2017 Long-Term Energy Plan – Electricity Outlooks / Forecasts

Working Draft

July 2017

Context

- On August 31, 2017, Ministry of Energy will be seeking Cabinet approval of the 2017 Long-Term Energy Plan (2017 LTEP)) outlooks and forecasts.
  - On July 26, 2017, the Ministry will seek Cabinet approval of the policy initiatives for the 2017 LTEP.

- Outlined below are key discussion topics / decisions that need to be made in advance of the August 2017 Cabinet meeting:

  1) 2017 LTEP Outlooks / Forecasts;

  2) Ontario's Fair Hydro Plan (OFHP) / Fair Allocation Amount

  3) Bending the future cost curve of the electricity system.

- The Ministry will also need to finalize the non electricity outlooks and forecasts for the 2017 LTEP (e.g., fuels).

1) 2017 LTEP Outlooks and Forecasts

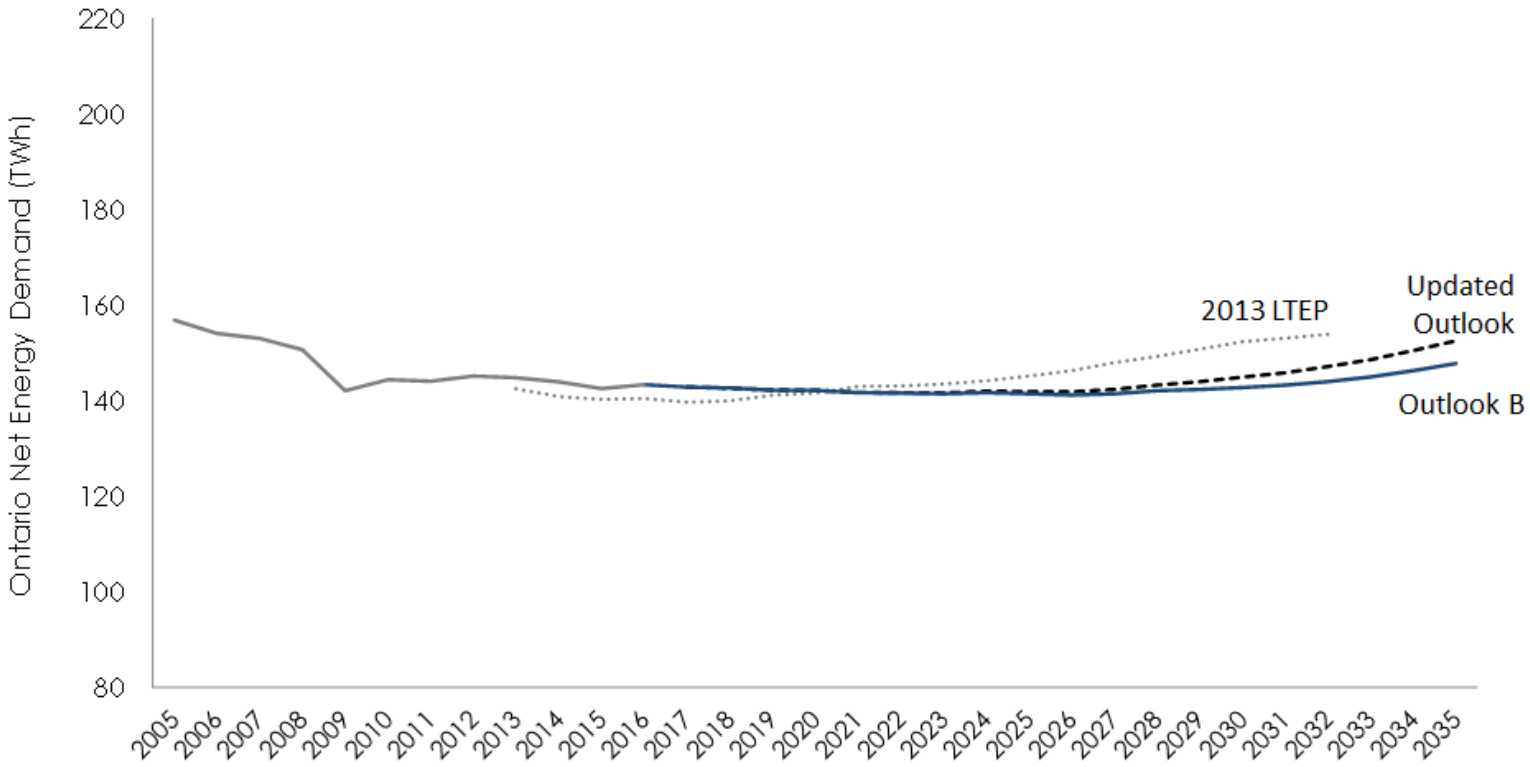
- The Long-Term Energy Plan (LTEP) is the energy sector's roadmap. It includes 20-year outlooks / forecasts, and identifies initiatives to position the energy sector for the future. Past LTEPs have included:
  - Electricity Demand Outlook;
  - Electricity Supply Outlook;
  - Greenhouse as (GHG) Emissions Outlook; and
  - Forecast of typical residential electricity bills.

- The introduction of Ontario's Fair Hydro Plan (OFHP) has impacted the residential electricity bill by reducing costs in the near term. Over the long-term the incurred debt will be repaid by electricity consumers.

- ENERGY and its agencies are also considering options to remove costs from the electricity system through efficiencies, other funding sources and supply mix decisions.

2017 LTEP – Electricity Demand Outlook

- The following chart compares the demand forecast in 2013 LTEP, IESO's outlook publically released in September (Outlook B), and the new updated outlook for 2017 LTEP.
- The updated outlook was based on Outlook B with increased EV uptake (2.4 million EVs by 2035) and recent sector updates (about 5 TWh higher than Outlook B by 2035).



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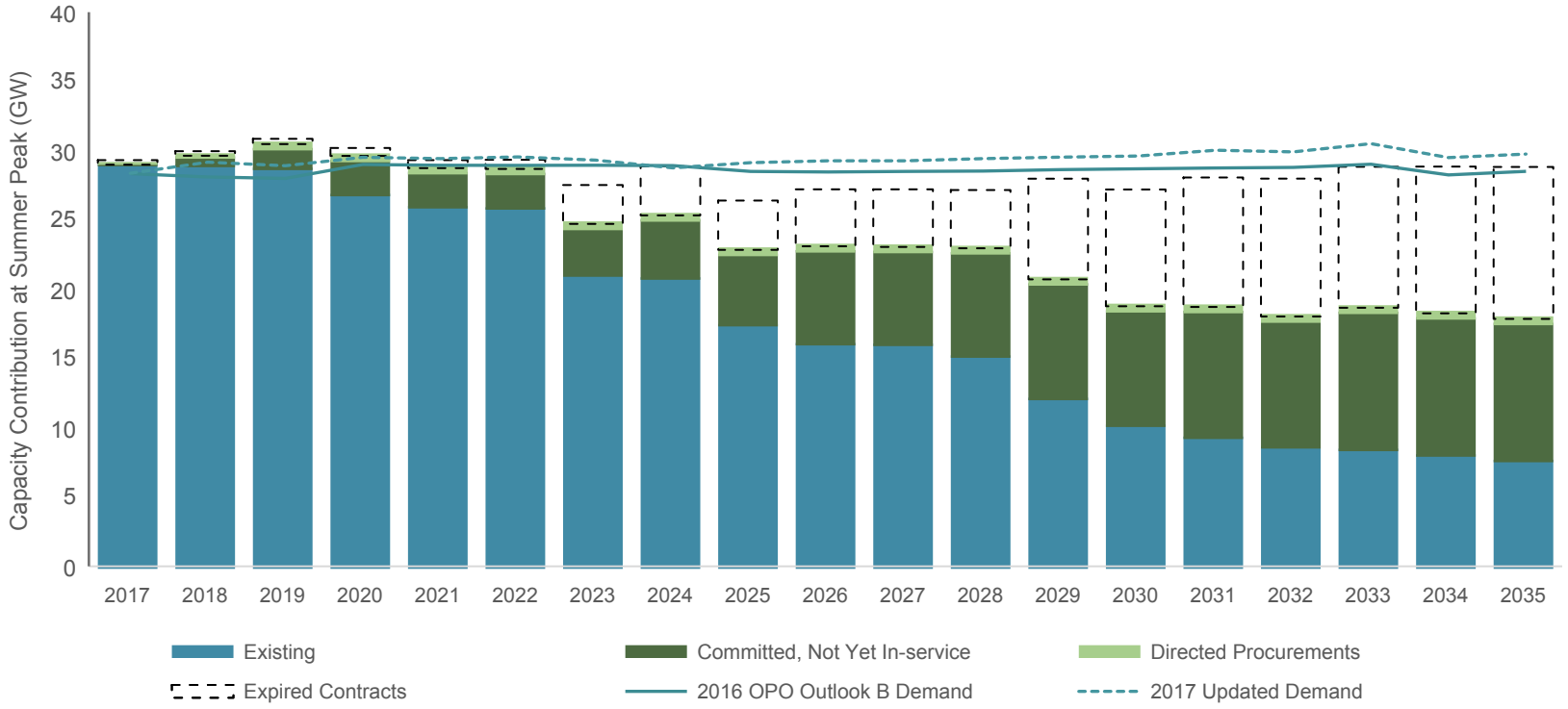
Source: IESO Modelling Update (Subject to Change)

