Distributing Allowances in the Mexican Emissions Trading System: Indicative Allocation Scenarios

SEMARNAT
SECRETARÍA DE MEDIO AMBIENTE Y
RECURSOS NATURALES

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Deutsche Gesellschaft
für Internationale
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List of Acronyms

BAU: Business as Usual

CSCF: Cross-Sectoral Correction Factor

ETS: Emissions Trading System

EU ETS: European Union Emissions Trading System

GDP: Gross Domestic Product

GHG: Greenhouse Gas

ICAP: International Carbon Action Partnership

INECC: National Institute of Environment and Climate Change of Mexico

MSR: Market Stability Reserve

NAP: National Allocation Plan

NDC: Nationally Determined Contribution

NER: New Entrants' Reserve

PMR: Partnership for Market Readiness

RENE: National Emissions Register

SCUF: Standard Capacity Utilisation Factor

SEMARNAT: Ministry of Environment and Natural Resources

Executive summary

Mexico is planning a three-year pilot phase of an Emission Trading System (ETS) which will be followed by a mandatory phase aligning with the implementation of the Paris Agreement. In order to strengthen the capacity and readiness for Mexican business to participate in emissions trading, the first carbon market simulation exercise was completed on the 28th of June 2018, which involved more than 100 companies from a range of economic sectors that represented approximately two thirds of the country's GHG emissions (ICAP 2018). Further details on the Mexican ETS are expected in the months to come, once the new national administration takes office in December 2018 (ICAP 2018).

This report is concerned with outlining different options for allocating allowances under the Mexican ETS, i.e. how the total quantity of allowances is distributed to individual companies. The allocation of allowances under an ETS determines how the costs related to the ETS are distributed across society. When distributing allowances, policy makers will seek to achieve some or all of the following objectives:

- Managing transition to an ETS;

- Reducing the risk of carbon leakage or loss of competitiveness;

- Raising revenue; and

- Preserving incentives for cost-effective abatement.

There are two fundamental approaches to allocation:

- Auctioning: a government sells allowances in an auction.

- Free allocation: allowances are given away by a government for free using either a:
    - Grandparenting approach (based on historic emissions);
    - Benchmarking approach with infrequent updating of output levels;
    - Benchmarking with frequent / annual updating (output-based approach).

This study has developed an allocation tool in order to support policy makers with the allocation of allowances under the Mexican ETS cap during the pilot phase to participating installations in different sectors of the economy. The tool can be used for future phases as well.

The results from a number of illustrative allocation scenarios presented in this report are primarily based upon the grandparenting approach to allocation. The distribution of allowances to installations based upon grandparenting reflects certain priorities (i.e. such as protecting firms from carbon leakage) and this is demonstrated in the allocation scenarios (i.e. in several scenarios the historic emissions of the sectors at risk of carbon leakage were fully covered by free allowances). However, there are also some drawbacks to this approach (i.e. the allocation of free allowances based upon grandparenting potentially distorts the price signal and may undermine the cost effectiveness of the abatement realised).

Stronger incentives for cost-efficient emissions reductions and more efficient price discovery may be achieved via the free allocation of allowances based upon a benchmarking approach. In an additional scenario, the impact of applying such an approach at the installation level revealed that there would be both 'winners' and 'losers' compared to the grandparenting approach.

Allocating allowances via auctions has many advantages, in that it is easy to implement, provides the best way for efficient price discovery, aids price management, generates revenues (which can be used to address unwanted distributional effects) and avoids potentially difficult political processes related to the implementation of free allocation. It is, however, common practice for ETSs to start with a relatively small share of auctioning in order to alleviate competitiveness and carbon leakage concerns. Also in the pilot phase of its ETS, Mexico is planning to collect first experiences with auctioning allowances.

Eventually, if the volume of allowances auctioned increased over time, the revenues raised could be used to directly support industries in order to decarbonise by capitalising existing national funds in Mexico, e.g. the Fondo para el Cambio Climático. Consignment auctions are one further way to explore auctioning already in the pilot phase while maintaining a high share of free allocation.

At their outset, ETSs typically allocate allowances based upon grandparenting in order to reduce the need for participants to trade immediately with one another and reduce the political cost of introducing an ETS. However, over time a transition to more auctioning as well as benchmarking and output-based forms of allocation can be observed. The latter (i.e. benchmarking and output-based forms of allocation) requires additional data in order to be implemented. The collection of activity data during the pilot phase, especially in terms of production, and improved emission data will be important if alternative forms of allocation are to be introduced at a later stage. By following a more differentiated approach to allocation by sector, the carbon leakage concerns of industry can initially be addressed via grandparenting. However, in the longer term, a larger share of auctioning and free allocation based on benchmarks foster a stronger price signal and will encourage the energy transformation required for the country to fulfil its NDC and subsequent updates.
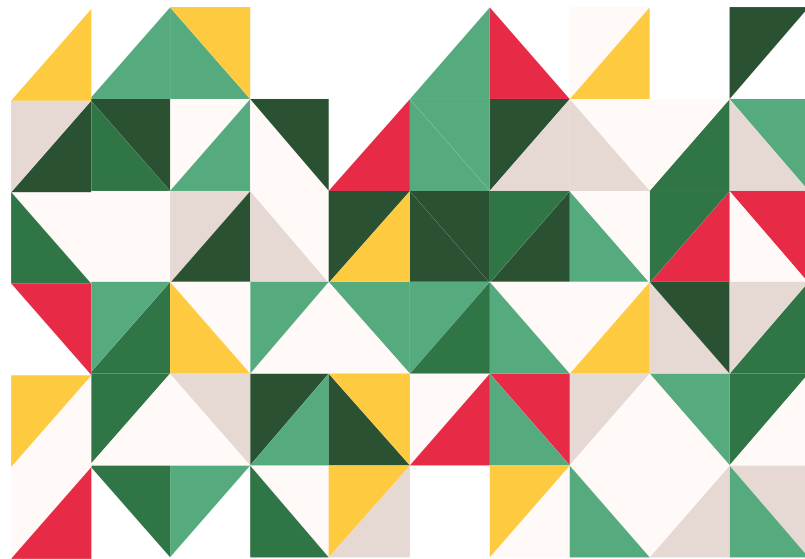
Resumen ejecutivo

México está planeando una fase piloto de 3 años de un Sistema de Comercio de Emisiones (SCE), que será seguida por una fase obligatoria alineada con la implementación del Acuerdo de París. Con el objetivo de fortalecer las capacidades y la preparación de las empresas mexicanas para participar en el comercio de emisiones, el 28 de junio del 2018 se completó el primer ejercicio de simulación del mercado de carbono, en el cual participaron más de 100 compañías de diversos sectores económicos que representan aproximadamente dos terceras partes de las emisiones de gases de efecto invernadero (GEI) del país (ICAP 2018). Se espera mayor detalle del SCE mexicano en los meses que vienen, una vez que el nuevo gobierno tome posesión en diciembre de 2018 (ICAP 2018).

Este reporte esboza diferentes opciones para asignar los Derechos de Emisión (DEMs) en el SCE mexicano, es decir, cómo se distribuye individualmente entre las compañías la cantidad total de DEMs. La asignación de DEMs bajo un SCE determina cómo se distribuyen entre la sociedad los costos relacionados con el SCE. Al distribuir los DEMs, los responsables de las políticas públicas buscarán lograr todos o algunos de los siguientes objetivos:

- Gestionar la transición hacia un SCE;
- Reducir el riesgo de fuga de carbono o pérdida de competitividad;
- Incrementar ingresos; y
- Mantener los incentivos para un abatimiento costo-efectivo.

Hay dos enfoques fundamentales para la asignación:

- Subasta: un gobierno vende DEMs en una subasta; y
- Asignación gratuita: los DEMs son dados por el gobierno de forma gratuita usando alguna de las siguientes opciones:
  - *Grandparenting* (basado en emisiones históricas);
  - *Benchmarking,* con actualización poco frecuente de los niveles de producción;
  - *Benchmarking,* con actualización frecuente/anual (asignación basada en producción).

Este estudio ha desarrollado una herramienta de asignación con el objetivo de apoyar a los tomadores de decisión con la asignación de DEMs a las instalaciones participantes bajo el límite o tope del SCE mexicano durante la fase piloto. La herramienta también puede ser usada para fases futuras.

