

# **Greening the Grid: Alberta's Electricity Evolution**

Mike Deising, Director, Corporate Communications

Alberta Urban Municipalities Association Conference  
October 5, 2016

# About the AESO

- Grid operator – reliability is our highest priority
- Plan the transmission system
- Provides access for new generation and load
- Operates wholesale electricity market
- Not-for-profit corporation; no financial interests

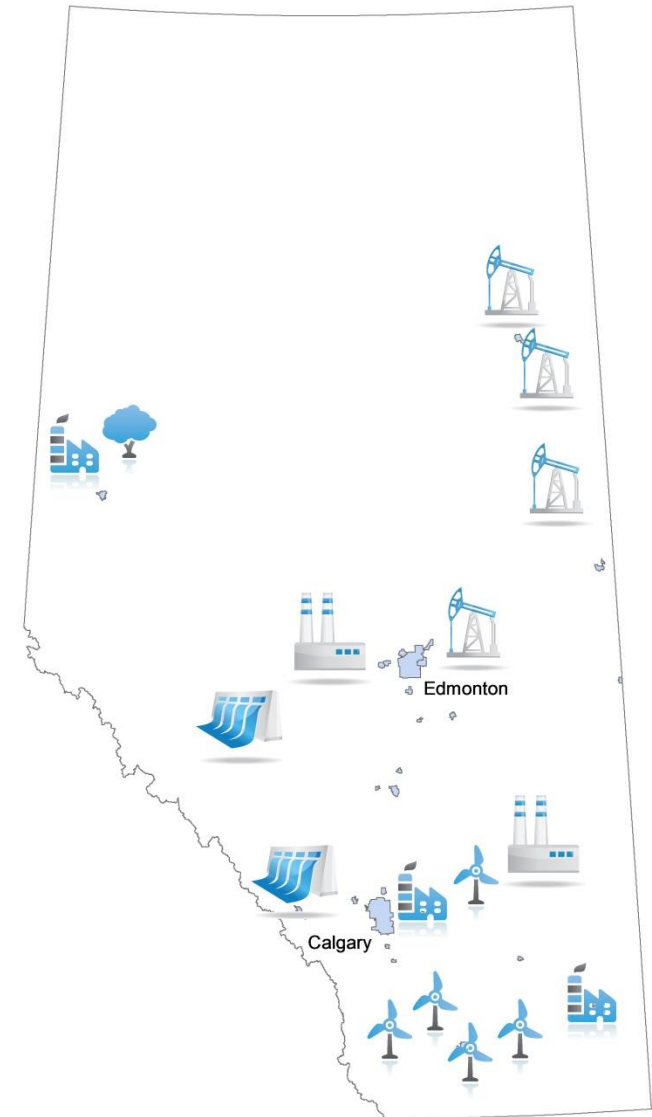
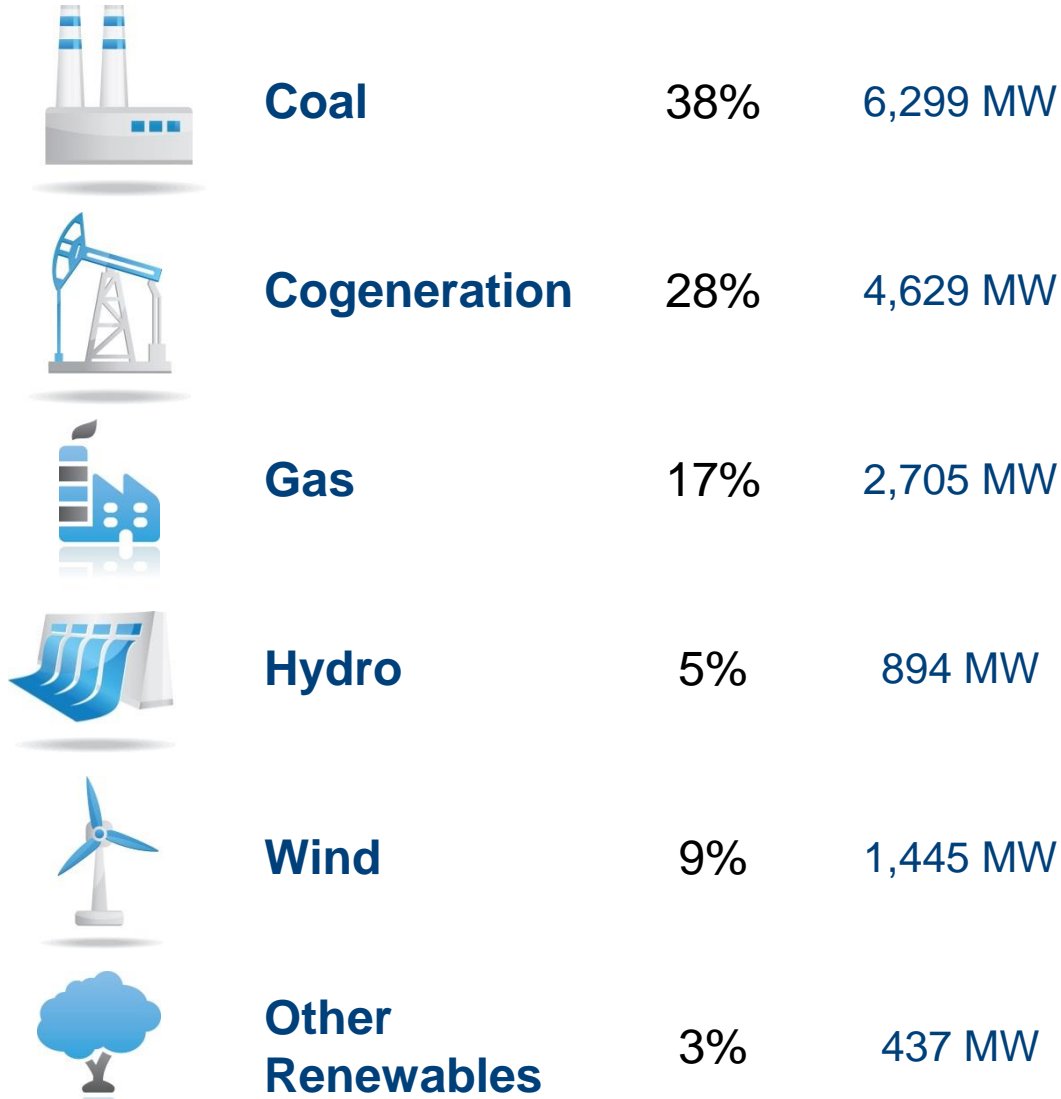


