



ColumbiaGrid

2018 Annual Interregional Coordination Meeting (AICM)

February 22, 2018

In This Presentation



- **ColumbiaGrid (CG) planning activities**
 - Planning process – key components, products
 - Planning activities
 - Results – key conclusions from last year's (2017) activities
 - Next steps & 2018 planning activities
 - Information and notifications

CG Planning Process & Activities

CG Planning Process: Overview



- Governed by Planning and Expansion (PEFA) & Order 1000 Functional Agreements
 - One single process
- The planning process produces, at least, 2 key documents
 - System Assessment (SA) report
 - Biennial Transmission Expansion Plan (BTEP)

CG Planning Activities: What we do?



- Several types of activities that are part of ColumbiaGrid's planning process
- Base case development
 - Support MOD-032 process
- Annual assessment
 - Identify Order 1000 Needs
 - Reevaluation of Order 1000 projects

CG Planning Activities: What we do?



- Annual technical studies
 - Reliability Assessment (Part of SA)
 - Sensitivity Studies (Flexible study scope)
- Additional technical studies
 - Economic Planning Study (EPS)
 - Transient Stability study
 - Geomagnetic Disturbance study (TPL-007-1)
 - Model validation study (MOD-032)

CG Planning Activities: Studies & Assessment



- **Study Teams**
 - Focus groups that address specific issues or specific areas
 - Identify issues and/or develop plans of service
 - Flexible timeline
- **Special Projects**
 - As requested by the members

CG Planning Process: SA



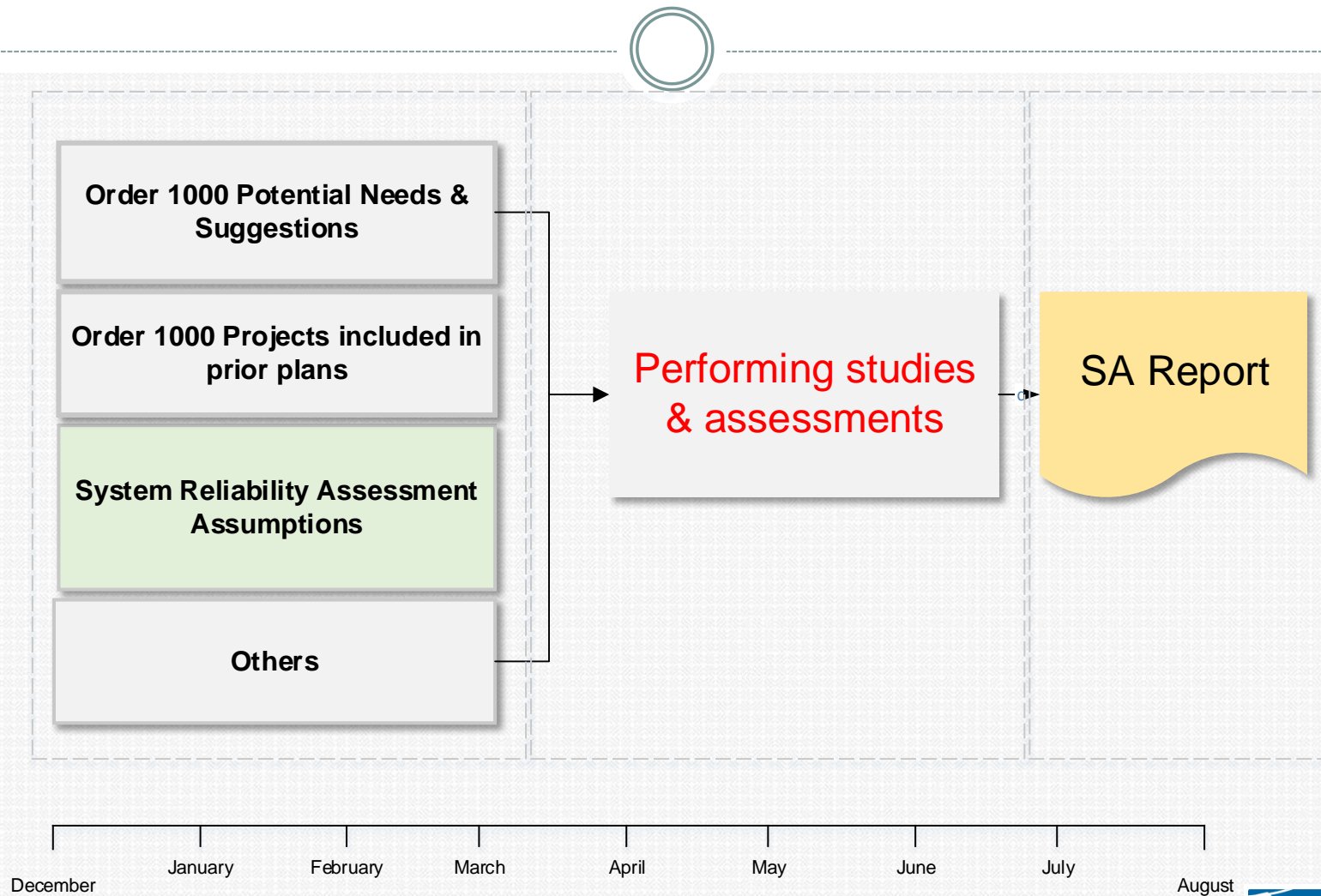
- Conducted annually (Dec – Jul)
 - The final report is issued by August of each year
- Scope, assumptions, and scenarios are developed in the public forum
 - Planning meetings (6 meetings a year)
- Fulfill the requirements from both Functional Agreements (FA)
 - Ability to serve load/transmission obligations
 - Identify Order 1000 Needs for regional transmission

