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Green Incentives for Climate Competitive Industries:

A Practitioner's Handbook

WORLD BANK GROUP

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List of abbreviations

ADB	Asian Development Bank
ANME	Tunisian National Agency for Energy Conservation
CDKN	Climate and Development Knowledge Network
CSCP	Collaborating Centre on Sustainable Consumption and Production
DFI	Development finance institution
ECA	Enhanced Capital Allowance
EU ETS	European Union Emissions Trading System
EU	European Union
FDI	Foreign direct investment
GDP	Gross domestic product
GHG	Greenhouse gas
GTZ	German Agency for Technical Cooperation
IDCOL	Infrastructure Development Company Ltd
IDS	Institute of Development Studies
IEA	International Energy Agency
IMF	International Monetary Fund
INCE	International Network for Compliance and Enforcement
LED	Light emitting diode
LPG	Liquefied petroleum gas

M&V	Monitoring and verification
MATTM	Italian Ministry of Environment, Land and Sea
MRV	Monitoring, reporting, and verification
MW	Megawatts
NPA	National Petroleum Agency
OECD	Organisation for Economic Co-operation and Development
PMR	Partnership for Market Readiness
POs	Partner organizations
REWG	Resource Efficiency Working Group
RFF	Resources for the Future
SHS	Solar home system
SMART targets	Specific, measurable, achievable, realistic, and time bound targets
STEG	Tunisian Company of Electricity and Gas
SWH	Solar water heating
UK	United Kingdom
UNEP	United Nations Environment Programme
VAT	Value added tax
WTO	World Trade Organization

MODULE 1

Background Information

1

INTRODUCTION

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What the reader will get from this chapter:

- an introduction to the concept of resource efficiency
- an understanding of why resource efficiency has not occurred as a result of market activity
- guidance on why incentive schemes should be considered

What is resource efficiency

Resource efficiency is about "using the Earth's limited resources in a sustainable manner while minimising impacts on the environment" (European Commission, 2015). It is a term used to describe a general goal, which may be applicable to a wide range of resources or environmental issues.

A wide range of actions can be applied to help to achieve the goal of resource efficiency. These actions can be applied at any stage of the life cycle in the production and consumption of goods and services, from raw material extraction to final use and disposal (United Nations Environment Programme (UNEP), no date). Therefore, for some goods and services, the greatest resource-efficiency gains may be achieved at the resource extraction stage (for example, energy used as part of the mining process). For others, it may be at the consumption stage (for example, reducing waste generation).

Resource efficiency is important for policymakers because, without policy interventions, markets may not deliver an allocation of resources that is optimal to society as a whole, due to the existence of market failures and other barriers.

For example, the benefit gained by an individual or industry from the consumption and production of a good may not take into account the social costs (environmental and social damage) associated with the consumption and production of that good. These social costs are known as externalities.

Externalities are the impacts of an economic activity on a third party[1] that are not reflected in the market price of the good or service concerned. For example, burning fossil fuels for energy used in the manufacture of plastics may lead to emissions of pollutants that adversely affect air quality. These pollutants may lead to wider issues such as human health impacts or contribute to climate change. However, the social cost of these issues is not reflected in the market price of the fossil fuels that are consumed.

The existence of these market failures provides the rationale for policymakers to put in place policies to stimulate increased resource efficiency.

1 Externalities can be positive, but with environmental externalities the impacts can be taken to be negative.

The importance of resource efficiency for industry

Improvements in resource efficiency can lead to direct cost savings and improvements in competitiveness. A reduction in the volume of inputs required to produce a good or service will typically lead to a proportional decrease in the costs of purchasing these inputs. Likewise, a reduction in the volume of waste produced in the production of a good or service will typically lead to a proportional decrease in the costs of disposing of this waste. Therefore, resource-efficiency actions can lead to direct cost savings for the businesses concerned.

The greatest potential for savings is often in those businesses, typically in the manufacturing industry, that consume large volumes of inputs in their processes, and produce large volumes of waste. For example, an analysis of the resource-efficiency opportunities for businesses in three industry sectors in Europe (food and drink manufacturing, fabricated metal products, and hospitality and food services) identified potential gross benefits associated with improving resource efficiency of between 10% and 17% of turnover (Lawton, et al., 2013).

A further reason why resource efficiency is important for industry is that commodity markets can be volatile (Dobbs, et al., 2013). This volatility represents a risk for any industry with a significant dependency on specific resources. Therefore, improving resource efficiency can also reduce exposure to any market fluctuations.

Barriers to and drivers for resource efficiency

While resource-efficiency actions can deliver clear and direct benefits to the businesses concerned, these opportunities are rarely fully realized by businesses.

In particular, the existence of barriers, or weak or non-existent drivers, can create a market environment in which resource-efficiency opportunities are not realized. Lawton, et al. (2013) presented a list of barriers to and drivers for businesses becoming more resource efficient.

The barriers and drivers of particular interest to this handbook are (Lawton, et al., 2013):

- barriers:
  - inconsistent policies and messages
  - lack of clear pricing signals
  - lack of external support and assistance
  - lack of incentives to invest
  - lack of access to capital
- drivers:
  - consistent policies and messages
  - taxes, levies, and charges
  - regulation
  - material and commodity prices
  - competitiveness
  - cost savings and avoided costs

The majority of these barriers and drivers can be influenced in some way by public policy.

Incentivizing resource efficiency in industry

As a result of externalities, and the barriers described above, businesses may not take advantage of the full potential that exists to improve resource efficiency. This may lead to a competitive disadvantage for these businesses when compared to businesses that have taken advantage of resource-efficiency gains. Moreover, the existence of these market failures will likely result in an inefficient overall allocation of resources for society as whole. For these reasons, policymakers may seek to provide further stimulus to businesses to improve their resource efficiency through policy interventions.

Policymakers have a range of levers that can be applied to influence resource efficiency. More traditional regulatory approaches may include setting minimum performance standards (for example, on energy efficiency). This approach has the advantage of achieving, if adhered to, a definite environmental outcome. However, regulatory approaches of this kind are less able to take into account the different costs associated with achieving an environmental standard. Since different companies will face different operational and capital costs in realizing environmental outcomes, such "command-and-control approaches" can be seen to be inefficient.

In contrast, economic incentives (referred to here as incentives, but also known as market-based approaches) utilize the motive of profit generation to achieve environmental outcomes. Existing market conditions are adjusted to reflect externalities associated with the economic activity, or to overcome other barriers, to make resource-efficiency actions even more attractive economically.

In the application of an incentive, resource users can pay an additional amount to reflect the social cost associated with resource use or receive a subsidy to reflect the social benefit associated with reducing resource use. Using these approaches, the externality associated with resource use is internalized. In many cases, implementing agencies require less knowledge about a company's operations or a particular technology when introducing an incentive than that required with command-and-control approaches. Implementing agencies know less about a business than the business itself, a situation known as asymmetric information. Asymmetric information is one of the reasons that incentive schemes are favored over command-and-control approaches. In reality, the approach facing a policymaker is not as binary as the choice between incentives or command-and-control instruments. The optimum solution may involve different combinations of instruments that are tailored to the local market context (as discussed in the section "Combining incentive schemes with other policies" on page 47).

About this handbook

This handbook has been developed to provide instruction on the design and implementation of incentives for resource-efficiency purposes. The target audience is World Bank staff and stakeholders who are supporting the implementation of a resource-efficiency program in a country on behalf of the government, development finance institution (DFI) or other institution.

It is intended to be applicable to most, if not all, resource-efficiency issues and incentives. However, it has a particular focus on energy-efficiency issues as this is the particular focus of the World Bank's Climate Competitive Industries program, and is an area with a high level of interest from industry stakeholders.

This handbook will help practitioners to understand:

- why incentives should be used
- the kinds of incentives that are available

- how incentives can be combined
- how to diagnose the resource-efficiency issues and potential for action in the country
- what the key considerations are in the selection and design on an incentive
- which institutional processes are required to support implementation of an incentive

It sets out the key considerations in designing and implementing an incentive for resource efficiency. Given the breadth of the potential areas of application, the handbook provides an introduction to each incentive type and sets out the skeleton approach to implementing an incentive. Further reading and support will be required at key stages to enable readers to undertake some of the technical aspects of implementation. For this reason, the handbook should be considered the entry point for any party considering an incentive scheme for resource efficiency. However, additional expertise may need to be sought when it comes to the actual design of a specific incentive.

Further reading

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TYPES OF INCENTIVES

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What the reader will get from this chapter:

- an understanding of the key incentive types that could be used to tackle resource efficiency
- an appreciation of the key considerations in applying these incentives and combinations of incentives

Introduction

This chapter introduces the different types of economic incentives that could be used by policymakers. Case studies are used to illustrate real examples of where the incentive types have been applied in practice[2].

Main types of incentives

Incentive types were discussed in the Investment Incentives Guide (World Bank Group, 2015). In this handbook, the focus is different (resource efficiency versus investment policy), which means that some incentives in the Investment Incentives Guide (such as incentives to attract businesses to a particular location) are not relevant for discussion here. At the same time, other incentives (such as resource taxes) are more relevant.

There is a range of different incentives that policymakers can use to increase the uptake of resource-efficiency actions. In all cases, the incentives aim to take advantage of the profit motivation of businesses, but different incentive types seek to influence this motivation in different ways. In turn, this influences how suitable they are for different circumstances.

The key characteristics of the different incentives are summarized below. The following incentive types are explored:

- tax on resource use
- tax preferences
- tariff exemptions for resource-efficient products
- grants
- vouchers
- subsidy reform
- green finance (loans and associated instruments)
- trading schemes

2 The OECD database on instruments used for environmental policy provides a useful resource on the global application of incentives (OECD, 2014).

In each case, the main characteristics are summarized in accordance with the following template.

- **How does the incentive work?**
  Description of how the incentive promotes the desired behavior.

- **How is the incentive typically applied?**
  Description of how the incentive is typically applied.

- **What are the conditions for successful application?**
  Description of the main conditions (for example, institutional factors and economic context) that can affect the success of the incentive.

- **How cost-effective is the incentive?**
  Discussion on the cost-effectiveness of the instrument.

Tax on resource use (including tax on proxies)

- **How does the incentive work?**
  Taxation on resource use (such as on fuel sales) or on proxies for resource use (such as new passenger vehicles) affects the market price of the resource or the proxy (referred to from here onwards as the resource). Since the demand (and associated consumption) for the resource will bear a direct relationship to the price of the resource, the change in the price of the resource resulting from the tax will lead to a change in demand. In other words, the higher the tax, the larger the reduction of demand for the resource taxed. In practical terms, the reduction in demand arises as businesses look for opportunities to reduce costs in response to the increase in price. This may include short-term behavioral change (for example, improved energy management) and longer-term investments in more efficient technologies/processes termed structural change (for example, investing in a more efficient heating system).

- **How is the incentive typically applied?**
  Taxes are frequently applied at the point of sale of the resource or resource-using activity (for example, fuel taxes are added to the gross price of fuel). The general principle is that the tax should be applied as close as possible to the resource or the activity that is using the resource. This provides businesses with the maximum number of options (including technologies) to reduce resource use and, therefore, drives the efficiency of the incentives. However, it can be more difficult to monitor and implement these types of taxes.

In some cases, taxes are applied to a proxy good to the resource (for example, the sale of goods that use a resource as opposed to the resource itself). While taxation of the proxy will also discourage consumption of the target good, this mechanism is generally considered to be a less efficient method of taxation. This is because proxy taxation only discourages one particular use of the resource, reducing the options for abatement. However, these types of taxes can often be easier to implement due to difficulties in measuring resource use precisely (Organisation for Economic Co-operation and Development (OECD), 2010).

- ### What are the conditions for successful application?

  For taxes to be successful, there are a number of conditions that need to be satisfied (German Agency for Technical Cooperation (GTZ)), the Collaborating Centre on Sustainable Consumption and Production (CSCP), Wuppertal Institute, 2006):
  - rule of law and low corruption levels — ensuring tax revenue is collected and penalties are applied
  - established and enforced property rights — ensuring businesses have the incentives to invest
  - functioning judiciary — allowing fines to be imposed on non-compliant companies
  - functioning reporting systems or ability to establish these systems — necessary to ensure that the correct amount of tax is being paid
  - institutional capacity — governments are required to ensure that the above conditions are in place and have the ability to design, implement, and enforce a scheme effectively

- ### How cost-effective is the incentive?

  The cost-effectiveness of taxes will depend on the design of the instrument.

  When taxes can be applied directly to the resource, it is generally more cost-effective than applying the tax to a proxy. For example, Greene and Braathen (2014) concluded that energy taxes were cost-effective because they provide polluters/consumers with the freedom to find their own most efficient way of reducing pollution/energy consumption.

  Cost-effectiveness can also be viewed in the broader context of the overall fiscal policy landscape. A review of green taxes by the Green Fiscal Commission (2009) concluded that green taxes can be very cost-effective by shifting taxes from areas that society values (profits, jobs, and incomes) to areas that negatively impact on society (such as pollution). This highlights the importance of considering the role of taxes as part of the whole policy package.

Case study 1: **United Kingdom — Landfill Tax**

The practice of landfilling carries a number of negative environmental impacts. These range from landfill gases that contribute to climate change to the loss of recyclable parts from waste products sent to landfill. By the mid 1990s, 85% of all municipal waste in the United Kingdom was being disposed of at landfill sites — compared with 55% in Austria, 30% in France, and only 13% in Sweden. In 1996, the United Kingdom (UK) government introduced the Landfill Tax to try to reduce the amount of biodegradable waste going to landfill by making other, more sustainable, waste treatment technologies more financially attractive in comparison. The tax was also partly driven by the European Union (EU) Landfill Directive, which required EU Member States to cut, by 2020, the landfilling of biodegradable waste to 50% compared with 1995 levels. The Landfill Tax was levied on site operators who, in turn, passed on the costs to businesses that used the landfill sites for waste disposal; the amount of tax depended on the weight and category of the waste. In addition, in 2010, the United Kingdom started applying an "escalator provision" that greatly accelerated the yearly rate of increase in the Landfill Tax; between 2011 and 2014, the amount payable per ton rose from £56 to £80. While the UK government abandoned the escalator after 2014 for an inflation-based adjustment, the level of the Landfill Tax which, in 2016 stands at £84.40, is a significant disincentive against the disposal of waste at landfill sites.

The Landfill Tax is credited with a drastic reduction in the amount of waste going to landfill in the United Kingdom. The amount of waste going to landfill fell by 57.3% between 2000 and 2012, and household recycling rates more than doubled — to 44%. By 2020, it is projected that landfill will account for only around 10% of waste treatment and disposal in the United Kingdom. Furthermore, a number of innovative waste-to-energy initiatives have surfaced that offer sustainable waste treatment and disposal solutions. For example, one company is building plants of up to 100 megawatts (MW) that use waste or waste by-products to generate electricity. Another company is using steam technology to process household waste into biomass. Landfill operators themselves are restructuring their business operations to optimize activities (such as the extraction of methane gas from landfill sites).

However, despite its apparent positive effects — the Landfill Tax is expected to add £20 billion to the UK treasury coffers by 2020 — the Landfill Tax may not be an entirely unmitigated success. Allegations have surfaced that it has led to an increase in "waste crime" (for example, the practice of "fly-tipping" where waste is dumped in a field or by the side of the road, the rise of illegal site operators, and fraudulent reporting practices by landfill operators). In addition, there have been calls for an incineration tax to further incentivize recycling over incineration — which is blamed for the release of greenhouse gases (GHGs) — as the preferred alternative to landfilling. Thus, to further stimulate sustainable waste treatment and disposal practices, the Landfill Tax might be most effective if applied in combination with other measures to provide a more nuanced and environmentally balanced solution.

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Tax preferences

- ### How does the incentive work?

  Tax preferences (as defined by the OECD) operate in much the same way that taxes on resource use do — by changing the relative price of resources or activities to promote a certain behavior. However, in the case of tax preferences, certain activities are made cheaper as opposed to more expensive, as is the case with taxes (Greene & Braathen, 2014). An example of a tax preference is the Enhanced Capital Allowance (ECA) scheme in the United Kingdom. This policy allows companies to write off the cost of the purchase of (eligible) resource-efficient technologies against their taxable profits (Carbon Trust, 2015).

  Tax preferences, although operating through the tax system, can be considered to be indirect subsidies. This is because governments are essentially forgoing tax revenues to promote a certain activity. Tax preferences are also known as tax expenditures, tax breaks, tax relief, tax rebates or tax subsidies (Greene & Braathen, 2014).

- ### How is the incentive typically applied?

  Tax preferences are applied through the existing tax system (Greene & Braathen, 2014). For example:
  - reducing tax rates or providing exemptions (for example on sales-related taxes or value added tax (VAT), or on specific environmental taxes)
  - tax credits against corporate income taxes
  - accelerated depreciation against corporate income taxes

  With respect to resource efficiency, these tax preferences could be applied when purchasing certain resource-efficient technologies or undertaking resource-efficient expenditure.

  An extensive list of the use of tax preferences for environmental purposes in the OECD is available in Appendix A of OECD report "Tax Preferences for Environmental Goals" (Greene & Braathen, 2014).

- ### What are the conditions for successful application?

  The following conditions are required for an appropriate tax preference program:
  - A functioning tax system must be in place, which requires the conditions as described for a tax.
  - The tax preference must be allowed for in the tax code (World Bank, 2015).
  - Simple eligibility criteria should be applied so that an adjustment can easily be incorporated into existing tax structures (Greene & Braathen, 2014).
  - Tax preferences are costly, similar to other subsidies, so adequate funds must be in place.
  - Tax preferences do not internalize the cost of an externality, so should not be used instead of taxes to tackle a negative externality (Greene & Braathen, 2014). However, they are often used in this manner due to political pressure.

  A full discussion on the principles of applying tax preferences are provided in the OECD report "Tax Preferences for Environmental Goals" (Greene & Braathen, 2014).

- ### How cost-effective is the incentive?

  Tax preferences are considered to be less cost effective than a traditional tax on resource use. This is because a tax on resource use gives businesses and industry the flexibility to reduce an environmental harm in whatever way they see fit to reduce their tax bills. Tax preferences are normally attached to a specific behavior or technology, so are more prescriptive in the resource-efficiency actions. This is highly likely to be less cost-effective than taxes due to the existence of asymmetrical information (as discussed above).

Case study 2: **France — bonus-malus scheme for purchasing private automobiles**

France introduced a bonus-malus or "feebate" scheme in 2008 for the purchase of new cars. The goal of the scheme was twofold: First, to cut vehicle carbon dioxide (CO_2) emissions; second, to encourage car manufacturers to shift their production to lower-emissions vehicles. As opposed to a more conventional fuel tax, which is an excise tax on the sale of fuel, the French feebate scheme took a carrot-and-stick approach by offering a purchase-price rebate to buyers of low-emissions vehicles while charging a fee to buyers of high-emissions ones ("bonus" and "malus" are Latin for "good" and "bad", respectively). Low-emissions cars were defined as those producing 130 grams or less of CO_2 per kilometer, while high-emissions vehicles were defined as those producing 160 grams or

more; the scheme neither incentivized nor penalized the purchase of cars emitting between 130 and 160 grams of CO_2. The rebate for conventional low-emissions vehicles went up as high as €1,000 (purchasers of electric vehicles were eligible to receive up to €5,000), while buyers of high-emissions cars were taxed as much as €2,600.

