Important Notice

Some of the information discussed during today’s meeting may be confidential (for business or securities law reasons) or competitive (for anti-trust law reasons). Thus, please treat as confidential and sensitive the information provided by Idaho Power during this meeting, unless and until Idaho Power itself discloses the information publicly.

If you are uncertain whether information is either confidential or competitive, or whether any particular information has been publicly disclosed, please ask. Adhering to this practice helps protect both you and Idaho Power.
IRP Advisory Council Meeting

- Idaho Power Clean Energy Goal
- Aurora Results Update
- Qualitative Risk Assessment
Will the world be similar to the Jetsons by 2045?
Trick Question
What Year Was The Jetsons Set?

2062
What will the energy sector look like in 2045?
World Energy Mix: 2040

Global Cumulative Installed Capacity: 2016

- Coal: 30%
- Gas: 24%
- Oil: 6%
- Nuclear: 5%
- Hydro: 17%
- Onshore Wind: 7%
- Small-Scale PV: 2%
- Utility-Scale PV: 3%

Global Cumulative Installed Capacity: 2040

- Coal: 13%
- Gas: 14%
- Nuclear: 3%
- Hydro: 12%
- Onshore Wind: 14%
- Utility-Scale PV: 22%
- Small-Scale PV: 10%
- Flexible Capacity

Global Cumulative Installed Capacity: 2016

Global Cumulative Installed Capacity: 2040

Source: Bloomberg New Energy Finance

Global Cumulative Installed Capacity: 2016

Global Cumulative Installed Capacity: 2040

Source: Bloomberg New Energy Finance
Our Energy Mix: Today

Hydroelectric 46.4%
Natural Gas 7.5%
Coal 17.5%
Other Purchases 9.3%
Long-Term Purchases 19.3%

About our Long-Term Purchases

Idaho Power is committed to providing customers with a sustainable energy mix through long-term purchases. We purchase electricity from Green Energy Credits (REC) so we get from alternative energy sources which help lower our costs and keep customers informed.

The buyer of the REC will claim the environmental credits for energy. Idaho Power represents the buyers of the produced energy and is being dedicated to our customers. We buy our energy from these alternative sources and we pass along the value to the organizations that buy the RECs from us.

National Average

Natural Gas 19.3%
Hydro 2.5%
Fuel Oil 0.6%
Nuclear 19.3%
Other 0.3%
Biomass 0.8%
Gas Hyd/Wind 10.7%
Other 0.6%
Solar 3.6%

Data Source: U.S. Energy Information Administration
Another Look

Boardman Retired Valmy #1 Retired
Jim Bridger #1 and #2 Retired Oregon
Solar PPAs Jackpot Solar PPA

Valmy #2 Retired
Jim Bridger #3 and #4 Retired

<table>
<thead>
<tr>
<th>Year</th>
<th>Clean Nameplate</th>
<th>Emission Nameplate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>64%</td>
<td>36%</td>
</tr>
<tr>
<td>2020</td>
<td>66%</td>
<td>34%</td>
</tr>
<tr>
<td>2025</td>
<td>74%</td>
<td>26%</td>
</tr>
<tr>
<td>2030</td>
<td>77%</td>
<td>23%</td>
</tr>
<tr>
<td>2035</td>
<td>84%</td>
<td>16%</td>
</tr>
<tr>
<td>2040</td>
<td>85%</td>
<td>15%</td>
</tr>
</tbody>
</table>

*This chart is for illustrative purposes; it does not account for renewable energy credits (RECs). Idaho Power sells the RECs for the benefit of our customers. The buyer of the REC gets to claim the renewable attribute.*
Yet Another Look*

Yet Another Look* and Total Load Chart

2017 = 88%
Total Clean Energy: 12,757,130
Total Load: 14,570,953

2018 = 91%
Total Clean Energy: 13,244,172
Total Load: 14,571,933

*This chart is for illustrative purposes; it does not account for renewable energy credits (RECs). Idaho Power sells the RECs for the benefit of our customers. The buyer of the REC gets to claim the renewable attribute.
Many Customers Want Cleaner Energy

89.6% Support Idaho Power’s clean-energy goal.
How much more are they willing to pay?

