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
Addis Ababa, Ethiopia
10 November 2017

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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

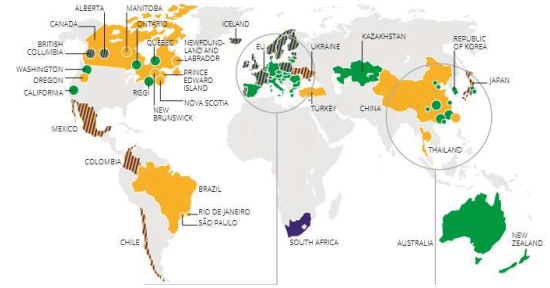
The Paris Climate Agreement

- 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 …..**

FIGURE 1 | Summary map of regional, national and subnational carbon pricing initiatives implemented, scheduled for implementation and under consideration (ETS and carbon tax)



ETS implemented or scheduled for implementation
Carbon tax implemented or scheduled for implementation
ETS or carbon tax under consideration
ETS and carbon tax implemented or scheduled
Carbon tax implemented or scheduled, ETS under consideration

Source: "World Bank; Ecofys. 2017. Carbon Pricing Watch 2017. Washington, DC: World Bank.

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

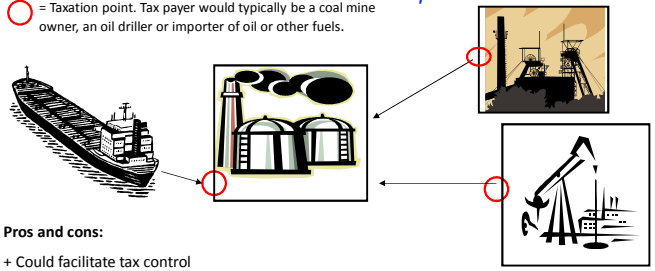
- In tax law, carbon tax rates expressed in normal trade units (**weight or volume**)
- Legislators use average **CO_2 emission factors** for different fuels to calculate tax rates
  - Internationally acknowledged emission factors
  - No need to measure at point of emissions to air
- Most countries already 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 Points for Taxes on Fossil Fuels

Extreme up-stream alternative[1]

○ = 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

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

An Example

Sweden's 26 years of carbon tax

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

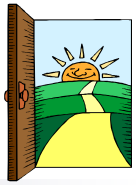
Basic Facts on Sweden

- 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

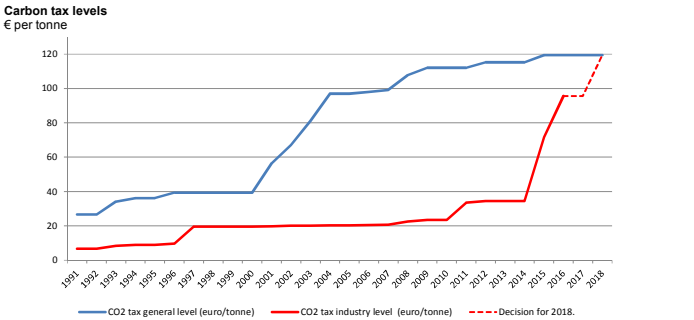


Swedish Carbon Pricing

- **Carbon tax on motor fuels and heating fuels**
  - Based on fossil carbon content of fuels.
  - *29 $ in 1991*; *132 $* in 2017; *135 $ in 2018*.
  - 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

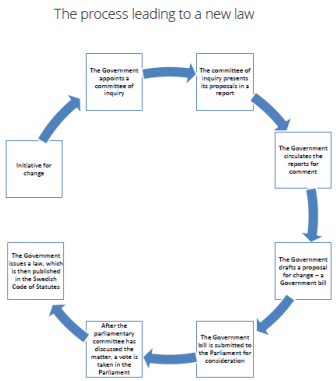
General level and industry level



NOTE: from 2008 industry outside EU Emissions Trading Scheme (EU ETS)

How Environmental Tax Laws are Decided in Sweden

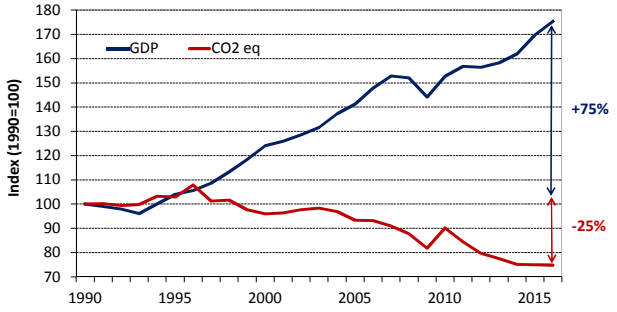
- **All political parties in broad consensus on basic structure**
- **Involve stake holders**
  - Committee of inquiry, incl. business representatives and various experts
  - Public consultation of proposals
- **Close cooperation within Government Offices**
  - Main responsibility: Ministry of Finance
  - 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 CO_2eq Emissions[1] in Sweden, 1990–2016



[1] In accordance with Sweden's National Inventory Report, submitted under the UNFCC and the Kyoto Protocol. CO_2 = approx. 80 % of total CO_2eq emissions. Preliminary data for 2016.

