The Alberta Electric System Operator

IEEE Switchgear Committee

October 14, 2008

Neil Millar, Vice-President, Transmission

Reliable **Power**

Reliable **Markets**

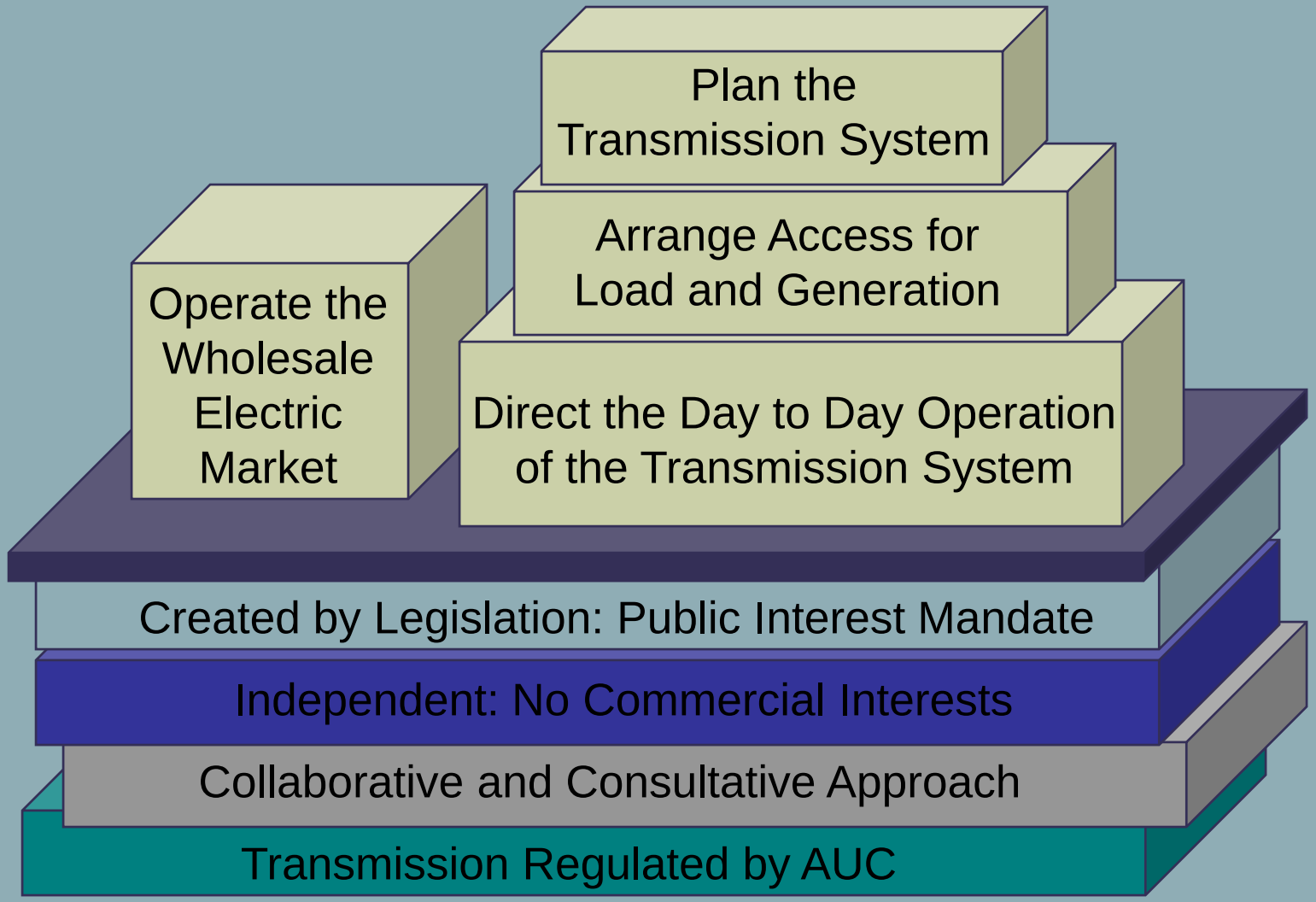
Reliable **People**

aeso
ALBERTA ELECTRIC SYSTEM OPERATOR

Alberta's Electric Industry

- 22,322 km transmission
- Single control area of 660,000 km²
- B.C. & Sask. Connections
  - (785MW)
- over 167 generating units
- 9,700 MW system peak
- Over 200 market participants
- Over 12,000 MW internal capacity net to grid

