

## *Overcoming Obstacles to Green Fiscal Reform*

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**Abstract:** *Green fiscal reforms (GFR) include a number of tax and pricing instruments that can raise revenues while furthering environmental goals such as mitigating climate change, protecting water resources, and reducing traffic congestion. Interest in GFR has been rising and the current context provides a favourable environment to launch such initiatives. However, efforts to date remain limited and are often constrained by obstacles including concerns about economic and social impacts. While such concerns are important, they should not be used as an excuse to avoid GFR as they can be addressed through careful design of the reform process. This article examines how obstacles to GFR can be overcome through targeted mitigation measures for vulnerable groups, use of revenues, and complementary tools, drawing on lessons from experiences in both developed and developing countries. This article highlights the need to adopt a comprehensive, consultative, pragmatic approach to GFR and build broad political and public support to ensure success.*

**Keywords:** *Environmental taxation, Biodiversity, Climate change, Compensation measures, Competitiveness concerns, Distribution impacts, Economic impacts, Energy, Fiscal reform, Governance, Mitigation measures, Natural resources, Fiscal revenues, Subsidies*

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## Introduction

Environmental or green fiscal reform (GFR) refers to a “range of taxation and pricing measures that can raise fiscal revenues while furthering environmental goals” (OECD 2005a, World Bank 2005). Such measures have attracted increasing attention in recent years driven by various considerations, including the push for fiscal consolidation, recognition of the financial burden of certain measures (e.g., fossil fuel subsidies in many developing countries) and growing appreciation of some of the limitations of traditional “command and control” approaches. GFR-related intervention such as congestion charges have been adopted at various policy levels: sub-national (e.g., in British Columbia in Canada and California in the United States) and national (e.g., a number of countries in Europe, Asia, and Africa) levels.

The multiple benefits of GFR and its potential role in supporting a range of objectives are well-documented (see, e.g., OECD 2005a, 2010, World Bank 2005, De Mooij *et al.* 2012). For example, according to Coady *et al.* (2015), eliminating energy subsidies (which arise from undercharging for supply and broader environmental costs of fossil fuel energy) would raise government revenue by US\$2.9 trillion, reduce global CO<sub>2</sub> emissions by more than 20 per cent, and reduce premature air pollution related deaths by 55 per cent. The current context with low oil prices is particularly favourable for undertaking GFR, and the case for such reforms is increasingly made.

Despite efforts to date, the use of GFR remains limited. Only 12 per cent of annual global greenhouse gas (GHG) emissions are formally priced and typically at levels below US\$10 per tonne (World Bank and Ecofys 2014). Environmentally harmful subsidies remain significant in several sectors such as fisheries, agriculture, and energy. Various obstacles hold back further progress including the strength of special interests; a lack of political will; limited transparency and awareness; as well as administrative, institutional, and technological constraints (OECD 2005b, Withana *et al.* 2012). Lack of political will is a key obstacle that often reflects concerns about perceived economic and social impacts on vulnerable groups. While such concerns are important and merit attention, they should not be used as an excuse to avoid GFR as they can be addressed through careful design of the process.

This article is based on a paper commissioned by the Fiscal Instruments Research Committee of the Green Growth Knowledge Platform, which examines how to overcome obstacles to GFR through the targeted use of well-designed mitigation measures for vulnerable groups; careful use of revenues; complementary strategies, tools, and approaches drawing on lessons from experiences in both developed and developing countries. This article seeks to provide general insights on overcoming obstacles to GFR, keeping in mind the need for tailored approaches depending on national circumstances and priorities.

## Impacts of GFR and Potential Mitigation Options

A key obstacle to GFR often relates to feared economic and social impacts of the reform. Thus, it is critical to understand and clarify these impacts, setting out the costs, benefits, and potential trade-offs (OECD 2007). Impacts are related to a number of factors (i.e. design, use of revenues, other policies, external factors, public support) and can vary over time. For example, while higher water charges may have negative impacts on certain households, revenues could be used to expand the network thus increasing access and generating health benefits among the wider population in the long term.

There are different tools to identify GFR impacts including quantitative (e.g., social accounting matrices, household consumption and input–output (I-O) data, dynamic or sector-specific models, and qualitative (e.g., literature reviews, stakeholder consultations) approaches—see Box 1.

### Box 1: Fuel subsidy reform in Ghana

The 2005, fossil fuel subsidy reform strategy in Ghana was informed by a poverty and social impact assessment, which identified consumption profiles and estimated price changes and impacts on consumption costs based on input-output data. It found that rich households disproportionately benefitted from the subsidies whereas their removal would lead to an increase in consumption costs of the poor. These findings were informed through a widespread public relations campaign that communicated the need for reform and how revenues would be used.

Mitigation measures included elimination of fees for state-run schools, an increase in public transport buses, a ceiling on public transport fares, increased funding for health care, an increase in the daily minimum wage, investment in rural electrification, continued cross-subsidization of kerosene and LPG. A pricing mechanism that linked domestic oil prices to international prices was adopted; however, it has periodically been abandoned, for example, in 2008 due to escalating oil prices and in the run-up to national elections in 2009.

Sources: Coady and Newhouse (2006), GIZ (2013), Beaton *et al.* (2013), Laan *et al.* (2010), IMF (2013), OECD (2005a)

### *Potential Impacts of GFR on Vulnerable Firms or Sectors*

Available literature on concerns about negative impacts of environmental regulation (including GFR) on the economy does not reveal statistically significant or robust evidence to support the claim (see, for example, Albrizio *et al.* 2014). Nonetheless, perceived economic impacts of GFR remain a key obstacle and are often used to block progress or to undermine efforts. Thus, an important step when considering GFR is to clarify the scale, nature, and economic impacts of reform that depend on various factors including design, revenue use, and external and firm-specific factors. In addition, impacts can be assessed at different levels, that is, national, sector, and firm (OECD 2005b) as it is possible to have benefits for a particular sector, but losses for individual firms as well as gains at a national

level but losses at a sector level. Thus, GFR should be seen in the wider context of national transformation and structural change—see Box 2.

**Box 2: Benefits of the carbon tax in British Columbia, Canada**

The carbon tax in British Columbia (BC) was introduced in July 2008 at a rate of CAD 10 per tonne of CO<sub>2</sub> equivalent with a schedule of four annual increases to reach CAD 30 per tonne of CO<sub>2</sub> in July 2012. The tax rate has been frozen since 2012 and some exemptions granted. The tax is revenue neutral with revenues used to decrease taxes on corporate and personal income, and to provide tax credits and benefits for vulnerable groups.

Assessments indicate that BC's petroleum fuel consumption per person dropped by 15.1 per cent from 2008 to 2011 and declined by 16.4 per cent more than the rest of Canada, while the province's per capita GHG emissions declined by 9.9 per cent between 2008 and 2010, which outpaced reductions in the rest of the country by more than 5 per cent. BC has also attracted green investment and green technologies at twice the Canadian average and saw a 48 per cent increase in clean technology industry sales from 2008 to 2010. Furthermore, as a result of corresponding tax cuts, BC has among the lowest income tax rates in Canada and general corporate income tax rates among G7 nations.

**Sources:** British Columbia Ministry of Finance (2013), British Columbia Ministry of the Environment (2012), Sustainable Prosperity (2012), World Bank and Ecofys (2014)

### *Potential Impacts of GFR on Vulnerable Households*

The perceived effect of GFR on vulnerable social groups is often used to block action. For example, proponents of reduced VAT rates on basic necessities such as energy, food, and water argue that they are needed to protect the poor, even though evidence suggests such subsidies tend to benefit the rich more (see Box 3). Thus, it is important to clarify the scale and distribution of impacts across social groups, taking into account both direct and indirect price effects. Impacts can vary across applications and over time as well as within countries, for example, between rural and urban areas (World Bank 2014). They also depend on how revenues are used, the nature of the wider reform process, and the socio-economic context. In addition, non-price effects (e.g., substitution), possible rebound effects, and changes over time (e.g., benefits from improved access to water) (Heindl *et al.* 2014) should be taken into account.

Even if the overall GFR is progressive, a sharp increase in prices of certain essential products and services (e.g., energy, water) will have an impact on poor household budgets. Moreover GFR can have wider impacts on poor households depending on substitution effects, for example, in developing countries where access to electricity grids is limited, higher fuel prices could lead to increased use of biomass for heating and cooking with related health and environmental impacts (World Bank 2014). Thus, in some cases there may be a need to introduce targeted mitigation measures for vulnerable groups to ensure that the GFR process does not lead to increased poverty (Sterner 2012) or other adverse impacts.

