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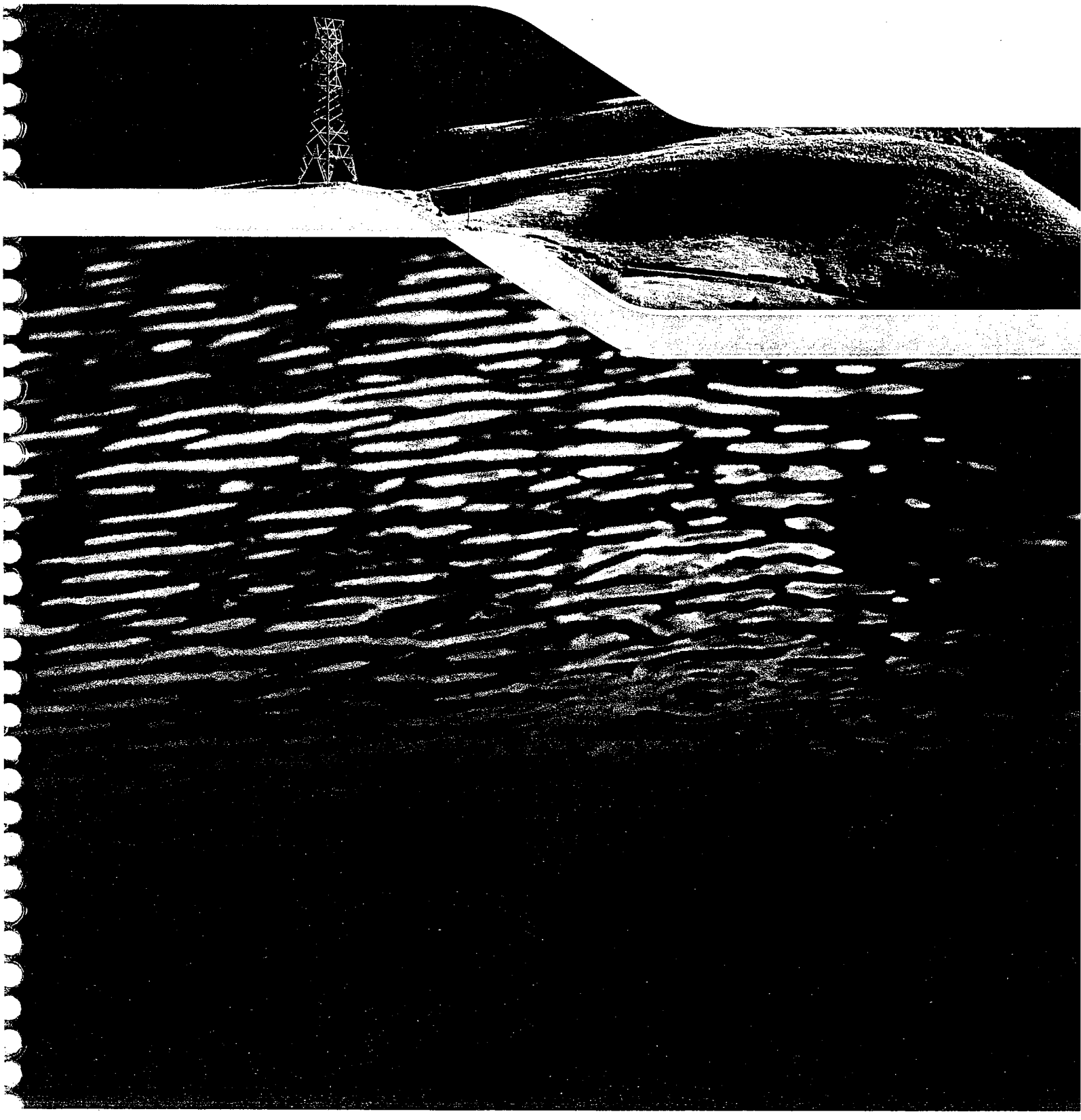
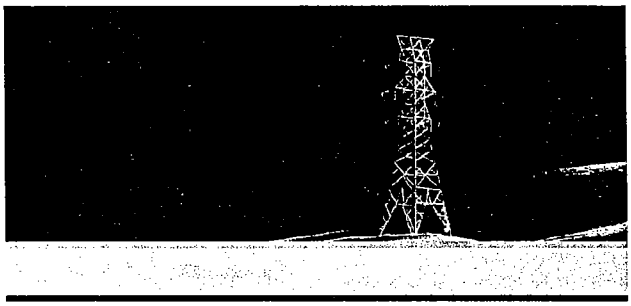
# 2006 Integrated Resource Plan