2017 LTEP – Electricity Supply Outlook

- 18 GW of supply resources will reach the end of their contact term by 2035. There will be a need for additional resources in the early 2020s.
  - These resources could bid into the electricity market to provide additional supply as required.
- These resources provide opportunities for adaptation should, for example, demand trend lower or as better opportunities arise.



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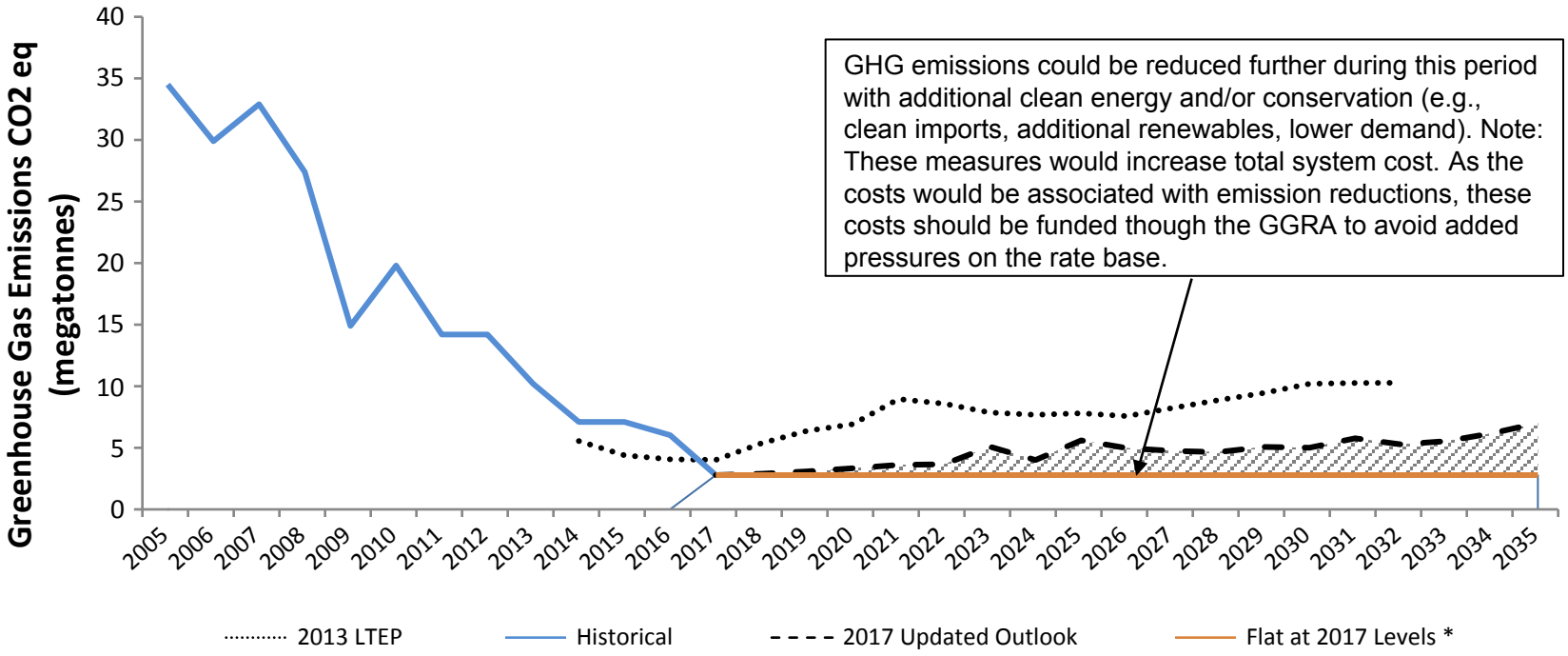
Source: IESO Modelling Update (Subject to Change)

2017 LTEP – GHG Emissions Outlook – Electricity

- With the retirement of coal plants, greenhouse gas (GHG) emissions have dropped by over 80% in the past 10 years. Today, Ontario electricity sector GHG emissions represent about 2% of Ontario's overall economy-wide GHG emissions.
- The trend of lower emissions is forecast to continue over the planning outlook.



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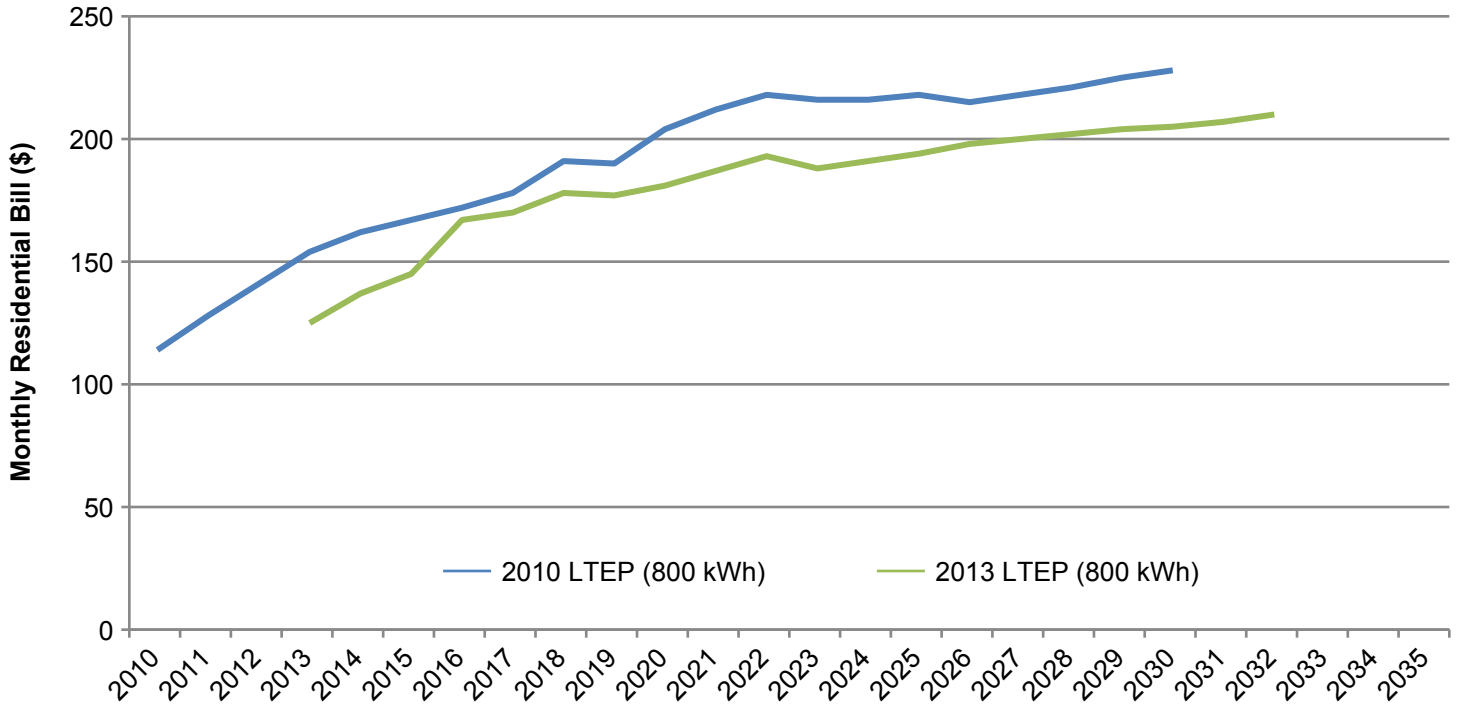
Source: IESO

Note: IESO is undertaking analysis of new scenarios including a flat GHG outlook and a declining GHG outlook.

