

# **Design and approaches to the carbon tax in Mexico: Lessons and the road ahead**

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Technical Seminar: Regional Perspectives on the  
implementation of Carbon Pricing Instruments

## Outline

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1. Mexican CO<sub>2</sub> Tax: a good start, but need for improvement
2. Lessons from the Mexican experience
3. The policy challenge: for the first time unconditional GHG targets Vs aspirational
4. Addressing the challenge: policy options for Mexico

# Mexican CO<sub>2</sub> Tax: a good start, but need for improvement

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- Tax on **fossil fuel production & imports**, not on emissions
  - Equivalent? In principle yes, but...
    - Only emissions from combustion, process emissions are left out (e.g. manufacturing cement)
- Introduced as **one element of a comprehensive tax reform package**: opposition significant, but public attention fixated on other taxes.
  - Downside: lower salience (Chetty et al.)
- **Applicable to: manufacturers, producers and importers.**
  - Pemex, CFE & manufacturers (approx. 30 entities) – liberalization of energy market will increase the number of liable entities.

# Mexican CO<sub>2</sub> Tax: a good start, but need for improvement

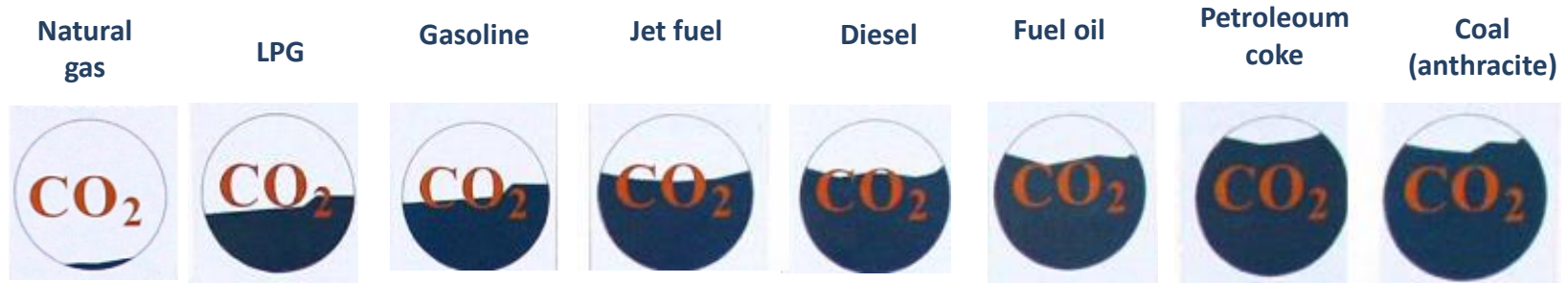
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- Good direction, but **low price (first set at \$5.7/tCO<sub>2</sub>, approved by Congress at US \$3.7 /tCO<sub>2</sub>)**
- **Inefficient signal**: initially designed to charge depending on carbon content of fuels, but discussions in Congress led to different shadow prices for different fuels.
  - Implicitly capped at 3% of the fuel price (not explicitly in the law)
- Yearly **adjusted by inflation**, not beyond.
- **Not revenue neutral** (but created to avoid raising other taxes), **no simultaneous announcement for climate protection investment**.
- **Liable companies may choose to pay the tax with credits from CDM projects developed in Mexico**.
  - These would be accepted in an amount equivalent to the value of credits at the time of paying the tax.

# CO<sub>2</sub> Tax : President's proposal

Proposed tax **MX\$ 70.68 /tCO<sub>2</sub>**  
**(US\$ 5.7 dollars)**

## Carbon content in each fuel



## Tax per unit of fuel (MXN/Unit)

<b>11.94</b> cents / m <sup>3</sup>	<b>11.42</b> cents / l	<b>16.21</b> cents / l	<b>18.71</b> cents / liter	<b>19.17</b> cents / liter	<b>20.74</b> cents / liter	<b>18.99</b> cents / kg	<b>17.83</b> cents / kg
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## Change in price (%)

<b>4.10%</b>	<b>1.70%</b>	<b>1.40%</b>	<b>1.60%</b>	<b>1.60%</b>	<b>2.60%</b>	<b>16.10%</b>	<b>17.00%</b>
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## Tax per ton of CO<sub>2</sub> (MXN/ t CO<sub>2</sub>)

<b>70.68</b> MXN / tCO <sub>2</sub>	<b>70.68</b> MXN / tCO <sub>2</sub>	<b>70.68</b> MXN / tCO <sub>2</sub>	<b>70.68</b> MXN / tCO <sub>2</sub>	<b>70.68</b> MXN / tCO <sub>2</sub>	<b>70.68</b> MXN / tCO <sub>2</sub>	<b>70.68</b> MXN / tCO <sub>2</sub>	<b>70.68</b> MXN / tCO <sub>2</sub>
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# The Political Economy of Carbon Taxes, or “*living in Stavins’ World*”.

