The Economic Impacts of a Carbon Tax

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ABSTRACT

Background: The local impact of a regional or national policy change in regards to carbon emissions is a problem which needs to be addressed. It is likely that new greenhouse gas decline legislation will be more ubiquitous and stringent than predecessors and one such mechanism may be a carbon tax. The primary objective of countries' carbon tax shift is to endorse reductions in greenhouse gas (GHG) emissions and fuel use, through a price on carbon. The accompanying tax cuts are meant to avoid an overall tax increase and to provide economic stimulus. The equity (distributional) impacts of the carbon tax shift, chiefly on vulnerable communities and households, are also an important consideration.

INTRODUCTION

In December 1997, representatives of 150 countries of the world met under the auspices of the United Nations in Kyoto, Japan, to discuss the very real threat of global warming and to come to an agreement on binding reductions of greenhouse gas (GHG) emissions that cause it. It was agreed that, while developing countries for the present would adopt only voluntary reduction targets, most industrialized countries would aim, by the years 2008 to 2012, to significantly reduce their GHG emissions (including the emissions of carbon dioxide (CO2)) below the levels prevailing in 1990.

Under the agreement (called the Kyoto Protocol), specific targets have been agreed to for each of the 38 industrial countries, and all signatory countries have been called upon to quickly ratify the agreement.

Carbon emissions caused by the widespread and rapidly expanding use of coal, oil and fossil fuel burning for increasing production and consumption have been shown to have undesirable concerns. They contribute to severe air pollution domestically, and the accumulation of carbon dioxide in the atmosphere, a primary source of global warming.

A carbon tax is a tax levied on the carbon content of fuels. It is a form of carbon pricing. Carbon is present in every hydrocarbon fuel (coal, petroleum, and natural gas) and is released as carbon dioxide (CO2) when they are burnt. In contrast, non-combustion energy sources wind, sunlight, hydropower, and nuclear do not convert hydrocarbons to CO2. CO2 is a heat-trapping "greenhouse" gas [1]. Scientists have pointed to the effects on the climate system of releasing greenhouse gases (GHGs) into the atmosphere. Since GHG emissions caused by the combustion of fossil fuels are closely related to the carbon content of the respective fuels, a tax on these emissions can be levied by taxing the carbon content of fossil fuels at any point in the product cycle of the fuel [2].

Taxes on fossil fuels are common in most countries, but these are often presented on fiscal grounds rather than as instruments for reducing CO2 emissions. Some countries have, however, implemented Pigouvian tax regimes to curb the emissions of climate gases. Within a few years we expect that the use of price mechanisms to combat CO2 emissions will be extended.

Many industrial countries have agreed to required reductions of greenhouse gases under the Kyoto Protocol. A carbon tax is one of the most efficient instruments available to achieve this objective. While such a tax could generate substantial revenue, it could also reduce the rate of economic growth, worsen the distribution of income, and erode the competitiveness of a country's exports.

The country confronts serious policy challenges from an unsustainable budget deficit, a tax and regulatory system that most experts agree is inefficient, and the long-term threat from climate disruption. A carbon tax...
offers a policy that can help address all three challenges by combating climate change, curbing the rising debt level, and facilitating efficient reforms to current policies.

2. International experience with carbon taxes:

The United States and the rest of the world make any significant use of taxes explicitly on carbon. As of 2011, only six countries explicitly taxed carbon, the five Scandinavian countries and the United Kingdom. There were also a number of subnational regimes (such as the carbon taxes in British Columbia and Quebec). There are, however, a wide range of taxes on, and subsidies for, energy (as well as a wide variety of regulatory regimes for GHGs).

At present, there are many countries have implemented carbon tax or energy tax policy such as Finland, Denmark, Netherlands, Norway, Sweden, Germany and Canada and other countries. In 1990, Finland took the lead in the establishment of a global carbon tax to substitute income tax and service tax. In 1991, Norway levied carbon tax for 65% of all carbon dioxide emissions. In 1991, Sweden began to levy carbon tax, during 1987 and 1994, the Swedish carbon dioxide emissions reduced 600-800 million tons, down 13% overall. In 1993, Denmark began to levy carbon tax for industries and families. In 1999, Germany began to levy carbon tax for vehicle fuel, natural gas and electricity, and taxes were used to replenish the employee pension. In 2001, the United Kingdom levied 15% additionally because of the Climate Change, which, for commercial and public sector standards of taxation subject on energy costs. 0.3% of income tax revenue pay back to the employer's national insurance accounts, part of which for the re-investment in energy efficiency and conservation technology. In 2008, the Canadian province of British Columbia (BC) became the first region to levy carbon tax from the final consumer in North American.

