Output-based Allocation Stakeholder Session 4

December 6, 2017

Agenda

- 1:00 - Plenary (includes Electricity)
- 15 mins – Q and A
  - Time permitting
- 2:45 – Plenary ends
- 3:00 – Breakouts begin
  - separate links sent out on invitations
- 4:30 - Breakouts end

Plenary Overview

- Context & Background on CCI
- Stakeholder Engagement
- Methodology
- Key Policies
- Compliance Owed Calculation Methodology
- Next Steps

Context and Background

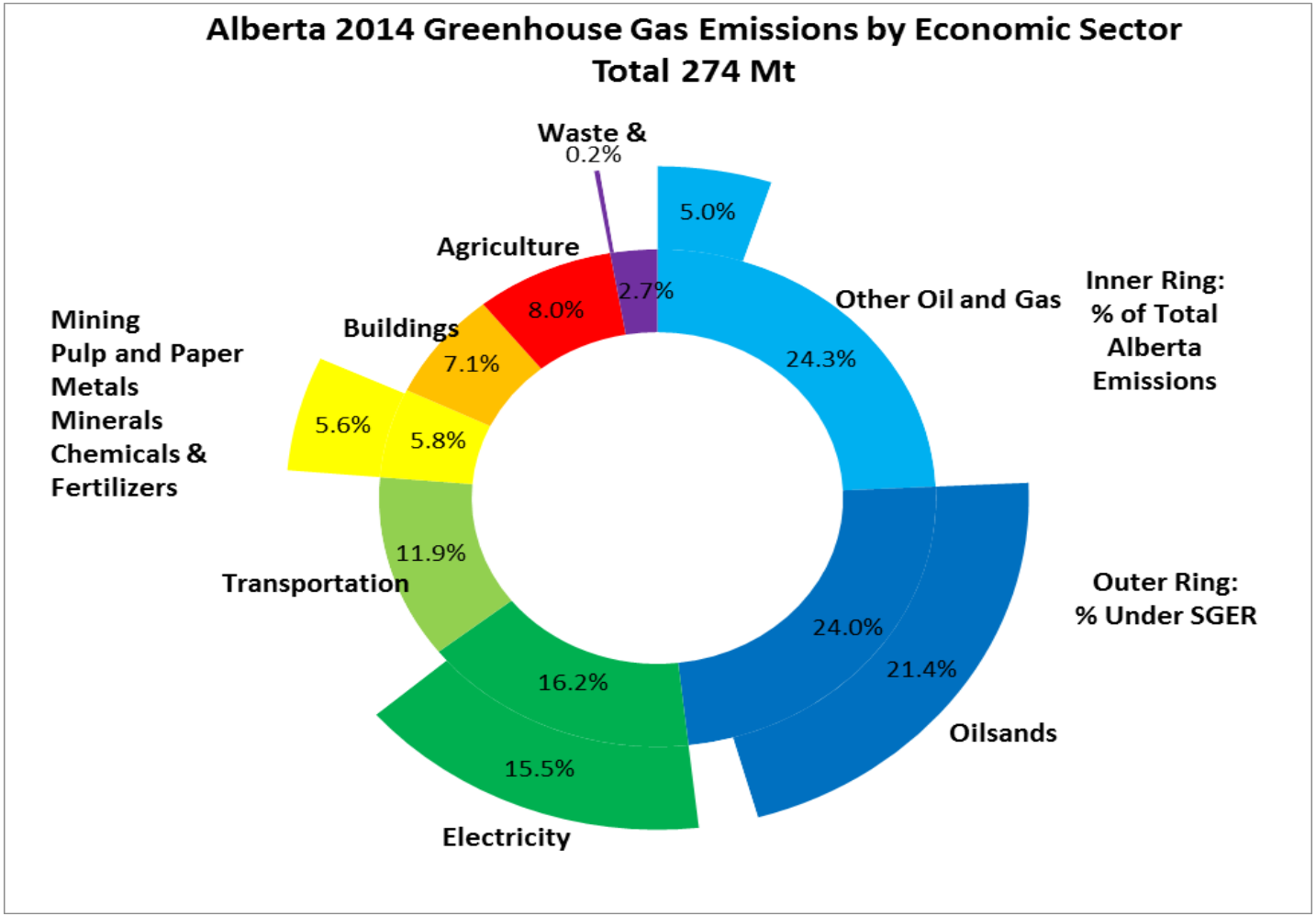
Climate Leadership Plan
November 2015

CLP:

- Coal Phase Out
- Energy Efficiency
- Oil Sands Emissions Limit
- Methane
- Carbon Pricing

Alberta GHG Emissions

- Approximately 48% of Alberta's emissions regulated under SGER
  - Continued regulation industry emissions is key to ensuring comprehensive carbon pricing is applied across economy



Existing Regulatory System

- Specified Gas Emitters Regulation (SGER), expires December 31, 2017.
- SGER:
  - 100,000 tonnes CO2e annual emission threshold
  - Facility-specific benchmarks based on historical performance
  - No signal for increasing stringency over time
- SGER 2015 - 12% reduction target, $15 / tonne
  - 5 % of emissions face costs due to carbon pricing
- SGER 2016 - 15% reduction target, $20 / tonne
  - 7 % of emissions face costs due to carbon pricing
- SGER 2017 - 20% reduction target, $30 / tonne
  - 12 % of emissions face costs due to carbon pricing
    - Opt-in allowed in 2017, “like for like”

Climate Leadership Panel

- Alberta's Climate Change Advisory Panel
  - Heard from a wide range of Albertans including the public, farmers, Indigenous communities, academia, think-tanks and industry representatives on a new climate change strategy for Albertans

- Panel recommended a carbon competiveness regulation to:
  - Achieve meaningful reductions in GHG emissions
  - Provide free allocations to regulated facilities.

Pan-Canadian Framework

- Alberta Carbon Levy and Output-based Allocation are designed to ensure interests of Alberta are protected under forthcoming carbon pricing requirements.

- Federal government requirement for provincial carbon pricing is anticipated in 2018. The federal backstop includes:
  - a carbon price applied to fossil fuels and,
  - an output-based pricing system that applies to designated sectors.

- The proposed federal price rises to $40 in 2021 and $50 in 2022.