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*“In principle, both carbon taxes and cap-and-trade can achieve cost-effective reductions.”*

*“But the key difference is **that political pressures on a carbon tax system will most likely lead to exemptions of sectors and firms, which reduces environmental effectiveness and drives up costs, as some low-cost emission reduction opportunities are left off the table.**”*

*But political pressures on a cap-and-trade system lead to different allocations of the free allowances, which affect distribution, **but not environmental effectiveness, and not cost-effectiveness.**”*

**Stavins, 2012.**

# CO<sub>2</sub> Tax : Approved by Congress

US \$3.7 /tCO<sub>2</sub>, introduced exemptions,  
capped price-change at 3%

## Carbon content in each fuel



## Tax per unit of fuel (MXN/Unit)

<b>Exempted</b>	6.6 cents / l	10.4 cents / l	0.0* cents / l	12.6 cents / l	13.5 cents / l	1.6 cents / kg	2.4 cents / kg
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## Change in price (%) *implicitly capped at 3%*

<b>0.0%</b>	1.0%	0.9%	0.0%	1.1%	1.7%	1.3%	2.6%
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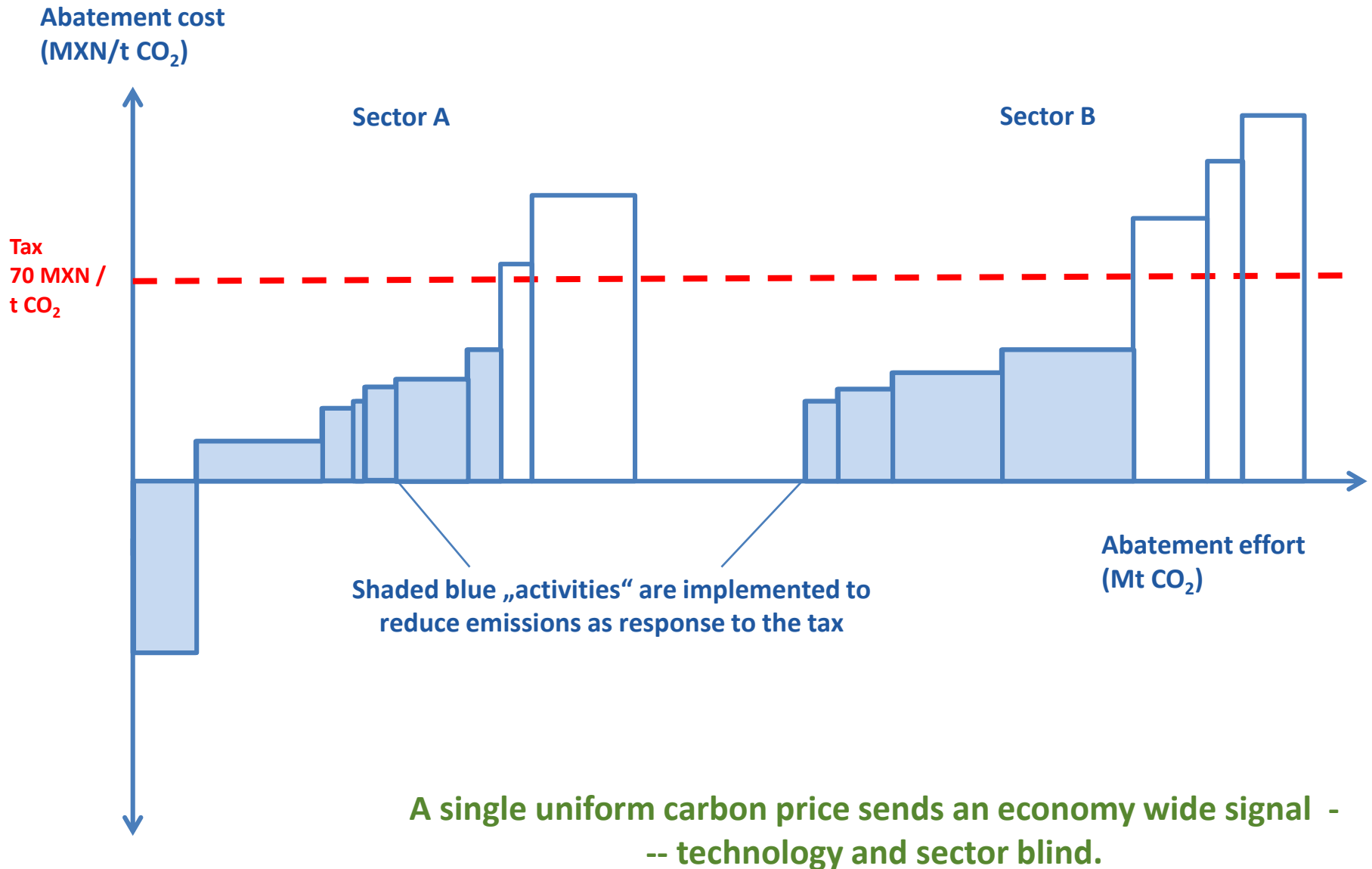
## Tax per ton of CO<sub>2</sub> (MXN/ t CO<sub>2</sub>), *different prices!*

<b>Exempted</b>	40.7 MXN / tCO <sub>2</sub>	45.3 MXN / tCO <sub>2</sub>	0.0* MXN / tCO <sub>2</sub>	46.4 MXN / tCO <sub>2</sub>	45.8 MXN / tCO <sub>2</sub>	5.8 MXN / tCO <sub>2</sub>	10.9 MXN / tCO <sub>2</sub>
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\* The carbon tax does not apply to JET FUEL because Mexico is a signatory of the Convention on International Civil Aviation (also known as the Chicago Convention) since 1946, which exempts commercial aviation fuel from taxation.

