Public Service Company of Colorado
PUC Rule 3627 Stakeholder Outreach

July 15, 2021

AGENDA

- Introduction & Overview
- Rule 3627
- Transmission Reporting and Planning Process
- PSCo 2021 Local Transmission Study Plan
- PSco Transmission Plan Updates
- Studies of Interest
- Solicit Stakeholder Feedback

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MEETING BACKGROUND

- Rule 3627 Report Filing due February 2022
- Stakeholder Engagements held in Q1 and Q4
  - Today's meeting topic is exclusively CPUC Rule 3627
- In attendance today
  - Elected officials
  - Federal, state and local government officials
  - Environmental groups
  - Energy developers
  - Chambers of Commerce
  - Business and industry
  - Planning and economic development agencies
  - Large energy users
  - Citizens and advocacy groups
  - Organizations involved in transmission planning (e.g., CCPG members)

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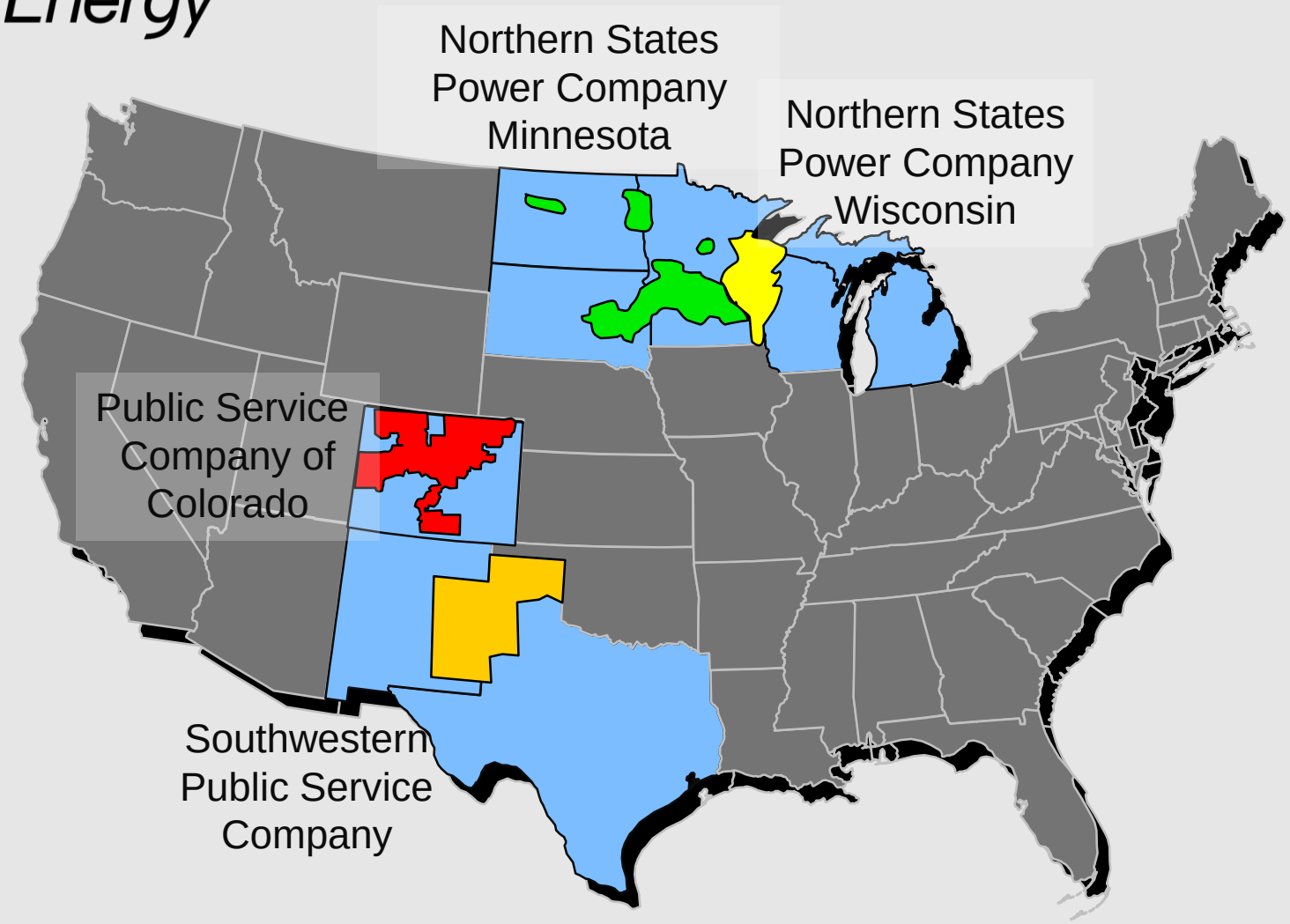

Gas Customers	2.0 M
Electric Customers	3.6 M

XCEL ENERGY TRANSMISSION

Over 20,000 transmission line miles

More than 1,200 substations

Serving customers in 8 states

3 NERC Regions; 2 RTOs; Non-RTO west

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WESTERN MARKET CONSIDERATIONS

PSCo Western Energy Imbalance Market (WEIM) Plans

- Engaged with CAISO and JDA partners since 2019
- May 2021 CSU announcement on SPP WEIS
- PSCo announced one-year pause on WEIM project work
- Evaluating CAISO governance challenges (wheel through)

Local Public Policy Colorado Senate Bill 21-072

- Requires utilities in Colorado to join an RTO by 2030
- Unless CPUC determines it is not in public interest
- No decisions have been made at this time

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COLORADO PUC RULE 3627

Rule 3627

- Public Utilities Commission of Colorado (PUC) Rule
- Adopted in 2011
- Applies to Black Hills, Tri-State, Public Service

Filing Includes

- **1**0-Year Transmission Plan & 20-Year Scenarios
- File in February of Even Years
- Next Filing: February 2022
- Stakeholder Participation

PUC Determines “Adequacy”

