

# Role of PMAs in Transmission and Distribution

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Tribal Leader Forum

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# Key Topics

- Introduction to BPA
- Governing Statutes
- Business Model
- BPA Transmission System
- Infrastructure Investments
- Customer Involvement

# BPA's Mission

## BPA's Mission Statement

BPA's mission as a public service organization is to create and deliver the best value for our customers and constituents as we act in concert with others to assure the Pacific Northwest:

- An adequate, efficient, economical and reliable power supply;
- A transmission system that is adequate to the task of integrating and transmitting power from federal and non-federal generating units, providing service to BPA's customers, providing interregional interconnections, and maintaining electrical reliability and stability; and
- Mitigation of the Federal Columbia River Power System's impacts on fish and wildlife.

BPA is committed to cost-based rates, and public and regional preference in its marketing of power. BPA will set its rates as low as possible consistent with sound business principles and the full recovery of all its costs, including timely repayment of the federal investment in the system.

# Introduction to BPA

## Federal Columbia River Power System (FCRPS)

- BPA markets power from 31 Federal Hydropower plants (21 COE/10 BOR) (6,845 avg. MW; 15,696 sustained peak), the Columbia Generating Station Nuclear Plant, some non-Federal hydro facilities, and several wind projects.
- About 80% of the power BPA sells is hydroelectric.
- BPA accounts for about 30% of the electric power consumed within the region.
- Canada has 15% of Columbia River Basin area, but provides 39% of 132 million acre feet (MAF) average annual flow at The Dalles.



# BPA's Governing Statutes and Other Key Legislation

## 1937 Bonneville Project Act (Referred to as the “Project Act”)

- Created BPA to market power at cost-based rates with public preference and to build a transmission system to deliver power.
- Grounded in: (1) Theodore Roosevelt’s idea of “conservation”—belief that natural resources, such as rivers, should be put to the “highest and best” use in service of the public; and (2) Franklin Roosevelt’s idea that electricity was an agent of social change.

## 1944 Flood Control Act

- Roosevelt recommended that Congress extend various principles from the Bonneville Project Act into a nationwide power policy.
- Stated that the Secretary of the Interior (now the Secretary of Energy) must transmit and dispose of power/energy in a way that encourages widespread use of the power/energy and is sold at the lowest possible rates, *consistent with sound business principles*.
- Stated that rates must recover the cost of producing and transmitting the power/energy (including amortization of the capital investment).

## 1961 Columbia River Treaty

Enabled 30 million acre-feet of increased water storage via three new Canadian dams and Libby Dam in Montana.

# BPA's Governing Statutes

## **1964 Pacific Northwest Preference Act**

- Prior to this Act, it was uneconomical to transmit power over long distances, but technological advances coincided with rapidly growing summer peaking load in Southern California.
- Set forth specific geographical definition of Pacific Northwest (which has since been amended by the Northwest Power Act).
- Established regional preference while authorizing construction of California intertie and surplus power sales outside the Northwest.

## **1974 Federal Columbia River Transmission System Act**

Placed BPA on self-financing basis (rates must recover costs) and provided limited borrowing authority from the U.S. Treasury.

## **1977 Department of Energy Organization Act**

Created the Department of Energy and preserved BPA as a “separate and distinct organizational entity within DOE.”

# Governing Statutes: The Northwest Power Act

## **1980 Pacific Northwest Electric Power Planning and Conservation Act (Referred to as the “Northwest Power Act” or the “Power Act”)**

- Assured the Pacific Northwest an adequate, efficient, economical and reliable power supply.
- Created the open-ended requirement that BPA meet the net load requirements of Northwest utilities.
- Gave BPA the authority to purchase generating output from electric generation projects to meet the needs of Northwest customers.
- Directed BPA to encourage cost-effective conservation and renewable resources and to create financial incentives for utilities to do so as well.
- Created the residential exchange program for BPA to provide benefits to residential and small farm customers of investor-owned utilities.
- Required BPA to protect, mitigate and enhance fish and wildlife affected by federal hydropower construction and operation.
- Provided for regional planning through the NW Power and Conservation Council.

