Path to Green Growth:

Green Tax and Budget Reform

Green Tax and Budget Reform (GTBR) is a fundamental fiscal policy instrument for: reducing poverty; raising fiscal revenues; and improving eco-efficiency, public health, and environmental quality. It is a key driver for sustainable infrastructure, greening business, and sustainable consumption and production. GTBR entails two major complementary policy initiatives that should be implemented in coordination to maximize effectiveness. The first, green taxation, involves levying taxes on environmentally relevant activities and products, such as the extraction of natural resources or pollution. Green subsidy reform, the second component, consists of gradually eliminating counterproductive subsidies that favor unsustainable development and redirecting fiscal funds towards areas that support Green Growth and poverty reduction. The combination of such actions sends a price signal to consumers that more correctly reflects the *real* cost of production, or in economic terminology, *internalizes negative externalities*. In efforts to reduce the tax burden and correct the distortionary effect of traditional tax structures, GTBR aims to be revenue neutral, whereby income taxes, pension payments, and/or the VAT are reduced to compensate for increased green taxation.

Subtotal $ _____

Green Tax $ _____

Total Due $ _____

Less Deposit $ _____

Balance Due $ _____

GTBR

Green Taxes can be effectively imposed in many areas, for example, transport, energy, products, waste, raw materials, and natural resources. Evidence shows that they are an effective tool of environmental policy and are more cost-efficient to implement and maintain than traditional "command and control" approaches. Revenue from Green Taxes can be used for financing sustainable infrastructure projects that can increase green jobs, monitoring and adjusting the reformed tax system itself, or for other poverty reduction programmes. Considering that Green Taxes have the potential to be regressive, steps such as setting *thresholds* for taxes to ensure that the poor are not disproportionately adversely affected should be undertaken from the initial design phase. Educating both citizens and public officials alike on the benefits of GTBR is crucial for garnering political support. Border tax adjustments and short-term tax exemptions are measures that can be taken to reduce the impact on international and sectoral competitiveness.

Sequencing of not only various green taxes, but also other complementary policies, such as transportation infrastructure projects or eco-labeling, for instance, must be closely coordinated to ensure policy effectiveness.

Each country will require a unique blend of GTBR instruments. For developing countries in particular, GTBR may be most applicable to the transport sector, commercial scale forestry sector, commercial fisheries sector, energy sector, drinking water, and for industrial pollution control. Applying GTBR to these sectors is an effective means for improving environmental quality, reducing poverty, and fostering Green Growth.

Green Tax and Budget Reform in Context

Objectives of the Module:

To provide a brief thematic overview of the fundamental tenets of Green Tax and Budget Reform, various methods for overcoming obstacles to implementation, as well as its applicability to the Asia and Pacific region, particularly within the context of developing countries.

Green Tax and Budget Reform refers to a wide spectrum of fiscal pricing measures that have the potential to simultaneously increase revenue and foster *Green Growth*. More specifically, it entails 1) a shifting of the tax burden from traditional areas of taxation, such as income, savings, and capital gains, to environmentally relevant products and activities like fossil fuels and waste; and 2) the redirecting of subsidies from environmentally perverse activities towards activities that promote Green Growth and poverty reduction. The entire reform of the fiscal system is done with the aim of maintaining *revenue neutrality*: a net-zero increase in the level of taxation on the economy.

GTBR encompasses a broad array of fiscal instruments in areas such as transportation, raw materials, natural resources, waste, and energy. Applying GTBR policies within these areas can create jobs; reduce poverty; and improve resource productivity, international competiveness, and environmental quality. Effectively educating the public and private sectors, as well as a country's citizenry on the benefits of GTBR, has been deemed as crucial for ensuring effective implementation and long-term adoption. In addition to recycling revenue from *subsidy reform* and *green taxation* into pro-poor development programmes, the setting of *thresholds* for taxation is another means for reducing any negative distributive impact on lower income groups.

This Module is arranged into Eleven Subsections:

- Why do we need Green Tax and Budget Reform?
- Background and Thematic Overview
- Major Components of GTBR
- GTBR in Comparison
- Benefits of GTBR
- GTBR in an Asia-Pacific Country Context
- Competitiveness
- Addressing Social and Distributive Concerns
- Administrative Costs
- Garnering Public Acceptance
- Coordinating the GTBR Process

Key Concepts:

- Environmental Tax Reform
- Environmental Fiscal Reform
- Revenue Neutrality
- Revenue Recycling
- Subsidy Reform
- Border Tax Adjustments
- Cap-and-Trade Permit Systems
- Integrated Sustainability Assessment
- Market Failure
- Government Failure
- Regressivity
- Threshold
- Green Tax
- Double Dividend Hypothesis
- Earmarking
- Sequencing
- Command and Control
- Market-based Instruments

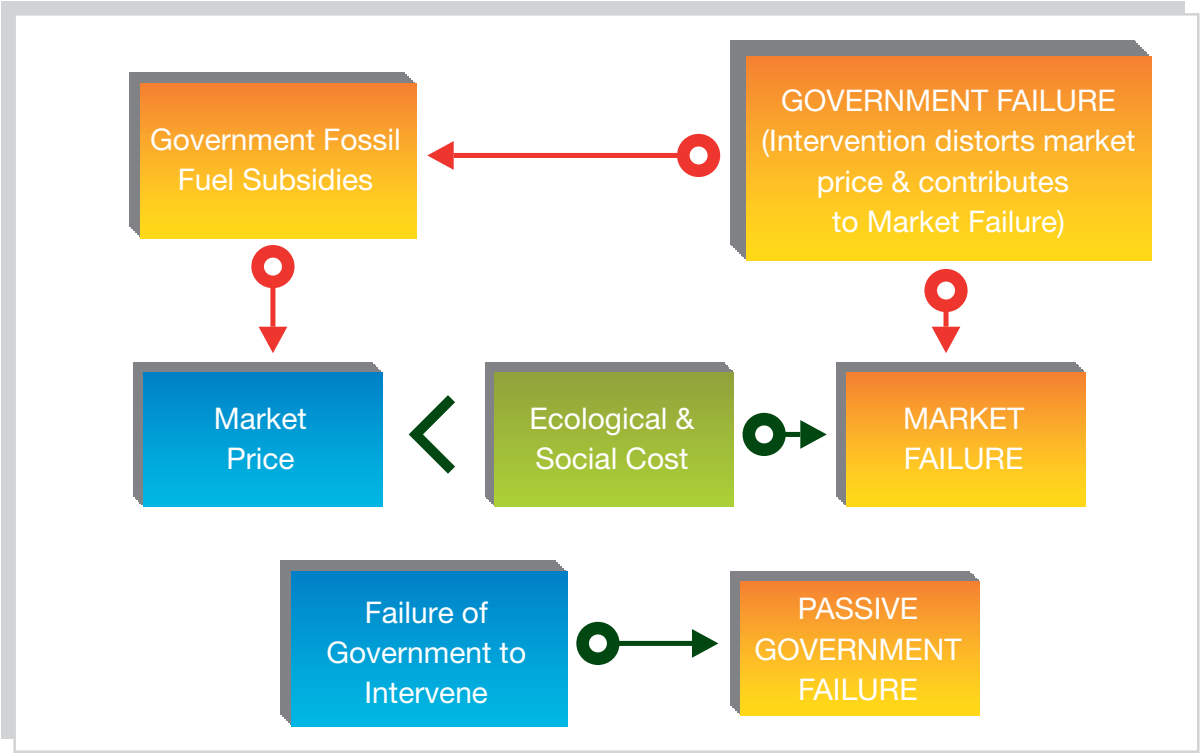
Why do we need Green Tax and Budget Reform?

We currently stand at a critical juncture. Markets are faltering, the environment is facing crises on numerous fronts, and governments are struggling to effectively deal with these challenges.

How did we get here?

The failure of fossil fuel prices to reflect the costs of climate change is "a market failure on the greatest scale the world has ever seen." Nicholas Stern

Market Failure



In large measure these problems can be attributed to *market failure*. Under the current system, markets are failing to reflect the real (ecological and social) cost of production into the final price of goods and services. Moreover, governments' fiscal policies have at times aggravated the price discrepancy (between the market prices and the true costs to society) by subsidizing environmentally harmful products and processes. This action fosters an incentive structure that discriminately favors the consumption of harmful products such as fossil fuel-based energy over that of renewables.

Market Failure is when a market left to its own devices doesn't efficiently allocate resources. Asymmetric information, the exploitation of market power, existence of externalities, and provision of public goods are considered by many economists to be the root causes of market failure.

Government Failure is a situation that arises when either 1) the government fails to intervene to correct for market failure (this is passive government failure), or 2) the government's intervention distorts the market and causes goods and services to be allocated inefficiently.

Green Tax and Budget Reform refers to a wide spectrum of fiscal pricing measures that have the potential to simultaneously increase revenue and foster Green Growth.

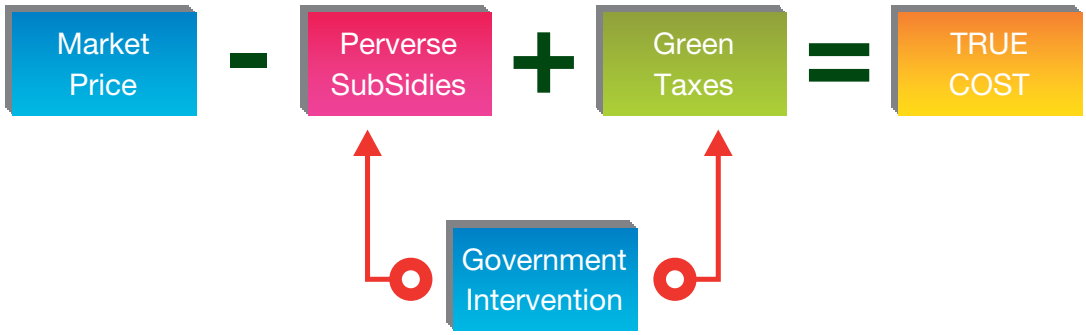
Fiscal Policy Tools are policies that involve government spending (i.e. public procurement and green subsidies) and/or taxation.

While noteworthy progress has been made in some areas to correct for market and government failures, we are still approaching, if not already arrived at, an environmental tipping point from which we cannot return. The conflict in Darfur has already demonstrated the dire consequences that can arise from the combination of population growth, overconsumption of natural resources, and climate change; all of which are occurring in varying degrees throughout the world.

John F. Kennedy once noted *"the Chinese use two brush strokes to write the word 'crisis.' One brush stroke stands for danger; the other for opportunity. In a crisis, be aware of the danger - but recognize the opportunity."* Major revisions to any economic system in the absence of a crisis, are, to say the least, politically challenging and adverse. The current crises offer a political opportunity to make drastic corrections to the manner by which we conduct economic activity.

The world's consumption and production patterns are largely dictated by market price signals. *Fiscal policy tools* such as taxes and subsidies heavily impact these signals. *Green Tax and Budget Reform* offers governments the instruments for correcting these price signals and redirecting their economies to more sustainable paths that will induce economic growth, reduce poverty, and improve environmental quality.

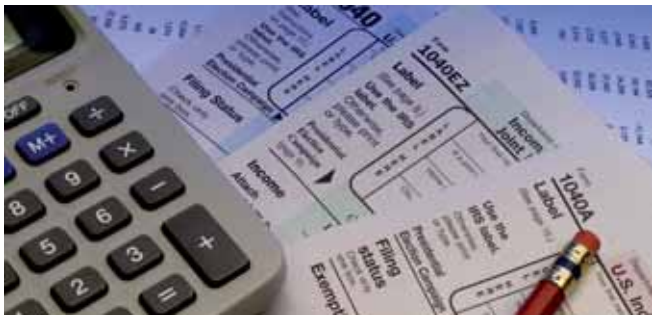
"Environmental tax reform can help deal with the mean streets and withered lives of economic recession"
Pigou (father of Welfare Economics)



Background & Thematic Overview

Green Tax and Budget Reform (GTBR) refers to a wide spectrum of fiscal pricing measures that have the potential to simultaneously increase revenue and foster Green Growth.

