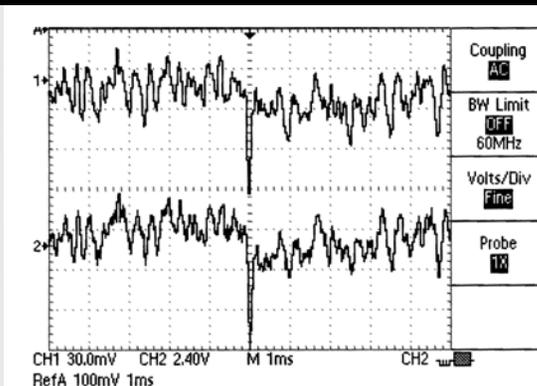


# Time-Based Metering & Communications Standard “Smart Metering”

April 24, 2007



## 2005 Energy Policy Act Provisions

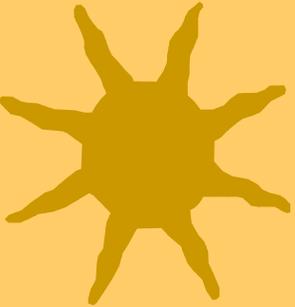
By Warren Wood, PE

Director, Utility Operations Division

Missouri Public Service Commission - Staff

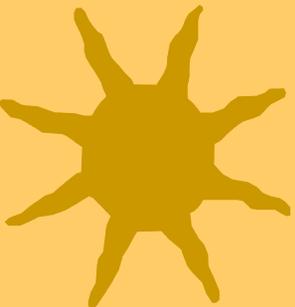


## *Topics*

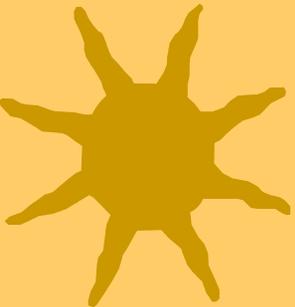


### **Energy Policy Act 2005 (EPAAct 05)**

#### **Provision I Will Cover:**



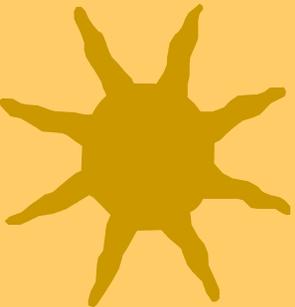
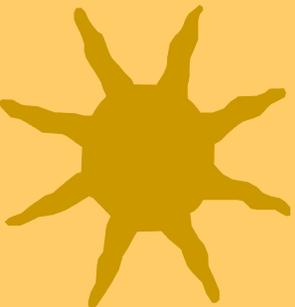
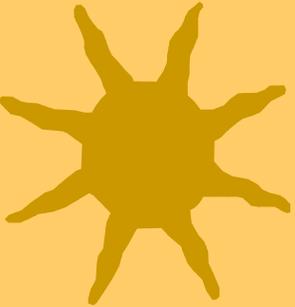
**PURPA Section 111(d)(14) Time-Based Metering and Communications Standard...**



