



THE ECONOMICS OF ECOSYSTEMS AND BIODIVERSITY

TEEB for National and International Policy Makers

Part I: The need for action

- Ch1 The global biodiversity crisis and related policy challenge
- Ch2 Framework and guiding principles for the policy response

Part II: Measuring what we manage: information tools for decision-makers

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Chapter 6: Reforming Subsidies

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Chapter 6

Reforming Subsidies

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Key Messages of Chapter 6

The last decade has seen **increasing and sometimes strenuous efforts to phase out or reform subsidies in various countries**. These experiences indicate that **subsidy reform or removal can alleviate environmental pressures, increase economic efficiency, and reduce the fiscal burden**.

Although declining slightly in some sectors, the **overall level of subsidies remains remarkably high**. Leaving aside conceptual and data deficiencies of global estimates for most sectors, conservative estimates point to hundreds of billions of dollars in annual subsidies. Agricultural subsidies in OECD countries averaged US\$ 261 billion/year in 2006–8, global fisheries subsidies are estimated at US\$ 15–35 billion and energy subsidies amounted to around US\$ 500 billion per year worldwide, and to US\$ 310 billion in the 20 largest non-OECD countries in 2007.

Many production subsidies serve to reduce costs or enhance revenues, e.g. the majority of agricultural support measures provided by OECD countries. Together with below-cost pricing for the use of natural resources under consumer subsidies, they effectively provide incentives to increase use of subsidised resources, production and consumption. This not only **increases environmental damage but can also restrict the development and use of more sustainable technologies and processes**. At the global level, **agricultural and fisheries subsidies are particularly worrying** in this respect, and analyses of other sectoral subsidies also highlight the substantial potential for environmental gains through their reform.

Not all subsidies are bad for the environment. Some subsidy programmes are already used to reward ecosystem benefits, like the range of transfer programmes in agriculture or forestry that reward less harmful production methods by compensating lost revenue or making payments against desired outcomes. However, **even ‘green’ subsidies can still distort economies and markets, and may not be well-targeted or cost-effective**. They too need to be examined carefully.

It is important **not to restrict subsidy reform to the identification and reform of environmentally harmful subsidies**. The reform process also needs to focus on those subsidies which have clearly outlived their purpose, are not targeted towards their stated objectives, or do not reach their objectives in a cost-effective manner. This is because of opportunity cost considerations: **phasing out ineffective subsidies frees up funds which can be re-directed to areas with more pressing funding needs**. From the perspective of TEEB, this includes rewarding the unrewarded benefits of ecosystem services and biodiversity.

Policy-makers already have a range of analytical tools to help them identify subsidies which offer potential benefits from reform, and assess the likely benefits, including for the environment. The growing number of **successful subsidy reforms around the world also provide useful lessons learnt**. Specifically, they show that the design of the reform process is a critical success factor.

Improving the **quality and comprehensiveness of available subsidy data and analytical information** is important for successful reform. **Transparency** is a key precondition for a well-informed public debate on current subsidy programmes, and can provide a powerful motivating force for change. **Dialogue and communication with stakeholders** including the wider public is needed in order to develop a clear set of agreed objectives and a **timetable** for reform.

Redoubled efforts are needed to reform subsidies. With a few exceptions, progress in reforming subsidies is generally too slow and protracted. The reasons are rooted in the political economy of subsidy reform and in some important cases are combined with technological and institutional barriers. Current public expenditure under the stimulus programmes of many countries will require stringent budgetary consolidation policies in the future. **Subsidy reform therefore needs to be a key element of current recovery measures and future budgetary consolidation policies** so as to free up increasingly scarce public resources and re-direct them towards more pressing areas.

The recent commitment of the G-20 to phase out inefficient fossil fuel subsidies in the medium term is laudable and needs to be urgently expanded to other relevant subsidies and of course implemented. At the global level, the **removal of capacity-enhancing or effort-enhancing fisheries subsidies and the continued and deepened reform of production-inducing agricultural subsidies, still prevalent in most OECD countries, are priority areas for reform** for better conservation of ecosystems and biodiversity. Depending on national circumstances, most OECD countries need to complement these global priorities with **prioritised reform efforts in other sectors**, particularly those provided in the **water and transport sectors** in addition to **energy subsidies**. These sectors are also interesting candidates for subsidy reform in non-OECD countries, with specific priorities to be determined in light of national circumstances.

Governments should, in the **short run**, establish transparent and comprehensive **subsidy inventories** and assess their effectiveness against stated objectives, their cost-efficiency and their environmental impacts – bearing in mind that the size of a subsidy does not necessarily reflect the extent of its harmful effect. Based on these assessments, governments should develop **prioritised plans of action for subsidy removal or reform**, for implementation in the **medium term** (up to 2020). Windows of opportunity for earlier subsidy reform, arising within the existing policy cycles, should be proactively and systematically seized.

6 Reforming Subsidies

Subsidies are often inefficient, expensive, socially inequitable and environmentally harmful, imposing a burden on government budgets and taxpayers – all strong arguments for reforming the existing subsidy policies.

OECD (2005)

We commit our agencies to support our developing country partners in the design and implementation of fiscal reforms that raise revenue, advance environmental sustainability and assist in reducing poverty.

Statement signed in 2005 by Klaus Toepfer (then Executive Director, UNEP), Ian Johnson (then Vice President World Bank), Olav Kjørven (UNDP) as well as Ministers and government representatives from Denmark, EC, Finland, Germany, Sweden, Switzerland, and the United Kingdom

Chapter 6 addresses the need for comprehensive reform of subsidy policies to reduce harm to biodiversity and ecosystem services and improve effectiveness of public expenditures. **6.1** explains the **terminology and scale** of current subsidies. **6.2** explains how existing subsidies can fall short of their stated objectives and be cost-inefficient, and how **subsidies can harm or**

benefit the environment. **6.3** provides a critical breakdown of **subsidies by major sector**, showing ways in which subsidies can be better designed for social and environmental goals. **6.4** presents a possible **roadmap for reform** with guidance on tackling specific obstacles. **6.5** concludes the chapter with **priority actions** for the way ahead.

6.1 SUBSIDIES AND THEIR IMPLICATIONS

Subsidies have been firmly on the international agenda for twenty years. Spurred on by studies by major international and non-governmental organisations in the 1990s, considerable analytical work has been undertaken in the last decade on their implications for the cost-effectiveness of government expenditures, social objectives and the environment.

Practical guidance is now available on identifying and reforming harmful subsidies. This builds on the considerable reform efforts made in various countries – efforts which in some cases have been successful. Lessons learnt from their experience indicate that **subsidy reform or removal can increase economic efficiency and reduce the burden on government budgets while alleviating environmental pressures.**



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6.1.1 WHAT ARE SUBSIDIES?

Subsidies come in many shapes and forms. They can include direct transfers of funds and potential direct transfers (to cover possible liabilities e.g. for nuclear accidents). They may consist of income or price support (e.g. for agricultural goods and water), tax credits, exemptions and rebates (e.g. for fuel), low-interest loans and guarantees, preferential treatment and use of regulatory support mechanisms (e.g. demand quotas). They can take the form of implicit income transfers when natural resources or services are not priced at full provisioning cost (e.g. water, energy).

Some subsidies are *on-budget* (clearly visible in government budgets or can be estimated from budget accounts) while others are *off-budget* (not accounted for in national budgets).

There are two internationally-agreed definitions of a subsidy but other key terms and definitions are also relevant and are used differently depending on the context (see Box 6.1).

Similarly, different measurement approaches are used for different purposes, sectors or contexts (e.g. international trade). Each approach to measurement has its own specific indicators.

6.1.2 HOW BIG ARE EXISTING SUBSIDIES?

The overall level of global subsidies is, quite simply, enormous. Despite a slightly declining trend in some instances, they add up to **hundreds of billions of dollars every year**. Subsidies to agriculture are amongst the largest, estimated at over US\$ 250 billion/year in OECD countries alone. Subsidies to other sectors are also significant and probably under-estimated due to limited data and the specific measurement methodologies used (see Table 1.1).

