2006 Integrated Resource Plan
Public Input Meeting

April 20, 2006
Agenda

Update on IRP Inputs, Assumptions, and Studies

- Climate Change Policy Developments
- CO$_2$ Analysis in the 2006 IRP
- Integrated Gasification Combined Cycle (IGCC) Analysis Update
- Treatment of IGCC in the 2006 IRP
- Long-Term Load Forecast
- Preliminary Load & Resource Balance
- Next Steps
Climate Change Policy Developments

Cathy Woollums
Today’s Discussion

• Policy developments
  – International
  – National
  – Regional

• Considerations for analyzing CO$_2$ impacts for the 2006 IRP
Kyoto Protocol

• Ratified by 155 countries representing 55% of world Greenhouse Gas (GHG) emissions, the Protocol came into force February 2005 upon Russia’s ratification
• Reduce GHG emissions from developed countries by 5.2% from 1990 levels, during 2008-2012
  – Different nations have different targets
• Developing nations not covered by the cap, but can participate though programs such as Clean Development Mechanism (offsets for compliance by developed nations)
• United States did not ratify the Protocol
Kyoto Protocol – European Union and Canada

• EU committed to 8% reduction from 1990 levels by 2012
• Current European Union (EU) emissions trading scheme not fully reflective of what is to come under Kyoto
  – “Flexibility mechanisms” just ready for substantial activity
  – Russia able to sell “hot air” and potentially depress prices from current levels
  – Clearing price on the European Climate Exchange (ECX) at €24-28/ton ($29-34/ton) for 2006-2007
• Canada committed to 6% reduction from 1990 levels by 2012
  – Current levels approximately 25% above 1990
  – $10 billion investment
• New Conservative government in Canada has indicated that Kyoto is potentially “flawed” and that it will re-examine its timetables and compliance plans
Federal Policy

• Numerous Congressional proposals to cap GHGs
• None have passed out of either side of Congress
• Some bipartisan interest in Senate to address GHGs
• Bush Administration and House appear opposed to GHG caps
• Method and cost of GHG reductions, rather than questions over science, are now the key issues in Washington
Congressional Proposals

- **Bush Clear Skies**
  - Would limit NOx, SOx and Hg emissions but not CO₂
  - Stuck in Senate Environmental and Public Works Committee on tied vote
- **Bingaman (National Commission on Energy Policy)**—Not yet proposed; under development
  - Based on recommendation of bipartisan National Commission on Energy Policy
  - Limits intensity (tons/MWh) and have a cost cap of $7/ton escalated at 5% annually
  - Has earned potential support of Senate Energy Chair Domenici
- **McCain Lieberman**
  - Would limit 2010 emissions to 2000 levels
  - Made it out of Committee to Senate Floor
- **Carper**
  - 2005 levels in 2008; 2001 levels in 2012
  - Introduced into Committee but did not go to markup
- **Jeffords**
  - 1990 levels in 2007
  - Introduced into Committee but did not go to markup
Regional/State Efforts — Regional Greenhouse Gas Initiative

- To cover 7 states: Maine, New Hampshire, Vermont, Connecticut, New York, Delaware and New Jersey
  - Massachusetts and Rhode Island have pulled out for now
  - Maryland might join via legislation

- “Smokestack” cap on emissions
  - Caps emissions from plants greater than 25 MW located within states
  - Annual emissions in 2009-2014 capped at 1990 levels
  - Annual emissions in 2015-2018 must drop 10% further
  - Penalty: loss of 3 times the deficit in allowances for next compliance period, plus possible state-specific fines

- Draft “model rule” released recently for comment; for adoption by states via administrative rulemakings
Regional/State Efforts — Regional Greenhouse Gas Initiative

- Cost capped at $10/ton in 2009 with 2% escalator annually
  - Cost of CO$_2$ must remain at cost cap level for a year to trigger cost cap
  - Cost cap in turn triggers more flexibility for regulated entities (more time, more tools)

- 75% of allowances to be granted to emitters; remainder to be managed to benefit consumers (e.g., sales to emitters to raise funds)
Regional/State Efforts — Regional Greenhouse Gas Initiative

