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Institut für angewandte Ökologie
Institute for Applied Ecology

Setting the ETS cap

Options for a Mexican ETS

Sean Healy
Öko-Institut
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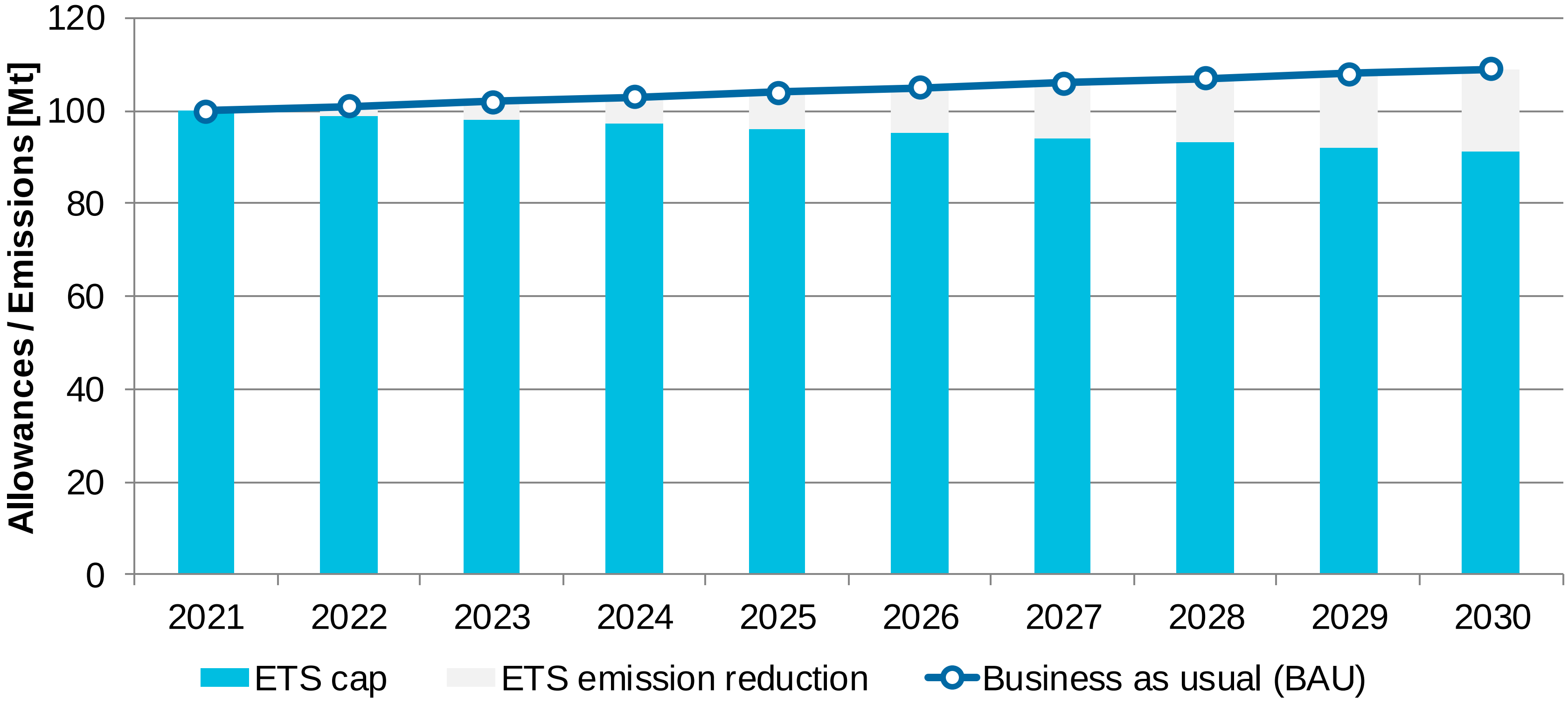
Outline

1. **Defining the cap**
2. **Data requirements**
3. **Cap-setting approaches**
4. **Market intervention**
   a) **Long term cap adjustment**
   b) **Flexibilities**
5. **Conclusions**

(1) Defining the cap
What is an ETS cap?

An ETS cap is the maximum quantity of allowances issued by a government over a defined period of time (i.e. *sets a limit on how much covered sources can emit*)



(1) Defining the cap
Cap ambition

Three key issues that policy makers should consider when setting cap ambition, include:

1) Trade-offs between emissions reduction ambition and system costs (i.e. *needs to be politically acceptable, environmentally credible and economically fair*);
2) Aligning cap ambition with target ambition (i.e. *ETS may be part of a wider policy mix to meet an economy wide target*);
3) Share of mitigation responsibility beween capped and uncapped sectors (i.e. *needs to take into account the abatement potential of different sectors*).