5 Percent More  27.7%
10 Percent More  18.9%
20+ Percent More  11.5%
Eliminate carbon emissions by 2050

100% renewable vision

Low to no carbon by 2050
### Emissions Goal

#### Carbon Dioxide (CO₂) Emissions Intensity

<table>
<thead>
<tr>
<th>Year</th>
<th>Emissions Goal (lb/MWh*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>500</td>
</tr>
<tr>
<td>2000</td>
<td>700</td>
</tr>
<tr>
<td>2002</td>
<td>900</td>
</tr>
<tr>
<td>2004</td>
<td>1,100</td>
</tr>
<tr>
<td>2006</td>
<td>1,300</td>
</tr>
<tr>
<td>2008</td>
<td>1,500</td>
</tr>
</tbody>
</table>

*2005 Level: 1,300 lb/MWh*  
*2018 Level: 46% decrease* 

*pounds per megawatt-hour*
Our Goal

Our commitment to serving customers and communities with clean, reliable, affordable energy has been the hallmark of our 100-year history.

As we begin the next century of service, we look to build on that foundation with a new and exciting goal: **100% clean energy by 2045**
How do we get there in the short term?
Glide Path Away From Coal
“It is likely that the energy portfolio selected for 100% Zero Carbon scenario would require dozens of new high-voltage transmission lines.”

– E3 January 2019
Photovoltaic Solar Resource:
Flat Plate Tilted South at Latitude

January

United States - Land-Based and Offshore Annual Average Wind Speed at 100 m

- Projection: Albers Equal Area WGS84
Clean today. Cleaner tomorrow.™

Questions
Agenda

• Portfolio Results

• Risk/Stochastic Results
Portfolio Analysis

- All 24 Portfolios were analyzed under the following scenarios:
  - 4 scenarios for each Optimized Portfolio.

<table>
<thead>
<tr>
<th>Portfolio --</th>
<th>Planning Carbon</th>
<th>High Carbon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning Gas</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>High Gas</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Portfolio Energy/NPV Summary (2019-2038)
Scenario: Planning Gas – Planning Carbon

NPV ($ x 1000)

MWh

<table>
<thead>
<tr>
<th>Portfolio 1</th>
<th>Portfolio 2</th>
<th>Portfolio 3</th>
<th>Portfolio 4</th>
<th>Portfolio 5</th>
<th>Portfolio 6</th>
<th>Portfolio 7</th>
<th>Portfolio 8</th>
<th>Portfolio 9</th>
<th>Portfolio 10</th>
<th>Portfolio 11</th>
<th>Portfolio 12</th>
<th>Portfolio 13</th>
<th>Portfolio 14</th>
<th>Portfolio 15</th>
<th>Portfolio 16</th>
<th>Portfolio 17</th>
<th>Portfolio 18</th>
<th>Portfolio 19</th>
<th>Portfolio 20</th>
<th>Portfolio 21</th>
<th>Portfolio 22</th>
<th>Portfolio 23</th>
<th>Portfolio 24</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZC</td>
<td>PC</td>
<td>GC</td>
<td>HC</td>
<td>ZC</td>
<td>PC</td>
<td>GC</td>
<td>HC</td>
<td>ZC</td>
<td>PC</td>
<td>GC</td>
<td>HC</td>
<td>ZC</td>
<td>PC</td>
<td>GC</td>
<td>HC</td>
<td>ZC</td>
<td>PC</td>
<td>GC</td>
<td>HC</td>
<td>ZC</td>
<td>PC</td>
<td>GC</td>
<td>HC</td>
</tr>
<tr>
<td>PLANNING GAS</td>
<td>MID GAS</td>
<td>HIGH GAS</td>
<td>PLANNING GAS</td>
<td>MID GAS</td>
<td>HIGH GAS</td>
<td>PLANNING GAS</td>
<td>MID GAS</td>
<td>HIGH GAS</td>
<td>PLANNING GAS</td>
<td>MID GAS</td>
<td>HIGH GAS</td>
<td>PLANNING GAS</td>
<td>MID GAS</td>
<td>HIGH GAS</td>
<td>PLANNING GAS</td>
<td>MID GAS</td>
<td>HIGH GAS</td>
<td>PLANNING GAS</td>
<td>MID GAS</td>
<td>HIGH GAS</td>
<td>PLANNING GAS</td>
<td>MID GAS</td>
<td>HIGH GAS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hydro</th>
<th>Coal</th>
<th>Gas</th>
<th>PURPA</th>
<th>New Solar</th>
<th>New Wind</th>
<th>New Storage</th>
<th>Other</th>
<th>DR</th>
<th>Purchases</th>
<th>Sales</th>
<th>Total NPV</th>
<th>Fixed Costs</th>
</tr>
</thead>
</table>

