The Business of Utilities

APPA Institute for Facilities Management
January 2016
Steve Kraal
The University of Texas at Austin - Retired
Jeff Zumwalt
The University of New Mexico

Purpose

“There’s gold in them ‘thar bills”
The benefits of being an active consumer

Overview

- Provide an overview of the utility industry
- Review components of a utility bill
- Discuss strategies to reduce utility expenses
- Review emerging factors and how they may impact utility costs
The “Business” of Utilities

- “Production” the campus generates and “sells” electricity, chilled water, steam and water/waste water to campus facilities
- “Consumption” the campus purchases a large percentage of their utility requirements from either regulated or deregulated companies

The majority of campuses operate as consumers; as a result this presentation will focus on that element of the “business of utilities.”

Higher Education Context

- Energy intensity higher than most other industries
- Reliability essential to support institutional mission
- Natural resource management one of most complex issues on a campus
- Majority of resource needs driven by existing building inventory
- Energy market increasingly complex and volatile

HEPI Cost Change (%)

<table>
<thead>
<tr>
<th>Year</th>
<th>Utilities</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>-30.5</td>
<td>1.9</td>
</tr>
<tr>
<td>2003</td>
<td>33.5</td>
<td>5.1</td>
</tr>
<tr>
<td>2004</td>
<td>11.9</td>
<td>3.7</td>
</tr>
<tr>
<td>2005</td>
<td>13.5</td>
<td>3.9</td>
</tr>
<tr>
<td>2006</td>
<td>27.7</td>
<td>5.1</td>
</tr>
<tr>
<td>2006</td>
<td>-13.7</td>
<td>2.8</td>
</tr>
<tr>
<td>2008</td>
<td>14.2</td>
<td>5.0</td>
</tr>
<tr>
<td>2009</td>
<td>-15.1</td>
<td>2.3</td>
</tr>
<tr>
<td>2010</td>
<td>-9.5</td>
<td>0.9</td>
</tr>
<tr>
<td>2011</td>
<td>4.1</td>
<td>2.3</td>
</tr>
<tr>
<td>2012</td>
<td>-4.9</td>
<td>1.7</td>
</tr>
</tbody>
</table>
Utility Companies – How they work

- Rate base
- Rate of return – based on cost of capital and amount of risk assumed by utility company
- Operating expenses versus capital expenses
- Various fees - energy conservation, renewable energy, etc.
- Imbalance of fixed and variable fee structures

Major Components of US Average Electrical Price, 2011


Components of Power Pricing
Utility Companies

- Rate base: $100M
- 10% Rate of return: $10M
- Operating expenses: $7M
- Total Cost Recovery: $17M

Customers Bills
- Fixed revenue: $10M
- Variable revenue: $7M
- Revenue from rates: $17M
- Operating expenses: -$7M
- Interest expense: -$4M
- Company Profit: $6M

Yin and Yang – New Customer

- Rate base: $120M
- 10% Rate of return: $12M
- Operating expenses: $10M
- Total Cost Recovery: $22M

Customers Bills
- Fixed revenue: $12M
- Variable revenue: $10M
- Revenue from rates: $22M
- Operating expenses: -$10M
- Interest expense: -$5M
- Company Profit: $7M

Yin and Yang - Renewables

- Rate base: $100M
- 10% Rate of return: $10M
- Operating expenses: $5M
- Total Cost Recovery: $15M

Customers Bills
- Fixed revenue: $10M
- Variable revenue: $5M
- Revenue from rates: $15M
- Operating expenses: -$5M
- Interest expense: -$4M
- Company Profit: $6M
**Imbalanced Fixed and Variable**

- Rate base: $100M
- 10% Rate of return: $10M
- Operating expenses: $7M
- Total Cost Recovery: $17M

Customers Bills
- Fixed revenue: $7M
- Variable revenue: $10M
- Revenue from rates: $17M
- Operating expenses: -$7M
- Interest expense: -$4M
- Company Profit: $6M

**Yin and Yang – Renewables 2**

- Rate base: $100M
- 10% Rate of return: $10M
- Operating expenses: $5M
- Total Cost Recovery: $15M

Customers Bills
- Fixed revenue: $7M
- Variable revenue: $6M
- Revenue from rates: $13M
- Operating expenses: -$5M
- Interest expense: -$4M
- Company Profit: $4M

**Variable Charges**

- Demand fees to collect for cost of capacity – minimum with ratchet
- Energy charge – on peak and off peak
- Taxes (often termed franchise fees)
- Other fees – safety fees, fuel adjustment clauses, renewable energy, energy conservation, etc.
Dissecting Your Bills

Finding the Gold

Strategies
- Legislative
- Regulatory
- Technology
- Donors?