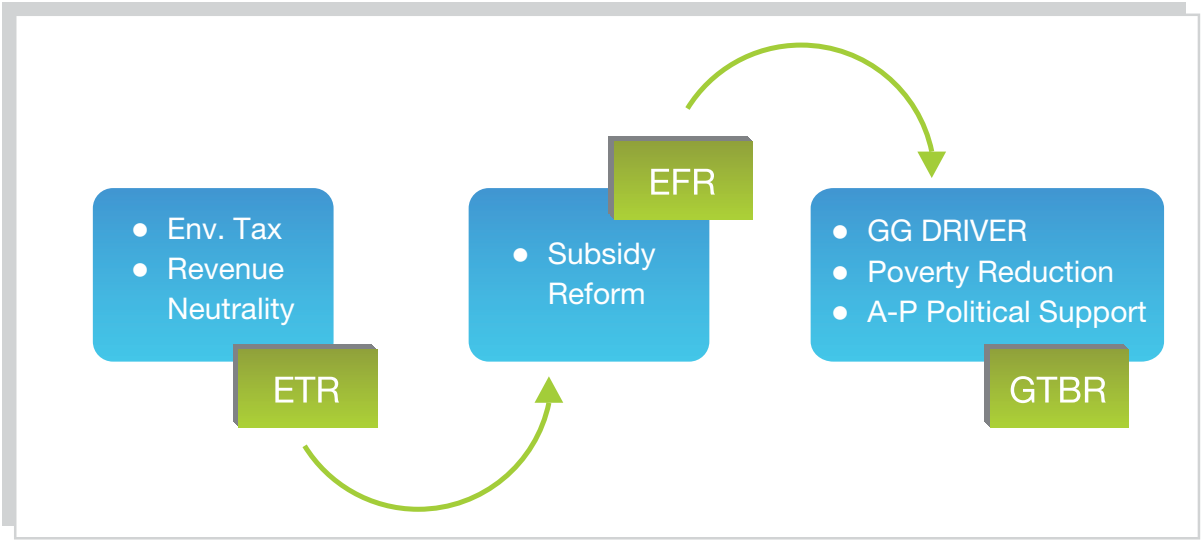
The thematic basis for GTBR is by no means novel. Its origins lie with the concept of *environmental tax reform (ETR)*, which has been adopted by numersous countries since the late 1980s to address issues related to the environment, resource productivity, and economic progress. ETR is essentially a restructuring of the tax system whereby the tax base is shifted from traditional taxes, such as those based around labour, to taxes that have environmental relevance, for example pollution or natural resource extraction. While ETR can greatly assist in the effort to internalize the negative external social and environmental costs not usually reflected in the market price, it doesn't address the problem of *perverse subsidies*, which can also distort prices. Recognizing this shortfall, *environmental fiscal reform (EFR)* has entered the foreground of sustainable development policy dialogues. EFR extends beyond environmental tax reform by also including subsidy reform, which entails redirecting subsidies from environmentally perverse activities and products, such as petroleum, to more environmentally friendly ones, such as renewables.



Green Tax and Budget Reform (GTBR) refers to a wide spectrum of fiscal pricing measures that have the potential to simultaneously increase revenue and foster Green Growth.
Environmental Tax Reform (ETR) is a restructuring of the tax system whereby the tax base is shifted from traditional taxes, such as those based around labour, to taxes that have environmental relevance, for example pollution or natural resource extraction.
Environmental Fiscal Reform (EFR) extends beyond environmental tax reform by also including subsidy reform, which entails redirecting subsidies from environmentally perverse activities and products, such as petroleum, to more environmentally friendly ones, such as renewables.
Perverse Subsidies are subsidies that are environmentally harmful and work to promote unsustainable development.

Green Tax and Budget Reform provides a third stage to the evolution of environmental tax reform. GTBR encompasses all the major principles of EFR, but is unique in that it also:

- Is a direct driver for *Green Growth*
- Emphasizes poverty reduction as a key objective
- Already garners political acceptance within Asia-Pacific (UNESCAP member countries accepted GTBR as a means for achieving Green Growth in 2005 at the 5th Ministerial Conference on Environment and Development in Republic of Korea)



Major Components of GTBR

Green Taxation

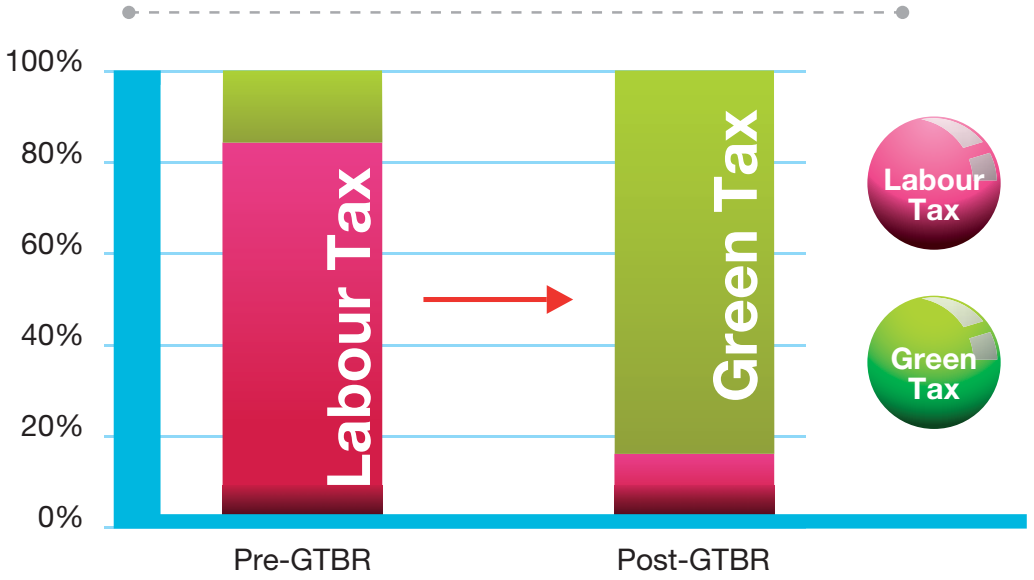
Green Taxation is the process of imposing levies on activities and products that are of environmental relevance in an effort to assist markets in reflecting the real costs (i.e. production as well as social and ecological costs) of production and consumption.

Green Growth is ecologically sustainable economic progress that fosters low-carbon, socially inclusive development.
Green Taxation is the process of imposing levies on activities and products that are of environmental relevance in an effort to assist markets in reflecting the real costs (i.e. production as well as social and ecological costs) of production and consumption.
Green Tax is categorized as any tax, fee, levy, or charge that is environmentally relevant, irrespective of its designated purpose.

The OECD, IEA and European Commission have grouped environmental charges, fees, and taxes under the category of levies. They have agreed upon the definition of environmental taxes to be *"any compulsory, unrequited payment to general government levied on tax-bases deemed to be of particular environmental relevance."* Contrary to taxes, charges and fees are usually imposed in proportion to the service obtained—for instance, electricity, water, or waste services—and as such, are considered to be requited payments. For simplification, the Green Growth Capacity Development Programme refers to a *green tax* in general terms as any levy (which includes taxes, charges, and fees) that is environmentally relevant, irrespective of its designated purpose.

Green taxes have been widely used as instruments for improving environmental quality and raising revenue. Imposing a tax on a product or activity increases the cost and can alter the behavior of both consumers and producers. The degree to which the tax will affect their behavior depends heavily on demand *elasticity*, or the responsiveness of the amount demanded in relation to any change in price, and the availability of *substitute goods*.

Unlike environmental regulations, i.e. *Command and Control*, green taxes allow producers to adjust at "least cost." They may choose to either adopt cleaner production processes and/or environmentally sound technologies (EST), or simply not produce. Green taxes also don't have the burdensome costs of pollution monitoring, which is often outside the administrative capacity of many developing countries. The taxing of pollution and other environmentally relevant activities helps to internalize the *negative externalities* and correct for market failure. In so doing it also facilitates a market shift towards greater social and environmental stewardship.



Revenue Neutrality

It is important to emphasize that GTBR does not just involve the levying of new environmentally relevant taxes. An integral part of GTBR is *revenue neutrality*: transferring the burden of taxes away from "goods" (labour and savings) and more towards the "bads" (waste and pollution) while having a net-zero increase in the level of taxation on the economy.

Often, revenue neutrality is essential for securing public support for new green tax initiatives. It also has the potential to improve competitiveness by reducing the overall tax burden of firms, freeing-up capital for investments, especially for those that have high levels of eco-efficiency or a low level of resource input intensity. Policy makers have a wide range of options for accomplishing revenue neutrality including, for example, reducing social security or health care contributions (SSC and HCC), personal income tax (PIT), corporate income tax (CIT), corporate profits tax (CPT), business income tax (BIT), and capital gains tax (CGT). The graph below illustrates some of the instruments adopted for accomplishing revenue neutrality, as well as the magnitude of the shift in various countries.

Elasticity is the responsiveness of the amount demanded in relation to any change in price

Substitute Good is a good or service that can be used in place of another for the same purpose; or more specifically in economic terms, a good that's increase (decrease) in demand results in a decrease (increase) in demand for another good.

Command and Control more commonly referred to as standards or regulations, Command and Control encompasses two components: 1) command, involves the setting of standards, such as the maximum level of pollution allowed; and 2) control, consists of the monitoring and enforcement of that standard.

Negative Externalities are the costs not incorporated into the market price of a good or service that result from economic activity which affects individuals, firms or communities uninvolved in that activity. Pollution and congestion are common examples of negative externalities.

Revenue Neutrality a fiscal policy tool that can be utilized to overcome political resistance to an increase in environmental taxes by seeking to have the same proportional reduction in income tax, pension contributions, or possibly even value-added taxes (VAT).

	Start Year	Taxes raised on	Tax cut	Magnitude
Sweden	1990	CO_2 SO_2 Various	PIT, Energy taxes on agriculture, Continuous education	2.4% of total tax revenue
Denmark	1994	CO_2 SO_2 Various	PIT, SSC capital income	Around 3% of GDP by 2002, or over 6% of total tax revenue
Netherlands	1996	CO_2	CPT, PIT, SSC	0.3% of GDP by 2002, or over 6% of total tax rev.
United Kingdom	1996	Landfill	SSC	Around 0.1% of total tax revenue in 1999
Norway	1999	CO_2 SO_2 Diesel	PIT	0.2% of total tax revenue
Germany	1999	Petroleum products	SSC	Around 1% of total tax revenue in 1999
Italy	1999	Petroleum products	SSC	Less than 0.1% of total tax revenue in 1999

Source: Benoit Bosquet "Environment tax reform: does it work? A survey of the empirical evidence". Ecological Economics, vol.34. No. 1 July 2000, pp. 19-30.

Most direct forms of taxation on labour including PIC and CIT distort inter-temporal economic choices. Transferring a government's tax base from direct (i.e. PIT and CIT) to indirect (i.e. sales tax and VAT) taxation can reduce the level of distortion and better incentivize foreign direct investment (FDI), innovation, capital formation, labour supply, and entrepreneurship.

Revenue Recycling

Double Dividend Hypothesis states that a revenue neutral restructuring of the tax system, whereby green taxes are increased in proportion to a decrease in traditional taxes (e.g. income tax), could not only improve environmental quality (the first dividend), but also reduce the distortion of the tax system and the cost of labour, subsequently generating higher levels of employment (second dividend).

Earmarking refers to assigning revenue from a specific tax, or group of taxes, to a particular expenditure or governement ministry/department.

Newly generated revenue from reductions in perverse subsidies and increases from *green taxes* can be recycled in a number of ways. One option, as the previous table explained, is to use it to offset traditional taxes that distort economic efficiency, such as PIT, CIT, and SSC. Such action could further the political acceptance of green taxes, improve the competitiveness of firms by reducing their tax burden, and as the *double dividend hypothesis* proposes, i) reduce the level of distortion in the economy that is created by the existence of conventional taxes on labour, and ii) increase employment.