• Limited reliance on offsets
  – 3.3% of total reported emissions during a period
  – Limit is raised if cost cap is triggered
  – Specific “direct reduction” offsets permitted (e.g., methane capture, afforestation, oil-fired boiler efficiency)

• 0.3% - 3.2% increase in retail rates in 2015

• Concern about “leakage” of supply to other states not covered by the cap
Regional/State Efforts —
California Load-Based Cap

• In February, CPUC issued decision to apply a “load-based” cap to IOUs and other types of load-serving entities
  – Unlike RGGI “smokestack” approach, California would place requirements on all power consumed by Californians, whether located in or out of California
    • Attempt to address “leakage” problem that RGGI might face
  – Does not cover municipals, though proposed legislation would
• Many details are not yet resolved and await further proceedings
• If fully implemented, it could affect generation across the West if such generation is used to serve California
California Load-Based Cap — Known Design Elements*

- Emissions allowances will be based on “tons of CO₂ equivalent”, and over time will include all six major GHGs
- Cap will include provisions for lowering GHG emissions over time relative to a baseline
- Baseline will be established on a historical year basis, with 1990 as the preference year
- Emissions allowances to be allocated administratively
- Preference for allowing alternative compliance payments, as well as sales of excess allowances for shareholder profit

* Slide content courtesy of Julie Fitch, CPUC
California Load-Based Cap—Outstanding Issues*

- Establishment of baseline and cap
  - 1990 Baseline per Kyoto and the Governor’s Targets
  - Adjustment and true-up
- Reporting standards and requirements
  - Verification, tracking, and enforcement
  - Emissions factors
  - Inclusion of long-term non-specific source contracts and short-term/spot purchases
- Administrative allocation of allowances
  - Historically-based allocation
  - Partial auction?
- Flexible compliance mechanisms (offsets, trading, banking, penalties, etc.)

* Slide content courtesy of Julie Fitch, CPUC
Regional/State Efforts - California
GHG Performance Standard

- Would require IOU energy contracts and owned plant to meet GHG emissions levels of a combined-cycle natural gas turbine for all long-term procurement activities (over 3 years)
- Would essentially require coal-fired generation serving CA load to be coal gasification (IGCC) with sequestration
- State anticipates coordinating GHG performance standard with implementation of the load-based cap and other measures such as the CO$_2$ adder
- CPUC proceedings on details to follow
  - Not enough detail to estimate cost/benefit impacts
Regional/State Efforts - Oregon

• 1997 Oregon siting law requires offsetting CO₂ emissions when they rise above a level equal to an 18% reduction from a CCCT
  – Currently set at 85 cents/ton

• Governor Kulongoski convened an Advisory Group to identify additional measures

• A taskforce is examining GHG limits for power and gas sectors
CO₂ Analysis in the 2006 IRP

Greg Duvall
2004 Adder Compared to Federal Proposals and RGGI

CO2 Values: 2010-2025

- Bush
- Carper
- Jeffords
- McCain
- NCEP
- RGGI
- 2004 Adder
Historic Approach to CO$_2$ Risk Assessment in the IRP

- From the early 1990s, the company’s Integrated Resource Plan has included analysis of CO$_2$ risk, using $0, $10, $25, and $40/ton in its scenario analyses.

- In the 2003 and 2004 Integrated Resource Plan, the company included an inflation-adjusted CO$_2$ adder of $8.00/ton (2008$)

- This value was determined by the company, and was intended to represent a reasonable carbon tax future given considerable uncertainty concerning future costs.
Assessment of CO₂ Risk in the 2006 IRP

• A review of the current federal, regional and state initiatives on CO₂ continues to imply significant uncertainty over the future cost impacts of CO₂ emissions on customers
• Given this uncertainty, the company will use a range of CO₂ values to assess cost sensitivity and risk
  – The Washington Utilities and Transmission Commission, in their 2004 IRP acknowledgement order, also requested a cost impact analysis of early CO₂ adder adoption assuming that regulations come much later than expected, or not at all
• PacifiCorp intends to continue using the $8.00/ton adder value as a base case assumption
• In addition, the company will compare the relative CO₂ emission rates of each portfolio. Combined with their respective Present Value Revenue Requirement (PVRR) values, the value of CO₂ required to switch portfolio will be determined
IGCC Analysis Update

Ernie Wessman / Ian Andrews
Baseline Proxy IGCC Assumptions

- EPRI “Coal Fleet” User Design Basis Specification (UDBS) used as Reference Case:
  - Spare gasifier assumed to achieve 90% capacity factor (except for Shell gasifier)
  - UDBS Design 2 Standard (Selective Catalytic Reduction assumed for additional NOx removal & deeper sulfur removal)
  - Wet cooling
  - Natural gas available for startup and backup

- “Reference Plant IGCC” 2x1 configuration using GE 7FB gas turbines.