2017 LTEP – Residential Price Forecast

- The 2017 LTEP will include an updated residential electricity bill forecast.
- Previous LTEP residential bill forecasts have followed a trend of being lower than the prior LTEP.



2017 LTEP – Residential Price Forecast (cont'd)

- The modelling assumptions for 2017 LTEP Residential Price Forecast are:
  - The 2017 LTEP price forecast needs to show progress at lowering costs relative to the 2013 LTEP.
  - Ontario's Fair Hydro Plan (OFHP) is an input into in the 2017 LTEP price forecast.
  - Actions to mitigate increases in the residential bill, in the near, medium and long term, include:
    A. Shifting Costs (e.g., funding conservation / renewables from Greenhouse Gas Reduction Account (GGRA) proceeds);
    B. Finding Greater Efficiencies (e.g., incenting further efficiencies in the distribution sector);
    C. Improving Processes (i.e., IESO's Market Renewal Initiative);
    D. Suspending Existing Initiatives (i.e., Supply options);
    E. Enhancing existing measures (e.g., the Ontario Rebate for Electricity Consumers (OREC)); and
    F. Other measures (e.g., adjust the rate of inflation, federal funding for energy infrastructure).

Ontario

2) Ontario's Fair Hydro Plan

- The Ontario Fair Hydro Plan Act, 2017 requires the Minister of Energy to calculate the "Fair Allocation Amount" (FAA) for each 6-month period to 2047.
  - The FAA is the accumulated difference between the allocation of clean energy costs and any associated financing costs payable by specified consumers under the OFHPA and the allocation of clean energy costs that would have been payable by those same consumers absent the OFHPA.

- The FAA aligns clean energy costs with clean energy benefits into the future.

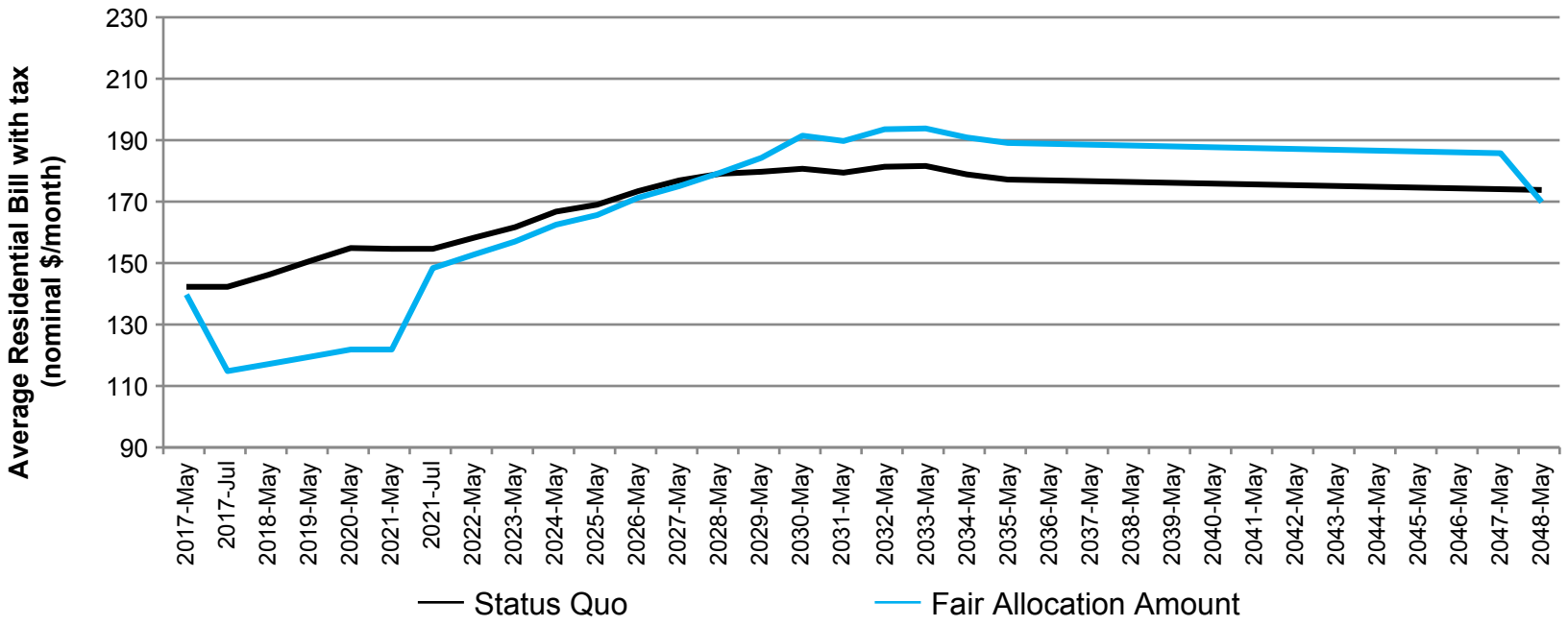
- The Minister is required by the Act to provided the FAA to the Ontario Power Generator (OPG) as Financial Services Manager.
  - The FAA is expected to be set out in a letter from the Minister to OPG.

- The FAA is a constraint on the debt that the Financial Services Manager can finance.

- This is an important input in the development of the 2017 LTEP residential price forecast curve (i.e., the forecast cannot be finalized until the OFHP payback period is finalized).

2) Ontario's Fair Hydro Plan – Fair Allocation Amount

- The Fair Allocation Amount (FAA) forecast outlined below includes a period capped at inflation and is consistent with the *Ontario Fair Hydro Plan Act, 2017*.



	2017-May	2017-Jul	2018-May	2019-May	2020-May	2021-May	2021-Jul	2022-May	2023-May	2024-May	2025-May	2026-May	2027-May	2028-May	2029-May	2030-May	2031-May	2032-May	2033-May	2034-May	2035-May	2036-May	2037-May	2038-May	2039-May	2040-May	2041-May	2042-May	2043-May	2044-May	2045-May	2046-May	2047-May	2048-May	2049-May
Average Residential Bill ($/month)	140	115	117	119	122	122	148	153	157	162	166	171	175	179	184	191	190	194	194	191	189	189	189	188	188	188	187	187	187	187	186	186	186	170	170
Change in bill (%)	n/a	n/a	2%	2%	2%	0%	22%	3%	3%	3%	2%	3%	2%	3%	3%	4%	-1%	2%	0%	-2%	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-9%	0%
Total Accumulated Debt ($B)	0.0	0.8	3.3	6.1	9.3	11.6	12.0	12.9	13.7	14.6	15.4	16.1	16.8	17.4	17.7	17.4	17.0	16.4	15.8	15.1	14.4	13.6	12.8	11.9	10.9	9.9	8.9	7.7	6.5	5.2	3.8	2.4	0.8	0.0	0.0

Note: Based on a preliminary July 2017 forecast; forecast is subject to change. Assumes 30-year financing period and a nominal interest rate of 5% (compounded monthly). Status Quo forecast beyond 2035 is extrapolated.

2) Ontario's Fair Hydro Plan – Fair Allocation Amount (cont'd)

Considerations

- Under the OFHPA, the recovery of debt created by the deferral of electricity charges must reasonably align with the fair allocation of clean energy costs.

- Under the FAA, the typical residential electricity bill increases by 22% after the end of the cap period, followed by annual increases of 3% annually until the recovery period.

