EDC Associates Ltd.

Banff Conference

Session 3

Financing an Affordable and Reliable Transition

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Presentation Outline

1. EDC Associates Ltd.
2. Key Forecast Assumption Used
   - Energy & demand
   - Natural gas prices
   - Carbon price & compliance policy
   - Resource supply additions/retirements
3. Overview of Forecast Results
   - Energy Production
   - Pool Prices Q3-2022
4. Potential Cost Impact to Alberta
5. Observations & Conclusions

EDC Associates Ltd. – Overview

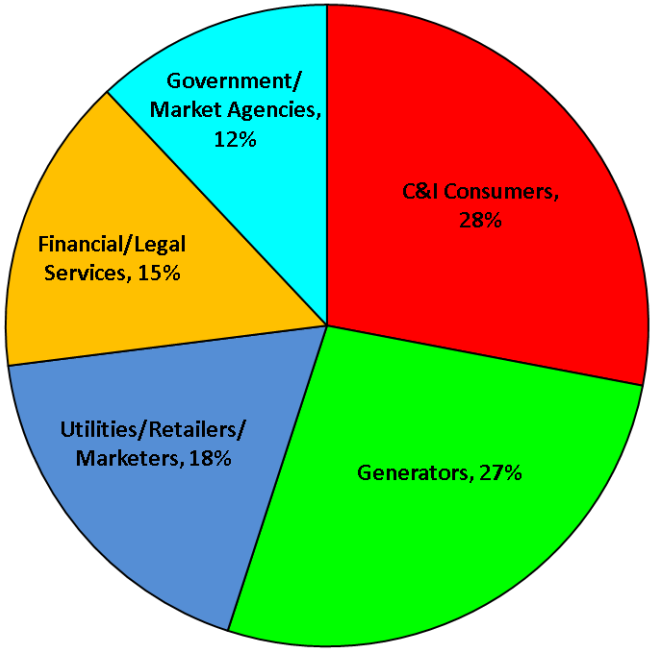
EDC Associates Ltd. has been providing industry-leading market intelligence detailing Alberta's electricity sector since 1992

Core EDC Associates Ltd. Activities

- **Publication** of 7 weekly/monthly/quarterly/annual reports that provide regulatory updates, market intelligence and short/long-term forecasts detailing Alberta's electricity sector
- Independent and rigorous **M&A transactional advisory services and generation economic development services** with respect to generation feasibility and economic modeling used by those considering generation development, value optimization, acquisition or divestiture
- **Energy management/procurement services**, including requests for quote and proposal development, purchase/sale recommendations, purchase/sale strategies, portfolio monitoring services, budget assistance and reporting
- **Regulatory application and legal consulting services** to prepare and file evidence in various AER/AUC proceedings, as well as to act as an expert witness on behalf of clients
  - Including **site connection project management services**, primarily for industrial/commercial loads interested in developing on-site facilities
- **Electric industry training** where EDCA staff has facilitated or made presentations to many industry wide conferences or corporate sessions on key market fundamentals, regulatory structures, operations etc.
- **Software development/support** for EDCA's proprietary Alberta electricity market forecasting platform that is sold into the market and currently used by several market participants

