

June 1, 2018

BY EMAIL, COURIER & RESS

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
Suite 2700, 2300 Yonge Street
Toronto, Ontario
M4P 1E4

**RE: EB-2017-0255 – Union Gas Limited 2018 Cap-and-Trade Compliance Plan –
Public Filing of JT1.1 and JT1.12 Technical Conference Undertakings**

Dear Ms. Walli,

In a letter filed with the Ontario Energy Board's ("OEB") on April 26, 2018 Union Gas Limited ("Union") requested that Undertakings JT1.1 and JT1.12, received during the 2018 Cap-and-Trade Compliance Plan Technical Conference held on April 9, 2018, be treated as confidential in accordance with Rule 10.1 of the OEB's *Rules of Practice and Procedure* and Section 5 of the *Practice Direction on Confidential Filings*. Union indicated that its letter should be read in conjunction with letters from counsel for California Carbon dated April 25, 2018 and counsel for ICF dated April 26, 2018.

In accordance with the OEB's Decision on Confidentiality Request and Procedural Order No. 5 dated May 25, 2018, attached are redacted non-confidential versions of the documents referred to in the responses to Technical Conference Undertakings JT1.1 and JT1.12.

If you have any questions with respect to this submission please contact me at 519-436-4558.

Yours truly,

[Original signed by]

Adam Stiers
Manager, Regulatory Initiatives

c.c.: EB-2017-0255 Parties *(by email)*
Myriam Seers, Torys *(by email)*
Valerie Bennett, OEB *(by email)*
Ljuba Djurdjevic, OEB *(by email)*
Lawren Murray, OEB *(by email)*
Josh Wasylyk, OEB *(by email)*

Comparison of Price Scenarios

	Price USD				
Year	Projected Reserve Price (US\$)	Baseline Emissions Scenario	Low Emissions Scenario	High Emissions Scenario	Price Ceiling
2021					
2022					
2023					
2024					
2025					
2026					
2027					
2028					
2029					
2030					
Average Price (2021-2030)					



Ontario Cap and Trade: Overview, Price Outlook, and Impact on NG

Union Gas
April 22, 2016

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Context and Objective

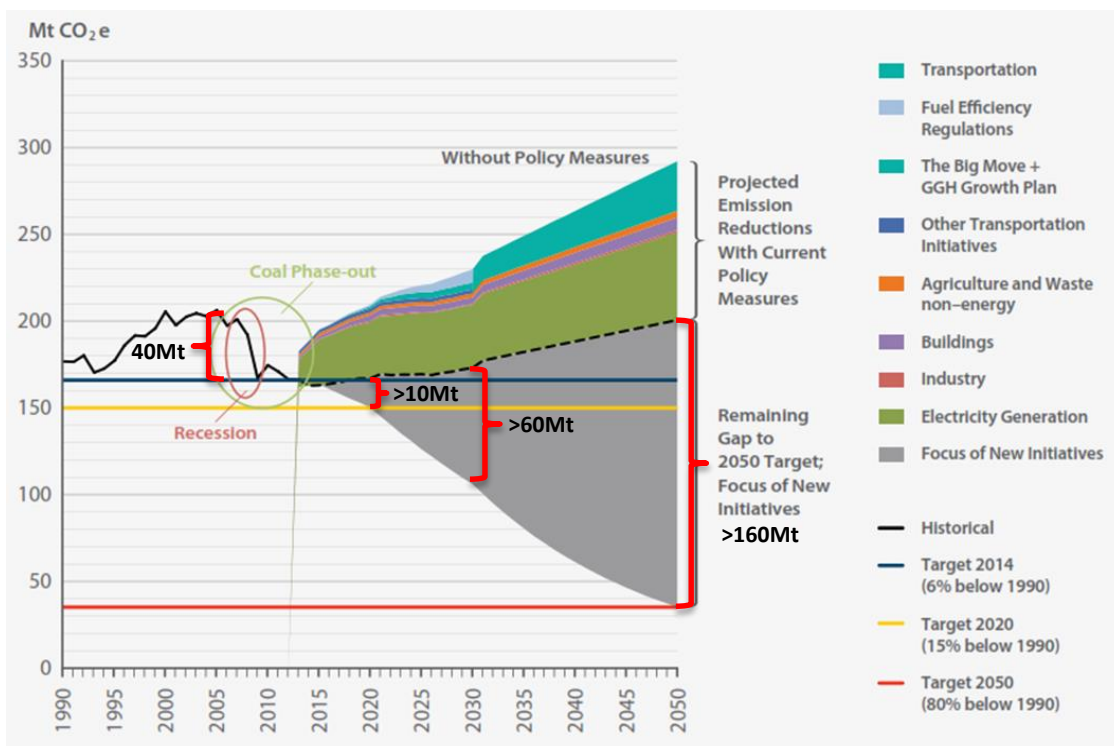
- Provide preliminary view on price of allowance (under cap and trade) in Ontario 2017/18 - 2030
 - Ontario context (emissions profile and cap)
 - WCI (California and Quebec) context (emissions, caps, market fundamentals)
 - California Carbon Info view on market / price
 - ICF view on price of allowance in WCI with Ontario

- Next steps



Ontario Emissions Profile and Context

Ontario has defined 2020 and 2030 targets and a linear path to de-carbonization by 2050



Significant reductions from 2005 to 2010. >40 Mt (20%).

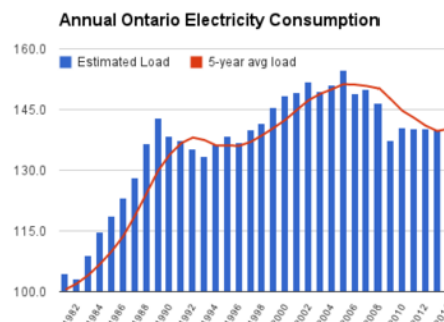
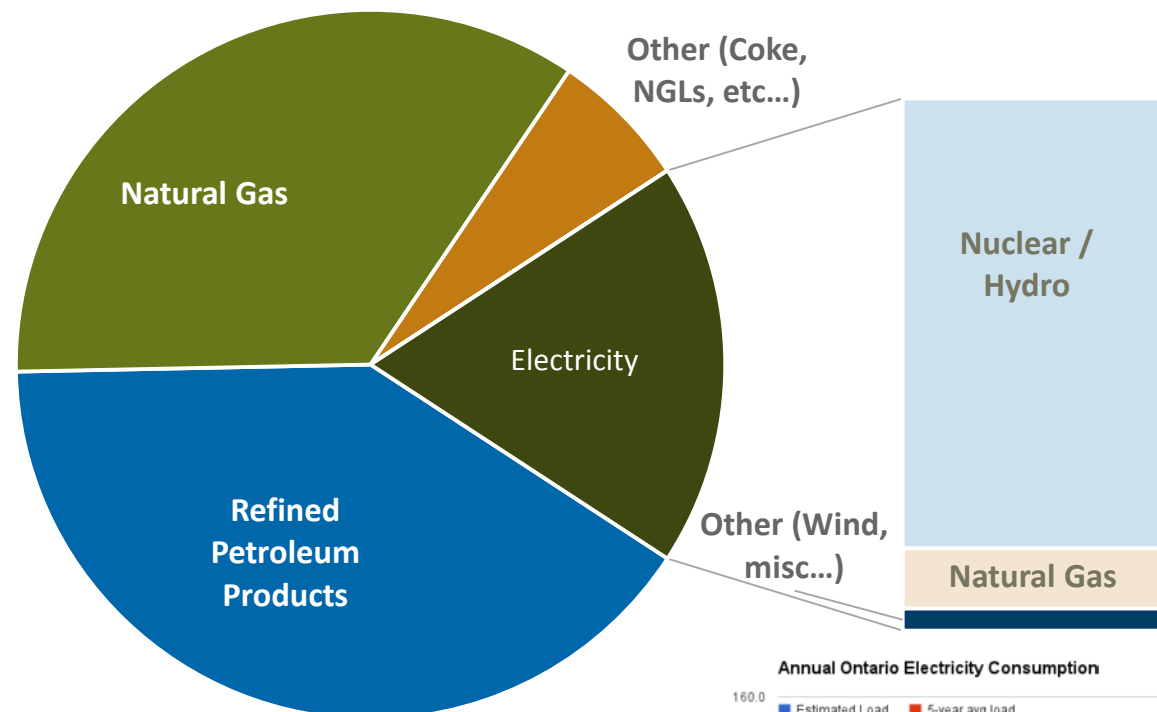
Ontario's emission targets established versus 1990 baseline. 2020 (15%), 2030 (37%) and 2050 (80%).