The scheme proved to be very popular with the French public and was extremely successful. Sales of low-emissions vehicles jumped from 20% of the total at the end of 2007 to 32% in January of 2008. However, the scheme's popularity somewhat mitigated its positive environmental impact. As the bonus-malus scheme was introduced without significant advance warning in November 2007, sales of more polluting vehicles jumped in December 2007 before the new rules came into effect. Then, after the rebate provisions came into force, French consumers rushed to buy new cars, so that the total volume of automobile purchases rose by 13.4% between November 2007 and May 2008 — a far larger increase than could be accounted for by seasonal buying patterns. Since car buyers tended to favor makes that came in just under the low-emissions threshold, the average overall level of CO_2 emissions per kilometer went down less than might have been expected. Moreover, because it ended up being far more popular than policymakers had anticipated, the bonus-malus scheme — instead of being revenue-neutral as conceived — ended up costing the French treasury €285 million in 2008.

The unexpected popularity of the scheme — and the resulting attenuation of the scheme's environmental effectiveness — is an indication that feebate systems can spur the desired change in behavior, but that such schemes must be calibrated carefully to achieve the looked-for impact. In the case of the French bonus-malus scheme, it seems likely that the rebate was too generous, while the threshold for low-emissions vehicles was set too high. Nevertheless, the long-term effects of the scheme are still to be determined, especially with regard to the response of manufacturers; a production shift in the long run to lower-emissions vehicles may more dramatically counteract the overall increase in fleet size seen to date.

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Tariff exemptions for resource-efficient products

- ### How does the incentive work?
  Countries impose import tariffs/duties on a wide range of products to protect domestic industries and to provide a source of government revenue. Therefore, one possibility for promoting the import of resource-efficient products is to grant exemptions to import tariffs for these products, so reducing their price. The measure is analogous to tax preferences, but applied to tariffs rather than taxes.

- ### How is the incentive typically applied?
  Tariff exemptions are applied through the tariff system by setting reduced tariff rates on resource-efficient products.

- ### What are the conditions for successful application?
  There is little published analysis on tariff exemptions for resource efficiency, with recent interest around international trade in energy-efficient products being focused on trade impacts of minimum energy performance standards (Ecofys et al., 2015). However, OECD (2005) suggests that eliminating tariffs on renewable energy technologies in developing countries could yield significant gains.

While generally not publicized as tariff exemptions for resource efficiency, there is evidence that tariff reductions on resource-efficient products are being widely applied. For example, tariffs on light emitting diode (LED) lamps tend to be 5 percentage points or more lower than tariffs on halogen light bulbs in 65 countries (Pitney Bowes, no date). Consequently, there appear to be few barriers to successful application. The following circumstances may make successful application of tariff exemptions difficult:

- Domestic industries face strong competitive pressure from international, resource-efficient products. Building a domestic resource-efficient industry is the stated reason for which Ukraine is planning to revoke reduced tariffs on energy-efficient products (Interfax Ukraine, 2015).
- Tariff exemptions cause significant loss in government revenue.

- **How cost-effective is the incentive?**
  Tariffs are a barrier to international trade. Reducing the overall levels of tariffs and other trade barriers may lead to increased gains from trade, and is a key objective of the World Trade Organization (WTO, no date). Leaving these potential gains aside, tariff exemptions (just as tax preferences and grants) can be effective in accelerating the uptake of the targeted technologies, but are, by themselves, not well suited to correcting environmental externalities. It should also be noted that only imported goods are affected by reduced tariffs. This may put domestically produced products at a disadvantage if these have previously been shielded from international competition through import tariffs on competing imported products.

Grants

- **How does the incentive work?**
  Grants are payments from a donor organization (such as a government) to a recipient organization or individual (Salamon & Elliott, 2002). As such, grants typically constitute one of the most direct types of subsidy. Their aim is to stimulate or support a particular type of activity, to which the availability of a grant payment is usually tied. The incentive works through the grant payment covering part or all of the cost of the desired activity. Therefore, pursuit of the desired activity increases as it becomes less costly for the grant recipients to undertake.

- ## How is the incentive typically applied?

  Grants are one of the most widely used forms of subsidy. Given the breadth of the definition, a large variety of different grant types are used in public policy. Within the realm of resource efficiency, one of the most common targets for grants are energy-efficiency improving investments. Energy-efficiency grants exist in many countries, including all International Energy Agency (IEA) member states (IEA, 2016). Grants may be directed either at producers (for example, for investment in resource-efficient products or production techniques) or consumers of resource-efficient products (reducing the price of a product and, thereby, increasing demand).

  The timing and conditionality of a grant payment can vary from traditional upfront grants to results-based support over several years. Upfront grants also address the lack of availability of funding by reducing the required investment capital. Results-based grants aim to strengthen the exposure of the project initiators and only provide payments if certain milestones have been reached.

  Upfront grants can play an important role with regard to risk sharing during the high-risk early stage of project development or research and development (R&D) in new technologies. Grants can reduce the capital exposure of project initiators. Often, DFIs provide matching grants to reduce the exposure of developers. Such risk sharing in early stages of development will ensure demand for later project financing.

  Results-based grants are not necessarily paid over the full lifetime of a project, although this approach would certainly offer the highest level of results orientation. A "frontloading" of results-based grants can be recommended for various reasons including: 1) donors prefer to disburse committed funds within a reasonable timeframe rather than "park" them for up to 20 years, 2) a frontloading will reduce overall financing costs, and 3) a frontloading can at least partially address the lack of availability of long-term funding (Frankfurt School of Finance & Management, 2016).

- **What are the conditions for successful application?**
  The following conditions are required for an appropriate tax preference program (GTZ, CSCP, Wuppertal Institute, 2006; GreenMax Capital Advisors, 2009):
  - objectives clearly defined — good understanding of how a grant payment could address a particular barrier to resource efficiency
  - setting the right grant amount — little uptake/impact if it is set too low, low efficiency/ windfall gains to recipients if it is set too high
  - setting the right scope — little impact if the number of eligible recipients is too low, too high a burden on government funds if the number of eligible recipients is too high
  - setting the right eligibility requirements — be aware of the trade-off between the administrative burden and ensuring that only effective measures are supported

- **How cost-effective is the incentive?**
  Grants can be a cost-effective means for ensuring innovation and technology diffusion. However, by themselves, they are unlikely to be cost-effective as a mechanism for improving resource efficiency as they do not directly address the externalities from resource use (Duval, 2008). Moreover, they may also create incentives for inefficiency should inefficient practices be supported while efficient practices are not. They may also reduce innovation and create incentives for fraud and corruption if actors' incentives shift from receiving income through competitive provision of goods and services to receiving income from subsidies (GTZ, CSCP, Wuppertal Institute, 2006).

Vouchers

- **How does the incentive work?**
  Vouchers are a particular form of grant, and work by subsidizing the price of specific goods and services that meet the aims of the scheme. While only certain goods and services may be eligible under the scheme, the beneficiary of the voucher may have some flexibility over which of these goods or services they wish to buy with the voucher.

  One of the benefits of a voucher scheme is that eligibility can be ascertained prior to the actual transaction (that is, only eligible beneficiaries are given a voucher). This may have advantages in terms of reducing the administrative burden for eligible buyers and sellers of the subsidized good or service. Moreover, it can be a transparent system for disbursing available grants when the total number of available grants is capped (such as through a limited program budget).

- ### How is the incentive typically applied?
  Issuing vouchers as a way of improving resource efficiency has not been in widespread use. One example from the United Kingdom is the provision of vouchers to households for undertaking energy-saving home improvements as part of the Green Deal Home Improvement Fund (GOV.UK, 2015). Under the scheme, households could apply for a voucher that could then be redeemed as partial payment for a specific energy-saving investment (for example, solid wall insulation).

  Vouchers can be a helpful tool for disbursing large numbers of small grant sums. For example, utilities in Austria provide vouchers to customers to help with the purchase of energy-efficient household goods and boilers (Fair Energy Partner, no date).

- ### What are the conditions for successful application?
  The same conditions as for grants apply (see above). In addition, voucher programs should be well designed and fraud-resistant (for example, through personalization and electronic verification of vouchers).

- ### How cost-effective is the incentive?
  The cost-effectiveness of vouchers reflects that of grants more widely (see above). As is the case for other "consumer-side" grant schemes, vouchers may encourage competition in the field by allowing grant recipients a free choice of suppliers.

Subsidy reform

- ### How does the incentive work?
  Subsidy reform involves phasing out subsidies that incentivize inefficient resource use (such as fossil-fuel subsidies), and introducing alternative incentives that encourage a more efficient use of resources. These alternative incentives would have the same primary objective as the original subsidy (such as energy security), but would deliver the objectives using more resource-efficient practices (such as renewable energy subsidies). On a global scale, there is a large number of subsidies, especially in the field of energy, which act counter to resource-efficiency objectives (International Monetary Fund (IMF), 2013). In addition to encouraging more efficient resource use, subsidy reform can help governments address fiscal imbalances.

- ## How is the incentive typically applied?

  When the production and consumption of a natural resource is subsidized (directly or indirectly), efficient use of the resource is disincentivized as the subsidized price of the resource no longer reflects its scarcity. In addition, using the resource may be associated with negative externalities so that its use is inefficiently high even at market prices. By implementing subsidy reform, resource use is adjusted to more efficient levels while the strain on public funds is reduced.

- ## What are the conditions for successful application?

  Subsidy reforms can be politically difficult to implement. Industries benefitting from subsidies tend to develop strong connections to governments and regulatory agencies. The effects of energy subsidy reforms are likely to impact immediately upon a majority of the electorate. Therefore, subsidy reforms require detailed planning.

  A number of success factors have been identified (World Bank, 2012; IMF, 2013):
  - a comprehensive energy sector reform plan with clear long-term objectives
  - an extensive communications strategy with announcement of one-off compensatory measures
  - appropriately phased price increases
  - introduction of credible targeted measures to protect the poor
  - institutional reforms that depoliticize energy pricing, such as the introduction of automatic pricing mechanisms

- ## How cost-effective is the incentive?

  Subsidy reform targets inefficient allocation in resource markets by removing price distortions. Therefore, successful subsidy reform is, by definition, cost-effective.

Case study 3: **Ghana — fuel subsidy reform**

Ghana has tried several times to reform fuel subsidies. Fuel subsidies were not just draining the treasury, they were also spilling over into and threatening the soundness of the financial sector. The state-owned Ghana Commercial Bank was extending loans to prop up the loss-making activities of the state-owned Tema Oil Refinery, which had a monopoly on the import and processing of refined oil products. However, these loans were essentially non-performing loans and, as the size of these loans grew, the solvency of the state bank itself came under threat.

In 2001, the government established an automatic pricing mechanism that tied Ghanaian fuel prices to the international market price — and fuel prices rose by 91%. To lessen the impact of this increase on Ghanaian households, cross-subsidies on kerosene and liquefied petroleum gas (LPG) were also introduced. However, despite these mitigating measures, the government was forced to abandon the automatic pricing mechanism in the face of popular opposition, rising global oil prices, and a depreciating currency. Nonetheless, the financial situation remained precarious, and the government reintroduced the pricing mechanism in 2003. Fuel prices again rose by 90%. In turn, this caused real incomes to fall by 8.5% despite a new round of cross-subsidies. Not surprisingly, the political will to stick with the increase wavered in the run-up to the 2004 national elections, and the increase was once again abandoned. By 2004, the financial cost of the subsidies to the Tema Oil Refinery reached 2.2% of gross domestic product (GDP).

By 2005, the government was ready to try again. However, having learned from the previous attempts, it took a number of measures to ensure that this round of reform would have a greater chance of success. A poverty and social impact assessment was commissioned to understand more clearly how higher fuel prices would affect different segments of society. This assessment found that the impact of a fuel increase would fall disproportionately on the poor. With this information in hand, the government launched a concerted media campaign to explain the rationale for the fuel subsidy reform and try to win over the public. One of the key messages of this campaign was that part of the savings from removing the subsidy could fund other types of social spending. Aside from cross-subsidies on kerosene and LPG, additional measures taken in conjunction with the 2005 reform included:

- a ceiling on public transport fares
- an increase in the minimum wage
- the removal of tuition fees for state primary and secondary schools

In addition, the 2005 reform created an independent governing body, the National Petroleum Authority (NPA), to administer the pricing mechanism. The NPA comprised representatives from government, trade unions, the private sector and non-governmental organizations (NGOs). As a result, the government was not seen to have a controlling hand in setting fuel prices.

While initially successful, the impact of the 2005 reform was reduced by flagging political will. The pricing mechanism was abandoned between May 2008 and November 2008 following a rapid rise in world oil prices. During the 2009 national elections, fuel prices were again an issue, with the winning party running on a platform to reduce energy costs.

While Ghana's push to reform fuel subsidies was motivated mainly by budgetary concerns, removing subsidies has significant climate implications. Eliminating fuel subsidies worldwide would reduce GHG emissions by 5%. As Ghana's experience shows, political will and effective communications are key factors in determining the success or failure of subsidy reform.

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Green finance (loans and associated instruments)

- ### How does the incentive work?

  Loans can be provided to business or countries to support resource-efficiency investments. Loans will be repaid to the lending institution plus any agreed level of interest. An incentive of this type can provide loans at favorable terms to businesses pursuing resource-efficiency projects or to support the provision of loans where they were previously unavailable.

  Concessional loans

  Concessional loans are offered on substantially more favorable terms, such as reduced rates of interest or a grace period, than are available in the market. This lowers the overall costs associated with resource-efficiency investments. These loans can have a significant impact and can be included with other approaches (Amin, Dimsdale, & Jaramillo, 2014).

  Underwriting

  Underwriting offered by the government/funder can provide project sponsors and intermediaries, such as banks, with a form of insurance when they offer loans to smaller companies. Government and intermediaries can agree on allocations of different types of risk by using appropriate terms and conditions, such as limits on liability and restrictions of loans to certain types of counterparties. The government and the intermediaries can select the kinds of risks for which they will take responsibility and then they can agree on a price for doing so. More generally, underwriting allows risks to be spread across a wider group of counterparties and, when offered across a number of projects, it allows risks and support services to be aggregated. With aggregation comes specialization and underwriting markets can then be used to offer guarantees against very specific types of risk.

  Loan guarantees are similar to underwriting. They are an obligation on the guarantor to assume the debt obligation of a borrower if that borrower defaults. Loan guarantees can cover the full amount of debt outstanding or apply only for a defined portion. Loan guarantees are used in very specific cases when a private-sector lender can provide the required capital, but does not want to absorb the credit risk.

Green lines of credit

A line of credit is an agreement between the intermediary (such as a bank) and the government/funder that underwriting will be put in place if the intermediary's loan portfolio meets specific requirements. Green lines of credit are a way that intermediaries can obtain insurance to financially back any loans that align with resource-efficiency objectives. The advantage can be that credit is advanced only when needed and that government funds can be used for other purposes (the funds are not earmarked or ring-fenced) until the credit line is used. The structure of charges is likely to include an arrangement, such as higher payments, that will give the financial institution an incentive to complete loans.

- ## How is the incentive typically applied?

Loans and the associated incentives generally use existing domestic finance institutions (such as banks, national bank, or funds) and can build up the local financial sector's skillset in resource efficiency.

Concessional loans

Concessional loans are often similar in structure to typical commercial loans. The subsidy is provided using government or DFI funds and may be implemented directly by the government or through an intermediary, such as a bank. In practice, the design of the scheme will depend on its objective, available government funds, and details such as the target number of companies in the sector being subsidized.

The government or intermediaries may be able to offer companies variants of the same subsidy with a limited set of standardized (mutually exclusive) options, such as:

- an interest rate below market rate
- a longer repayment rate
- a set of lower requirements for collateral
- flexible scheduling of interest payments

Underwriting

By offering underwriting, the government participates in what is a wholesale market for risk. The government has a choice over how tightly to define the terms it offers to intermediaries. The more tightly defined the terms are, the less flexibility the intermediary will have in the offers it makes to final resource-using companies in the retail market for risk, but the more

certain the government will be that the underwriting is being used for the intended specific purposes. The more loosely defined the terms are, the more the underwriting offered will be valuable to the intermediary as a flexible form of credit that can be deployed across a wider range of retail products. The value of that flexibility may enable the intermediary to charge lower fees to the government.

Green lines of credit

Green lines of credit are offered to local financial institutions by national development banks or DFIs and international finance institutions (IFIs) for a particular purpose at concessional rates (Amin, Dimsdale, & Jaramillo, 2014). DFIs/IFIs can lend to the local financial intermediary for the purpose of on-lending to green projects. Such loans can also help to reduce refinancing costs and, consequently, financing costs for the ultimate borrower. This helps local financial institutions develop expertise in resource efficiency. On-lending is of particular interest when it comes to end-customer/household finance. Then, local operations and understanding of the market are required to manage a high number of ultimate borrowers.

- ## What are the conditions for successful application?

The following conditions are necessary for a scheme using financial markets:

- coherent regulatory and policy environment
- effective financial institutions
- matching funds are available
- administrative conditions are:
  - simplified and standardized
  - well documented with lists of eligible materials and equipment provided
  - well marketed
  - that monitoring procedures are well established
- there is collaboration between the public and private sector
- high-quality investments are on offer

- ## How cost-effective is the incentive?

The cost-effectiveness of financial instruments cannot be assessed in general terms and depends on the calibration of the specific financial instrument.

Case study 4: **Tunisia — green financing for solar water heaters**

Tunisia enjoys high levels of solar irradiance, making solar power an abundant and potentially attractive source of renewable energy for domestic needs. For example, it is estimated that solar power could supply up to 80% of the country's residential hot water needs. However, until the early 2000s, almost 80% of these needs were supplied by imported LPG. Early efforts to promote solar water heating (SWH) were hampered by a number of factors including market-distorting fossil-fuel subsidies, weak financing channels, and the newness of the technology, and the underlying market and supply chain for it.

In 2005, the Tunisian National Agency for Energy Conservation (ANME) and the state electrical utility, the Tunisian Company of Electricity and Gas (STEG) launched Program Prosol (Prosol) to jumpstart the spread of SWH technology. Financial and technical support for Prosol came from the Italian Ministry of Environment, Land and Sea (MATTM) and from UNEP. Prosol drew on lessons learned from Tunisia's previous attempts at promoting SWH technology.