- Standard provisions for “Carbon Capture Ready” - Design includes space for additional equipment, balance of plant, & site access to install carbon capture equipment at a later date. Carbon capture capability to be evaluated as an incremental cost to base case for evaluation purposes.

- Financial Assumptions:
  - 10 Yr Modified Accelerated Cost Recovery System (MACRS) depreciation for Gasification Equipment, and 20 Yr MACRS for Power Island
  - Typical assumptions (Company weighted average cost of capital, 40-year economic life, ad-valorem taxes, etc)

- Results from recent Worley-Parsons (WP) study to be used to develop lowest cost IGCC at proxy PacifiCorp brownfield sites (Jim Bridger & Hunter). WP study results adjusted to include Owner’s costs & contracting assumptions not included in the consultant analysis.
Accuracy of results are estimated to be +/- 15-20% depending on the study and source. Worley-Parsons has indicated that cost estimates are +/- 30%. Point values should be viewed as a mid-point of a range of values.
Estimated Coal-based Resource Costs of Energy (Excludes Transmission) - Preliminary

Wyoming IGCC Premium = 22.0%
Utah IGCC Premium = 17.8%

Accuracy of results are estimated to be +/- 15-20% depending on the study and source. Worley-Parsons has indicated that cost estimates are +/- 30%. Point values should be viewed as a mid-point of a range of values.
WP Expanded Study Summary Conclusions to date

- Based on preliminary evaluation, the results indicate that there is a substantial spread (15-25%) between supercritical, coal-fired options and IGCC depending on location, gasifier technology, coal type, assuming target availability levels are achieved.

- Accuracy of current results are estimated to be +/- 15-20% depending on the study and source. Worley-Parsons has indicated that cost estimates are +/- 30%. Point values should be viewed as a mid-point of a range of values.

- IGCC resources located in SW Wyoming are expected to be lower cost than Utah-based IGCC resources

- Gasifier technology has an impact on Cost of Energy

- Additional effort will focus on evaluating ITC/financing benefits, spare gasifier tradeoff, CO₂ capture & sequestration, Engineer, Procure, & Construct cost & “wraps,” turbine type, etc. Results will be provided to the IGCC Working Group.
Treatment of IGCC in the 2006 IRP

Peter Warnken
Major Analysis and Modeling Steps

• Specifying IGCC proxy resources
• Evaluate IGCC proxy resources for inclusion in candidate portfolios on a comparable basis with other supply and demand-side resources using the Capacity Expansion Model (CEM)
• Use scenario analysis to evaluate tradeoffs between IGCC and other types of resources
• Update IRP analyses with information from IGCC Working Group if significant new information becomes available and time permits
Specifying IGCC Proxy Resources

- Develop a manageable number of IGCC proxy resources (< 5) that capture key distinguishing cost, benefit, and risk characteristics of IGCC vs. comparable alternatives

- Potential technology configuration assumptions
  - Availability: single gasifier vs. two gasifiers
  - Carbon-capture-ready/sequestration design

- Potential financial incentive assumptions
  - ITC availability
  - Loan guarantees

- Address technology risks & uncertainty of cost estimates

- Use WorleyParsons Expanded Study and EPRI Technical Assessment Guide (TAG®) “reference plant” information to develop IRP resource costs and characteristics
Candidate Resource Evaluation

