

WECC

Transmission Planning - CCTA Process – and TEPPC 2016 Study Program

05/12/2016

Update to WRP- Energy Committee

WECC team: Vijay Satyal PhD– Sr. Policy Analyst & Colby
Johnson – Assoc. Planning Engineer

WECC History and Background

- Energy Policy Act 2005
- FERC Authority under Section 215
 - Mandatory Reliability Standards
 - Compliance Monitoring and Enforcement
 - Civil Penalties and Sanctions
- NERC approved as Electric Reliability Organization (ERO)
- Eight Regional Entities including WECC delegated to implement standards and compliance

Northeast Blackout

August 14, 2003

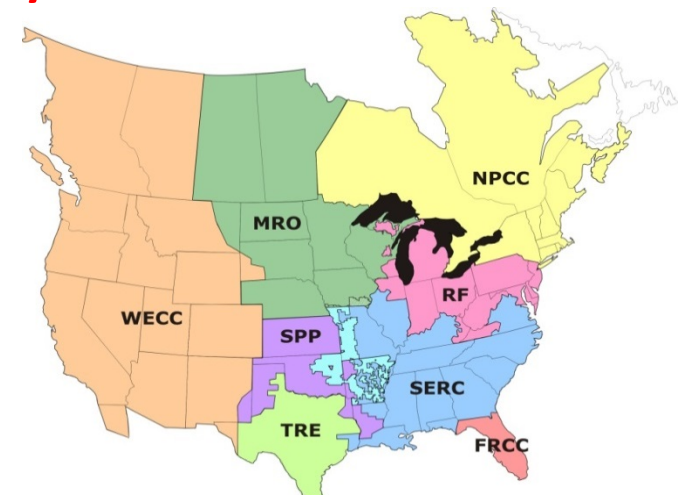
~50 million people

\$6 billion



WECC Roles in the Industry

- **What we do:**
 - Compliance Monitoring and Enforcement
 - Standards Development
 - WREGIS (REC tracking)
 - ✓ **Reliability Planning and Performance Analysis**
- **What we do not do:**
 - Site, permit, or build transmission
 - Operate transmission
 - Cost allocation
 - “Pick winners”



WECC's mission is to promote and foster a reliable and efficient bulk electric system

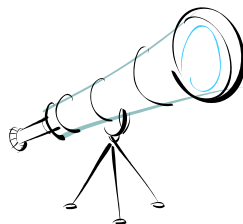
Reliability Planning and Performance Analysis

Planning Services – Transmission Planning –
Reliability Assessment

Event Analysis

Performance
Assessments

Stakeholder Committees and Input



- *Base cases*
- *Common case*
- *Powerflow*
- *Stability analysis*
- *Principal Transmission Facilities Map*
- *Project Tracking*

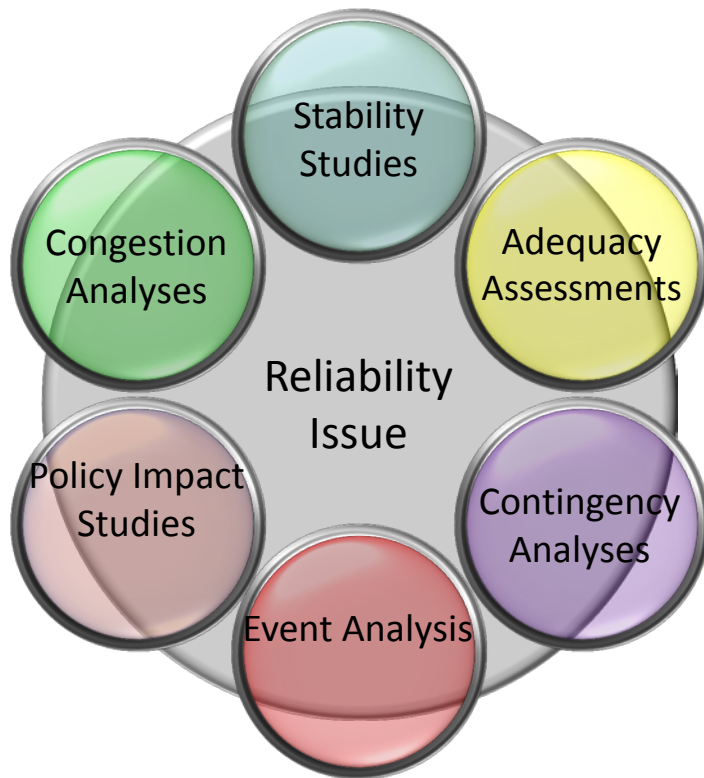
- *Congestion study*
- *Datasets and models*
- *Long-Term Planning Tool*
- *Transmission plans*
- *Resource adequacy*
- *State of Interconnection*

- *Event Analysis reports*
- *Cause Coding*
- *Root-cause analysis*
- *Guidelines*

- *State of the Interconnection*
- *Situational Awareness*
- *Operating Practices Survey*
- *Entity Certification*
- *Mis-operation review*

