The Benefits of a Carbon Tax – Swedish experiences and a focus on developing countries

Domestic Resource Mobilization and Tax Base Protection
UN Workshop on Practical Issues in Protecting the Tax Base of Developing Countries
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Why is a Carbon Tax Important Now?

Tax Base Protection for Developing Countries

• Huge challenges
• Increased revenues are essential
• Domestic Resource Mobilization

The Paris Climate Agreement

• Cost-effective tools are needed to deliver …. by all countries
• Put a price on carbon – strong signal to households and firms
• A carbon tax has low administrative costs vs emission trading
Global Outlook

• How can a carbon tax help deliver on the Paris Agreement and raise revenues?

• More and more jurisdictions across the globe are introducing a carbon tax
  – Sweden has had a carbon tax since 1991.
  – What lessons can be learned?
  – What is of particular importance to developing countries?

• The Road Forward ….
Global Outlook
*Why a carbon tax can work well in developing countries* ....

- **Low administrative costs**
  - is easy to administer, can be added to existing fuel tax system
  - no need to measure actual emissions
  - sets a price on fossil carbon according to Polluters Pay Principle – national conditions determine choices made by households and firms

- **Taxation points can be chosen up-stream** – few tax payers

- **Start with low tax rates; step-by-step approach**

- **Revenues can be used to**
  - enable options to fossil fuel use (e.g. public transport, substitutes to fossil heating, such as district heating or cooling systems using household waste as a resource)
  - address distributional consequences (e.g. poor households)
Easy to Administer

- In tax law, carbon tax rates expressed in normal trade units (weight or volume)
- Legislators use average CO$_2$ emission factors for different fuels to calculate tax rates
  - Internationally acknowledged emission factors
  - No need to measure at point of emissions to air
- Most countries already apply some kind of duties on fuels. A carbon tax can be paid by the same tax payers (e.g. distributors or large consumers, Sweden: pop. 10 million people, 300 tax payers for energy taxes)
- Low administrative costs for tax authorities and business
  - Administrative costs for Swedish Tax Administration is 0.1 % of total revenues for energy and carbon taxes
- Tax points up-stream facilitate tax collection and controls
General principle: Fuels taxed at the time of production (incl. extraction) or importation.

= Taxation point. Tax payer would typically be a coal mine owner, an oil driller or importer of oil or other fuels.

Pros and cons:

+ Could facilitate tax control
+ Less number of tax payers, easier tax administration
- Negative liquidity effects on business, due to that tax is to be paid before fuels are sold
- Difficult to differentiate tax between refined oil products
- Difficult to differentiate tax between areas of use

1 For discussion; would not be possible in Sweden due to general EU provisions
An Example
Sweden’s 26 years of carbon tax

Carbon Tax
• 1988-1989 Committee of inquiry
• 1989 Committee Report
• 1990 Governmental Bill and Parliament Decision
• 1991 Carbon Tax introduced

New national climate targets decided by Parliament in 2017
• By 2045 no net emissions of greenhouse gases.
• By 2030 emissions from domestic transports (excl. aviation) reduced by 70 % compared to 2010
Basic Facts on Sweden

- 10 million people; size of California
- 50 % of land is covered by forests and 10 % by lakes
- Major natural resources: forests, iron ore (90 % of EU’s resources) and hydro power
- Export-oriented country, open approach to trade; major exports machinery & vehicles, steel, paper & wood, electronics, telecommunications
- Energy consumption: 33 % electricity, 30 % fossil fuels, 37 % biofuels and heat produced from biofuels and household waste
- Steel and metal industry = 20 % of industry's total energy consumption
- Electricity production: 47 % hydro, 34 % nuclear, 10 % wind, 9 % combined heat and power plants (in-put basically non-fossil)
Reasons for Taxing Energy in Sweden

Increased focus on environmental taxes

- **Until 1980’s:** Primarily fiscal purposes
  - generally low tax levels
- **1990’s and onwards:** Environmental issues given high priority by Government and citizens
  - increased focus on environmental taxes
  - increased tax levels, step-by-step
  - focus on increased carbon tax share of taxation of energy (“carbon tax heavy”)
- **Now:**
  - Energy tax: fiscal and energy efficiency
  - Carbon tax: climate
Swedish Carbon Pricing

• Carbon tax on motor fuels and heating fuels
  – Based on fossil carbon content of fuels.
  – Introduced along with existing energy tax. Part of major general tax reform.
  – Two levels of carbon tax, per tonne fossil carbon, lower level for industry will be abolished in 2018. Non-heating purposes in industry is not taxed.