# Snapshot: Alberta's Power Grid



- High industrial load
- 26,000+ km of transmission
- ~235 generating units
- 16,315 MW installed generation
- 1,348 MW wind record Oct 2015
- Three interconnections to B.C., SK, Montana
- Coal served 64% of Alberta demand for electricity in 2015

# Current Generation Mix (Installed)



Installed capacity as of Sept. 29, 2016

# Evolving Objectives for the Industry



## Past

- Safe
- Reliable
- Competitively Priced

## Future

- Safe
- Reliable
- Affordable
- Sustainable
  - Better air quality
  - Lower carbon
  - Socio-economic considerations





## Coal Emissions Phase-out

- Support the GoA and Coal Facilitator

## Renewable Integration

- Develop and implement a Renewable Electricity Program

## Sustainable Framework

- Ensure Alberta remains an attractive investment environment

# Renewable Electricity Program (REP)

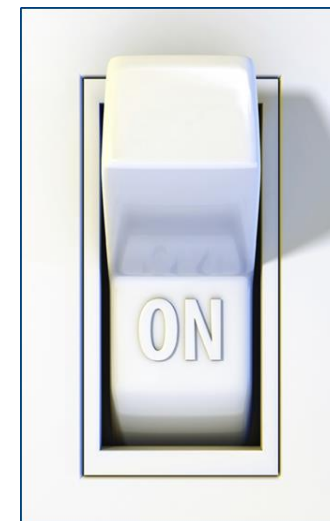


CLP: 30% renewable energy by 2030

- REP will provide incentives for utility-scale projects:
  - 5,000 MW of new, renewable generation by 2030
  - Competitive process to keep costs low as possible
  - Eligible projects must:
    - Be new or expanded facilities based in Alberta
    - Be  $\geq 5$  MW
    - Meet Natural Resources Canada definition of a renewable source
- REP must sync with coal fleet retirements
- Series of competitions held until target achieved