# BPA's Business Model: One Agency, Two Businesses

## FERC ORDERS 888 & 889

In 1996, BPA voluntarily complied with FERC Orders 888 and 889. At the time, there was a national desire for wholesale trading markets for energy.

- Was designed to facilitate a more competitive wholesale electric marketplace.
- Required that public utilities provide open access to their transmission systems at rates that are comparable to what the utility would charge itself.
- Requires public utilities to separate their wholesale power marketing function from their transmission operation and reliability function.
- Requires that utilities post information about the availability of their transmission system on the internet so all customers can access it equally.

*As a result...*

- BPA is one agency with respect to repaying Treasury debt.
- BPA operates separate businesses for setting rates for power and transmission services.
- Overlapping, but different customers for Power Services and Transmission Services.
- BPA operates as an open-access, non-discriminatory transmission carrier.



# BPA's Business Model: Our Customers

## *BPA's customers include...*

- **Publicly Owned Utilities**
  - Entitled to a statutory preference and priority in the purchase of available federal power
  - Northwest Regional Municipalities
  - Public Utility Districts
  - Cooperatives
  - Tribal Utilities
- **Investor Owned Utilities**
  - Entitled to the Residential Exchange Program that effectively provides an offset to IOU residential and small farm customers rates
  - Includes Portland General Electric, Puget Sound Energy, PacifiCorp, etc.
- **Direct Service Industries**
  - BPA is not required to, but may sell power for direct consumption to a limited number of existing industrial companies in the Northwest
  - Aluminum Smelters (e.g. Alcoa, Columbia Falls Aluminum)
  - Chemical and paper, and other metal industries (e.g. Port Townsend Paper Corporation)
- **Sales outside the Northwest**
  - Public and investor owned utilities in the Southwest and California
  - Sales, purchases, and exchanges of power via the Southern Intertie
- **Wheeling and other Sales**
  - Network and point-to-point transmission services
  - Generation integration services
  - Conservation and environmental impact analysis services

## BPA's Business Model: The Political Environment

### *BPA's role in regional and national policy and politics...*

- Because it manages an important resource for the region, BPA has great economic and political significance.
- The Agency faces many different, and often conflicting, political pressures within the Pacific Northwest.
  - Customers perceive an ownership-like right in the system from cost-recovery through the rates they pay.
  - Various regional interest groups have formed around the public responsibilities BPA seeks to meet.
  - An example of the conflicting political pressures is the tension between customers who seek low rates and fish advocacy groups who demand BPA increase funding to our fish programs (resulting in higher rates).
  - The Northwest Congressional delegation pays close attention to BPA generally and the specific issues that impact their constituencies.
- Additionally, regional political interests occasionally come in conflict with the interests of those in other parts of the country.
- The resulting effect on the agency can be a high degree of contention over BPA decisions and a high degree of political involvement.

# Facets of BPA

*In 2011, BPA invested more than \$1 billion in Northwest transmission, hydropower, fish and wildlife, and energy efficiency infrastructure that will serve the region for decades.*

## TRANSMISSION SERVICES

Our transmission system is in a highly dynamic period of expansion and adaptation. We provide open-access transmission service to any qualified transmission user on a non-discriminatory basis.

## POWER SERVICES

In 2011, BPA set tiered rates and started the delivery of power under 20-year Regional Dialogue power sales contracts. The Regional Dialogue contracts secure Northwest publicly-owned utilities' access to low-cost federal power for the next generation.

## STEWARDSHIP

We at BPA are dedicated and proud of the work we do. We know our work will benefit the region for decades to come. We appreciate the deep engagement of our customers, tribes, state and local governments, other federal agencies, and citizens in all that we do. Together, we are stewards of the FCRPS.

