Electric and Gas Integrated Resource Plans

Phase II Public Workshop
January 29, 2020
1. Integrated resource plans (IRPs) and timelines
2. Phase I Review: Approved goals and sensitivities
3. Portfolio Evaluation Attributes
4. Attribute Exercise and Ranking
5. Next steps in process

Written comments may be submitted at the end of the workshop.
Objectives

• Provide update on IRP process
• Learn about your priorities and preferences regarding energy planning
Colorado Springs Utilities Mission & Vision

Mission
Provide safe, reliable, competitively-priced electric, natural gas, water, and wastewater services to the citizens and customers of Colorado Springs Utilities.

Vision
Colorado Springs Utilities is a treasured community partner, well known for responsible and dependable services that are vital to the future of our region.
Energy Vision

Provide resilient, reliable and cost-effective energy that is environmentally sustainable, reduces our carbon footprint and uses proven state-of-the-art technologies to enhance our quality of life for generations to come.
Pillars of the Energy Vision

**ECONOMIC**
Cost-effective and equitable initiatives that drive a strong economy

**ENVIRONMENT**
Sustainable solutions that complement our natural resources

**RESILIENCY**
Reliably withstand and recover from disturbances in a dynamic environment

**INNOVATION**
Proactively and responsibly evolve in a transforming landscape

OUR FOUNDATION IS THE COMMUNITY WE SERVE
Utilities Policy Advisory Committee Assignment

• Evaluate and provide feedback for process plans, modeling assumptions, inputs, targets, evaluation criteria for the 2020 Electric and Gas Integrated Resource Plans (EIRP/GIRP) based on the Energy Vision.

• Oversee public outreach planning, provide feedback on portfolio options, and deliver recommendations to the Utilities Board.

Public Process Oversight

Reference Case, Inputs, Sensitivities, and Goals

- Recommendation to Utilities Board (Sept) and Board approval (Oct)

Portfolio Attributes

- Recommendation to Utilities Board (Feb) and Board approval (Mar)

Portfolio Recommendation with Metrics

- Recommendation to Utilities Board (June) and Board approval (July)
What is an Integrated Resource Plan (IRP)?

Our energy IRPs are a roadmap, combining technical analysis and public input, to meet forecasted electric and natural gas needs of the community using both supply and demand side resources to ensure resilient, reliable and cost-effective energy that is environmentally sustainable.
IRP Process

Rate portfolios based on attributes developed early in the process

Focus in on specific plans to understand the uncertainty and impact of changes in assumptions

Initial results may provide insight to additional sensitivities to be evaluated

What are we trying to accomplish? What are our guiding principles? What are the critical decision points? How will we make a decision? Alternative resources

What is being evaluated and how will it be analyzed? Sensitivities / risk / reference case

It is critical to know the sensitivities to be considered in order to gather the correct inputs

Gather inputs & assumptions

Modeling & analysis

Evaluate results

Risk analysis

Determine course of action

Develop foundation for IRPs

Reference Case, Inputs, Sensitivities, and Goals

Q4 2019

Q3 2020

Portfolio Attributes

Q1 2020

EIRP/GIRP Process

Portfolio Recommendation with Metrics
IRP Goals -- Developing Long-Term Plans that Align with the Energy Vision (slide 1 of 2)

**Resilient and reliable**
- Industry leading reliability and resiliency while avoiding potential stranded assets
- Support economic growth of the region

**Cost-effective energy**
- Maintain competitive and affordable rates
- Further advance energy efficiency and demand response

**Environmentally sustainable**
- Grow renewable portfolio
- Establish timelines for decommissioning of assets
IRP Goals -- Developing Long-Term Plans that Align with the Energy Vision (slide 2 of 2)

Reduces our carbon footprint
  • Meet all environmental regulations with specific metrics that include reducing our carbon footprint
  • Reduce reliance on fossil fuels

Uses proven state-of-the-art technologies
  • Proactively and responsibly integrate new technologies

*to enhance our quality of life for generations to come*
Significance of these IRPs

• Drake, Birdsall and Nixon potential closures evaluated
• Gas and non-potable supply changes
• Environmental/carbon strategies
• Evaluation of battery storage
• Electrification potential
• Electric vehicles and rooftop solar
• Evaluation of market participation
• Distributed generation and military resiliency
• New business model
Phase 1 Summary
# Electric IRP Reference Case