First, within a few months of the program's launch, the government introduced into law a 20% capital cost subsidy for residential SWH. This subsidy, which was funded with the support of MATTM, aimed to counterbalance the existing LPG subsidies that lessened the financial attractiveness of SWH, and marked the first time that subsidies were applied to renewable energy technologies.

Second, STEG took on the role as debt servicer and guarantor for SWH loans, thereby lowering the risk for commercial banks and stimulated their interest in, and capacity to award, renewable energy loans. STEG conducted credit checks, processed paperwork, and enforced repayment terms by suspending electricity and gas services to defaulting borrowers. In addition, Prosol allowed the banks to offer very favorable lending terms. These included a temporary interest rate subsidy funded by UNEP (the subsidy was phased out after 18 months), a reduction in interest rates from 12% to 6%, and an extension in the repayment term from 3 years to 5 years. Because of such measures, loan default rates under Prosol were very low.

Third, Prosol introduced an accreditation system for suppliers, installers, and the technology itself. This accreditation system helped build consumer confidence in the quality of the solar water heaters and in the reliability of the after-sales maintenance offered by installers.

Finally, in 2006, the government supported Prosol with a number of decrees maintaining a VAT exemption for residential SWH and bringing down customs duties to 10% — the lowest rate allowed by law.

To date, Prosol has overseen the installation of 119,000 systems. The program has also benefited the government's bottom line — the move from LPG to SWH has reduced the cost of fossil-fuel subsidies and is expected to save $101 million over the SWH lifespan. The SWH systems installed under Prosol are also projected to reduce CO_2 emissions by 715,000 metric tonnes over the SWH lifespan. In the longer term, the application of a double subsidy is not an ideal situation, and it remains to be seen if the government of Tunisia will find it effective to subsidize LPG and SWH technologies.

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Case study 5: **Bangladesh — solar home systems**

Bangladesh has identified solar home systems (SHS) as a technology that can help the country reach its goal of providing electricity to all households by 2021. While this goal is ambitious in itself, reaching rural households not connected to existing power grids — about two thirds of people in the countryside lack electricity — presents an especially daunting task. Each SHS consists of a rooftop solar module connected to an in-home control panel and battery box that can power lamps, mobile chargers, and small appliances — the number depends on the size and capacity of the unit. Since they rely on rooftop installation rather than on power grid generation, SHS are seen as a viable way to take advantage of the country's average of more than 200 sunny days a year to generate a sustainable power supply for village households.

In 2003, to encourage the distribution of SHS, Bangladesh put in place a program that combines purchase grants and state refinancing of purchase credit. This program was later modified by an adjustment of import tariffs on SHS components and parts. Under this program, the state-owned Infrastructure Development Company Limited (IDCOL) has contracted with 47 partner organizations (POs) with grassroots networks in rural areas, typically NGOs or microfinance institutions. In turn, POs are responsible for selling, installing, and providing maintenance services for the SHS. The POs select SHS units from a list of IDCOL-approved suppliers, which buy the units from IDCOL at a price that has been partly subsidized (about $20 of the approximate unit cost of $400) by buy-down grants from donors. POs offer purchase financing to the customer at rates of between 12% and 15%, but can then obtain IDCOL concessional refinancing of up to 80% of the loan amount at preferential rates of between 6% and 9%. At the same time, since many SHS were assembled in Bangladesh using components imported from China, the government later exempted solar panel imports from customs duty. As a result, the price of batteries and accessories were drastically reduced, and this helped keep the cost of SHS units down.

By 2014, more than 3.5 million SHS had been installed under the program, providing electricity to over 16 million Bangladeshis, mainly in the countryside. While the SHS program has been a great success, there is rising opposition to the current tariff treatment of imported solar components, as Bangladeshi manufacturers have claimed that they are able to meet the national demand for SHS parts and that they are harmed by the customs duty exemption for imported solar panels.

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Trading schemes

- ### How does the incentive work?

  Trading schemes have mostly been used as an incentive for pollutant and CO_2 emission control, but can, in principle, be applied as an incentive for limiting natural resource consumption or controlling access to land (GTZ, CSCP, Wuppertal Institute, 2006). Trading schemes involve governments defining an upper limit to a given activity (for example, emitting CO_2) in a given region over a given time period and issuing certificates/permits that allow holders to pursue the activity up to the given maximum. Certificates can be auctioned off or pre-allocated to market participants (for example, based on their previous emission levels).

3 Climate and Development Knowledge Network.

Market participants may freely buy and sell certificates to each other. Thus, the optimum strategy for participants is to reduce the given activity to the point where it is cheaper than buying certificates. Conversely, participants will buy certificates where reducing the activity would be more expensive than the cost of the certificate.

Trading schemes are broadly similar to taxes. Both associate a given activity with a uniform price, leading to efficient and low-cost emission reductions (Parry & Pizer, 2007). However, outcomes can vary in practice. Trading schemes set a limit on the quantity of an activity, allowing certificate prices to fluctuate when demand changes, while taxation schemes impose a price on an activity and allow quantity to fluctuate when demand changes.

- ## What are the conditions for successful application?
  - **Stakeholder readiness:** key stakeholders are generally familiar with taxes, but they may be unfamiliar with the requirements of a trading scheme. Such things as extensive capacity building and trials may be required prior to implementation.
  - **Monitoring:** to ensure compliance, robust monitoring, reporting, and verification procedures are required.
  - **Participant size:** large numbers of participants help establish a liquid market for allowances. The efficiency of the market can be compromised if some actors have monopoly power and strategically manipulate prices. Some researchers found evidence of price manipulation in the early phases of the EU Emissions Trading System (ETS) (Hintermann, 2015).
  - **Institutional capacity:** all of the above require functioning institutions including rule of law, financial systems, government, and judiciary systems (GTZ, CSCP, Wuppertal Institute, 2006).

- ## How is the incentive typically applied?

  Typically, the scheme is applied to defined sectors of the economy (such as the energy industry and heavy industries under the EU ETS). Companies in these sectors are required to purchase allowances for each unit of emissions they generate. This incentivizes them to reduce the number of units they emit. The incentive is typically not applied to individuals or SMEs as information requirements for participation can be substantial and costly.

The OECD database on instruments used for environmental policy (OECD, 2014) presents examples of trading schemes used in:

- water abstraction rights
- CO_2 and other emissions that impact water and air quality
- fishing quotas
- water quality (nitrogen emissions)
- development rights

- **How cost-effective is the incentive?**
  From a theoretical perspective, emissions trading is a cost-minimizing way of achieving a defined level of emissions reductions. Therefore, it is well suited for correcting externalities (as is taxation of emissions). In practice, imperfect information for market actors has led to high price volatility in the EU ETS. This uncertainty is likely to increase costs for scheme participants compared to taxes where levels are more predictable. Another potential issue is strategic behavior by actors with monopoly power (Hintermann, 2015).

Combining incentive schemes with other policies

Incentives can be applied in isolation, but are frequently applied in combination with other policy instruments. Indeed, a complementary mix of instruments can often provide a more effective approach to achieving a given environmental outcome. For example, introducing a new resource tax on businesses without developing or ensuring the capacity of business to respond or providing awareness of exactly who will be subject to the tax will severely undermine the environmental outcomes. Equally, unless the tax is very high, it is unlikely to stimulate significant investments in resource efficiency on its own (Sorrell, et al., 2003)[4].

The UK Environment Agency (2009) suggests that the optimum combination of instruments would involve incentives being applied alongside regulatory measures, and in combination with capacity building and awareness-raising activities.

4 Taxation measures can also benefit other policy measures that support resource-efficiency improvements more explicitly. In theory, the revenues from taxation can also be hypothecated and made available for resource efficiency. However, in practice, hypothecation is not particularly popular among fiscal policymakers.

The UK Environment Agency (2009) provides a checklist of actions to complete when combining policy actions:

- **Raising awareness among key groups** — what is the scale of the issue and what problems are faced?
- **Building capacities to change and comply** — stakeholders need the capacity to be able to respond to incentives and any other regulatory instrument adopted.
- **All instruments and approaches have the same environmental objective** — care must be taken to ensure that all instruments have objectives and no conflicts are in place.
- **Regulations should support rather than contradict** — stakeholder engagement should be included at each stage to ensure support.
- **Incentives should reward change and compliance** — enforcement action should reflect the scale of the environmental problem experienced.
- **Policies, instruments, and approaches should be sequenced** — policies and initiatives should be sequenced to reflect the desirability of the instrument. Softer options should be introduced first (such as awareness raising and capacity building) followed by the introduction of incentives and regulation to ensure environment objectives are met.
- **Monitoring and evaluation** — an effective monitoring and evaluation program must be in place to monitor the effectiveness and costs of the policies.

The UK Environment Agency (2009) also recommends that, before implementing a program, a log-frame matrix should be used that can identify the mechanisms by which the program will reach its stated aims and the risks. More details are provided in the log-frame handbook (World Bank, 2005).

All other things being equal, decision makers should favor policies that are complementary and try to avoid those that overlap. A number of policies appear always to interact in a complementary way with others — taxation, standards and norms, and information. There is a relatively small number of policy instrument combinations that can deliver less than the sum of their parts — and these largely feature subsidies and instruments providing access to capital.

However, in many cases, policy instruments address several goals and are used to mitigate unintended effects of another policy instrument (for example, financial instruments can be used to support businesses to comply with minimum efficiency standards). In other words, it may be legitimate to combine policy instrument types even if the overall effect on resource efficiency is diminishing. Hence, the goal is not to always avoid such combinations where the overall effect is diminishing, but to assess in which circumstances the interaction between policy instruments is acceptable or unacceptable (Sorrell, et al., 2003).

Challenges faced by governments in introducing incentive schemes

The following section describes the issues faced by governments when introducing incentive policies. Therefore, it presents some of the key considerations for practitioners to discuss and explore with governments when establishing a resource-efficiency scheme.

Political factors

Business and investors must be assured that any incentive scheme is operating in a manner that is free from corruption and political manipulation of the allocation of funds. Without such assurances, confidence in investments will be low and this will impact environmental outcomes.

Political will is vital to ensure incentives are introduced at a significant level to influence behavior. Policies to address resource efficiency will favor the "resource efficient" over "resource inefficient" and will, therefore, be met with some resistance from vested interests. A careful political calculation must be made about how to ensure these vested interests do not hinder any move towards resource efficiency. Any approach must be founded on stakeholder engagement.

As well as extensive stakeholder engagement, governments must signal their commitment to a resource program by enacting strong plans and strategies, and enshrining these in law where possible.

Ineffective allocation of public resources

Without thorough assessment of the cost-effectiveness of incentives and ongoing monitoring, public funds could be supporting initiatives that offer poor value for money. Therefore, objective analysis must be undertaken to ensure that supporting an incentive is the best use of funds and is effective in achieving the desired outcomes.

Distortions to competition

Incentives can distort markets and have an impact on competition. With incentives that promote resource efficiency, distorting the market in favor of resource-efficient companies is a central objective. Incentives are introducing social values into existing markets and moving resource allocation towards a more socially optimal allocation — the more efficient companies will have a competitive advantage.

Taking action on resource efficiency, such as implementing an environmental tax, may place domestic companies at a disadvantage in international markets. For this reason, it is often difficult politically to introduce taxes on resource use or provide exemptions to heavy users of resources. This need not be the case; taxes on economic "bads" (resource use) could utilize double dividends to reduce taxes on economic goods (income or energy output), although the application of this idea is not well tested or grounded in theory.

Administrative inefficiencies

Overly bureaucratic approaches add significant costs to doing business during the incentive application process, can undermine the attractiveness of incentives, and add significant costs to government to ensure compliance.

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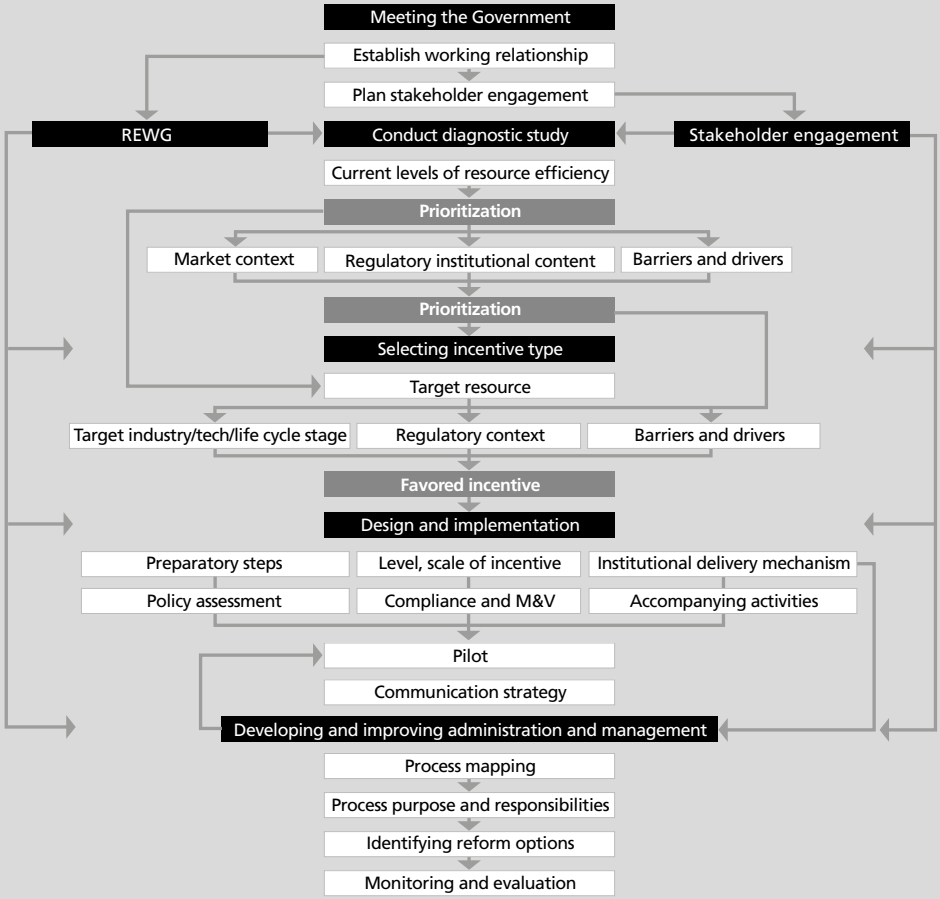
MODULE 2

Application of Incentive Scheme

Figure 1 is a schematic that takes the reader through a suggested order of tasks for implementing an incentive as set out in Chapters 3 and 4. This order can be adapted to the particular circumstances in the country and is only intended as a guide.

FIGURE 1 **Implementing an incentive**



3

UNDERSTANDING THE CONTEXT

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Conducting a diagnostic study 61

What the reader will get from this chapter:

- guidance on how to establish the working and stakeholder relationships that will be used throughout the introduction of a program
- an understanding of the country context in terms of resource use, regulation, and market
- guidance on how to determine priorities for the incentive

Introduction

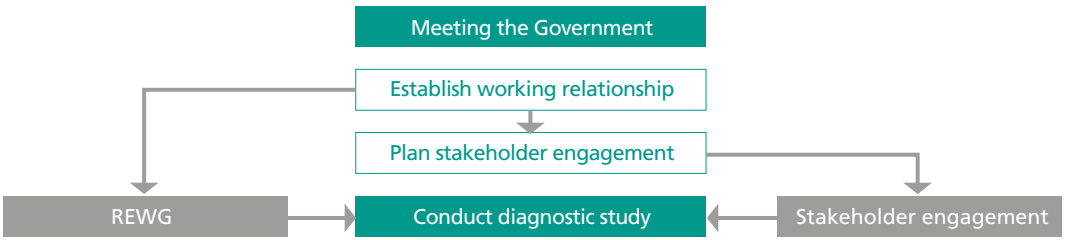
This handbook now turns to taking practitioners through the required steps in introducing an incentive scheme for resource efficiency. The steps outlined in this chapter draw heavily on the approach outlined in "Climate Competitive Industries: A Practitioner's Field Guide" (World Bank, 2016), but departs in some areas to reflect the focus on incentives in this handbook.

The focus of this chapter is understanding the context into which the incentive will be introduced.

Meeting the government

The first stage of the project will be an inception meeting between the practitioner and the government ministry responsible for the resource-efficiency program. The aim of the meeting is to establish a working relationship and to plan the stakeholder engagement activities required as part of the development of the incentive. Plans should also be discussed for conducting a diagnostic study.

FIGURE 2 **Establishing working and stakeholder relationships**



Establish working relationship

Requirement and expected output

The main outcome of the initial meeting will be the objectives of an incentive scheme, any resources or industries of focus, and establishing a resource efficiency working group (REWG) that will guide development of the incentive. By establishing clear objectives and a government-led stakeholder group, actions can be planned in advance, reducing the time and effort involved.

Application

Use this initial meeting to create a flexible, but clear, work plan including the next steps, task allocation, and plan for stakeholder engagement.

There are also a number of items to be taken away from the initial meeting. Therefore, it is essential to plan what are the desired outcomes of the meeting in advance. At this stage, the following preliminary details are essential:

1. **The goal** — including preliminary resources, industries, and areas of focus.
2. **Funding** — source of funding and, if applicable, scale and mode of possible contribution of the World Bank and other donors.
3. **Information and data** — existing sources of data and means of collecting this data.
4. **Stakeholders** — determining who the key stakeholders are in the public and private sectors.
5. **Ambition** — what is the scale of the ambition and is there a preliminary understanding of the intended outputs of an incentive scheme?
6. **Timeline** — is the project particularly time sensitive and what is the intended timeline?
7. **Communication channels** — how will the government ministry communicate with the practitioner and establish communication channels and frequency of communication?
8. **Establish an REWG** — the REWG will be the key decision-making panel from the government side. It will be the first port of call for in-country context, data and other relevant details. It should be made up of important members of the key government departments that have a stake in tackling resource efficiency and the development of the incentive (environment, business, and industry ministries). The REWG will review the evidence to determine whether an incentive is the right approach and, if so, direct the development and implementation of the incentive. Varying levels of seniority should be included so that the REWG not only covers decision approval (from senior civil servants), but also research support and engaging with stakeholders.

Plan stakeholder engagement

Requirement and expected output

The full implementation of a scheme involving incentives will require the involvement of a range of parties. Including the views and support of these parties at the relevant time will help ensure that the scheme is robust and will increase the chance of smooth development without surprises. In general, the willingness of all key parties must be established early, but details can be developed later.

Stakeholder engagement should be an ongoing process that starts in the early phases of the project, continues throughout the incentive development phase, and then into the implementation phase. The aim of consultation at this early phase of the incentive design is to help understand the driving forces of resource efficiency and the barriers to implementation, and to identify the factors that will be critical to the program's success. This will allow a practitioner to develop transparent, relevant, and achievable objectives.

Application

The following stages may be involved in the development of the stakeholder engagement plan. They should be followed throughout the development of an incentive at intervals determined by the REWG. It is good practice for the engagement plan to be developed and undertaken with the support of the REWG.

