



ALBERTA: AN EMISSIONS TRADING CASE STUDY



Alberta

The World's Carbon Markets: A Case Study Guide to Emissions Trading

Last Updated: April 2015

Compliance Period (2015)	
Target	50 million tCO ₂ e reduction by 2020, compared with BAU projections
Cap	12% below established 2003-05 baseline emissions
Carbon price	CAD \$15/tCO ₂ e
Greenhouse gases Covered	Carbon Dioxide (CO ₂), Methane (CH ₄), Nitrous Oxide (N ₂ O) Sulphur Hexafluoride (SF ₆) Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs)
Number of Entities Covered	108 (2013)
Sectors Covered	Chemical and fertilizer manufacturers; coal mines; forest product producers; gas plants; mineral and metal processors; oil sand mines, upgraders and extractors; petroleum refiners; pipeline transportation; power plants; waste management
Threshold	> 100,000 tCO ₂
% Total Emissions Covered	50% (of Alberta emissions)
Compliance tools & Flexibility mechanisms	Offset credits, financial contributions to an emissions management fund, emission performance credits

Table 1: Program Overview

Brief History and Recent Developments

Year	Event
1988	Alberta announced first Strategy for Action on Climate Change
2002	First climate action plan released: Albertans and Climate Change: taking action
2003	First Canadian province to develop climate change legislation - Climate Change Management Act
2004	Specified Gas Reporting Standard was established
2007	Specified Gas Emitters Regulation (SGER) came into force
2008	Alberta sets 2020 emission reduction target of 50 million tCO _{2e} below business as usual
2010	Alberta meets target to reduce emissions by 20 million tCO _{2e}
2013	Cumulative greenhouse gas reductions achieved from SGER between 2007 and 2013 equal 51 million tonnes CO _{2e} and the collection of \$497 million in the Climate Change and Emissions Management Fund to be invested into climate change mitigation or adaption projects
2014	Government extends expiration deadline of SGER, and other greenhouse gas regulations, until June 2015

Table 2: Key Dates

In 2013, Alberta emitted 267 million tonnes of carbon dioxide equivalent (million tCO_{2e}), which was the highest amount of greenhouse gases (GHG) emissions of the 13 Canadian provinces and territories.¹ Alberta accounted for 36.8% of Canada's overall emissions (726 million tCO_{2e}).¹ Alberta has the world's third-largest supply of proven crude oil reserves, after Saudi Arabia and Venezuela.² Because of its role as a global energy supplier, Alberta has an emissions profile dominated by industrial activity and the fastest growing economy of the Canadian provinces and territories.³

In 2002, the Alberta Government released an action plan outlining the province's approach to managing GHG emissions. This action plan led to the *Climate Change and Emissions Management Act* (CCEMA), which was passed in 2003. CCEMA developed a mandatory emissions reporting program, established in 2004, which required all facilities in Alberta emitting over 100,000 tonnes of CO_{2e} (tCO_{2e}) per year to submit an annual report on their previous year's GHG emissions. The reporting threshold was later changed in 2010 to apply to all facilities emitting more than 50,000 tCO_{2e} in 2010.⁴

In 2007, Alberta passed the *Specified Gas Emitters Regulation (SGER)*, North America's first GHG emissions regulation for large emitters and compliance carbon pricing system. SGER requires large emitting facilities to reduce baseline emissions intensities from 1 July, 2007 by 12%, during each compliance period. In order to meet their intensity reductions, covered facilities have four compliance options:

- Reduce on-site emissions;
- Purchase or use emission performance credits issued on the Alberta Emission Performance Credit Registry;
- Purchase Alberta-based offset credits; or
- Contribute to the Climate Change and Emissions Management Fund.

¹ Note: in 2013 Environment Canada's National Inventory Report quantified emissions with IPCC 2007 global warming potentials and IPCC 2006 Guidelines. For comparison to SGER 2013 compliance, Alberta's emissions as quantified with IPCC 2004 global warming potentials were 261 million tCO_{2e}.

