Drake Decommissioning

John Romero
General Manager, Energy Acquisition Engineering & Planning

Scott Shewey
Interim Chief Planning and Finance Officer

November 17, 2017
Drake Planning Discussion

Agenda

- Board Direction
- Progress to date
- Planned Transmission Projects
- Drake Site Layout
- Decommissioning Scenarios
- Replacement Generation Location
- Solutions Analysis
- Next steps and community engagement
Board Direction

Evaluate decommissioning Drake Power Plant prior to the Board approved EIRP date of 2035

- Evaluate 2025 and 2030
- Evaluate phasing closure Drake unit 6 and unit 7

Evaluate scenarios for replacement generation

- Build generation inside service territory
- Build generation outside service territory
- Combination of inside and outside service territory
Drake Planning Discussion

Progress to Date

May Utilities Board Meeting
- Reviewed the Following Information:
  - Current Operation
  - HDR Study
  - 2016 Electric Integrated Resource Plan (EIRP)
  - 2016 Drake Transmission Study
  - Preliminary Drake Planning Calendar
  - Referred to Strategic Planning Committee

June Strategic Planning Committee Meeting
- Reviewed the Following Information:
  - Planning Topics
    - Minimum time required to close with reliable replacement
  - Community Engagement Plan
  - Options for Planning Approach

July Utilities Board Meeting
- Reviewed the Following Information:
  - Planning Topics
    - Minimum time required to close with reliable replacement
  - Community Engagement Plan
  - Options for Planning Approach
    - Strategic Planning Recommendation
      - Make Drake decision separate from the next EIRP
      - Maintain site for utility use, including generation, substation and other critical infrastructure
      - Study “greening” downtown, such as solar rooftops
Drake Planning Discussion

Progress to Date

July Utilities Board Meeting
- Reviewed the Following Information:
  - Planning Topics
    - Minimum time required to close with reliable replacement
  - Community Engagement Plan
  - Options for Planning Approach
  - Strategic Planning Recommendation
    - Make Drake decision separate from the next EIRP
    - Maintain site for utility use, including generation, substation and other critical infrastructure
  - Utilities Board Input

August Strategic Planning Committee Meeting
- Reviewed the Following Information:
  - Preliminary Scenarios
  - Reviewed Site Map
  - Reviewed Site Operational and Environmental Considerations
  - Reviewed Draft Baseline Survey

September, 2017
- Strategic Planning Committee Meeting
  - Review preliminary scenarios
  - Review Drake site operational and environmental considerations
  - Review research results
- Utilities Board Meeting
  - Review preliminary scenarios
  - Review Drake site operational and environmental considerations
  - Review research results
- Community Engagement
  - Baseline survey fielded
  - Customer education
  - Media outreach with preliminary scenarios
Drake Planning Discussion

Progress to Date

October, 2017
- **Strategic Planning Committee Meeting**
  - Review transmission modeling and resource modeling
  - Discuss high pros and cons
  - Review preliminary renderings
  - Input on narrowed list of scenarios
- **Utilities Board Meeting**
  - Review transmission modeling and resource modeling
  - Discuss high level pros and cons
  - Review preliminary renderings
  - Input on narrowed list of scenarios
- **Community Engagement**
  - Customer education
  - Public meeting including transmission and resource modeling, narrowed list of scenarios and visual renderings

November, 2017
- **Strategic Planning Committee Meeting**
  - Narrowed scenarios
    - Pros & cons
    - Financial implications
    - Costs & risks
    - Operational considerations
    - Renderings of visual aesthetics
- **Utilities Board Meeting**
  - Narrowed scenarios
    - Pros & cons
    - Financial implications
    - Costs & risks
    - Operational considerations
    - Renderings of visual aesthetics
- **Community Engagement**
  - Customer education
  - Telephone town hall
  - Potential survey #2 or focus groups
Drake Planning Discussion

Planned Transmission Projects

- Minimum projects required with or without Drake Decommissioning due to recent changes on the CSU system and neighboring systems
- All planned projects must be completed prior to Drake decommissioning
- Upcoming changes around the system may require project modifications

<table>
<thead>
<tr>
<th>Planned Transmission Projects</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
<th>ROM Total ($M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kelker Transformer</td>
<td>$3.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$34.5</td>
</tr>
<tr>
<td>Cottonwood Transformer</td>
<td>$2.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$34.5</td>
</tr>
<tr>
<td>Series Reactor</td>
<td></td>
<td>$2.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$34.5</td>
</tr>
<tr>
<td>Line Upgrades</td>
<td>$1.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$34.5</td>
</tr>
<tr>
<td>New Midway-Nixon Line*</td>
<td></td>
<td>$1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$34.5</td>
</tr>
<tr>
<td>Transmission System Expansion at Kelker**</td>
<td>$8.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$34.5</td>
</tr>
<tr>
<td>North System Solution**</td>
<td></td>
<td>$8.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$34.5</td>
</tr>
</tbody>
</table>

