WELCOME

PUC Rule 3627 Stakeholder Participation
August 2015
Meeting Logistics – Webinar Participants

- Due to feedback problems that prevent webinar participants from hearing the presentation clearly, we have muted all call in lines.
- If you are attending via webinar and would like to submit a question or comment, please do so using the typewritten comment box available to you.
- Staff is monitoring these written comments and we will address them during the meeting.
Today’s Presentation

► Introduction and overview

► Transmission planning basics
  ► Overview of the planning process

► 10-year plans
  ► High-level review of plans
  ► More specific review of the projects
Xcel Energy Inc.

- No. 1 wind energy provider
- No. 5 in utility solar capacity
- Top 5 in Energy Efficiency programs
- Industry-leading voluntary emission reductions
- Leader in pursuit of new technologies

Gas Customers 1.9 M
Electric Customers 3.4 M
Xcel Energy Transmission

- Nearly 20,000 transmission line miles
- 1,200 substations
- Assets in 10 states
- 3 NERC Regions; 2 RTOs; Non-RTO west
- $4.5 billion investment 2015 - 2019
CPUC Rule 3627

- Adopted by the Colorado Public Utilities Commission
- Two-Year Cycle
  - File in February of Even Years
- List All Projects > 100 kV
- Report 10-Year Plans & 20-Year Scenarios
- Stakeholder Opportunities for Participation
- Commission Determines Adequacy
Webinar Objectives

► Provide an overview of transmission planning
► Review 10-Year plans
► Solicit Stakeholder Feedback
Feedback Requested

- Alternative Solutions
- Termination points
- Public Policy Concerns
- Environmental / Societal
- Renewable Energy Policies
- Significant Load Impacts
Power is generated and transmitted over transmission lines to distribution lines to customers. Voltage is changed at substations to efficiently deliver electricity to customers.
Why Plan?

- **Planning**: 1 to 2 years
- **Development**: 3 to 5 years
- **Construction**: 2 to 3 years

Timeframe takes 7 to 10 years to plan, develop and construct.
Transmission planning is the art of identifying future transmission infrastructure for delivery from forecasted resources to forecasted load centers without violating mandatory compliance standards.
Transmission Planning Process

- Generation
- Transmission
- Loads

Data Gathering and Assumptions

Timeframes & Analysis
- 5-year
- 20-year
- 10-year

Proposal of solutions

Transmission Plan
Transmission Planning Drivers

- Load Service / Reliability
  - Near-Term (1-5 years)
    - “Core” Studies (5 year capital budget)
  - Longer-Term (5-10 years)
    - WestConnect, CCPG
- Resource Accommodation
  - ERP
  - Generator Interconnection
- Public Policy
  - Senate Bill 07-100 (SB-100)
  - Clean Air Clean Jobs Act (CACJA)
- Other
  - Tariff Studies
  - Transmission Service
10-Year Transmission Plans
New Substations

2016
- Happy Canyon (IREA Wholesale Load)
- Pleasant Valley (Retail Load)

TBD
- Greeley Improvements:
  - Beebe Draw (LaSalle Replacement)
  - Box Elder Replacement
  - Ault Replacement
  - Eaton Replacement
- Retail Load Requests:
  - Barnesville (retail load)
  - Severance (retail load)
- Reliability:
  - Bluestone Valley

Distribution
- Avery (2017)
- Thornton (2017)
- Moon Gulch (2018)
- New Castle (TBD)
- Wilson (TBD)
- Barker (TBD)
- Conceptual:
  - National Western (TBD)
  - Sterling Ranch (TBD)
  - Surrey Ridge (TBD)
New Transmission

- 2016
  - Rifle – Parachute 230 kV #2 (2017)
  - Southwest Weld Transmission Project (SWEP)

- 2019
  - Avon – Gilman 115 kV
  - Milton – Rosedale 230 kV
  - Rosedale – Weld 230

- 2022
  - Pawnee – Daniels Park 345 kV

- TBD
  - San Luis Valley
  - New Ault – Monfort 115 kV
  - DCP Lucerne 2 – Barnesville 115 kV
  - Glenwood – Rifle Upgrade
  - Parachute – Cameo 230 kV
  - Lamar – Front Range
  - Weld County Expansion
  - Hayden – Foidel – Gore Pass 230 kV Loop
# Denver/Boulder