En este reporte se presentan los resultados de un número de escenarios de asignación ilustrativos basados principalmente en la asignación gratuita de tipo *grandparenting*. La distribución de DEMs a instalaciones usando *grandparenting* refleja ciertas prioridades (por ejemplo, proteger a las compañías de la fuga de carbono) y esto se refleja en los escenarios de asignación (es decir, en muchos escenarios las emisiones históricas de los sectores en riesgo de fuga de carbono fueron totalmente cubiertas por DEMs gratuitos). Sin embargo, este método tiene también algunos inconvenientes (la asignación de DEMs gratuitos basados en *grandparenting* potencialmente distorsiona la señal de precios y puede disminuir el carácter costo-efectivo del abatimiento realizado).

Se obtienen incentivos más fuertes para la reducción de emisiones costo-efectivas y para una formación de precios más eficiente si se utiliza la asignación gratuita de DEMs con base en el método de *benchmarking*. Se exploró el impacto de aplicar dicho método a nivel de instalación en un escenario adicional, que reveló que habría tanto "ganadores" como "perdedores" comparado al método de *grandparenting*.

Asignar DEMs por medio de subastas tiene muchas ventajas, puesto que es fácil de implementar, ofrece la mejor manera de tener una formación de precio eficiente, ayuda a la gestión de precios, genera ingresos (que pueden ser usados para atender los efectos distributivos no deseados) y evita potenciales dificultades en los procesos políticos relacionados con la implementación de la asignación gratuita. Sin embargo, es una práctica común para un SCE comenzar con una pequeña proporción de subastas para aliviar las preocupaciones en cuanto a competitividad y fuga de carbono. En la fase piloto de su SCE, México está planeando recolectar unas primeras experiencias con subastas de DEMs.

Eventualmente, si el volumen de DEMs subastados se incrementa con el tiempo, los ingresos recabados pueden ser usados para apoyar directamente a las industrias a descarbonizarse, por medio de capitalizar fondos nacionales existentes como el Fondo para el Cambio Climático. Las subastas de consignación son otra manera de explorar las subastas desde la fase piloto, manteniendo una gran parte de asignación gratuita.

En sus fases iniciales, los SCE típicamente asignan DEMs basados en *grandparenting*, de manera que se reduzca la necesidad de que los participantes comercien inmediatamente los unos con los otros y disminuya el costo político de introducir un SCE. Sin embargo, con el tiempo se observa una transición hacia una mayor proporción de subastas, así como a los métodos de asignación por *benchmarking* y asignación basada en producción. Estos últimos métodos (es decir, *benchmarking* y asignación basada en producción) requieren datos adicionales para ser implementados. Si se planea introducirlos en una fase posterior, es importante la recolección de datos de actividad durante la fase piloto, especialmente en términos de producción, y de datos de emisiones mejorados. Si se sigue un enfoque diferenciado de asignación por sector, las preocupaciones de la industria respecto a la fuga de carbono pueden ser atendidas por medio de *grandparenting*. Sin embargo, en el más largo plazo, el tener una mayor proporción de subastas y asignación gratuita basada en *benchmarking* fomenta una señal de precios más fuerte e incentivará la transformación energética requerida para que el país cumpla con sus Contribuciones Determinadas a nivel Nacional (NDC por sus siglas en inglés) y sus subsecuentes actualizaciones.
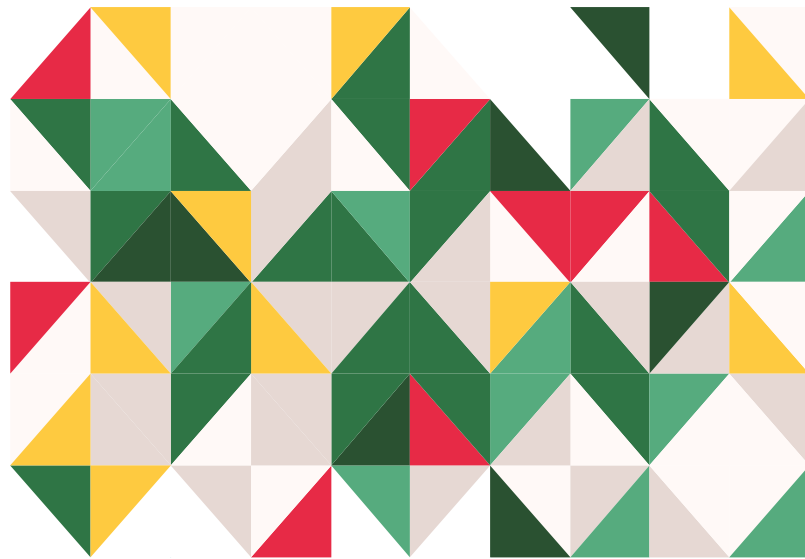
1

Introduction

1. Introduction

Mexico announced in 2015 its Nationally Determined Contribution (NDC) of -22% GHG mitigation (-36% conditional upon international support) until 2030 compared to Business as Usual (BAU) (Mexico 2015). The NDC outlines the expected contribution of different sectors of the economy towards the achievement of the greenhouse gas (GHG) mitigation target. Mexico also published in 2016 a Mid-Century Strategy, which includes indicative emissions trajectories that allows the country to shift from current emissions levels to achieve either the unconditional or conditional NDC target in 2030 and to then subsequently reach a 50% GHG reduction compared to 2000 levels by 2050 (SEMARNAT-INECC 2016). The Climate Change Law from 2012 and its recent reform that entered into force in July 2018 mandates the Secretariat of Environment and Natural Resources (SEMARNAT) to adopt the preliminary basis for a mandatory ETS pilot phase no less than ten months after the regulation comes into force (Mexico 2018)

Against this policy background, the Ministry of Environment and Natural Resources (SEMARNAT) is exploring an Emissions Trading System (ETS) as an instrument for cost-efficient mitigation to contribute towards the achievement of the country's NDC.

The ability of emitters to trade permits that correspond to an overall limit on emissions set by an ETS cap ensures, in theory, that emission reductions are achieved in a cost-effective manner (i.e. emitters with high abatement costs purchase permits from emitters with lower abatement costs). A three-year pilot phase of an ETS is planned to start either in 2019 or 2020 and will be followed by a mandatory phase aligning with the implementation of the Paris Agreement. Further details on the ETS in Mexico are expected in the months to come, once the new federal administration takes office in December 2018 (ICAP 2018). In order to strengthen the capacity and readiness for Mexican business to participate in emissions trading, the first carbon market simulation was completed on the 28th of June 2018, which involved more than 100 companies from a range of economic sectors that represented approximately two thirds of the country's GHG emissions (ICAP 2018).

The allocation of allowances under an ETS determines how the costs related to the ETS are distributed across society. When distributing allowances, policy makers will seek to achieve some or all of the following objectives:

- Managing transition to an ETS;
- Reducing the risk of carbon leakage or loss of competitiveness;
- Raising revenue; and
- Preserving incentives for cost-effective abatement.

There are two fundamental approaches to allocation:

- Auctioning: a government sells allowances in an auction.
- Free allocation: allowances are given away by a government for free using either a:
- Grandparenting approach (based on historic emissions);
- Benchmarking approach with infrequent updating;
- Benchmarking with frequent / annual updating (output-based approach).

As a number of systems demonstrate (i.e. EU ETS, Californian cap-and-trade program), it is possible to use different approaches for different sectors or entities covered by an ETS. It is common to use a mixture of both auctions and free allocation.

The aim of this study is to provide technical support by assessing a range of different options for allocating allowances under the Mexican ETS cap in the pilot phase. An overview of the different options for allocating allowances is firstly provided in Section 2. The methodological approach and the different scenarios assessed are then outlined in Section 3 with the results summarised in Section 4. A more wide ranging discussion of the potential implications of the results is analysed in Section 5, which refers to previous work completed for SEMARNAT with regards to carbon leakage risk. The conclusion of this study summarises the key findings of the assessment and puts forward several recommendations for the allocation of allowances in the Mexican ETS.

2

Overview of allocation options

2. Overview of allocation options

According to the PMR and ICAP (2016), 'whereas the cap determines the emissions impact of an ETS, allowance allocation is an important determinant of its distributional impacts. It can also influence the efficiency of the system and therefore merits careful attention.' In this overview, the way in which allowances are distributed and, subsequently the allocation methods and rules applied, will be outlined along with the key advantages and disadvantages and implications for other issues such as the inclusion of new entrants and the use of other reserves.