AESO: Our role and context



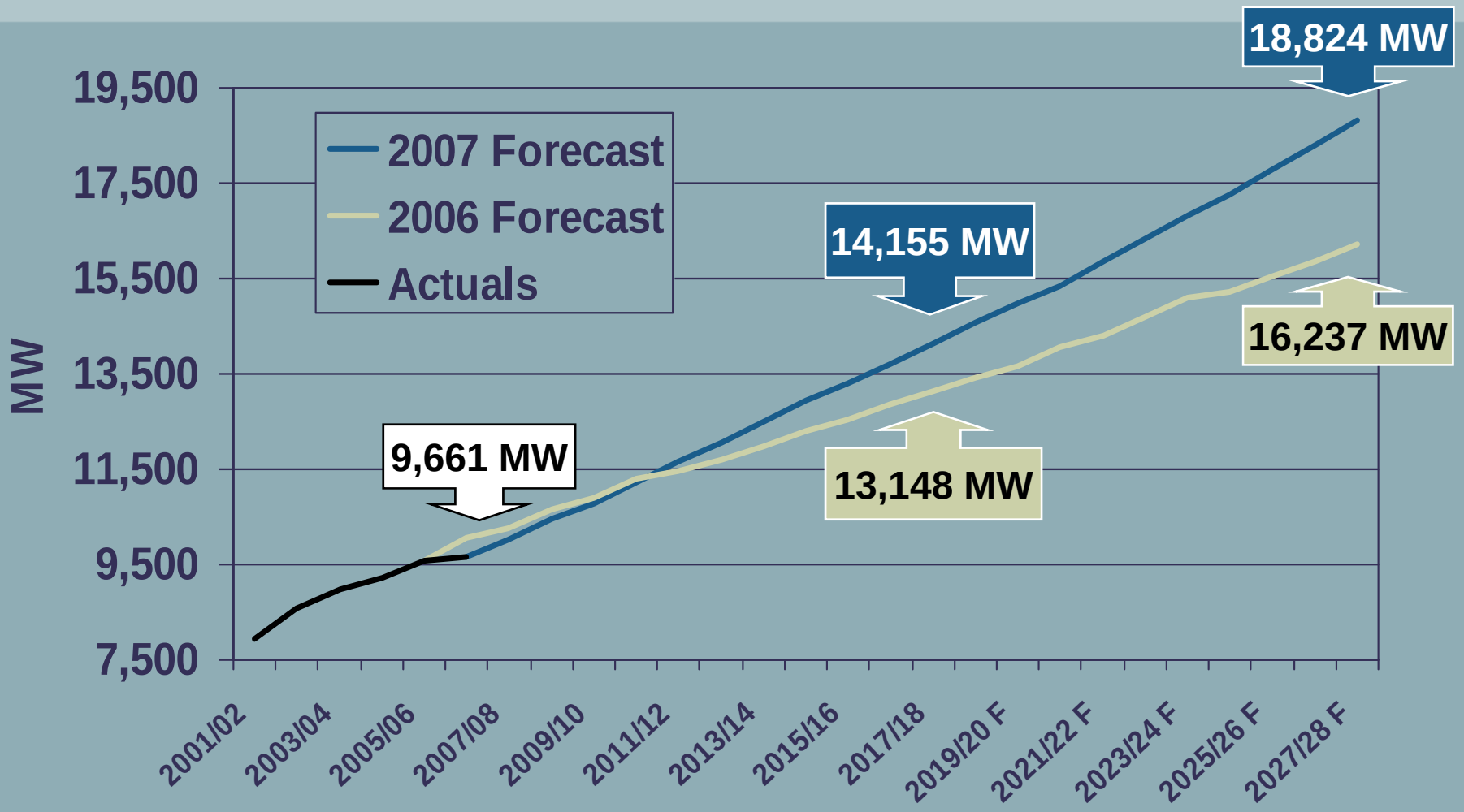
March 27, 2008 Letter
Premier to Minister of Energy