(1) Defining the cap
Cap type

There are two types of cap that can be applied in an ETS:

1) an absolute cap (e.g. 100 Mt CO_2) – *allowances fixed in advance*;
2) an intensity cap (e.g. 250 g CO_2/kWh) – *allowances issued per unit of input/output*

Whether an absolute or intensity-based cap is applied depends upon:

1) Certainty over the emissions level or the overall cost of abatement (*absolute cap – uncertainty of cost / intensity cap – uncertainty of emission outcome*);
2) Alignment between the ETS cap and overarching mitigation target (i.e. *structural alignment easier to communicate progress*);
3) Whether to link with another ETS & the design of that ETS; and
4) Data considerations (*i.e. additional metrics for intensity cap*)

(2) Data requirements

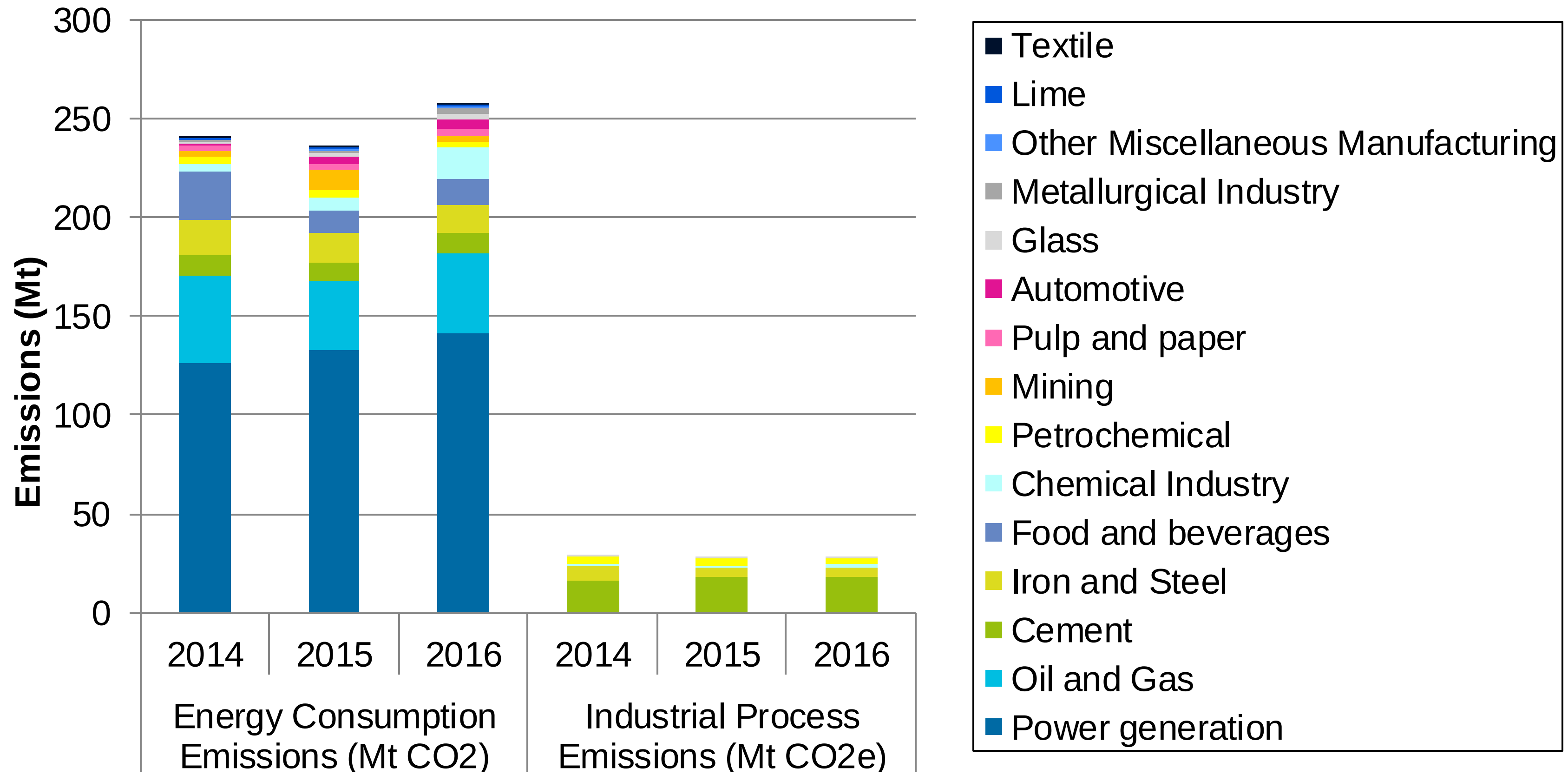
What data is required for cap-setting?