# Where does inefficiency steam from?

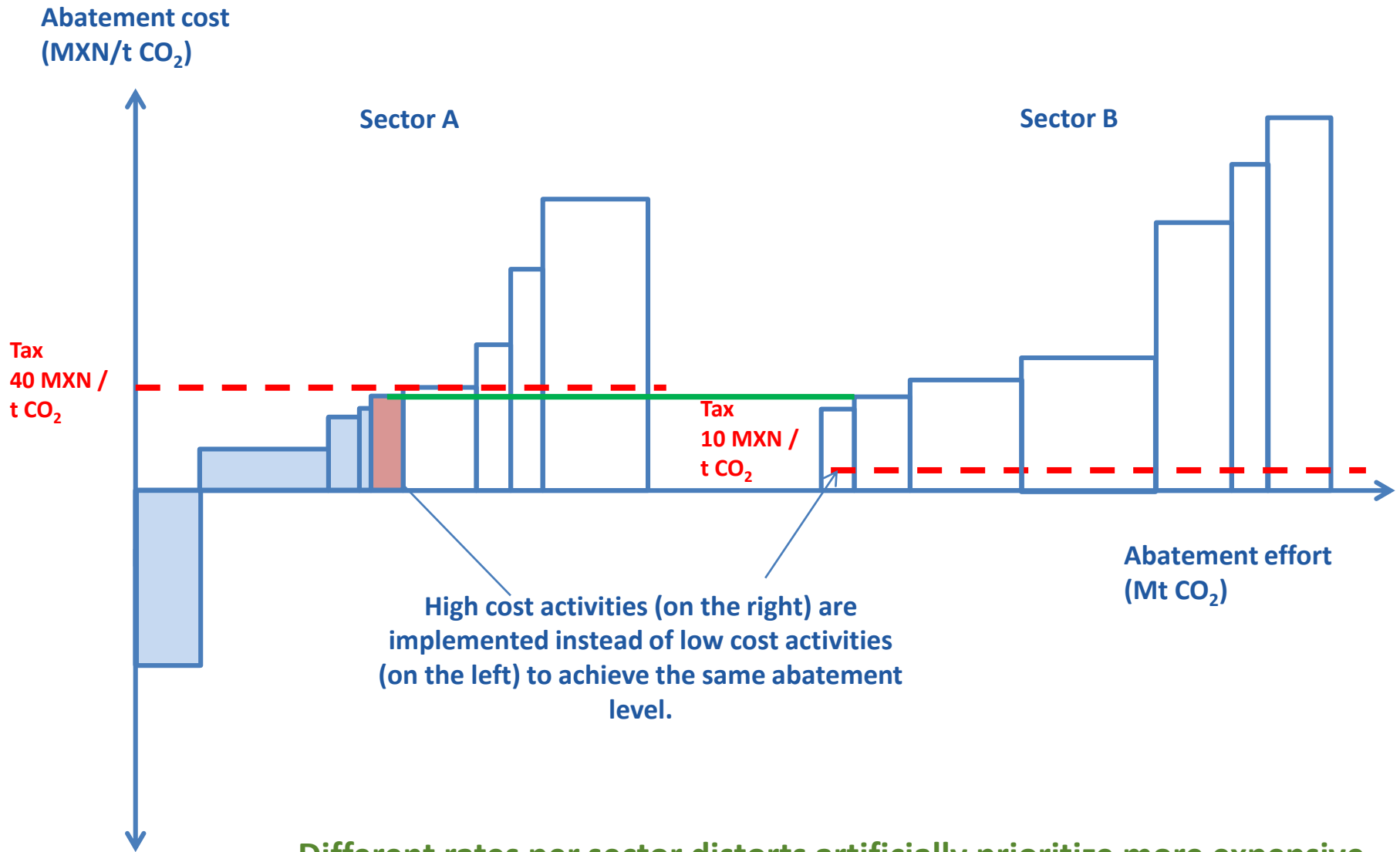
Optimal case: single, uniform carbon price.





