normy") Funm Prague.

Other energy standards for non-residential buildings:

CSN 73 0560: Thermo-Technical Properties of Engineering Structures. Industrial Plants. (FESM)

Survey completed by: Title:	Ivan Chmurny Slovak Technical U Department of Build Radlinského 11 813 68 Bratislava		cs	Country:	Czechoslovakia
Tel:	427-57448	Fax:	427-499	•	
Date completed:	6/30/92				

dl âll	Ι	DENMAR	RK		<u>Bâ</u> im
ERAL OVERVIEW O	OF BUILDING ENERGY	STANDARDS			
1. General building star	ndards exist at the following (governmental levels:	National	<u> </u>	
2. Proposed or existing	g ENERGY standards cover t	he following building sectors	Both Res	dential and Non-R	esidential
3 Status of Non-Resid	ential Building Energy Stan	dards at the			
a. National level:	Mandatory		- None	c. Local level: - -	- None
- 4. Single energy stand	lard selected for further des	cription:		-	
Title, Organization	Building Regulations	s, Danish Ministry of Bu	uilding and H	ousing (Effective A	pril 1, 1983)
Year: 1982	Geographic Coverage:	Nation Abbr	reviated Title:	BR-DMBH, 1982	
CRIPTION OF SPEC	IFIED ENERGY STAN	DARDS - BR-DMBH,	1982		
5. The standard defined	in Question 4 applies to the	following kinds of buildings:			
a. Building types:		b. Building vintage:			
A - All Build	lings	New buildings	}		· · · · · · · · · · · · · · · · · · ·
		— c. Other characterist	tics:		
· · · · · · · · · · · · · · · · · · ·		P - Physical siz	ze		
					······
					· · · · · · · · · · · · · · · · · · ·
<u> </u>	<u></u>				
6. Basic approach of the	he standard: Both press	riptive and performanc	:e	-	•
7. The following subject	ts are included in the energy s	standard:			
a. Whole building e		_	ng envelope provi	isions:	
- None		Root			
			l system		· · · · · ·
		Fene	estration syste	em	
	. =:=: =: ,	Infil	ltration		
a 1 inkline new 2-'-		d Maaba	anical provisions:		-, <u>·</u> ,
c. Lighting provisio - None	115.		-		
- INOILE	· · · · · · · · · · · · · · · · · · ·	<u>Cont</u>	trois tilation		
······································				requirements for ce	ntral heating
		[
);				· · · ·
e. Other provisions					
e. Other provisions - None	· · · · · · · · · · · · · · · · · · ·				

DENMARK **2**

Government agency: Building Agency	· · · · · · · · · · · · · · · · · · ·
Government agency: Energy Agency	· · · · · · · · · · · · · · · · · · ·
Research group: National Building Research Ins	stitute
	· · · · · · · · · · · · · · · · · · ·
	······································
9. Decision Process: Consensus Comment:	
10. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b ENEDCY USE of existing buildings
a. Philoical chanacienistics of existing buildings	b. ENERGY USE of existing buildings:
-	· · · · · · · · · · · · · · · · · · ·
	·
	-
c. WEATHER data	d. Other information
	Building Regulations concern only new buildings
-	
11. Standards from a different country used as source material:	
- None	
2. COMPUTER programs used:	
a. In developing the standard: TSBI	b. For complying with the standard: No
· · ·	
· · · · · · · · · · · · · · · · · · ·	
· .	
····	
3. Standard is set at a level: Above current practice	
3. Standard is set at a level: Above current practice	
4. Considerations influencing the inclusion or exclusion of measures	
4. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness	s in the standard: Comments:
4. Considerations influencing the inclusion or exclusion of measures <u>E</u> - Cost effectiveness Availability of energy efficient products	Comments:
4. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness	
4. Considerations influencing the inclusion or exclusion of measures <u>E</u> - Cost effectiveness Availability of energy efficient products	Comments:
4. Considerations influencing the inclusion or exclusion of measures <u>E</u> - Cost effectiveness Availability of energy efficient products	Comments:
4. Considerations influencing the inclusion or exclusion of measures <u>E</u> - Cost effectiveness Availability of energy efficient products	Comments:
4. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Availability of energy efficient products Comfort 15a. Standard scheduled for regular review and revision?	Comments:
4. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Availability of energy efficient products Comfort 15a. Standard scheduled for regular review and revision?	Comments:
4. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Availability of energy efficient products Comfort 15a. Standard scheduled for regular review and revision?	Comments:

3 DENMARK

	ible for implementation, its former focus was on	buildings, energy, or another area:
Buildings		
. TRAINING & EDUCATION provided for arc	chitects, engineers and other professionals:	
Written guidelines to assist with	a compliance procedure	
·		·····
	······································	
	· · · · · · · · · · · · · · · · · · ·	
. Compliance mechanisms used at different	charac in construction process:	· · · · · · · · · · · · · · · · · · ·
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval	Certification/approval	Certification/approval
Percent designs checked: ?	Percent sites checked: ?	Percent buildings checked: ?
Comment:	Comment:	Comment
	•	, I -
d. Other compliance procedures		
e. Effectiveness of combined compliance	mechanisms (scale of 1-5): 4	
	· · · <u> </u>	
f. Explanation for effectiveness in part e:	Tradition and extended reliability.	······································
	standards' impact	
Types of assessments or audits of energy		
Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based	-	
	-	
a. ENERGY SAVINGS POTENTIAL based	-	
a. ENERGY SAVINGS POTENTIAL based	l on prototypical (not actual) buildings:	
a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING	l on prototypical (not actual) buildings: GS in actual buildings complying with standard	l:
a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING	l on prototypical (not actual) buildings:	l:
a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING Completed	l on prototypical (not actual) buildings: GS in actual buildings complying with standard	l:
a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING Completed c. COST EFFECTIVENESS based on eng	l on prototypical (not actual) buildings: GS in actual buildings complying with standard ineering economic CALCULATIONS:	
a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING Completed c. COST EFFECTIVENESS based on eng	l on prototypical (not actual) buildings: GS in actual buildings complying with standard	
a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING Completed c. COST EFFECTIVENESS based on eng Completed	I on prototypical (not actual) buildings: GS in actual buildings complying with standard ineering economic CALCULATIONS:	
a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING Completed c. COST EFFECTIVENESS based on eng	I on prototypical (not actual) buildings: GS in actual buildings complying with standard ineering economic CALCULATIONS:	

DENMARK 4

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20. E	fficien	cy testing faci	ities and pro	ocedures est	ablished	d:					
	-	•	-								
	The	mal prope	ties of m	aterials							
	Oth	er: boilers (oil and ga	s)							
		·									
					_						
					-						
						·					
21. C)ther p	rograms or pol	icies develo	ped to increa	ise energ	gy efficiency in build	dings:				
	-	•		-			Energy effic	iencv	has been	under tł	ne Ministry
	Aud	rmation pro lits (free or s	ubsidized)			Housing and	d Buil	ding up t	o 1989. v	whereafter
	Reh						Ministry of	Energ	v took ov	<u>er (i.e. E</u>	nergy
						<u> </u>	Agency).		<u>.</u>		
				· · · <u></u> · · · · · · · · · · · · · · · ·		— I					
	Addi	tional sources	of informativ	n shout ene	rav effici	iency for buildings	in Denmark			1. T	
		1 () () () () () () () () () (•••						
	1.	<u>"Denmark I</u>	Jses Energ	zy Better,"	Nation	nal_Building_Ag	ency				
	-		·								
	2	<u>"Energy Eff</u>	ciency_in_	New Build	lings.".	Report conduct	ted by COWIc	ronsul	t and SB	in Denr	nark at the
	-	request of th	e Commis	sion of the	Europ	ean Communiti	es, December	1991.			
	3										
	3			·							
22. C	ontact	for written co				in Question 4:					
	-	for written co							 -		
	ontact Name	t for written co									
	ontact Name iress:	t for written co									
	ontact Name iress:	t for written co									
	ontact Name iress: Coun	t for written co				in Question 4:					
	ontact Name iress:	t for written co									
	ontact Name iress: Coun Tel:	t for written co	by of energy	, standard sj		in Question 4:		· · · · · · · · · · · · · · · · · · ·			
	ontact Name iress: Coun Tel:	t for written co :: try:	by of energy	, standard sj		in Question 4:				· .	
	ontact Name iress: Coun Tel:	t for written co :: try:	by of energy	, standard sj		in Question 4:				· .	
	ontact Name iress: Coun Tel:	t for written co :: try:	by of energy	, standard sj		in Question 4:				· · · · · · · · · · · · · · · · · · ·	
	ontact Name Iress: Coun Tel: Type	t for written co :: try:	py of energy	y standard sj n available:	pecified	in Question 4: Fax:			· · · · · · · · · · · · · · · · · · ·	·	
	ontact Name Iress: Coun Tel: Type Other	t for written co try: s of supporting r energy stand	py of energy information ards for nor	y standard sj n available: n-residential	pecified	in Question 4: Fax:			ations an	d Heatir	12
	ontact Name Iress: Coun Tel: Type Other	t for written co try: s of supporting r energy stand	py of energy information ards for nor	y standard sj n available: n-residential	pecified	in Question 4: Fax:			ations an	d Heatir	18
	ontact Name Iress: Coun Tel: Type Other	t for written co try: s of supporting r energy stand	py of energy information ards for nor	y standard sj n available: n-residential	pecified	in Question 4: Fax:			utions an	d Heatir	\g
	ontact Name Iress: Coun Tel: Type Other	t for written co try: s of supporting r energy stand	py of energy information ards for nor	y standard sj n available: n-residential	pecified	in Question 4: Fax:			ations and	d Heatir	\g
	ontact Name Iress: Coun Tel: Type Other	t for written co try: s of supporting r energy stand	oy of energy I information ards for nor d Mainter	y standard sj n available: n-residential	pecified building arger (in Question 4: Fax:	ed Heating IN		ations an	d Heatir	\g
	ontact Name Iress: Coun Tel: Type Other	t for written co try: s of supporting r energy stand	oy of energy I information ards for nor d Mainter	y standard sy n available: n-residential nance of L	pecified building arger (in Question 4: Fax: S: Dil- and Gas-fire	ed Heating IN	Nstalla	ations an	d Heatir	18
	ontact Name Iress: Coun Tel: Type Other	t for written co try: s of supporting r energy stand	oy of energy I information ards for nor d Mainter	y standard sy n available: n-residential nance of L	pecified building: arger (in Question 4: Fax: Jesper Lorentz Engineering, J Danish Energy	ed Heating IN en Head of Section y Agency	<u>Nstalla</u>	ations an	d Heatir	1g
	ontact Name Iress: Coun Tel: Type Other	t for written co try: s of supporting r energy stand	oy of energy I information ards for nor d Mainter	y standard sy n available: n-residential nance of L	pecified building: arger (in Question 4: Fax: Jesper Lorentz Engineering, J Danish Energy Landemaerke	ed Heating IN en Head of Section y Agency t 11, DK-1119	<u>Nstalla</u>			······································
	ontact Name Iress: Coun Tel: Type Other	t for written co try: s of supporting r energy stand	oy of energy I information ards for nor d Mainter	y standard sy n available: n-residential nance of L	pecified building: arger (in Question 4: Fax: Jesper Lorentz Engineering, J Danish Energy	ed Heating IN en Head of Section y Agency t 11, DK-1119	<u>Nstalla</u>		d Heatir	······································
	ontact Name Iress: Coun Tel: Type Other	t for written co try: s of supporting r energy stand	oy of energy I information ards for nor d Mainter	y standard sy n available: n-residential nance of L	pecified building: arger (in Question 4: Fax: Jesper Lorentz Engineering, J Danish Energy Landemaerke	ed Heating IN een Head of Section y Agency t 11, DK-1119	<u>Nstalla</u>		untry: D	······································
	ontact Name Iress: Coun Tel: Type Other	t for written co try: s of supporting r energy stand	oy of energy I information ards for nor d Mainter	y standard sy n available: n-residential nance of L	building: arger (ed by: Title: Tel:	in Question 4: Fax: S: Dil- and Gas-fire Jesper Lorentz Engineering, J Danish Energy Landemaerke Copenhagen F	ed Heating IN een Head of Section y Agency t 11, DK-1119	<u>Nstalla</u>	Ca	untry: D	······································

) & WALES A
NERAL OVERVIEW OF BUILDING ENERGY STANDARD	NS.
1. General building standards exist at the following governmental level of the standards and the standards are standards at the standard standard standard standards at the standard sta	vels: National
2. Proposed or existing ENERGY standards cover the following bu	uilding sectors: Both Residential and Non-Residential
3. Status of Non-Residential Building Energy Standards at the: a. National level: b. Regional	al level: c. Local level:
4. Single energy standard selected for further description: Title, Organization: <u>The Building Regulations, Part L</u> ,	Department of the Environment (England and Wales)
Year: 1990 Geographic Coverage: Nation	Abbreviated Title: BR-ADL1, 1990
SCRIPTION OF SPECIFIED ENERGY STANDARDS - B	R-ADL1, 1990
5. The standard defined in Question 4 applies to the following kinds of	of buildings:
	ling vintage:
A - All Buildings Bot	th new and existing
c. Othe	er characteristics:
	er: exception made for unheated buildings
	Ŭ
6. Basic approach of the standard: Both prescriptive and p	nerformance
of busic approach of the standard	Jerrormance
7. The following subjects are included in the energy standard:	
a. Whole building energy provisions:	b. Building envelope provisions:
E- Energy amount target	Roof
Other: target for space heating for dwellings	Wall system
······································	Fenestration system
	Other: Floor insulation
	d. Mechanical provisions:
c. Lighting provisions: - None	
- INDIRE	Controls Ventilation
	Other: insulation of ducts, pipework and hot water
	storage
e Other provisions:	
e. Other provisions:	
e. Other provisions: - None	

ENGLAND & WALES 2

	hment
Industry group	
Academic institution	
Research group	
Other: Public consultation	
Decision Process: Consensus Comment: I O. Information used in developing the standard:	Lead taken by central government. Result becomes mandat
a. PHYSICAL CHARACTERISTICS of existing buildings	h ENERCY LISE of ovicting buildings:
	b. ENERGY USE of existing buildings:
Estimated using professional judgment	Estimated using professional judgment
Gathered through audits and surveys	Already available prior to standard
Already available prior to standard	
c. WEATHER data	d. Other information
Already available prior to standard	Yes: cost of improvements to enable cost-effective
Inicially available prior to buildard	- calculations to be made.
	-
2. COMPUTER programs used:	
a. In developing the standard: <u>BREDEM</u> ESP-II	b. For complying with the standard: BREDEM
201-11	
· · · · · · · · · · · · · · · · · · ·	
· · · · · · · · · · · · · · · · · · ·	
3. Standard is set at a level: Above current practice	
 Considerations influencing the inclusion or exclusion of measur 	
E - Cost effectiveness	Comments:
Availability of energy efficient products]
Comfort	
Other: Capability of construction industry to	
standard without undue techinical risks.	
5a. Standard scheduled for regular review and revision?	
Yes: 1) Consultation with Building Regulation Parliamentary_approval.	Advisory Committee, experts; 2) Public consultation; 3)

	the Environment, enforced at local level	
	ible for implementation, its former focus was on b	uildings, energy, or another area:
Other: Environment, planni	ng, land use	
. TRAINING & EDUCATION provided for arc	hitects, engineers and other professionals:	
Written guidelines to assist with	compliance procedure	
Example calculations		
Seminars, workshops, or conferer Information or resource center	nces	
		· · · · · · · · · · · · · · · · · · ·
Compliance mechanisms used at differents	stages in construction process:	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval	Certification/approval	No mechanism
	•	
Percent designs checked: 100	Percent sites checked: ?	Percent buildings checked: <u>lo</u>
Comment:	Comment:	Comment:
·	Random inspection for energy	·
	measures (100% for other	
	measures, e.g. foundations).	
d. Other compliance procedures	nechanisms (scale of 1-5): 4	
e. Effectiveness of combined compliance r	nechanisms (scale of 1-5): _4	ontrol system.
e. Effectiveness of combined compliance r	Accepted as part of standard building c	ontrol system
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e:	Accepted as part of standard building c	ontrol system.
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: . Types of assessments or audits of energy s	Accepted as part of standard building c	ontrol system.
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: . Types of assessments or audits of energy a a. ENERGY SAVINGS POTENTIAL based	Accepted as part of standard building c	ontrol system
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: . Types of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based In progress	Accepted as part of standard building c standards' impact: on prototypical (not actual) buildings:	ontrol system.
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: . Types of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based In progress	Accepted as part of standard building c	ontrol system
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: . Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING	Accepted as part of standard building c standards' impact: on prototypical (not actual) buildings:	ontrol system
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: . Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING	Accepted as part of standard building c standards' impact: on prototypical (not actual) buildings:	ontrol system.
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: . Types of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING In progress c. COST EFFECTIVENESS based on engi	Accepted as part of standard building c standards' impact: on prototypical (not actual) buildings: 3S in actual buildings complying with standard:	ontrol system
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: . Types of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING In progress	Accepted as part of standard building c standards' impact: on prototypical (not actual) buildings: 3S in actual buildings complying with standard:	ontrol system.
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: . Types of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING In progress c. COST EFFECTIVENESS based on engi	Accepted as part of standard building c standards' impact: on prototypical (not actual) buildings: 3S in actual buildings complying with standard:	ontrol system.
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: . Types of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING In progress c. COST EFFECTIVENESS based on engi	Accepted as part of standard building c standards' impact: on prototypical (not actual) buildings: GS in actual buildings complying with standard: neering economic CALCULATIONS:	ontrol system
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: . Types of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING In progress c. COST EFFECTIVENESS based on engi	Accepted as part of standard building c standards' impact: on prototypical (not actual) buildings: GS in actual buildings complying with standard: neering economic CALCULATIONS:	ontrol system.
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: . Types of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING In progress c. COST EFFECTIVENESS based on engi Completed d. COST EFFECTIVENESS based on AC	Accepted as part of standard building c standards' impact: on prototypical (not actual) buildings: GS in actual buildings complying with standard: neering economic CALCULATIONS:	ontrol system.

ENGLAND & WALES 4

FURTHER INFORMATION ON ENERGY CONSERVATION - England & Wales

20. Efficiency testing facilities and procedures established:

Motors

Insulation Air conditioners/chillers/other appliances

Ballasts

Thermal properties of materials

Other: controls

21. Other programs or policies developed to increase energy efficiency in buildings:

Information programs

Government energy policy

Comment: _

Additional sources of information about energy efficiency for buildings in: England & Wales

- 1. The Building Regulations, 1985 (1990 Edition), Part L- The Conservation of Fuel and Power, HMSO, London.
- 2. A.B. Birtleg, "Achieving Energy Efficiency in Buildings," Proceedings of the 14th Annual International Conference for Energy Economics. Honolulu, 1991.
- 3. _____

22. Contact for written copy of energy standard specified in Question 4:

Name

Address:

BRE Bookshop Bucknalls Lane, Garston Watford WD2 7JR England Country: United Kingdom

Tel: 44-923-664 444

Fax:

Types of supporting information available:

Other energy standards for non-residential buildings:

Survey completed by:	George Henderson	•
Title:	Energy Economics a	nd Statistics Section
	British Research Es	
	Garston	
	Watford	WD2 7JR Country: England
Tel:	44 923 664 517	Fax: 44 923 664 097
Date completed:	3/6/92	

		LANCE	
VERAL OVERVIEW	OF BUILDING ENERGY STAND	ARDS	
1. General building st	andards exist at the following governme	ntal levels: National Local	1
2. Proposed or existing	ng ENERGY standards cover the followi	ng building sectors: Both Residential and N	on-Residential
-	-		
	idential Building Energy Standards at the		- None
a. National level:	Mandatory b. Re	gional level: C. Local le	vel:
			······
4. Single energy star	ndard selected for further description:		
Title, Organizatio	Regulmentation Thermique Buildings. Ministry of Indus	TertiaireEnergy Efficiency Standards in N try and Buildings, 1988.	on-Residential
Vac. 1099			
Year: 1988	Geographic Coverage: Nati	on Abbreviated Title: CSTB-88	
CRIPTION OF SPE	CIFIED ENERGY STANDARDS	- CSTB-88	
5. The standard define	d in Question 4 applies to the following l	kinds of buildings:	
a. Building types:	: b.	Building vintage:	
O - Offices	·	New buildings	
H - Hotels		Other characteristics:	
	ment Facilities	F - Type of fuel: more restrictive for electric	hosting systems
F - Restaura		r - Type of fuel. more restrictive for electric	neating systems
D - Hospita		· · · · · · · · · · · · · · · · · · ·	
	rcial/retail stores		
	onal facilities (schools)	·······	
<u>I - Industria</u>	al Buildings		· · · · · · · · · · · · · · · · · · ·
6. Basic approach of	<u></u>	and performance	
	cts are included in the energy standard:		
a. Whole building	energy provisions:	b. Building envelope provisions:	
- None	· · ·	Roof	······················
	· · · · · · · · · · · · · · · · · · ·	Wall system Fenestration system	
		Infiltration	
		Other: floor insulation, solar gai	ns
c. Lighting provisi	ons:	d. Mechanical provisions:	<u> </u>
- None		Controls: descriptive on equipme	ent
		Ventilation: descriptive on equip	
e. Other provision	15:		
-			
Yes: Thermo		the building is taken into account to specify	

3. Organizations involved in developing the standard:	
Government agency: Minstry of Buildings	
Government agency: Ministry of Industry	· · · · · · · · · · · · · · · · · · ·
Research group: CSTB	
Government agency: Ademe	
Decision Process: Consensus Comment: Er	nergy producers, professional associations
0. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Gathered through audits and surveys	Estimated using professional judgment
Already available prior to standard	Computer simulations used for estimates
	Gathered through audits and surveys
c. WEATHER data	d. Other information
Already available prior to standard	- None
2. COMPUTER programs used:	
2. COMPUTER programs used: a. In developing the standard: <u>Uncertain</u>	b. For complying with the standard: Uncertain
2. COMPUTER programs used: a. In developing the standard: <u>Uncertain</u>	b. For complying with the standard: Uncertain
	b. For complying with the standard: Uncertain
	b. For complying with the standard: Uncertain
	b. For complying with the standard: Uncertain
a. In developing the standard: Uncertain	
a. In developing the standard: Uncertain	
a. In developing the standard: Uncertain	
a. In developing the standard: <u>Uncertain</u>	s in the standard:
a. In developing the standard: Uncertain	s in the standard:
a. In developing the standard: Uncertain 3. Standard is set at a level: Lower than current practice 4. Considerations influencing the inclusion or exclusion of measure E - Cost effectiveness A - Availability of energy efficient products	s in the standard:
a. In developing the standard: Uncertain 3. Standard is set at a level: Lower than current practice 4. Considerations influencing the inclusion or exclusion of measure E - Cost effectiveness A - Availability of energy efficient products	s in the standard:
a. In developing the standard: Uncertain	s in the standard:
a. In developing the standard: Uncertain	s in the standard:
a. In developing the standard: Uncertain	increasing level of standards: 1976, 1988, 1995 (?)

6. Entities involved in IMPLEMENTING energy	y standards:	
Existing agency: CSTB		
	· · · · · · · · · · · · · · · · · · ·	
If an existing agency was made respon	sible for implementation, its former focus was	on buildings, energy, or another area:
Buildings		
7. TRAINING & EDUCATION provided for ar	chitects, engineers and other professionals:	
Written guidelines to assist with	L	
Example calculations		
Compliance forms	•	
Seminars, workshops, or confere	ences	
······		
<u> </u>		
8. Compliance mechanisms used at different	•.	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval	?	?
<u> </u>		
Percent designs checked: ?	Percent sites checked: ?	Percent buildings checked:
Comment:	Comment:	Comment:
technical certification on		
materials and equipment		
d Other compliance presedures		
d. Other compliance procedures - Nor	······································	
e. Effectiveness of combined compliance	mechanisms (scale of 1-5):	
e. Effectiveness of combined compliance	······································	
e. Effectiveness of combined compliance	mechanisms (scale of 1-5):	
e. Effectiveness of combined compliance	mechanisms (scale of 1-5):	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e	mechanisms (scale of 1-5): : standards' impact:	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base	mechanisms (scale of 1-5): : standards' impact:	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base	mechanisms (scale of 1-5): : y standards' impact: d on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base Completed: goal: -25% heating of	mechanisms (scale of 1-5): ; y standards' impact: d on prototypical (not actual) buildings: consumption; economy : 50,000TOE/	year
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL bases Completed: goal: -25% heating of b. MEASUREMENTS OF ENERGY SAVIN	mechanisms (scale of 1-5): ; y standards' impact: d on prototypical (not actual) buildings: consumption; economy : 50,000TOE/ IGS in actual buildings complying with stand	year ard:
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL bases Completed: goal: -25% heating of b. MEASUREMENTS OF ENERGY SAVIN	mechanisms (scale of 1-5): ; y standards' impact: d on prototypical (not actual) buildings: consumption; economy : 50,000TOE/	year ard:
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL bases Completed: goal: -25% heating of b. MEASUREMENTS OF ENERGY SAVIN	mechanisms (scale of 1-5): ; y standards' impact: d on prototypical (not actual) buildings: consumption; economy : 50,000TOE/ IGS in actual buildings complying with stand	year ard:
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL bases Completed: goal: -25% heating of b. MEASUREMENTS OF ENERGY SAVIN ?	mechanisms (scale of 1-5): ; y standards' impact: d on prototypical (not actual) buildings: consumption; economy : 50,000TOE/ IGS in actual buildings complying with stand	year ard:
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL bases Completed: goal: -25% heating of b. MEASUREMENTS OF ENERGY SAVIN	mechanisms (scale of 1-5): ; y standards' impact: d on prototypical (not actual) buildings: consumption; economy : 50,000TOE/ IGS in actual buildings complying with stand	year ard:
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base Completed: goal: -25% heating of b. MEASUREMENTS OF ENERGY SAVIN ? c. COST EFFECTIVENESS based on eng	mechanisms (scale of 1-5): ; y standards' impact: d on prototypical (not actual) buildings: consumption; economy : 50,000TOE/ IGS in actual buildings complying with stand	year ard:
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base Completed: goal: -25% heating of b. MEASUREMENTS OF ENERGY SAVIN ? c. COST EFFECTIVENESS based on eng	mechanisms (scale of 1-5):	year ard:
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base Completed: goal: -25% heating of b. MEASUREMENTS OF ENERGY SAVIN ? c. COST EFFECTIVENESS based on eng	mechanisms (scale of 1-5):	year ard:
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL bases Completed: goal: -25% heating of b. MEASUREMENTS OF ENERGY SAVIN ? c. COST EFFECTIVENESS based on eng ? d. COST EFFECTIVENESS based on A	mechanisms (scale of 1-5):	year ard:
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL bases Completed: goal: -25% heating of b. MEASUREMENTS OF ENERGY SAVIN ? c. COST EFFECTIVENESS based on eng ? d. COST EFFECTIVENESS based on A	mechanisms (scale of 1-5):	year ard:

FRANCE 4

Motors	shed:			
Insulation				
Air conditioners/chillers/other applia	nces			
Ballasts				
	· · · · · · · · · · · · · · · · · · ·			
Thermal properties of materials				
1. Other programs or policies developed to increase er	nergy efficiency in build	lings:		
Audits (free or subsidized)	Comment:	Third party	financing, subsid	ized fiscal
Information programs		incentives fo	r existing buildin	gs
Rebates				
	1			
Additional sources of information about energy e	ffinionau for huildings i	n France	• •	
••				
1	· ·	·, · · · · · · · · · · · · · · · · · ·		
·	·		<u> </u>	
2		. '		
4.				
3			· · · · · · · · · · · · · · · · · · ·	
2. Contact for written copy of energy standard specifi	,			
2. Contact for written copy of energy standard specifi Name: Address: -	,			
2. Contact for written copy of energy standard specifi	,			
2. Contact for written copy of energy standard specifi Name: Address: -	,			
2. Contact for written copy of energy standard specifi Name: Address: -	,			
2. Contact for written copy of energy standard specifi Name: Address: - Country: Tel:	ied in Question 4:			
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2. Contact for written copy of energy standard specifi Name: Address: - Country: Tel:	ied in Question 4:			
2. Contact for written copy of energy standard specifi Name: Address: - Country: Tel:	ied in Question 4:			
2. Contact for written copy of energy standard specifi Name: Address: - Country: Tel: Types of supporting information available:	ied in Question 4: Fax:			
2. Contact for written copy of energy standard specifi Name: Address: - Country: Tel:	ied in Question 4: Fax:			
2. Contact for written copy of energy standard specifi Name: Address: - Country: Tel: Types of supporting information available:	ied in Question 4: Fax:			
2. Contact for written copy of energy standard specifi Name: Address: - Country: Tel: Types of supporting information available:	ied in Question 4: Fax:			
2. Contact for written copy of energy standard specifi Name: Address: - Country: Tel: Types of supporting information available:	ied in Question 4: Fax:			
2. Contact for written copy of energy standard specifi Name: Address: - Country: Tel: Types of supporting information available:	ied in Question 4: Fax:			
2. Contact for written copy of energy standard specific Name: Address: - Country: Tel: Types of supporting information available: 	ied in Question 4: Fax:	· · · · · · · · · · · · · · · · · · ·		
2. Contact for written copy of energy standard specific Name: Address: - Country: Tel: Types of supporting information available: 	Fax:	etti		· (A doz)
2. Contact for written copy of energy standard specific Name: Address: - Country: Tel: Types of supporting information available: 	Fax: Fax: ings: Robert Angiol	etti nd Energy Ma	nagement Agency	y (Ademe)
2. Contact for written copy of energy standard specific Name: Address: - Country: Tel: Types of supporting information available: 	Fax: Fax: Robert Angiol Environment a 500, route des	etti nd Energy Ma Lucioles	nagement Agency	y (Ademe)
2. Contact for written copy of energy standard specific Name: Address: - Country: Tel: Types of supporting information available: 	Fax: Fax: Robert Angiol Environment a 500, route des Sophia-Antip	etti nd Energy Ma Lucioles olis_		
2. Contact for written copy of energy standard specific Name: Address: - Country: Tel: Types of supporting information available: Other energy standards for non-residential build Survey completed by Title	Fax: Fax: ings: Robert Angiol Environment a 500, route des Sophia-Antip 06565 VALBO	etti nd Energy Ma Lucioles iolis NNE	CEDEX Count	ry: France
2. Contact for written copy of energy standard specific Name: Address: - Country: Tel: Types of supporting information available: 	Fax: Fax: ings: Robert Angiol Environment a 500, route des Sophia-Antip 06565 VALBO	etti nd Energy Ma Lucioles iolis NNE		ry: France

a di li	HON	G KONG	ſ	
GENERAL OVERVIEW OF BUILDING ENERGY STANDARDS				
1. General building stan	dards exist at the following governme	ntal levels: Nationa	ı	
2. Proposed or existing ENERGY standards cover the following building sectors: Non-Residential Only				
3. Status of Non-Reside a. National level:	ential Building Energy Standards at (Proposed b. R	he: egional level:Proposed	c. Local level:	Proposed
4. Single energy standard selected for further description: Title, Organization: Code of Practice on Calculation of Overall Thermal Transfer Value to Building Envelope, Hong Kong Government (Draft, August 1991)				
Year: 1991	Geographic Coverage:Cit:	es Abbreviated Ti	tle: <u>OTTV-HKG</u> , 1991	
DESCRIPTION OF SPECIFIED ENERGY STANDARDS - OTTV-HKG, 1991				
5. The standard defined in Question 4 applies to the following kinds of buildings: a. Building types: Offices Hotels				
c. Lighting provision <u>- None</u>		d. Mechanical provi	· · · · · · · · · · · · · · · · · · ·	

HONG KONG 2

Government agency: Hong Kong Government, Bui	Iding Ordinance Office
Research group: J. Roger Preston & Partners, Consu	
Research group: Charles Eley and Associates	
Decision Process: Consensus Comment: Hor	ng Kong Government and J Roger Preston & Partners
. Information model in developing the atomical	
0. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Gathered through audits and surveys	Computer simulations used for estimates
· · · · · · · · · · · · · · · · · · ·	Gathered through audits and surveys
c. WEATHER data	d. Other information
Already available prior to standard	<u>- None</u>
	······································
1. Standards from a different country used as source material:	1
USA Australia & NZ	
ASEAN	
Japan	
· · · · · · · · · · · · · · · · · · ·	
2. COMPUTER programs used:	
a. In developing the standard: DOE-2-1D	b. For complying with the standard: No
<u> </u>	
3. Standard is set at a level: Above current practice	
4. Considerations influencing the inclusion or exclusion of measures	in the standard:
E - Cost effectiveness	Comments:
Availability of energy efficient products	•
Similarity/difference to local design	-
	· · · · · · · · · · · · · · · · · · ·
	_ 1
	· · · ·
5a. Standard scheduled for regular review and revision?	
Sa. Standard Scheduled for regular review and revision:	
-	

3 HONG KONG

		· · · · ·
If an existing agency was made respons Buildings	ible for implementation, its former focus was	on buildings, energy, or another area:
TRAINING & EDUCATION provided for and		
Written guidelines to assist with	compliance procedure	
Example calculations Compliance forms		
		······································
	, 	
3. Compliance mechanisms used at different	stages in construction process:	······································
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval	No mechanism	No mechanism
Percent designs checked: 100	Percent sites checked:	Percent buildings checked:
Comment:	Comment:	Comment:
d. Other compliance procedures - Non	-	
d. Other compliance procedures <u>- Non</u> e. Effectiveness of combined compliance		
e. Effectiveness of combined compliance		e to be responsible and if deviatio
e. Effectiveness of combined compliance in f. Explanation for effectiveness in part e:	mechanisms (scale of 1-5): _5_ Because the professionals are made discovered will be penalized.	e to be responsible and if deviatio
e. Effectiveness of combined compliance	mechanisms (scale of 1-5): _5_ Because the professionals are made discovered will be penalized standards' impact:	e to be responsible and if deviatio
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy	mechanisms (scale of 1-5): _5_ Because the professionals are made discovered will be penalized standards' impact:	e to be responsible and if deviatio
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e: 0. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based	mechanisms (scale of 1-5): _5_ Because the professionals are made discovered will be penalized standards' impact:	e to be responsible and if deviatio
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Completed	mechanisms (scale of 1-5): <u>5</u> Because the professionals are made discovered will be penalized. standards' impact: I on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING Name conducted	mechanisms (scale of 1-5): <u>5</u> Because the professionals are made discovered will be penalized. standards' impact: I on prototypical (not actual) buildings: GS in actual buildings complying with stand	ard:
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING Name conducted	mechanisms (scale of 1-5): <u>5</u> Because the professionals are made discovered will be penalized. standards' impact: I on prototypical (not actual) buildings:	ard:
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING Name conducted	mechanisms (scale of 1-5): <u>5</u> Because the professionals are made discovered will be penalized. standards' impact: I on prototypical (not actual) buildings: GS in actual buildings complying with stand	ard:
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING None conducted	mechanisms (scale of 1-5): <u>5</u> Because the professionals are made discovered will be penalized. standards' impact: d on prototypical (not actual) buildings: GS in actual buildings complying with stand	ard:
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING None conducted c. COST EFFECTIVENESS based on eng	mechanisms (scale of 1-5): <u>5</u> Because the professionals are made discovered will be penalized. standards' impact: d on prototypical (not actual) buildings: GS in actual buildings complying with stand ineering economic CALCULATIONS:	ard:
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING None conducted	mechanisms (scale of 1-5): <u>5</u> Because the professionals are made discovered will be penalized. standards' impact: d on prototypical (not actual) buildings: GS in actual buildings complying with stand	ard:
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 0. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING None conducted c. COST EFFECTIVENESS based on eng None conducted	mechanisms (scale of 1-5): <u>5</u> Because the professionals are made discovered will be penalized. standards' impact: d on prototypical (not actual) buildings: GS in actual buildings complying with stand ineering economic CALCULATIONS:	ard:
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVIN None conducted c. COST EFFECTIVENESS based on eng None conducted d. COST EFFECTIVENESS based on Ad	mechanisms (scale of 1-5): <u>5</u> Because the professionals are made discovered will be penalized. standards' impact: d on prototypical (not actual) buildings: GS in actual buildings complying with stand ineering economic CALCULATIONS:	ard:

	MATION ON ENERGY CONSERV	
20. Efficiency t	esting facilities and procedures establishe	:d:
- None	,	
		
