

Clean Energy Certificates and Emissions Trading in Mexico: Reciprocal Effects and Interactions



SEMARNAT
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RECURSOS NATURALES

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On behalf of:



Federal Ministry
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List of Acronyms

- AB 32:** Assembly Bill 32
- AR4:** Intergovernmental Panel on Climate Change Fourth Assessment Report
- BAU:** Business as Usual
- BMU:** Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit
- CARB:** California Air Resources Board
- CBA:** California Balancing Authority
- CDM:** Clean Development Mechanism
- CEC:** California Energy Commission
- CEL:** *Certificado de Energía Limpia* (Clean Energy Certificate)
- CER:** Certified Emissions Reductions
- CFT:** Clean Fuels and Technology
- CITSS:** Compliance Instrument Tracking System Service
- CO₂:** Carbon Dioxide
- COATS:** CO₂ Allowance Tracking System
- CPUC:** California Public Utilities Commission
- ETS:** Emissions Trading System
- GHG:** Greenhouse Gas
- GIZ:** *Deutsche Gesellschaft für Internationale Zusammenarbeit*
- GWh:** Gigawatt Hour
- GWP:** Global Warming Potential
- IKI:** The International Climate Initiative
- LCFS:** Low Carbon Fuel Standard
- LGCC:** *Ley General de Cambio Climático* (General Climate Change Law)
- MMT:** Million Metric Tons
- MMTCO₂e:** Million Metric Tons of Carbon Dioxide Equivalent
- MSW:** Municipal Solid Waste
- MWh:** Megawatt Hour
- NDC:** Nationally Determined Contribution
- NREL:** National Renewable Energy Laboratory
- NYGATS:** New York Generation Attribute Tracking System
- PCC:** Portfolio Content Categories
- PJM-GATS:** PJM Generation Attribute Tracking System
- PJM EIS:** PJM Energy Information System
- PRODESEN:** *Programa de Desarrollo del Sistema Eléctrico Nacional*
(Development Programme for the National Electricity System)
- REC:** Renewable Energy Certificate
- RGGI:** Regional Greenhouse Gas Initiative
- RPS:** Renewable Portfolio Standard
- SEMARNAT:** *Secretaría de Medio Ambiente y Recursos Naturales*
(Ministry for the Environment and Natural Resources)
- SENER:** *Secretaría de Energía* (Ministry of Energy)
- SiCEM:** GIZ Project “Preparation of an Emissions Trading System in Mexico”
- TCU:** Transportation, Communications and Utilities
- UNEP:** United Nations Environment Programme
- U.S.:** United States of America
- WECC:** Western Electricity Coordinating Council
- WREGIS:** Western Renewable Energy Generation Information System

Executive Summary

The purpose of this report is to draw on international experience to assess possible interactions between a new Mexican Emissions Trading System (ETS) and the existing “clean energy certificate” (*Certificado de Energía Limpia* [CEL]) quota system. The first compliance year of the Mexico CEL program is 2018. The program requires electricity suppliers and large consumers to acquire CELs as a proportion of the electricity consumed in load centers. This clean electricity quota has been set at 5% for 2018 and will increase to progressively contribute to the country’s clean energy target of 35% by 2024. In addition, an April 2018 reform of Mexico’s General Law on Climate Change (*Ley General de Cambio Climático* [LGCC]) defines the establishment of a mandatory ETS to limit the amount of carbon dioxide (CO₂) emissions from specified sectors of the economy. A three-year pilot phase of the ETS will begin in 2019 covering sources in the electricity and industrial sectors. Under the ETS, obligated parties will be required to acquire allowances—each representing one metric ton of CO₂ emissions (tCO₂). The total amount of allowances issued each year will be fixed. This is known as “cap” and limits the total amount of CO₂ emissions permitted from regulated sources.

Both programs—the CEL quota and the ETS—will operate simultaneously in the Mexican electricity sector. They are, however, implemented separately and do not directly affect one another in terms of the distinct objectives and operations of each program. Provided they remain separate, with separate compliance instruments and rules, there is no inherent risk of double counting or threats to policy effectiveness by their simultaneous operation. The programs are complementary to the extent that a quota for clean energy can reduce CO₂ emissions and a price on CO₂ can provide an economic advantage to clean energy generation in the electricity sector.

The reformed LGCC requires the ETS to recognize emissions reductions achieved through the usage of CELs. While there is no clear legal definition of this recognition, there are several possible approaches to how this could occur. It is important to recognize in developing these approaches that there is a risk of double counting emissions benefits if CELs are recognized as compliance instruments in the ETS. The emissions reductions caused by clean energy generation in the electricity sector

are already automatically accounted for and reported by obligated parties under the ETS design. The same fundamental risk occurs if offsets—verified emissions reductions occurring at project activities—are issued to Mexican clean energy facilities and can be used for compliance with the ETS. Issuance of compliance offsets to CO₂ mitigation projects or actions in sectors covered by the ETS is currently not allowed under draft ETS rules⁽¹⁾.

However, the ETS can acknowledge emissions reductions achieved through the CEL quota system in program design, particularly related to intermediate targets and flexibility mechanisms. Calculations of the emissions reductions that can be expected from implementation of the CEL quota system (ideally done using sophisticated models of the electricity sector) can be used to inform the design of other flexibility mechanisms (e.g. offsets from non-capped sectors, trading) and other program design options (e.g. related to banking rules, multi-year compliance, price banding, and intermediate targets), or even linkages with other programs, that may be used to reduce risk for the program and obligated parties related to the price and supply of allowances.

This report provides a simplified, illustrative estimation of such a calculation, which indicates that the CEL quota system could result in significant avoided emissions in the electricity sector. For example, in 2021—the final year of the ETS pilot period—this rough estimation indicates that CEL compliance could reduce total electricity sector emissions by approximately 12%. Interestingly though, because forecasted increases in clean energy generation fluctuate on a year-to-year basis, the actual avoided emissions associated with the CEL quota may be more substantial in certain years relative to others, and this may have considerable implications for ETS compliance. More sophisticated models of the electricity sector may yield different or more detailed information about the effect of the CEL quota system on allowance supply, and when and how the CEL market might moderate pressure on carbon prices (and when it will not). The report describes this recognition of emissions reductions from the CEL quota system in ETS design as “incrementality.” Though there may be no ex-ante cap adjustment for the CEL quota, and while emissions reductions achieved by the CEL quota may still be captured under the ETS,

(1) Mitigation projects for non-CO₂ gases will be accepted for the pilot phase.

the degree to which each program provides incremental benefits (e.g. emissions reductions or clean energy generation) with respect to the other can be assessed and then managed with flexibility mechanisms and other program design options.

If Mexico's clean energy trading with neighboring countries increases or Mexico links its ETS with other regions, mutual recognition agreements with neighboring jurisdictions can consider other risks related to accounting of imports and exports of clean energy. Mexico can also consider other ETS design options that impact the electricity sector. Options that have been considered and/or adopted in other jurisdictions include allocating allowances or auction revenues to clean energy projects or including an allowance set-aside for voluntary renewable energy generation. A voluntary renewable energy set-aside mechanism is used to lower the overall cap in response to private, voluntary commitments (substantiated with certificates) to renewable energy use.

There is significant experience in the United States with simultaneous operation of similar programs—Renewable Portfolio Standards (RPSs) and cap-and-trade/ETS—in California and nine states participating in the Regional Greenhouse Gas Initiative (RGGI). Key programmatic elements in these states for effective simultaneous operation of these programs include:

- Renewable Energy Certificates (RECs) (the CEL analog in the U.S.) are not used for cap-and-trade compliance
- Compliance offsets are not allowed from within the electricity sector
- Auction revenue is used, in part, to support renewable energy projects
- RECs include all environmental benefits, including direct and avoided CO₂ emissions, for the purposes of supplier and consumer claims in both voluntary and compliance renewable energy markets

It is important to recognize key differences between the U.S. experience and Mexico that affect how the CEL quota and the ETS will interact, including:

- Structure of electricity market (e.g. the electricity market in California is not fully deregulated, and there is full retail choice for electricity in many RGGI states)
- Structure of regulatory oversight of the electricity market, the CEL/RPS programs, and the ETS programs
- Scope of the sectors covered by the ETS
- Resource eligibility rules in the CEL program vs. RPS programs (renewable vs. clean resources);
- CEL vs. REC definitions, and the benefits and claims associated with each instrument
- Certificate tracking (e.g. all-generation certificate tracking in the northeast and mid-Atlantic U.S.)
- The history of the Clean Development Mechanism (CDM) in Mexico
- The voluntary renewable energy market in the U.S.

While these differences do not necessarily prohibit the implementation of programmatic elements that have been adopted in California and RGGI, they can affect the way the CEL program and ETS will interact and provide a different context for those interactions. For example, they may affect the degree of overlap between compliance entities.

This report recommends that Mexico avoid double counting and ensure the environmental integrity of the ETS by not allowing CELs to be used as compliance instruments under the ETS and keeping the CEL quota and ETS administratively separated. Nevertheless, acknowledging emissions reductions from the CEL quota in program design, target setting, and flexibility mechanisms can provide many benefits for both program design and achieving policy goals. Detailed modeling of projected emissions reductions from the electricity sector, and those that can be attributed to the CEL system, along with continued communication and information sharing between lead regulatory agencies, will enable ETS regulators a greater degree of certainty regarding the expected emissions benefits due to the CEL quota and the CEL system's ongoing role in meeting ETS goals.

Resumen Ejecutivo

El propósito de este informe es aprovechar la experiencia internacional para evaluar interacciones posibles entre un nuevo Sistema de Comercio de Emisiones (SCE) en México y el sistema de cuotas de los Certificados de Energía Limpia (CEL). El primer año de cumplimiento para el programa de CEL en México es el 2018. La cuota requiere que los suministradores de electricidad y los grandes consumidores adquieran los CEL en proporción al consumo eléctrico en los centros de carga. La cuota de CEL se estableció en 5% para el 2018, y esta aumentará de manera que contribuya progresivamente a la meta de tener un 35% de energías limpias para 2024. Además, la reforma de abril 2018 a la Ley General de Cambio Climático de México indica el establecimiento de un SCE obligatorio para limitar la cantidad de emisiones de dióxido de carbono (CO₂) de sectores específicos de la economía. Una fase piloto de tres años comenzará en 2019 cubriendo las emisiones de los sectores eléctrico e industrial. En el SCE, las partes obligadas tendrán que adquirir derechos de emisión – cada uno representando una tonelada métrica de emisiones de CO₂ (tCO₂). El monto total de los derechos de emisión emitidos cada año será establecido (el "tope") para limitar la cantidad total de emisiones de CO₂ permitidas de fuentes reguladas.

Ambos programas – la cuota de CEL y el SCE – operarán simultáneamente en el sector eléctrico mexicano. Sin embargo, serán implementados independientemente y no afectarán directamente el uno al otro en cuanto a los distintos objetivos y operaciones de cada programa. Siempre que permanezcan independientes, con reglas e instrumentos de cumplimiento separados, no hay un riesgo inherente de doble conteo o de amenazas a la efectividad de las políticas causadas por la operación simultánea. Los programas son complementarios en la medida de que una cuota de energía limpia puede reducir las emisiones de CO₂, y un precio del carbono puede producir una ventaja económica para la generación de energía limpia en el sector eléctrico.

Las enmiendas recientes a la Ley General de Cambio Climático de México requieren que el SCE reconozca las reducciones de emisiones logradas a través de la cuota de CEL. Aunque no existe una clara definición legal de dicho reconocimiento, existen varios enfoques posibles para que esto ocurra. Es importante reconocer en el desarrollo de estos enfoques que existe un riesgo del doble conteo de los beneficios ambientales si los CEL son reconocidos como instrumentos de cumplimiento para el SCE. Las reducciones de emisiones causadas por la generación de energía limpia en el sector eléctrico ya son contabilizadas e informadas

automáticamente por las partes obligadas en el SCE. El mismo riesgo fundamental ocurre si las compensaciones de carbono – reducciones de emisiones verificadas de proyectos cualificados – son emitidos a las instalaciones de energía limpia y también pueden ser utilizados para cumplir con el SCE. La emisión de compensaciones de carbono para cumplimiento a proyectos o acciones de mitigación de CO₂ en sectores cubiertos por el SCE está prohibida actualmente en el borrador de reglas del SCE.

Sin embargo, el SCE puede reconocer las reducciones de emisiones logradas a través de la cuota de CEL en el diseño del programa, especialmente en relación con objetivos intermedios y mecanismos de flexibilidad. Los cálculos de las reducciones de emisiones esperados como resultado de la implementación de la cuota de CEL (idealmente usando modelos sofisticados del sector eléctrico) pueden ser utilizado para determinar los mecanismos de flexibilidad (por ejemplo, créditos de compensación de sectores no cubiertos o transacciones de derechos de emisión) y otras opciones para el diseño del programa (por ejemplo, relacionadas con reglas bancarias, cumplimiento multianual, bandas de precios, y objetivos intermedios), o incluso vínculos con otros programas que pueden reducir el riesgo para el programa y para las partes obligadas relacionadas con el precio y el suministro de los derechos de emisión.

Este informe proporciona una estimación simplificada e ilustrativa de este cálculo que indica que la cuota de CEL podría generar emisiones evitadas significativas en el sector eléctrico. Por ejemplo, en 2021, el último año del período piloto del SCE, esta estimación indica que el cumplimiento con la cuota de CEL podría reducir aproximadamente las emisiones totales del sector eléctrico en un 12%. Sin embargo, puesto que los aumentos previstos en la generación de energía limpia fluctúan de un año a otro, las emisiones evitadas actuales asociadas con la cuota de CEL pueden ser más sustanciales en ciertos años que en otros, y esto puede tener implicaciones considerables para el cumplimiento del SCE. Los modelos más sofisticados del sector eléctrico pueden producir información diferente o más detallada sobre como la cuota de CEL afecta el suministro de los derechos de emisión, y cuándo y cómo el mercado de CEL podría impactar el precio del carbono (y cuándo no). Este informe describe este reconocimiento de las reducciones de emisiones de la cuota de CEL en el diseño del SCE como "incrementalidad." Aunque no existan necesariamente unos ajustes ex ante para la cuota de CEL, y aunque las reducciones de emisiones logradas a través de la cuota de CEL

aún pueden ser capturadas bajo el SCE, el grado en que cada programa proporciona beneficios incrementales (por ejemplo, reducciones de emisiones o generación de energía limpia) con respecto al otro puede ser evaluado y gestionado con mecanismos de flexibilidad y otras opciones de diseño para estos programas.