<table>
<thead>
<tr>
<th>Reference Case Assumptions</th>
<th>Methodology (Study period through 2050)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Load Forecast</strong></td>
<td>Utilize Planning and Finance Department’s peak demand and sales forecasts</td>
</tr>
<tr>
<td><strong>Planning Reserve Margin</strong></td>
<td>16.5%. Recommendation from reserve margin study</td>
</tr>
<tr>
<td><strong>Commodity Price Forecast</strong></td>
<td>First 5 years utilizes short-term forward pricing. Fundamental forecast utilized between 2025-2050.</td>
</tr>
<tr>
<td>(Gas, Coal, Energy Market)</td>
<td></td>
</tr>
<tr>
<td><strong>Energy Efficiency</strong></td>
<td>1% annual energy efficiency savings/spend throughout study period. No dispatchable capacity provided beyond what’s included in load forecast.</td>
</tr>
<tr>
<td><strong>Renewables</strong></td>
<td>264 Megawatt (MW) solar and 25 MW battery by 2024. Rooftop solar provides no additional capacity on peak. Integration costs from Xcel Balancing Authority.</td>
</tr>
<tr>
<td><strong>Drake and Birdsall</strong></td>
<td>Retire by 2035; no selective catalytic reduction control</td>
</tr>
<tr>
<td><strong>Nixon</strong></td>
<td>No selective catalytic reduction control (will perform sensitivities around nitrogen oxides [NO_x] controls). Not retired during study period.</td>
</tr>
<tr>
<td><strong>Front Range</strong></td>
<td>No selective catalytic reduction control (will perform sensitivities around NO_x controls). Not retired during study period.</td>
</tr>
<tr>
<td><strong>Hydro</strong></td>
<td>Maintain/extend existing hydro contracts through Western Area Power Administration (WAPA)</td>
</tr>
<tr>
<td><strong>Interruptible Customer Load</strong></td>
<td>Assume 20 MW of interruptible load throughout study period</td>
</tr>
<tr>
<td><strong>Transmission</strong></td>
<td>Full transmission project to import replacement generation for Drake/Birdsall</td>
</tr>
</tbody>
</table>

1. Replacement Generation is Gas Reciprocating Engines  
2. Assumes no generation at Drake or Birdsall sites
EIRP Sensitivities

- High and low load growth
- Low cost energy efficiency
- High demand response potential
- Regional transmission organization/market
- High and low natural gas prices
- Plant decommission dates\(^1\)
- Carbon reduction\(^1\)
- Renewables\(^1\)
- Military resiliency

- Low energy purchases available
- High and low renewables/battery costs
- Carbon price
- High renewable integration costs
- Extension of investment tax credit/production tax credit
- Higher and lower planning reserve margin
- Annexations
- Front Range reliability\(^2\)

1. See subsequent slides
2. Control Upgrades, isolate combustion turbine from steam turbine
# Plant Decommission Sensitivities

<table>
<thead>
<tr>
<th>Plant</th>
<th>Decommissioning Sensitivities</th>
<th>Selective Catalytic Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drake/Birdsall</td>
<td>All units in – 2023, 2025, 2028, 2030</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Birdsall Only 2025</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Drake 6 only 2025</td>
<td></td>
</tr>
<tr>
<td>Nixon 1</td>
<td>2026, 2030, 2035, 2040, 2050</td>
<td>2028</td>
</tr>
<tr>
<td>Front Range</td>
<td>2030, 2040, 2050</td>
<td>2028, 2038</td>
</tr>
</tbody>
</table>

*Drake and Birdsall retired by 2035 in reference case*
Renewables
Sensitivities

100% by 2030
100% by 2040
100% by 2050
100% by 2030 (market purchases available)
100% by 2040 (market purchases available)
100% by 2050 (market purchases available)
30% and 50% by 2030
40% and 60% by 2040
60% and 80% by 2050
100% Carbon Reduction by 2050
90% Carbon Reduction by 2050
Carbon Reduction Sensitivities

50% by 2030, 90% by 2050
50% by 2030, 100% by 2050
50% by 2030, 80% by 2040, 90% by 2050
80% by 2030, 90% by 2050
80% by 2030, 100% by 2050
Gas IRP Reference Case