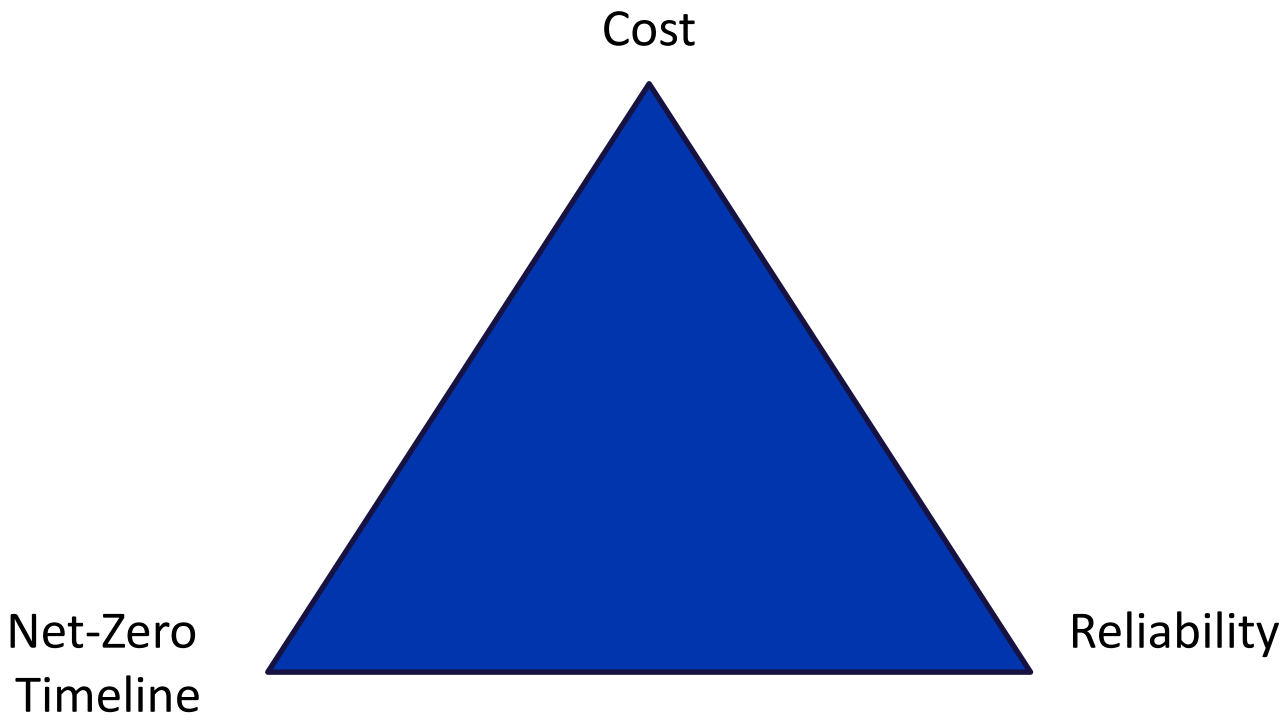
EDC Associates Ltd. Client Base

- EDCA's client base consists of over 300 clients, constituting a wide range of electricity industry participants, including industrial consumers, generators, utilities/retailers/marketers, financial/legal service providers and all major government and market agencies



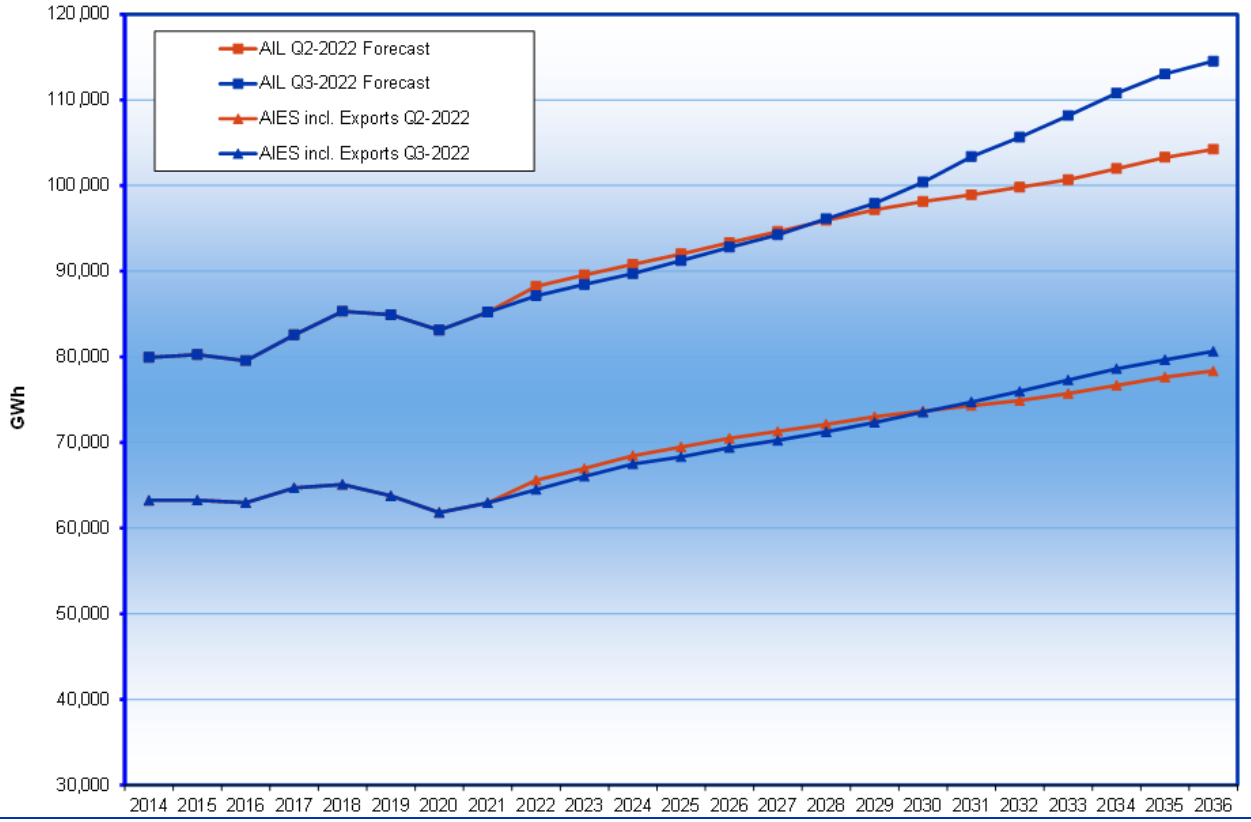
Financing an Affordable and Reliable Transition… to Net-Zero

- The electric industry's transition to net-zero emissions will be a herculean task
  - If net-zero is required in a short period of time
    - ✓ 2023 to 2035 is light speed when considered in "electric industry" years
  - With a high degree of reliability – which is a must and assumed a prerequisite
  - Then it is not likely to be cheap – without any cross-cutting subsidies to enable it