- Evaluate IGCC proxy resources for inclusion in candidate portfolios on a comparable basis with other supply and demand-side resources using the Capacity Expansion Model (CEM)
  - Use specified IGCC proxy resources
  - Determine earliest, realistic IGCC in-service dates based on current assessment of technology maturity, procurement, and permitting timelines and associated risks
  - Conduct portfolio optimization studies using scenarios that reflect alternative futures; portfolio selection will be based on relative cost performance of portfolio resources across the range of modeled futures
  - Include the impact of capital cost uncertainty in the risk assessment; i.e., incorporate distributions of potential capital costs in the PVRR analysis
  - For coal resource evaluation, include both subcritical and supercritical pulverized coal along with IGCC

- Perform detailed deterministic and stochastic simulations of candidate resource portfolios using the Planning and Risk (PaR) model; candidate portfolios will consist of screened resources from the CEM optimization studies
Scenario Analysis

- Use scenario analysis to evaluate tradeoffs between IGCC and other types of resources
  - Start with Preferred Portfolio resources
  - Replace a large baseload proxy plant in the Preferred Portfolio with the IGCC proxy plant
  - Proxy IGCC resource includes carbon capture and sequestration cost estimates
  - Determine the stochastic Present Value Revenue Requirement (PVRR) impact relative to the Preferred Portfolio using the Planning and Risk (PaR) model
  - Use the difference in PVRR between these two portfolios to evaluate the tradeoffs between IGCC and the resource it replaced in this scenario analysis
Analysis Updates

• Update IRP analyses with information from IGCC Working Group if significant new information becomes available and time permits
  – The IRP Team will be informed by the IGCC Working Group and other sources on progress with respect to the IGCC parameters
  – To the extent that favorable developments with respect to IGCC procurement are significant enough to justify a resource portfolio modeling study—and can be accommodated in the overall planning process and schedules—the IRP Team can conduct a CEM evaluation of the Preferred Portfolio with an updated IGCC resource
    • Purpose is to determine if there is an impact on procurement decisions with respect to Preferred Portfolio resources (i.e., amount, type, and timing)
    • As part of the overall information-sharing effort, would be used to inform the IGCC Working Group on IGCC status as a viable future resource for PacifiCorp
Long-Term Load Forecast
Highlighting 2007-2017

Reed Davis
### National Economic Outlook

Global Insights Macro Forecast of February 2005

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<tbody>
<tr>
<td>GDP</td>
<td>+++</td>
<td>+++</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td>Employment</td>
<td>+</td>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Population</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

- GDP growth is lower in the forecast horizon than for the last 10 years
  - Slower population growth (especially in the working age population) will lead to slower employment growth.
  - Slightly lower productivity growth.
- Annual productivity growth at 2.2% per year
- Slower growth of the Housing stock
- Unemployment gradually reaches 4.8%

Legend:
- 0 to 1.5: +
- 1.5 to 3.0: ++
- 3.0 to 4.5: +++
- > 4.5: ++++
Regional Gross State Product Growth

The red value is the growth rate from 1994 – 2004. The blue value is the annual growth rate from 2004 – 2017.

Legend

<table>
<thead>
<tr>
<th>Growth Rate</th>
<th>Color</th>
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<tbody>
<tr>
<td>0 to 1.5</td>
<td>+</td>
</tr>
<tr>
<td>1.5 to 3.0</td>
<td>++</td>
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<tr>
<td>3.0 to 4.5</td>
<td>+++</td>
</tr>
<tr>
<td>&gt; 4.5</td>
<td>++++</td>
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• Pacific and Mountain Regions
  • Grow faster than national average
  • Grow as fast or faster than other regions
### Total Sales Forecast Summary

#### Average Annual Growth Rates

<table>
<thead>
<tr>
<th>Energy (GWh)</th>
<th>1994 to 04</th>
<th>2005 to 17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Company</td>
<td>1.38 %</td>
<td>2.41 %</td>
</tr>
<tr>
<td>Residential</td>
<td>1.95 %</td>
<td>2.20 %</td>
</tr>
<tr>
<td>Commercial</td>
<td>3.43 %</td>
<td>3.12 %</td>
</tr>
<tr>
<td>Industrial</td>
<td>-0.20 %</td>
<td>2.09 %</td>
</tr>
<tr>
<td>Utah</td>
<td>3.17 %</td>
<td>3.31 %</td>
</tr>
<tr>
<td>Oregon</td>
<td>0.00 %</td>
<td>1.19 %</td>
</tr>
<tr>
<td>Wyoming</td>
<td>0.30 %</td>
<td>3.06 %</td>
</tr>
<tr>
<td>Washington</td>
<td>0.90 %</td>
<td>1.01 %</td>
</tr>
<tr>
<td>Idaho</td>
<td>0.97 %</td>
<td>1.43 %</td>
</tr>
<tr>
<td>California</td>
<td>0.98 %</td>
<td>1.40 %</td>
</tr>
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</table>