Current measures identified for public transportation and energy efficiency.

Future reductions required to fill gap...



Natural Gas (NG) is forecast to be the largest energy source in Ontario heading out to 2030



NG's share of Ontario's energy demand has grown to over 33%;

- New supply.
- Newly connected communities and usage in transport.
- Coal backfill and enabling renewables.

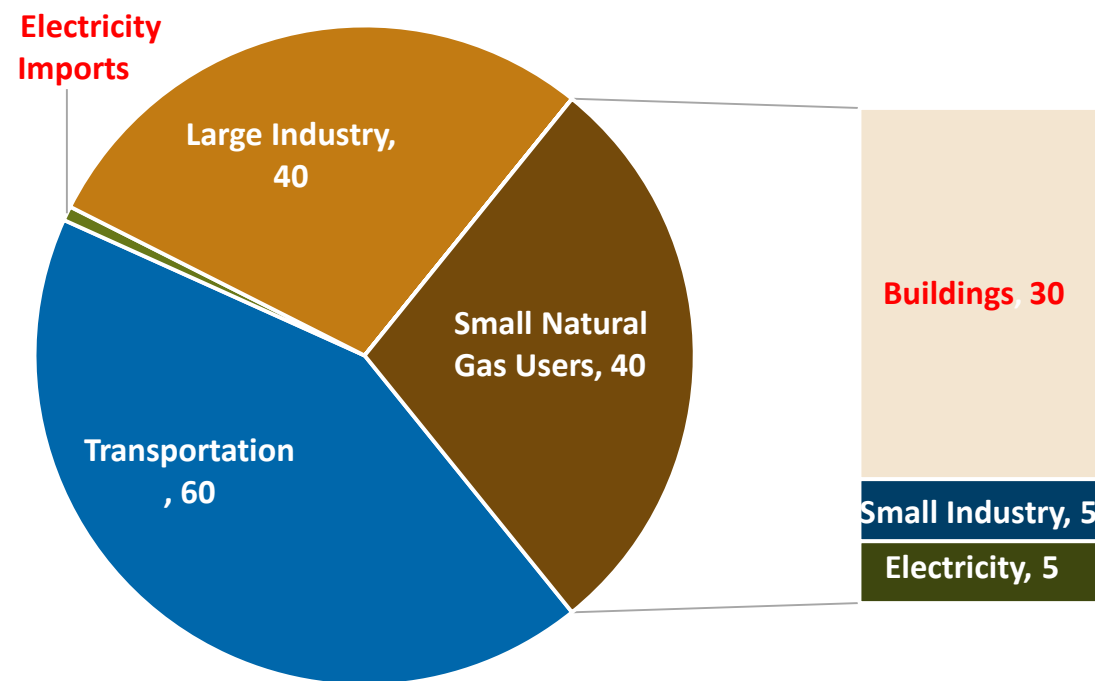
CNG use in transport and LNG as a replacement for diesel and propane will drive NG demand up and emissions down.

Peak NG demand is ~7 bcf/day equivalent to >80 GW.

Electricity demand declined 2004 – 2014 due to CDM and recession.

Source: StatsCan 2014

Based on Ontario's emissions profile reductions needed from NG and transport fuel use



Ontario Forecast 2017 GHG emissions for sectors / sources covered under proposed cap and trade (MtCO₂e)

NG and transportation fuel each meet 33% of energy demand and electricity meets 25%.

NG share of energy demand expected to grow over next 15 years.

Cap declines from 142M in 2017 to 124M in 2020 = 532M (avg 133M/yr)

To meet a 2030 target NG and transportation fuel use would need to decline by 50%.

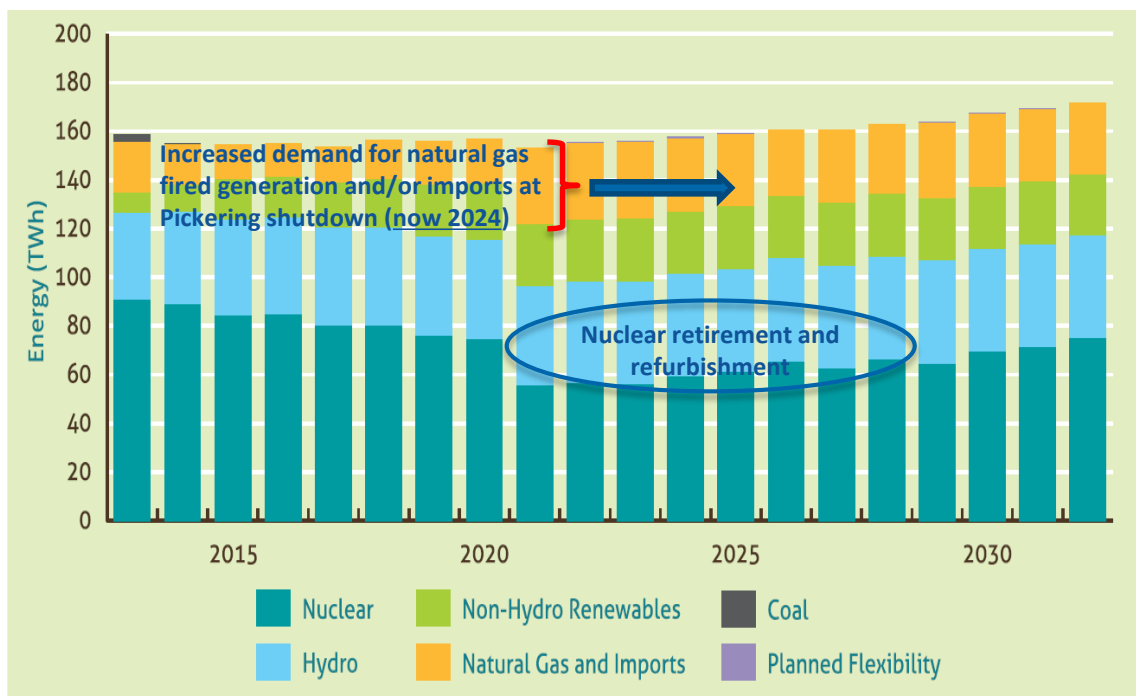
Unlikely to influence consumer behavior – transport / NG use with a price on CO₂ alone.

Emissions will increase as nuclear units retire and refurbish 2020-2030

- Ontario's electricity sector is almost CO₂ free (<0.05 t CO₂e/MWh).