The elimination of perverse subsidies can have a major positive influence on revenue accumulation, resulting in a net increase in unallocated budget. Another option for revenue recycling is to prioritize or *earmark* these funds towards pro-poor sustainable development programmmes and investments, for example, sustainable infrastructure or education. Policy makers, however, should be careful before earmarking revenue indefinitely.

Fully earmarking green tax revenue has been deemed among many within the economic community as being inefficient in the long-term because of its inflexibility to be redirected to newer, more relevant green growth objectives that may arise in the future. Accordingly, GTBR promotes the partial- or non-earmarking of green tax revenue. Partial earmarking may be necessary in order to effectively garner sufficient public and political support for new green tax initiatives. It may also be used to ensure that there is enough future revenue to fund the monitoring, adjusting, and collecting of green taxes.

Green Subsidy Reform

Green taxation's effectiveness can be compromised if perverse subsidies undercut attempts to alter market price signals. Green subsidy reform involves the redirecting of fiscal funds from perverse subsidies to activities, services and products that will foster Green Growth. This type of fiscal reform reinforces the price signal aims of green taxes instead of counteracting them.

A subsidy may constitute direct/indirect grants or payments, as well as pricing, tax or regulatory policies that are preferential to particular economic activities. According to the OECD, a subsidy "is a measure that keeps prices for consumers below market levels, or keeps prices for producers above market levels or that reduces costs for both producers and consumers by giving direct or indirect support." Subsidies can be damaging towards the environment when they cause higher degrees of consumption or production of environmentally harmful products and services than would occur in their absence. Specifically, they can result in the use of fossil fuels and extraction of natural resources at levels that are not sustainable; consequently increasing pollution, harmful emissions and waste. Examples include the subsidization of electricity, fossil fuels, water, waste collection, pesticides, and fertilizers.

> *"There is something unbelievable about the world spending hundreds of billions of dollars to subsidize its own destruction."* (Earth Council)

While the conventional theory behind and rational for perverse subsidies, for example subsidies to gasoline, are usually intended to be pro-poor, in most cases they tend to be benefit the middle and upper income groups in greater proportion. The resulting extent to which public funds are used inefficiently throughout the world is immense and shocking. It is estimated that US$300 billion, slightly less than 1% of global GDP, in subsidies goes to artificially reduce the financial cost of consuming and producing fossil fuels. Scaling back these perverse subsidies can free up enormous amounts of revenue, a commodity hard to come by, especially in times of economic and liquidity crises. Indonesia, a case in point, removed its pesticide subsidies in 1986 and ended up saving approximately USD100 million a year.

GTBR in Comparison

Implementing GTBR in concert with other complimentary policy instruments such as Command and Control (CAC) and Cap-and-Trade Permit Systems (CATPS) can strengthen the push towards realizing green growth and mitigating climate change. In comparison, however, the benefits of GTBR tend to outweigh those of CAC and CATPS, particularly in Asia-Pacific developing countries. The following sections present evidence for the case of adopting GTBR instead of simply relying on CAD and/or CATPS.

GTBR vs. Command and Control

Command and control, more commonly referred to as standards or regulations, encompasses two components: 1) command, involves the setting of standards, such as the maximum level of pollution allowed; and 2) control, consists of the monitoring and enforcement of that standard. CAC measures have been the most widely employed instruments for protecting the environment in both the developing and developed worlds. In already possessing much familiarity among policy makers, firms, and voters, CAC policies have tended to be more politically acceptable than green taxes. Moreover, when there is great ambiguity about the exact effects of pollution, CAC instruments have sometimes been touted as more pragmatic. However, as highlighted in the table below, the disadvantages of CAC when compared to *market-based instruments (MBI)*, such as green taxes and subsidies, far outweigh the advantages.

Disadvantages of Command and Control

- An 'optimum' standard is difficult to determine, especially with non-marketable goods, such as water and air.
- Under a CAC approach, firms have no incentives to reduce pollution beyond the standard.
- Penalties for violating standards tend to be too low and enforcement tends to be weak.
- To be effective, standards need to be revised frequently but in practice legislation tends not to keep up with the change.
- Standards tend to be less cost-effective than MBIs.
- The financial costs of standards may be high.
- There could also be political costs if the standards are stringent and businesses are adversely affected.

Source: UNESCAP, Role of various environment-related measures, http://www.unescap.org/drpad/vc/orientation/M5_2.htm

Command and Control (CAC) more commonly referred to as standards or regulations, encompasses two components: 1) command, involves the setting of standards, such as the maximum level of pollution allowed; and 2) control, consists of the monitoring and enforcement of that standard.
Market-based Instruments (MBI) are policy tools that utilize market price signals to incentivize environmentally-friendly behavior on the part of consumers and producers. Market-based instruments include, for example, green taxes, subsidies, full-cost resource pricing, and marketable/tradable permits.

In developing countries in particular, a lack of resources to support the monitoring and enforcement elements of CAC, as well as high levels of corruption, especially in the areas of natural resource extraction, have often rendered CAC measures very ineffective in terms of environmental protection.

In light of its greater overall advantage, green taxation has recently risen to the vanguard of sustainable development policy circles and is now being afforded much more political and public acceptance as a powerful policy tool for not only environmental protection, but also economic growth.

GTBR vs. Cap and Trade Permit Systems

Cap and trade refers to a policy, or group of policies, that creates a system and market for the buying, selling, and trading of emission permits with the intended aim of reducing overall pollution and/or emissions. An aggregate emission cap is agreed upon and the total is divided into individual permits, which can then be auctioned or freely distributed to participants in the scheme (e.g. individual firms, countries, or regions). Examples of such schemes include the United States SO_2 Trading Scheme and the European Emissions Trading System for CO_2 emissions.

When the abatement costs of polluters is certain, and there exists both a competitive and efficient permit trading market, then the efficiency gains realized from the application of both green taxes and CATPS under a "first-best" model would be same. However, in comparing CATPS to green taxes in "real-world" applications, particularly in developing countries, most policy circles agree that taxes are a more effective instrument for curbing carbon emissions and fostering green growth. This is particularly true when comparing CATPS that include a large percentage of *grandfathered permits*, or freely distributed permits to emit pollution (e.g. CO_2 and SO_2). Green taxes are easier to design and enforce, and garner more familiarity with the public, businesses, and policy makers.

If baselines for permits under CATPS are set during times of economic prosperity, and then suddenly the economy hits a slowdown, the price of carbon permits will fall in correlation with the slump in demand or increase in energy supply, and consequently, the potential effectiveness of carbon trading to induce emission reductions will have been marginalized. The price of sulfur emission permits in the CATPS administered by the EPA, for example, have been extremely volatile, varying by sometimes 50 percent in a single month. Gradually increasing taxes on the other hand will, even in times of economic slowdown, provide a consistent, predictable price signal to firms; one that states that if you want to pollute, you will have to pay for it.

In addition to problems of price volatility, CATPS have often not raised much revenue and actually can be quite expensive and require high levels of administrative capacity to implement and maintain. Green taxes on the other hand have traditionally been very successful at mobilizing revenue, which can be recycled into assisting the "losers" of green taxes adjust or financing poverty reduction programmes.

It is generally accepted that CATPS with one hundred percent auctionable permits are more effective than full or partial grandfathering CATPS. However, to gain sufficient political acceptance, initial proposals for the introduction of one hundred percent auctionable CATPS have often fallen prey to political concessions and had to be redesigned whereby a large portion of the permits are allocated free of charge to certain industries. This has been the case with the EU and the new bill for a CATPS, at the time of writing, under consideration in the US Congress. Unlike fully auctionable permit schemes, grandfathered systems to do not require firms to bid for permits, and hence, do not raise revenue. Under a scheme with grandfathered permits, it is not the firms that value the permits the most and would use them in the most *efficient* manner that receive them— which would occur under a fully auctionable system due to the firms' willingness to pay for them— but rather, the ones that the government favors. This reduces the possible efficiency gains that could have been made by a fully auctionable scheme or green tax.

When permits were allocated freely in the EU, firms simply pocketed the value of the permits and passed prices on to consumers, resulting in minimal emission reductions. If the firms that receive free permits are strictly monitored and regulated so that they keep energy prices cheap, then consumers will have no incentive to curb their wasteful energy consumption patterns. Since there is a cap on the aggregate emissions levels, as demand for goods and services rises, firms will have to then make even deeper cuts at higher costs, and prices will eventually be passed on to consumers in one way or another. If the purpose is to efficiently reduce emissions by increasing the price to pollute, then a green tax would be better.

In sum, CATPS tend to be complex, obscure, administratively cumbersome, lack transparency, are prone to horse-trading, and traditionally have offered little in terms of revenue mobilization (especially grandfathered CATPS). GTBR, on the other hand, is often fairer, simpler to design and understand, and is less prone to horse-trading. It offers more certainty to firms and consumers, transparency to voters, and more revenue for governments.

Cap and Trade refers to a policy, or group of policies, that creates a system and market for the buying, selling, and trading of emission permits with the intended aim of reducing overall pollution and/or emissions.

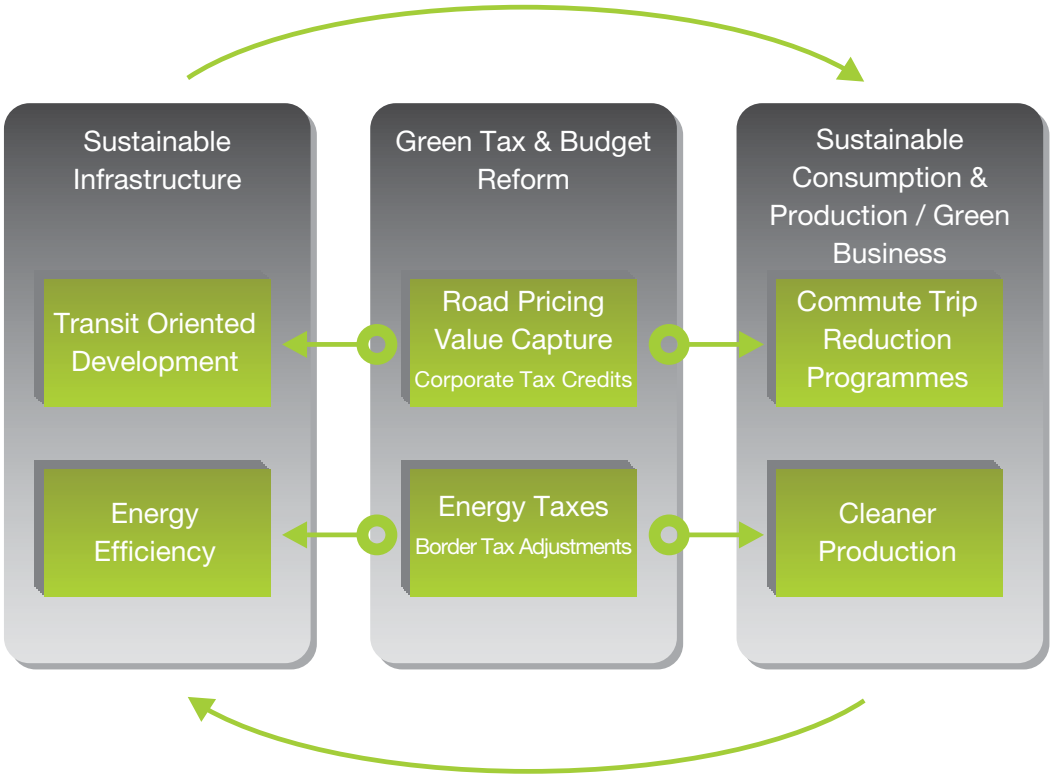
Grandfathered Permits are freely distributed permits to emit pollution (e.g. CO2 and SO2).

Efficient means achieving the maximum output from the minimum amount of resources used.

Benefits of GTBR

Driver for Green Growth

Through adopting GTBR, policy makers can be the enablers to drive the advancement of Sustainable Infrastructure, Greening Business, and Sustainable Consumption and Production. The chart below provides a few examples of not only how GTBR can be the main driver for the other tracks of Green Growth, but also the dynamic relationship that exists between each track.