• EU Emission Trading Scheme (EU ETS) since 2005
  – Emissions of fossil CO$_2$ and other greenhouse gases.
  – Large part of heavy industry.

• No carbon tax on industry covered by EU ETS

• 90 % of Swedish fossil carbon emissions are covered by carbon tax or EU ETS
Development of the Swedish Carbon Tax

General level and industry level

**NOTE:** from 2008 industry outside EU Emissions Trading Scheme (EU ETS)
How Environmental Tax Laws are Decided in Sweden

• All political parties in broad consensus on basic structure

• Involve stake holders
  – Committee of inquiry, incl. business representatives and various experts
  – Public consultation of proposals

• Close cooperation within Government Offices
  – Main responsibility: Ministry of Finance
  – Close cooperation with Ministries of Environment, Agriculture, Transport and Industry
Examples - 2017 and 2018 Swedish National Budget Bills

• **Continued focus on environmental taxes** (which in themselves are the key drivers to change behavior and reach targets)

• **Examples of environmental national expenditures**
  – New investments in climate measures, fossil free transports and renewable energy, e.g.
    – “Climate step initiative” – local climate investments, such as biogas and electric car charging stations
    – Urban investments in local public transports
    – Climate adaptation measures
    – Railroad maintenance
    – Premium to buy cars with low emissions
    – Buying and cancelling EU ETS emission allowances
    – Grants for emission reduction projects in industry
    – Grants for investments in solar energy

• **No earmarking of revenues**
Real GDP and Domestic CO₂eq Emissions¹ in Sweden, 1990–2016

Sources: Swedish Environmental Protection Agency, Statistics Sweden

¹ In accordance with Sweden's National Inventory Report, submitted under the UNFCC and the Kyoto Protocol. CO₂ = approx. 80% of total CO₂eq emissions. Preliminary data for 2016.
Distributional Effects

Households

• Heating fuels: Fossil heating fuels has been phased out.
  – Fossil heating fuel use has since 1990 dropped by 85 % and now represents 2 % of Sweden’s total greenhouse gas emissions.
  – Replaced by district heating (in-put basically household waste and wood scrap; 92 % of all flats), wood pellets burners and heat pumps
  – Temporary aid schemes for conversion to renewable heating

• Motor fuels:
  – Major challenge remains for a fossil free transport sector
  – 95 % of current carbon tax revenues from motor fuels
  – Reduction obligation scheme for fuel distributors; taking biofuel share into account when setting carbon tax rates for petrol and diesel

• General welfare state
  – Social transfers
  – Increased basic income tax reductions for low and middle income households.
Distributional Effects

*Business*

- **Industry within EU Emission Trading Scheme (ETS):** Generally energy intensive.
  - No carbon tax from 2011, lower energy tax.
  - Proposal to reintroduce carbon tax for heat production in combined heat and power plants covered by the EU ETS on January 1, 2018 at a rate of 11% of the general level.

- **Industry outside EU ETS:** Generally less energy intensive.
  - Step-wise increase to general carbon tax level 2011–2018; lower energy tax.
  - In general low costs for energy and high costs for labor and capital.

- Large shares of the Swedish industry’s use of energy consist of **bio fuels** (36%, mainly paper and pulp) and **electricity** (32%) in 2014.
  - No tax on solid bio fuels and residues; low energy tax on electricity for industry.
  - Steady decline in specific energy use (amount of energy used per monetary unit of value added).

- **District heating** provides 80% of **space heating for service sector** (e.g., offices, shops).
What Does the Public Think?

• What make households and firms adapt?

Swedes do not love to pay tax, but ……

– General environmental concerns, both from households and firms; Broad political consensus

– Ensure that feasible options are available (bio fuels, district heating, public transport, housing insulation etc.)

– “Polluter Pays” = “Money Talks”

– 26 years of carbon taxation show good environmental effects = pollution from fossil fuels is not essential to economic success.

…… the carbon tax is generally accepted.
The Road Forward ……

…. yes, a carbon tax is a good idea!

– reduced emissions can be combined with long-term economic development and prosperity
– low administrative costs; emission trading schemes more complicated and costly
  • leave the choice of measures to households and firms; no Governmental intervention is needed to pick a winner, no applications and evaluations of individual projects are necessary
– raises revenues, which can be used to make options available
  • fine-tune policy design – what works in one country may not work well in another
  • carbon tax is the engine – additional measures are lubricants that make the engine go faster
– step-by-step approach gives time for households and firms to adapt – consider limited tax exemptions or reductions for certain areas to achieve over-all good results in economy
– discuss with stake holders and academia; cooperate within Government offices
– Sweden and others can share experiences, but exact design needs to take account of national conditions
How to Make it Happen ….