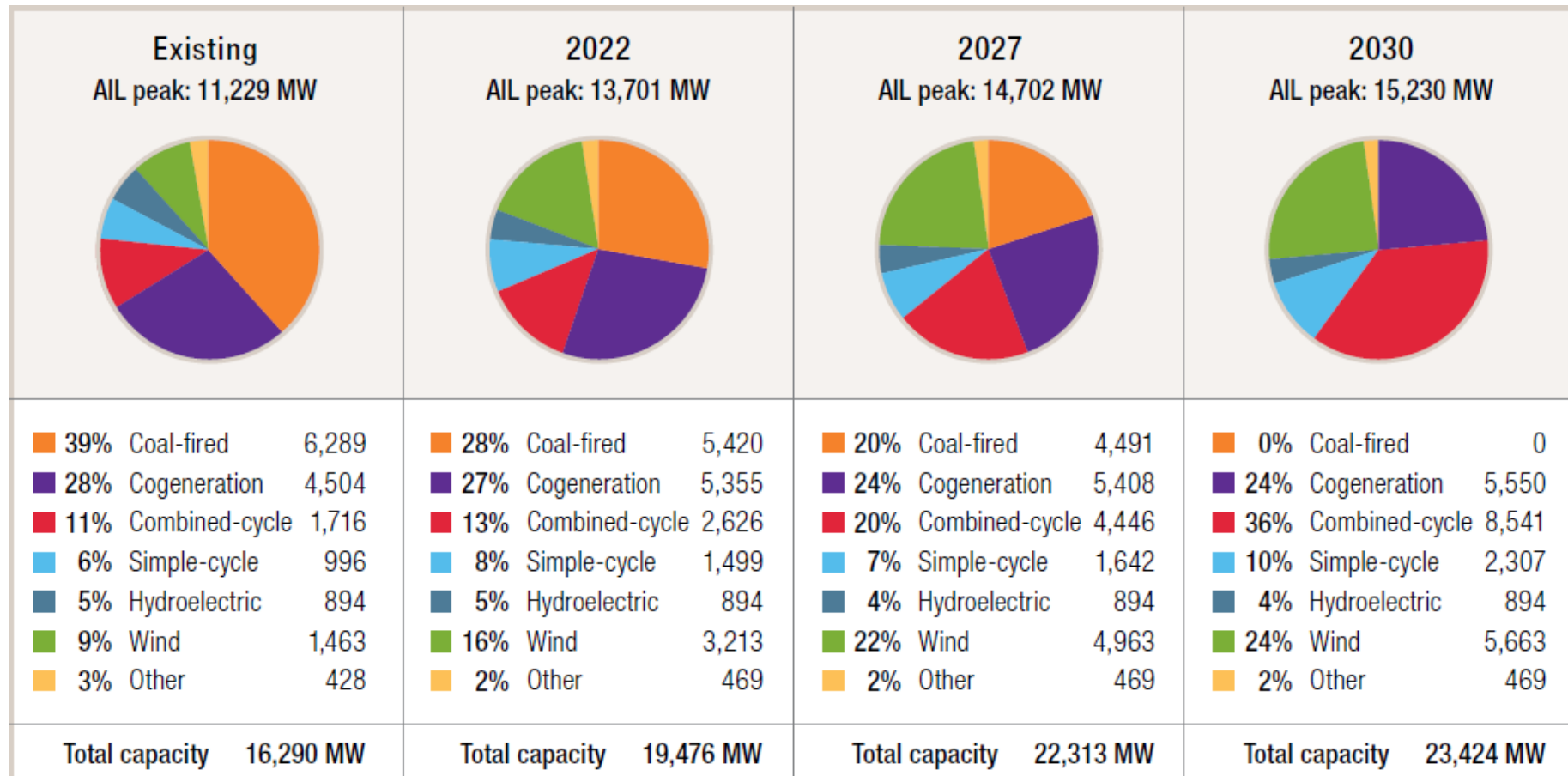
# Renewable Electricity Program (REP)