Because of the high population density of Asian cities, many Asian countries face rapidly increasing congestion problems as incomes rise and the demand for private vehicles grows. Urban sprawl and inefficient energy usage are contributing to problems of energy security. Road pricing, such as vehicle and parking taxes, is an effective transportation demand management instrument\. *Value capture* can be used to promote public transit while encouraging compact development. Corporate Tax Credits can be offered to companies that adopt Green Business practices, such as Commute Trip Reduction Programmes.

Value capture entails decreasing or eliminating building assessment taxes and increasing land value assessment taxes in order to "capture," or recoup, the increased value of land around new public transport facilities.

Commute Trip Reduction Programmes offer incentives for employs to walk, cycle, carpool, or take public transit, reducing the number of trips from home to work by private motor vehicle.

Transit oriented development emphasizes compact, more-livable communities, with high jobs-to-housing ratios, that provide optimal access for pedestrians and cyclists by designing residential and commercial centers around inter-modal public transit systems. Transit oriented development strategies provide support to companies attempting to implement *Commute Trip Reduction Programmes*, which offer incentives for employs to walk, cycle, carpool, or take public transit, reducing the number of trips from home to work by private motor vehicle.

Imposing energy taxes and adopting *border tax adjustments* increases the price of energy and can work to curb energy demand, thereby incentivizing companies to improve energy efficiency and reduce their carbon footprint. Cleaner production is the process by which enterprises systematically identify

steps to reduce their environmental impact across the production cycle. This supports energy efficiency in industrial areas and promotes the use of energy recycling practices such as co-generation that maximize resource efficiency. Taken a step further, GTBR can be a driver for the creation of *eco-industrial parks*, which can be an effective strategy for encouraging public private partnerships and fund raising.

A Solution to the Crises

Economists and top UN leaders from around the world are strongly supporting environmental fiscal reform as a cornerstone of the *New Green Deal*, a plan to revitalize the world economy, which at the time of writing, was plagued with retarded growth rates. The report states that "*governments should implement environmental fiscal reform (EFR) in order to re-focus; reshape and catalyze markets and venture capital investments into job creation, encouraging environmental innovations, and discouraging inefficient and wasteful use of scarce natural resources such as energy*." Beyond this, GTBR can be used to strengthen or restore fiscal solvency by freeing-up revenue previously allocated for perverse subsidies and generating new revenue from green taxes. This revenue can be recycled into various development projects to reduce the negative impacts that the economic crisis may have on the poor and women. Recognizing the important role that GTBR can play in mitigating the economic crisis, according to a report from HSBC the Republic of Korea and China are leading the G20 pack by dedicating 81% and 34%, respectively, of their fiscal stimulus packages towards greening the economy.

Fiscal

Embarking upon GTBR can yield profound fiscal benefits. The mobilization of revenue from new green taxation and the scaling back of perverse subsidies can greatly strengthen fiscal solvency. This is particularly important for developing countries whose budgets may already be overstrained and are struggling to meet the needs of their citizenry. The redirection of the tax base from direct to indirect taxes not only reduces the overall distortion within the economy, but also improves the efficiency of the fiscal system.

Environment

GTBR is a key policy tool for re-investing in the regeneration of natural capital, improving environmental management, reducing the overuse and over-extraction of natural resources, as well as mitigating and adapting to the negative impacts of climate change.

In most countries routine patterns of consumption do not reflect the greater environmental cost to society, consequently resulting in excess levels of pollution and the over extraction of natural resources. GTBR sends a price signal that is more reflective of these environmental impacts. This can in turn create incentives for minimizing the impact on a country's natural resources and reducing pollution and waste. The new revenue that is generated from new green taxes or the scaling back of perverse subsidies can be reallocated towards funding the monitoring and enforcement of environmental protection efforts or partially earmarked for ecological restoration initiatives, which can be an effective strategy for rehabilitating depleted or damaged environments such as reforestation or afforestation efforts. Funneling the new green tax revenue through the Ministry of Environment increases the ministry's political strength and voice within the government and improves its ability to effectively manage the environment. In functioning as a disincentive for the use of fossil fuels and natural resource extraction, thereby effectively limiting green house gas emissions, GTBR directly mitigates the negative impacts of climate change.

Border Tax Adjustments also referred to as border assessments or climate change-related border tax adjustments, are levies imposed on imported goods that were produced in countries that don't tax carbon or broad-based energy and rebated on domestically produced goods for export.

Eco-industrial Parks a network of firms and organizations, working together to improve their environmental, economic and social performance through mutual collaboration in the management of environmental and resource issues, with the greater objective of increasing economic gains while improving environmental quality.

Poverty Reduction

GTBR can work towards reducing poverty by improving environmental quality, incentivizing more sustainable use of natural resources, mitigating climate change, and mobilizing revenue that can be recycled into pro-poor development programmes. The connection between the environment and poverty is complex and dynamic. The poor rely more heavily on the environment for their livelihoods and are more exposed to environmental hazards and pollution than upper and middle-income groups. Consequently, they suffer the most from environmental degradation, pollution, and the overexploitation of natural resources.

Utilizing GTBR instruments such as stumpage taxes to reduce deforestation and levies on the volume of fishing takes to mitigate the overexploitation of fish stocks, for example, helps to ensure that these resources will be accessible to the poor in the future. Other GTBR instruments that aim to decrease pollution, for instance— landfill-taxes, water effluent charges and carbon taxes— can drastically improve health conditions of the poor (especially women and children), who tend to be the most exposed to pollution. Improved health conditions enhances poor peoples' ability to work and attend school, as well as reduces the financial burden of medical costs.

According to the United Nations Intergovernmental Panel on Climate Change, the poor stand to suffer the most from the negative effects of climate change. They are more vulnerable to changes in climatic conditions— including increases in the frequency and intensity of natural disasters, as well as rises in temperature and sea level— and often lack the necessary capacity to adapt or relocate. Through applying tools such as green house gas (GHG), carbon and broad-based energy taxes, GTBR can reduce GHG emissions, mitigating climate change and its negative impacts on the poor. Furthermore, revenue mobilized from the scaling-back of perverse subsidies and levying of green taxes can be recycled into efforts to assist the poor in adapting to the negative effects of climate change. This capital can also be directed towards improving and extending the poor's access to food, clean water and sanitation services, energy, sustainable transportation, education and employment opportunities, health care, and housing.

Green Jobs are defined by the International Labour Organization *"as positions in agriculture, manufacturing, construction, installation, and maintenance, as well as scientific and technical, administrative, and service-related activities, that contribute substantially to preserving or restoring environmental quality. Specifically, but not exclusively, this includes jobs that help to protect and restore ecosystems and biodiversity; reduce energy, materials, and water consumption through high-efficiency and avoidance strategies; de-carbonize the economy; and minimize or altogether avoid generation of all forms of waste and pollution. But green jobs, as we argue below, also need to be good jobs that meet longstanding demands and goals of the labor movement, i.e., adequate wages, safe working conditions, and worker rights, including the right to organize labor unions."*

Private Sector

The private sector reacts directly to signals from the government. A tax on one input such as fuel, for example, can create a greater incentive for businesses to shift capital towards investments in fuel-efficient technological research. Innovations spawning from such research can result in the demand for and creation of new products, services and markets. Furthermore, reductions in corporate income tax, capital gains tax, and social security contributions of firms can reduce costs and improve competitiveness in global markets.

Political Acceptance

Garnering political support for any fiscal reform at both the national and regional level can be very difficult and require a great deal of consensus building, stakeholder involvement, and effective dissemination of relevant information. Green Tax and Budget Reform, however, has already surmounted this first political obstacle when it received wide acceptance from 52 UNESCAP member governments as a component of Green Growth in March of 2005 at the Fifth Ministerial Conference on Environment and Development (MECD). Furthermore, many member governments including the Kingdom of Bhutan, Cambodia, Kazakhstan, the Philippines, and Thailand have already expressed interest in receiving assistance in the implementation of GTBR within their own countries.

Green Job and Skill Creation

Putting GTBR into effect has enormous potential for spurring job creation and new skill development, especially *green jobs* and green skills. According to the double dividend hypothesis, a revenue neutral restructuring of the tax system whereby green taxes are increased in proportion to a decrease in traditional taxes (e.g. income tax) could not only improve environmental quality (the first dividend), but also reduce the distortion of the tax system and the cost of labour, subsequently

generating higher levels of employment (second dividend). To clarify the issue of a distorted tax system, it should be noted that according to the *Pearce Hypothesis*, imposing green taxes works to correct for market failure and thus doesn't cause any distorting properties like traditional taxes. Furthermore, recycling revenue from green taxation or abolished perverse subsidies, such as fossil fuel subsidies, into renewable forms of energy production can also have a serious impact on reducing unemployment and creating new green jobs. Conventional forms of energy production based around fossil fuels are inherently very capital intensive. Renewable forms of energy production that can be installed, for instance, in individual houses or villages and require regular servicing, on the other hand, are far more labour-intensive. Thus, choosing to redirect incentives from fossil fuel-based energy production to renewables poses a much greater potential for job creation.

GTBR in an Asia-Pacific Country Context

Many developing Asia-Pacific countries with an abundance of valuable natural resources face under-funded budgets for regulation, monitoring and enforcement, as well as poor governance performance (e.g. high levels of corruption), demonstrating the ineffectiveness of CAC as a policy instrument for environmental protection. In this regard— with its ability to alter consumer and producers' behavior through price signals, raise revenue, and protect the environment— GTBR presents itself to developing Asia-Pacific countries as an excellent complimentary policy tool to conventional CAC approaches. Nevertheless, approaches to GTBR will differ from country to country.

Carbon taxes may be more appropriate for middle and developed/industrialized economies with high levels of pollution, but not necessarily a key priority for least developed economies. Most developing countries are often rich in natural resources, and the livelihoods of many of its citizenry, especially the poor, depend heavily on their availability. Consequently, GTBR as applied to the fishery sector, forestry sector, water use, and pollution may be most appropriate. Landlocked countries with little or no fishing industry will, needless to say, have little use for fiscal policies directed at this sector.

Environmental tax reform in European developed countries has usually relied on reductions in direct forms of taxation such as PIT, SSC, and CIT to offset increases in green taxes. However, as tax structures vary widely throughout the Asian and Pacific region, different approaches to achieve revenue neutrality under GTBR may be necessary. The graph below illustrates the amount of tax revenue collected as a percentage of GDP in selected Asia-Pacific countries. Some countries such as Japan and Malaysia derive most of their revenue from direct forms of taxation (e.g. PIC and CIT), while others including China and the Republic of Korea rely more heavily on indirect forms (e.g. VAT and sales and excise tax). The countries that rely more heavily on direct forms of taxation for their revenue may wish to follow the EFR experience of some EU member countries by reducing CIT, PIT, or SSC as a means to achieve revenue neutrality. However, in some countries, particularly developing ones, where these specific tax bases are low, this may not be very feasible. This problem underscores the importance of allowing for flexibility and adaptability in the design of reforms. One of the advantages of GTBR is its versatility, which is optimal for emerging economies where tax collection systems aren't very well developed. Because the VAT is a well-established tax base in some developing countries, GTBR proposes the option of using the VAT as an alternative to labour taxes to achieve revenue neutrality.

	China	India	Japan	Malaysia	Republic of Korea	Thailand
Direct Tax Total	**4.2**	**3.2**	**9.0**	**11.8**	**7.3**	**5.5**
Personal Income Tax	1.0	1.4	5.5	2.9	3.7	1.9
Corporate Income Tax	2.9	1.8	3.5	7.3	3.6	2.9
Indirect Tax Total	**11.3**	**10.7**	**5.2**	**5.0**	**10.9**	**10.5**
VAT	5.9	-	2.4	2.7	4.9	3.0
Sales & Excise Tax	0.9	8.8	2.1	1.2	5.2	4.4
Custom Duties	2.3	1.8	-	1.0	-	1.8

(Numbers represent 2002 national tax revenue as a percentage of GDP. Source: OECD, IMF, World Bank, and National Account Statistics)

Competitiveness

Critics of GTBR have made claims that environmental taxes adversely impact the competitiveness of the levying countries and cause resource-intensive industries or firms to flee to other countries with less strict environmental protection policies. Within the literature this is often referred to as the *Pollution Haven Hypothesis* (PHP). Although a pattern of industries relocating from developed to developing countries does in fact exist, it nevertheless appears that the prevailing opinion within the PHP literature is that environmental regulation is a small, almost inconsequential variable. More significant factors as to the reason for relocation might be the emergence of new or faster growing markets, lower corporate income taxes, or cheaper labour.