*Sometimes referred to as “Smart Metering”*



# *EPAct Smart Metering Provisions*



PURPA Section 111(d) Amendment

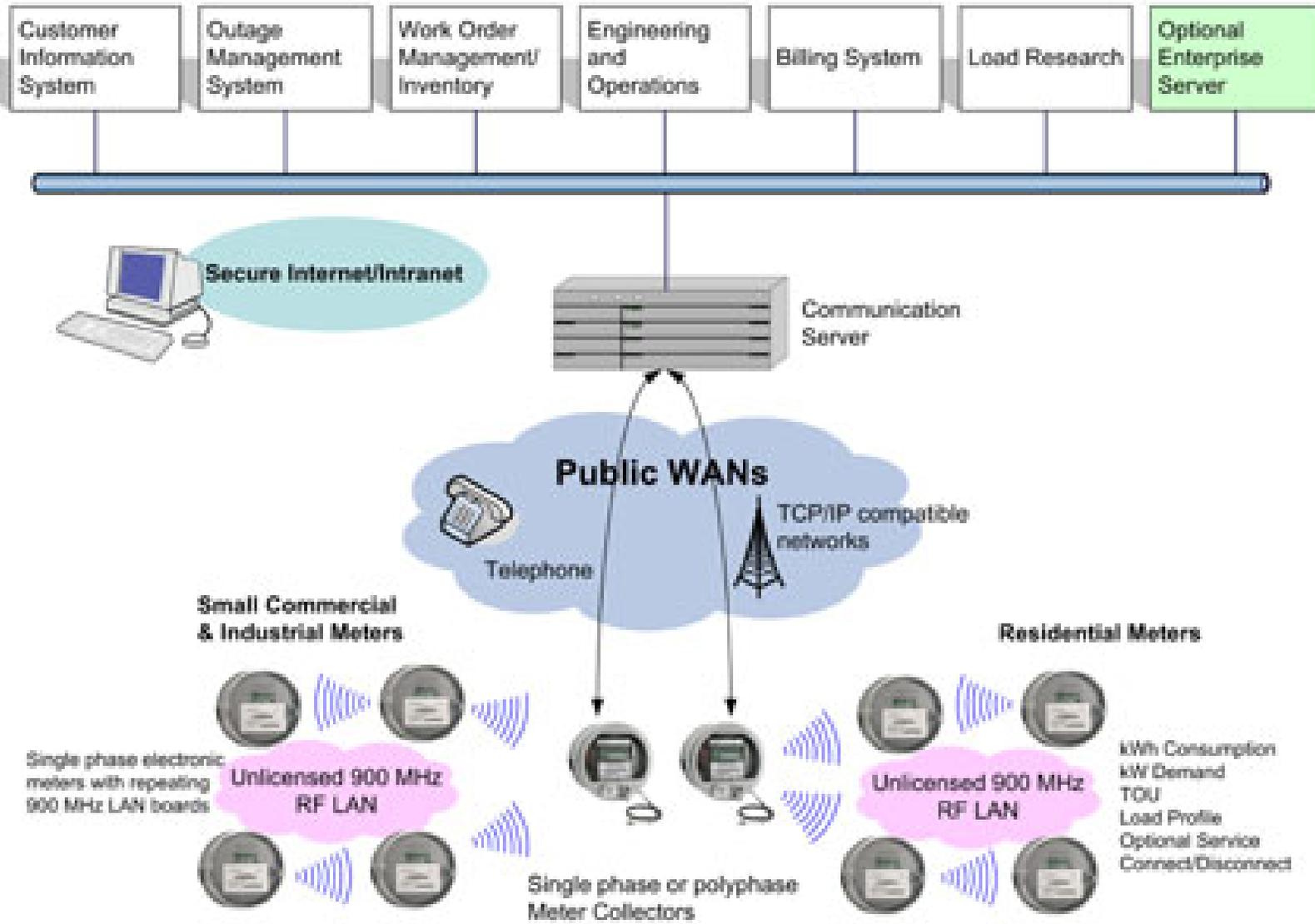
**(14) TIME-BASED METERING AND COMMUNICATIONS – (A)**

**Not later than 18 months after the date of enactment of this paragraph, each electric utility shall offer each of its customer classes, and provide individual customers upon customer request, a time-based rate schedule under which the rate charged by the electric utility varies during different time periods and reflects the variance, if any, in the utility's costs of generating and purchasing electricity at the wholesale level. The time-based rate schedule shall enable the electric consumer to manage energy use and cost through advanced metering and communications technology.**



# Smart Metering - the Network:

## Metering Automation System for Residential and Small Commercial and Industrial



# Smart Metering - In The Home

cellnet



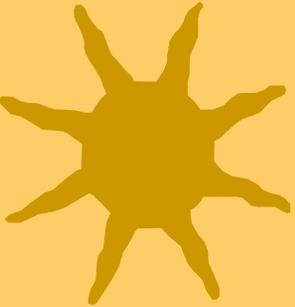
Cellnet  
www.cellnet.com  
(678) 258-1500