## ENERGY EFFICIENCY

BPA is nationally-recognized for its conservation achievements. Through our continued funding of regional programs and conservation infrastructure, BPA achieved about 119 average MW of energy efficiency in 2011 alone.

## ENVIRONMENT, FISH, &

## WILDLIFE

BPA continues to mitigate the impacts of the FCRPS on fish and wildlife. Salmon are returning to Columbia Basin streams in numbers not seen and to places they haven't been in decades. Fish passage has been improved and habitat restored in partnership with tribes, states and federal agencies through the Columbia Basin Fish Accords.

## WIND

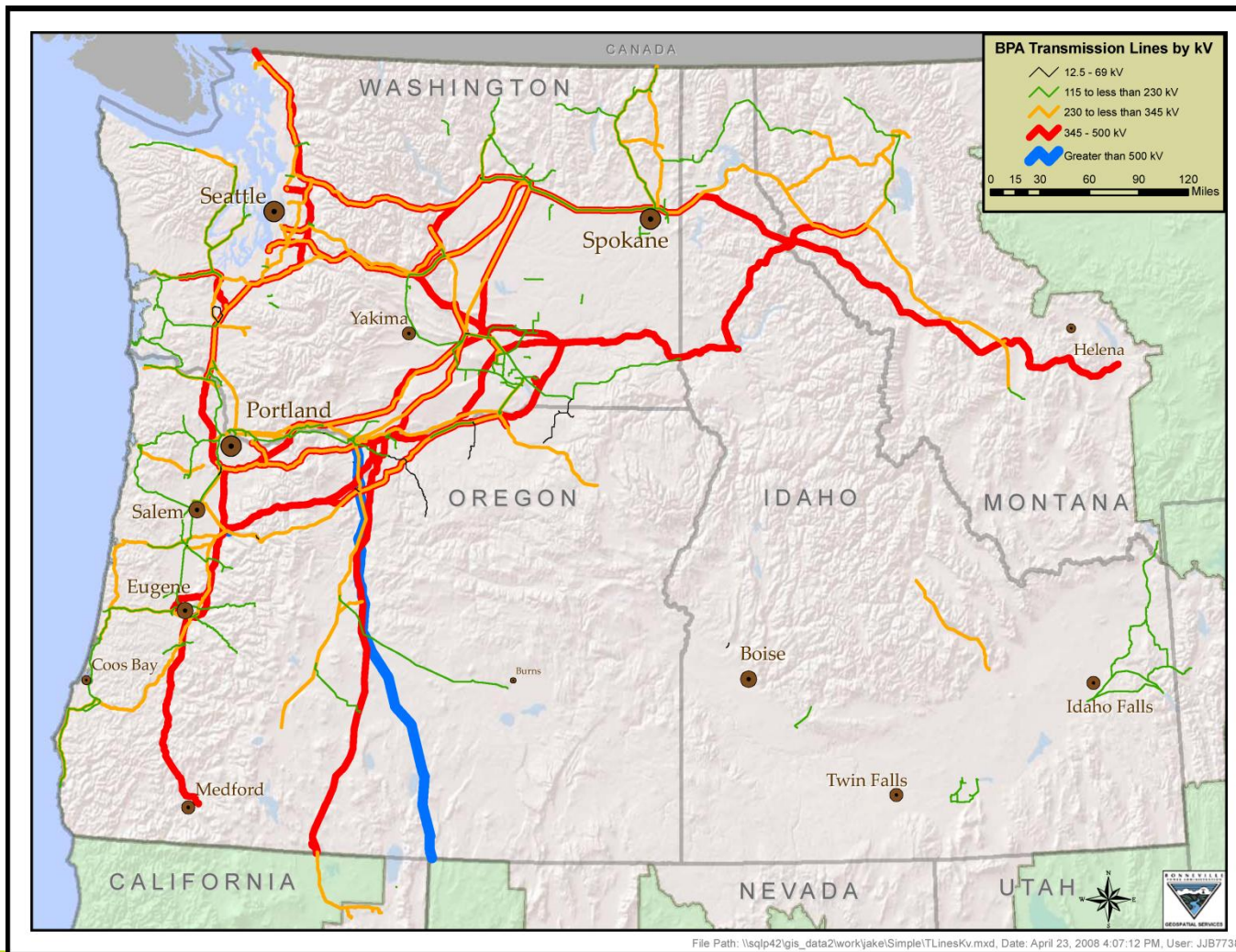
Wind power connected to our transmission grid is 10 years ahead of expectations. By the end of 2011, BPA had offered transmission service for 9,300 MW of wind power.