Si aumentan las transacciones de energía limpia con los países vecinos, o si México vincula su SCE con otras regiones, los acuerdos de reconocimiento mutuo con las jurisdicciones vecinas pueden considerar otros riesgos relacionados con la contabilidad de las importaciones y exportaciones de energía limpia. México también puede considerar otras opciones para el diseño del SCE que impactarán el sector eléctrico. Las opciones que han sido consideradas y/o adoptadas en otras jurisdicciones incluyen la asignación de los derechos de emisión o los ingresos de subasta a proyectos de energía limpia o la inclusión de una reserva de derechos de emisión para la generación voluntaria de energía renovable. Se utiliza este mecanismo voluntario de reservar derechos de emisión para reducir el tope general en respuesta a los compromisos privados y voluntarios (justificados con CEL) para el uso de energía renovable.

Los Estados Unidos tienen experiencia significativa con la operación simultánea de programas similares: existen sistemas de cuotas para energía renovable (RPS) y sistemas de comercio de emisiones en California y los nueve estados que participan en la Iniciativa Regional de Gases de Efecto Invernadero (RGGI). Los elementos programáticos fundamentales en estos estados que permiten la operación efectiva de estos programas de manera simultánea incluyen:

- Los certificados de energía renovable (REC) (el equivalente del CEL en los EE. UU.) no se utilizan para el cumplimiento del SCE
- Los derechos de compensación generados dentro del sector eléctrico no se permiten para cumplimiento del SCE
- Los ingresos de las subastas se utilizan, en parte, para apoyar proyectos de energía renovable
- Los REC incluyen todos los beneficios ambientales, incluyendo las emisiones de CO₂ directas y evitadas, con el propósito de los reclamos de proveedores y consumidores en los mercados de energía renovable voluntarios y de cumplimiento

Es importante reconocer las diferencias fundamentales entre la experiencia de los EE. UU. y México que afectan la forma en que interactuarán la cuota de CEL y el SCE, incluyendo:

- La estructura del mercado eléctrico (por ejemplo, el mercado eléctrico en California no está totalmente desregulado, y hay varias opciones para la venta minorista de electricidad en muchos estados de RGGI)
- La estructura de la supervisión regulatoria del mercado eléctrico, del sistema de cuotas para energía renovable, y del SCE
- El alcance de los sectores cubiertos por el SCE
- Las reglas de la elegibilidad para los recursos en el programa de CEL vs. los programas de RPS (recursos limpios vs. recursos renovables);
- Las definiciones de CEL vs. REC, y los beneficios y reclamos asociados con cada instrumento
- El seguimiento de certificados (por ejemplo, seguimiento de certificados de toda la generación en el noreste y el Atlántico-medio de los EE. UU.)
- La historia del Mecanismo de Desarrollo Limpio en México
- El mercado voluntario de energía renovable en los EE. UU.

Aunque estas diferencias no prohíben necesariamente la implementación de los elementos programáticos que fueron adoptados en California y en los estados de RGGI, pueden afectar la forma en que la cuota de CEL y el SCE interactuarán, y proporcionarán un contexto diferente para esas interacciones. Por ejemplo, pueden afectar el grado de superposición entre las entidades con obligaciones de cumplimiento.

CRS recomienda que México evite el doble conteo y asegure la integridad ambiental del SCE al no permitir que los CEL sean utilizados como instrumentos de cumplimiento para el SCE y al mantener que la cuota de CEL y el SCE se administren independientemente. Sin embargo, el reconocimiento de las reducciones de emisiones logradas a través de la cuota de CEL en el diseño del programa, en el establecimiento de objetivos, y en los mecanismos de flexibilidad puede producir muchos beneficios para el diseño del programa y para el logro de los objetivos de las políticas. La modelización detallada de las reducciones de emisiones proyectadas en el sector eléctrico, incluyendo las que se pueden atribuir a la cuota de CEL, junto con la comunicación continua y el intercambio de información entre las agencias regulatorias, proporcionarán a los reguladores un mayor grado de certeza en cuanto a los beneficios de emisiones esperados en asociación con la cuota de CEL y su papel continuo en el cumplimiento de los objetivos del SCE.



Introduction and Objectives

1. Introduction and Objectives

This report evaluates the effects of the simultaneous operation of the CEL quota and ETS in the Mexican electricity sector, and potential regulatory and programmatic interactions and risks related to compliance, accounting, and administration. It also evaluates interactions in terms of emissions, the supply of allowances, and program performance. This report identifies options to implement recent amendments to the LGCC regarding the recognition of emissions reductions achieved through the usage of CELs in the implementation of the ETS in Mexico. Finally, it discusses policy recommendations and responses to a series of questions related to the design of an ETS or potential changes in the design of the CEL mechanism to facilitate reaching the objectives of the energy and climate change policies in Mexico.

This report draws upon experience in the United States with simultaneous operation of similar programs, RPS


and cap-and-trade/ETS, recognizing that key policy design elements and operational practices in the U.S. vary from the Mexican context and programs.

There are other potential policy interactions and impacts that can affect both the CEL system and ETS that are not addressed in this report, including carbon tax, potential interactions between the Mexican ETS and other ETSs, and economic impacts of either policy (on the market or obligated parties). This report does not include legal analysis or detailed modeling of emissions from the power sector but instead relies upon existing published data from government sources. Recommendations in this report are consistent with the authors' understanding of current program requirements and discussions and feedback from Mexican stakeholders⁽²⁾.



(2) A participatory workshop was held on June 21st, 2018, with the attendance of the Ministry of Environment and Natural Resources (SEMARNAT), the Energy Regulatory Commission (CRE) and the Federal Electricity Commission (CFE).



Assessment of 
Simultaneous Operation
of the CEL System and
ETS in Mexico

2. Assessment of Simultaneous Operation of the CEL System and ETS in Mexico

Clean energy mandates or clean energy generation incentives like the CEL system and ETS are complementary but separate policy tools. This report draws on experience in other regions with these policy tools. There are many years of experience in ten different U.S. states—California, Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont—where ETS and clean energy mandates coexist in the electricity sector. In all states with ETS in the U.S., there is also a mandatory RPS program, and these states continue to strengthen and extend their programs. California recently extended and increased its RPS to 50% renewable power by 2030 at the same time as it extended its cap-and-trade program to 2030. The other nine states in RGGI also recently agreed to tighten the cap on emissions from the electricity sector in 2014, while New York increased its Clean Energy Standard to 50% by 2030.

While the goals and objectives of the CEL quota and ETS are legally different, they are clearly complementary. By incentivizing production of electricity from clean energy sources built since 2014, the CEL quota helps lower CO₂ emissions from the electricity sector, and by putting a price on CO₂ emissions in the power sector, the ETS provides an economic advantage to clean power, which may also be used to meet the CEL quota. As a result, both the CEL market and the ETS contribute to national goals related to providing incentives for clean generation and reducing electricity sector emissions.

The two programs are separate, however, with respect to the specific objectives of each program, what is regulated, the point of regulation, the units of compliance, and measured outcomes. Table 1 summarizes the differences between the two programs in terms of these dimensions.

...

While the goals and objectives of the CEL quota and ETS are legally different, they are clearly complementary. By incentivizing production of electricity from clean energy sources the CEL quota helps lower CO₂ emissions from the electricity sector, and by putting a price on CO₂ emissions in the power sector, the ETS provides an economic advantage to clean power, which may also be used to meet the CEL quota.

...

Table 1. Comparison of ETS and CEL Quota System in Mexico

	ETS	CEL QUOTA SYSTEM
POINT OF REGULATION	Emission sources	Load serving entities and large electricity consumers
SCOPE	Multi-sector	Electricity sector
UNIT OF COMPLIANCE	Metric Ton CO ₂ emitted or reduced	MWh clean energy generated
COMPLIANCE INSTRUMENT	Allowance and verified offset	CEL
OUTCOMES	Enforces emissions reduction without guaranteed delivery of clean energy	Enforces generation of clean energy without guaranteed, economy-wide emission reductions

Source: Center for Resource Solutions, 2018

2.1 Interactions between the CEL System and ETS

There are two dimensions of interactions between the CEL quota system and the ETS discussed in this report:

- a. Regulatory and programmatic interactions
- b. Performance interactions and incrementality

2.1.a Regulatory Interactions and Double-Counting Risks

Regulatory and programmatic interactions and potential risks are related to interoperability of compliance instruments, accounting, program design and administration. As previously stated, the policy objectives, tracking indicators, market rules, and trading instruments are different and distinct between the two policies. However, certain program design decisions can increase regulatory interactions and create potential risks related to double counting and program integrity.

Double counting is a situation in which the same benefit or attribute is counted, recorded, or claimed more than one time—in a registry, tracking system, or inventory; towards a regulatory or voluntary target; or by an end user—or in which a single benefit or attribute is counted, recorded, or claimed by more than one party. Double counting threatens the integrity, effectiveness and credibility of markets and programs. It means that the programs are not producing real outcomes. It also undermines consumer confidence and overall support for the programs, and it makes them difficult to link with other programs.

• • •

Double counting threatens the integrity, effectiveness and credibility of markets and programs. It means that the programs are not producing real outcomes.

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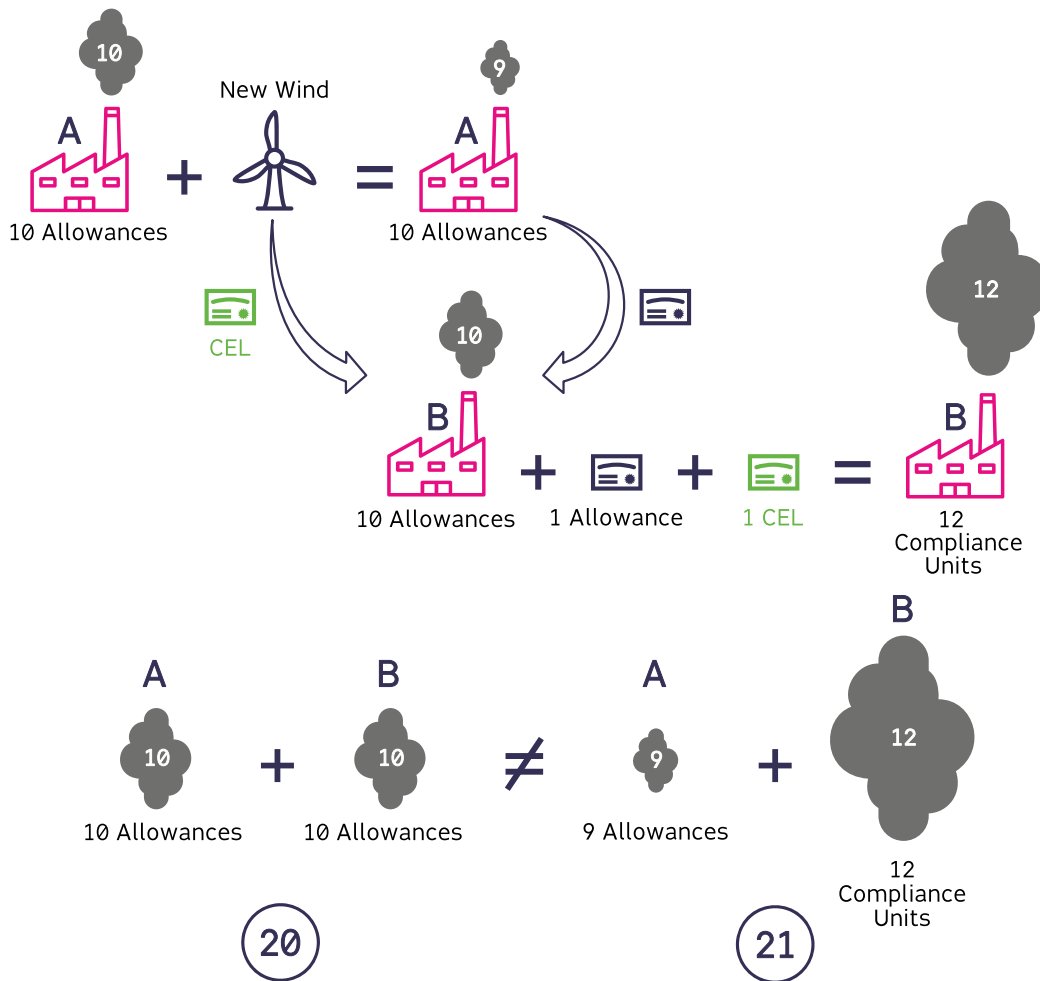
There are many ways that double counting can occur, both within an ETS and between an ETS and other programs. In this report, we focus on three:

1. Double counting within the ETS due to use of the CEL for ETS compliance
2. Double counting that could occur in the future between the Mexican ETS and external clean energy mandates (e.g. RPS programs in the U.S.) related to accounting of electricity imports
3. Double counting that could occur in the future between the CEL quota system and external ETS programs or carbon mandates (e.g. in the U.S.) related to accounting of electricity exports

Using CELs for compliance in ETS can lead to double counting of the emissions benefits from clean energy within the ETS program. The CO₂ emissions reductions in the electricity sector that occur at emitting plants due to clean generation displacing emitting generation are already automatically captured by ETS reporting. Allowing CELs issued to clean energy generators to also be used for compliance creates two units of compliance (a real, measured reduction and the CEL) for only one real reduction in emissions. Assuming that emissions occur up to the level of the cap, this accounting can produce an increase in emissions, or an artificial increase in the cap.

The CO₂ emissions reductions in the electricity sector that occur at emitting plants due to clean generation displacing emitting generation are already automatically captured by ETS reporting.

Figure 1. Illustration of ETS Operations with CELs from New Wind as a Compliance Unit: Double Counting and an Increase in Total Emissions



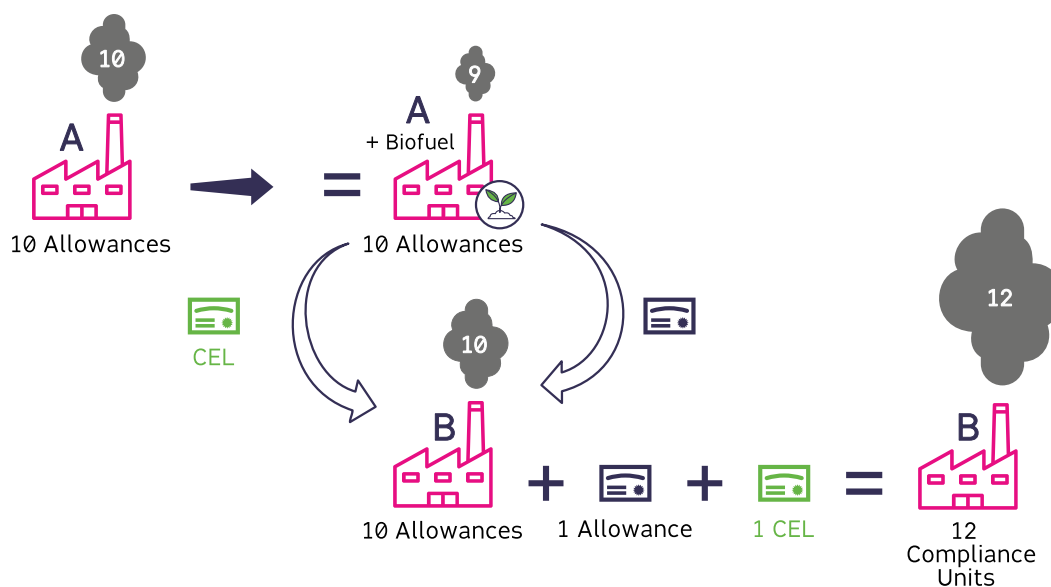
Source: Center for Resource Solutions, 2018

Figure 1 illustrates the double counting and emissions increase that can occur where CELs are used for ETS compliance. A real emissions reduction created by the impact of new wind generation on an emitting plant on the grid (Plant A in Figure 1) can result in an overall increase in emissions if the CELs associated with the wind generation are allowed to be used as compliance instrument with the ETS (Plant B in Figure 1).