2.1 Distribution options

It is necessary to determine how the allowances under the ETS cap will be distributed. In this report, we use the term 'cap' as the total quantity of allowances during a phase independently of allocation method and whether it goes into a reserve or directly to installations. Two options are available for the distribution of allowances:

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• • •

First to sectors and then to installations: Under a sectoral approach the share of the overall cap available to each sector is set in advance. The distribution of allowances under each sector cap would be based upon generally agreed allocation methods and rules (refer to Section 2.2). The method could differ by sector, but within a specific sector the method would be the same for all participants in the sector.

Directly to the installations: Under this option, allowances are distributed directly to ETS participants under a single cap for all sectors. Often the total cap is split into a share to be auctioned and one to be allocated free of charge, but not further differentiated by sectors. Although the allocation approach and rules may still vary by sector, only one cross-sectoral correction factor (CSCF) would be applied, if necessary, to the amounts allocated free of charge to all installations in order to ensure compliance with the overall ETS cap.

Setting sectoral shares may be politically challenging and result in sector-specific quantities that could place undue burden on certain sectors. In contrast, distributing allowances directly to installations is less complex but may not provide as much flexibility for differentiation by sector as ultimately all allowances will be corrected by the same CSCF. The ETSs in operation have generally not set sector-specific caps, but rather split up the overall cap into an auctioning budget and a budget for free allocation, where a CSCF is applied to the latter if necessary.

2.2 Allocation methods and rules

There are two main types of allocation (i.e. auctioning and free allocation) that are explained in the following sub-sections.

Auctioning

The auctioning of allowances encourages efficient emission abatement through the fast discovery of a transparent price signal. Further advantages of auctioning include the ability to raise revenues via the sale of allowances as well as the added flexibility of adjusting the auctioning calendar to correct for any potential supply and demand imbalances. What is more, allocating allowances via auctioning avoids potentially difficult political processes related to the free allocation of allowances.

> *The auctioning of allowances encourages efficient emission abatement through the fast discovery of a transparent price signal.*

Auctions should be conducted frequently in order to provide transparency and a steady price signal to participants. There should be enough participants in auction to avoid undue influence of individual buyers and the auctioning mechanism chosen should ensure an efficient outcome. 'When auctioning is chosen as the general allocation approach, the allocation to individual installations is simply the outcome of the auction' (Ecofys 2006).

$$A = 0$$

With: A = (Free) allocation

Free allocation

Allowances are given away by a government for free in order to manage the transition of firms to an ETS (i.e. to reduce the risk of carbon leakage and the loss of competitiveness) based upon the following approaches:

> *Allowances are given away by a government for free in order to manage the transition of firms to an ETS.*

- *Grandparenting:* Whereby firms receive allowances directly related to their historical emissions. Further adjustment factors to the allocation (i.e. carbon leakage factors, CSCF) may also be applied. The amount received remains independent of future output decisions or decisions to reduce carbon intensity. It is im-

portant that a date is set for the data used for grandparenting for all facilities early (i.e. the base year upon which allocation is determined) to avoid incentives to drive up emissions to increase allocation.

$$A = E * AF$$

With: A = (Free) allocation; E = Emissions (base period/planned); AF = Adjustment factor

- *Benchmarking with infrequent updating:* Whereby the allocation of allowances is determined by reference to a product or sector level benchmark. Further adjustment factors to the allocation (i.e. carbon leakage factors, CSCF) may also be applied. The installation-level allocation is calculated by applying this benchmark to historic levels of activity (e.g. output), which are updated only infrequently. The factor to benchmark (e.g. output) and the level of the benchmark (e.g. best available technology, most efficient 10%) needs to be determined (Ecofys 2006).

$$A = HAR * BM * AF$$

With: A = (Free) allocation; HAR = Historic activity rate; BM Benchmark; AF = Adjustment factor

- *Benchmarking with frequent / annual updating (output-based approach):* Similarly to the previous method, allowances are allocated according to a pre-determined product or sector level benchmark. Further adjustment factors to the allocation (i.e. carbon leakage factors, CSCF) may also be applied. However, in this case, instead of historic activity rates, recent or current activity rates are applied. That is, when firms increase or decrease their output, the amount of allowances that they receive correspondingly rises or falls. Compliance with the overall cap may therefore be more challenging under an output-based approach.

$$A = CAR * BM * AF$$

With: A = (Free) allocation; CAR = Current activity rate; BM Benchmark; AF = Adjustment factor

Case Studies

EU ETS

The allocation rules for the EU ETS have evolved over time and lessons have been learnt from past experiences on how best to incentivise efficient emissions abatement. Since the start of its third trading period in 2013, auctioning is the default method of allocating allowances within the EU ETS. As a consequence, firms have to buy an increasing proportion of allowances through auctions. Between 2013 and 2020, the share of allowances auctioned is rising to about 50% (European Commission 2018). Power generators generally do not receive any free allowances. Exceptions have been made for power generators in several Central and Eastern European Member States.

In sectors other than power generation, a transition to auctioning takes place progressively. Allocation to manufacturing industry is based on benchmarking with infrequent updating. Benchmarks are based on the performance of the most efficient installations. Sectors deemed at risk of carbon leakage receive 100% of the such calculated amount for free (subject to the cross-sectoral correction factor), sectors not deemed at risk of carbon leakage received 80% of their allowances free of charge in 2013, decreasing annually to 30% in 2020.

From 2021 onwards, the share of auctioning is set to increase further to 57%, while provisions for free allocation to sectors deemed at risk of carbon leakage and electricity generators in a number of countries remain in place (EU 2018).

Prior to 2013, allocation in the EU ETS was based on National Allocation Plans (NAPs) submitted by the participating countries and approved by the European Commission. While free allocation via grandparenting was the norm during the first years of the EU ETS, the share of allowances auctioned or allocated via benchmarking was small to start with, but increased steadily between 2005 and 2012.

Californian Cap and Trade Scheme

California also provides a mix of free allocation and auctioning.

One special feature of the Californian system – which is related to the structure of their retail market - is that allowances are allocated to electrical distribution utilities and natural gas supplies for free on behalf of ratepayers. (Californian Air Resources Board 2018a) These allowances are then sold in consignment auctions and the value associated with these sales used for the benefit of their retail ratepayers (i.e. through a rebate or reducing energy consumption). Since the majority of generation assets are not owned by the distribution companies, they only have to buy back a small share of the allowances at auction, while electricity generators participate in auctions and pass carbon costs through to wholesale prices (Burtraw et al. 2012).

Furthermore, allowances are allocated for free to industrial facilities for leakage prevention and transition assistance. The allocation to industry is generally based on product benchmarks, an assistance factor determined by the leakage risk, as well as a reduction factor that reduces allocation in accordance with the declining overall cap (Californian Air Resources Board 2018b, 2018c). In contrast to the EU ETS, allocation is not based on past activity rates (infrequent updating), but current activity (output-based allocation).

As a number of ETSs demonstrate, it is possible to use different approaches for different sectors or firms covered by an ETS. It is common to use a mixture of both auctions and free allocation. Table 2-1 provides an overview of the relative advantages and disadvantages of applying different allocation methods in an ETS.

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From the perspective of protecting firms against the risk of carbon leakage, free allocation of allowances may help to safeguard competiveness of domestic firms covered by an ETS.

. . .

From the perspective of protecting firms against the risk of carbon leakage, free allocation of allowances may help to safeguard competiveness of domestic firms covered by an ETS. Indeed, one-off grandparenting could provide transitional support (in the form of free allowances) for plants that might otherwise lose significant value from stranded assets as carbon pricing impacts the competitiveness of plants that, for example, are dependent upon carbon intensive fuels. However, such a form of allocation has only very limited rewards for early action (in case the reduction effort took place before the base period) and therefore potentially distorts production and investment decisions, as well as the price signal of the ETS reducing the efficiency of the instrument to realise low-cost abatement.

In contrast, allocation methods such as benchmarking or auctioning do reward early action. Free allocation via benchmarking also addresses carbon leakage concerns and is applied to carbon leakage sectors in both the EU ETS and the Californian cap-and-trade program. In that sense, benchmarking with frequent / annual updating (output-based) provides a high level of protection against carbon leakage, as it basically acts as an output subsidy for domestic firms. However, this may also lead to perverse production incentives.