Box 6.1: Subsidies: different definitions for different contexts

A subsidy: ‘... government action that confers an advantage on consumers or producers in order to supplement their income or lower their cost.’ (OECD 2005)

The subsidy definition provided by the United Nations Statistics Division (UNSD) is used for constructing national accounts and covers only budgetary payments to producers. The more comprehensive World Trade Organization (WTO) definition is used for regulating the use of subsidies that affect trade and provides that **“a subsidy is a financial contribution by a government, or agent of a government, that confers a benefit on its recipients”**. This definition excludes general infrastructure provided by government.

Different definitions are used in different contexts, depending on the specific nature of discussions. Terms like ‘transfers’, ‘payments’ and the more generic terminology of ‘support measures’, ‘assistance’ or ‘protection’ are all common. In practice, these are sometimes used interchangeably even though they refer to instruments that partially overlap and are associated with different methods of measurement and, as a result, different indicators.

Not all contexts cover all issues. For example, the WTO definition does not include transfers from consumers to producers through border protection. This is one reason why the **broader term ‘support’** is used in some contexts (e.g. OECD support estimates for agriculture).

One issue under debate is whether the formal definition of a subsidy should be expanded to include the non-internalisation of external costs. Those who object do so for analytical clarity (i.e. the notion of a subsidy traditionally implies an explicit government intervention rather than implicit lack of intervention) and also point to the practical challenges of computing externalities.

From the perspective of TEEB, what can be clearly stated is that the non-internalisation of externalities – or government inaction more generally – will frequently act like a subsidy. For example, not internalising pollution damages lowers costs to polluters in the market and thereby confers an advantage to them.

Table 6.1: Aggregate subsidy estimates for selected economic sectors

Sector	Region
Agriculture	OECD: US\$ 261 billion/year (2006-8) (OECD 2009) Biofuels: US, EU and Canada US\$ 11 billion in 2006 (GSI 2007; OECD 2008b)
Fisheries	World: US\$ 15-35 billion (UNEP 2008)
Energy	World: US\$ 500 billion/year (GSI 2009a) US\$ 310 billion in the 20 largest non-OECD countries in 2007 (IEA 2008)
Transport	World: US\$ 238-306 billion/year – of which EHS US\$173-233 billion (EEA 2005)
Water	World: US\$ 67 billion – of which EHS US\$ 50 billion (Myers and Kent 2002)

Although these estimates provide important indications of the order of magnitude of global subsidies, they are still **riddled with conceptual and data deficiencies**.

The agricultural sector has the most complete data in terms of comprehensiveness and methodology as well as some of the highest subsidy levels. In contrast, other sectoral coverage remains rather patchy even though considerable progress has been made in the past twenty years to formalise measurement methodologies.

We still have little or no subsidy data available for large parts of the energy and manufacturing sectors or for other environmentally significant sectors such as mining and forestry. Although these sectoral subsidies appear from Table 1.1 to be a pale shadow in comparison to agriculture, their actual support levels are probably underestimated due to incomplete coverage and methodological issues (IEEP 2007; OECD 2003a). Conversely, transport subsidy data may contain elements of over-estimation because measurement methodologies used for this sector often include non-internalised externalities. For these reasons, comparing subsidies across sectors is often difficult or potentially biased.

6.2 HOW SUBSIDIES CAN MISS THEIR MARK

6.2.1 DISTINGUISHING BETWEEN 'GOOD' AND 'BAD' SUBSIDIES

Subsidies are introduced or maintained for various social or economic reasons: to promote economic growth, secure employment or stabilise incomes by helping small producers. These are all 'good' – or at least politically rational - purposes.

However, subsidies all too often end up as long-term rigidities which distort prices and adversely affect resource allocation decisions, benefiting some producers to the detriment of others (including foreign producers). For analytical purposes, it is therefore important to **distinguish between the stated objectives of subsidies and their actual effects.**

The difference between 'good' and 'bad' subsidies often comes down to their specific design and implementation. Key questions (Pieters 2003) include:

- do they serve (or continue to serve) their intended purpose (effectiveness)?
- at what cost (efficiency)?
- how are the costs and benefits distributed (equity)?
- last but not least, are they harmful for the environment in general and for ecosystem services and biodiversity in particular (environmental impact)?

Answering these questions requires a careful **assessment covering all three dimensions of sustainable development** (economic, environmental and social) (De Moor and Calamai 1997; OECD 2005). The assessment process can help identify priorities for phasing out or reform; for instance, subsidies that have clearly outlived their rationale should receive close attention. When a subsidy programme is launched, policy-makers are often not fully aware of all its implications, including the risk of environmentally harmful effects. Ex ante

strategic impact assessments, undertaken as an integral part of policy formulation, can help minimise or avoid such effects and many of the other pitfalls associated with subsidies (see Chapter 4). They can also help identify opportunities for better instrument design.

In reality, subsidy programmes rarely seek to implement a single clearly-defined policy objective. They tend to have a long, complex and somewhat chaotic history, having been introduced and amended over decades, often under political pressure, often without a long term strategic vision and frequently for multiple objectives (Barde and Honkatukia 2003).

This mix of explicit and implicit objectives sometimes creates a daunting barrier to reform. It means that subsidies can too easily be presented as 'multifunctional' – the argument being that we cannot afford to remove them. Disentangling the effects and purposes of subsidies and separating myths from reality are important preconditions for successful reform. This makes the issue of cost-effectiveness in achieving stated goals a very useful test (OECD 2003a).

We can see this clearly by looking at subsidies defended on social grounds, for instance, to support smaller marginal producers in critical sectors such as agriculture or fisheries. **However, a careful analysis of distributive effects reveals that many subsidies are actually not well targeted, which means they may not be very cost-effective.** In agriculture for example, a 2003 study showed that most subsidies in OECD countries went to larger farms (which tend to be the richer farms) and that only 25% of market price support ended up as net income gain for farmers; that is, the bulk of the difference ended up somewhere else in the value chain (OECD 2003c).

Box 6.2 provides another illustration of poor targeting, this time with regard to energy subsidies in developing countries.

Whenever social objectives are presented as justification for subsidies, the general rule is that the transfer effects of such subsidies should be at least neutral or, even better, contribute towards more equal distribution of wealth or income. **Put simply, subsidies should work to the benefit (or at least not the detriment) of socially marginalised populations.** This is frequently not the case. Subsidies that disadvantage such populations are prime candidates to consider for prioritised removal or reform (Steenblik et al. in OECD 2007).

Subsidy removal or reform does raise considerable challenges and is often far from a vote-winner. Subsidies are embedded in the policy landscape in most countries and are linked in different ways to a range of other instruments, reflecting different regulatory styles and traditions. Their effects and the potential benefits of their removal or reform – as well as the associated challenges – need to be understood in the context of these inter-connections.

Since subsidies are typically funded through either taxes or deficits, they put considerable strain on governmental coffers and ultimately on current or future taxpayers. Conversely, **phasing out a subsidy frees up funds which can help smooth the transition and/or mobilise public support for wider subsidy reform.** The funds released can be used for different purposes:

- for **general deficit reduction or lowering taxes;**
- to **fund alternative policies that target the original objectives of the subsidy more cost-effectively;**
- to be **re-directed to areas with more pressing funding needs** – e.g. to reward benefits of ecosystem services and biodiversity (see Chapter 5).

Box 6.2: Estimated distributional impact of energy subsidies in four developing countries

- In **Bolivia**, the poorest 40 per cent of households receive 15% of the total benefits from fuel subsidies; the richest 60% of households get 85%.
- In **Gabon**, it is estimated that the richest 10% of households capture 33% of fuel subsidies, while the poorest 30% (below the poverty line) receive merely 13%.
- In **Ghana**, the poorest 40% of households get 23% and the richest 60% capture 77% of the benefits of fuel subsidies.
- In **Ethiopia**, the highest-income 20% of the population capture 44% of fuel subsidies, while the lowest-income 20% get less than 9%.

Source: Rijal 2007

6.2.2 HOW SUBSIDIES CAN HARM OR BENEFIT THE ENVIRONMENT

An Environmentally Harmful Subsidy (EHS) is... “a result of a government action that confers an advantage on consumers or producers, in order to supplement their income or lower their costs, but in doing so, discriminates against sound environmental practices”.

Adapted from OECD, 1998 and 2005

Some subsidy types have been identified as critical drivers of activities harmful to ecosystems and biodiversity, resulting in losses of ecosystem services. They negatively impact the environment in two ways.