- AESO work to date:
  - Inputs from industry and financial advisors
  - Reviewed key learnings from other jurisdictions
  - Developed efficient, flexible, sustainable program to incent renewables
  - Submitted program recommendations to GoA
- Current status:
  - REP awaiting formal GoA approval before AESO engages stakeholders
  - AESO developing program and procurement documentation

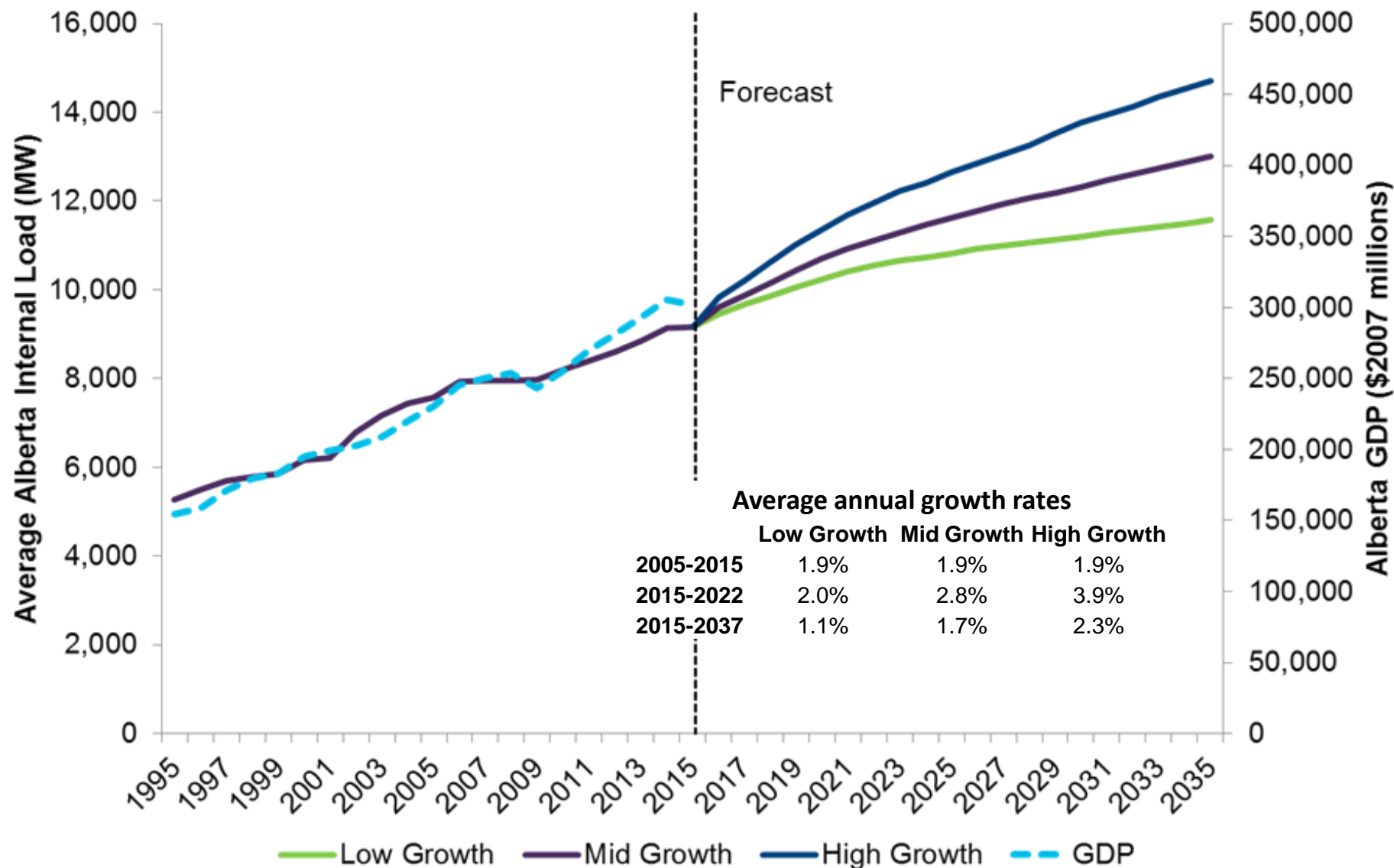




# Generation Outlook: Rapid Transition From Coal to Gas and Renewables

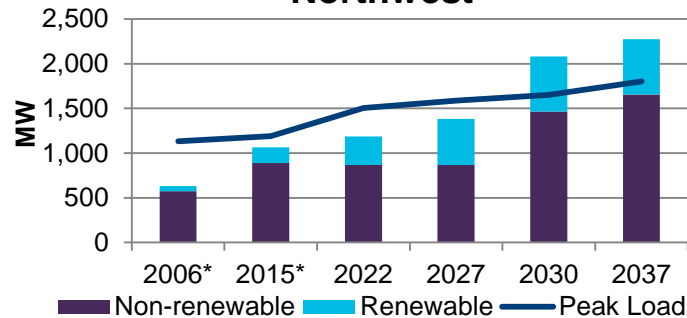


# Load Outlook: Range of Demand Scenarios to Capture Uncertainty

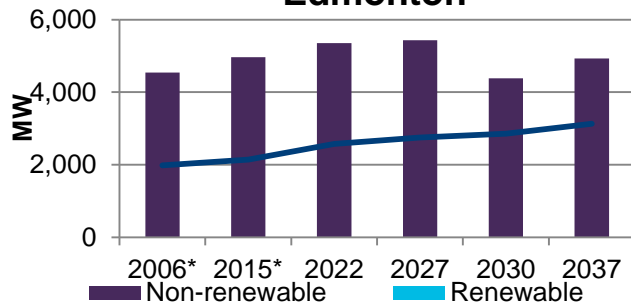


# Regional Load and Generation Outlook

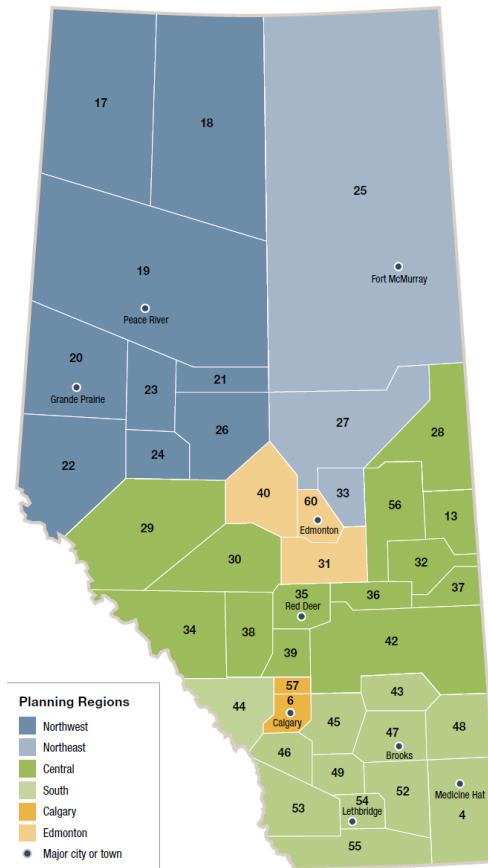
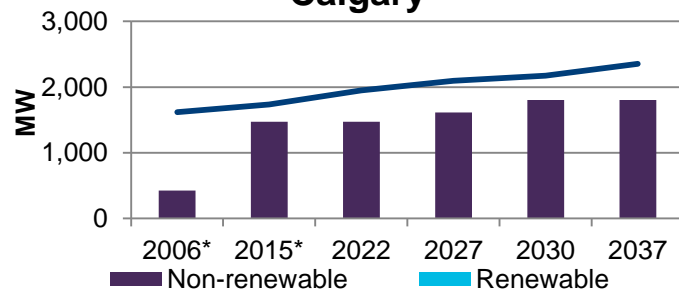
## Northwest