Auctioning requires less political input, encourages rapid and efficient price discovery and also raises revenues (that could be allocated to support decarbonisation of industry or mitigate unwanted distributional effects); the setting of benchmarks is a very political process that requires a wide range of technical expertise and many rounds of negotiation to reach consensus (refer to Section 5). What is more, the type of benchmark set, i.e. uniform or technology/ product-specific has a large impact on the relative advantages and disadvantages of the method (Betz et al. 2006).
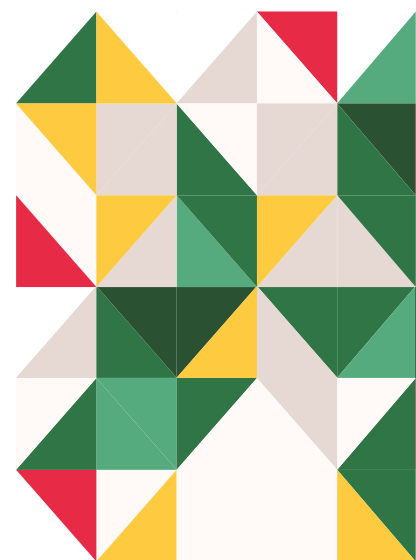
Table 2-1: Advantages and disadvantages of different allocation methods

	Auctioning	Free allocation		
		Grandparenting	*Benchmarking with infrequent updating*	*Benchmarking Output based*
Protection against carbon leakage	--	+	+	++
Rewarding early action	++	--	+	+
Less political Input	++	-	--	-
Revenue raising	++	--	--	--

Note: ++ to − illustrates the relative advantage or disadvantage of each allocation option
Source: Own illustration.

2.3 New entrants

A share of the allowances under an ETS cap is normally reserved for new entrants based upon the expected future growth of the ETS sectors. Since the overall cap ensures that sectors covered by the ETS will reach set reduction targets and thus contribute to meeting the NDC target in an efficient manner, it is important that the NER is set up inside the overall cap. Otherwise emissions by new entrants would not be in line with set reduction targets.

The ease at which new entrants can be accommodated within an ETS varies considerably depending upon the allocation method and rules:

- An auction system accommodates new entrants and exits due to the fact that allowances are readily available for purchase and no special rules are necessary for new entrants;

- For output-based allocation, new entrants are treated in broadly the same way as an existing source that expands production. When a new entrant reports output, it will receive allowances just like existing firms;

- For allocation based on grandparenting or benchmarking, the approach usually involves a new entrants' reserve (NER), which is set aside within the cap to provide free allocation to eligible new entrants. In existing ETSs, these reserves usually operate on a first-come-first-

served basis. For the allocation to new entrants often benchmarks are applied to activity rates (based on capacity and standard capacity utilisation factors (SCUFs) (European Commission 2012).

From an efficiency point of view, if new entrants have to purchase allowances on the market, they take into account the full cost of carbon when making investment decisions, as such favouring low-carbon investments. On the other hand, unequal treatment between existing installations and new entrants may be an issue in case existing installations do not have to purchase allowances at auctions. In case benchmarks are applied, a uniform benchmark for a certain product group encourages investment in the lowest emissions technology within this group. If benchmarks are technology-specific, this incentive is lost (Betz et al. 2016).

Access to free allocation from the NER may be limited to certain sectors in a similar way that limits free allocation in a system in general. In the EU ETS, for example, new entrants in electricity production generally have to buy the allowances they require. When the reserve is exhausted, the regulator may have rules in place to replenish the reserve (i.e. with allowances from the market) or not to do so. In case the reserve is not used up, allowances remaining in the reserve may be cancelled or auctioned. In the EU ETS unused allowances from the third trading period NER are added to the Market Stability Reserve.

2.4 Other reserves

In order to make an ETS more responsive to shocks and provide certainty regarding quantities and prices, a number of stability mechanisms may be included, which are typically linked to allowance reserves (GIZ 2018b):

- An auction reserve price ensures government revenue and provides price stability, which may be particularly important at the beginning of an ETS. If the reserve price is not reached at auction, the relevant allowances will typically be placed in an auction reserve.

- Stability mechanisms may also use quantity triggers (cf. the Market Stability Reserve, MSR in the EU). In this case, if the quantity triggers are reached, allowances will be placed into or released from a market stability reserve.

The auction reserve, but also the market stability reserve, usually operates via auctioned amounts. The EU's MSR, for example, will reduce auction amounts in the following years, if the upper trigger level (i.e. related to the number of allowances in circulation) is reached and increase auction amounts if the lower trigger is reached. In a similar fashion, the Californian cap-and-trade program currently operates an Auction Reserve as well as an Allowance Price Containment Reserve that are replenished or exhausted depending on realised auction prices[1].

In principle, reserves could also operate on amounts for free allocation. However, it would have to be defined in advance in what way and for whom, free allocation changes in case quantity triggers are reached (e.g. is free allocation reduced / increased by the same percentage for all covered entities? Are some sectors excluded?). It would also be important to ensure that it is legally possible to change free allocation ex-post in case the stability reserve would operate on these amounts.

2.5 Closures

In theory, stopping allocation for closures may act as a disincentive for closing down inefficient installations as this would be associated with a loss of free allowances (Betz et al. 2006). Nevertheless, in most emissions trading systems to date closures or significant capacity reductions are associated with a loss of free allocation (PMR and ICAP 2016). Again, in case only auctioning is used, closures and capacity reductions are readily and directly accommodated.

Allowances freed up by closures or significant capacity reductions can be cancelled, put into a reserve or auctioned.

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(1)   Note that California is planning to replace its soft price ceiling with a hard one (i.e. unlimited number of allowances released if certain ceiling price is reached) starting in 2021.

3

Methodology

3. Methodology

The following sub-sections provide an overview of the allocation tool used in this assessment as well as how the parameters within the tool were set and what allocation scenarios were developed for this study.

3.1 Tool to model different allocation options

A tool has been developed to be able to calculate the allocation at installation level under different parameters and allocation approaches. It is based on the Mexican situation using the installation data reported by operators but could be used in other contexts as well. The main functions of the tool are explained in the following sub-sections.

General approach

The tool calculates free allocation by installation. Allocation rules can be set differently for each sector and differentiated by energy and process emissions. Installation allocation can be based on historic emissions (grandparenting) or benchmarking. If the rules set by the user would exceed the available total quantity of allowances for free allocation, a CSCF is used to scale all allocation to remain within the given budget.

Data sources and base year(s)

The tool is based on the National Registry of Emissions (RENE) data for the years 2014-16 and uses the installation information (id, sector), energy and process emissions as well as energy consumption. When RENE data for future years becomes available, it can be easily included. Both grandparenting and benchmarking rely on the RENE data, either the emissions or the energy consumption. The user can select for each sector, which year(s) should be used as the historic base year(s) for these calculations. If multiple years are selected, the average emissions/energy consumption is used.

ETS installations

Two criteria are used to determine whether an installation participates in the ETS: its sector and a minimum threshold. The threshold can be set for each sector separately.

Sector targets and allocation method

A reduction factor can be set individually for each sector differentiated by energy and process emissions. This target is expressed in a relative change compared to the historic emissions in the selected base year(s). For each sector and type of emissions grandparenting or benchmarking can be used as the allocation method to determine the free allowances for each installation.

For grandparenting, each installation receives a preliminary allocation which is based on the base year emissions scaled with the reduction factor for the respective sector. For benchmarking, the average emission intensity for the base year for all installations is calculated to set the benchmark. The preliminary allocation is then calculated by multiplying the historic activity data with the benchmark and scale the result with the reduction factor. So far, the RENE only contains energy consumption but no production data. The benchmarking is therefore only possible for energy emissions based on the energy intensity (in g CO_2/MJ). The tool allows the calculation of product benchmarks when production data becomes available. To facilitate the process different sectors can be grouped together and treated identically.

Cross-sectoral correction factor (CSCF)

Depending on the parameters chosen for each sector the resulting preliminary allocation exceeds the quantity of allowances available for free allocation. If this is the case, a CSCF is multiplied to the preliminary allocation. The CSCF is the ratio between the total cap and the total preliminary allocation. If the preliminary allocation is at or below the cap, it is set to 1.

3.2 Parameters used

To demonstrate the functionality and show the implications of different options for allocation a set of illustrative scenarios were developed. The following parameters were used for the analysis and discussion:

- **Cap:** a total of 280 million allowances per year are available for the pilot period.

- **Free allocation:** 80% of the total cap is available for free allocation. 5% each go to the general reserve and will be used for auctioning; the remaining 10% of the total quantity of allowances is used for the new entrants' reserve (NER).

- **Threshold:** at least 100 kt CO_2 emissions from energy combustion and industrial processes in at least one year (2014, 2015 or 2016).