Other Jurisdictions

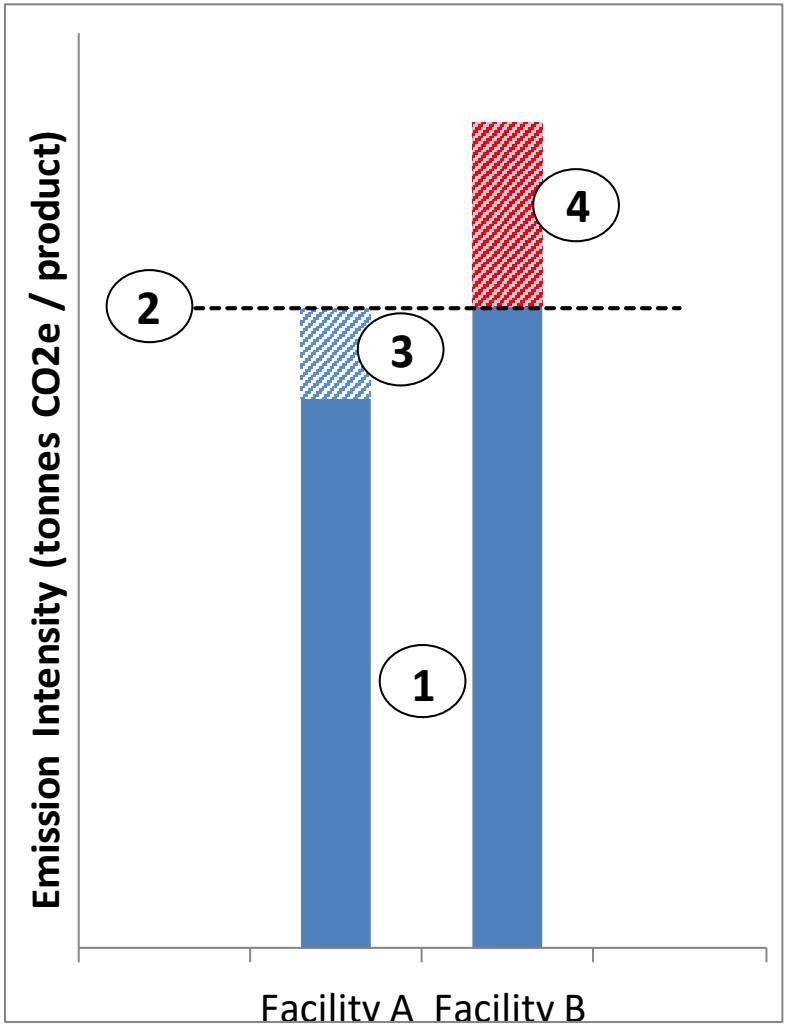
- **EU-ETS (cap and trade, began in 2005)**
  - Benchmark: top 10% of EU facilities
  - No free allocation for electricity – fully priced
  - Two types of tightening rates: reduction rates and correction factors:
    - Cross-sectoral correction factor (~1.5%; all sectors), plus ~8% reduction factor annually for non-EITE sectors
- **California (cap and trade, began in 2013)**
  - Benchmark: 90% of average emissions intensity, or best-in-class
  - Three categories: high, medium or low risk of carbon leakage
  - Tightening rate: generally ~2% annually on all emissions (~1% for sectors with a high proportion of process emissions)
- **Ontario (cap and trade, began 2017)**
  - Benchmark: 100% of sector average
  - Tightening rate: 4.575% annually on combustion emissions

What is an Output-based Allocation?

- The Output-based Allocation (OBA) is the regulation being implemented January 1, 2018
- The OBA applies to:
  - facilities that are large emitters over 100,000 tonnes,
  - sectors and facilities that qualify to opt-in
    - sectors that are emissions intensive and trade exposed or like for like
- The intent of the OBA system is to encourage meaningful GHG reductions by:
  - Comparing facilities against their cohort of peers to encourage leaders.
  - Sending a price signal to influence future investments.
- It provides free allocations to regulated sectors and facilities to minimize:
  - Risk of carbon leakage due to production moving from Alberta to jurisdictions without carbon pricing.

What is an OBA?

1. Product emissions intensity (solid blue).
2. An emissions benchmark is set at top-quartile (or similar) performance. Emissions below the benchmark are not priced i.e. they are allocated as free or incentives for low emissions.
3. Facilities with emission intensity below benchmark generate credits (excess allocations)
4. Facilities with emission intensities above benchmark have a compliance obligation – payment or submission of offsets or emission performance credits.



Stakeholder Engagement

Stakeholder Engagement

- Minister kick-off plus three workshops held between September 2016 and February 2017 in Calgary and Edmonton.
- Divided into four main sector groups representing Large Final Emitters (over 100,000t/year)
- The Pembina Institute was the main ENGO participating across sectors.
- Discussion Document was shared with stakeholders and posted online. It established principles of engagement and scope :
  - Product categories
  - Stringency, benchmarking, tightening rate, review period
  - Indirect emissions; process emissions
  - Competiveness information-sharing and impact-analysis

Stakeholder Engagement

- Feedback was presented to government throughout engagement and decision-making process
- Academic and ENGO main messages:
  - Strong tightening needed – OBAs are a temporary tool on a path to full carbon pricing
  - Electricity not trade exposed – tighten faster
  - No differentiation based on geology or technology
  - Marginal carbon price paramount for any transition options
- Industry main messages:
  - Highly trade exposed
  - Limited ability to reduce emissions; already high performance
  - Technology and geology should be considered in some instances
  - Cumulative effects include federal $50 price in 2022