- 2012, 2014, 2016, 2018, and 2020 Reports Deemed Adequate

Rule 3627

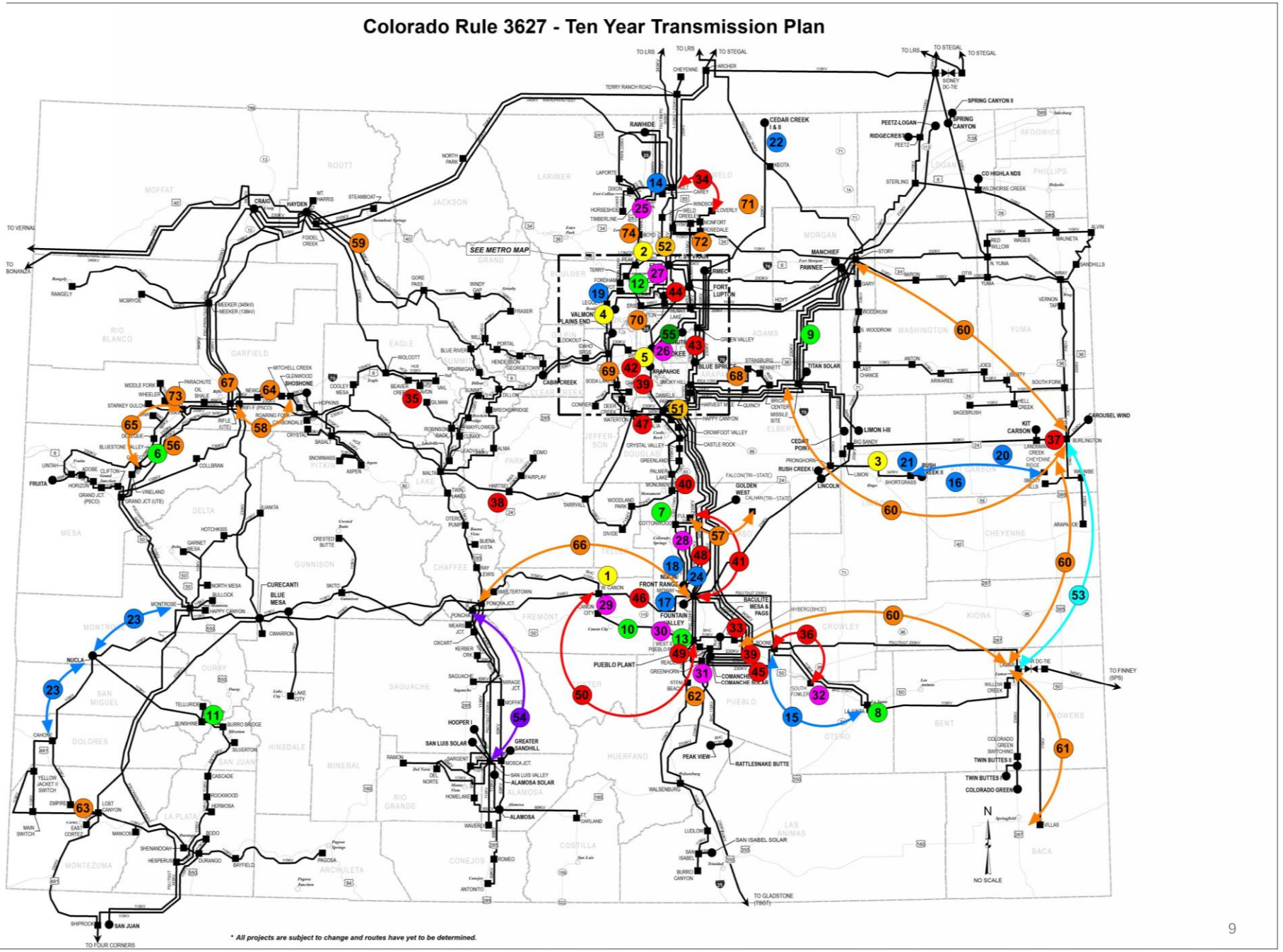
10-Year Report Content:

- Transmission Plans
  - Projects > 100 kV
  - “Planned” & “Conceptual”
- Other Details
- Methodology, Criteria, Assumptions
- Related Reports and Studies
- Summary of Stakeholder Participation