Indeed, alterations in policy that place some firms in a better competitive position will undoubtedly put others in a worse position. It is thus beyond question that, under the application of GTBR, both "losers" and "winners" will arise. The winners, however, will be the firms that can adapt by improving their eco-efficiency through new innovative solutions and ideas, which can improve their future competiveness within both domestic and international markets. In this regard, GTBR can be a driver for long-term innovation and resource productivity improvements, which will help firms hedge their risks in an extremely volatile commodities market, and countries reduce their dependence of foreign resources such as fossil fuels.

Pollution Haven Hypothesis argues that environmental taxes adversely impact the competitiveness of the levying countries and cause resource-intensive industries or firms to flee to other countries with less strict environmental protection policies.

Ex-post Evidence on the Impact of Environmental Tax Reform on Competitiveness in Europe

The purpose of imposing carbon and energy taxes has generally been to reduce carbon emissions and energy consumption while not compromising economic growth. This concept of detaching economic growth from energy consumption and carbon emission growth is often referred to in the literature as *"decoupling"*. Studies indicate that EU member countries that have utilized market-based instruments such as carbon and energy taxes are more energy efficient and competitive than the EU as a whole.

According to the Competitiveness Effects of Environmental Tax Reforms (COMETR) project, six European countries (Germany, U.K., Finland, Denmark, Netherlands, and Sweden) that adopted Environmental Tax Reform experienced reductions in demand for fuel (an average of 2.6% in 2004) with no negative impact on economic growth with regard to GDP. Largely as a result of ETR, by 2004 emissions in the six countries had decreased by an average of 3.1%, and a remarkable 5.9% in Finland. Carbon and energy taxes did cause an increase in the consumer price index— which was expected— and certain energy-intensive industries were slightly affected. However, due to revenue recycling and exemptions, these negative impacts were minimal.

While theoretically, policy makers should be more concerned with long-term national competitiveness, more often in reality greater attention has been afforded to the short-term consequences affecting certain losing sectors, and sometimes, even specific firms. This has probably been due to the political ramifications that may arise from the expressed discontent of "losers", which tend to exercise their "voice" option in public arenas more actively than winners. Accordingly, to not only appease losing firms and sectors, but also to ensure their ability to adequately adapt to new policy measures and maintain international competitiveness, various measures can be adopted. These may include:

- Providing credible information on the application of future market-based instruments
- Gradually phasing-in taxes and phasing out subsidies
- Granting certain concessions such as short-term sectoral exemptions
- Adopting *border tax adjustments (BTA)*

Border tax adjustments, also referred to as border assessments or climate change-related border tax adjustments, are levies imposed on imported goods that were produced in countries that don't tax carbon or energy and rebated on domestically produced goods for export. Recently, motions for adopting BTAs within countries using market-based instruments as a means to mitigate climate change have been gaining momentum. They have been proposed before the US Senate twice, in European Commission reports, and by a French Prime Minister and President. Proponents, including the OECD, argue that BTAs would 1) create a level playing field for competition between domestic and foreign producers, 2) prevent *"carbon leakage"*, and 3) act as a threat to developing countries to adopt serious commitments to mitigate the effects of climate change.

While the perceived benefits of adopting BTAs seem quite remarkable, there are some significant challenges facing implementation. First of all, BTAs are inherently complex and require a high level of administrative capacity. Secondly, governments must ensure that the application of BTAs is in compliance with international trade law. Specifically, this will entail treating foreign and domestic firms that produce "like products" equally (National Treatment Principle) and that there is no discrimination between products in regards to country of origin (Most Favored Nation). GATT article XX provides grounds for the justification of BTAs as it states that countries may breach GATT rules if:

- (b) (it is) *necessary to protect human, animal or plant life or health;*
- (g) (it) *relat*(es) *to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption*

Regardless of whether or not countries within Asia and the Pacific choose to adopt BTAs, it will be in their best interest to at least understand their implications in regards to international trade. This will be of particular importance for many Asia-Pacific countries that's GDP is largely dependent on exports.

"Decoupling" is a concept that refers to detaching economic growth from energy consumption and carbon emission growth.
Border Tax Adjustments (BTA) also referred to as border assessments or climate change-related border tax adjustments, are levies imposed on imported goods that were produced in countries that don't tax carbon or broad-based energy and rebated on domestically produced goods for export.
Carbon Leakage refers to a situation in which carbon reduction efforts in one country or region lead to an increase in carbon emissions in another.

Addressing Social and Distributive Concerns

As stated by the UN and the World Bank, financing adaptation and mitigation measures to climate change will cost middle and lower middle countries an estimated 2.1% of GDP: 0.5% for adaptation and 1.6% for mitigation efforts to keep CO2 emissions below the target of 450ppm. GTBR can be an effective vehicle for mobilizing these new funds, however, considerations of the impact that new taxes will have on the poor and women must be taken into account. The percentage varies depending on the level of economic and tax system development, but on average, countries indirect tax revenue is approximately 8-10% of GDP. This translates into a 20% increase in consumption costs for the poor if such fiscal financing initiatives are pursued.

Not fully addressing the distributional impact of green taxes on households during the design process can impose unnecessary financial burdens on the poor and also lead to waning support for future green tax initiatives. Indeed, many studies, mostly based on energy and/or carbon taxes, have shown that green taxes have the potential to be *regressive*. However, once taking into account the i) indirect price effects on inelastic goods, ii) behavioral changes of households to the tax in question, and iii) the environmental improvements realized from the tax, the regressive impact on households' income distribution is much smaller than many studies initially estimated. Important factors as to determining whether a tax is regressive are the manner in which the revenue is recycled, and within that, what compensationary measures, if any, are bundled within the tax policy. If steps are in fact taken during the initial design phase to adequately assist or compensate lower-income households, the net-effect of a green tax may even be *progressive*; such could be the case with lump-sum payments.

Lessening green taxes' disproportional impact on the income of poorer households can be accomplished in various ways. Setting *thresholds* for the use of basic services such as water and electricity, whereby any amount under the set level is not taxed, is one way of assisting the poor meet their basic needs affordably. The revenue from new taxes may also be recycled to into lump-sum payments, used to reduce other more distortionary taxes such as income tax, reinvested into sustainable infrastructure projects mainly aimed at improving the access of the poor, or directed towards other pro-poor development programmes (e.g. education or health care). Sustainable infrastructure projects, as well as the maintenance of renewable forms of energy production, are by nature more labour intensive than traditional forms of infrastructure. Reducing distortionary labour-based taxes and investing in sustainable infrastructure, therefore, both foster new job creation, essential for reducing poverty. Many of the previously mentioned interventions to reduce the regressivity of green taxes fall under the umbrella term of green subsidy reform, which is considered an essential complementary policy tool to green taxation. It should be remembered that to be effective and fair, though, subsidies must be carefully designed and accurately targeted if they are to improve the livelihoods of the poor, women and children.

Regressive: a tax is considered regressive if it levies a proportionately larger amount from lower income individuals or households.
Progressive refers to a tax that increases as a larger proportion of the total amount taxed as that sum increases
Thresholds are a levels or amounts that must be exceeded in order for a tax to be applied.

GTBR

Administrative Costs

The administrative costs associated with any new policy initiative can be a significant determining factor of that policy's overall effectiveness. As discussed earlier, market-based instruments, which include green taxation, are supported as being more cost-effective than command and control approaches. This is largely due to the high administrative costs that arise from the setting of standards, their monitoring and enforcement, as well as the fact that CAC is a non-revenue raising policy tool.

In the case of Germany, highlighted in the graph below, the administrative costs associated with their environmental tax reform were only 0.13% of the entire revenue generated. Moreover, they were much lower than other traditional forms of taxation such as personal income tax and corporate income tax. This demonstrates that it is very feasible to design Green Tax and Budget Reform in a manner that will generate large amounts of revenue with little administrative costs.

It is important to note that the level of administrative costs will increase, however, as other issues not necessarily related to the environment like competiveness and distributional impacts are addressed. Consequently, when introducing new green taxes a balance must be struck between the cost-effectiveness of the tax and the issue of its impact on *equity* and competitiveness, among others.

(Source: Organisation for the Economic Co-operation and Development. The Political Economy of Environmentally Related Taxes. Paris: OECD Publishing, 2006.)

Equity simply refers to fairness

Garnering Public Acceptance

Successful adoption of any policy will require a clear understanding of the local socio-political institutional context. For example, where do the political powerhouses reside and what are the country-specific drivers and processes of policy reformation? Which stakeholders stand to lose and win the most from a new green tax initiative or subsidy reform? Building political coalitions and engaging relevant stakeholders in the policy design phase will be crucial for overcoming many political obstacles.

The timing of a reform is also a major factor in determining whether a policy will be adopted. Implementing GTBR after an environmental or economic crisis might prove to be more politically feasible due to the public's greater awareness of the further consequences that could arise if the problems are not addressed. It wasn't until Ghana, which relies heavily on hydropower generation, experienced a major power crisis after an extended drought, that policy makers were able to rationalize increased energy prices to fund investments in non-hydro forms of energy production. China, another case in point, capitalized on a period of low oil prices in 2008 to usher in fuel taxes.

Garnering broad public acceptance for a new environmentally related fiscal instrument has generally been correlated to the level of awareness of the severity of the environmental problem being addressed by the policy and the effectiveness of the instrument to improve the problem. Polls in Europe and the United states have shown that 70% of voters actually supported environmental tax reform after having it explained to them clearly. This evidence lends weight to the importance of properly educating the public on the issues related to the policy through awareness campaigns well in advance.

Another matter affecting the level of acceptance is the discerned *fairness* of the policy, usually in regards to the possible negative effects on international/sectoral competitiveness and the poor. Effectively articulating to the public who is responsible for the environmental problems (often the sectors affected by the new policy) and the specific measures (e.g. tax rebates, "green checks", etc.) taken to prevent any unfair impacts can bode well for garnering greater public acceptance.

Even though the earmarking of green tax revenue has usually been argued by many economists as being inefficient, politicians have sometimes had to rely on at least short-term partial *earmarking* as a means for amassing political support for new green tax initiatives. Voters are concerned about how this new tax revenue will be used and don't want to see it wasted or fall prey to corruption. Partial earmarking thus offers policy makers a tool for achieving a compromise between efficiency and public acceptance.

Earmarking: to assign revenue from a specific tax, or group of taxes, to a particular expenditure or government ministry/department.

Coordinating the GTBR Process

Identifying what "green growth" means for a unique set of stakeholders— and accordingly the continuously altering country-specific challenges and policy mixes needed to achieve it— requires a broader, longer-term, more explorative and strategic process that emphasizes conceptual learning and transformative outcomes. A patchwork of uncoordinated, ill-sequenced policies will not fulfill the promises that GTBR has to offer. Successfully seeing GTBR through will require strong political ownership of the reform process and continuous cross-ministerial collaboration throughout all stages of the reform cycle. This is by no means an easy task. To assist in the facilitation of such efforts, the option of creating a new institutional body or working group responsible for guiding the process should be explored.

There exist a wide variety of instruments available for evaluating the overall implications policies have for sustainable development. These include, for example, Environmental Impact Assessment, Regulatory Impact Assessment, Sustainability Impact Assessment, and the EU regime of Impact Assessment. While these tools have been very useful in assessing individual policies, they have yet to provide much assistance in mapping out a sustainable, holistic, development strategy. The *Integrated Sustainability Assessment (ISA)* works to this end.