Integrated Approach to Addressing Key Reliability Issues

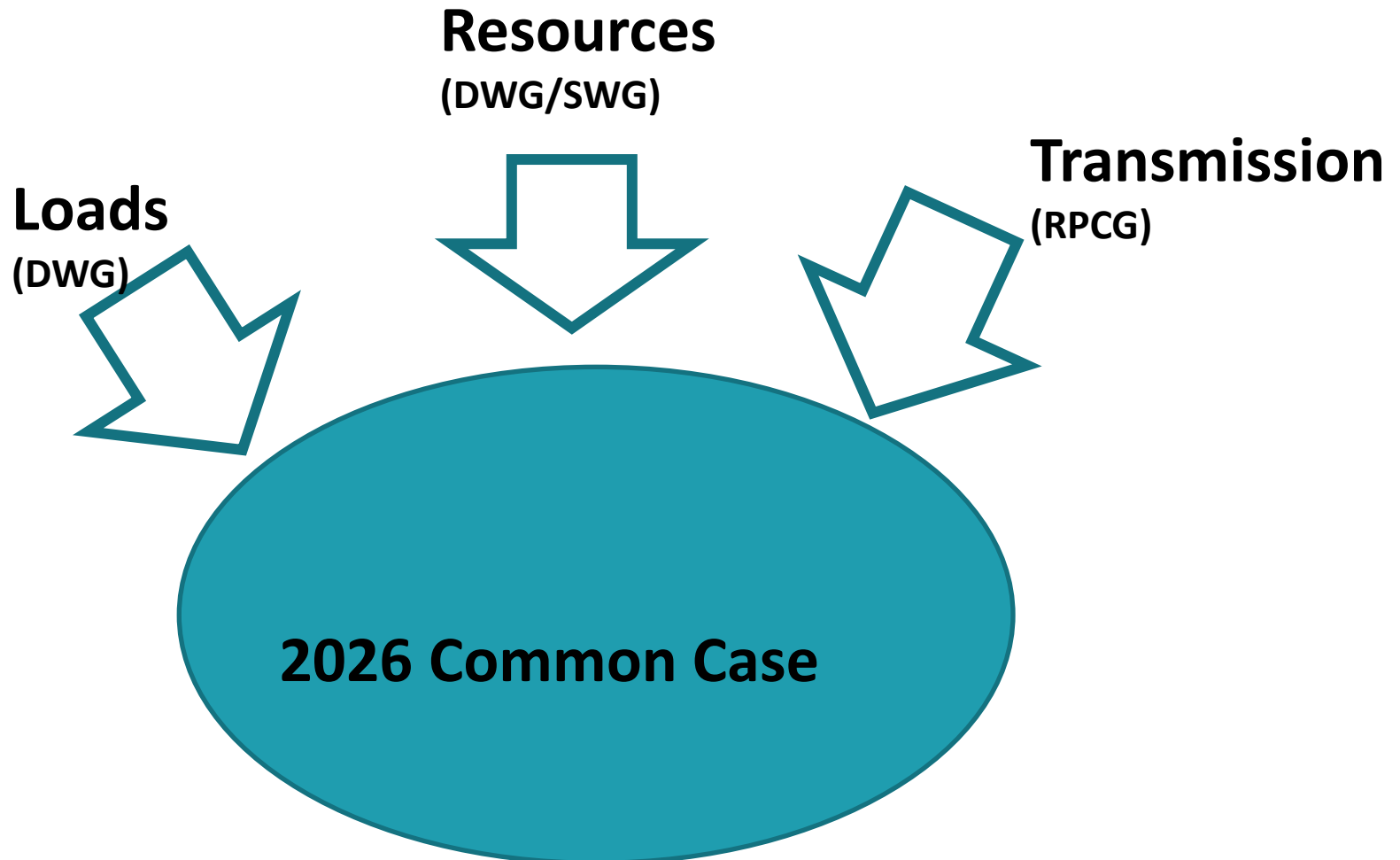
What are the potential impacts to RELIABILITY?



Key Planning Efforts

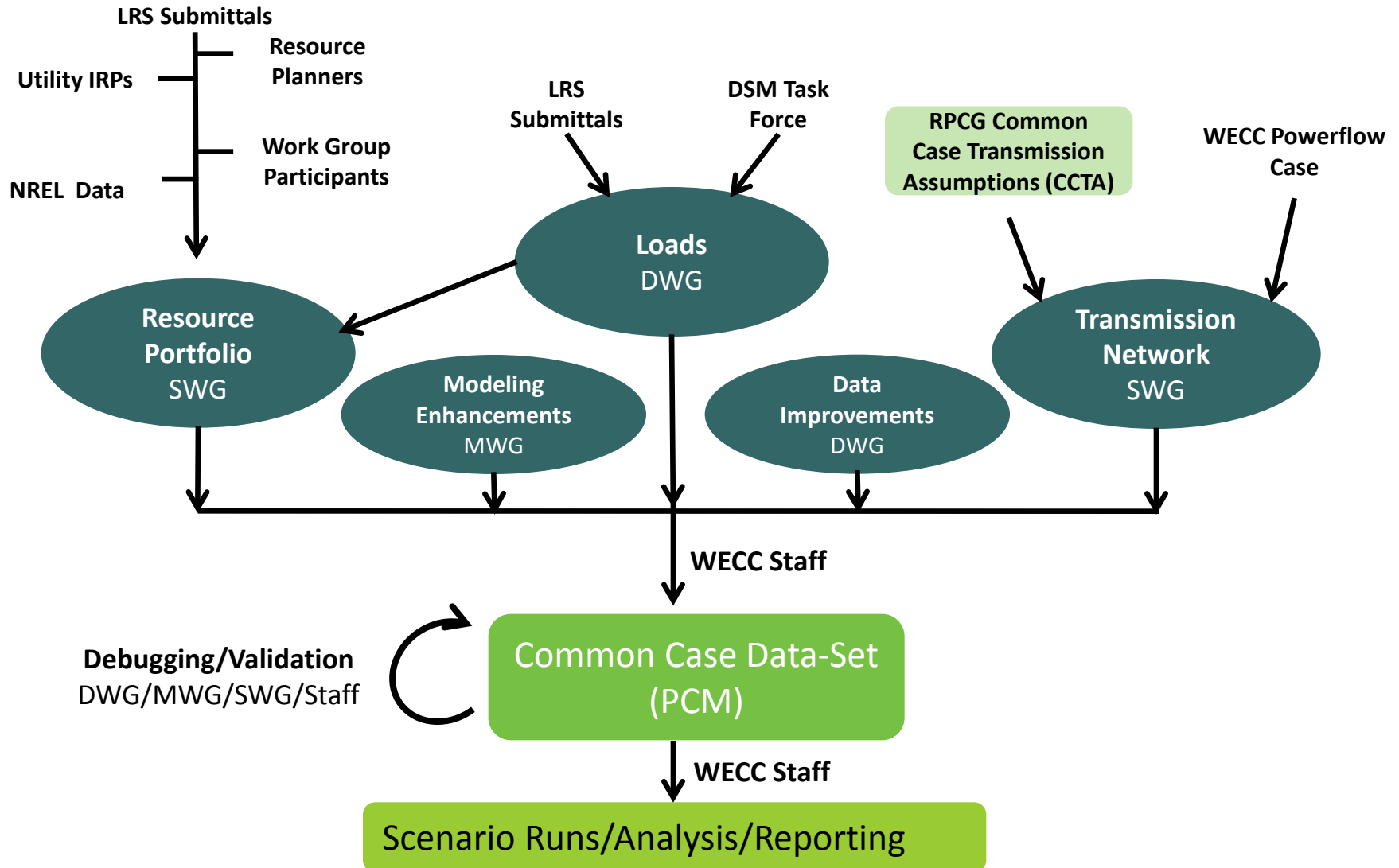
	Planning Services	Transmission Planning	Reliability Assessment
What we answer:	<ul style="list-style-type: none"> Is the system electrically sound, stable & reliable during abnormal conditions? 	<ul style="list-style-type: none"> What is the future state of the grid ? Do we need additional transmission? 	<ul style="list-style-type: none"> Is the future system adequate to meet demand? What risks to reliability exist?
How the information is used?	<ul style="list-style-type: none"> Operational changes Transmission expansion Input into others' studies Standards development 	<ul style="list-style-type: none"> Transmission and generation expansion Input into policy decisions Input into others' studies 	
Who will listen?	<ul style="list-style-type: none"> Registered entities States and provinces Policy makers Independent project developers Federal agencies NGOs & advocacy groups 		
<u>What we don't do:</u>	<ul style="list-style-type: none"> Make siting decisions Select projects Write public policy Create an Interconnection-wide IRP 		