CG Planning Process: SA



- The SA report contains major findings & results from various technical studies/evaluations
 - Screening studies of the Regional Interconnected System (RIS) using the Planning Criteria
 - Determine the ability of each TOPP to serve native load and other obligations, consistent with planning criteria
 - Determine conceptual transmission solutions to address Multi-system reliability issues (as needed)
 - Identify Needs (Need Statements)
 - Reevaluate Order 1000 Projects included in prior plans

CG Planning Process: SA



CG Planning Process: BTEP



- Single utility planning approach to develop a cost effective and efficient coordinated regional plan
- Covers ten-year planning horizon
- Identifies transmission additions necessary for members to:
 - Provide reliable load service
 - Integrate new resources
 - Meet transmission service commitments
 - Facilitate economic transfers

CG Planning Process: BTEP



- Projects included in the Plan are typically “committed projects”
 - In the permitting, design, or construction phases
- Biennial plan
 - The final report is issued in February (after the 2nd year of each planning cycle)
 - Ability to issue an “Updated” plan during the interim year (if needed)
 - The plan also discusses results from various “for information only” studies

CG Planning Process: BTEP



- **Contents of the BTEP report include**
 - Key conclusions from the latest System Assessment(s) such as Need Statements
 - Conclusions from other studies/activities that have been completed during the planning cycle
 - Updates from other ongoing studies/activities
 - Other updates