**IPC-E-06-24**



# *2006 Integrated Resource Plan*



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## Acknowledgement

Resource planning is a continuous process that Idaho Power Company constantly works to improve. Idaho Power prepares and publishes a resource plan every two years and expects the experience gained over the next few years will lead to modifications in the 20-year resource plan presented in this document. Idaho Power invited outside participation to help develop both the 2004 and 2006 Integrated Resource Plans.

Idaho Power values the knowledgeable input, comments, and discussion provided by the Integrated Resource Plan Advisory Council and the comments provided by other concerned citizens and customers. Idaho Power looks forward to continuing the resource planning process with its customers and other interested parties.

You can learn more about Idaho Power's resource planning process at www.idahopower.com.

**Safe Harbor Statement**

This document may contain forward-looking statements, and it is important to note that the future results could differ materially from those discussed. A full discussion of the factors that could cause future results to differ materially can be found in our filings with the Securities and Exchange Commission.

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# GLOSSARY OF TERMS

A/C – Air Conditioning

AIR – Additional Information Request

Alliance – Northwest Energy Efficiency Alliance

aMW – Average Megawatt

BOR – Bureau of Reclamation

BPA – Bonneville Power Administration

C&RD – Conservation and Renewable Discount

CAMR – Clean Air Mercury Rule

CCCT – Combined-Cycle Combustion Turbine

CDD – Cooling Degree-Days

CFB – Circulating Fluidized Bed

CFL – Compact Fluorescent Light

CHP – Combined Heat and Power

$CO_2$ – Carbon Dioxide

CRC – Conservation Rate Credit

CSPP – Cogeneration and Small Power Producers

CT – Combustion Turbine

DOE – U.S. Department of Energy

DG – Distributed Generation

DSM – Demand-Side Management

EA – Environmental Assessment

EEAG – Energy Efficiency Advisory Group

EIA – Energy Information Administration

EIS – Environmental Impact Statement

ESA – Endangered Species Act

FCRPS – Federal Columbia River Power System

FERC – Federal Energy Regulatory Commission

GDD – Growing Degree-Days

HDD – Heating Degree-Days

IDWR – Idaho Department of Water Resources

IGCC – Integrated Gasification Combined Cycle

INL – Idaho National Laboratory

IOU – Investor-Owned Utility

IPC – Idaho Power Company

IPUC – Idaho Public Utilities Commission

IRP – Integrated Resource Plan

IRPAC – Integrated Resource Plan Advisory Council

kV – Kilovolt

kW – Kilowatt

kWh – Kilowatt Hour

LIWA – Low Income Weatherization Assistance

MAF – Million Acre Feet

MMBTU – Million British Thermal Units

MW – Megawatt

MWh – Megawatt Hour

NEPA – National Environmental Policy Act

NWPCC – Northwest Power and Conservation Council

$NO_x$ – Nitrogen Oxides

OPUC – Oregon Public Utility Commission

PCA – Power Cost Adjustment

PM&E – Protection, Mitigation, and Enhancement

PPA – Power Purchase Agreement

PTC – Production Tax Credit

PUC – Public Utility Commission

PURPA – Public Utility Regulatory Policies Act of 1978

PV – Present Value

QF – Qualifying Facility

REC – Renewable Energy Credit

Rider – Energy Efficiency Rider

RFP – Request for Proposal

RPS – Renewable Portfolio Standard

RTO – Regional Transmission Organization

$SO_2$ – Sulfur Dioxide

SCCT – Simple-Cycle Combustion Turbine

WACC – Weighted Average Cost of Capital

WECC – Western Electricity Coordinating Council

# 1. 2006 Integrated Resource Plan Summary

## Introduction

The 2006 Integrated Resource Plan (IRP) is Idaho Power Company's eighth resource plan prepared to fulfill the regulatory requirements and guidelines established by the Idaho Public Utilities Commission (IPUC) and the Oregon Public Utility Commission (OPUC).

