

11-IEP-1E

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11-IEP-1G

DATE May 17 2011

RECD. May 18 2011

IEPR Committee Workshop

**Western Interconnection
Regional Trends and Initiatives
--Transmission and Renewables--**

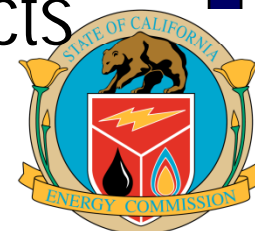
**Grace Anderson
California Energy Commission Staff**

May 17, 2011



Overview: Four Western Region Trends

1. Renewable Integration: Continuing Priority
 - ✓ Energy Imbalance Market
 - ✓ Sub-region/Utilities' Joint Initiatives
 - ✓ Dynamic Scheduling
2. T-Project Progress: Sub-region Planning
 - ✓ 30 new projects on-line by 2020?
3. Central Focus: Planning for Renewables
 - ✓ 10 Year Regional Transmission Plan
4. Sustained Interest: Multi-state Expansion Projects



Trend 1. Focus on Renewable Integration: WECC Energy Imbalance Market

- Real-time, centralized, energy dispatch market
- Security-constrained economic dispatch:
 - ✓ Energy and balancing needs
 - ✓ Resource characteristics
 - ✓ Transmission characteristics
 - ✓ Energy offer
 - ✓ “Optimal” 5 minute dispatch
- Voluntary participation
- Potential savings significant?



1. Focus on Renewable Integration: Sub-regional/Utilities' Joint Initiatives

- Intra-hour scheduling
 - ✓ implementation of 30 minute scheduling July 2011
(when automated scheduling tools are available)
- Dynamic Scheduling System
 - ✓ Implementation March 2011
- Intra-hour Transaction Accelerator Platform
 - ✓ expected availability Fall 2011 (“web-exchange”)



1. Focus on Renewable Integration: Dynamic Scheduling

- Western Wind Integration Team: Dynamic Transfer Capability and Limit Review
- Increases in Dynamic Transfer Capability require system enhancements
- Improvements target ability of the T-system to respond automatically:
 - ✓ enhanced state-awareness
 - ✓ automation of controls
 - ✓ additional reactive equipment
 - ✓ increased staffing at control centers