Methodology

Process

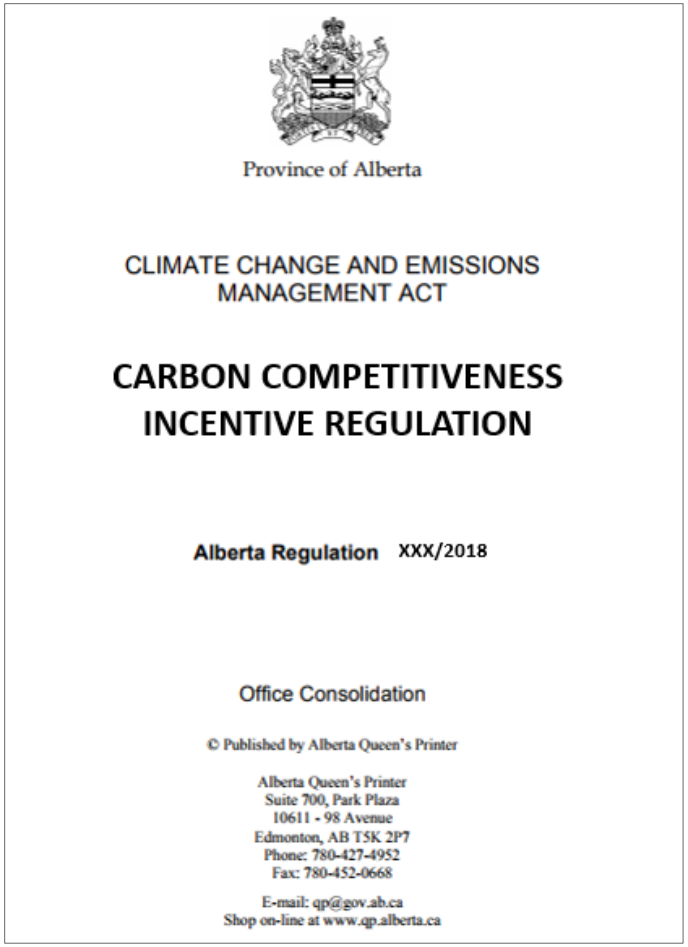
- ACCO followed a process that closely aligns with international best practices for establishing industry benchmarks.
  - Planning, Data Collection, Analysis, Implementation, Monitoring and Improvement.
  - Engage stakeholders at all stages.
- Conducted analysis with assistance of:
  - EnviroEconomics, Dave Sawyer
  - Department of Energy and AESO
  - Department of Treasury Board and Finance
  - Multi-ministry economic analysis working group
  - Alberta economists/industry experts

[1]Partnerships for Establishing Market Readiness *Guiding Principles for Establishing Benchmarks*

Key Policies

Key Policies

1. Phase-in
2. Compliance Flexibility
3. Tightening Rate
4. New Entrants
5. Opt-In/ Opt-out
6. Review Period
7. Emissions Coverage
8. Product Categories
9. Benchmarking
10. Cost Containment
11. Compliance Calculation



Province of Alberta

CLIMATE CHANGE AND EMISSIONS MANAGEMENT ACT

CARBON COMPETITIVENESS INCENTIVE REGULATION

Alberta Regulation XXX/2018

Office Consolidation

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(Specific Q and A's should be reserved for breakout sessions with regulated companies).

#1 -Phase-In

Approach

- Transition allocation will be provided to facilities.
- Additional allocation, based on historic performance:
  - 50% compliance in 2018
  - 75% compliance in 2019
  - Value of transitional allocations can not be greater than the equivalent of SGER 2016 compliance obligation
  - Full benchmark in 2020
  - Does not apply to electricity
- Applies to facilities in compliance and crediting positions.
- Transition allocations
  - Additional output based allocation for the transition years
  - Calculated at the facility level based on the historic information used to calculate benchmarks

#2 - Compliance Flexibility

- ACCO conducted focused engagement in July/August.
  - Policy goals: Maintain functional market, enable fiscal planning, and avoid recreating credit bubble

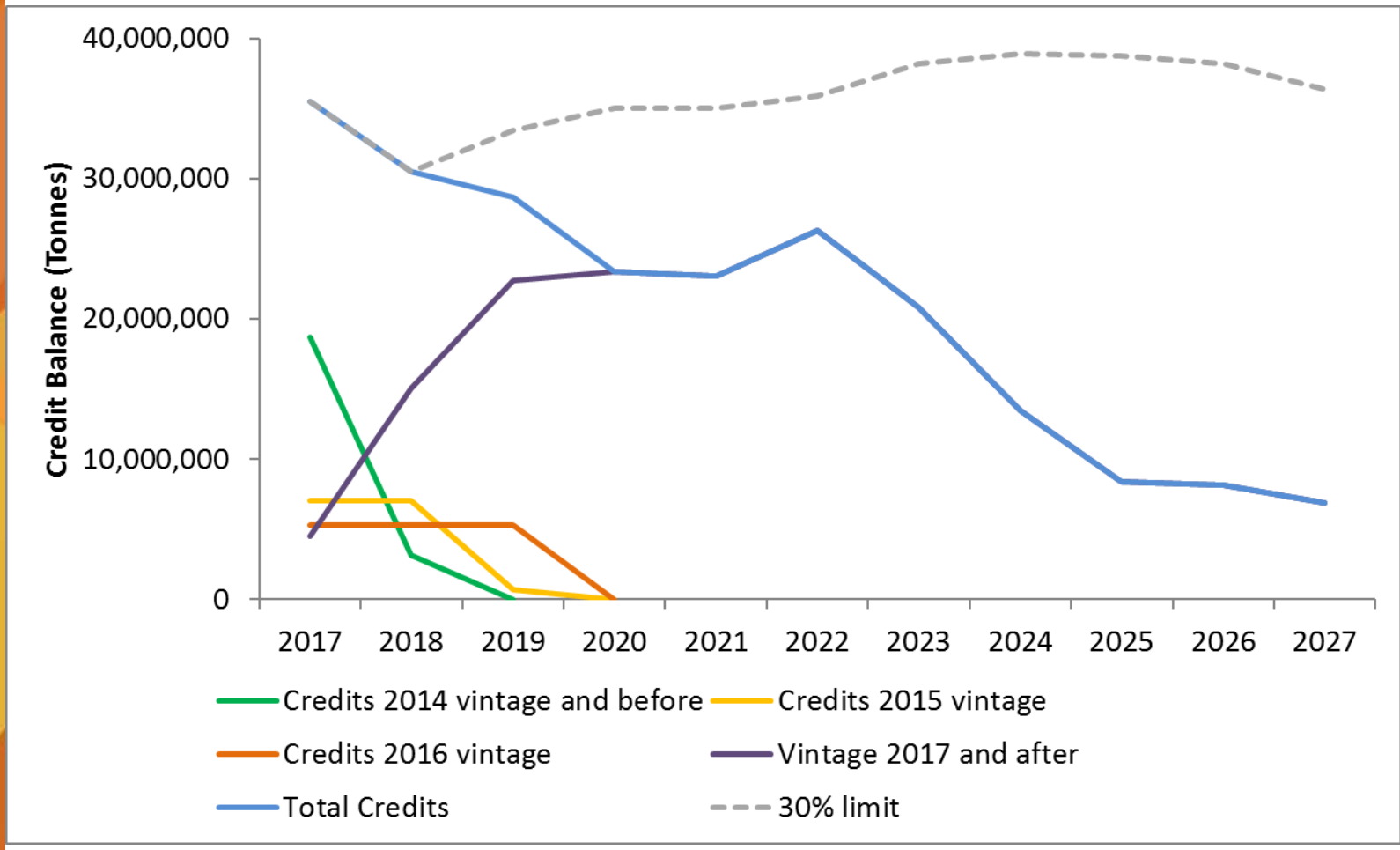
Approach

- Revise the previous 30% to a base limit of 40% plus additional allowance for New credits starting at 10% in 2018
  - New credits are defined as 2017 vintage and newer.
  - Credits = EPCs and Offsets