**Box 3: Distributional impacts of fossil fuel subsidies and their reform**

Fossil fuel subsidies are increasingly recognized as an inefficient means of protecting low income groups. It has been estimated that the richest 20 per cent of households in low and middle income countries capture six times more benefits from fuel product subsidies than the poorest 20 per cent, with impacts varying across fuel types (Clements *et al.* 2013). Communicating such effects can help build support for reform.

However, even if the status quo disproportionately benefits the rich, some reforms could be regressive, particularly in the short term, depending on the type of fuel taxed and characteristics of the economy. Arze del Granado *et al.* (2010) found that an increase in fuel prices of US\$0.25 per litre across 20 developing countries would result in an average 5.9 per cent decline in real household incomes. Direct effects vary across products (e.g., progressive impacts for gasoline and electricity, regressive impacts for kerosene). Indirect impacts accounted for a substantial share of total impacts (with regional variation), indicating that a high proportion of fuel use is for intermediate consumption.

### *Mitigation Measures and Approaches*

Once impacts of the GFR have been identified, there is a need to select those that may require mitigation (see Box 4). The extent to which mitigation measures are introduced “is a strategic decision that involves trade-offs between fiscal savings, capacity to target, and the need to achieve broad acceptance of the reform” (Clements *et al.* 2013).

There are different types of mitigation options and in most cases a package of measure may be required with different target groups and timelines that depend among others on the resilience of affected groups, their ability to absorb or respond to changes from the GFR, external pressures, and access to alternative options (Withana *et al.* 2012). Mitigation measures should be discussed in advance with stakeholders, well-targeted and time limited, maintaining positive incentive effects, and supporting overall objectives of the GFR process; see Figure 1 for a synthesis of key steps.

### **Compensation Measures for Vulnerable Groups**

#### *Vulnerable Firms or Sectors*

Different measures can be used to mitigate negative GFR impacts on vulnerable firms or sectors (see Table 1). Such measures should be well designed and targeted, aligning short-term concerns with long-term needs for change.

#### *Partial reductions or exemptions*

Some form of exemptions or special provisions for vulnerable firms or sectors is often relied on as a politically expedient measure when introducing GFRs. Such practices contravene conventional economic theory and tend to impair the effectiveness of GFR as the cheapest emission reduction potential is not exploited (Speck and Jilkova 2009). In some cases, exemptions are linked to one or more

**Box 4: Considerations to help assess whether an impact of GFR requires mitigation**

**Social considerations**

- Does the impact affect a group considered vulnerable based on its income or status, such as low-income households, pensioners, rural poor, impoverished women among others?

**Economic considerations**

- Does the impact affect a sector that plays an important role in the national/regional/local economy, such as employing a large number of people or accounting for a substantial share of GDP? If yes, does the sector have the capacity to absorb or pass on the impact?
- Does the GFR lead to isolated losses for a particular group such as job losses in a particular industry (e.g., coal mining) or within a certain group (e.g., fishermen)?

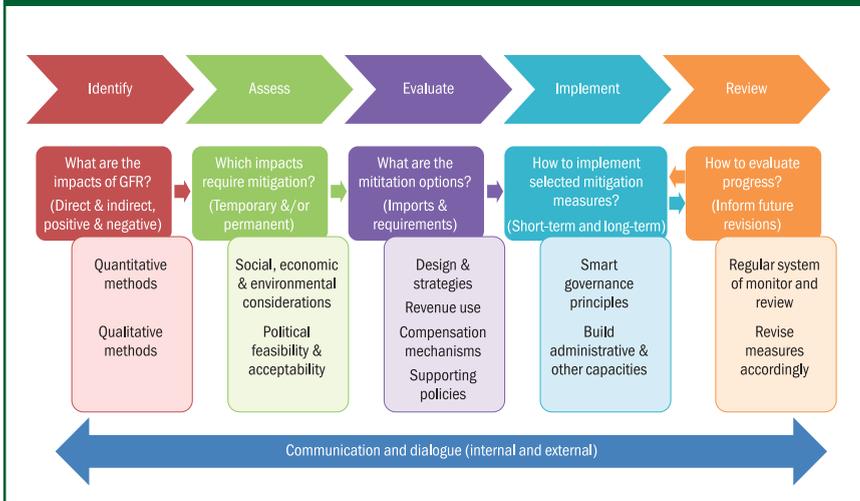
**Environmental considerations**

- Can the GFR lead to substitution effects that are detrimental to the environment and/or health such as increased wood burning?

**Political acceptability issues**

- Does the GFR have an impact on a politically influential group/sector such as farmers, energy-intensive industry?

**Figure 1: Identification, design and implementation of mitigation measures for GFR**



Source: Own representation.

conditionality such as voluntary agreements (see Box 5), which if well designed can improve information asymmetry between companies and authorities, inform future revisions, and potentially encourage change (ten Brink 2002). Specific requirements such as an environmental management systems and regular energy audits can also give the issue due executive attention and encourage progress (Withana *et al.* 2013).

**Table 1:** Overview of potential measures to mitigate impacts of GFR on vulnerable firms or sectors

Type of measure	Strengths	Weaknesses
<i>Design and implementation approaches</i>		
Timetable	<ul style="list-style-type: none"> <li>• Phased introduction allows time to adjust</li> <li>• Provides certainty</li> <li>• Reduces opposition</li> </ul>	<ul style="list-style-type: none"> <li>• Could lead to backsliding of reform commitments</li> <li>• Risk of hoarding and shortages</li> <li>• Creates expectations of inflation</li> </ul>
Stakeholder engagement	<ul style="list-style-type: none"> <li>• Builds ownership and legitimizes process</li> <li>• Increases awareness of pros/cons</li> <li>• Reduces opposition</li> </ul>	<ul style="list-style-type: none"> <li>• Risks delaying GFR process</li> <li>• Opportunity for lobbying against reform</li> </ul>
<i>Compensation mechanisms</i>		
Reductions/exemptions	<ul style="list-style-type: none"> <li>• Reduces opposition</li> <li>• When linked to effective conditionality, could encourage change and improve information asymmetry</li> <li>• Useful for political and public acceptability</li> </ul>	<ul style="list-style-type: none"> <li>• Does not provide efficient price signal or incentive, thus foregoing cost-effective opportunities</li> <li>• Imply advantages for certain firms and sectors but disadvantages to others</li> <li>• Once established, may be difficult to revise or phase out</li> </ul>
Transitional assistance to affected workers	<ul style="list-style-type: none"> <li>• Reduces opposition</li> <li>• Link to complementary policies</li> </ul>	<ul style="list-style-type: none"> <li>• Could become entrenched in expectations if not time limited</li> </ul>
Incentives for innovation	<ul style="list-style-type: none"> <li>• Facilitates transition</li> <li>• Drives innovation</li> <li>• Reduces opposition</li> </ul>	<ul style="list-style-type: none"> <li>• Could become entrenched in expectations if not time limited</li> </ul>
Minimum agreements/cooperation between countries	<ul style="list-style-type: none"> <li>• Avoids concerns of leakage and competitiveness impacts</li> <li>• Increases support</li> <li>• Encourages more ambitious GFR</li> <li>• Reduces opposition</li> </ul>	<ul style="list-style-type: none"> <li>• Difficult to get agreement on fiscal cooperation between countries, particularly larger groupings</li> </ul>
Border adjustments	<ul style="list-style-type: none"> <li>• Reduces concerns of competitiveness impacts</li> <li>• Increases support</li> <li>• Encourages other countries to initiate pricing regimes</li> <li>• Reduces opposition</li> </ul>	<ul style="list-style-type: none"> <li>• WTO compliance</li> <li>• Could be administratively complicated</li> <li>• Political barriers</li> </ul>

Source: Author's synthesis

### *Transitional assistance for displaced workers*

If GFR has significant impacts on a specific activity, industry, or firm, targeted compensation measures can be considered. For example, transitional assistance for displaced workers was provided in France, Poland, and the UK when reforming coal mining subsidies (Bruvoll and Vennemo 2014). While such measures can help buy support for reform, they can also be controversial and costly. In the

**Box 5: The energy tax in the Netherlands**

The energy tax applies to energy products for heating and electricity generation by households, small businesses, and intermediate firms. A refund is granted to large industrial electricity consumers if they enter long-term energy efficiency agreements with the government and pay on average more than the EU minimum rate. Reduced natural gas tax rates are also applied on the horticulture sector participating in energy efficiency agreements. Rebates and subsidies are provided for energy distribution firms for deploying combined heat and power, energy-saving technologies, and renewable electricity. Exemptions from energy taxation have led to low or zero energy taxes for sectors with the cheapest abatement options.

Revenues are recycled through lower income tax rates and higher tax free allowances for households, reduced employers' social security contributions, tax free allowances for small and medium sized enterprises, reduced corporate tax rates, and a lump sum refund on households' electricity bills. Until 2003, 15 per cent of revenues were earmarked to reward purchases of energy-efficient appliances. Evaluations suggest that the tax has supported a reduction in residential energy demand and an improvement in energy intensity among industry, while regressive elements of the tax are nearly neutralized through recycling measures.