Although the SGER was intended to expire in September 2014, it, along with the Specified Gas Reporting Regulation, the Administrative Penalty Regulation and the Climate Change and Emissions Management Fund Administration Regulation, has been extended through the end of June 2015 to explore new approaches to mitigating emissions and meeting future targets.⁵ The review offers an opportunity for Alberta to expand incentives to reduce emissions through technological innovations and energy efficiency measures or to modify or terminate existing legislations. Communication regarding the Alberta government's future Climate Change Strategy is expected in spring 2015.

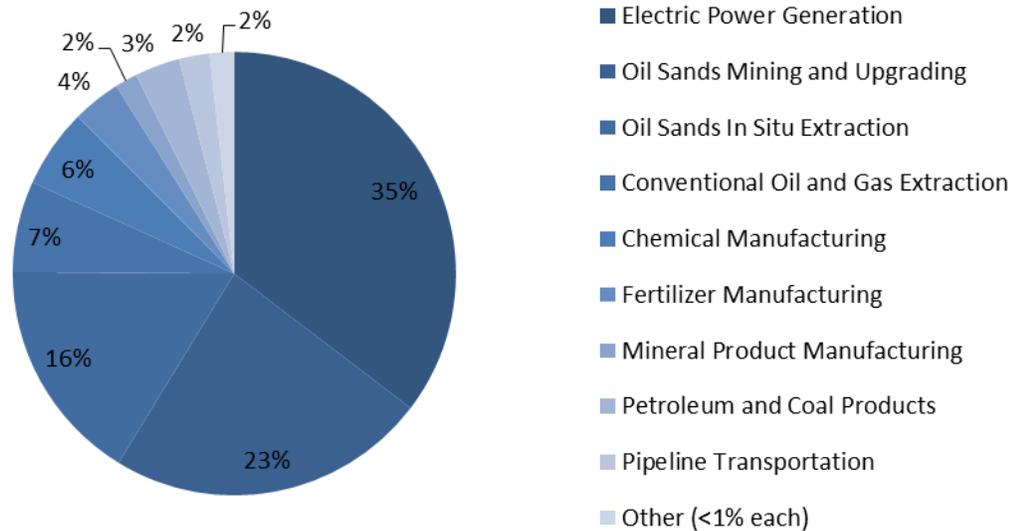


Figure 1: Total reported 2013 Alberta Greenhouse Gas Emissions by Industrial Sector

Source: Alberta Environment & Sustainable Resource Development Greenhouse Gas Reporting Program data, 27 April 2015

Summary of Key Policy Features

TARGET: Alberta's program sets a facility-level emissions intensity goal, as opposed to an absolute cap on aggregate emissions. Facilities' total annual emissions are divided by their total annual production. As such, the program allows the increase of GHG emissions annually as production expands so long as the facility is able to reduce GHG emissions per production unit through flexible compliance. For facilities existing in 2000, the goal is to reduce annual emissions intensity by 12% below a baseline established using 2003-05 averages for emissions and production.⁶

The baseline for new facilities is established during its first three years of commercial operation.⁷ Importantly, Alberta's SGER does not have a declining absolute target for facilities over time, but instead requires facilities to meet a constant emissions intensity target each year. The compliance obligation for these facilities begins at a 2% reduction per year, starting in the fourth year of commercial operation, and tightens by 2% each year until a 12% reduction target is reached (over a six-year period).⁸ Figure 2 depicts Alberta's planned emissions path relative to business as usual (BAU). With the exception of SGER's first compliance period, which spanned only six months and ended on 1 December, 2007,⁹ all of Alberta's compliance periods have been annual.

In 2008, the Alberta Government developed their Climate Change Strategy which outlines Alberta's emission reduction targets through to 2050:¹⁰

Year	Goal	Result
2010	Reduce projected emissions by 20 million tCO _{2e}	Meet intensity target established in 2002
2020	Reduce projected emissions by 50 million tCO _{2e}	Stabilise GHG emissions and begin reductions
2050	Reduce projected emissions by 200 million tCO _{2e}	Emissions reduced by 50% below BAU level and 14% below 2005

Table 3: Alberta's Climate Change Strategy

Source: Government of Alberta, 2008. Alberta's 2008 Climate Change Strategy. Available at: esrd.alberta.ca