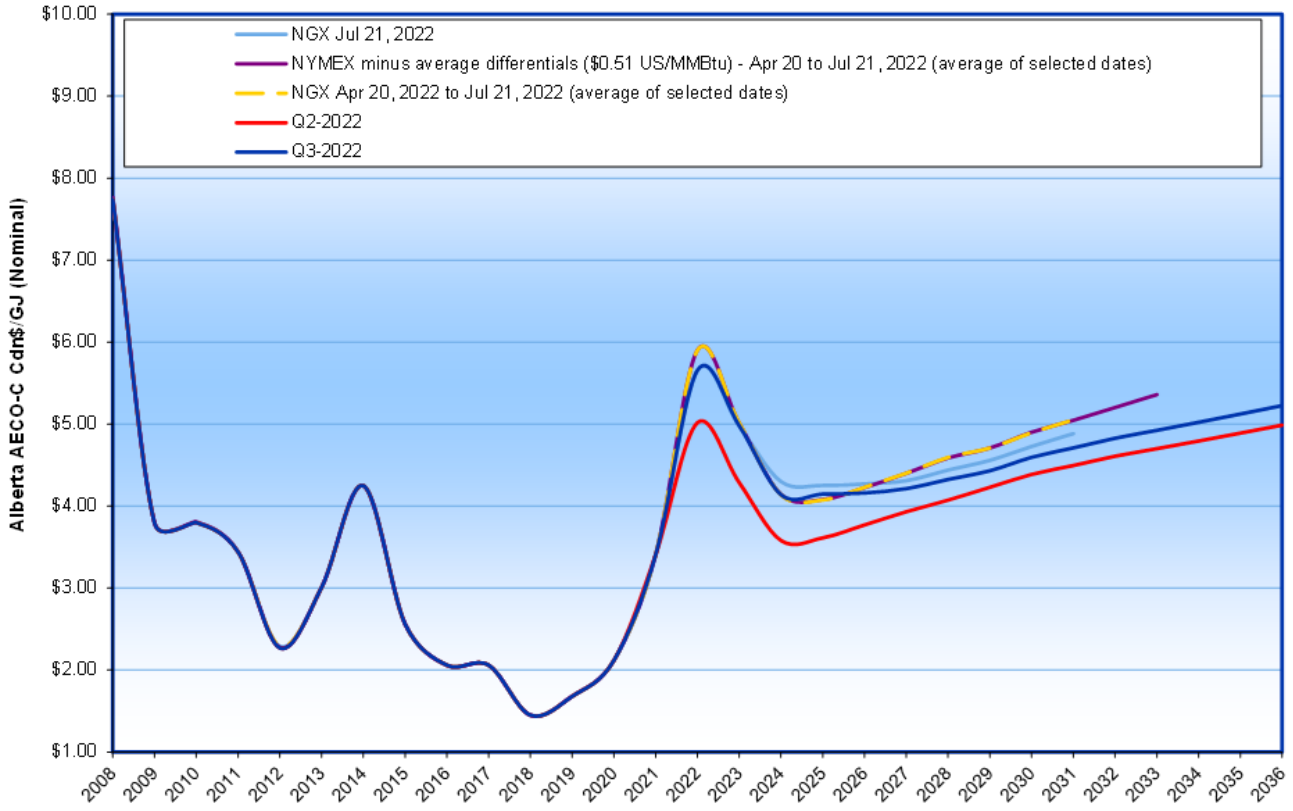
Key Forecast Assumptions – Energy & Demand (Q3 versus Q2)

- Forecast includes lower than anticipated oil and gas production growth despite higher commodity prices due to fossil fuel industry headwinds
- Increased penetration of EV's contributes moderately to load growth
- Implementation of CCUS in the electricity and oil sands sectors drives up demand



