



Northwest Power and Conservation Council

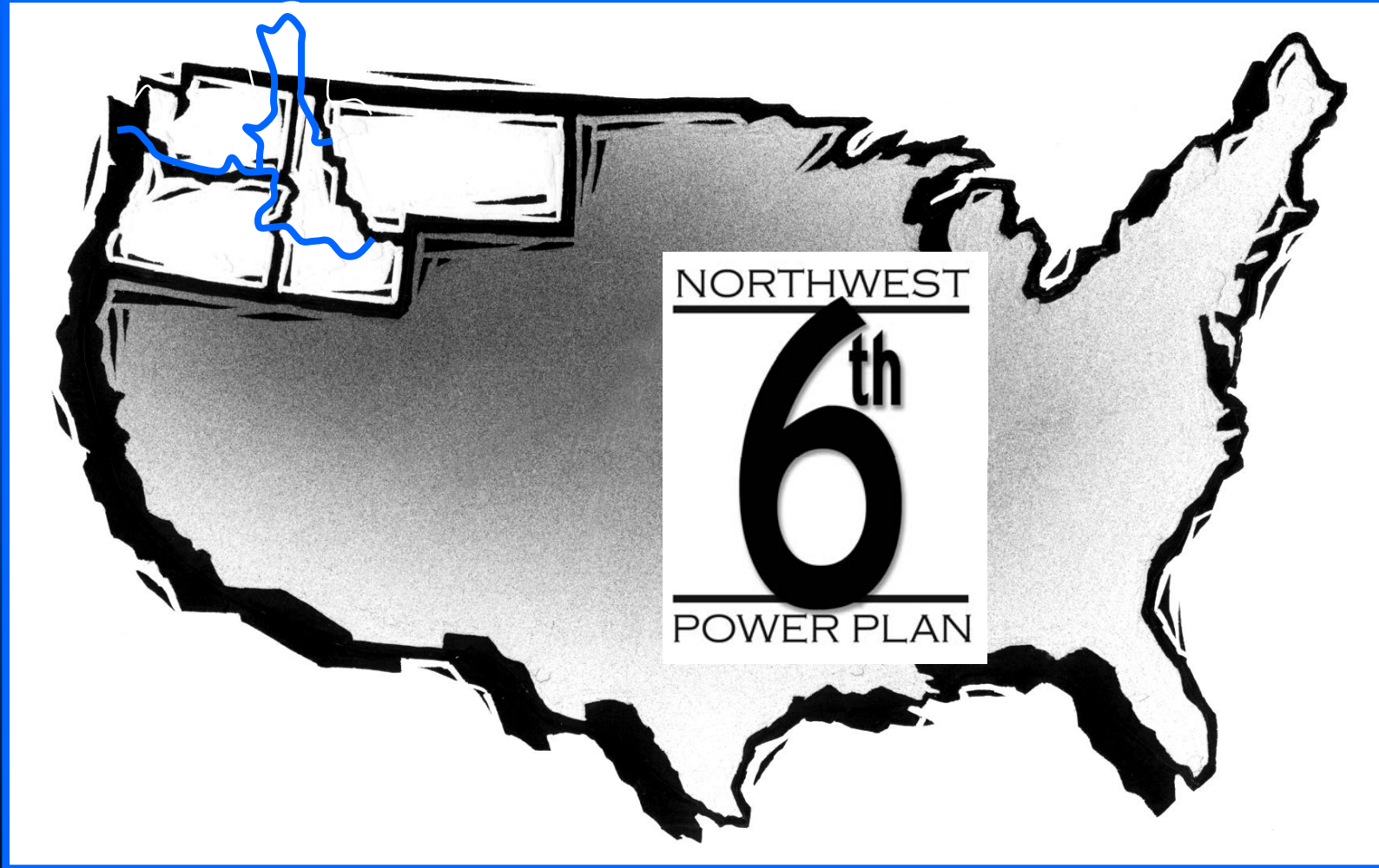
Draft Sixth Power Plan

Montana Energy and Telecommunications Interim
Committee

January 14, 2010