In developing this plan, Idaho Power worked with the Integrated Resource Plan Advisory Council (IRPAC), comprised of major stakeholders representing the environmental community, major industrial customers, irrigation customers, state legislators, public utility commission representatives, the Governor's office, and others. The IRPAC meetings served as an open forum for discussion related to the development of the IRP, and its members have made significant contributions to this plan. While input from the IRPAC has been considered and incorporated into the 2006 IRP, final decisions on the content of the plan were made by Idaho Power. A list of IRPAC members can be found in *Appendix D–Technical Appendix*. Idaho Power encourages IRPAC members to submit comments expressing their views regarding the 2006 IRP and the planning process.

The 2006 IRP assumes that during the planning period (2006–2025), Idaho Power will continue to be responsible for acquiring resources sufficient to serve all of its retail customers in its mandated Idaho and Oregon service areas and will continue to operate as a vertically-integrated electric utility.

The two primary goals of Idaho Power's 2006 IRP are to:

1. Identify sufficient resources to reliably serve the growing demand for energy within Idaho Power's service area throughout the 20-year planning period; and

2. Ensure the portfolio of selected resources balances costs, risks, and environmental concerns.

In addition, there are several secondary goals:

1. Give equal and balanced treatment to both supply-side resources and demand-side measures;

### Highlights

- Idaho Power uses 70$^{th}$ percentile water conditions and 70$^{th}$ percentile average load for energy planning.
- For peak-hour capacity planning, Idaho Power uses 90$^{th}$ percentile water conditions and 95$^{th}$ percentile peak-hour load.
- The 2006 IRP includes 1,300 MW (nameplate) of supply-side resource additions and DSM programs designed to reduce peak load by 187 MW and average load by 90 aMW.
- Idaho Power's average load is expected to increase by 40 aMW (1.9% annually); summertime peak-hour loads are expected to increase by 80 MW (2.1% annually) per year through 2025.
- Idaho Power expects to add 11,000–12,000 retail customers per year through 2025.
- In July 2006, Idaho Power set a new peak-hour load record of 3,084 MW.

2. Involve the public in the planning process in a meaningful way;

3. Explore transmission alternatives; and

4. Investigate and evaluate advanced coal technologies.

The number of households in Idaho Power's service area is expected to increase from around 455,000 in 2005 to over 680,000 by the end of the planning period in 2025. Population growth in southern Idaho is an inescapable fact, and Idaho Power will need to add physical resources to meet the electrical energy demands of its growing customer base.

Idaho Power, with hydroelectric generation as the foundation of its energy production, has an obligation to serve customer loads regardless of the water conditions which may occur. In light of public input and regulatory support of the more conservative planning criteria used in the 2002 IRP, Idaho Power will continue to emphasize a resource plan based upon a worse-than-median level of water. In the 2006 IRP, Idaho Power is again emphasizing 70$^{th}$ percentile water conditions and 70$^{th}$ percentile average load for energy planning, and the 90$^{th}$ percentile water conditions and 95$^{th}$ percentile peak-hour load for capacity planning. A 70$^{th}$ percentile water condition means Idaho Power plans generation based on a level of streamflows that is exceeded in seven out of ten years on average. Conversely, streamflow conditions are expected to be worse than the planning criterion in three out of ten years. This is a more conservative planning criterion than median water planning, but less conservative than critical water planning. Further discussion of Idaho Power's planning criteria can be found in Chapter 4.