However...

- 5-6 TWhs of imports = <1Mt CO₂e.
- Nuclear capacity decline = **doubling of NG / imports to 30TWh.**
- Ontario's forecast electricity demand is modest based on aggressive CDM targets (30+ TWh by 2030).
- Forecast generation will be more NG centric (or import).
- Emissions could increase from approximately 5 Mt to >15 Mt CO₂e.
- Continued CDM required to keep demand growth / emissions low. But new CHP rule will challenge LDC's targets.
- Load growth due to vehicle electrification?

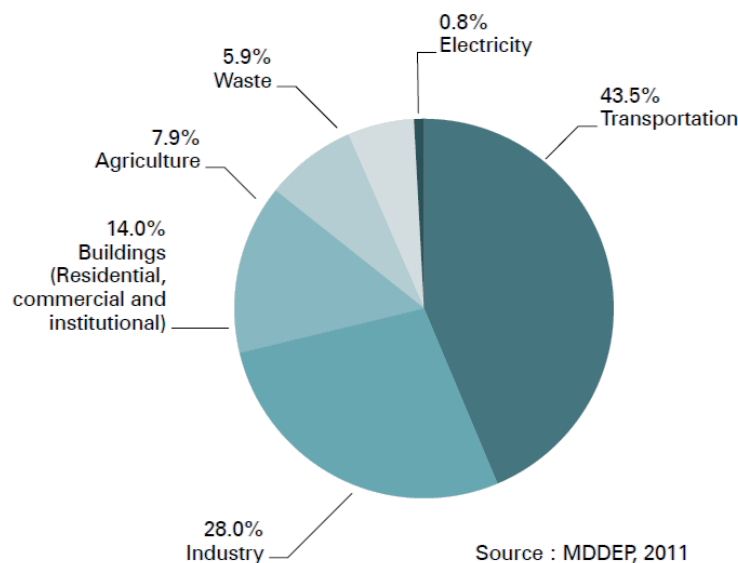


<http://www.energy.gov.on.ca/en/ltep/achieving-balance-ontarios-long-term-energy-plan/ltep-fig19/>



Quebec and California Emissions Profiles

Quebec's Emissions Profile is Transport Centric



Breakdown of Québec's GHG emissions in 2009 by industry sector

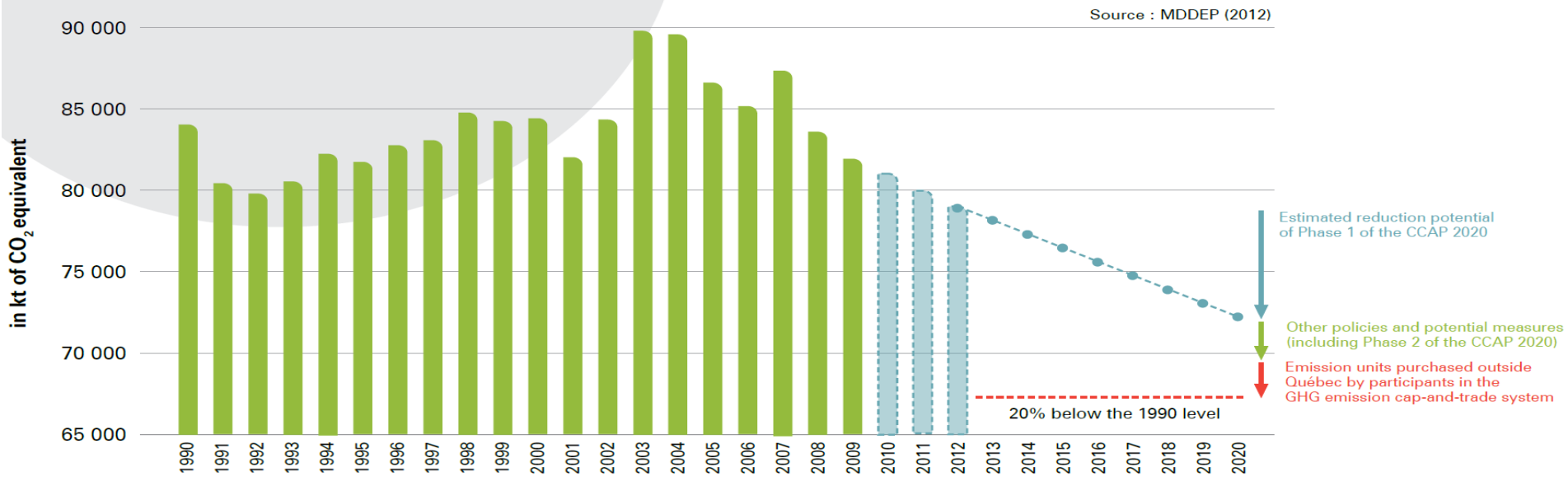
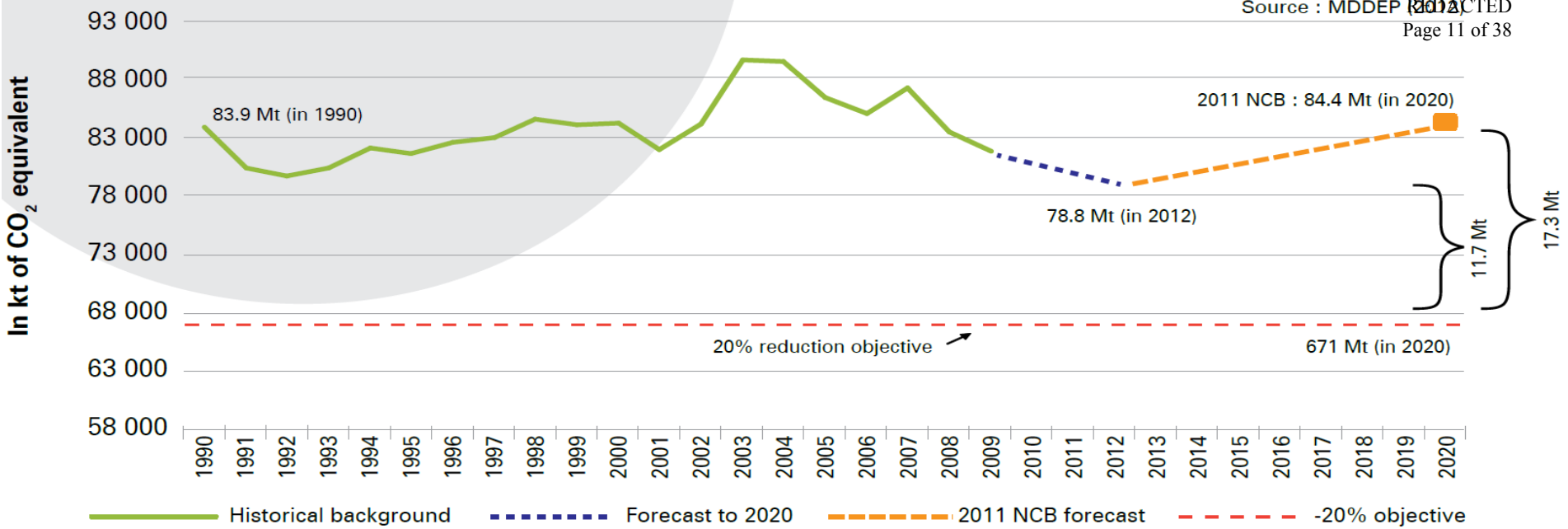
Industry sector	Sector's share in 2009	Emissions (MT of CO ₂ equivalent)
Transportation	43.5%	35.57
Industry	28.0%	22.93
Residential, tertiary	14.0%	11.42
Agriculture	7.9%	6.45
Residual materials	5.9%	4.80
Electricity	0.8%	0.61
Total	100.0%	81.79