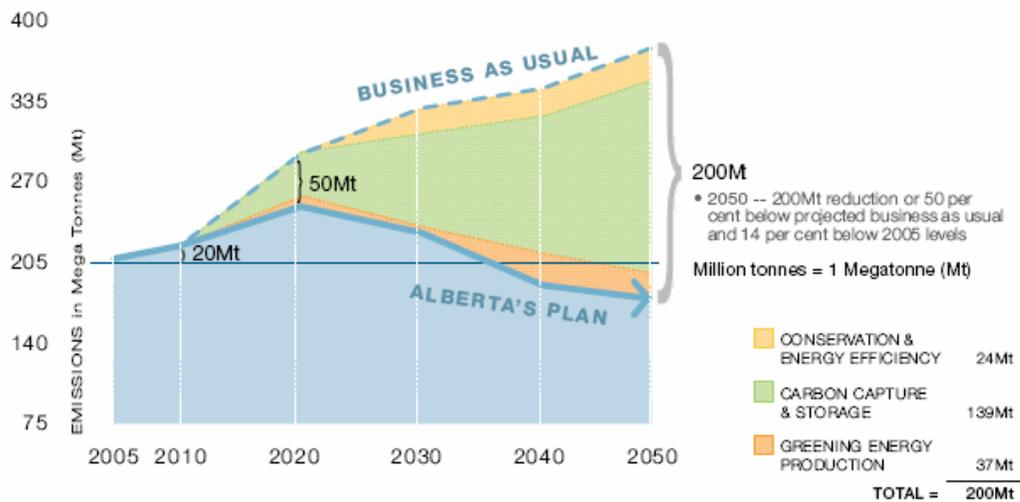


Figure 2: Alberta's Planned Emissions Reductions 2006-2050

Source: IETA Greenhouse Gas Market 2012

SCOPE/COVERAGE: Alberta's program covers any facility that emitted 100,000 tCO_{2e} or more in 2003 or any subsequent years.¹¹ The SGER covers all sectors and includes emissions from: chemical and fertilizer manufacturers; coal mines; forest product producers; gas plants; mineral and metal processors; oil sand mines, upgraders and extractors; petroleum refiners; pipeline transportation; power plants; and waste management.¹² Industrial process emissions and CO₂ emissions from biomass are exempt from compliance requirements, although reporting is required for any facility emitting more than 50,000 tonnes CO_{2e} annually.¹³ Alberta's program covers direct emissions of six gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) sulphur hexafluoride (SF₆), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs). In 2013, Alberta's program covered 108 facilities in 13 economic sectors¹⁴ and encompassed 50% of Alberta's GHG emissions.¹⁵

COMPLIANCE: As an intensity-based program, there are no allowance distributions or auctioning rules in place. Instead, each covered facility is obligated to achieve a 12% reduction below its established baseline intensity. Baselines can be revised if:

- the Alberta Environment and Sustainable Resource Development's representative appointed under the SGER (The Director) believes original baselines are inaccurate;
- the facility has undergone an expansion or significant change;
- for additional reasons at The Director's discretion.¹⁶

Facilities can comply with their intensity target by using one of the four pathways proposed by the SGER:¹⁷

- **Reduce emissions intensity on-site** through improvements in facility operations and efficiency.
- **Pay a fee** of CAD \$15 per tonne of CO_{2e} per year to Alberta's Climate Change and Emissions Management Fund (CCEMF), a dedicated fund to achieve emissions reductions in Alberta or prepare the province to adapt to changing climate. Much of the fund has been granted to the *Climate Change and Emissions Management Corporation (CCEMC)*, who have invested in green technology and innovation projects. For each payment to the fund, a facility obtains one fund credit equal to one tonne reduction in CO_{2e}. This fund creates a pool of resources that enables additional investments in reducing emissions or adapting to climate change.
- **Purchase an emission offset** generated from non-covered activities in Alberta. A one tonne reduction in CO_{2e} from a non-covered activity constitutes one emissions offset.¹⁸
- **Purchase or use Emissions Performance Credits (EPCs)** from covered facilities that have reduced their emissions intensity below their target and want to sell any extra reductions, or from their own stocks of banked credits from previous years.