. <u> </u>		
	1 · · · · · · · · · · · · · · · · · · ·	
21. Other prog	rams or policies developed to increase ener	rgy efficiency in buildings:
<u>- None</u>		Comment:
	· · · · · · · · · · · · · · · · · · ·	<u> </u>
Addition	al sources of information about energy effic	ciency for buildings in: Hong Kong
	•••	·····;······;······;······;······;······
1. <u>-</u>		
 7 -		
Z.		
3 -		
J		
	written copy of energy standard specified	In Question 4:
Name: Address:	Peter Osburne Building Ordinance Office	I in Question 4:
Name: Address:	Peter Osburne Building Ordinance Office Buildings and Lands Department	in Question 4:
Name: Address:	Peter Osburne Building Ordinance Office Buildings and Lands Department Murray Building, Garden Road	l in Question 4:
Name: Address:	Peter Osburne Building Ordinance Office Buildings and Lands Department	I in Question 4:
Name: Address:	Peter Osburne Building Ordinance Office Buildings and Lands Department Murray Building, Garden Road	I in Question 4:
Name: Address: Country: Tel:	Peter Osburne Building Ordinance Office Buildings and Lands Department Murray Building, Garden Road Hong Kong 852 848 2830	
Name: Address: Country: Tel: Types of	Peter Osburne Building Ordinance Office Buildings and Lands Department Murray Building, Garden Road Hong Kong 852 848 2830 supporting information available:	
Name: Address: Country: Tel: Types of	Peter Osburne Building Ordinance Office Buildings and Lands Department Murray Building, Garden Road Hong Kong 852 848 2830	
Name: Address: Country: Tel: Types of N	Peter Osburne Building Ordinance Office Buildings and Lands Department Murray Building, Garden Road Hong Kong 852 848 2830 supporting information available:	Fax:
Name: Address: Country: Tel: Types of <u>- N</u> Other en	Peter Osburne Building Ordinance Office Buildings and Lands Department Murray Building, Garden Road Hong Kong 852 848 2830 supporting information available: fone	Fax:
Name: Address: Country: Tel: Types of <u>- N</u> Other en	Peter Osburne Building Ordinance Office Buildings and Lands Department Murray Building, Garden Road Hong Kong 852 848 2830 supporting information available:	Fax:
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Name: Address: Country: Tel: Types of <u>- N</u> Other en	Peter Osburne Building Ordinance Office Buildings and Lands Department Murray Building, Garden Road Hong Kong 852 848 2830 supporting information available: fone	Fax: js:
Name: Address: Country: Tel: Types of <u>- N</u> Other en	Peter Osburne Building Ordinance Office Buildings and Lands Department Murray Building, Garden Road Hong Kong 852 848 2830 supporting information available: fone ergy standards for non-residential building Ione Survey completed by:	Fax: Js: K. C. Chan
Name: Address: Country: Tel: Types of <u>- N</u> Other en	Peter Osburne Building Ordinance Office Buildings and Lands Department Murray Building, Garden Road Hong Kong 852 848 2830 supporting information available: fone	Fax: JS: K. C. Chan Partner
Name: Address: Country: Tel: Types of <u>- N</u> Other en	Peter Osburne Building Ordinance Office Buildings and Lands Department Murray Building, Garden Road Hong Kong 852 848 2830 supporting information available: fone ergy standards for non-residential building Ione Survey completed by:	Fax: JS: K. C. Chan Partner J. Roger Preston & Partners Level 3 Maxi Mall, City Gardens
Name: Address: Country: Tel: Types of <u>- N</u> Other en	Peter Osburne Building Ordinance Office Buildings and Lands Department Murray Building, Garden Road Hong Kong 852 848 2830 supporting information available: fone tergy standards for non-residential building fone Survey completed by: Title:	Fax: JS: K. C. Chan Partner J. Roger Preston & Partners Level 3 Maxi Mall, City Gardens 233 Electric Road Country: Hong Kong
Name: Address: Country: Tel: Types of <u>- N</u> Other en	Peter Osburne Building Ordinance Office Buildings and Lands Department Murray Building, Garden Road Hong Kong 852 848 2830 supporting information available: fone ergy standards for non-residential building Ione Survey completed by:	Fax: JS: K. C. Chan Partner J. Roger Preston & Partners Level 3 Maxi Mall, City Gardens
Name: Address: Country: Tel: Types of <u>- N</u> Other en	Peter Osburne Building Ordinance Office Buildings and Lands Department Murray Building, Garden Road Hong Kong 852 848 2830 supporting information available: fone tergy standards for non-residential building fone Survey completed by: Title:	Fax: JS: K. C. Chan Partner J. Roger Preston & Partners Level 3 Maxi Mall, City Gardens 233 Electric Road Country: Hong Kong

d 🗐]	[NDO]	NESIA		
ENER/	AL OVERVIEW OF	F BUILDING ENER	GY STANDARDS	3		
1	General huilding stand	dards exist at the followir	na aovernmental levr	s: National	Regional	Local
	_					
2.	Proposed or existing	ENERGY standards cov	er the following build	ding sectors: Non-Re	sidential Only	
3.	Status of Non-Reside a. National level:	ntial Building Energy S Voluntary Proposed	tandards at the: b. Regional k	evel: None	c. Local level: - - 	- None
A.	 Single energy stands	rd selected for further c	description.			
			-			
	Inte, Organization:	Direktorat Tata A	ngunan- DITAB	A (Directorate of Bui	lding)	· · · · · · · · · · · · · · · · · · ·
				· · · · · · · · · · · · · · · · · · ·		
	Year: ?	Geographic Coverage	e: Nation	Abbreviated Title:	DITABA	
				-		
escri	PTION OF SPECI	FIED ENERGY STA	INDARDS - DI	TABA		 Balance States
5.7	The standard defined in	n Question 4 applies to t	he following kinds of	f buildings:		
	a. Building types:	· · · · · · · · · · · · · · · · · · ·		ig vintage:		
	O - Offices		1	buildings		
	H - Hotels			0	<u></u>	
	G - Governme	ant Facilities	c. Other	characteristics:		
	D - Hospitals		——— A - A	ir-Conditioned		
		nily residential			······································	
	and the second se			······································	····	
	I - Industrial	buildings				
	····					
6.	Basic approach of the	standard: Both pr	escriptive and pe	erformance		
	•					
7. 1	The following subjects	are included in the energy	gy standard:			
	a. Whole building end	erav provisions:		b. Building envelope pr	ovisions:	
	•					
	E- Energy amo		<u> </u>	Roof	·	
	P- Peak electr			Wall system		
	C- Energy cost	t target	<u></u>	Fenestration sys	stem	
			·	Infiltration	· · · · · · · · · · · · · · · · · · ·	
	c. Lighting provision	s:		d. Mechanical provision	S:	
	Control requir			-	ribution efficiency	
	Power density		<u></u>		ns for equipment sizi	ng
	Illumination r			Controls	is for equipment size	ч <u>б</u>
		nendation to use da	vlight	Ventilation		
			<u></u>	Equipment effic	iency	
					1.11. y	
**	e. Other provisions:					
	- None					
	- None				······································	
	<u>- None</u>					

INDONESIA 2

	partment of Public Works
Academic institution: Bandung Institute of Techn	ology
Research group: Indonesia Institute of Science	
Government agency: Building Research Center, D	
Foreign development agency: ASEAN-US Energy	project, Energy Conservation in Buildings
9. Decision Process: Consensus Comment	
	·
10. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Estimated using professional judgment	Estimated using professional judgment
Gathered through audits and surveys	Computer simulations used for estimates
	Gathered through audits and surveys
c. WEATHER data	d. Other information
Gathered through measurements	Data on local materials, equipment, and installa
Already available prior to standard:	commonly used.
11. Standards from a different country used as source material:	
Singapore: Energy Conservation Handbook	· · · · · · · · · · · · · · · · · · ·
· · · · · · · · · · · · · · · · · · ·	••••••••••••••••••••••••••••••••••••••
· · · · · · · · · · · · · · · · · · ·	
2. COMPUTER programs used:	
2. COMPUTER programs used: a. In developing the standard: DOE-2	b. For complying with the standard: Yes
	b. For complying with the standard: Yes
a. In developing the standard: <u>DOE-2</u>	b. For complying with the standard: Yes
a. In developing the standard: <u>DOE-2</u>	b. For complying with the standard: Yes
a. In developing the standard: <u>DOE-2</u>	b. For complying with the standard: Yes
a. In developing the standard: DOE-2 ASEAM	b. For complying with the standard: Yes
a. In developing the standard: <u>DOE-2</u>	b. For complying with the standard: Yes
a. In developing the standard: DOE-2 ASEAM	
a. In developing the standard: DOE-2 ASEAM 	s in the standard:
a. In developing the standard: DOE-2 <u>ASEAM</u> <u>In developing the standard:</u> <u>ASEAM</u> <u>In developing the standard:</u> <u>ASEAM</u> <u>ASEAM</u> <u>In developing the standard</u> <u>ASEAM</u>	s in the standard:
a. In developing the standard: DOE-2 <u>ASEAM</u> JOE-2 ASEAM JOE-2 J	s in the standard: Comments:
a. In developing the standard: DOE-2 ASEAM ASEAM 13. Standard is set at a level: Above current practice 14. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design	s in the standard: Comments: Local design practice and local materials as well local availability of equipment and products wi
a. In developing the standard: DOE-2 <u>ASEAM</u> JOE-2 ASEAM JOE-2 J	s in the standard: Comments: Local design practice and local materials as well local availability of equipment and products wi give great influence on the applicability of the
a. In developing the standard: DOE-2 ASEAM ASEAM 13. Standard is set at a level: Above current practice 14. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design	s in the standard: Comments: Local design practice and local materials as well local availability of equipment and products wi
a. In developing the standard: DOE-2 ASEAM	s in the standard: Comments: Local design practice and local materials as well local availability of equipment and products wi give great influence on the applicability of the
a. In developing the standard: DOE-2 ASEAM ASEAM 13. Standard is set at a level: Above current practice 14. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design	s in the standard: Comments: Local design practice and local materials as well local availability of equipment and products wi give great influence on the applicability of the
a. In developing the standard: DOE-2 ASEAM	s in the standard: Comments: Local design practice and local materials as well local availability of equipment and products wi give great influence on the applicability of the standard.
a. In developing the standard: DOE-2 ASEAM	s in the standard: Comments: Local design practice and local materials as well local availability of equipment and products wi give great influence on the applicability of the standard.
a. In developing the standard: DOE-2 ASEAM	sin the standard: Comments: Local design practice and local materials as well local availability of equipment and products wi give great influence on the applicability of the standard.

3 INDONESIA

	Buildings	· · · · · · · · · · · · · · · · · · ·
If an existing agency was made respons	sible for implementation, its former focus was	on buildings, energy, or another area:
Buildings		
7. TRAINING & EDUCATION provided for arc	chitects, engineers and other professionals:	
Written guidelines to assist with	n compliance procedure	
Example calculations Seminars, workshops, or conferen		
Information or resource center	nces	
8. Compliance mechanisms used at different	stages in construction process:	an a
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval		
Percent designs checked: ?	Percent sites checked: ?	Percent buildings checked:
Comment:	Comment:	Comment:
d. Other compliance procedures - Non		
e. Effectiveness of combined compliance		I
e. Effectiveness of combined compliance in f. Explanation for effectiveness in part e:	mechanisms (scale of 1-5):	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based	mechanisms (scale of 1-5): No evaluation has been done standards' impact:	· · · · · · · · · · · · · · · · · · ·
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy	mechanisms (scale of 1-5): No evaluation has been done standards' impact:	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based	mechanisms (scale of 1-5): No evaluation has been done standards' impact:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Planned	mechanisms (scale of 1-5): No evaluation has been done standards' impact:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Planned b. MEASUREMENTS OF ENERGY SAVING	mechanisms (scale of 1-5): No_evaluation has been done standards' impact: d on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Planned b. MEASUREMENTS OF ENERGY SAVING	mechanisms (scale of 1-5): No_evaluation has been done standards' impact: d on prototypical (not actual) buildings: GS in actual buildings complying with stand	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Planned b. MEASUREMENTS OF ENERGY SAVING In progress c. COST EFFECTIVENESS based on eng	mechanisms (scale of 1-5):	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Planned b. MEASUREMENTS OF ENERGY SAVING In progress c. COST EFFECTIVENESS based on eng None conducted	mechanisms (scale of 1-5):	

INDONESIA 4

20. Efficiency	r testing facilities and procedures establ	ished:	
Moto	rs		
Insul	ation		
Fixtu			
Therr	nal properties of materials	,, <u></u> , <u></u> ,	
		······································	· · · · · · · · · · · · · · · · ·
21. Other pro	grams or policies developed to increase		•
	nation programs .	Comment:	Energy awareness campaigns for government
Audit	ts (free or subsidized)		officials; Energy conservation in buildingsseminars
1. Sa Pa	olicy on Energy Conservation in I	aksanaan Konserva Buildings). Dept. of	si Energy Dalam Bangunan Gedung (Seminar or
	onservatsi Energi."		
	translation of above) Guideline for Energy Conservation.		ng Materials for Government Buildings in Relat
.u.	05		
	or written copy of energy standard spec		
22. Contact fo	or written copy of energy standard spec	ified in Question 4:	
22. Contact fo Name:	or written copy of energy standard spec Ir. Noraya DITABA, Public Works Depar Kramat Raya 63	ified in Question 4:	
22. Contact fo Name: Address:	or written copy of energy standard spec Ir. Noraya DITABA, Public Works Depar Kramat Raya 63 Jakarta	ified in Question 4:	
22. Contact fo Name: Address:	or written copy of energy standard spec Ir. Noraya DITABA, Public Works Depar Kramat Raya 63	ified in Question 4:	
22. Contact fo Name: Address: Country	or written copy of energy standard spec Ir. Noraya DITABA, Public Works Depar Kramat Raya 63 Jakarta y: Indonesia	ified in Question 4: tment	
22. Contact fo Name: Address: Country Tel:	or written copy of energy standard spec Ir. Noraya DITABA, Public Works Depar Kramat Raya 63 Jakarta Jakarta y: Indonesia 62 21 346 939	ified in Question 4:	
22. Contact fo Name: Address: Country Tel:	or written copy of energy standard spec Ir. Noraya DITABA, Public Works Depar Kramat Raya 63 Jakarta y: Indonesia	ified in Question 4: tment	
22. Contact fo Name: Address: Country Tel: Types o B	or written copy of energy standard spec Ir. Noraya DITABA, Public Works Depar Kramat Raya 63 Jakarta y: Indonesia 62 21 346 939 of supporting information available:	ified in Question 4: tment Fax: nd Artificial Lightin	ng Standards (Contact Ir. Soeprapto; Puslitban Idonesia)
22. Contact fo Name: Address: Country Tel: Types o B P	or written copy of energy standard spec Ir. Noraya DITABA, Public Works Depar Kramat Raya 63 Jakarta y: Indonesia 62 21 346 939 of supporting information available: uilding_Standard, Daylighting an	ified in Question 4: tment Fax: nd Artificial Lightin Cilenyi, Bandung, Ir	ng Standards (Contact Ir. Soeprapto; Puslitban ndonesia)
22. Contact fo Name: Address: Country Tel: Types o B P Other o	or written copy of energy standard spec Ir. Noraya DITABA, Public Works Depar Kramat Raya 63 Jakarta y: Indonesia 62 21 346 939 of supporting information available: uilding. Standard, Daylighting an emukiman, Public Works Dept., G	ified in Question 4: tment Fax: nd Artificial Lightin Cilenyi, Bandung, Ir	idonesia)
22. Contact fo Name: Address: Country Tel: Types o B P Other o	or written copy of energy standard spec Ir. Noraya DITABA, Public Works Depar Kramat Raya 63 Jakarta y: Indonesia 62 21 346 939 of supporting information available: uilding. Standard, Daylighting. an emukiman, Public Works Dept., of energy standards for non-residential buil	ified in Question 4: tment Fax: nd Artificial Lightin Cilenyi, Bandung, Ir	idonesia)
22. Contact fo Name: Address: Country Tel: Types o B P Other o	or written copy of energy standard spec Ir. Noraya DITABA, Public Works Depar Kramat Raya 63 Jakarta y: Indonesia 62 21 346 939 of supporting information available: uilding.Standard, Daylighting.ar emukiman, Public Works Dept., G energy standards for non-residential buil General Policy on Energy; Guide or	ified in Question 4: tment Fax: nd Artificial Lightin Cilenyi, Bandung, Ir dings: n Energy Conservatio	on Practice and Monitoring
22. Contact fo Name: Address: Country Tel: Types o B P Other o	or written copy of energy standard spec Ir. Noraya DITABA, Public Works Depar Kramat Raya 63 Jakarta y: Indonesia 62 21 346 939 of supporting information available: uilding. Standard, Daylighting. an emukiman, Public Works Dept., of energy standards for non-residential buil	ified in Question 4: tment Fax: nd Artificial Lightin Cilenyi, Bandung, Ir dings: n Energy Conservation W: Dr. Soegijanto le: Professor, Tek Institut Tekno	on Practice and Monitoring on Practice and Monitoring crik Fisika logi Bandung
22. Contact fo Name: Address: Country Tel: Types o B P Other o	or written copy of energy standard spec Ir. Noraya DITABA, Public Works Depar Kramat Raya 63 Jakarta 32 Indonesia 62 21 346 939 of supporting information available: uilding Standard, Daylighting ar emukiman, Public Works Dept., G energy standards for non-residential buil General Policy on Energy; Guide or Survey completed t	ified in Question 4: tment Fax: nd Artificial Lightin Cilenyi, Bandung, Ir dings: n Energy Conservation y: Dr. Soegijanto le: Professor, Tek	on Practice and Monitoring con Practice and Monitoring crik Fisika logi Bandung 10

C - 49

a milâl	ISRAEL	
ENERAL OVERVIEW OF	BUILDING ENERGY STANDARDS	
1. General building stand	ards exist at the following governmental levels: National	
2. Proposed or existing F	ENERGY standards cover the following building sectors: Residential Only	
3. Status of Non-Reside	ntial Building Energy Standards at the:	
a. National level: <u>N</u>	Iandatory (R) b. Regional level: Uncertain c. Local level:	Uncertain
	rd selected for further description: "Thermal Insulation of Residential Buildings, " the Standard Institution of I	srael
Year: <u>1989</u>	Geographic Coverage: Nation Abbreviated Title: TIRB-SII, 1989	
ESCRIPTION OF SPECI	FIED ENERGY STANDARDS - TIRB-SII, 1989	
a. Building types: <u>S - Single-fam</u> <u>M - Multi-fam</u> 6. Basic approach of the	are included in the energy standard:	
c. Lighting provisions - None	d. Mechanical provisions:	
e. Other provisions: - None		

ISRAEL 2

	ce ite for Building Research
Academic institution: Ben Gurion University	
Decision Process: Consensus Comment:	
0. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Estimated using professional judgment	Gathered through audits and surveys
Gathered through audits and surveys	· · · · · · · · · · · · · · · · · · ·
c. WEATHER data	d. Other information
Already available prior to standard	- None
Germany: DIN Standards	
· · · · · · · · · · · · · · · · · · ·	
	·
<u> </u>	· · · · · · · · · · · · · · · · · · ·
2. COMPUTER programs used:	
2. COMPUTER programs used: a. In developing the standard: - None	b. For complying with the standard: Uncertain
	b. For complying with the standard: Uncertain
	b. For complying with the standard: <u>Uncertain</u>
	b. For complying with the standard: <u>Uncertain</u>
	b. For complying with the standard: <u>Uncertain</u>
	b. For complying with the standard: <u>Uncertain</u>
a. In developing the standard: - None	
a. In developing the standard: <u>- None</u>	
a. In developing the standard: <u>- None</u>	in the standard:
a. In developing the standard: <u>- None</u>	in the standard:
a. In developing the standard: <u>- None</u>	in the standard:
a. In developing the standard: <u>- None</u>	in the standard:
a. In developing the standard: <u>- None</u>	in the standard:
a. In developing the standard: <u>- None</u>	in the standard: Comments:
a. In developing the standard: - None	in the standard: Comments:

3 ISRAEL

	horities	
If an existing agency was made respons	sible for implementation, its former focus was	on buildings, energy, or another area:
Buildings	·	
7. TRAINING & EDUCATION provided for arc	chitects, engineers and other professionals	
Written guidelines to assist with		
Example calculations		· · · · · · · · · · · · · · · · · · ·
Compliance forms	······	
Seminars, workshops, or confere	nces	· · · · · · · · · · · · · · · · · · ·
Information or resource center		
8. Compliance mechanisms used at different	stages in construction process:	
a. PRIOR to construction:		c. AFTER construction:
	b. DURING construction:	
Certification/approval	No mechanism	Certification/approva
·		
Percent designs checked:	Percent sites checked:	Percent buildings checked:
Comment:	Comment:	Comment:
		Inspection by consumers
· · · · · · · · · · · · · · · · · · ·		1
d. Other compliance procedures	mechanisms (scale of 1-5): 4_	
d. Other compliance procedures e. Effectiveness of combined compliance		
 d. Other compliance procedures e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based 	mechanisms (scale of 1-5): _4	
 d. Other compliance procedures e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based 	mechanisms (scale of 1-5):4	
 d. Other compliance procedures e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based 	mechanisms (scale of 1-5): <u>4</u> standards' impact: d on prototypical (not actual) buildings:	
 d. Other compliance procedures	mechanisms (scale of 1-5):4	lard:
 d. Other compliance procedures	mechanisms (scale of 1-5):4	lard:
 d. Other compliance procedures	mechanisms (scale of 1-5):4	lard:
d. Other compliance procedures	mechanisms (scale of 1-5):4	lard:

	FORMATION ON ENERGY CONSERVA	
20. Efficie	ncy testing facilities and procedures established:	
	Sulation	
	r conditioners/chillers/other appliances	
Th	ermal properties of materials	· · · · · · · · · · · · · · · · · · ·
		· · · · · · · · · · · · · · · · · · ·
		
21. Other	programs or policies developed to increase energy	efficiency in buildings:
-		_ Comment:
		-
	,,,	_
	· · · · · · · · · · · · · · · · · · ·	
Add	ditional sources of information about energy efficien	ncy for buildings in: Israel
1.	The Israel Government, Office of Energy	· · · · · · · · · · · · · · · · · · ·
	· · · · · · · · · · · · · · · · · · ·	
2.		
		· · · · · · · · · · · · · · · · · · ·
3.		· · · · · · · · · · · · · · · · · · ·
Address Cou	: Intry:	
Tele	-	and the second secon
Tel:		ax:
тур	es of supporting information available:	
	Commentary for the Israeli Standard; Te tel:972 4 292242; fax: 972 4 324 534	echnical Institution for Building Research; Prof. A. Bentur;
	JEU216 + 6766+6, Iak, 7/6 + 364 33+	and the second
	er energy standards for non-residential buildings:	
Un	X Y	
Uli	- None	
Our	- None	· · · · · · · · · · · · · · · · · · ·
	- None	· · · · · · · · · · · · · · · · · · ·
		Eng Rava Higi
	Survey completed by:	Eng. Raya Hizi Head of Building Branch
	Survey completed by: Title:	Head of Building Branch Standards Institution of Israel
Uur	Survey completed by: Title:	Head of Building Branch Standards Institution of Israel Standardization Deparment, 42 Chaim Levanon St.
	Survey completed by: Title:	Head of Building Branch Standards Institution of Israel Standardization Deparment, 42 Chaim Levanon St. Tel-Aviv Country: Israel
	Survey completed by: Title:	Head of Building Branch Standards Institution of Israel Standardization Deparment, 42 Chaim Levanon St.
	Survey completed by: Title: Tel:	Head of Building Branch Standards Institution of Israel Standardization Deparment, 42 Chaim Levanon St. Tel-Aviv Country: Israel
	Survey completed by: Title: Tel:	Head of Building Branch Standards Institution of Israel Standardization Deparment, 42 Chaim Levanon St. Tel-Aviv County: Israel 972-3-545-4154 Fax: 972-3-412-762

ERAL OVERVIEW O	F BUILDING ENERGY STANDARD	S
1. General building stand	dards exist at the following governmental lev	vels: National
2. Proposed or existing	ENERGY standards cover the following bui	ilding sectors: Both Residential and Non-Residential
3. Status of Non-Reside a. National level:	ential Building Energy Standards at the: Proposed b. Regional	l level: c. Local level:
 4. Single energy standa 	ard selected for further description:	<u></u>
Title, Organization:	<u>"Code de Qualite Energetique des Ministere des Mines et de L'energi</u> Spring 1993.	s Batiments", 1992. (Energy Efficiency Code, Draft Versic e, Bureau des Economies d'Energie. Plan to be developed
Year: 1992	Geographic Coverage: Nation	Abbreviated Title: IC-1993
		2,2004
	FIED ENERGY STANDARDS - IC	
a. Building types:	n Question 4 applies to the following kinds o	or buildings: ing vintage:
A - All Buildi		h new and existing
		r characteristics:
		Air-Conditioned Other: natural ventilation
· · · · · · · · · · · · · · · · · · ·		
. <u></u>		
	I	
6. Basic approach of the	e standard: Both prescriptive and p	performance
7 The following subjects	s are included in the energy standard:	
a. Whole building en		b. Building envelope provisions:
E- Energy amo		Roof
C- Energy cos		Wall system
0/		Fenestration system
c. Lighting provision	s:	d. Mechanical provisions:
c. Lighting provision Control requir		d. Mechanical provisions: Air/Water distribution efficiency
Control requir Power density	rements	Air/Water distribution efficiency Load Calculations for equipment sizing
Control requir Power density	rements	Air/Water distribution efficiency Load Calculations for equipment sizing Controls
Control requir Power density	rements	Air/Water distribution efficiency Load Calculations for equipment sizing Controls Ventilation
Control requir Power density Illumination r	rements y requirements: recommendations	Air/Water distribution efficiency Load Calculations for equipment sizing Controls
Control requir Power density Illumination r e. Other provisions:	rements y requirements: recommendations	Air/Water distribution efficiency Load Calculations for equipment sizing Controls Ventilation

IVORY COAST 2

	reau des Economies d'Ene	rgie
Academic institution: I		V
Foreign development ag	gency: ESMAP/ACDI	
Decision Process: Consensus	Comment:	
0. Information used in developing th	 e standard:	
a. PHYSICAL CHARACTERIS		b. ENERGY USE of existing buildings:
`		
Estimated using profes Gathered through aud		Estimated using professional judgment Computer simulations used for estimates
Already available pri		Gathered through audits and surveys
Alleady available priv		Gamered mough addres and surveys
c. WEATHER data		d. Other information
Cathered through the		- None
Gathered through mea Already available prio		
Alleady available pin		·
	· · · · · · · · · · · · · · · · · · ·	
2. COMPUTER programs used: a. In developing the standard:	OASIS CODYBA DOE-2	b. For complying with the standard: Yes: may be used
	CODYBA	b. For complying with the standard: Yes: may be used
a. In developing the standard:	CODYBA DOE-2	b. For complying with the standard: Yes: may be used
a. In developing the standard:	CODYBA DOE-2	b. For complying with the standard: Yes: may be used
a. In developing the standard: 3. Standard is set at a level: <u>Ab</u>	CODYBA DOE-2	
a. In developing the standard: 3. Standard is set at a level: <u>Ab</u>	CODYBA DOE-2	
 a. In developing the standard: 3. Standard is set at a level: <u>Ab</u> 4. Considerations influencing the inc <u>E - Cost effectiveness</u> 	CODYBA DOE-2	
 a. In developing the standard: 3. Standard is set at a level: <u>Ab</u> 4. Considerations influencing the inc. <u>E - Cost effectiveness</u> <u>A - Availability of energy</u> 	CODYBA DOE-2 ove current practice	
 a. In developing the standard: 3. Standard is set at a level: <u>Ab</u> 4. Considerations influencing the inc <u>E</u> - Cost effectiveness 	CODYBA DOE-2 ove current practice	
 a. In developing the standard: 3. Standard is set at a level: <u>Ab</u> 4. Considerations influencing the inc <u>E - Cost effectiveness</u> <u>A - Availability of ener</u> <u>S - Similarity/difference</u> 	CODYBA DOE-2 ove current practice	
 a. In developing the standard: 3. Standard is set at a level: <u>Ab</u> 4. Considerations influencing the inc <u>E - Cost effectiveness</u> <u>A - Availability of ener</u> <u>S - Similarity/difference</u> <u>C - Comfort</u> 	CODYBA DOE-2	
 a. In developing the standard: 3. Standard is set at a level: <u>Ab</u> 4. Considerations influencing the inc <u>E</u> - Cost effectiveness <u>A</u> - Availability of ener <u>S</u> - Similarity/difference <u>C</u> - Comfort 5a. Standard scheduled for regular Unsure: do not know the 	CODYBA DOE-2	the first standard. But given the French approach, saf
 a. In developing the standard: 3. Standard is set at a level: <u>Ab</u> 4. Considerations influencing the inc <u>E</u> - Cost effectiveness <u>A</u> - Availability of ener <u>S</u> - Similarity/difference <u>C</u> - Comfort 5a. Standard scheduled for regular 	CODYBA DOE-2	the first standard. But given the French approach, saf

IVORY COAST

If an existing agency was made respo	onsible for implementation, its former focus was	on buildings, energy, or another area:
Energy		
TRAINING & EDUCATION provided for	architects, engineers and other professionals:	· •
-	ith compliance procedure	
Example calculations		
Compliance forms		
Seminars, workshops, or confe	rences	
Compliance mechanisms used at differe	ent stages in construction process:	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
	·	
Percent designs checked:	Percent sites checked:	Percent buildings checked:
Comment:	Comment:	Comment:
<u></u>		
d. Other compliance procedures		
e. Effectiveness of combined complian	ce mechanisms (scale of 1-5):	
e. Effectiveness of combined complian f. Explanation for effectiveness in part Types of assessments or audits of energy	t e: gy standards' impact:	
e. Effectiveness of combined compliand f. Explanation for effectiveness in part Types of assessments or audits of ener- a. ENERGY SAVINGS POTENTIAL bas	t e: gy standards' impact: sed on prototypical (not actual) buildings:	
e. Effectiveness of combined compliand f. Explanation for effectiveness in part Types of assessments or audits of ener- a. ENERGY SAVINGS POTENTIAL bas	t e: gy standards' impact:	
e. Effectiveness of combined compliand f. Explanation for effectiveness in part Types of assessments or audits of ener- a. ENERGY SAVINGS POTENTIAL bas	t e: gy standards' impact: sed on prototypical (not actual) buildings:	
e. Effectiveness of combined compliant f. Explanation for effectiveness in part Types of assessments or audits of ener- a. ENERGY SAVINGS POTENTIAL bas In progress	t e: gy standards' impact: sed on prototypical (not actual) buildings: //NGS in actual buildings complying with stand	ard:
e. Effectiveness of combined compliant f. Explanation for effectiveness in part Types of assessments or audits of ener- a. ENERGY SAVINGS POTENTIAL bas In progress	t e: gy standards' impact: sed on prototypical (not actual) buildings:	ard:
e. Effectiveness of combined compliant f. Explanation for effectiveness in part Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL bas In progress	t e: gy standards' impact: sed on prototypical (not actual) buildings: //NGS in actual buildings complying with stand	ard:
e. Effectiveness of combined compliant f. Explanation for effectiveness in part Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL bas In progress b. MEASUREMENTS OF ENERGY SAV	t e: gy standards' impact: sed on prototypical (not actual) buildings: //NGS in actual buildings complying with stand	ard:
e. Effectiveness of combined compliant f. Explanation for effectiveness in part Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL bas In progress b. MEASUREMENTS OF ENERGY SAV	t e: gy standards' impact: sed on prototypical (not actual) buildings: //NGS in actual buildings complying with stand engineering economic CALCULATIONS:	ard:
e. Effectiveness of combined compliant f. Explanation for effectiveness in part Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL bas In progress b. MEASUREMENTS OF ENERGY SAV	t e:	ard:
e. Effectiveness of combined compliant f. Explanation for effectiveness in part Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL bas In progress b. MEASUREMENTS OF ENERGY SAV 	t e:	ard:

IVORY COAST 4

	Other:	: There is a building research and testing facility, but not for energy	
		· · · · · · · · · · · · · · · · · · ·	
١			
21 (Other prog	grams or policies developed to increase energy efficiency in buildings:	
ZI. (
		Comment:	
		nd courses of information about anown officiance for buildings in Turory Coast	
	Addition	nal sources of information about energy efficiency for buildings in: Ivory Coast	
	1		
			
	3	\$	
	Name:		
Add	dress:	.	
	Country:		
	Tel:	Fax	
	Types of	of supporting information available:	
·			
		energy standards for non-residential buildings:	
	Other e		
•	Other er		
•	Other en		
-	Other er		
-	Other er 	Survey completed by: Jean Thibon	
- - -	Other er 		
-	Other e: 	Survey completed by: Jean Thibon Title: Ingenieur E.N.S.I.G.C Bureaux des Economies Enérgies B.P. 2541	
· · · · · · · · · · · · · · · · · · ·	Other er 	Survey completed by: Jean Thibon Title: Ingenieur E.N.S.I.G.C Bureaux des Economies Enérgies	t

ERAL OVERVIEW OF BU	ILDING ENERGY ST	ANDARDS			
1. General building standards	exist at the following gover	mmental levels:	National		
2. Proposed or existing ENER	GY standards cover the fo	llowing building	sectors: Non-Res	idential Only	
0. Otatus af Nam Davidantial I	D. Heller - Presser - Oten dand	a at the			
		s at the: b. Regional level	- None	c. Local level: _ _ 	- None
4. Single energy standard sel	ected for further descript	ion:			
	ergy Efficiency Buildi		(C-92), October 199	2. Jamaica Bureau of	Standards
			······		
 Year: 1992 Ge	eographic Coverage: 1	Nation	Abbreviated Title:	EEBC-92	
	· · · · · · · · · · · · · · · · · · ·				
CRIPTION OF SPECIFIED	ENERGY STANDAR	RDS - EEBC	-92		
5. The standard defined in Que	stion 4 applies to the follow	wing kinds of bui	ildings:	***************************************	
a. Building types:		b. Building vi	•		
O - Offices		Both ne	w and existing		
H - Hotels					
G - Government Fa	acilities	c. Other cha			
F - Restaurants			ical size: > 93 sq. m		
D - Hospitals			unt of energy: > 11 V	V/sq. meter	· · ·
R - Religion-relate	d	A - Air-C	Conditioned		
M - Multi-family					
C - Commercial/re	etail stores				
 Basic approach of the stand The following subjects are in a. Whole building energy provide the stand of th	icluded in the energy stand rovisions: target	dard:	b. Building envelope pro Roof Wall system Fenestration system		
c. Lighting provisions: Control requiremer			d. Mechanical provisions	: ibution efficiency	
Power density				is for equipment sizir	 197
	ements: recommenda	tions	Controls		<u>.</u>
			Ventilation		
			Equipment effici	ency	
			F		
e. Other provisions:					
-					
Yes: electrical spec	rifications, theromosta	at settings, an	d energy managen	nent.	

STANDARDS DEVELOPMENT PROCESS - EEBC-92

8. Organizations involved in developing the standard:

Government agency: Jamaica Bureau of Standards; Ministry of Mines and Energy; Kingston Town Planning Local interest group: Jamaica Institute of Engineers; Jamaica Institute of Architects; EEBC Review Committee Industry group: Jamaica Public Service Co. (elec. util.); many local suppliers Academic institution: University of West Indies

Foreign development agency: World Bank, ESMAP; Dublin Bloome & the Deringer Group

9. Decision Process: Consensus

Comment:

10. Information used in developing the standard:

a. PHYSICAL CHARACTERISTICS of existing buildings

Estimated using professional judgment

Gathered through audits and surveys Already available prior to standard

c. WEATHER data

Gathered through measurements

b. ENERGY USE of existing buildings:

Estimated using professional judgment Computer simulations used for estimates Already available prior to standard

d. Other information

Yes: See Energy and Economic Analysis Report in Support of EEBC-92 by J. Cumper & S. Marslim, 1992.

11. Standards from a different country used as source material:

USA: ASHRAE 90.1-1989 Malaysia Thailand Philippines Indonesia

12. COMPUTER programs used:

a. In developing the standard:	ASEAM -2D DOE-2.1D	b. For complying with the standard:	Yes
13. Standard is set at a level: Abc	we current practice: 30-35	% above current	
14. Considerations influencing the incl	usion or exclusion of measures	in the standard:	
E - Cost effectiveness		Comments:	
A - Availability of ener	gy efficient products		
S - Similarity/difference			
C - Comfort			
		_ /	
15a. Standard scheduled for regular I	review and revision?		
NR		·	
		· · · · · · · · · · · · · · · · · · ·	

b. Does revision include procedures to MONITOR and EVALUATE earlier versions of the standard?

NR

3 JAMAICA IMPLEMENTATION AND COMPLIANCE - EEBC-92

	sible for implementation, its former focus was	on buildings, energy, or another area:
Buildings		
TRAINING & EDUCATION provided for an	chitects, engineers and other professionals:	
Written guidelines to assist with	n compliance procedure	
Example calculations		
Compliance forms		· · · · · · · · · · · · · · · · · · ·
Seminars, workshops, or conference	nces	
Information or resource center		· · · · · · · · · · · · · · · · · · ·
Compliance mechanisms used at different	stages in construction process:	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval		
Perment designs shasked, 2	Percent sites checked:	Bornont huildingo checkodu
Percent designs checked: ?		Percent buildings checked:
Comment:	Comment:	Comment:
Certification is powerful in		
English tradition (strong in		
Jamaica)	-	
f. Explanation for effectiveness in part e: Types of assessments or audits of energy		
a. ENERGY SAVINGS POTENTIAL based	•	
· Completed: J. Deringer & J. Gill	• • • •	
Completed: J. Deringer & J. Gill	ing, ACEEE Proceedings, 1992.	
		t
	GS in actual buildings complying with stand	ard:
b. MEASUREMENTS OF ENERGY SAVIN In progress	GS in actual buildings complying with stand	ard:
	GS in actual buildings complying with stand	
In progress	· · · · · · · · · · · · · · · · · · ·	ard:
In progress c. COST EFFECTIVENESS based on eng	ineering economic CALCULATIONS:	ard:
In progress	ineering economic CALCULATIONS:	
In progress c. COST EFFECTIVENESS based on eng Completed: J. Deringer & J. Gill	ineering economic CALCULATIONS: ing, ACEEE Proceedings, 1992.	ard:
In progress c. COST EFFECTIVENESS based on eng	ineering economic CALCULATIONS: ing, ACEEE Proceedings, 1992.	