A range of data can help policy makers make informed decisions on the type and ambition of the cap.

1) Historical emissions data;
2) Projections for emissions under a baseline;
3) Technical and economic potential to reduce emissions;
4) Role of existing policies and barriers to mitigation; and
5) National or sectoral mitigation goals.

(2) Data requirements
Historical emissions data

Cap options in our study relies upon bottom-up data from the RENE (based on 2016 data), which is reported directly from installations.



(2) Data requirements
Projected data

Mexico's unconditional NDC target of 22 % relative to a 2030 BAU baseline, includes the following sectoral reduction targets :

1) Electricity generation: 31.2%
2) Oil & gas: 13.9%
3) Industry: 4.8%

Given that both the BAU and unconditional target were provided only in 5 year intervals in the NDC, missing years gapfilled by interpolation.

It was assumed for the study that the NDC took into consideration.

1) The technical and economic potential to reduce emissions;
2) Role of existing policies and barriers to mitigation.

Cap setting tool can be improved with new projections i.e. from industry.

(3) Cap setting approach

Selected cap type, ambition and approach

An absolute cap that contributes to the achievement of the political agreed NDC 2030 targets was selected for this study.

Annual absolute caps for energy and process CO_2 emissions were calculated using a tool based upon the following two approaches:

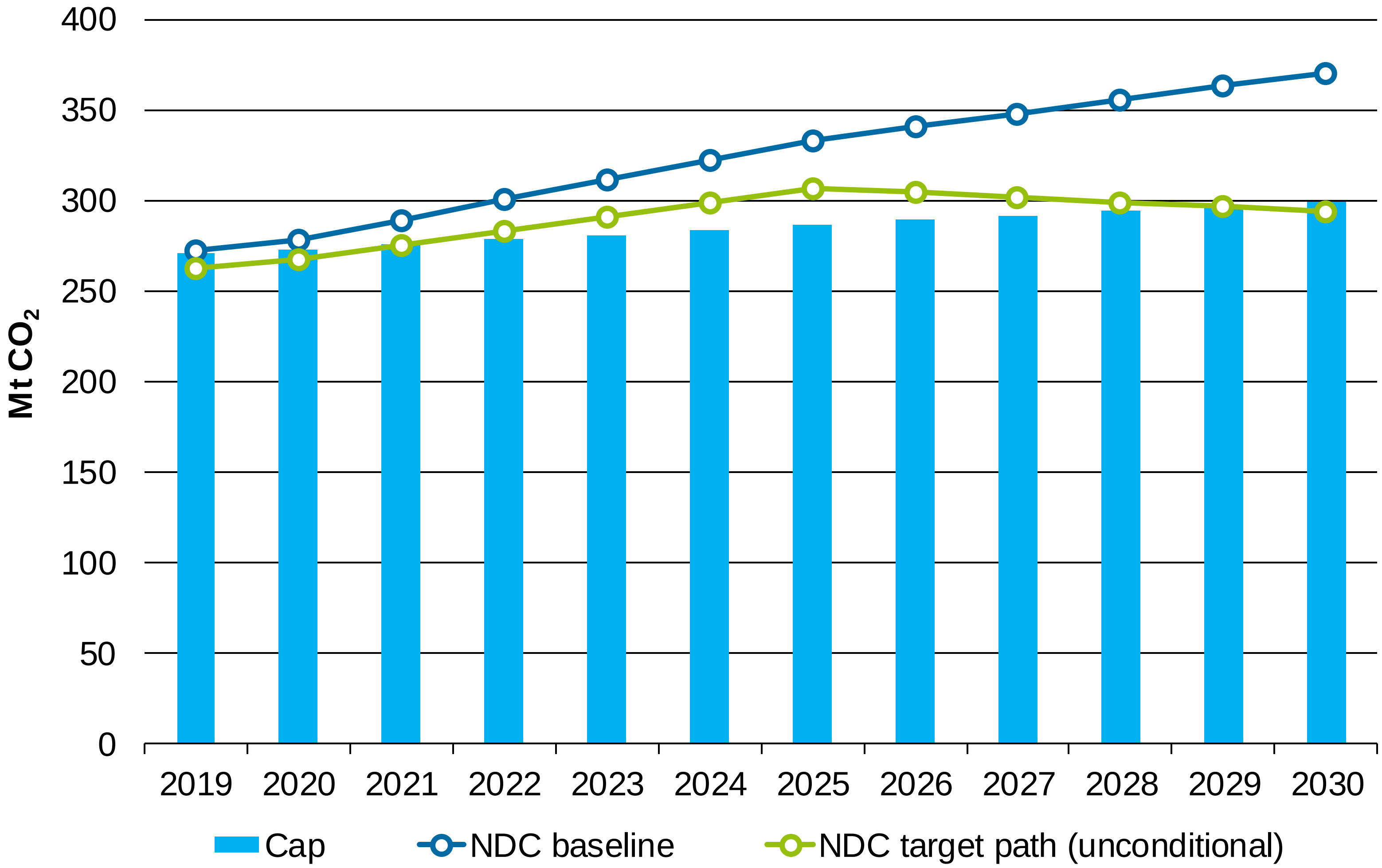
1) Applying a Linear Reduction Factor (LRF)
   (i.e. *an annual absolute change in emissions relative to 2016 emissions that is applied for every year of the trading period*)