Pacific Northwest Region

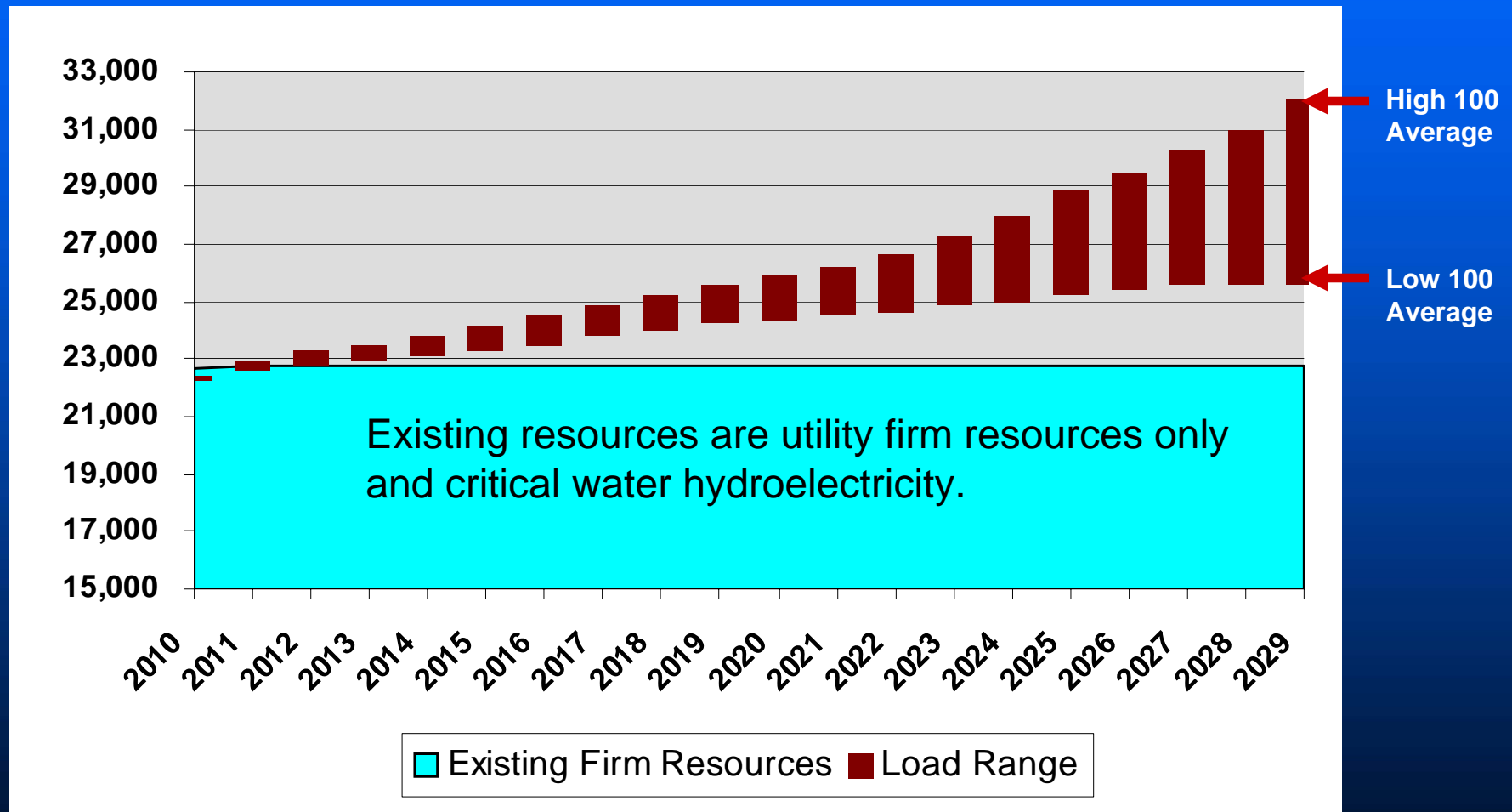
The 1980 Regional Power Act



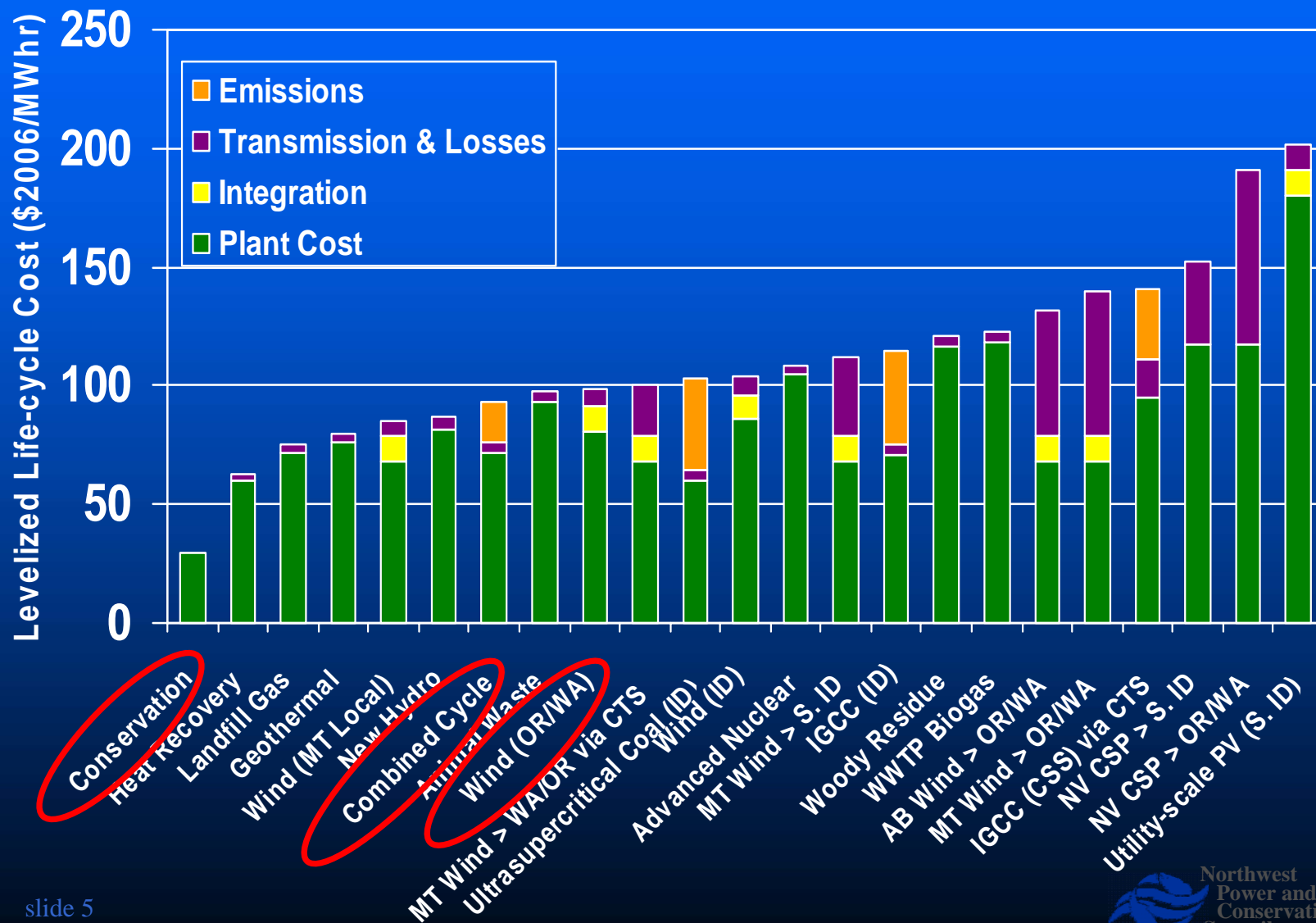
Goal of the Sixth Power Plan

- Recommend a **low-cost and low-risk resource strategy** ...
- To assure the region of an adequate, efficient, economic, and reliable power system ...
- While supporting implementation of the Fish and Wildlife Program