- Smoothing post the inflationary cap period would provide a larger medium-term benefit to Regulated Price Plan (RPP) eligible consumers when compared to the FAA curve. However, smoothing results in increases above the FAA for the period 2026 to 2047.
  - In order to provide a smoothed annual 6.3% increase after the inflation cap ends, there is a funding gap of $6.5 billion from 2021 to 2026 compared to the FAA forecast.
  - Smoothing at 5.9% annually after the inflation cap ends increases the funding gap to $7.8 billion from 2021 to 2026 when compared to the FAA forecast.
  - Further smoothing at an annual 5% increase after inflation cap ends provides puts additional pressure on the incurred debt and represents a funding gap of $10.9 billion over the same time period when compared to the FAA forecast.

Fiscal Year Impact of the Funding Gap	17-18	18-19	19-20	20-21	21-22	22-23	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31
6.3% Smoothing	0.0	0.0	0.0	0.3	1.3	1.8	1.4	1.0	0.5	n/a	n/a	n/a	n/a	n/a
5.9% Smoothing	0.0	0.0	0.0	0.3	1.3	1.9	1.6	1.3	0.9	0.5	n/a	n/a	n/a	n/a
5% Smoothing	0.0	0.0	0.0	0.3	1.4	2.0	1.9	1.7	1.4	1.1	0.7	0.4	n/a	n/a

3) 2017 LTEP – Bending the Future Cost Curve

- The government has indicated publicly that the upcoming 2017 LTEP will continue the trend of taking costs out of the electricity system and making it more affordable for ratepayers.

- Ontario has taken a number of actions to lower electricity costs for all consumers by:
  - Deferring investments in generation (e.g., new build nuclear), improving market efficiency (e.g., wind dispatch) and decreasing the cost of renewable procurements (e.g., Green Energy Investment Agreement (GEIA) renegotiation, decreasing Feed-In Tariff (FIT) prices, competitive Large Renewable Procurement (LRP));
  - Increasing cost effectiveness and improving efficiency by adopting new electricity market approaches (e.g., no NUG contract extensions and demand response);
  - Suspending the LRP II and the Energy from Waste Standard Offer Program (EFWSOP) – up to $3.8 billion in cost savings; and
  - Limiting FIT5 procurement target to 150 MW and suspending future FIT procurements – an average annual savings of $15 million.

- ENERGY and its agencies are also considering options to remove costs from the electricity system through efficiencies, other funding sources and supply mix decisions.

3) 2017 LTEP – Bending the Future Cost Curve (cont'd)

- The 2017 LTEP is an opportunity to profile several initiatives to bend the future cost curve that could include:

  A. Shifting Costs (e.g., funding conservation / renewables from Greenhouse Gas Reduction Account (GGRA) proceeds);

  B. Finding Greater Efficiencies (e.g., incenting further efficiencies in the distribution sector);

  C. Improving Processes (i.e., IESO's Market Renewal Initiative);

  D. Suspending Current and/or Plan Initiatives (i.e., Supply options);

  E. Enhancing Existing Measures (e.g., the Ontario Rebate for Electricity Consumers (OREC)); and

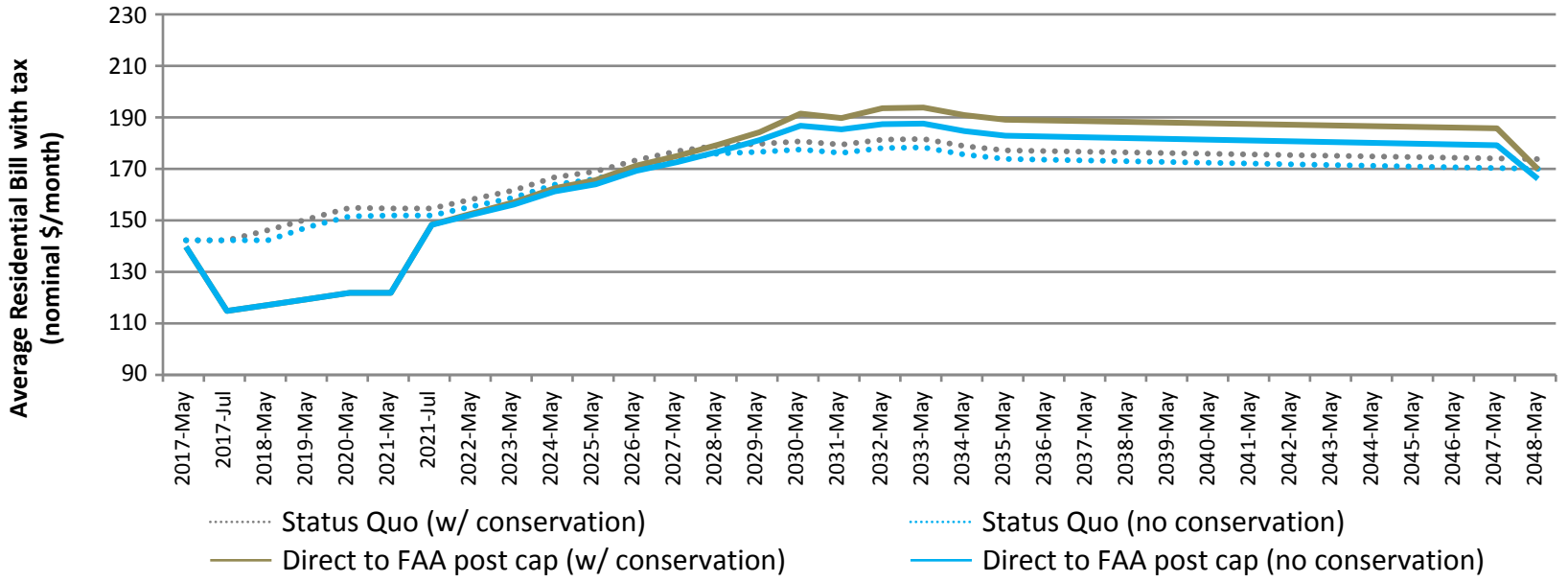
  F. Other measures (e.g., adjust the inflationary cap, federal funding for energy infrastructure).

- The above initiatives reduce the rate increases during recovery period for OFHP-eligible electricity consumers, while simultaneously providing longer term persistent benefits to all ratepayers.

- Bending the future cost curve is likely to be achieved through a combination of these initiatives. A summary of each is provided in the following slides.

A1. Shifting Costs – Funding Conservation from GGRA Proceeds

- Removing conservation costs from the Global Adjustment (GA) starting in 2018 reduces accumulated debt associated with OFHP by $3.2 billion from 2021 to 2029 under the scenario that directly returns to the FAA curve after the capped period.



With Conservation	2017-May	2017-Jul	2018-May	2019-May	2020-May	2021-May	2021-Jul	2022-May	2023-May	2024-May	2025-May	2026-May	2027-May	2028-May	2029-May	2030-May	2031-May	2032-May	2033-May	2034-May	2035-May	2036-May	2037-May	2038-May	2039-May	2040-May	2041-May	2042-May	2043-May	2044-May	2045-May	2046-May	2047-May	2048-May	2049-May
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Without Conservation	2017-May	2017-Jul	2018-May	2019-May	2020-May	2021-May	2021-Jul	2022-May	2023-May	2024-May	2025-May	2026-May	2027-May	2028-May	2029-May	2030-May	2031-May	2032-May	2033-May	2034-May	2035-May	2036-May	2037-May	2038-May	2039-May	2040-May	2041-May	2042-May	2043-May	2044-May	2045-May	2046-May	2047-May	2048-May	2049-May
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Total Accumulated Debt ($B)	0.0	0.8	3.0	5.5	8.3	10.4	10.7	11.3	11.9	12.5	13.1	13.6	14.1	14.5	14.6	14.2	13.8	13.3	12.8	12.3	11.7	11.1	10.4	9.7	8.9	8.1	7.2	6.3	5.3	4.2	3.1	1.9	0.7	0.0	0.0

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Note: Based on a preliminary July 2017 forecast; forecast is subject to change. Assumes 30-year financing period and a nominal interest rate of 5% (compounded monthly). Status Quo forecast beyond 2035 is extrapolated. For more information on impacts under scenario 2 and 3, please see the Appendix.