Sources: Duscha *et al.* (2005), EEA (2011), European Commission (2013), OECD (2013a), OECD/EEA (2014), Peter *et al.* (2007), Speck and Jilkova (2009), Vollebergh (2008, 2013), Withana *et al.* (2013, 2014).

UK, for example, although the reform of coal subsidies enabled a more or less competitive domestic coal industry, it came with extensive mine closures and significant social costs as compensation provided was considered insufficient to avoid an increase in unemployment (IEEP *et al.* 2007). Measures need to be carefully designed and reviewed to ensure they are appropriate and adequate, with clear review clauses and end dates to avoid becoming entrenched in expectations of beneficiaries (OECD 2005b).

*Incentives for innovation and more efficient technologies, processes, and practices*

Certain countries use mechanisms to recycle revenues raised by the GFR into the affected sector to help keep down pressure, encourage transformation, and drive innovation (see Box 6). Such mechanisms can support structural change in the sector if carefully developed to ensure effective incentives. Incentives should be performance linked (i.e., favouring more efficient, innovative players), targeted at the most vulnerable sectors, and reduced gradually over time (see Box 6).

**Box 6: The NOx tax and refund system in Sweden**

In 1992, Sweden introduced a tax on emissions of nitrogen oxide (NOx) from energy generation at stationary combustion plants at a rate of Swedish Kroner 40/kg (US\$ 6000/tonne) of NOx. Revenues are recycled back to participating plants in relation to the amount of energy generated. This has provided a strong incentive to reduce NOx emissions and has stimulated innovation and investment in the sector—the number of plants subject to the tax with NOx abatement technologies increased from 7 per cent in 1992 to 72 per cent in 1995. The recycling mechanism has made the tax more politically acceptable and reduced concerns of negative competitiveness impacts. However, the design of the system does not reduce the overall amount of energy produced; thus, while the average emission intensity of participating plants was nearly halved in 1992–2005, total energy output increased by more than 70 per cent and total NOx emissions did not fall by much.

Sources: OECD (2010a, 2010b, 2013b), Sterner and Turnheim (2009), De Mooij *et al.* (2012), Sterner and Höglund-Isaksson (2006), OECD (2013b)

### *Minimum agreements or cooperation among coalitions of countries*

Cooperation between countries could overcome obstacles and lead to more harmonized or synchronized approaches to GFR—see Box 7. Such cooperation is likely to be useful in certain circumstances, in particular, depending on the ease with which a given tax could be avoided, for example through trade (e.g., waste exports) or movement of consumers (e.g., airline tax and fuel tax) (Withana and ten Brink 2015). Such cooperation is likely to be more feasible when smaller groups of countries are involved and may be more likely when countries agree to set minimum requirements or thresholds rather than specify individual rates to allow a certain degree of flexibility. For example, cooperation on waste-related taxes and fees could involve agreement to apply rates above a specified minimum so as to discourage exports/imports and thus drive waste management improvements (Watkins *et al.* 2012).

#### **Box 7: Agreeing minimum energy taxes among 28 EU Member States**

The 2003 Energy tax Directive (2003/96/EC) provides a common framework for the taxation of energy products and electricity across 28 EU member States. In 2011, the European Commission proposed to revise energy taxes to include a minimum CO<sub>2</sub> tax rate of EUR 20 per tonne of CO<sub>2</sub> for all uses of energy products and a minimum energy tax rate (European Commission, 2014). Significant opposition to the proposal led to its withdrawal in early 2015 and reflects *inter alia* the difficulty in reaching agreement among a large and diverse group of countries (the initial Directive was agreed among 15 member states, the proposed revision required agreement among 28 member states).

One option to take this forward could be for a subset of member states (currently at least nine) to cooperate under the 'enhanced cooperation procedure', which is possible under certain conditions (Bassi *et al.*, 2010). While there has been limited use of this procedure to date (e.g., patents, financial transaction tax), it remains an option that could be relied on more frequently in the future.

### *Border adjustments*

Trade-related measures such as border carbon adjustments (BCAs) would encourage other countries to initiate GFR as they are penalized for not having a similar system in place (De Mooij *et al.* 2012). Border adjustments are often raised in discussions; however, they are difficult to implement in practice and remain controversial. They are highly politically sensitive given trade implications. Nonetheless, there are some studies that suggest that well-designed BCAs could overcome concerns (e.g., see Vivid Economics 2012). There is a need for further analysis of such measures, in particular how they could be designed and implemented to be WTO compliant and whether they provide a feasible and practical option to mitigate some concerns related to ambitious GFR.

### *Compensation Measures for Vulnerable Households*

Different measures can be used to mitigate negative GFR impacts on vulnerable households (see Table 2). These measures need to be tailored to the national context. For example, providing compensation through changes in social security payments may be easier in developed countries where a dedicated administration and infrastructure exists; while it may be more challenging in developing countries until such capacities are developed (Clements *et al.* 2013).

#### *Tax free allowances or targeted reductions*

Some countries provide tax free allowances or lifeline tariffs for basic use of an essential service by vulnerable groups. In Uganda, for example, a lifeline tariff of Ugandan shilling 100 per kWh is provided for electricity consumption up to 15 kWh a month by poor households (IMF 2013). Such tariff schedules can help reduce the adverse effect of price increases on vulnerable households; however, they require supporting infrastructure such as metering devices and connection to the grid (World Bank 2014). Moreover, experiences in some countries suggest they are less effective in protecting low-income households. For example, in El Salvador a large proportion of low-income households do not benefit from lifeline electricity tariffs as they are not connected to the grid or their consumption levels are above the threshold given that the family size is large (Arze del Granado *et al.* 2010). In addition, such tariffs do not incentivize reduced consumption, thus other measures could be considered such as applying the full tax rate to all users and providing a targeted refund to vulnerable groups or providing support through other channels. For example, in Denmark, water pricing is based on metering while affordability of water and waste water services is ensured by income support through social policy systems (OECD 2008), thus retaining an incentive element in water pricing for all water users (EEA 2013).

#### *Cash transfers*

Many countries use targeted or untargeted cash or near-cash (e.g., vouchers) transfers as an effective way of compensating households for effects of GFR (World Bank, 2014). However they can also be considered inefficient for the overall economy compared to other revenue use options such as cuts in payroll, personal income, or corporate taxes. Moreover, there are issues of corruption, fraud, and targeting errors that have arisen in the application of some programmes, thus they need to be carefully designed and regularly monitored to ensure they reach intended beneficiaries. Such programmes may also require complementary investments (e.g., registers of eligible groups, a system to administer the transfer) that are costly and take time to set up. Technological advancements can simplify implementation, improve targeting, reduce corruption, and prevent leakage—see Box 8.

**Table 2:** Overview of potential measures to mitigate impacts of GFR on vulnerable households

Type of measure	Strengths	Weaknesses
<i>Design and implementation approaches</i>		
Timetable	Gradual introduction allows time to adjust to revised prices Reduces opposition	Could lead to backsliding and reversals of commitments Risk of hoarding and shortages Creates expectations of inflation Foregone revenues (and environmental benefits) in short term
Sequencing	Reduces impacts on vulnerable groups	Reduces revenues from GFR Creates distortions or negative incentives Time for opposition to build up
Stakeholder engagement	Builds ownership and legitimizes process Increases awareness Reduces opposition	Risks delaying GFR process Opportunity for lobbying against reform
<i>Compensation mechanisms</i>		
Allowances/reductions	Protects low-income groups Reduces opposition and builds support Ease of administration Can provide incentives for conservation if well designed	Limited reach as only covers households connected to electricity grid/water system Undermines incentives for conservation if not well designed Risk of leakage if measures are not means tested or well-targeted
Cash transfers	Beneficiaries have flexibility in spending Links to conditionality to ensure transfers spent on 'desirable' uses Reduces opposition and builds support	Requires administrative capacity and infrastructure Increases risk of corruption Targeting errors Requires regular monitoring Could become entrenched in expectations
In-kind transfers	Useful when government lacks administrative capacity to implement cash transfers Eases pressure on vulnerable groups Wins political and public favour as limits freedom of recipients to spend on 'undesirable' uses Can include incentives to encourage behaviour change	Limited flexibility Distorts household choices Could become entrenched in expectations Difficult to target, risk of diversion, smuggling, corruption

Source: Author's synthesis

In some cases, transfers are linked to specific conditionality, for example, requiring the beneficiary to invest in education or health, thus simultaneously alleviating the impacts of GFR and addressing some of the root causes of poverty (Clements *et al.* 2013). Similar conditional cash transfers have been successfully used in a number of countries, including Brazil, Columbia, and Mexico. Such measures do not require complex administration or governance systems and can be distributed through existing structures such as schools or post offices (Laan *et al.* 2010).

