

# Boardman to Hemingway Transmission Line Project

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Purpose and Need Meeting Summary  
South Advisory Area  
July 8, 2009

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Four Rivers Cultural Center  
676 SW 5th Avenue  
Ontario, OR 97914

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## INTRODUCTION

Idaho Power is committed to partnering with communities to identify proposed and alternate routes for the Boardman to Hemingway Transmission Line Project. Following public scoping meetings held in October 2008, Idaho Power initiated a process to engage communities—from Boardman, Oregon, to Melba, Idaho—in siting the proposed transmission line. This process is called the Community Advisory Process (CAP). Idaho Power will conduct a comprehensive and inclusive public process to locate proposed and alternate routes for the Boardman to Hemingway Transmission Line Project.

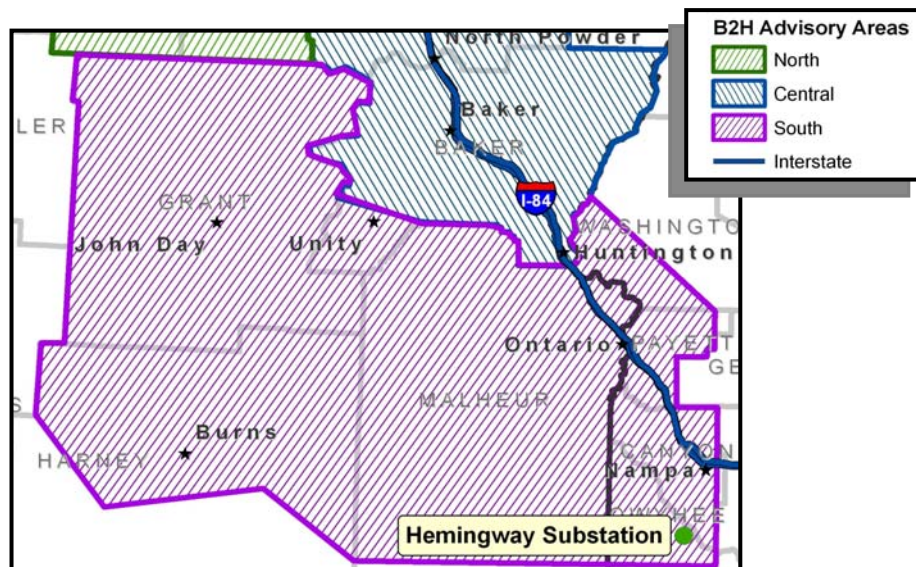
As a part of the Community Advisory Process, a Project Advisory Team (PAT) has been formed in each of the three geographic project areas: North, Central and South. During the first South Project Advisory Team meeting, team members expressed concern about the purpose and need of the proposed transmission line. To address this concern Idaho Power hosted an informal meeting. The purpose of this meeting was to:

- Present information about the background, purpose and need of the Boardman to Hemingway Transmission Line Project.
- Answer questions and discuss concerns with Project Advisory Team members.

Presenters:

- Dave Angell – Idaho Power, Manager of Delivery Planning
- Mark Stokes – Idaho Power, Manager of Power Supply Planning

**This document summarizes the South Purpose and Need meeting held in Ontario, Oregon, on July 8, 2009, from 10 AM to 12 PM. This summary is not intended to be a stand-alone source of information about the purpose and need for the project. The information discussed in this meeting that is outlined in this summary was very technical and in-depth. For more information please contact Kent McCarthy at Idaho Power, [kmccarthy@idahopower.com](mailto:kmccarthy@idahopower.com), (208) 388-6525.**



## **WELCOME AND BACKGROUND**

Kent McCarthy, Idaho Power, Community Advisory Process project leader, welcomed participants and asked all team members to introduce themselves. Kent also introduced the day's speakers

- Dave Angell, Idaho Power, Manager of Delivery Planning
- Mark Stokes, Idaho Power, Manager of Power Supply Planning.

An agenda and sign-in sheet are included in Appendix 1.

Dave Angell provided the following definitions and background information:

### Energy

- ◆ Defined as the wattage moved over time
- ◆ Metered as a kilowatt hour (kWh) for individual homes and a megawatt hour (MWh) for the service area

### Demand

- ◆ How much energy is needed
- ◆ Also called load

### Capacity

- ◆ Measured instantaneously as a watt, kilowatt (kW) or megawatt (MW)
- ◆ 1,000 watts = 1 kW
- ◆ 1,000,000 watts = 1 MW

### Electrical Flow

- ◆ Electricity flows from a higher to lower potential but can only travel one direction at a time on a set of transmission lines.
- ◆ Energy is bought and sold between utilities in the Western Electricity Coordinating Council.