- **We know how to price carbon by a carbon tax**
  - Economic theory is solid
  - Ongoing discussions in COP conferences, UN Tax Committee, World Bank, IMF Carbon Pricing Leadership Coalition (CPLC), IMF, World Bank etc. etc.

- **Political courage** …. not easy but necessary …. and revenues are raised

- **Cooperation between Governments, academia and stakeholders**
  - research on policy experience, economical effects on society
  - step-by-step solutions, time limited aid programmes, technical research etc
  - hands-on, practical solutions
Thank you for your attention!
Questions?
Questions to discuss ….

• What are the most alarming effects of climate change in your country? Deforestation? Draughts? Flooding? Air pollution? What measures are you already applying or considering – share your experiences!

• Pros and cons of earmarking environmental tax revenues?

• Interaction of a carbon tax with other climate policies such as feed-in tariffs and investment aid for low-carbon projects as well as with other policies, such as fossil fuel subsidies?

• What kind of outside technical support would be most valuable? How to provide the most beneficial hands-on?

• Could discussions in the UN Tax Committee be a road forward? Handbooks?
Annex

some additional information about the Swedish carbon tax
# Overview of Swedish Environmentally Related Taxes

<table>
<thead>
<tr>
<th>Category</th>
<th>Revenues Billion € ($) 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Energy tax</strong></td>
<td></td>
</tr>
<tr>
<td>- electricity</td>
<td>4.79 (5.38)</td>
</tr>
<tr>
<td>- petrol</td>
<td>2.39 (2.68)</td>
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<tr>
<td>- other fossil fuels than petrol</td>
<td>1.21 (1.36)</td>
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<td>1.20 (1.34)</td>
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<td><strong>B. Carbon tax</strong></td>
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<tr>
<td>- petrol</td>
<td>2.40 (2.69)</td>
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<td>- other fossil fuels than petrol</td>
<td>0.81 (0.91)</td>
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<tr>
<td>- other fossil fuels than petrol</td>
<td>1.59 (1.78)</td>
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<tr>
<td><strong>C. Other environmentally related taxes</strong></td>
<td></td>
</tr>
<tr>
<td>- tax on sulphur</td>
<td>0.001 (0.001)</td>
</tr>
<tr>
<td>- tax on pesticides</td>
<td>0.01 (0.01)</td>
</tr>
<tr>
<td>- landfill tax</td>
<td>0.03 (0.03)</td>
</tr>
<tr>
<td>- tax on natural gravel</td>
<td>0.02 (0.02)</td>
</tr>
<tr>
<td>- tax on chemicals</td>
<td>0.12 (0.13)</td>
</tr>
<tr>
<td><strong>D. Vehicle related taxes</strong></td>
<td></td>
</tr>
<tr>
<td>- tax on motor vehicles</td>
<td>1.83 (2.05)</td>
</tr>
<tr>
<td>- road user charges</td>
<td>1.44 (1.62)</td>
</tr>
<tr>
<td>- tax on congestion</td>
<td>0.10 (0.11)</td>
</tr>
<tr>
<td>- tax on congestion</td>
<td>0.29 (0.32)</td>
</tr>
<tr>
<td><strong>Total (A+B+C+D)</strong></td>
<td>9.19 (10.32)</td>
</tr>
</tbody>
</table>

1 Prognosis.

Exchange rates 1 € = 9.593 SEK; 1 $ = 8.54 SEK is used throughout this presentation.
Swedish Energy and Carbon Tax Revenues
A brief overview

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<td><strong>Total (A+B)</strong></td>
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¹ Prognosis.

- Energy and Carbon Taxes – share of GDP in 2017: 1.5 %
- Energy and Carbon Taxes – share of total national tax revenues in 2017: 3.4 %

Exchange rates 1 € = 9.593 SEK; 1 $ = 8.54 SEK
Development of the Swedish Carbon Tax

• Two levels of carbon tax, per tonne fossil carbon
  – High for motor fuels and heating fuels in households and service: 26 € (29 $) in 1991; 118 € (132 $) in 2017
  – Low for heating fuels in industry: 6 € (7 $) in 1991; in 2016 outside EU ETS 94 € (106 $), no carbon tax within EU ETS industry
  – Lower tax level has been the prerequisite for the high level. Major emission reductions in sectors where high tax level has been levied.

