Lessons from the Carbon Tax in Chile

Presentation for the Coalition of Ministers of Finance for Climate Action
Stockholm, Sweden October 3, 2019

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Context and Problem

- Chile has significant environmental problems
  - Climate Change
  - Atmospheric pollution
  - Congestion and motor vehicle pollution.
- Environmental policy is centered on standards and regulations.
In September 2014, Chile passed a General Tax Reform Bill (Ley 20.780) with 3 green taxes.

Three new taxes were introduced:

- tax on CO\textsubscript{2} emissions from stationary sources with boilers and turbines (sum over 50MW)
- tax on local contaminants also on stationary sources with boilers and turbines (PM, SO\textsubscript{2} and NO\textsubscript{x}).
- tax on the first sale of new cars considering the expected NOx emissions over their lifetime.
Tax Characteristics and Results

- Tax Proposed and Rates
- Design Elements
- Results
- Proposed Innovations
- Lessons from Chile
Key Design Elements
Taxes on Stationary Source

The tax is based on all annual emissions of liable facilities. The CO2 and Local Pollutant tax have different rates, determined in terms of their respective marginal costs.

\[
T_{ij} = 0.1 \times CCA_j \times CSCpc_i \times Pob_j
\]

**LOCAL POLLUTANT**

- **\( T_{ij} \)**: Tax Rate of pollutant “i” in municipality “j” in US$/t.
- **\( CCA_j \)**: Air Quality Coefficient “j”.
  - SATURATED ZONE: 1.2
  - LATENT ZONE: 1.1
- **\( CSCpc_i \)**: Social Cost of pollutant “i”.
  
<table>
<thead>
<tr>
<th>Pollutant</th>
<th>PM</th>
<th>SO2</th>
<th>NOX</th>
<th>COST (US$)</th>
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<tr>
<td></td>
<td>0.9</td>
<td>0.01</td>
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**GLOBAL POLLUTANT**

- **\( T \)**: Tax per ton US$/t.
  
  The tax exempts energy from biomass

There is no earmarking.
Revenues go to national budget
## Tax Rate on Local Pollutants

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Other Relevant Design Features

- Tax on Emissions
- Definition of Liable Stationary Sources
- Point of Regulation
- Monitoring, Reporting, and Verification (MRV)
- Institutional Infrastructure
Who are the Liable Entities?

Tax defines liable facilities in terms of the combined total power capacity of 50 MW.
Liable Entities

Tax defines liable facilities as those structures that have boilers and turbines (energy generation) in terms of the combined total power capacity of 50 MW.
Liable Facility

Multiple Facilities operating in coordination also liable
Which is the point of regulation?
Point of regulation

Tax based on carbon content

Chile

México, Colombia, South Africa, Sweden
How to measure emissions?

Measurement

Direct emissions
- Continuous Emissions Monitoring
- Direct point measurement

Estimation
- Estimation based on reporting

The key:
All methods require a reporting structure for each facility.
Monitoring, Reporting and Verification (MRV)

Institutional Framework for the Governance of MRV System

**Registry**
- Registry of Facility potentially affected
- Establish reporting requirements
- Determine necessary information
- Responsibility
- Penalties
- Technological Platform
- Training Users
- Regulatory Agency

**Measurement**
- Measurement methodologies protocols
- Eg. CEMS, Emission factors
- Base Lines (in the case of reductions)
- Quality Control
- Responsibilities
- Penalties
- Training Users
- Enforcement Agency

**Report**
- Structure of Report
- Eg. Requires information, dates
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**Verification**
- Verification System
- Standards required for verifiers
- Standards, criterion for verification.
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**Trade/Offset**
- System of Trades
- Emissions Registry
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Institutional Framework for the Governance of MRV system
Institutional Infrastructure in practice

- Law 20.780
- Regulatory Statute (30 dic 2016)
- Measurement Protocols (SMA)
- Notification of Facilities (MMA)
- Registration System (RETC)
- Development of a System of Reporting (SMA)
- Design of a Verification System (SMA)
Institutional Infrastructure

Major Institutional Framework

- Regulatory Framework of Climate Change Policies
- Institutions
- Regulatory Framework CPI
- Others
- MRV
  - Registry, Measurement, Reporting, Verification, Trade
  - Enforcement and penalties
Results
Results: Liable Facilities

2017 RESULTS

REVENUES $191,189,575: 88% CO₂ and 94% power generation.
RESULTS

Revenue: 191.1 MM USD
Facilities: 94

Graph showing CO2, Particulate Matter, Sulphur Dioxide, and Nitrogen Oxides with respective values.
### CO2 Coverage

<table>
<thead>
<tr>
<th>Category</th>
<th>CO2 tons (mm)</th>
<th>Tax (2016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>85.1</td>
<td></td>
</tr>
<tr>
<td>Generation</td>
<td>38.5</td>
<td>40</td>
</tr>
<tr>
<td>Industry</td>
<td>14.3</td>
<td>2.5</td>
</tr>
<tr>
<td>Others</td>
<td>32.3</td>
<td></td>
</tr>
<tr>
<td>Industrial Processes</td>
<td>6.6</td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>13.7</td>
<td></td>
</tr>
<tr>
<td>Waste</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>109.9</strong></td>
<td></td>
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</table>
Revenues (2018) on stationary source: US$186 mm

Contaminants
- CO2: 88%
- PM: 3%
- Nox: 1%
- SO2: 3%

Sectors
- Energy: 93%
- Wood/Pulp: 1%
- Fisheries: 1%
- Others: 3%

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Impact 2017-2018

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<tr>
<td>Revenue</td>
<td>-1%</td>
</tr>
<tr>
<td>CO2 emissions</td>
<td>-1.10%</td>
</tr>
<tr>
<td>PM emissions</td>
<td>-7%</td>
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<td>Nox emissions</td>
<td>-2%</td>
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<td>Sox emissions</td>
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Innovations
Proposal currently discussed in Congress

Revenue: 381,9 MM USD
Facilities: 89

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<th>Emission Type</th>
<th>Revenue (MM USD)</th>
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<td>Particulate Matter</td>
<td>200</td>
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<td>Sulphur Dioxide</td>
<td>150</td>
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<tr>
<td>Nitrogen</td>
<td>100</td>
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Current Tax

Proposal

Carbon Dioxide
Particulate Matter
Sulphur Dioxide
Nitrogen
Differences in Revenues is because of Local Pollutant Tax Rates:

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2. **Optimum tax** rate not so relevant. Low tax may be better, at least initially.

3. **Think about cobenefits**. Combining carbon taxes with local pollutants may be relevant for domestic policy, especially LDCs.

4. **Even a low tax has an impact**. Can act as a signaling and coordination device, and supports the development of an institutional infrastructure.

5. **MRV overestimated**. Often complexity is overestimated and necessary for other policies.

6. **Institutional infrastructure underestimated**. Reform of regulatory system underestimated is necessary and will serve other objectives.

7. **Success breeds new commitments and more ambition**. Can be the basis of carbon markets.

8. **Fuel approach vs Emissions Approach are complementary** rather than alternatives.
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