

# Electric Rate Regulation: Pricing structures

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# Time Based Pricing

**Time-of-Use Pricing:** pre-established prices for energy consumed during a specific time period, allowing consumers to vary usage in response to prices and manage energy costs by shifting their usage to a lower cost period, or to reduce their usage overall.

# Time Based Pricing

**Dynamic (Real-Time) Pricing:** Like Time-of-Use pricing, Dynamic Pricing allows customer to pro-actively switch usage to a lower cost period. However, prices may change hourly. Prices that reflect the utility's own cost of generation and cost of purchasing electricity on the wholesale market are signaled to the customer in advance, usually on a day-ahead basis. Dynamic pricing requires the most customer attention to the management of their energy usage.

# Time of Use Pricing

- Can be useful in traditionally regulated or in market-based environments.
- Time of Use Pricing is available from most jurisdictional utilities in Kentucky.
- Depending upon utility, available to residential, commercial, or industrial customers.
- Energy prices are stated for certain on-peak hours and off-peak hours, but unlike dynamic pricing rates, the rates do not change daily.

Example: 1:00 p.m. – 9:00 p.m. On-peak \$.15770 per kWh

9:00 p.m. – 1:00 a.m. Off-peak \$.05636 per kWh

- Participation rates in time-of-use programs have been low for residential and commercial customers. Requires customer to be involved in managing usage.

# Dynamic (Real-Time) Pricing

- Most programs are pilots with a stated sunset date
- Prices are usually on a day-ahead basis
- Customer has opportunity to shift load to lower cost periods
- Commercial or industrial customers
- Very low participation rates in Kentucky

# **Louisville Gas & Electric: Residential Smart Meter pilot program: 2007 – 2011**

- Both Time of Use and Real-Time components
- Limited to 150 customers
- Weekday and weekend divided into three Time-of-Use periods, each period had different, known rates
- Critical peak component limited to no more than 80 hours per year. (Critical peaks: days and times when high usage pushes LG&E into buying more expensive power from suppliers.)
- Critical Peak (Real-Time) rate component was signaled no less than one-half hour prior to time the rate was to be effective
- Smart Meters, in-house energy monitors and programmable thermostats were provided
- Obsolescence of technology - both hardware and software
- Participants consistently shifted load from higher-priced to lower priced periods
- Participants consumed more energy overall than non-participants

# **Demand-Side Management (“DSM”) Statute – KRS 278.285**

- **Enacted in 1994**
- **Major Features –**
  - **Stand-alone applications**
  - **Industrial opt out**
  - **Surcharge mechanism**
    - **Class specific**
    - **Program costs**
    - **Lost revenues**
    - **Financial rewards**

# Demand-side management:

- Utilities may propose plans
- PSC has no authority to require DSM
- Programs may include smart meters, home energy assistance programs
- Cost-effectiveness

PSC evaluates a variety of factors

“California” tests

- Consistency with utility resource plans



# Demand-side management:

- Recovery of program costs, including incentives
- Recovery of DSM costs includes foregone revenue
- All investor-owned utilities have DSM programs – all are expanding
- Electric cooperatives DSM programs are somewhat less extensive than IOU programs
- Several utilities have pilot programs to test smart grid technologies in combination with time-of-day or demand-based variable rate structures

# **Demand-Side Management and Energy Efficiency Programs - Objectives**

- **Defer or eliminate need for additional capacity**
- **Provide opportunities for customer to reduce usage / bills**
- **Reduce output of highest cost generation / fuel costs**
- **Reduce level of emissions**
- **Free-up capacity to make off-system sales**

# **DSM/Energy Efficiency Programs Delivered by Utilities in Kentucky**

## **Residential Programs**

**Energy Audits/Analysis**

**Comprehensive Energy Education**

**Direct Load Control of Air Conditioners / Water Heaters**

**Geothermal Cooling and Heating Incentives**

**High Efficiency -**

**Heat Pumps**

**Refrigerators – Energy Star**

**Lighting**

**Mobile Homes – New Construction**

**Programmable Thermostats**

**Low-Income Weatherization**

**Pilot on-bill financing program for energy efficiency improvements**

**Compact Fluorescent Bulbs**

**New Home Construction – Energy Star**

**High Efficiency -**

**Clothes Dryers – Energy Star**

**Air Conditioners – Energy Star**

**Water Heaters**

**Heat Pump – Mobile Home Retrofit**

**Low-Income Energy Assistance**

# **DSM/Energy Efficiency Programs Delivered by Utilities in Kentucky (continued)**

## **Commercial Programs**

**New Construction**

**Efficient Refrigeration**

**Efficient Heating, Ventilation, and Air Conditioning (“HVAC”)**

**Efficient Lighting**

**HVAC Diagnostics and Tune-Up**

**Direct Load Control of Air Conditioners / Water Heaters**

**Demand Response**

## **Industrial Programs**

**Demand Response (Load Shedding)**

**Demand response (Supply Generation)**

**High Efficiency Motors**

**Variable Speed Drive Motors**

**Combine Heat and Power (“CHP”) Projects**

# DSM/Energy Efficiency Programs in Kentucky (Examples)

## Air conditioner load control (LG&E/Kentucky Utilities)

Similar programs in place at most  
jurisdictional electric utilities

- Radio-controlled device mounted on outside AC unit
- Allows AC compressor (not interior ventilation fan) to be turned off remotely for 10 minutes per hour during times of peak demand – weekdays only
- Customer receives \$5 monthly credit during four-month heating season (June-Sept.) for \$20 total
- Capacity to reduce loads by 220 MW during peak times

# DSM/Energy Efficiency Programs in Kentucky (Examples)

## Energy efficiency rebates (East Kentucky Power Cooperative/member distribution cooperatives)

- Heating and cooling systems
  - Old system must be at least 10 years old
  - New system must meet certain efficiency standards
  - Rebate of up to \$500
- Insulation
  - Sealing of homes to reduce heating/cooling losses
  - Incentives of up to \$410
- New home incentives
  - Incentives of up to \$250 for purchasers who choose to purchase new homes meeting certain energy efficiency standards