2.1 Scandinavia:

Carbon taxes have mostly been implemented in Scandinavian countries, and a few other European countries. Where they have been implemented, it has often been in concert with other policy instruments. Nonetheless, the argument continues to be made for a carbon tax as a ‘pure’ economic instrument. The Scandinavian countries adopted carbon taxes in the 1990s. These taxes have narrow bases and do not impose a uniform tax on emissions from the sources that they do cover.

Finland (1990), Sweden (1991), Netherlands (1990), Norway (1991) and Denmark (1992) led the way in applying a carbon tax. According to a review by Anderson, an important factor favoring this shift was that ‘Concerns regarding climate change coincided with priorities to reduce income taxation, and combined to a tax shifting exercise [3]. In terms of the basis for the tax, there were different and varying approaches.

Finland was the first country to impose a carbon tax in 1990 as surtax on the carbon content of fossil fuels. The rate in 2011 was €50 per ton CO2 for motor vehicle fuels and €30 per ton CO2 for heating fuels. The tax is pushed with an energy tax and a strategic stockpile fee. In the Finnish case, some transport fuels (marine navigation and commercial aviation emissions) were exempted.

Sweden set its tax according to the average carbon content of the fuel. Biofuels and peat were exempted, but also fuels for electricity generation. The Netherlands enacted a carbon tax in 1990. In 1992, this tax was replaced with a tax on energy. Currently, they do not have a carbon tax per se but have a tax on coal at the rate of €12.95 per metric ton of coal manufactured or imported into the country. They also have an energy tax that is designed to reduce energy consumption and CO2 emissions [4].

The Norwegian carbon tax, for example, covers about 64% of CO2 emissions and 49% of total GHG emissions. The impact of the tax is weakened by numerous exemptions related to competitiveness concerns. Moreover, the tax does not accurately reflect variations in emissions across fuels.

Finally, even though the Scandinavian countries are relatively similar and each adopted a carbon tax, they differed considerably in what they included in the tax base and what tax rate they applied to different sectors. This makes it difficult for these neighboring countries to harmonize their taxes.

Among the Scandinavian countries, Denmark’s approach of combining a carbon tax with subsidies for energy efficiency appears to have had the best effects, noting that its electricity sector is more carbon-intensive [5].

2.2 Other parts of Europe:

Energy-intensive industries in particular will argue the case of exemptions from a broad carbon tax. Anderson notes the complicated schemes have been planned to balance, cap, or reduce the tax. Member states apply to the European Commission for approval, essentially for lower tax rates. While the burden on energy-intensive industries ‘remains negative … due to many exemptions, the actual burden is rather modest [3].

Anderson examined six European countries that implemented Environmental Tax Reforms (ETR) and showed reductions in fuel demand and GHG emissions, on average by 3.1 percent in 2004 against the counterfactual baseline. The size of the reduction in fuel demand depended on the tax rate, its basis, and the
accessibility of substitute fuels. A notable exception was the German ETR, which was not efficient in reducing GHGs because it excluded coal. Another feature of the European experience relate to exemptions.

The United Kingdom instituted a climate tax (known as the climate change levy or 'CCL') in 2001. The CCL is imposed on industrial and commercial use of energy and excludes transportation and domestic (residential) use. The rate is currently modest. For example, electricity is charged at £4.85 per megawatt hour (‘MWh’). Natural gas is taxed at £1.69 per MWh. For electricity production in the United Kingdom, produced by bituminous coal, the tax rate on electricity relates to a carbon tax of £5.34 per ton of CO2, whereas the tax on natural gas corresponds to a carbon tax rate of £4.01. Moreover, tax payers can enter into agreements with the government to reduce emissions in exchange for a significantly reduced rate of tax, effectively converting the CCL into a command-and-control regulation [6].

2.3 South Africa:

In South Africa, tax relief has been given in years when it was possible, and while the South African Revenue Services (SARS) could still over-recover tax this may change with the global financial crisis [7]. A priority that is not likely to change any time soon is that given to poverty alleviation and job creation [8]. If revenues from a carbon tax can be combined with reduced taxes or incentives for the poor (e.g. subsides for food-stuffs consumed mostly by the poor or a basic income grant), the overall tax-incentive package would be better aligned with major development priorities.