Under-pricing the use of natural resources. Even without subsidies, the price charged for using natural resources – if one is even charged in the first place – rarely reflects their real value in terms of the ecosystem services that they provide, which leads to over-consumption. This results from free markets that fail to incorporate negative externalities and from poorly defined property rights (see Chapters 2 and 7). Subsidies can aggravate this problem by reducing the price even further to below extraction cost. Their benefits often accrue to consumers of services, for instance,

through provision of water and energy at low prices. This kind of subsidy can also lead to increased production if subsidised resources are used as an input e.g. irrigation subsidies to agriculture or energy subsidies to industry in general.

Increasing production. Many policies providing subsidies in OECD countries are implemented in order to support environmentally sensitive sectors e.g. agriculture, fisheries, energy production, transport and heavy industry. Support measures for producers that reduce costs or enhance revenue provide incentives to produce. This leads to increased use of possibly polluting inputs (e.g. pesticides, fertilisers) and higher production levels, which in turn aggravates the risk of environmental damage.

Support that is not conditional on production or input levels tends to be less environmentally damaging than other support mechanisms, although the overall level of the subsidy is also relevant.

The **size of a subsidy does not necessarily reflect the extent of its harmful effect** (OECD 2003a). Even relatively small subsidies can have a major negative impact. For example, subsidies paid to high seas bottom trawl fleets operating outside the Exclusive Economic Zones of maritime countries amount to around US\$ 152 million/year (Sumaila et al. 2006). Bottom trawling practices have a major impact on the habitat of deep-sea demersal fish species which, with their long life span and low growth rate, are particularly vulnerable.

Quantifying the impacts on ecosystems and biodiversity is difficult due to the complexity of the analysis:

- first, the effects of subsidies on consumption and production depend on many factors, including what economists term **'price elasticities'** (relative increase in demand or supply of a good due to relative price changes), **'leakages'** (of support away from the intended targets of the subsidy) and the specific regulatory, tax and policy system in place;
- second, there are often several contributing factors, making it very challenging to disentangle the direct causality between subsidies and the exact extent of their environmentally harmful effects;

- third, ecosystem functioning is not fully understood. The strain put on ecosystems by increased production and consumption affects intricate inter-linkages of species in ways that are very difficult to predict and quantify. For instance, there may be 'threshold' levels of pollution and environmental damage beyond which adverse effects on biodiversity increase substantially.

The associated uncertainty, the possibility of irreversible damage and the alarming rate of current biodiversity loss all demonstrate the need to apply precautionary approaches. This could include reversing the burden of proof for damage i.e. requiring potentially damaging subsidy programmes to show, where appropriate, that they are not harmful to the environment (OECD 2003a).

All subsidies operate in the larger context of what Pieters calls a 'policy filter'. This includes a whole range of (environmental) policy tools such as: sustainability criteria (see UNEP and WWF 2007) or emissions standards; environmental taxes, charges or fees; production or extraction limits; tradable pollution or extraction quota etc. (Pieters 2003). These tools may counteract (some of) the adverse incentives created by subsidies. However, the tools applied may not always be successful. Their success depends on effective monitoring and ensuring compliance which can be too costly or beyond the institutional capacity of many States. Moreover, analysis of the political economy of subsidies suggests that, in the presence of large potential profits created by subsidies, lobbying by beneficiaries can lead to weak regulation.

It is important to stress that not all subsidies are bad for the environment. On the contrary: Some are used to correct specific market failures e.g. certain transport subsidies. Road transport and its environmentally harmful effects would further increase if public transport were not subsidised; conversely, removing or reducing support provided to private passenger transport, road haulage and air transport can potentially provide environmental benefits. Energy provides another example: many countries have substantial programmes to support renewable energy development and production - although for some programmes the claimed environmental benefits seem unclear (see below).

Subsidy programmes are already used to generate ecosystem benefits. A prime example concerns transfers to farmers under agri-environment programmes that compensate lost revenue (income foregone) arising from adoption of less harmful production methods. In a growing number of cases – e.g. payments for watershed protection that improves water provision to cities – such transfers can be characterised as payments for ecosystem services (see Chapter 5). Where there is a specific focus on increasing ecosystem service provision to provide a public good, the term ‘subsidy’ is arguably not appropriate (see Chapter 5 for further discussion).

However, even **‘green’ subsidies can still distort economies and markets and may not be well-targeted or cost-effective.** This is not surprising as there is no a priori reason why ‘green’ subsidies should be superior in this respect. In some cases, they can even have unintended secondary impacts on the environment. In the fisheries sector, for example, vessel decommissioning schemes aim to reduce fishing capacity in order to reduce pressure on fish stocks, but they often have the unintended effect of creating additional rent that is re-invested in the same or another fishery (UNEP 2004a). For these reasons, even ‘green’ subsidies need to be examined carefully (OECD 2005).

It is important not to limit subsidy reform to environmentally harmful subsidies alone but rather to aim at a more comprehensive reform process, because:

- the identification and reform of ineffective and inefficient subsidies, even if not directly environmentally harmful, can free up considerable funds which could be used for more pressing environmental needs, such as rewarding the unrewarded benefits of ecosystem services and biodiversity;
- ensuring that ‘green’ subsidies are targeted and cost-effective will make their case stronger in the policy area/in the eternal tug-of-war over scarce public resources.

As repeatedly emphasised by the OECD in the context of agricultural production (e.g. OECD 2003b; OECD 2009), it is the coherence of the overall policy package which matters. ‘Green’ subsidies will remain higher than necessary for as long as they are used to offset damage caused by support policies that stimulate harmful production. Simply **introducing new ‘green’ subsidies without analysing and reforming the entire subsidy landscape runs a high and foreseeable risk of not being cost-effective.**

Lastly, data gaps and lack of certainty over the specific size of subsidies should not lead to delaying action to identify and remove or reform subsidies that are identified as environmentally harmful and/or not cost-effective. With fisheries on the verge of collapse, CO₂ emissions still on the rise and the 2010 Target of significantly reducing the rate of loss of biological diversity all but unreachable, “there is little need to calculate our precise speed when heading over a cliff” (Myers and Kent 1998).



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6.3 SPECIFIC IMPACTS OF SUBSIDIES ACROSS SECTORS

6.3.1 AGRICULTURE

Subsidies to agriculture are amongst the largest and merit special attention in light of the sector's critical importance for food security and development. Those providing incentives to produce can lead to increased environmental damage, typically by stimulating agricultural intensification and/or expansion (land use change).

Intensification refers to an increase of agricultural production on a given acreage (through e.g. application of more fertilisers and other agricultural chemicals, more irrigation, more mechanisation). The most significant environmental impacts can include:

- loss of non-target species, including pollinators, due to direct and indirect effects of pesticides;
- reduced habitat diversity due to consolidation of holdings, removal of patches of non-farmed habitats and boundary features, and greater regional specialisation;
- loss of biodiversity-rich extensive farmlands (e.g. semi-natural grasslands) due to increased fertiliser use or increased grazing;
- hydrological changes to habitats as a result of drainage or irrigation (e.g. leading to wetland loss and reductions in groundwater levels from over-abstraction);
- eutrophication of freshwater and marine ecosystems from fertilisers and nutrient rich run-off (see Box 6.3);
- eutrophication of terrestrial ecosystems from deposition of airborne nutrients, particularly ammonia, from intensive livestock systems; and
- soil degradation and erosion e.g. from routine cultivation.

