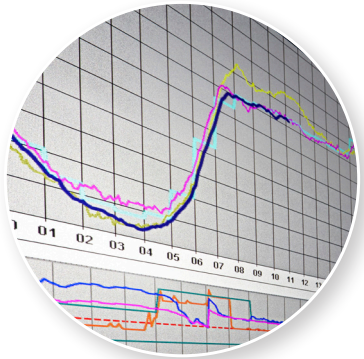
AESO 2021 Long-term Outlook Report Highlights

JULY 2021

2021 LTO Scenarios

For more details refer to
aeso.ca/grid/forecasting

The 2021 Long-term Outlook (LTO) represents the AESO's view of Alberta's demand and generation for the next 20 years. The report includes four scenarios to capture possible futures of the Alberta market and energy sector.



REFERENCE CASE

Scenario that tests the impact of the current policy and regulatory landscape, technological advancements and the most-predominant economic outlook for Alberta. This scenario serves as the main corporate forecast.

CLEAN-TECH

Scenario that tests an upside to trends in decarbonization, electrification and cost reductions in renewables that accelerate grid changes toward low-emissions and greater Distributed Energy Resources (DER) technologies. This scenario tests a carbon price that rises to $170/tonne by 2030.

ROBUST GLOBAL OIL & GAS DEMAND

Scenario that tests the impact of an aggressive growth outlook for Alberta's energy sector. This scenario assumes that oilsands production is 25 per cent higher than the Reference Case by 2040.

STAGNANT GLOBAL OIL & GAS DEMAND

Scenario that tests the impact of economic stagnation in Alberta due to muted investment in the oil and gas sector. This scenario assumes that oilsands production is 25 per cent lower than the Reference Case by 2040.

2021 LTO Key Insights

For more details refer to aeso.ca/grid/forecasting

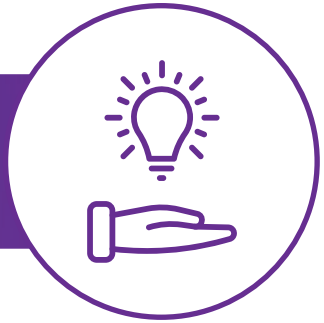
LOAD OUTLOOK

- ‘Slow and steady’ Alberta Internal Load (AIL) growth – lowest AIL growth profile compared to past AESO forecasts at 0.5 per cent annual growth over next 20 years due to reduced economic and oil sands growth, and increased Distributed Energy Resources (DER) penetration
- Oil sands sector remains the key driver of growth; electric vehicle (EV) charging load drives peak load post-2030

GENERATION OUTLOOK

- Changing supply mix: natural gas generation becomes the dominant fuel type providing firm generation, supplemented with wind and solar generation (driven by corporate power purchase agreements and environmental attributes value)

