



The Southern Cross Transmission Project

SCT Project Overview

September 7, 2017



Public



Agenda



- Pattern Energy Group LP
- SCT Project Overview
- SCT Project Development Status
- Southern Cross Transmission LLC Role in ERCOT



Pattern Energy Group LP

About Pattern Development



- Pattern Energy Group LP (Pattern Development) is a leading independent wind, solar and transmission project development company
- We develop projects in the United States, Canada, Mexico, Chile and Japan
 - Our 24/7 Operations Control Center and our Development Hub are both in Houston, TX
- Our highly-experienced team has brought more than 4,500 MW of wind and solar power and 400 MW of independent transmission projects to market
 - Our team has been active in Texas for more than a decade. We currently manage 966 MW of Texas wind power.
- Our current development pipeline includes approximately 6,000 MW of wind and solar power projects, in addition to a series of transmission projects
- Pattern Development's affiliate company, Pattern Energy Group Inc. (Pattern Energy) is an independent power company listed on the NASDAQ Global Select Market and Toronto Stock Exchange
 - Pattern Energy has a portfolio of 20 wind power facilities, including two projects it has agreed to acquire, with a total owned interest of 2,736 MW in the United States, Canada, Chile and Japan

SCT Project Overview






The bi-directional SCT Project can deliver up to 2,000 MW of economic energy and reliability products in either direction





Southern Cross Transmission Project Facilities Designations

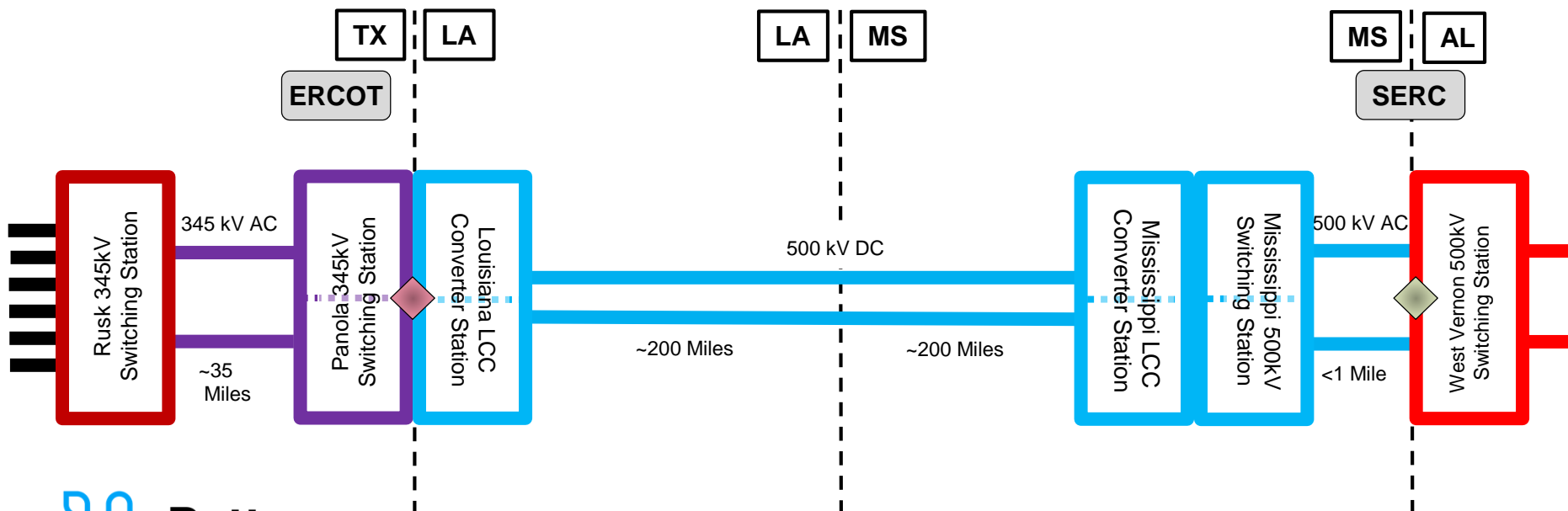


Facilities Ownership:

| | | |
|---|--|---------------------------------------|
|  | Oncor Facilities (Existing) | (345 kV AC) |
|  | Oncor Facilities (New) | (345 kV AC) |
|  | Garland Power & Light Facilities (New) | (345 kV AC) |
|  | SCT Facilities (New) | (345 kV AC → 500 kV DC → 500kV AC) |
|  | SoCo Facilities (Existing) | (500 kV AC) |

Notes:

-  Point of Delivery (West to East), or
Point of Receipt (East to West)
-  Point of Receipt (West to East), or
Point of Delivery (East to West)
- 2,100 MW to Point of Delivery
→ ~5% losses →
2,000 MW to Point of Receipt





Southern Cross Transmission Project Overview



- **Technology:** Conventional (“LCC” or “Classic”) HVDC Bipole
- **Sizing:** 2,000 MW (delivered, after ~5% losses)
- **Length:** ~400 miles.
- **Western interconnection with ERCOT:** New 345 kV transmission system of GPL, which in turn will connect to existing Oncor/ERCOT in East Texas
- **Eastern interconnection with SERC:** Existing 500 kV transmission systems of Southern Company, and possibly TVA
- **Target Commercial Operation Date:** 3Q 2022



SCT Project Development Status

Southern Cross Transmission Project

Present Development Status



- Established project configuration, technology and interconnection endpoints
 - Determined optimal project size (2,000 MW, after ~5% losses) and cost
 - Selected primary and alternative routes.
 - Critical land parcels are under option. Additional parcels being secured.
 - HVDC technology supplier under contract
- Feasible project schedule has been developed:
 - Construction commencement: 2019
 - Energization: early 2022
 - Commercial Operation: 3Q 2022
- Obtained final FERC 210/211 Orders and agreements in May 2014 for interconnection to and transmission service in ERCOT that maintain the FERC jurisdictional status quo

Southern Cross Transmission Project

Present Development Status (continued)



- In the Southeast, initial transmission feasibility studies are complete and final studies are underway
- Continuing discussions with stakeholders and capacity subscribers
 - Formal FERC-prescribed Open Solicitation process to commence in 2018
- PUCT CCN (Docket No. 45624) for the new GPL transmission line has been approved and a route for the line has been established
- PUCT directives for ERCOT are in place (Project No. 46304) that provide, among other matters, for the process of integrating and operating the SCT Project as a part of the ERCOT system and within the construct of the ERCOT market
- Process to obtain Siting Certificate for the SCT Project's transmission line is underway at the Mississippi Public Service Commission; no siting certificate is required in Louisiana



Southern Cross Transmission LLC

Role in ERCOT

Southern Cross Transmission LLC (“SCT”) will be a DC Tie operator in ERCOT



- The term “DC Tie operator” is currently used in the ERCOT Protocols, although it is not specifically defined in Section 2. Examples:
 - Protocols Sec. 4.4.4(10) ... “The **DC Tie operator** shall communicate deratings of DC Ties to ERCOT and other affected regions and all parties shall agree to any adjusted or curtailed e-Tag amounts.”
 - Protocols Sec. 6.5.4(1) ... “ERCOT shall coordinate operation of each DC Tie with the **DC Tie operator** such that the Inadvertent Energy Account is maintained as close to zero as possible.”
- DC Tie operators manage the net flows on DC Tie in accordance with approved e-Tag schedules, ERCOT Protocols, and ERCOT operator instructions
- ERCOT Protocols assign certain responsibilities to DC Tie operators. Both of the current ERCOT DC Tie operators (AEP & Sharyland) are “electric utilities” as defined by Texas law and “TSPs” as defined by ERCOT Protocols. SCT will not own any facilities in the State of Texas and, therefore, will not be a Texas “electric utility”. As such, SCT does not currently meet the ERCOT Protocols definition of a “TSP”
- SCT will be a “public utility” as defined by the Federal Power Act and, probably a “TSP” as defined by NERC.

Southern Cross Transmission LLC will not buy or sell energy in the ERCOT market; will not charge transmission rates in ERCOT



- SCT DC line capacity holders will decide whether to export from ERCOT, import to ERCOT, or not to transact over the tie during any given hour
 - Capacity owners may release unused capacity to be made available on an OASIS where any party may reserve the available capacity to support a transaction
 - SCT will facilitate non-discriminatory open access pursuant to the terms of its FERC-approved OATT
- ERCOT QSEs will schedule SCT DC Tie transactions similar to the way they schedule transactions across the existing ERCOT DC Ties
 - NERC e-Tags submitted via OATI interface, confirmed by both BAs and the DC Tie operator
- The ERCOT-registered QSEs which schedule transactions across the SCT DC Tie will be settled for ERCOT market-related charges through the ERCOT settlement process. SCT will not participate in the ERCOT market settlement process
- QSEs exporting over the SCT DC Tie will be responsible for paying TSP charges for transmission rates applicable to DC Tie exports. SCT will not have a Texas tariff or charge or collect transmission rates in the ERCOT region



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