Sources: Swedish Environmental Protection Agency, Statistics Sweden

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 ……

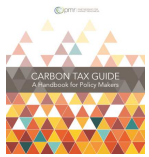
  - General environmental concerns, both from households and firms; Broad political consensus
  - Ensure that feasible options are available (bio fuels, district heating, public transport, housing insulation etc.)
  - "Polluter Pays" = "Money Talks"
  - 26 years of carbon taxation show good environmental 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!

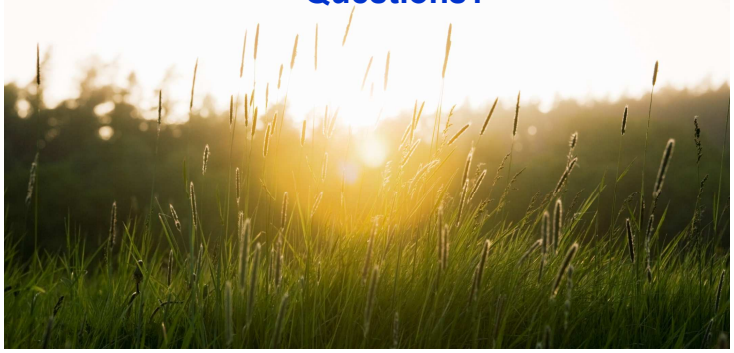
- reduced emissions can be combined with long-term economic development and prosperity
- low administrative costs; emission trading schemes more complicated and costly
  - leave the choice of measures to households and firms; no Governmental intervention is needed to pick a winner, no applications and 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
  - More and more countries can share experiences. See e.g. *"Partnership for Market Readiness. 2017. Carbon Tax Guide : A Handbook for Policy Makers. World Bank, Washington, DC.* https://openknowledge.worldbank.org/handle/10986/26300
  - 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

	Revenues Billion € ($)[1] 2017
A. Energy tax	**4.79 (5.38)**
- electricity	2.39 (2.68)
- petrol	1.21 (1.36)
- other fossil fuels than petrol	1.20 (1.34)
B. Carbon tax	**2.40 (2.69)**
- petrol	0.81 (0.91)
- other fossil fuels than petrol	1.59 (1.78)
C. Other environmentally related taxes	**0.17 (0.19)**
- tax on sulphur	0.001 (0.001)
- tax on pesticides	0.01 (0.01)
- landfill tax	0.03 (0.03)
- tax on natural gravel	0.02 (0.02)
- tax on chemicals	0.12 (0.13)
D. Vehicle related taxes	**1.83 (2.05)**
- tax on motor vehicles	1.44 (1.62)
- road user charges	0.10 (0.11)
- tax on congestion	0.29 (0.32)
Total (A+B+C+D)	**9.19 (10.32)**

[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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B. Carbon tax	**2.40 (2.69)**
- petrol	0.81 (0.91)
- other fossil fuels than petrol	1.59 (1.78)
Total (A+B)	**7.19 (8.07)**

[1] Prognosis.

Exchange rates 1 € = 9.593 SEK; 1 $= 8.54 SEK

- 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 %**

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

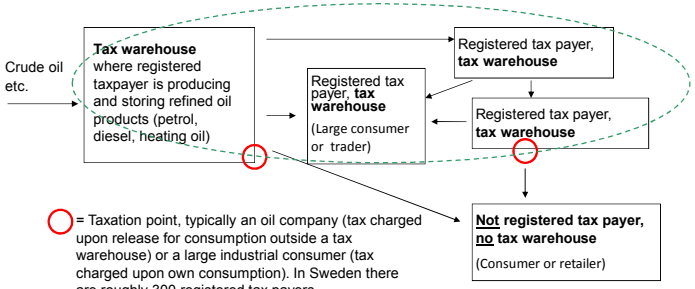
- 2001-2006 Green tax shift
  - raised environmental taxes, cuts in income taxes focusing on low incomes
- 2007-2013 Increased environmental taxes significant cuts in labour taxes
- 2014 and onwards, for example
  - phasing out carbon tax reductions
  - new taxes on chemicals in electronic products and 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)

Taxation Points for Taxes on Fuels

in Sweden (mandatory EU rules)

General principle: Fuels shall be taxed at the time of production (incl. extraction) or import.

Major exception: Tax suspension regime



= 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)

	Page 1: Quantities, liters	Page 2: Tax calculations, SEK		
		Energy tax	**Carbon tax**	**Total tax**
	A	B=A*3.72	C=A*2.59	D=B+C
Deliveries to non tax payers	500 000	1 860 000	1 295 000	3 155 000
Own consumption	10 000	37 200	25 900	63 100
Deductions (tax exempted areas)				
- export	-5 000	-18 600	-12 950	-31 550
- non-fuel use	-15 000	-55 800	-38 850	-94 650
Tax to pay		**1 822 800**	**1 269 100**	**3 091 900**

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*)