20, Efficiency	y testing facilities an	d procedures establishe	d:	
		lers/other appliance		_
				_
		······································		_
	······································	· · · · · · · · · · · · · · · · · · ·		-
		·		-
	· · · · · · · · · · · · · · · · · · ·		,,,,,,,,	_
21. Other pro	ograms or policies de	veloped to increase ener	gy efficiency in buildings:	. •
-				
Gove	ernment energy po	olicy: DSM		· · · · · · · · · · · · · · · · · · ·
		•		
		· · · · · · · · · · · · · · · · · · ·	I	
Additi	onal sources of infor	nation about energy effic	iency for buildings in: Jamaica	
2	•			
. –		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	
3. –	•		· · · · · · · · · · · · · · · · · · ·	
				-
—		ergy standard specified	· · · ·	
	or written copy of er		· · · ·	
 22. Contact f Name:	for written copy of er Joe Gilling		· · · ·	
 22. Contact f Name: Address:	or written copy of er Joe Gilling ESMAP		· · · ·	
 22. Contact f Name:	or written copy of er Joe Gilling ESMAP		· · · ·	· · · · · · · · · · · · · · · · · · ·
 22. Contact f Name: Address:	or written copy of er Joe Gilling ESMAP		· · · ·	
22. Contact f Name: Address: Countr	or written copy of er Joe Gilling ESMAP		in Question 4:	
22. Contact f Name: Address: Countr Tel:	for written copy of er Joe Gilling ESMAP ry:	ergy standard specified	· · · ·	· · · · · · · · · · · · · · · · · · ·
22. Contact f Name: Address: Countr Tel:	or written copy of er Joe Gilling ESMAP	ergy standard specified	in Question 4:	
22. Contact f Name: Address: Countr Tel:	for written copy of er Joe Gilling ESMAP ry:	ergy standard specified	in Question 4:	
22. Contact f Name: Address: Countr Tel: Types –	for written copy of er Joe Gilling ESMAP ny: of supporting inform	ergy standard specified	Fax:	
22. Contact f Name: Address: Countr Tel: Types –	for written copy of er Joe Gilling ESMAP ny: of supporting inform	ergy standard specified	Fax:	
22. Contact f Name: Address: Countr Tel: Types –	for written copy of er Joe Gilling ESMAP ry: of supporting inform energy standards for	ergy standard specified ation available: r non-residential building	Fax:	
22. Contact f Name: Address: Countr Tel: Types –	for written copy of er Joe Gilling ESMAP ry: of supporting inform energy standards for	ergy standard specified	Fax:	
22. Contact f Name: Address: Countr Tel: Types –	for written copy of er Joe Gilling ESMAP ry: of supporting inform energy standards for	ergy standard specified ation available: r non-residential building	Fax:	
22. Contact f Name: Address: Countr Tel: Types –	for written copy of er Joe Gilling ESMAP ry: of supporting inform energy standards for	ergy standard specified ation available: r non-residential building	Fax:	
22. Contact f Name: Address: Countr Tel: Types –	for written copy of er Joe Gilling ESMAP ry: of supporting inform energy standards for	ergy standard specified ation available: r non-residential building Survey completed by:	Fax: Fax: Roosevelt DaCosta Group Director, Engineering Jamaica Bureau of Standards	
22. Contact f Name: Address: Countr Tel: Types –	for written copy of er Joe Gilling ESMAP ry: of supporting inform energy standards for	ergy standard specified ation available: r non-residential building Survey completed by:	Fax: Fax: Roosevelt DaCosta Group Director, Engineering Jamaica Bureau of Standards 6 Winchester	
22. Contact f Name: Address: Countr Tel: Types –	for written copy of er Joe Gilling ESMAP ry: of supporting inform energy standards for	ergy standard specified ation available: r non-residential building Survey completed by:	Fax: Fax: JS: Roosevelt DaCosta Group Director, Engineering Jamaica Bureau of Standards 6 Winchester Kingston 10	

mill	JAPAN	
GENERAL OVERVIEW O	F BUILDING ENERGY STANDARDS	
1. General building stan	lards exist at the following governmental levels: National Local	
2. Proposed or existing	ENERGY standards cover the following building sectors: Both Residential and Non-F	Residential
3. Status of Non-Reside a. National level:	ntial Building Energy Standards at the: <u>Mandatory</u> b. Regional level: - None c. Local level: - Voluntary	- None
	rd selected for further description: "Standards of Owner's Evaluation Regarding the Rationalization of Energy I for Office Use" Ministry of International Trade and Industry; Ministry of Con	
Year: 1980	Geographic Coverage: Nation Abbreviated Title: MITI, 1980	
DESCRIPTION OF SPECI	FIED ENERGY STANDARDS - MITI, 1980	and the second second
a. Building types: Offices 	are included in the energy standard: argy provisions: Building envelope provisions: Roof Wall system Fenestration system Infiltration	
e. Other provisions:	s: d in Japanese industrial standard - None - Non	

Organizations involved in developing the standard:	
-	
	le and Industry/Ministry of Construction
Other: Energy Conservation Center	
Other: Institute of Building Energy Conservation	
Decision Process: Mandate Comment: Min	istry held a council.
0. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Already available prior to standard	Already available prior to standard
c. WEATHER data	d. Other information
	- None
Already available prior to standard	
	· · ·
2. COMPUTER programs used:	
a. In developing the standard: Uncertain	b. For complying with the standard: Yes
	Each constructor h
	program.
· · · · · · · · · · · · · · · · · · ·	
3. Standard is set at a level: Above current practice	
I. Considerations influencing the inclusion or exclusion of measures in	n the standard: Comments:
E - Cost effectiveness Similarity/difference to local design	
ommunity/ unicience to total design	
The Observation of the Article of th	
5a. Standard scheduled for regular review and revision?	
No: not regularly	
No: not regularly	· · · · · · · · · · · · · · · · · · ·

	standards:	
Existing agency: local offices of th	e Ministry of Construction	
If an existing agency was made responsib	le for implementation, its former focus was	s on buildings, energy, or another area:
Buildings	· · · · · · · · · · · · · · · · · · ·	
7. TRAINING & EDUCATION provided for archi	itects, engineers and other professionals	:
Written guidelines to assist with o		
Seminars, workshops, or conference		
Information or resource center		
 Compliance mechanisms used at different sta a. PRIOR to construction: 	ages in construction process: b. DURING construction:	c. AFTER construction:
Certification/approval	No mechanism	No mechanism
	`	
Percent designs checked: <u>100</u> Comment:	Percent sites checked:	Percent buildings checked Comment:
All office buildings with floor		
space above 2000 sq. m		
d. Other compliance procedures		<u> </u>
e. Effectiveness of combined compliance me f. Explanation for effectiveness in part e: _ 9. Types of assessments or audits of energy st a. ENERGY SAVINGS POTENTIAL based of	andards' impact:	
e. Effectiveness of combined compliance me f. Explanation for effectiveness in part e: _ 9. Types of assessments or audits of energy st	andards' impact:	
e. Effectiveness of combined compliance me f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy st a. ENERGY SAVINGS POTENTIAL based on None conducted	andards' impact: n prototypical (not actual) buildings:	
e. Effectiveness of combined compliance me f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy st a. ENERGY SAVINGS POTENTIAL based of	andards' impact: n prototypical (not actual) buildings:	
e. Effectiveness of combined compliance me f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy st a. ENERGY SAVINGS POTENTIAL based on None conducted	andards' impact: n prototypical (not actual) buildings:	
e. Effectiveness of combined compliance me f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy st a. ENERGY SAVINGS POTENTIAL based on None conducted	andards' impact: n prototypical (not actual) buildings:	
e. Effectiveness of combined compliance me f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy st a. ENERGY SAVINGS POTENTIAL based on None conducted	andards' impact: on prototypical (not actual) buildings: S in actual buildings complying with stand	
e. Effectiveness of combined compliance me f. Explanation for effectiveness in part e:	andards' impact: on prototypical (not actual) buildings: S in actual buildings complying with stand	

HER INFORMATION ON ENERGY CONSERVAT	FION - Japan
20. Efficiency testing facilities and procedures established:	
Motors	
Insulation	
Air conditioners/chillers/other appliances	· · · · · · · · · · · · · · · · · · ·
Thermal properties of materials	
·	
	· · · · · · · · · · · · · · · · · · ·
21 Other programs or policies developed to increase ensure	officiency in buildings.
21. Other programs or policies developed to increase energy of	
Information programs	Comment: Japanese-language sample of information_
	campaign enclosed.
	-
Additional sources of information about energy efficien	euferhuildinge in Japan
	Conditioning, and Sanitary Engineers of Japan," address:
Kirashinjuke 1-8-1, Shinjuku-ku, Tokyo.	Tel: 81 3 3363 8261
2. The Magazine of Building Equipment. A 3 3668 4059	Address: Nihonbaski Hon-Machi 4-14-2 Chijoku, Tokyo. T
2	·
3 22. Contact for written copy of energy standard specified in (
	Question 4:
22. Contact for written copy of energy standard specified in Name: Address: Agency of National Resources and En Ministry of International Trade and 1 Chiyodaku; Kasumigaseki 1-3-1 Tok	Question 4: nergy Industry
22. Contact for written copy of energy standard specified in Name: Address: Agency of National Resources and En Ministry of International Trade and 1	Question 4: nergy Industry
22. Contact for written copy of energy standard specified in Name: Address: Agency of National Resources and En Ministry of International Trade and 1 Chiyodaku; Kasumigaseki 1-3-1 Tok	Question 4: nergy Industry ayo
22. Contact for written copy of energy standard specified in Name: Address: Agency of National Resources and En Ministry of International Trade and 1 Chiyodaku; Kasumigaseki 1-3-1 Tok	Question 4: nergy Industry ayo
22. Contact for written copy of energy standard specified in Name: Address: Agency of National Resources and En Ministry of International Trade and I Chiyodaku; Kasumigaseki 1-3-1 Tok Country: Japan	Question 4: nergy Industry ayo
22. Contact for written copy of energy standard specified in the Name: Address: Agency of National Resources and Em Ministry of International Trade and P Chiyodaku; Kasumigaseki 1-3-1 Tok Country: Japan Tel: 81 3 35-01-1511 Fa	Question 4: nergy Industry ayo
22. Contact for written copy of energy standard specified in the Name: Address: Agency of National Resources and Em Ministry of International Trade and P Chiyodaku; Kasumigaseki 1-3-1 Tok Country: Japan Tel: 81 3 35-01-1511 Fa	Question 4: nergy Industry ayo
 22. Contact for written copy of energy standard specified in the Name: Address: Agency of National Resources and En Ministry of International Trade and I Chiyodaku; Kasumigaseki 1-3-1 Tok Country: Japan Tel: 81 3 35-01-1511 Fa Types of supporting information available: 	Question 4: nergy Industry ayo
22. Contact for written copy of energy standard specified in the Name: Address: Agency of National Resources and Em Ministry of International Trade and P Chiyodaku; Kasumigaseki 1-3-1 Tok Country: Japan Tel: 81 3 35-01-1511 Fa	Question 4: nergy Industry ayo
 22. Contact for written copy of energy standard specified in the Name: Address: Agency of National Resources and En Ministry of International Trade and I Chiyodaku; Kasumigaseki 1-3-1 Tok Country: Japan Tel: 81 3 35-01-1511 Fa Types of supporting information available: 	Question 4: nergy Industry ayo
22. Contact for written copy of energy standard specified in the Name: Address: Agency of National Resources and Emministry of International Trade and Point Chiyodaku; Kasumigaseki 1-3-1 Tok Country: Japan Tel: 81 3 35-01-1511 Factor Types of supporting information available:	Question 4: nergy Industry ayo
22. Contact for written copy of energy standard specified in the Name: Address: Agency of National Resources and Emministry of International Trade and Point Chiyodaku; Kasumigaseki 1-3-1 Tok Country: Japan Tel: 81 3 35-01-1511 Factor Types of supporting information available:	Question 4: nergy Industry ayo
 22. Contact for written copy of energy standard specified in the Name: Address: Agency of National Resources and En Ministry of International Trade and I Chiyodaku; Kasumigaseki 1-3-1 Tok Country: Japan Tel: 81 3 35-01-1511 Fa Types of supporting information available: 	Question 4: hergy Industry tyo x: 81 3 3580-8439
 22. Contact for written copy of energy standard specified in the Name: Address: Agency of National Resources and Emministry of International Trade and I Chiyodaku; Kasumigaseki 1-3-1 Tok Country: Japan Tel: 81 3 35-01-1511 Fa Types of supporting information available: 	Question 4: hergy Industry tyo x: 81 3 3580-8439 x: 81 3 3580-8439
22. Contact for written copy of energy standard specified in the Name: Address: Agency of National Resources and Emministry of International Trade and I Chiyodaku; Kasumigaseki 1-3-1 Tok Country: Japan Tel: 81 3 35-01-1511 Fa Types of supporting information available:	Question 4: hergy Industry tyo x: 81 3 3580-8439 x: 81 3 3580-8439 Visuo Iguchi Senior Technical Advisor
22. Contact for written copy of energy standard specified in the Name: Address: Agency of National Resources and Emministry of International Trade and I Chiyodaku; Kasumigaseki 1-3-1 Tok Country: Japan Tel: 81 3 35-01-1511 Fa Types of supporting information available:	Question 4: hergy Industry tyo fr: 81 3 3580-8439 Misuo Iguchi Senior Technical Advisor Energy Conservation Center 2-39-3, Nishi-Shinbashi
22. Contact for written copy of energy standard specified in the Name: Address: Agency of National Resources and Emministry of International Trade and I Chiyodaku; Kasumigaseki 1-3-1 Tok Country: Japan Tel: 81 3 35-01-1511 Fa Types of supporting information available:	Question 4: hergy Industry kyo x: 81 3 3580-8439 Misuo Iguchi Senior Technical Advisor Energy Conservation Center
22. Contact for written copy of energy standard specified in the Name: Address: Agency of National Resources and Emministry of International Trade and Point Chiyodaku; Kasumigaseki 1-3-1 Tok Country: Japan Tel: 81 3 35-01-1511 Fair Types of supporting information available: 	Question 4: hergy Industry iyo x: 81 3 3580-8439 Misuo Iguchi Senior Technical Advisor Energy Conservation Center 2-39-3, Nishi-Shinbashi
22. Contact for written copy of energy standard specified in a Name: Address: Agency of National Resources and Em Ministry of International Trade and I Chiyodaku; Kasumigaseki 1-3-1 Tok Country: Japan Tel: 81 3 35-01-1511 Fa Types of supporting information available: 	Question 4: Mergy Industry Syo Mr: 81 3 3580-8439 Misuo Iguchi Senior Technical Advisor Energy Conservation Center 2-39-3, Nishi-Shinbashi Minato-Ku Tokyo Country: Japan 105

	N	IALA	YSIA		
ERAL OVERVIEW OF	BUILDING ENERGY	STANDARDS			
1. General building stand	lards exist at the following g	overnmental level	s: National	Regional	Local
2 Proposed or existing	ENERGY standards cover the	e following build	ing sectors: Non Roa	idential Only	
		-	<u>10011-Res</u>		
3. Status of Non-Reside a. National level:	ntial Building Energy Stand Voluntary	lards at the: b. Regional le	vel: Voluntary	c. Local level: -	Voluntary
		-		-	· · · · · · · · · · · · · · · · · · ·
_				-	·····
4. Single energy standa	rd selected for further desc	cription:			
Title, Organization:	"Guidelines for Energ Posts.	<u>y Efficiency in</u>	Buildings", Ministry	of Energy Telecomm	unications, an
		······			
Year: 1989	Geographic Coverage:	Nation	Abbreviated Title:	GEEB-METP, 1989	
	FIED ENERGY STAN				
	n Question 4 applies to the f	•	-		
a. Building types:		b. Building	j vintage: Buildings		
O - Offices		<u> </u>	Dunungs		
<u>H</u> - Hotels G - Governme	nt Engilition	c. Other c	haracteristics:		
$\frac{G - Governme}{F - Restaurant}$		E - An	nount of energy: peak	design rate > 10W/	m2 (installed)
	al/retail stores	_	0,		
<u>C - Contanterci</u>	ai/ letail stoles				
······································			· · · · · · · · · · · · · · · · · · ·	·····	·
		<u> </u>			
a. Whole building end	are included in the energy s	······································	b. Building envelope pro	visions:	-
7. The following subjects	are included in the energy s	······································	Roof	visions:	
7. The following subjects a. Whole building end	are included in the energy s	······································			-
7. The following subjects a. Whole building end	are included in the energy s	······································	Roof Wall system		
7. The following subjects a. Whole building end	are included in the energy s argy provisions:	······································	Roof Wall system Fenestration sys	tem	
7. The following subjects a. Whole building end - None - None c. Lighting provision Control requir	are included in the energy s argy provisions: s: ements	······································	Roof Wall system Fenestration sys Infiltration d. Mechanical provisions Load calculation	tem	
7. The following subjects a. Whole building ene - None - None c. Lighting provision Control requir Power density	are included in the energy s ergy provisions: s: ements	······································	Roof Wall system Fenestration sys Infiltration d. Mechanical provisions Load calculation Controls	tem : s for equipment sizir	
7. The following subjects a. Whole building ene - None - None c. Lighting provision Control requir Power density	are included in the energy s argy provisions: s: ements	······································	Roof Wall system Fenestration sys Infiltration d. Mechanical provisions Load calculation	tem : s for equipment sizir	ng
7. The following subjects a. Whole building ene - None - None c. Lighting provision Control requir Power density	are included in the energy s ergy provisions: s: ements n requirements	······································	Roof Wall system Fenestration sys Infiltration d. Mechanical provisions Load calculation Controls	tem : s for equipment sizir	ng
7. The following subjects a. Whole building ene - None - None c. Lighting provision Control requir Power density Illumination	are included in the energy s ergy provisions: s: ements n requirements	······································	Roof Wall system Fenestration sys Infiltration d. Mechanical provisions Load calculation Controls	tem : s for equipment sizir	ng

C - 66

MALAYSIA 2 STANDARDS DEVELOPMENT PROCESS - GEEB-METP, 1989 8. Organizations involved in developing the standard: Government agency: Ministry of Energy, Telecommunications and Posts, Malaysia Academic institution: Universiti Technologi, Malaysia Comment: Professional institutions (e.g., engineering, architecture); 9. Decision Process: Consensus Building organizations/associations 10. Information used in developing the standard: a. PHYSICAL CHARACTERISTICS of existing buildings b. ENERGY USE of existing buildings: Gathered through audits and surveys Gathered through audits and surveys Already available prior to standard c. WEATHER data d. Other information Already available prior to standard 11. Standards from a different country used as source material: Singapore: Building Regulations USA: ASHRAE 90.1P 12. COMPUTER programs used: a. In developing the standard: b. For complying with the standard: No DOE-2 ASEAM-2 13. Standard is set at a level: Equal to current practice 14. Considerations influencing the inclusion or exclusion of measures in the standard: Comments: E - Cost effectiveness Standards were prepared so that it would not cost Availability of energy efficient products too much to implement them. Comfort is Comfort maintained. 15a. Standard scheduled for regular review and revision? Yes: A special working group on energy conservation in buildings is working on a revision of standards. b. Does revision include procedures to MONITOR and EVALUATE earlier versions of the standard? No

MALAYSIA

Voluntary standards; no agenc	gy standards: y	
If an existing agency was made respo	nsible for implementation, its former focus was	on buildings, energy, or another area:
<u> </u>		
	rchitects, engineers and other professionals	
Example calculations	ences	· · · · · · · · · · · · · · · ·
Senimars, workshops, or comer		· · · · · · · · · · · · · · · · · · ·
	·	· · · · · · · · · · · · · · · · · · ·
8. Compliance mechanisms used at differer	it stages in construction process:	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
No mechanism	No mechanism	No mechanism
Percent designs checked:	Percent sites checked:	Percent buildings checked:
Comment:	Comment:	Comment:
- <u></u>	<u> </u>	
d. Other compliance procedures		
e. Effectiveness of combined compliance	<pre>> mechanisms (scale of 1-5):</pre>	
f. Explanation for effectiveness in part of	9:	·
		· · · · · · · · · · · · · · · · · · ·
. Types of assessments or audits of energ		
a. ENERGY SAVINGS POTENTIAL bas	ed on prototypical (not actual) buildings:	gs Standards in Malavsia." I.I. D
a. ENERGY SAVINGS POTENTIAL bas		gs Standards in Malaysia." J.J. D
a. ENERGY SAVINGS POTENTIAL base Completed: "Energy and Econ	ed on prototypical (not actual) buildings: omic Analysis of Commercial Buildin	
a. ENERGY SAVINGS POTENTIAL base Completed: "Energy and Econ b. MEASUREMENTS OF ENERGY SAVI	ed on prototypical (not actual) buildings:	
a. ENERGY SAVINGS POTENTIAL base Completed: "Energy and Econ	ed on prototypical (not actual) buildings: omic Analysis of Commercial Buildin	
a. ENERGY SAVINGS POTENTIAL base Completed: "Energy and Econ b. MEASUREMENTS OF ENERGY SAVI Planned	ed on prototypical (not actual) buildings: omic Analysis of Commercial Buildin NGS in actual buildings complying with stand	
a. ENERGY SAVINGS POTENTIAL base Completed: "Energy and Econ b. MEASUREMENTS OF ENERGY SAVI Planned c. COST EFFECTIVENESS based on en	ed on prototypical (not actual) buildings: omic Analysis of Commercial Buildin NGS in actual buildings complying with stand	
a. ENERGY SAVINGS POTENTIAL base Completed: "Energy and Econ b. MEASUREMENTS OF ENERGY SAVI Planned	ed on prototypical (not actual) buildings: omic Analysis of Commercial Buildin NGS in actual buildings complying with stand	
a. ENERGY SAVINGS POTENTIAL base Completed: "Energy and Econ b. MEASUREMENTS OF ENERGY SAVI Planned c. COST EFFECTIVENESS based on en Completed: see above	ed on prototypical (not actual) buildings: omic Analysis of Commercial Buildin NGS in actual buildings complying with stand gineering economic CALCULATIONS:	
a. ENERGY SAVINGS POTENTIAL base Completed: "Energy and Econ b. MEASUREMENTS OF ENERGY SAVI Planned c. COST EFFECTIVENESS based on en Completed: see above d. COST EFFECTIVENESS based on A	ed on prototypical (not actual) buildings: omic Analysis of Commercial Buildin NGS in actual buildings complying with stand gineering economic CALCULATIONS:	
a. ENERGY SAVINGS POTENTIAL base Completed: "Energy and Econ b. MEASUREMENTS OF ENERGY SAVI Planned c. COST EFFECTIVENESS based on en Completed: see above	ed on prototypical (not actual) buildings: omic Analysis of Commercial Buildin NGS in actual buildings complying with stand gineering economic CALCULATIONS:	

		ATION - Malaysia
	antime facilities and succeedence antablishes	
-	esting facilities and procedures establishe	
Motors Insulat		
	nditioners/chillers/other appliance	<u></u>
Ballas		
Danas		
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-	· · · · · · · · · · · · · · · · · · ·	
1. Other prog	rams or policies developed to increase energy	av efficiency in buildings:
	ation programs: Ministry of Energy,	
Andite	Ministry of Energy	, Comment:
Fnergy	Ministry of Energy, Efficiency Training: Ministry of	
LICIEY	Zandency rounding. Willibury Of	—
	······································	— I
Addition	al sources of information about energy effic	iencvforbuildingsin : Malavsia
		• •
1. Ser		for energy efficiency.
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2. Contact for	written copy of energy standard specified	· · ·
2. Contact for Name:	written copy of energy standard specified	· · ·
	Energy Unit	in Question 4:
Name:	Energy Unit Ministry of Energy, Telecommunic	in Question 4: cations, and Posts
Name:	Energy Unit Ministry of Energy, Telecommunic Wisma Damansara, Jalan Semant	in Question 4: cations, and Posts
Name: Address:	Energy Unit Ministry of Energy, Telecommunic Wisma Damansara, Jalan Semant 50668 Kuala Lumpar	in Question 4: cations, and Posts
Name: Address: Country:	Energy Unit Ministry of Energy, Telecommunic Wisma Damansara, Jalan Semant 50668 Kuala Lumpar Malaysia	in Question 4: cations, and Posts tran
Name: Address: Country: Tel:	Energy Unit Ministry of Energy, Telecommunic Wisma Damansara, Jalan Semant 50668 Kuala Lumpar Malaysia 60-3-2562222	in Question 4: cations, and Posts
Name: Address: Country: Tel:	Energy Unit Ministry of Energy, Telecommunic Wisma Damansara, Jalan Semant 50668 Kuala Lumpar Malaysia	in Question 4: cations, and Posts tran
Name: Address: Country: Tel:	Energy Unit Ministry of Energy, Telecommunic Wisma Damansara, Jalan Semant 50668 Kuala Lumpar Malaysia 60-3-2562222	in Question 4: cations, and Posts tran
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Name: Address: Country: Tel: Types of	Energy Unit Ministry of Energy, Telecommunic Wisma Damansara, Jalan Semant 50668 Kuala Lumpar Malaysia 60-3-2562222 supporting information available:	in Question 4: cations, and Posts fran Fax: 60-3-255-7901
Name: Address: Country: Tel: Types of Other en	Energy Unit Ministry of Energy, Telecommunic Wisma Damansara, Jalan Semant 50668 Kuala Lumpar Malaysia 60-3-2562222 supporting information available: ergy standards for non-residential building	in Question 4: cations, and Posts fran Fax: 60-3-255-7901
Name: Address: Country: Tel: Types of	Energy Unit Ministry of Energy, Telecommunic Wisma Damansara, Jalan Semant 50668 Kuala Lumpar Malaysia 60-3-2562222 supporting information available: ergy standards for non-residential building	in Question 4: cations, and Posts fran Fax: 60-3-255-7901
Name: Address: Country: Tel: Types of Other en	Energy Unit Ministry of Energy, Telecommunic Wisma Damansara, Jalan Semant 50668 Kuala Lumpar Malaysia 60-3-2562222 supporting information available: ergy standards for non-residential building	in Question 4: cations, and Posts fran Fax: 60-3-255-7901
Name: Address: Country: Tel: Types of Other en	Energy Unit Ministry of Energy, Telecommunic Wisma Damansara, Jalan Semant 50668 Kuala Lumpar Malaysia 60-3-2562222 supporting information available: ergy standards for non-residential building	in Question 4: cations, and Posts fran Fax: 60-3-255-7901
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Name: Address: Country: Tel: Types of Other en	Energy Unit Ministry of Energy, Telecommunic Wisma Damansara, Jalan Semant 50668 Kuala Lumpar Malaysia 60-3-2562222 supporting information available: ergy standards for non-residential building ne Survey completed by:	lin Question 4: cations, and Posts tran Fax: 60-3-255-7901 js: K.S. Kannan Faculty of Mechanical Engineering Universiti Teknologi Malaysia
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			LANDS		
NERAL OVERVIEW OF	BUILDING ENERGY	'STANDARDS			
1. General building stand	dards exist at the following	governmental levels:	National	Local	·
2. Proposed or existing	ENERGY standards cover t	the following building	sectors: Both Res	idential and Non-F	Residential
3. Status of Non-Reside	ential Building Energy Stan	idards at the:			
a. National level:	Proposed	b. Regional level	- None	c. Local level: -	Mandatory
—	<u> </u>			- -	
4. Single energy standa	rd selected for further des	cription:			
-	Bouwbersluit, Effect	-			
			· · · · · · · · · · · · · · · · · · ·		······
Year: 1992	Geographic Coverage:	Nation	Abbreviated Title:	Bouwbersluit, 1992	2
	• • • <u>·</u>				
SCRIPTION OF SPECI				a sana a ta sana	
	n Question 4 applies to the	following kinds of bui b. Building vi	-		
a. Building types: O - Offices		-	w and existing		
$\frac{O - Onces}{H - Hotels}$				······································	
×	nily residential	c. Other char	racteristics:		
	nily residential				
D - Hospitals		-			
	al facilities (schools)				
	· · · · · · · · · · · · · · · · · · ·				
 Basic approach of the The following subjects 	are included in the energy	standard:			
- -	and brovisions:		h Building amplone pro	iciano.	
a. Whole building ene] '	b. Building envelope prov	isions:	
- -		[']	Roof	isions:	
a. Whole building ene			Roof Wall system		
a. Whole building ene			Roof Wall system Fenestration syst		·
a. Whole building ene			Roof Wall system		
a. Whole building ene			Roof Wall system Fenestration syst Infiltration	em	
a. Whole building ene - None - None 			Roof Wall system Fenestration syst Infiltration d. Mechanical provisions	em	· · · · · · · · · · · · · · · · · · ·
a. Whole building ene			Roof Wall system Fenestration syst Infiltration d. Mechanical provisions	em	rs for rooms
a. Whole building ene - None - None 			Roof Wall system Fenestration syst Infiltration d. Mechanical provisions	em	rs for rooms
a. Whole building ene - None - None 			Roof Wall system Fenestration syst Infiltration d. Mechanical provisions	em	rs for rooms
a. Whole building ene - None - None 			Roof Wall system Fenestration syst Infiltration d. Mechanical provisions	em	rs for rooms
a. Whole building ene - None - Lighting provisions - None	s:		Roof Wall system Fenestration syst Infiltration d. Mechanical provisions	em	rs for rooms
a. Whole building ene - None - None 	s:		Roof Wall system Fenestration syst Infiltration d. Mechanical provisions	em	rs for rooms
a. Whole building ene - None - Lighting provisions - None	s:		Roof Wall system Fenestration syst Infiltration d. Mechanical provisions	em	rs for rooms
a. Whole building ene - None - Lighting provisions - None	s:		Roof Wall system Fenestration syst Infiltration d. Mechanical provisions	em	rs for rooms

NETHERLANDS 2

	of Housing and the E	nvironment	
Government agency: Ministry			
Research group: Novem TNC			-1
Other: NNI - standards com	hission - representation	on of all interested groups who de	sign standard
Decision Process: Consensus		culations and descriptions were co	
		mission (and the government) ma	<u>ade the levels manate</u>
Information used in developing the stan			
a. PHYSICAL CHARACTERISTICS o		b. ENERGY USE of existing buildings	
Already available prior to	standard	Not available, not used in s	tandard
	· · · · · · · · · · · · · · · · · · ·	·	
c. WEATHER data		d. Other information	
Already available prior to	standard	<u>- None</u>	
	· · ·		
Standards from a different country use			
•		······································	
	·	······································	
COMPUTER programs used:			•
COMPUTER programs used: a. In developing the standard: CE	N TC 89	b. For complying with the standard:	No
	N TC 89	b. For complying with the standard:	No
a. In developing the standard: <u>CE</u> TC		b. For complying with the standard:	<u>No</u>
a. In developing the standard: <u>CE</u> TC	M	b. For complying with the standard:	<u>No</u>
a. In developing the standard: <u>CE</u> TC	M	b. For complying with the standard:	<u>No</u>
a. In developing the standard: CE TC ISS	M O pub. 16	b. For complying with the standard:	<u>No</u>
a. In developing the standard: <u>CE</u> TC	M O pub. 16	b. For complying with the standard:	<u>No</u>
a. In developing the standard: CE TC ISS Standard is set at a level: Equal to	M O pub. 16 current practice		<u>No</u>
a. In developing the standard: <u>CE</u> <u>TC</u> ISS Standard is set at a level: <u>Equal to</u> Considerations influencing the inclusion	M O pub. 16 current practice or exclusion of measures		<u>No</u>
a. In developing the standard: <u>CE</u> <u>TC</u> <u>ISS</u> Standard is set at a level: <u>Equal to</u> Considerations influencing the inclusion <u>E - Cost effectiveness</u>	M O pub. 16 current practice	in the standard:	<u>No</u>
a. In developing the standard: <u>CE</u> <u>TC</u> ISS Standard is set at a level: <u>Equal to</u> Considerations influencing the inclusion	M O pub. 16 current practice or exclusion of measures	in the standard:	<u>No</u>
a. In developing the standard: <u>CE</u> <u>TC</u> <u>ISS</u> Standard is set at a level: <u>Equal to</u> Considerations influencing the inclusion <u>E - Cost effectiveness</u>	M O pub. 16 current practice or exclusion of measures	in the standard:	<u>No</u>
a. In developing the standard: <u>CE</u> <u>TC</u> <u>ISS</u> Standard is set at a level: <u>Equal to</u> Considerations influencing the inclusion <u>E - Cost effectiveness</u>	M O pub. 16 current practice or exclusion of measures	in the standard:	<u>No</u>
a. In developing the standard: <u>CE</u> <u>TC</u> <u>ISS</u> Standard is set at a level: <u>Equal to</u> Considerations influencing the inclusion <u>E - Cost effectiveness</u>	M O pub. 16 current practice or exclusion of measures	in the standard:	<u>No</u>
a. In developing the standard: CE TC ISS Standard is set at a level: Equal to Considerations influencing the inclusion E - Cost effectiveness Comfort	M O pub. 16 current practice or exclusion of measures	in the standard:	<u>No</u>
a. In developing the standard: CE TC ISS Standard is set at a level: Equal to Considerations influencing the inclusion E - Cost effectiveness Comfort	M O pub. 16 current practice or exclusion of measures v and revision?	in the standard: Comments:	
a. In developing the standard: CE TC ISS Standard is set at a level: Equal to Considerations influencing the inclusion E - Cost effectiveness Comfort Standard scheduled for regular review Yes: Until July 1, 1992, revisi	M O pub. 16 current practice or exclusion of measures i v and revision?	in the standard: Comments:	on the National Targ
a. In developing the standard: CE TC ISS Standard is set at a level: Equal to Considerations influencing the inclusion E - Cost effectiveness Comfort Standard scheduled for regular review Yes: Until July 1, 1992, revisi	M O pub. 16 current practice or exclusion of measures in and revision? on every year. The host effectiveness. Tex	in the standard: Comments: 	on the National Targ

3 NETHERLANDS IMPLEMENTATION AND COMPLIANCE - Bouwbersluit, 1992

Buildings	le for implementation, its former focus was on	buildings, energy, or another area:
TRAINING & EDUCATION provided for archi	tects, engineers and other professionals:	
Written guidelines to assist with c	•	
Example calculations		· · · · · · · · · · · · · · · · · · ·
Compliance forms		
Information or resource center		
Compliance mechanisms used at different sta	mes in construction process:	· · · · · · · · · · · · · · · · · · ·
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval	Penalty	No mechanism
<u>certification</u> , approval	<u>I churty</u>	
Percent designs checked: 100	Percent sites checked: 10	Percent buildings checked: 0
Comment:	Comment:	Comment:
Approval required to become	Penalty consists of no	
the license for construction.	permission to finish	
	construction.	
e. Effectiveness of combined compliance me f. Explanation for effectiveness in part e: L	.icense is needed before starting constr	uction. Inspection during construc
21	s very simple.	· · · ·
Types of assessments or audits of energy sta	-	
a. ENERGY SAVINGS POTENTIAL based of		
Completed: National Environmer		
	ıg, 1990	
Completed: Noto Energiebesparin		:
b. MEASUREMENTS OF ENERGY SAVINGS None conducted	in actual buildings complying with standard	
b. MEASUREMENTS OF ENERGY SAVINGS None conducted	ering economic CALCULATIONS:	
b. MEASUREMENTS OF ENERGY SAVINGS None conducted	ering economic CALCULATIONS:	
b. MEASUREMENTS OF ENERGY SAVINGS None conducted	ering economic CALCULATIONS: hhater. Ministry of Housing.	· · · · · · · · · · · · · · · · · · ·