# Inefficiency of the Mexican tax.

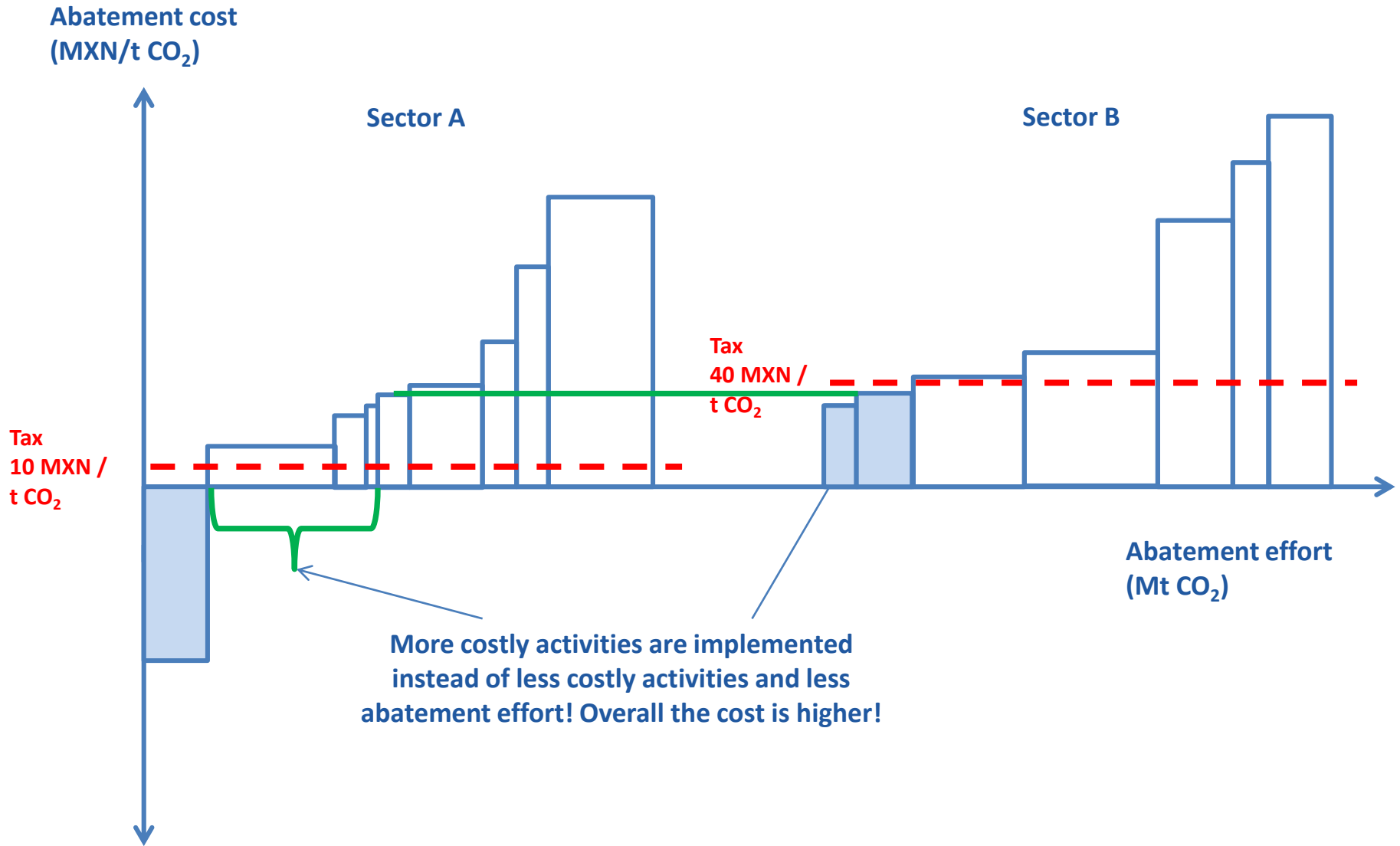
Case 1: high rate for sector with low abatement costs... less harmful case.



Different rates per sector distorts artificially prioritize more expensive abatement options.

# Inefficiency of the Mexican tax.

Case 2: high rate for sector with high abatement costs... most harmful case.



This is the worst case scenario.

## What is the carbon tax doing? Income generation

Fuel	Tax rate		Revenue
	2014	2015	2014+2015
	US\$ /tCO2	US\$ /tCO2	US\$ million*
Gasoline	3.44	3.00	532.9
Diesel	3.56	3.11	321.7
Natural Gas	---	---	0.0
LPG	3.01	2.66	111.3
Jet fuel	---	---	0.0
Fuel oil	3.57	3.12	103.4
Cokes	1.09	1.01	13.8
Coal	1.11	1.03	39.5
<b>Total</b>			<b>1,178.0</b>

\*Average exchange rate=14.58

Source: SHCP (2015)

## What is the carbon tax doing? Emissions reductions

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**Current emissions are compared to counterfactual (what would have happened without carbon tax):**