<table>
<thead>
<tr>
<th>Reference Case Assumptions</th>
<th>Methodology (Study period through 2050)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load Forecast</td>
<td>Utilize Planning and Finance Department’s peak demand and sales forecasts</td>
</tr>
<tr>
<td>Hourly Peak Factor</td>
<td>5.1% based on recent study conducted by gas planning</td>
</tr>
<tr>
<td>Natural Gas Price Forecast</td>
<td>First 5 years utilizes short-term forward pricing. Fundamental forecast utilized between 2025-2050.</td>
</tr>
<tr>
<td>Gas-fired generation</td>
<td>No new local distributing company (LDC) load from gas-fired generation</td>
</tr>
<tr>
<td>Interruptible Customer Load</td>
<td>Assume no change to prior years</td>
</tr>
<tr>
<td>Current Capacity</td>
<td>Assume no changes to current capacity charges (Firm, No Notice Transport (Storage), Propane Air)</td>
</tr>
</tbody>
</table>
GIRP Sensitivities

- High and low load growth
- High and low gas prices
- Firm reservation cost
- Firm and non-firm capacity options
- Higher heat content fuel
- Gas demand side management potential
- Gas-fired generation sensitivities to align with EIRP capacity expansion
- Design criteria alternatives 1-in-10 year event (vs. 1-in-25 year event)
IRP Phase 2
Portfolio Evaluation
Attributes
Attributes

• Criteria necessary for evaluating and comparing portfolios
• Each receive a weighting based on its relative priority compared to other attributes
• Portfolios are scored on how well they reflect the definition of each attribute
• Highest scoring portfolio is presumed to be the best value
Survey Performance

• 1,918 completed surveys
• 1,824 comments reviewed

Quantitative Results
• Residential (n=619)
• Employee (n=350)

Qualitative Results
• Commercial (n=136)
• Open Web Survey (n=813)
Key Findings Overall

• Top four attributes for all segments are Cost, Reliability, Environment and Stewardship
  • Residential - Focused on Cost and Reliability
  • Commercial* - Focused on Cost and Reliability
  • Employee - Focused on Reliability and Cost
  • Open* - Focused on Environment and Cost

*Qualitative Results
IRP Phase II: Portfolio Attributes (Draft 1)

- **Cost**: Cost-effective, maintaining competitive and affordable rates, and the financial health of the utility which drives a strong economy. XX%
- **Diversity**: Balancing multiple types of generators and sources of fuel, including distributed generation, and reducing reliance on fossil fuels. XX%
- **Environment**: Sustainably grow our renewable portfolio, reduce our carbon footprint and meet all environmental regulations. XX%
- **Flexibility**: The ability to modify a strategy to account for regulatory and market disruptions. (e.g. Portfolio can quickly adapt to sudden change in demand.) XX%
- **Innovation**: Proactively and responsibly integrating technologies and programs. XX%
- **Implementation**: Constraints impacting the execution of a portfolio within a desired timeframe. XX%
- **Reliability**: The ability to react to variable or extreme daily operating conditions. (i.e. The lights stay on.) XX%
- **Stewardship**: Responsibly protecting and supporting quality of life now and for the future. XX%

Utilities Policy Advisory Committee
Value Allocation By Attribute – 8

*Qualitative Results

Cost: 26, 26, 19, 18, 12
Diversity: 7, 7, 7, 6, 5
Environment: 7, 6, 6, 5, 5
Flexibility: 7, 7, 7, 9, 8
Implementation: 7, 7, 7, 9, 8
Innovation: 18, 18, 18, 18, 18
Reliability: 21, 19, 21, 9, 9
Stewardship: 10, 10, 18, 9, 9

Residential, Commercial*, Open*, Employee
Phase 2 Attributes (UPAC Recommendation as of January 15, 2020)

- **Cost**: Cost-effective, maintaining competitive and affordable rates, and the financial health of the utility which drives a strong economy while being able to execute the portfolio within a desired timeframe.

- **Environment**: Sustainably grow our renewable portfolio, reduce our carbon footprint, meet all environmental regulations while responsibly protecting and supporting quality of life now and for the future.

- **Flexibility**: The ability to modify a strategy to account for regulatory and market disruptions through balancing multiple types of generators and sources of fuel, including distributed generation, and reducing reliance on fossil fuels.