Inputs to the Common Case



System Adequacy Planning – Critical Data

Source: Common Case



RPCG and CCTA process

- Forum of Regional Planning Groups
- 4 CCTA cycles so far
- CCTA Process- Review and provide input on “most likely” transmission projects for C. Case
- Focus: Projects that are either in the “planning” or “construction” phase*

WECC Interactive Transmission Project Portal Map



Edit existing projects through interactive map

*Paths shown are approximations and are provided to us in the form of Keyhole Markup Language (KML) by project sponsors/contacts

Click Lines to See Additional Details on Project --- Click Buttons Below to Toggle Voltage Layer On/Off (Color)

Below 230 kV
230 kV
345 kV
500 kV AC

Line Routing is Conceptual in Nature and Does Not Necessarily Reflect the Final Line Route

ADD NEW PROJECT

PROJECT LIST

Add new/edit projects through "list view"



new item or edit this list

Project Name	Project Purpose	Modified
Abel-Ball	... To meet expected load growth in the eastern service territory.	11/5/2014 2:11 PM
Bighorn-Eldorado	... Move Solar Renewable Energy from the Jean and Pahrump Nevada area to Eldorado updated	11/5/2014 2:11 PM
Boardman-Hemingway 500 kV (B2H)	... The B2H project will increase transmission capacity between the Pacific Northwest and Idaho to provide: dependable electrical service for Idaho Power network load, access to energy markets, and transmission service to eligible customers.	5/19/2015 2:40 PM
Centennial II (Amargosa -Northwest)	... Interconnect renewable resources in Amargosa Valley with the NVE transmission system via Northwest Substation. This project has been under consideration since the completion of the centennial project as part of a project to increase capacity from Harry Allen to Northwest. Last updated 121613	11/5/2014 2:11 PM
Centennial II (Harry Allen - Eldorado)	... 1. This project has been under consideration since the completion of the centennial project as part of a project to increase capacity from Harry Allen to Northwest. This project may also require the construction of a Harry Allen 500 kV / 230 kV transformer depending on NV Energy Requirements and customer need.	11/5/2014 2:11 PM

Data Outreach

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MEMO

Date: August 20th, 2015

To: Regional Planning Coordination Group
 Studies Work Group
 Technical Studies Subcommittee
 System Review Work Group

Subject: Data Request for Common Case Transmission Assumptions – CCTA 2016

The WECC System Adequacy Planning (SAP) Department (formerly Transmission Expansion Planning team) has initiated its biennial effort to collect up-to-date information regarding “new transmission projects and/or any transmission upgrades” throughout the Western Interconnection which are expected to be in-service in the 10-year time horizon (2016-2026). Please review the information below and respond to this request by September 15, 2015.

WECC Staff are reaching out to transmission planners (TPs), transmission owners (TOs), transmission project sponsors and others to ensure complete and accurate information is available for our next planning cycle. The information requested herein will be shared with the Regional Planning Coordination Group (RPCG) as the RPCG members move forward to gather information to develop and improve transmission assumptions for use in the next Common Case data set.

You are receiving this message because you were identified as part of WECC’s targeted outreach audience. Your responses will allow the RPCG to assist TEPPC in determining if your project will be included in the next Common Case as a base input assumption (assumed to be in-service in 2026) and to better assess how your project impacts various TEPPC study cases.