Control4  
www.control4.com  
(801) 523-3100



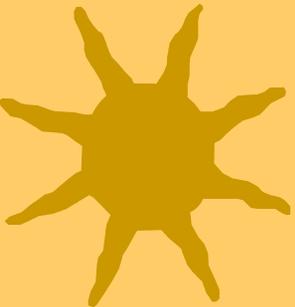
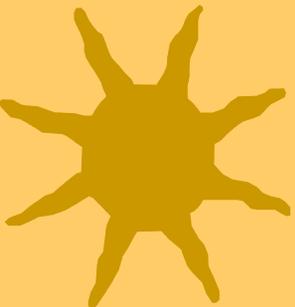
# *Smart Metering*

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## **Objectives?**

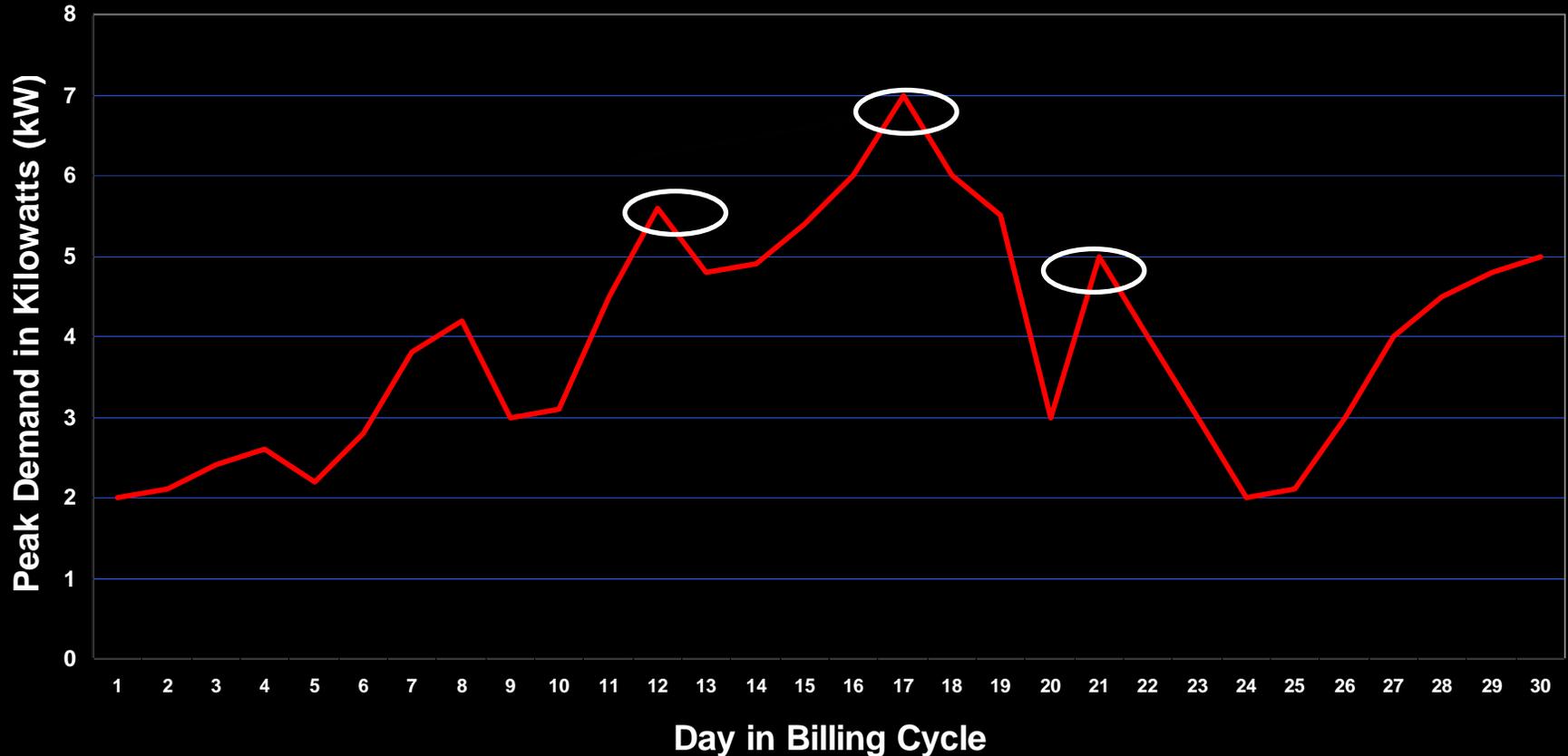
- **Provide people with real-time energy costs information so they can make informed energy usage decisions – save money, reduce emissions?**
- **Provide advanced control systems with real-time energy costs information so equipment demand patterns can be altered to reduce overall cost?**
- **Reduce demand for energy during peak periods?**
- **Reduce overall energy consumption on system?**
- **All of the above and maybe more?**