"In addition, as Minister of Energy, you will lead the following initiatives which will assist us in achieving our collective goals:

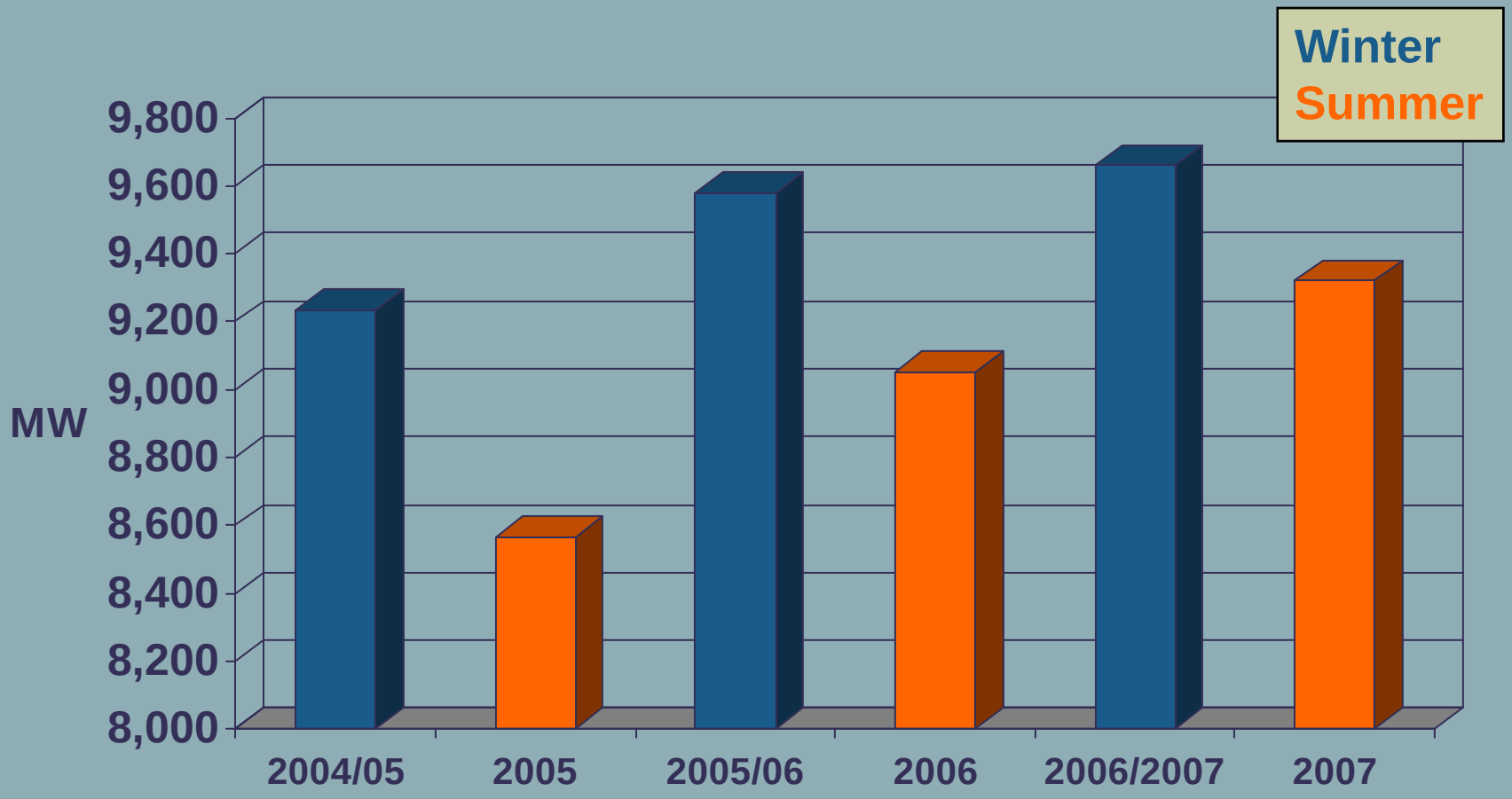
- Ensure Albertans receive appropriate benefits from their ownership of nonrenewable resources by implementing the *New Royalty Framework* for Alberta.
- Develop and implement policy to ensure sufficient and reliable electric transmission facilities are available in a timely manner to support continued economic growth in the province."