**Box 8: Driving fuel subsidy reform in India**

Fossil fuel subsidy reform (and food subsidy reform) is part of a package of good governance and reform being driven by Prime Minister Shri Narendra Modi in India. Reforms announced by the government in October 2014 included immediate decontrol of diesel prices, an increase in the regulated price of natural gas, fixing the total subsidy per LPG cylinder, and direct transfer schemes. Reform has been facilitated by wider technological advancements including a programme to increase household bank accounts that will help implement cash transfers, while the Aadhaar (unique identification scheme) will help reduce corruption and leakage of benefits.

Sources: Clarke and Sharma (2014), The Economist (2014)

*In-kind transfers*

Where cash transfers are not feasible (e.g., due to limited administrative capacity), in-kind transfers such as investments in social programmes can reduce pressure on vulnerable household budgets and thus alleviate some negative impacts of GFR—see Box 9. In-kind transfers can also include incentives to help ease pressure on household budgets (e.g., energy efficiency improvements, tax breaks on public transport). Although such in-kind transfers are less economically efficient (as they distort household choices), they are sometimes favoured by policy makers as they ensure spending on ‘acceptable’ uses and are often relatively easy to implement (World Bank 2014). They should be carefully designed and regularly reviewed to ensure they reach intended beneficiaries.

**Box 9: Fossil fuel subsidy reform in Indonesia**

In 2005, the government began a process to eliminate fuel subsidies, supported by a public information campaign and a programme of cash and in-kind transfers that used the existing social protection programmes and included temporary unconditional cash transfer payments, investments in education, rural development and health, incentives to shift from kerosene to LPG. Following the reintroduction of subsidies in 2009 in the lead up to national elections, the reform was put back on track in 2013 and was accompanied by a package of compensatory measures including temporary unconditional cash transfers, assistance for poor students, subsidized rice, basic infrastructure, and conditional cash transfers. In November 2014, the government under President Joko Widodo raised gasoline and diesel prices and in January 2015 announced the elimination of gasoline subsidies and a reduction in the diesel subsidy. Falling global oil prices helped mitigate impacts of the reforms. Revenue savings supported social programmes, including cash transfers to the poor and infrastructure investments.

Sources: IMF (2013), GIZ (2013), Beaton *et al.* (2013), The Economist (2015a, 2015b), World Bank (2014)

*Using GFR Revenues*

There are different options for how revenues from GFR are used (see Table 3). How revenues are used and the proportion used to mitigate adverse impacts depends

**Table 3:** Overview of potential options for revenue use from GFR

Revenue use option	Strengths	Weaknesses
Tax shift	<ul style="list-style-type: none"> <li>• Part of wider tax shifting programme</li> <li>• Can help with economy wide efficiency by allowing reduction in distorting taxes (e.g. on labour)</li> <li>• 'Lock-in' GFR as changes require increase in other taxes (De Mooij <i>et al.</i>, 2012)</li> <li>• Allows overall tax burden to remain the same</li> </ul>	<ul style="list-style-type: none"> <li>• Only affects people who pay taxes (except VAT reductions)</li> <li>• Needs to be combined with additional measures to address regressivity concerns</li> <li>• Immediate benefits may be less clear than other options, which can lead to less public acceptability</li> </ul>
Raise revenues for general budget	<ul style="list-style-type: none"> <li>• Flexibility in government spending</li> <li>• Maintains rigour in budgetary allocation systems</li> <li>• Supports fiscal consolidation needs</li> </ul>	<ul style="list-style-type: none"> <li>• May not be favoured by public as benefits not visible and expenditure cannot be tracked</li> <li>• Against public perceptions that revenues from 'green' reforms used for environmental purposes</li> </ul>
Recycle into economy or affected sector	<ul style="list-style-type: none"> <li>• Can transform sector and maintain competitiveness</li> <li>• Increases acceptance in affected sector, reduces transition costs</li> <li>• Revenue neutrality can increase political acceptability as overall tax burden on sector remains the same</li> </ul>	<ul style="list-style-type: none"> <li>• Limits signalling effect and incentives for change if not well designed</li> <li>• Should be time limited</li> </ul>
Earmarking (full or partial)	<ul style="list-style-type: none"> <li>• Facilitates/catalyses innovation</li> <li>• Ease transition costs among affected group(s)</li> <li>• Ensures resources for relevant activities (e.g., enforcement)</li> <li>• Can be useful to build support among public who believe GFR revenues should be used for environmental purposes</li> </ul>	<ul style="list-style-type: none"> <li>• Usually no relation between amount of revenue from GFR and the efficient amount of spending on a particular earmark</li> <li>• Can create distortions, lead to a prioritization of certain spending</li> <li>• Once in place, may be difficult to reverse or revise</li> <li>• Creates obstacles/rigidities in tax system</li> <li>• Conflict between revenue raising and environmental objectives</li> <li>• Legal obstacles to earmarking</li> <li>• Not favoured by finance/economic departments</li> </ul>

Source: Author's synthesis.

on various factors including objectives of the GFR, stakeholder perceptions, tax structure, government credibility, and administrative capacities.

There are different types of revenue recycling mechanisms including reductions in income tax rates and social security contributions, lump sum transfers, and

tax credits. Such mechanisms need to be carefully designed to ensure effective incentives—see Box 10. Recycling mechanisms may also need to be revised over time, for example, to maintain revenue neutrality or to ensure system does not become regressive.

While earmarking revenues (partially or fully) for specific purposes is controversial, it can be useful in certain circumstances, for example, to finance environmental monitoring and enforcement efforts, particularly in countries where such activities are underfunded (OECD 2005a, World Bank 2005)—see Box 11.

Revenues could be used to support positive incentive schemes such as payments for ecosystem services (e.g., hydrological environmental services programme in Mexico financed through an earmarked share of water use fees—see CBD 2011). Such partial earmarking can build acceptance given that the public sometimes believes revenues from GFR should be used for environmental purposes. Where (partial) earmarking is adopted, it needs to be carefully designed with a clear target, level, and timescale, taking into account the absorption potential of the target group. Such provisions should also be regularly reviewed with adequate safeguards to ensure correct management and use of funds (OECD 2005a).

### ***Smart Principles for the Design and Implementation of Compensation Measures***

Compensation measures need to be carefully designed and monitored to ensure they achieve intended objectives, maintain a positive signalling effect, contribute to overall objectives of GFR, avoid becoming entrenched in expectations of beneficiaries, and costs do not spiral out of control (UNEP 2004). Some smart principles to guide design are set out in Box 12 (building on findings by Withana *et al.* 2013).

### **Strategies, Approaches, and Tools to Drive GFR**

In addition to mitigation measures, there are a number of strategies, approaches, and tools to help overcome obstacles to GFR. These form part of a comprehensive GFR strategy encompassing all stages of the policy cycle (see Figure 2).

### ***Processes and Tools to Support GFR***

Before deciding on whether to undertake a GFR, there is a need to identify priority areas for action. For example, in relation to subsidies, countries could screen the status quo to establish which subsidies are harmful and require action and are thus priorities for reform. Such an assessment could make use of different tools such as the OECD's quick scan (OECD 1998), checklist (OECD 2005b), and integrated assessment framework (OECD 2007), and other such as the subsidy reform flowchart (see Figure 3). These efforts could build on existing work that is particularly advanced on fossil fuel subsidies (e.g., Parry *et al.* 2014).

**Box 10: Lessons from the carbon tax experiment in Australia**

A carbon tax introduced in July 2012, which was to be replaced by a tradable permit system from July 2015, was repealed in July 2014. Although no longer in existence, the tax had a number of interesting mechanisms to mitigate impacts including increases in pension allowances, family payments, and income tax cuts and incentives to businesses to invest in cleaner energy programmes and production processes. Support provided to 'emission-intensive trade-exposed' industrial activities was varied according to the degree of exposure of industries and was to be reduced by 1.3 per cent/year, thus providing targeted assistance while ensuring due dynamics in the sector through a gradual reduction over time.

Despite this package of compensating measures, the tax was the target of major attack with critics arguing it would lead to substantial job losses and economic costs (despite previous modelling results from the Treasury, which suggested otherwise). Political interests and a strong mining lobby led to the repeal of the tax in July 2014 and its replacement by a 'Direct Action Plan', which offers grants to companies voluntarily reducing emissions.