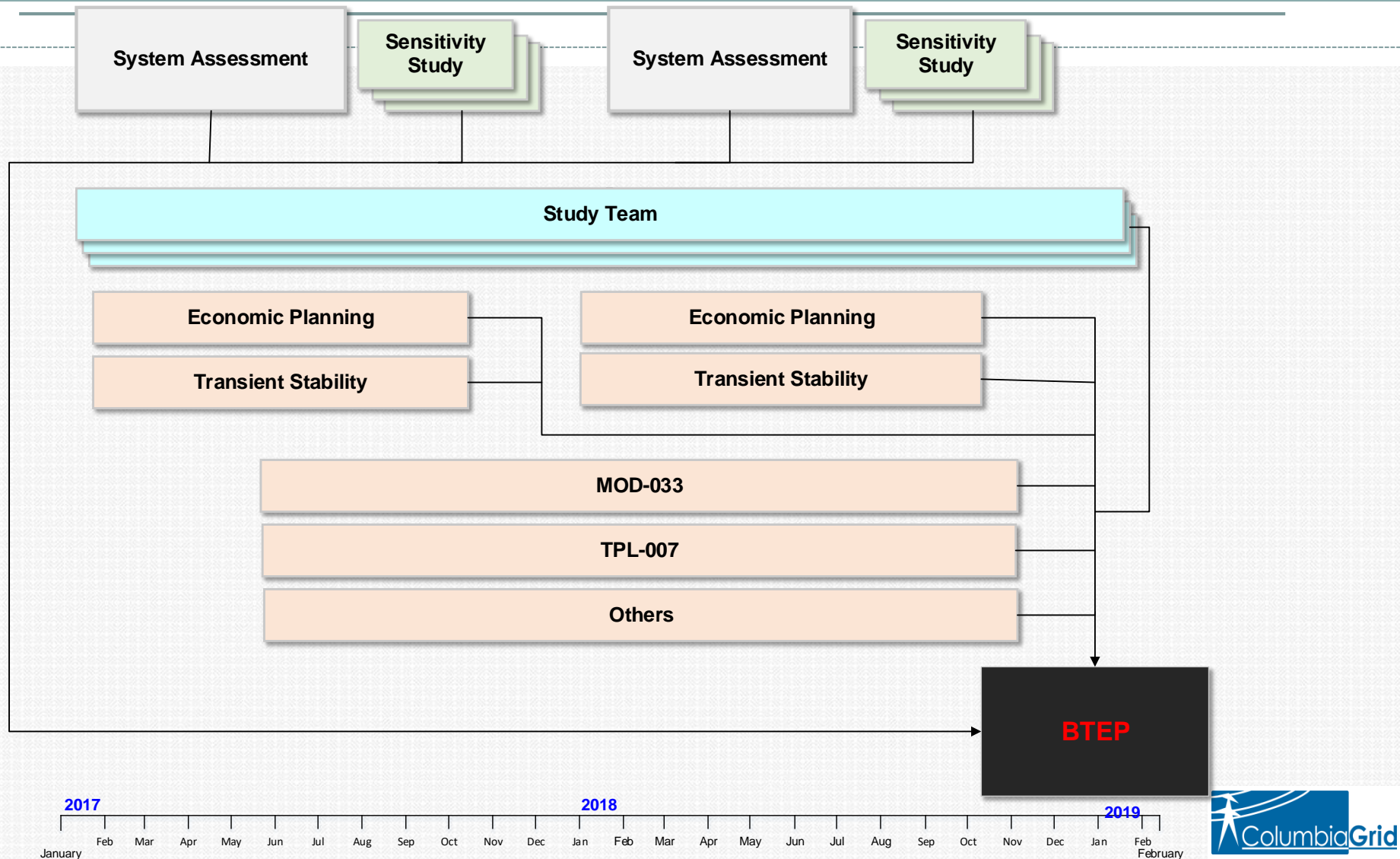
CG Planning Process: BTEP



- “Other” studies that were conducted in 2017 (some still ongoing)
 - Sensitivity Studies (e.g. High Renewable, N-1-1)
 - Study Teams*
 - Economic Planning Study (Production Cost Simulation)
 - Transient Stability Study
 - Model validation (MOD-033)
 - GMD studies (TPL-007)