### Hells Canyon Complex (HCC)

- ◆ Brownlee, Oxbow, and Hells Canyon dams comprise the HCC.
- ◆ The nameplate capacity (maximum rated output) of the HCC is 1,167 MW.
- ◆ Brownlee Dam is operated to follow changes in customer demand or load (water is stored in the reservoir and released as needed to help meet short-term, unexpected peak-load requirements).
- ◆ All three hydropower facilities operate under licenses issued by the Federal Energy Regulatory Commission that contain minimum flow and ramping rate restrictions and spring flood control requirements. Ramping rate restrictions are limits placed on river level changes below a dam and are typically expressed in feet per hour.

- ◆ Snow pack is directly correlated to total energy production because the amount of water available determines how much electricity can be generated at a hydroelectric project.

## Discussion

Based on questions from meeting attendees, Idaho Power provided the following information:

- Electricity can't be stored. That is, it must be converted to another energy form to store it. Some dams are able to store water, but wind can't be stored and excess power produced by wind facilities must be used as it is generated.
- As more wind power is added to its portfolio, Idaho Power will need additional reserves (other generators that can be increased or decreased to keep the system balanced). Peaking generators in Mountain Home work well as operating reserves but take 30 minutes to get up and running.
- Idaho Power has nearly 200 MW of wind nameplate capacity online. Another 150 MW will be online early next year and approximately 100 MW of other development is under consideration. Idaho Power is also evaluating proposals to buy up to an additional 150 MW of wind generation.
- Idaho Power is following energy storage technology research. Batteries, fly wheels and compressed air technologies all look promising but are not yet economical.
- If storage options were available, Idaho Power could add more wind generation to its portfolio. However, energy would still need to be transferred between regions since the wind does not blow consistently—capacity factors for wind resources in the Northwest (i.e., the percentage of time the resource is generating energy) vary from 30 to 45 percent.
- Idaho Power has analyzed pump storage projects (pumping water up into a reservoir at night and generating electricity with the same water during the daytime), but downstream flow requirements may prevent this option and the price differential between peak and off-peak (i.e., the difference between the price of energy during the day versus during the night) has not made this option economical.
- Idaho Power has purchased approximately 1 cfs of additional water rights for the Langley Gulch project. After flowing through the plant, the water will not be pumped back into the river but will be injected back into the ground.

## PENDING LEGISLATION

Mark Stokes distributed a summary of active federal renewable electricity legislation (Appendix 2). The bill (HR 2454) contains both carbon cap and trade and renewable energy requirements. Idaho Power has shares in coal generation facilities and predicts future coal generation will need to be reduced. However, changes to HR 2454 are expected in the Senate since many senators are from states that rely heavily on coal generation. The bill also requires a certain percentage of energy to be from renewable resources—from approximately 3 percent in 2012 to 20 percent in 2020.

Although existing hydropower generation can be subtracted from the sales base used to calculate the percentage of renewable resources required, Idaho Power would still need an increasing amount of renewable resources in its portfolio.

## Discussion

Based on questions from meeting attendees, Idaho Power provided the following information:

- Renewable energy certificates (RECs) or green tags can be purchased, but only a limited number of carbon allowances will be available and that number will diminish over time.
- The website [www.green-e.org](http://www.green-e.org) explains green tags or RECs.
- Generators sell RECs independently of energy.
- One MWh equals one green tag. A complex system is in place to track the green tags to make sure none are double counted.
- Selling, buying, and using green tags will be heavily monitored and regulated.
- HR 2454 would not supersede Oregon’s renewable portfolio standard. The federal legislation would likely set a minimum national renewable portfolio standard requirement.

## INTEGRATED RESOURCE PLAN

Stokes provided an update on the Integrated Resource Plan (IRP) (Appendix 3). The presentation of the Integrated Resource Plan included information about cost comparisons for transmission line options and supply-side resource options.

The Idaho Public Utilities Commission (IPUC) and Oregon Public Utilities Commission require utilities to each file an IRP, which has four goals:

1. Identify sufficient resources to reliably serve the growing demand for energy within Idaho Power’s service area throughout the 20-year planning period.
2. Give equal and balanced treatment to both supply- and demand-side resources.
3. Ensure the portfolio of selected resources balances cost, risk, and environmental concerns.
4. Involve the public in the planning process in a meaningful way.

Idaho Power met the last goal by forming the IRP Advisory Council, which represents a broad range of customer, governmental, environmental, and regulatory interests. The IRP Advisory Council typically meets monthly during the IRP process, which takes approximately one year to complete.

### ***Cost Comparisons - Transmission Line Options***

In 2004, the IPUC recommended Idaho Power expand its analysis of possible transmission projects, associated costs, and potential risks in the 2006 IRP. Stokes displayed the 30-year nominal levelized cost of production estimates for 14 different transmission line options. The estimates were based on the following:

- Baseload capacity factors—61%

- Peaking capacity factors—4%
- Capital costs
- Fixed operating costs

Levelized costs are useful tools since certain resource alternatives carry low fixed costs and high operating costs while other alternatives require significantly higher capital investment and subsequent fixed operating costs but have very low variable operating costs. The levelized cost of production measurement represents the estimated annual cost per MWh for a resource based on some expected level of energy output.