NETHERLANDS 4

Utility initiatives Affairs: all utilities (Milieu Aklie Plan); Rebates subsidies in existing buildings: awareness. Audits (free or subsidized) campaign in all governmental buildings by Novem and Ministry of Housing Campaign in all governmental buildings by Additional sources of information about energy efficiency for buildings in: Netherlands Netherlands 1. Environmental Action Plan from the utilities. (English) 2. National Environmental Plan and Noto Energiebesporing. Ministry of Housing and Environment (English) 3. Lecture: "Regulations for the Energy Performance of Buildings: a Status Quo" by S. REnes, Government Building. Agency. Ministry of Housing (Available in English by request, R. Trines) 22. Contact for written copy of energy standard specified in Question 4: Name: H.L. von Duijze Address: Ministry of Housing Box 3001 2700 KA Zosterman Country: The Netherlands Tel: 31 79 272 003 Fax: 31 79 516 431 Types of supporting information available:	20. Efficier	ncy testing facilities and procedures established:	
Thermal properties of materials Other: boilers Importantion programs Information programs Multistry of Housing and Environment/Econom Multistry of Housing and Environment/Econom Audits (free or subsidized) National Environmental Action Plan from the utilities. (English) 2. National Environmental Plan and Noto Energiebesporing. Ministry of Housing and Environment (English) 3. Lecture: "Regulations for the Energy Performance of Buildings: a Status Quo" by S. REnes, Government Building Agency, Ministry of Housing Box 3001 2. Contact for written copy of energy standard specified in Question 4: Name: H.L. von Duize Address: Ministry of Housing Box 3001 2.700 KA Zosterman Country: The Netherlands Tie: 31.79 272 003 Fax: 31.79 516 431 Types of supporting information available:	Ins	ulation	
Other: boilers 21. Other programs or policies developed to increase energy efficiency in buildings: Information programs Utility: initiatives Rebates Audits (free or subsidized) Additional sources of information about energy efficiency for buildings: in: Netherlands 1. Environmental Action Plan from the utilities. (English) 2. National Environmental Plan and Noto Energiebesporing. Ministry of Housing and Environment (English) 3. Lacture: "Regulations for the Energy Performance of Buildings: a Status Quo" by S. REnes, Government Building. Agency. Ministry of Housing 2. Contact for written copy of energy standard specified in Question 4: Name: H.L. von Duijze Address: Ministry of Housing Box 3001 2.700 KA Zosterman Country: The Netherlands Types of supporting information available:			white goods, boilers
21. Other programs or policies developed to increase energy efficiency in buildings: Information programs Utility initiatives Audits (free or subsidized) Navon and Ministry of Housing Additional sources of information about energy efficiency for buildings in: Netherlands 1. Environmental Action Plan from the utilities. (English) 2. National Environmental Plan and Noto Energiehesporing, Ministry of Housing and Environment (English) 3. Lecture: "Regulations for the Energy Performance of Buildings: a Status Quot" by S. REnes, Government Building Agency, Ministry of Housing Box 3001 2700 KA Zosterman Country: The Netherlands Tel: 31 79 272 203 Fee: 31 79 516 431 Types of supporting information available: Yes: Building Standards for Governmental Buildings, Government Buildings Agency. (from above) Minn S. Renes; Box 20952; 2500 E2 Don Hoog; tel: 31 70 356 7890; fax: 31 70 356 7588 Survey completed by: Ruud Trines Novem Sittard Sventiboldstrat 21 P.O. Box 17, 6130 AA <t< td=""><td></td><td></td><td></td></t<>			
Information programs Comment: Ministry of Housing and Environment/Economi Utility initiatives Additional sources of information about energy efficiency for buildings in cashing buildings; awareness. campaign in all governmental buildings by Novem and Ministry of Housing Additional sources of information about energy efficiency for buildings in: Netherlands 1. Environmental Action Plan from the utilities. (English) 2. National Environmental Plan and Noto Energiebesporing, Ministry of Housing and Environment (English) 3. Lecture: "Regulations for the Energy Performance of Buildings: a Status Quo" by S. REnes, Government Building Agency, Ministry of Housing Box 3001 22. Context for written copy of energy standard specified in Question 4: Name: H.L. von Duijze Address: Ministry of Housing Box 3001 Z700 KA Zosterman Country: The Netherlands Tel: 31 79 272 003 Fax: Tel: 31 79 272 003 Fax: Yes: Building Standards for Governmental Buildings; Yes: Building Standards for Governmental Buildings, Government Buildings Agency. (from above) Minn S. Renes; Box 20952; 2500 E2 Don Hoog; tel: 31 70 356 7890; fax: 31 70 356 7588 Survey completed by: Ruut Trines Title: Project-Manager Novem Sittard Swentibuldistrat 21 P.O. Box 17, 6130 AA <t< td=""><td>Oth</td><td>ner: boilers</td><td></td></t<>	Oth	ner: boilers	
Information programs Comment: Ministry of Housing and Environment/Economi Utility_initiatives Additional sources of information about energy efficiency for buildings in: Risking buildings; avaraneess. campaign in all governmental buildings by Novem and Ministry of Housing Additional sources of information about energy efficiency for buildings in: Netherlands 1. Environmental Action Plan from the utilities. (English) 2. National Environmental Plan and Noto Energiebesporing, Ministry of Housing and Environment (English) 3. Lecture: "Regulations for the Energy Performance of Buildings: a Status Quo" by S. REnes, Government Building Agency, Ministry of Housing Box 3001 22. Context for written copy of energy standard specified in Question 4: Name: H.L. Name: H.L. View of Housing Box 3001 Fax: 31 79 516 431 Types of supporting information available: Vers: Yes: Building Standards for Governmental Buildings, Government Buildings Agency. (from above) Minn S. Renes; Box 20952; 2500 E2 Don Hoog; tel: 31 70 356 7890; fax: 31 70 356 7588 Survey completed by: Ruu Trines Title: Pio: Box 10, Guatards 12 P.O. Box 17, 6130 AA Sittard Sittard Country: The Netherla Sittard Sittard 12 <td></td> <td></td> <td></td>			
Information programs Comment: Ministry of Housing and Environment/Economi Utility_initiatives Additional sources of information about energy efficiency for buildings in: Risking buildings; avaraneess. campaign in all governmental buildings by Novem and Ministry of Housing Additional sources of information about energy efficiency for buildings in: Netherlands 1. Environmental Action Plan from the utilities. (English) 2. National Environmental Plan and Noto Energiebesporing, Ministry of Housing and Environment (English) 3. Lecture: Regulations for the Energy Performance of Buildings: a Status Quo" by S. REnes, Government Building Agency, Ministry of Housing Box 3001 22. Context for written copy of energy standard specified in Question 4: Name: H.L. Name: H.L. View of Housing Box 3001 Fax: 31 79 516 431 Types of supporting information available: Guiner energy standards for Governmental Buildings, Government Buildings Agency. (from above) Minn S. Renes; Box 20952; 2500 E2 Don Hoog; tel: 31 70 356 7598 Survey completed by: Novern Sittard Swentboldstraat 21 P.O. Box 17, 6130 AA Sittard Country: The Netherlands		· · · · · · · · · · · · · · · · · · ·	······································
Information programs Comment: Ministry of Housing and Environment/Economi Willity initiatives Affairs; all utilities, (Milen Aklie Plan); Rebates campaign in all governmental building; avareness. Audits (free or subsidized) Subsidies in existing building; avareness. Additional sources of information about energy efficiency for buildings in: Netherlands 1. Environmental Action Plan from the utilities. (English) Subsidies in existing building; avareness. 2. National Environmental Plan and Noto Energiebesporing, Ministry of Housing and Environment (English) Subsidies in existing buildings: a Status Quo" by S. REnes, Government Building Agency, Ministry of Housing (Available in English by request, R. Trines) 22. Contact for written copy of energy standard specified in Question 4: Name Name H.L. von Duijze Address: Ministry of Housing Box 3001 2700 KA Zosterman Country: The Netherlands Tel: 31 79 272 003 Fax: Yes: Building Standards for Governmental Buildings: Yes: Building Standards for Governmental Buildings, Government Buildings Agency. (from above) Minn S. Renes; Box 20952; 2500 E2 Don Hoog; tel: 31 70 356 7598 Survey completed by: Survey completed by: Ruu Trines Title: Project-Manager			· · · · · · · · · · · · · · · · · · ·
Utility initiatives Affairs; all utilities, Qhilien, Akie Plan;: Rebates audits (free or subsidized) subsidies in existing buildings; awareness. Audits (free or subsidized) subsidies in existing buildings; buildings by Norem and Ministry of Housing and Ministry of Housing and Environment Audits (free or subsidized) Norem and Ministry of Housing and Environment (English) . 2. National Environmental Plan and Noto Energiebesporing, Ministry of Housing and Environment (English) . 3. Lecture: Regulations for the Energy Performance of Buildings: a Status Quo" by S. REnes, Government Building Agency, Ministry of Housing . (Available in English by request, R. Trines) 22 Contact for written copy of energy standard specified in Question 4: Name H.L. von Duijze Address: Ministry of Housing Box 3001 2700 KA Zosterman Country: The Netherlands . Tel: 31 79 272 003 Fac: Yes: Building Standards for Governmental Buildings; Yes: Building Standards for Governmental Buildings, Government Buildings Agency. (from above) Minn S. Renes; Box 20952; 2500 E2 Don Hoog; tel: 31 70 356 7890; fax: 31 70 356 7588 Survey completed by: Ruu Trines	-		•
Rebates subsidies in existing buildings; awareness. campaign in all governmental buildings by Norwer and Ministry of Housing Additional sources of information about energy efficiency for buildings in: Netherlands 1. Environmental Action Plan from the utilities. (English)			Comment: Ministry of Housing and Environment/Econom
Audits (free or subsidized) campaign in all governmental buildings by Novem and Ministry of Housing Additional sources of information about energy efficiency for buildings in: Netherlands 1. Environmental Action Plan from the utilities. (English) 2. National Environmental Plan and Noto Energy/English) 2. 3. Lecture: "Regulations for the Energy Performance of Buildings: a Status Quo" by S. REnes, Government Building Agency, Ministry of Housing. (Available in English by request, R. Trines) 22. Contact for written copy of energy standard specified in Question 4: Name H.L. von Duijze Address: Ministry of Housing Box 3001 2700 KA Zosterman Country: The Netherlands Tel: 31 79 272 003 Fac: 31 79 516 431 Types of supporting information available:			
Additional sources of information about energy efficiency for buildings in: Netherlands 1. Environmental Action Plan from the utilities. (English) 2. National Environmental Plan and Noto Energiebesporing. Ministry of Housing and Environment. (English) 3. Lecture: "Regulations for the Energy Performance of Buildings: a Status Quo" by S. REnes, Government Building. Agency, Ministry of Housing. (Available in English by request, R. Trines) 22. Contact for written copy of energy standard specified in Question 4: Name: H.L. von Duijze Address: Ministry of Housing Box 3001 2700 KA Zosterman Country: The Netherlands Tel: 31 79 272 003 Fax: 31 79 516 431 Types of supporting information available:			
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 Environmental Action Plan from the utilities. (English) National Environmental Plan and Noto Energiebesporing, Ministry of Housing and Environment (English) Lecture: "Regulations for the Energy Performance of Buildings: a Status Quo" by S. REnes, Government Building Agency, Ministry of Housing. (Available in English by request, R. Trines) Contact for written copy of energy standard specified in Question 4: Name: H.L. von Duijze Address: Ministry of Housing Box 3001 2700 KA Zosterman Country: The Netherlands Tel: 31 79 272 003 Fax: 31 79 516 431 Types of supporting information available: 	امام ۸	itional sources of information about energy officia	neu for huildings in: Netherlands
 2. National Environmental Plan and Noto Energiebesporing, Ministry of Housing and Environment (English) 3. Lecture: "Regulations for the Energy Performance of Buildings: a Status Quo" by S. REnes, Government Building Agency, Ministry of Housing. (Available in English by request, R. Trines) 22. Contact for written copy of energy standard specified in Question 4: Name: H.L. von Duijze Address: Ministry of Housing Box 3001 2700 KA Zosterman Country: The Netherlands Tel: 31 79 272 003 Fac: 31 79 516 431 Types of supporting information available: Other energy standards for non-residential buildings: Yes: Building Standards for Governmental Buildings, Government Buildings Agency. (from above) Minn S. Renes; Box 20952; 2500 E2 Don Hoog; tel: 31 70 356 7890; fax: 31 70 356 7588 Survey completed by: Ruud Trines Title: Project-Manager Novem Sittard Swentiboldstraat 21 P.O. Box 17, 6130 AA Sittard Country: The Netherla Tel: 31-0-46-595-318 Fac: 31-0-46-528-260 		•••	
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5. The standard defined in Question 4 applies to the following kinds of buildings: a. Building types: O - Offices H - Hotels G - Government Facilities D - Hospitals C - Commercial/retail stores R - Religion-related Both prescriptive and performance	TAL OVERVIEW OF I	BUILDING ENERGY	STANDANDS	Construction of the Party of the		
3. Status of Non-Residential Building Energy Standards at the:	1. General building standar	ds exist at the following g	jovernmental levels	National		
a National level: <u>Mandatory</u> b. Regional level: <u>-None</u> c. Local calculations for equipment sizing Controls Ventilation	2. Proposed or existing EN	ERGY standards cover t	he following buildi	ng sectors: Both Resid	ential and Non-Re	esidential
a National level: <u>Mandatory</u> b. Regional level: <u>-None</u> c. Local level:	3. Status of Non-Residenti	al Building Energy Stan	dards at the:			
Title, Organization: Building Industry Authority, Approved Document H1_(refers to NZS 4220: Code of Practi- for Energy Conservation in Non-Residential Buildings) Year: 1982 Geographic Coverage: Nation Abbreviated Title: BIA H1 RIPTION OF SPECIFIED ENERGY STANDARDS - BIA H1 5. The standard defined in Question 4 applies to the following kinds of buildings: a. Building types: O - Offices Building vintage: B - Hotels Building vintage: C - Commercial/retail stores B. Building vintage: C - Commercial/retail stores P - Physical size: > 50 sq. m C - Commercial/retail stores P - Physical size: > 50 sq. m G. Basic approach of the standard: Both prescriptive and performance 7. The following subjects are included in the energy standard: b. Building envelope provisions: E - Energy amount target Wall system E - Energy amount target Infiltration Infiltration Infiltration Infiltration Infiltration				rel: - None	c. Local level: —	- None
Title, Organization: Building Industry Authority, Approved Document H1. (refers to NZS 4220: Code of Practi- for Energy Conservation in Non-Residential Buildings). Year: 1982 Geographic Coverage: Nation St. The standard defined in Question 4 applies to the following kinds of buildings: a. Building types: b. Building vintage: O - Offices b. Building vintage: Both new and existing Both new and existing H - Hotels C. Oronrenerial/retail stores P. Physical size: > 50 sq. m C - Commercial/retail stores P. Physical size: > 50 sq. m R - Religion-related Standard: Both prescriptive and performance 7. The following subjects are included in the energy standard: b. Building envelope provisions: E - Energy amount target Infiltration Infiltration Infiltration Geographic Coverage: Load Calculations for equipment sizing Controls Yentilation						
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for Energy Conservation in Non-Residential Buildings) Year: 1982 Geographic Coverage: Nation Abbreviated Title: BIA H1 Stress and defined in Question 4 applies to the following kinds of buildings: a. Building types: 0 Offices H - Hotels b. Building yintage: C - Convergent Facilities b. Building vintage: D - Hospitals C - Commercial/retail stores R - Religion-related P - Physical size: > 50 sq. m State approach of the standard: Both prescriptive and performance 7. The following subjects are included in the energy standard: a. Building envelope provisions: E - Energy amount target Mode building envelope provisions: E - Energy amount target D. Building trovisions: B - Energy amount target D - Mode Calculations for equipment sizing Controls Ventilation	• •		-	ved_Document H1. (refe	ers to NZS 4220: Co	de of Practic
RIPTION OF SPECIFIED ENERGY STANDARDS - BIA H1 5. The standard defined in Question 4 applies to the following kinds of buildings: a. Building types: b. Building vintage: Both new and existing b. Building vintage: Both new and existing c. Corrument Facilities c. Commercial/retail stores R - Religion-related b. Building energy provisions: b. Building energy provisions: b. Building energy provisions: c. Lighting provisions: Power density c. Lighting provisions: Power density c. Lighting provisions: b. Building energy provisions: c. Lighting provisions: b. Building energy provisions: c. Lighting provisions: b. Building energy provisions: b. Building envelope provisions: c. Lighting provisions: b. Building envelope provisions: b. Building envelope provisions: c. Lighting provisions: b. Building envelope provisions: c. Lighting provisions: b. Building envelope provisions: c. Lighting provisions: c. Lighting provisions: d. Mechanical provisions for equipment sizing c. Controls v. Controls v. Controls 						
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a. Building types: b. Building vintage: O - Offices Both new and existing H - Hotels C. Government Facilities D - Hospitals C. Commercial/retail stores R - Religion-related P - Physical size: > 50 sq. m	RIPTION OF SPECIFI	ED ENERGY STAN	DARDS - BLA	H1		
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G - Government Facilities C. Other characteristics: D - Hospitals P - Physical size: > 50 sq. m C - Commercial/retail stores P - Physical size: > 50 sq. m R - Religion-related	the second se		Both r	new and existing		
C - Government Facilities P - Physical size: > 50 sq. m D - Hospitals P - Physical size: > 50 sq. m R - Religion-related P - Physical size: > 50 sq. m Basic approach of the standard: Both prescriptive and performance 6. Basic approach of the standard: Both prescriptive and performance 7. The following subjects are included in the energy standard: b. Building envelope provisions: E - Energy amount target Nall system Fenestration system Infiltration Infiltration Infiltration U Mechanical provisions: Load Calculations for equipment sizing Controls Ventilation			c Other d	haracteristics.		
D = Trospitals C - Commercial/retail stores R - Religion-related	and the second	t Facilities				
R - Religion-related G. Basic approach of the standard: Both prescriptive and performance 7. The following subjects are included in the energy standard: b. Building envelope provisions: a. Whole building energy provisions: b. Building envelope provisions: E- Energy amount target b. Building envelope provisions: Best of the standard: c. Lighting provisions: Power density d. Mechanical provisions: Load Calculations for equipment sizing Controls Ventilation			$\frac{\mathbf{r} - \mathbf{r} \mathbf{n} \mathbf{y}}{\mathbf{r} - \mathbf{r} \mathbf{n} \mathbf{y}}$	sical size: > 50 sq. m		
6. Basic approach of the standard: Both prescriptive and performance 7. The following subjects are included in the energy standard: a. Whole building energy provisions: E- Energy amount target Building envelope provisions: Roof Wall system Fenestration system Infiltration c. Lighting provisions: Mechanical provisions: Load Calculations for equipment sizing Controls Ventilation 	C - Commercial	/retail stores				
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7. The following subjects are included in the energy standard: a. Whole building energy provisions: E- Energy amount target Building envelope provisions: Roof Wall system Fenestration system Infiltration Infiltration Infiltration C. Lighting provisions: Power density Load Calculations for equipment sizing Controls Ventilation	6 Basic approach of the s	landard: Both pres	riptive and per	formance		
a. Whole building energy provisions: b. Building envelope provisions: E- Energy amount target Roof Wall system Fenestration system Infiltration Infiltration c. Lighting provisions: Mechanical provisions: Power density Load Calculations for equipment sizing Controls Ventilation		bott pres	<u>inpute una per</u>			
a. Whole building energy provisions: b. Building envelope provisions: E- Energy amount target Roof Wall system Fenestration system Infiltration Infiltration c. Lighting provisions: Mechanical provisions: Power density Load Calculations for equipment sizing Controls Ventilation	7. The following subjects ar	e included in the energy	standard:			
E- Energy amount target Roof Wall system Fenestration system Infiltration Infiltration Power density Load Calculations for equipment sizing Controls Ventilation	•			b. Building envelope provisi	ons:	
Wall system Fenestration system Infiltration C. Lighting provisions: Power density Load Calculations for equipment sizing Controls Ventilation						
Fenestration system Infiltration c. Lighting provisions: Power density Load Calculations for equipment sizing Controls Ventilation		nt target				
c. Lighting provisions: Infiltration Power density Load Calculations for equipment sizing Controls Ventilation		<u> </u>		vvall system		····
c. Lighting provisions: Power density Load Calculations for equipment sizing Controls Ventilation				Comparing the second	n	·
Power density Load Calculations for equipment sizing Controls Ventilation		·				
Power density Load Calculations for equipment sizing Controls Ventilation		·				
Controls Ventilation	E- Energy amou			Infiltration		
Ventilation	E- Energy amou			Infiltration d. Mechanical provisions:		
	E- Energy amou			Infiltration d. Mechanical provisions: Load Calculations f	or equipment sizir	ng
e. Other provisions:	E- Energy amou			Infiltration d. Mechanical provisions: Load Calculations f Controls	or equipment sizir	ng
e. Other provisions:	E- Energy amou			Infiltration d. Mechanical provisions: Load Calculations f Controls	or equipment sizir	ng
No goals or targets presently set for non-residential buildings	E- Energy amou			Infiltration d. Mechanical provisions: Load Calculations f Controls	or equipment sizir	ng

NEW ZEALAND 2

Research group: Building Research Association of	f New Zealand
	· · · · · · · · · · · · · · · · · · ·
	· · · · · · · · · · · · · · · · · · ·
Decision Process: Mandate Comment: De	cree taking into account public comment
	······································
0. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Gathered through audits and surveys	Computer simulations used for estimates
Already available prior to standard	Gathered through audits and surveys
<u></u>	
c. WEATHER data	d. Other information
,	- None
Already available prior to standard	
1. Standards from a different country used as source material:	
USA: ASHRAE - Handbook of Fundamentals	
UK:	· · · · · · · · · · · · · · · · · · ·
BS 5422: 1977	
IHVE Guide Books	
UK: CIBS Energy Codes	
2. COMPUTER programs used:	
a. In developing the standard: SUSTEP	b. For complying with the standard: <u>ALF</u>
a. In developing the standard: <u>SUSTEP</u>	b. For complying with the standard: <u>ALF</u>
	b. For complying with the standard: <u>ALF</u>
a. In developing the standard: SUSTEP	b. For complying with the standard: <u>ALF</u>
	b. For complying with the standard: <u>ALF</u>
	b. For complying with the standard: <u>ALF</u>
	b. For complying with the standard: <u>ALF</u>
	in the standard:
3. Standard is set at a level: Equal to current practice	
3. Standard is set at a level: <u>Equal to current practice</u> 4. Considerations influencing the inclusion or exclusion of measures	in the standard:
3. Standard is set at a level: Equal to current practice 4. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness	in the standard:
3. Standard is set at a level: Equal to current practice 4. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness	in the standard:
3. Standard is set at a level: Equal to current practice 4. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness	in the standard:
3. Standard is set at a level: Equal to current practice 4. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Similarity/difference to local design	in the standard:
3. Standard is set at a level: Equal to current practice 4. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Similarity/difference to local design 5a. Standard scheduled for regular review and revision?	in the standard: Comments:
3. Standard is set at a level: Equal to current practice 4. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Similarity/difference to local design 5a. Standard scheduled for regular review and revision? Yes: when BIA has funding, H1 will be subject to	in the standard:
3. Standard is set at a level: Equal to current practice 4. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Similarity/difference to local design 5a. Standard scheduled for regular review and revision?	in the standard: Comments:
3. Standard is set at a level: Equal to current practice 4. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Similarity/difference to local design 5a. Standard scheduled for regular review and revision? Yes: when BIA has funding, H1 will be subject to	in the standard: Comments:

3 NEW ZEALAND

If an existing agency was made response	ible for implementation, its former focus was on bu	ildinge operation another area:
Buildings		indings, cragy, or anource area.
17. TRAINING & EDUCATION provided for arc	withouts and income and other professionals.	
Other: training expected to be pr		
	contact by maturity	
		······
18. Compliance mechanisms used at different	stages in construction process:	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval	Certification/approval	Certification/approval
Percent designs checked: 90	Percent sites checked: 25	Percent buildings checked: 1
Comment:	Comment:	Comment:
	Small buildings 100%; Large	Territorial authority mu
		give a code compliance
	buildings about 25%	
d. Other compliance procedures <u>NB: R</u>	Building code is administered by territor	certificate.
d. Other compliance procedures <u>NB: F</u> e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e:	Building code is administered by territon	certificate.
d. Other compliance procedures <u>NB: H</u> e. Effectiveness of combined compliance i f. Explanation for effectiveness in part e: 19. Types of assessments or audits of energy	Building code is administered by territor mechanisms (scale of 1-5): 4	certificate.
d. Other compliance procedures <u>NB: F</u> e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e:	Building code is administered by territor mechanisms (scale of 1-5): 4	certificate.
d. Other compliance procedures <u>NB: F</u> e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: 19. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based	Building code is administered by territor mechanisms (scale of 1-5): 4	certificate.
d. Other compliance procedures <u>NB: H</u> e. Effectiveness of combined compliance f f. Explanation for effectiveness in part e: 19. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Planned	Building code is administered by territon mechanisms (scale of 1-5): <u>4</u> standards' impact: h on prototypical (not actual) buildings:	certificate.
d. Other compliance procedures <u>NB: H</u> e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 19. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based <u>Planned</u> b. MEASUREMENTS OF ENERGY SAVING	Building code is administered by territor mechanisms (scale of 1-5): 4	certificate.
 d. Other compliance procedures <u>NB: H</u> e. Effectiveness of combined compliance if f. Explanation for effectiveness in part e: 19. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based <u>Planned</u> b. MEASUREMENTS OF ENERGY SAVING Completed: Baird, Brander, Bra 	Building code is administered by territon mechanisms (scale of 1-5): <u>4</u> standards' impact: h on prototypical (not actual) buildings:	certificate.
 d. Other compliance procedures <u>NB: H</u> e. Effectiveness of combined compliance if f. Explanation for effectiveness in part e: 19. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based <u>Planned</u> b. MEASUREMENTS OF ENERGY SAVING Completed: Baird, Brander, Bra 	Building code is administered by territor mechanisms (scale of 1-5): <u>4</u> standards' impact: d on prototypical (not actual) buildings: GS in actual buildings complying with standard: ahns, Donn, Isaacs, Pool, in Architecture	certificate.
 d. Other compliance procedures <u>NB: H</u> e. Effectiveness of combined compliance if f. Explanation for effectiveness in part e: 19. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based <u>Planned</u> b. MEASUREMENTS OF ENERGY SAVING Completed: Baird, Brander, Bra 	Building code is administered by territor mechanisms (scale of 1-5): <u>4</u> standards' impact: i on prototypical (not actual) buildings: GS in actual buildings complying with standard: ahns, Donn, Isaacs, Pool, in Architecture BD building energy use in Auckland and	certificate.
 d. Other compliance procedures <u>NB: F</u> e. Effectiveness of combined compliance if f. Explanation for effectiveness in part e: 19. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Planned b. MEASUREMENTS OF ENERGY SAVING Completed: Baird, Brander, Brander, Brander, Brander, Completed: Other reports on completed: Other r	Building code is administered by territor mechanisms (scale of 1-5): <u>4</u> standards' impact: i on prototypical (not actual) buildings: GS in actual buildings complying with standard: ahns, Donn, Isaacs, Pool, in Architecture BD building energy use in Auckland and	certificate.
 d. Other compliance procedures <u>NB: F</u> e. Effectiveness of combined compliance if f. Explanation for effectiveness in part e: 19. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Planned b. MEASUREMENTS OF ENERGY SAVING Completed: Baird, Brander, Brander, Brander, Brander, Completed: Other reports on completed: Other r	Building code is administered by territor mechanisms (scale of 1-5): _4	certificate.

NEW ZEALAND 4

		y testing facilities and p	procedures establishe	ed:		
		ation				
<u>1</u>	her	mal properties of	materials		·····	
· —					<u></u>	,
. –					·	
					<u>.</u>	
_						
21. Oth	er pro	ograms or policies deve	loped to increase ener	rgy efficiency in buik	lings:	
	•	ty initiatives	•		•	generating utility has
_						y Efficient House" progr
_				<u> </u>		ment and appliances.
-						
				I		
A	dditi	onal sources of informa	tion about energy efficient	ciency for buildings i	in: New Zealand	
					Manual.	
1	ير					
~	- -	aird Dopp Pool	rander & Chan "	Energy Parform	ance of Buildings " CP	C Press, Boca Raton,
2					ance of buildings, CR	
_		•		0,		
3	5. ·				<u></u>	· ····································
		or written copy of ener	gy standard specified	in Question 4:		
	ame:		· · ·			
N	ame:	Standards Asso	ciation of New Ze			
N Addre	ame:	Standards Asso Private Bag, W	ciation of New Ze			····
N Addre	ame: ss:	Standards Asso Private Bag, W	ciation of New Ze			
N Addre C	ame: ss: countr	Standards Asso Private Bag, W	ciation of New Ze	ealand		· · ·
Ni Addre C T	ame: ss: ountr el:	Standards Asso Private Bag, W y :	ciation of New Ze ellington			······································
Ni Addre C T	ame: ss: ountr el: ypes	Standards Asso Private Bag, W y: of supporting informati	ciation of New Ze ellington on available:	ealand Fax:		· · · ·
Ni Addre C T	ame: ss: ountr el: ypes	Standards Asso Private Bag, W y :	ciation of New Ze ellington on available:	ealand Fax:		
Ni Addre C T	ame: ss: ountr el: ypes	Standards Asso Private Bag, W y: of supporting informati	ciation of New Ze ellington on available:	ealand Fax:		
Ni Addre C T T	ame: ss: ountr el: ypes E	Standards Asso Private Bag, W y: of supporting informati building Code Perfo	ciation of New Ze ellington on available: ormance, from Ha	ealand Fax: mish Handley.		
Ni Addre C T T	ame: ss: ountr el: ypes E - ther	Standards Asso Private Bag, W y: of supporting informati building Code Perfo energy standards for n	ciation of New Ze ellington on available: ormance, from Ha	ealand Fax: mish Handley.		
Ni Addre C T T	ame: ss: ountr el: ypes E - ther	Standards Asso Private Bag, W y: of supporting informati building Code Perfo	ciation of New Ze ellington on available: ormance, from Ha	ealand Fax: mish Handley.		
Ni Addre C T T	ame: ss: ountr el: ypes E - ther	Standards Asso Private Bag, W y: of supporting informati building Code Perfo energy standards for n	ciation of New Ze ellington on available: ormance, from Ha	ealand Fax: mish Handley.		
Ni Addre C T T	ame: ss: ountr el: ypes E - ther	Standards Asso Private Bag, W y: of supporting informati building Code Perfo energy standards for n NZD 4220	ciation of New Ze ellington on available: ormance, from Ha on-residential building	ealand Fax: mish Handley.		
Ni Addre C T T	ame: ss: ountr el: ypes E - ther	Standards Asso Private Bag, W y: of supporting informati building Code Perfo energy standards for n NZD 4220	ciation of New Ze ellington on available: ormance, from Ha on-residential building urvey completed by:	ealand Fax: mish Handley. gs: Nigel Isaacs		
Ni Addre C T T	ame: ss: ountr el: ypes E - ther	Standards Asso Private Bag, W y: of supporting informati building Code Perfo energy standards for n NZD 4220	ciation of New Ze ellington on available: ormance, from Ha on-residential building	ealand Fax: mish Handley. gs: Nigel Isaacs Research Fell		
Ni Addre C T T	ame: ss: ountr el: ypes E - ther	Standards Asso Private Bag, W y: of supporting informati building Code Perfo energy standards for n NZD 4220	ciation of New Ze ellington on available: ormance, from Ha on-residential building urvey completed by:	ealand Fax: mish Handley. gs: Nigel Isaacs Research Fell Centre for Bui	ilding Performance Res	
Ni Addre C T T	ame: ss: ountr el: ypes E - ther	Standards Asso Private Bag, W y: of supporting informati building Code Perfo energy standards for n NZD 4220	ciation of New Ze ellington on available: ormance, from Ha on-residential building urvey completed by:	ealand Fax: mish Handley. gs: Nigel Isaacs Research Fell Centre for Bui School of Arc	lding Performance Res hitecture, Victoria Uni	versity of
Ni Addre C T T	ame: ss: ountr el: ypes E - ther	Standards Asso Private Bag, W y: of supporting informati building Code Perfo energy standards for n NZD 4220	ciation of New Ze ellington on available: ormance, from Ha on-residential building urvey completed by: Title:	ealand Fax: mish Handley. gs: Nigel Isaacs Research Fell Centre for Bui School of Arc PO Box 600	ilding Performance Rea hitecture, Victoria Un Welling	iversity of to Country: New Zeala
Ni Addre C T T	ame: ss: ountr el: ypes E - ther	Standards Asso Private Bag, W y: of supporting informati building Code Perfo energy standards for n NZD 4220	ciation of New Ze ellington on available: ormance, from Ha on-residential building urvey completed by:	ealand Fax: mish Handley. gs: Nigel Isaacs Research Fell Centre for Bui School of Arc	lding Performance Res hitecture, Victoria Uni	iversity of to Country: New Zeala

	NORT	HERN	IRELA	ND	
RAL OVERVIEW O	F BUILDING ENERGY	STANDARDS			
1. General building stan	dards exist at the following g	governmental levels:	National	<u> </u>	
2. Proposed or existing	ENERGY standards cover t	he following building	sectors: Both Res	idential and Non-J	Residential
2. Status of Non-Doside	ential Building Energy Stan	darde at the			
a. National level:	Mandatory	b. Regional level	Mandatory	c. Local level:	Mandatory
A Single operations	ard selected for further des	arintian.			
	Building Regulations	-	d) 1000 mins among	mont Bart E. Canaa	mutter of Two
nue, organizzation	and Power. July 1, 19				
Year: 1991	Geographic Coverage:	Nation	Abbreviated Title:	BR-DENI, 1991	
RIPTION OF SPECI	FIED ENERGY STAN	DARDS - BR-D	ENI, 1991		
	n Question 4 applies to the f				
a. Building types:	in ducsion 4 applies to the l	b. Building vi	-		
A - All Buildi	ings	-	w and existing		
		c. Other cha	ractoristics:		
				ential >30 sq. m floc	or area
·····				trial or storage > 50V	
	· · · · · · · · · · · · · · · · · · ·		other bu	ildings > 25 W/sq. m	
	· · · · · · · · · · · · · · · · · · ·			·	
				-	
6. Basic approach of the	e standard: Performan	ce-based			
•	are included in the energy a	-	L D. ". P	1.1	
a. Whole building en	ergy provisions:		b. Building envelope pro	/ISIONS:	
			Roof	<u> </u>	
- None			Wall sustam		
- None			Wall system Fenestration system	em	
- None	······		Wall system Fenestration syst	em	
			Fenestration syst		
c. Lighting provision	s:		Fenestration syst		
	IS:		Fenestration syst		
c. Lighting provision	IS:		Fenestration syst		
c. Lighting provision	IS:		Fenestration syst		
c. Lighting provision	IS:		Fenestration syst		
c. Lighting provision	· · · · · · · · · · · · · · · · · · ·		Fenestration syst		
c. Lighting provision - None	· · · · · · · · · · · · · · · · · · ·		Fenestration syst		

8. Organizations involved in develop	ing the standard:		
Government agency: De	epartment of the Environm	nent for Northern Ireland	•
		nent (England and Wales)	
Research group: Building	ng Research Establishmer	nt	
9. Decision Process: Consensus	Comment: Pu	blic consultation on proposals.7	·
10. Information used in developing t	he standard:		
a. PHYSICAL CHARACTERIS	TICS of existing buildings	b. ENERGY USE of existing building	S:
Gathered through aud	lits and surveys	Gathered through audits an	d survevs
			· · · · · · · · · · · · · · · · · · ·
c. WEATHER data		d. Other information	
		- None	
Already available price	or to standard		
		· .	
11. Standards from a different court	trv used as source material:		
England and			
Wales:			
114100.			
			·
COMPUTER programs used:			
12. COMPUTER programs used: a. In developing the standard:	BREDEM	, b. For complying with the standard:	No
	BREDEM CIBSE Energy Code	b. For complying with the standard:	<u>No</u>
		b. For complying with the standard:	<u>No</u>
		b. For complying with the standard:	<u>No</u>
		b. For complying with the standard:	<u>No</u>
a. In developing the standard:	CIBSE Energy Code	b. For complying with the standard:	<u>No</u>
	CIBSE Energy Code	b. For complying with the standard:	<u>No</u>
a. In developing the standard: 13. Standard is set at a level: <u>Ab</u>	CIBSE Energy Code		<u>No</u>
a. In developing the standard: 13. Standard is set at a level: <u>Ab</u> 14. Considerations influencing the inc	CIBSE Energy Code		<u>No</u>
 a. In developing the standard: 13. Standard is set at a level: <u>Ab</u> 14. Considerations influencing the inc <u>E - Cost effectiveness</u> 	CIBSE Energy Code	s in the standard:	<u>No</u>
a. In developing the standard: 13. Standard is set at a level: <u>Ab</u> 14. Considerations influencing the inc <u>E - Cost effectiveness</u> <u>Availability of energy</u>	CIBSE Energy Code	s in the standard:	<u>No</u>
 a. In developing the standard: 13. Standard is set at a level: <u>Ab</u> 14. Considerations influencing the inc <u>E - Cost effectiveness</u> 	CIBSE Energy Code	s in the standard:	<u>No</u>
a. In developing the standard: 13. Standard is set at a level: <u>Ab</u> 14. Considerations influencing the inc <u>E - Cost effectiveness</u> <u>Availability of energy</u> <u>Similarity/difference t</u>	CIBSE Energy Code	s in the standard:	<u>No</u>
a. In developing the standard: 13. Standard is set at a level: <u>Ab</u> 14. Considerations influencing the inc <u>E - Cost effectiveness</u> <u>Availability of energy</u> <u>Similarity/difference t</u> <u>Cost effectiveness</u>	CIBSE Energy Code	s in the standard:	<u>No</u>
a. In developing the standard: 13. Standard is set at a level: <u>Ab</u> 14. Considerations influencing the inc <u>E - Cost effectiveness</u> <u>Availability of energy</u> <u>Similarity/difference t</u> <u>Cost effectiveness</u>	CIBSE Energy Code	s in the standard:	<u>No</u>
a. In developing the standard: 13. Standard is set at a level: <u>Ab</u> 14. Considerations influencing the inc <u>E - Cost effectiveness</u> <u>Availability of energy</u> <u>Similarity/difference t</u> <u>Cost effectiveness</u> <u>Other:</u> 15a. Standard scheduled for regular	CIBSE Energy Code	s in the standard: Comments:	
a. In developing the standard: 13. Standard is set at a level: <u>Ab</u> 14. Considerations influencing the inc <u>E - Cost effectiveness</u> <u>Availability of energy</u> <u>Similarity/difference t</u> <u>Cost effectiveness</u> <u>Other:</u> 15a. Standard scheduled for regular <u>Yes: BRE research lead</u>	CIBSE Energy Code	s in the standard:	
a in developing the standard: 13. Standard is set at a level: <u>Ab</u> 14. Considerations influencing the inc <u>E - Cost effectiveness</u> <u>Availability of energy</u> <u>Similarity/difference t</u> <u>Cost effectiveness</u> <u>Other:</u> 15a. Standard scheduled for regular <u>Yes: BRE research lead</u> notification=> regulation	CIBSE Energy Code	s in the standard: Comments: 	

3 NORTHERN IRELAND IMPLEMENTATION AND COMPLIANCE - BR-DENI, 1991

Buildings	ible for implementation, its former focus was on t	uildings, energy, or another area:
·	hitects, engineers and other professionals:	· · · · · · · · · · · · · · · · · · ·
Written guidelines to assist with	• •	
Example calculations Seminars, workshops, or conferer		
Seminars, workshops, or conterer		
Compliance mechanisms used at different s a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval	Certification/approval	Certification/approval
Percent designs checked: 100	Percent sites checked: 75	Percent buildings checked: 95
Comment:	Comment:	Comment:
	Most buildings checked at	Objective is inspection of
		1
d. Other compliance procedures <u>- Non</u>	<u> </u>	every building on complet
e. Effectiveness of combined compliance r	e nechanisms (scale of 1-5): 5 Plans for every building are checked/a	pproved. Everyone [is] aware of
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e:	e	pproved. Everyone [is] aware of
e. Effectiveness of combined compliance r	e	pproved. Everyone [is] aware of
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: Types of assessments or audits of energy s	e	pproved. Everyone [is] aware of
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based	e	pproved. Everyone [is] aware of
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: Types of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based Completed	e	pproved. Everyone [is] aware of
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: Types of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based Completed	e	pproved. Everyone [is] aware of
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING	e	pproved. Everyone [is] aware of
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: Types of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING In progress	e	pproved. Everyone [is] aware of
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING	e	pproved. Everyone [is] aware of
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: Types of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING In progress c. COST EFFECTIVENESS based on engi Completed	e	pproved. Everyone [is] aware of
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e: Fypes of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based Completed b. MEASUREMENTS OF ENERGY SAVING In progress c. COST EFFECTIVENESS based on engi	e	pproved. Everyone [is] aware of