Source MDDEP, 2011

- Power sector is non-emitting
- Reliance on electricity for commercial / residential sector heating
 - Very modest adoption of NG
- Industrial sector highly EITE and highly free allocated through 2020
 - High abatement cost and limited demand
 - Will likely bank surpluses and not speculate
- Fuel distributors
 - No free allocation and no annual true up (unlike California)
 - Unlikely to speculate
- Very few offsets and offset types
- Overall – few buyers / net buyer of California allowance

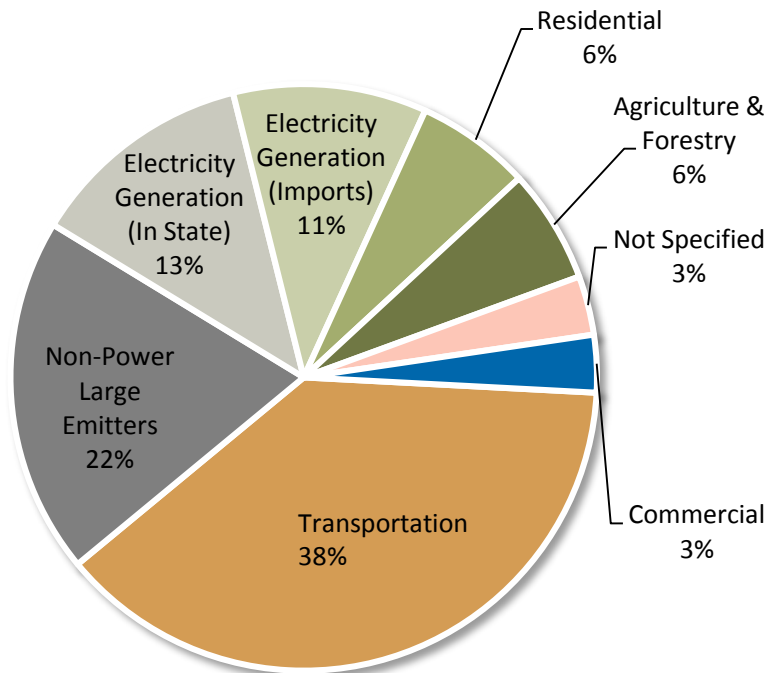
Quebec's compliance forecast is reliant on acquisition of California allowance

Updated: 2018-06-01
EB-2017-0255
Exhibit JT1.12
Attachment A
Source : MDDEP REDACTED
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California's Emissions Profile is more Electricity Centric than QC or ON

California GHG Emissions (2009)
Total Emissions: 452.97 MMtCO₂e



Source: ARB.

- Power sector makes up close to 25% of emissions
- Reliance on NG for commercial / residential sector heating
 - But less winter intensive
- Industrial sector highly EITE and highly free allocated through 2020
 - High abatement cost and limited demand
 - Will likely bank surpluses and not speculate
- Fuel distributors
 - Free allocation for NG distributors and annual true up
 - Transport makes up same portion of emissions profile as ON

California and Quebec Allowance Proceeds

- The total amount of auction proceeds to date deposited into the California Greenhouse Gas Reduction Fund.

Auction Quarter or Fiscal Year	CA Proceeds from Current and Advanced Auctions (USD)
Q1 2016 (February)	\$516,987,990
Q4 2015 (November)	\$656,779,307
Q3 2015 (August)	\$645,330,534
FY 2014-2015	\$1,490,776,417
FY 2013-2014	\$477,140,441
FY 2012-2013	\$257,264,031
TOTAL	\$4,044,278,721

- The total amount of auction proceeds to date deposited into the Quebec Green Fund.

Auction Period	QC Proceeds from Current and Advanced Auctions (CAD)
2013 (1 auction) – 2014 (4 auctions)	\$141,748,636
2015 (4 auctions)	\$830,193,848
2016 (1 auction)	\$219,533,976
TOTAL	\$1,191,476,460

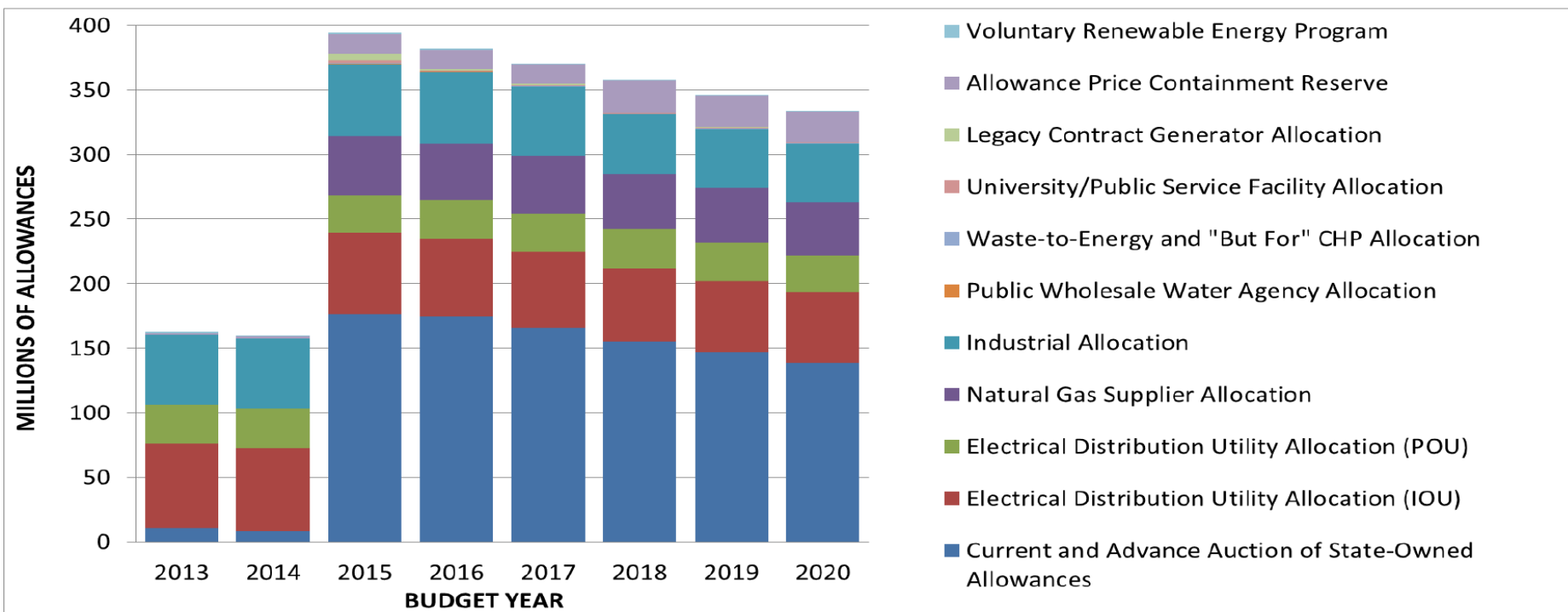
California Environmental Protection Agency, Air Resources Board, California Cap-and-Trade Program February 2016 Joint Auction #6, California Post Joint Auction Public Proceeds Report

Quebec, Développement durable, Environnement et Lutte contre les changements climatiques, Auction revenue paid to the Green Fund