As shown in Table 1 below, the B2H transmission line fell in the middle of the cost range for this analysis.

**Table 1. Comparing 30-year nominal levelized cost for transmission lines considered in the IRP**

	<b>Least Expensive Line (\$/MWh)</b>	<b>Most Expensive Line (\$/MWh)</b>	<b>B2H Line (\$/MWh)</b>
Baseload	65	82	72
Peaking Service	130	410	275

### ***Cost comparisons - Supply-Side Resource Options***

Stokes provided a comparison of the 30-year levelized costs between two supply-side resource alternatives—a new combined-cycle combustion turbine (CCCT) and a new single-cycle combustion turbine (SCCT)—with the new B2H line. SCCTs are designed and operated to meet peak loads and have a lower capital cost than CCCTs.

The B2H line capital costs (per kW) are much lower than the capital costs for a new CCCT; however, the 30-year levelized costs (per MWh) are nearly identical. Although the levelized costs are similar, another CCCT would put Idaho Power at greater risk if natural gas prices, which have historically been very volatile, increase. In addition, Idaho Power must diversify their portfolio to avoid overdependence on one particular resource.

When using capacity factor to compare levelized costs between the B2H line, a new CCCT, and a new SCCT, the percentage of time a resource is used greatly affects its levelized cost (Table 2). The import capacity of the B2H line used in this analysis is 850 MW.

**Table 2. Levelized cost comparison between the B2H line, a new CCCT, and a new SCCT**

<b>Capacity Factor (%)</b>	<b>B2H Line (\$/MWh)</b>	<b>CCCT (\$/MWh)</b>	<b>SCCT (\$/MWh)</b>
6	250	400	250
26	150	170	170
65	125	125	125

## **Discussion**

Based on questions from meeting attendees, Idaho Power provided the following information:

- Idaho Power can buy electricity from generators on the east side of its system, but the market to the east is less liquid because there are fewer parties to transact with. This typically results in paying higher prices when compared to the Pacific Northwest market.
- The percentage of energy lost during transmission is included in the cost estimates.
- An economic consultant developed some of the information used to prepare the sales and load forecast.
- Only load service requests that have paid to develop transmission interconnections or have energy contracts were included in the load forecast. Many other requests have been made, but these are not counted on in the load forecast until they become more certain.

## **LOAD AND RESOURCE BALANCE**

The IRP is based on a 20-year load forecast. The following are used to calculate energy and peak-hour surpluses and deficits:

- Sales and load forecast
- Existing demand-side management program performance
- Generation from existing resources
- Reserve requirement
- Transmission import capability

DSM programs help manage energy and peak-hour demand by reducing load and include demand response and energy efficiency programs.

Stokes distributed the following calculations for 2015, the year the B2H line will come online:

- Average energy load and resource balance
- Peak-hour load and resource balance

The calculations must be viewed knowing the following:

- Even with Langley Gulch and the B2H line, July and August still have monthly average energy deficits.
- Under peak conditions, the month of July still has a peak-hour deficit.
- Some of the purchase agreements listed on the spreadsheet show no values because they are only short-term measures being used until Langley Gulch comes online.
- Firm transmission agreements are agreements that carry guaranteed rights for Idaho Power to transmit energy on another company's lines, while non-firm transmission agreements are not and should not be used when planning resources.
- Energy from gas peakers (SCCTs) is not included in the average energy page of the load and resource balance since estimating how much they will run is difficult.

Idaho Power recently updated its load forecast to reflect downsizing of large commercial users, but actual load was within 29 MW of the forecasted load. A new forecast will be complete in August 2009 for the latest IRP.

## **Discussion**

Based on questions from meeting attendees, Idaho Power provided the following information:

- Hydropower generation decreases in the summer months as the spring runoff is usually over by mid-June.
- Many assumptions are included in these forecasts, but the forecasts are based on as much science as possible.
- The nameplate capacity for Langley Gulch is 300 MW, which is the maximum expected output from the plant. This value is used in the load and resource balance for peak-hour planning. Because Langley Gulch will not be running at full output all hours of all days, 251 MW is used to estimate the average monthly output for the average energy section of the load and resource balance.
- Without the B2H line and Langley Gulch, peak-hour deficits will increase by 525 MW (225 MW + 300 MW) and average monthly energy deficits will increase by 476 MW (225 MW + 251 MW).
- Market purchases are being used to compensate for existing deficits. However, during the summer months Idaho Power must import some of this energy on “non-firm” transmission, which means it is at risk of being curtailed.
- For the peak-hour load and resource balance, Idaho Power assumes 90<sup>th</sup> percentile water conditions for estimating hydro generation (1 year out of every 10 years would have lower flows), increased Langley Gulch and gas peakers to full capacity, and decreased wind to a 5 percent capacity factor to account for the variable and intermittent nature of wind.
- Independent solar studies indicate solar power production is declining during times of peak load (4–8 p.m.). Storage technologies will help with this issue, but the leveled cost of solar resources is still prohibitive.
- In the IRP, Idaho Power cannot plan on storage technologies for the near term that are not already commercially available.
- The B2H line is not likely to become obsolete, even if storage technologies advance.
- A nuclear plant in Idaho would affect the market price of power, but Idaho Power cannot depend entirely on one resource and must maintain a diversified portfolio.
- The B2H line will improve system reliability, particularly if a generation resource goes offline.
- Idaho Power representatives acknowledged that constructing the B2H line will increase rates but could not provide specific amounts; however, they noted Idaho Power is trying to keep rates affordable.
- Market prices fluctuate seasonally and are generally low during spring runoff due to the amount of hydropower in the Pacific Northwest. Power prices are at a premium during high