- **Base year(s):** average emissions 2015/2016 are used as the historic reference for allocation based on grandparenting.

- **Sector groups:** all installations have been included in three groups
  - Power generation;
  - Industries at risk for carbon leakage;
  - Industries deemed at no risk for carbon leakage.

These parameters can be changed by the user and should be seen as illustrative only. The categorisation of industry sectors in the two categories "at risk"/"not at risk" has been done arbitrarily to show potential allocation options, no risk assessment was conducted. For the pilot phase Mexico intends to assume that all industries are at risk for carbon leakage. If such a differentiated approach is used in the future, an in-depth carbon leakage risk-assessment would be necessary.

3.3 Scenarios for different allocation options

Table 3-1 shows an overview of the allocation of allowances relative to 2015/2016 average emissions by sectoral grouping for five scenarios based upon different grandparenting approaches along with the CSCF applied in each case. The five scenarios are as follows:

- An equal share of allowances relative to 2015/2016 average emissions is allocated to each of the sectoral groups for energy and process emissions under **Scenario 1** and for energy only emissions under **Scenario 2.**

- Under **Scenario 3**, industrial sectors receive an allocation of allowances that are equivalent to their average energy and process emissions from 2015/2016. This is offset as the power sector receives fewer allowances for free so that the cap for free allocation is met.

- The impact of applying a CSCF is demonstrated under **Scenario 4**, whereby the allocation of allowances exceeds the cap as the effort of the power sector is reduced by half compared to the previous scenario yet industrial sectors continue to receive allowances to fully cover their average 2015/2016 emissions. A CSCF of 0.95 is then equally applied to all installations in order to ensure that the allocation does not exceed the cap for free allocation.

- Carbon leakage risk is taken into account in **Scenario 5** with the allocation of allowances differentiated by sector grouping according to their vulnerability to carbon leakage.

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During the pilot phase Mexico intends to use grandfathering as the principal method without further differentiation.

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These scenarios show possible approaches to allocation to show the impacts of different choices; they are not meant as concrete proposals. During the pilot phase Mexico intends to use grandfathering as the principal method without further differentiation.

Table 3-1: Allocation relative to 2015/16 average emissions by sectoral grouping under five grandparenting scenarios

	Power	Industry at risk		Industry not at risk		CSCF
		Energy	*Process*	*Energy*	*Process*	
Scenario 1: Flat rate – Energy & process	-9.5%	-9.5%	-9.5%	-9.5%	-9.5%	1
Scenario 2: Flat rate – Energy only	-10.7%	-10.7%	0%	-10.7%	0%	1
Scenario 3: Power (Full effort)	-17.4%	0%	0%	0%	0%	1
Scenario 4: Power (Half effort)	-8.7%	0%	0%	0%	0%	0.95
Scenario 5: Carbon leakage risk	-14.8%	0%	0%	-7.4%	0%	1

Source: SEMARNAT (2018); Own calculation.

The following additional scenarios have also been completed to highlight further considerations when allocating allowances for free under the cap:

- **Historical base year:** Given the importance of the historical base year for determining the allocation of allowances under the grandparenting approach; a sensitivity analysis has been completed based on the outcome of Scenario 1 for different base years (i.e. 2014, 2015, 2016 and an average for 2014-2016 emissions).

- **Benchmarking:** The distributional impact of adopting a benchmarking approach to allocation has also been completed at the installation level for their energy emissions based on energy intensity (in g CO_2/MJ). The energy intensity of each installation is compared to the average for all ETS installations in order to determine the allocation of allowances.

4

Results

4. Results

An overview of the allocation of allowances by sectoral grouping under different scenarios is provided in the following sub-sections at both the sectoral (i.e. based on grandparenting) and installation (i.e. based on benchmarking) level.

4.1 Sectoral level

Figure 4-1 shows the allowances that would be allocated (relative to average 2015/2016 emissions) to the power sector, industrial sectors at risk of carbon leakage and the remaining industrial sectors not at risk of carbon leakage for each of the five grandparenting scenarios.

If all ETS sectors would be expected to equally contribute towards the achievement of the ETS cap, **Scenario 1** demonstrates that the allocation of allowances would be 9.5% lower for all sectors than their 2015/2016 baseline emissions. The allocation of allowances on such an equal basis may not be the most efficient outcome as some sectors have more low-cost abatement options than others (GIZ 2018a).

In **Scenario 2** the greater abatement potential in energy use than in mitigating process emissions is reflected in a reduction in the number of allowances allocated to the power sector compared to Scenario 1 (i.e. the power sector is short of 10.7% of allowances relative to average

2015/2016 emissions in Scenario 2 compared to being only 9.5% short of allowances in Scenario 1). Industrial sectors at risk of carbon leakage receive more allowances for free under Scenario 2 compared to Scenario 1 because their process emissions are fully covered by free allowances.

Scenario 3 demonstrates how the emissions of industrial sectors could be fully covered if power generation achieved all of the emission reductions from the 2015/2016 base year in order to comply with the cap on free allocation. The use of the auctioning reserve could help the power sector to meet this additional effort. **Scenario 4** shows that even if the abatement effort of the power sector would be only half of the previous scenario, the allocation of allowances to industry would still be more than under the first two scenarios.

In **Scenario 5**, the reduction factor applied to industrial sectors is differentiated based on their carbon leakage risk. This results in industries at risk of carbon leakage having their emissions fully covered and offset by a lower allocation to both power generation and industrial sectors not at risk of carbon leakage.

The outcome of the allocation scenarios illustrates how the differentiation of allocation rules by sector (i.e. based on mitigation potential, carbon leakage risk etc.) can have a significant impact on the allocation outcome and as a consequence, the cost of compliance for the different sectors participating in the ETS.