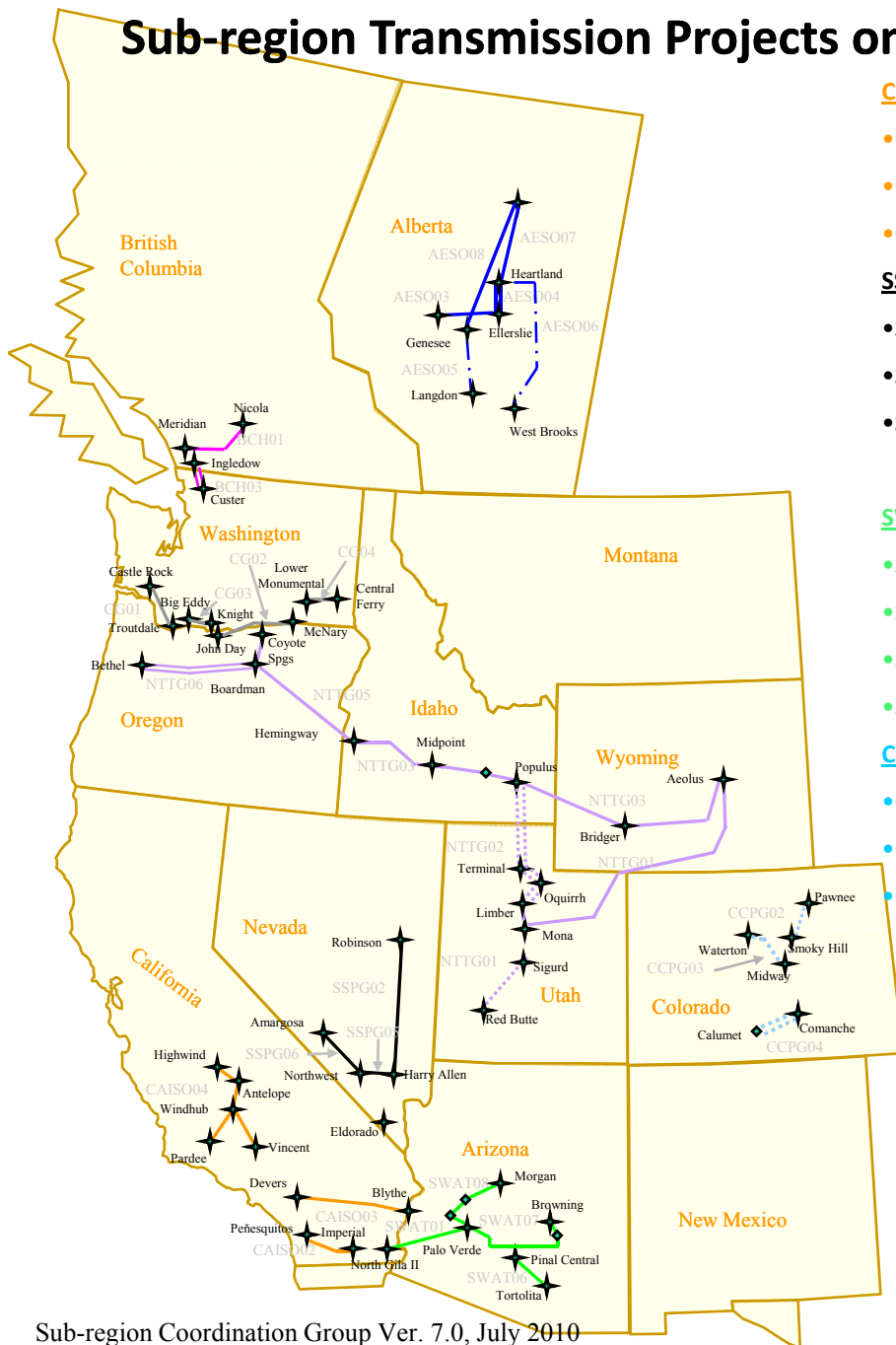


Trend 2: Transmission Projects Progressing

- Region reflects vibrant sub-regional planning group (SPG) function
- Sub-region Coordination Group integrates 8 SPG plans
- 30 foundational projects = very high probability by 2020
 - ✓ Projects mainly within sub-regions (slide 7)
 - ✓ Provide load service
 - ✓ Maintain reliability
 - ✓ Access renewable and conventional resources



Sub-region Transmission Projects on-line by 2020



CAISO

- CAISO02 Sunrise
- CAISO03 Blythe-Devers
- CAISO04 Tehachapi Upgrade

SSPG

- SSPG02 SWIP South
- SSPG05 TCP Harry Allen - Northwest
- SSPG06 TCP Northwest - Amargosa

SWAT

- SWAT01 PV-NG#2
- SWAT06 Pinal Central - Tortolita
- SWAT07 Southeast Valley (SEV)
- SWAT08 PV - Morgan

CCPG

- CCPG02 Pawnee - Smoky Hill
- CCPG03 Waterton- Midway
- CCPG04 San Luis Valley

NTTG

- NTTG01 Gateway South Phase 1
- NTTG02 Gateway Central Phase 1
- NTTG03 Gateway West Phase 1
- NTTG05 Hemingway - Boardman
- NTTG06 Cascade Crossing

CG

- CG01 I-5 Corridor
- CG02 West McNary
- CG03 Big Eddy - Knight
- CG04 Little Goose Area Reinforcement

