



Challenges for Merchant Transmission of Renewables

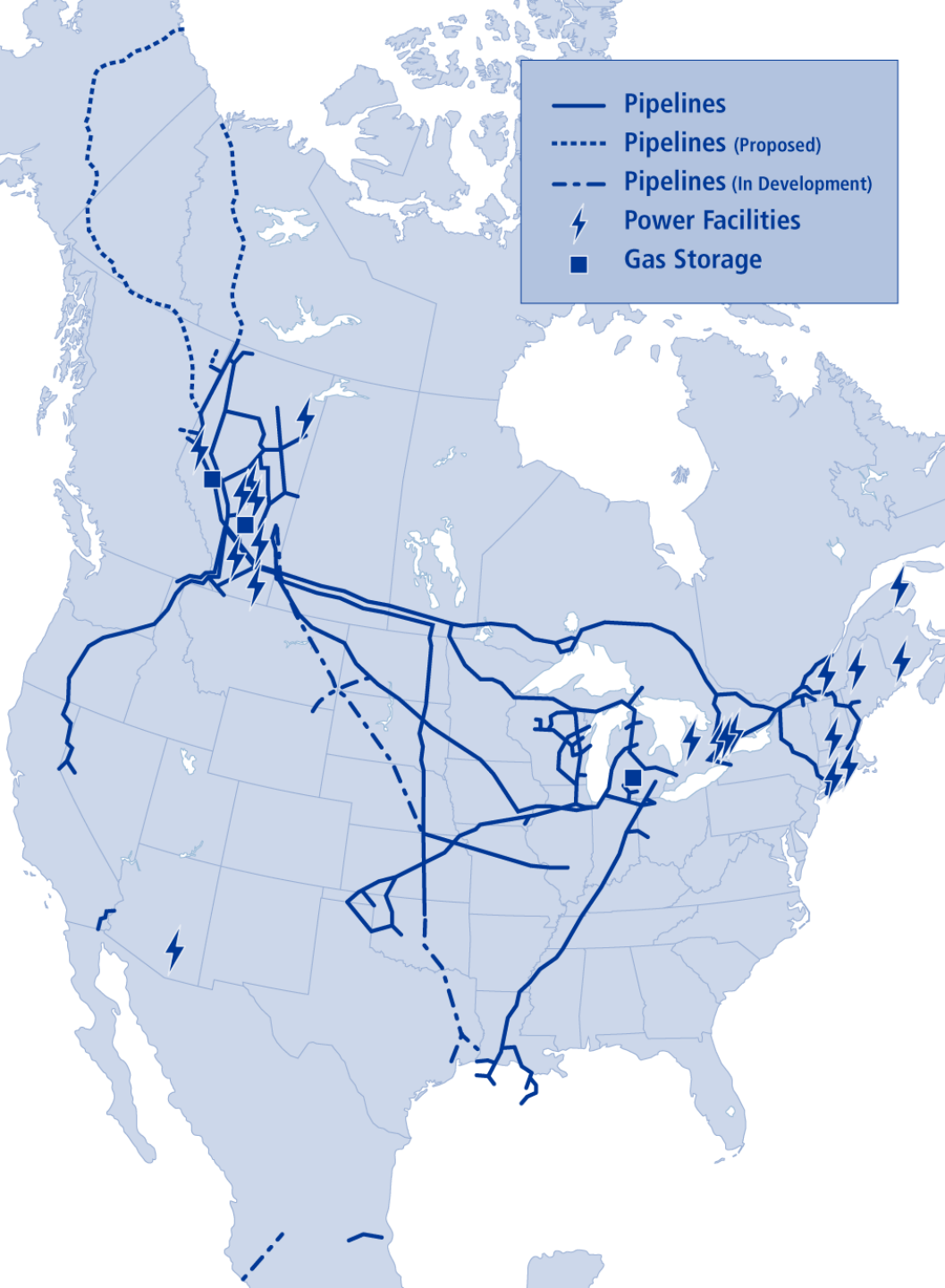
AzCPA Energy Conference

January 27th 2010



TransCanada
In business to deliver

TransCanada Corporation (TSX/NYSE: TRP)



•Gas Pipelines

- 59,000 km wholly owned
- 7,800 km partially owned
- 250 Bcf of regulated natural gas storage capacity
- Average volume of 15 Bcf/d