Figure 4-1: Allocation of allowances (relative to average 2015/2016 emissions) by sectoral grouping under five grandparenting scenarios
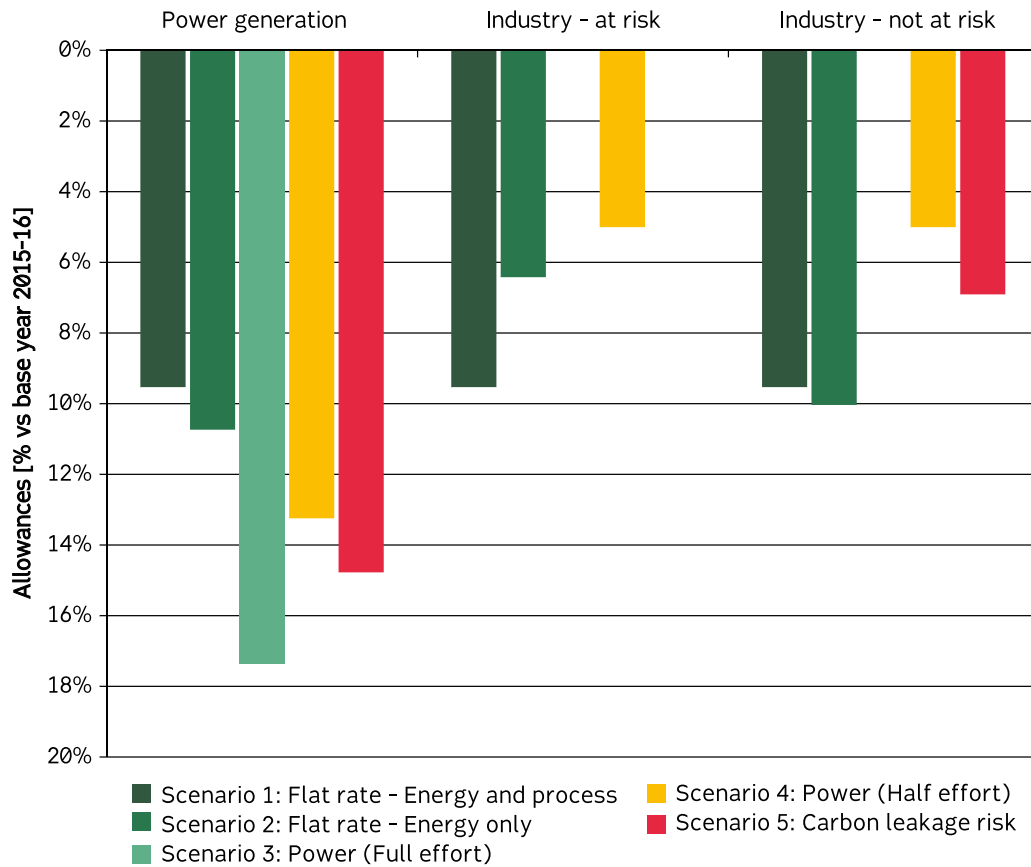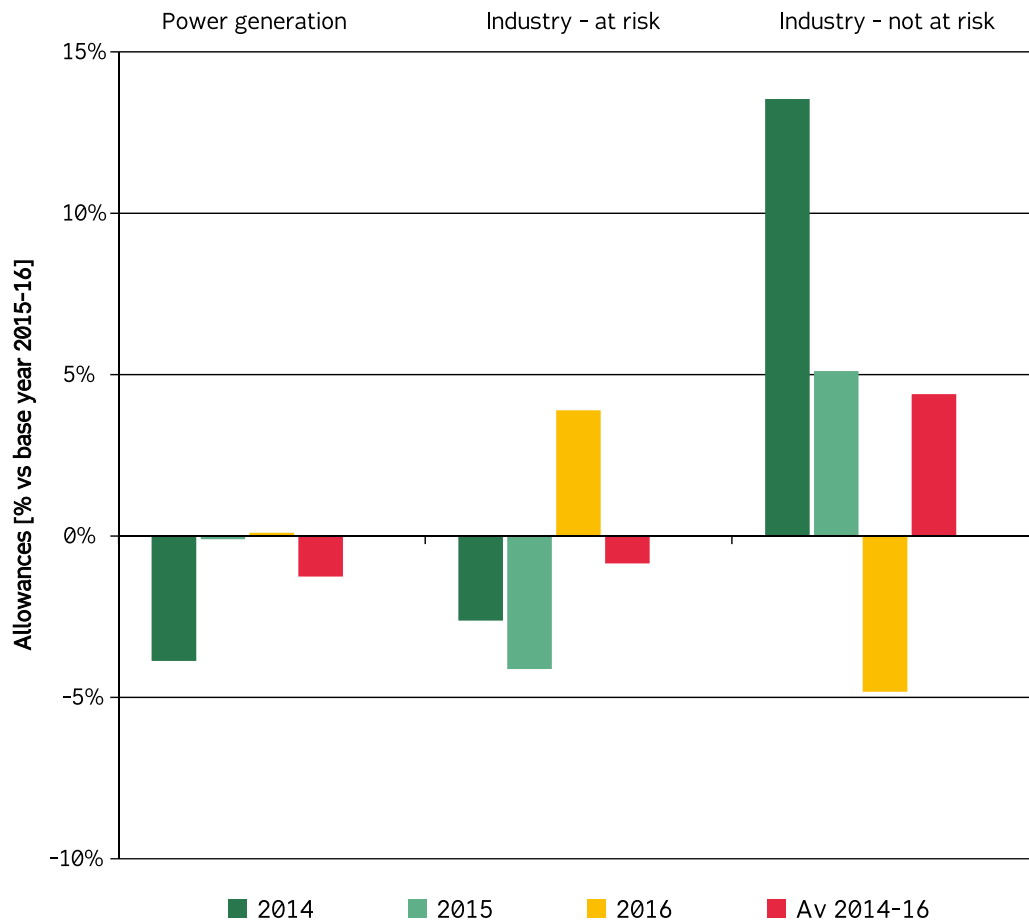
Source: SEMARNAT (2018); Own illustration.

Sensitivity analysis

Figure 4-2 shows the impact of applying different base years to Scenario 1. The share of allowances relative to average 2015/2016 emissions varies considerably between long and short positions highlighting the importance of base year selection for allocation via a grandparenting approach. Indeed, the selection of 2014 as the base year for the allocation of allowances under Scenario 1 would result in the power sector receiving considerably fewer allowances than the average for 2014-2016. 2014 was the first year that operators needed to report emissions to the RENE and not all operators reported data for the entire year. In addition, data quality of new reporting requirements is often lower at the beginning until operators and regulators have gained experience with compiling and processing the data.

Uncertainties in base year emissions are a common problem in the early years of an ETS with the potential to endanger the proper functioning of the market. For example, the price of allowances in the EU ETS declined to almost 0 EUR/t CO_2 in 2007 due to an over-supply of allowances. Safeguards and flexibility options are therefore essential in order to ensure that the supply and demand of allowances can be effectively managed over time (refer to the previous GIZ (2018b) study).

Figure 4-2: Sensitivity analysis based on applying different historical base years to the allocation outcome of Scenario 1
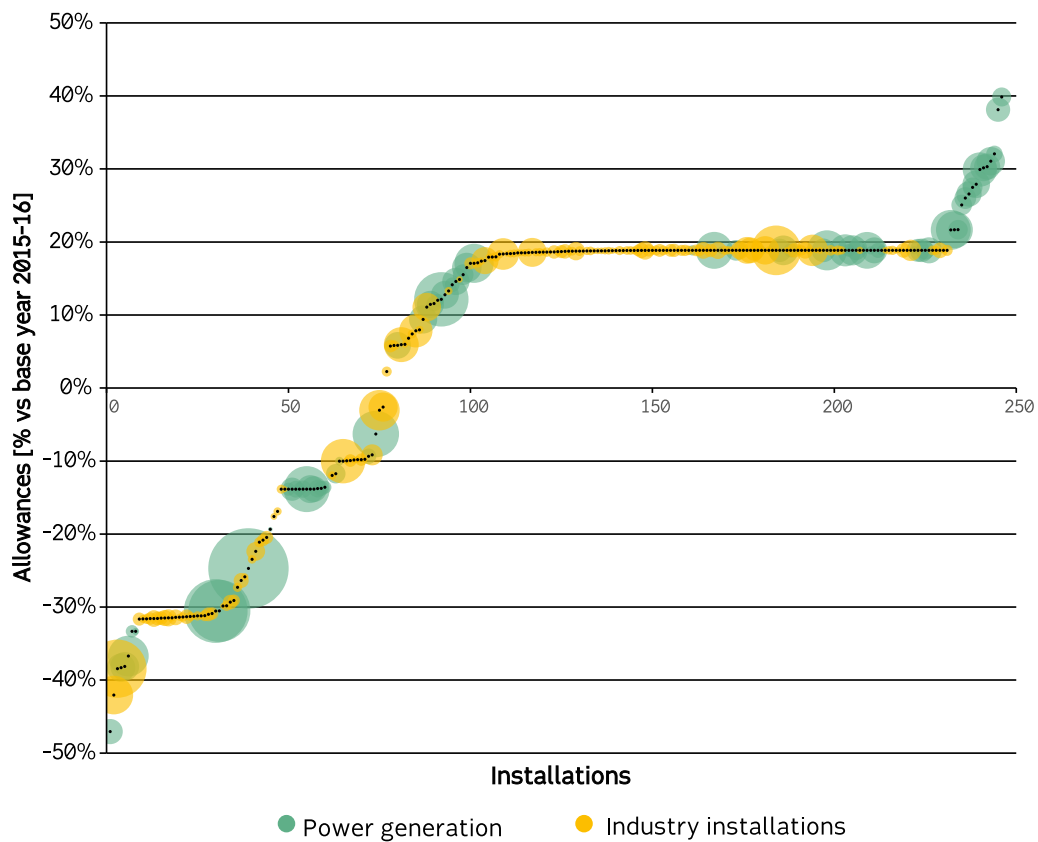

Source: SEMARNAT (2018); Own illustration.

4.2 Installation level

The impact of applying a benchmark based on emissions per energy consumption is illustrated in Figure 4-3 for power generating (blue circles) and industrial (green circles) installations. In comparison to the grandparenting approach whereby all of the installations receive the same allocation relative to their historic emissions from 2015/2016; the benchmarking approach rewards installations with low emission intensities (i.e. those towards the

right of the x-axis in Figure 4-3) and penalises installations with higher emission intensities (i.e. those towards the left of the x-axis in Figure 4-3). Depending upon the absolute emissions of an installation (i.e. illustrated in Figure 4-3 by a bubble sized relative to an installation's share of the total average emissions in 2015/2016 of all ETS installations), this may result in significant compliance cost implications if they receive fewer allowances for free (in comparison to a grandparenting approach) or equally significant revenues from selling allowances if they receive more allowances.

Figure 4-3: Allocation of allowances at the installation level based upon an energy intensity benchmarking

Note: Bubbles are sized relative to each installation's share of the total average emissions in 2015-16 of all ETS installations.
Source: SEMARNAT (2018); Own illustration.