A1. Shifting Costs – Funding Conservation from GGRA Proceeds (cont'd)

Considerations

- Post 2020, the Ministry could take steps to further reduce the cost curve by transferring the cost of electricity conservation and demand management (CDM) programs, either in whole or in part, from rates to the Greenhouse Gas Reduction Account (GGRA):
  - The Conservation First Framework (CFF) and Industrial Accelerator Program (IAP) are in place until December 31, 2020;
  - Timing aligns with when electricity bills are forecasted to increase (beginning 2021) and is coincident with the next Cap and Trade compliance period;
  - A natural point of change to the governing policy and framework; and

- The average annual costs over the course of the CDM framework and IAP are ~$500 million. Under OFHP smoothing with 6.3% post cap, this would reduce the funding gap by $2.5 billion and under OFHP smoothing with 5% post cap, it would reduce it by $4.0 billion.

- Removing conservation costs from the Global Adjustment (GA) could achieve ratepayer cost reductions starting in 2027:
  - While less debt and interest is accrued in early years, the OFHP holds bills low until 2027.

- Initiatives funded through GGRA must undergo annual approval by the Minister of the Environment and Climate Change, are subject to fluctuations in the revenue amounts collected through Cap and Trade audits, and will compete with other GHG reduction initiatives.

- GA funding could be used as a backstop for CDM programs if GGRA funding was not available in a given year.

- Conservation must be considered in the context of supply/demand planning. Therefore, its recommended that the Ministry and its agencies maintain oversight of conservation programs even if funded by GGRA.

A2. Shifting Costs – Funding Renewable Costs Through the GGRA

- Shifting the funding of a percentage (10%) of renewable costs from the Global Adjustment (GA) to the GGRA starting in 2017 would result in cumulative savings of $7.4 billion, a portion of which would accrue to OFHP consumers (analysis ongoing).

Considerations

- Similar funding systems are in place already in Canada. Alberta funds its renewable generating resources with funds generated through its carbon tax.

- The required GGRA funding would be variable due to changes in renewable capacity and generation, and well as variability in the wholesale electricity price.

- Funding renewables would reduce available GGRA funding for other programs and initiatives.

- There would be additional administrative burden to shift, manage and track a subset of total renewable costs.

B. Finding Greater Efficiencies – Distribution Sector Savings

- Ontario's distribution sector represents $3.6 billion in annual costs, and typically makes up ~20% of the average residential electricity bill.

- The 2012 Ontario Distribution Sector Review Panel (ODSRP) Report proposed that there was opportunity for $1.7 billion in savings over 10 years through capital planning optimization and operations, maintenance and administrative (OM&A) reductions as a result of LDC consolidation.

- While the ODSRP recommended legislating LDC consolidation, the majority of the savings they identified were in OM&A costs. These cost reductions could be targeted through other regulatory mechanisms, with a stretch savings target of about $135 million, to be sustained year over year. Under OFHP smoothing at 6.3%, this would reduce the funding gap by $0.7 billion and under OFHP smoothing at 5%, it would reduce it by $1.1 billion.

Considerations

- Through LTEP, the Ministry will request the Ontario Energy Board (OEB) via the LTEP implementation directive to use its authority to create more effective tools to harvest more efficiencies and savings in the distribution sector. Examples of potential mechanisms include:
  - Financial penalties for LDCs who do not meet performance expectations.
  - Requiring LDCs to partner and share back office services.
  - Modernizing regulatory compliance processes to reduce costs.

- The Ministry will also ask the OEB to revaluate its performance mechanisms to ensure that high-cost LDCs are becoming more efficient through the years and ensure clear metrics are in place to allow for proper evaluations of the low performing LDCs (e.g. further strengthen the scorecard that is already in place by the OEB that evaluates LDCs on various metrics and make it publicly available).

- Analysis is on going to develop a proportional estimate for a typical Toronto Hydro customer

C. Improving Processes – IESO's Market Renewal

- IESO's Market Renewal includes a number of initiatives focused on more efficiently meeting demand over the near and longer terms. Market Renewal includes the following:
  - Introduce a Day-Ahead Market based on a Single Schedule Market to provide greater certainty to market participants and lower the cost of producing electricity.
  - Reduce the cost of scheduling and dispatching resources to meet demand as it changes from hour to hour and minute to minute through Enhanced Real-Time Unit Commitment.
  - More efficiently manage unexpected short-term changes on the system by enabling More Frequent Intertie Scheduling.
  - Improve the way Ontario procures resources to meet our longer-term supply needs by implementing an Incremental Capacity Auction.

Considerations

- An independent third party report estimates that benefits from IESO's Market Renewal could reach up to $5.2 billion over a ten-year period beginning in 2021. Note: IESO has incorporated some of this saving into its current Outlook for electricity system costs and residential bills (i.e., Through reduced capacity payments for generators once their contracts expire).

- In addition to the up to $5.2 billion in estimated benefits, non-quantified benefits are likely to deliver additional value, for example:
  - Inefficiencies in the current market design need to be managed using extensive time and resources including expensive external legal expertise and consultants.

- In other jurisdictions that went through similar changes, actual efficiencies realized have been greater than those expected often because of the non-quantifiable benefits.
  - For example, Southwest Power Pool, a system operator covering 14 U.S. states, realized $1 billion in savings over a two year period compared to an expected saving of $400 million.

D. Suspending Current and/or Plan Initiatives – Supply Mix Options

- There are several supply mix and funding options to reduce system costs:

  1. Not proceeding with MicroFIT 2017 and FIT 5, and exiting LRP1 contracts would result in cumulative savings of over $1.5 billion.

  2. Replacement of Thunder Bay and Atikokan generating stations at a more competitive cost at contract expiry would result in cumulative savings of over $900 million.

Considerations

- LRP 1 contracts have already been issued. Contract amendments or terminations without the consent of developers could result in legal proceedings against IESO and the Province.

- The IESO is including savings from Atikokan and Thunder Bay in its revised cost analysis.

- The Atikokan and Thunder Bay plants are major employers in their host communities, and the Atikokan facility also contracts with two Ontario facilities for fuel supply.

E. Enhancing Existing Measures – OREC

- Enhancing the Ontario Rebate for Electricity Consumers (OREC) would reduce consumer bills by shifting costs to the tax base.

- Rate relief could be provided through on-bill rebates and ‘shaped’ to align with the post-inflation cap annual funding gap.

Considerations

- There will be a fiscal impact on the province resulting from increasing OREC funding.

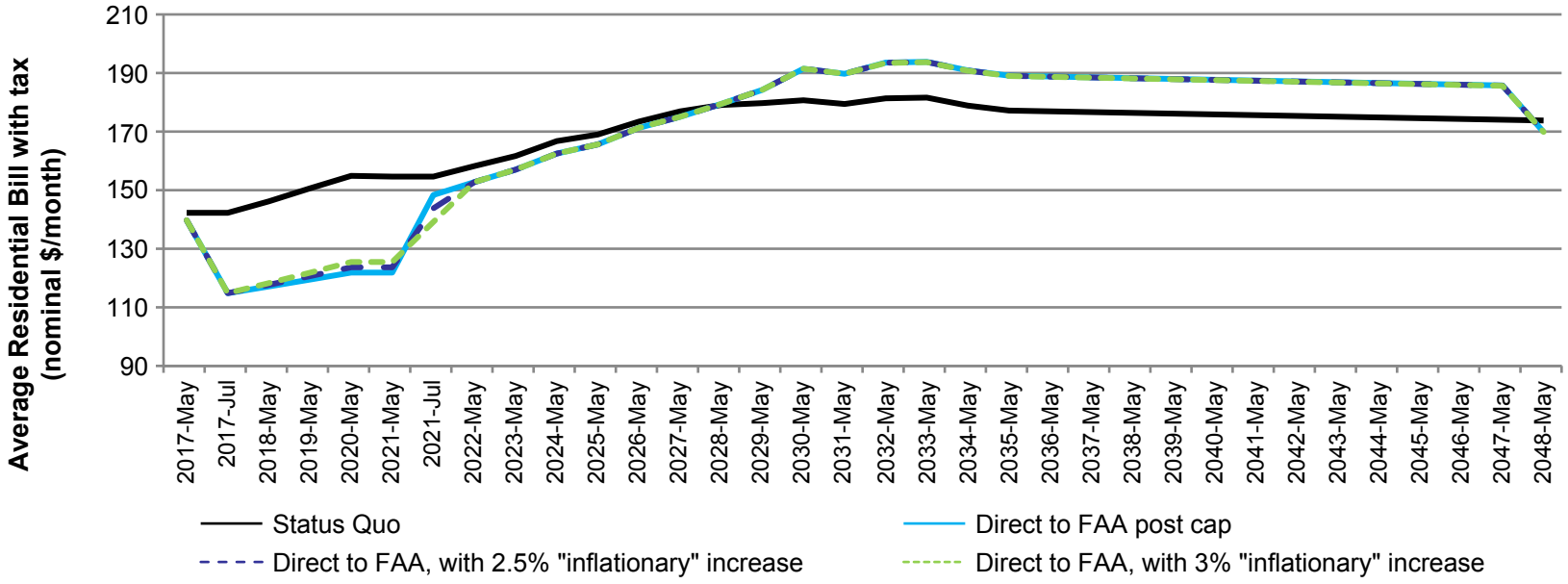
- The fiscal impact is front end loaded and could reach $2 billion per year.