Combining a tax with incentives and revenue-neutrality. This relates directly to another possible lesson for South Africa. Anderson’s review noted a broad consensus that taxation should be revenue-neutral. Such an approach would not raise concerns about new taxes, especially when the purpose of the tax is not to raise revenues.

2.3 British Columbia:

British Columbia passed a carbon tax in 2008 that applies to fossil fuels purchased or used in the Canadian province. It began at a level of C$10 per ton CO2 with annual increases of C$5 per ton per year planned until it reaches C$30 in 2012. The rate on July 1, 2010 was C$20 per ton CO2.

The tax collects roughly C$500 million annually with revenues earmarked for personal and business income tax reductions along with assorted other tax reductions. Quebec applied its carbon tax in October 2007 at an initial rate of C$3.50 per ton of CO2. The rate is adjusted annually to achieve a revenue target of C$200 million per year over 6 years to fund a $1.2 billion Green Fund. This fund supports initiatives that reduce GHG emissions and improves.

3. Setting an appropriate tax level:

A range of key policy issue and design questions will need to be addressed in considering the implementation of a carbon tax a country. These would include [9]:

- More detailed investigation in the effectiveness of a carbon tax in reducing GHG emissions;
- Detailed investigation of tax-setting and adjusting mechanisms;
- Equity, distributional impacts and addressing poverty and development;
- Combining a tax with incentives and recycling of revenues;
- Legislative compatibility;
- Technical and administrative viability, comprising the tax base and definitions of taxable events;
- Competitiveness effects and a structured approach to energy-intensive exporting sectors;
- Adjoining policy areas.

The location of this threshold is critically dependent on available alternative technologies and their cost. Thus, as new technology becomes available, and as costs of alternatives, the optimum tax level will change.

Three major design issues are highlighted here: setting the tax rate, identifying which gases and sectors are subject to the tax, and where the tax should be imposed. It is noted in passing that most, if not all, of these issues are relevant for other market-based instruments, including cap and trade systems.

3.1 Tax Rate:

At the most basic level, the principles for setting the correct tax rate were established long ago by Pigou: at any given level of emissions, the tax rate should equal the social marginal damages from producing an additional unit of emissions (otherwise known as the social cost of carbon). A caveat to this prescription is that the rate may need to differ from the social cost of carbon in the presence of market distortions. The extent to which, and even the direction of an adjustment to carbon taxes for market distortions, depends on subtle factors, such as whether there are preexisting regulatory regimes and the use of the revenues, rather than a priori economic reasoning [10].

Estimates of the social cost of carbon vary widely. The calculation is difficult because it involves combining uncertain science, including predictions of the local effects of climate change, with predictions about
economic and technological developments in the distant future. In addition, all these values must be discounted to the present.

The optimal tax rate will vary over time. In a welfare maximizing framework, where both the benefits and costs of carbon abatement are taken into account, the tax rate should match social marginal damages across time. Where the goal is to cap emissions at some fixed amount over a set time period, the tax rate should grow at the rate of return on capital. Taxes and permits, however, are merely substitute methods of imposing the Pigouvian price on emissions in the absence of uncertainty. Therefore, if permits optimally have this price form, taxes must as well.

Given the heroic assumptions needed to compute the optimal carbon tax rate, second-best optimal design considerations are to a large extent second order determining the carbon tax rate at this point involves guessing about orders of magnitude and not about potentially subtle adjustments.

When the carbon tax was introduced, one of the key principles was that the tax would be revenue neutral that all carbon tax revenue would be returned to individuals and businesses through reductions in other taxes and not used to fund government programs. Carbon tax revenues will continue to be recycled through tax reductions and not used to fund programs or other initiatives.

3.2 Tax Base:

In the absence of administrative, enforcement, and political costs, an ideal carbon tax would include all activities that produce climate externalities. This includes emissions of all GHGs from any activity, containing not only energy usage but also agriculture, forestry, and industrial emissions. Moreover, in the absence of administrative costs, the tax would include not only emissions of gases but also any climate forcing (i.e., any activity that causes a change in the climate), such as changes to albedo caused by forestry activities [10].

A final tax base issue is whether to tax GHGs on the basis of where the products giving rise to emissions are produced (an origin basis) or where the products are consumed (a destination basis). This distinction matters where trade is complicated.