FUTHER INSIGHTS

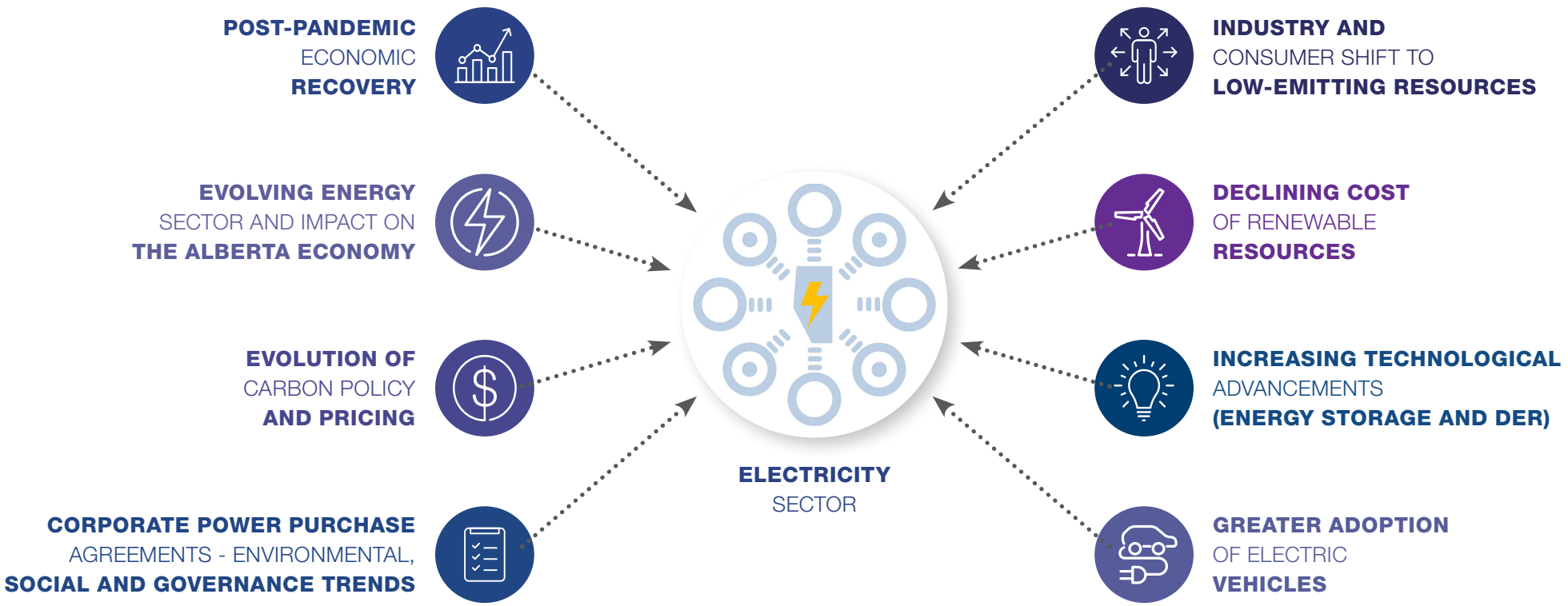


- Resource adequacy is not a concern over the near- and medium-term forecast horizon – the AESO will monitor risks identified in the longer-term horizon
- A more de-carbonized future is expected across all scenarios - electricity sector emissions projected to be significantly lower than 2005 levels
- Emerging duck curves will increasingly test system flexibility capabilities and needs – a more comprehensive flexibility assessment will be released in 2022
- The gap between AIL and system load is expected to remain as is or widen into the future – depending on the drivers of behind the fence configurations

Transformation Drivers

For more details refer to aeso.ca/grid/forecasting

The electricity sector in Alberta is transforming in direct response to these key drivers:



Transformation Effects

For more details refer to
aeso.ca/grid/forecasting

These drivers will further shape Alberta's future electricity sector in the following ways:

LOWER LOAD GROWTH

Although lower economic and oilsands outlooks are expected to keep load growth lower than past LTOs, the penetration of electric vehicles or increased electrification in other areas may drive higher growth rates.

CHANGES IN THE GENERATION FLEET

Changes of the thermal fleet composition (early retirement of coal, conversions of coal-to-natural gas, entry of more efficient gas), changes to the renewable mix (increased penetration of wind and solar).

CONTINUED LOWER EMISSIONS

Although the sector has lowered its emissions in the past 15 years, the trend continues across all scenarios due to the changes in the generation fleet.

MORE DER AND EV EXPANSION

Increased penetration of these technologies.