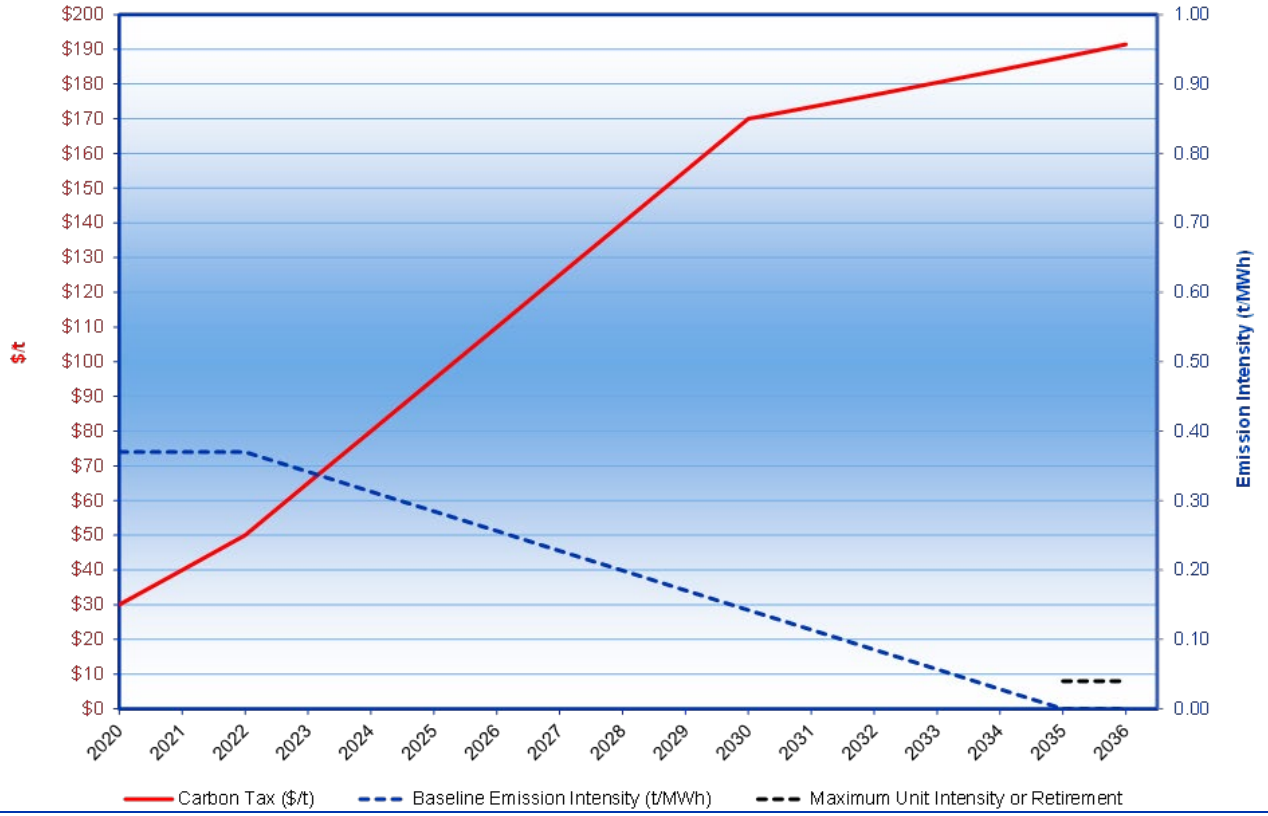
Key Forecast Assumptions – Natural Gas Price

- Natural gas prices have accelerated post-COVID19 due to shut-ins along with tighter storage supplies amid a return of more normal demand
- Exacerbated by European security of supply issues from the Russian-Ukraine war
- Alberta's disconnect with NYMEX has differentials at record highs pushing down on price



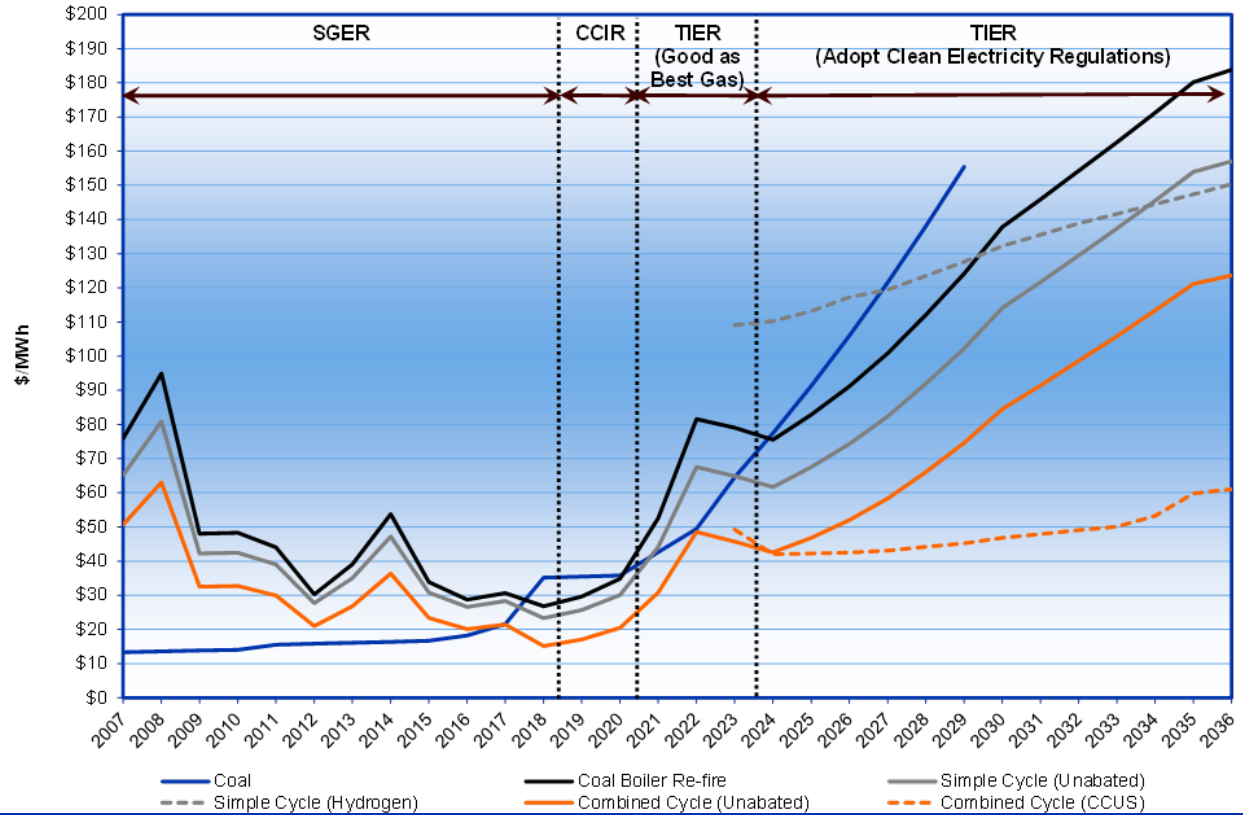
Key Forecast Assumptions – Carbon Price & Compliance Policy