For a different example, consider an individual coal plant that replaces some amount of coal use with an eligible biofuel. The plant is regulated under the ETS and may be allocated or purchase allowances through an auction. The plant may also earn CELs for generation using the biofuel. A reduction to covered emissions from the plant due to introduction of the biofuel may free up allowances that

could be traded to other emitters and used for emissions increases in the ETS. If the CELs issued to the plant can also be used for ETS compliance, as an emissions reduction (offset) or in place of an allowance, there would be double counting since there would be two compliance instruments (the CEL and the allowance) available for a single amount of reductions in the sector. This is illustrated in Figure 2. However, if the CEL is not used for ETS compliance, it can nevertheless be used for compliance with the CEL quota at the same time that allowances are traded in the ETS for emissions reductions associated with the clean energy generation, as should in Figure 3. In this case, a single unit of biofuel generation may result in compliance under both programs due to the delivery of clean energy generation (CEL quota) and a reduction of covered emissions (ETS).

Figure 2. Illustration of ETS Operations with CELs from Biofuel Substitution as a Compliance Unit: Double Counting

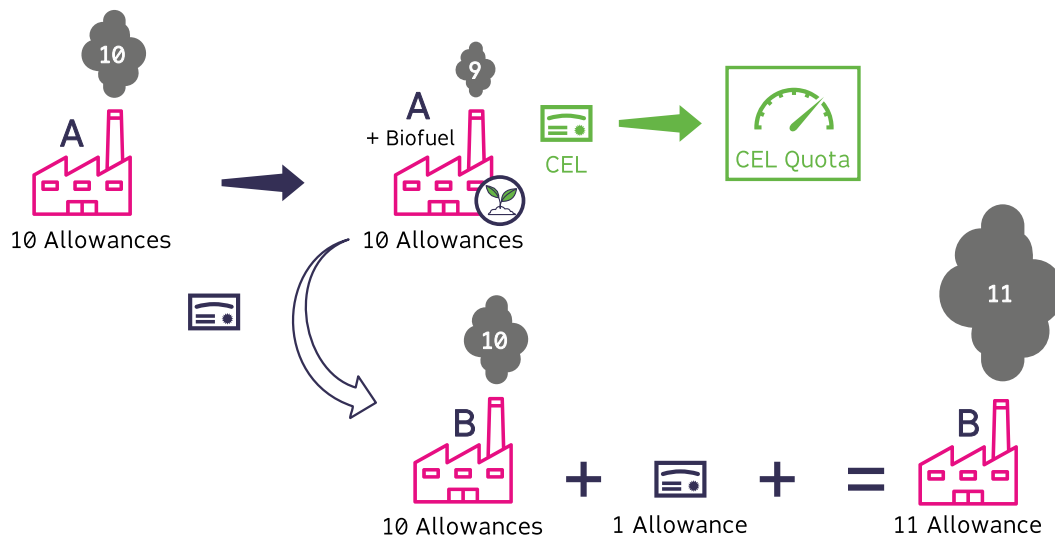


Source: Center for Resource Solutions, 2018

For yet another example, consider a single company that owns both wind facilities and fossil fuel facilities. The company may be an obligated party under the ETS for its fossil generation and receive emissions allowances (either freely or purchased through auction). The company may earn CELs for generation at its wind power facilities. Generation at the wind facilities may displace generation at the company's own fossil facilities or at other fossil facilities, freeing up allowances that the company

may sell or that may be sold to the company for emissions increases. Again, if the CELs issued to the wind facilities can also be used for ETS compliance, there would be double counting (two compliance instruments for a single emissions reduction). Otherwise, the wind plant's CELs may be used for compliance with the CEL quota at the same time that ETS allowances freed up due to that same wind generation are traded and used for compliance in the ETS.

Figure 3. Illustration of ETS Operations with CELs from Biofuel Substitution used for the CEL Quota: No Double Counting



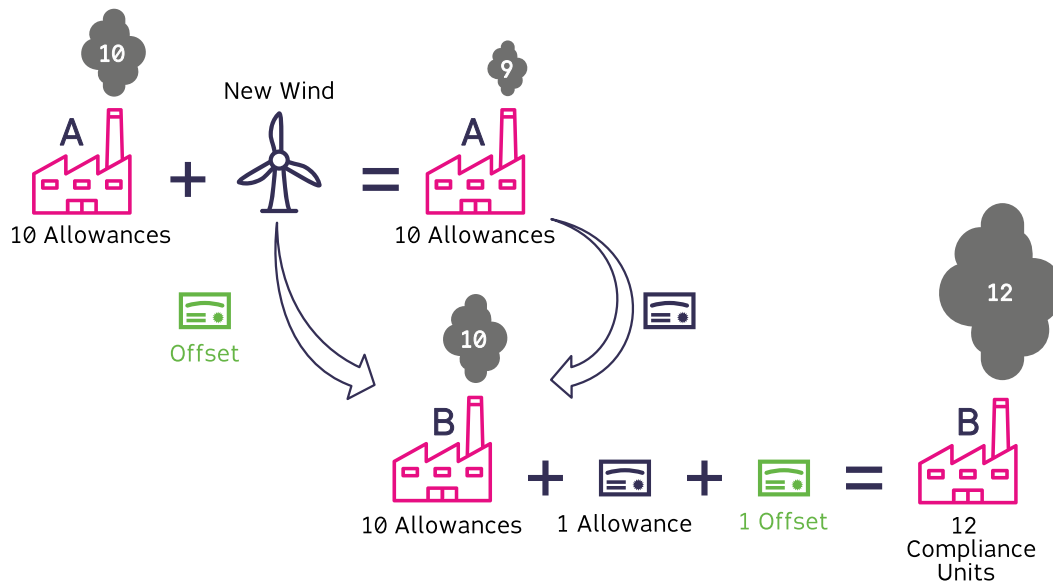
Source: Center for Resource Solutions, 2018

The same fundamental double counting problem occurs where compliance offsets are awarded to mitigation projects within capped sectors (e.g., clean energy generation in a capped electricity sector) which is prohibited under draft ETS rules. In this case, the CEL in Figure 1 can be replaced with an offset, as shown in Figure 4, which illustrates the same double counting. For example, at the time of publication there are 48 registered renewable energy Clean Development Mechanism (CDM) projects

in Mexico (Fenhann, 2018). If the Certified Emissions Reductions (CERs) associated with these projects are used for ETS compliance, there may be double counting if the ETS baseline already incorporates those emissions reductions. In this case, subsequent use of CERs from renewable energy generation for ETS compliance would represent a second count of those emissions reductions and may allow for emissions increases above the cap⁽³⁾.

(3) This report briefly addresses potential use of CDM CERs for early action compliance further below.

Figure 4. Illustration of ETS Operations with Offsets from Within the Capped Sector: Double Counting

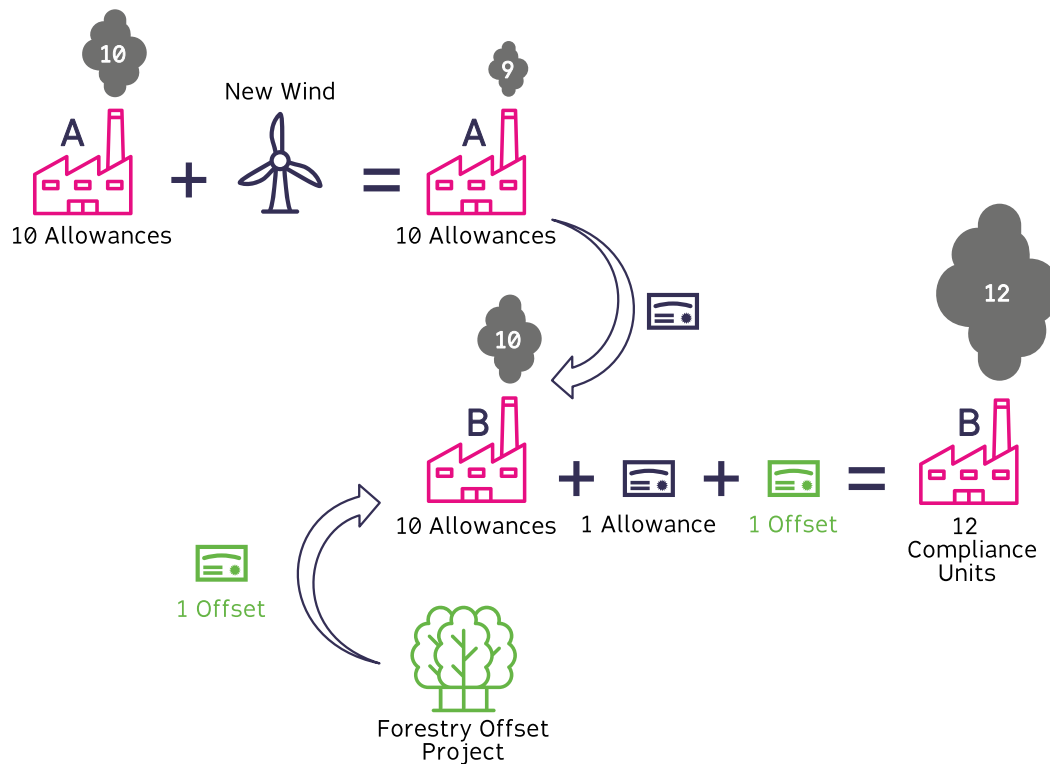


Source: Center for Resource Solutions, 2018

If, on the other hand, the CEL used by Plant B in Figure 1 was instead an offset from a mitigation project outside of the cap, it would represent a real, additional reduction, and there would be two compliance instrument for two different reductions. This is illustrated in Figure 5. As a result, the total emissions to the atmosphere would again

remain the same. The problem illustrated with Figure 1 is that the reduction used in the form of the CEL or an offset from within the electricity sector is an artifact of flawed accounting. It is a double count, and total emissions can increase.

Figure 5. Illustration of ETS Operations with Offsets from Outside of the Cap: No Double Counting



Source: Center for Resource Solutions, 2018

Double counting can also occur between policies or programs—where the same benefit is counted for compliance in two different programs. In this case, the double counting affects the integrity and credibility of both programs. For Mexico, these risks are more likely to occur in the future if CEL or ETS programs interact with external clean energy and/or ETS systems—where more than one jurisdiction is reporting delivery of the same benefits (e.g. CO₂ emissions) related to imports and/or exports of clean energy. Mutual recognition agreements with neighboring jurisdictions can consider the following risks and potential interactions related to electricity imports and exports.

One area of interaction that will need to be addressed is related to electricity imports. If Mexico decides to include or account for CO₂ emissions associated with imported electricity, there can be double counting if the power from a clean energy source located outside of and delivered to Mexico is assigned a zero emissions factor under the ETS and any clean energy certificates (e.g. U.S. RECs) associated with that power are not also delivered to Mexico. In this case, Mexico will be reporting delivery of specified clean power to Mexico under the ETS while the external certificate program (voluntary or compliance) may also claim delivery of that same specified power outside of Mexico.

...

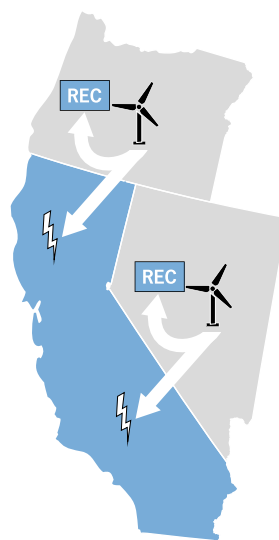
One area of interaction that will need to be addressed is related to electricity imports. If Mexico decides to include or account for CO₂ emissions associated with imported electricity, there can be double counting if the power from a clean energy source located outside of and delivered to Mexico is assigned a zero emissions factor under the ETS and any clean energy certificates (e.g. U.S. RECs) associated with that power are not also delivered to Mexico.

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California and neighboring states face this same potential for double counting. The California cap-and-trade program includes emissions associated with imported electricity, but the state currently does not require RECs to be imported with the power in order to assign the emissions factor of the renewable generator to the imported power. RECs are used in the U.S. to track and verify delivery and consumption of renewable electricity. The resulting situation is that there can be double counting where California is reporting that zero-emissions power is delivered to the state and the RECs associated with that same power are used in a different state, for example, to meet the Oregon RPS. In this case, the same MWh is reportedly delivered to two different states. This is illustrated in Figure 6. This has created potential problems for the Oregon RPS, and it is affecting how renewable facilities and load-serving entities participate in regional power markets.

One approach to avoid these potential issues for Mexico is for any future mutual recognition agreement between Mexico and a U.S. jurisdiction that pertains to imports and exports to specify that U.S. RECs must be imported to Mexico or retired in order for the imported power to be counted as a specified clean energy import (i.e. assigned a specified source emissions factor) in Mexico. Clean energy markets may also be developed in Guatemala and Belize, in which case a similar mutual-recognition agreement with these countries can contain the same conditions.

Figure 6. Illustration of Double Counting related to Emissions Associated with Electricity Imported to California



Source: Center for Resource Solutions, 2018

Double counting can also be a risk to Mexico clean electricity exports to California. As California does not require clean energy certificates in order to count a specified import for its cap-and-trade program, California would count the clean energy emissions towards the California cap. As a result, if a Mexican clean energy facility delivers power to California, a CEL is issued to that facility, and the CEL is used in Mexico for compliance with the CEL quota system, then there is potential double counting and reduction of the emissions benefits of the CEL system. California and Mexico would both be reporting delivery of the same MWh. This risk is mitigated by the fact that currently CELs are not issued for grid-tied facilities in Northern Baja that are part of the Western Electricity Coordinating Council (WECC). ETS programs may also be developed in New Mexico, Texas, Guatemala, and Belize in the future, and these programs may choose to include imported electricity—in which case a mutual recognition agreement with these jurisdictions can also contain conditions to prevent double counting.