Changes in the Supply Mix

For more details refer to aeso.ca/grid/forecasting

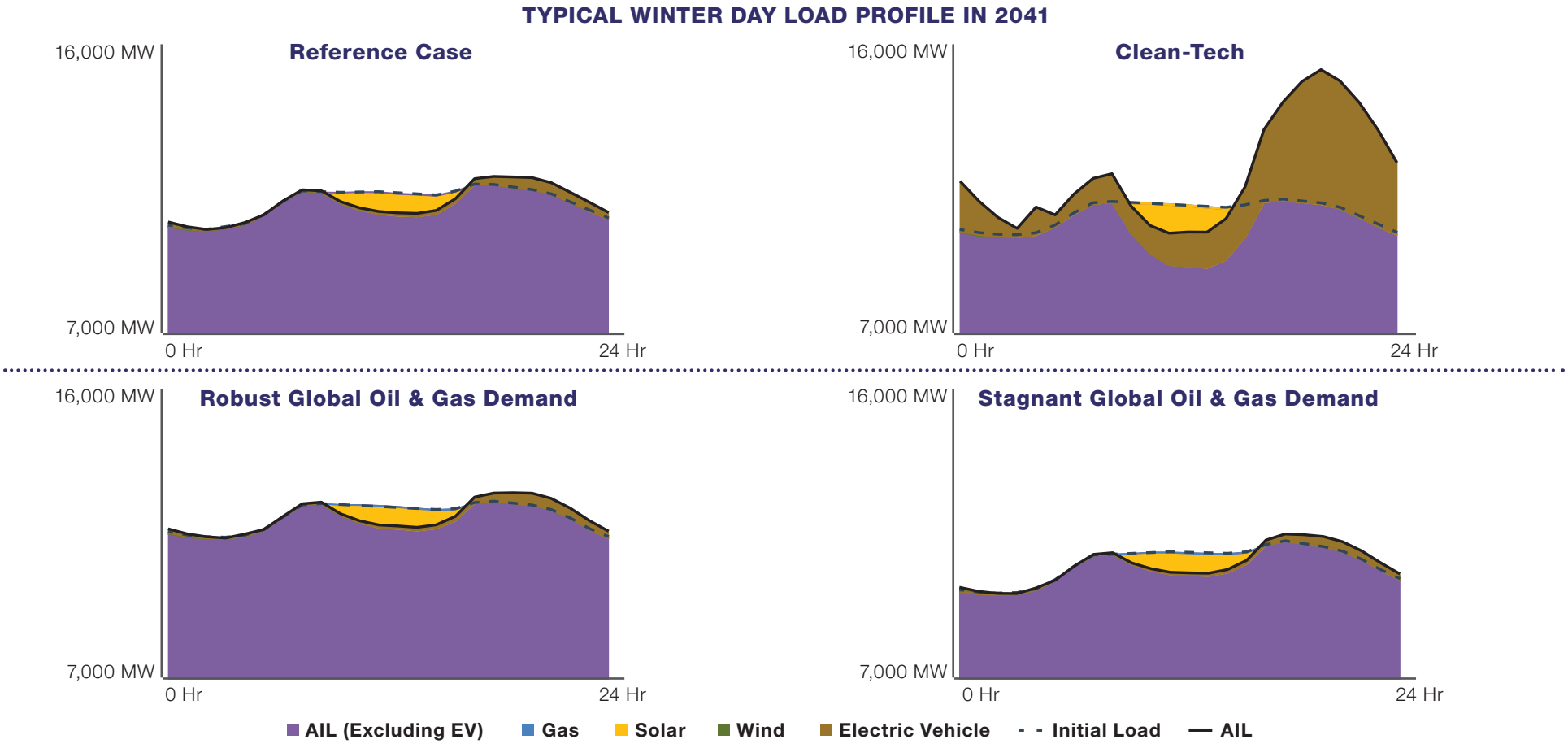
The future supply mix will be dominated by different types of natural gas-fired generation, supplemented with wind and solar renewable generation.