Sources: Australian Government (2011, 2012), BBC (2014), Withana *et al.* (2013)

**Box 11: Wastewater pollution charges in Columbia**

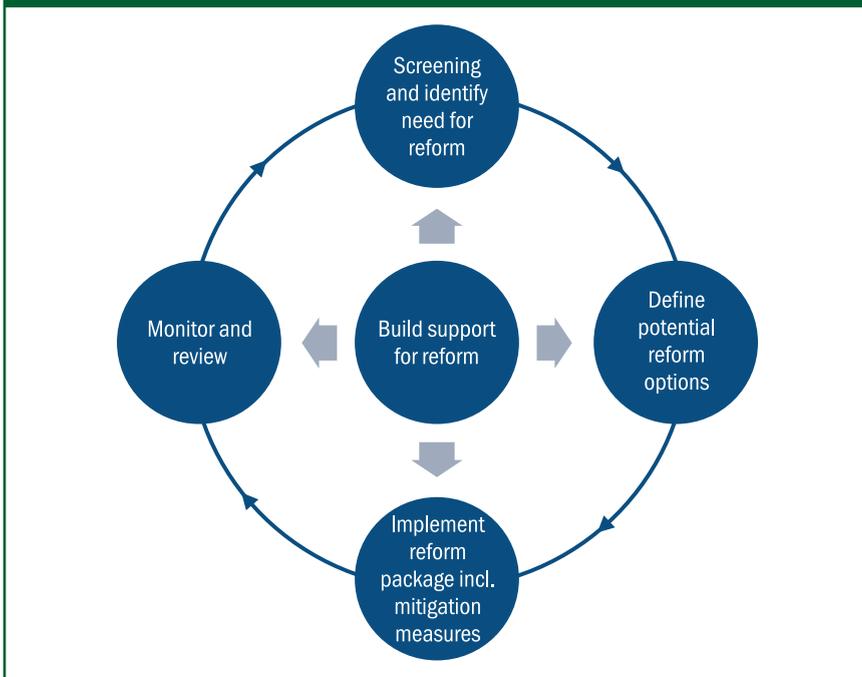
Under a national discharge fee programme, regions set pollution reduction goals, apply national base charges, and track discharges. Revenues are used by environmental authorities for environmental investments in industries and capacity building in environmental agencies. Despite some problems (including limited implementation in some regions), pollution discharges have dropped significantly in some watersheds since the programme was introduced. In addition to incentivizing emission reductions, the scheme has helped enhance transparency and accountability in certain cases, while the prospect of increased revenues has incentivized some local regulators to improve permitting, monitoring, and enforcement of wider water pollution-related legislation.

Sources: Blackman (2007), GIZ (2013), ECLAC and UNDP (2001), World Bank (2005)

**Box 12: Smart principles for the design and implementation of compensation measures**

- Measures should target the most exposed or vulnerable groups, for example, energy-intensive industries that operate in a highly competitive market and are in a sector with significant international trade. Criteria for granting exemptions should be developed with tax authorities to ensure that they are practical and enforceable.
- Measures should have a clear timeline that includes a schedule for a progressive phase out.
- Measures should be developed in an open, participatory approach with key stakeholders.
- Measures should be simple to administer and build on existing systems to the extent possible.
- Exemptions should be gradually reduced or phased out over time.
- Partial reductions should be used rather than full exemptions to maintain positive incentives.
- Exemptions (and other compensation measures) should be linked to effective conditionality.
- Exemptions should have some sort of reporting agreement that requires beneficiaries to demonstrate the merits of the exemption (proof of effectiveness).
- A monitoring and review system should be established to assess effectiveness of measures (and use of revenues) and undertake revisions where necessary.

Figure 2: Stylized representation of GFR policy cycle



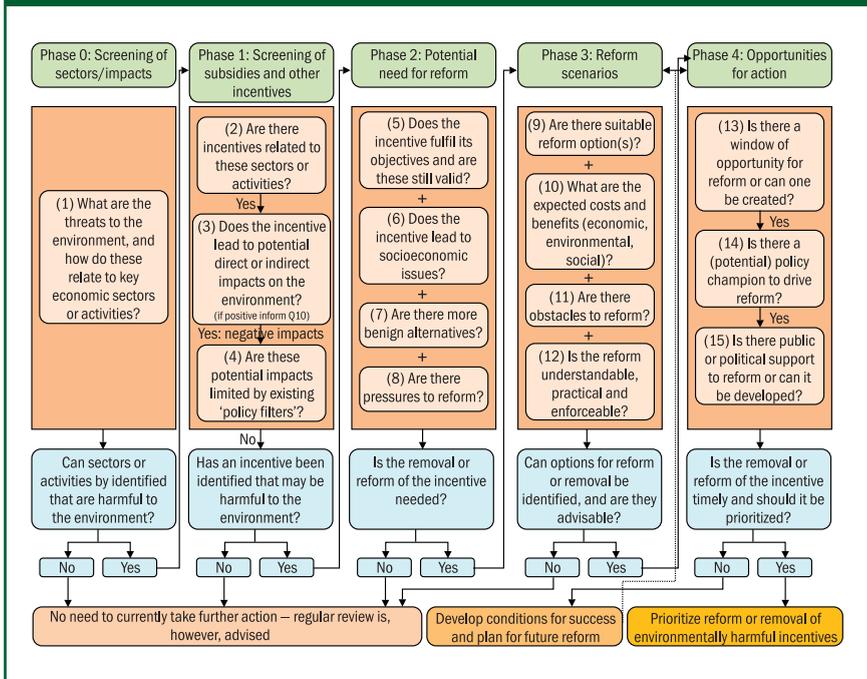
Source: Author's representation.

Countries could establish commissions or committees on (green) fiscal reform to identify reform options (e.g., in Portugal and Norway). Technical support could be provided by external actors such as international organisations (e.g. GIZ-IMF-UNEP Green Fiscal Policy Network, Energy Subsidy Reform and Delivery Technical Assistance Facility of the World Bank), national agencies, and civil society organizations.

### *Design and Implementation Options*

In a number of cases, a phased approach to GFR (e.g., starting with low rates and progressively scaling up over time) may be easier to implement as it allows actors time to adjust and reduces resistance. The risk of such an approach is backsliding, particularly over longer timelines—for example in Indonesia in 2009 (see Box 9) and in Australia in 2014 (see Box 10). Although there are some cases where a swift reform has been successful (see Box 13), there are however significant risks associated with such a sudden price hike. For example, in Nigeria, an overnight increase in gasoline prices of 117 per cent in January 2012 led to mass public riots and the government had to subsequently scale back the price increase (IMF 2013). Similarly in Bolivia, the elimination of subsidies in 2010 led to an unexpected and

**Figure 3: Subsidy reform flowchart piloted in the UK to identify incentives harmful to biodiversity**



Source: Oosterhuis and ten Brink (2014)

sudden increase in prices by over 80 per cent that led to widespread protests and eventual reinstatement of the subsidies (WEF 2013, UNEP/CBD/WGRI 2014). These experiences illustrate that even a sudden GFR requires appropriate planning and communication and should be accompanied by a wider package of measures. The timing of GFR is another important consideration. For example, one could introduce GFR at a time when effects are minimized such as in summer period when heating costs are lowest or when fuel prices are falling (e.g., recent fossil fuel subsidy reforms in India and Indonesia). One could also coordinate the GFR with other measures, for example, increases in electricity tariffs in Uganda coincided with an expansion in grid capacity that helped increase acceptability (Clements *et al.* 2013).

Sequencing of GFR is important and can be a temporary measure to alleviate impacts. For example, fossil fuel subsidy reform could start by focusing on subsidies that benefit the rich most (e.g., gasoline) while adopting a slower pace of reform for subsidies that affect the poor (e.g., kerosene). This should only be considered a short-term solution as large price differentials between different

types of fuels could lead to distortions such as smuggling (Beaton *et al.* 2013). One could also implement a pilot scheme to indicate expected effects and fine-tune reform before widespread implementation. Such an approach was, for example, adopted when introducing a congestion charge in Stockholm, Sweden (De Borger and Proost 2012).

### ***GFR as Part of a Wider Reform Package and Policy Context***

Making GFR part of a wider reform package that includes compensation mechanisms and complementary policies (e.g., investments in substitution possibilities) can help overcome obstacles, ease transition costs, and contribute to long-term sustainability (Lehmann *et al.* 2011)—see Box 13.

It is useful to link GFR to wider policy commitments and processes at different levels. For example, in France, work to identify and analyse biodiversity harmful incentives were launched in the context of the Grenelle de l'environnement process, which helped maintain focus on the issue (Withana *et al.*, 2012). GFR commitments can also be framed in relation to commitments at the regional (e.g., G-20, APEC, EU), or international levels (e.g., CBD) to build a further case for reform.