Idaho Power extended the planning horizon in the 2006 IRP to 20 years. Recent Idaho Power IRPs utilized a 10-year planning horizon, but with the increased need for baseload resources with long construction lead times along with the need for a 20-year resource plan to support PURPA contract negotiations, Idaho Power and the IRPAC decided to extend the planning horizon of the 2006 IRP to 20 years.

## Potential Resource Portfolios

Idaho Power examined 12 resource portfolios and several variations of portfolios in preparing the 2006 IRP. Discussions with the IRPAC led to the selection of four finalist portfolios for additional risk analysis—a portfolio that emphasized thermal resources, a portfolio with a strong commitment to renewable resources, a resource portfolio that emphasized regional transmission, and a modified version of the 2004 IRP preferred portfolio.

Following the risk analysis, a modified version of the 2004 preferred portfolio was selected as the preferred portfolio for the 2006 IRP. The selected portfolio adds supply-side and demand-side resources capable of providing 1,091 MW of energy, 1,250 MW of capacity to meet peak-hour loads, and 285 MW of additional transmission capacity from the Pacific Northwest. The selected portfolio also includes demand-side management (DSM) programs estimated to reduce loads by 90 aMW annually and peak-hour loads by 187 MW.

The preferred portfolio represents resource acquisition targets. It is important to note the actual resource portfolio may differ from the above quantities depending on acquisition or development opportunities, specific responses to Idaho Power's Request for Proposals (RFPs), the business plans of any ownership partners, and the changing needs of Idaho Power's system.

## Risk Management

Idaho Power, in conjunction with the IPUC staff and interested customer groups, developed a risk management policy during 2001 to protect against severe movements in Idaho Power's

power supply costs. The risk management policy is primarily aimed at managing short-term market purchases and hedging strategies with a typical time horizon of 18 months or less. The risk management policy is intended to supplement the existing IRP process.

Whereas the IRP is the forum for making long-term resource decisions, the risk management policy addresses short-term resource decisions that arise as resources, loads, costs of service, market conditions, and weather vary. The Risk Management Committee oversees both the implementation of the risk management policy and the IRP to ensure the planning process is consistent and coordinated.

Idaho Power intends to commit to, or acquire, a variety of resource types including renewable, thermal, and combined heat and power (CHP) resources, demand-side programs, and transmission resources early in the planning period. If any of the selected resources differ from the expected levels of production or reliability, Idaho Power may need to adjust the resource proportions in later resource plans. Should market or policy conditions change dramatically, the customers of Idaho Power will have the protection of a diverse resource portfolio.

## Near-Term Action Plan

Customer growth is the primary driving force behind Idaho Power's need for additional resources. Population growth throughout southern Idaho—specifically in the Treasure Valley—requires additional resources to meet both instantaneous peak and sustained energy needs. Idaho Power's data, projections, and analyses show that a blended, diversified portfolio of resources and full utilization of its import capability during peak-load hours is the most cost-effective, least-risk, and environmentally responsible method to address the increasing energy needs of its customers.

Idaho Power has selected a balanced portfolio which adds renewable resources, demand-side measures, transmission resources, and thermal generation to meet the projected electric demands over the next 20 years. The 2006 IRP identifies the following specific actions to be taken by Idaho Power prior to the next IRP in 2008:

**September 2006:** 2006 Integrated Resource Plan filed with the Idaho and Oregon Public Utility Commissions

**Fall 2006**

1. Conclude 100 MW wind RFP issued in response to the 2004 IRP
2. Notify short-listed bidders in 100 MW geothermal RFP issued in response to the 2004 IRP
3. Initiate McNary–Boise transmission upgrade process
4. Develop implementation plans for new DSM programs with guidance from the Energy Efficiency Advisory Group (EEAG)
5. Continue coal-fired resource evaluation with Avista and consider expansion opportunities at Idaho Power's existing projects (Jim Bridger, Boardman, and Valmy)
6. Investigate opportunities to increase participation in the highly successful Irrigation Peak Rewards DSM program
7. Complete the wind integration study
8. Evaluate the Energy Efficiency Rider (Rider) level to fund DSM program expansion