$7,000,000.00
$6,000,000.00
$5,000,000.00
$4,000,000.00
$3,000,000.00
$2,000,000.00
$1,000,000.00
$-          

(25,000,000)
(75,000,000)
CO2 Portfolio Emissions/NPV (2019-2038)
Scenario: Planning Gas – Planning Carbon
Hydro Generation (2019-2038)
Scenario: Planning Gas – Planning Carbon

Lost Generation
Hydro Generation
Regulation Reserves

- Aurora enforces hourly Regulation Reserves rules.
- Aurora relaxes constraint if a Regulation Reserve rule can’t be met.
Total Reserve Shortfall (2019-2038)
Scenario: Planning Gas – Planning Carbon
Note: Standard Deviation of the four Portfolio Scenarios are weighted equally.
Note: Standard Deviation of the four Portfolio Scenarios are weighted equally.
Portfolios were stressed under the following scenarios:

<table>
<thead>
<tr>
<th>Portfolio --</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Gas Prices</td>
<td>X</td>
</tr>
<tr>
<td>Hydro Generation</td>
<td>X</td>
</tr>
<tr>
<td>Demand</td>
<td>X</td>
</tr>
</tbody>
</table>
## Risk/Stochastic Results

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>NPV ($ x 1000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolio 1</td>
<td>$4,500,000</td>
</tr>
<tr>
<td>Portfolio 2</td>
<td>$5,000,000</td>
</tr>
<tr>
<td>Portfolio 3</td>
<td>$5,500,000</td>
</tr>
<tr>
<td>Portfolio 4</td>
<td>$6,000,000</td>
</tr>
<tr>
<td>Portfolio 5</td>
<td>$6,500,000</td>
</tr>
</tbody>
</table>

The diagram shows the NPV distribution for each portfolio, with dots representing the number of outcomes and crosses representing critical points.
Risk/Stochastic Results

- **Lowest NPV**
  - Iteration 8

- **Highest NPV**
  - Iteration 18

**Portfolio NPV ($ x 1000)**

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>NPV ($ x 1000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>2</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>3</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>4</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>5</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>6</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>7</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>8</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>9</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>10</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>11</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>12</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>13</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>14</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>15</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>16</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>17</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>18</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>19</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>20</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>21</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>22</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>23</td>
<td>$4,700,000</td>
</tr>
<tr>
<td>24</td>
<td>$4,700,000</td>
</tr>
</tbody>
</table>
Risk/Stochastic Iteration Comparison

- **Planning Case (2019-2038 Average)**
  - Hydro Generation: 8,644,313 MWh
  - Natural Gas Price: $4.16/MMBtu
  - Demand: 17,791,534 MWh

- **Iteration 8 – Lowest NPV (2019-2038 Average)**
  - Hydro Generation: 9,661,800 MWh
  - Natural Gas Price: $5.90/MMBtu
  - Demand: 16,568,352 MWh

- **Iteration 18 – Highest NPV (2019-2038 Average)**
  - Hydro Generation: 9,094,185 MWh
  - Natural Gas Price: $6.29/MMBtu
  - Demand: 19,333,986 MWh
Risk/Stochastic Iteration 8 - Hydro

- Planning Hydro Generation: 8,644,313 MWh
- Iteration 8 Hydro Generation: 9,661,800 MWh
Risk/Stochastic Iteration 8 – Natural Gas

- Planning Natural Gas Price: $4.16/MMBtu
- Iteration 8 Natural Gas Price: $5.90/MMBtu
Risk/Stochastic Iteration 8 - Demand

- Planning Demand: 17,791,534 MWh
- Iteration 8 Demand: 16,568,352 MWh
Risk/Stochastic Iteration 18 - Hydro

- Planning Hydro Generation: 8,644,313 MWh
- Iteration 18 Hydro Generation: 9,094,185 MWh
Risk/Stochastic Iteration 18 – Natural Gas

- Planning Natural Gas Price: $4.16/MMBtu
- Iteration 18 Natural Gas Price: $6.29/MMBtu
Risk/Stochastic Iteration 18 - Demand

- Planning Demand: 17,791,534 MWh
- Iteration 18 Demand: 19,333,986 MWh
Risk/Stochastic Iteration Comparison