Price elasticities: Gasoline:  $(-0.8 \pm 0.2)$

Coal, Diesel, LPG:  $(-0.4 \pm 0.2)$

Income elasticities

Gasoline:  $(-1.0 \pm 0.1)$

**Approximately 1.8 million tCO<sub>2</sub> per year**

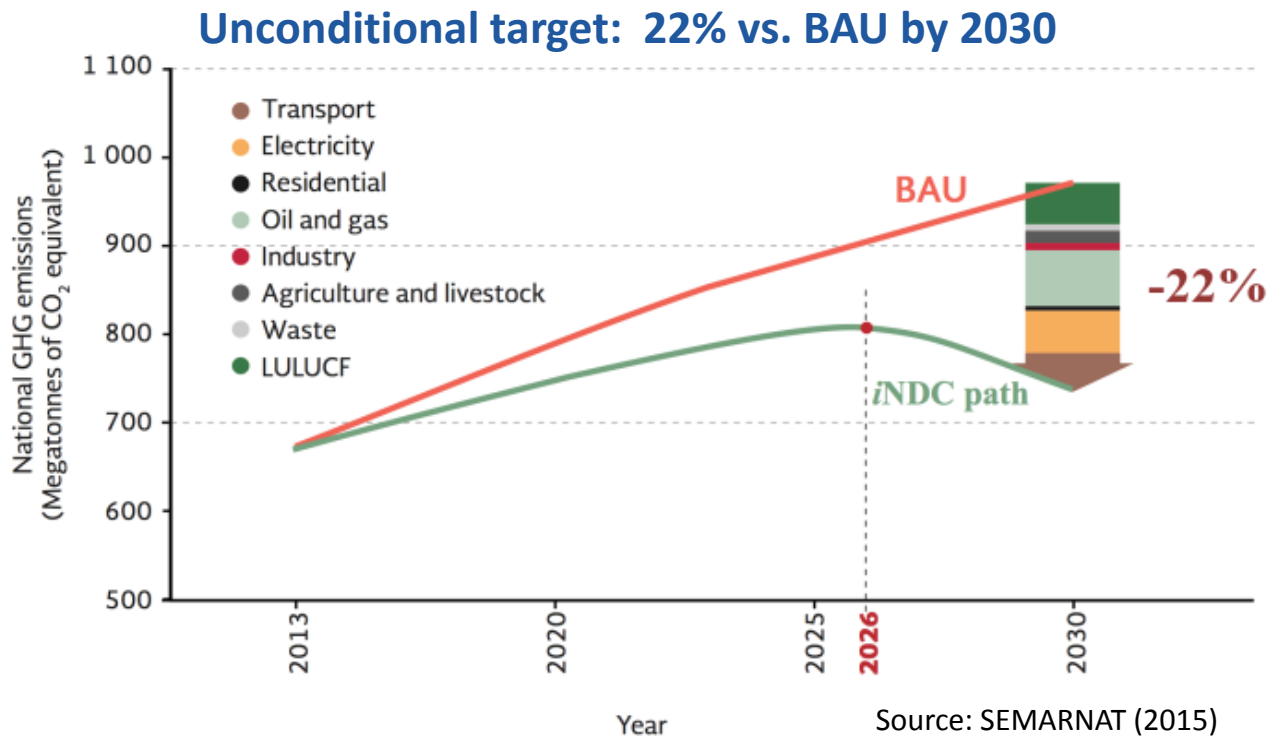
## Lessons: carbon tax in Mexico

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- Introducing carbon pricing as one element of a comprehensive tax reform package **can increase its public acceptance** (public attention typically focused on other taxes)
  - Downside: **salience** is low! **Consumers & producers underreact to taxes that are not salient (Chetty et al. 2009)** With low salience, low behavioral change, low emissions reduction.
- Advantage of fuel-based CO<sub>2</sub> tax: **administratively simple**
  - Downside : monitoring activities and CO<sub>2</sub> tax not strictly linked
- **Good direction, but inefficient signal**: Different shadow prices for different fuels
  - Stavins: this would not occur under an ETS
- Dynamic efficiency of the tax: **long term price signal?**

# The policy challenge: for the first time we have unconditional targets Vs aspirational targets (LGCC & Copenhagen pledges)

- Achieving the targets with command & control would be more expensive
- Low + inefficient carbon tax would not be enough !



# Addressing the challenge: policy options for Mexico

## *One single overarching instrument?*

Fix carbon tax!

### *Consider...*

*Higher certainty on costs*

*Lower certainty on environmental effect*

*Administratively simple*

*Vs*

## *Policy Mix*

1. Carbon tax + ETS
2. Carbon tax + innovation & tech adoption+ ETS + energy efficiency+ CELs market

### *Consider...*

*Check for policy interaction*

*Stringent policies will drive the change, the others act as backstop*

## Future agenda: policy options

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*One overarching instrument: fix carbon tax*

1. Eliminate exemptions and equalize the tax rate for all fuels

3. Draft rules for accepting credits

2. Increase tax level and introduce price trajectory (long term price signal)

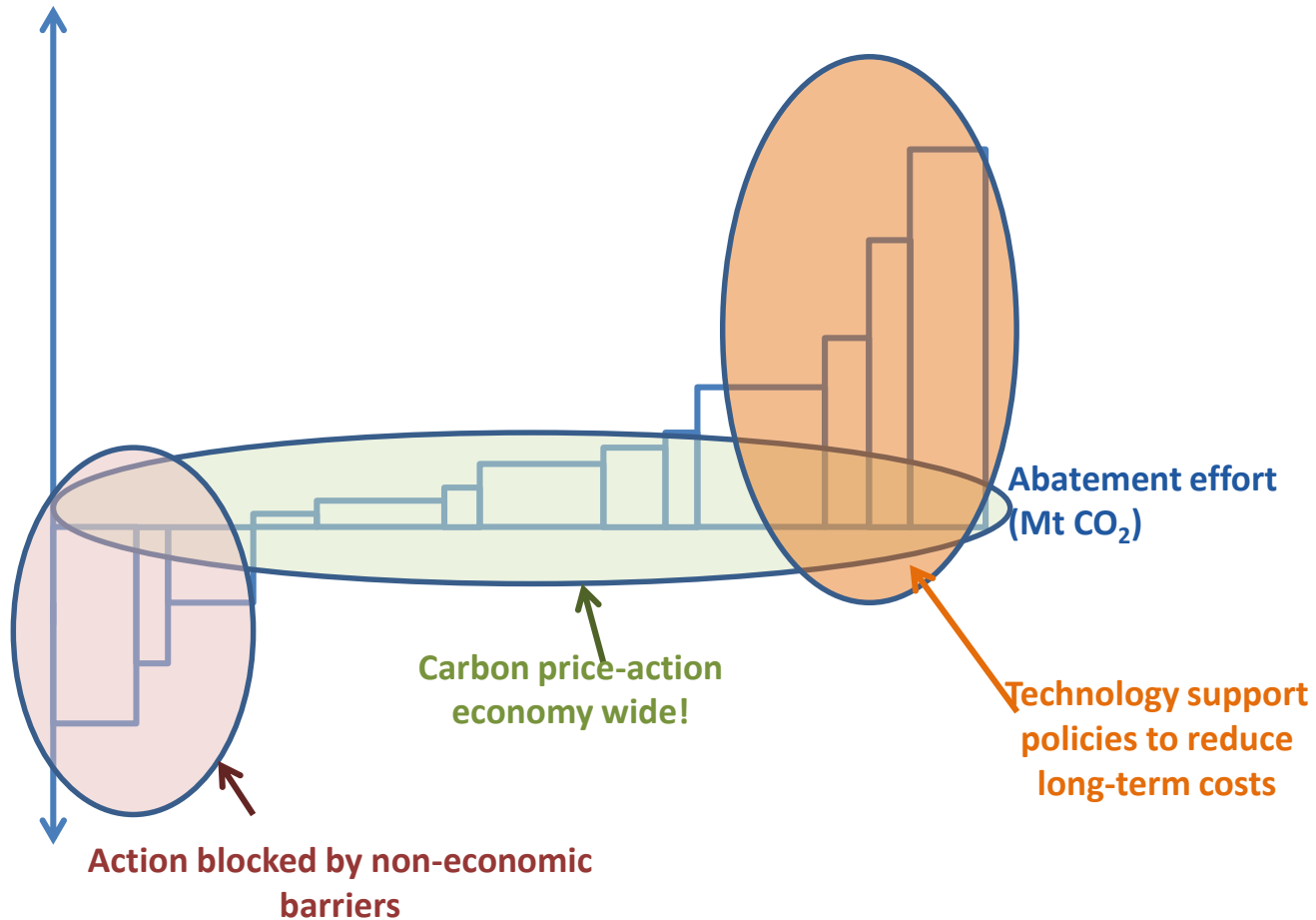
4. Facilitate behavioral change (i.e. elasticities are not fixed)