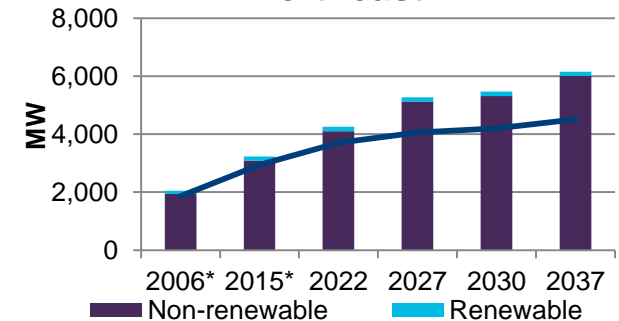
## Edmonton



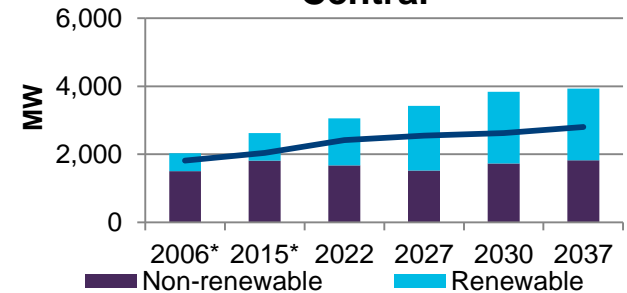
## Calgary



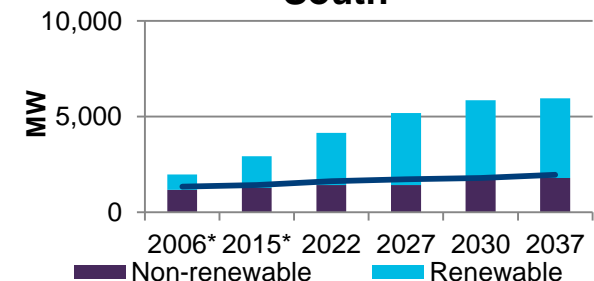
## Northeast



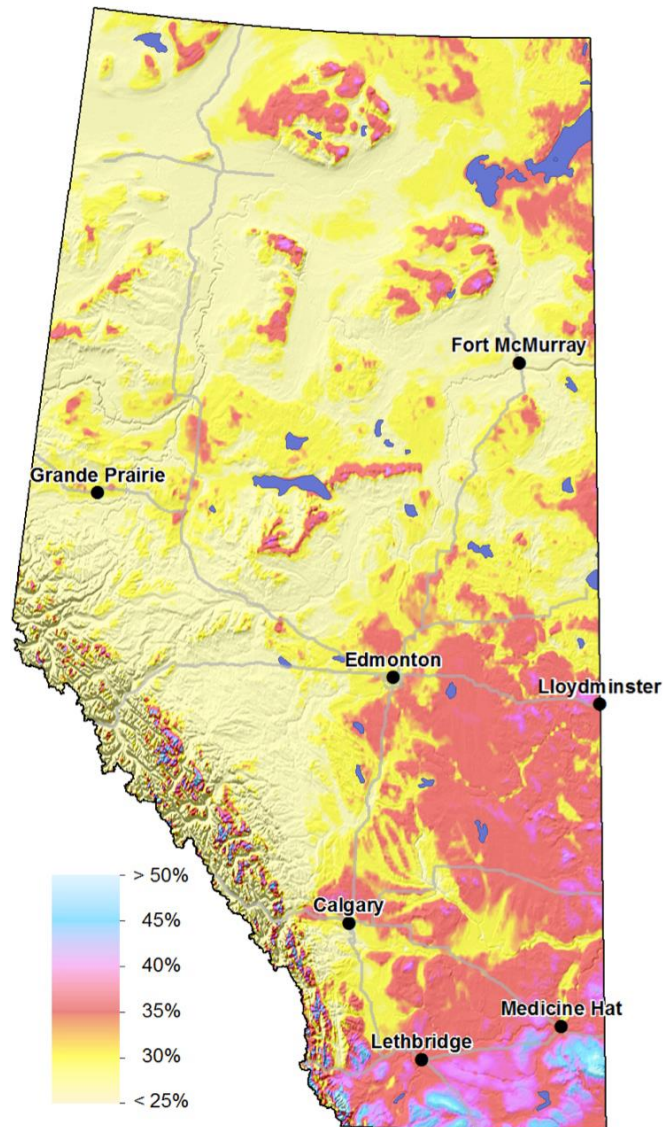
## Central



## South

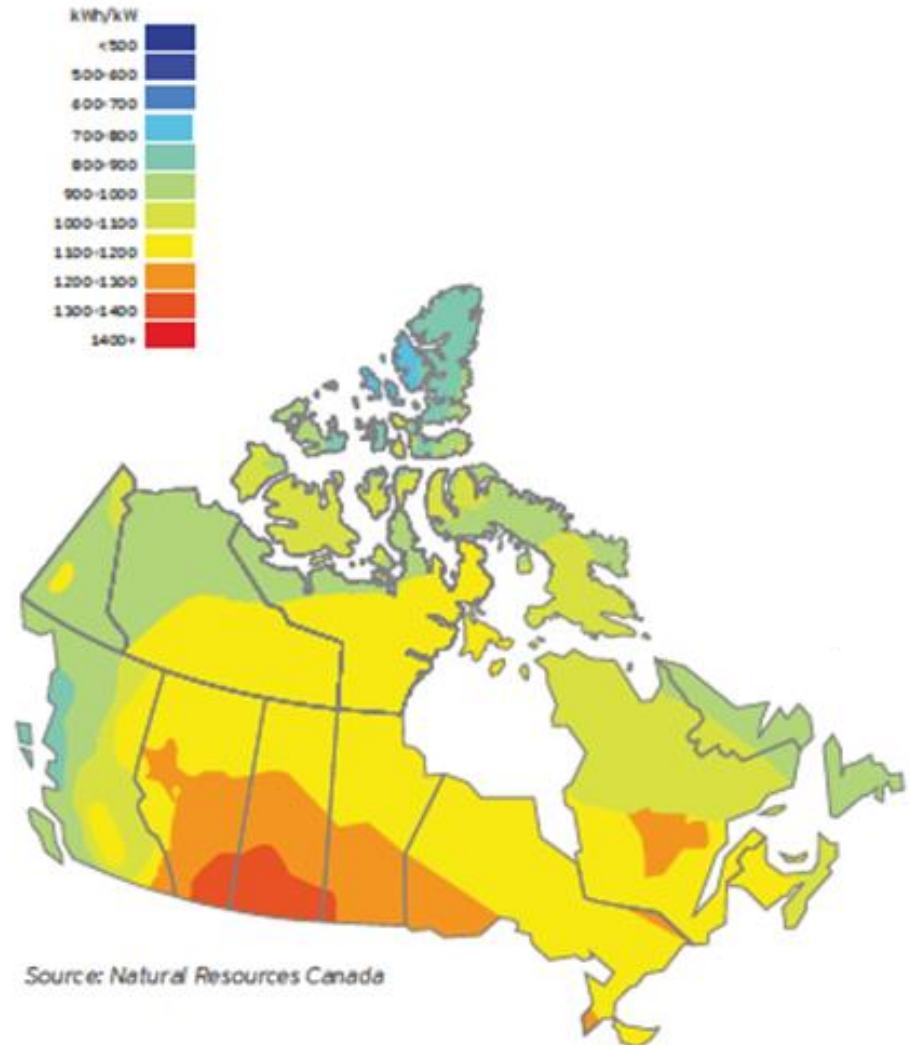


# Wind Potential in Alberta



# Growth Opportunity for Solar

- High solar resource potential
- Best in southern region but good across Alberta



# Emergence of Distributed Energy Resources (DER)

- Approx 470 MW of DER currently on system
  - From household solar to 29 MW wind facility
- CLP will drive DER development interest
- DER connection requirements currently differ from those for transmission generators
- AESO will need to revise/develop rules to accommodate DER growth
- Potential DER is 2,000+ MW across Alberta





# Transmission Adequacy Vital for a Successful Transition



- Integrating renewables will change traditional power flow patterns
- HVDC supports a robust transmission grid capable of handling new flow patterns
- Transmission capacity available for adding renewables and gas-fired replacement generation
- Development of renewables outside of existing grid footprint could create needs for transmission

# Key Takeaways

- Electricity industry is evolving; sustainability is becoming a new primary objective
- Transition from coal to renewables is complex and must be carefully coordinated over extended period
- We have designed REP to result in robust competition and best value for Albertans
- We will continue to evaluate impacts of phasing out coal and integrating renewables
- Maintaining reliability is always AESO's primary task

**Thank you**