**2007**

1. Finalize DSM implementation plans and budgets with guidance from the EEAG
2. Conclude 100 MW geothermal RFP
3. Assess CHP development in progress via the PURPA process—consider issuing RFP for 50 MW CHP depending on level of PURPA development
4. Identify leading candidate site(s) for coal-fired resource addition and begin permitting activities
5. Continue study of 225 MW McNary–Boise transmission upgrade
6. Bring 100 MW of wind on-line
7. Evaluate/initiate DSM programs
8. Select coal-fired resource, finalize contracts, begin design, procurement, and pre-construction activities

**2008**

1. Make final commitment to 225 MW McNary–Boise transmission upgrade
2. Complete 250 MW Borah–West transmission upgrade
3. Bring 170 MW Danskin expansion on-line
4. Evaluate/initiate DSM programs
5. Prepare and file 2008 IRP

The 2006 IRP has two significant supply-side resource additions that will require considerable preconstruction commitments; approximately 250 MW of coal-fired generation could come from either the expansion of an existing facility or the addition of a new generation facility and a 225 MW upgrade of the McNary to Boise transmission line. Idaho Power will continue its research efforts on these two resource additions during the fall of 2006.

The preferred portfolio also includes 250 MW of advanced coal technology in the form of an integrated gasification combined-cycle (IGCC) plant in the later stages of the planning period. The timing and commitment to the IGCC or other advanced coal facility will be assessed in future resource plans when additional feasibility information should be available concerning this technology.

## Renewable Resource Education, Research and Development

In the 2004 IRP, Idaho Power expressed its commitment to renewable energy by stating, "Idaho Power will continue to fund education and demonstration energy projects with up to $100,000 of funding." One of the projects supported with this commitment was the Foothills Environmental Learning Center in north Boise. Idaho Power's support for this project included the installation of a 4.6 kW fuel cell and a 2.0 kW solar panel. In addition, Idaho Power repaired and upgraded the 15 kW solar energy project on the roof of its corporate headquarters in downtown Boise.

Continuing with its commitment to support renewable energy through education and demonstration projects, Idaho Power intends to commit up to an additional $100,000 to support renewable energy education and demonstration projects. Areas currently under consideration include solar energy projects and river flow energy conversion devices. At present, Idaho Power has not selected a specific project(s) to pursue with this funding.

Idaho Power intends to conclude the wind integration study during the fall of 2006. Idaho Power also has an open RFP for a geothermal resource which it intends to conclude in early 2007. Idaho Power is currently negotiating a power purchase contract with the successful bidder identified for the wind RFP issued in 2005. The 2006 preferred portfolio includes 250 MW of wind resources, 150 MW of geothermal resources, and 150 MW of CHP generation resources.

## Portfolio Composition

The resource quantities identified in the preferred portfolio approximate the generation resources Idaho Power may acquire. Each resource and each resource acquisition has different characteristics and Idaho Power may alter the resource quantities to capitalize on market conditions, acquisition or development opportunities, and the specific characteristics of the bids offered during an individual RFP. Additionally, the results of Idaho Power's wind integration study may cause either an increase or decrease in the amount of wind generation included in the preferred portfolio. Idaho Power conducts the IRP process every two years which provides an opportunity to revisit the resource portfolio and make adjustments in response to changing conditions. The diversified resource portfolio allows Idaho Power to continue to reliably serve its customers while balancing costs, risks, and environmental concerns. A summary and timeline of the 2006 preferred portfolio is listed in Table 1-1.