Rate Structures
### Rate Structures

**YOUR CURRENT ELECTRICITY CHARGES**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Rate 150 - 2000 KWH</td>
<td>$0.10/ KWH</td>
</tr>
<tr>
<td>Peak Rate 2001 - 3000 KWH</td>
<td>$0.12/ KWH</td>
</tr>
<tr>
<td>Peak Rate 3001 - 4000 KWH</td>
<td>$0.135/ KWH</td>
</tr>
<tr>
<td>Peak Rate 4001 - 5000 KWH</td>
<td>$0.15/ KWH</td>
</tr>
<tr>
<td>Peak Rate 5001 - 6000 KWH</td>
<td>$0.165/ KWH</td>
</tr>
<tr>
<td>Peak Rate 6001 - 7000 KWH</td>
<td>$0.18/ KWH</td>
</tr>
<tr>
<td>Peak Rate 7001 - 8000 KWH</td>
<td>$0.195/ KWH</td>
</tr>
<tr>
<td>Peak Rate 8001 - 9000 KWH</td>
<td>$0.21/ KWH</td>
</tr>
<tr>
<td>Peak Rate 9001 - 10000 KWH</td>
<td>$0.225/ KWH</td>
</tr>
<tr>
<td>Peak Rate 10001 - 15000 KWH</td>
<td>$0.24/ KWH</td>
</tr>
<tr>
<td>Peak Rate 15001 - 20000 KWH</td>
<td>$0.255/ KWH</td>
</tr>
<tr>
<td>Peak Rate 20001 - 25000 KWH</td>
<td>$0.27/ KWH</td>
</tr>
<tr>
<td>Peak Rate 25001 - 30000 KWH</td>
<td>$0.285/ KWH</td>
</tr>
<tr>
<td>Peak Rate 30001 - 35000 KWH</td>
<td>$0.3/ KWH</td>
</tr>
<tr>
<td>Peak Rate 35001 - 40000 KWH</td>
<td>$0.315/ KWH</td>
</tr>
<tr>
<td>Peak Rate 40001 - 45000 KWH</td>
<td>$0.33/ KWH</td>
</tr>
<tr>
<td>Peak Rate 45001 - 50000 KWH</td>
<td>$0.345/ KWH</td>
</tr>
<tr>
<td>Peak Rate 50001 - 60000 KWH</td>
<td>$0.36/ KWH</td>
</tr>
<tr>
<td>Peak Rate 60001 - 70000 KWH</td>
<td>$0.375/ KWH</td>
</tr>
<tr>
<td>Peak Rate 70001 - 80000 KWH</td>
<td>$0.39/ KWH</td>
</tr>
<tr>
<td>Peak Rate 80001 - 90000 KWH</td>
<td>$0.4/ KWH</td>
</tr>
<tr>
<td>Peak Rate 90001 - 100000 KWH</td>
<td>$0.415/ KWH</td>
</tr>
<tr>
<td>Peak Rate 100001+ KWH</td>
<td>$0.43/ KWH</td>
</tr>
</tbody>
</table>

**Customer Charge**

- **The Customer Charge** recovers the fixed costs of providing service to this customer class.

### Customer Charge

**PUBLIC SERVICE COMPANY OF NEW MEXICO**

**ELECTRIC SERVICES**

**12th Biennial Rate No. 45**

**CANCELLING 7th Biennial Rate No. 18**

**LARGE POWE SERVICE – TIME-OF-USAGE**

**Page 2 of 4**

**MESSAGE AND NOTICE FOR CUSTOMER LOCATION:**

- The rate for electric service varies based on the number of kwhs consumed and the time of day.
- Rates are based on usage during the peak period, which is 8:00 AM to 8:00 PM, and off-peak periods are all times other than the peak period.