5. Reduce other sectorial fossil fuel subsidies (e.g. fisheries)



# Future agenda: policy mix ?

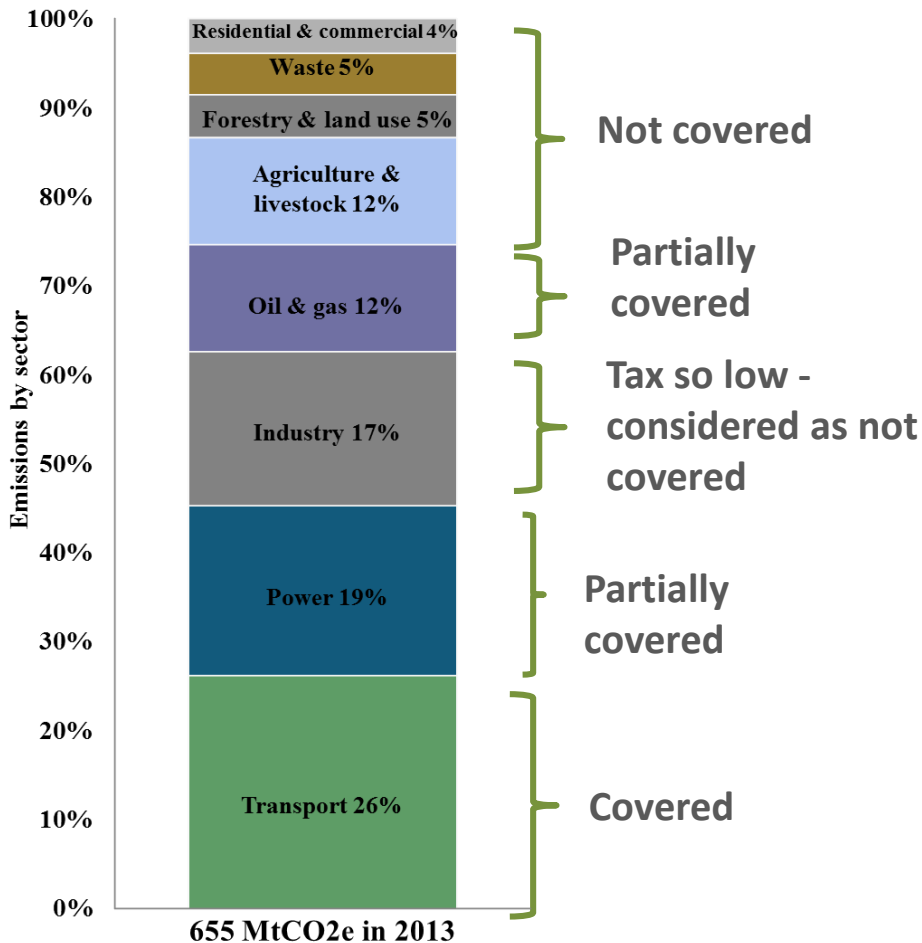
Abatement cost  
(MXN/t CO<sub>2</sub>)