NORTHERN IRELAND 4

	esting facilities and procedures established		
Insula		<u> </u>	
Therm	al properties of materials		
	······································		
	······································		······································
	,		·
	· · · · · · · · · · · · · · · · · · ·	•	- <u></u>
21 Other prog	rams or policies developed to increase energ	ny efficiency in build	linge
	• • •		•
Inform	ation programs	Comment:	Energy awareness campaigns- Department of Economic Development, Energy Efficiency
	· · · · · · · · · · · · · · · · · · ·	—	Service
		-	
	· · · · · · · · · · · · · · · · · · ·	— I	
Addition	al sources of information about energy effici	ency for buildings i	n. Northern Ireland
	,	•	
1. De	partment of the Environment, Appro	ved Document	L
			· · · · · · · · · · · · · · · · · · ·
2. BR	EDEM- Domestic Energy Model		
	·		
3. CI	BSE Building Energy Code, Part 2		
			· · · · · · · · · · · · · · · · · · ·
Manua		in Question 4:	
Name:	HMSO Bookshop		
Name: Address:	HMSO Bookshop 80 Chichester St.		
	HMSO Bookshop 80 Chichester St. Belfast, BTI 4JY		
Address:	80 Chichester St.		
Address:	80 Chichester St. Belfast, BTI 4JY	÷	
Address:	80 Chichester St. Belfast, BTI 4JY Northern Ireland	Fax:	
Address: Country: Tel:	80 Chichester St. Belfast, BTI 4JY Northern Ireland 44-323-238451	:	
Address: Country: Tel: Types of	80 Chichester St. Belfast, BTI 4JY Northern Ireland 44-323-238451 supporting information available:	Fac	
Address: Country: Tel: Types of	80 Chichester St. Belfast, BTI 4JY Northern Ireland 44-323-238451 supporting information available:	Fac	al Booklet F. Conservation of Fuel and Power.
Address: Country: Tel: Types of	80 Chichester St. Belfast, BTI 4JY Northern Ireland 44-323-238451 supporting information available:	Fac	al Booklet F, Conservation of Fuel and Power
Address: Country: Tel: Types of <u>Bu</u>	80 Chichester St. Belfast, BTI 4JY Northern Ireland 44-323-238451 supporting information available:	Fax:) 1991, Technicz	al Booklet F. Conservation of Fuel and Power.
Address: Country: Tel: Types of <u>Bu</u>	80 Chichester St. Belfast, BTI 4JY Northern Ireland 44-323-238451 supporting information available: illding Amendment regulations (N.I	Fax:) 1991, Technicz	al Booklet F, Conservation of Fuel and Power.
Address: Country: Tel: Types of <u>Bu</u>	80 Chichester St. Belfast, BTI 4JY Northern Ireland 44-323-238451 supporting information available: illding Amendment regulations (N.I	Fax:) 1991, Technicz	al Booklet F. Conservation of Fuel and Power.
Address: Country: Tel: Types of <u>Bu</u>	80 Chichester St. Belfast, BTI 4JY Northern Ireland 44-323-238451 supporting information available: illding Amendment regulations (N.I	Fax:) 1991, Technicz	al Booklet F, Conservation of Fuel and Power.
Address: Country: Tel: Types of <u>Bu</u>	80 Chichester St. Belfast, BTI 4JY Northern Ireland 44-323-238451 supporting information available: illding Amendment regulations (N.I wergy standards for non-residential buildings	Fax:) 1991, Technicz	al Booklet F. Conservation of Fuel and Power.
Address: Country: Tel: Types of <u>Bu</u>	80 Chichester St. Belfast, BTI 4JY Northern Ireland 44-323-238451 supporting information available: illding Amendment regulations (N.I mergy standards for non-residential buildings Survey completed by:	Fax:) 1991, Technica S: David L. Stew	vart
Address: Country: Tel: Types of <u>Bu</u>	80 Chichester St. Belfast, BTI 4JY Northern Ireland 44-323-238451 supporting information available: illding Amendment regulations (N.I wergy standards for non-residential buildings	Fax:) 1991, Technica S: David L. Stew Principal Arc	vart hitect
Address: Country: Tel: Types of <u>Bu</u>	80 Chichester St. Belfast, BTI 4JY Northern Ireland 44-323-238451 supporting information available: illding Amendment regulations (N.I mergy standards for non-residential buildings Survey completed by:	Fax:) 1991, Technica s: David L. Stew Principal Arc Department of	vart hitect f the Environment for Northern Ireland
Address: Country: Tel: Types of <u>Bu</u>	80 Chichester St. Belfast, BTI 4JY Northern Ireland 44-323-238451 supporting information available: illding Amendment regulations (N.I mergy standards for non-residential buildings Survey completed by:	Fax:) 1991, Technica S: David L. Stew Principal Arc Department of Cawood Hous	vart hitect f the Environment for Northern Ireland e, 24/26 Arthur St.
Address: Country: Tel: Types of <u>Bu</u>	80 Chichester St. Belfast, BTI 4JY Northern Ireland 44-323-238451 supporting information available: illding Amendment regulations (N.I rergy standards for non-residential buildings Survey completed by: Title:	Fax:) 1991, Technica S: David L. Stew Principal Arc Department of Cawood Hous Belfast, BT 1 4	vart hitect f the Environment for Northern Ireland e, 24/26 Arthur St. 4 GP Country: Northern Irela
Address: Country: Tel: Types of <u>Bu</u>	80 Chichester St. Belfast, BTI 4JY Northern Ireland 44-323-238451 supporting information available: illding Amendment regulations (N.I mergy standards for non-residential buildings Survey completed by:	Fax:) 1991, Technica S: David L. Stew Principal Arc Department of Cawood Hous	vart hitect f the Environment for Northern Ireland e, 24/26 Arthur St.
Address: Country: Tel: Types of <u>Bu</u>	80 Chichester St. Belfast, BTI 4JY Northern Ireland 44-323-238451 supporting information available: illding Amendment regulations (N.I rergy standards for non-residential buildings Survey completed by: Title:	Fax:) 1991, Technica S: David L. Stew Principal Arc Department of Cawood Hous Belfast, BT 1 4	vart hitect f the Environment for Northern Ireland e, 24/26 Arthur St. 4 GP Country: Northern Irela

	Ν	NORW	AY		<u>Bâla</u> a
ENERAL OVERVIEW O	F BUILDING ENERGY S	TANDARDS			
1. General building stan	dards exist at the following gov	vernmentai levels:	National		
2. Proposed or existing	ENERGY standards cover the	following building	sectors: Both Rea	sidential and Non-I	Residential
3. Status of Non-Reside a. National level:	ential Building Energy Standar Mandatory	rds at the: b. Regional level:	- None	c. Local level:	- None
	ard selected for further descri "Thermal Insulation an Regulations)		usness" (Chapter 5	53 of the Norwegian	Building
Year: 1987	_ Geographic Coverage:	Nation	Abbreviated Title:	NBR-53-87	
ESCRIPTION OF SPEC	FIED ENERGY STANDA	RDS - NBR-5	3-87	succession and a second	
a. Building types: <u>A - All Build</u> 6. Basic approach of th	e standard: <u>Both prescri</u> s are included in the energy sta	b. Building vin Both nev c. Other chara - None 	tage: v and existing acteristics:	tem	· · · · · · · · · · · · · · · · · · ·
c. Lighting provision - None - None		d	Air/Water distr	s: ibution efficiency	
	:	 			

NORWAY 2

Research Group: SINTEF	Technology and Administration
Government agency: Ministry of Petroleum and En	nergy
Industry group: Representatives of private compa	
Decision Process: Mandate Comment: Na	tional Office of Building Technology and
Ad	ministration/Ministry of Local Government
Information used in developing the standard:	·
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Gathered through audits and surveys	Computer simulations used for estimates
c. WEATHER data	d. Other information
Gathered through measurements	- None
· · · · · · · · · · · · · · · · · · ·	
Standards from a different country used as source material:	1
Denmark	
Sweden Finland	
Finland	
COMPUTER programs used:	
	h Car complying with the standards 2
a. In developing the standard: Yes	b. For complying with the standard: ?
Standard is set at a level: Equal to current practice	I
·····	in the standard:
Considerations influencing the inclusion or exclusion of measures	in the standard: Comments:
·····	
Considerations influencing the inclusion or exclusion of measures	
Considerations influencing the inclusion or exclusion of measures	
Considerations influencing the inclusion or exclusion of measures	
Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness	
Considerations influencing the inclusion or exclusion of measures	
Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness	Comments:
Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness	Comments:

Existing agency: National Office	standards: of Building Technology and Administi	ration
Existing agency. National Office	of building recruition gy and Automatics	
If an existing agency was made responsit	ole for implementation, its former focus was on b	uildings, energy, or another area:
Other: general building code	25	
7. TRAINING & EDUCATION provided for arch	itects, engineers and other professionals:	
Written guidelines to assist with Example calculations	compliance procedure	·····
		· · · · · · · · · · · · · · · · · · ·
		<u> </u>
8. Compliance mechanisms used at different st	tages in construction process:	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval	?	Certification/approva
		· · · · · · · · · · · · · · · · · · ·
Percent designs checked: <u>100</u>	Percent sites checked: ?	Percent buildings checked: _? Comment:
Comment:	Comment: Uncertain whether onsite	Commera:
All designs are checked at local level. But the quality of	inspections are undertaken.	
the check is not 100%. The		
d. Other compliance procedures - None		
· · · · · · · · · · · · · · · · · · ·		
e. Effectiveness of combined compliance m	echanisms (scale of 1-5): _3_	
f. Explanation for effectiveness in part e:	Problems with personnel qualifications under revision.	. As mentioned above, system i
· · · · · · · · · · · · · · · · · · ·	landarde' impact	
9. Types of assessments or audits of energy s	-	
9. Types of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based of	on prototypical (not actual) buildings:	eral surveys of energy savings
9. Types of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based of	-	eral surveys of energy savings
9. Types of assessments or audits of energy s a. ENERGY SAVINGS POTENTIAL based Completed: Noregian consulting	on prototypical (not actual) buildings: firm Energidata a/s has conducted seve	eral surveys of energy savings
9. Types of assessments or audits of energy so a. ENERGY SAVINGS POTENTIAL based of Completed: Noregian consulting b. MEASUREMENTS OF ENERGY SAVING	on prototypical (not actual) buildings: firm Energidata a/s has conducted seve S in actual buildings complying with standard:	· · · · · · · · · · · · · · · · · · ·
9. Types of assessments or audits of energy so a. ENERGY SAVINGS POTENTIAL based of Completed: Noregian consulting b. MEASUREMENTS OF ENERGY SAVING	on prototypical (not actual) buildings: firm Energidata a/s has conducted seve	· · · · · · · · · · · · · · · · · · ·
9. Types of assessments or audits of energy st a. ENERGY SAVINGS POTENTIAL based of Completed: Noregian consulting b. MEASUREMENTS OF ENERGY SAVING Completed: Surveys have been u	on prototypical (not actual) buildings: firm Energidata a/s has conducted seve S in actual buildings complying with standard: Indertaken by the research institution b	· · · · · · · · · · · · · · · · · · ·
9. Types of assessments or audits of energy st a. ENERGY SAVINGS POTENTIAL based of Completed: Noregian consulting b. MEASUREMENTS OF ENERGY SAVING Completed: Surveys have been u	on prototypical (not actual) buildings: firm Energidata a/s has conducted seve S in actual buildings complying with standard: Indertaken by the research institution b	· · · · · · · · · · · · · · · · · · ·
9. Types of assessments or audits of energy st a. ENERGY SAVINGS POTENTIAL based of Completed: Noregian consulting b. MEASUREMENTS OF ENERGY SAVING Completed: Surveys have been u	on prototypical (not actual) buildings: firm Energidata a/s has conducted seve S in actual buildings complying with standard: Indertaken by the research institution b	· · · · · · · · · · · · · · · · · · ·
9. Types of assessments or audits of energy st a. ENERGY SAVINGS POTENTIAL based of Completed: Noregian consulting b. MEASUREMENTS OF ENERGY SAVING Completed: Surveys have been u c. COST EFFECTIVENESS based on engin Completed: Ref. Energidata a/s	on prototypical (not actual) buildings: firm Energidata a/s has conducted seve S in actual buildings complying with standard: Indertaken by the research institution b meering economic CALCULATIONS:	· · · · · · · · · · · · · · · · · · ·
9. Types of assessments or audits of energy st a. ENERGY SAVINGS POTENTIAL based of Completed: Noregian consulting b. MEASUREMENTS OF ENERGY SAVING Completed: Surveys have been u	on prototypical (not actual) buildings: firm Energidata a/s has conducted seve S in actual buildings complying with standard: Indertaken by the research institution b meering economic CALCULATIONS:	· · · · · · · · · · · · · · · · · · ·

20. Efficiency testing facilities and procedures established	1.			
Unsure				
		·		
		<u> </u>		
		-		
21. Other programs or policies developed to increase energy		lings:		
Information programs	Comment:		ing efficiency in exis	
Rebates]	-		
	_			
· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
•				
Additional sources of information about energy effici	iency for buildings i	n: Norway		
1. The Ministry of Petroleum and Energy.				
Norwegian Storting (1988-89)	· · · · · · · · · · · · · · · · · · ·			
2	<u></u>			
·				
3.				
3 22. Contact for written copy of energy standard specified		<u> </u>	· · · · · · · · · · · · · · · · · · ·	
22. Contact for written copy of energy standard specified Name:		· · · · · · · · · · · · · · · · · · ·		
22. Contact for written copy of energy standard specified Name: Address:		 _		
22. Contact for written copy of energy standard specified Name:				
22. Contact for written copy of energy standard specified Name: Address:				
22. Contact for written copy of energy standard specified Name: Address:				
22. Contact for written copy of energy standard specified Name: Address:			· · · · · · · · · · · · · · · · · · ·	
22. Contact for written copy of energy standard specified Name: Address: Country: Tel:	in Question 4:		· · · · · · · · · · · · · · · · · · ·	
22. Contact for written copy of energy standard specified Name: Address: Country:	in Question 4:			
22. Contact for written copy of energy standard specified Name: Address: Country: Tel:	in Question 4:		·	
22. Contact for written copy of energy standard specified Name: Address: Country: Tel:	in Question 4:			
22. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available:	in Question 4: Fax:			
22. Contact for written copy of energy standard specified Name: Address: Country: Tel:	in Question 4: Fax:			
22. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available:	in Question 4: Fax:		· · · · · · · · · · · · · · · · · · ·	
22. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available:	in Question 4: Fax:			
22. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building:	in Question 4: Fax:			
22. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building: Survey completed by:	in Question 4: Fax: s: ?		· · · · · · · · · · · · · · · · · · ·	
22. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building:	in Question 4: Fax: s: ? Ministry of Pe	troleum and Energ	· · · · · · · · · · · · · · · · · · ·	
22. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building: Survey completed by:	in Question 4: Fax: s: ? Ministry of Pe P.O. Box 8148	troleum and Energ Dep.	53	
22. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building: Survey completed by:	in Question 4: Fax: s: ? Ministry of Pe P.O. Box 8148	troleum and Ener Dep. Library, P.O. Boy	5y < 49	Drway
22. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building: Survey completed by:	in Question 4: Fax: s: ? Ministry of Pe P.O. Box 8148 Riso National	troleum and Ener Dep. Library, P.O. Box Ros	53	prway

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aall	P	AKIS	TAN		<u>B</u> âlaa
GENERAL OVERVIEW OF	BUILDING ENERGY	STANDARDS			
1. General building stand	lards exist at the following go	overnmental levels	National	Regional	Local
_	ENERGY standards cover the				
		-	Both Re	sidential and Non-I	kesidential
3. Status of Non-Resider a. National level:	ntial Building Energy Stand Voluntary	ards at the: b. Regional leve	d: - None	c. Local level:	- None
 4. Single energy standa	rd selected for further desc	ription:			
Title, Organization:	Building Energy Code	of Pakistan. F	NERCON, Environ	ment and Urban Aff	airs Division
Year: <u>1990</u>	Geographic Coverage:	Nation	Abbreviated Title:	BEC, 1990	
DESCRIPTION OF SPECI	FIED ENERGY STAND	ARDS - BEC,	1990		- 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 199
5. The standard defined in	Question 4 applies to the fo	llowing kinds of b	uildings:		
a. Building types:		b. Building	-		
O - Offices		New b	uildings		
	lospitals/ Schools			· · · · · · · · · · · · · · · · · · ·	
G - Governme			aracteristics:		
S - Single-fan	nily residential	Other:]	permanent building	s/human habitation	
F - Restaurant	S	_	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	
C - Commerci	al/retail stores				
	· · · · · · · · · · · · · · · · · · ·				
·					
a. Whole building ene	are included in the energy sl rgy provisions:	iptive and perf andard:	b. Building envelope pr	ovisions:	
E- Energy amo	unt target		Roof Wall system		·
			Wall system Fenestration sys	stem	
			Infiltration		
c. Lighting provisions	»:		d. Mechanical provision	s:	
Control require	ements		Air/Water dist	ribution efficiency	-
Other: Daylig	ting			ns for equipment sizi	ng
			Controls		
			Ventilation		
			Equipment effic	iency	
e. Other provisions:					
Yes: Thermost	at settings	•			
	·····				

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. Organizations involved in developing the standard:		
Government agency: Environment and Urban Af	fairs Division	
Government agency: Pakistan Public Works Dep		
. Decision Process: Consensus Comment:		
0. Information used in developing the standard:		
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:	
Estimated using professional judgment	Computer simulations used for	estimates
Domaica ability protobolonial judgment		
	· · · · · · · · · · · · · · · · · · ·	
		·····
c. WEATHER data	d. Other information	
Already available prior to standard	<u>- None</u>	·
1. Standards from a different country used as source material:		
US: ASHRAE	· · · · · · · · · · · · · · · · · · ·	
· · · · · · · · · · · · · · · · ·	<u>,</u>	
	<u></u>	
2. COMPUTER programs used:	<u></u>	
	, b. For complying with the standard: L	ncertain
	b. For complying with the standard: <u>L</u>	ncertain
	b. For complying with the standard: 	ncertain
	b. For complying with the standard: <u>L</u>	ncertain
	b. For complying with the standard: 	ncertain
a. In developing the standard: - None	b. For complying with the standard: <u>\</u> 	ncertain
	b. For complying with the standard: 	ncertain
a. In developing the standard:		ncertain
a. In developing the standard: <u>- None</u> 3. Standard is set at a level: <u>Above current practice</u> 4. Considerations influencing the inclusion or exclusion of measure		ncertain
a. In developing the standard: <u>- None</u>	s in the standard:	
a. In developing the standard: <u>- None</u> 3. Standard is set at a level: <u>Above current practice</u> 4. Considerations influencing the inclusion or exclusion of measure	s in the standard: Comments: The basic aim was to produce. compiled using local expertis	a code which can b e, materials, and
a. In developing the standard: - None - None - None - None None 	s in the standard: Comments: The basic aim was to produce.	a code which can b e, materials, and
a. In developing the standard: - None - None None 	s in the standard: Comments: The basic aim was to produce. compiled using local expertis	a code which can b e, materials, and
a. In developing the standard: - None - None - None - None None 	s in the standard: Comments: The basic aim was to produce. compiled using local expertis	a code which can b e, materials, and
a. In developing the standard: - None - None - None - None None 	s in the standard: Comments: The basic aim was to produce. compiled using local expertis	a code which can b e, materials, and
 a. In developing the standard: <u>- None</u> 3. Standard is set at a level: <u>Above current practice</u> 4. Considerations influencing the inclusion or exclusion of measure: <u>E - Cost effectiveness</u> <u>Availability of energy efficient products</u> <u>Similarity/difference to local design</u> <u>Comfort</u> 5a. Standard scheduled for regular review and revision? <u>Yes: once every 5 years by a committee of person</u> 	s in the standard: Comments: The basic aim was to produce. compiled using local expertis technology.	a code which can b e, materials, and
a. In developing the standard: - None	s in the standard: Comments: The basic aim was to produce. compiled using local expertis technology.	a code which can b e, materials, and
 a. In developing the standard: <u>- None</u> 3. Standard is set at a level: <u>Above current practice</u> 4. Considerations influencing the inclusion or exclusion of measure: <u>E - Cost effectiveness</u> <u>Availability of energy efficient products</u> <u>Similarity/difference to local design</u> <u>Comfort</u> 5a. Standard scheduled for regular review and revision? <u>Yes: once every 5 years by a committee of person</u> 	s in the standard: Comments: The basic aim was to produce. compiled using local expertis technology.	a code which can b e, materials, and

3 PAKISTAN

If an existing agency was made respo Other: energy efficiency	nsible for implementation, its former focus was	on buildings, energy, or another area:
7. TRAINING & EDUCATION provided for a	architects, engineers and other professionals	
Written guidelines to assist wi	th compliance procedure	
Example calculations Compliance forms	<u> </u>	·
Seminars, workshops, or confer	rences	
	······································	
 Compliance mechanisms used at different a. PRIOR to construction: 	nt stages in construction process: b. DURING construction:	c. AFTER construction:
No mechanism	No mechanism	No mechanism
		· · · · · · · · · · · · · · · · · · ·
Percent designs checked:	Percent sites checked:	Percent buildings checked:
Comment:	Comment:	Comment:
d. Other compliance procedures _ <u>- No</u>		
e. Effectiveness of combined compliance f. Explanation for effectiveness in part 9. Types of assessments or audits of energy	e:	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL bas <u>Completed</u>	e:	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL bas Completed	e:	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL bas <u>Completed</u> b. MEASUREMENTS OF ENERGY SAV <u>Planned</u> c. COST EFFECTIVENESS based on en	e:	

PAKISTAN 4

Conservation Programme for Pakistan." 2. Arshad, M.K. et al. 1990. "The Building Conservation Symposium, KarachiPa	refficiency in build Comment: Comment: Comment: and Future Di and Future Di 2nd Intl Energy Energy Code kistan. Sud. 1990. "Bu	Described in "Building Sector Energy Conservation Programme of Pakistan," Energy and Buildings, 15-16 (1990/91):533-535.
Ballasts Fixtures	Comment:	Described in "Building Sector Energy Conservation Programme of Pakistan," Energy and Buildings, 15-16 (1990/91):533-535. in: Pakistan rection of a Comprehensive Building Energy gy Conservation Symposium, KarachiPakista of Pakistan," presented at 2nd Intl Energy
 Other programs or policies developed to increase energy Audits (free or subsidized) Information programs Building energy standards Additional sources of information about energy efficie Jamy, Gul Najam. 1990. "The Evolution Conservation Programme for Pakistan." Arshad, M.K. et al. 1990. "The Building Conservation Symposium, KarachiPa Cunningham, Gregory W. and Jamil Max 	Comment:	Described in "Building Sector Energy Conservation Programme of Pakistan," Energy and Buildings, 15-16 (1990/91):533-535. in: Pakistan rection of a Comprehensive Building Energy gy Conservation Symposium, KarachiPakista of Pakistan," presented at 2nd Intl Energy
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 Audits (free or subsidized) Information programs Building energy standards Additional sources of information about energy efficie 1. Jamy, Gul Najam. 1990. "The Evolution Conservation Programme for Pakistan." 2. Arshad, M.K. et al. 1990. "The Building Conservation Symposium, KarachiPa 3. Cunningham, Gregory W. and Jamil Max 	Comment:	Described in "Building Sector Energy Conservation Programme of Pakistan," Energy and Buildings, 15-16 (1990/91):533-535. in: Pakistan rection of a Comprehensive Building Energy gy Conservation Symposium, KarachiPakista of Pakistan," presented at 2nd Intl Energy
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 Conservation Programme for Pakistan." Arshad, M.K. et al. 1990. "The Building Conservation Symposium, KarachiPa Cunningham, Gregory W. and Jamil Material Symposium S	' 2nd Intl Energ 7 Energy Code 1kistan 1990. "Bu	gy Conservation Symposium, KarachiPakista of Pakistan," presented at 2nd Intl Energy
 Conservation Programme for Pakistan." Arshad, M.K. et al. 1990. "The Building Conservation Symposium, KarachiPa Cunningham, Gregory W. and Jamil Material Symposium S	' 2nd Intl Energ 7 Energy Code 1kistan 1990. "Bu	gy Conservation Symposium, KarachiPakista of Pakistan," presented at 2nd Intl Energy
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Conservation Symposium, KarachiPa 3. Cunningham, Gregory W. and Jamil Ma	ikistan. sud. 1990. "Bu	
3. Cunningham, Gregory W. and Jamil Ma	sud. 1990. "Bu	· · · · · · · · · · · · · · · · · · ·
3. Cunningham, Gregory W. and Jamil Ma Buildings in Pakistan," presented at 2nd	sud. 1990. "Bu d Intl Energy (ilding Energy Simulation: Computer Modelling
Buildings in Pakistan," presented at 2nd	<u>d Intl Energy (</u>	
		onservation Symposium, KarachiPakistan.
2. Contact for written copy of energy standard specified ir Name: Gul Najam Jamy	1 44534011 4:	
Address: Deputy Chief (Buildings) ENERCON, Buland Markaz		· ·
33-Blue Area		
Islamabad		
Country: Pakistan		
Tel: 92 813003/813009	ax: 92 826212	2
		-
Types of supporting information available:		
Code compliance handbook, available f	rom ENERCO	N
Other energy standards for non-residential buildings:	• .	
•••		
-None	·	
·		4
Survey completed by:	Gul Najam Jan	nv
Title:	Deputy Chief	
	ENERCON	(
		az, 33, Blue Area
	Islamabad	Country: Pakistan
Tel:	92 813003	Fax: 92 826212
Date completed:	3/8/92	

			PINES	
IERAL OVERVIEW O	F BUILDING ENERGY S	TANDARDS		
1. General building stan	dards exist at the following gov	vernmental level	s: National	
2. Proposed or existing	ENERGY standards cover the	following build	ing sectors: Non-Residential Only	
3 Status of Non-Reside	ential Building Energy Standa	rds at the		······································
a. National level:	Voluntary Proposed		rvel: c. Local lev	el:
4. Single energy standa	ard selected for further descri	ption:		
Title, Organization:	Proposed Building Ene	rgy Use Stan	dards, Office of Energy Affairs	
Year: 198?	Geographic Coverage:	Nation	Abbreviated Title: BEUS-OEA	
CRIPTION OF SPEC	IFIED ENERGY STANDA	ARDS - BEI	US-OEA	
5. The standard defined i	in Question 4 applies to the foll	lowing kinds of	buildings:	
a. Building types:		b. Building	g vintage:	
O - Offices		Both	new and existing	
H - Hotels				
G - Governm	ent Facilities		haracteristics:	4.0747./
C - Commerce	ial/retail stores	$\underline{E-An}$	nount of energy: Energy usage of more t	nan 10W/sq.m
D - Hospitals	/ schools	_		
F - Restauran	ts		· · · · · · · · · · · · · · · · · · ·	
	· · · · · · · · · · · · · · · · · · ·	_		
·		_		
6. Basic approach of th	e standard: <u>Both prescri</u> s are included in the energy sta		rformance	
7. The following subjects a. Whole building en	ergy provisions:		b. Building envelope provisions:	
a. Whole building en	ergy provisions: ricity demand		Roof	
a. Whole building en			Roof Wall system	
a. Whole building en			Roof Wall system Fenestration system	
a. Whole building en			Roof Wall system	
a. Whole building en	ricity demand		Roof Wall system Fenestration system	
a. Whole building en <u>P- Peak elect</u>	ricity demand		Roof Wall system Fenestration system Infiltration d. Mechanical provisions:	y
a. Whole building en <u>P- Peak electr</u> <u>C. Lighting provision</u> <u>Control requin</u> <u>Power density</u>	ricity demand		Roof Wall system Fenestration system Infiltration	
a. Whole building en <u>P- Peak electr</u> <u>C. Lighting provision</u> <u>Control requir</u>	ricity demand		Roof Wall system Fenestration system Infiltration d. Mechanical provisions: Air/Water distribution efficience Load Calculations for equipment Controls	
a. Whole building en <u>P- Peak electr</u> <u>C. Lighting provision</u> <u>Control requin</u> <u>Power density</u>	ricity demand		Roof Wall system Fenestration system Infiltration d. Mechanical provisions: Air/Water distribution efficience Load Calculations for equipment Controls Ventilation	
a. Whole building en <u>P- Peak electr</u> <u>C. Lighting provision</u> <u>Control requin</u> <u>Power density</u>	ricity demand		Roof Wall system Fenestration system Infiltration d. Mechanical provisions: Air/Water distribution efficience Load Calculations for equipment Controls	
a. Whole building en <u>P- Peak electr</u> c. Lighting provision <u>Control requir</u> <u>Power densit</u> <u>Illumination</u>	ricity demand		Roof Wall system Fenestration system Infiltration d. Mechanical provisions: Air/Water distribution efficience Load Calculations for equipment Controls Ventilation	
a. Whole building en <u>P- Peak electr</u> c. Lighting provision <u>Control requir</u> <u>Power densitt</u> <u>Illumination re</u> e. Other provisions	ricity demand		Roof Wall system Fenestration system Infiltration d. Mechanical provisions: Air/Water distribution efficience Load Calculations for equipment Controls Ventilation	
a. Whole building en <u>P- Peak electr</u> c. Lighting provision <u>Control requir</u> <u>Power densit</u> <u>Illumination</u>	ricity demand		Roof Wall system Fenestration system Infiltration d. Mechanical provisions: Air/Water distribution efficience Load Calculations for equipment Controls Ventilation	

PHILIPPINES 2

Concernment acongrue Office of Engager Affician DL	ilinging Council for Industry and Engrand Descent 1
Academic institution: University of Philippines	ilippine Council for Industry and Energy Research and
Foreign development agency: U.S. Agency for In	ternational Development; Lawrence Berkeley Laboratory
Other: technical Committee composed of building	g experts and practitioners
Onter: ternitar commune composed of bunant	
9. Decision Process: Consensus Comment:	· · · · · · · · · · · · · · · · · · ·
· · · · · · · · · · · · · · · · · · ·	
10. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Gathered through audits and surveys	Gathered through audits and surveys
<u></u>	
· · · · · · · · · · · · · · · · · · ·	
<u> </u>	· · · · · · · · · · · · · · · · · · ·
c. WEATHER data	d. Other information
Gathered through measurements	- None
<u> </u>	
11. Standards from a different country used as source material:	
Thailand:	
· · · · · · · · · · · · · · · · · · ·	
· · · · · · · · · · · · · · · · · · ·	
·	
· .	
2. COMPUTER programs used:	
a. In developing the standard: DOE-2	b. For complying with the standard: No
	b. For complying with the standard: <u>No</u>
a. In developing the standard: DOE-2	b. For complying with the standard: <u>No</u>
a. In developing the standard: DOE-2	b. For complying with the standard: <u>No</u>
a. In developing the standard: DOE-2	b. For complying with the standard: <u>No</u>
a. In developing the standard: DOE-2	b. For complying with the standard: <u>No</u>
a. In developing the standard: DOE-2	b. For complying with the standard: <u>No</u>
a. In developing the standard: DOE-2 ASEAM 13. Standard is set at a level: Equal to current practice	
a. In developing the standard: <u>DOE-2</u> <u>ASEAM</u> <u>ASEAM</u> <u>ASEAM</u> <u>13. Standard is set at a level: Equal to current practice</u> <u>14. Considerations influencing the inclusion or exclusion of measures</u>	s in the standard:
a. In developing the standard: DOE-2 <u>ASEAM</u> <u>ASEAM</u> <u>13. Standard is set at a level: Equal to current practice</u> <u>14. Considerations influencing the inclusion or exclusion of measures</u> E - Cost effectiveness	
a. In developing the standard: DOE-2 <u>ASEAM</u> <u>ASEAM</u> <u>ASEAM</u> <u>In developing the standard: DOE-2 <u>ASEAM</u> <u>ASEAM</u> <u>ASEAM</u> <u>In developing the standard: DOE-2 <u>ASEAM</u> <u>ASEAM</u> <u>In developing the standard: DOE-2 <u>ASEAM</u> <u>ASEAM</u> <u>In developing the standard: DOE-2 <u>ASEAM</u> <u>ASEAM</u> <u>ASEAM</u> <u>In developing the standard: DOE-2 <u>ASEAM</u> <u>ASEAM</u> <u>Asea</u> </u></u></u></u></u></u></u></u></u></u></u></u></u>	s in the standard:
a. In developing the standard: DOE-2 ASEAM ASEAM 13. Standard is set at a level: Equal to current practice 14. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design	s in the standard:
a. In developing the standard: DOE-2 <u>ASEAM</u> <u>ASEAM</u> <u>ASEAM</u> <u>I</u> I3. Standard is set at a level: Equal to current practice <u>E - Cost effectiveness</u> <u>Availability of energy efficient products</u> <u>Similarity/difference to local design</u> <u>Comfort</u>	s in the standard:
a. In developing the standard: DOE-2 ASEAM ASEAM 13. Standard is set at a level: Equal to current practice 14. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design	s in the standard:
a. In developing the standard: DOE-2 ASEAM	s in the standard:
a. In developing the standard: DOE-2 ASEAM	s in the standard: Comments:
a. In developing the standard: DOE-2 ASEAM	s in the standard: Comments:
a. In developing the standard: DOE-2 ASEAM	s in the standard: Comments:
a. In developing the standard: DOE-2 ASEAM	s in the standard: Comments:

3 PHILIPPINES

Uncertain Uncertain Unc Percent designs checked: Percent sites checked: Percent	If an existing agency was made respo	of Public Works & Highways	
TRAINING & EDUCATION provided for architects, engineers and other professionals:	• •	nsible for implementation, its former focus was	on buildings, energy, or another area:
- None	Other: public works		
Compliance mechanisms used at different stages in construction process: a. PRIOR to construction: b. DURING construction: C. AFTEF Uncertain Uncertain Uncertain Percent designs checked: Percent sites checked: Percent Comment: Comment: Percent sites checked: Percent d. Other compliance procedures - None - - e. Effectiveness of combined compliance mechanisms (scale of 1-5):	RAINING & EDUCATION provided for a	architects, engineers and other professionals:	
a. PRIOR to construction: b. DURING construction: c. AFTEF Uncertain Uncertain Unc Percent designs checked: Percent sites checked: Percent Comment: Percent sites checked: Percent Comment: Comment: Comment: Comment: Image: Compliance procedures - None Image: Compliance mechanisms (scale of 1-5):	- None		
a. PRIOR to construction: b. DURING construction: c. AFTEF Uncertain Uncertain Unc Percent designs checked: Percent sites checked: Percent Comment: Percent sites checked: Percent Comment: Comment: Comment: Comment: Image: Solution of the compliance procedures - None	·		
a. PRIOR to construction: b. DURING construction: c. AFTEF Uncertain Uncertain Unc Percent designs checked: Percent sites checked: Percent Comment: Percent sites checked: Percent Comment: Comment: Comment: Comment: Image: Solution of the compliance procedures - None			· · · · · · · · · · · · · · · · · · ·
a. PRIOR to construction: b. DURING construction: c. AFTEF Uncertain Uncertain Unc Percent designs checked: Percent sites checked: Percent Comment: Percent sites checked: Percent Comment: Comment: Comment: Comment: Image: Solution of the compliance procedures - None			
a. PRIOR to construction: b. DURING construction: c. AFTEF Uncertain Uncertain Unc Percent designs checked: Percent sites checked: Percent Comment: Percent sites checked: Percent Comment: Comment: Comment: Comment: Image: Compliance procedures - None Image: Compliance mechanisms (scale of 1-5):	ampliance mechanisms used at differe	nt chance in construction process:	
Uncertain Uncertain Unc Percent designs checked: Percent sites checked: Perce Comment: Percent sites checked: Perce Comment: Comment: Comment:	-	-	c. AFTER construction:
Percent designs checked: Percent sites checked: Percent sites checked: Comment:			Uncertain
Comment: Comment: Comment:			
d. Other compliance procedures - None e. Effectiveness of combined compliance mechanisms (scale of 1-5):	Percent designs checked:	Percent sites checked:	Percent buildings checked
 e. Effectiveness of combined compliance mechanisms (scale of 1-5):	Comment:	Comment:	Comment:
e. Effectiveness of combined compliance mechanisms (scale of 1-5):			·
e. Effectiveness of combined compliance mechanisms (scale of 1-5):			
 e. Effectiveness of combined compliance mechanisms (scale of 1-5):			
f. Explanation for effectiveness in part e: Compliance mechanisms are still being developed. standardsa re subject to final approval as a referra Types of assessments or audits of energy standards' impact: a. ENERGY SAVINGS POTENTIAL based on prototypical (not actual) buildings: None conducted b. MEASUREMENTS OF ENERGY SAVINGS in actual buildings complying with standard:			
standardsa re_subject to final approval as a referra Types of assessments or audits of energy standards' impact: a. ENERGY SAVINGS POTENTIAL based on prototypical (not actual) buildings: None conducted	-	· · · · · · · · · · · · · · · · · · ·	eing developed Currently the
a. ENERGY SAVINGS POTENTIAL based on prototypical (not actual) buildings: None conducted b. MEASUREMENTS OF ENERGY SAVINGS in actual buildings complying with standard:	. Explanation for enectiveness in part	standardsa re subject to final appro	oval as a referral code of the Nat
a. ENERGY SAVINGS POTENTIAL based on prototypical (not actual) buildings: None conducted b. MEASUREMENTS OF ENERGY SAVINGS in actual buildings complying with standard:	/pes of assessments or audits of energ	gy standards' impact:	
b. MEASUREMENTS OF ENERGY SAVINGS in actual buildings complying with standard:	a. ENERGY SAVINGS POTENTIAL bas	sed on prototypical (not actual) buildings:	
· · · · ·			,
	None conducted	INGS in actual buildings complying with stand	ard
	None conducted	INGS in actual buildings complying with stand	ard:
	None conducted	INGS in actual buildings complying with stand	ard:
c. COST EFFECTIVENESS based on engineering economic CALCULATIONS:	None conducted	INGS in actual buildings complying with stand	ard:
None conducted	None conducted MEASUREMENTS OF ENERGY SAV None conducted		ard:
	None conducted MEASUREMENTS OF ENERGY SAV None conducted COST EFFECTIVENESS based on en		ard:
d. COST EFFECTIVENESS based on ACTUAL COSTS:	None conducted MEASUREMENTS OF ENERGY SAV None conducted COST EFFECTIVENESS based on en		ard:
None conducted	None conducted MEASUREMENTS OF ENERGY SAV None conducted COST EFFECTIVENESS based on en None conducted	ngineering economic CALCULATIONS:	ard:
	None conducted MEASUREMENTS OF ENERGY SAV None conducted . COST EFFECTIVENESS based on en None conducted . COST EFFECTIVENESS based on en . COST EFFECTIVENESS based on en	ngineering economic CALCULATIONS:	ard:
	None conducted MEASUREMENTS OF ENERGY SAV None conducted . COST EFFECTIVENESS based on en None conducted . COST EFFECTIVENESS based on en . COST EFFECTIVENESS based on en	ngineering economic CALCULATIONS:	ard:

PHILIPPINES 4

	ncy testing facilities and procedures establishe			
	r conditioners/chillers/other appliance llasts			
	111705			
	her: fuels			_
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21. Other	programs or policies developed to increase ener	rgy efficiency in buik	lings:	
Inf	ormation programs	Comment	Office of Ene	rgy Affairs; Philippine Council fo
	dits (free or subsidized)			Energy Research and Developme
	bates			Philippines; National Engineeri
		- 1	Center	
		I		
۵de	litional sources of information about energy effic	ciency for buildings i	n: Philippin	es
•	•••			
1.	<u>-</u>			
2.				
	,			
3.				······································
		<u>.</u>		
Nam Address				
Address	: Office of Energy Affairs Merrit Road, Fort Bonifacio			
· .	Makati, Metro Manila			
				•
Cou	ntry: Philippines			
Cou	ntry: Philippines			
		Far: 63.2.877 (533	
Tel:	63 2 877 633	Fax: 63 2 877 6	533	
Tel:		Fax: 63 2 877 (533	
Tel:	63 2 877 633	Fax: 63 2 877 6	533	
Tel:	63 2 877 633	Fax: 63 2 877 (533	
Tel: Typ	63 2 877 633 es of supporting information available:		533	
Tel: Typ	63 2 877 633 es of supporting information available: er energy standards for non-residential building		533	
Tel: Typ	63 2 877 633 es of supporting information available: er energy standards for non-residential building			
Tel: Typ	63 2 877 633 es of supporting information available: er energy standards for non-residential building	j \$:		
Tel: Typ	63 2 877 633 es of supporting information available: er energy standards for non-residential building	j \$:		
Tel: Typ	63 2 877 633 es of supporting information available: 	js:		
Tel: Typ	63 2 877 633 es of supporting information available: er energy standards for non-residential building None Survey completed by:	js: Charisse B.T.	ablante	
Tel: Typ	63 2 877 633 es of supporting information available: 	js: Charisse B. T. Chief, Conser	ablante vation Divisio	
Tel: Typ	63 2 877 633 es of supporting information available: er energy standards for non-residential building None Survey completed by:	js: Charisse B. T. Chief, Conser Office of Ener Merritt Rd., F	ablante vation Divisio gy Affairs; Of ort Bonifacio	on fice of the President
Tel: Typ	63 2 877 633 es of supporting information available: er energy standards for non-residential building None Survey completed by:	js: Charisse B. T. Chief, Conser Office of Ener	ablante vation Divisio gy Affairs; Of ort Bonifacio	fice of the President
Tel: Typ	63 2 877 633 es of supporting information available: er energy standards for non-residential building None Survey completed by:	js: Charisse B. T. Chief, Conser Office of Ener Merritt Rd., F	ablante vation Divisio gy Affairs; Of ort Bonifacio o Manila	
Tel: Typ	63 2 877 633 es of supporting information available: er energy standards for non-residential building None Survey completed by: Title:	js: Charisse B. T. Chief, Conser Office of Ener Merritt Rd., F Makati, Metro	ablante vation Divisio gy Affairs; Of ort Bonifacio o Manila	fice of the President Country: The Philippi

		POLAND	
NERAL OVERVIEW (OF BUILDING ENERGY	STANDARDS	
1. General building sta	ndards exist at the following g	overnmental levels:National	
2. Proposed or existing	g ENERGY standards cover t	he following building sectors: Both Res	idential and Non-Residential
3. Status of Non-Resid	Sential Building Energy Stan	dards at the:	
a. National level:	Mandatory	b. Regional level: None	c. Local level: - None
-			
- 4. Single energy stand	dard selected for further des	cription:	
		ish Committee for Standardization,	Measures, and Quality Control.
	·····		
Year: 1991	Geographic Coverage:	Nation Abbreviated Title:	PN-91/B-02020
	- •· • -		
SCRIPTION OF SPEC	IFIED ENERGY STAN	DARDS - PN-91/B-02020	
8	in Question 4 applies to the f		
a. Building types:	•.	b. Building vintage:	
<u>A - All Build</u>	lings	Both new and existing	
	· · · · · · · · · · · · · · · · · · ·	c. Other characteristics:	
		P - Physical size A - Air-Conditioned	· · · · · · · · · · · · · · · · · · ·
			, <u></u> , <u>v</u>
	·····		
6. Basic approach of t	he standard: Performan	ce-based	
	<u> </u>		
	ts are included in the energy s	standard: b. Building envelope prov	icione.
a. Whole building e		Roof	1914 15.
<u>E- Energy an</u>	iount target	Wall system	
		Fenestration syst	em
		Infiltration	
			f setting humidity in walls
c. Lighting provisio	ons:	d. Mechanical provisions	: ·
?		<u>?</u>	
			······································
	······		
e. Other provision	S:		
- None	·		

. Organizations involved in developing the standard:	
Government agency: PKNMIJ Research group: Institute of Building Technique	
Research group: Institute of building Technique	2
Decision Process: ? Comment: _	
0. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Already available prior to standard	?
	-
c. WEATHER data	d. Other information
Already available prior to standard	_ <u>- None</u>
1. Standards from a different country used as source material:	
Yes	
2. COMPUTER programs used:	
	b. For complying with the standard: ?
2. COMPUTER programs used:	· · · · · · · · · · · · · · · · · · ·
2. COMPUTER programs used:	· · · · · · · · · · · · · · · · · · ·
2. COMPUTER programs used:	· · · · · · · · · · · · · · · · · · ·
2. COMPUTER programs used:	· · · · · · · · · · · · · · · · · · ·
2. COMPUTER programs used:	b. For complying with the standard: ?
2. COMPUTER programs used: a. In developing the standard: Uncertain	b. For complying with the standard: ?
2. COMPUTER programs used: a. In developing the standard: Uncertain	b. For complying with the standard: ?
2. COMPUTER programs used: a. In developing the standard: Uncertain	b. For complying with the standard: ?
2. COMPUTER programs used: a. In developing the standard: Uncertain	b. For complying with the standard: ?
2. COMPUTER programs used: a. In developing the standard: Uncertain Uncertain Uncertain Uncertain Uncertain Uncertain Uncertain Uncertain E - Cost effectiveness A - Availability of energy efficient products	b. For complying with the standard: ?
2. COMPUTER programs used: a. In developing the standard: Uncertain	b. For complying with the standard: ?
2. COMPUTER programs used: a. In developing the standard: Uncertain 3. Standard is set at a level: Lower than current practice 4. Considerations influencing the inclusion or exclusion of measur E - Cost effectiveness A - Availability of energy efficient products S - Similarity/difference to local design C - Comfort	b. For complying with the standard: ?
2. COMPUTER programs used: a. In developing the standard: Uncertain	b. For complying with the standard: ?
2. COMPUTER programs used: a. In developing the standard: Uncertain 3. Standard is set at a level: Lower than current practic 4. Considerations influencing the inclusion or exclusion of measur E - Cost effectiveness A - Availability of energy efficient products S - Similarity/difference to local design C - Comfort 5a. Standard scheduled for regular review and revision?	b. For complying with the standard: ?
2. COMPUTER programs used: a. In developing the standard: Uncertain 3. Standard is set at a level: Lower than current practic 4. Considerations influencing the inclusion or exclusion of measur E - Cost effectiveness A - Availability of energy efficient products S - Similarity/difference to local design C - Comfort 5a. Standard scheduled for regular review and revision?	e

3 POLAND

Existing agency: PKNMIJ	y standards:	
If an existing agency was made respons ?	ible for implementation, its former focus was	on buildings, energy, or another area:
7. TRAINING & EDUCATION provided for arc	chitects, engineers and other professionals:	
Written guidelines to assist with		
Example calculations		
Information or resource center		
· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·
8. Compliance mechanisms used at different	stages in construction process:	·····
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
?	?	?
······································		
Percent designs checked: ?	Percent sites checked: ?	Percent buildings checked: 2
Comment:	Comment:	Comment:
d. Other compliance procedures <u>- Non</u>		
e. Effectiveness of combined compliance r	mechanisms (scale of 1-5): _ ? ? standards' impact:	
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20. E		y testing facilities and procedures establish ation		
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21. 0	Other on	ograms or policies developed to increase ene	rav efficiency in buildings:	
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22. C	ontact f	or written copy of energy standard specifie		
22. C		· · · · · · · · · · · · · · · · · · ·		
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I. General building standards exist at the following governmental levels: National 2. Proposed or existing ENERGY standards cover the following building sectors: Both Residential and Non-Residential 3. Status of Non-Residential Building Energy Standards at the: a. National level:				UGAL	
Proposed or existing ENERGY standards cover the following building sectors: <u>Both Residential and Non-Residential</u> Status of Non-Residential Building Energy Standards at the: a National level: <u>Mandatory</u> <u>b Regional level</u> : <u>c Local level</u> :					
3. Status of Non-Residential Building Energy Standards at the: a. National level:	1. General building sta	ndards exist at the following	governmental leve	s: National	I
a. National level: b. Regional level: c. Local level: 4. Single energy standard selected for further description: Title, Organization: Year: Geographic Coverage:NationAbbreviated Title:CSOPT-91 CRIPTION OF SPECIFIED ENERGY STANDARDS - CSOPT-91 5. The standard defined in Question 4 applies to the following kinds of buildings: a. Building types: A - All Buildings C. Lighting provisions: E- Energy amount target C. Lighting provisions: C. Lighting pro	2. Proposed or existin	g ENERGY standards cover t	the following build	ding sectors: Both Residential and	Non-Residential
Title, Organization: CSOPT Year: Geographic Coverage: Nation Abbreviated Title: CSOPT-91 CRIPTION OF SPECIFIED ENERGY STANDARDS - CSOPT-91 5. The standard defined in Question 4 applies to the following kinds of buildings: a. Building types:				evel: c. Loca	ai levei:
CRIPTION OF SPECIFIED ENERGY STANDARDS - CSOPT-91 5. The standard defined in Question 4 applies to the following kinds of buildings: a. Building types:	• • • •			· · · · · · · · · · · · · · · · · · ·	
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Other: Limiting nominal thermal loads (winter and summer conditions)	A - All Build	lings	Both	new and existing	
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Wall system Fenestration system Infiltration Other: power density used for calculation only None: covered in another standard None: covered in another standard Other provisions:	•			••••	
Example Fenestration system Infiltration Infiltration C. Lighting provisions: d. Mechanical provisions: Other: power density used for calculation only - None: covered in another standard - - None: covered in another standard - - -	E- Energy an	nount target	<u> </u>		
Infiltration c. Lighting provisions: Other: power density used for calculation only - None: covered in another standard - None: covered in another standard - None: covered in another standard - Other provisions:					· · · · · · · · · · · · · · · · · · ·
Other: power density used for calculation only - None: covered in another standard					
Other: power density used for calculation only - None: covered in another standard	· •				<u> </u>
e. Other provisions:	c. Lighting provisio			d. Mechanical provisions:	
		1 . 16 1	lation only	- None: covered in another sta	indard
-		r density used for calcu			
- INOTE		r density used for calcu			
	Other: powe				

PORTUGAL 2

STANDARDS DEVELOPMENT PROCESS - CSOPT-91

Government agency: DGE (Lisbon)	
Academic institution: FUEP (Porto)	
Academic institution: IST (Lisbon)	
Decision Process: Consensus Comment: M	lajority decision, no consensus reached for final version. Irganizations included: AIP, LNEC, AECOPS
0. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Already available prior to standard	Estimated using professional judgment
·	-
· · · · · · · · · · · · · · · · · · ·	- I
·	
c. WEATHER data	d. Other information
Already available prior to standard	- None
1. Standards from a different country used as source material:	
France (moderate extent)	
Spain	·
	· · · · · · · · _ / _ · _ / _ · _ / _ /
2. COMPUTER programs used: a. In developing the standard: <u>- None</u>	b. For complying with the standard: <u>Uncertain</u>
	b. For complying with the standard: Uncertain
	b. For complying with the standard: Uncertain
	b. For complying with the standard: <u>Uncertain</u>
a. In developing the standard: - None	b. For complying with the standard: <u>Uncertain</u>
	b. For complying with the standard: Uncertain
a. In developing the standard: - None	
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a. In developing the standard: <u>- None</u> 	es in the standard: Comments: Pressure from AECOPS (the Building Constructor
a. In developing the standard: <u>- None</u>	es in the standard: Comments: Pressure from AECOPS (the Building Constructor Association) not to set the standard to a level abo
a. In developing the standard: <u>- None</u> 	es in the standard: Comments: Pressure from AECOPS (the Building Constructor
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a. In developing the standard: - None	es in the standard: Comments: Pressure from AECOPS (the Building Constructor Association) not to set the standard to a level abo current practice.
a. In developing the standard: - None	es in the standard: Comments: Pressure from AECOPS (the Building Constructor Association) not to set the standard to a level abo current practice.

3 PORTUGAL IMPLEMENTATION AN

	for implementation, its former focus was on buik	lings, energy, or another area:
Other: general	······································	······································
7. TRAINING & EDUCATION provided for archite	cts, engineers and other professionals:	
Written guidelines to assist with co	÷ .	
Example calculations		
Compliance forms		
Seminars, workshops, or conferences	<u>}</u>	
B. Compliance mechanisms used at different stage	es in construction process:	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval	No mechanism	No mechanism
Percent designs checked: ?	Percent sites checked: high	Percent buildings checked: hig
Comment:	Comment:	Comment:
Major local authorities enforce	Checks for compliance of other	Checks for compliance of
approval; smaller local	standards, but not for one under	other standards, but not for one under discussion.
authorities unable to enforce	discussion.	one under discussion.
d. Other compliance procedures		·
e. Effectiveness of combined compliance mech f. Explanation for effectiveness in part e: Ω	mpliance is most effective in large urb	an areas and there are a few
e. Effectiveness of combined compliance mech f. Explanation for effectiveness in part e: Co pro	ompliance is most effective in large urb oblems (mainly bureaucratic) in applyi	an areas and there are a few ng the standard to smaller towr
e. Effectiveness of combined compliance mech f. Explanation for effectiveness in part e: <u>Co</u> pro 9. Types of assessments or audits of energy stan	ompliance is most effective in large urb oblems (mainly bureaucratic) in applyi dards' impact:	an areas and there are a few ng the standard to smaller towr
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e. Effectiveness of combined compliance mech f. Explanation for effectiveness in part e: Co pro- pro- b. Types of assessments or audits of energy stan a. ENERGY SAVINGS POTENTIAL based on Completed: for solar houses made b b. MEASUREMENTS OF ENERGY SAVINGS in	mpliance is most effective in large urb oblems (mainly bureaucratic) in applyi dards' impact: prototypical (not actual) buildings: by FEUP/LNETI in the region of Porto n actual buildings complying with standard: ed out by universities	an areas and there are a few ng the standard to smaller towr
 e. Effectiveness of combined compliance mech f. Explanation for effectiveness in part e: Complete Types of assessments or audits of energy stan a. ENERGY SAVINGS POTENTIAL based on Completed: for solar houses made b b. MEASUREMENTS OF ENERGY SAVINGS in Planned: this type of work is carrie c. COST EFFECTIVENESS based on engineer 	empliance is most effective in large urb oblems (mainly bureaucratic) in applyi dards' impact: prototypical (not actual) buildings: by FEUP/LNETI in the region of Porto n actual buildings complying with standard: ed out by universities	an areas and there are a few ng the standard to smaller towr

PORTUGAL 4

FURTHER INFORMATION ON ENERGY CONSERVATION - Portugal

20. Efficiency testing facilities and procedures established:

Motors

Insulation Air conditioners/chillers/other appliances

Fixtures

Thermal properties of materials

Other: refrigeration equipment (tests available only for low or moderate

power

21. Other programs or policies developed to increase energy efficiency in buildings:

Information programs

Additional sources of information about energy efficiency for buildings in: Portugal

- 1. <u>A energia em Portugal DGE Min. Industria e Energia (information on the energy situation in Portugal)</u>
- 2. Series of properties of building materials thermal properties, physical properties of most common masonry solutions used in Portugal-LNEC Laboratório Nacional de Engenharia Civil

22. Contact for written copy of energy standard specified in Question 4:

Name:

Address:

Conselho Superior de Obras Públicas e Transportes (CSOPT) R.S. Mamede ao Caldas 1196 Lisboa Codex

Country: Portugal

Tel: 351-1-8884234 Fax:

ac: 351-1-876430

Types of supporting information available:

Program disk: Oliveria Fernandes; FEUP - Univ. do Porto; R. dos Bragas; 4099 Porto Codex; Portugal. Tel: 351-2-311-254 ; Fax: 351-2-319-280

Other energy standards for non-residential buildings:

Yes: Reg. da Qualidade do Sist. de Climatizacao em Edificios; CSOPT

Survey completed by:	Luis Roriz	
Title:		
	Universidade do Alga	
	Escola Superior de Teo	cnologia
	Quinta da Penha	800 Faro Country: Portugal
Tel:	351-98-803561	Fax: 351-98-832539
Date completed:	1/5/92	

NERAL OVERVIEW OF BUILDING ENERGY STANDARDS 1. General building standards exist at the following governmental levels: National Regional Local 2. Proposed or existing ENERGY standards cover the following building sectors: Both Residential and Non-Residential Local 3. Status of Non-Residential Building Energy Standards at the: a. Local level:		R	OMAN	[A	1	
2. Proposed or existing ENERGY standards cover the following building sectors: Both Residential and Non-Residential 3. Status of Non-Residential Building Energy Standards at the: a National levet:	ENERAL OVERVIEW O	F BUILDING ENERGY ST	TANDARDS			
3. Status of Non-Residential Building Energy Standards at the: a National level:	1. General building stan	dards exist at the following gov	ernmental levels:	National	Regional	Local
a National level:	2. Proposed or existing	ENERGY standards cover the f	ollowing building sectors	Both Reside	ntial and Non-Re	sidential
Title, Organization: Building regulations, Romania Year: ? Geographic Coverage: Nation Abbreviated Title: BR-Romania SCRIPTION OF SPECIFIED ENERGY STANDARDS - BR-Romania S. The standard defined in Question 4 applies to the following kinds of buildings: b. Building vintage: Building types: b. Building vintage: A - All Buildings c. Other characteristics: P - Physical size E - Amount of energy E - Amount of energy E - Amount of energy C. Basic approach of the standard: Prescriptive 7. The following subjects are included in the energy standard: b. Building envelope provisions: E - Energy amount target b. Building envelope provisions: Yes	200			-	c. Local level: 	
SCRIPTION OF SPECIFIED ENERGY STANDARDS - BR-Romania 5. The standard defined in Question 4 applies to the following kinds of buildings: a. Building types: A - All Buildings Both new and existing C. Other characteristics: P - Physical size E - Amount of energy Statistic approach of the standard: Prescriptive 7. The following subjects are included in the energy standard: a. Whole building energy provisions: E - Energy amount target Stating provisions: - None - Other provisions:				· · · · · · · · · · · · · · · · · · ·		
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P - Physical size E - Amount of energy E - Amount of energy G. Basic approach of the standard: a. Whole building energy provisions: E - Energy amount target	<u></u>		-			<u></u>
			P - Physical siz	ze		
7. The following subjects are included in the energy standard: a. Whole building energy provisions: E- Energy amount target			$\frac{E - Amount of e}{E - Amount of e}$	nergy		
7. The following subjects are included in the energy standard: a. Whole building energy provisions: E- Energy amount target			-			
7. The following subjects are included in the energy standard: a. Whole building energy provisions: E- Energy amount target			_ 1	·		
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- None - None - None		· · · · · · · · · · · · · · · · · · ·				
- None - None - None						
- None ? ?	c. Liahting provision	IS :	d. Mech	anical provisions:		
			<u>?</u>			
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ROMANIA 2

8. Organizations involved in developing the standard:	
Government agency	
Research group	
Industry group	
·	
9. Decision Process: <u>Mandate</u> Comment:	· · · · · · · · · · · · · · · · · · ·
10. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Estimated using professional judgment	Estimated using professional judgment
	Gathered through audits and surveys
·	· · · · · · · · · · · · · · · · · · ·
c. WEATHER data	d. Other information
Gathered through measurements	- None
	-
	· · · ·
11. Standards from a different country used as source material:	
European countries	
·	
	······
	<u>.</u>
2. COMPUTER programs used:	
2. COMPUTER programs used: a. In developing the standard: Uncertain	b. For complying with the standard: ?
	b. For complying with the standard: ?
	b. For complying with the standard: ?
	b. For complying with the standard: ?
	b. For complying with the standard: ?
a. In developing the standard: Uncertain	b. For complying with the standard: ?
	b. For complying with the standard: ?
a. In developing the standard: Uncertain	
a. In developing the standard: Uncertain	s in the standard:
a. In developing the standard: Uncertain	s in the standard: Comments:
a. In developing the standard: Uncertain Uncertain In developing the standard: Uncertain Example 1. Uncertain Example 2. Un	s in the standard:
a. In developing the standard: Uncertain	s in the standard: Comments:
a. In developing the standard: Uncertain Uncertain In developing the standard: Uncertain Example 1. Uncertain Example 2. Un	s in the standard: Comments:
a. In developing the standard: Uncertain I.1. Standard is set at a level: Equal to current practice I.3. Standard is set at a level: Equal to current practice I.4. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design	s in the standard: Comments:
a. In developing the standard: Uncertain I.3. Standard is set at a level: Equal to current practice I.4. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design	s in the standard: Comments:
a. In developing the standard: Uncertain II. Standard is set at a level: Equal to current practice II. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design II. Standard scheduled for regular review and revision?	s in the standard: Comments:
a. In developing the standard: Uncertain I.3. Standard is set at a level: Equal to current practice I.4. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design	s in the standard: Comments:
a. In developing the standard: Uncertain II. Standard is set at a level: Equal to current practice II. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design II. Standard scheduled for regular review and revision?	s in the standard: Comments:
a. In developing the standard: Uncertain II. Standard is set at a level: Equal to current practice II. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Availability of energy efficient products Similarity/difference to local design II. Standard scheduled for regular review and revision?	s in the standard: Comments:

3 ROMANIA

Under revision		
If an existing agency was made respo	onsible for implementation, its former focus was o	on buildings, energy, or another area:
TRAINING & EDUCATION provided for	architects, engineers and other professionals:	
Written guidelines to assist w	ith compliance procedure	
Comulian on former		
Seminars, workshops, or confe	rences	
Compliance mechanisms used at different	ent stages in construction process:	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Penalty	?	?
Percent designs checked:	Percent sites checked:	Percent buildings checked:
Comment:	Comment:	Comment:
Difficult to estimate.		
Difficult to Estimate.		
······································		
d. Other compliance procedures - N		
e. Effectiveness of combined complian	ce mechanisms (scale of 1-5): _2	
e. Effectiveness of combined complian		
e. Effectiveness of combined complian f. Explanation for effectiveness in par	ce mechanisms (scale of 1-5): _2 te:	
e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ener	ce mechanisms (scale of 1-5): _2 t e: gy standards' impact:	
e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba	ce mechanisms (scale of 1-5): _2 te:	
e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ener	ce mechanisms (scale of 1-5): _2 t e: gy standards' impact:	
e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba In progress	ce mechanisms (scale of 1-5): _2	
e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba In progress	ce mechanisms (scale of 1-5): _2	
e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba In progress	ce mechanisms (scale of 1-5): _2	
e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba In progress b. MEASUREMENTS OF ENERGY SAV	ce mechanisms (scale of 1-5): _2	
e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba In progress b. MEASUREMENTS OF ENERGY SAV In progress	ce mechanisms (scale of 1-5): _2	
e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL bas In progress b. MEASUREMENTS OF ENERGY SAV In progress	ce mechanisms (scale of 1-5): _2	ırd:
e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL bas In progress b. MEASUREMENTS OF ENERGY SAV In progress	ce mechanisms (scale of 1-5): _2	ırd:
e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL bas In progress b. MEASUREMENTS OF ENERGY SAV In progress	ce mechanisms (scale of 1-5): _2	ırd:
e. Effectiveness of combined complian f. Explanation for effectiveness in par Types of assessments or audits of ener a. ENERGY SAVINGS POTENTIAL ba In progress b. MEASUREMENTS OF ENERGY SAV In progress c. COST EFFECTIVENESS based on e In progress	ce mechanisms (scale of 1-5): _2	ırd:

0. Efficiency testing facilities and procedures establishe	ed:
Insulation	·
Thermal properties of materials	
······································	
1. Other programs or policies developed to increase ener	my efficiency in huildings
Information programs	Comment:
	—— I
Additional sources of information about energy effic	ciency for buildings in: Romania
1	······································
2	· · · · · · · · · · · · · · · · · · ·
	······································
2. Contact for written copy of energy standard specified	
2. Contact for written copy of energy standard specified Name: Address:	
2. Contact for written copy of energy standard specified Name:	
2. Contact for written copy of energy standard specified Name: Address:	
2. Contact for written copy of energy standard specified Name: Address:	
2. Contact for written copy of energy standard specified Name: Address: Country:	in Question 4:
2. Contact for written copy of energy standard specified Name: Address: Country: Tel:	
2. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available:	in Question 4:
2. Contact for written copy of energy standard specified Name: Address: Country: Tel:	in Question 4:
2. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available:	in Question 4:
2. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: - None	d in Question 4: Fax:
2. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: <u>- None</u> Other energy standards for non-residential building	d in Question 4: Fax:
2. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: - None	d in Question 4: Fax:
2. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: <u>- None</u> Other energy standards for non-residential building	d in Question 4:
2. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: - None Other energy standards for non-residential building - None	d in Question 4:
2. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: - None Other energy standards for non-residential building - None Survey completed by:	d in Question 4: Fax: gs:
2. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: - None Other energy standards for non-residential building - None	d in Question 4: Fax: gs: Adrian Gheorghe Division of Nuclear Safety
2. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: - None Other energy standards for non-residential building - None Survey completed by:	f in Question 4: Fax: gs:
2. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: - None Other energy standards for non-residential building - None Survey completed by:	fin Question 4: Fax: gs: Adrian Gheorghe Division of Nuclear Safety International Atomic Energy Agency Wagramerstrasse 5, P.O. Box 200, A-1400
2. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: - None Other energy standards for non-residential building - None Survey completed by: Title:	Fax: gs: Adrian Gheorghe Division of Nuclear Safety International Atomic Energy Agency Wagramerstrasse 5, P.O. Box 200, A-1400 Vienna Country: Austria
2. Contact for written copy of energy standard specified Name: Address: Country: Tel: Types of supporting information available: - None Other energy standards for non-residential building - None Survey completed by:	fin Question 4: Fax: gs: Adrian Gheorghe Division of Nuclear Safety International Atomic Energy Agency Wagramerstrasse 5, P.O. Box 200, A-1400

OVERVIEW OF BUILDING ENERGY STANDARDS ieneral building standards exist at the following governmental levels: National roposed or existing ENERGY standards cover the following building sectors: Both Residential and Non-Residential and Non-Residential and Non-Residential Building Energy Standards at the: a National level: Mandatory b. Regional level:	
roposed or existing ENERGY standards cover the following building sectors: Both Residential and Non-Residential and Non-Residential and Non-Residential Building Energy Standards at the: C. Local level: a National level: Mandatory b. Regional level: - C. Local level: - ingle energy standard selected for further description: Title, Organization: Building. Regulations, Scotland -	
roposed or existing ENERGY standards cover the following building sectors: Both Residential and Non-Residential and Non-Residential and Non-Residential Building Energy Standards at the: C. Local level: a National level: Mandatory b. Regional level: - C. Local level: - ingle energy standard selected for further description: Title, Organization: Building. Regulations, Scotland -	
tatus of Non-Residential Building Energy Standards at the:	
a National level:	-
Title, Organization: Building Regulations, Scotland Year: ? Geographic Coverage: Nation Abbreviated Title: BR-SCT TION OF SPECIFIED ENERGY STANDARDS - BR-SCT e standard defined in Question 4 applies to the following kinds of buildings: b. Building vintage: A - All Buildings b. Building vintage: Mainton New buildings C. Other characteristics: - None Basic approach of the standard: Both prescriptive and performance a Whole building energy provisions: b. Building envelope provisions: E-Energy amount target b. Building envelope provisions:	
Year: Ceographic Coverage: Nation Abbreviated Title: BR-SCT TION OF SPECIFIED ENERGY STANDARDS - BR-SCT e standard defined in Question 4 applies to the following kinds of buildings: a. Building types: b. Building vintage: New buildings a. All Buildings b. Building vintage: New buildings c. Other characteristics: -	
TION OF SPECIFIED ENERGY STANDARDS - BR-SCT re standard defined in Question 4 applies to the following kinds of buildings: a. Building types: A - All Buildings Building types: A - All Buildings Building types: A - All Buildings Building types: Building type: Building type: Building type: Building type: Building type: Building type:	
e standard defined in Question 4 applies to the following kinds of buildings: a. Building types: A - All Buildings	·
a. Building types: b. Building vintage: A - All Buildings New buildings C. Other characteristics: - None - None - None Basic approach of the standard: Both prescriptive and performance re following subjects are included in the energy standard: b. Building envelope provisions: a. Whole building energy provisions: b. Building envelope provisions: E- Energy amount target b. Building envelope provisions:	
A - All Buildings New buildings	
c Other characteristics: - None - None - None - None - None - Sector characteristics: - Sector characteristrestricts:	
- None - None - None - None - Second S	
Basic approach of the standard: Both prescriptive and performance Be following subjects are included in the energy standard: b. Building envelope provisions: a. Whole building energy provisions: b. Building envelope provisions: E- Energy amount target Roof Wall system Wall system	
a. Whole building energy provisions: b. Building envelope provisions: E- Energy amount target Roof Wall system Wall system	
a. Whole building energy provisions: b. Building envelope provisions: E- Energy amount target Roof Wall system Wall system	
a. Whole building energy provisions: b. Building envelope provisions: E- Energy amount target Roof Wall system Wall system	
a. Whole building energy provisions: b. Building envelope provisions: E- Energy amount target Roof Wall system Wall system	
a. Whole building energy provisions: b. Building envelope provisions: E- Energy amount target Roof Wall system Wall system	
a. Whole building energy provisions: b. Building envelope provisions: E- Energy amount target Roof Wall system Wall system	
E- Energy amount target Roof Wall system	
Wall system	
c. Lighting provisions: d. Mechanical provisions:	
- None Yes	<u> </u> ~
e. Other provisions:	
Yes	

SCOTLAND 2

Industry group Academic institution Research group ision Process: Mandate commation used in developing the standard: . PHYSICAL CHARACTERISTICS of existing buildings ?	of existing buildings:
Academic institution Research group ision Process: Mandate commation used in developing the standard: . PHYSICAL CHARACTERISTICS of existing buildings b. ENERGY USE ? ?	of existing buildings:
Research group ision Process: Mandate Comment: commation used in developing the standard: . . PHYSICAL CHARACTERISTICS of existing buildings b. ENERGY USE ? ? ?	of existing buildings:
ormation used in developing the standard: PHYSICAL CHARACTERISTICS of existing buildings ? ? ? WEATHER data ? andards from a different country used as source material: England and Wales	of existing buildings:
ormation used in developing the standard: PHYSICAL CHARACTERISTICS of existing buildings ? ? ? WEATHER data ? andards from a different country used as source material: England and Wales	of existing buildings:
PHYSICAL CHARACTERISTICS of existing buildings b. ENERGY USE ? ?	ion
PHYSICAL CHARACTERISTICS of existing buildings b. ENERGY USE ? ?	ion
? ?	ion
	ion
. WEATHER data	ion
. WEATHER data	ion
WEATHER data d. Other informat <u>- None </u> andards from a different country used as source material: England and Wales	ion
?	
andards from a different country used as source material: England and Wales	· · · · · · · · · · · · · · · · · · ·
andards from a different country used as source material: England and Wales	· · · · · · · · · · · · · · · · · · ·
England and Wales	
England and Wales	
	· ·
*	
OMPUTER programs used:	
In developing the standard: Uncertain , b. For complying	with the standard: ?
· · · · · · · · · · · · · · · · · · ·	
· · · · · · · · · · · · · · · · · · ·	
andard is set at a level: ?	
nsiderations influencing the inclusion or exclusion of measures in the standard:	
E - Cost effectiveness	
Availability of energy efficient products	
Comfort	
1	
tendent askedulat for executor entropy and envision?	
tandard scheduled for regular review and revision?	,
Yes	
<u>Yes</u>	

3 SCOTLAND

Comment: Comment: Comment:	If an existing agency was made responsi		
Written guidelines to assist with compliance procedure Example calculations Seminars, workshops, or conferences		ble for implementation, its former focus was	on buildings, energy, or another area:
Example calculations Seminars, workshops, or conferences	7. TRAINING & EDUCATION provided for arc	hitects, engineers and other professionals	
Seminars, workshops, or conferences Seminars, workshops, or conferences Compliance mechanisms used at different stages in construction process: a. PRIOR to construction: b. DURING construction: Uncertain Uncertain Percent designs checked:	Written guidelines to assist with	compliance procedure	
a. PRIOR to construction: Uncertain c. AFTER construction: Uncertain Uncertain Uncertain Percent designs checked: Percent sites checked: Percent buildings check Comment: Comment: Percent sites checked: Percent sites checked: Percent sites checked: d. Other compliance procedures	Seminars, workshops, or conferen	ICES	
a. PRIOR to construction: Uncertain c. AFTER construction: Uncertain Uncertain Uncertain Percent designs checked: Percent sites checked: Percent buildings check Comment: Comment: Percent sites checked: Percent sites checked: Percent sites checked: d. Other compliance procedures			
Percent designs checked: Percent sites checked: Percent buildings check Comment: Comment: Comment: Comment:	-	· ·	c. AFTER construction:
Comment: Comment: Comment:	Uncertain		
d. Other compliance procedures	Percent designs checked:	Percent sites checked:	Percent buildings checked:
d. Other compliance procedures	Comment:	Comment:	Comment:
e. Effectiveness of combined compliance mechanisms (scale of 1-5):		· · · · · · · · · · · · · · · · · · ·	
e. Effectiveness of combined compliance mechanisms (scale of 1-5):		· · · · · · · · · · · · · · · · · · ·	
e. Effectiveness of combined compliance mechanisms (scale of 1-5):			
f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy standards' impact: a. ENERGY SAVINGS POTENTIAL based on prototypical (not actual) buildings:		·	
	e. Effectiveness of combined compliance n	nechanisms (scale of 1-5):	
	f. Explanation for effectiveness in part e:		
a. ENERGY SAVINGS POTENTIAL based on prototypical (not actual) buildings:	·····		
a. ENERGY SAVINGS POTENTIAL based on prototypical (not actual) buildings:		standards' impact:	
). Types of assessments or audits of energy s	-	
COST EFFECTIVENESS based on engineering economic CALCULATIONS:		on prototypical (not actual) buildings:	
C. COST EFFECTIVENESS based on engineering economic CALCULATIONS:		on prototypical (not actual) buildings:	
COST EFFECTIVENESS based on engineering economic CALCULATIONS:		on prototypical (not actual) buildings:	
C. COST EFFECTIVENESS based on engineering economic CALCULATIONS:		on prototypical (not actual) buildings:	
	a. ENERGY SAVINGS POTENTIAL based		lard:
•	a. ENERGY SAVINGS POTENTIAL based		lard:
	a. ENERGY SAVINGS POTENTIAL based		lard:
	a. ENERGY SAVINGS POTENTIAL based		lard:
d. COST EFFECTIVENESS based on ACTUAL COSTS:	a. ENERGY SAVINGS POTENTIAL based b. MEASUREMENTS OF ENERGY SAVING	as in actual buildings complying with stand	lard:
d. COST EFFECTIVENESS based on ACTUAL COSTS:	a. ENERGY SAVINGS POTENTIAL based b. MEASUREMENTS OF ENERGY SAVING	as in actual buildings complying with stand	lard:
d. COST EFFECTIVENESS based on ACTUAL COSTS:	a. ENERGY SAVINGS POTENTIAL based b. MEASUREMENTS OF ENERGY SAVING	as in actual buildings complying with stand	lard:
<u>-</u>	a. ENERGY SAVINGS POTENTIAL based b. MEASUREMENTS OF ENERGY SAVING	as in actual buildings complying with stand	lard:
	a. ENERGY SAVINGS POTENTIAL based b. MEASUREMENTS OF ENERGY SAVING c. COST EFFECTIVENESS based on engin	as in actual buildings complying with stand	lard:
	a. ENERGY SAVINGS POTENTIAL based b. MEASUREMENTS OF ENERGY SAVING c. COST EFFECTIVENESS based on engin	as in actual buildings complying with stand	
	a. ENERGY SAVINGS POTENTIAL based b. MEASUREMENTS OF ENERGY SAVING c. COST EFFECTIVENESS based on engin	as in actual buildings complying with stand	
	a. ENERGY SAVINGS POTENTIAL based b. MEASUREMENTS OF ENERGY SAVING c. COST EFFECTIVENESS based on engin	as in actual buildings complying with stand	

SCOTLAND 4

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<u></u>		1
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21. Other program	s or policies developed to increase ener	rgy efficiency in buildings:
	· · · · · · · · · · · · · · · · · · ·	
	······································	<u>.</u> 1
Additional s	ources of information about energy effi	ciency for buildings in: Scotland
1	· · · · · · · · · · · · · · · · · · ·	-
2		· · · · · · · · · · · · · · · · · · ·
 	· · · · · · · · · · · · · · · · · · ·	
3	·	
22. Contact for wr	tten copy of energy standard specified	
Name: - Address: -		
Name: - Address: -		
Name: - Address: - Country: Tel:		d in Question 4:
Name: - Address: - Country: Tel:	tten copy of energy standard specified	d in Question 4:
Name: - Address: - Country: Tel:	tten copy of energy standard specified	d in Question 4:
Name: - Address: - Country: Tel: Types of su	tten copy of energy standard specified	d in Question 4: Fax:
Name: - Address: - Country: Tel: Types of su	tten copy of energy standard specified	d in Question 4: Fax:
Name: - Address: - Country: Tel: Types of su	tten copy of energy standard specified	d in Question 4: Fax:
Name: - Address: - Country: Tel: Types of su	tten copy of energy standard specified	d in Question 4: Fax:
Name: - Address: - Country: Tel: Types of su	tten copy of energy standard specified	d in Question 4: Fax: gs: John Foster Senior Architect Building Directorate, Scottish Office
Name: - Address: - Country: Tel: Types of su	itten copy of energy standard specified oporting information available: y standards for non-residential building Survey completed by:	fin Question 4: Fax: gs: John Foster Senior Architect Building Directorate, Scottish Office Rm. 3/113 New St. Andrews House
Name: - Address: - Country: Tel: Types of su	itten copy of energy standard specified oporting information available: y standards for non-residential building Survey completed by:	d in Question 4: Fax: gs: John Foster Senior Architect Building Directorate, Scottish Office

		APORE	
ERAL OVERVIEW OF	BUILDING ENERGY STANDA	RDS	
1. General building stand	ards exist at the following governmental	levels: National	<u> </u>
2. Proposed or existing I	ENERGY standards cover the following	building sectors: Both Residential a	nd Non-Residential
3. Status of Non-Reside	ntial Building Energy Standards at the:		- 19%
a. National level:			.ocal level:
·			
	rd selected for further description:		
Title, Organization:	Control Regulations; Building C	ation in Buildings and Building Serv Control Division, Public Works Depa general building code, S148/89.	
Year: 1980	Geographic Coverage: Nation	• •	Div 10
1900	Geographic coverage		, DIV. 10
RIPTION OF SPECI	FIED ENERGY STANDARDS -	S 148/89, Div. 10	
5. The standard defined in	Question 4 applies to the following kine	ds of buildings:	
a. Building types:		likding vintage:	
A - All Buildi	ngs <u>N</u>	Jew buildings	<u> </u>
	c. O	ther characteristics:	
		t <mark>her characteristics:</mark> - Amount of energy: >30kw cooling o	capacity for AC equip.
	<u>E</u>		capacity for AC equip.
	<u>E</u>	- Amount of energy: >30kw cooling of	capacity for AC equip.
	<u>E</u>	- Amount of energy: >30kw cooling of	capacity for AC equip.
	<u>E</u>	- Amount of energy: >30kw cooling of	capacity for AC equip.
6. Basic approach of the	<u>E</u>	- Amount of energy: >30kw cooling of - Air-Conditioned	capacity for AC equip.
		- Amount of energy: >30kw cooling of - Air-Conditioned	capacity for AC equip.
	standard: Both prescriptive and are included in the energy standard:	- Amount of energy: >30kw cooling of - Air-Conditioned	capacity for AC equip.
7. The following subjects	standard: Both prescriptive and are included in the energy standard:	- Amount of energy: >30kw cooling of - Air-Conditioned d performance b. Building envelope provisions: Roof	capacity for AC equip.
7. The following subjects a. Whole building ene	standard: Both prescriptive and are included in the energy standard:	- Amount of energy: >30kw cooling of - Air-Conditioned d performance b. Building envelope provisions: Roof Wall system	capacity for AC equip.
7. The following subjects a. Whole building ene	standard: Both prescriptive and are included in the energy standard:	- Amount of energy: >30kw cooling of - Air-Conditioned d performance b. Building envelope provisions: Roof Wall system Fenestration system	capacity for AC equip.
7. The following subjects a. Whole building ene	standard: Both prescriptive and are included in the energy standard:	- Amount of energy: >30kw cooling of - Air-Conditioned d performance b. Building envelope provisions: Roof Wall system	capacity for AC equip.
7. The following subjects a. Whole building ene - None	standard: Both prescriptive and are included in the energy standard: rgy provisions:	- Amount of energy: >30kw cooling of - Air-Conditioned d performance b. Building envelope provisions: Roof Wall system Fenestration system	capacity for AC equip.
7. The following subjects a. Whole building ene	E A standard: Both prescriptive and are included in the energy standard: rgy provisions:	- Amount of energy: >30kw cooling of - Air-Conditioned d performance b. Building envelope provisions: Roof Wall system Fenestration system Infiltration	capacity for AC equip.
7. The following subjects a. Whole building ene - None - None - Control require Power density	E A Standard: Both prescriptive and are included in the energy standard: rgy provisions: Standard: Standard:	- Amount of energy: >30kw cooling of - Air-Conditioned d performance b. Building envelope provisions: Roof Wall system Fenestration system Infiltration d. Mechanical provisions:	capacity for AC equip.
7. The following subjects a. Whole building ene - None - None - C. Lighting provisions Control require	E A Standard: Both prescriptive and are included in the energy standard: rgy provisions: Standard: Standard:	- Amount of energy: >30kw cooling of - Air-Conditioned d performance b. Building envelope provisions: Roof Wall system Fenestration system Infiltration d. Mechanical provisions: Controls	capacity for AC equip.
7. The following subjects a. Whole building ene - None - None - Control require Power density	E A Standard: Both prescriptive and are included in the energy standard: rgy provisions: Standard: Standard:	- Amount of energy: >30kw cooling of - Air-Conditioned d performance b. Building envelope provisions: Roof Wall system Fenestration system Infiltration d. Mechanical provisions: Controls	capacity for AC equip.
7. The following subjects a. Whole building ene - None - None - Control require Power density	E A Standard: Both prescriptive and are included in the energy standard: rgy provisions: Standard: Standard:	- Amount of energy: >30kw cooling of - Air-Conditioned d performance b. Building envelope provisions: Roof Wall system Fenestration system Infiltration d. Mechanical provisions: Controls	capacity for AC equip.