BCH

- BCH01 Nicola - Meridian
- BCH03 BC-US Intertie

Alberta AESO

- AESO03 1202L Conversion
- AESO04 Heartland
- AESO05 West HVDC
- AESO06 East HVDC
- AESO07 Fort McMurray - East Line
- AESO08 Fort McMurray - West Line

Legend

- 500 kV Single Circuit Line
- 345 kV Single Circuit Line
- == 500 kV Double Circuit Line
- 345 kV Double Circuit Line
- . - DC Circuit (various voltage)
- ★ Termination Substations
- ◆ Intermediate Substations

Trend 3. Regional Transmission Planning: Focused on Delivering Renewables

- WECC 2020 Reference Case compliant with statutory RPS
- Western states engaged through Steering Committee
- All load and renewable requirements vetted through states; (cases incl. high DSM, low carbon and coal fleet changes)
- CTPG members and CAISO engaged
- **WECC: First W Regional Transmission Plan Sept. 2011**

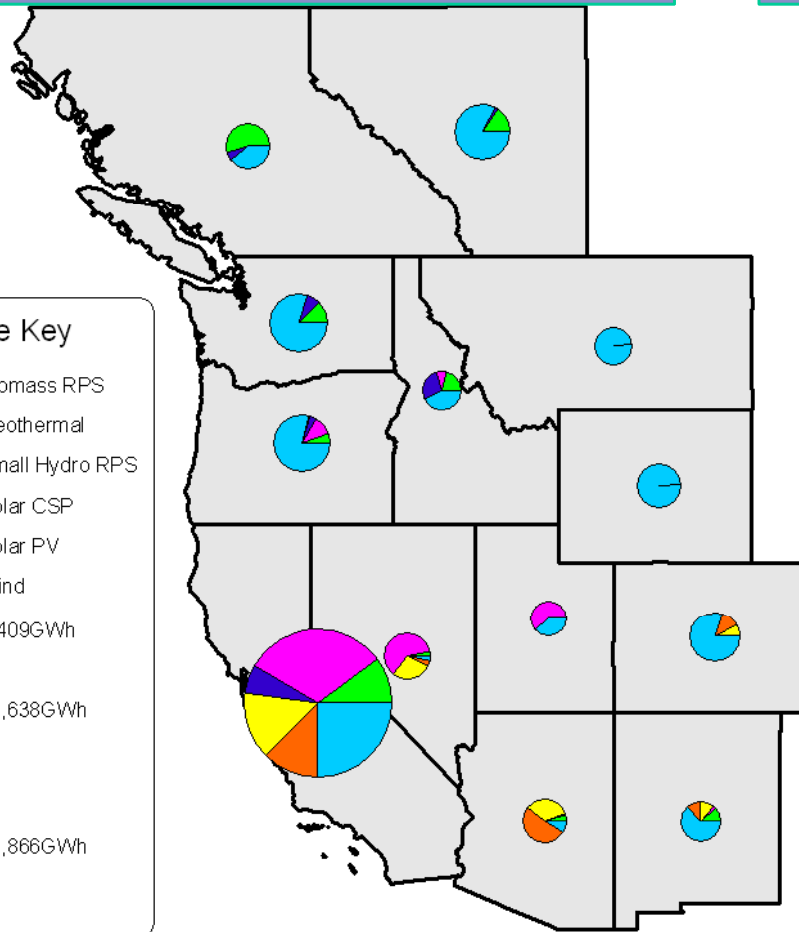
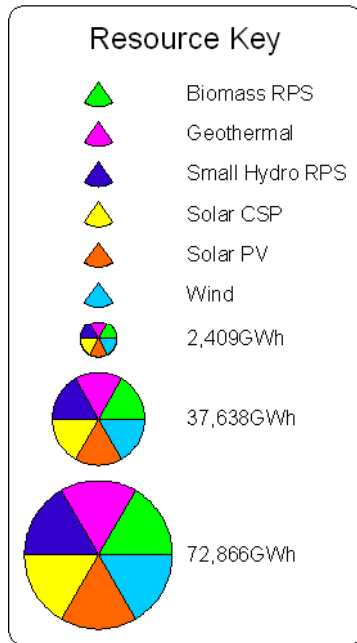
*\$26 million (ARRA) allocated for western regional T-planning