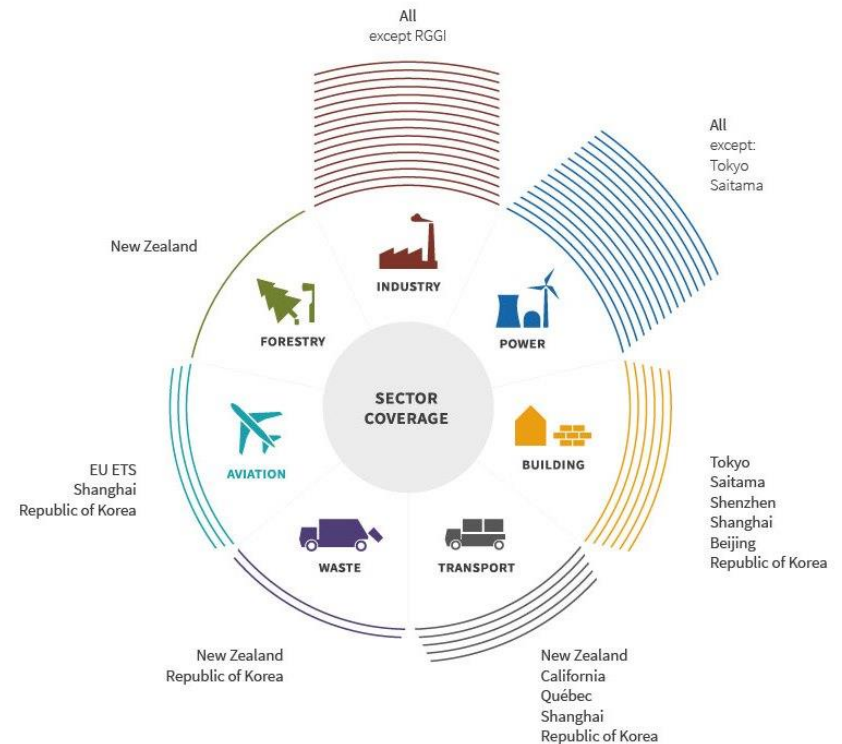
# Option 1: ETS + carbon tax

Do we even need an ETS if we already have a carbon tax?

Sectors not covered by carbon tax could be covered by Mexican ETS: industry, residential, waste, & power?.



Source: INECC/SEMARNAT (2015)



Source: ICAP (2015)

## Option 1: ETS + carbon tax

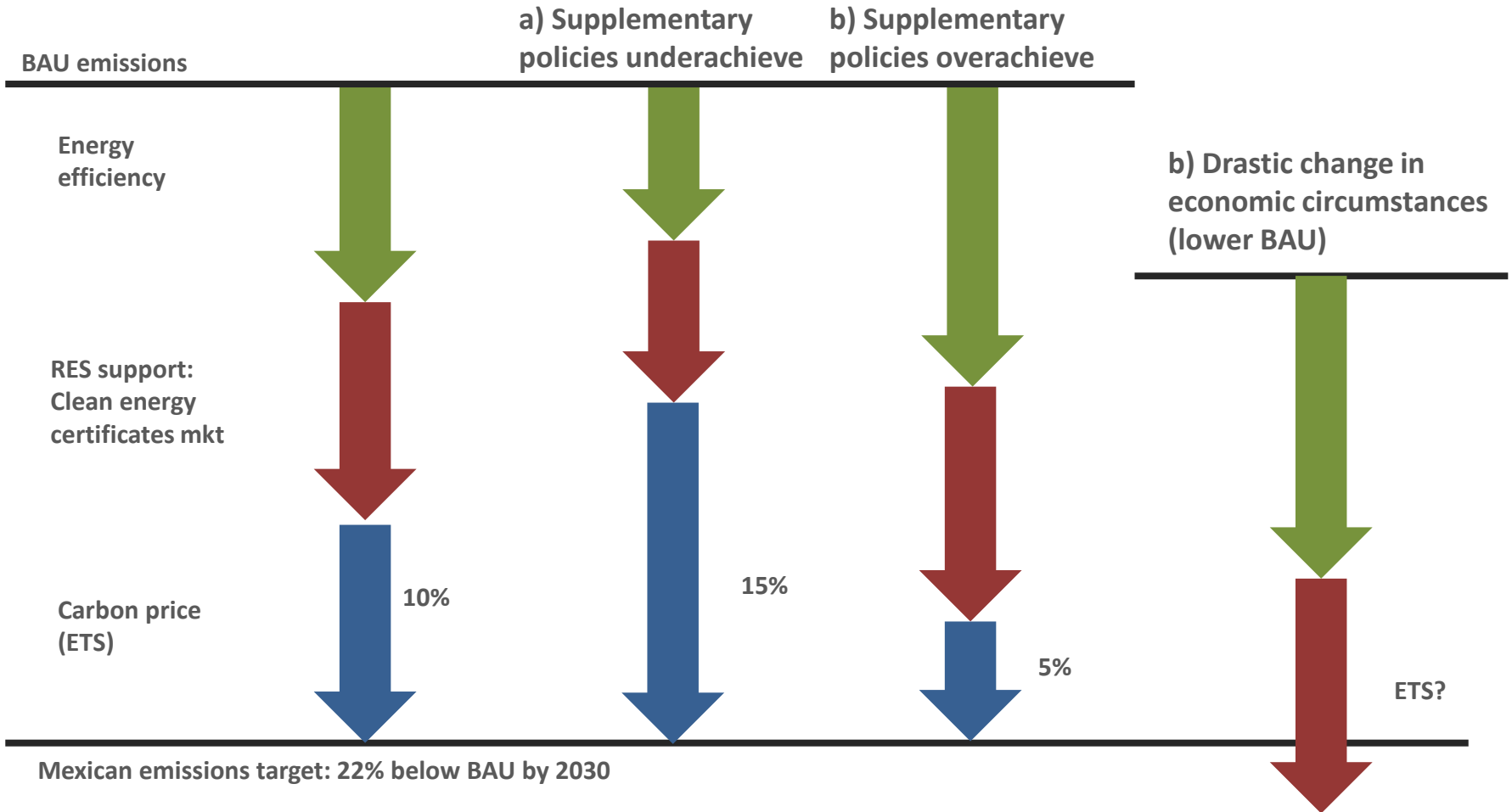
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Possible, but check for policy interaction!