California has provided future Allowance Allocation Information (to 2020) and Quebec provides to Current Year (2016)

Updated: 2018-06-01
EB-2017-0255
Exhibit JT1.12
Attachment A
REDACTED
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California:



Data source: ARB Estimated State Auction Budget (<http://www.arb.ca.gov/cc/capandtrade/stateauction.htm>)

Quebec:

Year	Quantity Free Allocated	Number of Entities
2013	18,888,614	55
2014	18,659,418	52
2015	13,403,934	51
2016	13,651,426	48



WCI Cap and Trade Market Context

WCI Targets

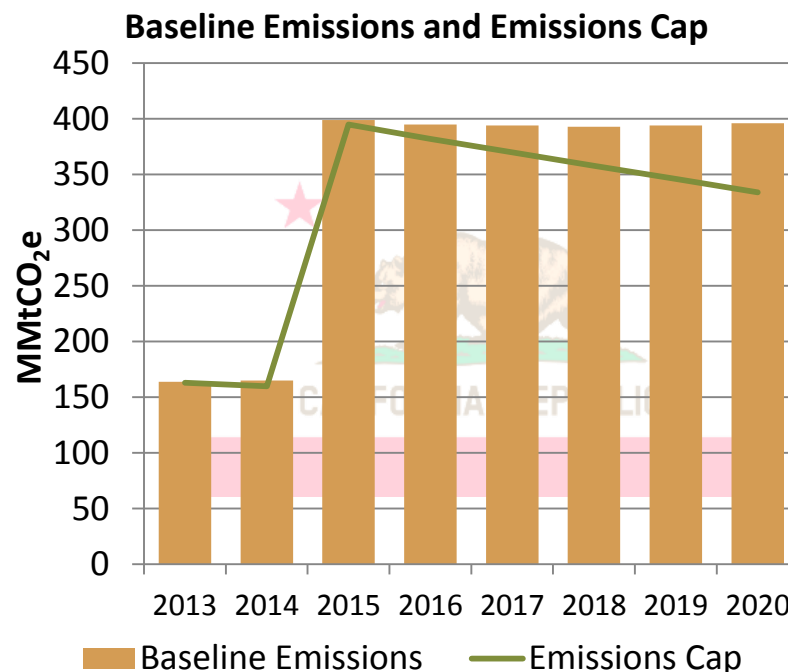
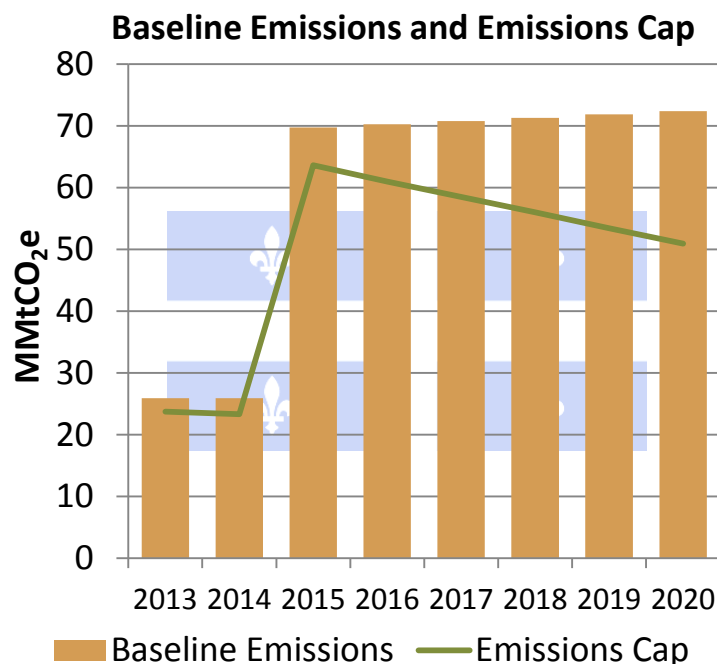
- Shared market benefits:
 - Shared administrative burden/resources
 - Larger pool of abatement options and Greater liquidity
- Western Climate Initiative (WCI):
 - Shared policy design principles, but very different economies (structure + size)

Jurisdiction	Target by 2020	Target by 2030	1990 (MT CO ₂ e)	2020 (MT CO ₂ e)	2030 (MT CO ₂ e)
 Quebec	20% below 1990	37.5% below 1990	~84	~67	~53
 California	To 1990 levels	40% below 1990	~431	~431	~259
 Ontario	15% below 1990	37% below 1990	~177	~151	~112

Targets above represent the Provincial / State level targets NOT caps under “cap and trade”

WCI Cap and Trade Coverage

- Ontario will have flexibility in terms of what sectors get covered and by when. Quebec and California have synchronized the sectors to be covered for each of the first two compliance periods under the WCI.
- Compliance Period 1 (2013 - 2014) – CA and QC both included electricity generation, electricity imports, and large emitters (stationary sources).
- Compliance Period 2 (2015 – 2017) – CA and QC added fuel distributors (natural gas and transportation fuels).
- Compliance Period 3 (2018-2020) – will see Ontario (others?) added to CA and QC



Note the cap increases with increased program coverage.

There were unsold allowances at the most recent WCI auction

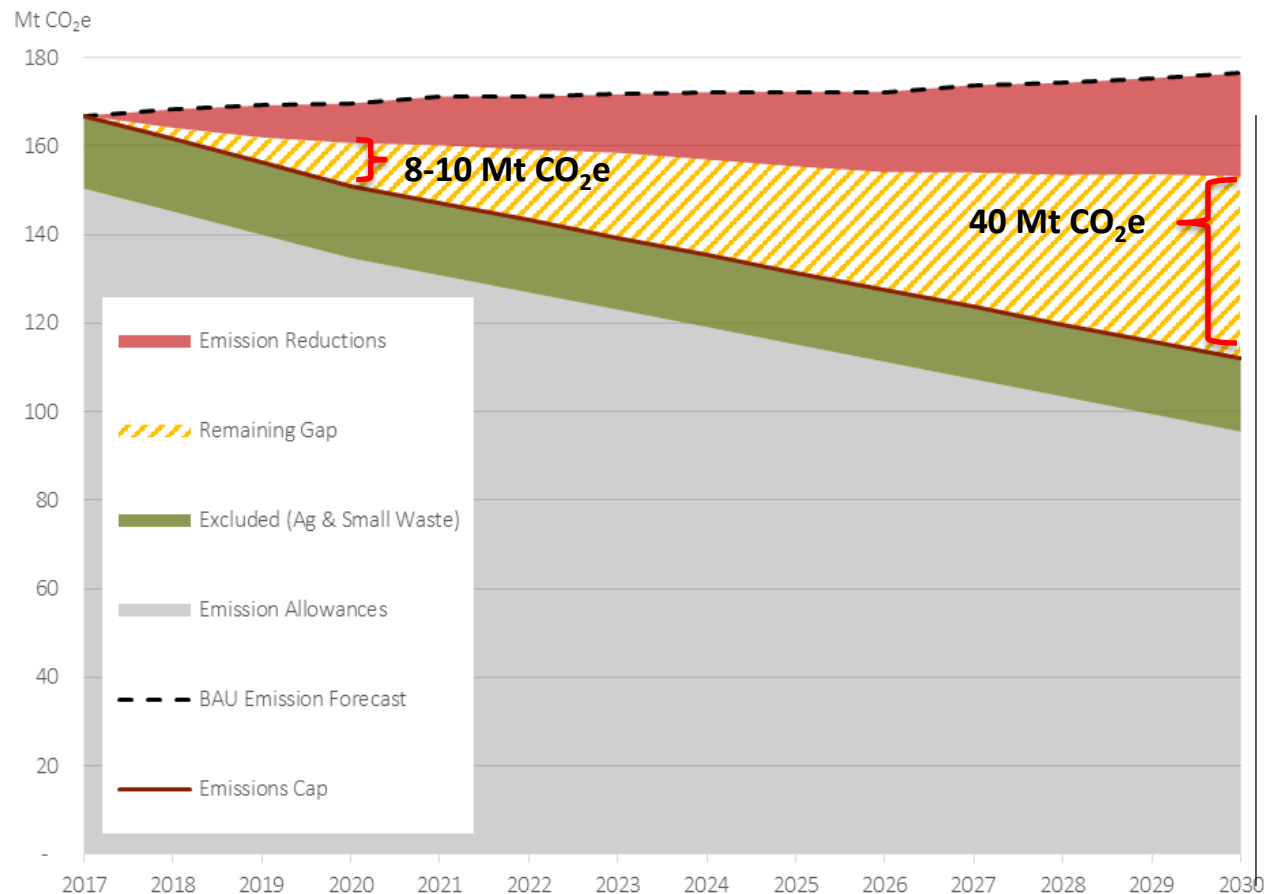
- The California ARB and Québec's MDDELCC held the 6th joint auction of greenhouse gas (GHG) allowances on February 17, 2016, including 2013, 2014, and 2016 vintage allowances, and an Advance Auction of 2019 vintage allowances.
- Of the total CA Entity Consignment allowances sold, 18,288,926 allowances from IOUs (proceeds of \$232,818,027.98 USD) and 5,927,808 allowances from POUs (proceeds of \$75,460,995.84 USD). Québec entities do not consign any allowances.
- Appears that allowances were sold proportionally based on share of total CA vs. total QC allowances available for sale (though under CA rules, consigned allowances are sold first before ARB allowances)