2) Applying a deviation from a selected emission projection
   (i.e. *percentage change from a projection (i.e. NDC baseline) for each year of the trading period*)

A number of variables were also consistently selected under both approaches: sector / emission thresholds / growth rate 2017/18 and LRF or emission projection to deviate from.

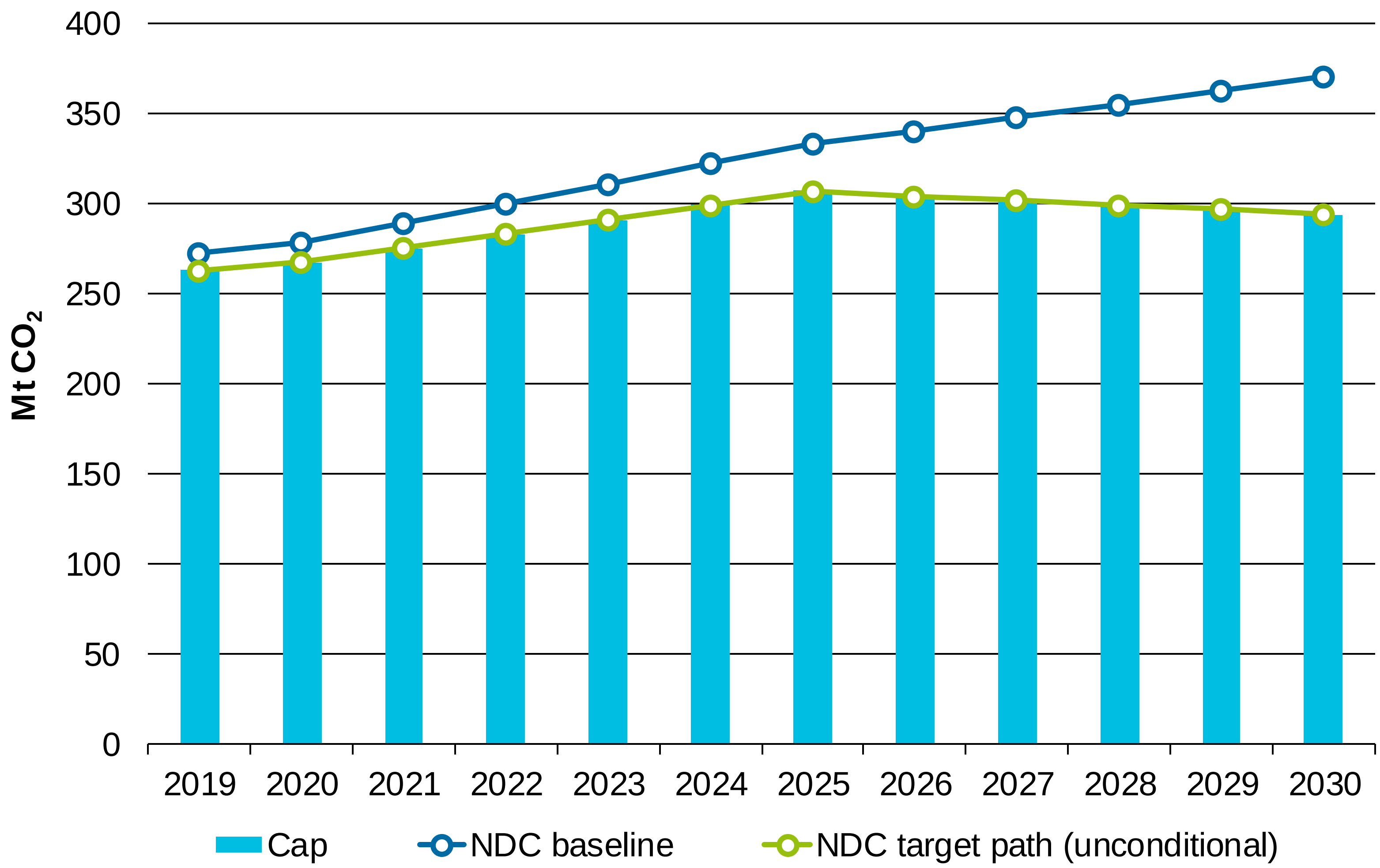
(3) Cap setting approach

Increase in LRF of +1 % (vs. 2016) between 2019-30



(3) Cap setting approach

Annual caps meets the unconditional NDC target



(4) Market intervention
Reasons for market intervention

ETS caps have often been over-estimated for the initial phases:

	Cap	Offset use	Emissions	Oversupply
EU ETS (2005-07)	6 370 Mt	-	6 215 Mt	155 Mt (2%)
EU ETS (2008-2012)	10 411 Mt	1 048 Mt	9 710 Mt	1 756 Mt (18%)
California (2013-14)	323 Mt	23 Mt	292 Mt	54 Mt (19%)
California (2015-16)	777 Mt	53 Mt	665 Mt	166 (25%)

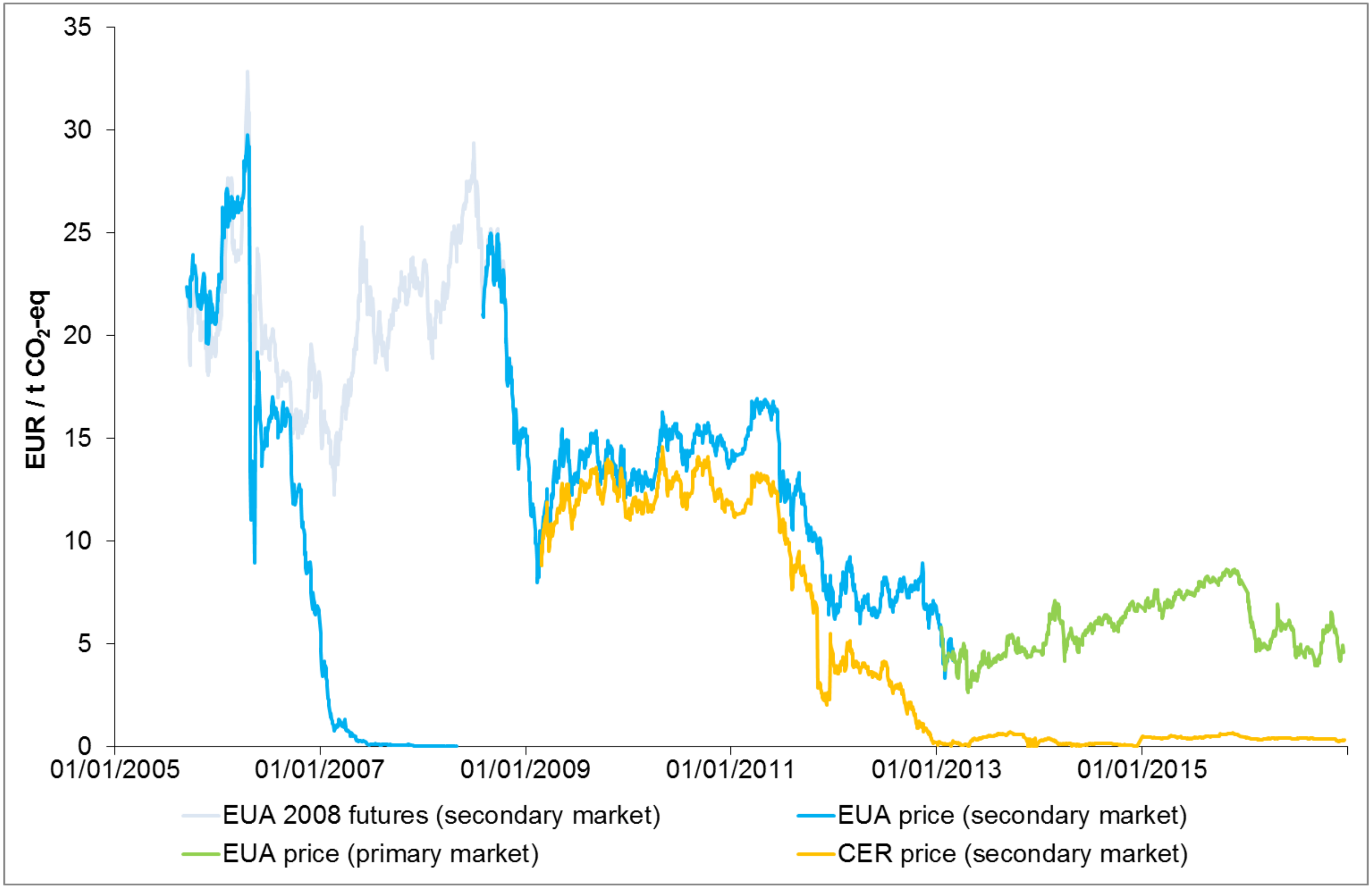
Reasons for such an over-estimation include:

1) Data quality may be low and it may therefore be impossible to set an effective and efficient cap;

2) Cap does not (fully) anticipate emission reductions achieved by complementary policies or system-wide shocks.