- TIER expected to evolve for Alberta to maintain jurisdiction over its carbon revenues to maintain alignment with the federal Clean Electricity Regulations
  - Carbon price follows federal $50/t in 2022 + $15/yr growth to $170/t in 2030 +2% thereafter
  - 0.37 t/MWh emission intensity target expected to decline to 0 t/MWh by 2035
  - CER calls for physical intensity of 0.04t/MWh for new units in 2035, with existing units by EOL



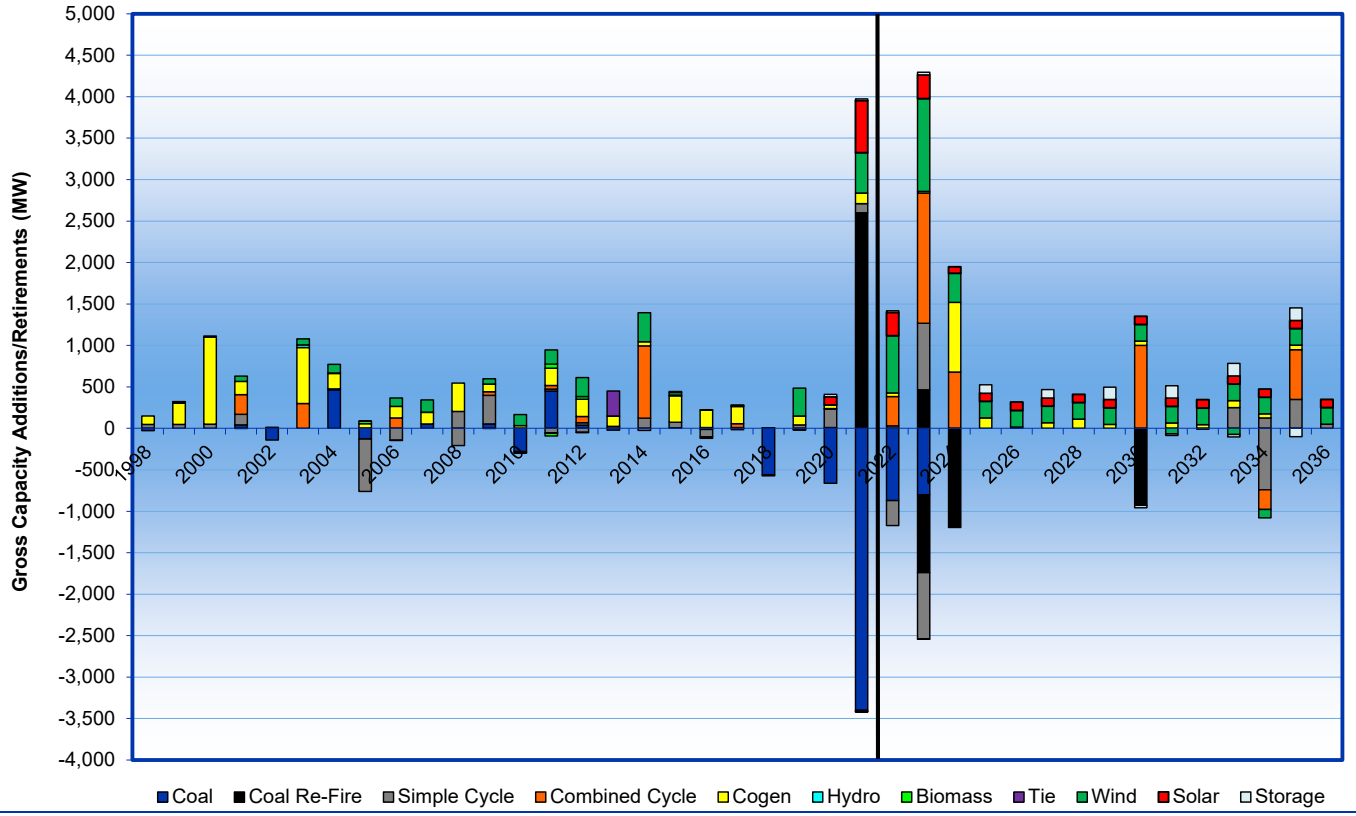
Key Forecast Assumptions – Carbon Price & Compliance Policy

- Short-run marginal costs of generation are expected to accelerate substantially
- Boiler re-fires rise to top of the stack along with other unabated gas-fired generation