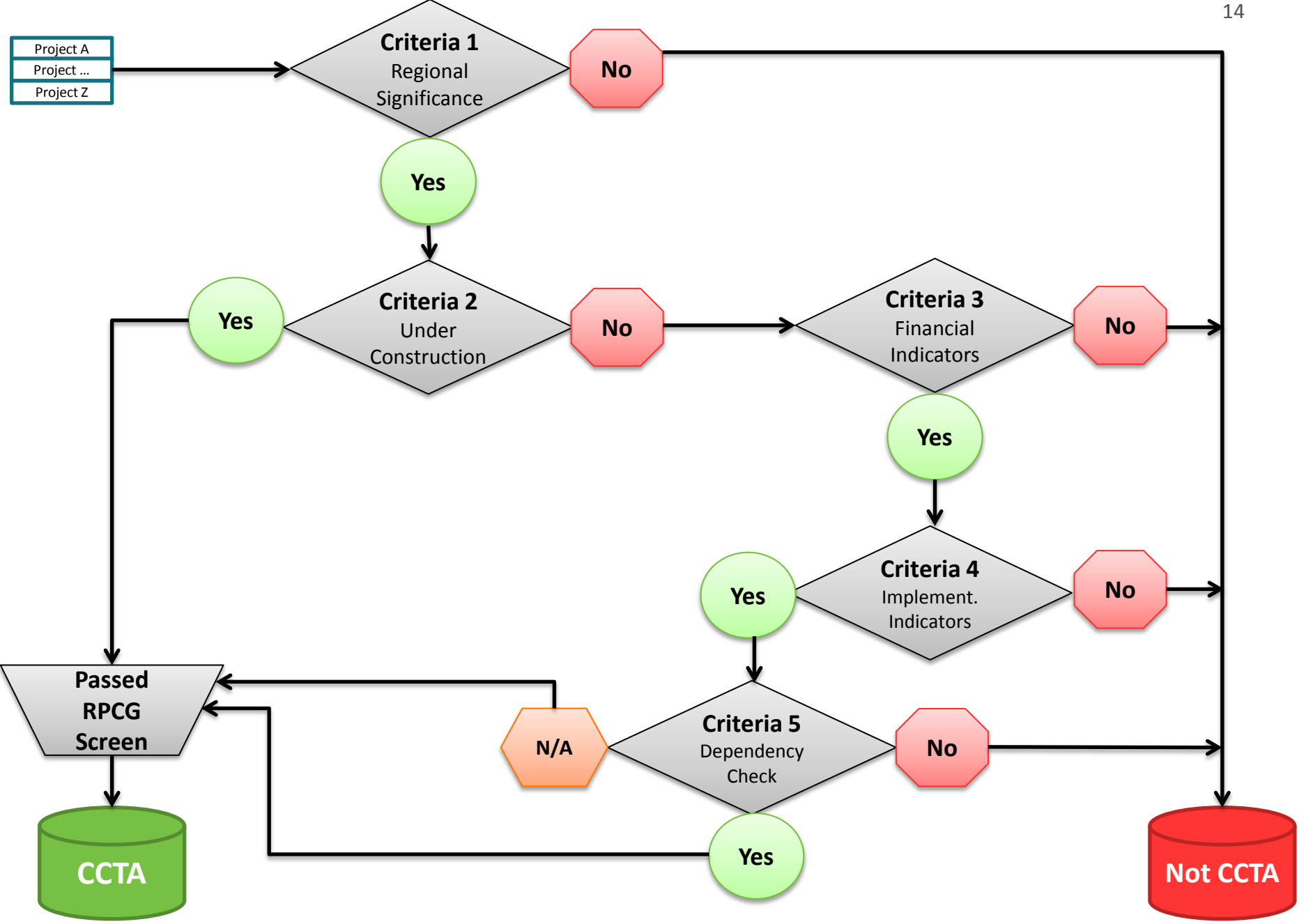
CCTA Process - Overview

- CCTA Selection Process Review
 - CCTA Criteria Flow Chart
 - Criteria 1-5 Detailed Review
- Transmission Projects: Under Construction
 - Met Criteria 1 & 2 -> Default Inclusion
- Transmission Projects: Not Under Construction
 - Did meet Criteria 3 & 4 & 5 (if necessary) -> Inclusion
 - Did not meet Criteria 3, 4, 5 -> Exclusion
- Ballot Review: Inclusion/Exclusion List, Tie
- Final 2026 CCTA Project List & Future Improvements

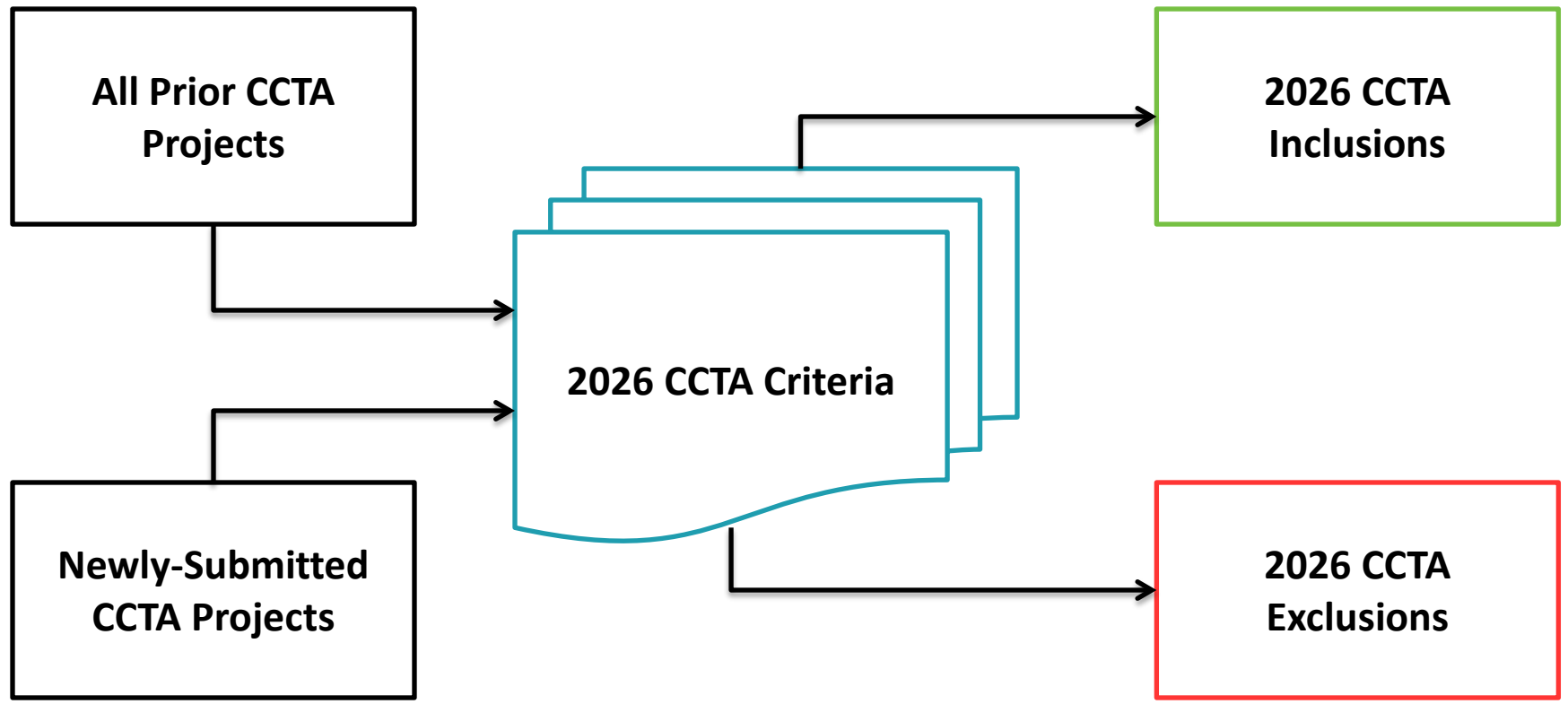
5 Criteria Used For Project Review

- Criteria 1: Regional Significance
 - Based on Voltage:
 - 230kV and above
- Criteria 2: Construction Status
 - Is the project currently under construction?
- Criteria 3: Financial Indicators
 - Financial questions added to project survey to indicate if the project has financial commitment
- Criteria 4: Implementation Status Indicators
 - Environmental Impact Status (EIS – if required) questions added to survey
- Criteria 5: Project Dependency
 - Is this project dependent upon another transmission project to be completed and used for its intended purpose? If so, did the dependent project pass the CCTA criteria?