• **Planning Case (2019-2038 Average)**
  – Hydro Generation: 8,644,313 MWh
  – Natural Gas Price: $4.16/MMBtu
  – Demand: 17,791,534 MWh

• **Iteration 8 – Lowest NPV - (2019-2038 Average)**
  ↑ – Hydro Generation: 9,661,800 MWh
  ↑ – Natural Gas Price: $5.90/MMBtu
  ↓ – Demand: 16,568,352 MWh

• **Iteration 18 – Highest NPV - (2019-2038 Average)**
  ↑ – Hydro Generation: 9,094,185 MWh
  ↑ – Natural Gas Price: $6.29/MMBtu
  ↑ – Demand: 19,333,986 MWh
2019 IRP
Qualitative Risk Assessment
Qualitative Risk Assessment
Common Themes

• B2H
• Jim Bridger
  – Unit exit 2022
  – 2-unit exit by 2026
  – 4-unit exit in 2020s
  – Exit unit(s) 2034

• Solar
  – Solar 2022-23
  – Solar >500 MW added capacity

• Wind
  – Wind 600 MW added capacity
  – Wind >600 MW added capacity

• NG CCCT
  – CCCT ≥600 MW added capacity

• Reciprocating engines
• Energy storage/batteries
• Demand response
Qualitative Risks & Benefits

- Fuel supply
- Fuel price
- Wholesale electric market price
- Siting and permitting
- Technological obsolescence
- Jim Bridger NOx compliance alternatives
- Partner
- Federal and state regulatory
- Legislative energy policy
- System regulation (balancing operations)
- Resource off ramps
- Regional transmission initiatives
- Renewable attributes
- Modularity/scalability
- Transmission tariff revenue
- Resource useful life
- Resource potential
• Risks
  – Wholesale electric market price
  – Partner
  – Off ramps
  – Siting and permitting

• Benefits
  – Wholesale electric market price
  – Regional transmission initiatives
  – Technological obsolescence
  – Transmission tariff revenue
Jim Bridger
Early Unit Exit*

• Risks
  – System regulation (balancing operations)
  – Partner
  – NOx compliance alternatives
  – Off ramps

• Benefits
  – Federal and state regulatory
  – Legislative energy policy

*Early unit exit = unit exit 2022, 2-unit exit by 2026, or 4-unit exit in 2020s.
Jim Bridger
Unit Exit 2034

- Risks
  - Partner
  - NOx compliance alternatives
  - Technological obsolescence
  - Federal and state regulatory
  - Legislative energy policy

- Benefits
  - System regulation (balancing operations)
  - Off ramps
Solar
Solar 2022-23 & >500 MW

- Risks
  - System regulation (balancing operations)
  - Siting and permitting

- Benefits
  - Renewable attributes
  - Modularity/scalability
Wind
Wind 600 MW & >600 MW

• Risks
  – System regulation (balancing)
  – Siting and permitting

• Benefits
  – Renewable attributes
Risks
- Technological obsolescence
- Federal and state regulatory
- Legislative energy policy
- Siting and permitting
- Fuel supply
- Fuel price

Benefits
- System regulation (balancing operations)
- Fuel price
Reciprocating Engines

- **Risks**
  - Federal and state regulatory
  - Legislative energy policy
  - Fuel supply
  - Fuel price
  - Siting and permitting

- **Benefits**
  - System regulation (balancing operations)
  - Modularity/scalability
  - Fuel price
Energy Storage/Batteries

- **Risks**
  - Technological obsolescence
  - Resource useful life (i.e., cycle life limitations)

- **Benefits**
  - System regulation (balancing operations)
  - Modularity/scalability
Demand Response

- Risks
  - Resource potential (i.e., finite potential)

- Benefits
  - System regulation (balancing operations) – peaking capacity
  - Modularity/scalability
  - Technological obsolescence
## Portfolios & Common Themes

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>JB 2022 exit</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>JB 2-unit exit by 2026</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>JB 4-unit exit in 2020s</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>JB 2034 exit</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>solar 2022-23</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>solar &gt;500 MW add</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>wind 600 MW add</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>wind &gt;600 MW add</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>CCCT</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>CCCT ≥600 MW add</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>recips</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>batteries &amp; other energy storage demand response</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
## Portfolios 2, 4, 14 and 16