Net emissions intensity is calculated using the following equation:

$$\text{Net Emissions Intensity} = \frac{[\text{Emissions Intensity of Covered Facility's Operations} - (\text{Fee} + \text{Offsets} + \text{Credits})]}{\text{Production}}$$

Where the fee is equal to the number of credits received from paying into the CCEMF; offsets equals the number of credits received from purchasing qualified emissions offsets; and, credits equals the number of EPCs purchased from over-achieving entities or banked from previous years at an over-achieving facility.

Requirements for Climate Change and Emissions Management Fund (CCEMF)

Credits received from funds paid to the CCEMF cannot be banked for future use. Specifically, a technology fund credit obtained before the annual compliance deadline (on 31 March) can only be used in meeting a facility's net emissions intensity limit for the previous year. Similarly, a fund credit obtained after the annual compliance deadline can only be used for compliance in that year. Fund credits may also be used to reconcile errors in previous reporting years¹⁹

To date, the CCEMC has invested CAD \$248.9 million in 100 projects focusing on energy efficiency, clean and renewable energy and adaptation issues.²⁰

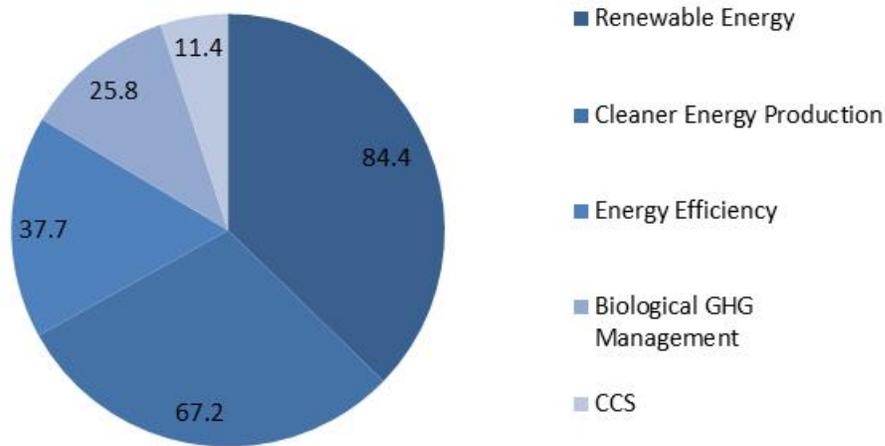


Figure 3: CCEMC Funding by Strategic Investment Area (\$ millions)

Source: CCEMC, Available at: ccec.ca

Requirements for Emissions Offsets

The SGER details the following requirements for offset eligibility. The reduction must:²¹

- have occurred in Alberta;
- be from an action that is not required by law at the time of its initiation;
- result from actions taken on or after 1 January, 2002, and must occur on or after 1 January, 2002;
- be real, demonstrable, quantifiable and measurable.

Alberta has approved many existing **quantification protocols**. Alberta draws on related protocols to inform its quantification, monitoring and reporting, including – but not limited to – the Clean Development Mechanism (CDM), the Climate Action Reserve (CAR), the World Resources Institutes (WRI), and the Intergovernmental Panel on Climate Change (IPCC).²² Currently, oversight occurs through Alberta Environment and Sustainable Resource Development (AESRD) who provide technical guidance to offset project developers²³ which outlines standards, system criteria and all conditions that must be satisfied to obtain offset project approval. Registered offset projects must be reviewed by an independent verifier, such as a chartered accountant or professional engineer, who will submit a signed statement in support of the project.²⁴

Alberta quantification protocols provide standardized methodologies for specific GHG emission reduction opportunities within the province. Offset credits are available to Alberta facilities, municipalities, agricultural producers and others that emit less than 100,000 tonnes of CO₂e a year and to projects that intend to start claiming credits in the same calendar year in which they were registered. Project registrations are valid for eight years, and most can be extended for an additional five years. The two exceptions are conservation cropping and afforestation projects, each of which has longer, specific duration periods based on biological cycles.²⁵

MARKET REGULATION & OVERSIGHT: On 31 March of each year, covered facilities must submit a report confirming whether the net emissions intensity limit has been met or provide an acknowledgment, explanation and proposal to address non-compliance. In addition, each report must be verified by a third-party auditor.²⁶ In order to

qualify, auditors must be a professional engineer under the *Engineering, Geological and Geophysical Professions Act* or a chartered accountant under the *Regulated Accounting Profession Act*, or a member of a profession with similar competence and practice requirements. Verifiers must also have technical knowledge of specified gas emission quantification methodologies and audit practices. Auditors cannot be associated or affiliated with the reporting facility or be an employee or agent of the Alberta Government.²⁷