2.1.b Performance Interactions and “Incrementality”

The CEL quota system will affect emissions in the power sector, the supply of allowances, and the general performance and outcomes of the ETS. This report uses the term “incrementality” to refer to the degree to which each program produces incremental benefits or outcomes. Emissions reductions achieved through the CEL system can be calculated and recognized in the implementation of the ETS, to guide implementation decision making, and to reduce risk for the program and obligated parties related to the price and supply of allowances.

Emissions reductions from the CEL quota system can be recognized in the implementation of flexibility mechanisms and other ETS program design options, including, but not limited to, the level of compliance that can be achieved using offsets (from outside capped sectors), trading rules and boundaries, allowance banking rules, compliance periods, price banding, and intermediate target setting. They can also inform decisions about linking with other jurisdictions, which will also provide flexibility and affect prices.

Like Mexico, California has both a clean energy quota (the RPS) and an ETS that includes the electricity sector. In the California Air Resources Board’s (CARB’s) 2017 Climate Change Scoping Plan for the state, the cap-and-trade program sits on top of other emissions-reducing measures, including the RPS. The cap-and-trade compliance requirement is used to close the gap between emissions reductions from the other measures, including the RPS, and the final target: “known commitments will deliver some reductions in each sector [and] the Cap-and-Trade Program will deliver additional reductions in the sectors it covers” (California Air Resources Board, 2017, pg. 31). CARB addresses the RPS in the current and previous Scoping Plans for the state by estimating emissions reductions they expect from the RPS vs. emissions reductions they expect from other programs and the cap-and-trade program. To do this, they employ a model developed by Energy and Environmental Economics, Inc. (E3) called PATHWAYSTM. According to California’s 2017 Climate Change Scoping Plan, “PATHWAYS is structured to model GHG emissions while recognizing the integrated nature of the industrial economic and energy sectors,” and “The ability to capture a subset of interactive effects of policies and measures helps to provide a representation of the interconnected nature of the system and impacts to GHGs” (California Air Resources Board, 2017, pg. 31).

To illustrate this approach, selected charts and graphs from both the First Update to the California Scoping Plan 2014 and the California 2017 Scoping Plan are reproduced as Figures 7-9. Figures 7 and 8 show the amount of reductions expected from the RPS/energy sector through 2020 and 2030, respectively. The relative benefit of the RPS emissions reductions are “front-loaded,” meaning the RPS provides a larger portion of emission reductions relative to other measures and the cap before 2020, and the carbon price (cap-and-trade) and policies in other sectors will play a larger relative role in driving emissions reductions between 2020 and 2030. This “closing of the gap” using cap-and-trade, across all sectors, is shown graphically in Figure 9.

Figure 7. Expected GHG Emissions Reductions from Different Measures through 2020 under the First Update to the California Scoping Plan, 2014

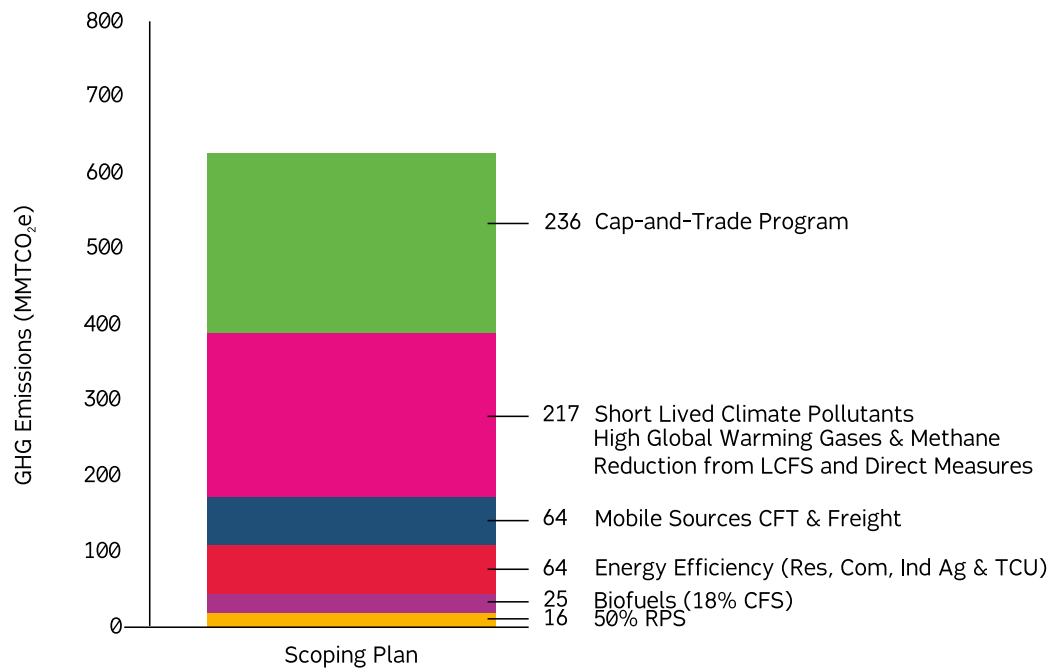
Meeting the 2020 Emissions Target	
Category	2020 (MMTCO ₂ e)**
AB Baseline 2020 Forecast Emissions (2020 BAU)	509
Expected Reductions from Sector-Based Measures	
Energy	25
Transportation	23
High-GWP	5
Waste	2
Cap-and-Trade Reductions	23*
2020 Limit	431

* Cap-and-Trade emission reductions depend on the emission forecast.

** Based on AR4 GWP values.

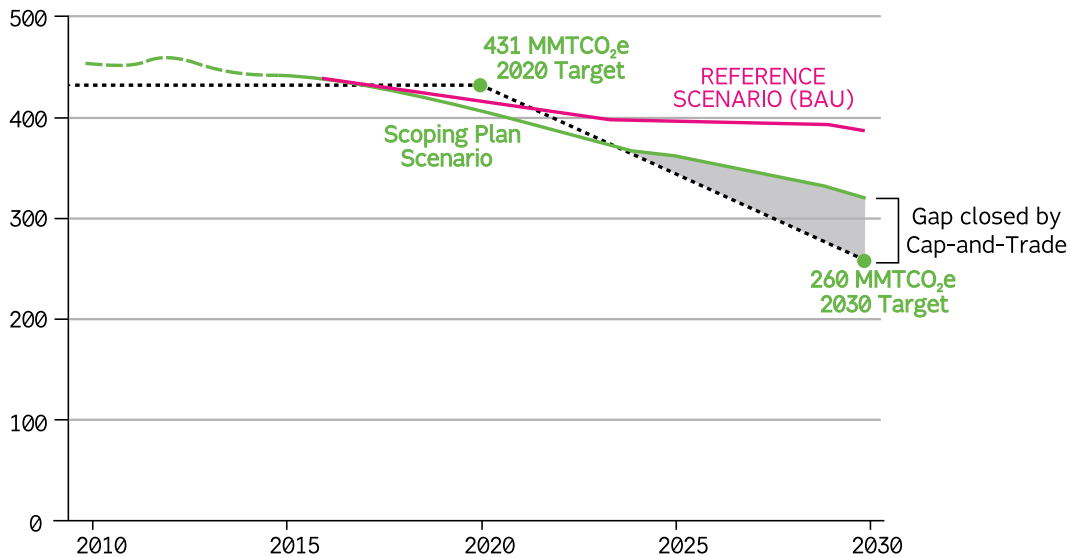
Source: California Air Resources Board, 2014

Figure 8. Expected Cumulative GHG Emissions Reductions by Measure between 2021-2030 under the California 2017 Scoping Plan



Source: California Air Resources Board, 2017

Figure 9. GHG Emissions Reductions Achieved under the California 2017 Scoping Plan Scenario (Measures) and the Gap Closed by Cap-and-Trade through 2030



Source: California Air Resources Board, 2017

California’s analyses of emissions reductions from the RPS have informed program design decisions and the development of the state’s overall scoping plan for meeting its goals.

The authors have not employed sophisticated models of the Mexican electricity sector for this report. However, they have performed a simple, illustrative exercise to estimate of the effect of the CEL quota system on CO₂ emissions from the energy sector in Mexico.

2.1.2 Quantitative Exercise: Estimated Effects of CEL Quota System on CO₂ Emissions from the Electricity Sector

This exercise uses technology-specific electricity sector projections and a simplified methodology⁽⁴⁾ to estimate avoided GHG emissions associated with CEL quota compliance during the ETS pilot period.⁽⁵⁾ The data underpinning these calculations was collected predominantly from the SENER 2018-2032 Programa de Desarrollo del Sistema Eléctrico Nacional (PRODESEN). Table 2 provides a summary of key assumptions used to estimate the effects of the CEL quota system on emissions from the electricity sector. The results indicate that clean energy generation associated with the CEL quota will produce considerable avoided emissions in the electricity sector compared to a business as usual scenario. Furthermore, total new clean energy generation is forecasted to exceed that which is required for CEL compliance, so the total GHG impact of clean energy will likely surpass what is mandated through the CEL quota.

(4) The methodology used in this exercise differs from other methodologies used to calculate emissions reductions from clean power generation, such as those used for the Clean Development Mechanism (CDM) and other carbon offset protocols. For example, offset protocols often use a “build margin”—emissions reductions that occur because the clean generation facility was built instead of an alternative plant—in combination with an “operating margin”—emissions reductions that occur when clean generation displaces or backs down other generating facilities—in order to estimate the total emissions effect of an additional clean power generating facility relative to a business as usual baseline scenario. This methodology uses electricity sector forecasting from the PRODESEN published by SENER to estimate the operating margin of new clean energy generation in Mexico.

(5) The PRODESEN emissions projections are reported in GHG rather than for CO₂ specifically, and the data has been rounded to the nearest million for metric tons GHG, and to the nearest GWh for electricity generation, both of which impact the specificity of these results. More specific data for CO₂ emissions would improve the accuracy of these calculations. In future years, the PRODESEN generation and emissions projections will also account for the effect of ETS on electricity forecasting, which will also help improve the accuracy of the projections.

Table 2. Summary of Assumptions Used to Calculate Avoided Emissions Associated with CEL Quota Compliance

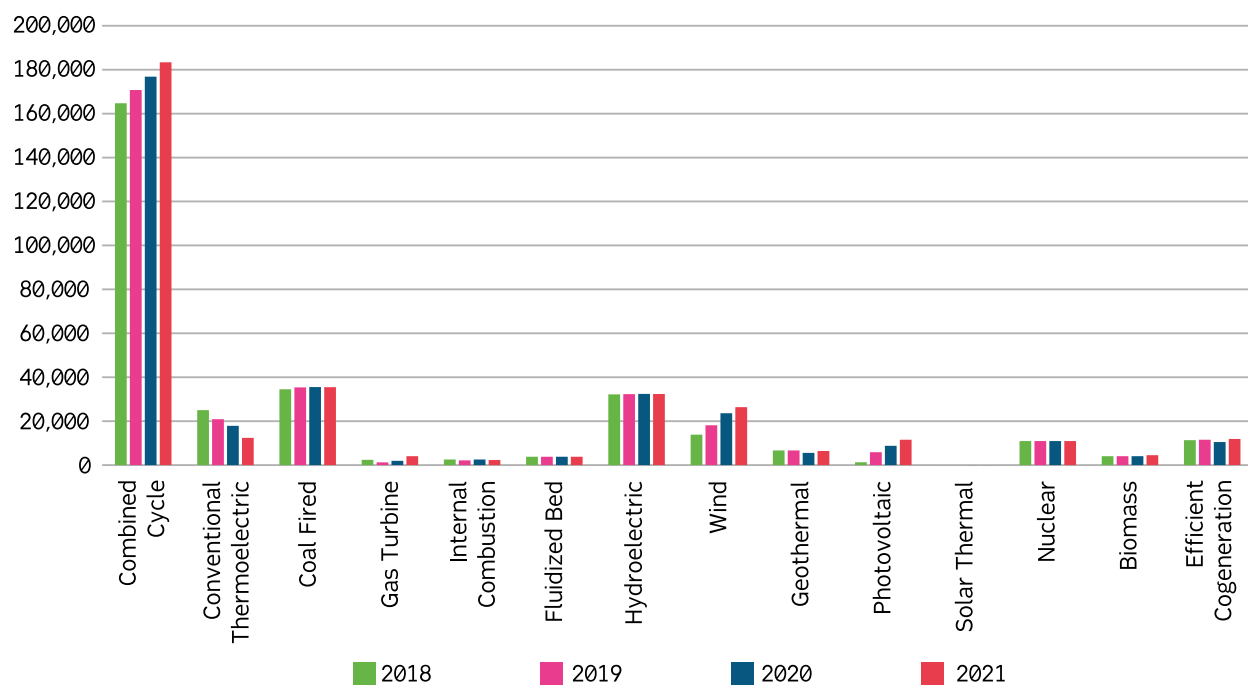
Year	Total Electricity Generation (GWh)	CEL Quota	Potential GWh Displaced by CEL Compliance	Combined Cycle GHG Intensity (Metric Tons/GWh)	Avoided Grid Emissions (GHG Tons)	Avoided GHG as % of Total Electricity Sector Emissions
2018	313,335	5.0%	15,667	395	6,188,465	5.0%
2019	323,798	5.8%	18,780	392	7,361,760	6.0%
2020	334,398	7.4%	24,745	396	9,799,020	7.9%
2021	345,380	10.9%	37,646	393	14,794,878	11.9%

Source: Secretaría de Energía de México, 2018

The PRODESEN data in Figure 10 shows forecasted growth for wind, photovoltaic solar, and combined cycle generation during the ETS pilot period. All other generation types show a relatively flat trajectory, with the exception of conventional thermoelectric, which will li-

kely decline. This analysis assumes that increases in clean energy production will result in corresponding decreases in fossil fuel-based production, therefore creating avoided emissions in the electricity sector.