Programs can be structured to reduce peaks in demand (price signals to cause customer usage changes and/or automatic controls on appliances). May delay the need to build power plants or simply reduce overall cost.

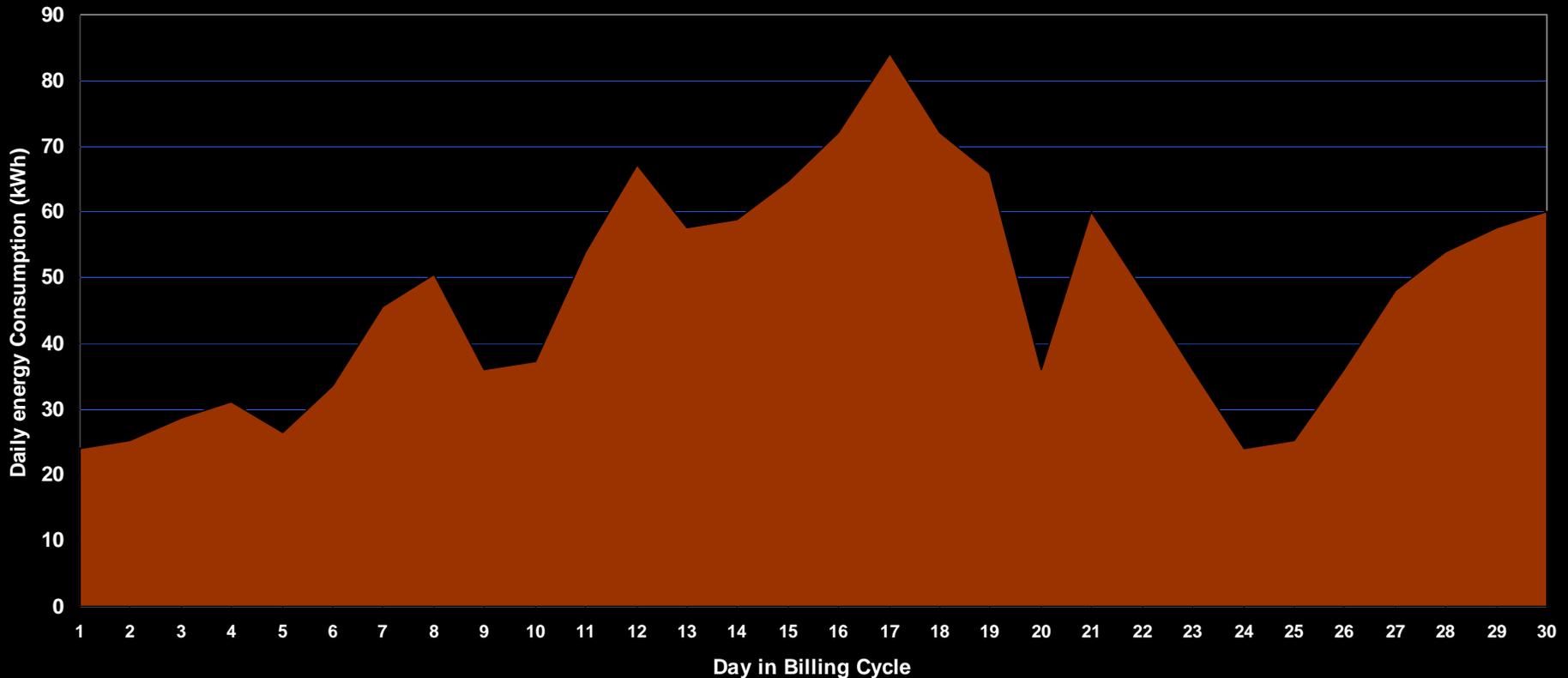
### Customer Peak Demand by Day (kW)