Figure 4-3 shows that under a benchmarking approach to free allocation based on emissions per energy consumption, several plants that burn coal, coke and waste would be disadvantaged as they would be around 40 to 50% short of allowances compared to their average 2015/2016 emissions. There is also another distinct grouping of power generating installations, which are likely to burn residual fuel oil based on their emission intensities and they would be around 10 to 15% short of allowances relative to their average 2015-16 emissions. In contrast, many plants with relatively smaller emissions burning natural gas would receive around 20% more allowances than their average 2015/2016 emissions.

It is important to acknowledge, however, that this allocation primarily reflects the different fuel types used by the power plant and that other factors such as emissions per unit of production may be even more appropriate to use. Such an output-based benchmark (e.g. g CO_2/kWh electricity generation) would not only incentivise low carbon fuels (as with the fuel-based benchmark) but also reflect the level of energy efficiency of an installation.

5

Discussion

5. Discussion

The previous section assessed illustrative allocation options at both the sectoral and installation level that reflected a range of policy objectives (i.e. protection against carbon leakage, transformation of the energy sector, low-cost abatement etc.). The scenario outcomes demonstrate how the allocation of allowances to sectors / installations can vary considerably depending upon how the policy objective is set. The design of a National Allocation Plan (NAP) will need to take into account such policy priorities along with other country specific issues that may impact upon ETS implementation. The following sub-sections outline some of the key considerations for the design of a NAP for the Mexican ETS.

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The scenario outcomes demonstrate how the allocation of allowances to sectors / installations can vary considerably depending upon how the policy objective is set.

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5.1 Distribution methodology

In the allocation scenarios in Section 4, it was assumed that free allowances would be distributed directly to the installations. In the majority of the scenarios shown in Figure 4-1, the reduction factors applied to the allocation of allowances in the different sectoral groups (i.e. power generation, industry at risk, industry not at risk) were calibrated so that it was not necessary to apply a CSCF in order to comply with the cap. These scenarios therefore demonstrate that it is possible to differentiate allocation rules by sector without the need for sector specific caps (i.e. less complex than distributing allowances first to sectors and then to installations).

The use of a CSCF was only applied in Scenario 4 in Figure 4-1. Industrial installations were initially given allowances in accordance with their average historic 2015/16 emissions. However, in order to comply with the cap, it was necessary to subsequently apply a CSCF to all of the installations as the effort of the power sector was insufficient to meet the required emissions level alone. This scenario demonstrates that sector specific allocation methods and rules which (too) generously distribute allowances directly to installations may trigger a CSCF if the overall number of allowances exceeds the cap.

Given that the distribution of allowances directly to installations still allows for some differentiation by sector (i.e. reflecting the mitigation potential / competitiveness risk etc.) and is importantly less complex (i.e. not necessary to first establish sectoral caps and apply sector specific correction factors), it is recommended that this distribution option is implemented during the pilot phase of the Mexican ETS.

This would be aligned with the distribution options implemented in other ETSs. For example, the EU ETS distinguishes between an auctioning budget and a free allocation budget, where a CSCF is triggered if the sum of free allocations directly to installations exceeds the allocation budget (this is currently the case in the EU ETS). Within the free allocation budget in the EU ETS, there are still differences in the allocation methods and rules applied (i.e. sectors at risk of carbon leakage receive more allowances for free than sectors deemed not to be at risk of carbon leakage). Similarly, in the Californian cap-and-trade program, an auctioning budget and free allocation budget are defined. Free allocation is given to industrial installations at risk of carbon leakage, as well as electricity distribution companies and natural gas suppliers that subsequently have to offer these allowances in consignment auctions (refer to next sub-section on allocation methods and rules).

5.2 Allocation method and rules

The majority of ETSs apply a mix of allocation methods, initially starting with higher levels of free allocation and then increasing shares of auctioning over time.

The use of free allocation is common at the outset of an ETS as competent authorities and market participants both adapt to the new policy instrument. Grandparenting (i.e. allocation based on historical emissions) is likely to be the main approach to allocating allowances in the Mexican ETS pilot phase due to the lower data requirements (i.e. in comparison to benchmarking or output-based allocation that require additional information on activity rates) and initially provides more protection to firms to help with transition with regards to compliance costs (i.e. in comparison to auctioning whereby firms are exposed to full carbon costs). However, the base year selected under grandparenting may have a considerable impact on the abatement required by each ETS sector as the historical dataset shows large annual variations in emissions for certain installations in Mexico (refer to Figure 4-2 in Section 4). It is recommended that the more recent historical data (i.e. average emissions for 2015/2016) should be applied for allocation based on grandparenting; however, it should be a priority to improve upon the dataset during the pilot phase of the Mexican ETS.

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The use of benchmarking as an alternative approach to allocating allowances for free should be further explored during the pilot phase of the Mexican ETS.

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The use of benchmarking as an alternative approach to allocating allowances for free should be further explored during the pilot phase of the Mexican ETS. In the results section, allowances were allocated to power installations based upon a benchmark factor comparing their emissions per unit of energy consumption. The outcome of the scenario showed clear winners and losers from the allocation reflecting the use of fuels with a higher or lower CO_2 intensity. An even more appropriate benchmark factor may be the specific emissions of a plant based upon production data – however this is not currently available and should be collected during the pilot phase to make the use of benchmarking or output-based allocation methods a more viable option in future trading periods. This also applies to other sectors where benchmarking may be introduced in the future, i.e. cement. It should be kept in mind that the type of benchmark used, i.e. uniform or specific determines its effects in terms of encouraging low-carbon development. In general, uniform benchmarks (per product) are more efficient in doing so[2].

Under both grandparenting and benchmarking forms of free allocation, it is necessary to reserve a share of allowances under the cap for new entrants. It is currently envisaged that 10% of the cap during the pilot phase of the Mexican ETS will be allocated to a NER. Given that there are no reported emissions for new entrants, it is necessary to estimate activity levels by multiplying the capacity of an installation with a standard capacity utilisation factor (SCUF). This SCUF could be higher than the average capacity utilization factor of existing installations because new installations tend to be more efficient and operate at lower costs. This activity level is then multiplied by a benchmark value (i.e. product benchmark based on emissions per unit of production, heat, or fuel) to determine a preliminary allocation to new entrants[3]. This allocation may subsequently be corrected (i.e. to take into account sectors at risk of carbon leakage or simply to ensure the allocation is aligned to the overall cap). This step-wise approach to allocating allowances from the NER to new entrants is currently implemented

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(2)   For the EU ETS over fifty different product benchmarks and two fall-back approaches based on energy consumption have been defined. The benchmark is based on the best 10% of the installations and does not differ between technologies, i.e. is defined by products (DECISIÓN DE LA COMISIÓN de 27 de abril de 2011 por la que se determinan las normas transitorias de la Unión para la armonización de la asignación gratuita de derechos de emisión con arreglo al artículo 10 bis de la Directiva 2003/87/CE del Parlamento Europeo y del Consejo (2011/278/UE).
(3)   For more information see DECISIÓN DE LA COMISIÓN de 5 de septiembre de 2013 relativa al factor de utilización estándar de la capacidad con arreglo al artículo 18, apartado 2, de la Decisión 2011/278/UE (2013/447/UE).

in the third trading period of the EU ETS (European Commission 2012) . In case output-based allocation is used, current reported activity by new entrants would be applied, in accordance with allocation to existing installations. It is recommended that data is collected to initially explore replicating similar rules during the pilot phase of the Mexican ETS. Any allowances that are unused from the NER may be transferred to subsequent trading periods, auctioned or cancelled.

As an alternative in the short term, new entrants could be required to simply purchase allowances from the market whilst more complex rules were under development. This would be in line with encouraging investment in low-carbon developments. It would, however, potentially raise issues of unequal treatment between existing and new firms producing the same product. Regarding the treatment of closures, from an efficiency point of view, reducing free allocation as a response to closure of significant capacity reduction could encourage running an inefficient plant for longer than necessary in order to secure free allocation. Most ETSs operational to date, however, do reduce free allocation in case of closure or significant capacity reduction.