** Timeline to conduct detailed studies or develop plan of service can be flexible*

CG Planning Activities: BTEP



Results & Major Findings

2017 System Assessment: Overview

2017 System Assessment



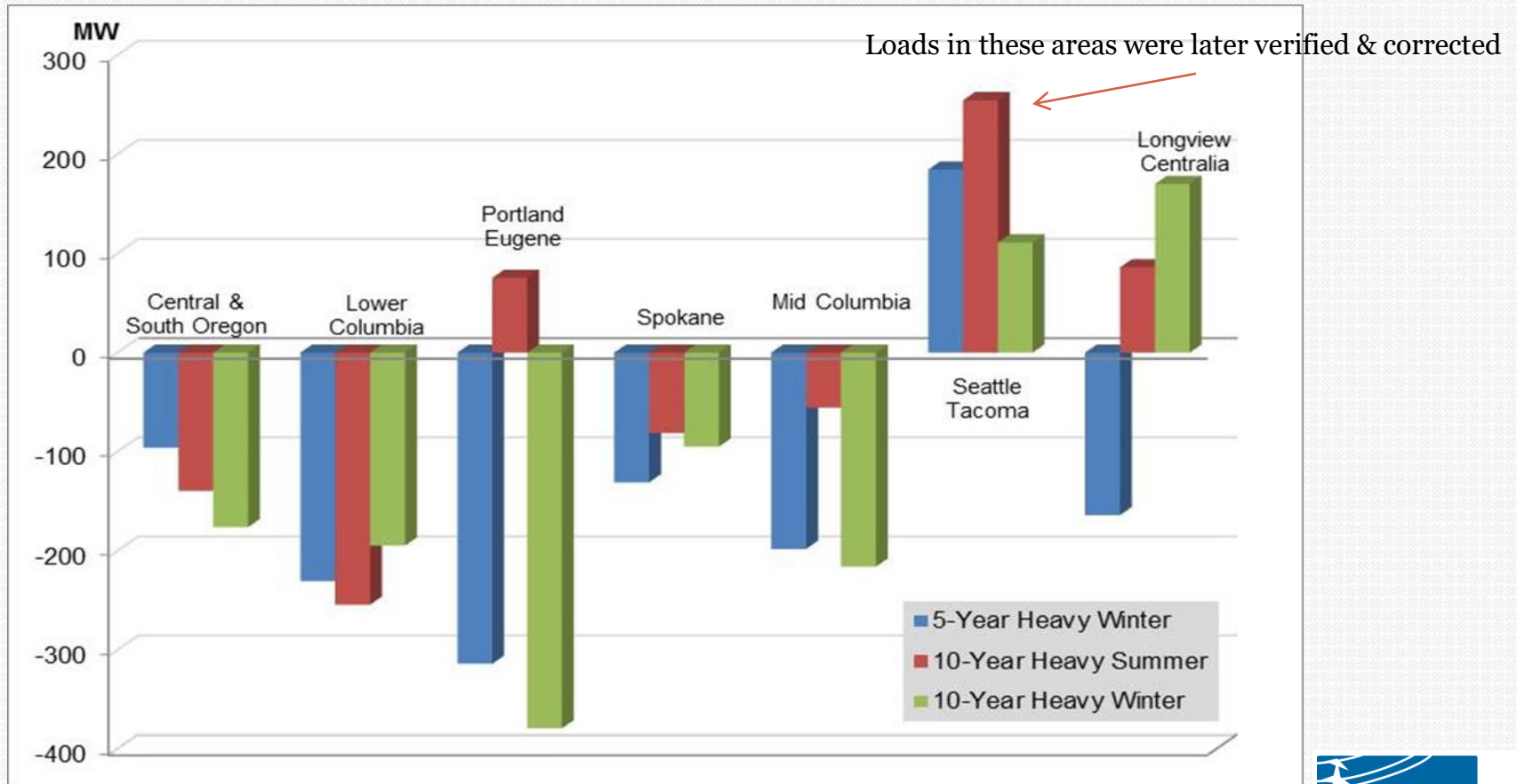
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Major contents