If a facility is found to be non-compliant, the Director may issue an order to the facility to minimize or remedy the effects of non-compliance. Moreover, the Director may require the facility to obtain emissions offsets or performance credits, make contributions to the CCEMF or take any other measure the Director considers advisable. Further, a facility in non-compliance can be charged a fine of no more than CAD \$200 for every tonne of CO₂e emitted over the limit.²⁸ For individual offences, the fine will not exceed CAD \$50,000, whereas a corporation is liable to a fine not more than CAD \$500,000.²⁹

To ensure accuracy and completeness, all Alberta Compliance Reports must be in conformance with SGER and be verified by a third-party verifier. For the first time, in 2012 Alberta regulators required these reports to be verified to a “*Reasonable Level of Assurance*” (compliance information must be reviewed by a third-party verifier) as opposed to previous years in which only regulator required the verification to a “*Limited Level of Assurance*”. This transition to “*Reasonable*” from “*Limited*” levels of assurance has resulted in more extensive verification procedures during the quantification and verification of Alberta compliance submissions. The transition also results in more standardized verification procedures, more reliable and complete reports, and now Alberta is basically reporting at the same level of assurance as other North American jurisdictions.

COMPLEMENTARY POLICIES: In addition to its carbon pricing system, Alberta has employed several complementary policies to reduce GHG emissions including:³⁰

- A *Renewable Fuels Standard Regulation*, mandating a 5% blend of ethanol and 2% blend of biodiesel;
- Incentives for *energy efficiency and conservation* in the form of energy efficiency rebates;
- Programs to *raise awareness* and promote environmental stewardship;³¹
- *Adaptation Framework and Manual* to increase adaptive capacity and inform decision makers to identify appropriate adaptation responses, by assessing the potential impacts of climate change, prioritizing risks, identifying vulnerabilities and potential adaptation options;³²
- Investment into *Carbon Capture and Storage (CCS)* (CAD \$1.3 billion has been invested in two CCS projects which will be operational in between 2015 and 2017 and are expected to reduce 2.76 million tCO₂ a year);³³ and,
- Projects funded by the CCEMC, such as “*Farming 4 Land*” which encourages Alberta farmers to adopt the government-approved Nitrous Oxide Emissions Reduction Protocol.³⁴

RESULTS: From 2007 to 2013, Alberta has reduced GHG emissions by 51 million tCO₂e from business as usual and has raised CAD \$497 million through the CCEMF, CAD \$249 million of which has already been invested into 100 clean energy projects.³⁵ This has been achieved through operational changes as well as investments in offsets created by other Alberta projects.³⁶ It is expected that by 2020 Alberta’s SGER system will achieve a 10.2 million tCO₂ reduction in GHG emissions.³⁷

Compliance Cycle	Emissions Reduction at Facility's	Offset Credits Submitted	Recognition of Cogeneration	Total Reductions	Fund Payment
	(million tCO ₂ e)	(million tCO ₂ e)	(million tCO ₂ e)	(million tCO ₂ e)	(million tCO ₂ e)
2007 (half year)	1.6	0.88	1.28	3.76	41.3
2008	1.35	2.68	2.58	6.61	85.4
2009	0.89	3.74	2.66	7.29	61.3
2010	1.02	3.85	2.55	7.43	67.4
2011	3.06	5.4	2.51	10.96	55
2012	1.2	3.2	3.41	7.8	87.7
2013	0.45	2.04	4.17	6.66	98.6
Total	9.57	21.79	19.16	50.51	496.7

Table 4: GHG Emission Reduction Program Results³⁸

Source: AESRD Greenhouse Gas Emission Reduction Program Results (27 April 2015)