- The eastern portion of the system continues to lead the growth in the service territory
- Wyoming growth significantly changes due to oil & gas activity
- Commercial growth lower than historical levels
- Decline in many industries or loss of large customers is not expected to continue
State Sales Forecasts
# Oregon Sales Summary

<table>
<thead>
<tr>
<th></th>
<th>Actual 2005</th>
<th>Forecast 2017</th>
<th>Average Annual Growth Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2005</td>
<td>2017</td>
<td>1994 to 04</td>
</tr>
<tr>
<td><strong>Residential</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Energy (GWh)</td>
<td>5,374</td>
<td>6,203</td>
<td>0.86 %</td>
</tr>
<tr>
<td>Customers (Thousands)</td>
<td>447</td>
<td>513</td>
<td>1.39 %</td>
</tr>
<tr>
<td>Use per Customer (kWh)</td>
<td>12,016</td>
<td>12,100</td>
<td>-0.53 %</td>
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<tr>
<td><strong>Commercial</strong></td>
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<tr>
<td>Energy (GWh)</td>
<td>4,614</td>
<td>5,547</td>
<td>2.52 %</td>
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<tr>
<td>Customers (Thousands)</td>
<td>72</td>
<td>87</td>
<td>2.08 %</td>
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<tr>
<td>Use per Customer (kWh)</td>
<td>63,920</td>
<td>63,880</td>
<td>0.44 %</td>
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<tr>
<td><strong>Industrial</strong></td>
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</tr>
<tr>
<td>Energy (GWh)</td>
<td>2,957</td>
<td>3,146</td>
<td>-3.78 %</td>
</tr>
</tbody>
</table>
Oregon Items of Note

Residential
• Saturations are declining where there is a preference for gas
• Cooling is increasing as real income increases, real prices decrease, square footage grows and high expectations for AC among those migrating into the state

Commercial
• Growth expected in professional and information services employment leading to growth in Offices and Retail businesses
• Office Equipment is growing through Offices, Health Services, and Retail businesses

Industrial
• Increased sales to specialty foods manufactures and exports
• Other sectors (e.g., metals and glass) have strong economic outlooks in Oregon and the Nation
• Lumber & Wood Sector helped by a small number for lumber firms finding growing niche markets
• Large drop in Paper Products in past due to loss of Ft James and Pope & Talbot at Halsey
# Utah Sales Summary

<table>
<thead>
<tr>
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<th>Actual 2017</th>
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<tr>
<td><strong>Residential</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Energy (GWh)</td>
<td>5,707</td>
<td>8,518</td>
<td>3.89 %</td>
<td>3.39 %</td>
<td></td>
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<tr>
<td>Customers (Thousands)</td>
<td>646</td>
<td>870</td>
<td>2.88 %</td>
<td>2.51 %</td>
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<tr>
<td>Use per Customer (kWh)</td>
<td>8,916</td>
<td>9,793</td>
<td>1.01 %</td>
<td>0.88 %</td>
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<tr>
<td><strong>Commercial</strong></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Energy (GWh)</td>
<td>6,775</td>
<td>11,224</td>
<td>4.82 %</td>
<td>4.30 %</td>
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</tr>
<tr>
<td>Customers (Thousands)</td>
<td>70</td>
<td>101</td>
<td>3.99 %</td>
<td>3.09 %</td>
<td></td>
</tr>
<tr>
<td>Use per Customer (kWh)</td>
<td>97,011</td>
<td>111,571</td>
<td>0.79 %</td>
<td>1.17 %</td>
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</tr>
<tr>
<td><strong>Industrial</strong></td>
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<tr>
<td>Energy (GWh)</td>
<td>6,944</td>
<td>9,169</td>
<td>1.56 %</td>
<td>2.34 %</td>
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</tbody>
</table>
Utah Items of Note