- Should smoothing be provided to OFHP eligible consumers, increasing OREC funding could be combined with other initiatives to meet the funding gap between the FAA forecast and required funding.

- Potential impacts on OFHP accounting are still being analyzed.

F1. Other Measures – Review Inflationary Cap

- Under Ontario's Fair Hydro Plan (OFHP), typical residential bills would increase at the "rate of inflation" for four years.
- Increasing this cap would have the effect of reducing the incurred debt and smoothing the step change in rates when they return to the Fair Allocation Amount (FAA).
- OFHP modelling previously based on 2% "rate of inflation".



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Change in bill for 2.5% during cap (%)	n/a	n/a	2.5%	2.5%	2.5%	0%	16%	6%	3%	3%	2%	3%	2%	3%	3%	4%	-1%	2%	0%	-2%	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-9%	0%
Total Accumulated Debt ($B)	0.0	0.8	3.3	6.0	9.0	11.2	12.0	12.9	13.7	14.5	15.3	16.1	16.8	17.4	17.6	17.3	17.0	16.4	15.7	15.1	14.3	13.6	12.7	11.9	10.9	9.9	8.8	7.7	6.5	5.2	3.8	2.4	0.8	0.0	0.0
Change in bill for 3% during cap (%)	n/a	n/a	3%	3%	3%	0%	11%	10%	3%	3%	2%	3%	2%	3%	3%	4%	-1%	2%	0%	-2%	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-8%	0%
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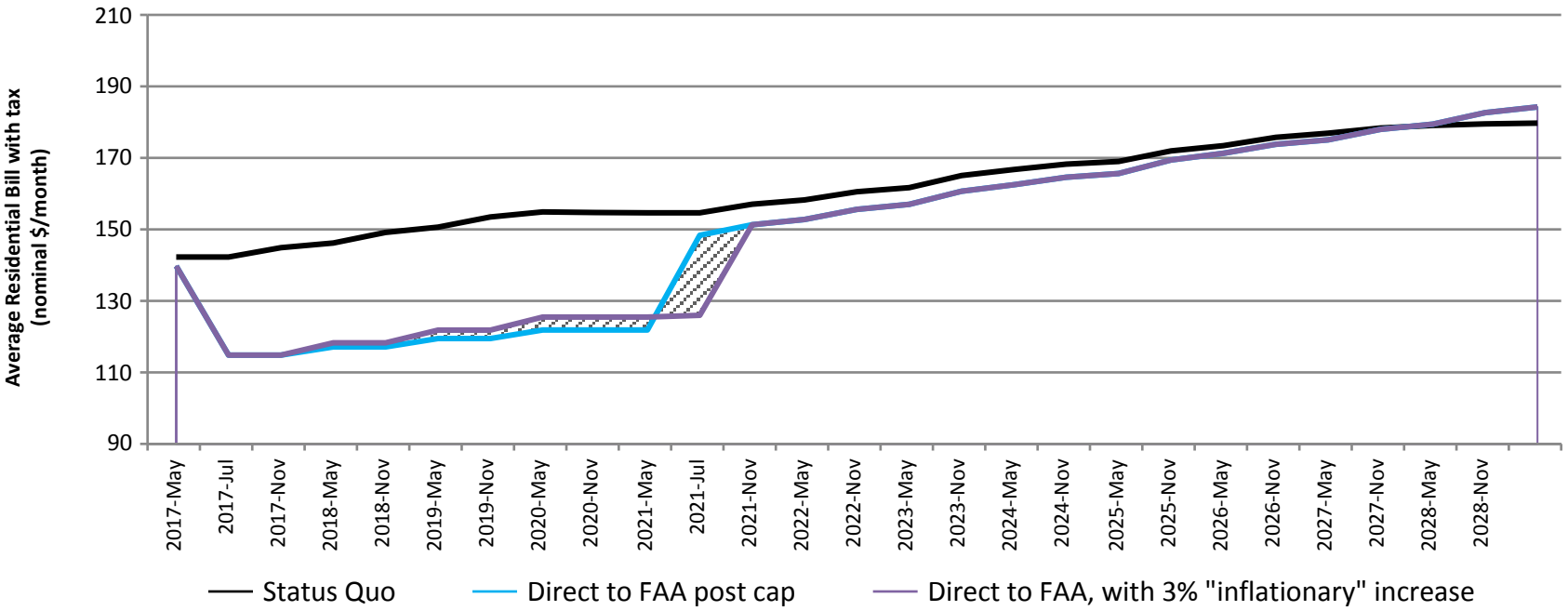
Note: Based on a preliminary July 2017 forecast; forecast is subject to change. Assumes 30-year financing period and a nominal interest rate of 5% (compounded monthly). Status Quo forecast beyond 2035 is extrapolated. Under the 2.5% inflationary scenario, unused FAA is allocated between July 2021 and November 2021. Under the 3% inflationary scenario, unused FAA is allocated between July 2021 and May 2022.

F1. Other Measures – Review Inflationary Cap (cont'd)