*All project in-service dates subject to change*

<table>
<thead>
<tr>
<th>#</th>
<th>Project</th>
<th>Comments</th>
<th>ISD*</th>
<th>Drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Moon Gulch Substation</td>
<td>Proposed new Distribution Substation in either the City of Arvada or Jefferson County to serve distribution loads</td>
<td>2018</td>
<td>Distribution</td>
</tr>
<tr>
<td>2</td>
<td>Pawnee – Daniels Park 345 kV Transmission Line</td>
<td>Add an additional 345 kV line between the Pawnee and Daniels Park substations.</td>
<td>2022</td>
<td>Reliability</td>
</tr>
<tr>
<td>3</td>
<td>Cherokee–Arvada-Ridge 230kV Conversion</td>
<td>Convert the existing 115kV line between the Cherokee and Ridge substations to a 230kV line.</td>
<td>2016</td>
<td>Reliability and Distribution</td>
</tr>
<tr>
<td>4</td>
<td>Thornton Substation</td>
<td>New substation in Thornton to serve distribution loads. Replaces the Brantner Substation project.</td>
<td>2017</td>
<td>Distribution</td>
</tr>
<tr>
<td>5</td>
<td>Barker Substation</td>
<td>New Substation in Denver Area to serve distribution load growth in Historic Ballpark Area</td>
<td>TBD</td>
<td>Distribution</td>
</tr>
</tbody>
</table>
**Foothills/Greeley Area**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Southwest Weld Transmission Project (SWEP)</td>
<td>Expand the lower Weld county area to serve growing loads.</td>
<td>2017</td>
<td>Reliability</td>
</tr>
<tr>
<td>2</td>
<td>Milton – Rosedale 230 kV</td>
<td>Build a line from the Rosedale substation to the planned Milton substation to create a 230 kV loop in conjunction with the Weld – Rosedale 230 kV line. This line will alleviate overloading of the Greeley area under projected loads and increase capacity for the area.</td>
<td>2019</td>
<td>Reliability</td>
</tr>
<tr>
<td>3</td>
<td>Rosedale – Weld 230 kV / Beebe Draw Substation (La Salle Replacement)</td>
<td>Expand the Rosedale substation to include a 230kV yard. Build a new 230 kV substation (Beebe Draw) to replace the existing 44kV La Salle Substation. Build a line from the Weld 230 kV substation to the new Rosedale 230kV substation to provide a second 230kV point of interjection to the town of Greeley, alleviating potential overloading of the Weld transformers. Tie in Beebe Draw substation to this line.</td>
<td>2019 (line)</td>
<td>Reliability</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TBD (substation)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Weld County Expansion</td>
<td>Add in secondary loop and have another point of interjection to the Greeley area. Increase capacity for the city and surrounding area</td>
<td>TBD</td>
<td>Reliability</td>
</tr>
<tr>
<td>5</td>
<td>Avery Substation</td>
<td>Add in a new distribution substation to service loads in the area</td>
<td>2017</td>
<td>Distribution</td>
</tr>
<tr>
<td>6</td>
<td>Wilson Substation</td>
<td>Add in a new 115kV substation to serve distribution loads. This project will tap PRPA’s 115kV Horseshoe – West transmission line.</td>
<td>TBD</td>
<td>Distribution</td>
</tr>
<tr>
<td>7</td>
<td>New Ault – Monfort 115 kV / Eaton Replacement / Ault Replacement / Cloverly Substation / Pleasant Valley Replacement</td>
<td>Convert both the existing Eaton and Pleasant Valley substations from 44 kV to 115 kV; Add in a new 115 kV Substation (Cloverly) to service a retail load. Add a new 115 kV line from the new Ault substation, tie in the Eaton and Cloverly substation and terminate at the Monfort 115kV substation.</td>
<td>TBD (line)</td>
<td>Reliability / Load Growth</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td>(Cloverly)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TBD (other substations)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Severence Substation</td>
<td>Add in a new 230 kV substation by tapping the Weld Ft. St. Vrain line to service a retail customer</td>
<td>TBD</td>
<td>Retail Load</td>
</tr>
<tr>
<td>9</td>
<td>Barnesville Substation / DCP Lucerne 2 – Barnesville 115 kV</td>
<td>Add in a new 115 kV Substation via a new line from DCP Lucerne to the Barnesville Substation to service a retail load</td>
<td>TBD</td>
<td>Retail Load</td>
</tr>
<tr>
<td>10</td>
<td>Box Elder Replacement</td>
<td>Convert the existing 44kV Box Elder Substation to a 115kV substation to service growing loads in the area. Tie into Tri-State’s Southwest Weld Expansion Project (SWEP) via the Neres Canal 115 kV Substation.</td>
<td>TBD</td>
<td>Load Growth</td>
</tr>
</tbody>
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<tr>
<td>1</td>
<td>Grand Jct 138/115 TX #2</td>
<td>Replace 50 MVA TX with 100 MVA TX (prev. add second 100 MVA bank)</td>
<td>2016</td>
<td>Reliability</td>
</tr>
<tr>
<td>2</td>
<td>Bluestone Valley Substation</td>
<td>Add a new 230/69 kV transformer at Bluestone. Construct a 4 mile 69 kV line to Debeque from Bluestone</td>
<td>TBD</td>
<td>Reliability</td>
</tr>
<tr>
<td>3</td>
<td>Rifle-Ute – Parachute 230 kV Line</td>
<td>Install a new, second 230 kV line between Rifle and Parachute for customer load growth</td>
<td>2016</td>
<td>Retail Load, Reliability</td>
</tr>
<tr>
<td>4</td>
<td>Hayden – Foidel – Gore Pass 230kV Loop</td>
<td>Loop Hayden-Gore Pass 230kV line into Foidel Creek Substation creating a Hayden-Foidel Creek 230kV Line #2 and a Foidel Creek-Gore Pass 230kV line.</td>
<td>TBD</td>
<td>Reliability</td>
</tr>
<tr>
<td>5</td>
<td>Glenwood-Rifle 69 to 115kV</td>
<td>Replace existing Glenwood-Rifle 69 kV transmission system with 115 kV system</td>
<td>TBD</td>
<td>Reliability</td>
</tr>
<tr>
<td>6</td>
<td>Gilman – Avon 115kV Line</td>
<td>New 10-mile 115kV line in Eagle County for reliability and alternate source to Holy Cross customers</td>
<td>2019</td>
<td>Reliability</td>
</tr>
<tr>
<td>7</td>
<td>Parachute – Cameo 230kV Line</td>
<td>New 230 kV line from the Parachute substation to Cameo substation</td>
<td>TBD</td>
<td>Reliability</td>
</tr>
<tr>
<td>8</td>
<td>New Castle Substation</td>
<td>Construct a new 115 kV substation to service Distribution loads in New Castle</td>
<td>TBD</td>
<td>Distribution</td>
</tr>
</tbody>
</table>