Residential
- Utah customer growth driven mainly by household formation, with some net immigration
- Use per customer mainly driven by increasing incomes and house square footage
- Air conditioning continues its steady increase, led by central A/C, as income rises and consumer preferences change

Commercial
- Higher residential customer growth in the state creates a stable higher growth rate
- Healthy growth in the office and health sectors

Industrial
- Without new additional companies, load growth rate nearly equal to historical
- Micron – expected to grow to 50 MW into 2007
- Oil & Gas growth expected by Kerr McGee near Vernal
Central Air Conditioning continues to penetrate into the Residential class
Customer moving into the state have a preference for Central Air Conditioning
We expect to see a continuation of this trend in the coming years as well as additional customers choosing to Air Condition
## Wyoming Sales Summary

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</tr>
<tr>
<td>Energy (GWh)</td>
<td>939</td>
<td>1,190</td>
<td>1.25 %</td>
<td>2.00 %</td>
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<tr>
<td>Customers (Thousands)</td>
<td>101</td>
<td>114</td>
<td>0.70 %</td>
<td>0.99 %</td>
</tr>
<tr>
<td>Use per Customer (kWh)</td>
<td>9,279</td>
<td>10,455</td>
<td>0.55 %</td>
<td>1.00 %</td>
</tr>
<tr>
<td><strong>Commercial</strong></td>
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</tr>
<tr>
<td>Energy (GWh)</td>
<td>1,290</td>
<td>1,928</td>
<td>2.60 %</td>
<td>3.41 %</td>
</tr>
<tr>
<td>Customers (Thousands)</td>
<td>22</td>
<td>25</td>
<td>1.50 %</td>
<td>1.12 %</td>
</tr>
<tr>
<td>Use per Customer (kWh)</td>
<td>59,847</td>
<td>78,239</td>
<td>1.10 %</td>
<td>2.26 %</td>
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<tr>
<td><strong>Industrial</strong></td>
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</tr>
<tr>
<td>Energy (GWh)</td>
<td>5,756</td>
<td>8,348</td>
<td>-0.28 %</td>
<td>3.15 %</td>
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</tbody>
</table>
Wyoming Items of Note

Residential
- PacifiCorp’s Wyoming customer growth is faster than the state population growth because of decreasing persons per household
- Use per customer is driven by increasing per capita income growth giving bigger home sizes and appliance levels
- Energy sales are driven by customer growth and increasing use per customer

Commercial
- Higher residential customer growth will drive more commercial growth
- Additionally increasing growth in the office, schools, and health sectors

Industrial
- Sales are dominated by the petroleum and natural gas production industries. Forecasted to be the fastest growing sector.
- Approximately 280 MW over next five years of new growth in the petroleum and natural gas sector is included
Eastern Wyoming – New Large Oil & Gas Forecast
Western Wyoming – New Large Oil & Gas Forecast

The graph shows the increase in MW from January 2006 to July 2011, with a significant rise starting in March 2009.
## Idaho Sales Summary

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<tr>
<td><strong>Residential</strong></td>
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<tr>
<td>Energy (GWh)</td>
<td>652</td>
<td>878</td>
<td>-0.22 %</td>
</tr>
<tr>
<td>Customers (Thousands)</td>
<td>51</td>
<td>57</td>
<td>2.25 %</td>
</tr>
<tr>
<td>Use per Customer (kWh)</td>
<td>12,710</td>
<td>15,320</td>
<td>-2.47 %</td>
</tr>
<tr>
<td><strong>Commercial</strong></td>
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<tr>
<td>Energy (GWh)</td>
<td>382</td>
<td>622</td>
<td>5.11 %</td>
</tr>
<tr>
<td>Customers (Thousands)</td>
<td>7</td>
<td>9</td>
<td>2.98 %</td>
</tr>
<tr>
<td>Use per Customer (kWh)</td>
<td>61,643</td>
<td>68,697</td>
<td>2.13 %</td>
</tr>
<tr>
<td><strong>Industrial</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy (GWh)</td>
<td>1,650</td>
<td>1,722</td>
<td>0.82 %</td>
</tr>
</tbody>
</table>
Idaho Items of Note

Residential
- Idaho customer growth driven by household formation and net migration
- Use per customer is driven by increasing home size which is driven by per capita income growth and relatively high number of people per household.