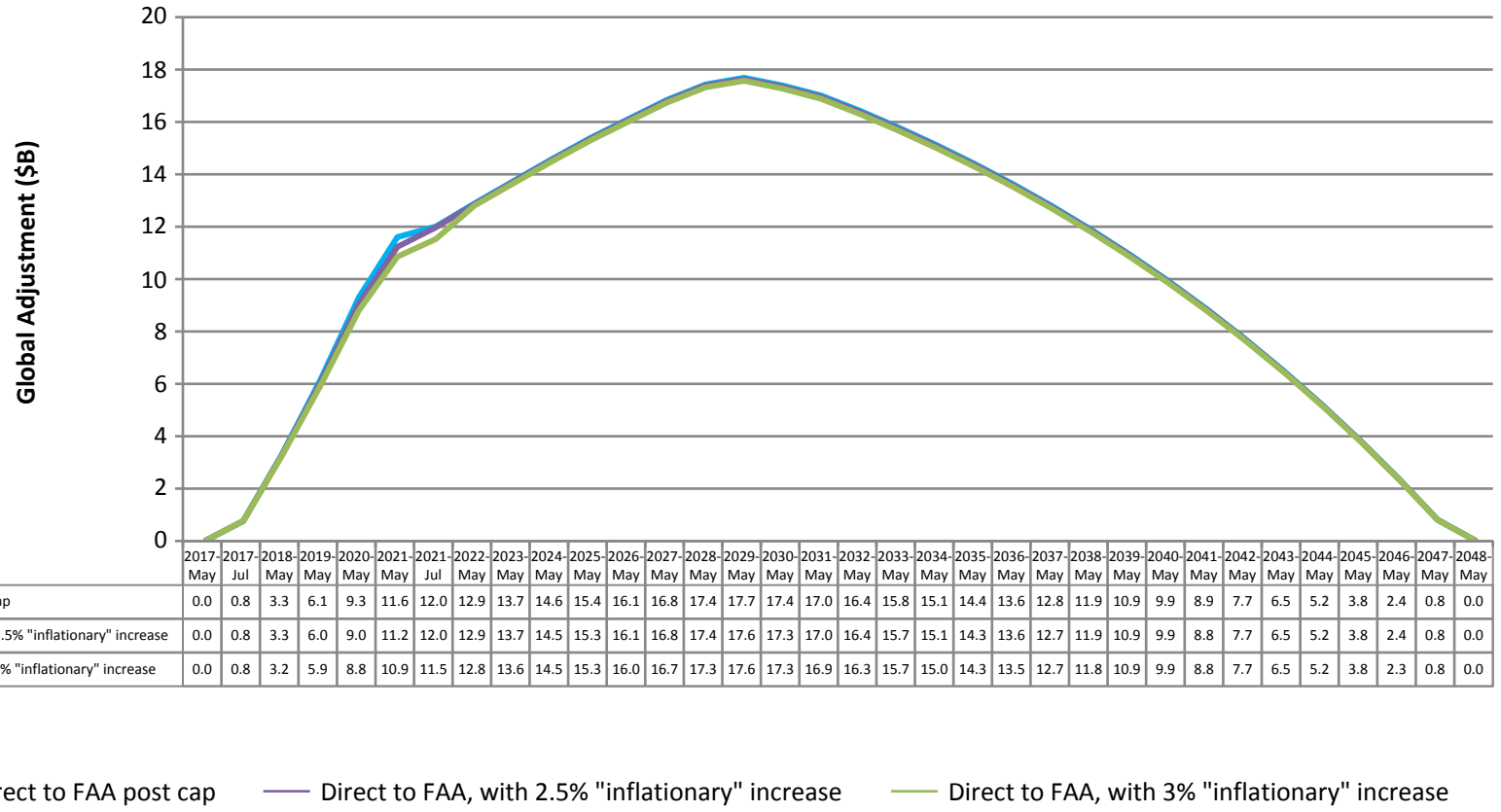


Considerations

- The four-year inflationary cap has been publicly communicated.
- Inflationary increases are specified in O.Reg. 195/17 to be applied by the Ontario Energy Board (OEB) when setting Regulated Price Plan (RPP) rates. This regulation would need to be amended to alter or extend the increase cap.
- A 2.5% increase during the inflationary cap period reduces the incurred debt by $0.3 billion from 2018-2021, while a 3% increase reduces debt by $0.5 billion over the same period when compared to the FAA forecast.

Note: Assumes unused FAA is allocated between July 2021 and November 2021.

F1. Other Measures – Review Inflationary Cap (cont'd)



	2017-May	2017-Jul	2018-May	2019-May	2020-May	2021-May	2021-Jul	2022-May	2023-May	2024-May	2025-May	2026-May	2027-May	2028-May	2029-May	2030-May	2031-May	2032-May	2033-May	2034-May	2035-May	2036-May	2037-May	2038-May	2039-May	2040-May	2041-May	2042-May	2043-May	2044-May	2045-May	2046-May	2047-May	2048-May
Direct to FAA post cap	0.0	0.8	3.3	6.1	9.3	11.6	12.0	12.9	13.7	14.6	15.4	16.1	16.8	17.4	17.7	17.4	17.0	16.4	15.8	15.1	14.4	13.6	12.8	11.9	10.9	9.9	8.9	7.7	6.5	5.2	3.8	2.4	0.8	0.0
Direct to FAA, with 2.5% "inflationary" increase	0.0	0.8	3.3	6.0	9.0	11.2	12.0	12.9	13.7	14.5	15.3	16.1	16.8	17.4	17.6	17.3	17.0	16.4	15.7	15.1	14.3	13.6	12.7	11.9	10.9	9.9	8.8	7.7	6.5	5.2	3.8	2.4	0.8	0.0
Direct to FAA, with 3% "inflationary" increase	0.0	0.8	3.2	5.9	8.8	10.9	11.5	12.8	13.6	14.5	15.3	16.0	16.7	17.3	17.6	17.3	16.9	16.3	15.7	15.0	14.3	13.5	12.7	11.8	10.9	9.9	8.8	7.7	6.5	5.2	3.8	2.3	0.8	0.0

Considerations

- Raising the "inflationary" increases during the cap period reduces total accumulated OFHP debt as shown in the summary provided below.

Note: Based on a preliminary July 2017 forecast; forecast is subject to change. Assumes 30-year financing period and a nominal interest rate of 5% (compounded monthly). Status Quo forecast beyond 2035 is extrapolated. Under the 2.5% inflationary scenario, unused FAA is allocated between July 2021 and November 2021. Under the 3% inflationary scenario, unused FAA is allocated between July 2021 and May 2022.

F2. Other Measures – Federal Funding for Energy Infrastructure

- 2017 LTEP provides an opportunity to seek federal or provincial capital funding for major energy infrastructure (i.e., electricity transmission and distribution infrastructure) that supports economic development, job creation and GHG reductions.

Considerations

- Funding could target:
  - Reliability Upgrades: Enhancements to single-circuit lines which lack redundancy, power quality improvements including back up generation, ride-through equipment and micro-grids and upgrades from single-phase to 3-phase power;
  - Connection of New Customers: Expansions and enhancements of transmission and distribution infrastructure to enable customers to grow or establish a new connection; and
  - Facilitating Connection of Renewable Generation: Enhancements to infrastructure to eliminate connection constraints to advance clean energy projects.

- Federal funding would likely require an equivalent provincial contribution.

- Depending on the amount of funding available, the program could target a few large, high impact projects, many smaller projects or include streams targeting projects of different size and impact.
  - For comparison purposes, the proposed 230 kV line in Greenstone is estimated at approximately $110 million, with a potential benefit to present and future companies. Resolving a power quality issue caused by sensitive electrical equipment, such as those identified by Kimberly Clark in Muskoka could be in the $0.5 million range, though the benefit would be only to one company.

- Program delivery considerations include the delivery model, application process and governance are highly dependent on the source of funding, which may include specific delivery mechanisms.