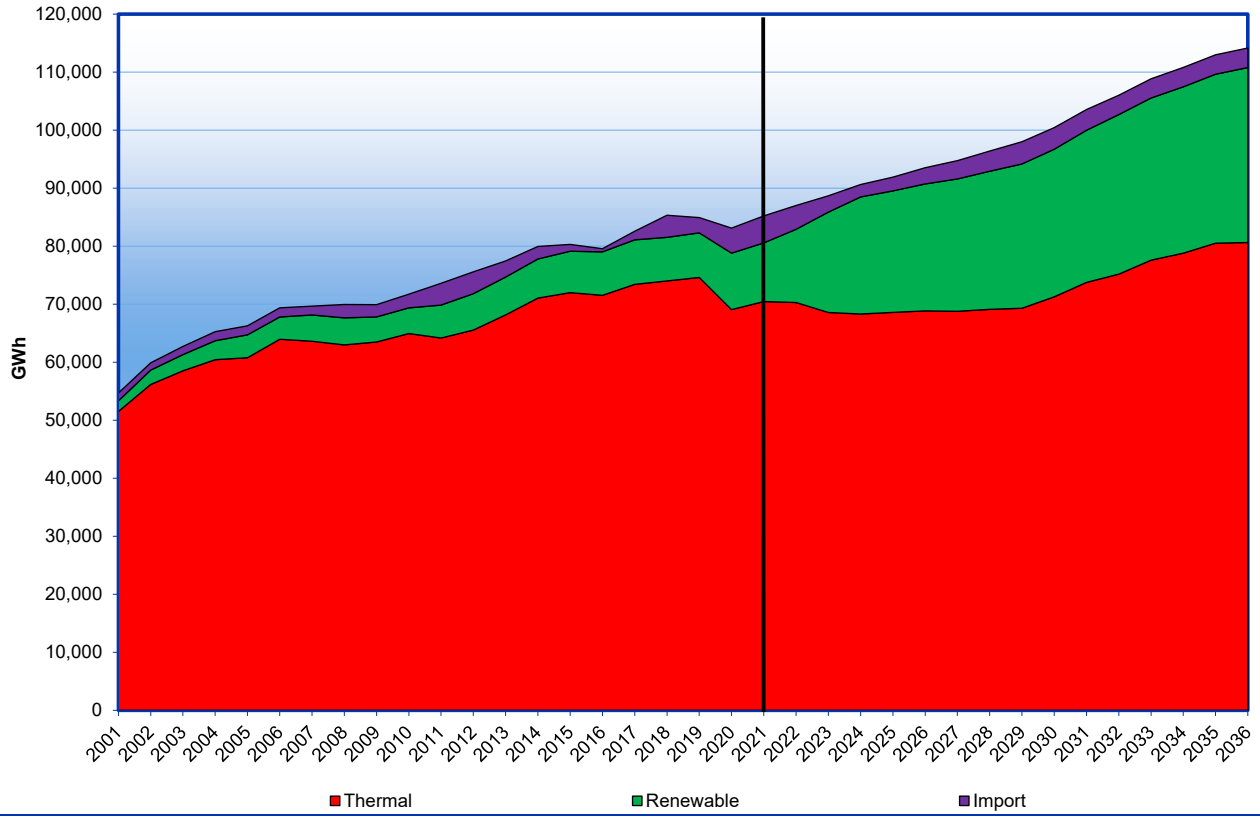
Key Forecast Assumptions – Resource Supply Additions/Retirements

- Generation was added historically at ~500 MW per year
- 2021 to 2024 represents the most prolific transformation of Alberta's generation industry in its 130-year history with an average of 3,000 MW per year added
- In total 15,151 MW estimated to be added by 2036 w/7,345 MW in retirements