According to the Methods and Tools for Integrated Sustainability Assessment (MATISSE) Project, *"ISA is a cyclical, participatory process of scoping, envisioning, experimenting, and learning through which a shared interpretation of sustainability for a specific context is developed and applied in an integrated manner in order to explore solutions to persistent problems of unsustainable development."*

ISA can serve as an indispensible instrument for governments and policy makers seeking to effectively undertake and coordinate GTBR and other complimentary policies in an effort to foster green growth.

ISA underscores four major stages that are often continuous and overlapping.

1. Scoping stage:

A key objective of this stage is to attempt to clearly identify, define, and understand any pressing problems that are contributing to unsustainability, for instance, natural resource depletion, issues of chronic unemployment, and poor economic performance. Recognizing the root causes of these problems, such as incorrect price signals from perverse subsidies or lax command and control, is also important. At the same time stakeholders must also be identified and engaged, and a consensus based on country-specific problems must be framed and agreed upon. Collecting sound data on the problems and their impact on relevant stakeholders will be an important asset for the future when attempting to garner public support for reform. After the ISA cycle has been completed once, the problems must be reformulated and stakeholders again identified to fit within the new context.

2. Envisioning stage:

Moving into this stage first involves envisioning among stakeholders what green growth and sustainability would resemble in their own country context. Indentifying the vision of and challenges to sustainability and green growth will require the use of various participatory assessments. In line with the *Sustainable Livelihoods Approach (SLA)*, the concerns of vulnerable (including the poor) men and women in particular, should be included. Based on this consensus, the envisioning stage entails designing a long-term, holistic strategy to achieve green growth and sustainability. GTBR and other non-MBI complimentary instruments (e.g. eco-labeling), as well as the proper *sequencing* of these policies, should be examined. This vision should contain multiple pathways including both a "business as usual" and green growth scenarios. Short-term policy proposals should strike a balance between cost-effectiveness, equity, and political feasibility. However, considerations of cost-effectiveness should only be focused on in the short-term, as it will not be relevant for long-term strategies ranging from 25-50 years. This strategy might be effectively articulated in a Map to Green Growth that could be referenced and

Integrated Sustainability Assessment "is a cyclical, participatory process of scoping, envisioning, experimenting, and learning through which a shared interpretation of sustainability for a specific context is developed and applied in an integrated manner in order to explore solutions to persistent problems of unsustainable development."

Sustainable Livelihoods Approach (SLA) is a pro-poor approach where livelihoods are conceptualized as increasing beneficiaries' access to assets (whether it be natural, human, physical, social or financial capital) with the aim of improving the resiliency of the very poor.

Incidence refers to how the burden or effect of a particular tax is distributed between producers and consumers, or among income groups.

Sequencing is the process of implementing policies in a specific order to have a combined complementary effect greater than that which could have been achieved were they to have been implemented in a different order.

disseminated during windows of political opportunity. Wide-reaching public education and awareness campaigns on the persistent problems facing the achievement of sustainability, and the subsequent reasons for and benefits of adopting GTBR, for example, can greatly enhance political support.

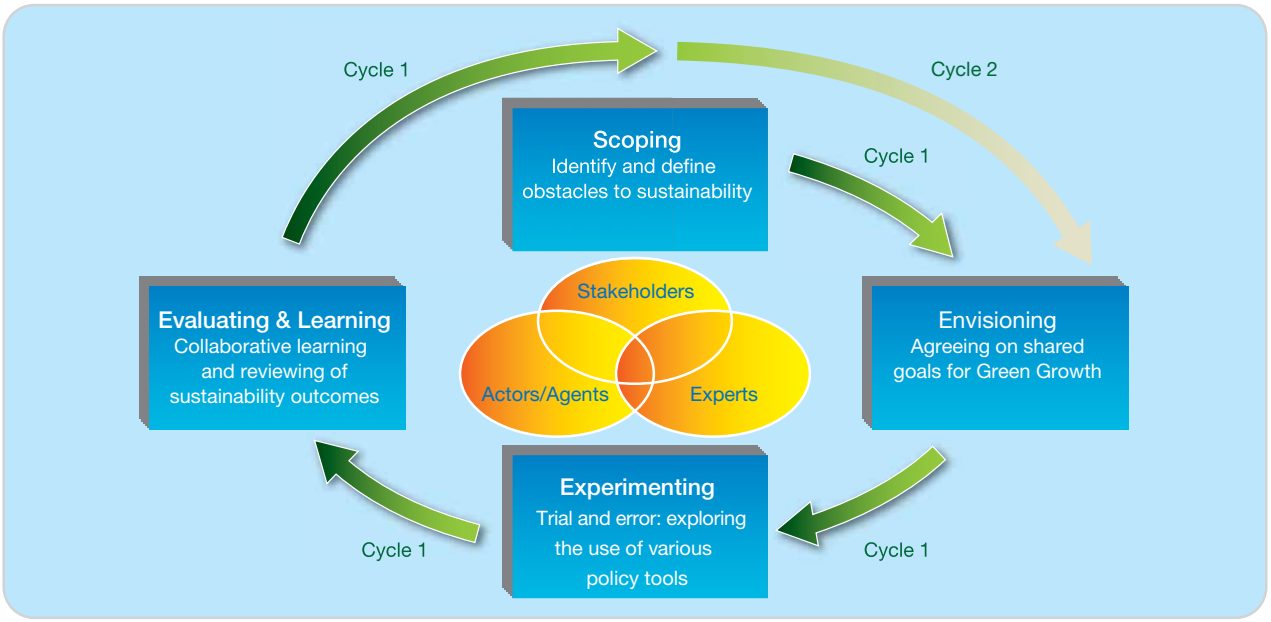
3. Experimental stage:

This stage focuses on utilizing ISA tools to analyze the feasibility, consistency, and adequacy of the vision of sustainability, in particular the drivers of various possible trajectories (pathways) of development. Stakeholder input should be a criterion for determining which tools would be the most appropriate. Nonetheless, a combination of both qualitative processes and quantitative tools (e.g. models of systems and subsystems) would be ideal. The quantitative component is especially important for assessing eco-systems, as well as tax and subsidy *incidence* on the poor.

4. Learning stage:

Formulating "lessons learned" from previous monitoring and evaluation activities is crucial for readjusting and fine-tuning visions for sustainability. These will feed into the first stage (scoping stage) of the next ISA cycle. It is also important to underline whether or not the policies achieved their intended goals and objectives in transitioning to a more sustainable pathway of development. They may have caused unintended consequences that must now also be addressed. Widely presenting information on the results of GTBR— such as the amount of revenue mobilized or improvements to environmental quality— is a method for maintaining long-term support for this process.

Applying ISA to Green Growth



Review Questions

1. What are the major differences between Environmental Tax Reform, Environmental Fiscal Reform, and Green Tax and Budget Reform? Why should governments undertake GTBR?
2. Describe various obstacles to implementing GTBR and list what measures can be taken to overcome them.
3. Does the adoption of GTBR negatively affect the poor and/or the international competitiveness of domestic firms?
4. What are some of the key issues that should be addressed in designing and implementing GTBR?

Further Reading

Milne, Jane E. *The Reality of Carbon Taxes in the 21st Century.* Vermont Journal of Environmental Law, 2008.

Organisation for Economic Co-operation and Development. *DAC Guidelines and Reference Series: Environmental Fiscal Reform for Poverty Reduction.* Paris: OECD Publishing, 2005.

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GTBR in the Transport Sector

Objectives of the Module:

To familiarize users with the various tax instruments and financing techniques available for greening the transportation sector.

Over the period between 1990 and 2000, global emissions from road transport and aviation increased by approximately 25%: 12% more than total global emissions growth over the same period. Transportation now accounts for roughly 16% of global CO2 emissions and 31% of Ozone. Beyond the transport sector's intensive carbon contribution to global warming, the compounding pressures of rapid urbanization and population growth in Asia-Pacific countries have rendered a transport development strategy based around private automobile ownership unfeasible. Building more sustainable transportation infrastructure will reduce congestion and pollution, and improve overall productivity, environmental quality and public health.

Green transport taxes offer the most cost-efficient means to facilitate the change to a more sustainable transport system. They span a large spectrum of taxes associated with the use and ownership of various vehicles of transportation (e.g. motor vehicles and airplanes). Increasing taxes on transportation alone, however, will not automatically lead to a greener transport sector and may potentially place an undue financial burden upon the public if alternative modes of public transportation are not installed in advance. Revenue from green transport taxes can be *partially earmarked* to fund such investments. The initial financing of sustainable transportation infrastructure projects can be challenging, particularly for developing countries. Nevertheless, strategies such as *public private partnerships, value capture*, and *tax incremental financing* have shown to be effective options for accomplishing this. Disproportional impacts to sectoral and international competitiveness, as well as the poor, can be avoided if such considerations are taken up during the initial planning and design phases. Educating the public on new transport policy initiatives, for example through public awareness campaigns coordinated by *transportation management associations*, is critical for not only garnering public acceptance, but also for ensuring effective and timely adaptation.

This Module is arranged into two Subsections:

- Road Transport Pricing
- Other Tools for *Sustainable Transport and Mobility*

Key Concepts:

- Vehicle Tax
- Congestion Charge
- Full-variable Pricing
- Parking Pricing
- Smart Growth Tax Incentives
- Transport Sector Subsidies
- Value Capture
- Tax Incremental Financing

Road Transport Pricing

In terms of subsectors, road transport is the greatest contributor to global warming. Fiscal instruments aimed at internalizing negative *transport sector externalities* include: *vehicle taxes* (e.g. sales, ownership, registration, or license tax/fee), *fuel taxes, congestion charges* (sometimes referred to as tolls), *parking pricing, emmission pricing*, and *subsidies*. Experiences demonstrate that using a combination of these intruments in concert with other complimentary policies (e.g. setting emissions standards and investing in sustainable public infrastructure) can be very effective for promoting *sustainable transport and mobility*.

Vehicle Taxes

Vehicle taxes may be used to disincentivize private vehicle ownership and use, or to reduce emissions, congestion, and environmental pollution. Spanning a wide variety, both recurrent and non-recurrent types of payments fall under the classification of vehicle taxes. Non-recurrent refers to a single payment usually in the form of a tax or fee, levied when the car is initially purchased or registered. Recurrent payments may be imposed annually or monthly, for example, a vehicle tax and car insurance which are both used in Japan.

Numerous levels of pricing, as well as standards by which to base a vehicle tax, are practiced throughout the world today. In order to manage rapidly increasing vehicle demand, the government in Shanghai, China, raised car registration fees to $4,600 in 2005, more than double the city's per capita income. While in Europe most countries base their vehicle tax on engine capacity, engine model, fuel type, and vehicle age or weight; in Asia the criteria usually depends on engine capacity, such as in Malaysia. In designing vehicle taxes, policy makers should be aware that setting a high, non-recurrent tax for the sale or registration of new cars, while not applying any charge to the resale of used cars, could result in consumers purchasing older, less fuel-efficient vehicles. Accordingly, an annual differential car tax based on fuel-efficiency may be one of the more effective options for reducing negative transport externalities.

Vehicle Taxes comprise both recurrent and non-recurrent types of payments that aim to discourage the ownership of vehicles such as sales, ownership, registration, or license taxes/fees.

Fostering the Greening of Business in Terms of Transportation

The transportation incentives that companies provide to their employees have a major impact on how individuals commute to work, and consequently, their *carbon footprint*. Governments can provide corporate tax credits to businesses that make noteworthy efforts to green their transportation activities. Saville, Spain, for example, has adopted a policy that grants up to a 50% tax credit to businesses that implement a transportation plan approved by the local energy agency. To be eligible for this credit, the plan must promote public or shared transportation for employees' commute to and from work. These approaches can assist businesses in promoting and implementing commute trip reduction programmes.

Offering corporate or sales tax credits for the purchase of hybrid-automobiles is another method for fostering a market shift towards greater sustainable consumption and sustainable transport. Taxing the purchase of fuel-inefficient vehicles, or "gas guzzlers", is a complementary fiscal policy that has been used by policy makers ever since the United States passed its Energy Tax Act in 1978. Other countries such as Canada and a few EU member states have also implemented similar tax measures. Denmark's new car sales tax, for instance, is now greater than the actual price of the car!