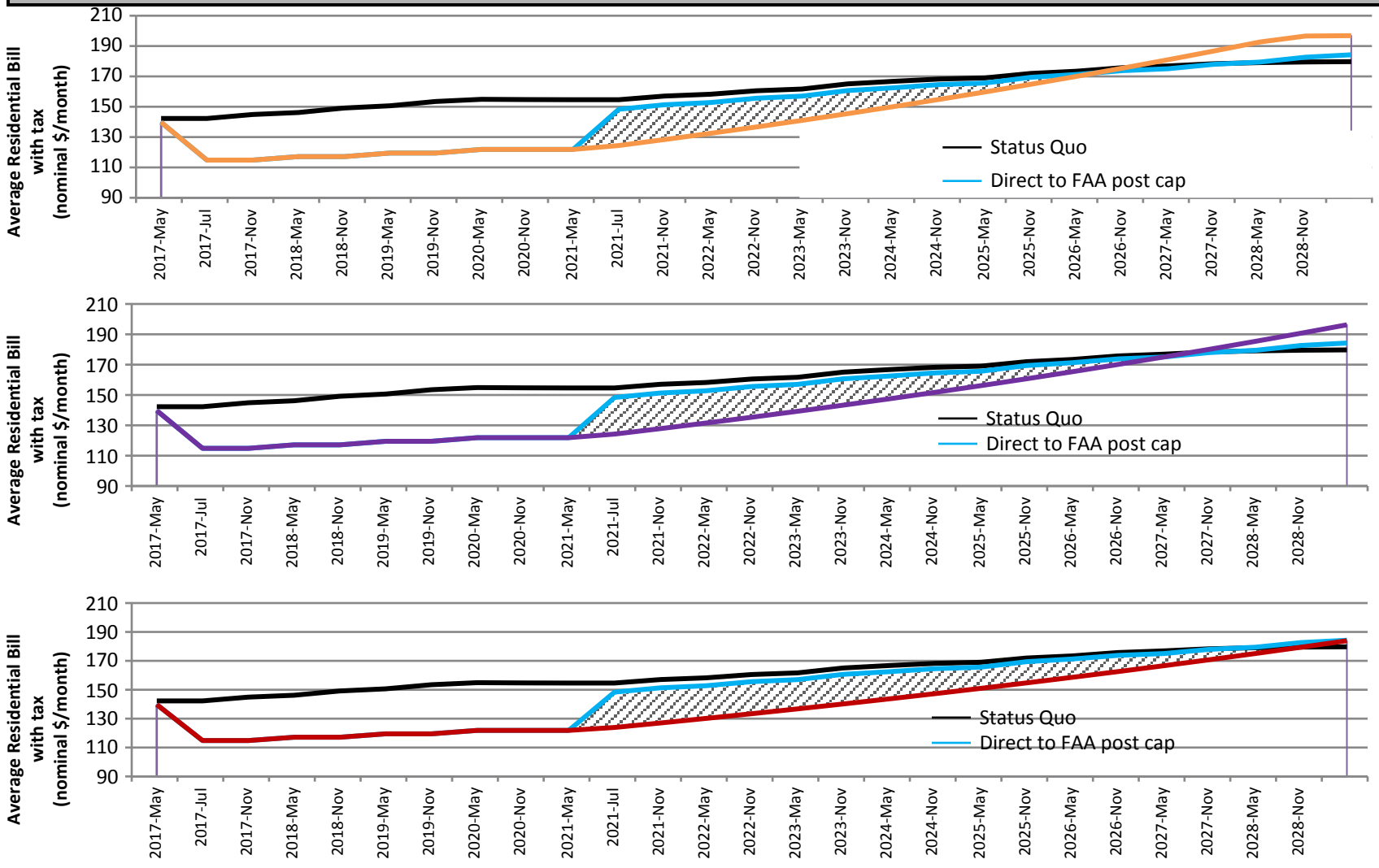
Summary

	Funding Gap ($B)												
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**Cumulative Total**
OFHP with 5.9% Smoothing Post Cap	0	0	0	1.1	2.0	1.7	1.4	1.0	0.6	0.1	n/a	n/a	7.8
Initiatives to Bend the Cost Curve	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**Cumulative Total**
A1. Funding Conservation from GGRA Proceeds	0	0	0	-0.2	-0.4	-0.4	-0.4	-0.4	-0.5	-0.5	-0.4	-0.1	-3.3
A2. Funding 10% of Renewable Costs from GGRA	n/a	n/a	n/a	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
B. Distribution Sector Savings	n/a	n/a	n/a	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
C. IESO's Market Renewal	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
D. Suspending Current and/or Planned Supply	n/a	n/a	n/a	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
E. Enhancing OREC	n/a	n/a	n/a	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
F1. Review the Inflationary Gap	-0.1	-0.2	-0.3	0	0	0	0	0	0	0	0	0	-0.5
F 2. Federal Funding for Energy Infrastructure	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Total from Initiatives ($B)	**-0.1**	**-0.2**	**-0.3**	**-0.2**	**-0.4**	**-0.4**	**-0.4**	**-0.4**	**-0.5**	**-0.5**	**-0.4**	**-0.1**	**-3.9**
Total Remaining Funding Gap ($B)													**3.9**
Total Remaining Funding Gap, including cumulative savings from Distribution Sector Savings (~$1B) and Suspending Current/Planned Supply ($2.4B).													**0.5**

Note: Based on a preliminary July 2017 forecast; forecast is subject to change. Assumes 30-year financing period and a nominal interest rate of 5% (compounded monthly). Status Quo forecast beyond 2035 is extrapolated. Reflects reference periods as per Ontario Fair Hydro Act, 2017 under which the inflationary cap periods ends as of July 2021. The above reflects replacement of Thunder Bay and Atikokan generating stations at a more competitive cost at contract expiry and not proceeding with MicroFIT 2017,FIT 5 and exiting LRP1 contracts. The above assumes the 3% inflationary scenario, unused FAA is allocated between July 2021 and May 2022. Estimates are subject to change.

APPENDIX

OFHP – Post Inflation Cap Smoothed at 6.3%, 5.9% and 5%



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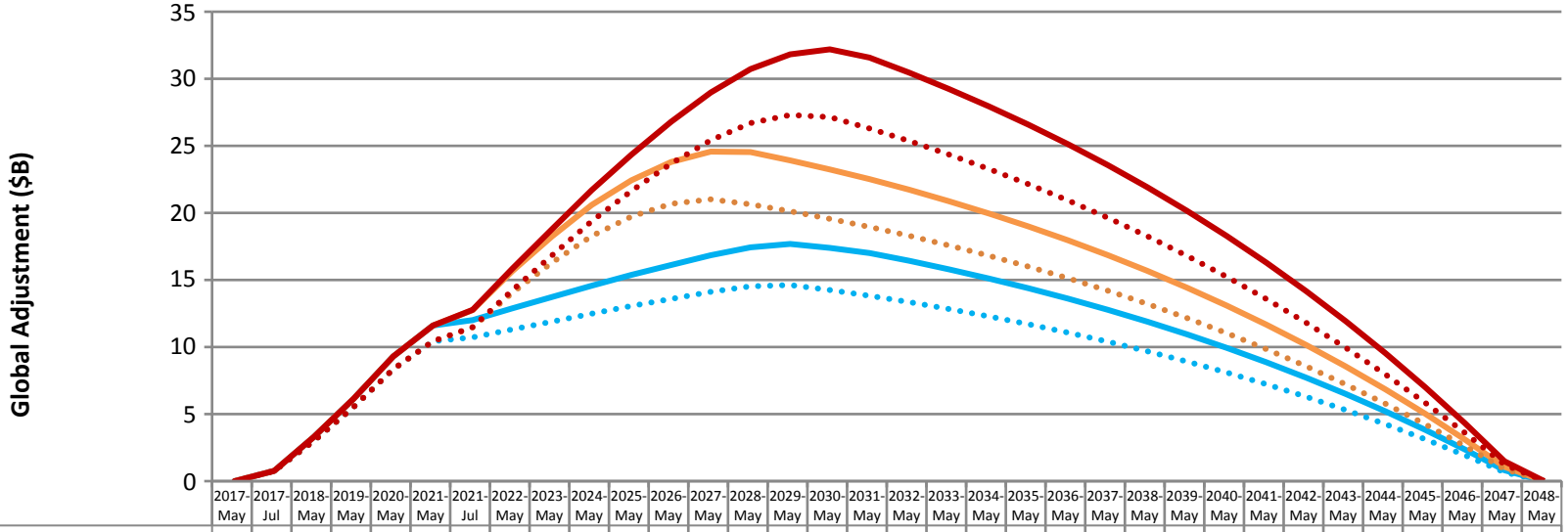
A1. Shifting Costs – Funding Conservation from GGRA Proceeds – Impact (cont'd)

- Funding conservation from GGRA proceeds starting in 2018 reduces total accumulated OFHP debt as shown in the summary provided below.



	2017-May	2017-Jul	2018-May	2019-May	2020-May	2021-May	2021-Jul	2022-May	2023-May	2024-May	2025-May	2026-May	2027-May	2028-May	2029-May	2030-May	2031-May	2032-May	2033-May	2034-May	2035-May	2036-May	2037-May	2038-May	2039-May	2040-May	2041-May	2042-May	2043-May	2044-May	2045-May	2046-May	2047-May	2048-May
Direct to FAA post cap	0.0	0.8	3.3	6.1	9.3	11.6	12.0	12.9	13.7	14.6	15.4	16.1	16.8	17.4	17.7	17.4	17.0	16.4	15.8	15.1	14.4	13.6	12.8	11.9	10.9	9.9	8.9	7.7	6.5	5.2	3.8	2.4	0.8	0.0
Direct to FAA post cap (no conservation)	0.7	[illegible]																																
Post cap smoothed at 6.3%	0.0	0.8	3.3	6.1	9.3	11.6	12.8	15.7	18.2	20.6	22.4	23.8	24.6	24.5	23.9	23.2	22.5	21.7	20.9	20.0	19.0	18.0	16.9	15.7	14.4	13.1	11.7	10.2	8.5	6.8	5.0	3.1	1.1	0.0
Post cap smoothed at 6.3% (no conservation)	0.7	[illegible]																																
Post cap smoothed at 5%	0.0	0.8	3.3	6.1	9.3	11.6	12.8	15.8	18.8	21.7	24.3	26.8	29.0	30.7	31.8	32.2	31.6	30.5	29.2	28.0	26.6	25.1	23.6	21.9	20.2	18.3	16.3	14.2	11.9	9.5	7.0	4.3	1.5	0.0
Post cap smoothed at 5% (no conservation)	0.7	[illegible]																																

Direct to FAA post cap
Post cap smoothed at 6.3%
Post cap smoothed at 5%
Direct to FAA post cap (no conservation)
Post cap smoothed at 6.3% (no conservation)
Post cap smoothed at 5% (no conservation)