(Besides emphasis on comprehensive energy strategy, oil sands recovery, and bitumen upgrading.)

Summary of Results
AIL Winter Peak



AIL Historical Peak Analysis



Geographical Additions

Northern

- Coal
- Gas
- Hydro
- Nuclear
- Oilsands By-products
- Wind

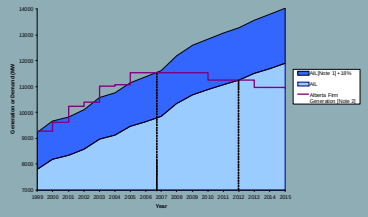
Southern

- Coal
- Gas
- Wind

Transmission Planning Challenges

aeso ALBERTA ELECTRIC SYSTEM OPERATOR

Load Growth



Insufficient Infrastructure investment

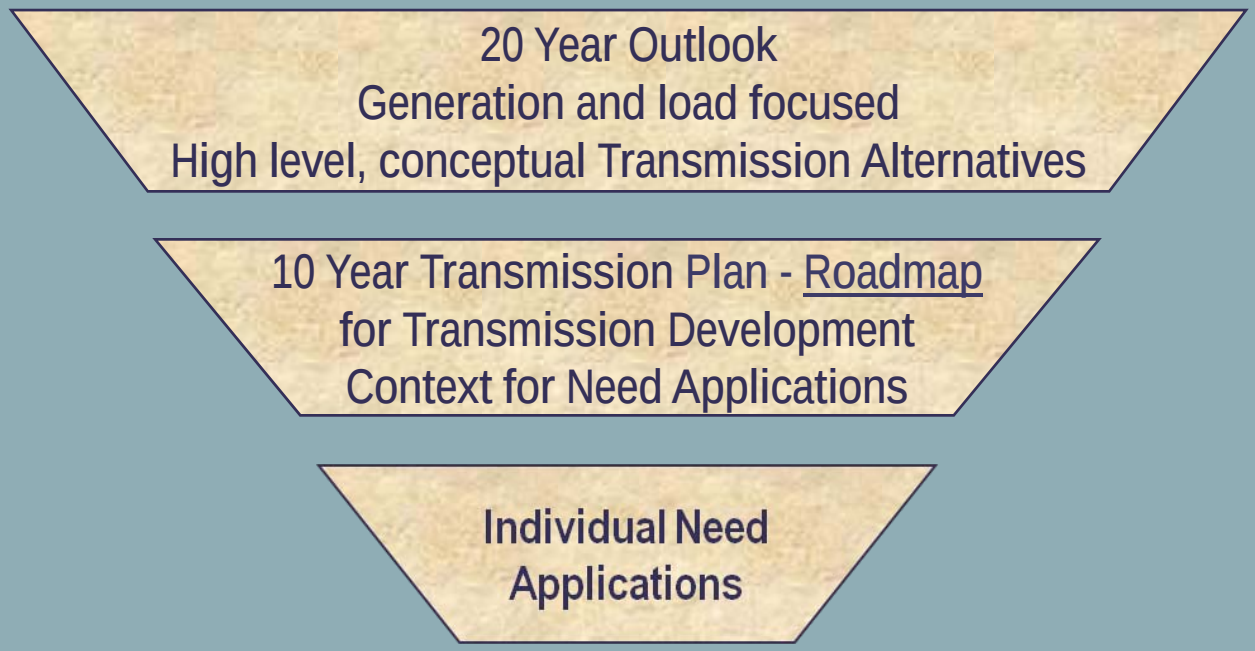
Transmission Planning

Ensure Reliability and Transmission Adequacy

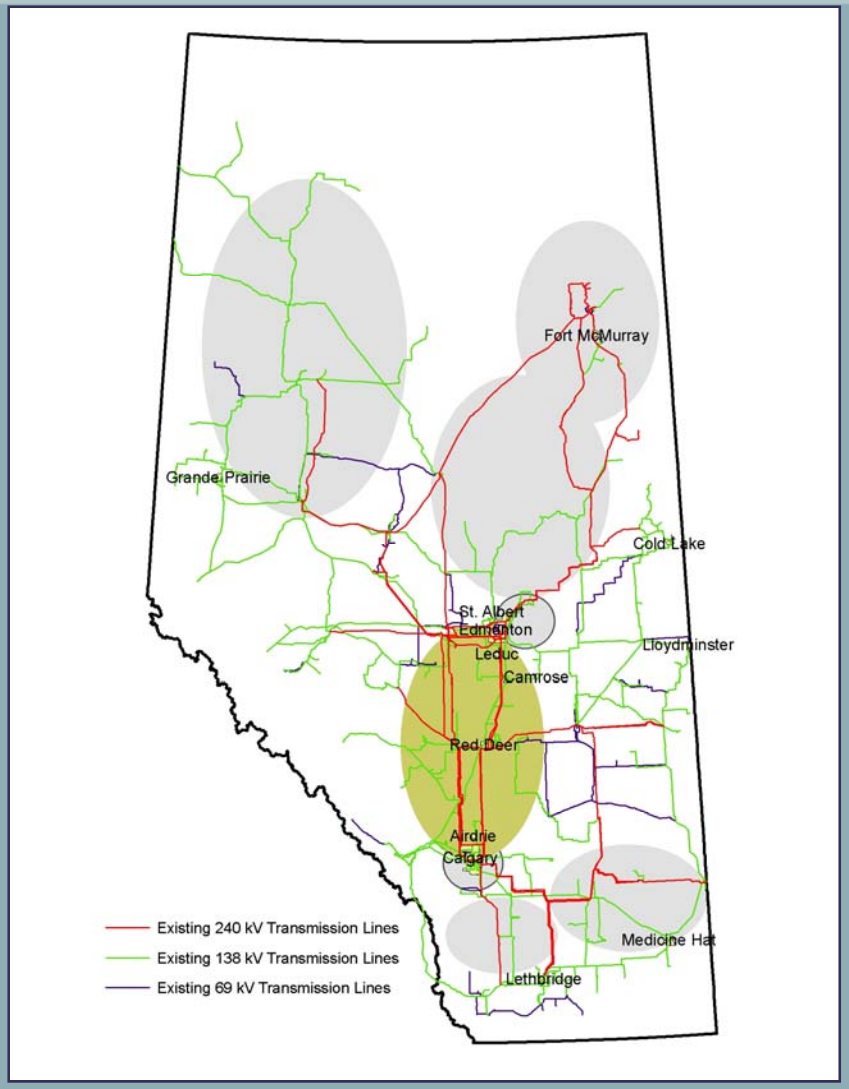
Merchant Generation Development

Lead times!

Overall Transmission Planning Framework



Transmission System Development



- ***No major upgrades to the transmission backbone in 20 years***
- **Edmonton to Calgary System Reinforcement**
- **NW Alberta**
- **Southern Alberta**
- **Fort McMurray**
- **Heartland/Fort Saskatchewan**
- **Calgary area**

Transmission Options
"New to Alberta"

As Alberta system grows and evolves from a "pioneering" system:

- Phase Shifting Transformers
- High Capacity Conductor
- Series Capacitors
- More SVC's and a return of Synchronous Condensers
- HVDC
- High Voltage underground DC
- More high voltage underground AC
- Increased Interties