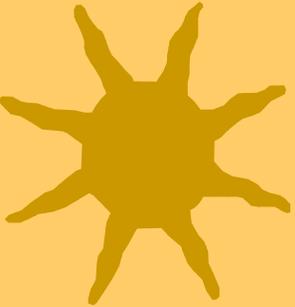
Programs can be structured to reduce energy consumption (customer education, prepayment meters, rebates on efficient appliances or bounties on inefficient appliances).

**Customer Energy Consumption by Day (kWh)**





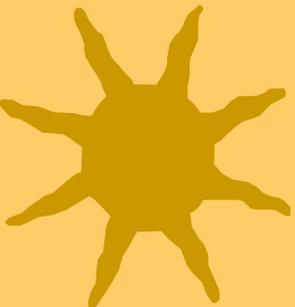
## *Smart Metering*



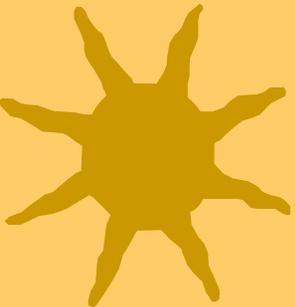
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### **Different Levels of Customer**

#### **Involvement:**



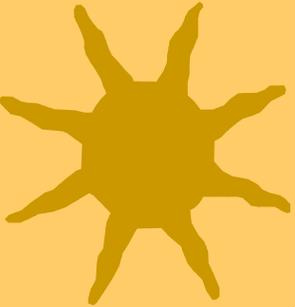
- **Regular Monitoring of Pricing by the Customer & Changing Appliance Usage Patterns to Save Money: or**
- **Automatic Controls That Respond to Price and/or Demand Signals from the Utility to Reduce Demand for Energy**





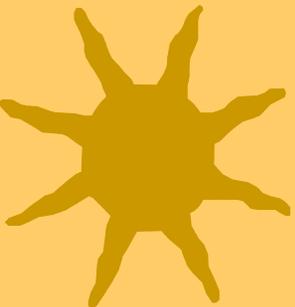
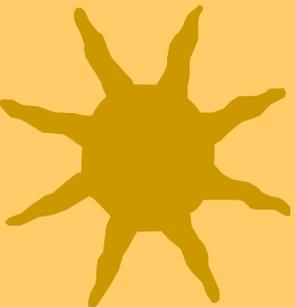
## *Smart Metering*

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### **Regular Customer Involvement:**

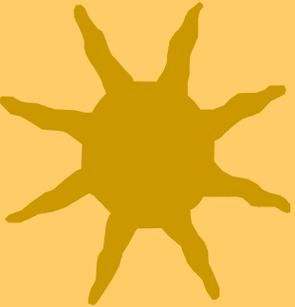
- **Time of Use (TOU) Rates, Metering & Communications to Support Hourly Usage Data, Smart Thermostats, Home-Based Monitoring and Appliance Control Systems ...(maybe prepayment meters?)**