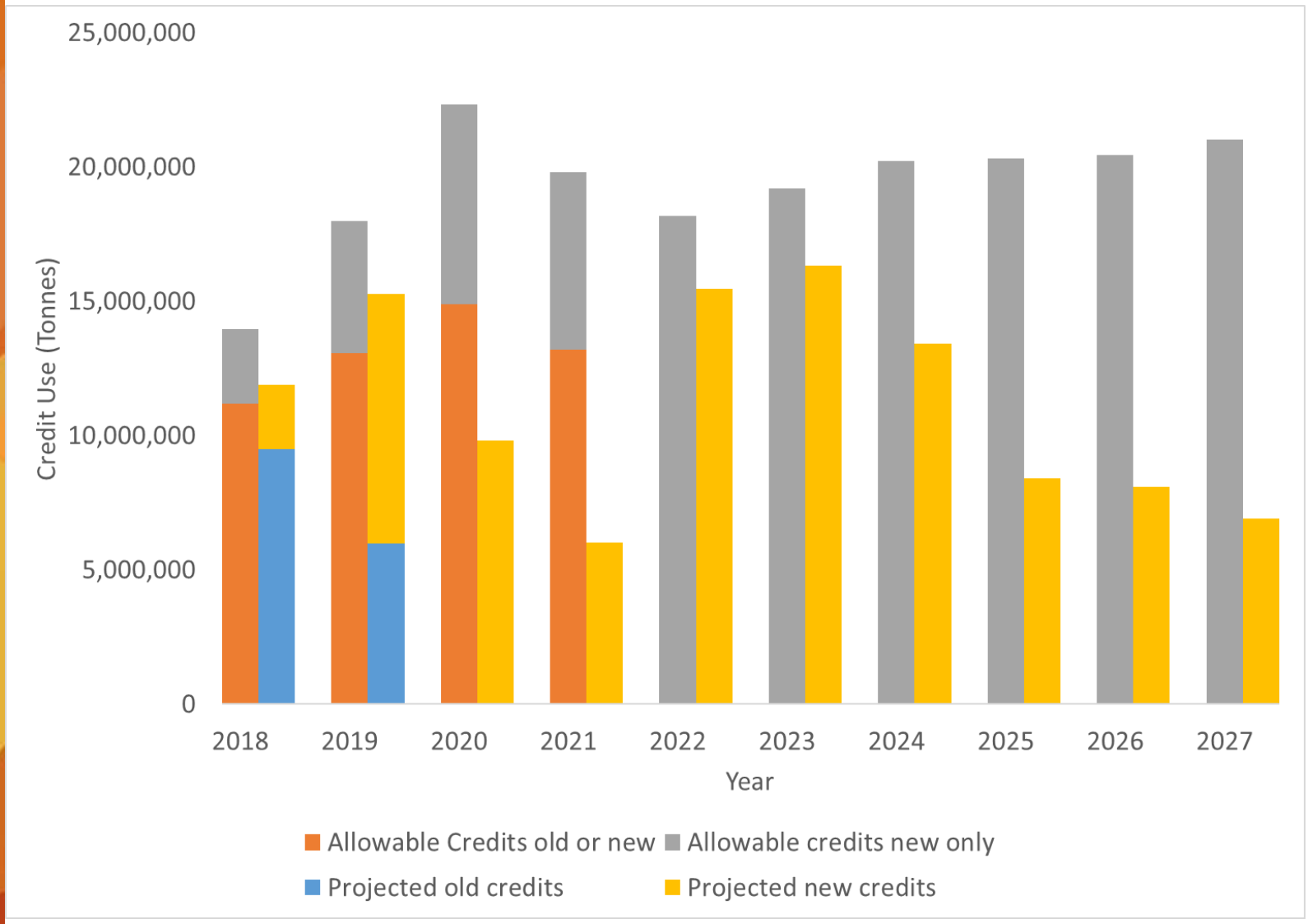
Policy Option	Credit Limit on	2018	2019	2020	2021	2022
Revised Approach – based on Engagement and Policy Phase-In	New and old	40%	40%	40%	40%	60%
	New	10%	15%	20%	20%	

- Create an expiry period for credit vintages where:
  - credits from 2014 and older expire after 2020 compliance
  - credits from 2015 expire after 2021 compliance
  - credits from 2016 expire after 2021 compliance
  - New credits from 2017 and newer expire after 8 years.

Projected Credit Balance



Credit Use vs. Allowable



Reporting and Forecasting

- There are no new reporting requirements for facilities.
- As announced Spring 2017, only regulated facilities emitting over one megatonne shall submit quarterly compliance reports and annual forecasts.
- Quarterly interim compliance report and true-up
  - for quarter one, by May 15 of that year;
  - for quarter one and two, by August 15 of that year; and
  - for quarters one, two and three, by November 15 of that year
  - full calendar year, by March 31 of the following year (verified, all facilities)
- Submit forecast by end of November for upcoming year.
  - 2018 forecast due January 15
- Quarterly true-up must match the proportion credit use provided in forecast.
  - Updates to forecast allowed with each quarterly report.
- Webinar to follow on December 6, 2017

#3 - Tightening Rate

- A tightening rate is an annual reduction in free permits allocated to a regulated emitter, as a percentage.
- The Climate Leadership Panel recommended 1-2% per year.
  - Other systems vary, with Ontario at 4+% tightening but in a different system.
- Provides consistent signal for emissions improvement; can drive innovation and investment in abatement technologies.