# BPA's high-voltage transmission system

## *An introduction to BPA's transmission system...*

- BPA owns and operates 75% of the Pacific Northwest's high voltage electrical transmission system.
- BPA's system includes more than 15,000 miles of transmission line and 285 substations.
- The Federal Columbia River Transmission System networks across 300,000 square miles in Oregon, Washington, Idaho, Montana and sections of Wyoming, Nevada, Utah and California.
- The system enables a peak loading of about 30,000 megawatts and generates more than \$700 million a year in revenues from transmission services.
- BPA's Transmission Business Line operates under an Open Access Transmission Tariff based on FERC's pro forma tariff as a non-jurisdictional entity.

# BPA's Transmission System

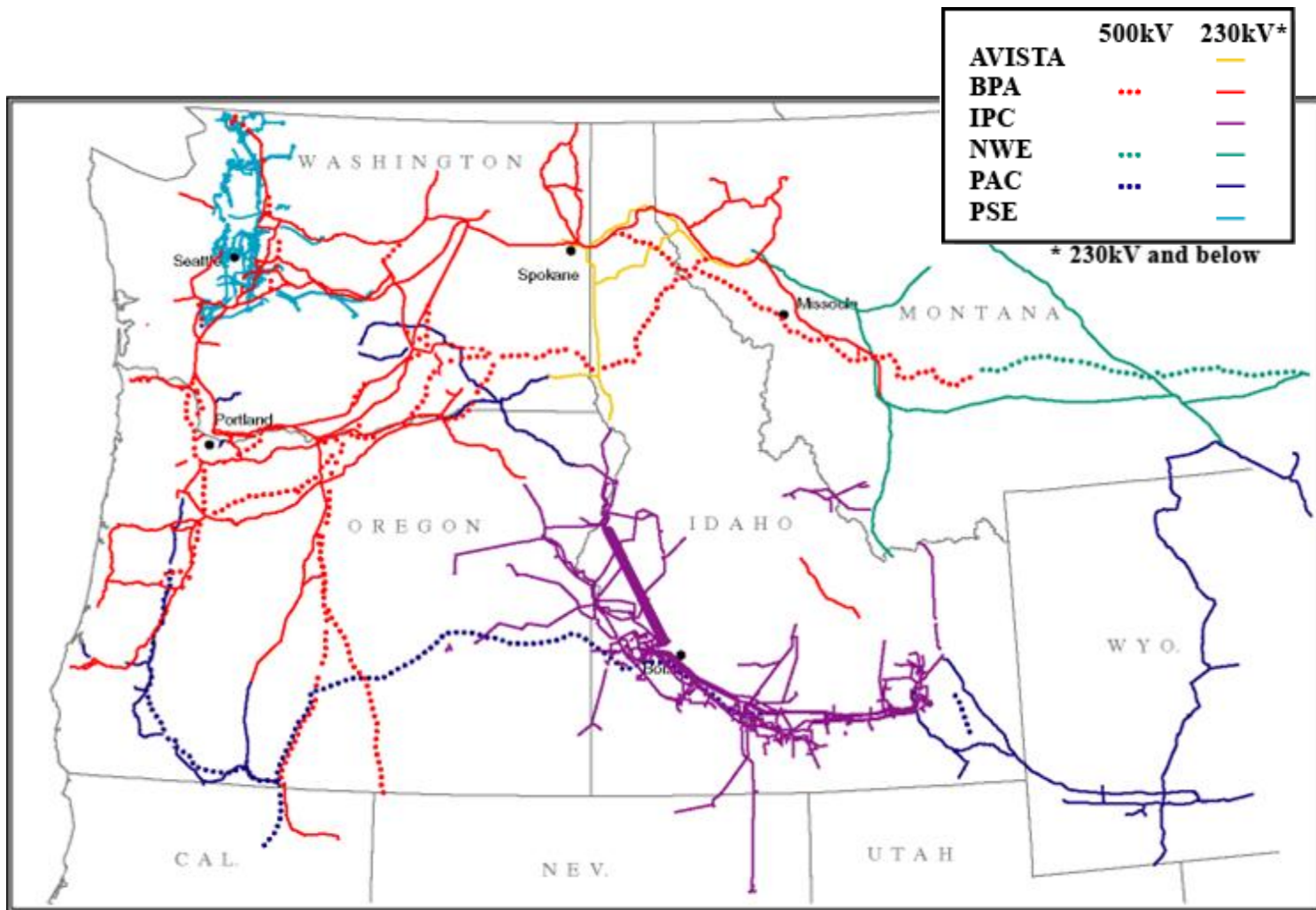


## Transmission System

| Operating voltage   | Circuit miles |
|---------------------|---------------|
| 1,000 kV            | 264*          |
| 500 kV              | 4,735         |
| 345 kV              | 570           |
| 287 kV              | 229           |
| 230 kV              | 5,324         |
| 161 kV              | 119           |
| 138 kV              | 50            |
| 115 kV              | 3,556         |
| <u>below 115 kV</u> | <u>368</u>    |
| <b>Total</b>        | <b>15,215</b> |

\* BPA's portion of the PNW/PSW direct-current intertie. The total length of this line from The Dalles, Ore. to Los Angeles is 846 miles.