3. T-Planning Focused on Delivering Renewables

Renewable Generation

Conventional Generation



- Under construction
- Retirements
- OTC replacement units

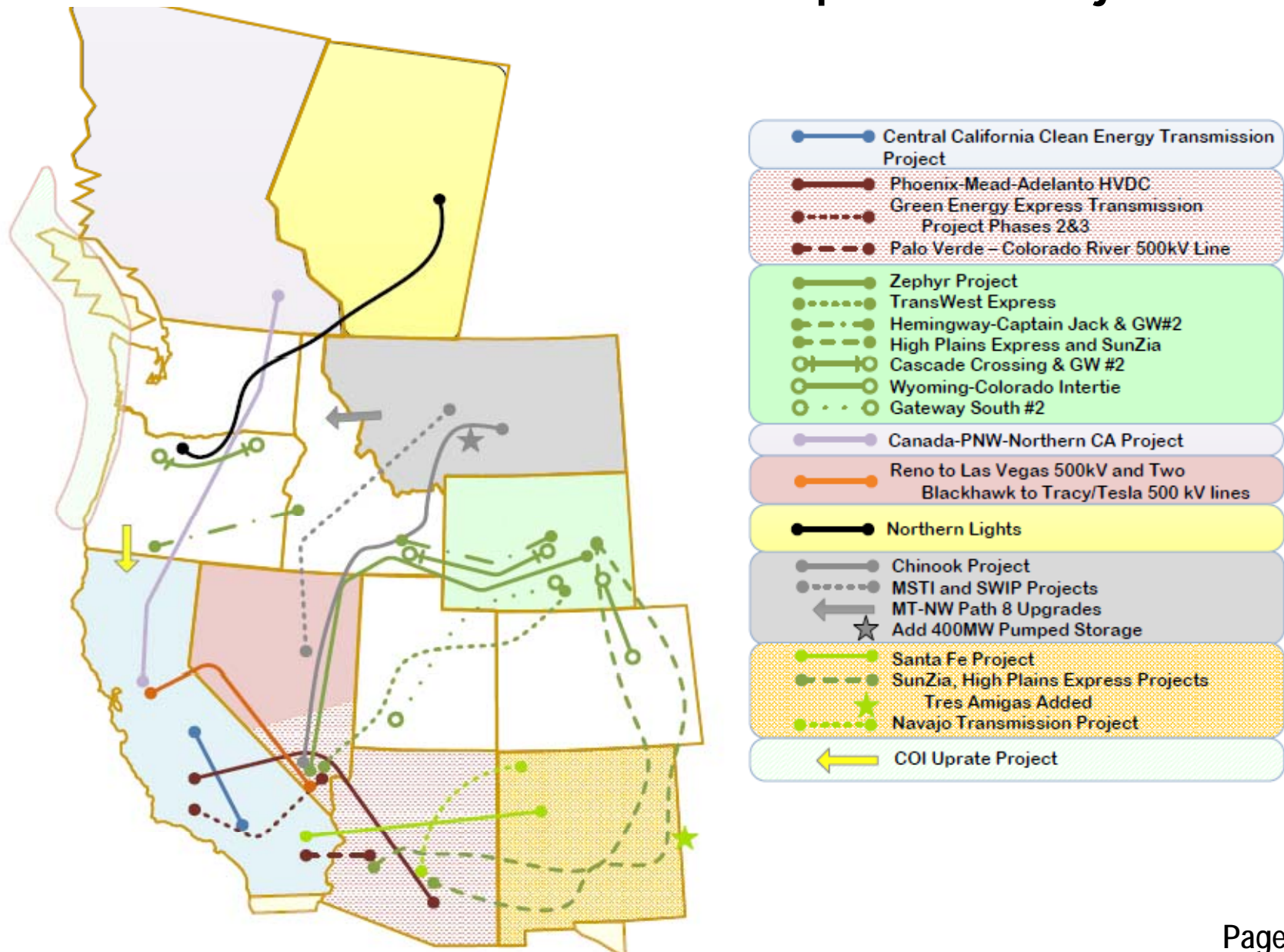
WECC Slide

Trend 4. Sustained Development Interest: Multi-state Expansion Projects

- High quality wind resources (40-45+) capacity factors in remote locations drive market interest (slide 11)
- Utility and independent developers rely on FERC Order 890 framework for review
- WECC expansion cases show benefit?
 - ✓ Wind profile diversity
 - ✓ Lower cost?
 - ✓ Competition
 - ✓ Backstop to delays in large solar deployment



4. Sustained Interest: Multi-state Expansion Projects



Western Trends: Policy Implications for CA?

- EIM may allow 5 minute schedules, reduced congestion, increased integration @ lower cost
- Joint Initiatives are bringing tools for 30 minute scheduling online; understanding dynamic transfer improvements could lead to increased flows and reduce integration costs on existing/new lines
- Additions of sub-region transmission projects strengthen western grid and increase ability to interconnect renewables
- Plan can illuminate paths to lower carbon future and identify potential benefits from regional perspective
- High quality remote resources put competitive pressure on CA procurement = lower cost in-state procurement



Perspective? Questions?

“In preparing for battle, plans are useless, but planning is indispensable.”