SINGAPORE 2

Acadomic institution: National University of Si	Public Works Department
Academic institution: National University of Sin	ngapore
Government agency: Public Utilities Board	······
Local interest group: Institution of Engineers	•
Local interest group: Singapore Institute of Arch	utects
Decision Process: Consensus Comment:	
Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Gathered through audits and surveys	Estimated using professional judgment
	·
· · · · · · · · · · · · · · · · · · ·	
c. WEATHER data	d Other information
	d. Other information
Gathered through measurements	- None
<u> </u>	
	- · · · · · · · · · · · · · · · · · · ·
. Standards from a different country used as source material:	•
USA: ASHRAE 90	
	·
	······································
	······································
COMPUTER programs used:	
COMPUTER programs used:	b. For complying with the standard No.
COMPUTER programs used: a. In developing the standard: <u>- None</u>	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
a. In developing the standard: <u>- None</u>	b. For complying with the standard: <u>No</u>
	b. For complying with the standard: <u>No</u>
a. In developing the standard: - None	
a. In developing the standard: <u>- None</u> Standard is set at a level: <u>Above current practice</u> Considerations influencing the inclusion or exclusion of measures	s in the standard:
a. In developing the standard: <u>- None</u>	
a. In developing the standard: - None	s in the standard:
a. In developing the standard: <u>- None</u>	s in the standard:
a. In developing the standard: - None	s in the standard:
a. In developing the standard: - None - None - None - Standard is set at a level: Above current practice Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness A - Availability of energy efficient products S - Similarity/difference to local design	s in the standard:
a. In developing the standard: - None - None - None - Standard is set at a level: Above current practice Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness A - Availability of energy efficient products S - Similarity/difference to local design	s in the standard:
a. in developing the standard: - None	s in the standard:
a. in developing the standard: - None	s in the standard: Comments:
a. in developing the standard: - None	s in the standard: Comments:
a. in developing the standard: - None	s in the standard:
a. In developing the standard: - None	s in the standard: Comments:

3 SINGAPORE IMPLEMENTATION AND COMPLIANCE - S 148/89, Div. 10

In all existing agency was made response	sible for implementation, its former focus wa	s on buildings, energy, or another area:
Buildings		
TRAINING & EDUCATION provided for an	chitects, engineers and other professionals	
Written guidelines to assist with	n compliance procedure	
Example calculations		
Compliance forms		
Seminars, workshops, or confere		
Compliance mechanisms used at different	stages in construction process:	·····
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval	No mechanism	Certification/approval
Percent designs checked: -	Percent sites checked:	Percent buildings checked:
Comment:	Comment:	Comment:
Random		Random
d. Other compliance procedurese. Effectiveness of combined compliance	mechanisms (scale of 1-5): 5	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e: Types of assessments or audits of energy	standards' impact:	e a responsibility of the professional
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based	standards' impact: d on prototypical (not actual) buildings:	e a responsibility of the professional
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e: Types of assessments or audits of energy	standards' impact: d on prototypical (not actual) buildings:	e a responsibility of the professional
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Completed: ASEAN-US cooper	standards' impact: d on prototypical (not actual) buildings: rative program report GS in actual buildings complying with stan	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Completed: ASEAN-US cooper b. MEASUREMENTS OF ENERGY SAVIN Completed: ASEAN-US cooper	standards' impact: d on prototypical (not actual) buildings: rative program report GS in actual buildings complying with stan rative program report	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Completed: ASEAN-US cooper	standards' impact: d on prototypical (not actual) buildings: active program report GS in actual buildings complying with stan rative program report	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Completed: ASEAN-US cooper b. MEASUREMENTS OF ENERGY SAVIN Completed: ASEAN-US cooper c. COST EFFECTIVENESS based on eng	standards' impact: d on prototypical (not actual) buildings: rative program report GS in actual buildings complying with stan rative program report ineering economic CALCULATIONS: rative program report	

SINGAPORE 4

Insulation	······································
Ballasts	
Thermal properties of materials	
	· · · · · · · · · · · · · · · · · · ·
ther programs or policies developed to increase energy	gy efficiency in buildings:
Information programs	Comment: Public Utilities Board
	_
	[
Additional sources of information about energy effic	iency for buildings in: Singapore
· · ·	
	· · · · · · · · · · · · · · · · · · ·
3	· · · · · · · · · · · · · · · · · · ·
ontact for written copy of energy standard specified Name:	in Question 4:
	in Question 4:
Name: Address:	in Question 4:
Name: Address: Country:	
Name: Address: Country: Tel:	Fax:
Name: Address: Country:	
Name: Address: Country: Tel:	
Name: Address: Country: Tel:	
Name: Address: Country: Tel:	Fax:
Name: Address: Country: Tel: Types of supporting information available:	Fax:
Name: Address: Country: Tel: Types of supporting information available:	Fæc: j\$:
Name: Address: Country: Tel: Types of supporting information available:	Fax:
Name: Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building Survey completed by:	Fæc: j\$:
Name: Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building 	Fax: s: Ng Aik Huat Building Control Division
Name: Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building Survey completed by:	Fax: s: Ng Aik Huat Building Control Division 5 Maxwell Road; Tower Block , MND Complex
Name: Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building Survey completed by: Title:	Fax: s: Ng Aik Huat Building Control Division 5 Maxwell Road; Tower Block , MND Complex Singapore 0106 Country : Singapor
Name: Address: Country: Tel: Types of supporting information available: 	Fax: s: Ng Aik Huat Building Control Division 5 Maxwell Road; Tower Block , MND Complex
Name: Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building Survey completed by: Title:	Fax: s: Ng Aik Huat Building Control Division 5 Maxwell Road; Tower Block , MND Complex Singapore 0106 Country : Singapor

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ERAL OVERVIEW O	F BUILDING ENERGY	STANDARDS			
1. General building star	ndards exist at the following g	overnmental levels:	National	Local	
2. Proposed or existing	ENERGY standards cover th	e following building	g sectors: Non-Res	idential Only	
3 Status of Non-Resid	ential Building Energy Stand	lards at the			<u></u> ,
a. National level:	Voluntary	b. Regional leve	t Voluntary	c. Local level:	- None
-					
	ard selected for further desc				
nue, organization	Department of Finance	<u>'e</u>		·····	
			· · ·		· <u>····</u> ·······························
Year: ?	Geographic Coverage:	Nation	Abbreviated Title:	BES-DF	
CRIPTION OF SPEC	IFIED ENERGY STAND	ARDS - BES-	DF		
	in Question 4 applies to the fi				
a. Building types:		b. Building v	-		
O - Offices		-	uildings		
	ent Facilities			· · · · · · · · · · · · · · · · · · ·	
D - Hospital	s	c. Other cha			
		<u> </u>	unt of energy		
<u> </u>					
<u></u>	······	/		····	
· · · · · · · · ·	<u></u>	<u> </u>			
6. Basic approach of th	ne standard: Performan	ca-bacad		•	
o. Dasic approach or a		Le-Daseu	<u> </u>		
7. The following subject	s are included in the energy s	tandard:			
a. Whole building er	nergy provisions:	1	b. Building envelope pro	visions:	
E- Energy am	ount target		?		
<u>2 110.8) un</u>	<u></u>		<u> </u>		·
			<u> </u>		·······
			d. Mechanical provision	5.	
c. Liabtino novisio	A Bulle	1		-	
c. Lighting provisio			2		
c. Lighting provision			?		, ·
c. Lighting provision			?		
c. Lighting provision ?			?		·
c. Lighting provision ?			?	······································	
?			?		
e. Other provisions			?	······	
?			?		

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SOUTH AFRICA 2

	Iniversity of Pretoria	
<u> </u>		
Decision Process: Mandate	Comment:	
). Information used in developing th		· · · · · · · · · · · · · · · · · · ·
a. PHYSICAL CHARACTERIS		b. ENERGY USE of existing buildings:
Estimated using profes	sional judgment	Estimated using professional judgment Computer simulations used for estimates
	· · · · · · · · · · · · · · · · · · ·	Computer simulations used for estimates
······································		
c. WEATHER data		d. Other information
Already available price	or to standard	- None
Alleady available priv		
· · · · · · · · · · · · · · · · · · ·		
. COMPUTER programs used: a. In developing the standard:	QUICK	b. For complying with the standard: Yes
1.1	<u>QUICK</u>	b. For complying with the standard: Yes
1.1	QUICK	b. For complying with the standard: Yes
a. In developing the standard:		b. For complying with the standard: Yes
a. In developing the standard: . Standard is set at a level: <u>Equ</u>	al to current practice	
a. In developing the standard: . Standard is set at a level: <u>Equ</u> . Considerations influencing the inc	al to current practice	s in the standard:
 a. In developing the standard: Standard is set at a level: <u>Equ</u> Considerations influencing the inc E - Cost effectiveness 	aal to current practice	
a. In developing the standard: . Standard is set at a level: <u>Equals</u> . Considerations influencing the inc <u>E - Cost effectiveness</u> <u>Similarity/difference to</u>	aal to current practice	s in the standard:
 a. In developing the standard: Standard is set at a level: <u>Equ</u> Considerations influencing the inc E - Cost effectiveness 	aal to current practice	s in the standard:
a. In developing the standard: . Standard is set at a level: <u>Equals</u> . Considerations influencing the inc <u>E - Cost effectiveness</u> <u>Similarity/difference to</u>	aal to current practice	s in the standard:
a. In developing the standard: . Standard is set at a level: <u>Equals</u> . Considerations influencing the inc <u>E - Cost effectiveness</u> <u>Similarity/difference to</u>	aal to current practice	s in the standard:
a. In developing the standard: . Standard is set at a level: <u>Equals</u> . Considerations influencing the inc <u>E - Cost effectiveness</u> <u>Similarity/difference to</u>	al to current practice Ausion or exclusion of measures	s in the standard:
a. In developing the standard: Standard is set at a level: Equ. Considerations influencing the inc <u>E - Cost effectiveness</u> <u>Similarity/difference to</u> <u>Comfort</u> ia. Standard scheduled for regular <u>No</u>	al to current practice Ausion or exclusion of measures	s in the standard: Comments:

3 SOUTH AFRICA

······································	Works	
	sible for implementation, its former focus was o	n buildings, energy, or another area:
Buildings		
7. TRAINING & EDUCATION provided for an	chitects, engineers and other professionals:	
- None		
	· · · · · · · · · · · · · · · · · · ·	
		····
 Compliance mechanisms used at different a. PRIOR to construction: 	b. DURING construction:	c. AFTER construction:
No mechanism	No mechanism	No mechanism
Percent designs checked: 5	Percent sites checked: 0	Percent buildings checked: 0
Comment:	Comment:	Comment:
		_
		— I ————
d Other compliance procedures		
d. Other compliance procedures		
d. Other compliance procedures e. Effectiveness of combined compliance	mechanisms (scale of 1-5): 1.5	
e. Effectiveness of combined compliance	: Energy conservation not perceived a	s important; pollution (some) not
e. Effectiveness of combined compliance		s important; pollution (some) not ed; energy is cheap
e. Effectiveness of combined compliance	Energy conservation not perceived a perceived as important; coal produce	s important; pollution (some) not ed; energy is cheap
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e). Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base	: Energy conservation not perceived a perceived as important; coal produc standards' impact: d on prototypical (not actual) buildings:	s important; pollution (some) not ed; energy is cheap
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e). Types of assessments or audits of energy	: Energy conservation not perceived a perceived as important; coal produc standards' impact: d on prototypical (not actual) buildings:	s important; pollution (some) not ed; energy is cheap
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e. Effectiveness of combined compliance f. Explanation for effectiveness in part e 0. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base Completed: National Energy C	: Energy conservation not perceived a perceived as important; coal produce standards' impact: d on prototypical (not actual) buildings: ouncil	ed; energy is cheap
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e J. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base Completed: National Energy C	: Energy conservation not perceived a perceived as important; coal produce standards' impact: d on prototypical (not actual) buildings: ouncil	ed; energy is cheap
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e J. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base Completed: National Energy C	: Energy conservation not perceived a perceived as important; coal produce standards' impact: d on prototypical (not actual) buildings: ouncil	ed; energy is cheap
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e o. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base Completed: National Energy C b. MEASUREMENTS OF ENERGY SAVIN Completed: National Energy C In progress	: Energy conservation not perceived a perceived as important; coal produce standards' impact: d on prototypical (not actual) buildings: ouncil IGS in actual buildings complying with standa ouncil	ed; energy is cheap
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e O. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base Completed: National Energy C b. MEASUREMENTS OF ENERGY SAVIN Completed: National Energy C In progress	: Energy conservation not perceived a perceived as important; coal produce standards' impact: d on prototypical (not actual) buildings: ouncil IGS in actual buildings complying with standa ouncil	ed; energy is cheap
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e o. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL base Completed: National Energy C b. MEASUREMENTS OF ENERGY SAVIN Completed: National Energy C In progress	: Energy conservation not perceived a perceived as important; coal produce standards' impact: d on prototypical (not actual) buildings: ouncil IGS in actual buildings complying with standa ouncil	ed; energy is cheap
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SOUTH AFRICA 4

Thermal properties of materials Other programs or policies developed to increase energy efficiency in buildings: Audit manual made available (1987) Time of day pricing introduced (1991) but withdrawn but withdrawn Comment: Audit manual made available (1987) Time of day pricing introduced (1991) but withdrawn but withdrawn Comment: Audit manual free through Department of Morks; high demand but few audits comp Tariff introduced by Eskom on trial basis, withdrawn due to local authority electric denartments Additional sources of information about energy efficiency tor buildings in: South Africa 1 Lewis, Basson, and Snow, "Efficient utilisation of electricity." NEC/Eskom Seminar on Electricit firategy. April 1990. 2. Basson, "Energy Conservation R&D, Progress Report from South Africa," Building Research and Practice. Nov/Dec 1982. 3. Mathysen, "Energy Consumption in Large Buildings, a South Africa survey." South Africa Refrigeration and Air Conditioning. Nov. 1986. Contact for written copy of energy standard specified in Question 4: Name: Address: Country: Tel: Fac: Types of supporting information available: Survey completed by: J.A. Basson	Efficiency testing facilities and procedures establishe Insulation	
Other programs or policies developed to increase energy efficiency in buildings: Audit manual made available (1987) Time of day pricing introduced (1991) but withdrawn Lewis, Basson, and Snow. "Efficiency tor buildings in: South Africa 1 Lewis, Basson, and Snow. "Efficient utilisation of electricity." NEC/Eskom Seminar on Electricit Strategy. April 1990. 2. Basson, Theory, Conservation R&D, Progress Report from South Africa," Building Research and Practice. Nov/Dec 1982. 3. Matthysen, "Energy Consumption in Large Buildings, a South Africa survey." South Africa Refrigeration and Air Conditioning. Nov. 1986. Contact for written copy of energy standard specified in Question 4: Name: Address: Country: Survey completed by: J.A. Basson Title: Director, Electricity and Energy Efficiency Energy Branch, Department of Mineral and Energy Private Bag X03 Lynnwood Ridge, Pretoria 0040 Country: South Africa		
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1. Lewis, Basson, and Snow. "Efficient utilisation of electricity." NEC/Eskom Seminar on Electricit Strategy, April 1990. 2. Basson, "Energy Conservation R&D, Progress Report from South Africa," Building Research and Practice. Nov/Dec 1982. 3. Matthysen, "Energy Consumption in Large Buildings, a South Africa survey." South Africa Refrigeration and Air Conditioning. Nov. 1986. Contact for written copy of energy standard specified in Question 4: Name: Address: Country: Tel: Fax: Types of supporting information available:	Additional courses of information about another affi	ciona for huildinge in South Africa
Strategy, April 1990. 2. Basson, "Energy Conservation R&D, Progress Report from South Africa," Building Research and Practice, Nov/Dec 1982. 3. Matthysen, "Energy Consumption in Large Buildings, a South Africa survey," South Africa Refrigeration and Air Conditioning, Nov. 1986. Contact for written copy of energy standard specified in Question 4: Name: Address: Country: Tel: Fax: Types of supporting information available: Other energy standards for non-residential buildings: Survey completed by: J.A. Basson Title: Director, Electricity and Energy Efficiency Energy Branch, Department of Mineral and Energy Private Bag X03 Lynnwood Ridge, Pretoria 0040 Country: South Africa Tel: 27 12 348-9564 Fax: 27 12 348-9676	•••	
Practice. Nov/Dec 1982. 3. Matthysen, "Energy Consumption in Large Buildings, a South Africa survey," South Africa Refrigeration and Air Conditioning. Nov. 1986. Contact for written copy of energy standard specified in Question 4: Name: Address: Country: Tel: Fax: Types of supporting information available:		utilisation of electricity," NEC/Eskom Seminar on Electricity
3. Matthysen, "Energy Consumption in Large Buildings, a South Africa survey," South Africa Refrigeration and Air Conditioning. Nov. 1986. Contact for written copy of energy standard specified in Question 4: Name: Address: Country: Tel: Fax: Types of supporting information available:		Progress Report from South Africa," Building Research and
Refrigeration and Air Conditioning. Nov. 1986. Contact for written copy of energy standard specified in Question 4: Name: Address: Country: Tel: Fax: Types of supporting information available:		
Contact for written copy of energy standard specified in Question 4: Name: Address: Country: Tel: Fax: Types of supporting information available: Cother energy standards for non-residential buildings: Cother energy standards for non-residential buildings: Survey completed by: J.A. Basson Title: Director, Electricity and Energy Efficiency Energy Branch, Department of Mineral and Energy Private Bag X03 Lynnwood Ridge, Pretoria 0040 Country: South Af Tel: 27 12 348-9564 Fax: 27 12 348-9676		
Name: Addresss: Country: Fax: Tel: Fax: Types of supporting information available:	Kerrigeration and Air Conditioning. I	NOV. 1986
Name: Addresss: Country: Fax: Tel: Fax: Types of supporting information available:	Contact for written conv of energy standard specifier	t in Question 4:
Address: Country: Tel: Fax: Types of supporting information available:	ondorios minicipopy of chergy standard specific	
Country: Fax: Types of supporting information available:		
Country: Fax: Types of supporting information available:	Name:	· ·
Tel: Fax: Types of supporting information available:		
Types of supporting information available:	Address:	
Types of supporting information available:	Address:	
Types of supporting information available:	Address:	
Types of supporting information available:	Address:	
Other energy standards for non-residential buildings: Survey completed by: J.A. Basson Title: Director, Electricity and Energy Efficiency Energy Branch, Department of Mineral and Energy Private Bag X03 Lynnwood Ridge, Pretoria 0040 Country: South Af Tel: 27 12 348-9564	Address: Country:	Fac
Survey completed by: J.A. Basson Title: Director, Electricity and Energy Efficiency Energy Branch, Department of Mineral and Energy Private Bag X03 Lynnwood Ridge, Pretoria 0040 Country: South Af Tel: 27 12 348-9564 Fax: 27 12 348-9676	Address: Country: Tel:	Fax:
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Title:Director, Electricity and Energy Efficiency Energy Branch, Department of Mineral and Energy Private Bag X03 Lynnwood Ridge, Pretoria 0040Country: South AfTel:27 12 348-9564Fax: 27 12 348-9676	Address: Country: Tel: Types of supporting information available:	·
Title:Director, Electricity and Energy Efficiency Energy Branch, Department of Mineral and Energy Private Bag X03 Lynnwood Ridge, Pretoria 0040Country: South AfTel:27 12 348-9564Fax: 27 12 348-9676	Address: Country: Tel: Types of supporting information available:	·
Title:Director, Electricity and Energy Efficiency Energy Branch, Department of Mineral and Energy Private Bag X03 Lynnwood Ridge, Pretoria 0040Country: South AfTel:27 12 348-9564Fax: 27 12 348-9676	Address: Country: Tel: Types of supporting information available:	·
Title:Director, Electricity and Energy Efficiency Energy Branch, Department of Mineral and Energy Private Bag X03 Lynnwood Ridge, Pretoria 0040Country: South AfTel:27 12 348-9564Fax: 27 12 348-9676	Address: Country: Tel: Types of supporting information available:	· ·
Energy Branch, Department of Mineral and Energy Private Bag X03 Lynnwood Ridge, Pretoria 0040 Country : South Af Tel: 27 12 348-9564 Fax: 27 12 348-9676	Address: Country: Tel: Types of supporting information available: 	gs:
Private Bag X03 Lynnwood Ridge, Pretoria 0040 Country: South Af Tel: 27 12 348-9564 Fax: 27 12 348-9676	Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building Survey completed by:	gs: J.A. Basson
Lynnwood Ridge, Pretoria 0040 Country: South Af Tel: 27 12 348-9564 Fax: 27 12 348-9676	Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building Survey completed by:	gs: J.A. Basson Director, Electricity and Energy Efficiency
Tel: 27 12 348-9564 Fax: 27 12 348-9676	Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building Survey completed by:	gs: J.A. Basson Director, Electricity and Energy Efficiency Energy Branch, Department of Mineral and Energy
	Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building Survey completed by:	gs: J.A. Basson Director, Electricity and Energy Efficiency Energy Branch, Department of Mineral and Energy Private Bag X03
	Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building Survey completed by: Title:	gs: J.A. Basson Director, Electricity and Energy Efficiency Energy Branch, Department of Mineral and Energy Private Bag X03 Lynnwood Ridge, Pretoria 0040 Country: South Afri
	Address: Country: Tel: Types of supporting information available: Other energy standards for non-residential building Survey completed by: Title:	gs: J.A. Basson Director, Electricity and Energy Efficiency Energy Branch, Department of Mineral and Energy Private Bag X03 Lynnwood Ridge, Pretoria 0040 Country: South Afr
	Address: Country: Tel: Types of supporting information available: 	gs: J.A. Basson Director, Electricity and Energy Efficiency Energy Branch, Department of Mineral and Energy Private Bag X03 Lynnwood Ridge, Pretoria 0040 Country: South Afr 27 12 348-9564 Fax: 27 12 348-9676

	SO	UTH	KOREA	LA
RAL OVERVIEW C	F BUILDING ENERGY	STANDARD	S	
1. General building star	ndards exist at the following g	jovernmental lev	els: National	
2. Proposed or existing	J ENERGY standards cover t	he following buil	king sectors: Both Residential and	I Non-Posidontial
	-	•	bout residential and	i ivon-kesidendal
 Status of Non-Resid a. National level: 	lential Building Energy Stan Mandatory	dards at the: b. Regional	kavalı a Lav	:al level:
a. Nauviai ICVCI. _	wanualof y	D. NEYOTA	кта. <u> </u>	
4. Single energy stand	lard selected for further des	cription:		
•		•	uction. Effective June 1, 1992.	
V 1000	Coomushie Association	Nation		
Year: <u>1992</u>	Geographic Coverage:	Nation	_ Abbreviated Title: BC-1992	<u></u>
RIPTION OF SPEC	IFIED ENERGY STAN	DARDS - BC	C-1992	
	in Question 4 applies to the f			
a. Building types:			ng vintage:	
O - Offices			v buildings	
H - Hotels	· · · · · · · · · · · · · · · · · · ·		characteristics:	
	ent Facilities			
F - Restaurar		$ \frac{r - Pl}{r}$	hysical size: offices/shopping cente	13 > 3000 sq. m
D - Hospital		I	······································	
	cial/retail stores			
	mily residential	<u> </u>		
w - wurth-la	mily residential	I		
6. Basic approach of th	ne standard: Both press	riptive and p	performance	
7. The following subject	s are included in the energy s	standard:		
a. Whole building er	•		b. Building envelope provisions:	
E- Energy an	nount target (residentia	l & office)	Roof	
		·····	Wall system	
· · · · · · · · · · · · · · · · · · ·			Fenestration system	
			Infiltration	
				· · · · · · · · · · · · · · · · · · ·
c. Lighting provisio			d. Mechanical provisions:	
Control mani-	rements	·····	Load Calculations for equipm	nent sizing
and the second sec	W.	-,	Controls	
Power densit				
Power densit	y requirements		Equipment efficiency	· · · · · · · · · · · · · · · · · · ·
Power densit			Equipment efficiency	· · · · · · · · · · · · · · · · · · ·
Power densit	requirements		Equipment efficiency	· · · · · · · · · · · · · · · · · · ·
Power densit Illumination	requirements	heating syste	Equipment efficiency	system)
Power densit Illumination	requirements	heating syste		system)

SOUTH KOREA 2

Government agency: Ministry of Energy and Resou	
Research group: Korea Institute of Energy Resear	<u>ch</u>
Decision Process: Consensus Comment:	
0. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Estimated using professional judgment	Estimated using professional judgment
Gathered through audits and surveys	Computer simulations used for estimates
Already available prior to standard	Gathered through audits and surveys
	Already available prior to standard
c. WEATHER data	d. Other information
Cathored through measurements	- None
Gathered through measurements Already available prior to standard	
1. Standards from a different country used as source material:	
USA: BEPS	
USA: ASHRAE 90.1	
Japan: PAL, Building Code, and oth. stds.	·
2. COMPUTER programs used: a. In developing the standard: DOE-2 Trakload TRNSYS KIZRB1	b. For complying with the standard: Yes
	· · · ·
	• •
3. Standard is set at a level: Above current practice	
4. Considerations influencing the inclusion or exclusion of measures	in the clandard.
-	Comments:
E - Cost effectiveness	
A - Availability of energy efficient products	Some of energy efficient products are imported fro foreign countries.
S - Similarity/difference to local design C - Comfort	
	-
·	_ 1
5a. Standard scheduled for regular review and revision?	
5a. Standard scheduled for regular review and revision? Yes: review in research institute => governmenta	al agency => revision

3 SOUTH KOREA IMPLEMENTATION AND COMPLIANCE - BC-1992

If an existing agency was made respons	ible for implementation, its former focus was on I	buildings, energy, or another area;
Buildings		
	hitects, engineers and other professionals:	
Written guidelines to assist with		
Example calculations	compliance procedure	
Compliance forms		
Seminars, workshops, or conferen	nces	
	· · · · · · · · · · · · · · · · · · ·	·····
Compliance mechanisms used at different : a. PRIOR to construction:	· ·	
	b. DURING construction:	c. AFTER construction:
Certification/approval	Certification/approval Other policy mechanism	Certification/approval Penalty
	· · · · ·	
Percent designs checked: 50	Percent sites checked: 50	Percent buildings checked: 100
Comment:	Comment:	Comment:
	· · · · · · · · · · · · · · · · · · ·	
d. Other compliance procedures Yes: v	ve have to receive the inspections for f	ire protection, utility hookups, etc.
e. Effectiveness of combined compliance	nechanisms (scale of 1-5): <u>3</u>	ire protection, utility hookups, etc.
e. Effectiveness of combined compliance r f. Explanation for effectiveness in part e:	Nechanisms (scale of 1-5): 3	ire protection, utility hookups, etc.
e. Effectiveness of combined compliance	Ne don't have perfect one	ire protection, utility hookups, etc.
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e:	Ne don't have perfect one	ire protection, utility hookups, etc.
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based	Ne don't have perfect one	ire protection, utility hookups, etc.
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Planned	Ne don't have perfect one	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Planned	nechanisms (scale of 1-5): <u>3</u> <u>We don't have perfect one</u> standards' impact: on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Planned b. MEASUREMENTS OF ENERGY SAVING	nechanisms (scale of 1-5): <u>3</u> <u>We don't have perfect one</u> standards' impact: on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Planned b. MEASUREMENTS OF ENERGY SAVING	nechanisms (scale of 1-5): <u>3</u> <u>We don't have perfect one</u> . standards' impact: on prototypical (not actual) buildings: GS in actual buildings complying with standard:	
e. Effectiveness of combined compliance in f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based Planned b. MEASUREMENTS OF ENERGY SAVING Planned	nechanisms (scale of 1-5): <u>3</u> <u>We don't have perfect one</u> . standards' impact: I on prototypical (not actual) buildings: GS in actual buildings complying with standard: neering economic CALCULATIONS:	

SOUTH KOREA 4

FURTHER INFORMATION ON ENERGY CONSERVATION - South Korea

20. Efficiency testing facilities and procedures established:

Motors	
Insulation	
Air conditioners/chillers/other appliances	
Ballasts	
Fixtures	<u></u>
Thermal properties of materials	

21. Other programs or policies developed to increase energy efficiency in buildings:

Government energy policy	
Utility initiatives	
Information programs	
Audits (free or subsidized)	

Comment:	Electricity peak load reduction: Ministry of	
	Energy and Resources:	

Additional sources of information about energy efficiency for buildings in: South Korea

- 1. Energy Research and Development, Korea Insitute of Energy Research
- 2. Energy Management, Korea Energy Management Corporation
- 3. Energy Economy (newspaper)

22. Contact for written copy of energy standard specified in Question 4:

Name: Sang Dong Park

Address: Director, Building Energy Research Departmen Korea Institute of Energy Research P.O. Box 5, Daedeok Science Town Daejeon 305-343

Country: Korea

 Tel:
 82 42 860 3200
 Fax:
 82 42 861 6224

Types of supporting information available:

- None

Other energy standards for non-residential buildings:

Rational Energy Utilization Law, Ministry of Energy and Resources

Korea Institute of Energy Rese P.O. Box 5, Daedeok Science To	arch
Daejeon 305-343	Country: Korea
82 42 860 3200 Fax:	82 42 861 6224
11/10/92	
	Director, Building Energy Rese Korea Institute of Energy Rese P.O. Box 5, Daedeok Science To Daejeon 305-343 82 42 860 3200 Fax:

BUILDING ENERGY STAN ds exist at the following governm ERGY standards cover the follow al Building Energy Standards at fandatory b.	ving building sectors:	ional Both Resident	ial and Non-R	esidential
ERGY standards cover the follow	ving building sectors:	I	ial and Non-R	esidential
ERGY standards cover the follow	ving building sectors:	I	ial and Non-R	esidential
al Building Energy Standards at	the:	both Kesident	al and Non-R	esidential
		one	c. Local level: - -	- None
selected for further description		9-01-01		
Geographic Coverage: <u>Na</u>	tion Abbrevi	ated Title: BFS	1988: 18	
ED ENERGY STANDARD	S - BFS 1988: 18			
s	 b. Building vintage: New buildings c. Other characteristics: 			
	Other: all permane	ently used buil	dings	······································
•••		nvelone nmvisions	•	
			•	
<u> </u>		ystem		
· · · · · · · · · · · · · · · · · · ·				
ing	<u>Ventila</u>			
for ventilation				
	Sybyggnadsregler, BES 19/ Geographic Coverage: Na ED ENERGY STANDARD Juestion 4 applies to the following iss gs gandard: Performance-bas e included in the energy standard y provisions: building guirements: daylighting	Sybyggnadsregler, BES 1988: 18 Boverket, 198 Geographic Coverage: Nation Abbrevia ED ENERGY STANDARDS - BF5 1988: 18 suestion 4 applies to the following kinds of buildings: b. Building vintage: rs b. Building vintage: rs New buildings c. Other characteristics: Other: all permane other: all permane	Jybyggnadsregler, BES 1988: 18. Boverket, 1989-01-01 Geographic Coverage: Nation Abbreviated Title: BFS ED ENERGY STANDARDS - BFS 1988: 18 Iuestion 4 applies to the following kinds of buildings: b. Building vintage: Image: Same statement in the second statement in the energy standard: New building envelope provisions Building b. Building envelope provisions Building b. Building envelope provisions Building Infiltration Infiltration Infiltration Infiltration Infiltration	Jybyggnadsregler, BES 1988: 18. Boverket, 1989-01-01 Geographic Coverage: Nation Abbreviated Title: BFS 1988: 18 ED ENERGY STANDARDS - BFS 1988: 18 uestion 4 applies to the following kinds of buildings: b. Building vintage: rs

Government agency: Boverket	
and the second	
9. Decision Process: Mandate Comment: Bo	overket
· · · · · · · · · · · · · · · · · · ·	
10. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
· · · · -	Estimated using professional judgment
· · · · · · · · · · · · · · · · · · ·	Computer simulations used for estimates
<u> </u>	
c. WEATHER data	d. Other information
Already available prior to standard	- None
Aneady available prior to standard	-
	-
11. Standards from a different country used as source material:	
- None	
	······································
· · · · · · · · · · · · · · · · · · ·	·····
12. COMPUTER programs used:	
12. COMPUTER programs used: a. In developing the standard: ENORM	b. For complying with the standard: Yes
	b. For complying with the standard: Yes
	b. For complying with the standard: Yes
	b. For complying with the standard: Yes
	b. For complying with the standard: Yes
a. In developing the standard: ENORM	b. For complying with the standard: Yes
	b. For complying with the standard: Yes
a. In developing the standard: ENORM	
a. In developing the standard: ENORM	
a. In developing the standard: ENORM	s in the standard:
a. In developing the standard: ENORM ENORM Ended Above current practice Above current practice E - Cost effectiveness	s in the standard:
a. In developing the standard: ENORM ENORM Ended Above current practice Above current practice E - Cost effectiveness	s in the standard:
a. In developing the standard: ENORM ENORM Ended Above current practice Above current practice E - Cost effectiveness	s in the standard:
a. In developing the standard: ENORM I.1. Standard is set at a level: Above current practice 14. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Comfort	s in the standard:
a. In developing the standard: ENORM ENORM Ended Above current practice Above current practice E - Cost effectiveness	s in the standard:
a. In developing the standard: ENORM I.1. Standard is set at a level: Above current practice 14. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Comfort	s in the standard: Comments:
a. In developing the standard: ENORM II. Standard is set at a level: Above current practice II. Considerations influencing the inclusion or exclusion of measures E - Cost effectiveness Comfort II. Standard scheduled for regular review and revision?	s in the standard: Comments:

.