Approach

- 0% tightening rate in 2018 and 0% in 2019, 1% tightening rate starting in 2020.
  - Applies to all emissions except Industrial Process emissions, which are generally subject to 0% tightening rate.
  - Regularly assessed at review.

#4 - New Entrants

- New facilities receive up to two years with no compliance to normalize emissions;
  - Allows time for most facilities to stabilize operations prior to facing compliance
- There are two possible types of new entrants:
  - New or Existing facilities that exceed 100,000 tonnes threshold
  - Opted-in facilities.
- Benchmarks:
  - Opting-in facilities will receive a product benchmark where available
  - Where a product benchmark is not available facilities will receive standard facility-specific benchmarking approach.
  - New product benchmarks in the OBA system may be developed for products not currently considered in the OBA.

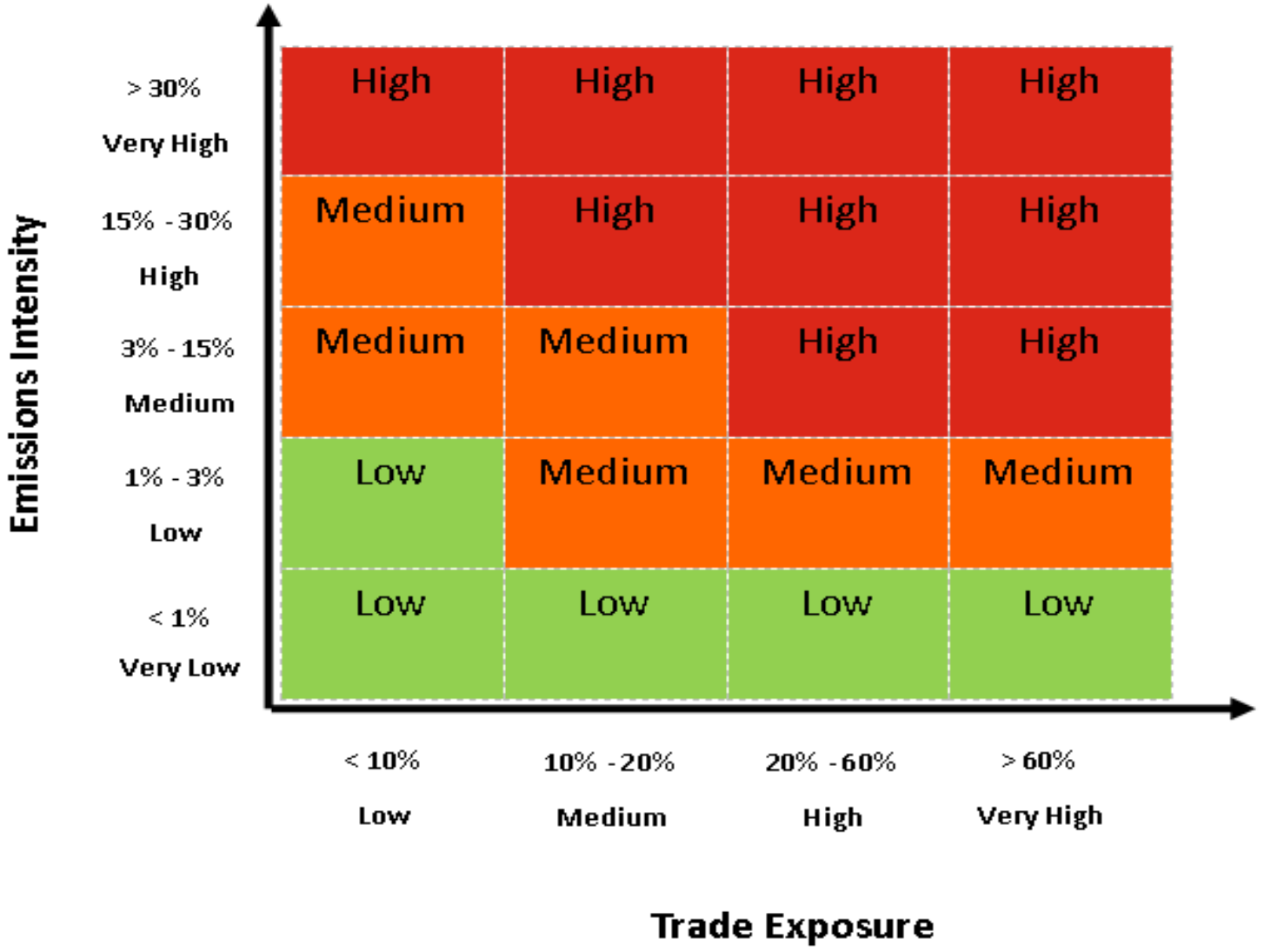
#5 - Opt-In / Opt-Out

- The CLP recommended that similar facilities producing EITE goods under 100,000 tonnes be permitted to opt-in to the OBA.
- SGER 2017 provided opt-in for facilities producing the same product as a competitor under SGER – “like for like”.
- A regulation with significant reporting and administrative costs is not likely suitable to most smaller emitters.

Approach

- Facilities may opt-in to the OBA System if they fall under one of the following two categories:
  - "Like for like", meaning that there is the same product category or sector that is currently regulated under OBA, OR
  - The facility emits at least 50,000 tonnes of emissions of CO2 equivalent per year and is part of High EITE sector.
- Facilities that have opted in will also have the ability to opt-out, provided that the facility’s emissions coverage will be equivalent under the levy or comparable regulatory system.

Economic Impact Analysis – Emissions Intensity Trade Exposure



#6 - Review Period

- A regulatory review period specifies the time interval and scope of the formal opportunity for revision of the OBA.
- The Climate Change Panel Report to Minister recommended that reviews on a sector basis to:
  - Ensure balance between emissions reductions and maintaining competitiveness, and
  - Adjust to changing global commodity markets and climate policies

Approach

- Interim assessment by Dec 31, 2020 focusing on:
  - Stringency and any impacts associated with federal price
  - Any remaining interim benchmarks
  - New entrant and opt-in facility benchmarks
- Full review by the end of fifth year in force and every five years thereafter (i.e. review by the end of December 2022)

#7 - Emissions Coverage

- OBA will continue to regulate specified gas emissions and sources listed within the Specified Gas Emitters Regulation, including:
  - GHGs include carbon dioxide, methane, nitrous oxides, specified HFCs and PFCs (refrigerants) and sulphur hexafluoride. Expanded to match NIR.
  - Sources include stationary fuel combustion, on-site transportation, venting and flaring, fugitives, formation CO2, waste and waste water.
- Quantification requirements are under development and will be discussed in dedicated workshop.