• Towards one single price on carbon
  – Step-by step raising the lower level for industry outside EU ETS; lower level fully abolished in 2018.
  – Heavy industry mainly within EU ETS – another economic instrument which puts a price on carbon.
Green Taxes 1991 and Onwards ….

1990/1991 tax reform

- Reduced and simplified labour taxes (-6 billion $)
- Value Added Tax on energy (+1.8 billion $)
- Carbon tax introduced at a low levels combined with approx. 50% cuts in energy tax rates (+0.4 billion $)
- Certain investment state aid measures

In Sweden no earmarking of revenues … but it may be a solution in other national contexts.

Since 1991

- 2001-2006 Green tax shift
  - raised environmental taxes, cuts in income taxes focusing on low incomes
- 2007-2013 Increased environmental taxes significant cuts in labour taxes
- 2014 and onwards, for example
  - phasing out carbon tax reductions
  - new taxes on chemicals in electronic products and air travels
  - increased taxes on pesticides and natural gravel as well as energy tax on transport fuels
  - reform of vehicle taxation
  - public inquiries about e.g. road distance tax, waste incineration tax)
**General principle:** Fuels shall be taxed at the time of production (incl. extraction) or import.

**Major exception:** Tax suspension regime

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**Taxation Points for Taxes on Fuels in Sweden (mandatory EU rules)**

- **Tax warehouse**
  - where registered taxpayer is producing and storing refined oil products (petrol, diesel, heating oil)

- **Registered tax payer, tax warehouse**
  - (Large consumer or trader)

- **Registered tax payer, tax warehouse**
  - (Consumer or retailer)

- **Not registered tax payer, no tax warehouse**
  - (Consumer or retailer)

- = Taxation point, typically an oil company (tax charged upon release for consumption outside a tax warehouse) or a large industrial consumer (tax charged upon own consumption). In Sweden there are roughly 300 registered tax payers.

- = Tax suspension regime (products can be handled without tax being charged), enables taxation closer to consumption.
## Calculations in Tax Declaration

### Example (petrol, 2016 Swedish tax rates)

<table>
<thead>
<tr>
<th>Page 1: Quantities, liters</th>
<th>Page 2: Tax calculations, SEK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Energy tax</td>
</tr>
<tr>
<td>A</td>
<td>B=A*3.72</td>
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</tbody>
</table>

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<tr>
<th>Deliveries to non tax payers</th>
<th>500 000</th>
<th>1 860 000</th>
<th>1 295 000</th>
<th>3 155 000</th>
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<tr>
<td>Own consumption</td>
<td>10 000</td>
<td>37 200</td>
<td>25 900</td>
<td>63 100</td>
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<th>Deductions (tax exempted areas)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>- export</td>
<td>-5 000</td>
<td>-18 600</td>
<td>-12 950</td>
</tr>
<tr>
<td>- non-fuel use</td>
<td>-15 000</td>
<td>-55 800</td>
<td>-38 850</td>
</tr>
</tbody>
</table>

**Tax to pay**

<table>
<thead>
<tr>
<th></th>
<th>1 822 800</th>
<th>1 269 100</th>
<th>3 091 900</th>
</tr>
</thead>
</table>

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**Deliveries to non tax payers**

- 500 000 liters of petrol
- 1 860 000 SEK energy tax
- 1 295 000 SEK carbon tax
- Total tax: 3 155 000 SEK

**Own consumption**

- 10 000 liters of petrol
- 37 200 SEK energy tax
- 25 900 SEK carbon tax
- Total tax: 63 100 SEK

**Deductions (tax exempted areas)**

- Export: 5 000 SEK
- Non-fuel use: 15 000 SEK
- Total deductions: 20 500 SEK

**Tax to pay**

- 1 822 800 SEK energy tax
- 1 269 100 SEK carbon tax
- Total tax: 3 091 900 SEK
Who Face the Tax Burden?

Example petrol – Swedish context

- **Tax payer: Oil distribution company A**
  - Tax is paid when petrol leaves A’s tax warehouse
- **Gas station receives petrol after tax is paid**
- **Households and firms buy taxed petrol**
- **Swedish petrol retail price of ~13.20 SEK (1.38 €/1.55 $)/liter consists of (2016):**
  - Gross margin (11 %)
  - Product cost (23 %)
  - Taxes: Carbon, energy and value added taxes (66 %)
- **Who face the tax burden?**
  - 3 million owners of petrol driven cars (*via higher petrol prices*)
  - oil production and distribution companies (*via lower profit or lower wages*)
  - owners of petrol stations (*via lower profit or lower wages*)