Dwight Eisenhower

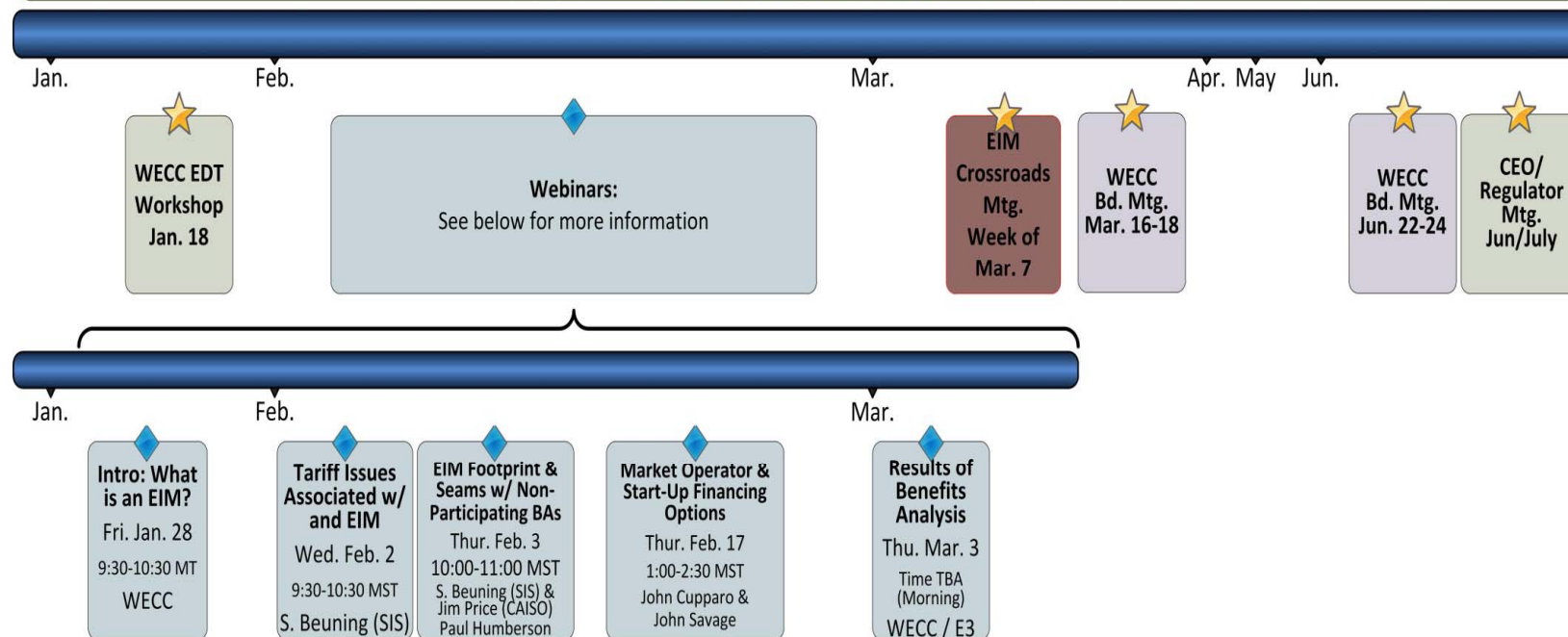


Background 1. WI Energy Imbalance Market: Decision Summer '11

Energy Imbalance Market (EIM) Crossroads Meeting

Overview of activities and events

January 2011 – June 2011



Background 2.

Multi-level Framework for Regional T-Planning:

- Federal
 - ✓ FERC regulations and DOE funding deliverables
- Regional :
 - ✓ WECC responsible for Regional Plans
- Sub-region:
 - ✓ Identifies high probability transmission projects
- States:
 - ✓ Determine policy, assumptions and data for Regional Plan Reference Case



Background 3.

"Alternative" Futures: Generation Locations

Alternative Resource Location Options:

Montana

Wyoming

Arizona/Southern Nevada

New Mexico

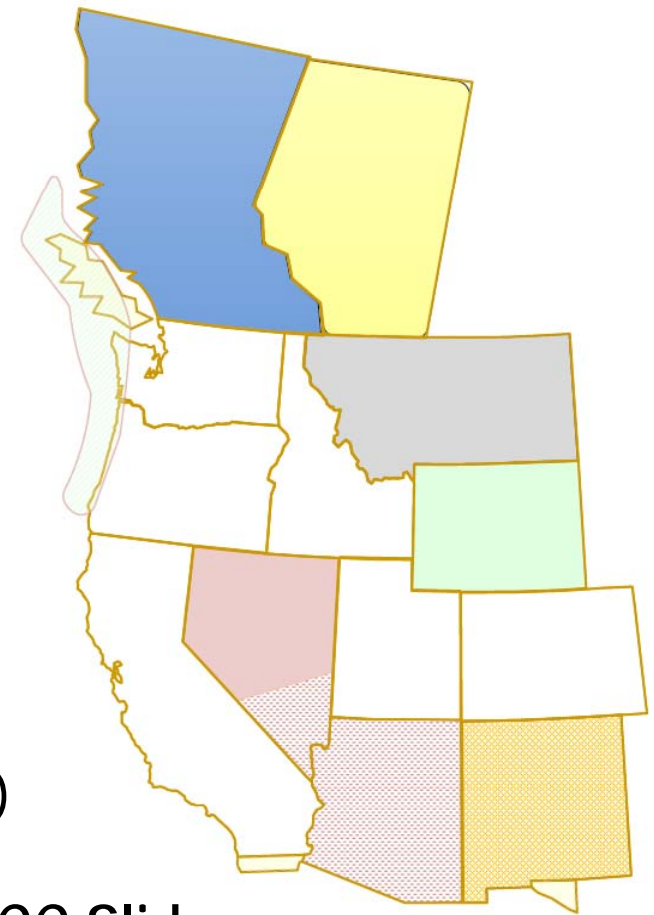
Northern Nevada

British Columbia

Alberta

Coastal Northwest

(12,000 GWh relocation cases)



WECC Slide