Emissions Coverage cont'd…

- Industrial Process (IP) Emissions
  - Regulated and provided free allocation benchmark at 100% of sectoral average, or 100% of facility average where facility-specific benchmark exists.
  - Product categories using a complexity weighted barrel approach (such as refining) will treat industrial process emission the same as all other emission sources.
- Biomass Emissions
  - Carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O).
  - Consistent with other jurisdictions:
    - Biomass CO2 emissions excluded from compliance and OBA emissions threshold, but included in reporting requirements.
    - Biomass CH4 and N2O emissions included in emissions threshold and compliance obligations.

Emissions Coverage cont'd…

- Indirect emissions
  - To ensure fair treatment of facilities, regardless of technology choices (i.e. self-generate vs import electricity) accounting for indirect emissions is required.
  - Facilities with cogeneration receive free emissions allocations (i.e. OBAs) for both products they produce and export – heat and power:
    - 0.3700 tonnes / MWh for electricity
    - 0.06299 tonnes / GJ for heat
  - Accounting for indirect emissions means that facilities that import heat, power, or hydrogen do no receive those same free emissions. This scope adjustment means a reduction to the total free emissions allocations provided to that facility, and are applied at the following rates in 2018 :
    - 0.3700 tonnes / MWh deducted for imported electricity
    - 0.06299 tonnes / GJ deducted for imported heat
    - 7.970 tonnes / tonne deducted for imported hydrogen
  - Product categories using a complexity weighted barrel approach (such as refining) will not require this treatment for hydrogen.

#8 - Product Categories

- Product categories are the basic building blocks of the regulation. They facilitate comparison of emissions performance.
- The Climate Leadership Panel recommended one product receive one benchmark, and specifically:
  - Electricity produced (MWh)
  - Mined barrel of bitumen
  - In situ barrel of bitumen
  - Complexity-weighted barrels (CWB) for refining and upgrading

OBA

- Follows “One Product, One Benchmark” principle where verified data allowed.

Product Categories (cont'd)

OBA– Interim Benchmarks

- For three sub-sectors, data challenges did not allow for the product category recommended in engagement.

- These sub-sectors receive interim facility-specific benchmarks:
  - Upgrading
  - Natural gas processing
  - Multi-product chemical facilities

- Interim benchmarks are intended to transition to product-based benchmarks in collaboration with industry as soon as possible.

Product Categories (cont'd)

1. Megawatt Hour of Electricity
2. Barrel of Bitumen (in-situ)
3. Barrel of Bitumen (mined)
4. Complexity Weighted Barrel (Refining)
5. Upgrading (interim)
6. Natural Gas Processing (interim)
7. Natural Gas Transmission Networks (Pipelines)
8. Linear Alpha Olefins
9. Calcined Coke
10. Iso-Octane
11. Carbon Black
12. Methanol
13. Ethylene, Polyethylene, Ethylene Glycol, Styrene (interim)
14. Ammonia
15. Ammonium Nitrate
16. Other Fertilizer Products
17. Metals (Nickel + Cobalt)
18. Magnesium Oxide
19. Lime
20. Cement
21. Bituminous Coal
22. Subbituminous Coal
23. Hardwood Kraft Pulp
24. Softwood Kraft Pulp
25. Landfill Methane Generated
26. Live Cattle Weight
27. Hydrogen
28. Industrial Heat

#9 Benchmarking

What is a benchmark?

- Benchmarking is a method of comparing relative performance. It is one element of policy stringency.
  - Using product benchmarks, all facilities within a sector receive the same allocation per unit production.

Data Sources

- Verifiable data
- SGER compliance reports
- Additional data provided by facilities and verified by ACCO

Baseline

- In the majority of cases, three years of data was used for benchmark development: 2013, 2014, and 2015.
  - To reflect best practice to use most recent available data

Benchmarking

- Maintain Climate Leadership Panel recommendations for:
  - Good-as-best-gas standard for electricity
  - Top-quartile production-based for in-situ and mined bitumen
- For all other sectors:
  - 80% of production-weighted average (PWA)
  - Adjusted if needed based on economic-impact analysis, upward by 10% increments (90 PWA, 100 PWA)
  - Best-in-class to ensure benchmark does not fall below the best performing facility in the sector.
- Where product-based benchmarks were not possible (e.g. only 1 facility produces that product):
  - Facility-specific benchmarks with 80% PWA based on years of production with same adjustments for economic impact.
- Some exceptions to the standard approach – these will explained in further detail in sector breakout sessions.