Project A
Project ...
Project Z



Process Overview



Criteria-based results

- Internal review
- Criteria developed in consultation with entities
- Electronic voting by RPCG members
- Staff recommendation of CCTA 2026 list

Transmission Projects: Not Under Construction Poll Majority – Agree to Exclude

Did not meet Criteria 3, 4, and/or 5:

- Bighorn-Eldorado
- Centennial West Clean Line
- Chinook
- Centennial II (Amargosa-Northwest)
- Centennial II (Northwest - Harry Allen)
- Great Basin HVDC
- Harcuvar Transmission Project
- Hemingway-Captain Jack 500 kV Transmission Line
- Juan de Fuca HVDC Sea Cable
- Juan de Fuca II HVDC Cable
- Lamar-Vilas
- Lassen 230kV East/West Tie
- Lucky Corridor Transmission Project
- Path 8 Upgrade/Colstrip Transmission Upgrade
- Mountain States Transmission Intertie (MSTI) (Townsend-Midpoint 500 kV)
- North Gila - Imperial Valley #2 Project
- NV Energy Robinson - Harry Allen 500 kV Line
- Southern Nevada Intertie Project (SNIP)
- Southwest Intertie Project - North (SWIP-North)
- SunZia Southwest Transmission Project
- TransWest Express Transmission Project
- West Side Tie
- Tres Amigas
- Western Spirit Clean Line
- Westside Tie 345/500 kV
- Wyoming-Colorado Intertie Project
- Zephyr
- WECC - Eastern Interconnect DC Tie Upgrade Project

Final 2026 CCTA Project List

- (1) Boardman – Hemingway (B2H) [500 kV]
- (2) Delaney – Colorado River (Ten West Link)
- (3) Delaney – Palo Verde [500 kV]
- (4) Delaney – Sun Valley [500 kV]
- (5) Energy Gateway: Wallula – McNary [230 kV]
- (6) Energy Gateway South: Aeolus – Mona [500 kV]
- (7) Energy Gateway West: Bridger – Populus [500 kV]
- (8) Energy Gateway West: Windstar – Jim Bridger [230-500 kV]
- (9) Energy Gateway West: Midpoint – Hemingway [500 kV]
- (10) Energy Gateway West: Populus – Midpoint [500 kV]
- (11) Energy Gateway West: Populus – Cedar Hill – Hemingway [500 kV]
- (12) Harry Allen – Eldorado (Centennial II) [500kV]
- (13) I-15 Corridor Reinforcement Project (Castle Rock – Troutdale)
- (14) Morgan – Sun Valley [500 kV]
- (15) Pawnee – Daniels Park
- (16) West of McNary Reinforcement Project Group 2 (Big Eddy – Knight)

2026 Common Case Transmission Assumptions (CCTA)

The purpose of the CCTA is to provide a basic set of facilities that TEPPC can use as a starting point for their own studies. The CCTA is a list of facilities that are expected to be in-service by 2026.



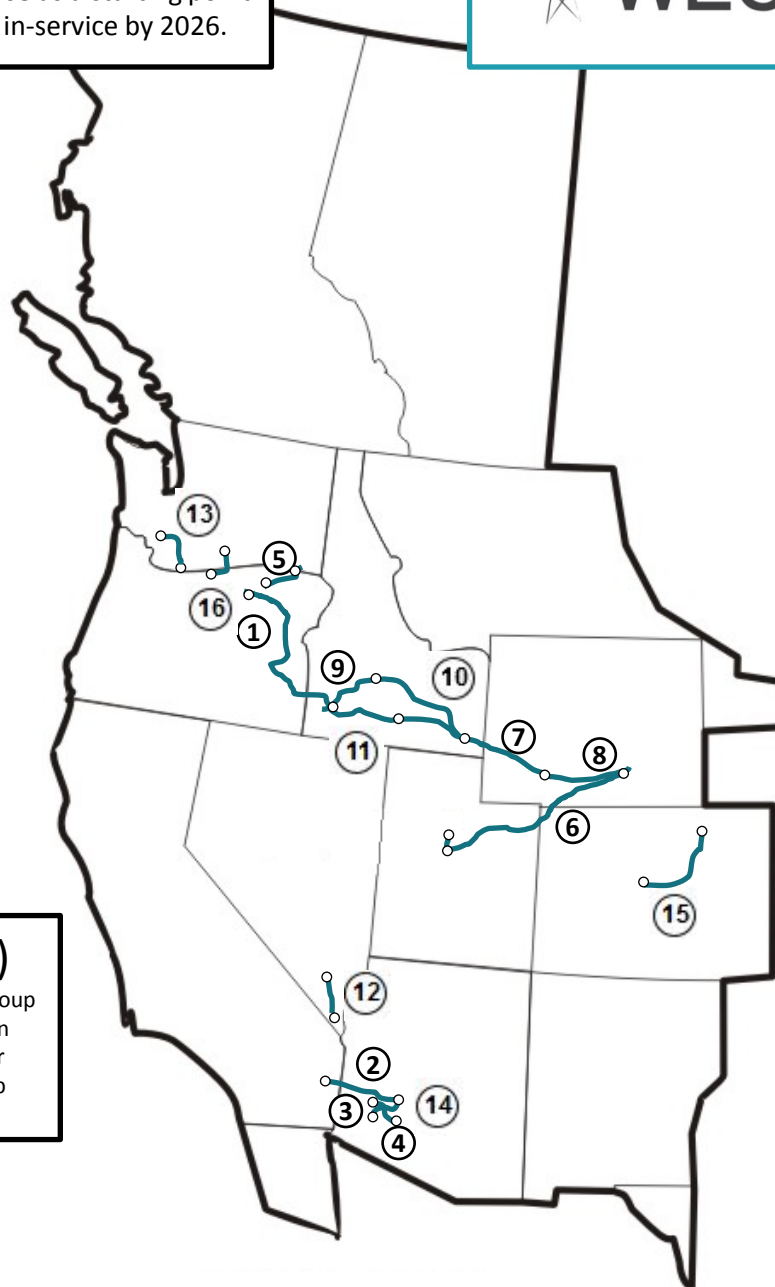
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Blue text – Indicated “Under Construction”

Regional Planning Coordination Group (RPCG)

CAISO – California Independent System
CTPG – California Transmission Planning Group
CG – Columbia Grid
CCPG – Colorado Coordinated Planning Group
NTTG – Northern Tier Transmission Group