## IRP Methodology

A brief outline of Idaho Power's IRP methodology is as follows:

1. Assess present and estimate future conditions by:
   - Developing load, hydrologic, and generation forecasts
   - Determining energy surplus and deficiency on a monthly and hourly basis
   - Developing a peak-hour transmission analysis to estimate transmission deficiencies from the Pacific Northwest
   - Determining energy (monthly) and capacity (peak-hour) targets

**Table 1-1. 2006 Preferred Portfolio Summary and Timeline**

| Summary | | Timeline | | |
|---|---|---|---|---|
| Resource | MW | Year | Resource | MW |
| Wind | 250 | 2008 | Wind (2005 RFP) | 100 |
| Geothermal (Binary) | 150 | 2009 | Geothermal (2006 RFP) | 50 |
| CHP | 150 | 2010 | CHP | 50 |
| Transmission | 285 | 2012 | Wind | 150 |
| Coal | 250 | 2012 | Transmission McNary–Boise | 225 |
| Regional IGCC Coal | 250 | 2013 | Wyoming Pulverized Coal | 250 |
| Nuclear | 250 | 2017 | Regional IGCC Coal | 250 |
| **Total Nameplate** | **1,585** | 2019 | Transmission Lolo–IPC | 60 |
| | | 2020 | CHP | 100 |
| DSM Peak | 187 | 2021 | Geothermal | 50 |
| Energy (aMW) | 1,091 | 2022 | Geothermal | 50 |
| Transmission | 285 | 2023 | INL Nuclear | 250 |
| Peak | 1,250 | | **Total Nameplate** | **1,585** |

2. Inventory the potential supply-side and demand-side options and construct numerous portfolios capable of meeting energy and capacity targets by:

   - Estimating the costs of potential supply-side resources and demand-side programs using preliminary transmission interconnection cost estimates
   - Constructing practical portfolios based on supply-side resources and demand-side program costs and estimates
   - Simulating performance and determining the portfolio costs
   - Ranking each portfolio based on the present value of expected costs and selecting finalist portfolios for further risk analysis

3. Evaluate the finalist portfolios and identify a preferred portfolio by:

   - Refining the transmission integration cost analysis and incorporating backbone upgrades
   - Performing qualitative and quantitative risk analyses

4. Develop near-term and 10-year action plans based on the preferred portfolio

## Public Policy Issues

A number of public policy issues have emerged since Idaho Power filed the 2004 IRP. These issues include green tags, emission offsets, financial disincentives for DSM programs, technology risks, and asset ownership. Each issue significantly affects long-term resource planning and the resulting portfolio of resources acquired. The near-term actions that Idaho Power takes to position itself and its customers for potential future regulations are also affected by a range of public policy issues.

Idaho Power discussed a range of public policy issues with the IRPAC and was hopeful a consensus opinion would emerge as a result of the discussions. While the topics were discussed at length, it became apparent that a consensus opinion would likely compromise individual positions on these important issues.

In lieu of being able to provide recommendations from the IRPAC on these issues, Idaho Power has chosen to present a series of questions and its position on each of the issues. Members of the IRPAC and the public are invited to provide specific comments on Idaho Power's proposed position on each of the topics. Public comments will help Idaho Power, the Idaho and Oregon PUCs, and the IRPAC assess the level of public support for each of the proposals.

### *Environmental Attributes or Green Tags*

Due to a growing interest in renewable resources, over the past five years the electric industry has seen the output from renewable resources separated into two components, delivered energy and environmental attributes. Environmental attributes are more commonly referred to as "green tags" due to the positive environmental aspects, measured in dollars-per-MWh of production, of renewable resources. The emergence of two products stemming from one resource raises policy questions that are beginning to influence resource decisions for Idaho Power and other electric utilities. The main policy questions Idaho Power associates with green tags are:

- Should Idaho Power acquire the green tags for any renewable energy regardless of whether the energy is generated at an Idaho Power generation unit or purchased through a purchased power