Cost-of-Service and Rate Design Study for Rochester Public Utilities
Overview

1. Objectives
2. Study Components
3. Financial Forecast
4. Cost of Service
5. Rate Design
Objectives of the Study

• Update base on 2019 Five-Year Financial Plan

• Determine Cost of Providing Service to each class

• Develop and Refine New Rate Designs

• Provide Rate Recommendations for Future Consideration
Study Components

**STEP 1: Financial Planning**
- Unit-Based Revenue Forecast
- O&M Expenses
- Capital Financing Plan

**Financial Plan**
- Are Current System Revenues Adequate?

**STEP 2: Cost of Service**
- Test Year Revenue Requirements
- Functional Allocators
- Units of Service Development

**Compare Revenue to Costs by Class**
- How Should Costs Be Recovered by Class?

**STEP 3: Rate Design**
- Costs by Class
- Revenue Under Alternative Rates

**How Should Services Be Priced?**

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Economic Modeling/Rate Model Customization
Financial Forecast

• Reviewed Cash Flow Analysis Results
  • Updated financial forecast model sales, power cost, capital, and O&M projections
  • Minimum cash reserves, capital replacement reserves, coverage ratios, and target income are acceptable currently but starting to decline

• Reviewed Financial Plan with RPU management
  • Financial plan developed assumes pre-Covid 19 conditions
  • Operating margins and cash balances acceptable currently
  • No rate increases / decreases proposed for 2021
  • RPU will continue to monitor financial conditions in budget process
RPU Financial Strategy

**Rates**
- Based on cost of providing service per Board policy
- Reasonable, Compensatory and Uniform within same Class *(Home Rule Charter)*
- Match fixed charge with fixed costs and commodity charge with variable costs
- No cross subsidies between rate classes
- Regionally and nationally competitive without compromising safety or reliability

**AA Bond Rating**
- Target Change in Net Assets (Net Income)
- Debt Coverage Ratio
- Minimum Cash Reserves & Capital Replacement Funds
- Equity Percentage
Cost-of-Service Analysis

• Step 1: Unbundle Annual Revenue Requirement:
  • Power Supply Demand, Energy, and Generation
  • Distribution Costs (Primary, Secondary)
  • Customer Costs

• Step 2: Develop Cost Allocation Factors:
  • Demand Allocation
  • Energy Allocation
  • Distribution Allocation
  • Customer Allocation

• Step 3: Assign Revenue Requirements
  • Determined Unit Costs of Service
  • Assign Costs to Customer Classes
  • Compare Costs with Revenues
  • Determine Revenue Adjustment
Cost-of-Service Analysis

<table>
<thead>
<tr>
<th>Cost-of-Service Summary</th>
<th>Total System</th>
<th>Residential</th>
<th>Small General Service</th>
<th>Medium General Service</th>
<th>Large General Service</th>
<th>Large Industrial</th>
<th>Lighting</th>
<th>Company Use, No Charge</th>
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</thead>
<tbody>
<tr>
<td>Total</td>
<td>$148,255,454</td>
<td>$55,413,960</td>
<td>$17,551,749</td>
<td>$41,815,031</td>
<td>$13,966,070</td>
<td>$17,470,093</td>
<td>$1,759,583</td>
<td>$278,968</td>
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<tr>
<td>Monthly Cost Per Consumer</td>
<td>$162.52</td>
<td>$90.72</td>
<td>$321.41</td>
<td>$6,706.50</td>
<td>$83,131.37</td>
<td>$727,920.55</td>
<td>$13.82</td>
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<tr>
<td>Average Cost per kWh</td>
<td>$0.1133</td>
<td>$0.1570</td>
<td>$0.1246</td>
<td>$0.1112</td>
<td>$0.1060</td>
<td>$0.1054</td>
<td>$0.2490</td>
<td>$0.1096</td>
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<tr>
<td>Power Supply Costs</td>
<td>$107,495,474</td>
<td>$33,904,503</td>
<td>$12,980,690</td>
<td>$33,502,133</td>
<td>$11,619,428</td>
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<tr>
<td>Monthly Cost Per Consumer</td>
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<td>$55.51</td>
<td>$237.70</td>
<td>$5,737.24</td>
<td>$69,163.26</td>
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<td>Average Cost per kWh</td>
<td>$0.0822</td>
<td>$0.0960</td>
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<tr>
<td>Power Delivery Costs</td>
<td>$7,220,384</td>
<td>$2,172,400</td>
<td>$867,154</td>
<td>$2,312,110</td>
<td>$802,370</td>
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<td>Monthly Cost Per Consumer</td>
<td>$7.92</td>
<td>$3.56</td>
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<td>$44,967.06</td>
<td>$108.76</td>
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<td>Average Cost per kWh</td>
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<td>$0.0062</td>
<td>$0.0062</td>
<td>$0.0062</td>
<td>$0.0061</td>
<td>$0.0062</td>
<td>$0.0062</td>
<td>$0.0062</td>
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<tr>
<td>Distribution Costs</td>
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<td>$7,332,127</td>
<td>$2,568,629</td>
<td>$4,910,011</td>
<td>$1,515,195</td>
<td>$1,872,619</td>
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<td>Monthly Cost Per Consumer</td>
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<td>$12.00</td>
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<tr>
<td>Average Cost per kWh</td>
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<td>$0.0208</td>
<td>$0.0182</td>
<td>$0.0131</td>
<td>$0.0115</td>
<td>$0.0113</td>
<td>$0.0031</td>
<td>$0.0132</td>
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<tr>
<td>Customer Costs</td>
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<td>$12,004,930</td>
<td>$1,135,276</td>
<td>$1,090,778</td>
<td>$29,077</td>
<td>$4,144</td>
<td>$1,018,422</td>
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<tr>
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<td>$19.65</td>
<td>$20.79</td>
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<td>$173.08</td>
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<td>$8.00</td>
<td>$20.98</td>
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<tr>
<td>Average Cost per kWh</td>
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<td>$0.0340</td>
<td>$0.0081</td>
<td>$0.0029</td>
<td>$0.0002</td>
<td>$0.0000</td>
<td>$0.1441</td>
<td>$0.0012</td>
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</table>