Addressing issues of corruption, good governance, credibility, and trust could be an important entry point for GFR in some countries—see Box 14. This is by no means a trivial task and encompasses multiple challenges relating to governance, transparency, accountability, administrative capacities, and stakeholder engagement. Some of the tools and strategies for GFR can contribute to these efforts (e.g., encouraging stakeholder dialogue, building enforcement capacities, supporting budgetary transparency, etc.).

### ***Communication and Engagement***

Building support is critical to ensure success of the GFR process. For example, an IMF review of experiences with subsidy reform in 40 countries between 2002 and 2006 found that the likelihood of success almost tripled with public support and an engaging public communications campaign (IMF 2011). A strong communication

#### **Box 13: Reforming fisheries subsidies in New Zealand**

New Zealand undertook a major reform of its fisheries policy in the late 1980s, which saw subsidies eliminated abruptly. This was combined with more fundamental changes to the fisheries management regime that dampened the effect of the subsidy removal. The reform package included introduction of a property rights-based quota management system and individual transferable quotas combined with a minimum buy-out of existing rights from fishermen. These measures helped create a sustainable fishing sector, avoid potential negative social and environmental impacts of the sudden removal of the subsidies, and increase public acceptability. The subsidy removal and new management regime contributed to more effective management of fish stocks and in some cases a recovery of certain stocks from overexploitation.

Sources: CBD (2011), Lehmann *et al.* (2011), OECD (2007, 2011), ten Brink *et al.* (2014a)

**Box 14: Forestry reform in Cameroon**

In the late 1990s, the government initiated a number of transparency and governance reforms in the forestry sector to improve its international credibility and increase revenues (corruption was estimated to lead to lost revenues from the sector of over US\$ 100 million each year). The reform was driven by the Ministry of Finance. Publication of data on lost revenues helped build support for reform while a number of key stakeholders were engaged in the reform process. The reforms increased revenues from about US\$ 5 million to US\$ 50 million per annum in revenues to the state, and from close to zero to US\$ 9 million per annum in revenues to local governing bodies from 1994 to 2002. The reforms also led to substantial environmental improvements, encouraged stakeholder collaboration, and improved forest governance and transparency.

Source: OECD (2005a), Topa *et al.* (2009), World Bank (2005)

and engagement strategy is needed throughout the process—see Box 15. This strategy should use a variety of media and target external (stakeholders, public, and parliamentarians) and internal (different government departments) actors. It is important to frame messages in a positive narrative, clarifying concrete impacts on people's everyday lives (e.g., improved service provision, expanded coverage of network, impacts on health), clarify how those adversely affected will be supported, and refer to cases of successful reforms in other sectors and/or countries.

***Monitoring and Review***

Impacts of GFR can change over time, thus it is important to regularly review the process to reassess impacts over time, ensure mitigation measures are effective, and maintain momentum. This can be done at different levels, for example:

- At the national level, revenues raised and their use should be independently monitored to assess implementation of government spending commitments and reduce risks of corruption. The effectiveness of mitigation measures should also be assessed.

**Box 15: Plastic bag levy in Ireland**

The Irish plastic bag levy was introduced in 2002 at a rate of EUR 0.15 per bag and increased to EUR 0.22 from July 2007. Following its introduction, plastic bag use fell from an estimated 328 bags per capita in 2002 to 14 bags per capita in 2012. In preparing for the introduction of the levy, the government undertook extensive consultation on the design of the scheme with the public, the Irish Business and Employers' Confederation, and leading retailers. A national publicity campaign reiterated the message that revenues would be used for environmental purposes. The levy was introduced at the end of the winter when littered plastic bags are especially visible. The then Irish Environment Minister ensured close collaboration between various arms of government and was influential in ensuring a robust legislative and regulatory base for the levy.

Sources: Convery *et al.* (2007), GIZ (2013), Lyons (2013), O'Connell (2013), Withana *et al.* (2014)



- At the regional level, voluntary peer-review processes initiated under the G20 and APEC in relation to fossil fuel subsidies can be used to monitor progress.
- At the international level, reporting could build on efforts to monitor progress on international commitments such as regular reporting on Aichi Biodiversity Target 3 (UNEP/CBD/COP 2014).

### *Windows of Opportunity*

The current economic context, high levels of public debt, and needs for fiscal consolidation have been used by some countries such as Ireland, Italy, and Portugal to drive forward recent GFR-related initiatives (Withana *et al.* 2014). Thus, a crisis, such as an economic or financial one, can simultaneously be a useful trigger to mobilize action and an opportunity to generate change. Other windows of opportunity at the national level include a post-election period (e.g., see Box 8 on India), deteriorating public energy or water infrastructure, dwindling national energy reserves, corruption concerns (e.g., see Box 14 on Cameroon), and a decline in oil prices (e.g., see Box 9 on Indonesia). Such efforts should be based on a comprehensive strategy to ensure they are not reversed when times change.

Commitments at the regional or international level can also be useful windows of opportunity. For example, GFR processes could be framed in the context of implementing Sustainable Development Goals (SDGs) and related targets (e.g., on fisheries and fossil fuel subsidies) or to meet CBD and UNFCCC commitments to mobilize financing for biodiversity and climate change, respectively.

It is also possible to create new windows of opportunity and avenues for progress. For example in the EU, the European Semester process provides a mechanism to monitor Member States' progress on issues including GFR and recommend improvements. A future avenue could appear in a possible revision of Regulation on European Environmental Economic Accounts No. 691/2011 to include a module on environmentally related subsidies (ten Brink *et al.* 2014b).

### **Moving Forward with GFR**

GFR has attracted renewed interest in recent years. However, efforts remain limited and are often constrained by various obstacles. While these concerns are important they should not be used as an excuse to avoid GFR as they can be addressed through well-designed mitigation measures for vulnerable groups, use of revenues, and complementary strategies. GFR requires a comprehensive, integrated, and consultative approach. There is also a need to be pragmatic, allowing for deviations from certain theoretical ideals (e.g., no earmarking, avoiding exemptions), as a politically expedient way of making progress. Such departures should be tolerated provided they are well designed with adequate safeguards including monitoring and review mechanisms.

The political challenges of reform remain significant and sometimes despite good intentions and due processes, GFR efforts fail or decisions are reversed. Thus, it is critical to build widespread support and political capital for reform that transcends party–political lines and short-term electoral timelines to ensure GFR stays on track despite changing circumstances. As with other types of political reform, durable GFR also depends on government credibility and links to wider issues of good governance. This is by no means a trivial task; however, the tools and strategies for GFR can contribute to these processes.

Additional research including ex-post assessments of GFR in different areas (including but going beyond climate and energy) and impacts (including on competitiveness, jobs, and health) can build support and provide lessons on design. Research on options for further progress such as cooperation between countries or border adjustments could drive more ambitious efforts. There is also a need to better understand the role of GFR in the policy mix to support the shift to an inclusive green economy and implement the SDGs.

There are currently several attractive windows of opportunity to further promote the GFR agenda, including falling oil prices. Some countries are already seizing these opportunities and creating new avenues to promote GFR. Others should be encouraged to follow their lead. Such efforts should be based on a comprehensive reform strategy and seek broad support to ensure their success.

## References

- Albrizio, S., Botta, E., Koźluk, T., and Zipperer, V. (2014). *Do Environmental Policies Matter for productivity growth? Insights from New Cross-Country Measures of Environmental Policies* [Working Papers No. 1176]. Paris, France: OECD Economic Department.
- Arze del Granado, J., Coady, D., and Gillingham, R. (2010). *The Unequal Benefits of Fuel Subsidies: A Review of Evidence for Developing Countries* [Working Paper No.10/202]. Washington, DC: International Monetary Fund Fiscal Affairs Department.
- Australian Government. (2011). *Securing a Clean Energy Future: The Australian Government's Climate Change Plan in Summary*. Commonwealth of Australia 2011. Retrieved from <http://www.cleanenergyfuture.gov.au/wp-content/uploads/2011/07/securing-a-clean-energy-future-summary.pdf> (accessed on December 1, 2014).
- Australian Government. (2012). *An overview of the Clean Energy Legislative Package*. Retrieved from [http://www.cleanenergyfuture.gov.au/wp-content/uploads/2012/05/CEF-overview\\_Apr2012.pdf](http://www.cleanenergyfuture.gov.au/wp-content/uploads/2012/05/CEF-overview_Apr2012.pdf) (accessed on December 1, 2014).
- Bassi, S., Pallemaerts, M., and ten Brink, P. (2010). Exploring the Potential of Harmonizing Environmental Tax Reform Efforts in the European Union. In *Critical Issues in Environmental Taxation – International and Comparative Perspectives, Volume VIII*, H. Ashiabor, K. Deketelaere, C. Dias Soares, L. Kreiser, and J. E. Milne, eds. New York, NY: Oxford University Press, pp. 89–107.