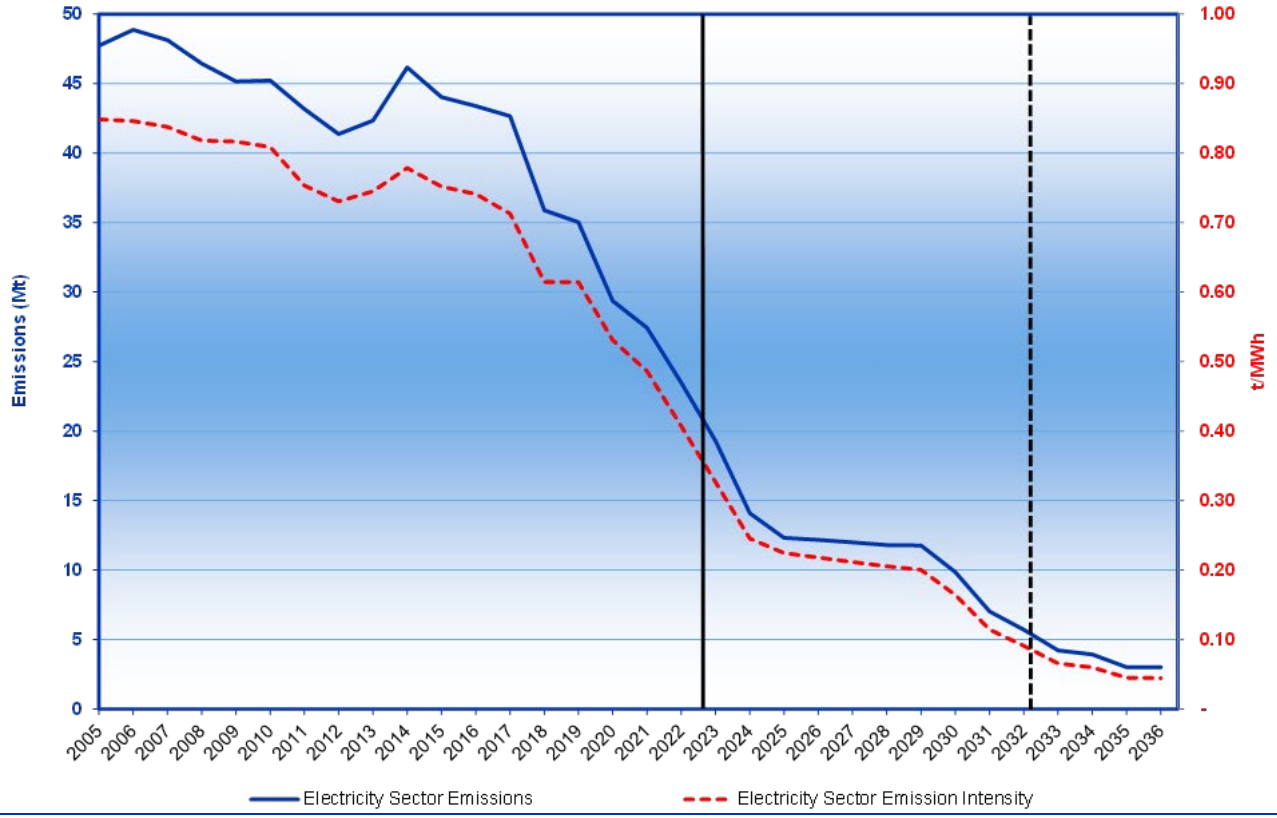
Key Forecast Results – Energy Production

- Significant renewable energy capacity is expected to be added
- If Alberta remains largely industrial with a load factor in 80%-90% range, then substantial thermal base load supply is required to maintain reliable energy



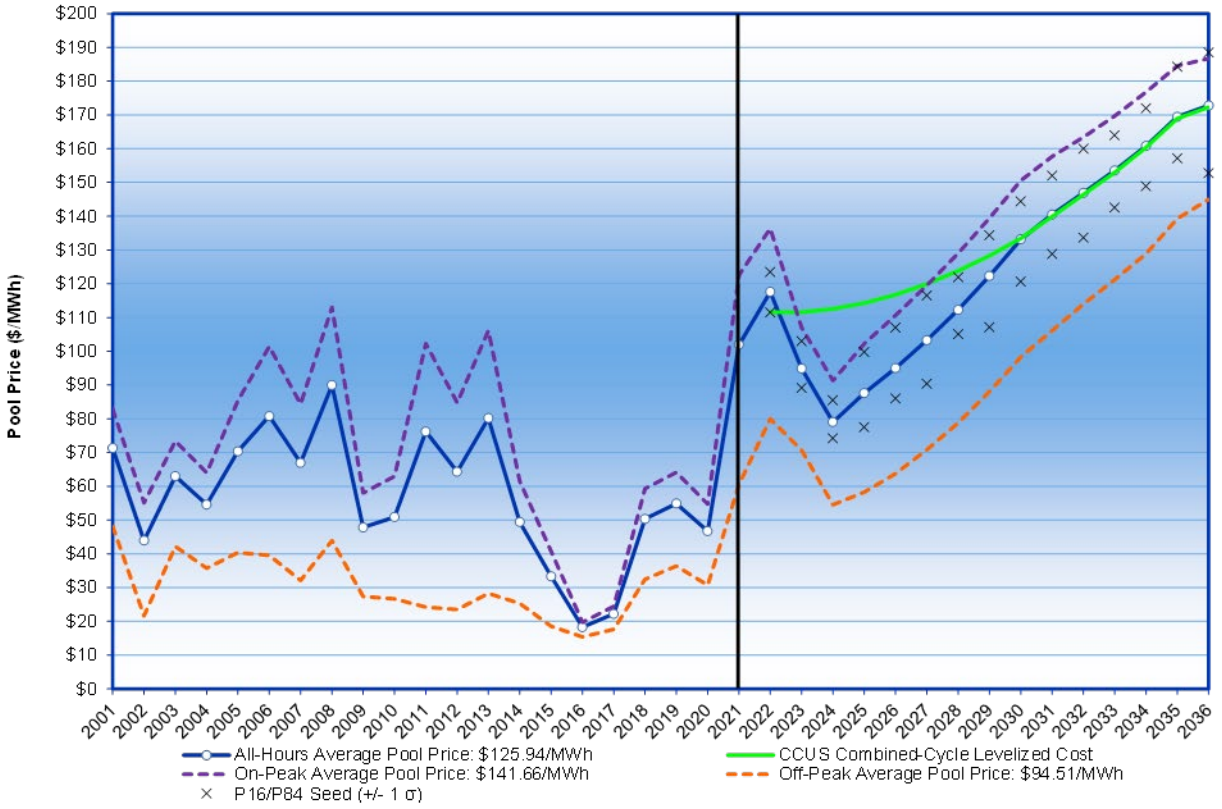
Key Forecast Results – GHG Emissions & Emission Intensity