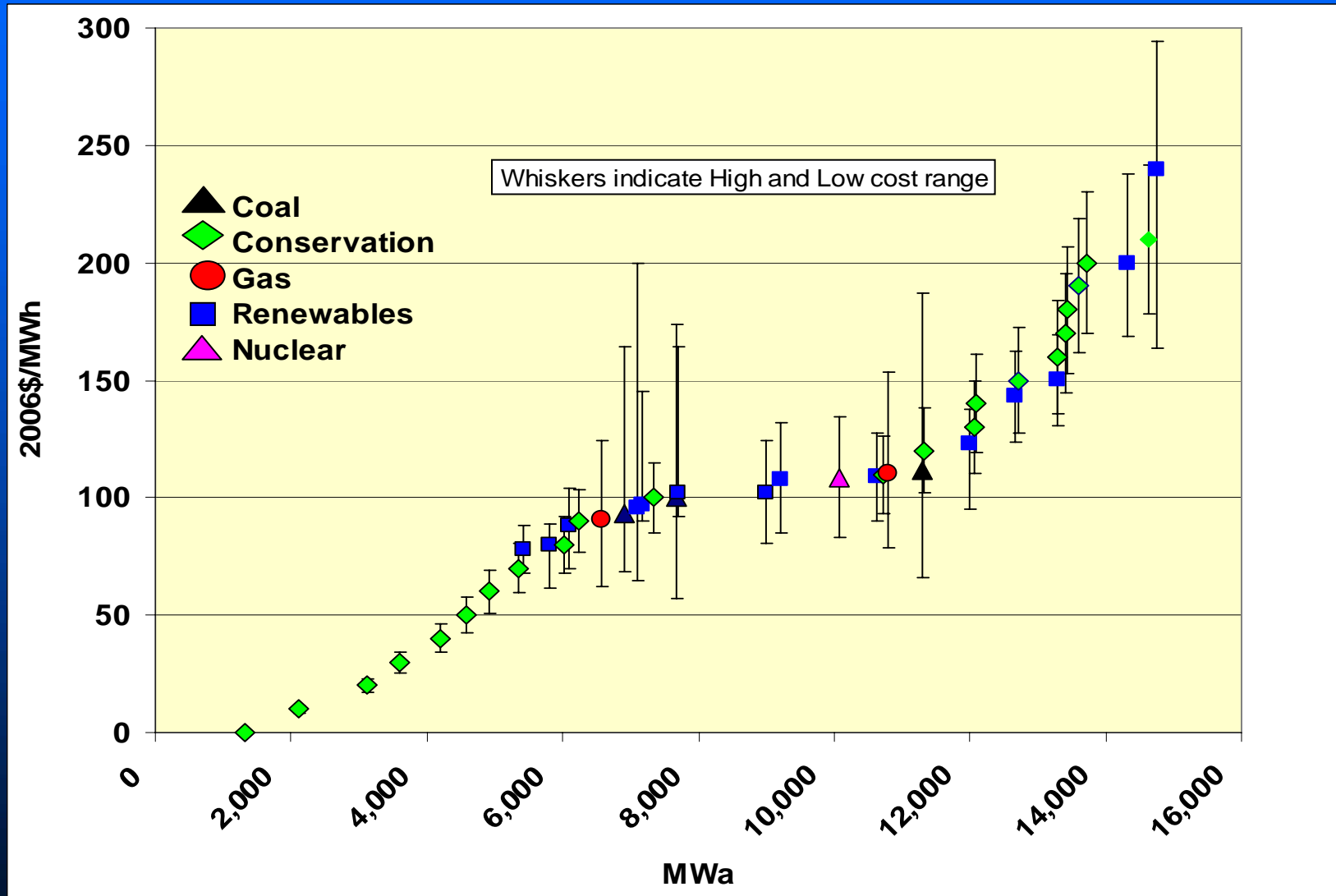
Utility Firm Resource Needs



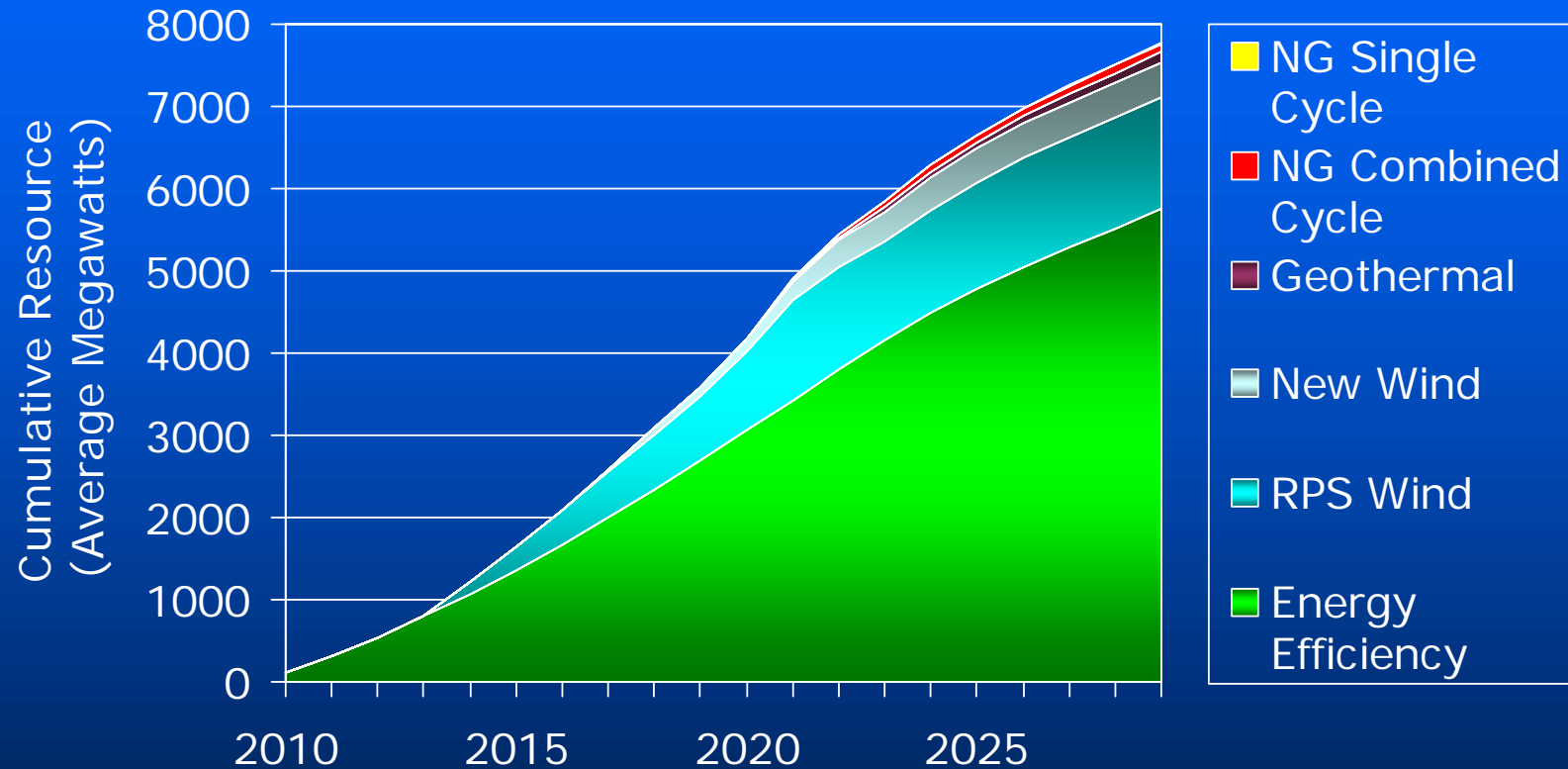
Resource Costs



Resource Supply Curve & Cost Uncertainty



Draft 6th Plan Resource Portfolio*



*Expected Value Build Out.

Actual build out schedule depends on future conditions

The Draft Plan: How To Meet Our Resource Needs

1. Energy efficiency can potentially meet 85% of demand growth over 20 years
 - 1200 MWa in five years, 5900 MWa in 20 years
2. Wind and other renewables to meet RPS+
 - 1500 MWa for state renewable standards
3. Natural gas-fired generation will provide energy, capacity and flexibility as needed
 - Also displaces coal
4. Develop new low-carbon alternatives

Why So Much Conservation?