3 SWEDEN IMPLEMENTATION AND COMPLIANCE - BFS 1988: 18

Buildings	nsible for implementation, its former focus was on	buildings, energy, or another area:
TRAINING & EDUCATION provided for a	rchitects, engineers and other professionals:	
Written guidelines to assist wi	th compliance procedure	·
Example calculations		
Seminars, workshops, or confer Information or resource center	rences	
	· · · · · · · · · · · · · · · · · · ·	
Compliance mechanisms used at differen	nt stages in construction process:	······································
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval	Certification/approval	Certification/approval
Percent designs checked: 100	Percent sites checked: 1-100	Percent buildings checked: 100
Comment:	Comment:	Comment:
d. Other compliance procedures - No	Dne	•
 d. Other compliance procedures <u>- No</u> e. Effectiveness of combined compliance f. Explanation for effectiveness in part 		•
e. Effectiveness of combined compliance f. Explanation for effectiveness in part Types of assessments or audits of energy	e mechanisms (scale of 1-5): 5	•
e. Effectiveness of combined compliance f. Explanation for effectiveness in part Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL bas	e mechanisms (scale of 1-5): 5	•
e. Effectiveness of combined compliance f. Explanation for effectiveness in part Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL bas	e mechanisms (scale of 1-5): 5	•

SWEDEN 4

Insulation	d:
Air conditioners/chillers/other appliance	es
Thermal properties of materials	
and and a second se	
Other programs or policies developed to increase energy	gy efficiency in buildings:
· ·	
	·
	inner for huildings in Cruz Ja-
Additional sources of information about energy efficiency	
1. Nybggnads Regler, BFS 1988: 18, ISBN	N 91-38-09758-3
2	
3	· · · · ·
Name: Stephan Norrman Address: Boverket Box 534 S37123 Karlskrona	
Country: Sweden	
ooming. Sweden	
Tel: 46 455 53215	Fax: 46 455 53221
Types of supporting information available:	
Byggtianst: S171 88 Solna, Sweden: tel:	46 8 734 5100: fax: 46 8 734 5098
Other energy standards for non-residential building	S:
- None	
	:
Survey completed by:	Stephan Norrman
	Boverket
Title:	National Koard of Housing Kuudung and Universit
	National Board of Housing, Building and Physical P.O. Box 534
	National Board of Housing, Building and Physical P.O. Box 534 S-37-123 Karlskrona Country: Sweden
	P.O. Box 534

NERAL OVERVIEW OF BUILDING ENERGY STANDARDS 1. General building standards exist at the following building sectors: 2. Proposed or existing ENERGY standards cover the following building sectors: Both Residential and Non-Residential 3. Status of Non-Residential Building Energy Standards at the: a. National level: Mandatory b. Regional level: Mandatory c. Local level: Mandatory c. Status of Non-Residential Building Energy Standards at the: Mandatory c. Status of Non-Residential Building: Status of Non-Residential Building: c. Geographic Coverage: Nation Year: 1988 S.The standard defined in Question 4 applies to the following intrage: a. Walling types: Nation of denergy c. Lighting provisions: Both prescriptive and performance 7. The following subjects are included in the energy standard. Nation system a. Whobe building energy provisions: Both chan		SW	ITZE	RLAND		
2. Proposed or existing ENERGY standards cover the following building sectors: Both Residential and Non-Residential 3. Status of Non-Residential Building Energy Standards at the: Mandatory a. National levet Mandatory b. Regional levet Mandatory c. Local levet Mandatory 4. Single energy standard selected for further description: Title, Organization: Energie im Hochbau. Schweizerischer Ingenieur und Architekrenverein (SIA) Year: 1988 Geographic Coverage: Nation Abbreviated Title: EH-SIA, 1988 SCRIPTION OF SPECIFIED ENERGY STANDARDS - EH-SIA, 1988 5. The standard defined in Question 4 applies to the following kinds of buildings: a. All Buildings b. Building vintage: Both new and existing c. Understandard standard: Both prescriptive and performance 7. The following subjects are included in the energy standard: a. Wole building energy provisions: building envelope provisions:	ENERAL OVERVIEW O	F BUILDING ENERGY	STANDARDS			
3. Status of Non-Residential Building Energy Standards at the: Andatory C. Local level: Mandatory a. National level: Mandatory b. Regional level: Mandatory c. Local level: Mandatory 4. Single energy standard selected for further description: Title, Organization: Energie im Hochbau. Schweizerischer Ingenieur und Architekrenverein (SIA)	1. General building stan	dards exist at the following g	overnmentai level	s: National	<u> </u>	·
 a. National levet Mandatory b. Regional levet Mandatory c. Local levet Mandatory d. Single energy standard selected for further description: Title, Organization: Energie im Hochbau. Schweizerischer Ingenieur und Architekrenverein (SIA) Year: 1988 Geographic Coverage: Nation Abbreviated Title: EH-SLA, 1988 SCRIPTION OF SPECIFIED ENERGY STANDARDS - EH-SIA, 1988 SCRIPTION OF SPECIFIED ENERGY STANDARDS - EH-SIA, 1988 CRIPTION OF SPECIFIED ENERGY STANDARDS - EH-SIA, 1988 C. Other characteristics: P - Physical size E - Annount of energy F - Type of fuel: oil, gas, electricity F - Type of fuel: oil, gas, electricity S. The following subjects are included in the energy standard: a. Whole buikting energy provisions: 	2. Proposed or existing	ENERGY standards cover th	e following build	ing sectors: Both Resider	ntial and Non-R	esidential
Title, Organization: Energie im Hochbau. Schweizerischer Ingenieur und Architekrenverein (SIA) Year: 1988 Geographic Coverage: Nation Abbreviated Title: EH-SIA, 1988 SCRIPTION OF SPECIFIED ENERGY STANDARDS - EH-SIA, 1988 S. The standard defined in Question 4 applies to the following kinds of buildings: b. Building vintage: a. Building types: b. Building vintage: Both new and existing c. Other characteristics: P. Physical size E- Amount of energy F. Type of fuel: oil, gas, electricity F. Type of fuel: oil, gas, electricity 6. Basic approach of the standard: Both prescriptive and performance 7. The tollowing subjects are included in the energy standard: b. Building envelope provisions:	- S.S.			vel: <u>Mandatory</u>	c. Local level:	Mandatory
SCRIPTION OF SPECIFIED ENERGY STANDARDS - EH-SIA, 1988 The standard defined in Question 4 applies to the following kinds of buildings: a. Building types: A - All Buildings C. Other characteristics: P - Physical size E - Amount of energy F - Type of fuel: oil, gas, electricity C. Basic approach of the standard: Both prescriptive and performance C. The following subjects are included in the energy standard: a. Whole building energy provisions: b. Building envelope provisions: b. Buildi			-	er Ingenieur und Archite	krenverein (SIA))
5. The standard defined in Question 4 applies to the following kinds of buildings: a. Building types:	Year: <u>1988</u>	Geographic Coverage:	Nation	Abbreviated Title: EF	I-SIA, 1988	·
a. Building types: b. Building vintage: A - All Buildings Both new and existing	SCRIPTION OF SPEC	IFIED ENERGY STAND	DARDS - EH	SIA, 1988		•
A - All Buildings Both new and existing	5. The standard defined	in Question 4 applies to the f	ollowing kinds of I	buildings:		
c. Other characteristics: P - Physical size E - Amount of energy F - Type of fuel: oil, gas, electricity G. Basic approach of the standard: Both prescriptive and performance 7. The following subjects are included in the energy standard: a. Whole building energy provisions:	a. Building types:		b. Building	vintage:		•
P - Physical size E - Amount of energy F - Type of fuel: oil, gas, electricity G. Basic approach of the standard: Both prescriptive and performance 7. The following subjects are included in the energy standard: a. Whole building energy provisions:	<u>A - All Build</u>	ings	Both	new and existing		
E - Amount of energy F - Type of fuel: oil, gas, electricity F - Type of fuel: oil, gas, electric			c. Other c	haracteristics:		
				÷		
6. Basic approach of the standard: Both prescriptive and performance 7. The following subjects are included in the energy standard: a. Whole building energy provisions: b. Building envelope provisions:					<u>.</u>	
 7. The following subjects are included in the energy standard: a. Whole building energy provisions: b. Building envelope provisions: 			$-\left[\frac{\mathbf{F}-\mathbf{T}\mathbf{y}}{\mathbf{F}}\right]$	pe of fuel: oil, gas, electri	city	
 7. The following subjects are included in the energy standard: a. Whole building energy provisions: b. Building envelope provisions: 						
	7. The following subject:	s are included in the energy s		· · ·		
E- Energy amount target Koof Wall system Fenestration system Infiltration Infiltration • None Load Calculations for equipment sizing Equipment efficiency Equipment efficiency • Other provisions: - • None - • Other provisions: - • None - • Other provisions: - • None - • Other provisions: - • Other provisions: -		••••		1	15:	
interference Fenestration system Infiltration Infiltration c. Lighting provisions: d. Mechanical provisions:	E- Energy am	ount target				
c. Lighting provisions: Infiltration - None Load Calculations for equipment sizing Equipment efficiency Equipment efficiency e. Other provisions: None		· · · · · · · · · · · · · · · · · · ·		Fenestration system		······
c. Lighting provisions: d. Mechanical provisions: - None Load Calculations for equipment sizing Equipment efficiency Equipment efficiency - None			·····	Infiltration		
- None Load Calculations for equipment sizing Equipment efficiency	c. Lighting provision	ns:		d. Mechanical provisions:		
e. Other provisions:	- None		······································			ng
e. Other provisions:	·			Equipment efficiency	1	<u></u>
e. Other provisions:			·······			· · · · · · · · · · · · · · · · · · ·
	e. Other provisions - None	:				
				······································	······································	

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SWITZERLAND 2

Government agency: Bundesant energiwirishaft	
Academic institution: SIA	
	· · · · · · · · · · · · · · · · · · ·
). Decision Process: Consensus Comment:	
0. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Already available prior to standard	Estimated using professional judgment
Alleady available prior to standard	Estimated using professional judgment
c. WEATHER data	d. Other information
Already available prior to standard	- None
1. Standards from a different country used as source material:	
Germany: DIN France: AFNOR	·
France: AFINOR	
	· · · · · · · · · · · · · · · · · · ·
	· · · · · · · · · · · · · · · · · · ·
	······································
2. COMPUTER programs used:	
a. In developing the standard: - None	b. For complying with the standard: ?
	· · · · · · · · · · · · · · · · · · ·
3. Standard is set at a level: Lower than current practice	
4. Considerations influencing the inclusion or exclusion of measures	in the standard
-	Comments:
E - Cost effectiveness C - Comfort	- 1
	-
	-
	-
	-
15a. Standard scheduled for regular review and revision?	
Vac	
Yes	
Yes b. Does revision include procedures to MONITOR and EVALUA	

3 SWITZERLAND

	ible for implementation, its former focus was	on buildings, energy, or another area:
Example calculations	chitects, engineers and other professionals:	
Seminars, workshops, or conferen	nces	
Information or resource center		
		
Compliance mechanisms used at different	ciaco is construction process.	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval		
Ceruncation, approvai		
Percent designs checked: 100	Percent sites checked: -	Percent buildings checked:
Comment:	Comment:	Comment:
	-	
	-	
d. Other compliance procedures		
	mochanisme (coole of 1.5):	
d. Other compliance procedures	mechanisms (scale of 1-5):	
e. Effectiveness of combined compliance	mechanisms (scale of 1-5):	
e. Effectiveness of combined compliance		
e. Effectiveness of combined compliance of for a spectrum of the sector	standards' impact:	
e. Effectiveness of combined compliance in f. Explanation for effectiveness in part e:	standards' impact:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based	standards' impact:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based	standards' impact: d on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress	standards' impact: d on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: fypes of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress	standards' impact: d on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress	standards' impact: d on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: ypes of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress	standards' impact: d on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: ypes of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress	standards' impact: I on prototypical (not actual) buildings: GS in actual buildings complying with stand	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: ypes of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress	standards' impact: I on prototypical (not actual) buildings: GS in actual buildings complying with stand	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: ypes of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING In progress c. COST EFFECTIVENESS based on eng	standards' impact: I on prototypical (not actual) buildings: GS in actual buildings complying with stand	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: ypes of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING In progress c. COST EFFECTIVENESS based on enging In progress	standards' impact: d on prototypical (not actual) buildings: GS in actual buildings complying with stand ineering economic CALCULATIONS:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: ypes of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVING In progress	standards' impact: d on prototypical (not actual) buildings: GS in actual buildings complying with stand ineering economic CALCULATIONS:	

SWITZERLAND 4

	nicien	cy testing facilitie	s and procedures e	established:						
		ilation	-							
			chillers/other a	ppliances	· · · · · · · · · · · · · · · · · · ·					
	The	rmal propertie	s of materials							
			· · · · · · · · · · · · · · · · · · ·							
			•							
21. C)ther p	rograms or policie	is developed to incr	rease energy	efficiency in buil	dings:				
	Buil	ding energy st	andards		i Comment:	SIA 380/4	Elekt	ische Ene	rgie im H	lochbau
		0 0/ 0/			-					
					-					
			-		-		- <u>1</u> 1. 1.			
					- •					
	Addi	tional sources of i	nformation about e	nergy efficier	ncy for buildinas	in: Switzer	rland			
					•					
	1						,	·····		
										•
	2.				<u> </u>					
	-				·····					
	3.									
22. C			of energy standard	specified in	Question 4:			v	<u></u>	
22. C	Name Addre	: - xxx:	of energy standard	specified in	Question 4:				<u>.</u>	
22. C	Name	: - xxx:	of energy standard	specified in	Question 4:					
22. C	Name Addre	: - xxx:	of energy standard	specified in	Question 4:					
22. C	Name Addre	: - xxx:	of energy standard	specified in	Question 4:					
22. C	Name Addre Coun	: - xxx:	of energy standard	-	• • •					
22. C	Name Addre Coun Tel:	: - xss: try:		F	Question 4:			x		
22. C	Name Addre Coun Tel:	: - xss: try:	of energy standard	F	• • •			· · · · · ·		
22. C	Name Addre Coun Tel:	: - xss: try:		F	• • •					
22. C	Name Addre Coun Tel:	: - xss: try:		F	• • •					
22. C	Name Addre Coun Tel: Type	: - ss: try: s of supporting in -	formation available:	F	ac:		,			
22. C	Name Addre Coun Tel: Type	: - ss: try: s of supporting in -		F	ac:		,			
22. C	Name Addre Coun Tel: Type	: - ss: try: s of supporting in -	formation available:	F	ac:					
22. C	Name Addre Coun Tel: Type	: - ss: try: s of supporting in -	formation available:	F	ac:					
22. C	Name Addre Coun Tel: Type	: - ss: try: s of supporting in -	formation available:	F	ac:					
22. C	Name Addre Coun Tel: Type	: - ss: try: s of supporting in -	formation available: Is for non-residenti	F al buildings:	ax:	uppiser		· · · · · · · · · · · · · · · · · · ·		
22. C	Name Addre Coun Tel: Type	: - ss: try: s of supporting in -	formation available:	F al buildings:	ax:	uppiser	,			
22. C	Name Addre Coun Tel: Type	: - ss: try: s of supporting in -	formation available: Is for non-residenti	F al buildings: eted by: Title:	ax:		, , , , , , , , , , , , , , , , , , ,	Architekr	enverein	
22. C	Name Addre Coun Tel: Type	: - ss: try: s of supporting in -	formation available: Is for non-residenti	F al buildings: eted by: Title:	ac Santiago Sch Dipl. Arch Schweizerisch Postfach CH-	ner Ingenieu	r und			
22. C	Name Addre Coun Tel: Type	: - ss: try: s of supporting in -	formation available: Is for non-residenti	F al buildings: eted by: Title:	ac Santiago Sch Dipl. Arch Schweizerisch	ner Ingenieu	ur und			vitzerland
22. C	Name Addre Coun Tel: Type	: - ss: try: s of supporting in -	formation available: Is for non-residenti	al buildings: eted by: Title:	ac Santiago Sch Dipl. Arch Schweizerisch Postfach CH-	ner Ingenieu			ountry: Sw	vitzerland

		THAILA			
NEHAL OVEHVIEW OI	F BUILDING ENERGY	STANDARDS			
1. General building stan	dards exist at the following g	overnmental levels:	National	<u> </u>	·
2. Proposed or existing	ENERGY standards cover th	e following building se	ctors: Non-Resi	dential Only	
3. Status of Non-Reside a. National level:	Proposed	b. Regional level: _ 	Proposed	c. Local level:	Proposed
4. Single energy standa	ard selected for further desc				
Title, Organization:	"Guidelines and Requ Office, Office of the F				
Year: 1987	Geographic Coverage:	Nation	Abbreviated Title:	ECNB, 1987	*
SCRIPTION OF SPECI	FIED ENERGY STAN	JARDS - ECNB,	1987		
5. The standard defined i	in Question 4 applies to the f	ollowing kinds of buildi	ngs:		
a. Building types:		b. Building vinta	-		
		-	and existing		
H - Hotels	······································				
G - Governme	ent Facilities	c. Other charac	teristics:		
F - Restaurant		E - Amoun	t of energy: 1000 l	cilowatts	
D - Hospitals					······································
$\frac{2}{C}$ - Commerce	ial/retail stores			· · · · · · · · · · · · · · · · · · ·	
		— [
O - Offices H - Hotels G - Governme F - Restaurant D - Hospitals C - Commerc					······
6. Basic approach of the	s are included in the energy s	standard:		delene.	
	- 571			/SIUIS:	
			Roof	/6101.6:	<u></u>
			Roof Wall system		
			Roof Wall system Fenestration syst		
			Roof Wall system		
			Roof Wall system Fenestration syst	em	
	16:	d.	Roof Wall system Fenestration syst Infiltration Mechanical provisions	em	
	ns: rements	d.	Roof Wall system Fenestration syst Infiltration Mechanical provisions	em	ing
	ns: rements	d.	Roof Wall system Fenestration syst Infiltration Mechanical provisions Load Calculation	em : s for equipment siz	ing
	ns: rements	d.	Roof Wall system Fenestration syst Infiltration Mechanical provisions Load Calculation Ventilation	em : s for equipment siz	ing
	ns: rements	d.	Roof Wall system Fenestration syst Infiltration Mechanical provisions Load Calculation Ventilation	em : s for equipment siz	ing
	IS: rements	d.	Roof Wall system Fenestration syst Infiltration Mechanical provisions Load Calculation Ventilation	em : s for equipment siz	ing
- None - None - C. Lighting provision Control requir Power density	IS: rements	d.	Roof Wall system Fenestration syst Infiltration Mechanical provisions Load Calculation Ventilation	em : s for equipment siz	

THAILAND 2

	nistry of Science, Technology, and Energy
Government : National Energy Policy Office, Of Academic : Division of Energy Technology, Asian	
Academic . Division of Energy recurrology, Asia	
). Decision Process: <u>Mandate</u> Comment:	
10. Information used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing buildings	b. ENERGY USE of existing buildings:
Already available prior to standard	Already available prior to standard
c. WEATHER data	d. Other information
Already available prior to standard	The standards have been developed based on
	 information compiled for central region. More information is being compiled to strengthen the
	- Information is being complied to strengthen the
11. Standards from a different country used as source material:	1
Singapore	······
USA: ASHRAE 90 A,B,C	
	· · · · · · · · · · · · · · · · · · ·
	·
2. COMPUTER programs used:	;
a. In developing the standard: DOE-2	b. For complying with the standard: Yes
	the second s
3. Standard is set at a level: Above current practice	
4. Considerations influencing the inclusion or exclusion of measure	
E - Cost effectiveness	Comments:
Availability of energy efficient products	
Similarity/difference to local design	
Comfort	
15a. Standard scheduled for regular review and revision?	
-	
	be_developed
Yes: It is believed that a review procedure will	

3 THAILAND

	y Affairs	
	sible for implementation, its former focus was	s on buildings, energy, or another area:
Energy		
. TRAINING & EDUCATION provided for an	chitects, engineers and other professionals	:
Written guidelines to assist with	n compliance procedure	
Example calculations		
		······
		· · · · · · · · · · · · · · · · · · ·
	a	
3. Compliance mechanisms used at different	stages in construction process:	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Penalty	Penalty	Penalty
Percent designs checked: 100	Percent sites checked: -	Percent buildings checked: 100
Comment:	Comment:	Comment:
d. Other compliance procedures	machaniame (coole at 1.5).	· · · · · · · · · · · · · · · · · · ·
e. Effectiveness of combined compliance	mechanisms (scale of 1-5):	
e. Effectiveness of combined compliance		
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e:	·	
e. Effectiveness of combined compliance	standards' impact:	· · · · ·
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e:). Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based	standards' impact:	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e:). Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based	standards' impact: d on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress	standards' impact: d on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 7. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVIN	standards' impact: d on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress	standards' impact: d on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 9. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVIN	standards' impact: d on prototypical (not actual) buildings:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 7. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVIN Planned	standards' impact: d on prototypical (not actual) buildings: GS in actual buildings complying with stand	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 7. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVIN Planned C. COST EFFECTIVENESS based on eng	standards' impact: d on prototypical (not actual) buildings: GS in actual buildings complying with stand	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 7. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVIN Planned	standards' impact: d on prototypical (not actual) buildings: GS in actual buildings complying with stand	
e. Effectiveness of combined compliance i f. Explanation for effectiveness in part e: 7. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVIN Planned c. COST EFFECTIVENESS based on eng Planned	standards' impact: d on prototypical (not actual) buildings: GS in actual buildings complying with stand ineering economic CALCULATIONS:	
e. Effectiveness of combined compliance of f. Explanation for effectiveness in part e: 7. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVIN Planned C. COST EFFECTIVENESS based on eng	standards' impact: d on prototypical (not actual) buildings: GS in actual buildings complying with stand ineering economic CALCULATIONS:	
e. Effectiveness of combined compliance i f. Explanation for effectiveness in part e: 7. Types of assessments or audits of energy a. ENERGY SAVINGS POTENTIAL based In progress b. MEASUREMENTS OF ENERGY SAVIN Planned c. COST EFFECTIVENESS based on eng Planned	standards' impact: d on prototypical (not actual) buildings: GS in actual buildings complying with stand ineering economic CALCULATIONS:	

THAILAND 4

	ncy testing facilities	•		
	conditioners/d llasts	chillers/other applianc	es	
Da	114515			
	<u>_</u>			
				······································
21. Other	programs or policie	s developed to increase ener	gy efficiency in build	dings:
	ility initiatives		Comment:	An Energy Conservation Act was passed in Ma
Go	vernment energ	y policy		1992. (effective April) that emphasizes use o
			[incentive and disincentive means to encourage compliance. Requirements passed by the
		······	1	Ruilding Central Commission could become
ر المر ک	litional assumes of t	nformation about energy effic	long for buildings	in Thailand
				,
1.	Publications in	journals of: Engineerin	ig Institute of Th	ailand
-	D 111	· · · · · · · · · · · · · · · · · · ·	1	· · · · · · · · · · · · · · · · · · ·
2.	Publications in	Ljournals of: Siam's Ar	chitectural Socie	ty
			·····	
3. 22. Conta Narr	t for written copy o	of energy standard specified	l in Question 4:	
22. Conta Narr	t for written copy o E ress: Division of Departme	Energy Economics nt of Energy Affairs		
22. Conta Narr	e: ress: Division of Departme Ministry of	Energy Economics nt of Energy Affairs f Science, Technology, a		
22. Conta Nar Add	t for written copy of e: ress: Division of Departme Ministry of Rama I Ro	Energy Economics nt of Energy Affairs		
22. Contae Narr Add Cou	t for written copy of ress: Division of Departme Ministry of Rama I Ro ntry: Thailand	Energy Economics nt of Energy Affairs f Science, Technology, a	nd Energy	
22. Contae Nam Addi Cou Tel:	e: ress: Division of Departme Ministry of Rama I Ro ntry: Thailand	Energy Economics nt of Energy Affairs f Science, Technology, a ad Bangkok		
22. Contae Nam Addi Cou Tel:	et for written copy of res: Division of Departme Ministry of Rama I Ro ntry: Thailand es of supporting inf	Energy Economics nt of Energy Affairs f Science, Technology, a ad Bangkok ormation available:	nd Energy Fac:	
22. Contae Nam Addi Cou Tel:	et for written copy of res: Division of Departme Ministry of Rama I Ro ntry: Thailand es of supporting inf	Energy Economics nt of Energy Affairs f Science, Technology, a ad Bangkok	nd Energy Fac:	
22. Contae Nam Addi Cou Tel:	et for written copy of res: Division of Departme Ministry of Rama I Ro ntry: Thailand es of supporting inf	Energy Economics nt of Energy Affairs f Science, Technology, a ad Bangkok ormation available:	nd Energy Fac:	
22. Contac Narr Add Cou Tel: Typ	et for written copy of ress: Division of Departme Ministry of Rama I Ro ntry: Thailand es of supporting inf	Energy Economics nt of Energy Affairs f Science, Technology, a ad Bangkok ormation available:	nd Energy Fax: Buildings	
22. Contac Narr Add Cou Tel: Typ	et for written copy of ress: Division of Departme Ministry of Rama I Ro ntry: Thailand es of supporting inf	Energy Economics nt of Energy Affairs f Science, Technology, a ad Bangkok comation available: Energy Conservation for	nd Energy Fax: Buildings	
22. Contac Narr Add Cou Tel: Typ	et for written copy of ress: Division of Departme Ministry of Rama I Ro ntry: Thailand es of supporting inf Handbook on F	Energy Economics nt of Energy Affairs f Science, Technology, a ad Bangkok comation available: Energy Conservation for	nd Energy Fax: Buildings	
22. Contac Narr Add Cou Tel: Typ	et for written copy of ress: Division of Departme Ministry of Rama I Ro ntry: Thailand es of supporting inf Handbook on F	Energy Economics nt of Energy Affairs f Science, Technology, a ad Bangkok comation available: Energy Conservation for	nd Energy Fax: Buildings	
22. Contac Narr Add Cou Tel: Typ	et for written copy of ress: Division of Departme Ministry of Rama I Ro ntry: Thailand es of supporting inf Handbook on F	Energy Economics nt of Energy Affairs f Science, Technology, a ad Bangkok cormation available: Energy Conservation for s for non-residential building	nd Energy Fac: Buildings	
22. Contac Narr Add Cou Tel: Typ	et for written copy of ress: Division of Departme Ministry of Rama I Ro ntry: Thailand es of supporting inf Handbook on F	Energy Economics nt of Energy Affairs f Science, Technology, a ad Bangkok comation available: Energy Conservation for	nd Energy Fac: Buildings js: Surapong Chir	
22. Contac Narr Add Cou Tel: Typ	et for written copy of ress: Division of Departme Ministry of Rama I Ro ntry: Thailand es of supporting inf Handbook on F	Energy Economics nt of Energy Affairs f Science, Technology, a ad Bangkok cornation available: Energy Conservation for s for non-residential building Survey completed by:	nd Energy Fac: Buildings JS: Surapong Chir Energy Techno	rarattananon ology Division e of Technology
22. Contac Narr Add Cou Tel: Typ	et for written copy of ress: Division of Departme Ministry of Rama I Ro ntry: Thailand es of supporting inf Handbook on F	Energy Economics nt of Energy Affairs f Science, Technology, a ad Bangkok cornation available: Energy Conservation for s for non-residential building Survey completed by:	nd Energy Fac: Buildings s: Surapong Chir Energy Techno Asian Institute GPO Box 2754	ology Division e of Technology
22. Contac Narr Add Cou Tel: Typ	et for written copy of ress: Division of Departme Ministry of Rama I Ro ntry: Thailand es of supporting inf Handbook on F	Energy Economics nt of Energy Affairs f Science, Technology, a ad Bangkok comation available: Energy Conservation for s for non-residential building Survey completed by: Title:	nd Energy Fac: Buildings s: Surapong Chir Energy Techno Asian Institute GPO Box 2754 Bangkok	ology Division e of Technology 10501 Country: Thailand
22. Contac Narr Add Cou Tel: Typ	et for written copy of ress: Division of Departme Ministry of Rama I Ro ntry: Thailand es of supporting inf Handbook on F	Energy Economics nt of Energy Affairs f Science, Technology, a ad Bangkok cornation available: Energy Conservation for s for non-residential building Survey completed by:	nd Energy Fac: Buildings s: Surapong Chir Energy Techno Asian Institute GPO Box 2754	ology Division e of Technology

		U.S.S.	.R.		
NERAL OVERVIEW C	OF BUILDING ENERGY	STANDARDS			
1. General building star	ndards exist at the following	governmental levels:	National	1	
2. Proposed or existing	g ENERGY standards cover t	he following building	sectors: Both Reside	ntial and Non-I	Residential
3. Status of Non-Resid	dential Building Energy Stan	dards at the:			
a. National level:	Proposed	b. Regional level:	Proposed	c. Local level:	- None
	·		<u></u>	· -	·
- 4. Single energy stand	dard selected for further des	cription:			
	R: Building Thermophy		Research Institute for	Building Physic	s (NIISF)
Year: 1991	Geographic Coverage:	Nation	Abbreviated Title: B	Γ-NIISF , 1991	
			—		
SCRIPTION OF SPEC	XFIED ENERGY STAN	DARDS - BT-NI	ISF, 1991		
	I in Question 4 applies to the		-		
a. Building types:	•	b. Building vir	-		
<u>A - All Build</u>	lings		v and existing	·	
	<u> </u>	c. Other char	· · · · · · · · · · · · · · · · · · ·		
		$$ $\underline{E - Amou}$	nt of energy: minimiza	tion during desig	n process
·			····	·	
		~			
6. Basic approach of th	he standard: Performar	ice-based			
7. The following subject	ts are included in the energy	standard:			
a. Whole building e	•••		. Building envelope provisio	ns:	
a. Whole building e	nergy provisions:		Roof	ns:	
a. Whole building e	nergy provisions:		Roof Wall system	·	
a. Whole building e	nergy provisions:		Roof Wall system Fenestration system	·	
a. Whole building e	nergy provisions:		Roof Wall system		rade
a. Whole building e	nergy provisions: nount target	b	Roof Wall system Fenestration system Infiltration Other: main floor ab		rade
a. Whole building e	nergy provisions: nount target	b	Roof Wall system Fenestration system Infiltration Other: main floor ab		rade
a. Whole building e	nergy provisions: nount target	b	Roof Wall system Fenestration system Infiltration Other: main floor ab		rade
a. Whole building e	nergy provisions: nount target	b	Roof Wall system Fenestration system Infiltration Other: main floor ab		rade
a. Whole building e	nergy provisions: nount target	b	Roof Wall system Fenestration system Infiltration Other: main floor ab		rade
a. Whole building e	nergy provisions: nount target	b	Roof Wall system Fenestration system Infiltration Other: main floor ab		rade
a. Whole building e	nergy provisions: nount target	b	Roof Wall system Fenestration system Infiltration Other: main floor ab		rade
a. Whole building et <u>E- Energy am</u> c. Lighting provisio <u>- None</u>	nergy provisions: nount target	b	Roof Wall system Fenestration system Infiltration Other: main floor ab		rade

U.S.S.R. 2

Kesearch group: The Research and Design	r Building Physics Institute for Industrial Buildings
Research group: The Research and Design	
Research group: The Research and Design	
ecision Process: Consensus Comme	nt:
nformation used in developing the standard:	
a. PHYSICAL CHARACTERISTICS of existing building	ngs b. ENERGY USE of existing buildings:
Already available prior to standard	Computer simulations used for estimates
	Gathered through audits and surveys
· ·	
c. WEATHER data	d. Other information
Already available prior to standard	- None
includy available prior to standard	
Standards from a different country used as source mate	erial:
ISO-9164	
Germany: DIN 4108	······································
Sweden: SBN 1980	······································
America: California Energy Code	
America: California Energy Code	
America: California Energy Code	
COMPUTER programs used:	b Ear complying with the standard. Vac
	b. For complying with the standard: Yes
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COMPUTER programs used:	b. For complying with the standard: Yes
COMPUTER programs used:	b. For complying with the standard: Yes
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COMPUTER programs used:	
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COMPUTER programs used: a. In developing the standard: <u>HEAT</u> 	e comments:
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COMPUTER programs used: a. In developing the standard: <u>HEAT</u> 	neasures in the standard:

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	onsible for implementation, its former focus was	on buildings, energy, or another area:
Buildings and energy		· · · · · · · · · · · · · · · · · · ·
•	architects, engineers and other professionals	:
- None		
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a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
	-	Certification/approva
Percent designs checked:	Percent sites checked:	Percent buildings checked:
Comment:	Comment:	Comment:
	[
I. Other compliance procedures		·····
I. Other compliance procedures E. Effectiveness of combined complian	ce mechanisms (scale of 1-5): _3_	· · · · · · · · · · · · · · · · · · ·
e. Effectiveness of combined complian	ce mechanisms (scale of 1-5): _3	·····
e. Effectiveness of combined complian		· · · · · · · · · · · · · · · · · · ·
 Effectiveness of combined complian Explanation for effectiveness in part /pes of assessments or audits of ener 	gy standards' impact:	
Effectiveness of combined complian Explanation for effectiveness in part pes of assessments or audits of ener ENERGY SAVINGS POTENTIAL bas	te:	· · · · · · · · · · · · · · · · · · ·
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U.S.S.R. 4

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Ott	her: Thermal prope	erties of envelope;	air-tightness; ener	gy consumption	L .	
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1. Other (programs or policies de	eveloped to increase e	nergy efficiency in buik	lings:		
Go	vernment energy p	olicy	Comment:		of Russian Federa	
		·		economic cond	tions, Russian Go	vernment
	·····	·				
.	· · · · · · · · · · · · · · · · · · ·		I			
Add	litional sources of infor	mation about energy of	efficiency for buildings i	n: U.S.S.R.		
		•••	ved in the Setting o	1.	ding Heat Engine	pering in the
	U.S.S.R." Energy					
2.		•	Building Physics in	the U.S.S.R." E	<u>erev and Buildin</u>	<u>es (1992) 13:</u>
•	25-33.					
3.	Yu. Matrosov, "Tr	rends of Developm	nent of Energy Cons	sumption in Buil	dings and Energy	Efficiency
		dertaken in the S	oviet Union." 15th	Annual Internat	<u>ional Scientific F</u>	orum, "Maki
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RAL OVERVIEW OF	BUILDING ENERGY	STANDARDS			
1. General building stand	lards exist at the following g	overnmental levels:	National	Regional	Local
2. Proposed or existing I	ENERGY standards cover th	e following building	sectors: Both Res	idential and Non-	Residential
3 Status of Non-Reside	ntial Building Energy Stand	iande at the		·····	
a. National level:	Mandatory Voluntary	b. Regional level:	Mandatory Voluntary	c. Local level:	Mandatory Voluntary
4. Single energy standa	rd selected for further desc	ription:			
Title, Organization:	"Energy Efficient Des ASHRAE/IES, 1989.	ign of New Build	ings Except New	Low-Rise Residenti	al Buildings,"
Year: 1989	Geographic Coverage: _	Nation	Abbreviated Title:	ASHRAE 90.1-89	
RIPTION OF SPECH	FIED ENERGY STAND	DARDS - ASHR	AE 90.1-89		
	n Question 4 applies to the f				
a. Building types:	••	b. Building vin	-		
O - Offices	•	New bui	-		
H - Hotels					
F - Restaurant	S	— c. Other chara			
D - Hospitals		O - Other	: buildings designe	d for human occupa	ancy (not stora
R - Religion-re					
	al/retail stores				
	al facilities (schools)				
	Bldgs (non-process area	is)			
 Basic approach of the The following subjects Whole building energy cost C- Energy cost Cost 	are included in the energy s argy provisions:		Building envelope pro Wall system Fenestration sys		
c. Lighting provisions Control require	ements	d	Mechanical provisions Load Calculation Controls	s for equipment siz	ing
Power density			Ventilation		
			Equipment effici	ency	······································
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hnology
Air-Condintioning Engineers
-Conditioning and Refrigeration Inst. (ARI)
); Portland Cement Assn. (PCA)
rimary Glass Manuf. Council (PGMC);

TISA

STANDARDS DEVELOPMENT PROCESS - ASHRAE 90.1-89

8. Organizations involved in developing the standard:

Government agency: Department of Energy, Office of Building Ted

Research group: American Society of Heating, Refrigeration, and Industry group: Gas Appliance Manufacterers Assn (GAMA); Ai Industry group: North American Insulation Manuf. Assn. (NAIMA Industry group: National Concrete and Masonry Assn. (NCMA); P

9. Decision Process: Consensus Comment:

10. Information used in developing the standard:

a. PHYSICAL CHARACTERISTICS of existing buildings

Estimated using professional judgment

c. WEATHER data

Already available prior to standard

b. ENERGY USE of existing buildings: Computer simulations used for estimates

d. Other information

- None_

11. Standards from a different country used as source material:

- None

12. COMPUTER programs used:

a. In developing the standard:

b. For complying with the standard: Yes: Software

13. Standard is set at a level: Above current practice

14. Considerations influencing the inclusion or exclusion of measures in the standard:

DOE-2

A - Availability of energy efficient products C - Comfort

Comments:

15a. Standard scheduled for regular review and revision?

Yes: Standards are reviewed on a five year cycle for revision or reaffirmation

b. Does revision include procedures to MONITOR and EVALUATE earlier versions of the standard?

No_

. Entities involved in IMPLEMENTING energ	y standards:	
Existing agency: Department of		
Other non-governmental agence	y: Building code officials (ICBO, CAE	30, SBCCI, BOCA)
If an existing agency was made respon	sible for implementation, its former focus was o	n buildings, energy, or another area:
Energy		
TRAINING & FDI ICATION provided for an	chitects, engineers and other professionals:	
Written guidelines to assist with		
Example calculations		
Seminars, workshops, or confere	nces	
. Compliance mechanisms used at different	stages in construction process:	
a. PRIOR to construction:	b. DURING construction:	c. AFTER construction:
Certification/approval	Uncertain	Uncertain
Percent designs checked: ?	Percent sites checked: ?	Bernant huildings sheeled.
Comment:	Comment:	Percent buildings checked:
		Comment:
	-	
	- ·	
d. Other compliance procedures <u>- Nor</u>	ne	
d. Other compliance procedures		
e. Effectiveness of combined compliance	mechanisms (scale of 1-5): 5	
e. Effectiveness of combined compliance	mechanisms (scale of 1-5): 5	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e	mechanisms (scale of 1-5): 5	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e . Types of assessments or audits of energy	mechanisms (scale of 1-5): 5	
e. Effectiveness of combined compliance f. Explanation for effectiveness in part e	mechanisms (scale of 1-5): 5	
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Insulation	<u> </u>			
Air conditioners	/chillers/other appliance	<u>s </u>		
Inermal propert	ies of materials			
<u> </u>			**	
·····	·····		······	
21 Other programs or polic	ies developed to increase energ	w afficiency in buildings:		
Utility initiativ Government ener	es	Comment:		
Government ener	ду роцсу		······································	
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Additional sources of	f information about energy effici	oncy for buildings in IIS	A	
Additional Sources of	i intornation about encayy entra		* •	
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22. Contact for written copy Name: Address: ASHRAI 1791 Tull Atlanta Country: USA Tel: 404-636-8	y of energy standard specified E Lie Circle, NE GA 30329 3400	in Question 4:		
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22. Contact for written copy Name: Address: ASHRAI 1791 Tuli Atlanta Country: USA Tel: 404-636-8 Types of supporting i	y of energy standard specified E Lie Circle, NE GA 30329 3400 information available:	in Question 4: Fax: 404-321-5478		
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