- BBC. (2014, July 17). Australia Votes to Repeal Carbon Tax. *BBC News*. Retrieved from <http://www.bbc.com/news/world-asia-28339663> (accessed on December 1, 2014).
- Beaton, C., Gerasimchuk, I., Laan, T., Lang, K., Vis-Dunbar, D., and Wooders, P. (2013). *A Guidebook to Fossil Fuel Subsidy Reform for Policy Makers in South-East Asia*. Geneva, Switzerland: Global Subsidies Initiative of the International Institute for Sustainable Development.
- Blackman, A. (2007). *Colombia's Discharge Fee Program - Incentives for Polluters or Regulators?* [Discussion Paper No. 05-31 REV]. Retrieved from <http://www.rff.org/rff/Documents/RFF-DP-05-31-REV.pdf> (accessed on December 1, 2014).
- British Columbia Ministry of the Environment (2012). *Making Progress on B.C.'s Climate Action Plan*. Retrieved March 4, 2013, from: <http://www.env.gov.bc.ca/cas/pdfs/2012-Progress-to-Targets.pdf> (accessed on December 1, 2014).
- British Columbia Ministry of Finance (2013). *Carbon tax: Overview of the revenue-neutral carbon tax and Carbon tax review*. Retrieved March 3, 2013, from: [http://www.fin.gov.bc.ca/tbs/tp/climate/carbon\\_tax.htm](http://www.fin.gov.bc.ca/tbs/tp/climate/carbon_tax.htm) (accessed on December 1, 2014).
- Bruvoll, A., and Vennemo, H. (2014). Reform of Environmentally Harmful Subsidies: Distributional Issues. In *Paying the Polluter: Environmentally Harmful Subsidies and Their Reform*, F. Oosterhuis and P. ten Brink, eds. Cheltenham, UK: Edward Elgar Publishing, pp. 263–80.
- CBD. (2011). *Incentive Measures for the Conservation and Sustainable Use of Biological Diversity - Case Studies and Lessons Learned* [CBD Technical Series No. 56]. Montreal, Canada: Secretariat of the Convention on Biological Diversity.
- Clarke, K., and Sharma, S. (2014). *India Energy Subsidy Review – A Biannual Survey of Energy Subsidy Policies*. Geneva, Switzerland: Global Subsidies Initiative of the International Institute for Sustainable Development.
- Clements, B., Coady, D., Fabrizio, S., Gupta, S., Alleyne, T., and Sdravovich, C., eds. (2013). *Energy Subsidy Reform: Lessons and Implications*. Washington, DC: International Monetary Fund.
- Coady, D., and Newhouse, D. (2006). Ghana - Evaluating the Fiscal and Social Costs of Increases in Domestic Fuel Prices. In *Poverty and Social Impact Analysis of Reforms: Lessons and Examples from Implementation*, A. Coudouel, A.A. Dani and S. Paternostro, eds. Washington, DC: The World Bank, pp. 387–413. Retrieved from [http://siteresources.worldbank.org/INTPSIA/Resources/490023-1120841262639/ch11\\_ghana.pdf](http://siteresources.worldbank.org/INTPSIA/Resources/490023-1120841262639/ch11_ghana.pdf) (accessed on December 1, 2014).
- Coady, D., Parry, I., Sears, L., and Shang, B. (2015). *How Large are Global Energy Subsidies?* [Working Paper 15/105]. Washington, DC: International Monetary Fund.
- Convery, F., McDonnell, S. and Ferreira, S. (2007). The most popular tax in Europe? Lessons from the Irish Plastic Bags Levy. *Environmental and Resource Economics* 38(1): 1–11.
- De Borger, B., and Proost, S. (2012). A political economy model of road pricing. *Journal of Urban Economics* 71(1): 79–92.
- De Mooij, R., Keen, M., and Parry, I. W. H., eds. (2012). *Fiscal Policy to Mitigate Climate Change – A Guide for Policymakers*. Washington, DC: International Monetary Fund.

- Duscha, M., Grießmann, B., Rath, U., Seebach, D., and Thomas, S. (2005). *Politikinstrumente zum Klimaschutz durch Effizienzsteigerung von Elektrogeräten und Anlagen in Privathaushalten, Büros und im Kleinverbrauch*. Endbericht im Auftrag des Umweltbundesamtes (FKZ 201 41 137). Heidelberg, Germany: Institut für Energie- und Umweltforschung (IFEU)
- ECLAC and UNDP. (2001). *Financing for Sustainable Development in Latin America and the Caribbean*. Paper prepared for the Regional Preparatory Conference of the Latin America and the Caribbean for the World Conference on Sustainable Development, Economic Commission for Latin America and the Caribbean, and the United Nations Development Programme.
- EEA. (2011). *Environmental Tax Reform in Europe: Implications for Income Distribution* [EEA Technical Reports No. 16/2011]. Copenhagen, Denmark: European Environment Agency.
- EEA. (2013). *Assessment of Cost Recovery through Water Pricing* [EEA Technical Report No 16/2013]. Copenhagen, Denmark: European Environment Agency.
- European Commission. (2013). *Taxation Trends in the European Union: Data for the EU Member States, Iceland and Norway*. Luxembourg, European Union: Eurostat Statistical Books.
- European Commission. (2014). *Taxation and Customs Union - European Commission Proposes to Overhaul Energy Taxation Rules*. Retrieved from [http://ec.europa.eu/taxation\\_customs/taxation/excise\\_duties/energy\\_products/legislation/index\\_en.htm](http://ec.europa.eu/taxation_customs/taxation/excise_duties/energy_products/legislation/index_en.htm) (accessed on January 12, 2014).
- GIZ. (2013). *Environmental Fiscal Reform Case Studies*. Bonn and Eschborn, Germany: Deutsche Gesellschaft für Internationale Zusammenarbeit.
- Heindl, P., Germany, M., and Löschel, A. (2014). *Addressing Social Implications of Green Growth: Energy Sector Reform and Its Impact on Households*. Issue note prepared for Session 1 of the Green Growth and Sustainable Development Forum, November 13–14, 2014. Paris, France: OECD.
- IIEP, Ecologic, Vrije Universiteit Amsterdam, and Fondazione Eni Enrico Mattei. (2007). *Reforming Environmentally Harmful Subsidies* [Final report to the European Commission's DG Environment, March 2007]. IIEP, Ecologic, FEEM and IVM.
- IMF. (2011). *Regional Economic Outlook: Middle East and Central Asia*. World Economic and Financial Surveys. Washington, DC: International Monetary Fund.
- IMF. (2013). *Case studies on Energy Subsidy Reform: Lessons and Implications*. Washington, DC: International Monetary Fund.
- Laan, T., Beaton, C., and Presta, B. (2010). *Strategies for Reforming Fossil Fuel Subsidies: Practical Lessons from Ghana, France and Senegal*. Geneva, Switzerland: Global Subsidies Initiative (GSI) of the International Institute for Sustainable Development (IISD).
- Lehmann, M., ten Brink, P., Bassi, S., Cooper, D., Kenny A., Kuppler, S., von Moltke A., Withana, S., and Shine, C. (2011). Reforming Subsidies. In *The Economics of Ecosystems and Biodiversity in National and International Policy Making*, P. ten Brink, ed. London, UK: Earthscan, pp.259–97.