Figure 10. PRODESEN Forecast of Generation by Technology (GWh)

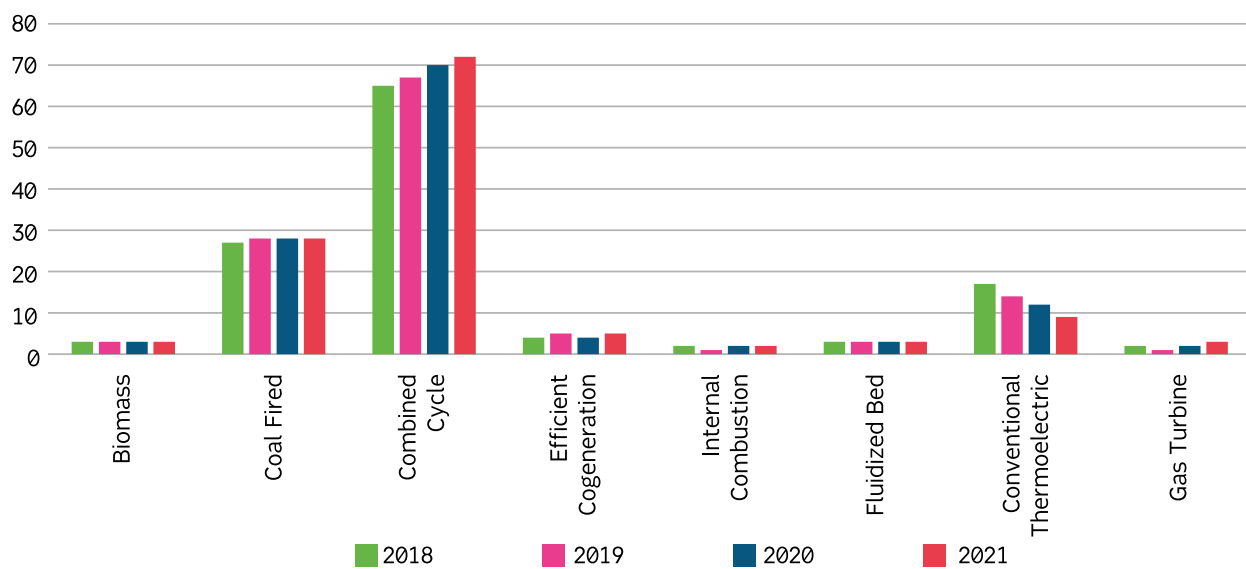


Source: Secretaría de Energía de México, 2018

Figure 11 shows GHG emissions from the electricity sector. Although emissions from combined cycle generation are still expected to increase annually, they would likely do so at an even greater rate but for the forecasted growth of clean energy in Mexico. While overall electricity generation will increase over the course of the pilot

period, emissions are expected to remain fairly level, in part due to increases in solar and wind generation, as well as a decline in emissions caused by a reduction in conventional thermoelectric generation, which has a higher GHG intensity than combined cycle generation.

Figure 11. PRODESEN Electricity Sector GHG Emissions (Millions of Metric Tons)



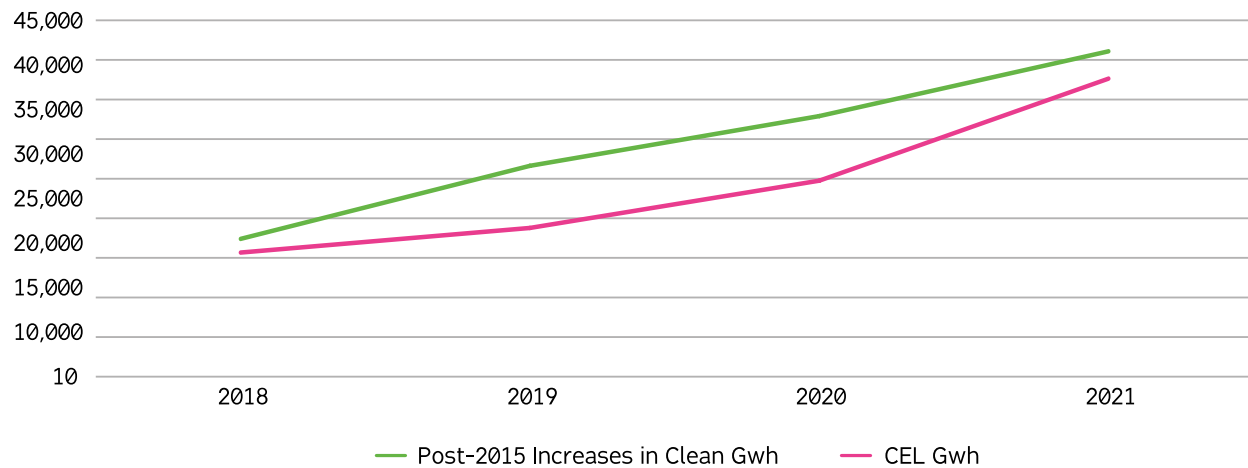
Source: Secretaría de Energía de México, 2018

Figure 12 shows that projected increases in clean energy generation may exceed the CEL quota in the 2018-2021 timeframe. Forecasted increases in clean energy generation also fluctuate on a year-to-year basis, meaning that the actual avoided emissions impact of clean energy generation associated with the CEL quota may be more substantial in certain years relative to others.⁽⁶⁾ These va-

riations in clean energy generation and avoided emissions may have implications for ETS compliance in any given year. CEL banking, where CELs issued for clean energy generation in one year are used for compliance in another, can also impact the timing of actual emissions reductions relative to CEL quota compliance targets.

(6) Projected clean energy generation associated with CEL compliance was calculated by applying the CEL quota percentage to PRODESEN total electricity sector generation projections. Post-2015 increases in clean energy generation were calculated using both historical generation data (from 2017 PRODESEN) and forecasted generation data (from 2018 PRODESEN). “Post-2015 Increases in Clean GWh” in Figure 8 represents cumulative increases in clean energy output beginning in 2016.

Figure 12. PRODESEN Forecasted Generation Associated With CEL Compliance vs. Post-2015 Increases in Clean Energy



Source: Secretaría de Energía de México, 2018; Own calculations

Figure 13 demonstrates PRODESEN forecasted avoided emissions in the electricity sector, compared to projected business as usual scenarios where the avoided emissions associated with CEL compliance and post-2015 increases in clean energy have been removed. As illustrated, the CEL Quota System and overall growth of new clean energy generation will result in a significant amount of avoided grid emissions during the ETS pilot period⁽⁷⁾.

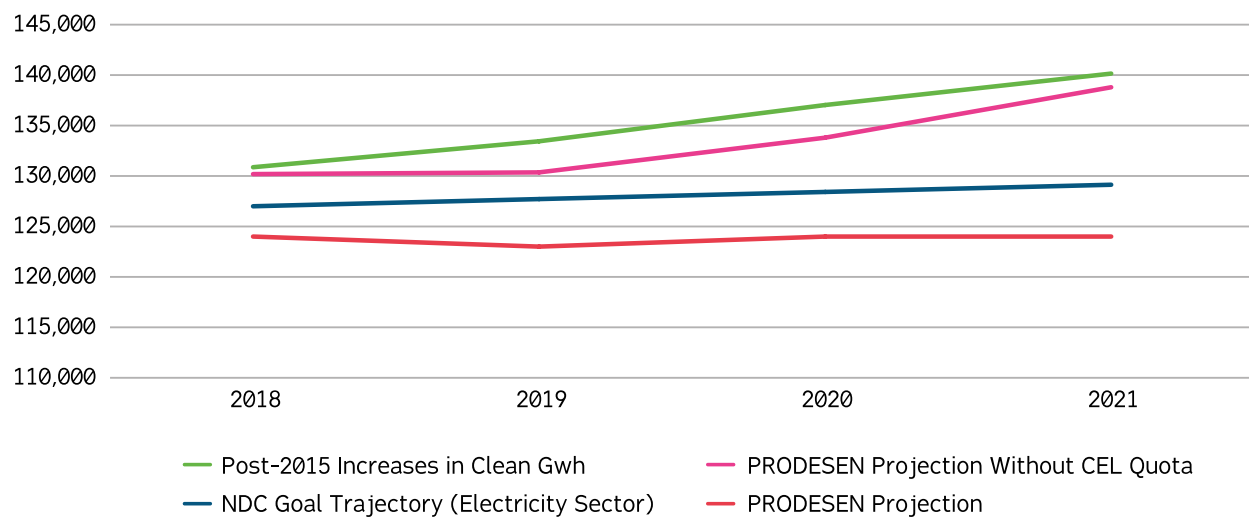
PRODESEN forecasting offers a more detailed snapshot of projected electricity sector changes beyond the CEL targets. The differences between the level of the CEL quota and current expectations of clean energy generation highlight the importance using the forecasts of total

clean energy production, not just the CEL targets, when projecting the GHG benefits of clean energy in the electricity sector. These results are shown in reference to a linear approximation for this period⁽⁸⁾ of Mexico's unconditional electricity sector emissions goal for its Nationally Determined Contribution (NDC) to the Paris Agreement (*Instituto Nacional de Ecología y Cambio Climático, 2018*). This juxtaposition may be useful in determining Mexico's conditional NDC goals for the electricity sector moving forward.

(7) Based on electricity generation forecasting, it was assumed that CEL compliance would be achieved with solar and wind. Furthermore, it was assumed that these intermittent resources would primarily back down combined cycle generation, and that the increased clean energy generation associated with CEL compliance would avoid fossil fuel-based generation on a GWh for GWh basis. Future avoided grid emissions were calculated by multiplying forecasted wind/solar generation (in GWh) used for CEL compliance by the emissions intensity (in GHG tons/GWh) associated with combined cycle generation. Forecasted wind/solar generation resulting from CEL compliance was calculated by multiplying the CEL quota (as a percentage of total electricity sector generation) by the total forecasted generation (in GWh) for the Mexican electricity sector. Emissions intensity per GWh of combined cycle generation was calculated by dividing forecasted emissions (in GHG tons) for this specific technology type by forecasted combined cycle generation (in GWh).

(8) NDC goal trajectory calculation based on linear growth from 2013 baseline of 127 tons CO₂e to 2030 goal of 139 tons CO₂e.

Figure 13. Forecasted Electricity Sector Emissions, Impact of CEL Quota and Post-2015 Clean Energy Increases, Comparison with NDC Electricity Sector Goal (Metric Tons GHG)



Source: Secretaría de Energía de México, 2017/2018; Instituto Nacional de Ecología y Cambio Climático, 2018; Own calculations

It should be noted that the simplified methodology employed in this exercise assumed that only combined cycle generation would be displaced by new clean energy. If other technologies with higher carbon intensities relative to combined cycle generation, i.e. coal fired and conventional thermoelectric, are displaced by new clean generation, then these calculations may underestimate total avoided grid emissions.

The inherent limitations of this exercise point to the value of more nuanced and comprehensive modelling of the electricity sector. Further quantitative analysis and forecasting will give regulators a more thorough understanding of the magnitude and timing of the effects of the CEL Quota System on emissions reductions in Mexico.

2.1.3 Other Potential Interactions between ETS and Clean Energy in Mexico

There are other ETS design options that have been considered and/or adopted in other regions to recognize or reward the contributions of clean energy generation. These options include allowance and auction revenue allocation to clean energy.

For example, California allocates a portion of auction revenue to clean energy projects. States participating in the RGGI program do this as well. In California, cap-and-trade auction proceeds are deposited into a fund, which the California State Legislature appropriates to agencies that administer California Climate Investments programs. In fiscal year 2018-19, \$1.25 billion in funding was received for California Climate Investments⁽⁹⁾. These investments are focused on disadvantaged and low-income communities.

(9) More information is available at: <http://www.caclimateinvestments.ca.gov>

According to discussions with representatives of Mexican government agencies, auction revenue might in the future be used for program operation and to support climate change adaptation projects. In the future, Mexico could consider allocating allowances or auction revenue to clean energy generation, or load-serving entities with clean generation. According to an analysis completed before implementation of California’s cap-and-trade system, these approaches can provide additional incentives to clean energy, quicken progress toward reducing emissions, and lower overall cost impacts (Coward, 2009).

...

In the future, Mexico could consider allocating allowances or auction revenue to clean energy generation, or load-serving entities with clean generation. According to an analysis completed before implementation of California’s cap-and-trade system, these approaches can provide additional incentives to clean energy, quicken progress toward reducing emissions, and lower overall cost impacts.

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Mexico could also consider recognizing “early action” clean energy projects from the 2013-2018 period. For example, Mexico could decide to recognize CDM CERs

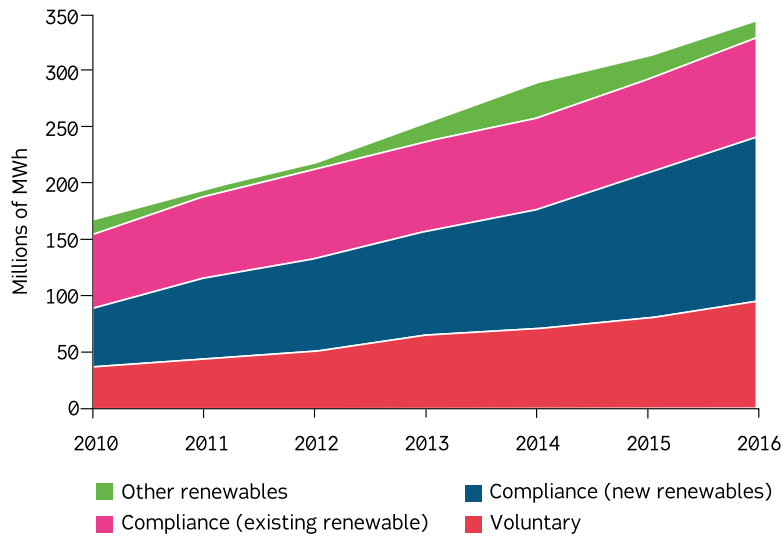
from clean energy projects as early action. As described earlier, if the emission impacts of these projects are already captured in the ETS, the early action measures are not additional or incremental and can lead to double counting. However, it may nevertheless be permitted to reward the pre-compliance action. This would have the effect of “loosening” the cap for this period. Alternatively, Mexico could reduce the number of allowances issued to compensate for the amount of early action CERs. Again, the reason for doing this would be to recognize the contributions from these non-required projects, to address loss in value that the project owners may have, and to balance those desires with the potential negative impact on the overall GHG reduction goal. CRS does not recommend this as a best practice, but consideration of this approach in the pilot phase may generate regulatory learning about how CERs could be incorporated in the future ETS.

2.1.4 Recognizing and Incentivizing Voluntary Renewable Energy Markets under ETS

Besides the CEL quota system, the ETS may also affect the development of voluntary markets for clean energy in Mexico. Separate from the CEL quota, voluntary and corporate demand for and purchasing of renewable energy can represent a separate and significant driver of its development.