	Current			Future	
	2013 Vintage	2014 Vintage	2016 Vintage	Current Vintage Total	2019 Vintage
Total Allowances Available for Sale	1,073,347	537,971	69,944,509	71,555,827	10,078,750
CA Entity Consignment			24,216,734	24,216,734	
ARB			35,610,823	35,610,823	8,657,500
MDDELCC	1,073,347	537,971	10,116,952	11,728,270	1,421,250
Total Allowances Sold at Auction				68,026,000	9,361,000
CA Entity Consignment			24,216,734	24,216,734	
ARB			32,659,548	32,659,548	8,040,963
MDDELCC	1,073,347	537,971	9,538,400	11,149,718	1,320,037



WCI Cap and Trade Allowance Price: ICF View

ICF Ontario Emission Reduction Forecast



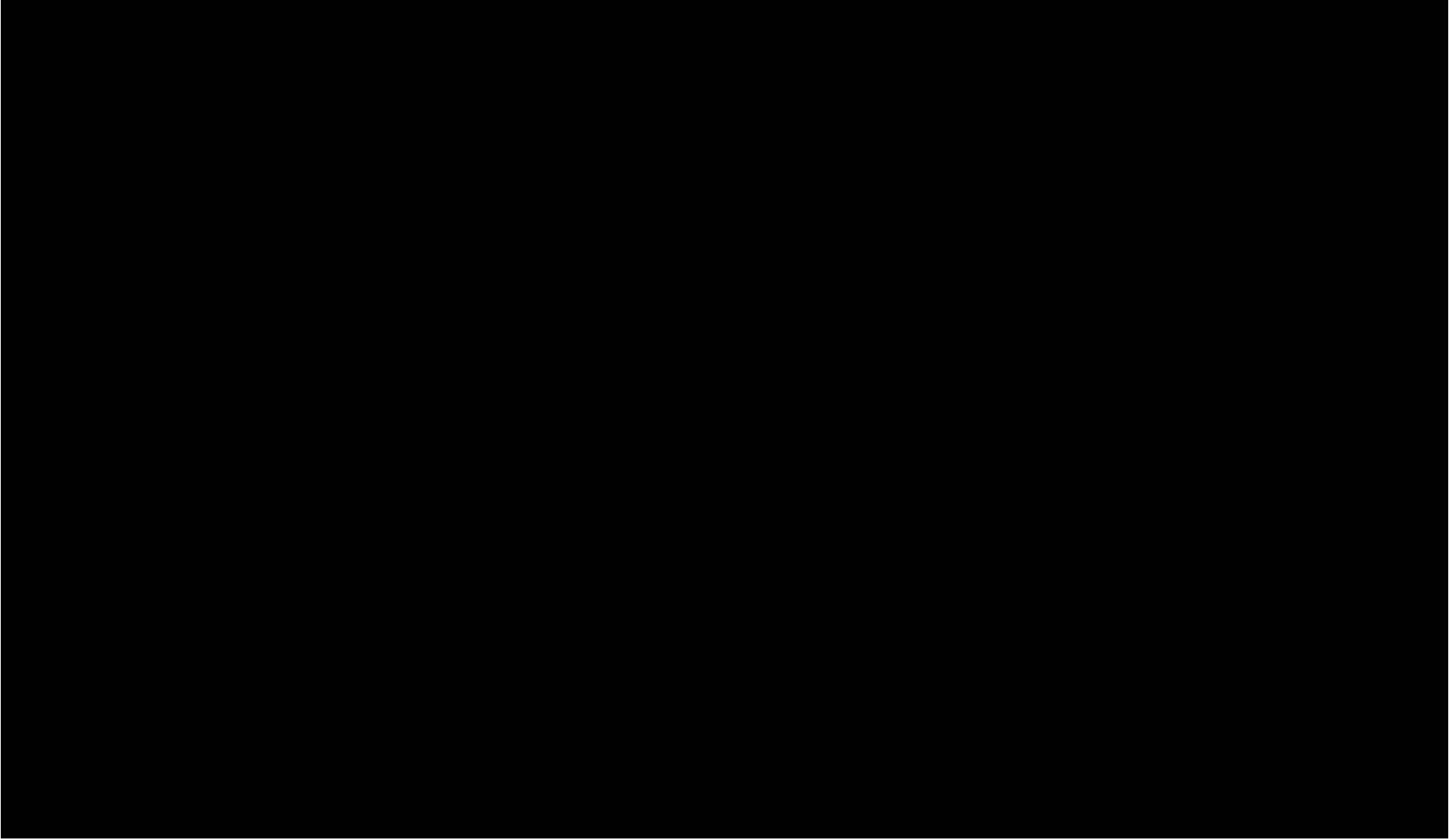
Informed by ICF economy wide model.