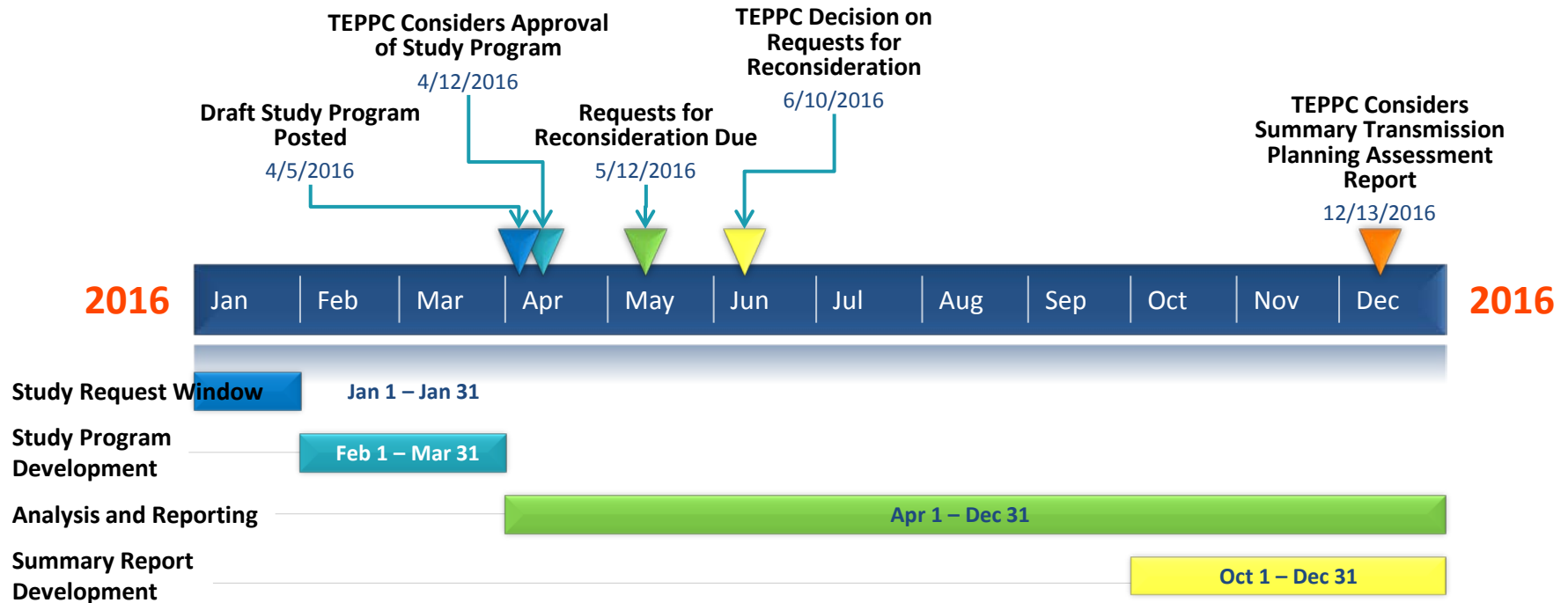
SIERRA – Sierra Subregional Planning Group
SWAT – Southwestern Area Transmission
AESO – Alberta Electric System Operator
BCCPG – BC Coordinated Planning Group



TEPPC 2016 Study Program

- Stakeholder based – advise and review
- Follows the Interim [TEPPC 2016 Protocol](#)
- Guiding themes:
 - Request address reliability, economic and other planning concerns across WI
 - Fundamental planning questions that address multiple planning regions
 - Diversity of stakeholder representation (customers, generators, regulators, developers and Transmission Providers)
 - Assist with/inform FERC assessments/studies/plans

2016 Study Request Process



2016 Draft Study Program

- Summary of
10-year
Studies

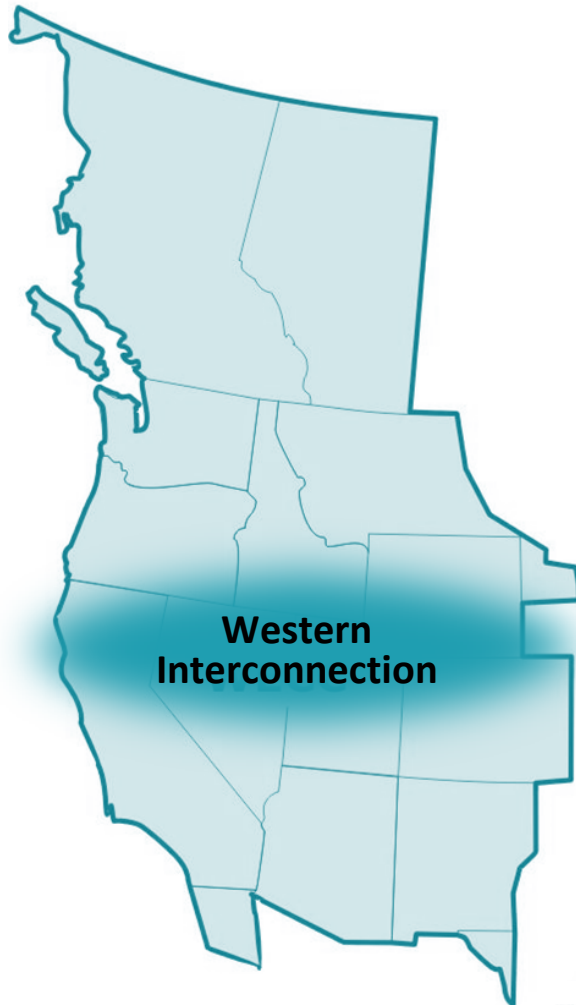
Case ID	Case Summary	Requester(s)
Common Case and Sensitivities		
2026 PC01	2026 Common Case	WECC
2026 PC02	Increased Load	PG&E
2026 PC03	Decreased Load	PG&E
2026 PC04	Increased Hydro	PG&E
2026 PC05	Decreased Hydro	PG&E
2026 PC06	Increased Natural Gas Price	PG&E
2026 PC07	Decreased Natural Gas Price	PG&E
2026 PC08	Increased CO2 Price	PG&E
2026 PC09	Decreased CO2 Price	PG&E
2026 PC10	Diablo Canyon Power Plant Retirement	CAPUC & PG&E
Policy Drivers on Resource Mix and High DER Future		
2026 PC11	Coal Retirement / Low Carbon Future	CREPC/WIRAB
2026 PC12	High Renewables with 50% CA RPS and CPP via targeted CO ₂ prices	CREPC/WIRAB; PG&E; SCE
2026 PC 13	Double EE per SB 350	PG&E
2026 PC 14	Probabilistic assessment of any of the above studies: 2026 PC10/PC12/PC13	WECC Staff Proposal
2026 PC 15	High DER Future	CREPC /WIRAB; PG&E and Strategen
Storage Studies		
2026 PC 16	Pump Storage in OR/WA near AC-DC interties with High Renewables penetration	Clean Power Development
2026 PC 17	Compressed Air Energy Storage (1200 MW) at IPP STS's Delta (UT) and Zephyr Wind Project (WY).	Burbank and DATC
2026 PC 18	Double CAES storage capacity (PC 17)	Burbank and DATC
2026 PC19	Double battery storage in CA (1300 to 2600 MW)	PG&E
2026 PC20	High Storage case assessment (PC 18 and PC 19)	Burbank, DATC, PG&E
Transmission Changes		
2026 PC 21	Use existing grid (less specified CCTA projects) and add wind in NM (2500 MW) and WY (2250 MW).	SDG&E
2026 PC 22	Examine North-South flows with increased RE in Southern CA and Southwest (AZ, NV, NM)	Pacific Gas & Electric
2026 PC 23	Examine North-South flows with increased RE in N. CA and NW (OR, WA, MT), followed by expansion case with high hydro conditions.	Pacific Gas & Electric
2026 PC 24	Compare 2026 PC 12 with the decommissioning vs. retaining of Eldorado-Moenkopi 500 kv	Hualapai Tribe