Revenue Comparison

| Revenue Requirement | $148,255,454 | $55,413,960 | $17,551,749 | $41,815,031 | $13,966,070 | $17,470,093 | $1,759,583 | $278,968 |
| Revenue from Current Rates | $148,255,453 | $53,611,934 | $19,088,931 | $42,918,520 | $13,309,877 | $17,607,642 | $1,718,549 | $278,968 |
| Difference       | $0            | $1,802.026  | -$1,537,182 | -$1,103,489 | $656,193    | -$137,549    | $41,033    | $278,968 |
| Required Adjustment | 0.0%          | 3.4%        | -8.1%       | -2.6%       | 4.9%        | -0.8%        | 2.4%       | 0.0%     |
| Rev. Requirement - $/kWh | $0.1133      | $0.1570     | $0.1246     | $0.1112     | $0.1060     | $0.1054      | $0.2490    | $0.1096   |
| Rev. from Current Rates | $0.1133      | $0.1519     | $0.1355     | $0.1142     | $0.1010     | $0.1062      | $0.2432    | $0.0000   |
| Difference       | $0.0000       | $0.0051     | ($0.0109)   | ($0.0029)   | $0.0050     | ($0.0008)    | $0.0058    | $0.1096   |
| Required Adjustment | 0.0%          | 3.4%        | -8.1%       | -2.6%       | 4.9%        | -0.8%        | 2.4%       | 0.0%     |

*Cost of Service technical analysis demonstrates that Residential and Large General Service need to increase while Small and Medium General Service should decrease.*
Rate Design Analysis

• No changes to existing rates for 2021
• Residential Time of Use Rates (New)
• LED Street Lighting Rates (New)
• Future rate considerations
Residential TOU Rate

RPU 2019 EV & DSM Studies identified need for Time of Use (TOU) rate for Residential Customers.

TOU rates provide an incentive to customers to shift use to off peak times and save money.

TOU rates are adopted 85% of the time by customers with EV’s for off-peak charging.

This study developed cost of service based TOU rates that equitably benefit RPU, is Residential customers, and EV owners.
Residential TOU Rates and Existing Rates

- Rates are bill neutral over the year based on average Residential usage profile.
- No change in behavior = no change in bill on average.
TOU Rate Demand Response & Savings

Typical RPU Residential Customer
- Price differentials drive demand response
- Critical Peak: On Peak of ~1.7 -> 4.5% shift
- On Peak: Off Peak of ~2.4 -> 7% shift
- Estimated RPU & Customer Savings = $14/year*
  - *Expect behavioral change
  - *Savings are based on customer behavior changes

Typical Electric Vehicle
- Low off-peak rate drives EV charging behavior
- Nearly all EV charging will shift to off-peak
- Estimated RPU & Customer Savings = $196/year
# Residential TOU Rate Summary

## RPU TOU Pilot

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Time Period</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Peak</td>
<td>4pm-8pm</td>
<td>$0.2880</td>
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<tr>
<td>On-Peak</td>
<td>8am-4pm; 8pm-10pm</td>
<td>$0.1713</td>
</tr>
<tr>
<td>Off-Peak</td>
<td>10pm- 8am</td>
<td>$0.0705</td>
</tr>
<tr>
<td>Standard</td>
<td>All Hours</td>
<td>$0.1280</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Time Period</th>
<th>Winter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Peak</td>
<td>4pm-8pm</td>
<td>$0.1391</td>
</tr>
<tr>
<td>On-Peak</td>
<td>8am-4pm; 8pm-10pm</td>
<td>$0.1391</td>
</tr>
<tr>
<td>Off-Peak</td>
<td>10pm- 8am</td>
<td>$0.0706</td>
</tr>
<tr>
<td>Standard</td>
<td>All Hours</td>
<td>$0.1073</td>
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</table>
City Street Lighting Rates

- City is replacing (and funding) unmetered lamp replacement with LEDs
- LED streetlights will use less energy than existing HPS streetlights
- Two sets of streetlight rates required for LED streetlights
  - RPU Owned
  - City Owned
City Street Lighting Rates

• City owned fixtures recovers RPU utility system cost to serve the light.

• RPU owned fixture rates also recover cost for fixture (20 years).

• Need to transition billing systems to a lighting equipment rate and utility charge rate

<table>
<thead>
<tr>
<th>Type</th>
<th>Fixture Ownership</th>
<th>Energy Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED</td>
<td>City Owned Fixture</td>
<td>$0.4165/kWh</td>
</tr>
<tr>
<td>LED</td>
<td>RPU Owned Fixture</td>
<td>$0.5572/kWh</td>
</tr>
</tbody>
</table>
Future Rate Planning Considerations

- **Interruptible Credits & Standby Rates**
  - Working towards adjusting credit value and mechanisms

- **Rate Class Consolidation**
  - Considering freezing and potentially merging some classes

- **Power Cost Adjustment**
  - Recover PCA monthly versus over 12 months

- **Demand Rates**
  - Consider wider use of demand rates for Residential and Small General Use
Discussion And Questions