# The Combined Transmission System

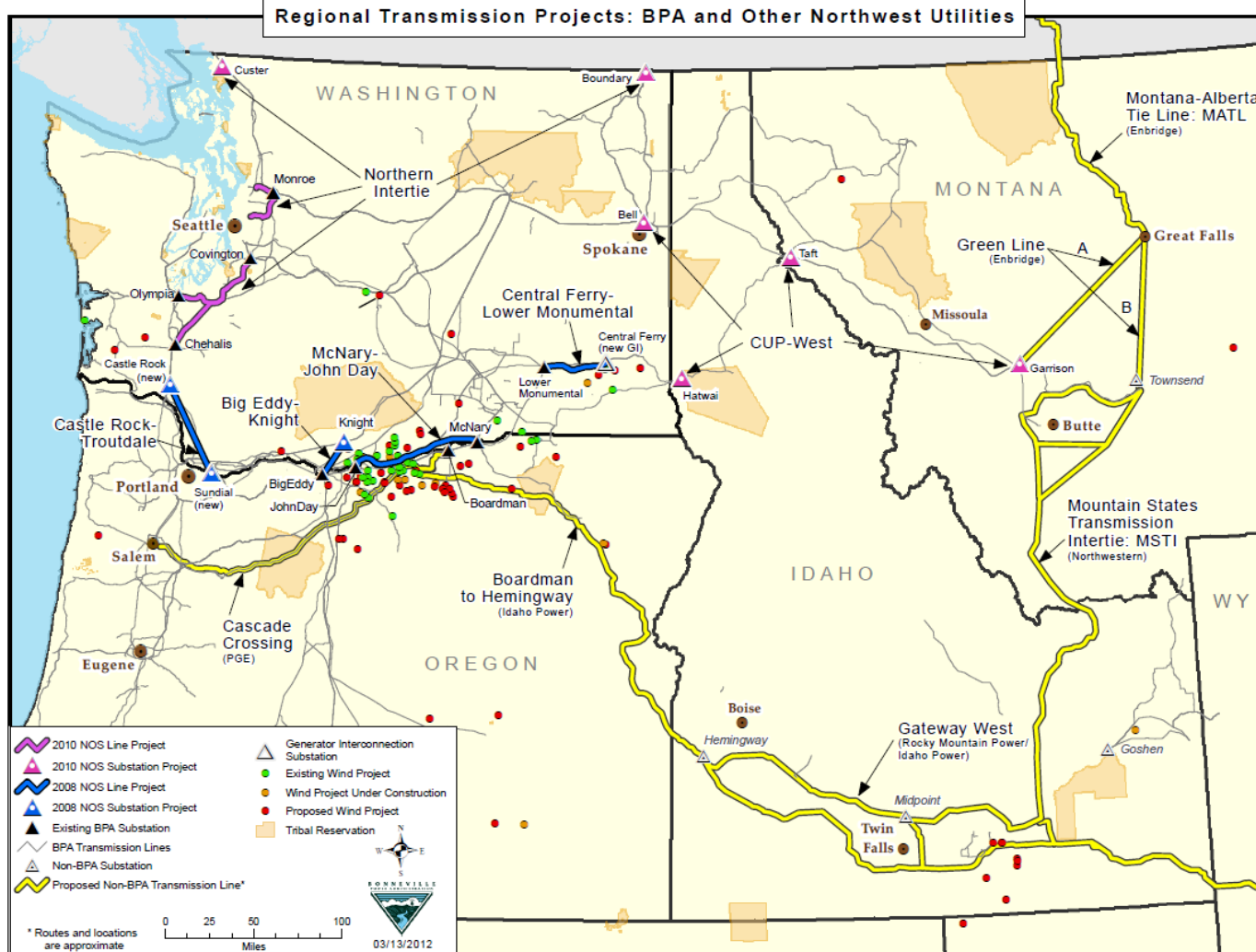


# Investing in the NW Transmission System

*In the midst of our largest transmission expansion program in decades...*

- The Pacific Northwest's growing population and need for clean, renewable energy is placing new demands on BPA's already strained transmission grid.
- Most renewable energy will come from wind generation and most wind farms are located away from population centers, which means that additional high-voltage transmission is needed to ensure reliable delivery of that energy.
- To meet these needs, BPA completed its the McNary-John Day line in early 2012 and is proposing to add four new high-voltage transmission lines to its network. The Big Eddy-Knight (BEK) project is under construction. The Central Ferry-Lower Monumental (CFLM) line has completed environmental review. The I-5 project is in environmental review. The Colstrip Upgrade Project (CUP West) is in study-phase. And NEPA scoping is in process for the Northern Intertie Reinforcement project.
- Together, the McNary-John Day, BEK, CFLM, and I-5 transmission lines would add more than 225 miles of high-voltage transmission to the Pacific Northwest's federal transmission grid, improving reliability and delivering about 3,700 megawatts of energy for the region. About 2,800 megawatts would come from additional renewable energy.
- The lines provide reliability benefits and will allow BPA to accommodate current and future transmission service requests to meet the region's growing energy needs.

# Transmission Infrastructure Projects





# Challenges and Solutions to Incorporating Wind Resources

## Operational Challenges

- Balancing wind variability with other generation resources.
- Wind is an energy resource; must have firm resources to rely on for capacity needs.
- Wind facilities are remotely controlled, unlike traditional generation; communications are a challenge.
- Schedules seldom match actual generation—we have to adjust other generation to maintain load/generation balance.

## Operational Improvements

- Wind plant operators have become much better at forecasting and adjusting wind schedules and thereby reducing reserves.
- The per MW charge for wind imbalance service has reduced for the FY12-13 rate period.
- BPA has joined the Northwest Power Pool Market Assessment and Coordination Committee, which will seek to improve coordination among NW Balancing Authorities.
- BPA has implemented several initiatives to improve grid operation, including intra-hour scheduling and customer-supplied balancing reserves.