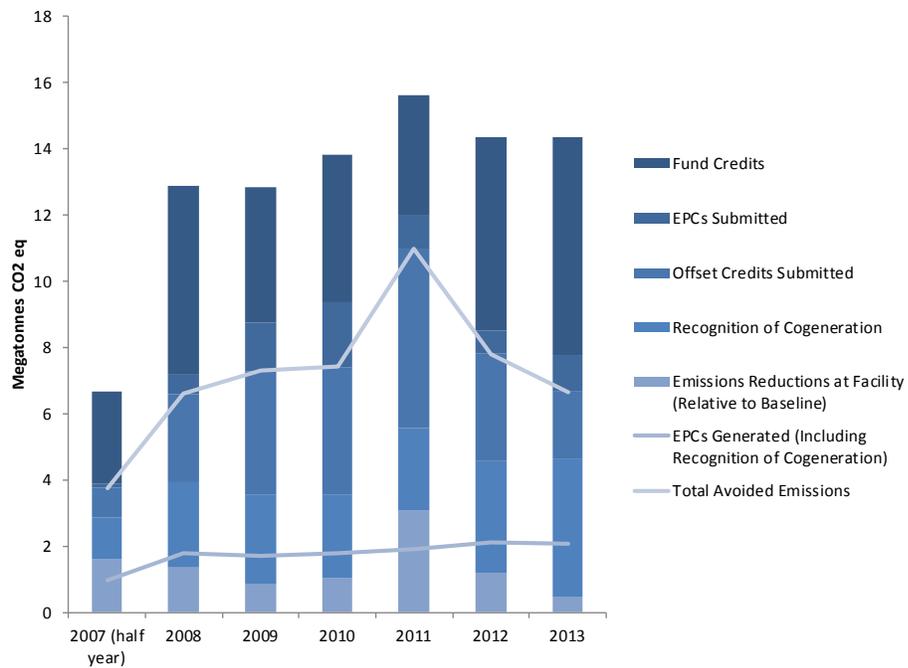


Figure 4: Breakdown of Compliance Tools for 2007-2013

Source: AESRD Greenhouse Gas Emission Reduction Program Results (27 April 2015)³⁹

What Distinguishes this Policy?

UNIQUE ASPECTS:

1. Alberta was the first North American jurisdiction to regulate GHG emissions from large emitters and implement a compliance carbon pricing program.
2. Alberta uses a unique carbon pricing system, based on GHG emissions rates and featuring **intensity targets**, tradable compliance units (EPCs and offsets) measured in tCO_{2e}, and a first-of-its kind technology fund.
3. Due to the fixed-price (CAD \$15/t) and unlimited access to Alberta's CCEMF (technology fund), Alberta's program features a price ceiling, with trading and offsets allowed. This feature leads some to confuse Alberta's system with a carbon tax.

CHALLENGES:

1. A major challenge for Alberta's SGER will be how it will interact with future federal Canadian government oil and gas sector regulations. It is unclear whether or how regulations coming into effect in 2016 will impact Alberta's ability to achieve its 2020 and 2050 targets.
2. While the deadline of the program has been extended to June 2015, policy-makers must agree on whether to continue, modify, or terminate the program in the first half of 2015. As of 22 April 2015, Alberta has yet to define core proposed amendments (including revised targets, technology fund pricing/structure changes, offset system changes etc.), or clear steps and timelines for stakeholder review and consultations. The delayed process and increasing uncertainty about the shape of Alberta's future program is prompting concern across industry, investors, and other affected stakeholders.
3. As the SGER is an intensity-based program, GHG emissions can rise annually so long as the carbon footprint per unit diminishes annually.
4. Compared to other emissions trading schemes, Alberta's 100,000 tCO_{2e} threshold is relatively high (the threshold is 25,000 tCO_{2e} in California and Quebec). As such, the Alberta Government is considering lowering the regulatory threshold to include smaller emitters during the SGER review.
5. Since 1990, Alberta's GHG emission levels have risen 65% (to 2013) and are likely to grow. While Alberta remains committed to reducing their emissions through the SGER, the Alberta government may want to consider fortifying new and existing complimentary policies to provide greater flexibility in meeting emission reduction targets for 2020 and 2050.

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Disclaimer: The authors encourage readers to please contact the EDF or IETA contacts with any corrections, additions, revisions, or any other comments, including any relevant citations. This will be invaluable in strengthening and updating the case studies and ensuring they are as correct and informative as possible.

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²⁶ SGER139/2007 See generally Part 3 Section 11

²⁷ SGER139/2007. See generally Part 3, Section 18

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