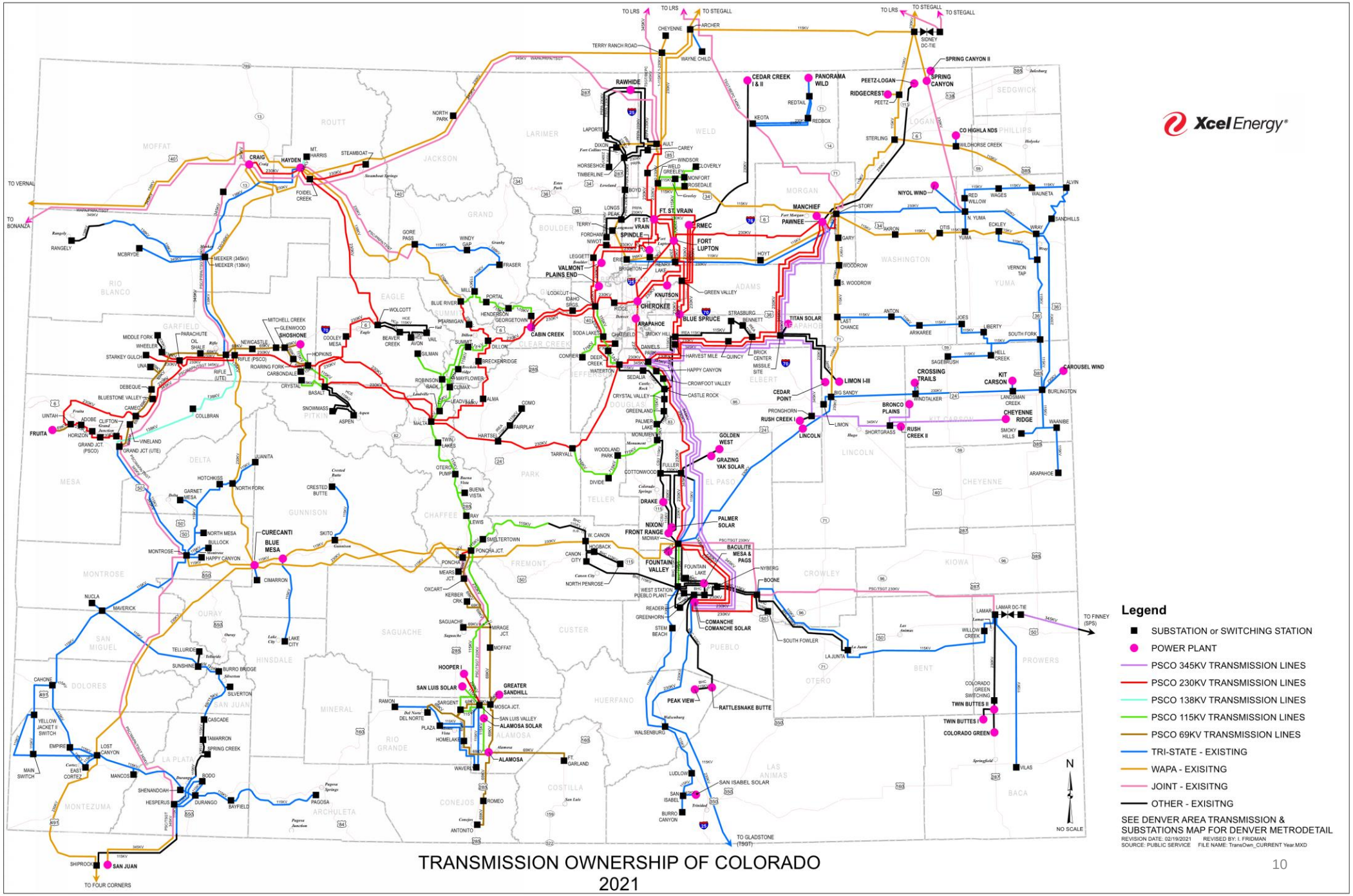
Proceeding Consolidated with SB07-100

- Public Policy Legislation that Promotes Proactive Transmission Planning

2020 Rule 3627 Colorado Ten Year Transmission Plan, Map



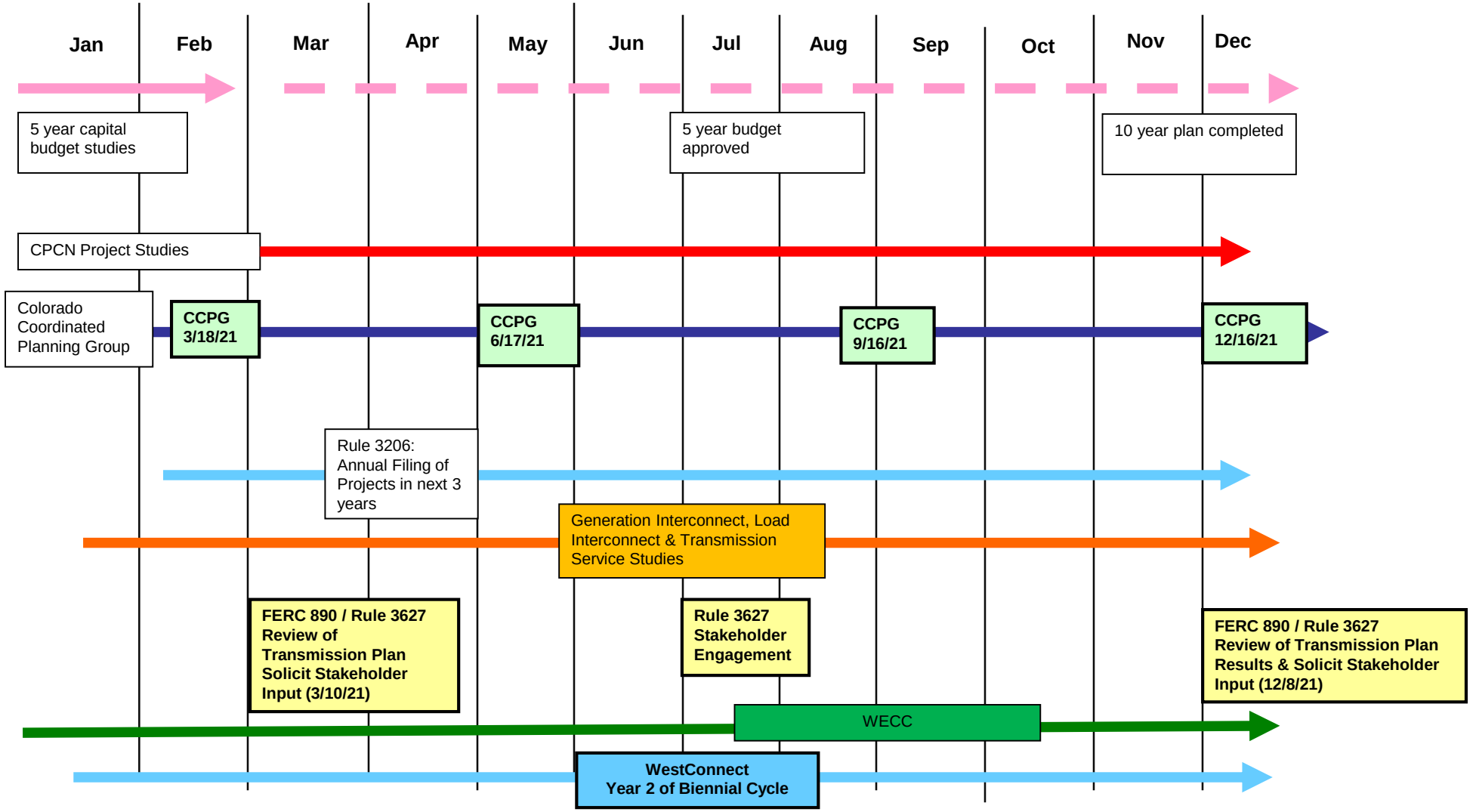
2021 TRANSMISSION OWNERSHIP COLORADO



TRANSMISSION OWNERSHIP OF COLORADO
2021

TRANSMISSION REPORTING AND PLANNING PROCESS

PLANNING PROCESS CALENDAR 2021



REPORTING

Rule 3627 Report (10 year plan and 20 year conceptual scenarios) & Senate Bill 07-100	CPUC	February 2022
FERC 715	WECC/FERC	March 2021
Annual Progress Report	WECC	March 2021
Rule 3206	CPUC	April 2021
WestConnect Regional Plan	WestConnect	1st Quarter 2022

INFORMATIONAL LINKS

Tariff Studies

PSCO Transmission Studies (rmao.com)

FERC 890 Information

http://www.oasis.oati.com/psco/index.html under “FERC 890 Postings”

SB07-100

http://www.transmission.xcelenergy.com/Projects/Colorado

http://regplanning.westconnect.com/ccpg_senate_bill_wg.htm

CCPG, WestConnect

http://www.westconnect.com/

Rule 3627 (10-Year Plan)

http://www.transmission.xcelenergy.com/Planning/Planning-for-Public-Service-Company-of-Colorado/Colorado-Public-Utilities-Commission-Rule-3627

http://regplanning.westconnect.com/ccpg_rule_3627.htm

Transmission Planning Documents

http://www.rmao.com/public/wtpp/PSCO_Transmission_Planning_Docs.html

FERC ORDER 890 LINKS (PSCO)

Contacts:

http://www.oasis.oati.com/PSCO/PSCOdocs/PSCo_Contacts-14.pdf

PSCo Tariff: Attachment R

PSCo_Attachment_R_5-5-2020.pdf (oati.com)

Meeting Notices and Materials

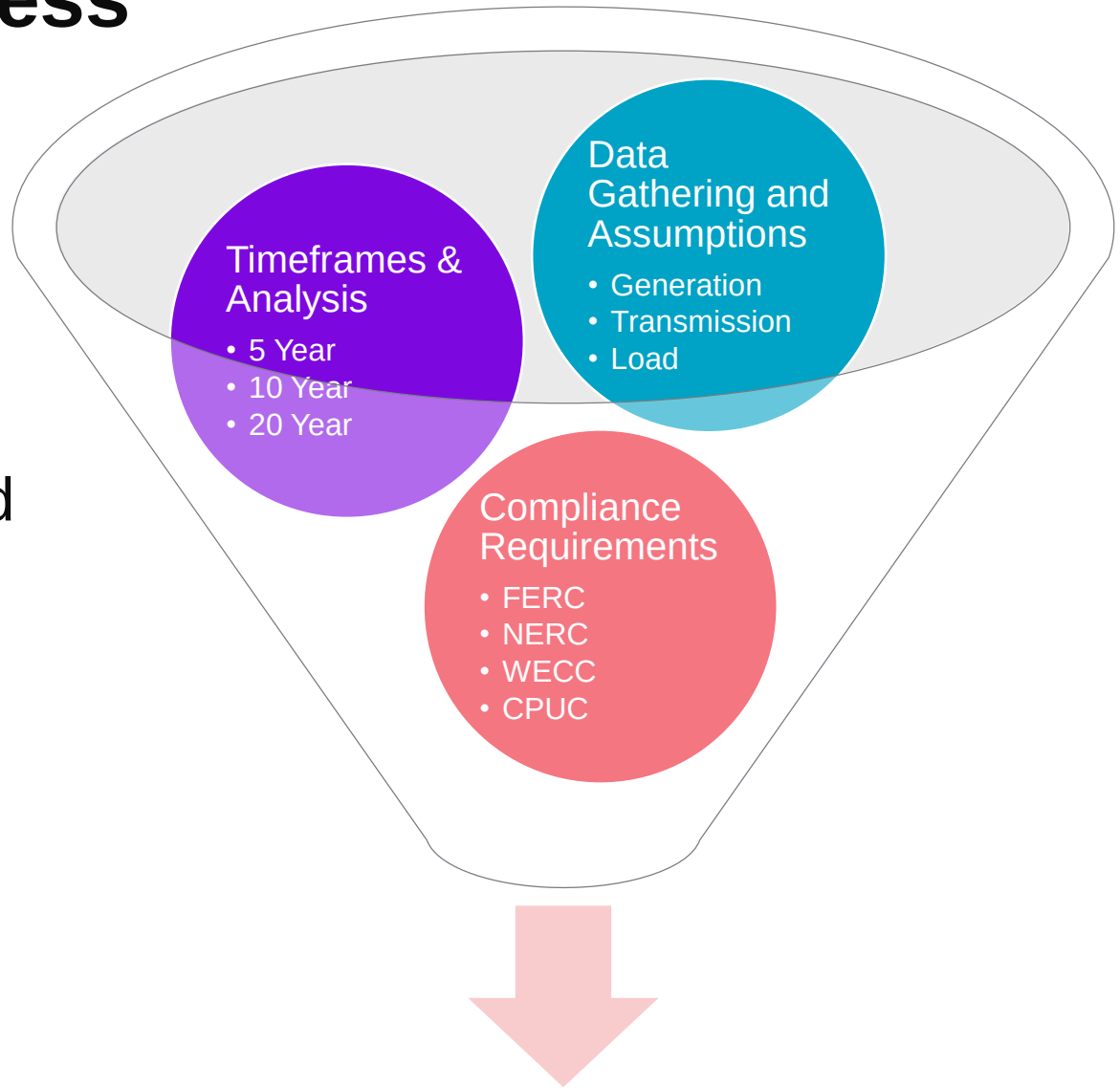
http://www.oasis.oati.com/psco/index.html under “FERC 890 Postings” → “Stakeholder Meetings”

Open Access Transmission Tariff

http://www.transmission.xcelenergy.com/Resources/Open-Access-Same-Time-Information-System-&-Open-Access-Transmission-Tariff

Transmission Planning Process

Transmission planning is the process of identifying future transmission infrastructure for delivery from forecasted resources to forecasted load centers without violating mandatory compliance standards.