Benchmarking - Economic Impact Analysis

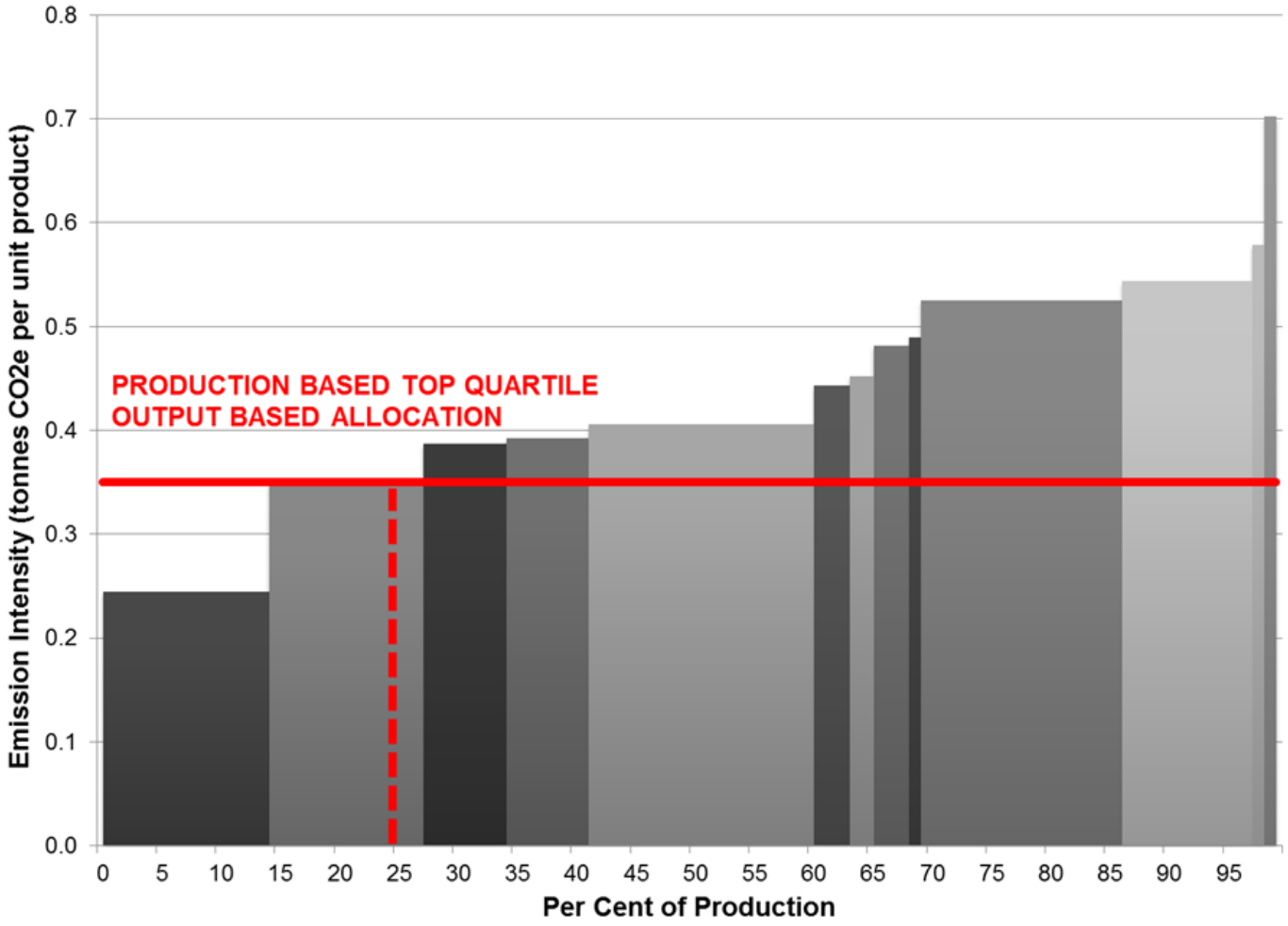
Sales/Profit Tests

- Analysis by EnviroEconomics by product and by facility using best available data.
- Facility Impact defined as greater than 3% to sales or greater than 10% to profits may present risk to facilities.

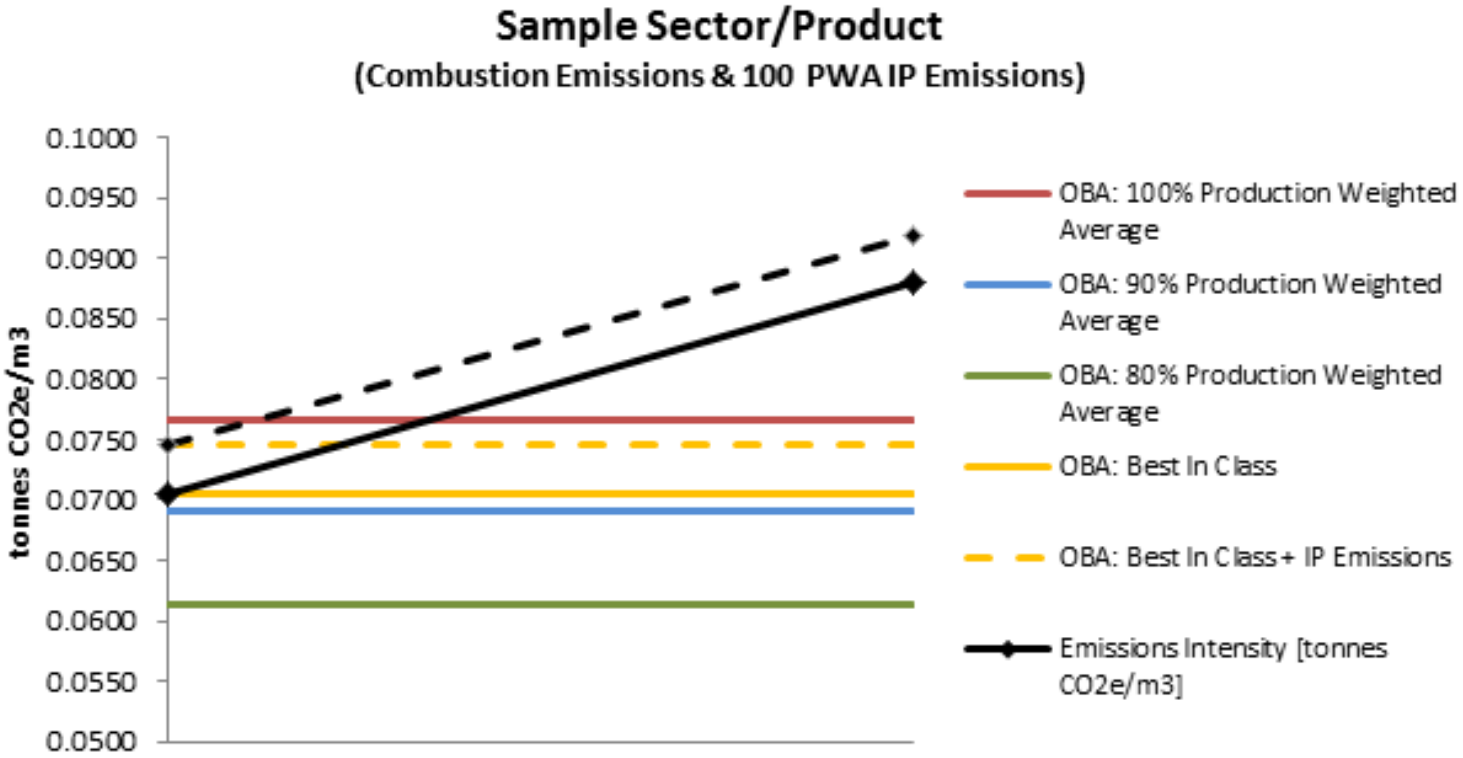
CGE Modeling

- ACCO conducted economy-wide modeling to assess changes in sector and provincial GDP levels relative to SGER 2015.
- Benchmarks were adjusted upward based on the following criteria:
  - % of Production exceeding Sales Test > 10%
  - % of Production exceeding Profit Test > 25%
  - % Reduction in Sector GDP > 5% per year or
  - EITE of High or Very High at the 4 or 6 digit NAICS