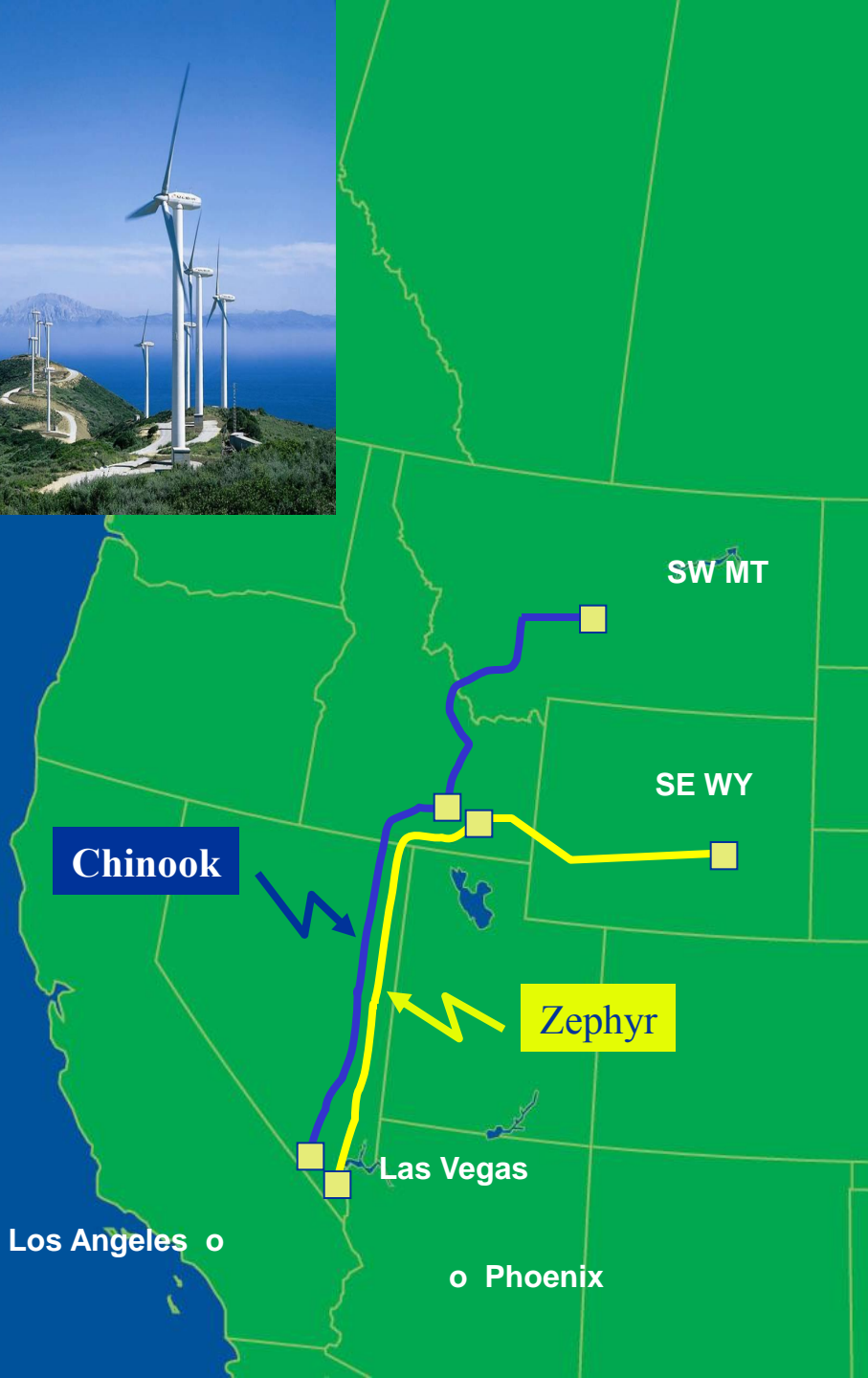
•Oil Pipelines*

- Keystone 1.1 million Bbl/d
- Expandable to 1.5 million Bbl/d

•Energy

- 20 power plants, 11,800 MW
- Diversified portfolio, primarily low-cost, base-load generation
- 120 Bcf of non-regulated natural gas storage capacity