Fuel Taxes

Fuel taxes are a very efficacious policy tool for both mobilizing revenue and furthering the strategy of sustainable transport and mobility. More specifically, the levying of fuel taxes can foster:

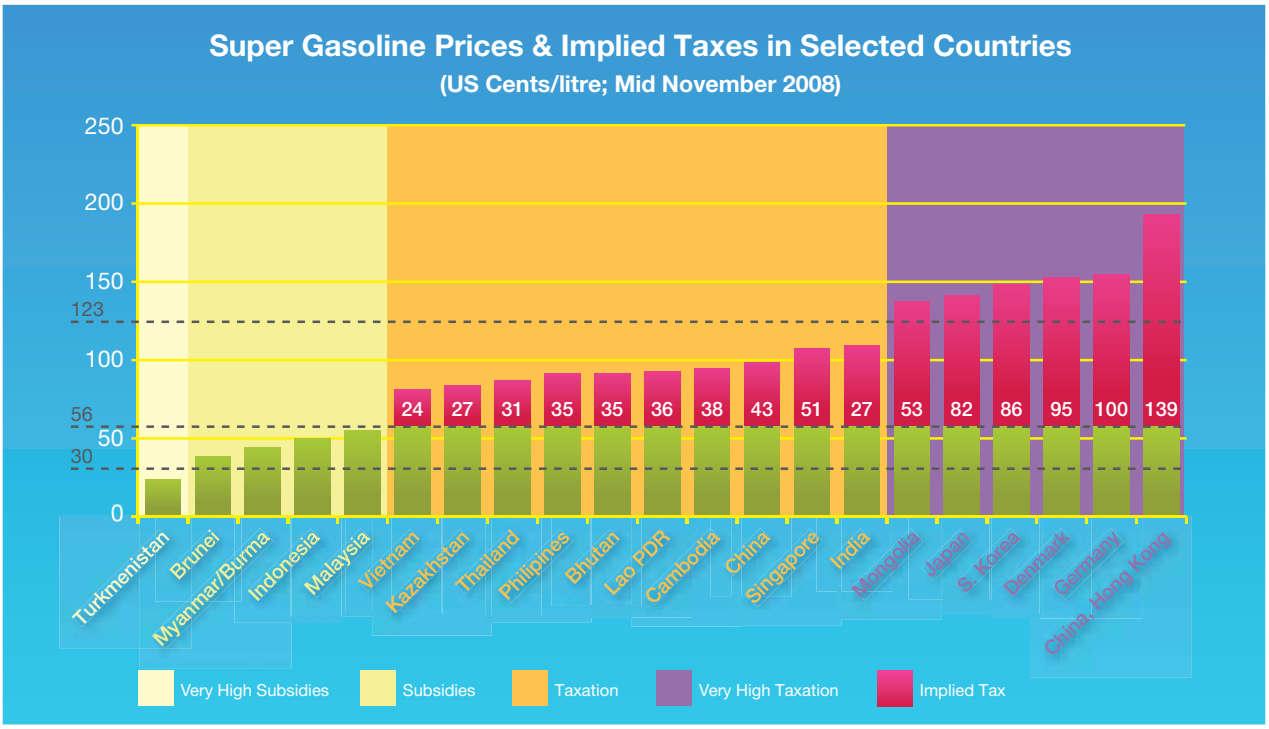
- A transfer to more fuel-efficient or hybrid vehicles
- Greater use of public or non-motorized (e.g. walking or cycling) transportation
- Reductions in the number of private vehicle trips and/or their duration
- Lower levels of transport emissions and traffic congestion

A fuel tax refers to a specific levy that is set in proportion to the market price and imposed on fuel consumption. Fuel taxes have been applied in many countries. The graph below illustrates the retail prices of super gasoline and the implied tax (shaded in red and indicated in white numbers) in various countries in November 2008.

Cutting income taxes while increasing gasoline taxes would lead to more rapid economic growth, less traffic congestion, safer roads, and reduced risk of global warming— all without jeopardizing long-term fiscal solvency. This may be the closest thing to a free lunch that economics has to offer.

N. Gregory Mankiw,
Nobel Prize winner in Economics

Carbon Footprint is a measure of total green house gases emitted in terms of CO2 and CO2 equivalents.
Fuel Tax refers to a specific levy that is set in proportion to the market price and imposed on fuel consumption.



Source: GTZ International Fuel Prices 2009

GTZ considers the US price of 56 US cents per litre to be the "international minimum benchmark for non-subsidised" fuel pricing. Accordingly, any price above the 56 US cents mark contains an implied tax. Any country whose retail price is above 123 US cents per litre (shaded in brown starting from Mongolia) is regarded as applying "very high taxation" to a degree that will foster improvements in energy efficiency. Countries with retail prices below 56 US cents per litre are deemed as following a fuel subsidizing pricing policy. Such a strategy is often considered to be *regressive*; fiscally burdensome, particularly during times of high oil prices; and a hindrance to improving energy efficiency.

The abolishment of any *perverse subsidies* to fossil fuels is generally considered the first step to applying stricter fuel pricing measures. After consumers and producers have had sufficient time to adapt to the removal of subsidies, fuel taxes can then gradually be imposed. China has recently followed such a path, eliminating subsidies in the summer of 2008, and then shortly thereafter in early 2009, imposing a 16% levy on the consumer market price.

The effectiveness of any fuel pricing policy depends largely on the price *elasticity* and the flexibility of the pricing system. Adopting a formula-based automatic pricing system will allow for greater timely adjustments in accordance with changes in demand, supply and price elasticity.

Regressive: A tax is considered regressive if it levies a proportionately larger amount from lower income individuals or households.
Perverse Subsidies are subsidies that are environmentally harmful and promote unsustainable development.
Elasticity is the responsiveness of the amount demanded in relation to any change in price.

Congestion Pricing

Objectives for implementing *congestion charges* could be reducing urban congestion and/or fuel consumption, increasing environmental quality and public safety, or simply revenue generation.

Increased travel time of motorists due to high levels of congestion can result in higher marginal and average costs. This is often a product of misallocating public resources, i.e., free access to public roads and highways. Increasing the monetary cost of traveling through congested areas at peak times encourages a change in motorist behavior, and promotes a "polluter pays" approach to correcting for social and environmental *negative externalities*. According to a report from the World Bank, theoretically, this charge should "equal the difference between the social marginal cost and the private cost for the flow" of traffic.

There are numerous international examples of congestion pricing systems operating in the world today. Singapore, San Diego, London, and Stockholm have all been successful in implementing such systems. A wide array of proven design options and tools are available for policy makers to engineer a system that would fit within their own country's unique challenges. While San Diego employs a charge based on entry through corridors, London, Singapore, and Stockholm have chosen to use a system that charges motorists upon entry into a congestion zone, or cordon zone.

Three years after its initial inception, London's congestion zone pricing scheme helped to reduce traffic congestion in the cordon zone by nearly 30%. Moreover, within the cordon, people using buses to enter the city increased by 37%, CO2 emissions were reduced by an estimated 16%, and nitrogen oxides and particulate matter have fallen by 18% and 22%, respectively.

Congestion charges can be imposed in a variety of ways: by day, week, or month; per use; or by vehicle kilometers traveled. Some require travelers to pay the same price regardless of time of day or degree of congestion; others charge a higher rate for peak hours. *Full variable pricing systems* that factor in the level of congestion, frequency of use, and distance traveled are generally considered to be more welfare enhancing because they more accurately price both the level and source of externalities. To be effective though, rates of the charges should be re-evaluated on a timely basis and adjusted accordingly.

As the cases of Singapore, Norway and the UK below demonstrate, congestion pricing, which falls under the umbrella of road pricing, can be a very powerful tool for revenue mobilization.

Cost-effectiveness of Various Road Pricing Schemes

	Singapore (Electronic Road Pricing)	Norway (Toll Rings)	United Kingdom (Area Congestion Pricing)
Annual Revenue	35 (1998)	143 (2002)	65 & 102
Annual Operating Cost	3.75	23	130
Annual Net Revenue	**31.25**	**120**	**37**

Measured in millions of Euros. Source: Palma, de Andre; Lindsey, Robin; and Proost, Stef. "Research Challenges in Modeling Urban Road pricing: An overview", Transport Policy 13 (2006) 97-105.; and Timilsina, (2008) "Fiscal Policy Instruments for Reducing Congestion and Atmospheric Emissions in the Transport Sector:" A Review. The World Bank.

Congestion Charges are levies imposed on motorists for entering a designated area (such as a cordon zone or toll road) usually implemented for the purpose of raising revenue, reducing congestion, or internalizing other transport related externalities.

Negative Externalities are the costs not incorporated into the market price of a good or service that result from economic activity which affects individuals, firms or communities uninvolved in that activity. Pollution and congestion are common examples of negative externalities.

Full Variable Pricing System is a pricing system that factors in the level of congestion, frequency of use, and distance traveled

Lower income households, women and children can also gain to benefit from congestion charges if the accrued revenue is recycled into extending access to public transportation or other poverty reduction programmes.

Parking Pricing

Parking pricing is a method for internalizing transport sector externalities by levying a charge, fee, or tax on vehicle parking. Increasing the cost of vehicle parking can, for instance, contribute to reduced congestion, parking demand, air pollution, number of trips made by private vehicles, and vehicle kilometers traveled. It can also facilitate a change in the choice of parking location or mode of transport. Following an increase in parking prices, motorists may find it more cost effective to use public or non-motorized transportation.

It is important to note that complementary policy sequencing plays a major role in the overall effectiveness of parking pricing. For example, pre-installing alternative modes of public transportation before applying parking pricing mechanisms is essential for offering motorists a lower-carbon transportation alternative. Furthermore, the adoption of transit oriented strategies such as designating park and ride or kiss and ride facilities can allow for a quicker adoption of and transfer to cleaner public transportation. Proper public awareness campaigns highlighting such travel alternatives is very important for ensuring the success of the programs, as well as for garnering public and political support.

The effectiveness of parking pricing measures will greatly depend on parking pricing elasticities. If the tax, fee, or charge is not set high enough, then the pricing mechanism could fail to have the intended effect on motorist behavior. One simulation estimated that parking charges in five British cities would need to be doubled in order to reduce central area trips by 13%. Using a variable pricing system whereby rates are higher during peak hours and lower during off-peak times is generally deemed as more equitable.

Businesses and individual government departments or offices can also contribute to reducing parking demand by altering internal transportation incentive/remuneration policies. Charging for workplace parking or cash-in-lieu-of-parking incentives are just a few options that can be adopted.

Emissions Pricing

The pricing of emissions can be accomplished through levying what are generally referred to as *emission taxes*. Emission taxes are levies either 1) charged on a fuel based on the content of the respective pollutant, for example carbon or sulfur taxes, or 2) imposed on effluents, such as a NOx tax.

In terms of the transport sector, the most commonly levied emission taxes have been sulfur and NOx. Due in part to the recent increased attention on climate change mitigation, however, the acceptance of carbon taxes as an effective fiscal instrument has been quickly gaining momentum. Other important pricing tools falling under the umbrella of emission taxes may include levies on volatile organic compounds (VOCs) and suspended particulate matters (SPM). Despite their relevance to reducing transport sector externalities, they have, nevertheless, rarely been applied.

Parking Pricing is a method for internalizing transport sector externalities by levying a charge, fee, or tax on vehicle parking.

Emission Taxes are levies either 1) charged on a fuel based on the content of the respective pollutant, for example carbon or sulfur taxes, or 2) imposed on effluents, such as a NOx tax.

Singapore's Road Pricing Experience

The Singaporean experience presents a quintessential example of how the combination of various policy instruments can be used in concert to better manage transportation demand. During the early 1970s, Singapore was faced with the problems of heavy congestion, rapidly rising private vehicle ownership demand, and limited space for road expansion. These challenges are not unique to Singapore; nearly all-major cities in the Asia and Pacific region are confronting similar problems. The government's first attempt to curb vehicle ownership was the Additional Registration Fee (ARF) coupled with higher import duties on vehicles. These levies alone, however, failed to effectively curb demand. In order to facilitate a transfer to public transportation and reduce congestion, a cordon-based Area Licensing System (ALS) was introduced in 1975. The ALS imposed a flat rate license fee that could be purchased daily or monthly. By displaying this license motorists could gain unlimited access to the Restricted Zone, which covered a large portion of Singapore's Central Business District (CBD). The ALS was met with great success as traffic within the RZ was initially reduced by approximately 45%.