load periods like summer afternoons. Because of the large number of wind turbines being installed in the Pacific Northwest, there have been times when the spot market prices for electricity have been negative. Wind project developers are receiving a production tax credit for every MWh they produce, so at times it is financially better for them to pay someone to take their power so they can still collect the tax credit.

- In establishing new rate allocations, consideration is given to who is causing the need for new resources.
- Irrigation rates have been subsidized for years. Idaho Power has been working to get these rates aligned with current costs.
- Idaho Power invited everyone to attend the mapping sessions and propose routes for everyone to consider.

## **NORTHERN TIER TRANSMISSION GROUP**

In 1992, an energy policy act geared toward deregulating the energy industry was introduced. Pacific Northwest utilities have been working towards deregulation for several years but have been unable to reach an agreement because rates are different (cost shifting). Therefore, regional planning became the best alternative and the Northern Tier Transmission Group was assembled to help plan an efficient transmission system for the region.

### **Discussion**

Based on questions from meeting attendees, Idaho Power provided the following information:

- At this time, Idaho Power is the only entity paying for the B2H line process.
- Transmission rates are based on a collective rate.
- If Idaho Power had chosen to build a 230 kV line, the entire cost would have been paid for by Idaho Power customers. If Idaho Power builds a 500 kV line, others could use it, which would offset Idaho Power's costs. Costs would decrease even more once transmitting power the other direction was included.
- The Oregon Public Utilities Commission will review the 2009 IRP when making their decision regarding need.
- If need in Oregon and Idaho diminishes, Idaho Power still has 3rd party requests from others that need the B2H line, so Idaho Power has an obligation to build it.

## **ENERGY LOSSES**

The net import capacity for the B2H line will be 850 MW and the export capacity will exceed 1,400 MW if the Gateway West line is also built. When energy flows on a transmission line, some energy is lost as heat. To illustrate losses on a 500 kV, 300 mile transmission line, Angell displayed a spreadsheet of peak demand on July 16, 2005. By 3 p.m., Idaho Power was importing power and using 91 percent of the capacity of the existing transmission line. Let's assume that 91 percent of the rating of the B2H line, nearly 1,200 MW, is flowing into Idaho Power, the losses will equal 2.67 percent.

- A recent commercial by IBM claimed 50 percent of energy is lost. McCarthy studied the commercial transcripts and believes those calculations were based on losses along the entire system from the oil fields to the consumer.
- Transmission and distribution losses are approximately 10 percent; the majority of losses occur at the distribution level due to lower voltages.
- Increasing the size of the conductor can decrease losses to less than 1 percent.
- The current northwest interconnected power system (with 1,200 MW of import capability to Idaho) losses are 1,940 MW. If the B2H line is added, losses would drop by 86 MW—the system would be more efficient with this line. Running the system at 2,050 MW, with the B2H line, reduces losses significantly.
- Since 1 MW serves 650 homes, saving 86 MW per year is substantial.
- The B2H line will provide a more efficient transmission path compared to the existing transmission lines. Therefore, the addition of the B2H line will reduce power flow on the existing lines, which also reduces losses resulting in the northwest loss reduction of 86 MW.
- Short term, the B2H line would have more capacity than Idaho Power would use. However, future load growth could absorb any additional capacity not taken by 3rd parties.
- Commercial growth, which also brings in new jobs, can significantly increase energy demand. Idaho's energy rates are some of the lowest in the nation and extremely competitive.
- Power could be shipped on the B2H line from Wyoming to Portland, Oregon, in the winter.
- The HCC provided a surplus of energy for a long time, but demand growth has used it all up. The addition of new resources has become a “just in time” activity due to the high cost of acquiring new resources.

## **CONCLUSION**

The purpose of the B2H line is to serve the needs of Idaho Power's customers, particularly during peak loads, and to fulfill Idaho Power's obligation to transmit energy for third parties while maintaining a reliable system.

## APPENDIX 1—AGENDA AND ATTENDEES



### **Boardman to Hemingway Project**

#### **Purpose and Need Meeting**

Wednesday, July 8, 2009 • 10 a.m. to 12 p.m.