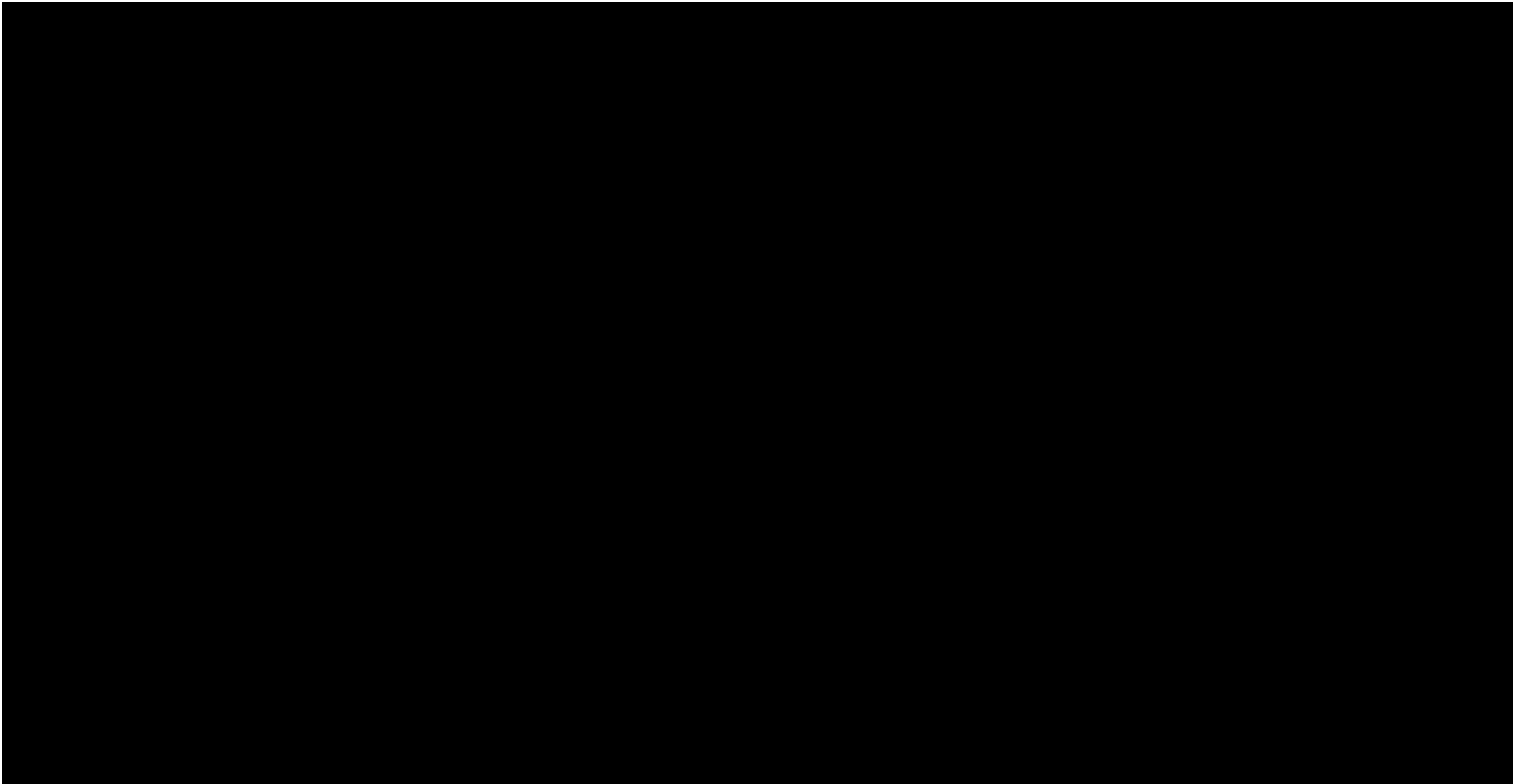
Identified reductions available at less than \$100 / t CO₂e and within 2030 timeframe.

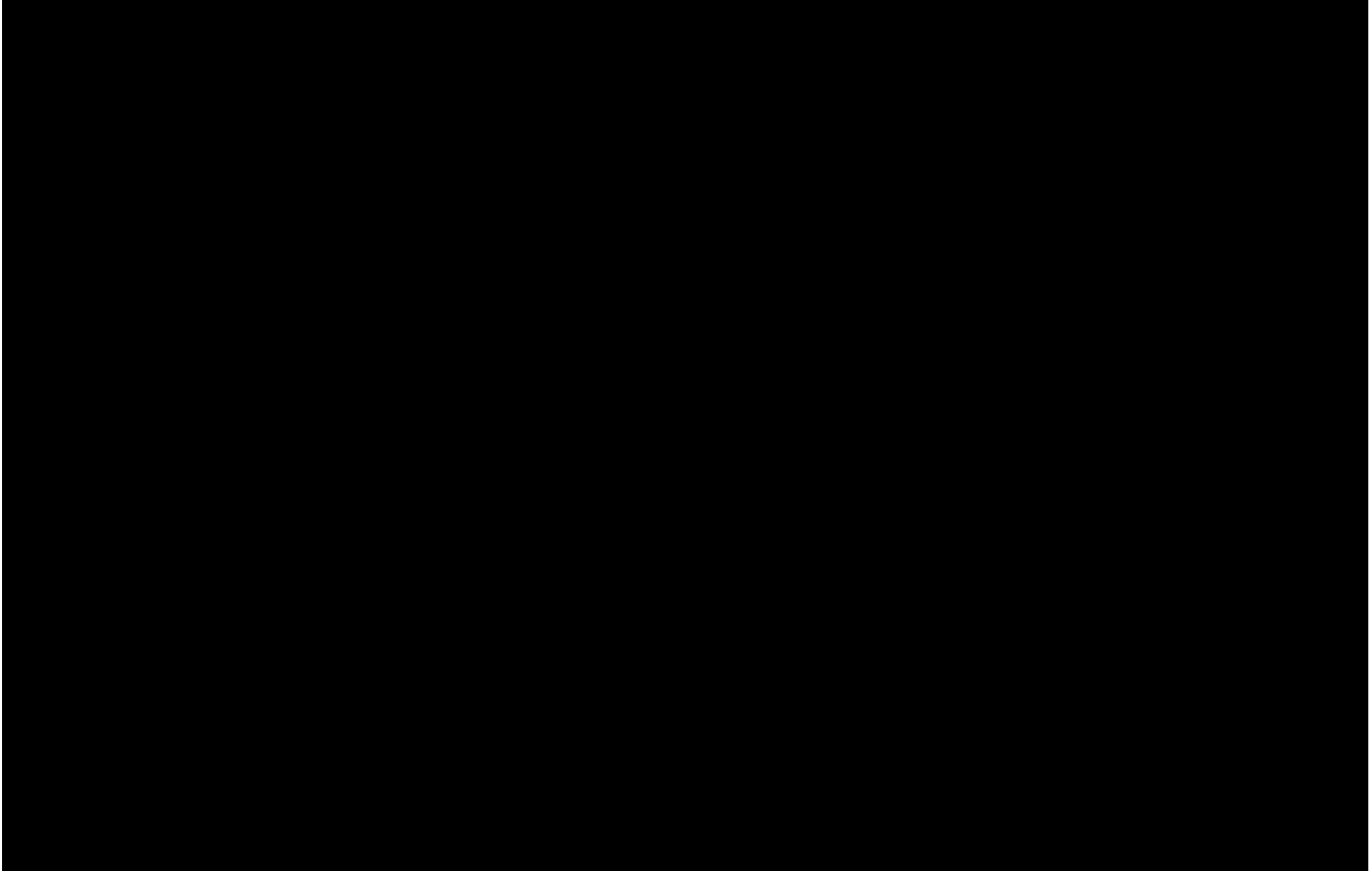
By 2030

- NG related initiatives (RNG, EE, LNG/CNG, CHP) reduce emissions by 10-12 Mt CO₂e.
- Refined fuel initiatives reduce emissions by 5-8 Mt CO₂e.
- Response to increasing fuel prices reduce 3-5 Mt CO₂e.