3.3 Where the tax should be imposed:

The design of a carbon tax also cannot be isolated from considerations about how the revenues raised by the tax will be utilized in fact; this plays a crucial role in determining the ’net’ economic impact of the tax and its political acceptability. To be more precise, the potential use of the revenues is important for the following reasons:

• The size of the revenues will depend on a large number of factors (level of the tax, phase in, etc.), they are likely to be significant particularly in countries with a large energy sector that is dominated by carbon-high fuels.

• How the revenues are used may help allay some of the concerns caused by the burden of the tax, for example, its impact on economic growth, or its distributional effects, or its effect on a country’s international competitiveness.

• Revenues may be allocated to public activities that can help mobilize public opinion in favor of the adoption of the tax.

In general, the cost to the economy of achieving any given reduction in emissions could be minimized by limiting the number of entities that were exempt from paying the tax and by allowing tax credits for activities that capture and permanently store emissions before they are released.

4. Effects of a Carbon Tax on the Economy:

The ultimate economic effects of a carbon tax, however, would depend on how the revenues from the tax were used. Some uses, such as reducing federal budget deficits or lowering existing marginal tax rates, would reduce the total costs to the economy from a carbon tax. Other uses would be unlikely to lower those total costs, but they could target relief to groups that would bear a disproportionate share of the burden from a carbon tax.

The literature offers a range of ex ante studies of how taxes can reduce emissions and the involved cost. Most such studies are based on simulations on computable general equilibrium models [11, 12].

Some studies discuss a “climate cost function”, i.e. a path showing the model correlation between different emission goals and GDP reductions [13]. In these analyses, calculations of energy use are made both with and without taxes. Other studies apply a counterfactual (ex post) method, in which the level of estimated energy consumption is adjusted (calibrated) to the level actually observed. Larsen and Nesbakken [14] perform a partial counterfactual study of the Norwegian CO2 taxes applying sectoral models of the Norwegian economy. Another method used to study changes in emissions is a divisia index decomposition analysis (Schipper et al. [15] and Bruvoll and Medin [16]).

By raising the cost of using fossil fuels, a carbon tax would tend to increase the cost of producing goods and services—especially things, such as electricity or transportation, that include relatively large amounts of CO2 emissions.
4.1 Carbon Tax Revenues:
A carbon tax that covered the bulk of CO2 emissions or the carbon content of most fossil fuel consumed in the country could generate a substantial amount of revenue.

- Increase expenditures on environmental and other public programs;
- Reduce budget deficits and lower inflation;
- Reduce existing distortionary taxes (revenue switching).

Existing taxes on individual and corporate income decrease people’s incentives to work and invest by lowering the after-tax returns they receive from those activities. Consequently, reducing those marginal tax rates would have positive effects on the economy.

4.2 Revenues to Reduce Deficits:
At least part of the negative economic effect of a carbon tax would be offset if the tax revenues were used for deficit reduction. The budget deficits tend to result in lower economic output over the long run than would otherwise be the case, by crowding out private-sector investment. Thus, policies that reduce deficits normally have a positive effect on the economy in the long run.

Policies that trimmed deficits would mitigate such adverse economic consequences by increasing national saving and investment, thus most important to an increase in output in the long run. If a carbon tax was used to reduce future budget deficits, the long-term effect on total output would depend on the relative sizes of two offsetting factors: the negative effects of the tax itself (which would reduce real wages, investment, and output) and the positive effects of accumulating less debt than would otherwise be the case (which would increase real wages, investment, and output).

4.3 Energy-intensive industries:
Energy price fluctuations have a much greater impact on the profitability of these industries, particularly if commodities are being produced for export and thus compete on the international market.

In developing a carbon tax, the aim is to incentivize both producers and consumers to reduce carbon intensity. Moreover, many of these industries would not pass on cost increases due to the tax to consumers because of the regulatory environment in which they operate (for instance, Sasol would not be able to pass on the cost of a carbon tax to consumers without a change in the liquid fuels regulatory system); this would decline the impact of the tax, but in some cases still provide a strong incentive to producers. Thus, any special dispensation regarding energy-intensive users should involve the following elements:
- If there is a special allowance for energy-intensive users, it should exclude new investment or expansion of existing plants, as part of the aim of a carbon tax would be to incentivize a low carbon development path.
- Competitiveness of existing industries operating in the international market would need to be protected, but a process of discovery would be necessary to demonstrate that this is a real problem.