Benchmarking - Illustrative Example
Production Based Top Quartile



Benchmarking - Illustrative Example
Percent of Production Weighted Average



#10 – Cost Containment

- Impacts to individual facilities are addressed through supports and tools to assist facilities to reduce GHGs and therefore reduce compliance costs:
  - Transition Allocation (phase in)
  - $1.368 Billion in funding towards Industrial Energy Efficiency, funding to support innovation, Green Loans and other programs announced Dec 5, 2017.
  - Additional measures for substantial hardship
- Program to be finalized early 2018:
  - Transparent criteria, eligible to all sectors, consistently applied in accordance with trade law
  - Temporary, proportionate to regulatory impact
  - Planned improvements to emissions intensity
  - Based on auditable statements, and
  - Application substantiated through third-party audit

#11 - Compliance Owed Calculation Methodology

$$\textbf{Compliance} = TRE - \left[\left(\sum_{i=Product\ 1}^{Product\ n} OBA_i \times \boldsymbol{P}_i\right) - Scope\ Adj. + \left(\sum_{i=Product\ 1}^{Product\ n} TA_i \times P_i\right)\right]$$

Where:

- **TRE =** Total Regulated Emissions in a facility are*:*
  - all direct GHG emissions in tonnes CO2e, less biomass CO2 emissions, less CO2 brought on site which has been reported at another facility subject to the regulation, plus CO2 sent offsite including as a product, plus CO2 used as a feedstock for the production of urea
- P_i : Production of product i
- $Scope\ Adjustment = Electricity_{Import} \times OBA_{Electricity} + Heat_{Import} \times OBA_{Heat} + Hydrogen_{Import} \times OBA_{Hydrogen}$
- TA_i = Transition Allocation per unit of product..
  - TA is based on phase in schedule, SGER 2016 floor or zero depending on facility and sector.
  - TA for phase in schedule calculated at 50% of OBA compliance based on historic emissions and production for 2018, and 25% for 2019, zero for all facilities from 2020 onwards
  - Facilities will be informed of their transition allocations for 2018 and 2019 individually

Note1: Scope Adjustment for the refining sector does not include hydrogen imports.

Note2 : any exported Electricity, Heat, or Hydrogen would be accounted for as a product in the Production term.

Next Steps

- **Stakeholder meetings will be scheduled in early December and continue on into the New Year.**
- **The Alberta Climate Change Office intends to:**
  - **Release final regulations in December/January**
  - **Release policy standards documents in December/January, including details on:**
    - Compliance and regulatory requirements
    - Quantification requirements
    - Benchmarking methodology and approach standards
- **Ongoing stakeholder support (technical webinars), as needed**
- **OBA regulation will come into effect January 1, 2018**

Alberta Government

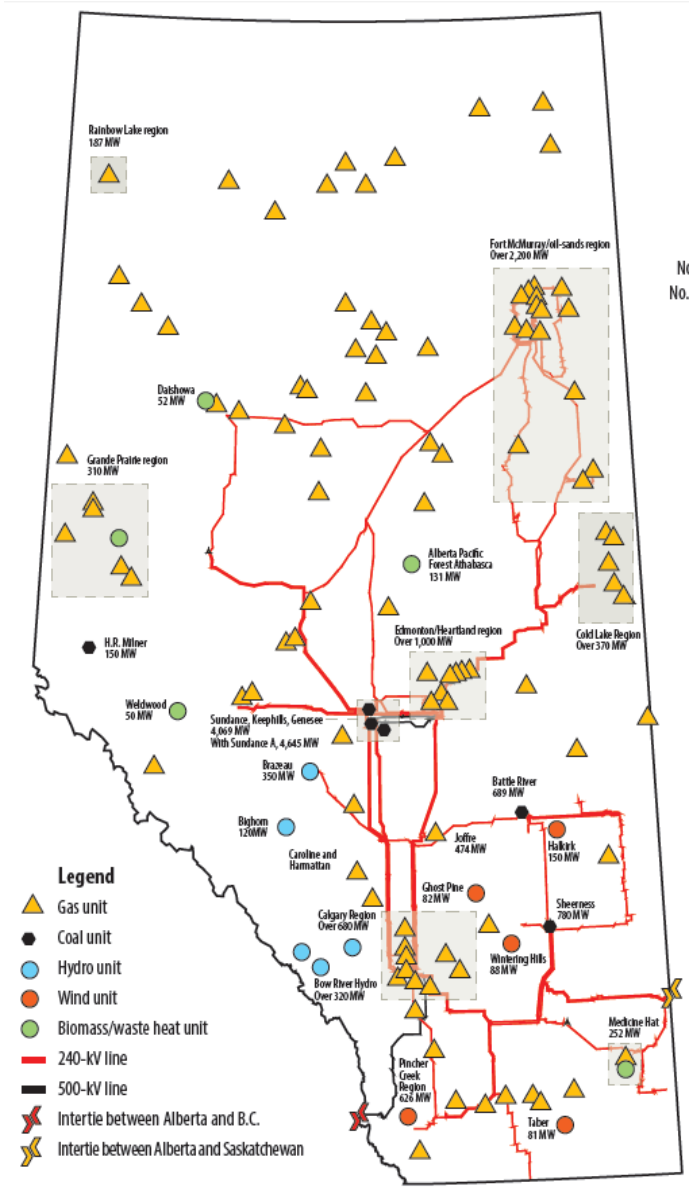
Electricity
Carbon Competitiveness Incentive (CCI)

CCI Engagement

December 8, 2017

Electricity Sector in Alberta – Sector Map

- Electricity is not a trade exposed sector, and is therefor a unique sector in the CCI system
- However electricity is a critical input to Alberta's most trade exposed sectors



Key CCI Policy Elements

- Benchmark = 0.37 t/MWh
  - This is in following with advice of Climate Leadership Panel's recommendation for "good-as-best" gas standard
- One product category for all electricity regardless what generation technology is used
- Renewables are able to opt-in to CCI
  - Renewables receiving offsets or REP funding not eligible until offsets projects/REP contracts are finished.
- Tightening rate set at 1% starting in 2020.

Questions