2016 Draft Study Program

- Summary of
20-year
Studies

Case ID	Case Summary	Requester(s)
2036 PC 1	2036 Reference Case	WECC
2034 PC 2	SPSG Scenario 2 – Aggressive policies to reduce GHG and promote technological innovation.	SPSG
2034 PC 3	SPSG Scenario 3 – Slow growth with focus on consumer costs	SPSG
2034 PC 4	SPSG Scenario 4 – Slow growth with focus on low-hanging fruit clean energy investments.	SPSG
2034 PC 5	High DG case	SPSG
2034 PC 6	Coal retirements or low-carbon pathway with electrification of infrastructure.	SPSG
2034 PC 7	SPSG Energy-Water-Climate Change (EWCC) Scenario	SPSG

Goal of Reliability Planning



Perspective & Analytics

- Interconnection-wide view
- Data, information and perspective
- Enhance tools and capabilities
- Look to future grid-changes and assess impacts in year 10 and year 20.

Contact Information

**Vijay Satyal – Sr. Policy Analyst and Liaison – Studies
Work Group and Regional Planning Coordination
Group**

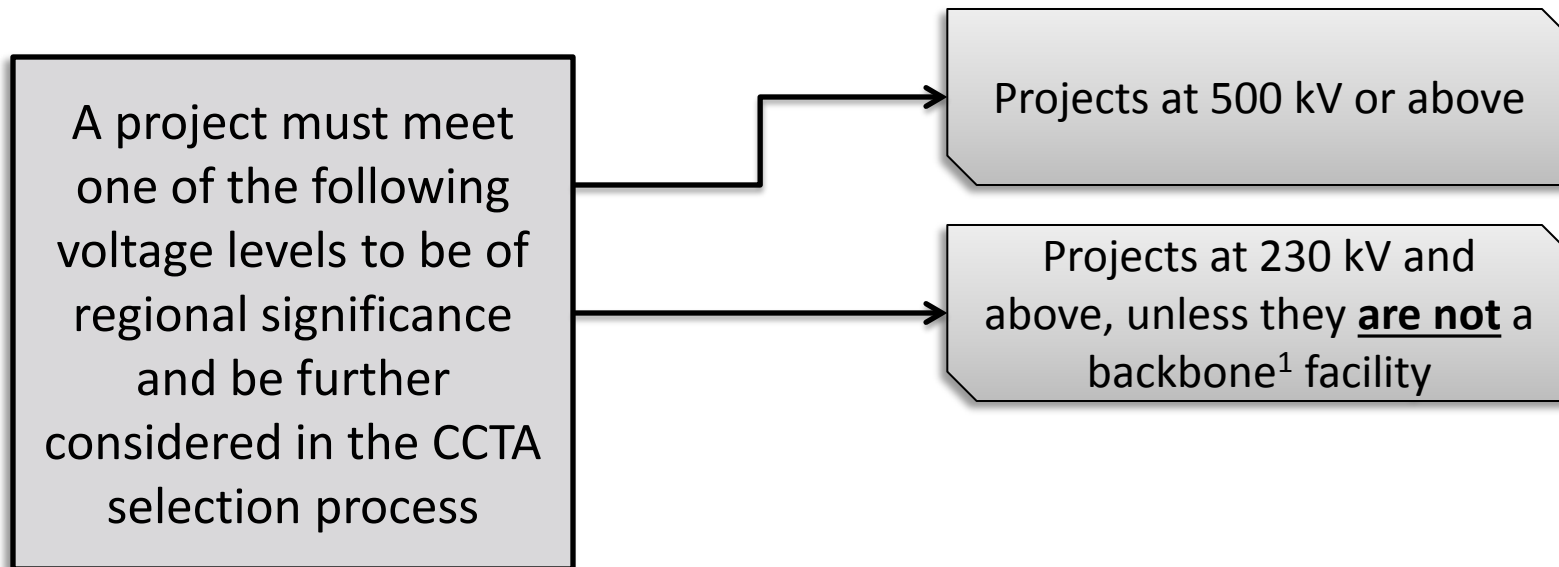
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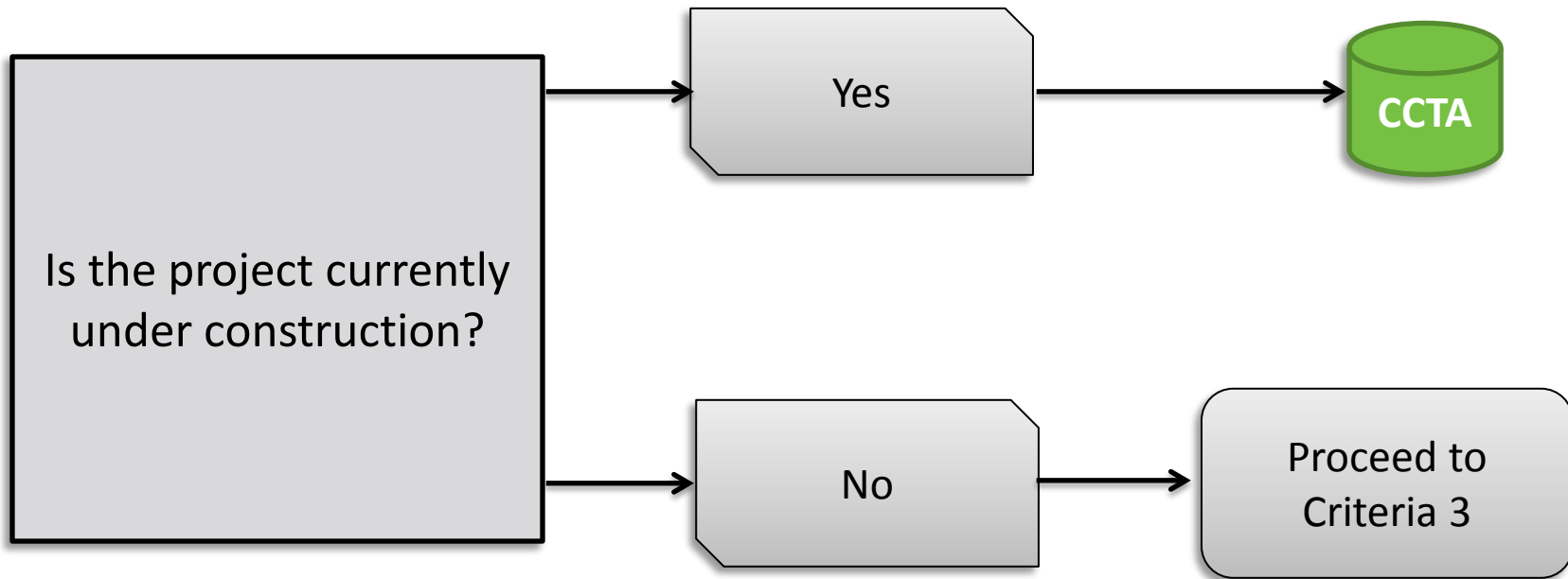
Additional Slides