**TIME-OF-USAGE RATES**

**CUSTOMER CHARGE**

- **Customer Default Transmitter** (For Residential Use): $7.95/ Month
- **Customer Default Transmitter** (For Commercial Use): $100/ Month
- **Customer Default Transmitter** (For Industrial Use): $179.95/ Month

**SPECIAL RATES**

- **SUMMARY OF ALL RATES**

**Calculations:**

- **Customer Charge:** 
  - Residential: $7.95
  - Commercial: $125
  - Industrial: $179.95

**Terms and Conditions:**

- 

---

**APPENDIX:**

- 

---

**APPENDIX:**

- 

---
### Demand Charge

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Demand</td>
<td>1340 kW</td>
</tr>
<tr>
<td>Active Demand (Peak Demand)</td>
<td>1470 kW</td>
</tr>
<tr>
<td>Non-Demand (Total Demand)</td>
<td>1470 kW</td>
</tr>
<tr>
<td>Active Demand (Above 1000 kW)</td>
<td>$12,226.50</td>
</tr>
<tr>
<td>Non-Demand (Above 1000 kW)</td>
<td>$12,226.50</td>
</tr>
</tbody>
</table>

**Current Electricity Charges**: $77,201.88

---

### Energy Charge & Power Factor

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Demand</td>
<td>1040 kW</td>
</tr>
<tr>
<td>Energy Use</td>
<td>8000 kWh</td>
</tr>
<tr>
<td>Energy Charge</td>
<td>$1,540.00</td>
</tr>
<tr>
<td>Power Factor</td>
<td>0.90</td>
</tr>
</tbody>
</table>

**Current Electricity Charges**: $77,201.88

---

**Effective**: Aug 1, 2019

---

**Cardinal Resources Co.**: Executive Director [Name] (307) 408-5000

---

**Cardinal Resources Co.**: Executive Director, [Name] (307) 408-5000

---

**Cardinal Resources Co.**: Executive Director, [Name] (307) 408-5000

---

**Cardinal Resources Co.**: Executive Director, [Name] (307) 408-5000

---

**Cardinal Resources Co.**: Executive Director, [Name] (307) 408-5000

---

**Cardinal Resources Co.**: Executive Director, [Name] (307) 408-5000

---

**Cardinal Resources Co.**: Executive Director, [Name] (307) 408-5000

---

**Cardinal Resources Co.**: Executive Director, [Name] (307) 408-5000

---

**Cardinal Resources Co.**: Executive Director, [Name] (307) 408-5000

---

**Cardinal Resources Co.**: Executive Director, [Name] (307) 408-5000

---

**Cardinal Resources Co.**: Executive Director, [Name] (307) 408-5000

---

**Cardinal Resources Co.**: Executive Director, [Name] (307) 408-5000

---
**Energy Charge & Power Factor**

**On-Peak Period Charging**
- S10.00/kW
- S12.00/kVA

**Off-Peak Period Charging**
- S1.00/kW

**ENERGY CHARGE**
- Off-Peak
  - $0.00/kWh, $0.00/kW, and $0.00/kVA

**POWER FACTOR ADJUSTMENT**: This section details the impact of power factor on energy charges. An improved power factor can reduce energy costs. For specific details, see the table below.

**Effective**
- ASR 21-21
- (New rates effective 10/1/2019)

**Other Fees**

<table>
<thead>
<tr>
<th>Rate Description</th>
<th>Off-Peak kW</th>
<th>Off-Peak kVA</th>
<th>On-Peak kW</th>
<th>On-Peak kVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Rate</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Demand Service</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Renewable energy, fuel costs, energy conservation programs, and local taxes</td>
<td>$240.00</td>
<td>$240.00</td>
<td>$240.00</td>
<td>$240.00</td>
</tr>
</tbody>
</table>

**Other Fees**

**PUBLIC SERVICE COMPANY OF NEW MEXICO**
**ELECTRIC SERVICES**

**17th REVISED RATE NO. 42**
**CANCELING 16TH RIVER RATE NO. 45**

**LARGE POWER SERVICE**

**FUEL AND PURCHASED POWER COST ADJUSTMENT**: These rates are based on the average cost of fuel and energy for the previous year. An increase in the cost rate is $0.02/kWh and is effective for fuel and purchased power expenses incurred beginning July 1, 2019.

All kWh usage under this rate will be subject to a Fuel and Purchase Power Cost Adjustment (FPPCA) factor calculated according to the previous year's FPPC adjustment rate.

The appropriate FPPC factor will be applied to all kWh usage of this rate, and the FPPC factor is calculated as the sum of all previous FPPC factors.

**OTHER APPLICABLE RATES**: Any other rates that may apply to this rate will be listed in the rate table with the rates of those other rates.
Finding the Gold

- Regulatory
- Legislative
- Donors
- Amended Renewable Energy Act
- Partnered with a donor

Emerging Issues

- Low cost of natural gas and oil
- Regulatory pressure
  - fracking
  - wind power
  - solar
- External prices pressures on electricity
  - Pressure on coal
  - Renewable energy
- Energy exports

The Business of Utilities

Questions, Comments, Observations
Sign-in Sheet & Evaluations