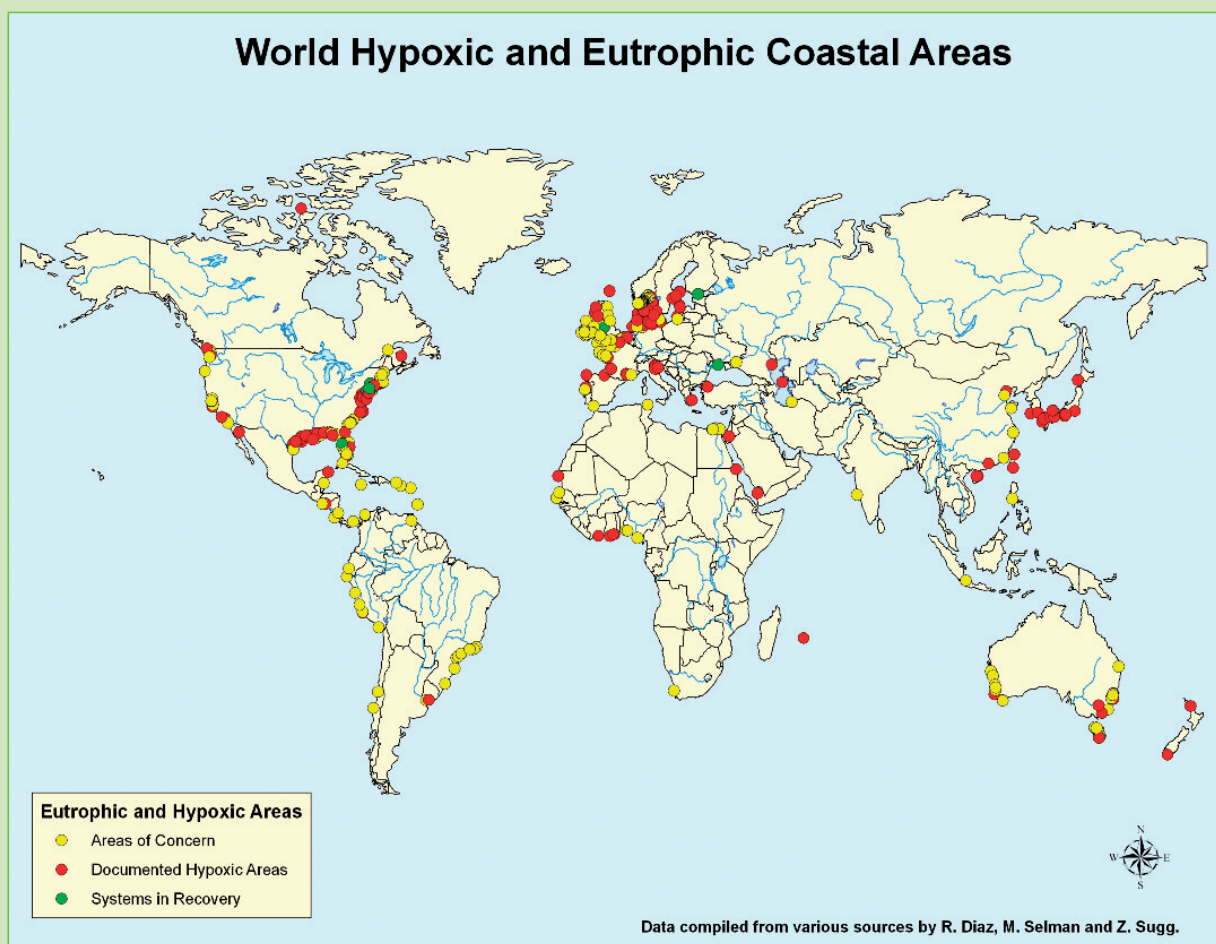
Incentives to increase production may also encourage the conversion of more natural ecosystems into farming areas (land use change). Conversely, subsidy removal or reform could lead to contraction of agricultural land. This could have positive impacts for ecosystems and biodiversity in areas of highly mechanised and specialised production, provided that effective long-term conservation policies are in place to restore the original non-agricultural habitats e.g. wetlands (George and Kirkpatrick 2003).

However, agricultural land contraction could have negative biodiversity impacts if affected areas are located in extensive farming regions where traditional practices play a key role in creating site-specific biodiversity, soil properties and landscape amenities (OECD 2003d; EEA 2004). High nature value (HNV) farmlands include semi-natural areas as well as features like hedges, walls, trees and buffer zones created as an integral part of farm management. In such regions, high agro-biodiversity actually depends on continuing these practices (see Box 6.4).

Box 6.3: Knock-on impacts of intensive agriculture: coastal 'dead zones' continue to spread

Fertiliser run-off and fossil fuel use deprive massive areas of the ocean of any or enough oxygen, killing large swathes of sea life and causing hundreds of millions of dollars in damage (Juncosa 2008).

Expanding coastal dead zones caused by nutrient run-off not only spell trouble for biodiversity but also threaten the commercial fisheries of many nations. Dead zones form seasonally in economically vital ecosystems worldwide, including the Gulf of Mexico and Chesapeake Bay. Agricultural run-off sparks many of these die-offs; increased use of nitrogen fertilisers has doubled the number of lifeless pockets every decade since the 1960s, resulting in 405 dead zones now dotting coastlines globally. The map below splits the sites into documented hypoxic areas, areas of concern and systems in recovery.



Source: WRI 2009

Box 6.4: The EU Common Agricultural Policy (CAP) and its impacts on biodiversity

The CAP has stimulated important structural shifts in farming, investments and technological developments, which has led to widespread agricultural intensification in the EU. This intensification has had well-documented impacts on biodiversity, including birds, since the 1970s. According to the Pan-European Common Bird Monitoring Scheme (2007), the farmland bird index (an indicator of the health of European farmland ecosystems) has declined by almost 50% in the last 25 years. Non-crop plants and invertebrates have also declined massively, mainly due to fertiliser and pesticide use.

Many of the remaining species-rich agricultural habitats are rare or much reduced. A high proportion of rare and vulnerable species of EU importance are associated with these threatened semi-natural habitats and agricultural landscapes. Many of these habitats and high nature value farming systems, if not threatened by intensification, are at risk of abandonment as they are typically of marginal economic value. These depend on CAP payments designed to support farming in disadvantaged areas or to support environmentally beneficial practices (see also Box 6.5).

Extensive farming systems with high agricultural biodiversity are often located on marginal land (i.e. land that would be taken out of production first when production-inducing subsidies were removed). Stopping production would have negative effects on biodiversity with subsequent losses of related ecosystem services (OECD 2000c).

The close links between biodiversity and extensive farming on marginal land raises a twofold policy challenge:

- to keep these marginal lands under production and preserve traditional practices;
- to take out of production those infra-marginal lands that could deliver significant positive impacts for biodiversity if converted into natural habitats.

This observation does not imply support for production-inducing support in general. It simply recognises the fact that **subsidy reduction or removal is not enough, in isolation, to meet the challenge of maintaining biodiversity-rich extensive farming systems** (see Chapters 5, 7 and 8 for additional policy tools which can be used to preserve ecosystems and biodiversity associated with agriculture).

As with other subsidies, **production-increasing support is more environmentally harmful than support which is ‘decoupled’ from production**. Since the 1990s, spurred on by the Uruguay Agreement on Agriculture, many OECD countries have increasingly re-designed their support policies in favour of more decoupled measures which are exempt from the Agreement’s disciplines under the so-called ‘Green Box’ (see example in Box 6.5).



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Box 6.5: Reforming production subsidies: example of the EU CAP

The 'Agenda 2000' reform of the EU's Common Agricultural Policy (CAP) foresaw gradual reductions in market price support and increasing reliance on direct payments, coupled with rural development programmes and agri-environmental measures under the CAP's 'second pillar'.

In June 2003, after difficult negotiations, EU farm ministers adopted a compromise providing for:

- the introduction of a single farm payment for farmers that is independent from production for the CAP 'first pillar', whose level would be based on historical support payments;
- linkage of this payment to compliance with environmental, food safety, animal health and animal welfare standards ('cross-compliance');
- a reduction in direct payments for bigger farms ('modulation') and transfer of this money to the European Agricultural Fund for Rural Development to finance the new rural development policy (the second pillar); and
- some revisions to the CAP's market policy.

The 2008 agreement pursuant to the CAP 'Health Check' foresees, amongst other measures, the phasing out of some remaining coupled payments as well as increased modulation.

Many agri-environment programmes under the second pillar have generally positive impacts for biodiversity and ecosystems (Boccaccio et al. 2009). However, it is noteworthy that eight years after the introduction of this reform, most support still comes under the first pillar – even though it is gradually approaching an equal share with the second pillar.

Although less environmentally harmful than earlier support policies, the sheer magnitude of support under the first pillar gives reason for concern, because of the limits to decoupling as well as opportunity cost considerations. While cross-compliance and modulation do contribute to better targeting of payments for environmental and social objectives (see Alliance Environnement 2007), it is doubtful that these instruments currently maximise the cost-effectiveness of payments for such objectives.