	Total Capacity (MW)	Change in Capacity (MW)			Total Capacity (MW)	Change in Capacity (MW)		
	Reference Case	*Clean-Tech*	*Robust Global Oil and Gas Demand*	*Stagnant Global Oil and Gas Demand*	*Reference Case*	*Clean-Tech*	*Robust Global Oil and Gas Demand*	*Stagnant Global Oil and Gas Demand*
Year	**2031**	**2031**	**2031**	**2031**	**2041**	**2041**	**2041**	**2041**
Average Load	10,483	(217)	543	(593)	10,615	781	897	(903)
Distribution-Connected (< 5 MW) Generation								
Solar	396	628	–	–	729	1,321	–	–
Gas	123	26	–	–	161	50	–	–
Wind	41	7	–	–	48	11	–	–
Total Distribution-Connected (< 5 MW) Generation	**560**	**661**	–	–	**939**	**1,382**	–	–
Grid-Connected and Distribution-Connected (5 MW or greater) Generation								
Wind	4,617	(120)	(90)	(710)	4,907	540	(120)	(750)
Solar	1,054	910	160	–	1,254	1,680	320	–
Simple Cycle	1,351	99	–	47	1,461	515	(140)	233
Combined Cycle	2,648	2,174	–	–	3,772	737	–	(479)
Coal to Gas Conversion	4,122	(3,187)	–	(2,387)	–	–	–	–
Coal	–	–	–	–	–	–	–	–
Cogeneration	6,579	–	720	(585)	6,669	135	990	(675)
Other	423	20	–	–	423	100	–	–
Hydro	894	–	–	–	894	–	–	–
Energy Storage	100	1,030	–	–	150	1,370	–	–
Total Grid-Connected and Distribution-Connected (5 MW or greater) Generation	**21,788**	**926**	**790**	**(3,636)**	**19,530**	**5,077**	**1,051**	**(1,672)**

Impact to Consumption Patterns

For more details refer to
aeso.ca/grid/forecasting

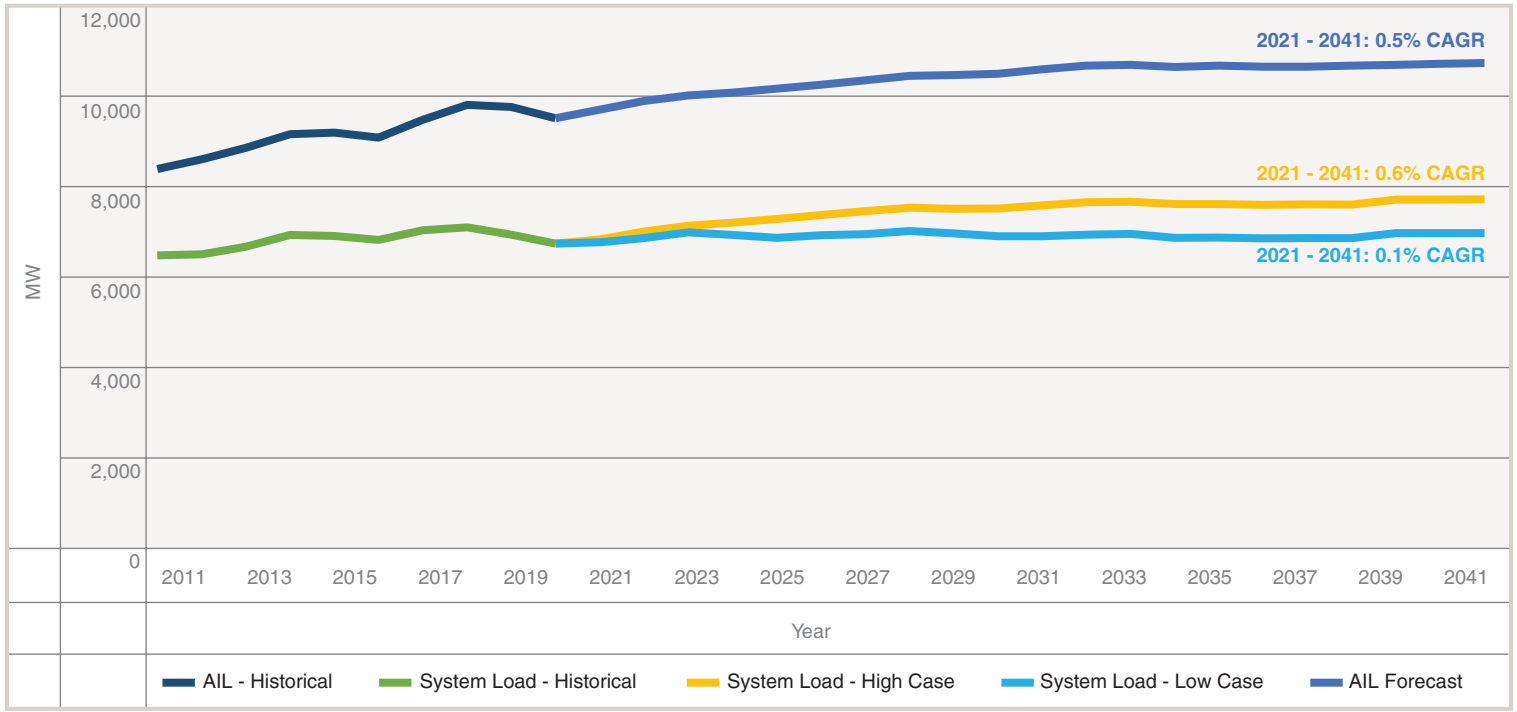
A combination of increased DER and EV translates into a daily shape with dual peaks and dual troughs — a Duck curve. System flexibility studies of these duck curves will be released in 2022.