TRANSMISSION PLANNING STUDIES

Reliability / Load Service

- TPL Studies (NERC Requirement)
  - 2-, 5-, and 10-year models
- Extreme Weather Study (NERC Recommendation)
- Craig/Hayden retirement evaluation

Economic Planning Studies

- Long-Term (10 year)
  - Local studies upon request

Public Policy Requirements

- PSCo Local Public Policy Planning through CCPG 80 x 30 Task Force (See CCPG Website)
  - Senate Bill 07-100 (SB-100)
  - Senate Bill 19-236

Other

- Transmission Service
  - Point to Point
  - Network Service (DNR/New Delivery Point)
- Generator Interconnection
- Transmission to Transmission Interconnections

ANALYSIS & CRITERIA

Analysis

- Steady State, Transient Stability, Short Circuit
- Economic Studies

Criteria

- NERC Standards (TPL, MOD, FAC)
- PSCo Criteria
- Variable Energy Resource (VER) Guidelines

2021 ORDER 890 LOCAL TRANSMISSION STUDY PLAN

Transmission Planning Study Objectives

- To provide adequate transmission to access sufficient resources in order to reliably and economically serve retail and wholesale loads.
- Where feasible, to integrate proposed alternatives such as demand response resources that could meet or mitigate the need for transmission additions or upgrades.
- To support PSCo's local transmission and sub-transmission system
- To provide for interconnections for new generation resources and load service
- To coordinate new transmission to transmission interconnections with other transmission systems
- To accommodate request for long-term transmission access.
- To consider local transmission needs driven by Public Policy Requirements

MODEL DEVELOPMENT

Model Development (Unique to each study)

- Main 2021 Study Models:
  - 2023 Heavy Summer
  - 2023 Off-peak Summer
  - 2026 Heavy Summer
  - 2031 Heavy Summer
- Start with WECC Case, updated through CCPG
- Load Forecasts
  - Latest Transmission Customer’s Forecast is used
- Update generation as appropriate for the study

Transmission Customer Updates

Please submit changes to the following on or before **September 1** of each year. Customers are also asked to provide any assumptions they wish to be included.

Generators – Planned additions or upgrades, planned retirements, planned permanent de-rates, and environmental restrictions.

Demand Response Resources – Existing and planned demand resources and their impacts on demand and peak demand

NITS Customers – Forecast information for load and resource requirements over the planning horizon and identification of generation resources and demand response reductions.

PTP Customers – Projections of need for service over the planning horizon, including transmission capacity, duration, and receipt and delivery points.

See PSCo Tariff Attachment R, Section II.C

*All project in-service dates subject to change

PSCO 2020 LONG TERM TRANSMISSION PLAN UPDATE

SUBSTATIONS & SWITCHING STATIONS

- 2021
  - Cloverly 115kV Expansion
- 2022
  - CEPP Interconnections
    - Mirasol Switching Station 230kV
    - Tundra Switching Station 345kV
    - Hartsel – Tarryall Switching Station 230kV
- 2023
  - Bluestone Valley Phase 2 (Reliability)
  - CEPP Voltage Control
  - Graham Creek 115kV
  - Husky 230/115kV
- 2024
- 2025
  - Canal Crossing 345 kV
  - May Valley 345 kV
  - Goose Creek 345 kV

- Distribution
  - Avery (2022)
  - Barker (Bank 1: 2025, Bank 2: 2026)
  - High Point (2022)
  - Titan (2023)
  - Dove Valley (2023)
  - Stock Show (2026)
  - Conceptual, ISD TBD
    - Box Elder Replacement
    - New Castle
    - Wilson
    - Solterra
    - Superior
    - Sandy Creek

TRANSMISSION

Planned

- 2021
- 2022
  - Greenwood – Denver Terminal 230kV
- 2023
  - Climax – Robinson Rack – Gilman 115kV
  - Ault–Husky 230kV
  - Husky–Graham Creek–Cloverly 115kV
- 2024
  - Gilman–Avon 115kV
  - CSU Flow Mitigation
- 2025 – 2030
  - Colorado's Power Pathway 345kV

Conceptual, ISD TBD

- Glenwood–Rifle Upgrade
- Parachute–Cameo 230kV
- San Luis Valley–Poncha 230kV #2
- Poncha–Front Range 230kV
- Cloverly-Rosedale 230kV
- Erie 230kV Interconnection
- Weld – Ennis 230/115kV

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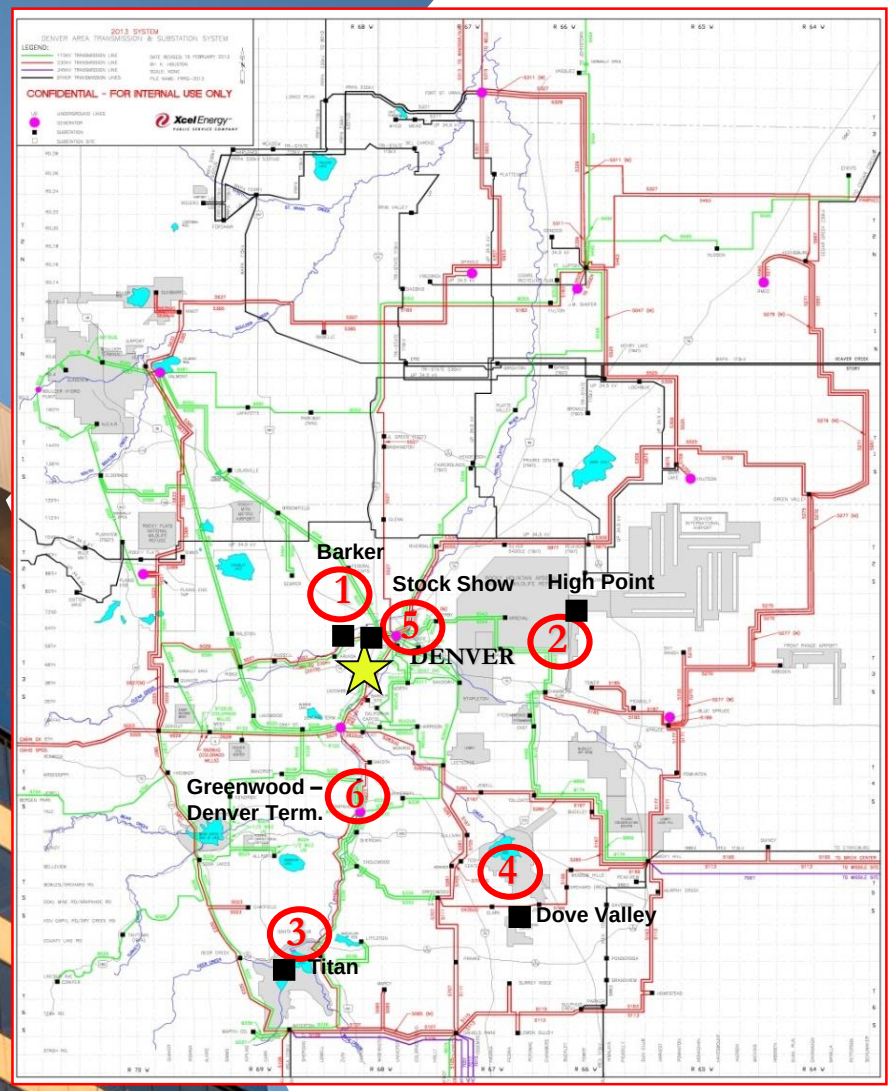
DENVER/BOULDER