*All project in-service dates subject to change
# Project Comments ISD* Drivers

| #  | Project            | Comments                                              | ISD* | Drivers          |
|----|--------------------|                                                      |      |                 |
| 1  | IREA Happy Canyon  | Construct a new 115 kV substation for IREA            | 2016 | Wholesale Customer |

*All project in-service dates subject to change
South Metro Conceptual Distribution

- I-70 and the National Western Complex Study Area
  Est. ISD: 2021-2022

- Surrey Ridge Study Area
  Est. ISD: 2024-2025

- Sterling Ranch Study Area
  Est. ISD: 2019-2020
Public Policy Planning
* Senate Bill 07–100
Public Service Company of Colorado SB-100 projects

Key Projects:
- TOT FE Expansion 230kV
- Pawnee-Story 145kV
- Pawnee-Daniel Park 345kV
- Big Sandy-Story 145kV
- Pawnee Smoky Hill 145kV
- Missile Site 230kV Switching Station
- Missile Site 145kV Switching Station
- Lamar-Front Range 345kV
- Midway-Waterton 345kV
- Lamar-Watson 230kV

Legend:
- 230 kV
- 345 kV

Notes:
1. Actual routing and ISD have not been determined
2. Currently under construction
3. In Service
## Senate Bill 100 Project List

<table>
<thead>
<tr>
<th>Item</th>
<th>Project</th>
<th>Zone</th>
<th>In Service Date*</th>
<th>Project Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Missile Site 230kV Switching Station</td>
<td>2</td>
<td>Nov 2010</td>
<td>In Service; No CPCN Required</td>
</tr>
<tr>
<td>2.</td>
<td>Midway-Waterton 345kV Transmission Project</td>
<td>3,4,5</td>
<td>Jun 2011</td>
<td>In Service; CPCN Granted July 2009</td>
</tr>
<tr>
<td>3.</td>
<td>Missile Site 345kV Switching Station</td>
<td>2</td>
<td>October 2012</td>
<td>In service CPCN Granted June 2010</td>
</tr>
<tr>
<td>5.</td>
<td>Weld County Expansion (Formerly TOT 7 Expansion Project)</td>
<td>1</td>
<td>TBD</td>
<td>Studies Ongoing</td>
</tr>
<tr>
<td>6.</td>
<td>Pawnee-Daniels Park 345kV Transmission Project</td>
<td>1</td>
<td>2022</td>
<td>CPCN Granted March 2015 ISD Delayed 3 years by PUC</td>
</tr>
<tr>
<td>7.</td>
<td>Lamar-Front Range 345kV Transmission Project</td>
<td>2, 3</td>
<td>TBD</td>
<td>Studies Complete. Project Deferred</td>
</tr>
<tr>
<td>8.</td>
<td>Lamar-Vilas 230kV Transmission Project</td>
<td>3</td>
<td>TBD</td>
<td>Studies Completed with LFR</td>
</tr>
<tr>
<td>9.</td>
<td>San Luis Valley</td>
<td>4</td>
<td>TBD</td>
<td>Studies Ongoing</td>
</tr>
</tbody>
</table>