FIGURE 3 **Stakeholder engagement process**

Identify stakeholders	• Building on the preliminary list of stakeholders identified at the initial meeting with the government ministry, all key public sector, private sector, and community stakeholders should be identified.
Map stakeholders	• Stakeholders should be mapped using matrices to determine interest and influence of stakeholders over any incentive. • What does your (the practitioner's) team add to the capacity that is in the country? How do the goals of the stakeholders that are operating in country overlap with your own?
Get government support	• It is assumed in this guidance that a government will lead the implementation of the incentive scheme. Therefore, governments are essential stakeholders. Prominent ministries should be seen to lend their backing to a scheme. • Local governments are also key stakeholders that are key implementation partners and potential beneficiaries of a resource-efficiency scheme. • The benefits of resource efficiency must be clearly explained to governments to ensure their support.
Engage financiers and end users	• Financiers, technical experts, and end users should be included in any stakeholder engagement from the outset. Examples of previously successful resource-efficiency schemes should be used to demonstrate the potential of resource efficiency to potential target groups.
Establish organization and leadership	• The accountability of the incentive and the responsibilities of the REWG.
Define engagement strategy	• Determine the best method of approach with key stakeholder groups.

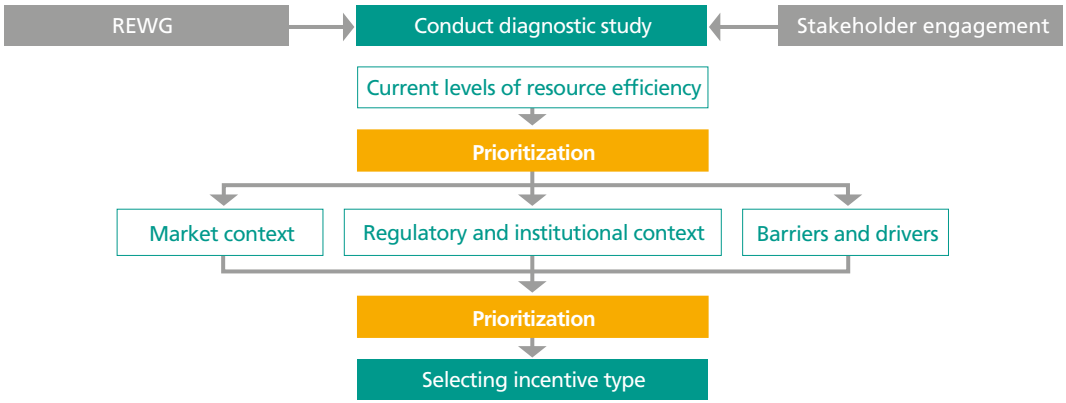
A common approach to understanding the stakeholder landscape is to build relationships with key in-country stakeholders who are supportive of the implementation of an incentive mechanism. Working with such stakeholders will result in a good understanding of the role of each stakeholder group, their attitudes towards resource-efficiency incentives, and the most effective ways of engagement.

Conducting a diagnostic study

Conducting a diagnostic study is important for gathering the key evidence required to inform decision making around the potential resource-efficiency incentive. This may include analysis of the levels of resource efficiency in the country, information on the market and the regulatory context, and the potential barriers and drivers of resource efficiency at a local level. This information is important for prioritizing and screening options and, ultimately, selecting the incentive type.

The scope of the diagnostic study should be informed by the REWG and the data gathering should involve key stakeholders (as shown in Figure 4).

FIGURE 4 **Conducting a diagnostic study**



Assess the current levels of resource efficiency

Understanding the current levels of resource efficiency within the country is an essential precursor to the development of an incentive scheme. It is necessary to understand the absolute level of resource production and consumption, but also the potential for resource-efficiency gains. Those industries with a high level of resource production and consumption are likely to be priority targets for resource-efficiency actions. Therefore, greater focus should be invested in gathering data for these sectors.

Indicators and benchmarks can be used to assess relative performance and to help identify areas with the potential for resource-efficiency gains. These can be defined at different levels. For example, it is possible to derive performance indicators at the level of specific technologies or industry sectors, and for different goods and services. Indicators developed as part of the diagnostic study can also be used to monitor and evaluate performance once the incentive has been implemented.

The key questions that should be answered in this task are:

- What is the current level of resource production/consumption?
- What are the sectors with the greatest levels of production/consumption?
- What have been the historical trends in production/consumption and the projected future trends?
- How does the resource efficiency of the country/sector compare with relevant performance benchmarks?

The output of this task is a dataset, including any relevant indicators, that can be used to assess the current levels of resource efficiency in the country and the potential areas where resource efficiency can be improved.

Application

Data gathering

The initial meeting with the government should be used to identify and gather relevant national data sources on resource production/consumption. This should include historical statistics and any projections on future production/consumption.

Statistics on volumes of resource use at a national level are usually available from government sources, although the quality may vary for different resources and/or sectors. Data may be held by different government ministries and, depending on the resources or sectors concerned, they may need to be gathered from several different ministries.

Most countries have a centralized national statistical office, which is a good starting point for basic data and for further information about more detailed or recent data (regional offices may also exist). More recent data that has not been published may be available on request. Commonly, the degree of data disaggregation is limited so that individuals or industrial sites cannot be identified. Notes about using the statistics may be published and, if available, should be read.

In some cases, prior national studies on resource production/consumption may have been prepared. These studies may be sufficiently authoritative that they reduce or eliminate the need to use government statistics directly. Such studies may also simplify the understanding of details (such as definitions).

National and international industry associations may also be a valuable source of data, but, more than that, they often have an important supplementary role as a source of advice. For example, their experts often are long-term users of government statistics and can provide an opinion of upcoming government and other data sources. Industry associations may also be able to identify experts that can assess specialized resources (such as very rare materials).

As a supplement to national-level data, international agencies can provide data and comparative statistics on production/consumption for certain resources. International data can also be used to make comparisons with other countries, including the performance of similar sectors in different countries. Sample organizations holding such data include the IEA, OECD, and the International Water Resources Association.

Data compilation

Definitions of resources are important when compiling data, particularly from different sources. Calculations of value and volume may be affected by the measurement points for a flow of resources and by accounting conventions, such as those for goods shipped, but not yet received. Averaging over a longer period (several years) can be a quick method to reduce the effects of timing. Resources are frequently reused, such as water that is used and then returned (such as cooling water), as opposed to water that is consumed and not returned. Where resources are converted — often from primary fuels to electricity — double-counting errors may be more common.

Resource definitions may also change over time and between countries. Examples of standardized measures, which are available from international agencies, can be used to make comparisons of resources with other countries. A measure that is most meaningful to changing behavior should be used in local implementation. The main types of resources (energy, water, waste, and strategically important materials) are sufficiently important that they usually have a well-established set of analytical institutions.

Data analysis — indicator analysis

The main objective of data analysis is to identify the potential opportunities for resource-efficiency gains, which may be targeted by the incentives. Indicator analysis and benchmarking can help identify the priority areas.

A number of approaches to resource-efficiency indicators are available. The most appropriate indicators to use should be chosen by the team undertaking the work and being advised by the REWG. These indicators will be determined by how easy it is to collect data, the effectiveness in determining the resources of focus in the country, and the alignment with any regional resource-efficiency programs already established. A great deal of work has already been undertaken to define indicators for resource efficiency (OECD, 2008; BIO Intelligence Service, Institute for Social Ecology and Sustainable Europe Research Institute, 2012; UNEP, 2015; Eurostat, n.d.; Hirschnitz-Garbers, et al., 2012).

UNEP (UNEP, 2015) provides an indicator set for the use of resource-efficiency assessment in Asia and the primary function of this is to determine trends. Therefore, it is important that multi-year data is collected. Indicators do not, in themselves, define resource priorities. These indicators must be assessed alongside an understanding of the scarcity of a resource, the environmental impact of the use of a resource, and the severity of an environmental pollutant. This may require a qualitative analysis speaking to key experts in the country.

International benchmarks should be used wherever possible to provide regional and global context to the data gathered. Industries that have particularly high levels of resource use in a regional or a global context should help determine priorities. Using benchmarks also helps to identify errors in the data as they aid the identification of outliers. Statistics should be adjusted to make valid comparisons, including using per-capita figures, per unit of turnover, adjusting costs for purchasing power parity, and so on.

Prioritization

After understanding resource use in the country, and in consultation with the REWG and other key stakeholders (civil society, in-country experts) the key focus areas should be determined (resources and industries).

Assess the market context

Requirement and expected output

The applicability of different incentive types, and their overall effectiveness, will be affected by the market context in which the incentive is required to operate. Therefore, an important element of the diagnostic study is an assessment of the market context.

This may include gathering information on the:

- price elasticity of demand for resources and substitution possibilities
- potential for technological innovation and resource-efficiency activity
- extent to which resource-efficiency costs might differ across sectors
- extent to which domestic sectors are in a favorable competitive position or in a fast-growing market
- market structure itself (competitive or oligopolistic markets[5])
- nature of supply chains and skills relevant to the resource-efficiency issue

Carrying out a market analysis will allow the practitioner and REWG to understand the resource-efficiency gains in a particular market through technical or behavioral action and an understanding of the potential for integration or development of resource-efficient technologies.

A clear understanding of the scale of the potential impact of an incentive on business is important to avoid unintended consequences. A scheme that is well thought out and presents the effects on markets up front, also contributes to making a case because it shows an understanding of the perspectives of commercial operators.

The types of priority areas identified in the previous task will define the way that the market analysis is undertaken in this task. If priority areas identify energy savings rather than improvements to waste collection, then the consideration of international factors relevant to

5 A market structure characterized by few sellers and many buyers, and homogenous or differentiated products (that is, the products offered may be identical or, more commonly, differentiated in one or more respects and barriers to entry (for example, there are five main players in the United Kingdom mobile phone market)).

energy markets will be more important than the consideration of domestic and regional factors relevant to the waste industry. The market analysis task is based on a simple conception of individual markets for companies in which the company operates as a buyer or a seller. Their upstream (purchasing) markets and downstream (sales) markets may have to be investigated.

A thorough market analysis should provide the following:

- an understanding of the importance of the focus markets to the country's economy
- an understanding of the supply chain in key industries
- what the historical trends are in the target markets
- what the baseline of resource use in these target markets is
- which technologies and/or behaviors can be adopted in the industry
- how much can be achieved and how quickly
- the finance going into resource efficiency at present (although this information is hard to come by)

Application

Existing evidence

The first step is to establish whether there is detailed knowledge of the resource-efficiency potential within the target sector (for example, whether information is available through recent audit programs). Where information is missing for specific equipment, or for activities within particular industries, resource-efficiency audits can be undertaken directly to support the project if considered necessary.

To carry out the assessment of the resource-efficiency potential, a technical analysis is required. Given that local expertise may be lacking, the project team's in-house capacity and external consultants might be required to undertake this analysis. Local groups may hold useful knowledge and should be involved from the start. The costs of the analysis will depend on the depth of the work and who is carrying it out.

Qualitative or quantitative analysis

Markets are the results of many complex features. Therefore, detailed statistics (particularly if they relate to conditions in the past) may be less informative than having a good understanding of the underlying factors that influence the behavior of experienced operators (for example, traders or manufacturers). For that reason, the most effective research may be gained by conducting interviews with knowledgeable participants, beginning with contacts supplied by industry associations.

Similarly, the choice between qualitative and quantitative analysis must reflect a considered balance of effort. A qualitative description can be a good starting point. Such a description should use simple statements or hypotheses that can be subsequently developed and confirmed. For example, the statement of "The price of solar panels is subsidized by overseas governments" can be used as a working description of an important influence on the domestic market, but it can also be checked and quantified independently to derive a quantitative answer to the question of "Subsidized by how much?"

Some of the basic sector, economic activity, and market statistics may be available from work in other settings (for example, preparatory work for World Bank Group engagements in specific regions or countries).

While this step of the analysis provides a good understanding of where most of the potential is located and which sectors are most likely to be suitable for resource-efficiency incentives, it does not evaluate the existing regulatory framework in which markets operate. This is the aim of the next step of the analysis.

Assess the regulatory and institutional context

Requirement and expected output

Regulatory and institutional analysis comprises a survey and mapping exercise to identify the overarching authorities, policies, targets, and measures that are relevant to resource efficiency. The information captured in this process will provide the practitioner with an understanding of the existing institutional and regulatory framework, and the challenges that may impact on the application of an economic incentive in the country. This is to provide an understanding of the regulatory environment into which an incentive will be introduced and the institutional capacities that exist.

Understanding the underlying conditions will make it possible to build on what is already there, by designing programs that will be reinforced by the existing regulatory infrastructure. On the other hand, it will also reveal any institutional or regulatory gaps that might be filled by an incentive program. Together with a market assessment, it will provide a further tool to identify the most appropriate incentive to apply.

The following questions should be answered at the end of this task:

- What is the regulatory context?
  - What action has already been undertaken for resource efficiency?
  - What are the policies governing industrial development?
  - Other relevant environmental legislation.
- What incentives, regulations, and initiatives have an impact on resource use?
- What are the in-country institutional capacities to develop incentive schemes?
- What are the barriers to implementing particular incentive schemes (for example, corruption and lack of trust)?

Application

Regulatory and incentives environment

It is necessary to understand existing regulations and incentives that impact on resource use in the area of focus. This requires undertaking the tasks described below. This approach follows the World Bank typical advisory assistance in rationalizing investment incentives, as set out in the investment incentive guidance (World Bank, 2015).

Incentives inventory

To understand existing incentives and any potential conflicts with an incentive for resource efficiency (for example, subsidizing an activity with negative impacts on resource efficiency) an inventory of all incentives in the country should be prepared. The key steps are presented below, and detailed steps are presented in World Bank (2015):

1. Obtain buy-in by ensuring that key stakeholders are engaged in the process and have ownership of the outcomes.
2. Collect inventory data from key government stakeholders.
3. Analyze data and produce descriptive report.
4. Submit report and collect feedback.

The following questions should be asked about the existing incentives:

- **Can rationalization save money?**
  What is the cost of existing incentives in the country and would rationalization save money for the government?

- **How important are these incentives for business decisions?**
  To be able to estimate the potential impact of additional incentive schemes, one first needs to understand how existing incentives are influencing business decisions. This relates to a) resource-using behaviors of businesses and b) investment decisions related to resource use. This analysis will also provide a better understanding of how any new incentives can be tied to existing schemes to maximize the response.

- **What are the market distortions provided by these incentives?**
  Depending on the calibration of existing incentives, they may either help with addressing market failures or lead to market distortions that, in turn, result in an even more inefficient resource use. A good example is subsidies for the consumption of certain resources (such as energy).

- **What are the results of a cost-benefit analysis of these incentives?**
  Taking into account the response from businesses and the degree to which the existing incentives distort or correct the market, a high-level, cost-benefit analysis is needed to establish which incentives generate real economic benefits and which do not.

This will be supported by the stakeholder engagement/consultation. The REWG should lead the in-government engagement.

Regulatory context and institutional capacity

Understanding the regulatory context

The regulatory context is of high importance when it comes to designing effective incentive schemes. An analysis of the regulatory context would need to consider:

- existing targets related to resource use (such as a requirement to reduce resource consumption by x% by 2020 compared with a base year of 1990)
- existing pollution limits
- waste regulations
- monitoring and reporting requirements
- existing performance standards and norms for resource-efficient equipment
- labeling of resource-efficient equipment
- levels of compliance
- enforcement regime

Some aspects of the regulatory context will be "softer" (such as indicative targets related to environmental issues and resource use), but other aspects will be "harder" (such as pollution limits, performance standards, and waste regulations). It is particularly important to get a good understanding of the levels of compliance and the enforcement regime. In case compliance levels are low and the enforcement regime weak, there are limited existing regulatory levers that encourage businesses to shift towards higher resource-efficiency standards.

The analysis should develop a set of recommendations with a view to enhancing the regulatory context in such a way that resource-efficiency incentives are more likely to be effective.

Institutional analysis

An institutional analysis should aim to assess the country's financial, human, and institutional capacity to:

- implement new regulations and incentives
- monitor and verify implementation of an incentive
- enforce and respond to non-compliance offenses
- evaluate the performance of the incentive
- update regulations and measures as appropriate

The assessment should be based on the developed understanding of the regulatory context and document the institutional current context. It should also provide a list of recommendations for areas of improvement and capacity-building measures to cover the institutional capacity gaps identified. Consider who should lead the assessment and which stakeholders to involve (for example, during interviews).

A thorough analysis of the regulatory and institutional capacity in a country can be conducted by following the checklist that is contained in "Climate Competitive Industries: A Practitioners Field Guide" (World Bank, 2016) of which an edited version is presented in Table 1. The analysis can be conducted through a review of secondary data. However, it may be necessary to supplement this with information gathered through stakeholder interviews. If there is no legislation/regulation in effect, an understanding should be generated of what draft legislation has been presented and the barriers it faced. Equally important is the compliance culture in the country and the quality of the monitoring processes. While legislation may require high levels of resource efficiency, a lax compliance culture, corruption, and/or a lack of monitoring and enforcement can seriously compromise the effectiveness of regulations in place.

TABLE 1 **A checklist for assessing the existing regulatory and institutional environment**

1. Institutional integration

A strong dialogue across relevant government bodies helps to support the development of an efficient industry. Policies relevant to the greening of industries cut across the domains of many agencies. Integration of environmental, social, and economic objectives and actions should take place — "vertically" (between the international, national, and local tiers of government) and "horizontally" (between government sectors) within government.

Do relevant authorities coordinate horizontally through:

- overarching strategies and policy frameworks?
- coordination mechanisms (for example, interagency working groups and joint-research programs)?
- high-level, interagency integration (that is, within presidents' or prime ministers' offices)?
- developing in-house capacity (such as an environmental unit within an economic ministry)?

Do relevant authorities coordinate vertically through:

- capacity building of local government (for example, through oversight, implementation support, policy guidance, and staff training)?
- appropriate funding and reporting mechanisms?
- clear allocation of responsibilities between levels of government to avoid friction, overlaps, redundancies, or lengthy procedures?
- information sharing to promote understanding of interlinked responsibilities and to facilitate coordinated decision making?

2. Influencing demand

How is government influencing demand for resource-efficient technologies?

- facilitating market access
- influencing framework conditions (for example, through competition policy)
- introducing regulations that affect product standards and production processes
- instituting green procurement

3. National strategies and legal frameworks

Integrating resource-efficient policies into national strategies and legal frameworks ensures policies receive a high profile, and benefit from national processes and allocated funding. Some countries promote their resource-efficiency strategies through integrated legal frameworks, which determine political and administrative authorities, and regulatory and enforcement instruments.

Is resource efficiency integrated into any of the following high-level government strategies?

- national sustainable development strategies
- poverty reduction strategies
- national development plans
- national innovation strategies

Are there any strategies that address resource efficiency specifically?