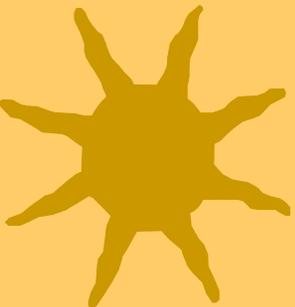
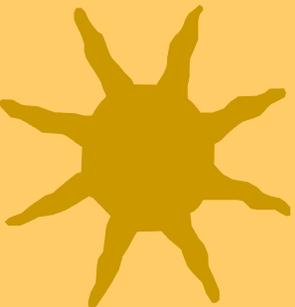
## *Smart Metering*

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### **Relatively Little Customer Involvement:**

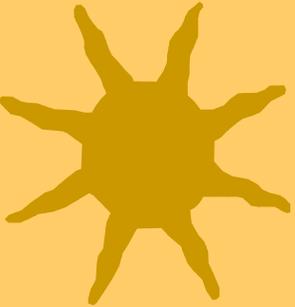
- **Air Conditioner and Water Heater Cycling Programs, Smart Thermostats with Automatic Appliance Control Features**





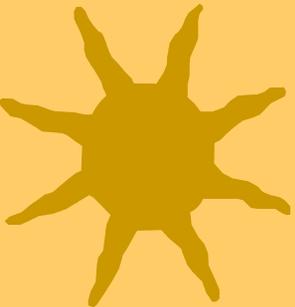
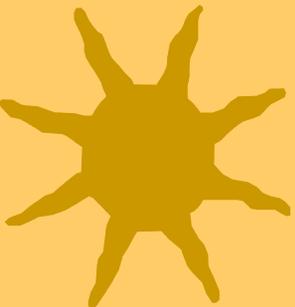
## *Smart Metering*

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### **High Impact & “Easy?”:**

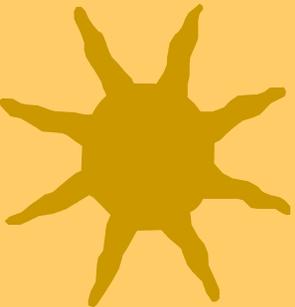
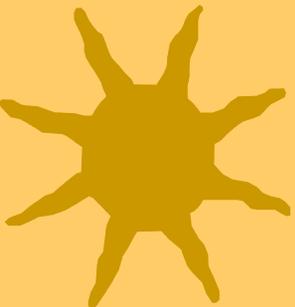
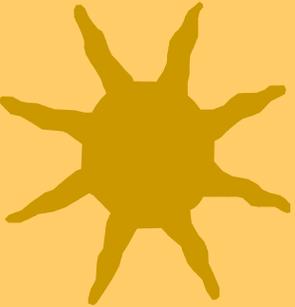
- **Air Conditioner Cycling Programs**
- **Industrial Peak Load Curtailment Programs**
- **Smart Thermostat Programs**
- **Prepaid/Credit Meter Programs**
- **Customer Education Programs**





## *Smart Metering*

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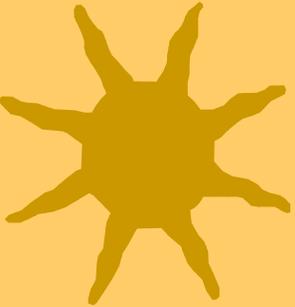


- ★ All of Missouri's Investor Owned Electric Utilities have optional time of use rates.
  - These tariff provisions are available to residential customers.
  - These tariff provisions may not provide an option for variable rates on an hour-by-hour basis.
- ★ Our Commission is very interested in this topic and smart metering is the subject of a current EPAct case with our agency.

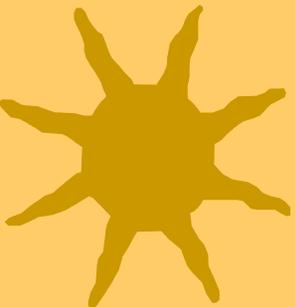


## *Smart Metering*

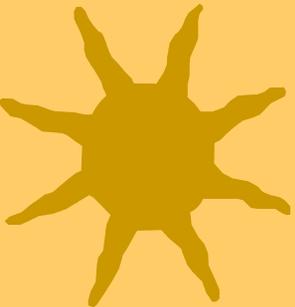
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★ A pilot program was conducted in southeast Missouri. A number of issues were noted in this pilot:



- Metering Costs
- Rate Differentials
- Customer Communications Portals
- Levels of Demand Response
- Customer Interest and Retention Rates
- Automatic vs Manual Response Schemes



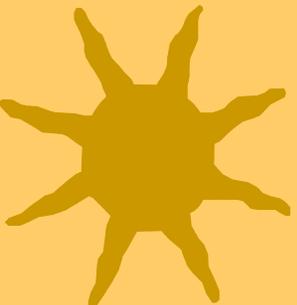
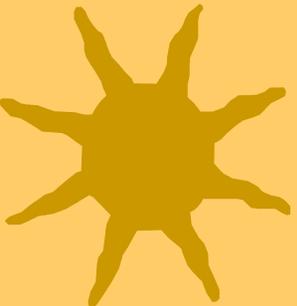
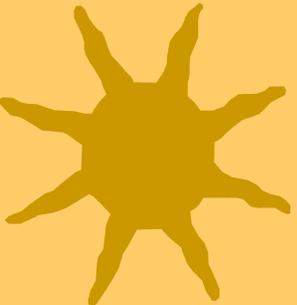


## *EPAct Prior State Action Provision*

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Prior State Action (for section to not apply):

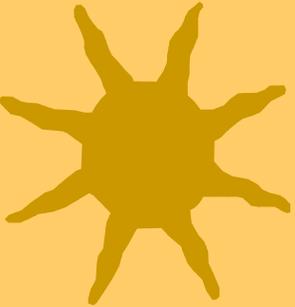
- (1) The State has implemented for such utility the standard concerned (or a comparable standard);
- (2) The State regulatory authority for such State or relevant nonregulated electric utility has conducted a proceeding to consider implementation of the standards concerned (or a comparable standard); or
- (3) the State Legislature has voted on the implementation of such standard (or a comparable standard).



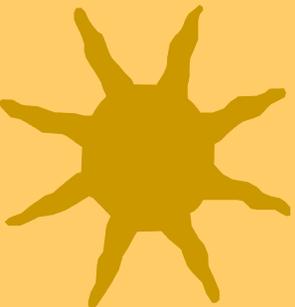


# *EPAct '05 Timeline Requirements*

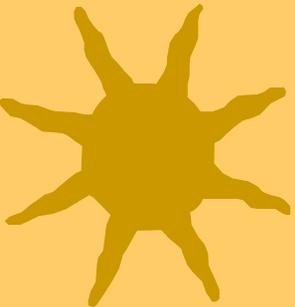
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Net Metering: Commence Consideration by August '07  
Determination by August '08



Interconnection: Commence Consideration by August '06  
Determination by August '07



Fuel Diversity: Commence Consideration by August '07  
Determination by August '08

Fuel Efficiency: Commence Consideration by August '07  
Determination by August '08

## **Smart Metering:**

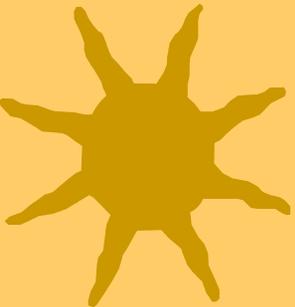
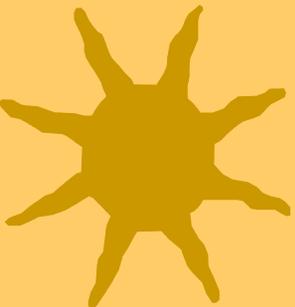
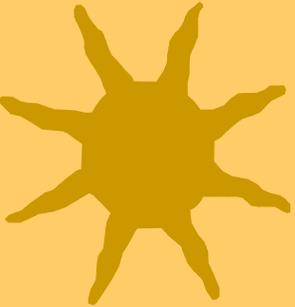
**Commence Consideration by August '06**

**Determination by August '07**



## Contact Information:

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*Jefferson City, MO 65102*

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