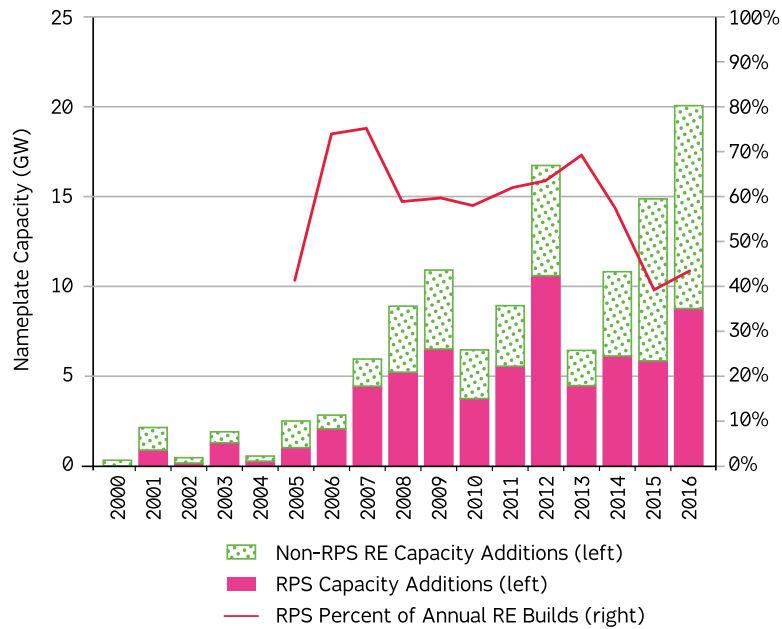
For example, in the U.S., the voluntary market for renewable energy is nearly 20 years old and has experienced tremendous growth. In 2016, over 6 million electricity customers across the country procured about 95 million MWh of green power, (O’Shaughnessy et al., 2016) which is roughly 2% of total U.S. electricity sales. The size of the voluntary market relative to combined RPS demand in the U.S. is shown in Figure 14. The market is growing at more than 10% per year, (O’Shaughnessy et al., 2016) representing a significant driver for new renewable generation capacity across the U.S. In 2015 and 2016, the majority of renewable capacity additions in the U.S.—60% and 55% respectively—were made outside of state-mandated renewable energy requirements, as shown in Figure 15 (Barbose, 2017).

Figure 14. Relative Size of Voluntary and RPS Markets for Renewable Energy in the United States



Source: National Renewable Energy Laboratory.

Figure 15. New Renewable Capacity Additions for RPS and non-RPS Uses in the United States



Source: Barbose, 2017

The extent to which voluntary and corporate demand for renewable energy can grow to become a significant driver of renewable energy production, as it has in the U.S., depends on the extent to which voluntary buyers can make exclusive usage claims and the generation is not counted toward compliance with the CEL quota. To achieve this “regulatory surplus” (generation beyond what is required by law) and ensure exclusive claims and delivery in Mexico, voluntary and corporate buyers of renewable energy may wish to procure CELs to substantiate their claims. This would ensure that the renewable generation is not used for compliance with the quota system. Experience in the U.S. voluntary renewable energy market indicates that voluntary and corporate purchasers of renewable energy also value claims that they are making a difference to emissions in the electricity sector. This presents a challenge under an ETS system which automatically accounts for the emissions benefits from voluntary renewable energy generation.

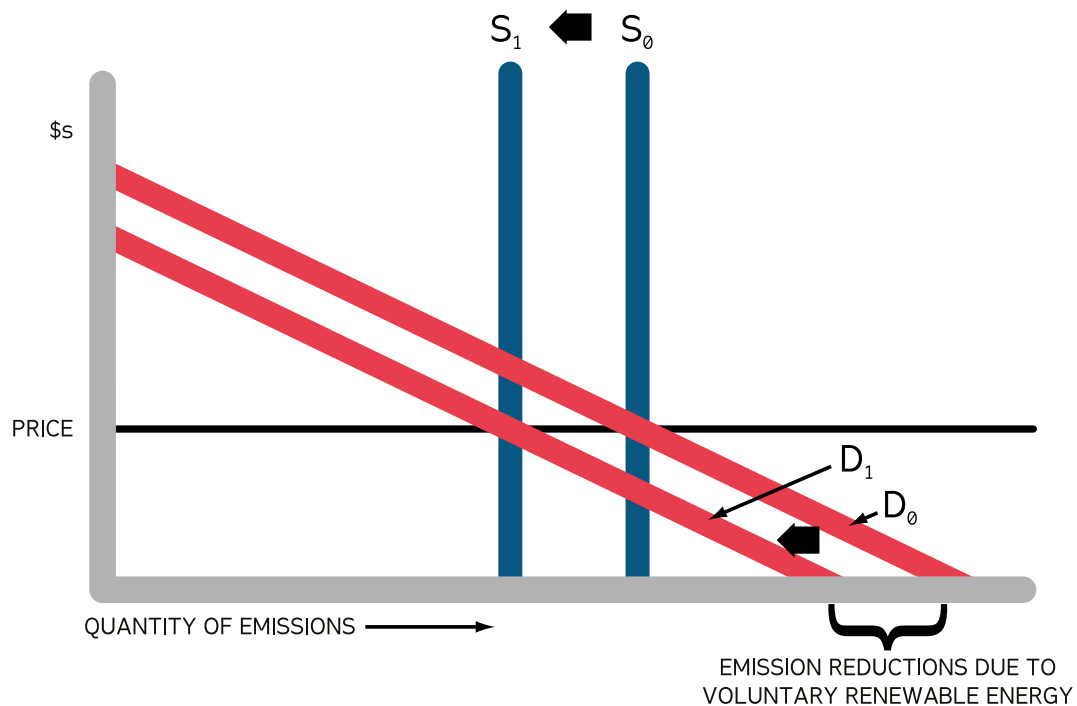
To address this challenge, both California and eight of the nine states participating in the RGGI program have adopted an allowance set-aside for voluntary renewable energy in their cap-and-trade/ETS programs. This mechanism sets aside and periodically retires allowances on behalf of voluntary renewable energy purchases and sales, effectively lowering the cap ex-post. Voluntary renewable energy purchases and sales volumes are reported to the program administrator at some regular interval in units of electricity generation (e.g. MWh) and substantiated with proof of voluntary purchase/sale (e.g. REC retirement in the U.S.). In Mexico, voluntary CEL retirement could be required to demonstrate that the generation was not used for compliance with the CEL quota. An emissions factor is applied to this amount of voluntary generation (e.g. tons/MWh) to determine the amount of allowances to be set-aside representing an approximation

of the emissions avoided by the voluntary generation. That amount of allowances is retired on behalf of the voluntary renewable energy purchasers, rather than for the compliance of any obligated party.

There are a number of options within this general framework, related to how voluntary sales are reported (e.g. voluntary market participants can be required to submit sales records and apply to the set-aside, or voluntary market data can be provided by a renewable energy tracking system); the timing and frequency of reporting and allowance retirement (e.g. annual vs. more or less frequent); how and when allowances are set aside (e.g. scheduled pre-allocation to an account vs. as needed in response to voluntary market activity and reports); eligibility requirements for set-aside retirements, if any; and the emissions factor used to calculate avoided emissions from renewable energy and determine the number of allowances per unit of renewable energy.

An allowance set-aside effectively restores the emission benefits associated with voluntary renewable energy generation, ensures regulatory surplus with respect to GHG emissions for voluntary buyers, and in so doing protects the environmental impact that is a key driver for voluntary and corporate demand for renewable energy in these places. Experience in both California and RGGI has also indicated that the cost of this set-aside mechanism is minimal. The number of allowances allocated to the set-asides is very small compared to the total supply of allowances, and the decrease in supply of allowances (and upward price pressure) is offset by the decrease in demand for allowances due to the emissions reductions created by voluntary renewable energy. This effect is illustrated in Figure 16.

Figure 16. Illustration of the Effect of a Voluntary Renewable Energy Set-aside on Allowance Prices



S_0 = the initial supply of allowances, before accounting for voluntary renewables
 S_1 = the supply of allowances, after the set-aside adjustment
 D_0 = the initial demand for allowances without reductions from voluntary renewables
 D_1 = the demand for allowances with reductions from voluntary renewables
 PRICE = price of allowances

Source: Center for Resource Solutions, 2018

The pilot phase of the ETS in Mexico will not include such a mechanism for voluntary action. But in the future, with the growth of voluntary renewable energy and interest among large corporations, Mexico could consider recognizing the incremental emissions benefits of voluntary and corporate procurement of clean electricity under the ETS by incorporating a similar allowance set-aside mechanism.

3

Analysis of Different 
Interaction Scenarios
between ETS and CEL

3. Analysis of Different Interaction Scenarios between ETS and CEL

This section describes experience with simultaneous operation of ETS and clean energy mandates (i.e. RPS) in California and RGGI states. As stated earlier, programs in these states are well established and have coexisted for quite some time. For example, the first compliance period for the RGGI program began in 2009 and both Maine and Massachusetts first launched their RPS programs in 1997. All ten states with ETS in the U.S. also operate RPS programs.

These state-based programs in the U.S. include key programmatic elements that support effective simultaneous operation of RPS and cap-and-trade, including the following.

- RECs are not used for cap-and-trade compliance.
- Compliance offsets are not allowed from within the electricity sector.
- Auction revenue is used (in part) to support renewable energy projects.
- RECs include all environmental benefits, including direct and avoided CO₂ emissions, for the purposes of supplier and consumer claims in both voluntary and compliance renewable energy markets.
- California's program includes an "RPS Adjustment" mechanism.

Since California's cap-and-trade program includes emissions associated with imported electricity, it has included the RPS Adjustment mechanism to resolve accounting

differences related to imports for entities that face compliance obligations under both programs. California's cap-and-trade program does not recognize RECs for compliance and assigns emissions to imported power based on the movement of physical power across balancing authorities using North American Electric Reliability Corporation (NERC) e-Tags. The RPS, on the other hand, recognizes firmed and shaped renewable imports that are composed of RECs paired with imported system power toward meeting the RPS requirement. The RPS Adjustment is used to adjust (lower) the compliance obligations of entities with compliance obligations under the RPS to account for non-directly delivered (firmed and shaped) imports that are recognized as renewable under the RPS. The RPS Adjustment resolves a key difference in accounting mechanisms used for electricity imports between the two programs.

Also, as noted earlier, California's cap-and-trade program does not require RECs to be imported with power in order for the state to assign the emissions factor associated with the renewable facility to the imported power under the program. This has created potential problems for neighboring RPS programs.

There are important differences, however, between the regulatory and market environment in these U.S. states and Mexico, and in program design. These differences will impact how CEL/RPS and ETS might interact and whether or not experience in the U.S. is directly applicable to the Mexican context. These differences include the following and are summarized in Table 3.

Table 3. Key differences between the U.S. and Mexico affecting the relevance of U.S. experience with RPS and ETS interactions to the Mexican CEL quota and ETS.

Difference between U.S. and Mexico	Effect related to Program Interactions
The structure of electricity market	The number and type of compliance entities in each program, and the number of entities that must comply with both.
Regulatory oversight	The way each program operates relative to others and the degree of coordination required between agencies.
Resource eligibility rules in CEL vs. RPS	How the program will affect emissions and potentially interact with ETS, in terms of both regulatory- and performance-related interactions.
CEL vs. REC definitions	The benefits and claims associated with the instrument, including CO ₂ benefits and claims, and whether or not the instrument can be used for voluntary claims and purchasing.
Certificate tracking	The tools that can be used to provide information to compliance entities, customers, and program administrators, and that can inform program design and manage interactions with ETS.
Treatment of electricity imports	Additional risks of double counting and whether additional mechanisms may be required to reconcile differences between accounting for imported/exported clean energy under the CEL quota and imported/exported emissions under the ETS.
The history of the CDM in Mexico	Whether and how CDM projects can or will be recognized under the ETS.
The voluntary renewable energy market	How ETS may want to accommodate voluntary demand for renewable energy in terms of program design (e.g. using a voluntary renewable energy set-aside) to achieve additional reductions.

- The structure of electricity market.* Mexico recently restructured its wholesale electricity market, but it is nevertheless significantly different from electricity markets in both California and the RGGI region. These differences affect the number and type of compliance entities and the number of entities that have compliance obligations under both the ETS and the CEL/RPS program. The electricity market in California is not fully deregulated, with large regulated investor-owned utilities (IOUs) still covering the majority of the state’s load. The state also features a dramatically increasing number of Community Choice Aggregation (CCA) programs, which compete with the large IOUs in their territories, as well as a number of small Publicly Owned or Municipal Utilities (POUs). All LSEs in California face RPS obligations. In most RGGI states (except Vermont), there is full retail choice for electricity, meaning competitive electricity suppliers (along with municipal electric aggregation programs, where permitted) face RPS obligations.
- Regulatory oversight of the electricity market, the CEL/RPS programs, and the ETS programs.* Just as the structure of electricity markets differ between regions of the U.S. and Mexico, so too do regulations governing activity in these markets and oversight of CEL/RPS and ETS programs. These differences impact the way these programs operate and interact. For example, in California, regulatory authority over the RPS is divided between the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC), requiring these agencies to coordinate with each other on reporting, compliance, and resource planning, and with CARB on cap-and-trade and emissions in the electricity sector. There is also an Independent System Operator (CAISO) and a regional Energy Imbalance Market, with its own governance structure.
- Resource eligibility rules in the CEL program vs. RPS programs.* RPS programs apply to renewable resources, and there are some differences between states’ definitions of eligible resources. Some states also have specified “carve-out” quotas for specific renewable resources. Mexico’s CEL quota system applies to clean resources that may include renewable as well as non-renewable resources. This difference affects how these programs interact with ETS, in terms of both the regulatory- and performance-related interactions discussed above.

- *CEL vs. REC definitions.* CELs and RECs are different instruments, and there are different benefits and claims associated with each instrument. For example, RECs generally convey all environmental attributes of the renewable electricity generation to the owner for the purposes of any delivery or consumption claim, whether voluntary or compliance. This includes CO₂ emissions attributes. In contrast, there is no defined emissions claim or benefit included with the CEL.

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- *Certificate tracking.* RGGI states in the northeast U.S. are served by all-generation certificate tracking systems (the New England Power Pool Generation Information System, the PJM EIS's Generation Attribute Tracking System, and the New York Generation Attribute Tracking System), in which each MWh of electricity generation, regardless of the resource type, is tracked with certificates. California is served by the Western Renewable Energy Generation Information System (WREGIS), which tracks

RECs from certain renewable resource types. Mexico's CEL tracking system only tracks CELs issued to qualified clean energy generators for generation after August 11, 2014. These differences affect the tools that can be used to provide information to compliance entities, customers, and program administrators, and that can inform program design and manage interactions. For example, emissions information can be tracked in NEPOOL-GIS in order to provide a picture of delivered emissions for each load serving entity.

- *Electricity imports are covered in the California cap-and-trade program but are not covered in RGGI or the pilot phase of the Mexican ETS.* Risks of double counting between ETS and CEL/RPS associated with electricity imports and exports are discussed in detail earlier in this report. In addition, mechanisms like California's RPS Adjustment are not necessary where imports are not included in the ETS. Unlike Mexico, electricity imports represent a significant proportion of total electricity served to load in both California and RGGI states.
- *The history of the CDM in Mexico.* According to the CDM Pipeline, 192 CDM projects have been registered to date in Mexico, of which 48 are renewable energy projects (Fenhann, 2018). Total CERs from these projects issued to date equal 10,162,000 tCO₂e; and expected total CERs from these projects through their crediting periods equal 12,553,000 tCO₂e (Fenhann, 2018). The presence of these projects raises the issue of if they will be acknowledged for early action under the ETS. They also raise the question of if and how these projects will participate in both the ETS and CEL quota. The U.S. ETS systems did not face this challenge as there are no CDM projects in the U.S., and there are a very limited number of voluntary renewable energy offset projects in the U.S., none of which are in states covered by an ETS.