- national sustainable consumption and production strategies
- cleaner production strategies

Is resource efficiency integrated into any overarching legal frameworks?

- integrated legal framework (for example, China's circular economy promotion law)
- defined political and administrative authorities
- defined regulatory and enforcement instruments

4. Effective policy development

A good policy process is vital for effective policy development. Listed below are some questions to ask that can lead to successful policy formulation and implementation.

- Do policies provide relevant agencies with clearly defined mandates, responsibilities, and timeframes?
- Are policies backed by adequate resources (for example, finance and personnel)?
- Are policy objectives clearly defined with measurable targets so that progress can be quantified?
- Are policies phased in gradually, providing time for affected industries to adjust?
- Is stakeholder consultation taking place (for example, through consultative bodies or taskforces that include the community, NGOs, industry, and trade unions)?
- Are agencies developing policies independent of political lobbying or external pressures?
- Is there systematic use of environmental policy evaluations in the policy design cycle?
- Are policies enforceable?
- Is there a low compliance cost?

5. Raising awareness and capacity building

Governments can support industry sectors and businesses by promoting practices that enable them to trade sustainably. Businesses need to be able to see the value in adopting sustainable practices. For example, understanding how consumer preferences are evolving in relation to sustainability issues in specific market segments and the resulting market opportunities.

What methods are being using to raise awareness?

- high-profile demonstration projects
- staff training
- providing funds for small investments
- providing resources to monitor and disseminate results of efficiency investments
- using cleaner production agencies

- using cleaner production rapid assessments
- tools for analyzing options regarding improvements of resource efficiency
- support for the acquisition of funding

How is government encouraging the development of technical capacity?

- promoting technology literacy by delivering high-quality education to as many people as possible
- encouraging investment
- permitting the creation and expansion of companies using high-tech processes
- facilitating access to finance
- building institutional capacity to promote the diffusion of technologies where private demand or market forces are inadequate
- fostering closer ties between public research institutes, universities, and industry
- assisting companies to learn to how to adapt, adopt, and market new technologies and services
- urging research institutions to practice outreach, testing, marketing, and dissemination activities
- being open to external technologies through foreign trade, foreign direct investment (FDI), diasporas, and other international networks is critical for technological progress — for low and middle-income countries
- integrating new technologies into government operations, including providing environmental infrastructure

How is the government supporting industry sectors to trade on the basis of sustainable business practices?

- gathering market intelligence about the environmental goods and services sector
- flagging areas and opportunities for environmental goods and services
- contributing evidence to regulatory impact assessments and consultations
- engaging and consulting with environmental goods and services sector stakeholders, trade associations, regional development agencies (and their clusters), and devolved administrations
- providing access to international partnerships and networks for disseminating information, and presenting trade and investment opportunities (such as the Asia-Pacific Partnership)

6. Encouraging environmental technologies

How is government encouraging the development and adoption of environmental technologies?

- having a sustained policy of increased openness to foreign trade and FDI
- increasing investments in capacity development
- investing in the development of science platforms
- fostering partnerships with industry and end-users to ensure investments result in relevant and/or commercially viable technologies
- developing technology transfer mechanisms/networks
- ensuring coherence between environmental and innovation policies

Identifying barriers to and drivers for resource efficiency

Requirement and expected output

This task will identify the main barriers that limit businesses taking additional resource-efficiency actions and the existing drivers. By exploring the barriers faced, the implementing agency will be able to design incentives that are targeted at overcoming the issues identified. Furthermore, the incentive can be designed to align with key drivers to maximize efficacy. It will build on the stakeholder engagement that has been developed up to this point.

It is important to recognize, as described in "Main types of incentives" on page 23, that incentives, by their very nature, are designed to address the specific barrier of businesses having insufficient financial incentive, or lack of access to capital, to implement resource-efficiency actions. As part of this step, other barriers may be identified that could be addressed through policy mechanisms and which may need to be implemented in parallel with the incentive.

Application

This work will be defined in part by the prioritization of resources, but should be undertaken alongside the market analysis.

The easiest way to undertake this task is through engagement with stakeholders in targeted industries. General methods of obtaining typical information from a large number of companies can be used, including surveys, interviews, and dialogue with relevant experts.

The main method is likely to be interview-based, and the effort to prepare and conduct interviews is a key component of the task.

The following are examples of the types of questions that can be posed to companies and their counterparties. They will need to be tailored to the country and industry context.

BOX 1 **Sample questionnaire**

What are the motivations for engaging with some resource-efficiency opportunities while not taking up others?

Can you tell me a little bit about why you adopted the opportunities you did? Prompt for:

- payback period
- part of natural upgrade
- ease of implementation
- support within business
- low cost/cost savings
- enhanced reputation
- supply chain pressure
- legislative compliance

We are interested in the daily experiences in taking up resource-efficiency opportunities and integrating them in the business. Can you tell me about any successes and challenges you faced when adopting these opportunities? Prompt for:

- management buy-in
- time
- expertise
- cost
- difficulty level
- lack of integration with existing systems/ infrastructure

Can you tell me why you decided not to implement resource-efficiency opportunities in the past? Prompt for:

- unattractive payback period
- lack of support within business
- cost
- time
- other priorities
- lack of detail
- lack of expertise
- not a priority
- not part of core business
- tenant/landlord issues
- other physical constraints

Following the interviews, a list of barriers and drivers will be developed. This will provide the basis for selecting the most appropriate incentive mechanism.

Prioritization of the incentive mechanism

As a result of the diagnostic study that looks at resource use, the following information will have been gathered at this stage:

- the resource of focus
- the industry and activity or focus
- the need for regulatory reform
- the institutional capabilities in country at present
- the barriers and drivers

This last round of prioritization, conducted with the REWG and stakeholders, will identify those potential areas of focus for the incentive scheme. The prioritization will determine:

- the availability of technology and or activities that could be supported through incentives for the purposes of resource efficiency
- the capacities of the private sector to enact change for the purposes of resource efficiency
- what the "low hanging fruit" are for companies (easy to enact, profitable, and reduces resource use)
- if an incentive is an appropriate approach to tackle resource efficiency or would other approaches be more suitable
- which types of incentives overcome the barriers identified and align well with the drivers
- overall, which types of incentive scheme appear to have a good fit

The output of this step will be a shortlist of potential incentive mechanisms.

Template for scope of work

Box 2 includes a template scope of work for inclusion in the terms of reference when planning the work and understanding capabilities in relation to diagnosis, targeting, and institutional and policy considerations. These templates should be revised as appropriate to reflect the specific support required for a given country or region.

BOX 2 **Template scope of work relevant to diagnosis, targeting, and institutional and policy considerations**

Assignment objective

A diagnostic assessment of the resource-efficiency landscape within *[insert country]* to identify suitable approaches, priorities, and incentives to improve resource efficiency in the country.

Scope of work

1. **Assessing the levels of resource efficiency** — development of indicators for use in assessing resource efficiency in *[insert priority areas]*. International best practice should be adopted in selecting and applying the indicators. The indicators will be used alongside expert judgement to assess resource-efficiency concerns in the country determining the priority resources and by users to target any incentive in *[insert country]*.

2. **Overview of market context** — an overview of the markets for priority areas in [insert country] should be provided. This will include an understanding of markets in the priority areas, and their importance to *[insert country/region]* (for example, GDP contribution). Key questions to answer include what are the trends in the industry in terms of economic growth and resource use, and what actions could be undertaken in industry to improve resource efficiency?

3. **Institutional and regulatory analysis** — based on the analysis of opportunities, an analysis on the regulatory and institutional context in *[insert country]* will be undertaken. The analysis should include:
   - **An inventory of existing in-country incentives** — to understand the support offered to resource use and resource efficiency in the country.
   - **Regulatory analysis** — the consultant will identify and analyze existing and planned policy measures related to energy efficiency. This should include country, regional, and sector-level policies and targets; and relevant international, national, and regional policies that are related specifically to resource efficiency. The analysis should include an assessment of how the different policies align, and their potential conflicts and synergies.
   - **Institutional analysis** — to understand the government and industry's ability to implement an incentive scheme. This analysis should take into account the capacity for implementation of the scheme, the costs associated with implementation for the different parties involved, and the benefits for their institutions.

4. **Identifying barriers and drivers** — should be performed to understand the impediments to resource efficiency by conducting an analysis with stakeholders in the industries of focus.

5. **Determining the best approach for regulation** — includes whether an incentive program would be the best approach for resource-efficiency goals.

Deliverables

A report presenting the research, findings, and recommendations.

Further reading

BIO Intelligence Service, Institute for Social Ecology and Sustainable Europe Institute. (2012). *Assessment of resource efficiency indicators and targets.* European Commission, DG Environment.

BIO Intelligence Service, Institute for Social Ecology and Sustainable Europe Research Institute. (2012). *Assessment of resource efficiency indicators and targets. Annex Report.* European Commission, DG Environment

Hirschnitz-Garbers, M., Srebotnjak, T., Porsch, L., Grünig, M., Hand, P., & Timeus Cerezo, K. (2012). *Integrating resource efficiency, greening of industrial production and green industries- scoping of and recommendations for effective indicators.* Berlin: Ecologic.

OECD. (2008). *Measuring Material Flows and Resource Productivity.* Paris: OECD

UNEP. (2015). *Indicators for a Resource Efficient and Green Asia and the Pacific — Measuring progress of sustainable consumption and production, green economy and resource efficiency policies in the Asia-Pacific region.* UNEP.

World Bank. (2015). *Investment Policy: Investment Incentives Toolkit with Tools and Selected Readings.* Washington: World Bank Group.

World Bank. (2016). *Climate Competitive Industries: A Practitioners Field Guide.* Washington: World Bank Group.

4

DESIGN OF INCENTIVE

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Selecting an incentive type 83

Design and implementation of an incentive 89

Developing and improving incentive administration and management 102

What the reader will get from this chapter:

- an understanding of the key considerations in the design of an incentive
- an appreciation of the "must haves" for efficient and effective implementation

Introduction

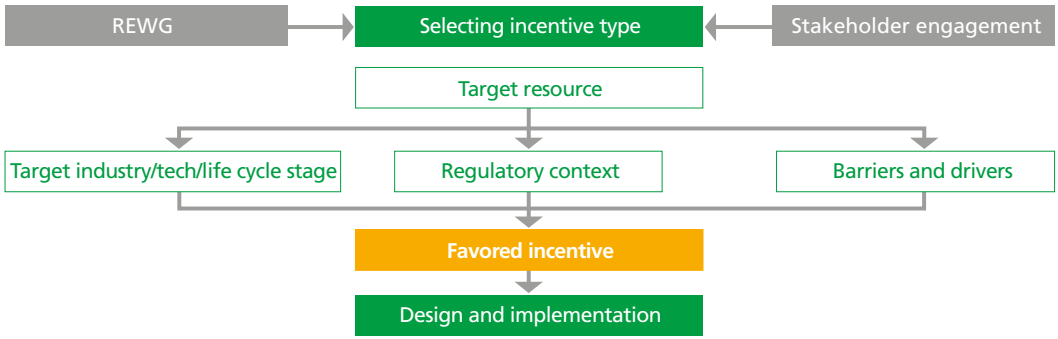
This chapter describes the key steps that need to be followed in the selection of the incentive and in its design.

Selecting an incentive type

Evidence gathered as part of the diagnostic study should be used to inform the selection of the incentive. This includes selecting the target resource for the incentive and the target industry, technology, or life cycle stage. Consideration also needs to be given to the regulatory context, and the barriers and drivers to resource efficiency in the markets in which the incentive is targeted to operate. Following the selection of the favored incentive, further work is required to design and implement the incentive.

The selection of the incentive type should be informed by the REWG and the data gathering should involve key stakeholders, as shown in Figure 5.

FIGURE 5 **Selecting an incentive type**



No single type of incentive is clearly superior to any other (Goulder & Parry, 2008). However, as identified in the section "Main types of incentives" on page 23, there are certain conditions that mean some types of incentive may be more effective in some circumstances than others. Therefore, in selecting the most suitable incentive type, it is important to take into account the relevant circumstances in which the incentive will be applied.

Some of these circumstances will be related to the country in question, and will be largely beyond the control of the practitioner and the government. This will include, for example, the regulatory and policy landscape, and the existing barriers to and drivers for resource-efficiency actions.

Other circumstances will be related to the decisions that have been made about the scope of the incentive. Specifically, as a result of the diagnostic studies recommended in the section "Conducting a diagnostic study" on page 61 and the prioritization step, the REWG and the practitioner should have decided upon the relevant resource(s) that will be targeted by the incentive. A decision should also have been made with respect to the relevant life cycle stages to target, and the sectors or groups of organizations to be targeted[6].

The main contextual circumstances that need to be taken into account when selecting the incentive type are discussed further below.

Accounting for the target resource(s)

Requirement and expected output

The characteristics of the target resource(s), including the availability of relevant production/consumption statistics, may influence the applicability of different incentive types.

It is necessary that the suitability of the different instrument types is assessed in relation to the characteristics of the target resource. For example, if freshwater is the target resource, a tax on water use or a trading scheme in water abstraction rights may not be feasible if data was lacking on the water consumption for different sectors. In this instance, proxies for water consumption may need to be used or an alternative incentive applied that does not require this information — such as a tax incentive for water efficient technologies.

6 In the case of manufacturing industry, resource-efficiency activities are often focussed on reducing consumption of energy, water, and other primary inputs, as this is where a large amount of the potential efficiency gains can be achieved, along with minimization of waste production.

The output is a qualitative assessment of the suitability of different instrument types, based on the target resource. Instrument types that are not suitable should not be considered further.

Application

Practitioners and the REWG should identify whether the target resource(s) presents any issues regarding the applicability of a particular type of incentive. This would draw upon the evidence gathered in the diagnostic study (see the section "Conducting a diagnostic study" on page 61).

Key questions to ask to help identify any issues are:

- How good is the quality of data on the production/consumption of the resource? Are there any important data gaps in the production/consumption statistics of the target resource?
- How good is the quality of market data for the resource? Are there any important data gaps in relation to market prices for the target resource?
- What is the international experience of applying incentives to that particular resource? Review the OECD database on economic instruments (OECD, 2014) and other sources.

Accounting for the target industries and/or technologies

Requirement and expected output

For an incentive to be effective, it needs to provide sufficient stimulus to the target businesses to drive a change in behavior in relation to resource efficiency, including investment in new technologies. Therefore, it is important that the selection of the incentives takes into account the nature of the opportunities that exist for resource efficiency in the target industries, including the relevant behaviors or technologies that the incentive is expected to stimulate. This may include identifying cases where specific technologies are particularly important — so a technology-focused incentive may be suitable.

Account also needs to be taken of the size and scale of the businesses that would be targeted. If the sector is represented by a small number of large organizations, the suitability of certain incentives will differ from a sector represented by a large number of small organizations. In the latter case, the transaction costs are likely to be much more important.

The output is a qualitative assessment of the suitability of different instrument types, based on the target industries and/or technologies. Instrument types that are not suitable should not be considered further.

Application

Practitioners and the REWG should consider the suitability of the different incentives types in relation to the specific characteristics of the industries concerned.

The following should be taken into account when selecting the correct incentive with reference to the market conditions:

- What is the size and scale of the targeted industry? Is it characterized by a small number of large organizations or a large number of small organizations?
- Is there capacity within the target industry to adopt technologies or processes to reduce resource use? Would capacity building be a better approach?
- Which incentive has the greatest chance of take-up in the selected industry?
- Which parts of the supply chain are affected by the most significant market failures and/or sub-optimal investment situations?
- What is the international experience in the application of incentives with this particular market focus? Review the OECD database on economic instruments (OECD, 2014) and other sources.

Accounting for the life cycle stage

Requirement and expected output

A key design choice for any incentive scheme is where in the supply chain the incentive will apply:

- upstream (such as, regulation on fuel suppliers to trade the emissions associated with the fuel they sell to customers)
- midstream (such as, regulation on direct emissions)
- downstream (such as, where consumers are responsible for the resource use in the goods they consume)

Upstream companies tend to be engaged in R&D, component manufacturing, and act as resource aggregators. Downstream companies typically comprise organizations offering resource-efficiency system integration and/or project development, resource-efficiency component distribution, and companies deploying resource-efficiency assets.

An upstream approach can cover a large number of resource users where costs associated with resource use (such as taxes and ETSs) or benefits associated with resource efficiency (subsidies) could be passed down to consumers. Downstream approaches may be favored where it is unlikely that costs and benefits would be passed on to consumers. However, in reality, theoretical considerations, industrial competitiveness, technical capacity, data availability, may give way to political advocacy and industrial acceptance.

Application

Practitioners and the REWG should consider the influence of the life cycle on the effectiveness of different incentive types. The following should be taken into consideration when selecting the appropriate application of an incentive with reference to the life cycle stage:

- Where in the supply chain can the greatest leverage effect be achieved?
- Is an upstream, midstream or downstream approach favored?
- What is the international experience in the application of incentives with this particular market focus? Review the OECD database on economic instruments (OECD, 2014) and other sources.

Accounting for the regulatory context

Requirement and expected output

Accounting for the existing regulatory context will ensure the proposed incentive is best suited to the existing regulatory infrastructure. For example, it will help determine whether the option exists for realigning an existing incentive or whether a new incentive needs to be introduced.

Application

Practitioners and the REWG should consider how the existing regulatory context may influence the appropriateness of a given incentive type. This should consider whether the option exists for realigning an existing incentive. The analysis should draw upon the information gathered in the section "Assess the regulatory and institutional context" on page 67.

The following questions should be answered:

- Does the existing regulatory environment (including existing incentives) provide any opportunities for rationalization for the purposes of resource efficiency?
- Are there any existing pricing and tariff systems that could be exploited when implementing incentives?
- How would a new incentive scheme complement or overlap with existing policy instruments?
- Are there any additional policy instruments that need to be introduced alongside the incentive scheme (for example, accreditation processes for resource-efficiency auditors/installers)?
- Are there any lessons learned from previous incentive schemes?
- What is the availability of skills within government? Is there sufficient capacity to adopt effective monitoring, evaluation, and compliance procedures?
- What is the political feasibility and acceptability for each incentive?

Accounting for barriers and drivers

Requirement and expected output

Accounting for the barriers and drivers identified in the section "Identifying barriers to and drivers for resource efficiency" on page 75 will help ensure the type of incentive (or combination of incentives and policies) is best suited to the barriers that exist at a local level. An incentive seeks to realign the country context for the pursuit of resource efficiency. Therefore, existing barriers and drivers are a key determinant on the type of incentive chosen.

Ideally, when carrying out the diagnostic study on barriers, some weighting of the importance of each barrier would have been undertaken to focus on the most important barriers in this step. Only a comprehensive strategy for improving resource efficiency that comprises complementary measures in the form of targeted investments, technical assistance, and policy and regulatory reforms is likely to be able to address the key barriers.

Application

Working with the REWG, while recognizing the bias that each stakeholder group may bring to any discussion, a choice of incentive will be made.