*All project in-service dates subject to change
Pawnee to Daniels Park

- Cost $152 million
- In-service date: 2022
- Purpose: Reliability, SB 07-100;
- Infrastructure: 124-mile transmission from Pawnee Substation to Daniels Park Substation and from Smoky Hill Substation to Daniels Park Substation
- Open House Meetings in September
Northeast Colorado
Northeast Colorado Planning Objectives

- Facilitate Load Growth Related to Oil & Gas Development
- Coordinate with Reliability Improvements in the Greeley Area
- Complement Longer-term Transmission Projects in NE Colorado
- Improve TOT 7 Capability
Northeast Colorado Plans

► Southwest Weld Expansion Project (SWEP)
► SWEP Expansion
► Greeley Master Plan
► Weld County Expansion
Southwest Weld Expansion Project
Weld County / Greeley Improvements
Weld County / Greeley Improvements
Weld County Expansion – Conceptual Plan

TEE

TOTAL 115 KV LOAD: 68.9 MW

ARROWHEAD LAKE: 57.1 MW

ROSEDALE: 50.4 MW

UNC SWITCHING STATION: NO LOAD

ROSEDALE: 50.4 MW

NEW PLEASANT VALLEY: 14.6 MW

BOOMERANG (WAPA): 4.5 MW

JOHNSTOWN: 28.0 MW

NEW AULT: 5.4 MW

NEW EATON: 15.4 MW

LEPRINO TAP: 15 MW

NEW AULT: 5.4 MW

BARNESVILLE (48.0 MW Proposed)

LUCERNE: 12.5 MW (20 MW Proposed)

NEW PLEASANT VALLEY: 14.6 MW

GODFREY BREAKER STATION

+30 MW OIL AND GAS

GODFREY BREAKER STATION

NEW AULT (WAPA)
San Luis Valley
San Luis Valley Planning Objectives

► Reliability
► Sustainability
► Export Capacity
San Luis Valley 50 miles wide
Alternative 3: New 230
Alternative 4: 115 -> 230 & 69 -> 115
Southeast Colorado
Lamar – Front Range Planning Objectives

- SB100: Serve ERZs 2, 3
- Facilitate Resource Needs
- Improve reliability in SE Colorado
Lamar – Front Range Alternatives

Lamar – Front Range Alternatives

- Proposed – New 345 Alternative
- 345 kV - existing
- 230 kV existing
- 115 kV existing

Cities and Locations:
- Daniels Park
- Midway
- Comanche
- Calumet
- Smoky Hill
- Pawnee
- Story
- Boone / Avondale
- Big Sandy
- Burlington
- Energy Center
- Lamar
- Vilas
- Gladstone
LFR Conceptual Plan

Transmission
► Two 345 kV transmission circuits between Lamar and Avondale/Boone
► Two 345 kV transmission circuits between Lamar and Energy Center
► Two 345 kV transmission circuits between Energy Center and Burlington
► Two 345 kV transmission circuits between Burlington and Big Sandy
► One 345 kV transmission line between Big Sandy and Missile Site
► One 345 kV transmission line between Big Sandy and Story
► One 345 kV transmission line between Story and Pawnee

Substations
► New Energy Center Substation
► New Avondale Substation
► Modifications to Boone, Lamar, Burlington, Big Sandy, Missile Site, Story, and Pawnee

Other
► CSU Overload Mitigation
► Other facilities to support O&M of the Project

COST: approximately $900 Million
Discussion/Feedback/Questions
PSCo PUC Rule 3627 Information

► On the Xcel Energy website at:
  ► [www.xcelenergy.com/About_Us/Transmission](http://www.xcelenergy.com/About_Us/Transmission)

► WestConnect website for all regional projects:

► Email questions and comments to:
  ► [Connie.paoletti@xcelenergy.com](mailto:Connie.paoletti@xcelenergy.com) or
  ► [Thomas.green@xcelenergy.com](mailto:Thomas.green@xcelenergy.com)
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