(4) Market Intervention

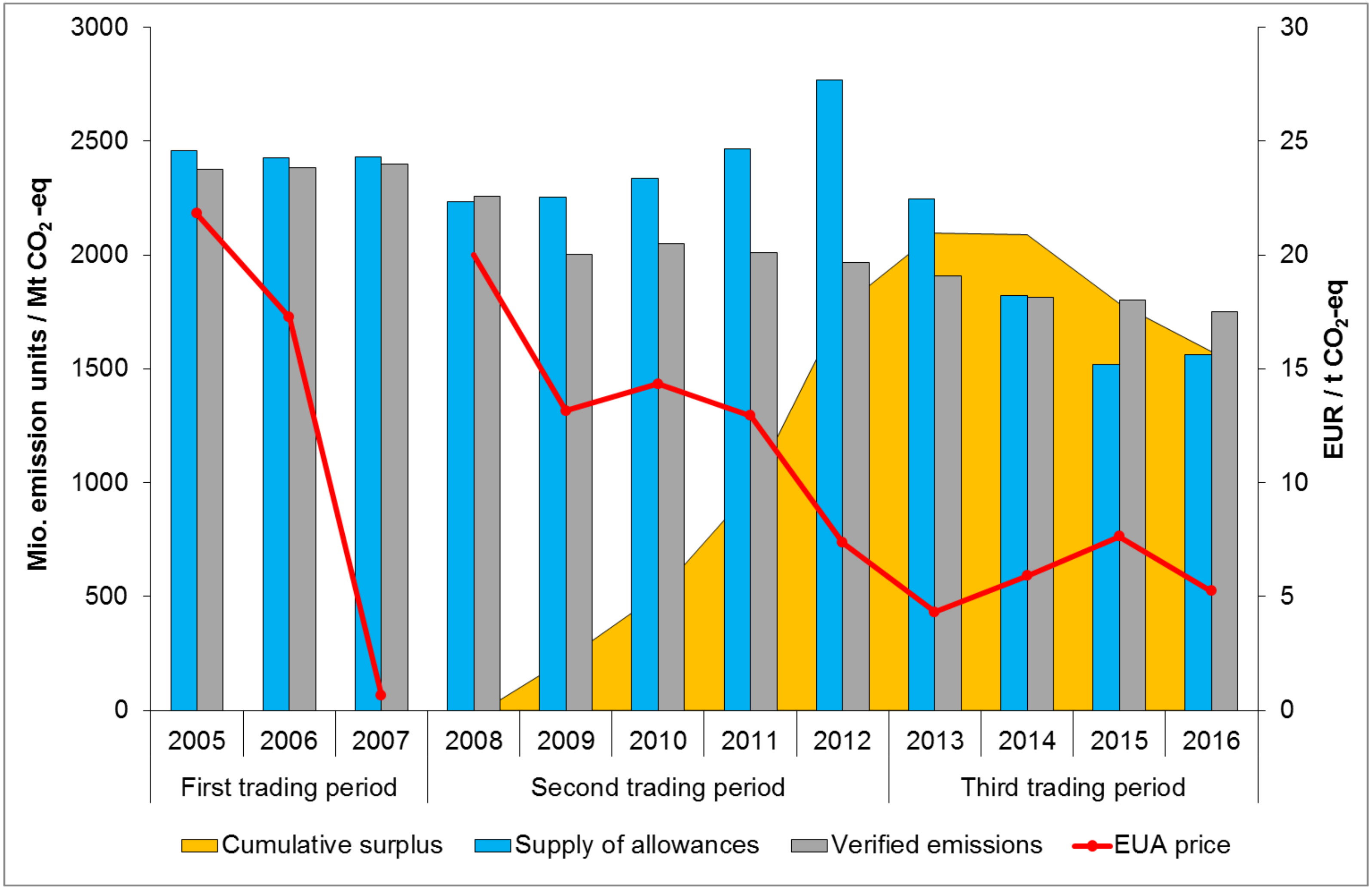
Case Study: EUA prices in EU ETS



Source: EEA (2017)