The use of auctioning should be considered during the pilot phase of the Mexican ETS in order to take advantage of some of the key benefits associated with the allocation method (i.e. efficient price discovery and thus incentivising efficient abatement, revenue raising, less political input required, added flexibility of adjusting the auctioning calendar to correct for supply and demand imbalances). However, given the initial high share of free allocation and the fact that the electricity sector has traditionally been state owned (with reforms to the wholesale electricity market only occurring more recently) the adoption of 'consignment auctions' may be more appropriate to explore in the Mexican context. A consignment auction consists of the following two steps:

1. Allowances are initially given to an entity based on a certain allocation method (i.e. grandparenting based on historical emissions). Entities must then consign (i.e. return) their initial allocation to the auctioneer, who will sell the allocations on the behalf of this entity in upcoming auctions.

2. Following the outcome of the auction, a price per allowance is determined. The entity that was the original holder of the allowances is fully reimbursed as it receives funds from the auction equal to the allowances that were submitted multiplied by the auction price. The regulator can also introduce the option of a guaranteed repurchase of allowances that are needed for compliance. This option may be particularly attractive for small entities that do not have other ways of purchasing allowances (Burtraw & McCormack 2016a).

According to Burtraw & McCormack (2016b), one of the key benefits of this allocation approach is the need for all participants receiving free allocation to participate in auctions as this helps to increase market liquidity and the early discovery of an allowance price close to the long term equilibrium. Such an approach may be particularly beneficial for a new ETS with only a small number of allowances in circulation and less trading partners.

The Californian approach of allocating consignment allowances to electricity and natural gas distributers is a special form of distributing auction revenues to these companies that are then used to generate benefits to the customers of these companies. Since the majority of generation assets are not owned by the distribution companies, they only have to buy back a small share of the allowances at auction, while electricity generators do not receive free allocation and participate in auctions and pass carbon costs through to wholesale prices (Burtraw et al. 2012).

Consignment auction could be considered during the pilot phase of the Mexican ETS. On the one hand, consignment auctions may be explored as a way to increasing the share of allowances available at auction, thus reducing the risk for price manipulation and aiding price discovery. On the other hand, consignment auctions can help the targeted distribution of auctioning revenues via the allocation of consignment allowances to certain entities (e.g. electricity and natural gas providers as is the case in California), where the direct distribution of auction proceeds towards this end may not be possible due to institutional constraints (Busch et al. 2018). In the EU ETS, where consignment auctions are not used, conditions are set on how the auctioning revenues that are received by governments are to be used (EU 2018).

5.3 Potential impacts of allocation

According to GIZ (2018a), the macroeconomic impact of implementing an ETS in Mexico is only expected to result in a marginal reduction in economic growth compared to a BAU scenario. Under the main scenario (i.e. with the ETS ambition corresponding to the unconditional NDC) the implementation of the ETS reduces GDP growth by 0.16 percentage points in 2021 compared to BAU. If the ambition of the ETS is aligned with the conditional NDC target for Mexico this would result in a further 0.02 percentage points reduction in GDP growth compared to BAU. However, this marginal reduction in economic growth may be offset by the broader economic impacts and environmental benefits from abatement (i.e. improved air quality and energy security) that were not taken into account in the modelling exercise (GIZ 2018a).

Based upon the results of an economy-wide model, GIZ (2018a) confirm that Mexico can meet its NDC at 'comparatively low cost' via emission reductions in ETS sectors. However, the abatement potential varies by ETS sector. While the electricity sector is expected to be able to reduce its emissions to meet the NDC with only marginal impacts to GDP, the modelling exercise revealed that minor cost increases as a result of ETS implementation would occur in key sectors at risk of carbon leakage (i.e. ranging from a 0.1% increase for chemicals and plastics to a 0.3% increase for ferrous metals compared to the BAU scenario). Indeed, several sectors (i.e. cement, chemicals, glass and iron and steel) were subsequently identified as being at risk of carbon leakage based on methodologies using trade intensity and carbon cost metrics deployed in other ETSs (i.e. EU ETS and the Californian cap-and-trade program).

In the allocation scenarios presented in Section 4, industrial groupings were differentiated according to their risk of carbon leakage as defined by GIZ (2018a). In Scenario 3 and Scenario 5 the sectors deemed at risk of carbon leakage were allocated allowances that fully covered their average 2015/2016 emissions under a grandparenting approach (refer to Figure 4-1 in Section 4). GIZ (2018a) advocate that the use of such an allocation approach at the outset of an ETS is preferable due to its simplicity and in order to win over political support for the policy instrument. However, the Mexican government could consider applying more targeted carbon leakage support after the pilot phase of the ETS once more detailed data on installations (i.e. such as production, capacity etc.) has been collected. This would enable other forms of allocation to be applied that may be more appropriate for certain sectors.

The type of allocation method applied to a sector in future trading periods of the Mexican ETS could be closely aligned to its carbon leakage status. Policy recommendations by GIZ (2018a) ranged from the use of output-based allocation in order to protect the sectors at risk of carbon leakage to full auctioning for sectors not deemed at risk of carbon leakage. In general, 100% auctioning is the best way to avoid adverse distributional effects, reward early action, etc. as well as to encourage optimal low-carbon investment and behaviour. The share of allowances auctioned in the Mexican ETS should therefore increase over time and only ambitious and uniform product / sector benchmarks should be adopted as free allocation becomes more targeted and less dependent on the historic emissions of an installation.

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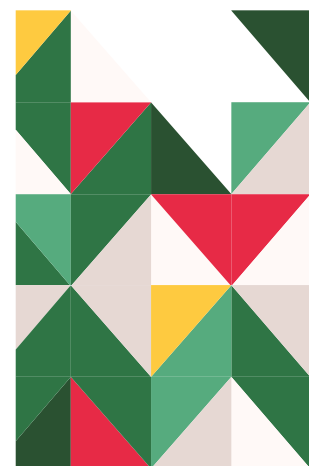
Conclusion

6. Conclusion

This study has developed an allocation tool in order to support policy makers with the allocation of allowances under the Mexican ETS cap during the pilot phase to participating installations in different sectors of the economy. The results from the illustrative allocation scenarios have been presented in Section 4, which were primarily based upon the grandparenting approach to allocation (i.e. allowances allocated based on historic emissions of the installations). The distribution of allowances to installations based upon grandparenting may reflect different priorities (i.e. such as protecting firms from carbon leakage) and this is demonstrated in the allocation scenarios (i.e. in several scenarios the historic emissions of the sectors at risk of carbon leakage were fully covered by free allowances). However, the allocation of free allowances based upon grandparenting may hinder the efficient discovery of a price signal and thus undermine the cost effective emissions abatement.

A more efficient price discovery and stronger incentives for efficient emissions abatement may be achieved via the free allocation of allowances based upon a benchmarking approach (i.e. allowances allocated based upon a benchmark factor applied to activity rates – historic or recent/current - at the installation level). In an additional scenario, the impact of applying such an approach at the installation level revealed that there would be both 'winners' and 'losers' with installations receiving more of less allowances than their historic emissions based upon their benchmark performance. Politically this may be especially challenging for installations with relatively large absolute emissions that receive fewer allowances than their historic emissions and additional support may need to be provided to assist installations to transition to less carbon intensive forms of production.

In general, allocating allowances via auctions has many advantages over free allocation, in that it is easy to implement, provides the best way for efficient price discovery, aids price management, generates revenues (which can be used to address unwanted distributional effects) and avoids potentially difficult political processes related to the implementation of free allocation. Eventually, if the volume of allowances auctioned increased over time, the revenues raised could be used to directly support industries in order to decarbonise by capitalising existing na-

tional funds in Mexico i.e. Fondo para el Cambio Climático. Consignment auctions are one way to increase the share of allowances offered at auction already in the pilot phase while maintaining a high share of free allocation.

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The collection of activity data, especially in terms of production, will be important if alternative forms of free allocation to grandparenting are to be introduced after the pilot phase.

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At the outset of other ETSs, the allocation of allowances based upon grandparenting has often been adopted to overcome initial data limitations and to reduce the need for participants to trade immediately with one another. However, over time existing ETSs have moved towards different forms of allocation (i.e. auctioning, benchmarking and output based forms of allocation) as initial data constraints were overcome and the familiarity of participants with auctions was increased. The collection of activity data, especially in terms of production, will be important if alternative forms of free allocation to grandparenting are to be introduced after the pilot phase. Similarly, auctions should ideally already be explored during the trial phase.

While carbon leakage concerns of industry can initially be addressed via grandparenting, in the long term other forms of allocating allowances – and in particular auctioning – that aid price discovery and provide stronger incentives for efficient abatement, as well as generating revenues, will encourage the energy transformation required for the country to fulfil its NDC and subsequent updates.

7

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7. References

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