- *The voluntary renewable energy market in the U.S.* The size and growth of the voluntary renewable energy market in the U.S. and how it is accommodated in the program design of both California’s cap-and-trade and the RGGI program were discussed earlier. Mexico does not currently face the same levels of voluntary action in the electricity sector, however this may change at which point similar policy mechanisms in ETS to protect this demand and produce additional emissions reductions in the sector can be considered.

While these differences between Mexico and the U.S. do not necessarily prohibit the consideration of programmatic elements from the California and RGGI systems, they highlight that Mexico will have a unique context for ETS-CEL program interactions. More detailed analysis may reveal unique challenges and yield new insights for ETS and CEL program design.

Interactions between the RPS and Cap-and-trade in California

The Renewable Portfolio Standard (RPS) and cap-and-trade programs in California are administered as separate programs, but both contribute to meeting the state’s greenhouse gas (GHG) emission reduction goals and both are included as measures in the state’s Climate Change Scoping Plan.

The RPS was originally enacted in 2002 to generate a certain percentage of retail electricity sales from eligible renewable energy—in other words, to require that a minimum amount of renewable energy be delivered to meet retail load in California. The target has been increased from 20% renewable by 2013, to 33% by 2020, to 50% by 2030, and now to 60% by 2030 (100% “carbon free” by 2045 as Senate Bill 100 was signed into law by Governor Jerry Brown on September 9, 2018). The RPS is administered jointly by the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC). Eligible technologies include solar, wind, geothermal, ocean wave and tidal, landfill gas, certain municipal solid waste (MSW) conversion, certain biomass, and certain hydroelectric. Compliance with the RPS is verified using renewable energy credits (RECs)—representing 1 MWh of electricity generated from a renewable resource and conveying all environmental attributes of renewable generation—tracked and retired in WREGIS. Eligible renewable facilities may be located anywhere in the Western Electricity Coordinating Council (WECC) region, including 14 states in the Western U.S., 2 Canadian provinces, and Northern Baja Mexico. In addition to the quotas, there are requirements for suppliers in terms of supply/procurement. There are three categories of eligible procurement, or Portfolio Content Categories (PCCs), informally called compliance “buckets:”

- PCC/Bucket 1: Energy and RECs delivered to a California Balancing Authority (CBA) without substituting electricity from another source (e.g. energy and RECs from an eligible interconnected facility);
- PCC/Bucket 2: Energy and RECs that cannot be delivered to a CBA without substituting electricity from another source (e.g. RECs and energy simultaneously purchased from a facility, and “firmed and shaped” power); and
- PCC/Bucket 3: RECs “unbundled” from associated energy generation or RECs that do not meet conditions of PCC 1 or 2.
- For the 2017-2020 period, most retail suppliers in California must demonstrate RPS compliance with at least 75% PCC/Bucket 1 and no more than 10% PCC/Bucket 3 procurement.

For the 2017-2020 period, most retail suppliers in California must demonstrate RPS compliance with at least 75% PCC/Bucket 1 and no more than 10% PCC/Bucket 3 procurement.

CARB adopted the state's cap-and-trade program in 2011, and the first compliance period began in 2013. Compliance is satisfied through the retirement of tradable emissions allowances, which are either issued freely to compliance entities by CARB or can be purchased at quarterly auctions. California's cap covers the electricity sector as well as industrial emitters and distributors of heating and transportation fuels. Affected parties originally only included large, stationary sources annually emitting more than 25,000 MTCO₂ e, but as of 2015, fuel distributors are included to cover emissions from nonpoint sources. This increased coverage from 35% to 85% of emissions in California. The program is not limited to carbon dioxide—covered emissions also include methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride. Eight percent of compliance obligations may be met by purchasing CARB-approved offset credits from forestry, urban forestry, livestock digesters, or destruction of ozone depleting substances projects. The transfer and retirement of allowances and offsets to meet these goals is reported using the Compliance Instrument Tracking System Service (CITSS). In 2015, the overall cap was 394.5 million metric tons (MMT). It is set to decrease to 334.2 MMT by 2020. California has linked its ETS with Quebec, and allowances from these regions have been entirely interchangeable since 2014. In July 2017, a bipartisan effort in the California legislature allowed for the extension of this regulation through 2030.

There are limited regulatory and programmatic interactions between the RPS and the cap-and-trade program. However, the cap-and-trade program does include the RPS Adjustment, which is used to adjust (lower) the compliance obligations of entities with compliance obligations under the RPS to account for non-directly delivered (firmed and shaped) imports that are recognized as renewable under the RPS and resolves a key difference in accounting mechanisms used for electricity imports between the two programs. In addition, auction proceeds are used to support renewable energy that can generate RECs and be used toward the RPS.

There are other ways in which cap-and-trade in California affects RECs. First, RECs associated with power that is imported to the state and counted as specified power could be double counted if they are used for RPS or voluntary purposes outside of the state. Second, California's cap-and-trade includes a set-aside mechanism to retire allowances on behalf of voluntary renewable energy.

Finally, there are certainly interactions between RPS and cap-and-trade in California in terms of performance and emissions reductions. In fact, the RPS is a critical measure used to meet California's overall emissions reduction goals. Cap-and-trade is used to close the gap between emissions reductions from the RPS and other measures and the final target. According to CARB analysis, the RPS provides a larger portion of emission reductions relative to other measures and the cap before 2020, and the carbon price (cap-and-trade) and policies in other sectors will play a larger relative role in driving emissions reductions between 2020 and 2030. This analysis has informed program design decisions and the development of the state's overall scoping plan for meeting its goals.

Interactions between RPS programs in the Northeast U.S. and RGGI

The Renewable Portfolio Standard (RPS) and cap-and-trade programs in California are administered as separate. The Regional Greenhouse Gas Initiative (RGGI), implemented via separate regulation in each of the nine participating states in the Northeast U.S., is administered separately from Renewable Portfolio Standard (RPS) programs in each of these states. But both RPS and RGGI contribute to meeting the region's and each state's GHG emission reduction goals.

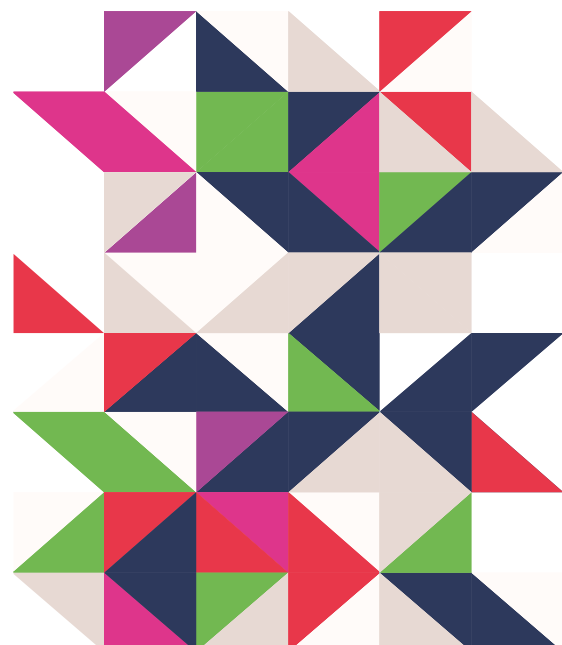
With its first compliance period starting in 2009, RGGI was the first mandatory cap-and-trade program in the U.S. Each participating state has adopted a policy consistent with the RGGI Model Rule, a set of consistent regulations collectively designed by the group. As of the date of this report, participating states include Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. RGGI covers CO₂ emissions at fossil fuel-fired electricity generators with a capacity of 25 MW or greater. For each short ton of CO₂ emitted annually, affected parties must procure an allowance from quarterly auctions or from other generators within RGGI. Alternatively, they may purchase carbon offsets from eligible projects. The RGGI CO₂ Allowance Tracking Systems (COATS) is used to record each regulated entity's compliance and is managed by RGGI, Inc. During the first compliance period (2009-2011), covered emissions fell below the cap of 188 million short tons. The annual cap for the second compliance period (2011-2013) was reduced to 165 million short tons. The 2014 cap was reduced again to 91 million short tons and was set to decrease annually by an additional 2.5% through 2020, which marks the end of the fourth and final control period. RGGI estimates that 115 million pre-2014 allowances were privately banked before the cap was tightened, and so RGGI has made interim adjustments to account for banked allowances. For example, the adjusted cap for 2014 was 82,792,336 short tons, and the final adjusted cap in 2020 will be 56,283,807 short tons. By 2020, RGGI is estimated to reduce power sector CO₂ emissions in member states by 45% compared with 2005 levels. Recently proposed revisions will extend regulation with the goal of reducing emissions by an additional 30% between 2020 and 2030; the final cap set in 2030 would be approximately 65% lower than the original cap set in 2009.

All nine RGGI states also have an RPS program, some of the most aggressive in the country. Maine and Massachusetts first launched their RPS programs in 1997. All programs establish a percentage of retail electricity sales to end-use customers that must be derived from renewable energy generating sources. The current targets for each state are below.

- Connecticut – 27% by 2020
- Delaware – 25% by 2026
- Maine – 40% by 2017
- Maryland – 25% by 2020
- Massachusetts – 15% by 2020 (new resources), 6.03% by 2016 (existing resources)
- New Hampshire – 24.8% by 2025
- New York – 50% by 2030
- Rhode Island – 38.5% by 2035
- Vermont – 75% by 2032

Each program is slightly different in terms of resource eligibility, “carve-outs” for specific resources, geographic eligibility, other supply/procurement requirements and limitations, compliance entities, multipliers, banking, and other rules. But all use Renewable Energy Certificates (RECs) —representing 1 MWh of electricity generated from a renewable resource and conveying all environmental attributes of renewable generation—as the compliance instrument, tracked in the New England Power Pool Generation Information System (NEPOOL-GIS) for Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont; tracked in the PJM EIS Generation Attribute Tracking System (PJM-GATS) for Delaware and Maryland; and New York has its own tracking system, the New York Generation Attribute Tracking System (NYGATS).

There are limited regulatory and programmatic interactions between RPS programs and RGGI. Auction proceeds are sometimes used to support renewable energy that generate RECs and may be used toward different RPS programs, where eligible. All RGGI states except for Delaware include a set-aside mechanism to retire allowances on behalf of voluntary renewable energy, a separate market for renewable energy. Finally, there are certainly interactions between RPS and RGGI in terms of performance and emissions reductions. RPS programs contribute to emissions reduction in the power sector under the RGGI cap and may lower the cost of RGGI compliance. Regular performance reviews of the RGGI program may consider RPS and other emissions reduction activities when considering cap adjustments.



4

Summary of Findings
and Lessons from
California and RGGI

4. Summary of Findings and Lessons from California and RGGI

This section provides short responses to specific questions that helped precipitate this report as its chief findings. The Concluding Recommendations that follow reflect and reiterate these findings, and the final Road Map organizes the recommendations along the process of ETS implementation.

How can Mexico ensure that the environmental effects of each program are incremental?

Changes in the electricity sector, in particular the transition to clean energy generation ushered in part by the CEL quota system, will affect CO₂ emissions from the sector, which are regulated under the Mexican ETS. In order to ensure that the programs produce non-overlapping results, the ETS cap for the electricity sector would need to be adjusted (i.e. lowered) either ex-ante or ex-post by the amount of emissions reductions caused by the CEL quota system. Using a simplified example, if the ETS cap is set at 500 tons for 2020 and the CEL quota is expected to reduce emissions in the electricity sector by 100 tons in 2020, then the ETS cap could be lowered by 100 to equal 400 tons in 2020, or 100 allowances could be set aside and not used for compliance. This would ensure, for example, that the price on carbon is driving all compliance with the ETS cap on the electricity sector, and that the CEL quota is producing emissions reductions in the sector that are above and beyond the ETS cap.

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Mexico can avoid double counting in the ETS by not allowing CELs or offsets from clean electricity facilities to be used for compliance in the ETS. This is also consistent with California and RGGI rules.

...

But this may not be necessary or desirable. As stated earlier, Mexico may wish for the ETS and CEL quota system to act as complementary measures to meet national goals related to clean energy and emissions reductions. Mexico can calculate and monitor changes in CO₂ emissions from the sector that can be attributed to the CEL quota system, and likewise track the effect of carbon prices on clean energy development. This will provide a view of how the programs are interacting in terms of performance. Flexibility mechanisms and other rules, such as allowance banking rules, which provide some price relief and insulation from spikes in the ETS can be adjusted based on this information to help improve the incremental performance of the ETS. Though CARB does not set the level of California's economy-wide cap based on emissions reductions from the RPS, it does calculate emissions reductions associated with the RPS relative to those from cap-and-trade with respect to overall state emissions goals in the AB 32 Scoping Plan.

Finally, Mexico can avoid double counting in the ETS by not allowing CELs or offsets from clean electricity facilities to be used for compliance in the ETS. This is also consistent with California and RGGI rules.

How can Mexico achieve the lowest cost of compliance for entities regulated under both programs?

Additional study and analysis are needed. Mexico can perform economic analysis that considers environmental effectiveness and economic efficiency of both programs as well as potential price fluctuations. It should not necessarily be assumed that regulation under both programs produces additional costs in all cases.

There are indeed entities that face compliance obligations under both cap-and-trade and the RPS in both California and RGGI states, namely utilities that both own emitting generation and act as a retail supplier of electricity. For the most part, compliance under the two programs is separate, and rules (in either program) do not depend on whether the entities face compliance obligations under multiple programs. However, there are some mechanisms in place to align the two programs for entities complying with both. One example is the RPS Adjustment in the California cap-and-trade program. Described in more detail above, the RPS Adjustment mechanism resolves accounting differences related to imports for entities that face compliance obligations under both programs. Since neither the CEL quota system nor the ETS includes imported electricity, Mexico may consider such a mechanism in the future depending on how rules addressing firmed and shaped renewable imports are structured in the CEL quota system.

Furthermore, previously discussed flexibility mechanisms in the ETS can provide price relief for all compliance entities. Separate rules could be developed for entities regulated under both programs, provided they demonstrate additional costs due to regulation under both programs that can be alleviated with additional flexibility under ETS.

Are compliance cycles, rules, certificate issuance and cancellation procedures compatible between both instruments?