### Table:

<table>
<thead>
<tr>
<th>MW</th>
<th>Portfolio 2 (Planning NG, Planning Carbon)</th>
<th>Portfolio 4 (Planning NG, High Carbon)</th>
<th>MW</th>
<th>Portfolio 14 (Planning NG, Planning Carbon, B2H)</th>
<th>Portfolio 16 (Planning NG, High Carbon, B2H*)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gas</td>
<td>Solar</td>
<td>Battery</td>
<td>DR</td>
<td>Coal Exit</td>
</tr>
<tr>
<td>2019</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2020</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2021</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2022</td>
<td>0</td>
<td>120</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2023</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2024</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2025</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-133</td>
<td>0</td>
</tr>
<tr>
<td>2026</td>
<td>0</td>
<td>111</td>
<td>0</td>
<td>0</td>
<td>111</td>
</tr>
<tr>
<td>2027</td>
<td>0</td>
<td>80</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2028</td>
<td>300</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2029</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2030</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2031</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2032</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2033</td>
<td>300</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2034</td>
<td>0</td>
<td>111</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2035</td>
<td>0</td>
<td>5</td>
<td>100</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>2036</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2037</td>
<td>56</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2038</td>
<td>56</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Nameplate</td>
<td>1,367</td>
<td>380</td>
<td>70</td>
<td>0</td>
<td>-1,026</td>
</tr>
<tr>
<td>Total*</td>
<td>791</td>
<td>1,883</td>
<td>791</td>
<td>1,883</td>
<td>1,883</td>
</tr>
</tbody>
</table>
## Preliminary Preferred Portfolio

<table>
<thead>
<tr>
<th></th>
<th>Portfolio 2</th>
<th>Portfolio 4</th>
<th>Portfolio 14</th>
<th>Portfolio 16</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Portfolio Costs ($ 000s)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning Gas - Planning Carbon</td>
<td>$5,193,822</td>
<td>$5,566,119</td>
<td>$5,140,799</td>
<td>$5,383,582</td>
</tr>
<tr>
<td>High Gas - Planning Carbon</td>
<td>$5,912,498</td>
<td>$6,103,940</td>
<td>$5,967,392</td>
<td>$6,128,204</td>
</tr>
<tr>
<td>Planning Gas - High Carbon</td>
<td>$6,584,945</td>
<td>$6,330,257</td>
<td>$6,833,200</td>
<td>$6,410,119</td>
</tr>
<tr>
<td>High Gas - High Carbon</td>
<td>$7,498,159</td>
<td>$6,897,190</td>
<td>$7,812,743</td>
<td>$7,183,363</td>
</tr>
<tr>
<td><strong>Rank 1-24</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning Gas - Planning Carbon</td>
<td>5</td>
<td>14</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>High Gas - Planning Carbon</td>
<td>6</td>
<td>13</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>Planning Gas - High Carbon</td>
<td>8</td>
<td>1</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>High Gas - High Carbon</td>
<td>11</td>
<td>1</td>
<td>17</td>
<td>6</td>
</tr>
<tr>
<td><strong>Fixed Costs NPV 20 years ($ 000s)</strong></td>
<td>$1,272,478</td>
<td>$2,119,871</td>
<td>$881,082</td>
<td>$1,581,410</td>
</tr>
<tr>
<td>Rank</td>
<td>8</td>
<td>18</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td><strong>Hydro Generation</strong></td>
<td>109,531,659</td>
<td>107,057,545</td>
<td>106,673,012</td>
<td>104,240,663</td>
</tr>
<tr>
<td>% of max (decrement = reserves/spill)</td>
<td>91%</td>
<td>88%</td>
<td>88%</td>
<td>86%</td>
</tr>
<tr>
<td><strong>Purchases</strong></td>
<td>18,039,004</td>
<td>19,577,716</td>
<td>47,895,946</td>
<td>34,676,713</td>
</tr>
<tr>
<td>% of total MWhs</td>
<td>5.1%</td>
<td>5.5%</td>
<td>13.5%</td>
<td>9.7%</td>
</tr>
<tr>
<td><strong>Sales</strong></td>
<td>(22,758,767)</td>
<td>(31,333,868)</td>
<td>(9,602,142)</td>
<td>(16,772,925)</td>
</tr>
<tr>
<td><strong>CO2 Emissions (Resources Only)</strong></td>
<td>71,956,956</td>
<td>46,550,742</td>
<td>59,449,442</td>
<td>41,418,466</td>
</tr>
</tbody>
</table>