Four Rivers Cultural Center

676 SW 5<sup>th</sup> Ave. • Ontario, OR 97914

## AGENDA

### **Meeting objectives:**

- Present information about the background, purpose and need of the Boardman to Hemingway Project
- Answer questions and discuss concerns with PAT members

<b>Presenters:</b>	<b>Dave Angell – Idaho Power, Manager of Delivery Planning</b>
	<b>Mark Stokes – Idaho Power, Manager of Power Supply Planning</b>

**South Purpose and Need Meeting  
Wednesday July 8, 2009  
10 a.m. – 12 p.m.  
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1. Jessica Lindley
2. Mary Mejia
3. Betty Lee Clarich
4. John Beal
5. Pat Trenkel
6. Evelyn Sayers
7. Gary Pearson
8. Roger Findley
9. Jean Findley
10. Mike Pollard
11. Patty Kennington
12. Clinton Kennington
13. Steven Rule
14. Dennis Heaps

Staff:

Dave Angell – Idaho Power  
Mark Stokes – Idaho Power  
Kent McCarthy – Idaho Power  
Kara Veit – RBCI  
Amanda Edge – RBCI  
Nicole Pearson – Peak Science  
Jessica – RBCI

## APPENDIX 2—PENDING LEGISLATION

### Active Federal Renewable Electricity Standard (RES) Legislation As of June 8, 2009

Policy Design Element	H.R. 2454	Majority RES Draft Text
Sponsor	Waxman (D-MA) & Markey (D-MA)	Bingaman (D-NM)
Chamber	House	Senate
Summary	20% by 2020	15% by 2021
Status	In committee (introduced May 2009)	In committee (introduced May 2009)
Treatment of Existing Hydro	Excluded from the sales base used to calculate	Excluded from the sales base used to calculate
Required Annual Percentage	2012 - 6% 2013 - 6% 2014 - 9.5% 2015 - 9.5% 2016 - 13% 2017 - 13% 2018 - 16.5% 2019 - 16.5% 2020 - 20% 2021-2039 - 20%	2011 - 3% 2014 - 6% 2017 - 9% 2019 - 12% 2021 - 15%
Resources Eligible to Meet RES	Wind, solar, geothermal, renewable biomass, biogas and biofuels derived exclusively from renewable biomass, marine and hydrokinetic and qualified hydropower (efficiency improvements or capacity additions).	Wind, solar, geothermal, ocean, biomass, landfill gas, incremental hydropower (efficiency improvements or capacity additions), hydrokinetic and new hydropower at existing dams with no generation.
Qualifying Date for Resources Eligible to Meet RES	Qualified hydropower (placed in service on or after January 1, 1992), no qualifying date for other eligible resources.	Incremental hydropower (placed in service on or after January 1, 2001), other eligible resources (placed in service on or after January 1, 2006).
Shelf life of federal RECs	Unlimited banking of RECs	3 years from date of issuance of the REC.
Alternative Compliance	\$25/MWh (inflation adjusted).	\$21.10/MWh (inflation adjusted) if the electric utility does not elect to petition the Secretary to waive the requirement.
Non-Compliance Penalty	\$50/MWh (inflation adjusted) or twice the Alternative Compliance payment.	200% of the value of the alternative compliance payment (adjusted for inflation)
Use of funds from Alternative Compliance Payments and Penalties	Paid directly to state in which electric supplier is located to be used for deploying renewable technologies and cost-effective energy efficiency measures and programs.	State grants for development of renewable resources or to offset increases in customers bills.
Energy Efficiency	Utilities can meet up to 25% of their requirements through energy efficiency savings: customer facility savings, reductions in distribution system losses, combined heat and power (CHP) savings and fuel cell savings. Governor can petition FERC to increase the energy efficiency savings proportion to not more than 40%.	Utilities can meet up to 26.67% of their requirements through energy efficiency savings: customer facility savings, electricity savings, recycled energy combined heat and power (CHP).
Cost Recovery	Not Addressed	Not Addressed
Exemption from RES	Electric utilities with less than 4 million MWh of retail sales.	Electric utilities with less than 4 million MWh of retail sales and the State of Hawaii.
Power Sales Contracts	If not addressed in the contract, RECs belong to the supplier.	Not Addressed
Coordination with State Policies	States can have higher standards.	States can have higher standards.
Renewable Generation Facilities	Not Addressed	Double RECs
Distributed Generation Facility	Triple RECs (generation < 2 MW)	Triple RECs (generation < 1 MW)
Mixed Renewable Resource (ex. combined solar and gas plant)	RECs based upon portion attributable to the renewable energy resource.	Not Addressed
Waiver from Compliance	Not Addressed	Secretary may waive requirements for 5 years because of natural disasters or acts of god.

## **APPENDIX 3—POWERPOINT PRESENTATION**



## **Integrated Resource Planning (IRP)**

In the early 1990s, the Idaho and Oregon public utilities commissions began requiring utilities to file an Integrated Resource Plan (IRP).