Different incentives are suited to overcome/address different barriers. Therefore, the types of barriers that are most important need to be established prior to instrument selection. This will determine which instruments are most likely to be effective in a given context.

For example:

- If the main barrier is related to the up-front investment costs, a loan scheme might be a suitable mechanism that enables businesses to invest while keeping the cost to the public manageable (as the loan will be repaid).
- If the main barrier is the principal-agent problem (the landlord of a property invests whereas the tenant receives the savings) then instruments, such as on-bill financing, may be appropriate.
- If the main barrier is imperfect information, then an incentive that engages beneficiaries through training might be suitable. This could be subsidized resource-efficiency audit and training.
- If resource prices are particularly low, rendering investments non-profitable, a tax measure is potentially the right response.

The favored incentive(s) and implementation plan

Requirement and expected output

The favored incentive will have been selected as a result of the country context. The next step is to develop a policy statement communicating the intention of implementing an incentive.

Application

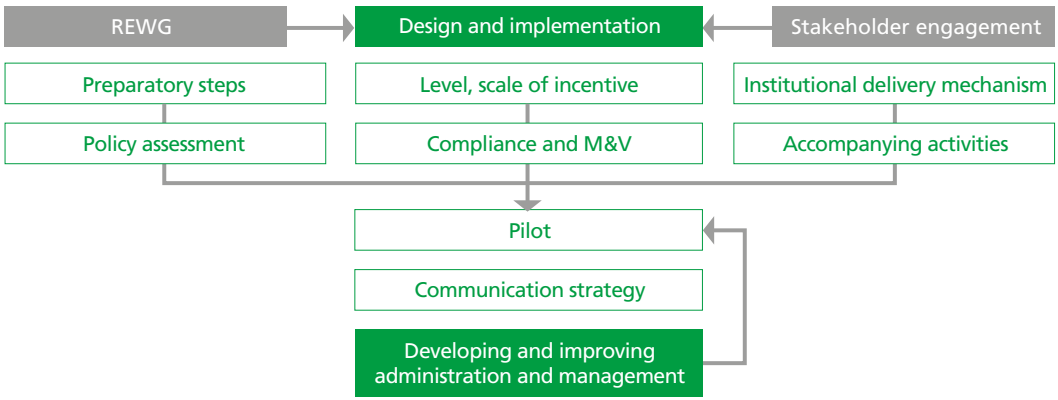
The incentive should be agreed with the REWG, which should then work to develop a policy statement that will be used in communications in the next phase.

Design and implementation of an incentive

Once the favored incentives have been identified, work needs to begin to design and then implement the incentive. This includes a number of preparatory activities, including the development of the governance associated with the incentives. The implementation of the incentive may be first piloted and then modified according to the lessons learned from the pilot phase.

The design and implementation of the incentive should be informed by the REWG and the data gathering should involve key stakeholders, as shown in Figure 6.

FIGURE 6 **Designing and implementing an incentive**



After selecting the preferred incentive type, it is necessary to carefully design how the incentive will be implemented. While some decisions may already have been made (for example, on the scope of the instrument), the design stage provides the opportunity to refine some of these decisions further.

A number of sequential steps for the design of the incentive are described below. These are underpinned by several guiding principles, which reflect the lessons learned from existing incentive schemes.

BOX 3 **Guiding principles of incentive design**

The conclusions of a European Commission assessment of market-based instruments (which are incentives) give general guidance on the development of incentive schemes (Rademaekers, van der Laan, Smith, van Breugel, & Pollitt, 2011). They provide overarching recommendations to the European Commission and Member States, and are excellent general principles by which to begin the design of an incentive scheme. These principles are be combined with those set out in the handbook contained in other useful documents.

Policymakers should remember to design instruments as part of a full package, because market-based instruments are not necessarily the single solution to all resource-efficiency issues. Incentives should be part of a broader, coherent, and consistent resource-efficiency strategy, this includes strategies across DFIs.

Market-based instruments for resource efficiency should have resource efficiency as a primary objective. Without the focus on resource efficiency, instruments are likely to be focused on mitigating impacts rather than resource efficiency itself.

Price-based measures should be set at a level that actually incentivizes change. Taxes must be set at a sufficient level to foster change in behavior.

Planners should also consider how resource taxes can incentivize efficient behavior and can expand the environmental tax base. Resource taxes have focused on energy and transport, but there is considerable scope to apply resource taxes to a wider variety of resources.

Incentives need to be dynamic or regularly reviewed. The fiscal cost and risk for the government should be assessed on a regular basis and so should the effectiveness of the instrument. To ensure the tax level reflects resource-efficiency goals, any tax incentives (and incentives more broadly) should be reviewed regularly.

Policymakers should take consumer behavior and perceptions into account during their instrument design phase. Information on the processes and procedures, administration, management, and dispersal of incentives should be transparent and publicly accessible.

Policymakers should investigate how targeted education and awareness raising can be expanded. As discussed in in the section "Combining incentive schemes with other policies" on page 47, incentives need to be combined with other policy tools to maximize effectiveness.

Market-based instruments should link resource quantity and overall effects. An incentive should cover a specific environmental impact of a resource, beyond simply the quantity of a resource used.

Distributional effects of market-based instruments are, typically, not large, but should be considered. Care must be taken where an incentive is regressive to make sure affected groups are not put into precarious positions.

Market-based instruments should be predicated on a sound life cycle to support real resource efficiency. Careful analysis must be made to ensure an incentive is achieving resource efficiency.

Incentives should be granted with a sunset clause[7] and be time bound. Incentives should recognize that business can come to depend and expect incentives after the need for the incentive has passed.

After possible reforms to the existing tax system have been considered, additional incentives should be used sparingly as a focused policy instrument to correct market failures. The introduction of incentives must provide additional efficiency gains to the status quo.

The process for applying for incentives should be simple and minimize discretion. In the case of tax incentives, the approval process should be automatic (with verification).

7 A sunset clause provides a definitive end date for an incentive programme.

Sources
(Rademaekers, van der Laan, Smith, van Breugel, & Pollitt, 2011; World Bank, 2015; Amin, Dimsdale, & Jaramillo, 2014; Whitley & Ellis, 2012)

The design of the incentive from this point follows a general process in consultation with stakeholders, which is described below.

Preparatory steps

Engagement and securing commitment

Requirement and expected output

An important initial step in the design of any new incentive is securing the necessary political, legislative, and regulatory commitment to enact changes within the country to implement the incentive scheme.

For a business to embrace a resource-efficiency project, there must be buy-in from government and industry. Therefore, the practitioner should work with the relevant government departments and users of a resource that have not yet been approached, or are not yet committed to resource efficiency, to develop an understanding of their commitment to resource efficiency and any activities that would need to be undertaken to implement an incentive.

Application

The practitioner decides how to convene these stakeholder discussions and whether to include key stakeholder groups individually or if a number of groups will come together. This work will be planned centrally with the REWG.

Understanding and committing resources

Requirement and expected output

This stage seeks to understand the budgetary implications of the chosen incentive. The financial transfers made between counterparties are often the main focus of the design of an incentive scheme. However, overhead costs can be high enough to make a design ineffective or even unviable. One reason the government may use an intermediary (such as a bank) to run a scheme is that the bank's overhead costs may be lower.

Those costs include:

- **administration** — for example, record keeping and government supervision
- **enforcement** — for example, legal costs
- **monitoring** — for example, measuring equipment and inspectors
- **transitional costs** — that is, costs that occur only once, such as training costs

Application

The practitioner will assist the REWG in costing the incentive and designating funds that should be allocated to the incentive from public funds. The practitioner will also support efforts to access funds from international sources if required.

For many incentive schemes, there is evidence on the relative cost of the different schemes. However, this data is not readily available for all types of incentives (an example can be found in Tukker & Ivanova (2013)). Contacting government departments and agencies in other countries where similar incentives have been successfully introduced can provide useful insights into the scale of the costs involved in setting up and running such schemes.

Agree on the desired outcomes or targets and monitoring and evaluation program

Requirement and expected output

It is important to agree on the desired outcomes for the incentive, including relevant targets. These targets will enable an assessment of the performance of the incentive to be carried out.

Targets should be specific, measurable, achievable, realistic, and time-bound (SMART). They should reflect the ambitions and expectations in the country, but also any potential constraints. This would take into account:

- government targets for resource use and resource efficiency
- resource-efficiency potential in the target sectors
- available funding
- risk aversion (reflecting confidence and experience from previous incentive deployment)
- knowledge of the likely reaction of companies
- capacity issues (as previously mentioned)

Targets are most valuable when they give clear expression to a future situation that a majority of stakeholders (or stakeholders who are particularly influential) understand as being achievable, but challenging. Targets can be expressed in general or specific terms.

Application

Although targets can be selected and designed in a number of ways, a beneficial beginning is to develop an ambitious set of targets with few restrictions, which are then progressively refined to match available technical solutions. If one uses that strategy, the initial set of targets need not be complementary or mutually compatible, and they can focus on reflecting the requirement and level of ambition.

Possible ways of expressing initial targets are in terms of:

- resource use (national, regional, or sectoral; reduction in absolute, percentage, or per-capita figures)
- investment (increase in percentage of investment for resource-efficiency measures; number of carbon-neutral developments)
- imports (percentage of reduction by volume or value; new use of accredited supplier of, for example, biomass)
- behavior change (level of reduction in energy consumption at peak times; grey water reuse)
- awareness raising (population or number of companies involved; knowledge of energy-saving measures)

The practitioner will help the REWG consider the above points, and agree on the desired objectives and targets to take forward.

Setting the level and scale of incentive required (to deliver the desired target)

Requirement and expected output

An incentive's primary function is to change behavior by using monetary levers. Therefore, an incentive must provide sufficient motivation to result in the required change in behavior. In addition, the scale of the incentive mechanism (for example, the total amount of annual funding provided) needs to be sizable enough to trigger significant resource-efficiency improvements.

Chapter 5 of this handbook presents the key considerations for setting the levels and scales for specific types of incentive. However, it should be recognized that this is unlikely to be an exact science. The level and scale of the incentive will be determined by many factors including the level of ambition and the funds available. The decision on the level and scale of incentive will be framed by the political context, so is likely to take into account the results of stakeholder consultation.

Designers of the incentive scheme must recognize that negotiated settlements are a critical part of achieving a scheme and that they must work in all relevant ways to make negotiations effective. Early bilateral dialogue to establish an indication of the "red lines" that participants will not cross during consultation is valuable preparatory work. Furthermore, working in stages is recommended. For example, obtaining a participant's commitment to the process may be easier than obtaining a commitment to support the outcome. Also, an incentive providing a subsidy rather than penalizing resource use is more likely to receive support from affected industry groups.

Application

A number of components are needed to estimate the correct level and scale of the incentive. Economic literature provides a vast amount of information on the level of incentive at which marginal social cost equals marginal social benefit for resource use. Estimating these values and determining the appropriate level of incentive is a complex task that is unlikely to be achievable in most projects introducing financial incentives.

Instead, a tailored diagnostic study is needed to be able to determine the incentive level and its scale in a practicable way.

When determining the level of the incentive (that is, the level of taxation or the grant contribution to the total cost of specific resource-efficiency improvements), the following aspects would need to be analyzed through a diagnostic study:

- **Cost-benefit profile of the technologies targeted** — while not applicable to taxation measures, the cost-benefit profile of the targeted technologies needs to be understood for financial incentives in the form of subsidies (whether a grant, tax rebate, loan, or other). This is because it allows the analyst to estimate the investment needed to finance specific resource-efficiency improvements and their payback periods. Such information can then be contrasted with perceptions of potential beneficiaries of what is deemed financially attractive to them (see next point).
- **Survey** — ideally, the diagnostic studies (as set out in the section "Conducting a diagnostic study" on page 61) will carry out an in-country survey across the potential beneficiaries of the incentive to determine the levels at which the incentive is deemed to be substantial enough to influence investment decisions that concern resource efficiency. For example, businesses would be asked which payback periods they consider financially attractive enough to invest in (typically this will be less than 3 years, but depends on the specific circumstances in the country and in different sectors). Once an attractive payback period has been established, the incentives can be designed in such a way that payback periods would be reduced to levels deemed financially attractive by the beneficiaries.

- **The resource target** — this applies only to taxation measures. Elasticities can be used to determine the level of incentive required to reach a certain level of resource use. Elasticities may not be readily available for a particular country. Therefore, estimates may be taken from existing studies.
- **Leakage** — this applies only to taxation measures and cap-and-trade systems, but not financial subsidies. In setting an incentive at too high a level (such as a very high tax rate on resource use) companies may take their industry elsewhere resulting in no resource efficiencies and potential job losses. The level of incentive needs to carefully determine the reaction of industries.
- **Benchmarks** — in the absence of data and limited resources to collect data, international benchmarks could be used to determine an appropriate level of incentive. A risk with this approach is that benchmarks may be based on rates that are inefficient and not appropriate to the country context, which would, ultimately, result in failure to achieve the expected resource-efficiency gains.
- **Consultations** — once the level of the incentive has been established, an in-country consultation process can help with validating the proposal and maintaining transparency.

Setting the level of incentive is a complex task and one that should be supported by experts in a particular incentive. For financial subsidies, in addition to the incentive level for subsidies, the scale of the allocated budget needs to be determined (for example, how many grants per year will be provided). This depends on:

- **The capacity of the supply chain** — when considering the level of an incentive aimed at increasing the deployment of resource-efficiency technologies, the capacity of the supply chain needs to be assessed. This includes an analysis of the current levels of market activity (that is, how many resource-efficiency measures are installed per year and what the market size is in terms of turnover). Given the diversity of resource-efficiency technologies and the sectoral variety of applications, a segmentation approach indicating the current supply chain capacity in different sectors and technology markets is needed. This is important to be able to estimate the potential for growth across the different parts of the resource-efficiency supply chain. Setting the scale of the incentive too low may simply subsidize existing levels of activity, whereas setting the scale of the incentive too high may result in underspending of the budget allocated to the incentive.
- **Available financial resources** — for a subsidy, the scale of the incentive is also determined by the available financial resources. This will depend on the maximum amount of funding that can be allocated to the incentive from the public budget and additional funding provided by third parties (including international donor agencies).

Select an institutional delivery mechanism

Requirement and expected output

The skills and capacity for fiscal incentive schemes are likely to be available already. Simplistically, an incentive scheme could require just an adjustment to a single number: the relevant tax rate. In practice, administrative procedures will be required to verify that applicants qualify for the adjustment and analysis will be required in the design phase to estimate the level of adjustment needed. Nevertheless, the relevant skills are likely to be in place already as a result of the skill sets used to manage government revenue.

More complex changes, such as a new specific tax — rather than an adjustment to the existing tax rate — may be much more difficult to put in place. Changes to operational tax systems are likely to be costly, especially if disruption results and system testing is required. The availability of experienced staff and the constraints of existing operational and maintenance schedules within government are likely to determine the capacity for more complex tax changes.

Technically, the main focus will be on the procedures for verifying that the tax adjustment applies to the applicant. Additional personnel may be needed for monitoring, but incorporating monitoring within existing systems (such as dockside checks on equipment that is claimed to qualify for import tax discounts) may also be possible.

Application

This task should be undertaken with careful assessment of the analysis described in the section "Assess the market context" on page 65 to determine the regulatory context in which an incentive will sit and also which agencies are best placed to introduce it.

The practitioner will support the REWG in determining the most suitable implementing agency delivery mechanism for this work, which will require the co-ordination of the REWG with the wider government.

Select activities to accompany the incentive

Requirement and expected output

To ensure that an incentive mechanism is successful, associated activities need to be considered. Financial incentives typically address financial barriers and additional activities can engage stakeholders through addressing other (non-financial) barriers.

This should build on the theory presented in the section "Combining incentive schemes with other policies" on page 47.

Application

The following associated activities can help to increase the efficacy of an incentive:

- **Capacity building.** A proven approach to capacity building is the use of resource-efficiency networks. Such networks engage in capacity building for resource efficiency by raising awareness, providing information, and showing possible solutions. Networks help to find and understand solutions by engaging different members in discussions and encouraging the exchange of experiences — successful and unsuccessful. The cooperation between network members is essential for sustainable learning. Training courses and workshops offered by networks contribute greatly to the creation of capacity of resource efficiency within businesses. External coaches and experts, which could be too costly to hire for a single company, can be brought to the whole network. Capacity building addresses processes in the production phase and those activities aiming to improve the use of products.
- **Performance standards.** Usually, there is a pool of products or production technologies on the market, with different environmental and resource-efficiency performances. Here, "hard" regulatory instruments can ensure a minimum performance standard, while softer informative instruments and financial incentives can be used to award the "top end" in a market. This can create a market dynamic by which, gradually, the average product or process performance improves over time.
- **Actor-specific approach.** In some cases, the improvement of resource-efficiency performance needs a coordinated change in a full value chain. In this case, policy mixes can be applied where each instrument addresses a different actor (such as labelling aimed at producers of products, information campaigns for consumers, and green public procurement to be implemented by authorities).

These should be considered by the REWG against what is politically feasible, required to support the development of the incentive, and the budget that exists.

Establish a compliance mechanism, and monitoring and verification for individual projects

Requirement and expected output

Compliance is relevant to all incentive schemes — taxes need to be collected, permits for trading schemes need to be held by participants, and measures need to be installed in case of subsidies for specific technologies.

Monitoring and verification is important to be able to understand whether or not the incentive scheme delivers the expected outcome at project level and beyond. If implemented comprehensively, the benefits of monitoring and verification can extend to the macro level: As policymakers gain better understanding of deficiencies in the resource use of the private sector, they are able to design targeted policy measures and regulation.

Application

An effective compliance mechanism can be developed by:

- specifying what compliance consists of (for example, performance standards)
- allocating enforcement responsibilities to qualified organizations and individuals
- carrying out spot checks
- establishing a penalty regime

A robust monitoring and verification (M&V) system can be established by:

- developing clear guidelines for reporting on project implementation and outcomes
- carrying out surveys to collect primary data on resource-use trends in individual companies
- carrying out quality checks of the installed resource-efficiency measures
- ensuring monitoring and verification is done independently from the beneficiaries
- ensuring that the personnel involved in monitoring and verification are trained and accredited

Detailed guidance on monitoring and verification can be found in the "International Performance Measurement and Verification Protocol" (Efficiency Valuation Organization, 2012). The development of a monitoring and verification mechanism is likely to require expert advice. Detailed guidance on compliance is also available from the International Network for Compliance and Enforcement (INCE) (INCE, 2009).

Policy assessments

Requirement and expected output

Careful consideration needs to be given to the potential impacts and cost-effectiveness of an incentive prior to its introduction. A full range of impacts should be assessed, including those beyond the immediate target of the incentive, and it should be ensured that the incentive chosen represents the best use of public and donor funds for the policy objective.