Criteria 1: Regional Significance

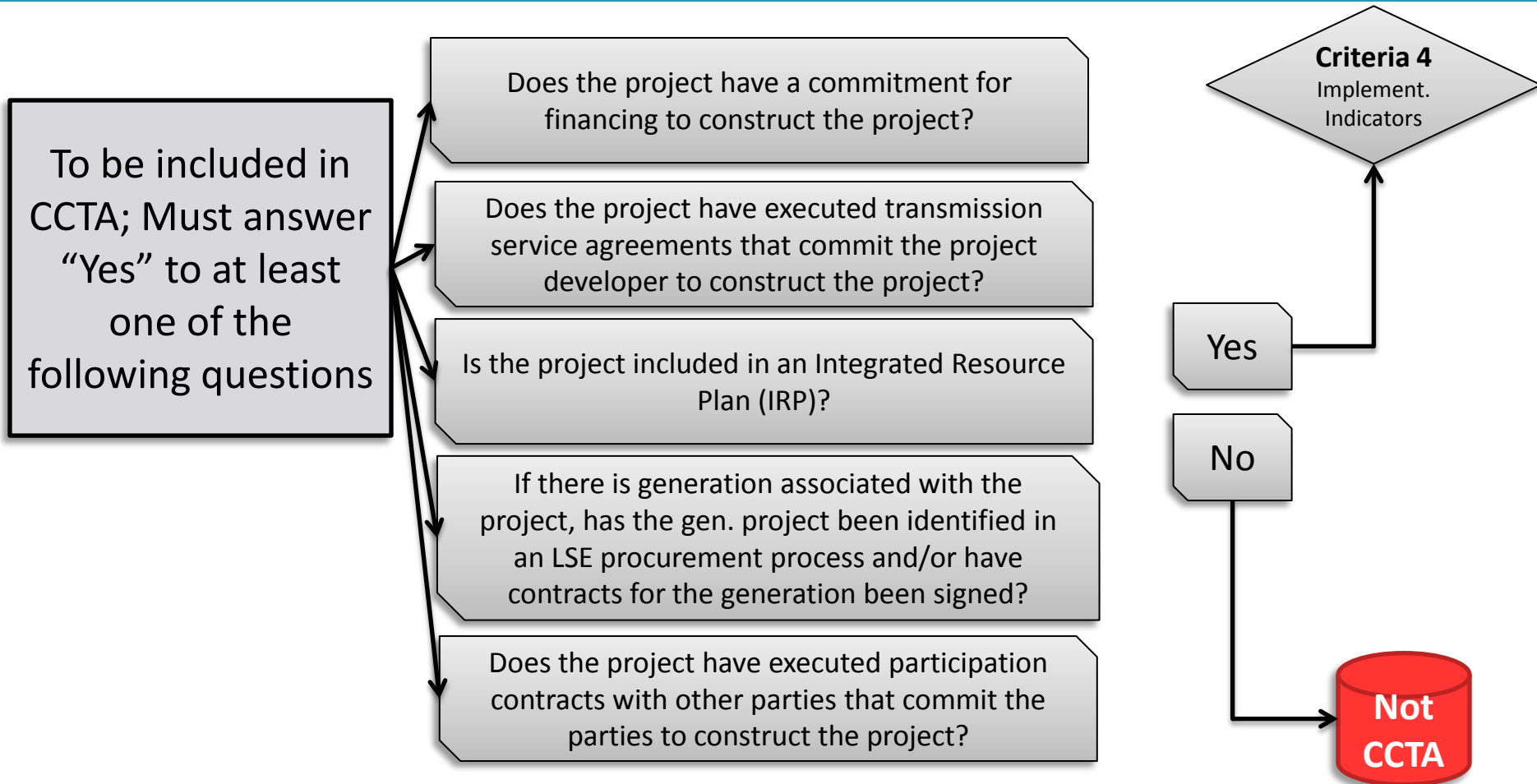


¹ Backbone transmissions are facilities that connect smaller pockets of the transmission network

Criterion 2: Construction Status



Criteria 3: Financial Indicators



Criteria 4: Implementation Status Indicators

Two key-
indicators

Does the project require a EIS and/or
similar state/county/town-level
environmental or siting process?

No

Yes

Criteria 5
Dependency
Check

Filed required applications, applications
must have been accepted or deemed
completed, formal noticed public
meeting (or equivalent) completed?

**Not
CCTA**

Until these steps have been taken*

No

Yes

Criteria 5
Dependency
Check

Criteria 5: Dependency Check

Two primary dependency questions