- Overview of ColumbiaGrid regional planning process and interregional coordination.
- Description of major projects that comprise the ColumbiaGrid Ten Year Plan. Total costs ~ \$2.4B
- 2017 System Assessment:
 - Modeling assumptions, study methodology and study results
- 2017 Sensitivity Studies: N-1-1 outage study, future generation supply study
- Transient Stability Study status update
- Economic Planning Study status update
- MOD-033 study update
- Geomagnetic Disturbance study update

2017 System Assessment: Key observations

- Load forecasts continue to decline in most areas



2017 System Assessment: Results



- Ten (10) areas of concern were identified
 - Driven by thermal overload issues.
 - All of these areas were identified in previous system assessments and are classified as “Recurring” problems
 - Reduction from 15 areas of concern in 2016 SA due to lower loading on limiting facilities
 - Primarily due to modeling improvements and lower load forecasts
- No new Order 1000 Needs has been identified

2017 System Assessment: Results



- **Thirty-seven (37) unsolved cases were confirmed**
 - Mostly triggered by local system issues
 - Potential solutions may involve addition of shunt reactive support to prevent voltage instability
 - Details of unsolved cases can be found in this section of the SA report

Sensitivity Studies: Results



- Two Sensitivity Studies were conducted in 2017
 - N-1-1
 - High Renewable
- N-1-1 study simulated multi-million combination of contingencies
 - Focus on multi-system issues
 - Identify potential reliability issues
 - Part of requirement under NERC planning standards

Sensitivity Studies: Results



- High Renewable Study focuses on potential impacts from significant supply changes
 - Uses PCM to determine potential major changes or additional scenarios to consider
 - Power flow is used to revalidate the results
 - Provide additional information (for information only)

Study Teams: Results



- The Alcoa Study Team concluded its work in December 2017
 - Evaluated impacts from major load shutdown
 - Study Team includes representatives from Chelan PUD, BPA, Grand PUD, Douglas PUD, and CG
 - The Study Team identified 7 alternatives to mitigate potential reliability issues
 - RAS option was recommended as the preferred alternative

Study Teams: Update



- A new Study Team was recently formed
 - Quincy Area Study Team
 - Address potential issues related to higher than expected load forecast in Mid-Columbia area
 - Ongoing activity

Economic Planning Study: Update



- An assessment of potential long-term system impacts using Production Cost Simulation (PCM)
 - Uses PCM as the screening tool
 - Revalidate results with power flow
 - For information only
 - Explore potential impacts on the longer timeframe such as 15 year horizon
 - Ongoing work

Transient Stability: Update



- Part of the annual study program to ensure system reliability
 - In addition to power flow and voltage stability
 - Also supports the base case development process
 - ColumbiaGrid has been conducting this type of study since 2015
 - Foundation for other studies such as the model validation (MOD-033)

Model Validation (MOD-033): Update



- A new study, in compliance with several requirements under MOD-033 standard
 - Model validation: Compare simulation results with actual events
 - Steady state power flow and transient stability
- Three major tasks to be conducted by CG
 - Development of the validation criteria document
 - Base case development
 - Perform the evaluation studies

Model Validation (MOD-033): Update



- **Current status**
 - The validation criteria have been developed & posted on CG's website
 - The reference event was selected (Aug 8th, 2017)
 - Base case has been developed
 - The evaluation work is being conducted

Geomagnetic Disturbance (GMD): Update



- A new study, in compliance with several requirements under TPL-007-1 standard
 - Evaluated power system performance during GMD events
 - The scope of current study focuses on assessing Geomagnetic Induced Current (GIC)
- Major tasks
 - Review of GIC system model data
 - Develop GMD study cases
 - Perform GMD study to determine GIC flow values

Geomagnetic Disturbance (GMD): Update



- **Current status**

- GIC base cases have been developed
- Preliminary GIC studies have been completed, the initial results are being reviewed by CG members
- Ongoing study

- **Next steps**

- Expansion of the study scope to include GMD Vulnerability Assessment
- Continue to monitor the development/requirements under TPL-007-2