- For some sectors carbon tax will act as a **backstop**, but in other sectors it will act as the **leading policy** (e.g. transport)
- Need to **adjust cap** considering previous policies (e.g. carbon tax)
- **Revisit assumptions** and adjust cap periodically.

# Option 2: ETS + energy efficiency + RES support

## Cross-check for policy interactions



Source: based on Hood (2011)

# Final remarks

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- Lessons from the Mexican experience in carbon pricing:
  - Tax as one element of fiscal package - **can increase public acceptance**
  - **Fuel-based tax is administratively simple**
  - Challenges
    - Tax rate: good start, need to **increase rate and remove inefficiencies!**
    - **CDM- mechanism**, how to develop linkages with other markets
- Policy challenge: mandatory, non-conditional GHG reduction targets
  - **Good arguments for policy mix ! BUT Crosscheck for policy interaction!**
  - ETS + carbon tax is possible- sectors not covered by tax can be covered by ETS
    - Current discussion: intensity vs. absolute cap

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**Backup**

# Option 1: international experience CO2 tax + ETS

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## Denmark

Tax covers consumption of fossil fuel- Sectors covered by the EUT-ETS have **refund provisions.**

## France

Tax on energy products based on the content of CO2 on fossil fuel consumption that is **not covered by EU ETS.**

## Ireland

Carbon **tax limited to sectors outside of the EU ETS.**

## Norway

Emissions **not covered** by the tax, included in ETS.

## Sweden

Installations in EU ETS **exempted from carbon tax.**



# Future agenda: policy options (climate policy mix)

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## *Policy mix instead?*

### *Arguments for:*

- ***Institutional barriers*** are not addressed through prices (*Myopic behavior*)
- ***Other externalities***
- ***Carbon tax is too low...*** changing it would face the same political barriers!
- *Some sectors are facing zero rate of CO<sub>2</sub> tax.*

### *Arguments against:*

- *May introduce harmful interactions that would raise costs & dampen environmental effect.*
- *Need to build institutional capacity before.*

- **Liabe companies may choose to pay the tax with credits from CDM projects developed in Mexico.**
  - These would be accepted in an amount equivalent to the value.
  - **Example: Mexican certified reduction, accepted instead or carbon tax liability by Mexican government, Mexican government values the certificate at NZ value, and accredits instead of tax, emissions reductions correspond to NZ (not to Mexico).**

# Setting the foundations for an ETS in Mexico:

Secondary legislation

## Climate Change Act (2012)

Basic framework for a **voluntary** ETS, **lack of a clear implementation plan!**

## Electric Industry Act (2014)

RPS, clean energy certificates market

## National Emissions Registry (2014)

Installations > 25,000 tCO<sub>2</sub>e

Based on emissions factors

Penalties/third party verification

**First step towards ETS/important for setting the cap**

## Energy transition Act (2015)

**Legal debate over whether it gave legal faculty to SEMARNAT to introduce ETS**

**Defined clean energy**

## Several unofficial announcements

ETS by 2018?

**Current regulation sets the framework for a voluntary ETS, however a mandatory scheme is under discussion.**

# CO<sub>2</sub> Tax : President's proposal

Proposed tax of MX\$ 70.68 pesos  
per ton of CO<sub>2</sub> (US\$ 5.7 dollars)

Fuel	Tax (MXN)	Implicit price per ton of CO <sub>2</sub> (MXN)	% change in price
Gasoline	16.21 cents per liter	70.68	1.40%
Jet fuel & other kerosene	18.71 cents per liter	70.68	1.60%
Diesel	19.17 cents per liter	70.68	1.60%
LP Gas	11.42 cents per liter	70.68	1.70%
Fuel Oil	20.74 cents per liter	70.68	2.60%
Natural Gas	11.94 cents per m <sup>3</sup>	70.68	4.10%
Petroleum Coke	18.99 cents per kg	70.68	16.10%
Coal Coke	19.30 cents per kg	70.68	17.00%
Propane	10.50 cents per liter	70.68	
Butane	12.86 cents per liter	70.68	
Coal	17.83 cents per kg	70.68	
Others		70.68	

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## Approved version by Congress introduces changes that will generate inefficiencies in price signals

### Approved carbon tax, 2013 Tax Reform

Fuel	Tax (MXN)		Implicit price per ton of CO <sub>2</sub> (MXN)	% Change in price
<b>Natural Gas</b>	<b>0.00</b>	cents per m3	<b>0.00</b>	<b>0.0%</b>
Propane	5.91	cents per liter	39.78	
Butane	7.66	cents per liter	42.10	
Gasoline	10.38	cents per liter	45.26	0.9%
Jet fuel and other kerosene	0.00*	cents per liter	00.00	0.0%*
LP Gas	6.59	cents per liter	40.68	1.0%
Diesel	12.59	cents per liter	46.42	1.1%
Fuel Oil	13.45	cents per liter	45.84	1.7%
<b>Petroleum Coke</b>	<b>1.56</b>	cents per kg	<b>5.80</b>	<b>1.3%</b>
<b>Coal Coke</b>	<b>3.66</b>	cents per kg	<b>13.4</b>	
<b>Mineral Coal</b>	<b>2.75</b>	cents per kg	<b>10.92</b>	<b>2.6%</b>

**Impact in the right direction, but inefficiencies due to different implicit prices.**

\* The carbon tax does not apply to air fuel because Mexico is a signatory of the Convention on International Civil Aviation (also known as the Chicago Convention) since 1946, which exempts commercial aviation fuel from taxation.