- **Innovation**: Proactively and responsibly integrating technologies and programs.

- **Reliability**: The ability to react to variable or extreme daily operating conditions. (i.e. The lights stay on.)
Value Allocation By Attribute – 5

*Qualitative Results

Cost & Implementation
- Residential: 33
- Commercial*: 31
- Open*: 29

Environment & Stewardship
- Residential: 28
- Commercial*: 27
- Open*: 22

Flexibility & Diversity
- Residential: 14
- Commercial*: 13
- Open*: 13

Innovation
- Residential: 7
- Commercial*: 7
- Open*: 7
- Employee: 9

Reliability
- Residential: 18
- Commercial*: 21
- Open*: 18
- Employee: 23

Legend:
- Residential
- Commercial*
- Open*
- Employee
## Scoring Example

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>Cost / Implementation</th>
<th>Environment / Stewardship</th>
<th>Diversity / Flexibility</th>
<th>Innovation</th>
<th>Reliability</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolio 1 - Rating</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td>Portfolio 1 - Score</td>
<td>1.32</td>
<td>0.56</td>
<td>0.28</td>
<td>0.21</td>
<td>0.72</td>
<td>3.09</td>
</tr>
<tr>
<td>Portfolio 2 - Rating</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Portfolio 2 - Score</td>
<td>1.32</td>
<td>0.84</td>
<td>0.56</td>
<td>0.14</td>
<td>0.54</td>
<td>3.4</td>
</tr>
<tr>
<td>Portfolio 3 - Rating</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Portfolio 3 - Score</td>
<td>0.66</td>
<td>1.4</td>
<td>0.28</td>
<td>0.28</td>
<td>0.54</td>
<td>3.16</td>
</tr>
</tbody>
</table>
IRP Next Steps
IRP Phase II Public Participation

Utilities Policy Advisory Committee
• February 5 – Finalize attributes and weightings recommendation

Utilities Board
• February 19 – Discuss UPAC's attributes and weightings recommendation
• March 18 – Consider approval of final attributes and weightings

Website: csu.org
Email energyvision@csu.org
IRP Phase III Public Participation

Utilities Policy Advisory Committee
• March 4
• April 1
• May 6
• June 3 – Finalize portfolio recommendations

Utilities Board
• June 17 – Discuss UPAC’s portfolio recommendation
• July 22 – Consider approval of final portfolios

Workshop
• May (TBD) – Business Customer & Public workshops

Website: csu.org

Survey
• April
Email energyvision@csu.org
## Draft Upcoming UPAC Agenda Items

### February 5
- Review IRP Process
- Public Process Update
- Finalize Attribute Weightings
- Draft IRP presentation to the Utilities Board
- Preliminary March UPAC Agenda

### March 4
- Risk analysis report out
- Societal costs
- Sensitivities and Transmission Projects update
- Public outreach update
- Preliminary April UPAC Agenda

### April 1
- 100% renewable portfolio report out
- Portfolio outline and integration of sensitivities
- Application of attributes and weightings
- Joint Dispatch Agreement update
- Renewable Integration
- Public outreach update
- Preliminary May UPAC Agenda

### May 6
- Legislative update
- Draft portfolio report out
- Additional sensitivities based on results
- Public outreach update
- June Utilities Board presentation outline
- Preliminary June UPAC Agenda
Exercise
Evaluation Attribute Exercise

Goal
• Collect public input on prioritization of attributes in potential IRP portfolios

Attribute Stations
• Utilities subject matter experts are at each station to answer questions.

Attribute Rankings
• How do you prioritize this list of attributes?
**Purpose of activity:**
- Collect public input on weight of each attribute by ranking in order of importance.
- Input will be combined with other input to help UPAC make informed recommendation to UB on attribute weighting for portfolios.

- Sign-in sheet
- Workshop agenda
- Activity description and purpose
- Comment cards/box
- FAQ sheets

- Station for each attribute
- Poster with attribute name and definition
- SME at each station to introduce attribute definition and answer questions
- Supporting documents?
- Rotate every 10 minutes?

**Staff needed:**
5 SMEs: David L., Michael, Tommy, Greg, Hisham
3-5 floating facilitators: Christian, Dave, Kerry, Leslie, Tiffany