Next Steps

2018 Regional/Interregional Planning Activities

Overview of Activities in 2018



- **January – March 2018**
 - CG Order 1000 Needs Suggestions window
 - Interregional Transmission Project (ITP) submittal window
 - Post annual interregional information
 - AICM Meeting
 - Finalize SA study plan and base cases
- **April – August 2018**
 - Evaluate O1K Needs suggestions that were received
 - Conduct 2018 SA and other studies
 - Develop the 2018 SA (Needs Statement) report

Overview of Activities in 2018



- **September – December 2018**
 - Begin study team activities to address regional needs
 - Evaluate Order 1000 proposed projects
 - Complete Sensitivity and other studies (such as MOD-033, GMD, etc.)
 - Start developing the 2019 Biennial Expansion Transmission Plan (BTEP)
- **February 2019**
 - Present the draft BTEP to CG's board for approval
 - Once approved, finalizes the 2019 BTEP

2018 Interregional Activities: Current Status



- Annual Interregional Information is posted under CG's "Order 1000 Inter-regional page":
<https://www.columbiagrid.org/O1000Inter-overview.cfm>
 - ColumbiaGrid information package
 - 2018 Draft Study Plan
 - 2017 Biennial Transmission Expansion Plan
 - 2017 System Assessment Report
- ITP submission window is open through Mar 31
- More information, once available, will be posted at this location & sent to interested persons

2018 Regional Activities: Current Status



- **Order 1000 Needs Suggestion Window**
 - Interested persons may submit suggestions for “Order 1000 Potential Needs”
 - Potential drivers for Order 1000 project(s)
 - An Order 1000 Potential Needs submission form can be downloaded at the following link:
<https://www.columbiagrid.org/1000-overview.cfm>

2018 Planning Activities: Ongoing Studies



- **2018 System Assessment (2018 SA)**
 - Study Plan is being finalized
 - Focus on reliability compliance for joint areas of concern (involving multiple entities/systems)
 - 10-year planning horizon
 - NERC TPL Reliability Standards used as reference
 - Evaluate applicable Order 1000 Potential Needs
- **Sensitivity studies**
 - Start sensitivity studies after completion of the 2018 SA
 - Study scope will be determined by July

2018 Planning Activities: Ongoing Studies



- **Additional Studies**
 - Transient stability assessment
 - Economic Planning Study (PCM)
 - System model validation (MOD-033)
 - Geomagnetic Disturbance (TPL-007-1)
 - Third party verification of physical security assessments (CIP-014)
- **Study Teams: Dedicated study groups**
 - Quincy area Study Team is ongoing, more are possible

Information and Notifications

Information, Events and Announcements

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CURRENT PROGRAMS

[Mission and Vision](#)

ColumbiaGrid's mission is to improve the reliability and efficient use of the Northwest's transmission grid. ColumbiaGrid performs grid expansion planning, and develops and implements solutions related to the expansion, operation, reliability, and use of the interconnected Northwest transmission system. In carrying out its mission, ColumbiaGrid endeavors to provide sustainable benefits for its members and the region, while considering environmental concerns, regional interests, and cost-effectiveness. [ColumbiaGrid Work Plan](#)

[Planning and Expansion](#)

ColumbiaGrid provides grid expansion planning based on a single-utility concept for the combined transmission grids of its planning parties. The goal of grid expansion planning is to determine reasonable solutions, or mitigations, of transmission grid issues pertaining to serving load and complying with reliability standards. In doing so, ColumbiaGrid helps to determine what should be built, where it should be built, and when it should be built. The participants in the Planning and Expansion program look to ColumbiaGrid's grid expansion planning to coordinate and support committing multi-party transmission projects in the ColumbiaGrid region.

For information on the Order 1000 Regional work please [click here](#).

For information on the Order 1000 Inter-regional work [click here](#).