In 2006-2008, 51% of support measures as measured by the OECD Producer Support Estimate (PSE) took the form of output-based payments (including market price support) or payments based on variable inputs. This was down from 82% in 1986-88. The reduction corresponds to a general decline in the relative level of producer support as a percentage share of total farm receipts, from 37 % in 1986-88 to 23 % today (OECD 2009).

Hence, progress is clearly being made, but more reform efforts are needed:

First, more than half of all support is still directly increasing production. In this context, the OECD cautions that progress on subsidy reform is uneven among OECD countries. It also notes that a significant part of the recent decline in support levels is a consequence of high world prices for agricultural commodities, without any explicit changes in government policies (OECD 2009).

Second, it has to be borne in mind that decoupling can never be complete because of real-world phenomena like market imperfections, risk and political dynamics (OECD 2000b). Under imperfect capital markets, for instance, any kind of income support would be partially reinvested in agriculture, generating additional production in future years. If wealthier farmers are ready to assume more risks, any payment – by increasing their wealth – will affect their production decisions (OECD 2000b). Moreover, scale also matters: even relatively small impacts may add up to a large aggregate distortion if the overall volume of the subsidy is high. These distortions may include the production decisions of potential foreign competitors.

Better targeting of decoupled support measures for specific income objectives or market failures remains a major challenge of ongoing policy reforms in OECD countries (OECD 2009). This includes agri-environment payments. A 2005 analysis of EU agri-environment payments noted generally positive effects of the measures on habitat preservation, but called for development of more impact-oriented monitoring, of evaluation procedures that are better adapted to the variety of issues, as well as for better targeting of measures for the most problematical farms and the most environmentally sensitive areas (Oréade-Breche 2005). The OECD stresses that both decoupling and targeting are among the policy principles that have shown to improve effectiveness, efficiency and equity of policies, and should continue to inspire future policy design (OECD 2009).

Support measures that encourage agricultural production are considered to distort potential trade flows and are therefore slated for ‘substantial reductions’ in the agricultural trade negotiations under the Doha work programme of the World Trade Organization (WTO). These negotiations also seek to review and clarify the ‘Green Box’ criteria, while ensuring that due account is taken of non-trade concerns, including environmental objectives (WTO 2004). While the **successful conclusion of the negotiations has the potential to create synergy with the objectives of preserving ecosystems and biodiversity**, the positions of WTO Members are still divergent. The agricultural negotiations remain one of the major stumbling blocks to the successful conclusion of the Doha work programme.

6.3.2 FISHERIES

“More than a decade after adoption of the 1995 U.N. Code of Conduct for Responsible Fisheries, putting an end to overfishing remains a fundamental global challenge... Progress towards improved fisheries subsidies policies has been made since 1997,...but the real work of ending harmful fisheries subsidies has just barely begun”.

Achim Steiner, Executive Director, UNEP, and James P. Leape, Executive Director, WWF. Source: UNEP and WWF (2007)

Although subsidies to fisheries are much less substantial than those to agriculture, they are significant both in terms of their potential impact on the environment and also relative to the size of the industry in several countries. For instance, in some EU Member States, fisheries subsidies are higher than the economic value of landings.

Addressing their negative environmental impacts is **a matter of particular urgency as almost one third of global marine fisheries are close to collapse or have already collapsed**. According to the 2008 Fisheries Report by the Food and Agriculture Organization of the United Nations (FAO):

- 28% of marine capture fish stocks monitored by FAO are either overexploited, depleted or recovering from depletion and are yielding less than their maximum sustainable yield (up from 25% in the 2006 report);
- 52% are fully exploited, producing at or close to their maximum sustainable yield;
- the remaining 20% are underexploited or moderately exploited (down from 25% in the 2006 report). Although this figure might imply that more could be produced, it must be borne in mind that at least some of these stocks are low-value species or consist of species for which harvesting may be uneconomical under current market conditions (FAO 2006 and 2008; map presented in Chapter 1).

The fact that some types of **fisheries subsidies can lead to increased fishing effort, and thus have negative impacts on the level of fish stocks**, is universally accepted in the literature on fisheries subsidies (UNEP 2004a). **Excessive capacity or catching power of global fishing fleets has been identified as a main cause of unsustainable fishing levels** (Porter 2001). While industrial fleets play the dominant role in overfishing due to their technology and size, the small-scale fishing sector sometimes also plays a role (see Box 6.6).

Yet, despite considerable overcapacity in the fishing industry, governments continue to subsidise the sector. This encourages further fishing effort which contributes to the decline in global stocks. Paradoxically, the industry is being undermined by the very subsidies supposed to protect incomes in the industry (OECD 2003a, see also Box 6.7). Nowhere is the nexus between sustainably using natural resources and protecting livelihoods more dramatically and tragically visible than in former fishing regions where fisheries have already collapsed.

To help us assess the impact of fisheries subsidies on stocks and the environment generally, we can conceptually distinguish different management regimes (though stylised, they reflect key features of real world management regimes: OECD 2006b; Hannesson 2001).

Box 6.6: The Environmental Impact of Subsidies to the Small-Scale Sector in Senegal

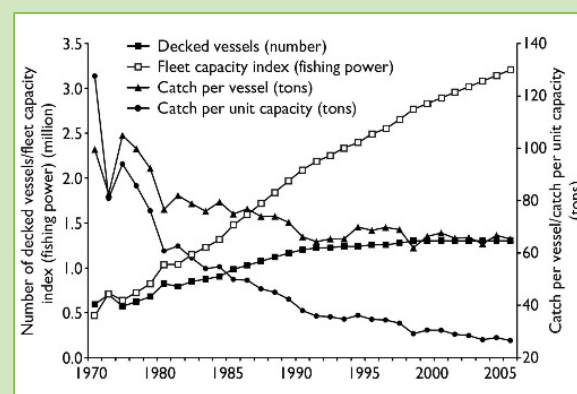
In the late 1970s, the Senegalese authorities started to provide direct support to fisheries, initially to the industrial sub-sector only but later also to small-scale fisheries. As a consequence, the small-scale fishery started to produce more for export than for the domestic market. Fishing effort of small-scale fishing units intensified, aggravating the pressure already exerted on demersal fish stocks by Senegalese and foreign trawler fleets. Today, factories receive 60% of their supply from small-scale fishing units. Most marketed species in this category are now in danger of biological collapse.

Source: UNEP 2003

Box 6.7: Sunken Billions

The contribution of the harvest sector of the world's marine fisheries to the global economy is substantially smaller than it could be. Using a stylised and simple model, a World Bank report estimates the lost economic benefits to be in the order of US\$50 billion annually – representing the difference between the potential and actual net economic benefits from global marine fisheries.

Despite increased fishing effort, the global marine catch has been stagnant for over a decade whereas the natural fish capital – the wealth of the oceans – has declined. At the same time, the margin has narrowed between the global costs of catching and the value of the catch. The lost benefits or the difference between the potential and actual net benefits can be largely attributed to two factors. First, depleted fish stocks mean that there are simply less fish to catch and the cost of catching is therefore greater than it could be. Second, massive fleet overcapacity, often described as 'too many fishers chasing too few fish' means that potential benefits are also dissipated through excessive fishing effort.



Source: World Bank and FAO 2008: 21

Under pure *open access*, standard economic analysis shows that over-exploitation of the resource results even without subsidies. However, it is generally agreed that the introduction of some subsidies would make a "bad situation worse" by further increasing exploitation (OECD 2000a; WTO 2000; Munro and Sumaila 2002; UNEP 2004a). This would be true for any subsidy that:

- increases the producer price of the resource (i.e. the price for fish received fishers);
- reduces the operating costs per unit (i.e. per fishing vessel); or
- reduces the purchase price of vessel capital (Munro and Sumaila 2002).

The FAO estimates that 90% of global fish production comes from within the 200 nautical mile exclusive economic zones (EEZ) of coastal States that are recognised under the UN Convention on the Law of the Sea (UNCLOS) and accordingly come under national jurisdiction. If national authorities could retain tight control over the Total Allowable Catch (TAC) in their EEZ, subsidies should have very limited consequences on fish stocks. In many cases, they would prove to be neutral provided that the TAC was fixed at sustainable levels (Munro and Sumaila 2002; UNEP 2004a; OECD 2006b).

