

# UC Berkeley

## Electric Grid

### Title

Public Interest Technology Assessment of Phasor-Based, Real-Time Dynamic Information Systems

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### Author

Brown, Merwin

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2008



## ***Project Summary***

### **Public Interest Technology Assessment of Phasor-Based, Real-Time Dynamic Information Systems**

#### **Context**

Phasor measurement units (PMUs) collect time-synchronized grid data to provide real-time information about the status of a point on the grid. The development of new phasor measurement-based technologies for analysis, modeling, visualization and control can produce previously unavailable, greatly needed tools for securely and reliably operating the modern electric transmission system under growing uncertainty.

The value of phasor measurement applications to California electric customers is largely proportional to the degree they are deployed throughout California and the Western Electricity Coordinating Council (WECC), because of the heavy reliance California places on having access to power imported from states throughout the West.

Transmission owners and operators, who have the means to purchase, install and operate phasor based applications, will usually deploy new technologies only if a business case can be made. While policy can have a strong influence on the degree and timing of deployment, policy makers need to know the high-value public benefits, and economic and financial barriers to commercial deployment.

#### **Goals and Objectives**

This “business case” study evaluates the potential benefits, costs and understanding of who benefits and who bears the cost of expanded deployment of phasor-based technologies and what are the best research and development opportunities to advance the most promising applications of this technology for the benefit of electricity consumers and the electric industry.

It provided organized consolidated information for use by the electric industry players, policy makers and researcher planners. This study was conducted to identify economic and financial barriers to commercial deployment, and technology development gaps. Especially important in this case, it also sought to obtain information to help develop technology transfer strategies and educate potential users for increased adoption of these technologies..

#### **Description**

This “business case” analysis and R&D roadmap were

developed through a consensus process by the Principal Investigator in cooperation with major California utilities, the California Independent System Operator, and other electric power stakeholders..

The project identified applications, benefits, business rationales, and development and deployment barriers. It also created a roadmap for technology development and deployment. Results were obtained through collaboration with stakeholders, from interviews, group meetings, literature, and high-level analysis. An industry workshop was held to assist in publicizing the project results.

#### **Key Results/Conclusions**

Phasor measurement technology has advanced to the point that commercial implementation of selected applications is both feasible and warranted and represents a prudent financial investment.

Significant benefits from the use of phasors can accrue to customers and society. Regulators may need to provide incentives and the National Electric Reliability Corporation (NERC) should facilitate data exchange agreements. To gain the potential benefits, a coordinated effort between utilities and system operators is needed to implement phasor measurements over a wide area.

#### **Why It Matters**

Phasor measurements can potentially transform the way the electric grid is operated, reducing costs, improving reliability, and reducing the number and scale of major outages. Some observers have likened its ability to improve grid situational awareness as akin to the medical diagnostic advancements in moving from x-rays to MRIs.

While the potential applications of phasor measurements are recognized by many, some industry professionals and policymakers remain uninformed or unconvinced of the financial soundness of the investment. This business case study provides sound rationales for the investment need to obtain the benefits of these tools.

{More details}



**ELECTRIC GRID RESEARCH PROGRAM**

**Project Summary**

**Public Interest Technology Assessment of Phasor-Based, Real-Time Dynamic Information Systems (Pg 2)**

**Participating Organizations**

**Principal Investigator:**

KEMA, Inc.



**Research Partners:**

Virginia Polytechnic Institute  
Georgia Institute of Technology  
Pacific Northwest National Laboratory  
University of Zagreb, Croatia

**Research Advisors:**

Bonneville Power Administration  
Pacific Gas and Electric  
San Diego Gas and Electric  
Southern California Edison  
US Department of Energy

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**Reports**

Final Report: *Phasor Measurement Application Study*

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**For More Information, Contact**

Dr. Merwin Brown,  
CIEE Electric Grid Research Program Director  
(916) 551-1871  
[merwin.brown@uc-ciee.org](mailto:merwin.brown@uc-ciee.org)