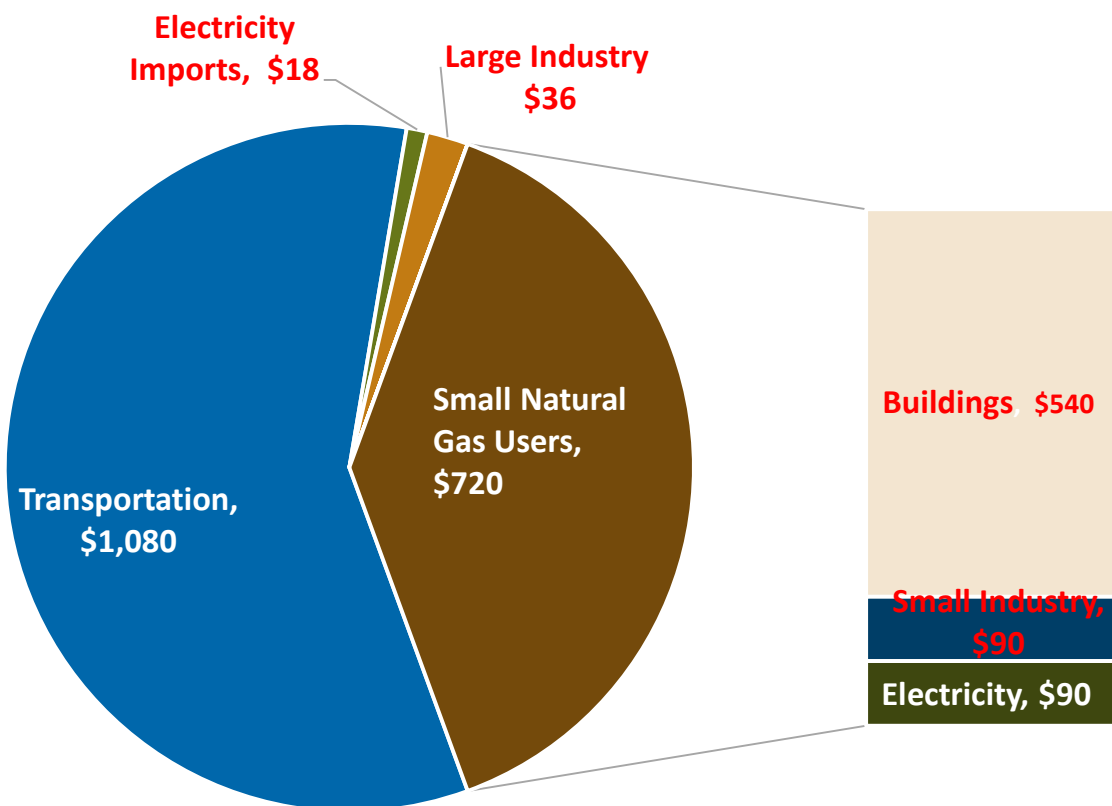
- As a result of the 40 Mt CO₂e gap, Ontario is expected to enter the market short.
- This is NOT the “UG/EGD view” where the 2030 gap is closer to 25 Mt CO₂e.
- The 2017-2020 gap is NOT updated based on the “cap” defined in the Draft Reg







Year 1: >\$1.8B in revenue from sale of allowance via auction. Mostly from the small energy user.



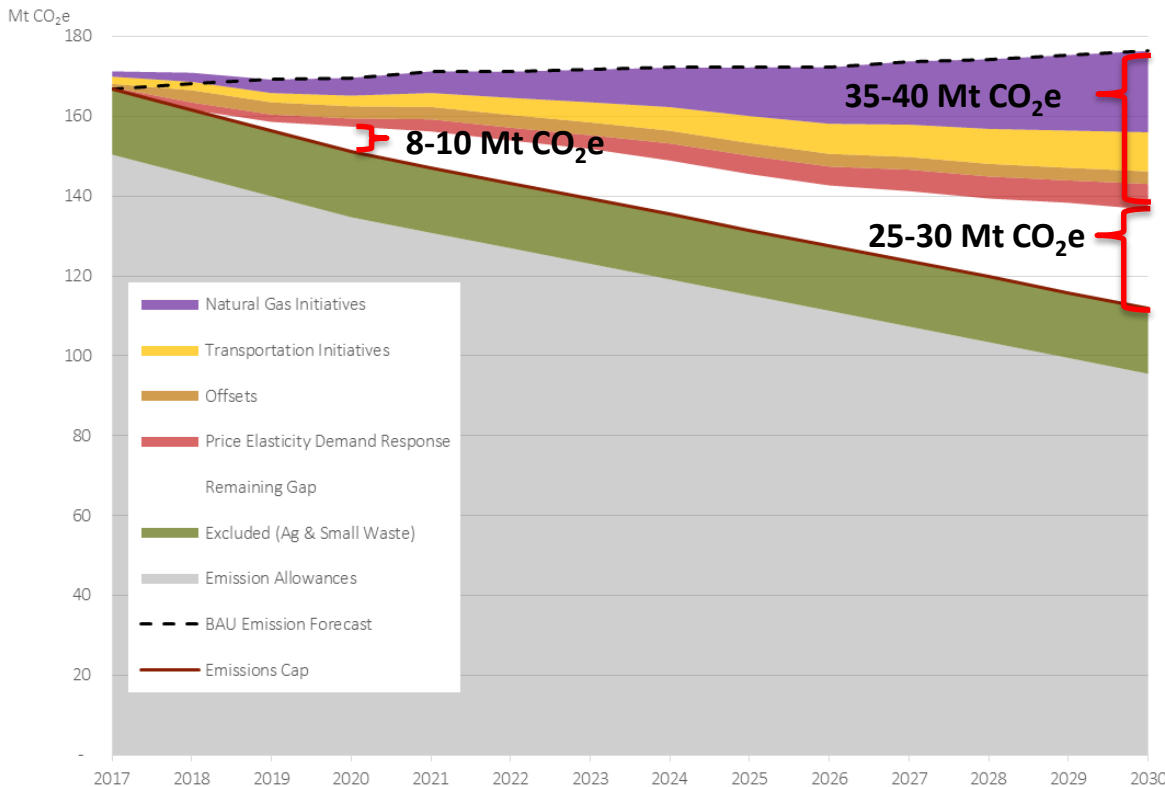
Ontario Forecast Year 1 (2017/18) proceeds of sale of allowance
 (Million \$s) – assuming \$18/tCO₂e (WCI = \$14US@0.77)

- 142M+ total allowances in Year 1
- ~38M free allocated to large industry (95% of 40M) = \$0
- ~104M allowances auctioned.
 - ~\$1.1B (60M) for transport fuels (6-12 buyers).
 - >\$700M (40M) for NG small end users and NG generators (2 buyers).
 - <40\$M (2M) by 100 large industrials (for portion not free allocated).
 - <\$20M (<1M) by electricity importers.
- @18\$/tCO₂ the average family will pay +\$85/yr for NG and +\$106/yr for transport fuel.

Thank You!

UG/EGD Ontario Emission Reduction Forecast

Updated: 2018-06-01
EB-2017-0255
Exhibit JT1.12
Attachment A
REDACTED
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Informed by ICF economy wide model and UG / EGD data.

By 2030

- NG related initiatives (RNG, EE, LNG/CNG, CHP) reduce emissions by 20 Mt CO₂e.
- Refined fuel initiatives reduce emissions by 10 Mt CO₂e.
- Response to increasing fuel prices reduce 5 Mt CO₂e.
- Gap of 25-30 Mt CO₂e.

ASSESS IMPACT of 25-30 Mt CO₂e gap?

Change in Union Gas NG Demand