In practice, such tight control over total catch is very difficult to achieve and is made more difficult by subsidies. Fisheries with excessive capacity are characterised by a ‘race for fish’ which puts strong pressure on the individual fisher’s profits. This gives fishers especially strong incentives to exceed catch limits and underreport their catch, which aggravates monitoring and enforcement problems of coastal states. **The value of illegal, unreported and unregulated fishing (IUU) is currently estimated to amount to US\$ 10 – 23.5 billion per year** (Agnew et al. 2009).

Furthermore, if there is no additional control on fishing effort e.g., through restrictions on the number of boats or how they are used, additional labour and capital will be attracted to the sector to the point where resource rents are competed away. The resulting fleet overcapacity will, in turn, often generate political pressure on fishery authorities to set catch limits beyond sustainable levels (WTO 2000).

In principle, TAC control could be supplemented with additional controls over fishing effort, mainly through restrictions on the number of vessels, the amount of time they are allowed to fish and on fishing gear and techniques. However, despite the best efforts of regulators, it is not always possible to identify and control all the variables that determine fishing effort and it is

possible that fishers can expand their effort along uncontrolled dimensions to increase effective effort. As the industry adapts to new restrictions, a race can result between development and application of new regulations on the one hand and the implementation of effort-increasing measures by fishers on the other. This phenomenon will aggravate the ever-present limitations in monitoring and enforcement capacity.

Given such constraints, **capacity enhancing subsidies should be seen as generally environmentally harmful**. These include (see further UNEP 2004a):

- **subsidies for fleet expansion and modernisation** (grants, low-interest loans, loan guarantees) as these reduce the purchase price of vessel capital;
- **payments to countries for the exploitation of fish stocks** in their EEZ by foreign fishing fleets. These constitute subsidies to the relevant fishing industry if not fully recuperated from the relevant companies;
- **tax preferences for intermediate inputs**, because they reduce the operating costs per vessel. Empirical studies confirm that tax preferences for fuel encourage the purchase of vessel with larger, fuel-intensive engines that, in turn, increase fishing ranges and enable larger catches.

A 2007 study of the University of British Columbia estimates global fisheries subsidies at US\$ 30 to 34 billion, of which at least US\$ 22 billion exacerbate overcapacity (see Box 6.8).

Removing subsidies will make the task of effective management easier, but in itself will not be effective in achieving conservation goals if the underlying management regime is not also fixed at the same time (see boxes 6.9 and 6.17 on the fisheries reform in Norway and New Zealand).

Some progress has been made in the context of the current WTO negotiations on fisheries subsidies. There is broad support among WTO members for strong rules (or ‘disciplines’) on fisheries subsidies. However, some developing country members wish to keep policy space for subsidies deemed necessary for diversification and

development of certain industries. It is widely recognised, nevertheless, that any subsidies permitted should not lead to overcapacity and overfishing.

A key element in this respect has been the development of ‘sustainability criteria’ by UNEP and WWF which can help ensure that subsidies falling outside a possible WTO ban do not have harmful impacts on fisheries resources (UNEP and WWF 2007).



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Box 6.8: Fisheries subsidies – the good, the bad, and the ugly

A 2007 study of the University of British Columbia classifies and analyses fisheries subsidies by their effects and impacts – the good, the bad, and the ugly.

Good subsidies encourage the growth of fish stocks by supporting conservation activities and the monitoring of catch rates, through fisheries management programmes and services, and fishery research.

Bad subsidies reduce the cost or enhance the revenue of fishing activities, thus exacerbating overcapacity.

Ugly subsidies are programmes that have the potential to increase capacity and result in harmful impacts, depending on the context and application, such as vessel buyback schemes or fisher assistance programmes.

The study estimates the worldwide level of fisheries subsidies to be US\$ 30 to 34 billion, out of which at least US\$ 20 billion are bad subsidies. Out of those, US\$ 6 billion are for fuel alone. Another US\$ 3 billion are characterised as ‘ugly subsidies – they are found to be potentially harmful depending on the context and programme. Only US\$ 7 billion are characterised as ‘good’ subsidies.

Source: Sumaila and Pauly 2007

Box 6.9: Removing fishery subsidies in Norway

Norway's experience shows that it is possible to drastically reduce subsidies – which had seemingly become a permanent lifeline – without destroying the industry. From a peak of US\$ 150 million/year in 1981 (amounting to approximately 70% of the value added in the industry), these subsidies were reduced by 1994 to only US\$ 30 million. Norway's successful reform was probably made easier by timing and measures that smoothed the transition to a more self-supporting industry. Although the number of fishers has declined, the fisheries sector is now self-supporting and in many ways healthier than it was at the height of subsidies.

Subsidy reform may also have contributed to improved fish stocks – although this effect is difficult to isolate from other factors e.g. variability of stocks, improved management regime and the fact that Norway shares its stocks with its neighbours. Nevertheless, cod and herring stocks went up by 110% and 1,040% respectively between 1981 and 1996 as fisheries subsidies were reduced by 85% in conjunction with more effective management measures.

Norway's success was due to several factors. First, optional employment opportunities existed for fishers who 'lost out' in the immediate aftermath of the subsidy removals, as the reforms were undertaken during good economic times. Secondly, the fall in oil prices in 1986 deprived the government of revenue and convinced many of the need for significant reform. Third, there was external pressure in the form of various multilateral agreements. Finally, the transition was gradual which helped fishers to take steps to prepare for the changes. The government combined the transition with other social measures to lessen the impact on those who had come to depend on the subsidies.

Source: OECD 2006b

6.3.3 TRANSPORT

The transport sector is a major contributor to global greenhouse gas (GHG) emissions, local air pollution and noise emissions but still benefits from large subsidies. One group of subsidies take the form of fuel prices kept below production cost. By increasing vehicle use and travel, these aggravate air pollution (i.e. release of noxious gases such as nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOC) and sulphur dioxide emissions as well as particulates). Vehicles are a major source of GHG emissions – by 2020 global CO₂ emissions from motor vehicles are projected to increase by approximately 83% from 1995 levels. **Emissions associated with the transport sector will have important direct and indirect impacts for ecosystems and biodiversity.**

Another type of subsidy includes direct grants for building road infrastructure not recovered by receipts (through e.g. fuel taxes or charges) and for roads that are not deemed general infrastructure. This is rather a grey area as some roads ostensibly provide a general infrastructure service - even though in reality access to

remote areas may disproportionately benefit specific industries such as mining or forestry.

Land use change from the construction of transport infrastructure threatens biodiversity. Encroachment destroys and fragments habitats and has significant impacts on viability of ecosystems and species populations (see Kettunen et al. 2007 for a European perspective). Deforestation patterns in 152 countries, analysed in a recent study, showed that road construction and improvement is one of the three main proximate causes of deforestation (CIFOR 2006). By reducing transport costs, these roads promote forestry in remote areas, open up areas of undisturbed, mature forests to pioneer settlement, logging, and agricultural clearance and also provide access for hunters and poachers. The study recommended that a key government reform to slow tropical forest deforestation would be to reduce or eliminate expenditure on road building near priority conservation areas and to reduce fossil fuel and transport cost subsidies (CIFOR 2006).

Road construction also creates physical barriers to wildlife movement and fragments previously continuous blocks of habitat into smaller areas that may be less able to support complex communities of plants and animals. This could remove ecological 'corridors', isolating members of a species genetically and geographically (Fahrig 2003; Crooks and Sanjayan 2006). Because populations tend to decrease in smaller fragments of habitat, this will increasingly threaten species requiring large home ranges. A recent study by the World Resources Institute on forest fragmentation in six central African countries found that roads have reduced the proportion of forest in large unfragmented blocks from 83% to 49% of the total forest area. In general, **infrastructure expenditure would be less harmful to the environment if it were focused on already opened-up areas** (CIFOR 2006).

As noted in section 6.1, subsidies to some types of transport can also be beneficial to the environment, for instance, those to railways and public transport can reduce car use as well as emissions and local air pollution.