#	Project	Comments	ISD*	Drivers
1	Barker Substation	New substation in Denver Area to serve distribution load growth in Historic Ballpark Area	2025	Distribution
2	High Point Substation	New substation in Denver Area to serve distribution load growth in Green Valley Ranch Area	2022	Distribution
3	Titan Substation	New substation in Denver Area to serve distribution load growth in Sterling Ranch Area	2023	Distribution
4	Dove Valley Substation	New substation in Denver Area to serve distribution load growth in South Metro Area	2023	Distribution
5	Stock Show Substation	New substation in Denver Area to serve distribution load growth for the National Western Stock Show renovation	2026	Distribution
6	Greenwood – Denver Terminal	Construction of 15 miles of new transmission line between existing Greenwood and Denver Terminal substations. The line is needed to accommodate CEP Projects.	2022	Generation Resources

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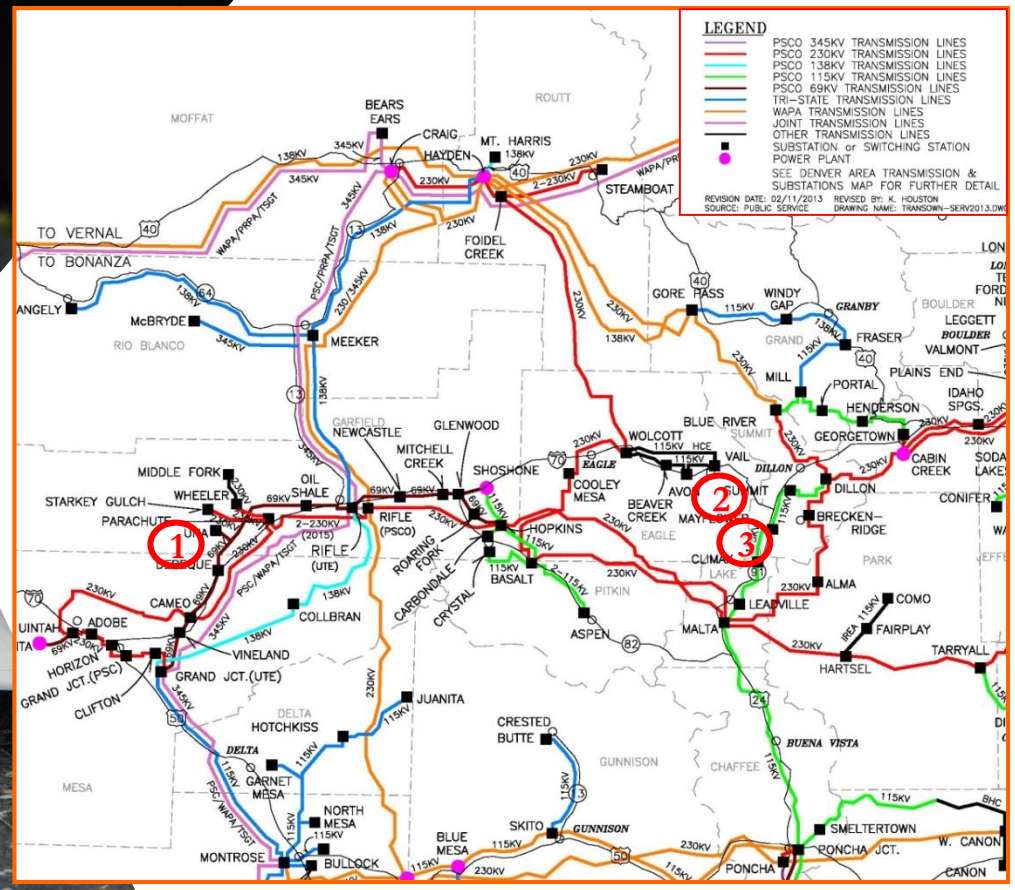
Western Slope / Mountain Area



#	Project	Comments	ISD*	Drivers
1	Bluestone Valley Substation	Phase 2: Construct the 230kV Bluestone Valley Substation that taps the Parachute-Cameo 230kV line.	Phase 2: 2023	Reliability
2	Gilman–Avon 115kV Line	Add a new 10-mile 115kV line in Eagle County for reliability and alternate source to Holy Cross customers	2024	Reliability
3	Climax – Robinson Rack – Gilman 115kV	Replace existing structures and uprate conductor	2023	Asset Renewal, Fire Mitigation, Reliability

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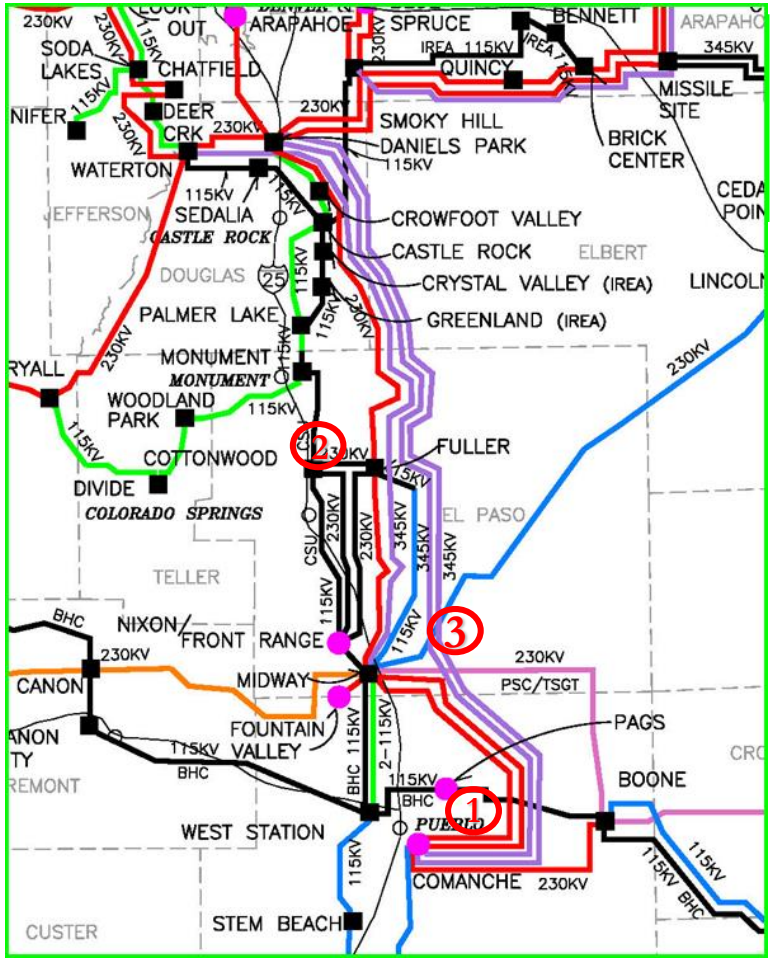
South Denver/CO Springs Area