The introduction of an incentive that penalizes resource use instead of rewarding efficiency can have regressive impacts on the poorer sections of society. For example, energy and CO_2 taxes can directly

impact on the end user and in poorer households, where energy use forms a large part of expenditure, the tax could have a disproportional effect on those less able to pay. It may be possible to reduce the impact on poorer households through the design of an incentive. Distributional concerns should be carefully considered in the design of any incentive and included in an impact assessment.

The output of this phase is a completed impact assessment that justifies the incentive adopted. If the impact assessment does not suggest that the incentive is cost effective, a different approach/ incentive must be taken.

Application

There is a lot of literature available on undertaking impact assessments of government interventions. For example the OECD (OECD, 2008) provides an "Introductory Handbook for Undertaking Regulatory Impact Analysis" and the UK's HM Treasury's "The Green Book" provides an overview of the requirements of any assessment of policy and the techniques to be adopted (HM Treasury, 2011).

Impact assessments can be a large undertaking. Predicting and assessing future states of the world and stakeholder response is a highly uncertain process. Resources can be diverted to undertaking impact assessments of larger size where the marginal benefit associated with more analysis is minimal. Impact assessments must, as a minimum, meet the legislative standards required for the introduction of policy within a jurisdiction and the funding requirements of any donor.

Pilot

Requirement and expected output

Pilot projects are used in many policy fields to test the applicability of a policy tool. Piloting experiences link theory to practical experience, and help to adapt the implementation of the policy tool to the specificities of each system.

The aim is to benefit from the lessons learned in the pilot projects so that authorities are able to implement reforms at a larger scale based on their experience. The piloting phase should allow an appropriate period of time to authorities to reflect on how to best fulfil their needs and objectives.

A pilot phase enables the incentive's implementer to assess whether or not specific design features require modification. This may include assumptions made regarding the resource-efficiency gains from specific interventions, the response from businesses, the costs of resource-efficiency improvements, and the effort involved in administering the scheme. It is recommended that a pilot

study is conducted even if similar technology has been used in similar countries. The results of the pilot are influenced by a host of factors including the skills and expertise of the personnel involved in delivery of the scheme, and the particular features of industry sites — especially when integrated resource-efficiency technologies are installed.

Application

From a practical point of view, the process to develop a pilot project could have the following structure:

- define responsibilities, timeframe and overall institutional framework
- plan the pilot-project stages: timetable, resources involved, objectives, and supervision-monitoring mechanisms
- gather performance data, identify areas for improvements, and demonstrate resource-efficiency savings that can be used to secure additional stakeholders' support (such executive leaderships and funders)
- analyze the outcomes of the pilot phase and study possible applications in the future in a more systematized way
- communicate the process and publicize the outcomes — these should be done from the beginning of the pilot process to foster support and engage stakeholders

Communication strategy

Requirement and expected output

Engaging with businesses to ensure compliance and commitment to an incentive requires a well-developed communication strategy.

Application

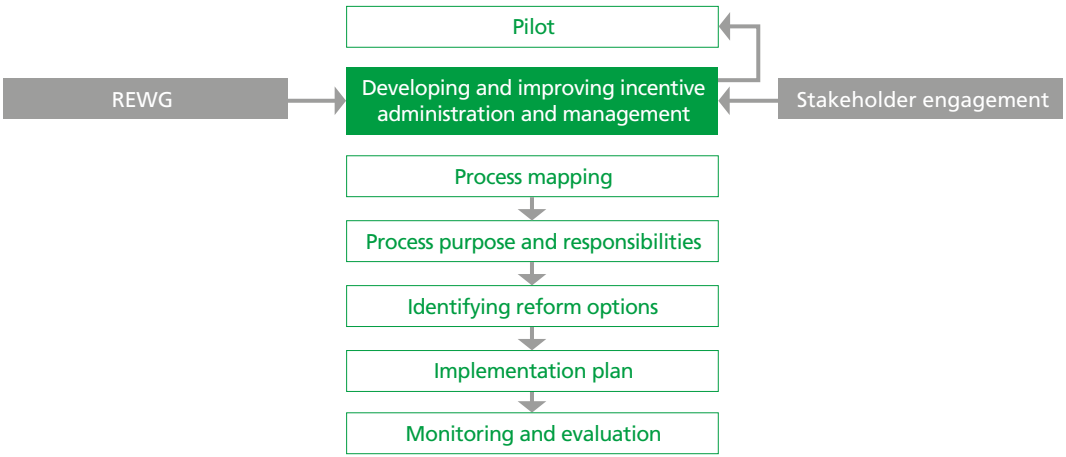
The general approach to developing a communications strategy is presented in "Climate Competitive Industries: A Practitioner's Field Guide" (World Bank Group, 2016). The development of this communication strategy will be led by the REWG. The steps below should be followed when creating a communication plan (World Bank Group, 2016).

1. Establish goals for the communication plan
2. Define/identify audience
3. Identify key messages
4. Create an outreach plan
5. Develop materials
6. Specify a timeline
7. Communicate program and policy results

Developing and improving incentive administration and management

The development of effective administration and management for an incentive scheme should be undertaken when the institutional delivery mechanism is understood. Once designed, the administration and management procedures should be tested. Where possible, this should be done using the pilot studies detailed in the previous stage.

FIGURE 7 **Developing and improving incentive administration and management**



The administration and management of incentives should minimize the costs for government and businesses associated with the incentive, while ensuring policy objectives are achieved. Step 4 of the investment incentives guidance (World Bank Group, 2015) provides guidance on how to improve the administrative efficiencies associated with investment incentives. The guidance follows the method of business process re-engineering. This guidance provides a useful overview of the reform of existing administrative structures and processes, and is useful in designing a management and administration regime from scratch. The key stages are taken mostly from the investment incentives guidance. Practitioners should refer to the original document for a complete overview.

Using process maps to diagnose how the system works

Requirement and expected output

In cases where existing structures (such as processes, implementing agencies, and enforcement) will be used by an incentive, it is necessary to understand how they operate and are performing. This provides the baseline for improvement. The output of this stage will be a process map identifying the key steps that will be used for the new incentive.

In the case of a new incentive scheme that will not adopt an administration structure, a method will have to be designed and put into a process map.

Application

By interviewing staff from relevant authorities and conducting stakeholder engagement with the private sector, each stage of the process should be established. The resultant process map should present:

- each step in the application for complying with an incentive
- the time burden associated with each step
- what the administrative requirements are for each step
- an estimate of costs associated with each step

This work should be supported by analyzing the applications received for an incentive. Why applications are withdrawn or why there are failures in compliance can provide valuable intelligence for improving application procedures.

In cases where the process has yet to be established, the process map can be drawn on the proposed approach.

Having a clear understanding of the purpose of a process and assigning responsibility for monitoring

Requirement and expected output

After understanding each stage of the process that is in place, the next level of analysis must determine why each stage is required and whether it provides value. During this assessment, the following questions should be answered:

- What is the purpose of the procedure?
- Does the process have a solid legal footing?
- Is each procedure absolutely necessary?

In cases where a process for an incentive has yet to be established, these questions must be kept in mind.

In addition, the following principles should provide the general basis against which the review, or development of an administration or management process should take place:

- transparency — procedures should be predetermined, uniform, and available to the public
- appropriate level of responsibility within government departments — administration should be undertaken by an appropriate government department
- responsiveness — the process and administration should be geared so that it is easy to understand for government and the private sector
- less discretion — incentives should not be assessed on a case-by-case basis
- compliance — consideration must be given to how compliance with a process will be assured

Application

In the case of a review of an existing process and the design of a new one, this phase should be undertaken in consultation with the private-sector organization that is subject to or will be subject to a process and with the government agencies responsible.

Identifying reform options: knowing the pros and cons, and costs and benefits in incentives reform

Requirement and expected output

Potential inefficiencies in the existing process will have been identified in the previous step. Reforms to the existing process should be suggested. The aim of this task is to develop reform options for incentives.

In cases where a process has yet to be designed, this task is likely to be considered before the previous two steps.

Application

The following can be used in the incentive reform and administration process to increase efficiency and effectiveness:

- process simplification — based on the process map, determine if there are any options for streamlining the process
- increasing accountability — multiagency approval should be minimized
- reducing discretion — discretion can create opportunities for bribery and corruption
- fast tracking — where circumstances allow, fast tracking may be applicable for certain applicants
- self-certification — where circumstances allow, self-certification may reduce administrative burden
- one stop shop — providing a single contact point can support efficiencies
- automation — online systems provide ease of administration and application

This phase should be undertaken in consultation with the private-sector organization that is subject to or will be subject to a procedure and with the government agencies responsible.

Developing an implementation plan: agreeing to a timeline of actions to implement and sustain the reform

Requirement and expected output

An implementation plan sets out the strategy for implementing a reform to an existing process, but can also set out the planned strategy for introducing a new administration and management process for an incentive.

Implementing any change to existing structures or introducing new structures is dependent on the level of stakeholder support and capacity.

Application

The implementation plan should identify:

- who the key stakeholders are
- the capacity building required to introduce the reform
- the level of communication required in government and with key stakeholders
- how often the process will be reviewed

Monitoring and evaluation: putting in place an evaluation framework to monitor, record, and assess development impact

Requirement and expected output

To ensure that the administrative processes involved are efficient and not overly burdensome, monitoring and evaluation of the procedures is recommended. This is to ensure that efficiencies are identified and realized.

Application

Monitoring and evaluation of the administrative processes should include:

- monitoring the number of full-time staff in government ministries and agencies dedicated to administration of the incentive
- a survey of costs to participants
- a process evaluation identifying which processes might need improvement

Template for scope of work

Box 4 includes a template for scope of work that could be included in the terms of reference when planning work and understanding capabilities in relation to designing an incentive scheme. This template should be revised as appropriate to reflect the specific support required for a given country or region.

BOX 4 **Template for scope of work relevant to designing an incentive**

Assignment objective

A program of work to design an incentive and its implementation that is suitable for the particular environment in *[insert country]* and will help to achieve resource-efficiency objectives.

Scope of work

1. **Selecting an incentive type:** building on work in understanding the context in *[insert country]*, the favored type of incentive should be chosen for implementation.

2. **Design and implementation of an incentive:** understanding how the incentive will be applied and the necessary conditions for effective implementation will include:
   - preparatory steps — to engage with key stakeholders to ensure buy-in and understanding; ensure budgetary commitment; and determine the targets for the incentive

- level and scale of incentive — determining the level and scale of the incentive that is to be applied
- institutional delivery mechanism — determining how the incentive will be delivered including the responsible agency and mechanism of delivery
- accompanying activities — supporting the implementation of an incentive by introducing supporting activities such as capacity building or performance standards
- compliance mechanism — ensuring the rules of an incentive scheme are adhered to through the design of an effective compliance mechanism including a monitoring and verification system
- policy assessments — ensuring any approach is cost-effective and potential impacts are understood prior to implementation requires policy assessment tools to be used
- pilot — testing the implementation of an incentive will help determine the potential success of the scheme at a larger scale
- communication strategy — designing an effective strategy to communicate the introduction of an incentive scheme to business and stakeholders

3. **Incentive administration and management** — following a systematic process to ensure that the design of the administration and management of an incentive is effective, but is achieved at minimum cost to business and the government.

Deliverables

A carefully designed implementation program for the introduction of an incentive.

Further reading

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5

INCENTIVE FOCUS

Tax on resource use (including tax on proxies) 113
Application of trading schemes 120
Application of green finance 125

What the reader will get from this chapter

- guidance on the specific considerations in implementing taxes, trading schemes or green finance
- an appreciation of the wider relevance of these principles for all incentive schemes

In this chapter, the focus is on three incentives. These have been selected because they are the most commonly used, but more technically difficult to apply. The key principles to consider in the development of these incentives, many of which are relevant for multiple approaches, are presented. The incentives that are considered are:

- taxes on resource use
- trading schemes
- green finance

Tax on resource use (including tax on proxies)

Principles of application

Taxes can create a strong economic signal to change behavior associated with resource use. A tax can correct (in part at least) for externalities associated with resource use, such as environmental or health impacts resulting from pollution that arises. It does so by imposing a cost on companies that use the resources concerned, either in relation to the quantity used or a measure of the pollutants or waste products that arise. The imposition of these costs may have an impact on the competitiveness of the companies using the resources and, potentially, on the prices paid by consumers for the associated products. For this reason, policy impact assessments need to be carried out and the range of design options fully considered (for example, in the coverage of the tax, its rate or for cost-mitigation measures). These options are discussed below.

The tax base

A key question in defining the base of a tax (that is, what is taxed) is what are the specific objectives in introducing the tax? Is it to reduce resource use or is it to reduce the harms associated with that resource use?

If the objective of the tax is to reduce any environmental harm (such as a pollutant) associated with resource use, then the tax should be applied as "closely" as possible to that pollutant (that is, in relation to the quantity of the pollutant at the point of release to the environment or a proxy directly related to the pollutant). This maximizes the incentive for the abatement options available. If the tax is applied to an intermediate good (or a proxy), the incentive will be limited to a subset of abatement options. An example given by the OECD (OECD, 2010) is that if a tax is put on coal use to address sulfur emissions, the abatement options will be limited to reducing coal use or

finding an alternative to the use of coal; there would be no financial incentive to adopt "end-of-pipe" measures that would reduce sulfur emissions.

If the objective is to reduce the resource use directly, then the tax should be applied as closely as possible to the point at which the resource is used.

Wider relevance — identifying the objective of the incentive and where it shall be applied is important for all incentives.

Coherence

Coherence means that government policies should be aligned consistently towards common objectives; be applied uniformly; and not have conflicting goals, economic incentives or administrative procedures. Coherent incentives will be more efficient and make the best use of public funds.

Any new tax that will be introduced for the purposes of resource efficiency must fit into the existing regulatory and tax environment.

Incentives or regulatory approaches that conflict with the goals of resource efficiency may be in place and reform should be considered (including a program of subsidy reforms) prior to the application of a new tax. The basis of any assessment of reform options should be the regulatory and institutional analysis described in the section "Assess the regulatory and institutional context" on page 67.

This coherence should extend to the same rate of tax being applied to every unit of pollution or resource use. Tax rates which are homogenous will ensure any reduction is achieved as cheaply as possible (OECD, 2010).

The establishment of a new tax can have a significant financial impact on businesses and they may seek to influence design choices. To minimize any potential disruption from vested interests, careful and extensive stakeholder engagement must be undertaken.

Wider relevance — coherence of regulation and incentives is a principle that should be adopted across all incentives.

Flexibility, certainty, and tax levels

Change is fostered through leveraging behavioral and structural responses — in this case through incentives. Generally, behavioral responses occur in response to price signals in the short term. Structural responses occur in the long term and come through investment in technologies, or through cultural or market changes. These structural responses are dependent on long-term price signals, and the predictability and credibility of a policy (OECD, 2010).

Changing economic circumstances and the difficulty in setting a tax level that results in the desired resource use means that the impact of a tax on businesses and on resource use is uncertain, and needs to be monitored carefully by the implementing body. The rate of tax may be adjusted if resource use is not decreasing, or the tax burden is disproportionate or having unintended consequences. For this reason, an effective monitoring and evaluation program must be created by the implementing body, with regular review of the level of tax.

However, it should be understood that frequently changing the level of taxes (and incentives more broadly) creates uncertainty and can undermine the intended structural changes towards resource efficiency. The evolution of the tax should be well communicated and provide long-term clarity to the market. A planned scale-up of the tax rate may be favored as it allows the progressive introduction of costs and monitoring of impacts. In the longer term, changes should be concerned with fine tuning.

Wider relevance — monitoring and evaluation of the level of an incentive is key.

Use of revenue

Taxes on resource use will generate revenues for the government. How this additional revenue should be spent is an important issue. Economic theory would suggest compensating those who suffer the damage of resource use (hypothecation), but this is very complicated to do in practice. Therefore, it is suggested that revenues from taxes on resource use should be treated much like the revenues from any other tax (OECD, 2010).

A further consideration for the use of revenues is that the impacts of the resource tax could be mitigated by correspondingly reducing the tax burden on other aspects of the economy. For instance, the impacts of energy-related taxation on energy-intensive industry could be mitigated by corresponding tax incentives associated with the purchase of capital intensive energy-efficient equipment. Such action may provide political support for a tax (OECD, 2010).

Wider relevance — the use of revenues collected from any incentive should seek to maximize societal benefit, be that through general government spending or reducing particular distortions in the economy.

Defining the level of the tax

The theoretical basis for setting taxes where the marginal cost of damage associated with an activity is equal to the marginal cost of abatement is known as the Pigouvian level (OECD, 2010). Setting Pigouvian taxes requires a detailed understanding of the social costs associated with resource use. These costs are difficult to estimate — knowing the marginal rate of damage associated with resource use and then giving it a monetary value is a complex process. Therefore, policymakers have preferred to introduce a desired target for resource use (or level of pollution) and adjust the tax rate to reach this desired level. Estimating the level of tax required to reach a level of output can be done based on elasticities[8] of demand for the resource.

Any method of determining marginal social costs or elasticities for a good will be uncertain. Therefore, some degree of refinement in the tax rate could be required as the policy evolves.

Wider relevance — setting levels of incentives is not an exact science and should be reviewed regularly.

What are the challenges specific to tax implementation?

Tax administration

There are three major tasks of effective tax administration that could present a challenge to governments without appropriate capacities or existing tax infrastructure (Bird, 2010).

Facilitating compliance

Implementing agencies must make sure those parties subject to any tax are able to pay easily and efficiently. There are four components of facilitating compliance (Bird, 2010):

- An easy registration process for taxpayers and a systematic process in which to identify those who are not fulfilling their tax obligations must be in place. This could be done by adopting unique tax identification.
- Tax liabilities should be determined through a systematic process using self-assessment or by the implementing agency.

8 Elasticities (or price elasticities) describe the change in quantity demanded of a good in response to a change in price. Price elasticities are presented as the percentage change in demand in response to a one percentage change in demand. For example, if a price elasticity of electricity is -0.4, it means that if prices go up by 10% then electricity demand will fall by 4%.

- Tax collection is key — this should be done through the financial system and cash collection should be avoided.
- Taxpayers require certain support services to facilitate taxpayer compliance, including advice agencies, telephone and online services, and guidance literature.

Ensuring compliance

Tax authorities must have a thorough understanding of the tax base and, as a consequence, who should pay to determine the extent of non-compliance. This would include the number of companies and the scale of their exposure to a tax so as to understand the number of companies that are not complying because they are not filing tax returns or they are underreporting resource use.

Attention should also be paid to ensure that the known tax base pays on time and in full. This is a matter of enacting simple tasks such as quickly following up on companies that do not file on time or pay incorrect amounts. Penalties and interest charges should be applied to provide incentives to deter evasion and late payments.

Ensuring tax system is free from corruption

To ensure the tax administration is free from corruption, tax officials must be adequately compensated and professionally trained to minimize the temptation to engage in corrupt practices. Direct contact between tax officials and taxpayers should be limited to exceptional circumstances to minimize the opportunity for corruption.