The cost increases would provide an incentive for companies to manufacture their products in ways that resulted in fewer CO2 emissions. Higher production costs would also lead to higher prices for emission-intensive goods and services, which would encourage households to use less of them and more of other goods and services.

4.4 Labor, Investment, and Output:
The tax would cause manufacturers to produce goods in ways that resulted in fewer emissions, primarily by cutting back on the use of fossil fuels in the production process. Those changes in the mix of products that people buy and in the way those products are made would cause labor and capital to shift throughout the economy and could alter the net flow of capital into or out of the United States [18].

In theory, for a single factor of production, such as capital, substitution effects could more than fully offset the decline in returns caused by output effects. Thus, a carbon tax (excluding any use of its revenues) would be likely to reduce both real wages and profits on investment to some extent, but the relative changes in wages and profits would be inexact.

A carbon tax would cause a smaller reduction in output if the cost of the tax fell on types of labor or capital that respond relatively little to changes in their prices. Those owners would obtain lower profits as a result of the tax, but because such resources were already in place, the supply of them would not change significantly in response to the carbon tax. Consequently, the effect on output would be diminished.

The impact of lower real wages on the supply of labor is the net result of two countervailing forces: On the one hand, lower wages provide an incentive for people to work less and spend more time on activities that do not generate earnings. On the other hand, because lower wages reduce people’s after-tax income they create an incentive for people to work more to maintain the same standard of living. Research studies indicate that the first effect generally outweighs the second effect and that, overall, taxes that reduce real wages also decrease the labor supply.
4.5 Economic Growth:

There are three dimensions to calculating the costs and benefits to the economy of mitigating carbon emissions-direct welfare costs, macroeconomic costs, and revenue benefits. The literature has, however, focused primarily on the macroeconomic cost in terms of its effects on the reduction in GDP growth.

A carbon tax curtails the use of fossil fuels as a source of energy for production purposes and, with a decline in the use of one of the factors of production, there is a reduction in national output compared to the case where there are no restrictions. Economic costs of a carbon tax are, therefore, usually measured as the percentage change of future GDP with respect to a "base scenario" where no carbon tax existed (the latter is called the business-as-usual scenario).

The adoption of a carbon tax does not necessarily have to result in a loss of GDP growth rate-it depends on the validity of assumptions made and the conditions prevailing in an economy. There seems to be a general agreement that the manner in which carbon tax revenues are used and the efficiency with which economic agents respond play an important role in the final outcome. If carbon tax revenues are recycled appropriately, one can expect the effect of a carbon tax on economic growth not to be that negative.

4.6 Marginal Tax Rates:

Current taxes on individual and corporate income generally decrease households’ after-tax returns from working, saving, and investing. Those lower returns reduce the overall supply of labor and capital, leading to less economic output than would otherwise be the case.

A carbon tax would compound the effects of those existing taxes, potentially creating significant tax-interaction costs. Using the revenues from a carbon tax to reduce existing marginal tax rates, an approach called a tax swap would reduce the economic costs of the tax. The net effect of a tax swap on output would depend on the relative sizes of the loss in output caused by the carbon tax itself and the gain in output caused by the reduction in existing marginal tax rates.

4.7 Equity and Income Distribution:

As with any policy action, the imposition of a carbon tax is likely to result in gains for some sections of the population (the winners) and losses for other sections of the population (the losers). A carbon tax will, thus, entail different burdens for different groups of population and, unless these distributional aspects are adequately dealt with, potential losers would most likely block the implementation of the tax.

4.8 International Competitiveness:

The adoption of a carbon tax is likely to affect firms producing energy-intensive outputs extremely. First, it would increase their production costs which would lead to a loss of competitiveness, especially for those firms which compete in an international market, and which cannot promptly adopt technological changes. Second, because of the loss of competitiveness, many firms would most likely relocate in countries that face less limiting environmental regulations and/or weaker monitoring of such regulations. This is the so-called "pollution haven" hypothesis.

Competitiveness has different meanings for different levels of economy-it is different for a firm or an industry than for the country as a whole [13].

Competitiveness at the Firm Level:

At the firm or the industry level, a carbon tax would hit the energy intensive firms and industries particularly hard and is likely to lead to loss of sales, loss of market share and ultimately plant closures, but such a result might not come about if all firms face similar cost increases. Besides, firms or industries do not operate in a static environment and generally adapt their operations to new regulations.