Box 6.10: reforming water subsidies in the Czech Republic

Until 1990, water pricing covered only a fraction of its real cost as it was only €0.02 per m³. This low price led to indirect subsidisation of water extraction, treatment and distribution. This hidden subsidy was removed in the 1990s, moving to full cost recovery. By 2004 the cost of water had reached €0.71 per m³. The reform also addressed fees for withdrawing both surface and ground water and discharge of waste water. As a result, water withdrawals between 1990-1999 decreased by 88% in agriculture, 47% in industry and 34% in public water mains.

Source: IEEP et al. 2007

6.3.4 WATER

Water services provision is subsidised by charging rates that do not cover operating and management costs (below-cost pricing), possibly combined with preferential treatment for some user groups (e.g. lower rates for irrigation water). In many countries, water charges have historically been – and in some cases still are – very low. This reflects the view that the provision of such basic services is seen as a duty of government and that access is considered a right.

Although such subsidies are often justified on social grounds, particularly for drinking water, at present **they often do not reach poor consumers effectively**. This is because the poor in many developing countries do not have access to piped water networks in the first place: many pay considerably more for water as they have to rely on private vendors. A recent World Bank study on consumption subsidies for electricity and water in four African countries found that, despite sizable subsidy levels, only 20 to 30% of poor households in the four countries are connected to the utility networks (Komives et al. 2005).

Below-cost pricing, together with low collection rates, results in cash-strapped utilities which can lead to inadequate operation and maintenance. An estimated 40-60% of water delivered by utilities in developing countries is lost due to leakage, theft and poor accounting (IEA 2005). Moreover, cash-strapped utilities will rarely have the necessary funds to expand the network to the poorest neighbourhoods.

Below-cost pricing leads to water over-use and wastage. Associated impacts include falling water tables, reduced availability for other user groups, additional investment needs for water provision (e.g. wells for farmers and households) and, in some cases, damage to the aquifer itself (salt water intrusion and increased pollution). Reforming water subsidies is increasingly urgent in the light of climate change: by 2050, the IPCC projects that the area of land subject to increasing water stress will be more than double the land with decreasing water stress.

In the agriculture sector, the price of irrigation water has been generally low in many countries and its use consequently high. **Irrigation accounts for 75% to 90% of total water use in developing countries and for over one third of water use in many OECD countries.** Irrigation subsidies are again often justified on social grounds, that is, the need to support low income farmers. However, **subsidies generally benefit all farmers indiscriminately and tend to exacerbate waste and to encourage cultivation of water-intensive crops.**

Area-based tariffs for irrigation water are far more common than other payment schemes such as charges based on the volume of water used. Schemes not based on volume give less incentive to conserve water, and this will be exacerbated by subsidized tariffs. For instance, a study of irrigation projects in Brazil revealed that the single most important cause of water over-use was the excessive length of irrigation time (OECD 2003a).

Box 6.11: Targeting water pricing against social objectives

Maltese water pricing uses a 'rising block' system where at lower levels of household water use, the rate per m³ is significantly lower than for higher use. In 2000 there were nearly 13,000 accounts in the social assistance category. This group represented around 4% of total water use in Malta and around 6% of domestic use. The average consumption charge for the social assistance tranche was 0.56 €/m³, while for the general residential sector it was 0.79 €/m³. Rates are higher for higher levels of consumption, but no tariff is charged for 'lifeline' consumption levels below 5.5m³/person per year. Rates also vary by economic sectors with the highest charges paid by those where affordability is higher i.e. tourist and commercial sectors (1.98 €/m³) and government (2.59 €/m³).

Source: GHK et al. 2006

Water scarcity, particularly in water-poor countries, can be exacerbated by cultivation of water-intensive crops (where climate conditions and rainfall patterns should dictate otherwise) and outright waste of water. In Europe as a whole, agriculture accounts for about 24% of total water use, but this reaches up to 80% in parts of Southern Europe (EEA 2009) where, despite evidence of desertification, crops like corn and strawberries are still grown. Water scarcity is expected to further increase in these already semi-arid or arid areas. The Mediterranean basin, together with the western USA, southern Africa and north-eastern Brazil, are particularly exposed to the impacts of climate change, which is projected to further decrease their water resources (IPCC 2007).

The negative impact of subsidised water prices on water resources is increasingly recognised. Several countries are already moving towards full cost recovery. Mexico is often cited as an example of a country that, after wide-scale reform of the agriculture sector, has substantially reduced irrigation subsidy levels, with many irrigation schemes now achieving financial self-sufficiency (Kloezen 2002; Cornish et al. 2004). The EU Water Framework Directive requires EU Member States to take into account the principle of full cost recovery in water pricing policies, in order to promote a more efficient use of resources (see also Boxes 6.10 and 6.11 for country cases and Chapter 7).

6.3.5 ENERGY

“Much greater national and international efforts are indispensable to reduce those subsidies that enhance fossil-fuel use and thus act as a hurdle to combating climate change and achieving more sustainable development paths”.

Achim Steiner, Executive Director UNEP. UNEP 2008a

The effects of energy subsidies on the environment vary depending on the type of energy source subsidised. **Subsidies to fossil fuels are of particular concern. According to the International Energy Agency (IEA), the fossil fuel industry is among the most heavily subsidised economic sectors (IEA 2005).** A recent estimate of the Global Subsidy Initiative calculates producer and consumer subsidies to be at least US\$ 500 billion a year globally (GSI 2009a). This is **equivalent to 1% of world gross domestic product**, the figure that the Stern Review estimated necessary to stabilise the world temperature rise to 2°C (Stern 2006).

Fossil fuel subsidies lead to increased noxious and GHG emissions while extraction of some fuels creates a huge ecological footprint. They also act as a disincentive to use alternative technologies or introduce efficiency measures, and can thus lead to a technology ‘lock-in’. Several studies have attempted to estimate the GHG emissions reductions which could be achieved by reforming such subsidies. The OECD (Barniaux et al. 2009) estimated the **consumer subsidies removal in the 20 largest developing countries would reduce global GHG by 2% in 2020, rising to 10% in 2050.**

Energy subsidies for producers, the most common form in OECD countries, usually come in the form of direct payments and tax breaks or as support for research and development. Consumption subsidies have been mostly eliminated in the OECD but remain important in many developing countries. Electricity and household heating and cooking fuels are usually the most heavily subsidised: some countries also subsidise road transport fuels (GSI 2009b).

Despite the difficulties in measuring the impacts of these subsidies, partial analyses suggest that the **reform of energy subsidies can significantly reduce GHG emissions and air pollution and be undertaken without severe social implications** (see case studies in Boxes 6.2, 6.12 and 6.13). Against this background, the recent commitment of the G-20, given at the Pittsburgh Summit in September 2009, to phase out inefficient fossil fuel subsidies is highly welcome and should be replicated by others.

In some cases, subsidy reform may also have direct positive impacts for ecosystems and biodiversity. For instance, peat mining is still subsidised in some countries as a major indigenous energy source even though it destroys biodiversity-rich bogs (see Kirkinen et al. 2007).

Box 6.12: Fuel subsidy reform in Ghana

In 2004, it became apparent that Ghana could not long maintain its policy of subsidising petroleum products. Guided by a steering committee of stakeholders from ministries, academia and the national oil company, the government launched a poverty and social impact assessment (PSIA) for fuel, completed in less than a year. By the time the government announced 50% price increases in February 2005, it was able to use the PSIA findings to make its case for liberalising fuel prices to the public—including the fact that existing price subsidies most benefited the better-off. The minister of finance launched a public relations campaign with a broadcast and a series of interviews explaining the need for the price increases and announcing measures to mitigate their impact. These measures, which were transparent and easily monitored by society, included the immediate elimination of fees at government-run primary and junior secondary schools and a programme to improve public transport. While the trade unions remained opposed to the price increases, the public generally accepted them, and no large-scale demonstrations occurred.

Source: Bacon and Kojima 2006

Some consumer energy subsidies may be justified on environmental or social grounds e.g. switching away from wood and other traditional energy sources (straw, crop residue and dung) can reduce deforestation caused by wood burning and reduce indoor air pollution. The argument that these subsidies are pro-poor is particularly pertinent where institutional pre-conditions for potentially more efficient social policies are poor or absent (e.g. for redistribution of income through progressive income taxation systems).