Wider relevance — making incentives easy to apply for or to comply with, making sure any conditions are adhered to, and ensuring that there is no corruption in the system are good practices for all incentives.

Implications for competitiveness and the environment

Taxes provide incentives to resource inefficient companies to improve their resource efficiency. If they do not adjust in response to the tax, inefficient resource users will be put at a competitive disadvantage. However, there is a concern about how taxes on resources will impact on the competitiveness of companies on an international scale and whether a tax would force companies to relocate with no improvement in resource efficiency, a situation known as leakage, originally phrased in the context of carbon leakage due to regulatory costs of carbon mitigation policies.

There are three causes of leakage:

- **Investment leakage** — regulatory action can result in incentives for companies to relocate to regions/areas with less stringent environmental regulations. The company's investments are then made outside of the regulated area and with less focus on improving resource efficiency.
- **Trade leakage** — unilateral environmental policies can create a competitive disadvantage for regulated companies competing in global markets. Consumption of products within the borders of a regulated market is substituted with imported goods from countries outside the regulated area whose products do not face comparable costs from climate legislation. A similar effect may also occur in the export market of the regulated area.
- **Energy price leakage/supply-side leakage** — the reduced demand for resources as a result of resource-efficiency policies can create a downward pressure on global resource prices. Those countries without stringent resource-efficiency policies will then use more resources as a result of reduced prices. In this instance, the resource use has not "leaked" in the same way as it does in the first two instances, but there could be a net increase in global resource use as a result of resource regulation and it is believed that this could be the most significant factor of all three.

The best option to tackle international competitiveness concerns and any leakage is to coordinate environmental regulation across countries. However, the extent to which this is feasible is very limited, and further options to mitigate competitive impacts should be considered. One method of addressing leakage concerns is to provide companies with fair warning that environmental regulation is coming. This gives them sufficient time to adjust investments accordingly, assuming they wish to avoid relocation. Companies affected by a tax could receive recycled revenues to reduce the impact on them. In this instance, an important consideration is whether or to what degree the mitigation measure reduces the incentive for resource-efficiency improvements. Tax allowances or rebates contingent on improvements in resource efficiency can be an option.

Border tax adjustments are measures imposed to correct for any competitive disadvantage businesses face resulting from domestic environmental policies (Eckermann, et al., 2012). This can have two components:

- a tax on imports that contain resources that domestic industries pay a tax on (if applied)
- a refund to exporting businesses for any tax paid domestically to ensure they are competitive internationally (Eckermann, et al., 2012)

This approach has yet to be adopted (OECD, 2010).

It should be recognized that environmental regulation is only one small part in a company's decision to relocate (OECD, 2010). The evidence on the existence of leakage as a result of environmental regulation is mixed. However, measures can be included in any incentive to address such concerns. These are discussed fully in the World Bank's Partnership for Market Readiness (PMR) document "Carbon Leakage" (PMR, 2015).

Wider relevance — incentives that impose a cost on companies should be designed with an awareness of leakage, but action to alleviate it should not undermine the desired objectives of the scheme.

Distributional concerns

Taxes on resource use can affect individuals through the "pass-through" of taxation costs to product prices or the tax applied directly to the resources used by individuals (such as utilities). This can have consequences for the poorest in society. Therefore, taxes should be designed with this in mind. Approaches to tackle distributional concerns have included exempting certain households from any tax or reducing tax rates for particularly poor regions. However, the risk in taking these approaches is that any incentive is reduced and the intended progressive impacts are not achieved (OECD, 2010). A better approach would be to address distributional concerns through existing taxes, such as lowering incomes taxes, or with welfare provision.

Wider relevance — incentives that could impose a cost on a poorer section of society should ensure that measures are in place to minimize the overall impact, although this need not necessarily be through reducing the level of incentive.

Application of trading schemes

Principles of application

Trading schemes involve governments defining an upper limit (a cap) to an activity (such as emitting CO_2 from specific sectors) in a region over a specified time period. Allowances up to the level of the cap are issued and regulated entities must acquire and surrender a number of allowances corresponding to their actual activity (for example, their verified emissions). The allowances can be auctioned or freely allocated to regulated entities (for example, based on their previous emissions levels). Regulated entities may freely buy and sell allowances from and to each other or from and to non-regulated entities that may participate in the allowance market. The optimum strategy for regulated entities is to reduce the activity covered by the trading system where it is cheaper to do so than to buy allowances, but no further. In doing so, the regulated entity may need to acquire additional allowances from the market or have a surplus to sell.

The following section presents the key aspects that should be considered for the design of a trading scheme to improve resource efficiency. These considerations are mainly based on those experiences associated with ETSs. Emissions trading does not focus directly on resources, but instead on the pollutants associated with the use of resources.

It should be kept in mind that emissions trading for the purposes of reducing CO_2 emissions is not the only area where trading schemes have been applied. Trading schemes have also been applied for sulfur dioxide (SO_2) emissions, water quality, and resource rights for fishing using individual transferable quotas (ITOs).

The cap

A key indication of the ambition of a trading scheme is the level of the cap on emissions, resources, or usage rights. The cap is converted into the allowances/quotas/credit/units of trade. The cap could severely curtail the use of resources in a country or it could be set at a level that sets low-level reductions in resource use from industry, but gets more stringent over time.

The setting of a cap determines the use of resources (or level of pollutant) in an economy, but is vulnerable to political manipulation from those groups with vested interests. A balance must be sought between environmental objectives and bearable economic costs for industry and consumers. Intensity targets could be used in place of a cap to allow for increased economic

activity in sectors with high and/or uncertain growth prospects that contribute to the wider development of the economy, such as in developing countries where economic development is so key to poverty reduction.

Wider relevance — all incentives must weigh up the benefits and costs for society in achieving an resource-efficiency target.

Allocation methodology

The unit of trade in a trading scheme, be it allowances, quotas, or credits (referred to as allowances for simplicity going forward), provides a participant in a trading scheme the right to emit a certain quantity of pollutant or use a quantity of a resource. The right to emit a pollutant or use a resource is valuable in a regulated market. Therefore, how these rights are initially determined is of critical importance to a scheme. The allocation can be undertaken using free allocations or auctions.

Free allocations could be used to minimize the burden on industries and to prevent leakage (discussed in the section "What are the challenges specific to tax implementation?" in the context of taxes on page 116). Free allocation can be based on historical emissions or resource use (grandfathering) or on benchmarks applied to historical activity levels. Both of these approaches require considerable data gathering and analysis. Providing allowances on a historical basis grants a form of rent to companies and, in principle, could provide perverse incentives for higher emissions, resource use, or activity prior to the system introduction to secure a more favorable allocation. An additional disadvantage is that the costs of allowances may be recoverable through product prices (at least in part) and an initial allocation for free can result in net windfall profits.

Auctioning the allowances in a trading scheme requires less primary data collection than free allocation and can provide revenue to implementing agencies. Grandfathering and auctioning will result in the same price in the trading market, but does impact the initial ownership of trading rights. In the case of grandfathering, polluting industries extract the benefit from these trading rights. With auctions, it is extracted by the implementing agency, which could then redistribute appropriately for social gain. As a result, most analyses stress that an auction system is a more cost-effective way for society to allocate permits.

Wider relevance — care must be taken in giving resource inefficient industries an advantageous position based on past performance.

Monitoring, reporting, and verification

An effective monitoring, reporting, and verification (MRV) system is a critical part of any trading scheme. It underlines the environmental integrity of, and underpins market confidence in, a system. Monitoring determines the emissions or resources used. This is generally done by the market participant themselves. The difficulty in measuring resource use or emissions may mean that a proxy to the resource is used as the basis for monitoring. In the case of ETS, direct emission monitoring or proxies (fuel use) are used to determine the emissions covered by the scheme. Verification is the process by which the monitoring of regulated parties is checked by a third party. Considerable guidance exists on MRV approaches, especially with regard to the EU ETS[9].

As part of the overall compliance and oversight processes, the emissions or resource use must be reported to the regulator and this is often done online. Again, this is done by the participant of the trading scheme.

Wider relevance — clear guidance must be established of what is expected from participants with regards to MRV for any incentive.

Flexible measures

Trading schemes could adopt flexible measures that allow market participants to meet their obligations at the lowest cost. These measures, which are primarily designed for ETS, include:

- **Banking** — gives participants the option to carry over surplus allowances for use in the future.
- **Borrowing** — allows for use of future allowances against the previous year's obligations.
- **Offset mechanisms** — participants are allowed to meet their obligations under the trading scheme by paying for reductions in resource/emissions outside the boundaries of the trading scheme. It must be ensured that the standards for offsets matches the standards of the trading scheme.
- **Linking** — linking trading schemes across national or regional boundaries would allow participants to achieve resource/emission reductions in the cheapest way possible. However, linking schemes requires extensive co-ordination and harmonization across schemes.

Wider relevance — incentive designers should allow companies and consumers to improve resource efficiency in the cheapest manner possible through building flexibility into an incentive.

9 http://ec.europa.eu/clima/policies/ets/monitoring/documentation_en.htm

Supporting measures

Supporting measures may be beneficial in a trading scheme to ensure market shocks and cost concerns are addressed. These measures, which are most commonly applied to ETS, fall into the following categories:

- **Managing market supply and price**
  - Managing supply of allowances — unforeseen events, such as recessions or particularly strong growth, may create circumstances in which there is an oversupply or undersupply in the scheme. While this is potentially manageable in the short term, severe or persistent imbalances can result in distortions in the market including extremely low or high prices. A system where allowances are kept in reserve or released from a reserve can be used to help accommodate such circumstances. This would not impact the level of the cap.
  - Price caps and price floors — these tools could be used to set boundaries in which prices can fluctuate. Such approaches impact the efficiency of the market and any unplanned or repeated regulatory interventions can undermine market confidence.

- **Managing participant and non-participant costs**
  To minimize costs to participant industries and minimize the risks of leakage, cost mitigation measures may be required. This could include free allowances or financial assistance. This support should be provided with the understanding that the long-term direction of the regulated industry is towards resource efficiency and this support is transitional.

- **Institutional infrastructure**
  Strong institutional infrastructure is required to establish an effective trading scheme. The following are key:
  - regulation and enforcement — an effective regulator is required to ensure compliance with the scheme and provide market oversight
  - allowance registry — a functioning registry system needs to be put in place to record ownership, and transfer and surrender of allowances
  - trading platform — a well-managed platform on which trading takes place is key; it will be a spot market and could allow for futures trading

- **Legal foundation**
  Any trading scheme requires a solid legal framework. There are levels of regulation:
  - the law or regulation concerning the trading scheme itself which specifies the structure of the scheme
  - the law that concerns the technical guidance for each component of the scheme
  - those legal/regulatory provisions that are required so that the scheme may be managed effectively

Wider relevance — strong institutional structures must be in place for incentive schemes.

What are the challenges specific to trading schemes?

Political commitment

Securing political commitment is critical to implementing a functioning trading scheme. For investors and the allowance market, this will help provide confidence in the longevity and stability of the system, and that oversight and enforcement arrangements will be applied robustly and fairly.

Wider relevance — incentives require strong political backing which can determine the success of any program.

Oversupply

A number of factors, including weak ambition (as a result of weak political commitment), the use of international credits, and the economic downturn resulted in oversupply of allowances in carbon trading systems after 2008. This oversupply resulted in an extremely low carbon price, providing very little incentive to abate (Asian Development Bank (ADB), 2016).

Wider relevance — strong price signals must be sent by incentives to change behavior.

Leakage from trading schemes

This is discussed in the section "What are the challenges specific to tax implementation?" with respect to taxes on page 116.

Application of green finance

Principles of application

In this section, "green finance" refers to loans and other instruments that can be applied through the financial system. Grants can be considered alongside these instruments, but are often provided through the public sector.

Existence of financial infrastructure

Financial incentives can be applied where the financial sector is well developed and stable. The strength of the financial sector in comparison to the capacities of the public sector may mean that an incentive that utilizes the established infrastructure is more attractive.

Wider relevance — existing institutional structures should be used wherever possible.

Demand for the incentive

If a financial incentive is to be utilized in the pursuit of resource efficiency, there must be demand from industry. The success of the incentive will be driven by the demand for it. If industry has no demand for resource-efficient investments and, therefore, for financial incentives, the demand could be created through a supplementary approach. For example, drivers from regulatory action or resource taxes could be utilized to make the case for longer term business benefits which in turn will drive demand.

Wider relevance — designers must be sure there is demand for an incentive through stakeholder engagement.

Poor public-sector financing

There will be circumstances where regulatory approaches such as taxes, tax preferences, grants (on their own), and subsidies may be inappropriate (for example, in countries with a poor fiscal position, political instability, or low institutional capacity). This leaves room for DFIs to support resource efficiency through financial incentives in a country by using the financial sector.

Wider relevance — DFIs may provide support to implement an incentive where government is in a poor financial position.

How to define the right level of incentives

International support for resource efficiency

At an international level, where concessional finance is provided by international donors (such as DFIs and bilaterally), the level of concessionality of a financial incentive is dependent on public-sector finances, capacity in the recipient country, and the financial variables of the activities supported. For example, grants, instead of loans, may be chosen if a country has a low level of income, high debts levels, or a lack of financial infrastructure. Those projects where revenue would be generated, but which do not occur due to high upfront capital costs, should be funded through loans. Table 2 provides an overview of the types of finance that should be offered in such circumstances.

TABLE 2 **Guidelines for uses of grants and loans (REDD-net, 2010)**

Conditions	Revenue-generating activities	Non-revenue generating activities (capacity building, policy planning)	Revenue-generating activities with high technical risk
Sovereign funding to government with strong macroeconomic and institutional conditions	Concessional loans	Grants	Grants
Sovereign funding to weak macroeconomic and institutional conditions	Grants	Grants	Grants
Project-based funding to non-government entity	Concessional loans	Grants	Grants

The choice of financial instrument is not as binary as a grant or loan. There are a number of financial instruments that could support the development of resource efficiency and the level of support provided by each can also vary enormously (the level of concessionality). The World Bank collects data on the average grant element (which provides some indication of concessionality) on new external debt commitments for developing countries (World Bank, 2015). The grant element of the loan is its

commitment less the discounted present value of its contractual debt service. Those loans included are from the World Bank, regional development banks, and other multilateral agencies. These are not prescriptive rates for resource efficiency, but do provide an indication that poorer countries receive greater grant elements in their debt obligations as presented in (World Bank, 2015) Table 3.

TABLE 3 **Average grant element on new external debt commitments, official (percent) (World Bank, 2015)**

	2010	2011	2012	2013	2014
Low income	71.08	65.89	65.84	64.70	61.40
Lower middle income	57.58	60.40	53.87	63.81	58.43
Low and middle income	56.62	53.76	54.25	61.40	57.51
Middle income	54.90	52.08	52.34	60.92	56.71
Upper middle income	52.49	43.71	49.46	52.51	54.48

Domestic support for resource efficiency

At a project level, the degree of concessionality provided to companies must make the investment in resource efficiency attractive while ensuring that the company feels a responsibility to own the project and that it makes returns for its business. For instance, if a financial incentive, say a loan, is offered to a company for a resource-efficiency project at just below market rates, there may not be sufficient incentive to undertake the project. However, if overly generous terms are offered, the company may not have any stake in ensuring the project achieves its financial and resource-efficiency objectives. This is a circumstance known as moral hazard (World Bank, 2015).

No strict rules or guidance exist in setting the levels of concessionality for financial incentives for projects. However, international benchmarks should be taken alongside stakeholder engagement and market analysis to determine appropriate rates.

Combination of instruments

Loans and other financial instruments can often be combined with grants to incentivize investment in resource efficiency. The level of support, as discussed in the preceding section, is

dependent on the country and project circumstances. Example approaches are provided in the European Commission Technical Guidance on Financing the Energy Renovation of Buildings with Cohesion Policy Funding (European Commission, 2014). A project may be funded throughout implementation by a mix of support grants, financial instruments, and the beneficiary's own contribution. Alternatively, a grant might fund a project through an inception phase with project implementation being funded by the beneficiary's own contribution and financial instruments (European Commission, 2014).

Wider relevance — the type of incentive is strongly dependent on the country context.

What are the challenges specific to green finance?

Capacity requirements

Loan-based incentive systems use basic financial infrastructure. Therefore, their effectiveness will depend on the robustness of the infrastructure, including, for example, the degree of corruption. Methods of ensuring that an incentive scheme will itself be financially robust and otherwise successful include:

- accessing prior experience in government and other organizations (particularly of similar policy measures, end users, and financing structures)
- working with reputable intermediaries (respected by resource-using companies)
- using international organizations to provide objective and unbiased checks and services
- explicitly including monitoring and checks to overcome weaknesses in the financial system (this may add appreciable or unaffordable costs)
- strongly focusing on organizational design and links with the operational components of the incentive scheme

In terms of staffing, technical requirements for such an incentive scheme involve specific scientific or engineering knowledge that is essential for understanding the application that the loan is designed to support. Skills in financial management and negotiation are required, as are more general skills in monitoring and reporting. At the government level, experience in the management of similar programs is necessary.

The availability of a suitably skilled workforce is required in all of those areas — with a priority on assessing scarce skills — because the lack of qualified staff may lead to bottlenecks. Any difference in capacity between the current and required skill levels may be met through:

- providing training (with additional costs)
- limiting the size of the incentive scheme (for example, by geographic area, industrial sector, or size of company)
- requiring proof of capacity and ability (for example, qualifications or track record) from applicants

Financially, the availability of government funds will be a primary consideration. Assessment of financial capacity should also consider:

- contingency requirements (for example, whether uptake is very high)
- the financial capacity of intermediaries (for example, additional lending may affect their creditworthiness or may be limited by banking rules or other agreements)
- aggregate financial capacity (creditworthiness) of end users (which could set an upper limit on the funding they can afford)
- potential for sharing risk (for example, with international donors)

Wider relevance — there must be the institutional capacity in place to implement and manage an incentive

Application, selection, and disbursement

There are two ways of applying for project finance (European Commission, 2014):

- Calls for project proposals — such as a tendering process where the best projects are selected based on the objectives of the scheme. This method is generally suited to large-scale projects and where there is limited funding.
- Open applications — applicants can apply where the criteria are met. This will generally result in a large number of applicants and, in the case where there are limited funds, successful applications can be determined on a first-come, first-served basis. Decentralized application and approval processes appear to be the most successful with local installers and approvers.

Project selection should be determined through a transparent and systematic project evaluation framework, allowing for scoring on key criteria. A project selection database should be established and feedback should be provided to unsuccessful applicants. Funds can be disbursed through (European Commission, 2014):

- regional financial institutions or DFIs
- national public financial institutions
- special purpose vehicles/dedicated investment vehicles
- private financial institutions

Wider relevance — designers must consider the management process associated with any incentive.

Further reading

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