IRP Goals:

- Identify sufficient resources to reliably serve the growing demand for energy within Idaho Power’s service area throughout the 20-year planning period
- Give equal and balanced treatment to both supply-side resources and demand-side measures
- Ensure the portfolio of selected resources balances cost, risk, and environmental concerns
- Involve the public in the planning process in a meaningful way



## **IRP Advisory Council Offers Opportunity for Public Input**

- Beginning with the 2004 IRP, Idaho Power formed the Integrated Resource Plan Advisory Council (IRPAC) to increase public participation in the planning process
- IRP Advisory Council members represent a broad range of customer, governmental, environmental and regulatory interests
- The IRP Advisory Council meets monthly during the preparation of the IRP

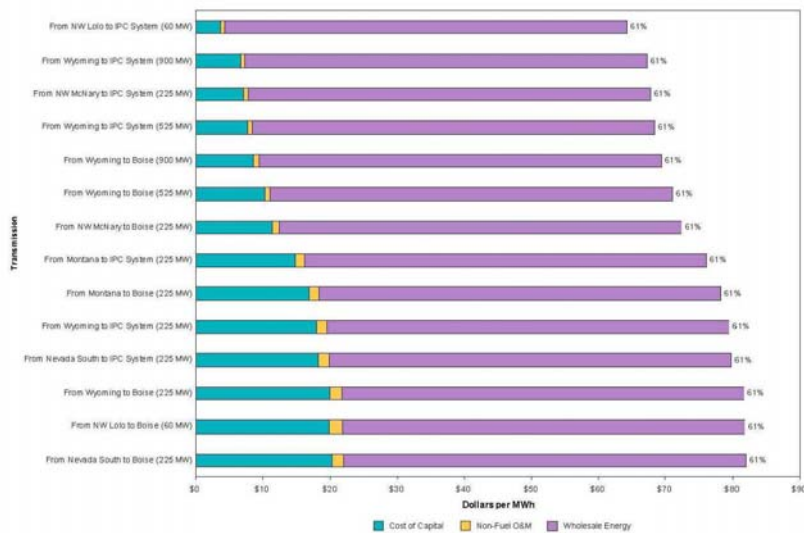


## B2H History in IRP

- In its acceptance of Idaho Power’s 2004 IRP, the Idaho PUC asked Idaho Power to evaluate additional transmission options in the 2006 IRP
- Transmission options analyzed in the 2006 IRP included:
  - McNary to Boise
  - Lolo to Oxbow
  - Wyoming to Boise
  - Montana to Boise
  - Nevada to Boise

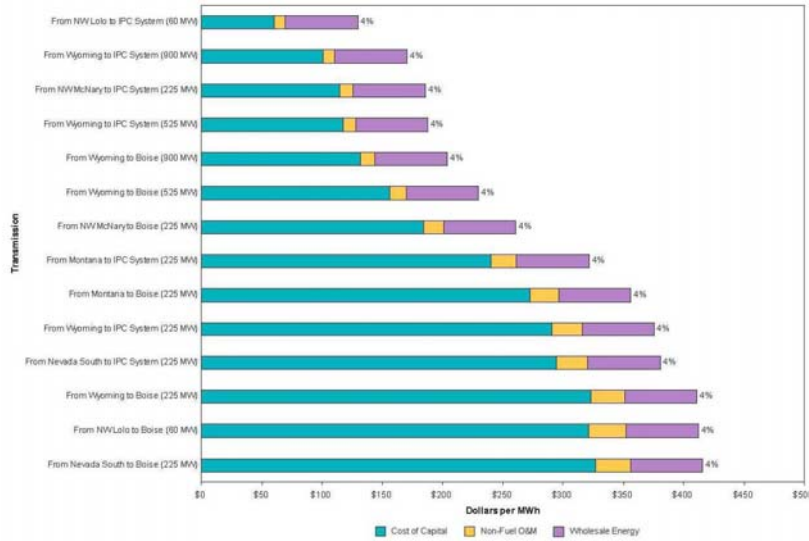


## Levelized Cost (Baseload)





### Levelized Cost (Peaking Service)



### IRP Cost Comparisons

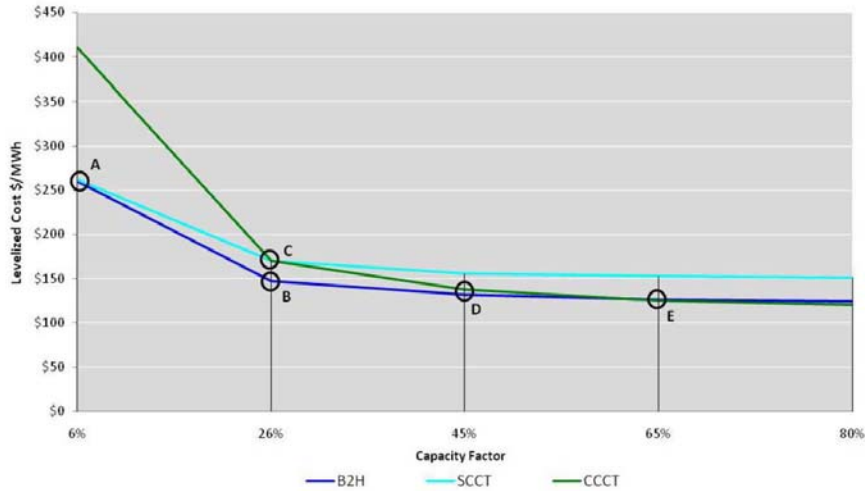
Capital Cost (\$/kW)	2006 IRP	2009 IRP
CCCT	\$693	\$1,293
B2H	\$546	\$706