If compliance under the ETS remains separate from compliance under the CEL quota system (e.g. CELs are not allowed for compliance under the ETS), then having different compliance cycles, rules, and procedures will not necessarily cause problems in each program. From an administrative standpoint, compliance entities may appreciate alignment of compliance cycles and rules to the extent possible (though offsetting compliance cycles may also be preferable to some entities to reduce administrative burden). Alignment of compliance cycles and reporting periods may also be beneficial to the regulatory agencies in terms of analyzing and comparing the performance of each program.

Is it feasible for an ETS to receive offsets from clean energy generation?

Allowing offsets from clean electricity generation facilities to be used for ETS compliance would produce double counting and could lead to an increase in emissions from the sector above planned levels, as is described above. This would affect the impact and credibility of the program. It may also affect Mexico's ability to link its ETS with other programs, e.g. California. We are not aware of any existing ETS program that allows offsets from within a capped sector to be used for compliance.

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If compliance under the ETS remains separate from compliance under the CEL quota system then having different compliance cycles, rules, and procedures will not necessarily cause problems in each program.

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How can Mexico consider clean energy generation goals and their reduction pathways in the ETS cap setting?

There are several options. One option, as discussed above, is to adjust (i.e. lower) the ETS cap for the electricity sector either ex-ante or ex-post for emissions reductions caused by the CEL quota system. This would ensure that the price on carbon is driving all compliance with the ETS cap on the electricity sector. Another is to leave the ETS cap unadjusted, while continuing to calculate and monitor changes in CO₂ emissions from the sector that can be attributed to the CEL quota system. This will give regulators a better sense of how the programs are interacting, what is driving change, and whether programmatic changes, e.g. related to flexibility mechanisms and other rules, can be adjusted to improve performance and drive additional reductions. This is similar to the approach that California has taken with respect to its cap-and-trade and RPS programs.

Regardless of which option is selected, Mexico can better assess the effect of clean energy pathways on emissions by improving 15-year projections of the electricity sector to incorporate the ETS.

Mexico can also consider clean energy generation goals not in terms of ETS cap setting specifically, but rather in terms of other elements of ETS design—for example, allowance and auction revenue allocation to clean energy generation.

What are the advantages of integrating tracking and registry platforms of ETS and CEL into a unified system, as opposed to maintaining two well-coordinated yet separate systems?

If CELs and emissions allowances remain separate compliance instruments, there is no perceivable advantage to tracking the instruments in the same system or registry. In fact, tracking them in the same registry may be confusing. The instruments represent different units (MWh vs. tonnes of CO₂). They are issued under different circumstances to different users (to generators based on an amount of verified electricity generation vs. to compliance entities and potentially others based on predetermined allowance allocation rules).

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If CELs and emissions allowances remain separate compliance instruments, there is no perceivable advantage to tracking the instruments in the same system or registry. In fact, tracking them in the same registry may be confusing.

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However, the instrument tracking systems for each program can communicate and share information to produce benefits for both programs. Real-time monitoring of compliance progress in each program could be helpful for

program planning. In California, WREGIS (a renewable energy only tracking system) and the Compliance Instrument Tracking System Service (CITSS) (the compliance registry for California cap-and-trade) are not coordinated in any significant way.

How can Mexico develop market rules that embrace all the aspects under analysis in this report?

In order to develop ETS market rules that reflect a full understanding of its interaction with the CEL quota system, Mexico can collect more detailed information about the CEL quota system in terms of its effect on CO₂ emissions. It could build flexibility in to the ETS that will allow for adjustments in response to changes in emissions from the power sector. Mexico can help avoid double counting by, first, explicitly determining that CELs and offsets from clean electricity generation may not be used for ETS compliance. Second, Mexico can monitor the development of clean energy quotas and ETS in neighboring jurisdictions and consider double counting risks around exports and imports in any future mutual recognition and/or linkage agreements.

Mexico can also plan for the future of the ETS as the electricity sector evolves. For example, it can consider allocating allowances or auction revenue to clean energy generation, or load-serving entities with clean generation, in order to provide an additional incentive to clean energy. Mexico can consider the potential role of a future voluntary market for clean energy in Mexico, and consider incorporating a voluntary renewable energy set-aside in future phases of the ETS.

Finally, the CEL quota system can also develop its rules with a full understanding of its effect on the ETS system and emissions accounting in general. For example, the CEL quota system can consider a clarification of the CEL definition to include the GHG benefits of clean energy production along with all other environmental attributes of generation. This would prevent potential double counting or leakage problems, particularly if there is more cross border trading in the future, which could affect the quality of the data provided to the ETS regarding the emissions impact of the CEL quota. It may also strengthen voluntary demand for CELs which may provide an additional driver for both clean energy generation and emissions reductions.

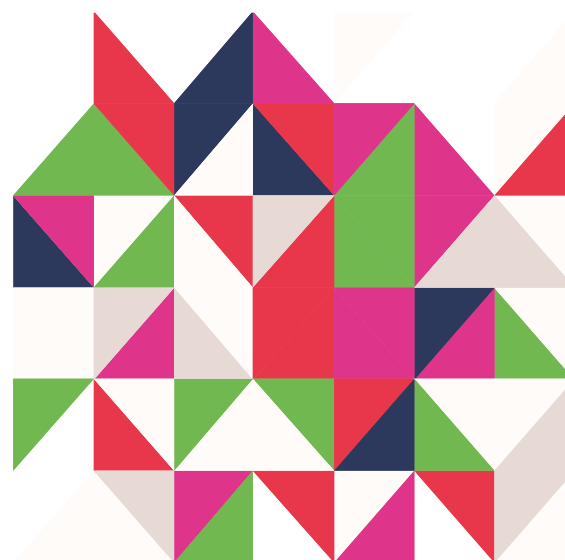
How can Mexico prepare for future linkages with other jurisdictions' ETS?

Mexico can align its program to the extent possible with other jurisdictions, perhaps using California as a model. The initial pilot phase rules for the Mexican ETS already appear well aligned with California cap-and-trade. First, to best prepare for future linkages, Mexico should avoid double counting. Mexican allowances may not be accepted in other programs if there is double counting with CELs or offsets from clean energy generation. Offsets from Mexican clean electricity generation are also unlikely to be accepted by other jurisdictions. Second, Mexico can monitor the development of neighboring programs, particularly related to the treatment of imported and exported electricity. Mutual recognition agreements with neighboring jurisdictions should consider double counting risks and other potential interactions related to electricity imports and exports.

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To best prepare for future linkages, Mexico should avoid double counting. Mexican allowances may not be accepted in other programs if there is double counting with CELs or offsets from clean energy generation.

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5

Concluding Recommendations

5. Concluding Recommendations

The following recommendations pertain to options related to recognizing emissions reductions from the CEL quota under the ETS, as required by recent amendments to the LGCC. This report supports options that avoid double counting, avoid oversupply situations for the ETS, ensure environmental integrity of the ETS, and ensure sectoral mitigation goals in line with Mexico's Nationally Determined Contribution (NDC) targets.

- CELs should not be used as a compliance instrument in ETS or converted to offsets that can be used for ETS compliance. This is to prevent double counting and is consistent with the current prohibition of offsets from mitigation projects in capped sectors under draft ETS rules.
- Instead, to meet the requirements of the law, it is recommended that emissions reductions from the CEL quota system be acknowledged under the ETS through program and cap design, reduction pathways, flexibility mechanisms, trading and banking rules, and linking decisions. This type of action is especially important, as the regulations for the ETS pilot phase do not allow SEMARNAT to impose these requirements on other ministries or agencies without environmental obligations.

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To meet the requirements of the law, it is recommended that emissions reductions from the CEL quota system be acknowledged under the ETS through program and cap design, reduction pathways, flexibility mechanisms, trading and banking rules, and linking decisions.


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- Comprehensive modeling of emissions in the electricity sector under the CEL quota, along with emissions in the industrial sector, is recommended. This will inform the development and implementation of flexibility mechanisms and banking rules in ETS. It will also help in producing an understanding of when there might be oversupply or undersupply, when the CEL market might moderate pressure on carbon prices and when it will not. The illustrative quantitative exercise included in this report demonstrated that CEL compliance could have a significant impact on avoided emissions in the electricity sector.
- Incorporation of the ETS into 15-year projections of the electricity sector is recommended, such that these projections can be considered in cap-setting and ETS program design, again related to flexibility mechanisms.
- Since projections may differ from actual dispatch, regular communication between energy and environmental regulators is recommended, and flexibility should be built into the ETS to account for those differences. In addition, emissions reductions from the CEL quota system during the pilot period be quantified so that they may be compared to projections and considered during cap setting and development of rules around flexibility mechanisms for the formal phase of the ETS.
- It is recommended that Mexico evaluate the total amount of CERs that will be recognized as early action under the pilot phase of the ETS as a proportion of overall reductions during the pilot phase in order to assess potential impact on the overall integrity of the market (compared to a scenario in which these CERs were not used). It is further recommended that any use of CERs for early action in the pilot phase be analyzed to inform decisions about their role in the formal phase of the ETS.

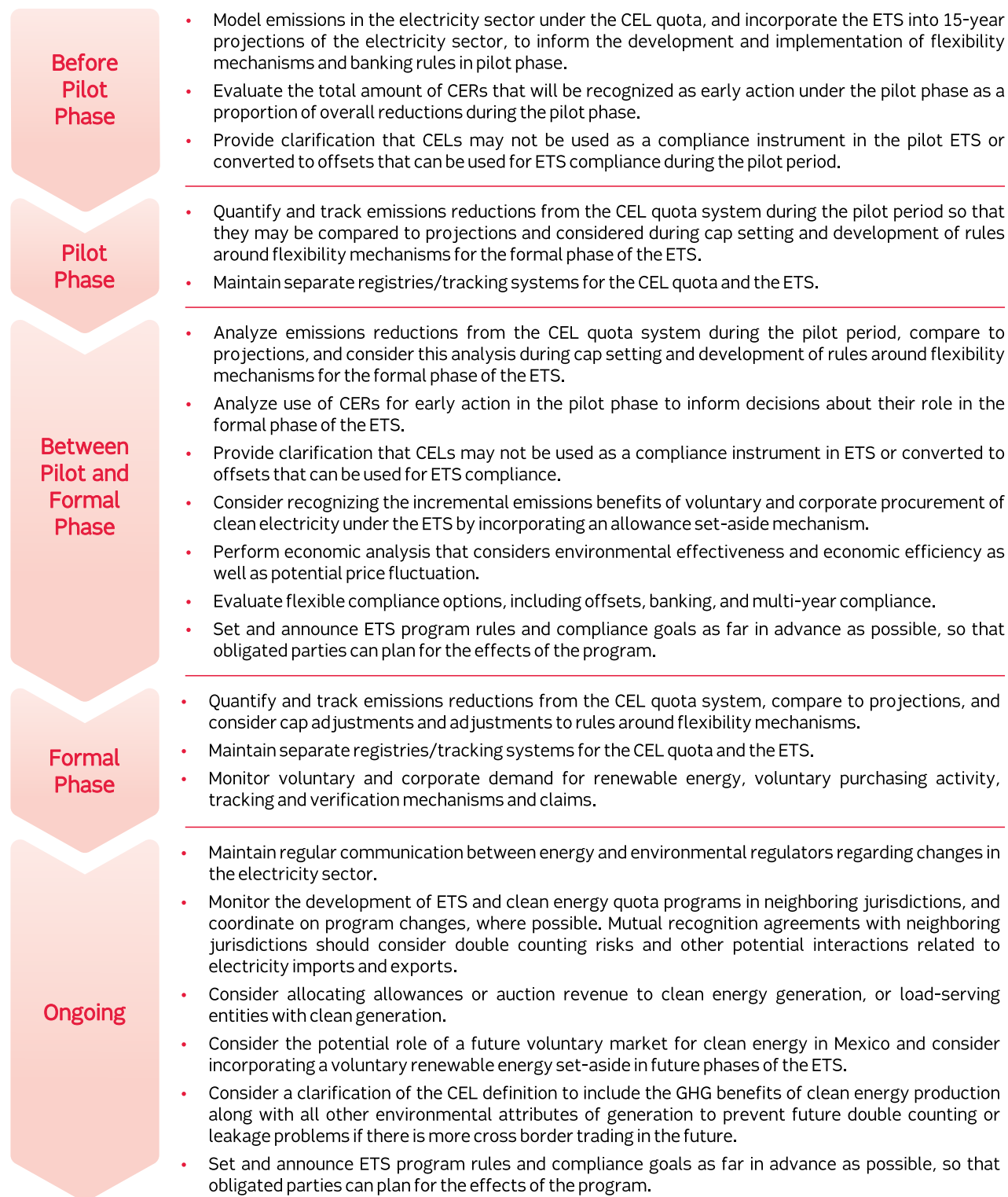
The following recommendations pertain to ETS and CEL design options to facilitate reaching the objectives of the energy and climate change policies in Mexico.

- Ensure that the environmental goals of each instrument are exclusive, surplus, and supplementary by:
 - Avoiding double counting;
 - Modeling emissions impacts in the electricity sector from the CEL quota to inform ETS design and development;
 - Considering a clarification of the CEL definition to include the GHG benefits of clean energy production along with all other environmental attributes of generation, which can prevent future double counting or leakage problems if there is more cross border trading in the future.
- Seek to reduce compliance costs for entities regulated under both instruments by:
 - Performing economic analysis that considers environmental effectiveness and economic efficiency as well as potential price fluctuation;
 - Incorporating flexible compliance options, including offsets (from non-capped sectors), banking, and multi-year compliance;
 - Setting and announcing ETS program rules and compliance goals as far in advance as possible, so that obligated parties can plan for the effects of the program.
- Consider the potential role of a future voluntary market for clean energy in Mexico and consider incorporating a voluntary renewable energy set-aside in future phases of the ETS.
- Maintain separate registries/tracking systems for the CEL quota and the ETS.
- Prepare for future linkages with other jurisdictions' ETS by avoiding double counting, monitoring the development of other programs, and coordinating on program changes, where possible. The pilot phase ETS is well positioned to align with the California program.
- Quantify and track emissions reductions from the CEL quota system during the pilot period. These may be compared to projections to improve accuracy of the projections and be considered during cap setting and development of rules around flexibility mechanisms for the formal phase of the ETS.
- In general, the pilot phase of the ETS can inform the formal phase with respect to decisions on the interaction of CELs and ETS and about the recognition of early action from clean energy and energy efficiency projects. Conduct analysis of how early and future energy efficiency actions may contribute to ETS obligations, based in part on any experience gained with use of CERs for early action in the pilot phase, if this is permitted.



Road Map for 
Effective Simultaneous
Operation of CELs
and ETS in Mexico

6. Road Map for Effective Simultaneous Operation of CELs and ETS in Mexico





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