# Commercial vs. Operational

*Interconnection Customers address commercial and operational needs separately*

- Interconnection/Integration Queue
  - New generation: can be either direct connection or behind-the-meter
  - System sales or establish a source as an Independent Power Producer (marketer)
  - 18 to 36 month timeline for coordination with BPA
  
- Transmission
  - Long-Term Firm queue
  - All transactions via OASIS
  - Enabling Agreements for either PTP or NT Customers provide access to ST Firm or Non-Firm Transmission
  - Constraints often pose challenges to developers wanting LTF Transmission.
    - Many purchasers want power purchase agreements that include Transmission.

## [http://transmission.bpa.gov/business/generation\\_interconnection/](http://transmission.bpa.gov/business/generation_interconnection/)

### Interconnection Home Page

BPA Transmission Services provides services for interconnection to the Federal Columbia River Transmission System. BPA interconnection procedures adhere to the requirements of its Open Access Transmission Tariff.

A Transmission Services Account Executive, in partnership with the appropriate [Procedural Administrator](#), will guide you through the Interconnection process. Call 360-619-6016 to request that an Account Executive be assigned to you.

If you would like help determining which sections apply to your entity or business, please call the Interconnection Administrator at 360-619-6047 or email to [interconnection@bpa.gov](mailto:interconnection@bpa.gov).

- ▶ [Large Generator Interconnection Procedures \(LGIP\)](#)
- ▶ [Small Generator Interconnection Procedures \(SGIP\)](#)
- ▶ [Line and Load Interconnection Procedures \(LLIP\)](#)
- ▶ [Balancing Authority Area Services](#)
- ▶ [Network Open Season & Generator Interconnection Reform](#)

#### Important information for new customers:

The Interconnection Request should be submitted in the name of the entity that will become BPA's contractual counterparty ("Interconnection Customer" as defined in the LGIP and SGIP) during the study process.