- Lyons, L. (2013). *DYNAMIX Policy Mix Evaluation - Reducing Plastic Bag Use in the UK and Ireland*. Dynamix. Retrieved from [http://dynamix-project.eu/sites/default/files/Plastic%20bags\\_Ireland%20and%20UK.pdf](http://dynamix-project.eu/sites/default/files/Plastic%20bags_Ireland%20and%20UK.pdf) (accessed on December 1, 2014).
- O'Connell, H. (2013, August 18). The Plastic Bag Levy has Raised over EUR 200 Million Since 2002. *The Journal.ie*. Retrieved from <http://www.thejournal.ie/plastic-bag-levy-revenue-1040128-Aug2013> (accessed on December 1, 2014).
- OECD. (1998). *Improving the Environment through Reducing Subsidies*. Paris, France: OECD Publishing.
- OECD. (2005a). *DAC Guidelines and Reference Series: Environmental Fiscal Reform for Poverty Reduction* [DAC Reference Document]. Paris, France: OECD Publishing.
- OECD. (2005b). *Environmentally Harmful Subsidies. Challenges for Reform*. Paris, France: OECD Publishing.
- OECD. (2007). *Subsidy Reform and Sustainable Development - Political Economy Aspects*. Paris, France: OECD Publishing.
- OECD. (2008). *OECD Environmental Performance Reviews: Denmark 2007*. Paris, France: OECD Publishing.
- OECD. (2010a). *Taxation, Innovation and the Environment*. Paris, France: OECD Publishing.
- OECD. (2010b). *Innovation Impacts of the Swedish NOx Charge*. Paris, France: OECD Publishing.
- OECD. (2011). *Fisheries Policy Reform: National Experiences*. Paris, France: OECD Publishing.
- OECD. (2013a). *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013*. Paris, France: OECD Publishing. Retrieved from: <http://www.oecd.org/site/tadffss/48786631.pdf> (accessed on December 1, 2014).
- OECD (2013b). *The Swedish Tax on Nitrogen Oxide Emissions: Lessons in Environmental Policy Reform* [OECD Environment Policy Paper No. 2, December 2013]. Paris, France: OECD Publishing.
- OECD/EEA. (2014). *Database on Instruments Used for Environmental Policy*. Retrieved from <http://www2.oecd.org/ecoinst/queries/> (accessed on February 9, 2015).
- Oosterhuis F. H., and ten Brink P., eds. (2014). *Paying the Polluter. Environmentally Harmful Subsidies and their Reform*. Cheltenham, UK and Northampton, MA: Edward Elgar.
- Parry, I. W. H., Heine, D., Li, S., and Lis, E. (2014). Summary for Policy Makers. In *Getting Energy Prices Right: From Principle to Practice*, I. W. H. Parry, D. Heine, S. Li, and E. Lis, eds. Washington, DC. International Monetary Fund, pp. 1–9.
- Peter, M., Lückge, H., Iten, R., Trageser, J., Görlach, B., Blobel, D. and Kraemer, R. A. (2007). *Erfahrungen mit Energiesteuern in Europa — Lehren für die Schweiz*. Schweizerischen Bundesamtes für Energie (BFE).
- Speck S., and Jilkova J. (2009). Design of Environmental Tax Reforms in Europe. In *Carbon-Energy Taxation: Lessons from Europe*, M. S. Andersen and P. Ekins, eds. Oxford, NY: Oxford University Press, pp. 24–52.

- Sternier, T., ed. (2012). *Fuel Taxes and the Poor: The Distributional Effects of Gasoline Taxation and Their Implications for Climate Policy*, Washington, DC: RFF Press.
- Sternier, T. and Höglund-Isaksson, L. (2006). Refunded Emission Payments Theory, Distribution of Costs, and Swedish Experience of NOx Abatement. *Ecological Economics* 57(1): 93–106.
- Sternier, T., and Turnheim, B. (2009). Innovation and Diffusion of Environmental Technology: Industrial NOx Abatement in Sweden under Refunded Emission Payments. *Ecological Economics* 68(12): 2996–3006
- Sustainable Prosperity. (2012). *British Columbia's Carbon Tax Shift: The First Four Years*. Ottawa, Canada: University of Ottawa.
- ten Brink, P., ed. (2002). *Voluntary Environmental Agreements - Process, Practice and Future Use*. Sheffield, UK: Greenleaf Publishing.
- ten Brink, P., Lehmann, M., Kretschmer, B., Newman, S., and Mazza, L. (2014a). Environmentally Harmful Subsidies and Biodiversity. In *Paying the Polluter. Environmentally Harmful Subsidies and their Reform*, F. H. Oosterhuis and P. ten Brink, eds. Cheltenham, UK and Northampton, MA: Edward Elgar Publishing, pp. 170–204.
- ten Brink P., Withana S., and Oosterhuis, F. H. (2014b). The Way Forward: Reforming EHS in the Transition to a Green Economy. In *Paying the Polluter: Environmentally Harmful Subsidies and their Reform*, F. H. Oosterhuis, and ten Brink P., eds. Cheltenham, UK and Northampton, MA: Edward Elgar Publishing, pp. 281–98.
- The Economist. (2014, October 18). *Remaking India – Yes, Prime Minister*. *The Economist* 413: No. 8909.
- The Economist. (2015a, January 10). *Indonesia's Economy – A Good Scrap*. *The Economist* 414: No. 8920.
- The Economist. (2015b, January 10). *Indonesia's Anti-Poverty Plans – Full of Promise*. *The Economist* 414: No. 8920.
- Topa, G., Karsenty, A., Megevand, C., and Debroux, L. (2009). *The Rainforests of Cameroon - Experience and Evidence from a Decade of Reform*. Washington, DC: The World Bank.
- UNEP. (2004). *Energy Subsidies: Lessons Learned in Assessing Their Impact and Designing Policy Reforms* (UNEP/ETB/2003/1). UNEP
- UNEP/CBD/COP. (2014). *Decision XII/3 on Resource Mobilization*. Conference of Parties to the Convention on Biological Diversity, Twelfth meeting, Pyeongchang, Republic of Korea, 6-17 October 2014. Retrieved from <http://www.cbd.int/decisions/cop/?m=cop-12> (accessed on December 1, 2014).
- UNEP/CBD/WGRI. (2014). *Modalities and Milestones for the Full Operationalization of Aichi Biodiversity Target 3 and Obstacles Encountered in Implementing Options Identified for Eliminating, Phasing Out or Reforming Incentives that are Harmful for Biodiversity* [Note by the Executive Secretary for the Convention on Biological Diversity, June 2014, Montreal, Canada]. Retrieved from: <https://www.cbd.int/doc/meetings/sbstta/sbstta-18/official/sbstta-18-11-en.pdf> (accessed on December 1, 2014).
- Vivid Economics. (2012). *Carbon Taxation and Fiscal Consolidation: the Potential of Carbon Pricing to Reduce Europe's Fiscal Deficits* [Report Prepared for the European



- Climate Foundation and Green Budget Europe]. London: European Climate Foundation, Green Budget Europe and Vivid Economics.
- Vollebergh, H. (2008). Lessons from the Polder: Energy Tax Design in The Netherlands from a Climate Change Perspective. *Ecological Economics* 64(3): 660–72.
- Vollebergh, H. (2013). *De belasting op energieproducten, CO2 en elektriciteit*. Presentation at the Dutch Ministry of Finance, Expertbijeenkomst belastingen op energie, on April 16, 2013, The Hague, The Netherlands.
- WEF. (2013). *Lessons Drawn from Reforms of Energy Subsidies*. Geneva, Switzerland: World Economic Forum.
- Watkins, E., Hogg, D., Mitsios, A., Mudgal, S., Neubauer, A., Reisinger, H., Troeltzsch, J., and Van Acoleyen, M. (2012). Use of Economic Instruments and Waste Management Performances – Final Report [Contract ENV.G.4/FRA/2008/0112]. European Commission (DG ENV) and Bio Intelligence Service.
- Withana, S., and ten Brink, P. (2015). Motivating Environmental Tax Reform through Coalitions of Like-Minded Countries. In *Critical Issues in Environmental Taxation, Volume XV: Carbon Pricing: Design, Experiences and Issues*, L. Kreiser, M. Skou Andersen, S. Speck, B. Egelund Olsen, J. E. Milne, and H. Ashiabor, eds. Cheltenham, UK and Northampton, MA: Edward Elgar Publishing, pp. 191–207.
- Withana, S., ten Brink, P., Illes, A., Nanni, S., and Watkins, E. (2014). *Environmental Tax Reform in Europe: Opportunities for the future* [A report by the Institute for European Environmental Policy (IEEP) for the Netherlands Ministry of Infrastructure and the Environment, Final Report]. Brussels, Belgium: IEEP.
- Withana, S., ten Brink, P., Kretschmer, B., Mazza, L., Hjerp, P., and Sauter, R. (2013). *Evaluation of Environmental Tax Reforms: International Experiences* [A report by the Institute for European Environmental Policy (IEEP) for the State Secretariat for Economic Affairs (SECO) and the Federal Finance Administration (FFA) of Switzerland, Final Report]. Brussels, Belgium: IEEP.
- Withana, S., ten Brink, P., Franckx, L., Hirschnitz-Garbers, M., Mayeres, I., Oosterhuis, F., and Porsch, L. (2012). *Study Supporting the Phasing Out of Environmentally Harmful Subsidies* [A report by the Institute for European Environmental Policy (IEEP), Institute for Environmental Studies - Vrije Universiteit (IVM), Ecologic Institute and VITO for the European Commission – DG Environment, Final Report]. Brussels, Belgium: IEEP.
- World Bank and Ecofys (2014). *State and Trends of Carbon Pricing 2014*. Washington, DC: World Bank Group. doi: 10.1596/978-1-4648-0268-3
- World Bank. (2005). *Environmental Fiscal Reform – What Should Be Done and How to Achieve It?* Washington, DC: The World Bank.
- World Bank. (2014). *Transitional Policies to Assist the Poor while Phasing Out Inefficient Fossil Fuel Subsidies that Encourage Wasteful Consumption* [Contribution by the World Bank to G20 Finance Ministers and Central Bank Governors, September 18–20, 2014]. Washington, DC: The World Bank.

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