#	Project	Comments	ISD*	Drivers
1	Mirasol Substation	Tap one Comanche – Midway 230kV line	2022	Resource Accommodation
2	CSU flow mitigation	Series reactor on the Monument – Flying horse 115kV line	2024	Reliability
3	Tundra 345 kV Substation	Tap one Daniels – Comanche 345 kV line	2022	Resource Accommodation

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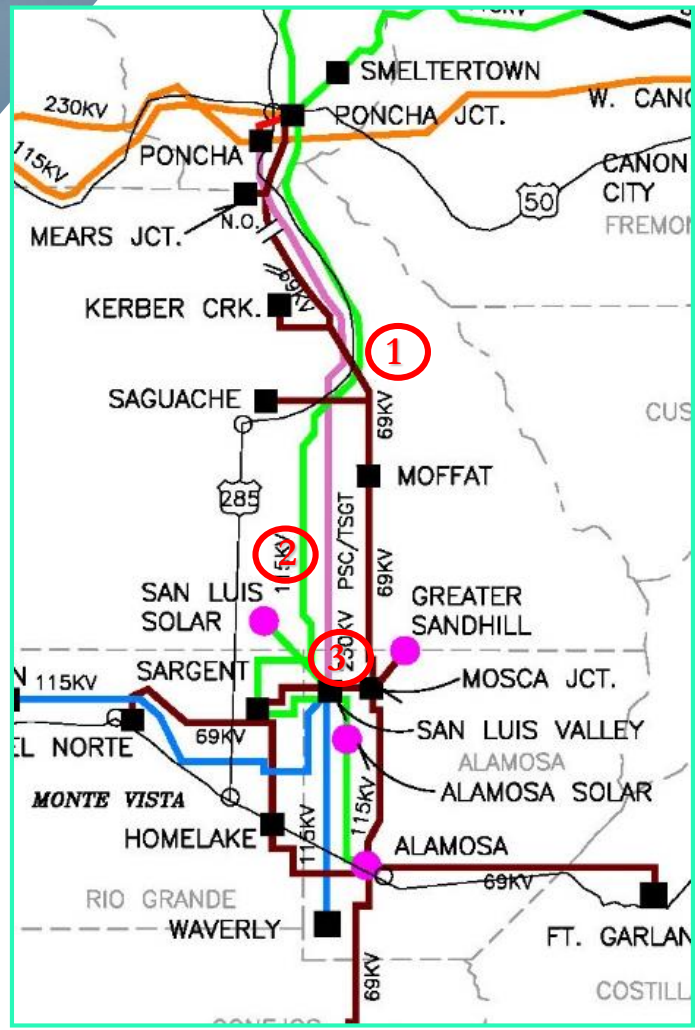
San Luis Valley Area



#	Project	Comments	ISD*	Drivers
1	Rebuild Poncha-Mosca 69kV line	Phase 4: Villa Grove – Poncha (2021) Replacing structures, conductors and transmission line switch at Oxcart in 2020	2021	Asset Renewal/Reliability
2	Rebuild Poncha-SLV 115kV line	Replacing deteriorate structures, poles, cross-arms and conductors on L9811 from Poncha to SLV substation	2024	Asset Renewal/Reliability
3	Rebuild SLV-Mosca 69kV line	Replacing deteriorate structures, poles, cross-arms and conductors on L6936 from SLV to Mosca substation	2022	Asset Renewal/Reliability

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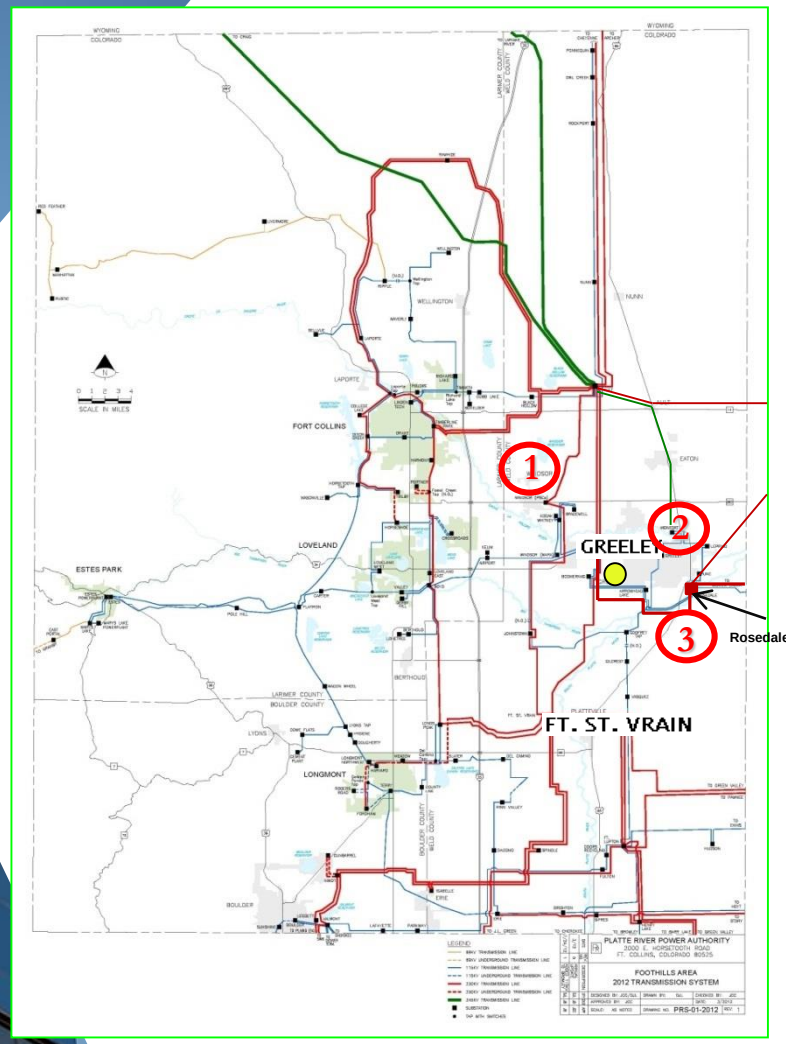
Foothills/Greeley Area



#	Project	Comments	ISD*	Drivers
1	Avery Substation	New distribution substation to serve loads in the area	2022	Distribution
2	Ault – Cloverly 230/115kV Subs: Husky, Graham Ck.	New line from Ault Substation to Cloverly Substation. Create new substations near PSCo Ault and Eaton to move 44kV loads to higher voltage.	2023	Reliability Load Growth Resource
3	Southern Greeley Area Project	New line from Weld Substation to Rosedale Substation. Build a new 230kV substation (Beebe Draw) to replace the existing 44kV La Salle Substation. New line from Rosedale Substation to New Box Elder 115kV Substation to Ennis Substation to replace the existing 44kV Box Elder Substation.	TBD	Reliability Load Growth