Impact to System Load

For more details refer to aeso.ca/grid/forecasting

Multiple factors affect system load growth in Alberta. To capture the uncertainty of these factors, the 2021 LTO presents high and low cases of the system load forecast, and these are compared against Alberta internal load (AIL).

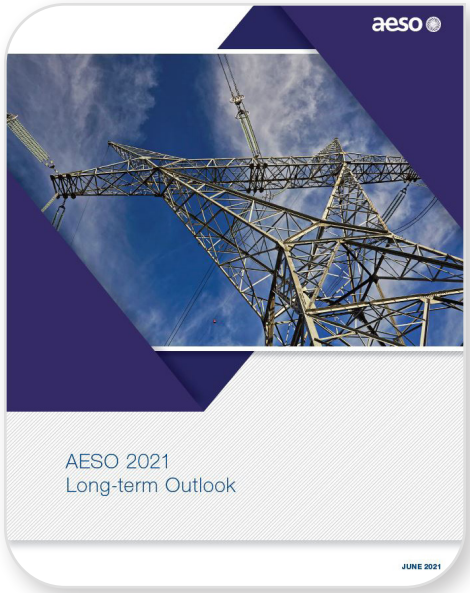


Full Report and Data

For more details refer to aeso.ca/grid/forecasting

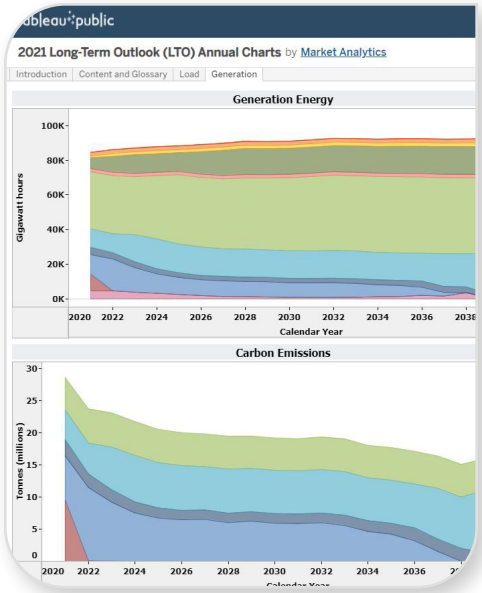
For more information regarding the 2021 Long-term Report and detailed data & visualizations, please refer to the links below:

LTO FULL REPORT



The AESO 2021 Long-term Outlook provides an in-depth analyses of the 2021 LTO main drivers (economic, policy and technological assumptions and discussions). This document also provides details on each of the outcomes and insights from all the scenarios, including implications to the industry and next steps for the AESO and how stakeholders were instrumental during the development process.

TABLEAU DATA SITE



A more comprehensive data visualization with interactive charts that can be downloaded are availble on the external Tableau site. This excel data file contains key inputs and comprehensive modeling output results.

Alberta Electric System Operator

2500, 330-5th Avenue SW
Calgary, AB T2P 0L4
Phone: 403-539-2450
www.aeso.ca

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