- We found more
 - New technology & applications
- It costs less than half of generating resources
 - \$30-\$40 per MWh versus \$90 to \$120
- It mitigates risks
 - Volatile fuel prices & unknown carbon costs
- A key element in reducing carbon emissions
- 5,900 average megawatts by 2030
 - Almost as big as the federal hydro system

We Found More

| MWa Achievable End of Period and <\$120/MWh | 5th Plan 2005 | 6th Plan 2009 |
|---|---------------|---------------|
| Consumer Electronics | 155 | 920 |
| Industrial | 350 | 800 |
| Distribution Efficiency | 0 | 420 |
| Residential | 2119 | 2460 |
| Commercial | 1183 | 1320 |
| Agriculture | 93 | 100 |
| Total | 3902 | 6020 |

Select New Measures in 6th Plan Conservation Assessment



| New Measure or Practice | MWa by 2029 | \$/MWh* |
|--|-------------|---------|
| Residential Heat Pump Water Heaters | 500 | \$26 |
| TVs & Set-Top Boxes | 470 | \$(5) |
| Computers & Monitors | 360 | \$60 |
| Distribution Efficiency & Voltage Optimization | 400 | \$9 |
| Industrial System Optimization Measures | 200 | \$16 |
| Residential Ductless Heat Pumps | 200 | \$70 |
| LED Street, Area, Facade & Parking Lighting | 140 | \$40 |
| Computer Server Rooms | 130 | \$(2) |
| Dairy | 10 | \$2 |

Residential Measure Potential

| Measure Bundle | MWa | Description of Bundle |
|--------------------------|------|--|
| Heat Pump Water Heater | 490 | |
| Television & Set Top Box | 470 | Energy Star 5.0 or better televisions |
| Computers and Monitors | 360 | Efficient Desktop PC and Efficient Monitor |
| Heat Pump Conversions | 430 | Space heating conversion from electric resistance to heat pump |
| Residential Appliances | 180 | Clothes Washer, Dishwasher, Refrigerator, Freezer |
| New Construction Shell | 170 | Measures above current state or local codes |
| Heat Pump Upgrades | 100 | Space heating heat pumps better than code |
| Weatherization | 280 | Primarily high performance windows |
| Ductless Heat Pump | 190 | |
| Lighting | 280 | Includes both EISA and non-EISA covered lamps |
| Showerheads | 80 | |
| Other Residential | 140 | |
| All Residential Measures | 3180 | |

Commercial Measure Potential

| Measure Bundle | MW _a | Description of Bundle |
|----------------------------------|-----------------|--|
| Lighting Power Density | 370 | Lamp, ballast and fixture improvements |
| Interior Lighting Controls | 90 | Occupancy controls for areas not required by code |
| Exterior Lighting | 190 | Streetlight, parking, outdoor area lighting to high-efficiency sources and control |
| Integrated Building Design | 60 | Multiple measures applied in integrated design practice for select new buildings |
| Packaged Refrigeration Equipment | 50 | Efficient refrigerators beverage merchandizers, ice makers and vending machines |
| Controls Commission Complex HVAC | 110 | Commissioning on HVAC systems in buildings with complex HVAC systems |
| Controls Optimization Simple | 50 | Package Roof Top HVAC measures |
| Grocery | 90 | Grocery store refrigeration measures |
| Computer Servers and IT | 130 | Consolidation & virtualization & upgrade of servers |
| Network PC Power Management | 70 | Control of a networked computer's advanced energy management systems |
| Municipal Sewage & Water | 50 | Suite of measures for sewage treatment and water supply |
| Restaurant Equipment | 40 | Ovens, steamers, hoods, sprayers, holding cabinets |
| Other Commercial Measures | 120 | |
| All Commercial Measures | 1420 | |

Better Codes & Standards Could Deliver Some of the Savings

■ Standards

- Appliances
- Lighting
- Residential
- Commercial

~15 Rulemakings
for New Federal
Standards Over
Next 2 Years

■ State Building Codes

- Residential
- Commercial
- Code Compliance

MT, OR, WA & ID all
looking at better codes.
Need Code Compliance

No Federal
Standard for TVs ...
State Standards?

Questions?

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