Competitiveness at the Country Level:

At the country level, the result of a carbon tax may be different since countries do not "compete" in the same way as firms do. Some economists have argued that the best measure of a country's international competitiveness in the long run is its productivity growth and, as Repetto et al [19] have shown, it is not clear if the U.S. environmental regulations have reduced her productivity growth or have discouraged new investments, including those from abroad.

The effect of a carbon tax on the international competitiveness of a country would also depend on how the revenues raised from the carbon tax are utilized. If distortionary taxes, such as payroll taxes, social security taxes or corporate income taxes, are lowered, the "loss" of international competitiveness, if any, might be significantly offset.
4.9 Burdens on Certain Groups:

The burden of a carbon tax that is, the hardship caused by price increases for fossil fuels and emission-intensive goods and services and by the reduction in wages and returns on investment would fall extremely on several groups [17]:

- Low-income households,
- Workers and investors in emission-intensive industries, and
- People in regions of the country that rely on emission intensive industries for their livelihood or that use the most emission-intensive fuels to produce power.

The higher prices resulting from a carbon tax would tend to be regressive that is, they would impose a larger burden (relative to income) on low-income households than on high-income households. The reason is that low income households spend a larger share of their income on goods and services whose prices would increase the most, such as electricity and transportation.

Employment would also increase in industries that manufacture equipment to produce energy from low-emission sources, such as nuclear, solar, and wind power. However, unlike using carbon tax revenues to reduce deficits or marginal tax rates, using them to provide relief from the tax’s effects on certain groups would generally not lower the total economic costs of a carbon tax, including the reduction in total output.

A carbon tax would be likely to have two impacts on the poor. The first would be a direct impact on the cost of energy carriers used by poor households, directly on electricity, paraffin, LPG and coal, and indirectly through higher fuel prices in transporting bulk solid fuels such as coal and fuel wood, where applicable. The second would be indirect economic effects, either via higher input costs for services used by the poor, or via economy-wide effects. Thus, the most sensible approach to this problem would be to address it in the context of household energy policy as a whole, and use pricing mechanisms to further encourage a shift from paraffin and coal to electricity and LPG in poor households.

Indirect impacts, either through increased cost of services such as transport or other economy-wide effects are more difficult to assess. In the case of poor households, transport has a similar property to energy provision in that it is underprovided, unaffordable and also unsafe. Economy-wide modelling of the impact of a carbon tax has been attempted by van Heerden on revenue recycling and ‘triple dividends’ and the impact on poor households [20].

Conclusion:

In practice, however, the carbon tax rate that is economically efficient depends on the way in which lawmakers use the revenues from the tax, the amount of leakage that arises, and the amount of additional benefits and costs that result from the tax. In addition, economic efficiency is only one of the measures that politicians might use in setting that rate.

Careful design of a carbon tax will be important to ensure that is effective in meeting its objective reducing GHG emissions. With appropriate design, a carbon tax can be a powerful instrument of mitigation, and at the same time contribute to socio-economic objectives.

An escalating CO2 would switch from coal to renewables and nuclear for electricity supply, and favor crude oil refineries over coal-to-liquids. Economic and industrial policy that redefines countries’ competitive advantage around climate friendly technology and investments would be stronger to a low-carbon future world. The efficiency with which a carbon tax achieves the goal of reducing GHG emissions depends on responsiveness and substitutability. Substitutability is key – the degree to which consumers can change to alternatives.

Equity demands that poor households, in particular, be protected from any burden, e.g. higher energy prices. Off-setting incentives, such as food subsidies or reduced VAT on basic goods, could be financed to achieve such a goal. Another option would be to finance energy efficiency and renewable energy in social housing. The principle would be to make the package a net benefit to the poor and not to treat the tax as a revenue-raising instrument.

At a time when the country is facing serious long-term budget difficulties, Revenue from the carbon tax funds a permanent reduction in the countries’ statutory corporate income tax rate, currently the highest in the developed world, to a more internationally competitive level.

As an overall strategy for a low carbon economy, it has been suggested that energy intensive sectors be required to reduce their energy intensity, while protecting employment. This strategy would need a combination of reviewing existing policy associate beneficiation, specific energy intensity targets, international debates on best location for such industries, and diversification within these sectors.

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