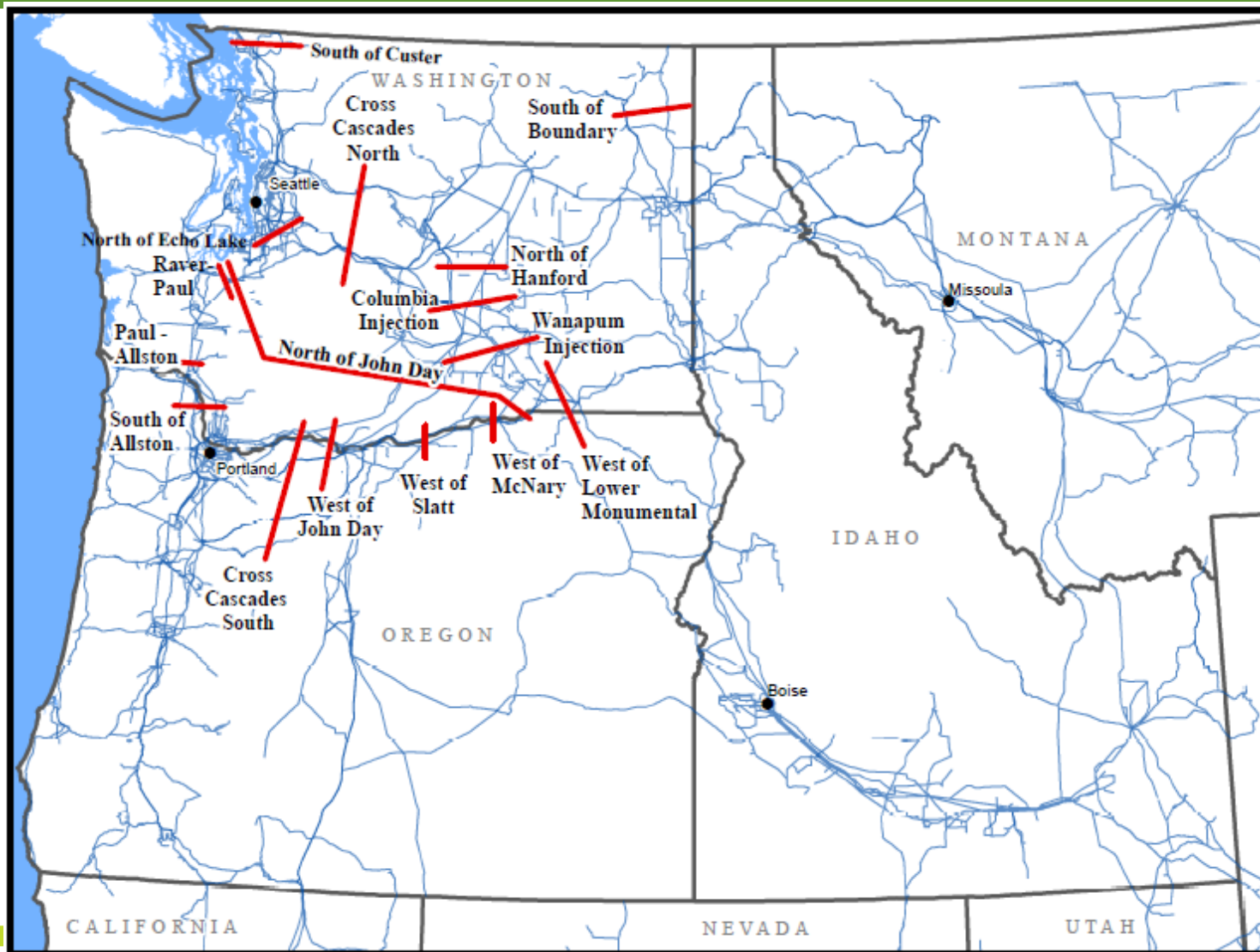
If that entity has not previously done business with BPA in its own name, please see [Establishing a new Interconnection Customer](#). This information applies equally to an existing BPA customer that submits an Interconnection Request in the name of a new subsidiary or affiliate.

### Related Links

View links to related documents.

- ▶ [Open Access Transmission Tariff](#)
- ▶ [Business Practices](#)
- ▶ [Interconnection Request Queue](#)
- ▶ [Transmission Studies](#)
- ▶ [RAS Talking Points](#)
- ▶ [Transmission Rate Schedules](#)
- ▶ [Subscribe to Email Alerts](#)
- ▶ [BPA Transmission System Maps](#)
- ▶ [Technical Requirements for Interconnection](#)
- ▶ [Operations Requirements For Generation Interconnection](#)
- ▶ [Process Flow For Commercial Operations](#)
- ▶ [Revenue and Interchange Metering Application Guide](#)

# 2013 Flowgates Map



# NT Transmission Service

- Network Integration Transmission Service – Serves Load Serving Entities
  - Customers must 'designate' Network Resources to acquire firm transmission service. May be federal or non-federal.
  - Includes non-Network Resources (Secondary NT)
  - Customer must own a resource or power purchase agreement prior to requesting firm transmission for a new Network Resource
  
- The Transmission Provider will plan, construct, and operate in order to deliver Network Resources to Network Load.
  - Plan of service includes load growth
  - Typically used by public load serving entities (Co-ops, PUDs, REAs)
  - Transmission costs based on load
  - No additional cost for use of non-firm
  
- For load service only (NT customers must acquire PTP transmission to make third party sales)

# Working with DOD

*Example: US Navy Kitsap (Bremerton, Bangor, Everett)*

- Possible renewables project development either on-base or remotely.
- Facilitate interconnection or integration efforts.
- Perform “What If” scenarios to determine ATC/Transmission availability.
- Educate on commercial and operational requirements.
  - Key steps and timelines
  - Provide cost estimates for BPA-performed work.
- Coordinate on local area planning requirements.