(4) Market Intervention

Case Study: EU ETS – Supply / demand balance



(4a) Adjusting the cap
Long term cap adjustments

Two main options to adjust an absolute cap in the long term include:

1) Changing the LRF (under LRF approach) / changing deviation from projection (under deviation approach)
2) Updating the cap reference year (under LRF approach) / updating baseline projection (under deviation approach)

Choice between the two types of options depends on the cause of the under or over-supply of allowances and expected future developments:

1) If improved data shows that emissions in electricity generation were over-estimated by 10%, it makes sense to re-base the cap;
2) If the overall ambition of the system in the long term is to be increased, it makes sense to increase the LRF

(4a) Adjusting the cap
Possible adjustments after the end of the pilot phase

Improve quality of data collection from covered installations during the pilot phase.

Following a review of the cap with the improved data collected during the pilot, it should remain an option to adjust the cap.

Re-base the cap / change projection if emissions differ significantly (not due to short term effects).

If NDC ambition increases in future (or distribution of effort between ETS and non-ETS sectors updated), change LRF / deviation from projection.

2019 -2021	2022-2024	2025 -2027	2028 -2030
Pilot Phase	**Phase I**	**Phase II**	**Phase III**

(4b) Flexibilities

Short term flexibilities triggered by allowance price

To address short-term imbalances, short-term flexibility options triggered by the price of allowances include:

1) Minimum price (auction reserve price)
   If an auction reserve price is in place, allowances at auction are only sold if a certain price level is reached.

2) Minimum price (surrender charge)
   If a surrender charge is in place, at compliance, emitters have to pay a top-up charge representing the difference between the market price of allowances and a set minimum price.

3) Maximum price (price ceilings)
   Soft price ceiling: portion of cap is set aside, which can be accessed if price triggers are met. Hard price ceiling: unlimited number of allowances available at the pre-defined price

(4b) Flexibilities

Short term flexibilities triggered by allowance quantity

Quantity triggers can also be used to activate a market integrity reserve

- A minimum and maximum acceptable size of the surplus is defined
- If these quantity triggers are reached, allowances are cancelled directly, added to or released from a market integrity reserve.

Typically, allowances are taken from and re-introduced into the auctioning budget .

It is important to combine any kind of reserve with a cancellation mechanism to avoid the build-up of a large reserve leading to higher emissions in future years and endangering long-term reduction targets.

(5b) Flexibilities

Possible adjustments after the end of the pilot phase

Price management mechanism could be trialled in the pilot.

+ From beginning there would be a level of price certainty.

Mexico already has a carbon price in place – the carbon tax. This could be combined with a (soft) price ceiling to avoid high costs to entities.

Quantity management mechanism is more complex to implement and may require further consideration once ETS is more established.

Regardless of the cap-setting approach selected, it is essential that any future cap is accompanied by appropriate flexibilities and safeguards.

2019 -2021	2022-2024	2025 -2027	2028 -2030
Pilot Phase	**Phase I**	**Phase II**	**Phase III**

(5) Conclusions

Cap-setting in Mexico

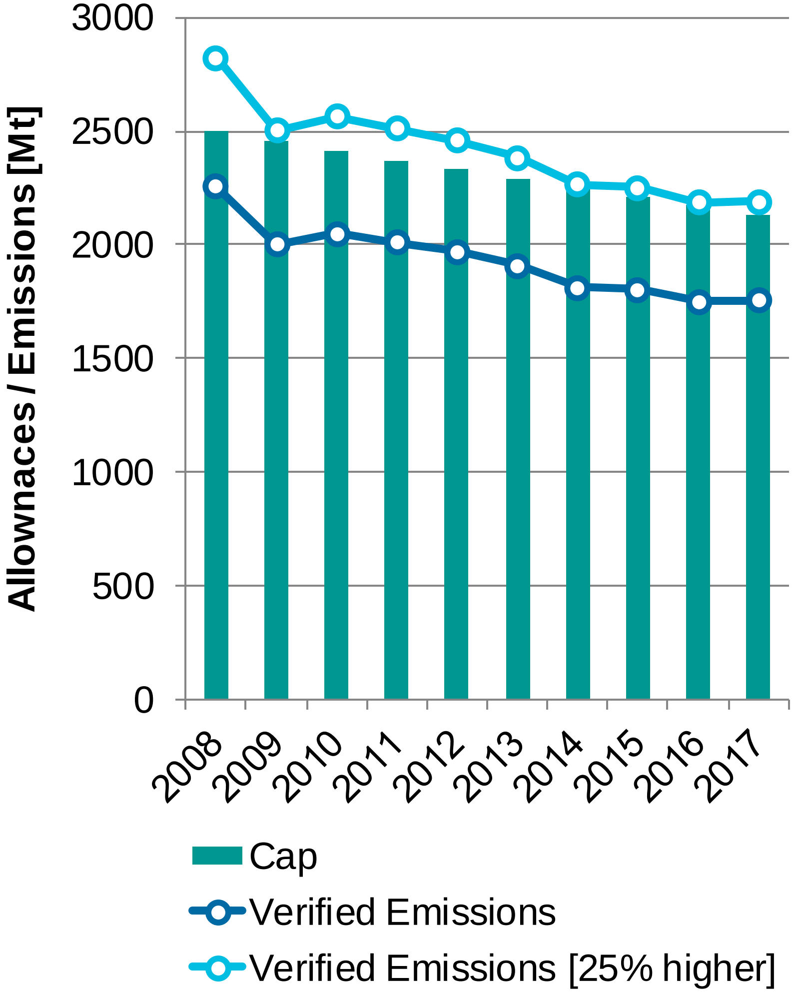
Key recommendations for ETS cap-setting in Mexico include the following:

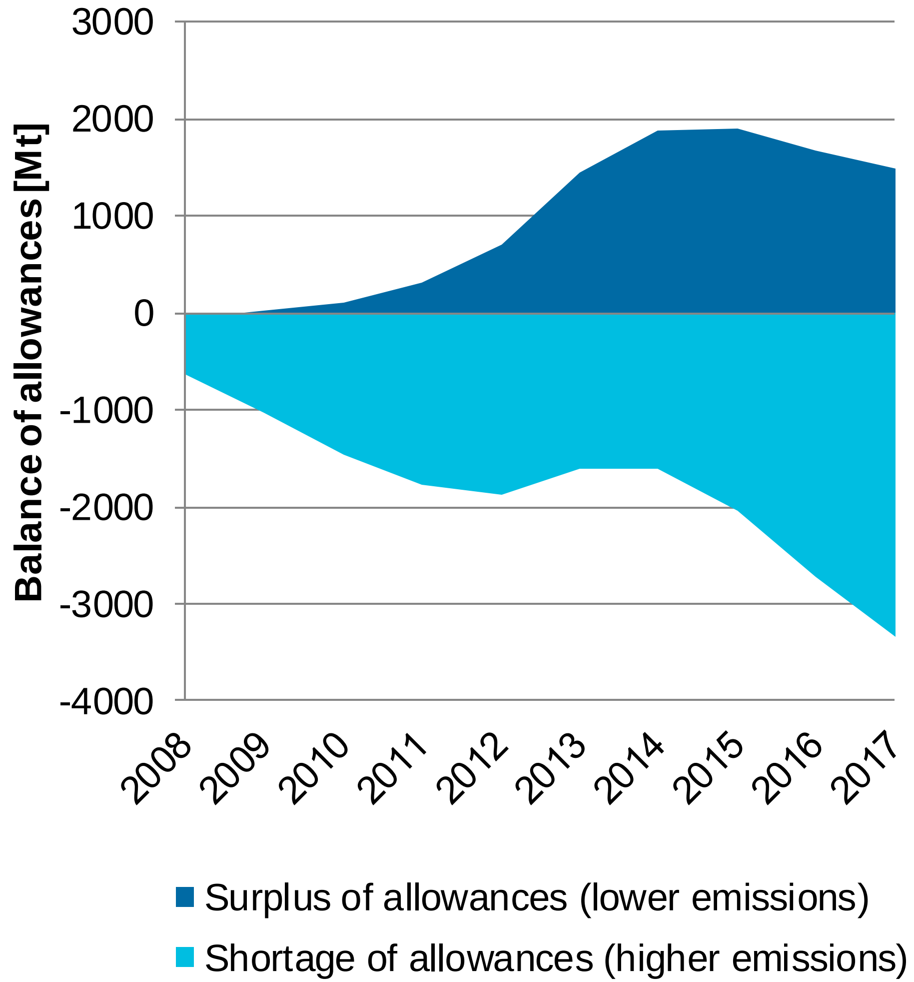
1) Recommended to set an <u>absolute cap</u>, which is based upon historical emissions data from the RENE;
2) Use the <u>unconditional and conditional NDC targets</u> to guide the long term target of ETS emission reductions;
3) <u>Take advantage of the pilot phase</u> to collect data, to allow for a future adjustment of the cap if necessary;
4) Ensure that <u>flexibilities are in place from the start</u> of ETS implementation (learn from the mistakes of other ETSs).

Additional slides

(2) Defining the cap

Absolute cap examples





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(2) Defining the cap

Intensity cap examples