- Significant renewable energy capacity reduce emissions profile
- Largest change comes from switch from coal to natural gas prior to 2025
- Implementation of pre/post combusting mitigation measures lead to next large decline post 2030



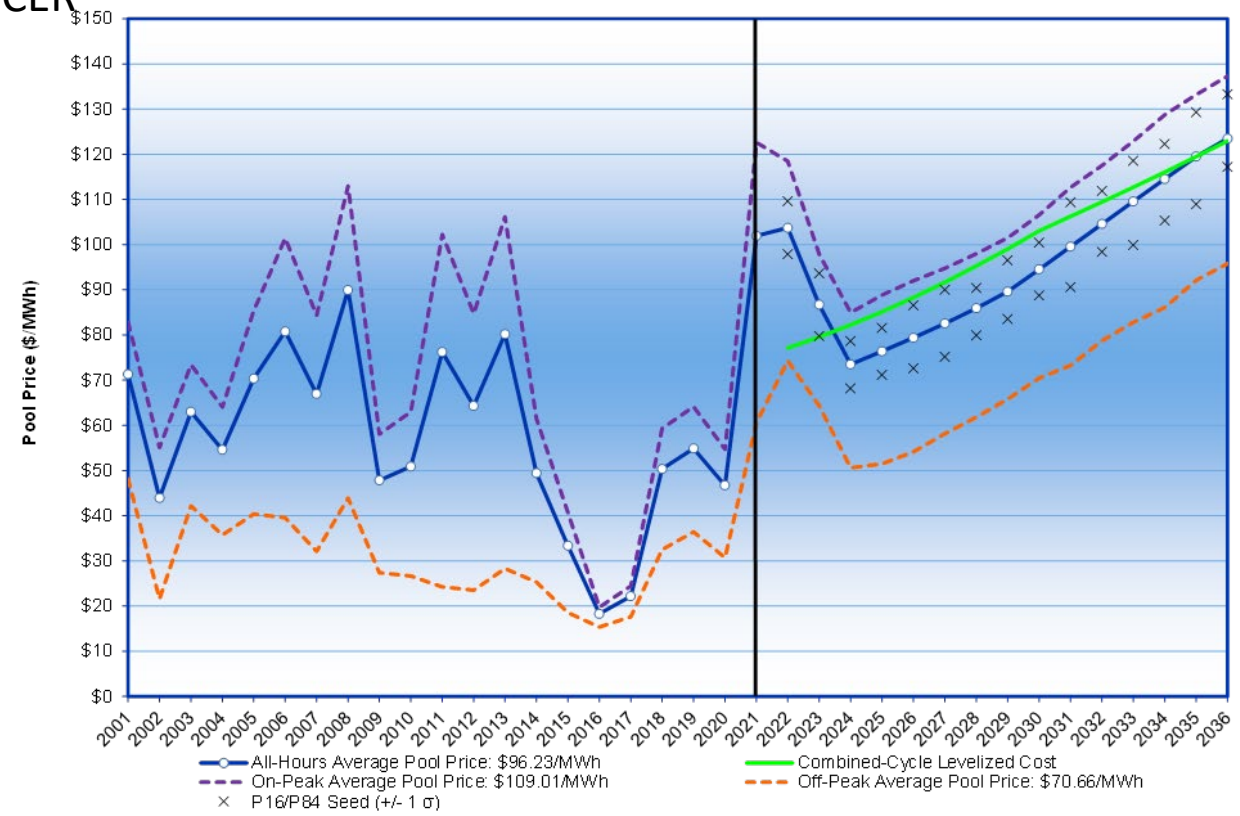
Key Forecast Results – Q3-2022

- EDCA's forecast includes the adoption of CER through Alberta's TIER system
- All-hours average price across the forecast period (2022-2036) is $125.94/MWh
- Long run forecast targets the LCOE of CCGT w/CCUS and SCGT w/H2
  - $125 & $175 /MWh, respectively under CER



Key Forecast Results – Q2-2022

- EDCA's Q2-2022 forecast was derived using the federal carbon price but with a more conservative approach to reaching a lower carbon footprint
- Convention supply resources continued to operate under TIER with only moderate decline to good-as-best-gas emission intensity threshold
- With no CER



Potential Cost Impact to Alberta – Q3-2022 versus Q2-2022

- Expected increase in cost of electric energy to Alberta consumers to meet net-zero emissions by 2035, as measured from the prior Q2-2022 report to this quarterly report, is estimated at $45 billion dollars or an average increase of $30/MWh
- The price of power could increase to a sustained level of $175/MWh by 2036, up $50/MWh from the previous forecast