Commercial
- Higher residential customer growth will drive more commercial growth
- Additionally increasing growth through in the office, schools, and health sectors
- Increase in the Rexburg area from growing university

Industrial
- Industrial sales dominated by few sectors:
  - Chemical and Allied Products – 92% of Sales
  - Food & Kindred Products – 5% of Sales
- Little growth in these two sectors
<table>
<thead>
<tr>
<th></th>
<th>Actual 2005</th>
<th>Forecast 2017</th>
<th>Average Annual Growth Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy (GWh)</td>
<td>1,587</td>
<td>1,792</td>
<td>0.86 %</td>
</tr>
<tr>
<td>Customers (Thousands)</td>
<td>99</td>
<td>112</td>
<td>0.56 %</td>
</tr>
<tr>
<td>Use per Customer (kWh)</td>
<td>15,982</td>
<td>15,984</td>
<td>0.30 %</td>
</tr>
<tr>
<td>Commercial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy (GWh)</td>
<td>1,345</td>
<td>1,657</td>
<td>1.45 %</td>
</tr>
<tr>
<td>Customers (Thousands)</td>
<td>17</td>
<td>20</td>
<td>1.71 %</td>
</tr>
<tr>
<td>Use per Customer (kWh)</td>
<td>84,722</td>
<td>83,754</td>
<td>-0.26 %</td>
</tr>
<tr>
<td>Industrial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy (GWh)</td>
<td>1,054</td>
<td>1,170</td>
<td>0.68 %</td>
</tr>
</tbody>
</table>
Washington Items of Note

Residential
• Energy sales are driven by customer growth
• Use per customer remains flat. Increases from larger house sizes and rising real income offset by increasing natural gas penetration and increasing efficiencies

Commercial
• Increasing growth in the office, schools, and health sectors

Industrial
• Port of Walla Walla Refrigerated Rail Project helps Agriculture
• Housing will continue to influence Lumber and Wood Products
## California Sales Summary

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Forecast</th>
<th>Average Annual Growth Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2005</td>
<td>2017</td>
<td>1994 to 04</td>
</tr>
<tr>
<td><strong>Residential</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy (GWh)</td>
<td>391</td>
<td>443</td>
<td>0.69 %</td>
</tr>
<tr>
<td>Customers (Thousands)</td>
<td>35</td>
<td>40</td>
<td>0.56 %</td>
</tr>
<tr>
<td>Use per Customer (kWh)</td>
<td>11,359</td>
<td>10,974</td>
<td>0.13 %</td>
</tr>
<tr>
<td><strong>Commercial</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy (GWh)</td>
<td>290</td>
<td>382</td>
<td>2.27 %</td>
</tr>
<tr>
<td>Customers (Thousands)</td>
<td>7</td>
<td>9</td>
<td>1.25 %</td>
</tr>
<tr>
<td>Use per Customer (kWh)</td>
<td>39,205</td>
<td>44,673</td>
<td>1.02 %</td>
</tr>
<tr>
<td><strong>Industrial</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy (GWh)</td>
<td>64</td>
<td>74</td>
<td>-2.33 %</td>
</tr>
</tbody>
</table>
California Items of Note

Residential
• Customer growth driven by steady birth rate and in-migration.
• Use per customer decreasing due to natural gas penetrations

Commercial
• Use per customer showing extra increase from restaurants and lodging increases

Industrial
• Sales to California industrial customers dominated by the lumber and wood products production. This sector has been declining; expect growth in future as niche marketing expands.
System Peak Demand
## Coincidental Peak Demand by State