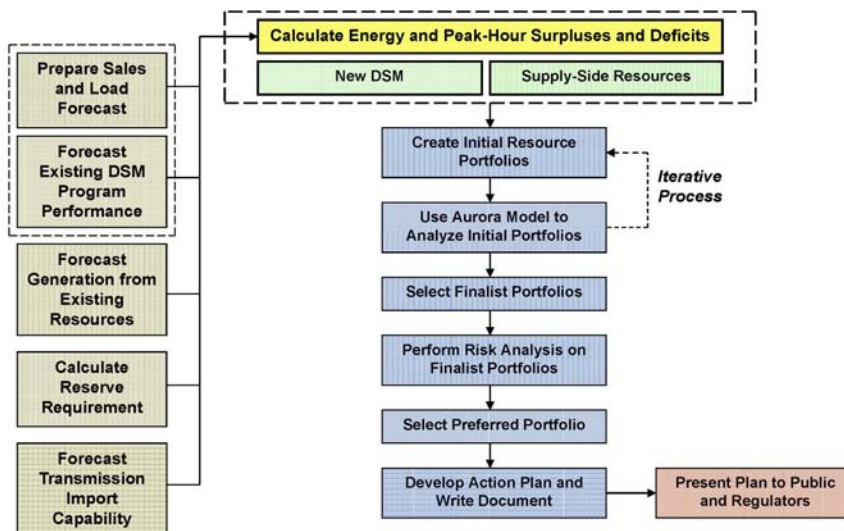
30-Year Levelized Cost (\$/MWh)	2006 IRP	2009 IRP
CCCT	\$78	\$125
B2H	\$72	\$125



### Current Levelized Cost Comparison



### IRP Process Flowchart





## Average Energy Load and Resource Balance

Average Energy Load and Resource Balance	2015											
	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15
Load Forecast (70th%) - May 2009	(2,339)	(2,068)	(1,824)	(1,819)	(2,003)	(2,435)	(2,763)	(2,546)	(2,191)	(1,793)	(1,365)	(2,397)
Existing DSM	67	67	68	70	78	95	96	93	74	68	68	67
Net Load Forecast (70th%) w/DSM	(2,171)	(2,001)	(1,756)	(1,749)	(1,925)	(2,340)	(2,668)	(2,453)	(2,027)	(1,723)	(1,297)	(2,239)
<b>Existing Resources</b>												
Coal	938	938	868	777	728	933	938	938	938	937	938	938
Hydro (70th%) - HCC	954	537	598	694	837	660	460	358	409	395	364	474
Hydro (70th%) - Other	214	300	252	240	327	338	246	242	233	216	202	206
Shoshone Falls Upgrade	6	31	14	1	19	22	0	0	0	0	0	3
Total Hydro (70th%)	874	868	864	935	1,183	1,020	706	599	642	611	567	683
CSPP (including wind)	101	120	190	148	185	195	181	174	172	146	120	125
<b>Power Purchase Agreements</b>												
Bighorn Valley Wind	34	33	34	35	30	37	37	33	29	35	32	44
Raft River Geothermal	10	10	10	10	10	10	10	10	10	10	10	10
PPL Montana - Jefferson (83 MW)	0	0	0	0	0	0	0	0	0	0	0	0
East Side Purchase (50 MW)	0	0	0	0	0	0	0	0	0	0	0	0
Mead Purchase	2	2	2	2	2	2	2	2	2	2	2	2
Total Power Purchase Agreements	44	43	44	45	40	47	47	43	39	45	42	54
Firm Pacific NW Import Capability (Actuals Through Sept 2010)	292	379	446	290	335	222	103	172	167	214	354	297
Langley Gulch	251	251	251	251	251	251	251	251	251	251	251	251
Boardman to Hemingway	0	0	0	0	0	225	225	225	225	225	225	225
Gas Peakers	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	2,411	2,601	2,603	2,445	2,721	2,893	2,452	2,403	2,434	2,429	2,497	2,573
Monthly Surplus/Deficit	239	600	847	706	796	554	(216)	(50)	407	706	600	334
<b>2009 IEP DSM</b>												
Industrial	4	4	4	4	4	4	4	4	4	4	4	4
Commercial	1	1	1	1	1	1	1	1	1	1	1	1
Residential	2	2	2	2	2	2	2	2	2	2	2	2
Total New DSM Average Energy	13	13	13	13	13	12	12	12	13	13	13	13
Monthly Surplus/Deficit w/New DSM	252	613	860	719	809	566	(204)	(38)	420	719	613	346