Over the years as demand continued to increase, other policies were introduced. In 1988, the government increased parking fees, road and petrol taxes. This was shortly followed in 1990 by a Certificate of Entitlement Scheme (COE) that required motorists to bid at an auction for the right to purchase a car.

Due to 1) newly available, affordable road pricing technology; and 2) various limitations of the ALS such as its inflexibility in terms of pricing, labour intensity, and high margin of error for enforcement; the ALS was replaced with an electronic road pricing (ERP) system in 1998. The ERP system overcame the drawbacks of a manually operated and enforced system. Because of its flexibility to allow for more frequent adjustments to congestion pricing, it has been able to constantly modify prices in accordance with changes in demand to maintain traffic flow speeds of 45-65 kilometers per hour (kph) for expressways and 20-30 kph for other roads. By more accurately charging users for externality creation (e.g. congestion and pollution) the addition of the ERP greatly improved the efficiency and equity of the overall road pricing system.

Lessons learned from the Singapore case:

- Greater welfare can be achieved by adopting a basket of disincentive policies that strike a balance between vehicle ownership and usage
- Alternative forms of public transport should be available for motorists to transfer to in order for the green transport taxes to be effective and not burdensome
- Additional public transport facilities can be financed through increased revenue from new land-use or green transport taxes
- Pricing rates must be constantly monitored and adjusted accordingly to ensure that the demand for private vehicle transport is kept at manageable levels
- The public should be properly informed of any new green transport tax initiatives well in advance so that they may plan accordingly

Transport Sector Subsidies

Transport sector subsidies are widely used fiscal instruments that have been implemented throughout both developed and developing countries alike. They have been undertaken with the aim of achieving various policy objectives including but not limited to:

- Reducing the cost of fuels and public transportation to the poor
- Promoting the adoption of eco-efficient automobiles and cleaner fuels
- Raising revenue
- Facilitating a transfer to public transportation
- Internalizing transport sector externalities
- Encouraging the market shift towards a green/low-carbon economy

The first step that governments can undertake within the context of transport sector subsidy reform is to identify and eliminate all perverse subsidies. These may include the subsidization of development, exploration, and pricing of fossil fuels, such as gasoline and diesel; tax exemptions for parking expenses, and the purchase of fuel inefficient vehicles. The abolition of some perverse subsidies, such as those artificially supporting the price of diesel, can negatively affect the poor by reducing their options for accessing certain basic services. However, considering that middle and upper income groups often benefit the most from perverse subsidies, mainly because the poor cannot afford to purchase a car, the goal of poverty alleviation can thus be achieved more effectively through other means.

Following the removal of perverse subsidies, governments can work to redirect fiscal funds to better support the greening of the transport sector and the more overarching objective of poverty reduction. Revenue generated from the elimination of perverse subsidies or the levying of new green taxes can be used to support such goals. In this light, policy makers can encourage consumers to purchase or convert to more eco-efficient automobiles (e.g. hybrids, vehicles operating on clean fuels, and electric vehicles) and clean fuels by providing tax credits and subsidies. The "National Clean Vehicle Action" initiative implemented in numerous major Chinese cities is one example highlighted in the box below.

The "National Clean Vehicle Action" sought to decrease oil dependence and vehicular pollution by promoting the consumption of Liquid Petroleum Gas (LPG) and Compressed Natural Gas (CNG). In order to receive wide acceptance, however, the construction of LPG stations was paramount. The Shanghai Municipal Government supported this effort with a 9 million Yuan subsidy and allowed the equipment needed for station construction to be imported duty-free.

While subsidies to eco-efficient automobiles, clean fuels, and the infrastructure that supports them can help to reduce emissions, they do not mitigate the problems of congestion, vehicles on the road, or private vehicle accidents. In this connection, demand-side subsidies that facilitate greater access and mobility— particularly to the poor and women— are considered more welfare-enhancing and effective fiscal transport policy tools.

Subsidy is a fiscal instrument that may constitute direct/indirect grants or payments, as well as pricing, tax or regulatory policies that are preferential to particular economic activities.
Transport Sector Subsidies include subsidies specifically relevant to the transport sector, such as the subsidization of fuel prices and public infrastructure.
Transport Sector Externalities include but are not limited to environmental pollution, congestion, global warming, noise, and accidents. See also externalities.

Subsidies to the construction, maintenance, and operation of public transportation infrastructure, such as bus-rapid transit systems can foster:

- A transfer from private vehicle ownership and use to public
- Reductions in *transport sector externalities* (e.g. congestion, emissions, vehicles on the road, accidents, etc.)
- Increased access of the poor and women to basic essential services

They are very powerful policy instruments for furthering the goals of low-carbon development and sustainable transport and mobility.

Studies show that most of the public urban transport subsidies in effect today, in fact, do not improve the welfare of the poorest and women. This is largely due to the fact that in many developing countries, the very poor tend to use non-motorized forms of transportation such as cycling or walking more than public transportation. Moreover, the consumption of public transportation in developing countries tends to increase in greater proportions as incomes rise, resulting in public transport being classified as a luxury good in many cases. This is not only a result of the financial cost of using public transport, but an access problem as well. In aims to improve the welfare of the poor it could be more effective to invest in the installation, repair, and widening of sidewalks and bicycle paths/lanes than supply-side subsidies to bus and rail pricing.

It should be noted that transportation is often not a basic need in itself, but the vehicle by which other basic needs such as medical care, employment, and education are serviced. While the provision of affordable and available transportation services to advance the goal of social inclusion is not without its merits, there may be better means for using scarce financial resources. In assessing the distributional incidence of subsidies, it may be more equitable, as well as more effective at reducing poverty, to allocate subsidies towards other development programmes that specifically target improving the access of the poor to these basic needs rather than simply extending transportation infrastructure facilities. This could be accomplished through the distribution of lump-sum payments to lower income households where each household can individually decide how to use the funds to best meet its most pressing needs. However, in countries where there is no developed welfare system, or certain needs of women and children do not necessarily coincide with the head of the household and they lack strong voice or exit options, subsidies to public transport may be warranted. It is in this connection that the importance of imbedding transportation demands under the overarching umbrella of poverty reduction efforts becomes apparent.

Other Tools for Sustainable Transport and Mobility

As identified in the *Sustainable Transport and Mobility Module*, following a ***transit-oriented development*** strategy is an effective means for facilitating the greater access and mobility of populations. The addition of public transportation facilities often greatly increases property values in the near vicinity. Contrary to stimulating compact development, the higher property prices serve as a disincentive. This in turn produces a "leapfrog" effect whereby developers move to areas of lower density further away with cheaper building costs, perpetuating ***urban sprawl*** and making it difficult for policy makers to impose ***urban growth boundaries***. As cities expand, local governments are faced with the challenges of further expanding infrastructure with already strained budgetary resources.

The aforementioned problems can be remedied in part by following *value capture* and *smart growth* strategies. Value capture entails decreasing or eliminating building assessment taxes and increasing land value assessment taxes in order to "capture," or recoup, the increased value of land around new public transport facilities. Pressured by the immediacy of high land value taxes, landowners are more likely to maximize the return on their assets by undertaking dense development as opposed to simply retaining their property for speculative gain. The revenue from land-use taxes can

Transit Oriented Development refers to compact communities that are designed to maximize mobility and transit, involving reductions in automobile use.
Urban Sprawl is poorly-planned or unplanned expansion of urban space into areas located on the periphery of a city; typified by an inefficient use of land resources and caused when land consumption disproportionately exceeds urban density.
Urban Growth Boundaries is a growth management tool that encourages a more efficient use of land by mapping borders around a city, separating it from surrounding areas with the aim of promoting more compact urban development.
Value Capture entails decreasing or eliminating building assessment taxes and increasing land value assessment taxes in order to "capture," or recoup, the increased value of land around new public transport facilities.
Smart Growth Policies are planned development policies that promote complementary land uses and support a variety of transportation choices, with the greater aim of diverting construction from environmentally-sensitive areas and protecting open space.

be partially *earmarked* for servicing the debt of the infrastructure installment or for financing future sustainable transportation infrastructure projects, which in turn can generate new green jobs. The distributional impact on the poor is generally much more favorable than other taxes since 1) the poor often do not own land or it is of low value, and 2) revenue from the increased land value taxes can be recycled into pro-poor programmes that increase their access to basic services. Tax evasion is also minimal on account of the fact that land, unlike intangible assets, is very immovable and visible, and hence, difficult to conceal. It should be noted that for developing countries, land tenure rights should be well defined and mechanisms for ensuring their protection should be established prior to employing the technique of value capture. Value capture is not a new phenomenon; it has been used extensively in the United States, and in Asia and the Pacific in Hong Kong Island, Singapore, Japan, and Australia. The mass transit railway in Hong Kong, for example, covers all of its costs through rents from co-developed land in the near area.

One key tool of value capture is *tax incremental financing (TIF)*. Policy makers have utilized TIF to invigorate economic development for over half a century. Often many underdeveloped areas lack the financial resources for new sustainable transportation projects that are urgently required. TIFs permit municipalities to use future increased tax revenues (tax increments) to service the debt of such a project. Initially, tax revenues from a specified district are assessed and marked. Any future revenues from that district that exceed the marker are dedicated to repaying the project's debt. TIF thus allows for the construction of new sustainable transportation infrastructure projects that would otherwise not have been realizable.

Earmarking refers to assigning revenue from a specific tax, or group of taxes, to a particular expenditure or government ministry/department.
Tax Incremental Financing permit municipalities to use future increased tax revenues (tax increments) to service the debt of such a project. Initially, tax revenues from a specified district are assessed and marked. Any future revenues from that district that exceed the marker are dedicated to repaying the project's debt.
Smart Growth Tax Incentives are reduced tax rates for development projects and businesses that follow smart growth guidelines.
Clean Development Mechanism (CDM) is a market-based instrument under the Kyoto Protocol that allows Annex countries (developed countries with commitments to reduce green house gas emissions) to finance projects aimed at reducing emissions in a more cost-effective manner in developing countries.

Smart growth is complimentary to value capture in that it provides numerous alternative modes of transportation for people living within smart growth communities. These other modes of transportation generally tend to be less carbon-intensive and include, for example, cycling and walking. Policy makers can encourage smart growth through *smart growth tax incentives*: reduced tax rates for development projects and businesses that follow smart growth guidelines.

Offering preferential land valuations and land-use tax rates for farmland outside of urban growth boundaries is another tool for reducing urban sprawl, and consequently, the demand on local governments to expand unsustainable transportation infrastructure. However, steps must be taken to ensure that agricultural expansion does not lead to deforestation. Ceasing tax incremental financing for transportation development projects in vulnerable areas may be one option.

The *Clean Development Mechanism (CDM)* is another option available to developing countries for technology transfer and funding acquisition for sustainable transportation projects. In New Delhi, India, for instance, a CDM project is responsible for the financing and development of an urban railway system. Unfortunately, in spite of the fact that transportation was underlined as a priority sector, it still only represents 0.12% of all CDM projects. As such, the CDM as it currently stands is not an international financing instrument that all developing countries can rely on for easing the budget burden for installing new sustainable transportation facilities.

Review Questions

1. What type of tax instruments has Singapore implemented to discourage private automobile ownership and use?
2. Describe some possible welfare and distributional impacts of transport taxes and subsidies on the poor, specifically in a developing country context. What strategies could be utilized to avoid regressivity?
3. How can policy makers use tax incentives to encourage value capture and smart growth?

Further Reading

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Subtotal $ _____

Green Tax $ _____

Total Due $ _____

Less Deposit $ _____

Balance Due $ _____

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Please visit our website at www.greengrowth.org for further information.

Subtotal $ _____
Green Tax $ _____
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Balance Due $ _____