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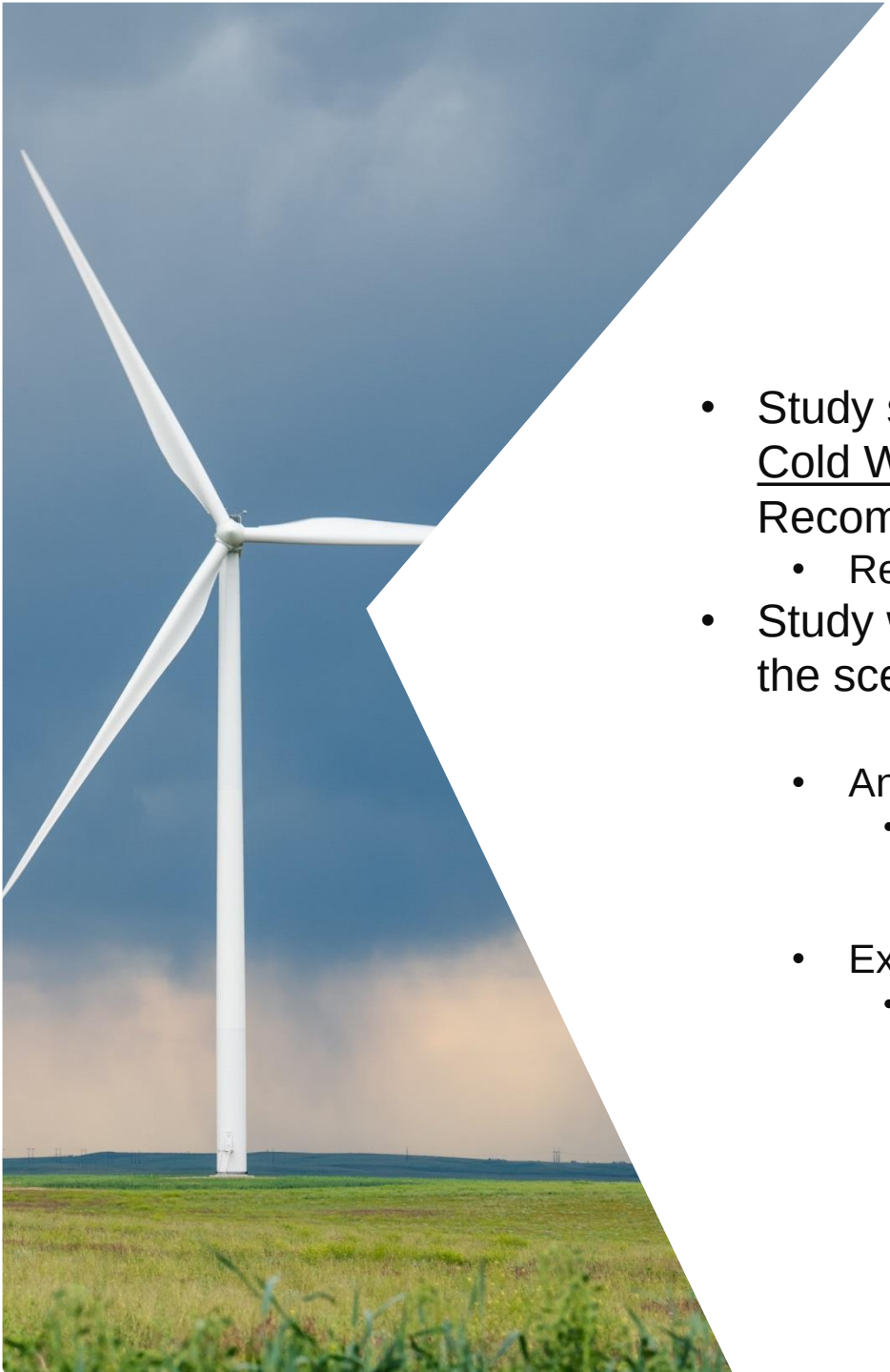
2021 TRANSMISSION PLANNING SELECT STUDIES AND ASSESSMENTS



EXTREME WEATHER STUDY

- Study stems from FERC-NERC report "The South Central United States Cold Weather Bulk Electric System Event of January 17, 2018", Recommendation 7
  - Recommendation 7: "...develop and study more-extreme condition scenarios."
- Study will use 2019 Bomb Cyclone event (March 13, 2019) as the basis for the scenario.

  - Analysis of "stressed" conditions
    - heavy load, low/no renewables, derated generation assets, outages at select generation facilities

  - Examination to include:
    - Thermal and voltage issues, stability analysis, steady state and contingency sets

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CCPG CRAIG/HAYDEN RETIREMENT STUDY

Background

CCPG initiated the reliability study in late 2020 due to the announcement of Craig/Hayden generation units.

Phase 1 – Reliability Study

Power flow (P1,P2-P7) , short circuit, and stability analysis (P1) on three study cases (re-dispatched based on project shares): 2025/26HW**,** 2030HS, 2030LSP. Redispatch involved ramping up existing generators in locations remote from western Colorado and avoiding the addition of fictitious generators and transmission.

Phase 2 - Impacts of replacing synchronous generation with inverters

Phase 3 - Impacts to transfer capabilities into and out of western Colorado

Study Status

The study team meets to review study results as they are completed.

Energy Storage and Non-Wire Alternatives

Colorado Coordinated Planning Group (CCPG) Energy Storage Work Group – Group developed to investigate energy storage applications and non-wire alternatives.

Scope of work group covers:

- Integration of energy storage to support bulk electric system as an alternative
- Integration of Non-wire alternatives
  - Some forms of Grid Enhancing Technologies (GETs) & Alternative Transmission Technologies (ATTs)

*All project in-service dates subject to change

PSCO LOCAL PUBLIC POLICY STUDY

- Studies are coordinated through the 80x30TF at CCPG
- PSCo is planning to meet the needs of Senate Bill 19-236 & Senate Bill 07-100 (SB-100) for PSCo Transmission Customers
- Facilitate ~ 5000 MW of carbon free resources
- March 2, 2021 - PSCo filed CPCN for Colorado's Power Pathway project
  - 560 miles of 345 kV double circuit lines in eastern Colorado

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80X30 TASK FORCE UPDATE

- CCPG 80x30TF Phase I studies complete
  - Identified Alt 3 (Colorado's Power Pathway)
- Phase 1 Study report attached to CPCN filing for Colorado's Power Pathway
- Phase II studies coordinated though the CCPG 80x30TF
  - Evaluating sensitivities, extensions of Power Pathway, and other studies/alternatives requested by stakeholders