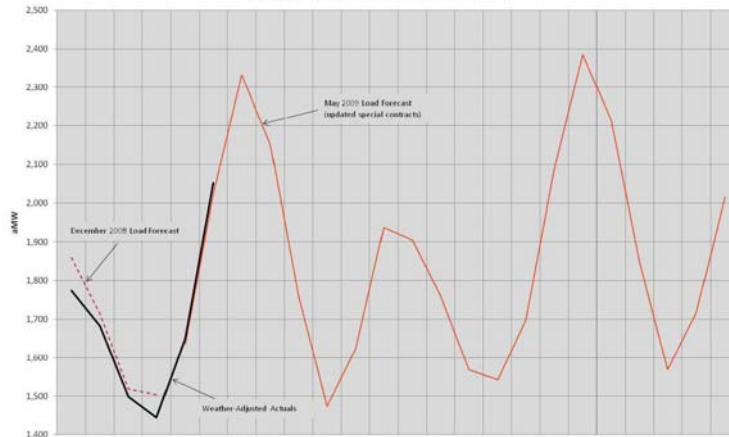
## Peak-Hour Load and Resource Balance

Peak-Hour Load and Resource Balance	2015											
	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15
Load Forecast (95th%) - May 2009	(2,895)	(2,715)	(2,436)	(2,166)	(1,123)	(3,755)	(3,362)	(3,563)	(3,294)	(2,375)	(2,618)	(3,113)
Existing DSM	82	82	88	78	78	122	122	163	78	88	88	82
Peak-Hour Load Forecast	(2,827)	(2,647)	(2,368)	(2,096)	(1,045)	(3,583)	(3,197)	(3,400)	(3,222)	(2,296)	(2,550)	(3,046)
<b>Existing Resources</b>												
Coal	982	982	816	816	761	982	982	982	982	982	982	982
Hydro (90th%) - HCC	1,079	847	555	600	1,199	1,115	1,035	845	1,035	765	600	786
Hydro (90th%) - Other	197	199	190	209	295	307	241	230	297	202	191	196
Shoshone Falls Upgrade	2	2	2	2	12	2	2	2	2	2	2	2
Total Hydro	1,278	1,048	745	893	1,508	1,440	1,276	1,175	1,242	968	791	982
CSPP (including wind)	49	50	55	81	127	137	141	136	119	87	62	57
<b>Power Purchase Agreements</b>												
Bighorn Valley Wind	5	5	5	5	5	5	5	5	5	5	5	5
Raft River Geothermal	10	10	10	10	10	10	10	10	10	10	10	10
PPL Montana - Jefferson (83 MW)	0	0	0	0	0	0	0	0	0	0	0	0
East Side Purchase (50 MW)	0	0	0	0	0	0	0	0	0	0	0	0
Mead Purchase	2	2	2	2	2	2	2	2	2	2	2	2
Total Power Purchase Agreements	15	15	15	15	15	15	15	15	15	15	15	15
Firm Pacific NW Import Capability (Actuals Through Sept 2010)	202	379	446	290	335	222	103	172	167	214	354	297
Langley Gulch	300	300	300	300	300	300	300	300	300	300	300	300
Boardman to Hemingway	0	0	0	0	0	225	225	225	225	225	225	225
Gas Peakers	416	416	416	416	416	416	416	416	416	416	416	416
Subtotal	3,242	3,190	2,793	2,811	3,482	3,737	3,458	3,421	3,456	3,207	3,145	3,274
Monthly Surplus/Deficit	0	0	0	0	0	0	(129)	0	0	0	0	0
<b>2009 IEP DSM</b>												
AC Cool Credit						5	5	5				
Commercial (ENRNOG)						57	57	57				
Irrigation Peak Rewards						228	228	228				
Energy Efficiency Peak Reduction						12	12	12				
Total New DSM Peak Reduction	0	0	0	0	0	302	300	48	0	0	0	0
Monthly Surplus/Deficit w/New DSM	0	0	0	0	0	0	(30)	0	0	0	0	0



## Load Forecast Performance

Monthly Average Load Forecast (50th Percentile)



	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	
Load Forecast (Dec 2009)	1,878	1,714	1,513	1,504																					
Load Forecast (May 2010)					1,635	2,022	2,332	2,150	1,760	1,473	1,623	1,937	1,905	1,762	1,569	1,543	1,696	2,049	2,385	2,214	1,848	1,569	1,716	2,034	
Weather-Adjusted Actuals	1,774	1,683	1,499	1,445	1,650	2,051																			
Variance	(8)	(1)	(2)	(5)	15	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0