* In development or under construction



Chinook & Zephyr Project Summary



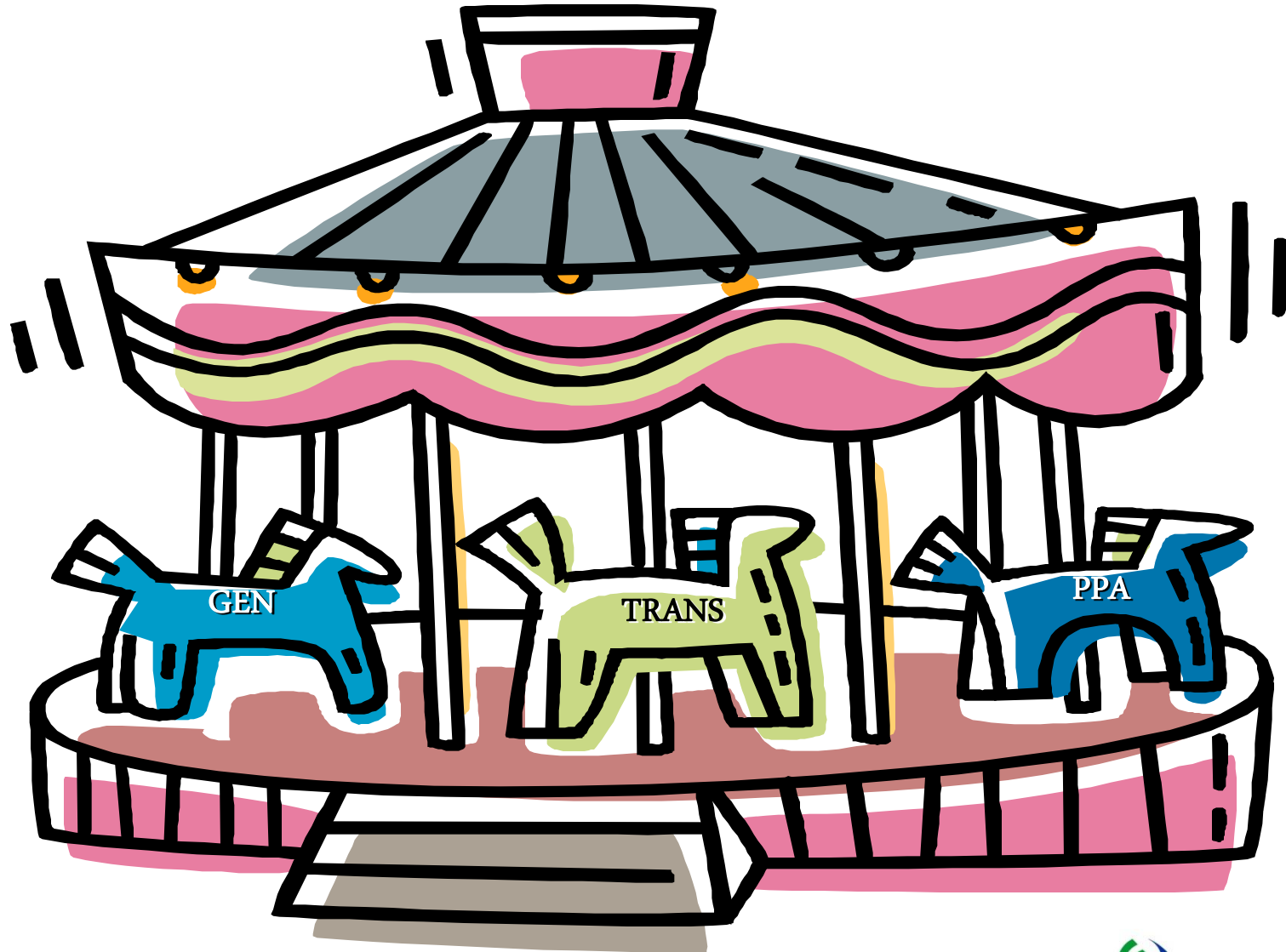
- Each project is a 1,000+ mile 3,000 MW 500 kv HVDC line costing \$US 3 billion
- Connects wind in Wyoming (Zephyr) and Montana (Chinook) to the demand for renewable power in U.S. Southwest
- FERC approval (Feb 09) for market-based rates and to pre-subscribe up to 50% of capacity to an anchor shipper
- Open Season was held October 13 to December 16 of 2009
- Decision to proceed to regulatory phase in March/April of 2010
- Planned in-service early 2015

Challenges for Chinook & Zephyr



- Both lines are being supported predominantly by wind generation
- HVDC
 - Better suited to intermittent resources
 - Not common in the West but not unique
 - Smaller footprint and lower losses
 - Fewer interconnects (both a pro & a con)
- Line size will be set by regional system limits not demand
 - WECC path rating
- Need for long term PPAs for the generators

Challenges-2



Challenges-3



- Recent transmission development has been mostly organic and/or incremental
- Shift to much larger contribution from renewables will require a paradigm shift in the industry
- Balancing is a major issue with all renewables, but where?
 - At the point of generation
 - At the system terminus (El Dorado Valley for Chinook/Zephyr)
 - Within the utility's service territory
- Balkanization & "protectionism"
- Competition for limited utility corridors
- Federal/public lands versus private lands
- Environmental issues
 - Sage grouse

Challenges-4



- Cost
 - Permitting could take 3+ years
 - Chinook & Zephyr expected to cost \$65 MM+ each to permit
 - Shareholders (not ratepayers) are at risk
- Federal permitting versus multi-state
 - Eminent domain is a state-by-state process
- Incentive programs
 - “shovel-ready” timeline too short
 - Development & permitting is risky & expensive
 - Good projects can be financed once permitted

Summary



- Substituting significant renewables into the supply equation will take longer than expected and will be expensive
- The existing system will have to dramatically change to allow that to occur
 - The change will need to be systemic
- The industry has the capability but needs the mandate and support to do so
 - Consistent political support is crucial
- The West should be better equipped to make the change
 - High quality renewables (wind & solar)
 - History of long distance transmission