### State Historical and Forecasted Growth Rates

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Weather Adjusted Summer Peak Demand</th>
<th>Summer Peak Demand</th>
<th>Weather Adjusted Load</th>
<th>Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>1.0%</td>
<td>0.8%</td>
<td>0.7%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Idaho</td>
<td>0.3%</td>
<td>2.6%</td>
<td>0.2%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Oregon</td>
<td>(0.2%)</td>
<td>0.8%</td>
<td>(0.4%)</td>
<td>1.2%</td>
</tr>
<tr>
<td>Utah</td>
<td>4.0%</td>
<td>4.3%</td>
<td>3.1%</td>
<td>3.3%</td>
</tr>
<tr>
<td>West Wyoming</td>
<td>(5.2%)</td>
<td>4.1%</td>
<td>(5.4%)</td>
<td>4.1%</td>
</tr>
<tr>
<td>Washington</td>
<td>1.0%</td>
<td>0.9%</td>
<td>0.9%</td>
<td>1.3%</td>
</tr>
<tr>
<td>East Wyoming</td>
<td>(0.2%)</td>
<td>2.9%</td>
<td>(0.2%)</td>
<td>2.8%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1.6%</strong></td>
<td><strong>2.9%</strong></td>
<td><strong>0.9%</strong></td>
<td><strong>2.4%</strong></td>
</tr>
</tbody>
</table>

- Utah’s gain reflects increased central air conditioning primarily in residential and continued commercial air conditioning.
- California, Washington and Oregon increase in peak demand is less than energy increase which reflects continued energy efficiency.
- Idaho summer peak demand increase reflects irrigation (low year in 2005; high year in 2017).
- Wyoming growth reflects increased industrial activity.
Preliminary Load & Resource Balance

Mark Klein
Preliminary L&R Assumptions

• Includes:
  – 15% planning reserve margin
  – All contracts that exist as of 4/1/2006
  – Blundell geothermal upgrades
  – Cove Fort geothermal plant
  – Path C upgrade
  – Expiring Qualifying Facilities and Interruptibles extended until the end of study period

• Does not include:
  – Renewal of the TransAlta agreement
  – Renewal of the BPA Peaking contract
  – West Valley extension
Preliminary L&R Assumptions cont.

• Definitions
  – Peak Obligation = Retail Load + Wholesale Sales
  – Planning Margin = (Peak Obligation – Firm Purchases) * 15%
  – Existing Resources = Thermal + Hydro + Dispatchable Load Control + Renewable + Purchases + Qualifying Facilities + Interruptible
System Capacity Chart: 2004 IRP Update L&R

![System Capacity Chart](chart.png)

- **Peak Obligation + Planning Margin**
- **Resource Deficit**
- **Planned Resources**
- **Existing Resources**

MW

System Capacity Chart: Preliminary 2006 L&R

- **Existing Resources**
- **Resource Deficit**
- **Peak Obligation + Planning Margin**
- **Planned Resources**
System Capacity Chart: Preliminary 2006 L&R
Excluding Planned Resources*

* Planned Resources consist of Front Office Transactions and 1,300 MW Wind Commitment
Preliminary Observations: L&R without Planned Resources

• Resource deficit starts at 328 MW in 2008
  – Termination of West Valley option
  – Expiration of TransAlta purchase
  – Increased load of 419 MW from 2007 to 2008 (4.5% growth)

• Deficit increases to 2,255 MW in 2012
  – Expiration of BPA Peaking contract
  – Reduction of Mid-Columbia contracts
  – Increased load of 1,189 MW from 2007 to 2012 (2.4% ave. annual growth)

• Deficit increases to 3,259 MW in 2016
  – Increased load of 2,077 MW from 2007 to 2016 (2.2% ave. annual growth)
PacifiCorp’s Position on Addressing Capacity Needs for the 2006 IRP

• This is the company's Integrated Resource Plan, and we are taking full responsibility in putting forward the appropriate least cost/risk balanced plan for our customers

• We are seeking and want public input; but in the end the company has the responsibility for delivering the right plan for all of our customers

• The company needs to determine whether continued reliance on long term Front Office Transactions is in the best interests of our customers

• Therefore ALL transactions will be evaluated on a comparable least cost/risk balanced approach
Next Steps

Peter Warnken
Next Steps

• IRP Meeting Schedule
  – May 10\textsuperscript{th} – Currently Scheduled
  – June 7\textsuperscript{th} – New Date
  – July 19\textsuperscript{th} – Currently Scheduled
  – October 17\textsuperscript{th} – Currently Scheduled