Estimates Per Year $M

<table>
<thead>
<tr>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.9</td>
<td>6.6</td>
<td>6.3</td>
<td>6.8</td>
<td>3.6</td>
<td>2.4</td>
<td>3.4</td>
<td>2.5</td>
<td>0.1</td>
<td></td>
</tr>
</tbody>
</table>

- * Project scope and cost estimate dependent on the Midway Interconnection request outcome
- ** Project alternatives to be determined and must begin earlier if 2025 Decommission

- Projects are in 5-year Service Plan

NERC Requirements
Reliability, contingency issues
PSCo Operating Procedure ineffective
Drake Planning Discussion

Drake Site Layout

- Existing Drake Units (16-20 acres)
- Potential gas power plant (8-10 acres)
- Historical building & substation (8-10 acres)
- Retention ponds (5 acres)
- Potential solar array (6 acres)

Potential Land Available for Development

<table>
<thead>
<tr>
<th>Generation at Drake</th>
<th>No Generation at Drake</th>
</tr>
</thead>
<tbody>
<tr>
<td>27-31 Acres</td>
<td>35 – 41 Acres</td>
</tr>
</tbody>
</table>
Drake Planning Discussion

Decommissioning Scenarios

Scenario 1 Generation Inside Service Territory
   a) Replacement Generation at Drake and/or Birdsall

Scenario 2 Generation Outside Service Territory (Transmission)
   a) Replacement Generation Outside Service Territory
   b) Import Power

Scenario 3 Combination
   a) Generation inside and outside Service Territory/Import
   b) Distributed Generation with Generation at Drake/Birdsall
   c) Distributed Generation without any generation at Drake/Birdsall

Require building new generation at Drake and/or Birdsall
Should replacement generation be built at the Drake Power Plant location?

<table>
<thead>
<tr>
<th>No Generation at Drake</th>
<th>Generation at Drake</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advantage</strong></td>
<td><strong>Disadvantage</strong></td>
</tr>
<tr>
<td>Downtown aesthetics</td>
<td>Requires additional transmission projects</td>
</tr>
<tr>
<td>Potential for import/export of resources including renewables (RTO)</td>
<td>Potential permitting/siting challenges</td>
</tr>
<tr>
<td>Largest portion of land available for redevelopment</td>
<td></td>
</tr>
<tr>
<td>Potential for less reliance of gas-pipeline constraint</td>
<td></td>
</tr>
<tr>
<td><strong>Advantage</strong></td>
<td><strong>Disadvantage</strong></td>
</tr>
<tr>
<td>No new transmission lines required initially</td>
<td>Downtown aesthetics</td>
</tr>
<tr>
<td>Potentially earliest decommissioning time</td>
<td>Coordination of construction and decommissioning of plant</td>
</tr>
<tr>
<td>Site already used/permitted for generation</td>
<td>Requires continued additions of generation</td>
</tr>
<tr>
<td>Generation close to load</td>
<td>May require back-up fuel</td>
</tr>
<tr>
<td>Some land for redevelopment</td>
<td>Greater potential for constrained gas pipeline</td>
</tr>
</tbody>
</table>
## Drake Planning Discussion

### Generation Solution

**Generation at Drake**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>All 128 MW at Drake</th>
<th>128 MW Generation → 48 MW at Drake</th>
<th>128 MW DG → 16 MW at Drake</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0% ($45M)</td>
<td>0.6% (52M)</td>
<td>1.7% ($124M)</td>
</tr>
<tr>
<td></td>
<td>0.9% ($62M)</td>
<td>1.7% ($123M)</td>
<td>0.2% ($12M)</td>
</tr>
</tbody>
</table>

**No Generation at Drake**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>128 MW Generation Outside Service Territory</th>
<th>128 MW Import</th>
<th>No Generation Birdsall OR Drake Import &amp; DG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.0% ($72M)</td>
<td>2.1% ($147M)</td>
<td>1.3% ($96M)</td>
</tr>
<tr>
<td></td>
<td>0.2% ($14M)</td>
<td>0.7% ($46M)</td>
<td>0.3% ($25M)</td>
</tr>
</tbody>
</table>