EVENTS

February 19, 2018

[Presidents' Day - Office Closed](#)

February 21, 2018 8:00 - 9:20

[Members' Roundtable Meeting](#)

February 21, 2018 9:30-12:30

[Board Meeting](#)

February 22, 2018 9:00 - 3:00

[Annual Interregional Coordination Meeting](#)

April 12, 2018 9:00-3:00

[Planning Meeting](#)

May 16, 2018 8:00 - 8:50

[Members' Roundtable Meeting](#)

May 16, 2018 9:00-12:30

[Biannual Member & Board Meetings](#)

May 28, 2018

[Memorial Day - Office Closed](#)

June 07, 2018 9:00-3:00

[Planning Meeting](#)

July 04, 2018

[Independence Day - Office Closed](#)

RECENT ANNOUNCEMENTS

February 02, 2018

[Final Agenda and Hotels are posted | 2018 Annual Interregional Coordination Meeting; February 22, 2018 Folsom, CA](#)

January 03, 2018

[Interregional Transmission Project \(ITP\) proposal window is currently open through March 31, 2018](#)

December 20, 2017

[Board Approves 2018 Schedule of Meeting Dates](#)

December 20, 2017

[Board Approves Fiscal Years 2018 and 2019 Budget](#)

December 19, 2017

[2018 Planning Meeting Schedule is published](#)

[Announcements](#)

Planning and Expansion:
General postings & PEFA
related information

Order 1000 Regional

Order 1000
Inter-regional

Recent Announcements



Stay Informed About Future Activities



- **Public notifications**
 - ColumbiaGrid will notify interested persons regarding future activities through email
 - Self-register system
 - Refer to “Join Interest List” on ColumbiaGrid’s main page

Stay Informed About Future Activities



The screenshot shows the ColumbiaGrid website. At the top left is the ColumbiaGrid logo. To the right of the logo is a navigation bar with links: [Join Interest List](#), [Contact Us](#), [Members](#), and [FAQs](#). Below these links is a search bar with a magnifying glass icon and a 'Login' link. A red arrow points from the top right towards the 'Join Interest List' link. Below the navigation bar is a horizontal menu with links: [ABOUT](#), [CORPORATE ACTIVITY](#), [RESOURCES](#), [NEWS](#), [PROGRAMS](#), [PARTICIPATION](#), [DOCUMENTS](#), and [CALENDAR](#). The main content area features a large banner with a background image of power lines. The banner text reads: 'IMPROVING THE **PLANNING, EXPANSION & EFFICIENT USE** OF THE NORTHWEST GRID'. Below the banner is a green button labeled 'LEARN MORE'. Below the banner are three columns of content: 'CURRENT PROGRAMS', 'EVENTS', and 'RECENT ANNOUNCEMENTS'. The 'CURRENT PROGRAMS' column contains a link to 'Mission and Vision' and a paragraph about the grid's mission. The 'EVENTS' column lists several upcoming meetings with dates and times. The 'RECENT ANNOUNCEMENTS' column lists recent news items, including the 'Final Agenda and Hotels are posted | 2018 Annual Interregional Coordination Meeting' and the 'Interregional Transmission Project (ITP) proposal window'.

ColumbiaGrid

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Grid

Future Planning Meetings



- Please refer to ColumbiaGrid's website for more details

No	Date	Location	Focus
1	February 8, 2018	Portland, OR	Order 1000 Needs suggestions, 2018 System Assessment assumptions, other updates
2	April 12, 2018	Portland, OR	Order 1000 Potential Needs, finalize 2018 study plan, updates on system assessment
3	June 7, 2018	Portland, OR	Order 1000 Needs, Draft System Assessment study results, Updates
4	August 16, 2018	TBD	Updates & Technical discussion
5	October 11, 2018	Portland, OR	Order 1000 updates, Draft Sensitivity Study results, Other updates
6	December 13, 2018	Portland, OR	Draft 2019 BTEP, Updates

Questions

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