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Colorado's Power Pathway

$1.7 to $2 billion dollar investment

New double-circuit 345-kilovolt electric transmission line

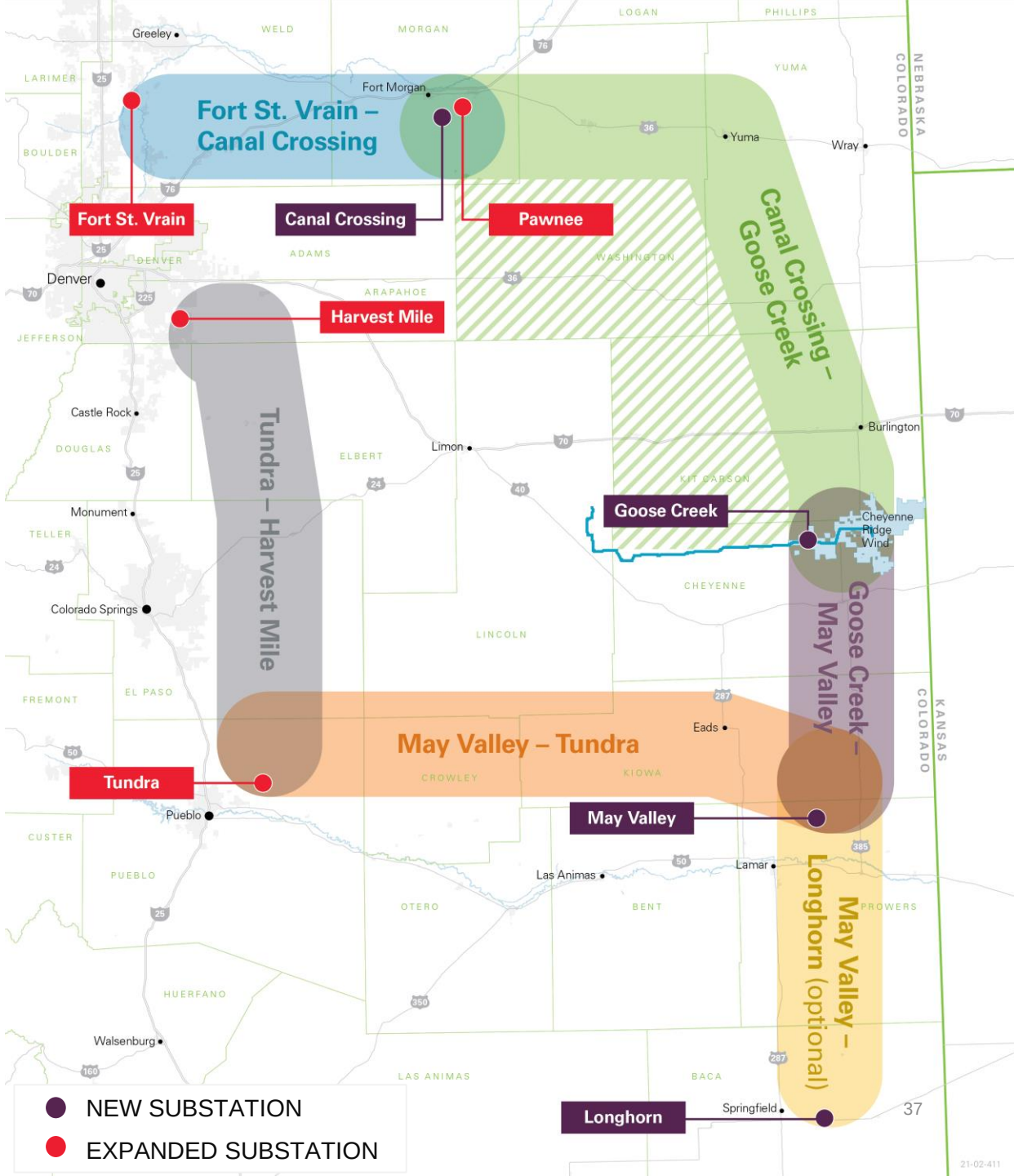
About 560 miles divided into 5 segments

- Includes 3 new and 4 expanded substations

Additional 90 miles with the May Valley - Longhorn Extension (MVLE) segment

- Includes 1 new substation
- Access wind in SE corner of the State
- Reduces the number of generation tie lines that may be needed

Access to low-cost wind/solar renewable energy in the Eastern Plains to bring to the Front Range population (demand) centers



Why is Colorado's Power Pathway Needed?

The Eastern Plains of Colorado is one of the nation's best areas for wind and solar.

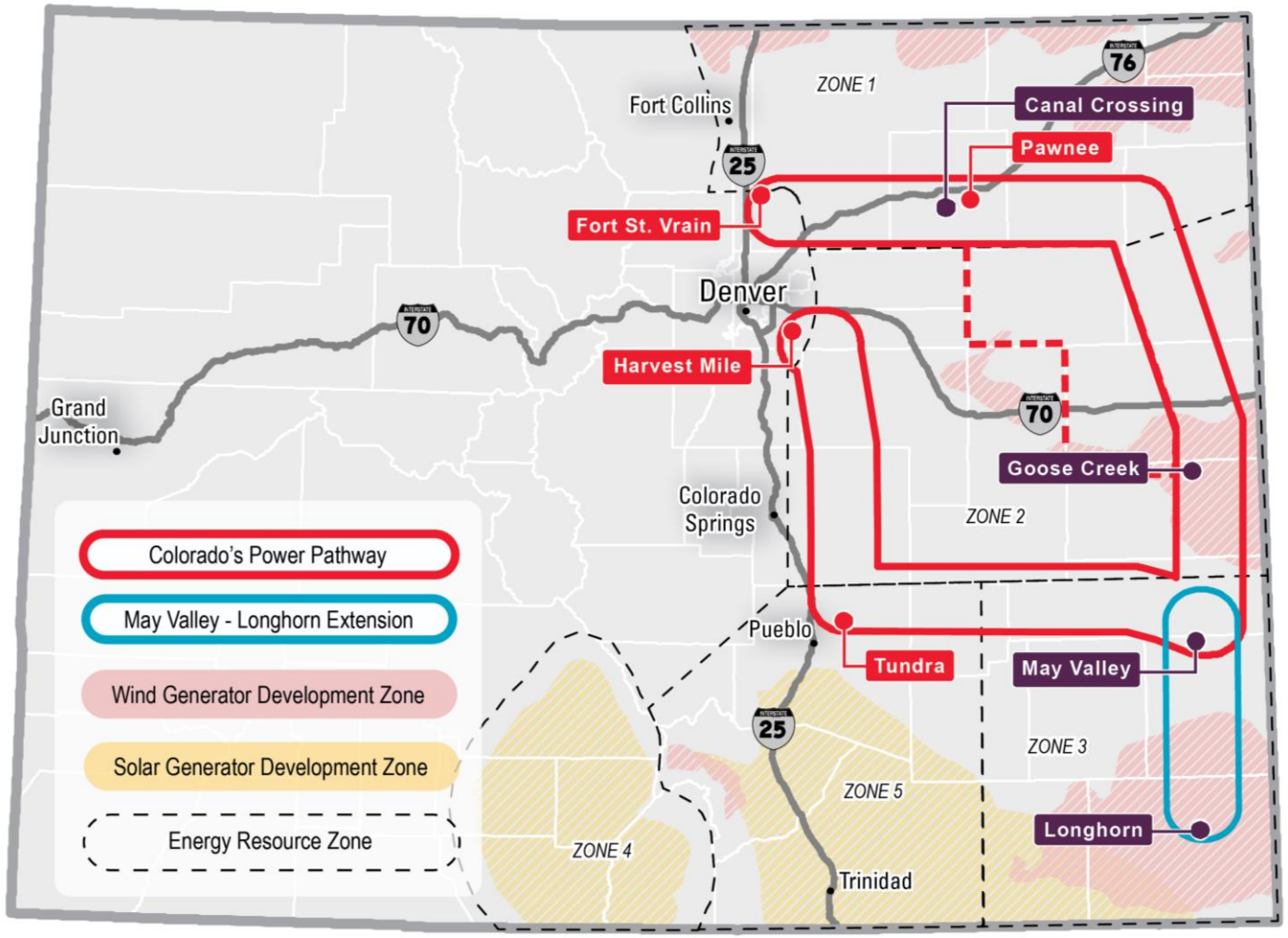
- New transmission lines encourage and support the construction of wind and solar power plants to bring more low-cost electricity to help meet the needs of our growing state.

Colorado's Power Pathway supports Xcel Energy's Clean Energy Plan that will add ~5000 megawatts of new wind, solar and other resources through 2030 to:

- meet the state's growing electricity needs reliably and affordably
- meet the company's goal of 80% lower carbon emissions
- enable the state's transition to clean energy

Colorado's Power Pathway provides high voltage "backbone" transmission

- positive impact on jobs and tax revenue in rural areas



Stakeholder Engagement

Stakeholder Submitted Proposals / Comments

- Larry Miloshevich - Evaluation of Advanced Transmission Technologies on the Colorado Transmission System
- Office of Consumer Council – 80x30 Task Force Phase 2 Balanced Portfolios Proposal

Stakeholder Opportunity for Input (Open Forum)

- Specific electric transmission interests
- Study scope, methodology, etc.
- **Comment forms on OASIS under → FERC 890/PUC 3627 Posting → Customer Requests**

LINK: OATI OASIS

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