### Transmission Solution

**Scenario 1**

- All 128 MW at Drake: 0.0% ($45M)
- 128 MW Generation → 48 MW at Drake: 0.6% ($62M)
- 128 MW DG → 16 MW at Drake: 0.9% ($123M)

**Scenario 3a**

- All 128 MW at Drake: 0.0% ($45M)
- 128 MW Generation → 48 MW at Drake: 0.7% ($52M)
- 128 MW DG → 16 MW at Drake: 1.7% ($124M)

**Scenario 3b**

- All 128 MW at Drake: 0.0% ($45M)
- 128 MW Generation → 48 MW at Drake: 0.2% ($14M)
- 128 MW DG → 16 MW at Drake: 1.7% ($123M)

**Scenario 3c**

- All 128 MW at Drake: 0.0% ($45M)
- 128 MW Generation → 48 MW at Drake: 0.2% ($14M)
- 128 MW DG → 16 MW at Drake: 1.7% ($123M)

### All scenarios 25 year NPVs

- Generation Solution
- Transmission Solution
Drake Planning Discussion

Assumptions

- Costs inflated to year spent
- 5 Yr Plan Rev. Requirement 2023-2035 1% growth
- 0.6% 2019 Energy Vision
- Excludes Scenario 2B Import
- Proprietary Fuel Forecast Current price curves
- Inflation at 1.75%
Drake Planning Discussion

2030 Decommissioning Scenarios

Revenue Requirement ($ Thousands)

- Costs inflated to year spent
- 5 Yr Plan Rev. Requirement 2023-2035 1% growth
- 0.6% 2019 Energy Vision
- Excludes Scenario 2B Import
- Proprietary Fuel Forecast Current price curves
- Inflation at 1.75%
## Drake Planning Discussion

### Additional Cost from Ratepayers for pre-2035 retirement

<table>
<thead>
<tr>
<th>Retirement Scenario</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2025</strong></td>
<td></td>
</tr>
<tr>
<td>Current Fuel</td>
<td>$160M to $260M*</td>
</tr>
<tr>
<td>High Fuel +20%</td>
<td>$680M to $820M*</td>
</tr>
<tr>
<td><strong>2030</strong></td>
<td></td>
</tr>
<tr>
<td>Current Fuel</td>
<td>$120M to $180M**</td>
</tr>
<tr>
<td>High Fuel +20%</td>
<td>$430M to $520M**</td>
</tr>
<tr>
<td><strong>2035</strong>*</td>
<td>$0</td>
</tr>
</tbody>
</table>

* Drake related increases begin 2023  ** Drake related increases begin 2028  
*** Regulatory requirements beyond 2030 are not included in this analysis
Additional Financial Considerations

• Earlier closure decision will require impairment of plant assets (est. $100-$150M)
• Impairment will reduce assets which increases debt ratio by about 2-3% (to between 58-59%)
• No bond defeasement is required
• Alternatives for the nonpotable rate class will need to be evaluated
Drake Planning Discussion

Next Steps

December 2017

- Strategic Planning Committee Meeting
  - Initial Utilities Board Recommendation
- Utilities Board Meeting
  - Initial Utilities Board Decision
- Additional modelling

January/February 2018

- Contingency for Utilities Board decision or additional information and/or outreach
Drake Planning Discussion

Community Engagement

- Education throughout the process
- Public opinion on draft scenarios
  - Quantitative
  - Qualitative
- Outreach to date:
  - Utilities Board meetings
  - Re:Sources Blog
  - Social Media
  - Insight eNewsletter (CSU employees)
  - Smart Home eNewsletter
  - First Source (business audience)
  - Baseline Survey
  - Connection Newsletter
  - Gazette Reporter Background
  - Gazette Articles
  - KRDO Radio Interviews

- Planned Outreach:
  - KRCC
  - KRDO TV
  - State of the Utilities
  - Utilities Board meetings
  - Media Outreach
  - Social Media
  - Potential Focus Groups
  - Newsletters, Employee, Business and Residential
  - Telephone Town Hall
  - In-Person Town Hall
Community Engagement – Town Hall Meetings

- Telephone Town Hall – Wednesday, Nov. 29 from 6:00-7:30 p.m.
- In-Person Town Hall at City Hall – Tuesday, Dec. 5 from 6:00-7:30 PM

- Outreach:
  - Newsletters: Insight, Smart Home, First Source
  - Email: Customers, Stakeholders, Key Accounts, Customers Count Panel
  - Social Channels
  - Media
  - CSU.ORG Website
Questions?