Nevertheless, there is often substantial scope for reform, in particular if the poor do not benefit from the subsidy because they do not even have access to the service (e.g. consumer electricity subsidies where the poorest are not connected to the grid). Once again, it is the medium to high income groups who benefit from a subsidy. One way of reducing harmful subsidy impacts is to set 'lifeline' rates limiting subsidies to low consumption levels and to target spending on expanding grids into poorer neighbourhoods.

Subsidies are also used to encourage the development and use of renewable (non-fossil) energy sources in order to fight global warming and achieve long-term energy security. However, these may have other environmental consequences. For instance, hydroelectric dams can result in the loss of wildlife habitat and reduce biodiversity (McAllister 2001). Batteries for solar home systems can leak toxic heavy metals. Wind farms can have significant biodiversity impacts, especially if inappropriately located (UNEP 2005; Drewitt and Langston 2008). These impacts need to be carefully assessed and considered in decisions on whether and how to support the development and use of renewable energy sources.

Biofuels illustrate the complex relationship between renewable energy subsidies and environmentally damaging impacts. Various subsidies are used to encourage production and consumption of biofuels which are promoted as a way to simultaneously increase energy security, reduce GHG emissions, and encourage rural development. These subsidies are provided at different points in the supply chain and include support for intermediate inputs and value adding factors, output linked subsidies, subsidies to distribution infrastructure, consumption incentives

Box 6.13: Removing fuel subsidies in Indonesia

Before raising fuel prices in October 2005, the government of Indonesia put into place a cash transfer scheme targeting 15.5 million poor and near-poor households (some 28% of the population). The transfers (quarterly payments of about US\$ 30 per household) lasted for one year. The scheme was widely publicised through newspapers, village notice boards, television talk shows and pamphlets with answers to frequently asked questions.

Though prepared quickly, the programme has performed well. The rapid rollout was followed by many media reports about initial problems, including mistargeting and leakage. The government responded quickly, commissioning an early assessment of the programme which pointed to satisfactory results overall, with transfers made on time and beneficiaries expressing satisfaction.

For poor recipients the cash transfers easily compensate for the fuel price increase. Even with moderate mistargeting – with cash benefits randomly distributed to the poorest 40% rather than the targeted 28% – the programme was expected to prevent an related increase in poverty.

As a consequence, the sharp rise in fuel prices passed without major public protest.

Source: Bacon and Kojima 2006

and high import tariffs. Several countries have also introduced targets and mandatory requirements that encourage biofuel development.

However, recent analysis suggests that large scale expansion of biofuels promoted by subsidies, targets and mandates will likely increase net GHG through direct and indirect land-use change (Gibbs 2008; Searching et al. 2008; Fargione et al. 2008).

These subsidies have contributed to the rapid global expansion in biofuel production and use. By 2006 government support to biofuels in the US, the EU and Canada was estimated to have reached US\$ 11 billion per year (GSI 2007; OECD 2008b). While the cost of reducing a tonne of CO₂-equivalent through biofuels has been calculated as between US\$ 960-1,700 (OECD 2008b), recent CO₂ prices in the European Emissions Trading scheme are in the range of US\$ 30-50. However, these calculations did not consider the GHG emissions from associated land use change. **While biofuels subsidies represent a significant strain on public resources, at best they do not therefore appear to be the most cost-effective option for reducing GHGs and there is an urgent need to review these biofuel policies** (FAO 2008), and in fact the public may actually be paying to increase GHG emissions.

An important efficiency determinant is the reduction in GHG emissions of a particular biofuel over the entire production and use cycle. According to the OECD, ethanol based on sugar cane – the main feedstock used in Brazil – generally reduces GHG emissions by 80% or more over the whole production and use cycle, relative to emissions from petroleum-based fuels. However, current support policies in the US, the EU and Canada target feedstocks that tend to reduce GHG emissions by much less (OECD 2008b). All these figures do not account for emissions from associated land use change. When these are factored in, they largely offset the gains from substituting fossil fuels.

The environmental impact of biofuels is the subject of much debate and controversy. This has highlighted that impacts are dependent on various factors, including type of feedstock used (see above), where it is grown, cultivation method used, production and conversion technology, distribution process, impacts of direct and indirect land use change etc.



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It should be emphasised that the subsidies themselves rarely distinguish between different biofuels based on the abovementioned factors or by reference to GHG emission savings achieved. As a result, not only are they poorly focused on their stated climate change objectives but they also exacerbate – by encouraging further production – the well-documented negative environmental impacts associated with the production of many (though not all) first-generation biofuels (see e.g. Koh 2007; Danielsen et al. 2008; Scharlemann and Laurance 2008).

6.4 MAKING REFORM HAPPEN

“People who love soft methods and hate inequity, forget this – that reform consists in taking a bone from a dog. Philosophy will not do it”.

Late 19th century American political commentator John Jay Chapman, quoted by Anthony Cox in OECD (2007).

Phasing out subsidies can not only **alleviate environmental pressures** but also **increase economic efficiency** and **reduce the fiscal burden**. Freed funds can be used for **more pressing funding needs, like rewarding those who provide biodiversity benefits** (see Chapter 5). It is therefore important to look beyond environmentally harmful subsidies and also target subsidies that have clearly outlived their purpose, are not targeted at their stated objectives or do not reach their objectives cost-effectively.

Unsurprisingly, there are many calls for subsidy reform and a lot of rhetorical support. More concretely, there is some policy support and action. The OECD has called for subsidy removal or reform in many fora and agricultural and fisheries subsidies are on the WTO’s Doha development agenda. The 2002 Johannesburg World Summit on Sustainable Development also highlighted the need to reform subsidies for agriculture, fisheries and energy. In the realm of global environmental policy, several multilateral environmental agreements (MEAs), such as the Convention on Biological Diversity, have drawn attention to the impacts of subsidies on the environmental assets that MEAs protect (CBD 2004).

For energy, the G-20’s recent commitment to phase out inefficient fossil fuel subsidies is a welcome step which needs to be replicated by others and expanded to other types of subsidy.

Many countries already foresee priority action on subsidy removal, possibly in the context of (environmental) fiscal reform (World Bank 2005). **A still small but increasing range of successful subsidy reforms can now be seen around the world** (see Boxes in this chapter). And yet, with few exceptions, **progress is too slow and protracted**. The reasons are rooted in the political economy of subsidy reform: in some important cases they are also linked to technological and institutional barriers.

6.4.1 ANALYTICAL TOOLS

A **range of useful tools is available to help policy-makers** identify subsidies whose reform offers potential benefits and assess such benefits, including for the environment:

- the **‘quick scan’ model** (OECD 1998) addresses the questions: *“is the support likely to have a negative impact on the environment?”* and *“does the support succeed in transferring income to the intended recipient?”*
- the **‘checklist’** (Pieters 2003) provides some policy guidance by addressing the question: *“is the subsidy removal likely to have significant environmental benefits?”*
- where the checklist delivers a positive result, the **integrated assessment methodology** (OECD 2007a) will help *create a comprehensive story on the effectiveness of the subsidy rather than a pass-fail test, and look at alternative policies;*
- for **‘green’ subsidies**, a specific checklist (UNEP 2008b) provides *minimum criteria any subsidy should fulfil to prevent it from turning perverse in the long-run* (see section 6.5 and Box 6.18).

The assumption underlying the OECD integrated assessment approach is that better policies will result when there is an explicit understanding of the distribution of costs and benefits and this information is made available to policy-makers and the interested public. Ideally, this means full disclosure of all costs and benefits, winners and losers, intended and unintended effects (environmental, economic, social) and highlighting where trade-offs exist.

To help policy-makers systematically reform their subsidies in line with tomorrow's priorities, Box 6.14 provides a checklist of useful questions based on the OECD analytical tools presented above.

Box 6.14: Developing a road map for reform: a checklist for policy-makers

Is there a subsidy causing damage to ecosystems and biodiversity?

1. **Is there harm to the environment?**
2. **Is there a subsidy in place that contributes to environmental damage?** (e.g. by influencing consumption, production levels) and if so, what is it?
3. **Does it lead to significant or potentially excessive resource use?** e.g. water use leading to loss from aquifers; thresholds crossed (e.g. salination of aquifers); social impacts from reduced resource availability.
4. **Does it actually harm the environment or do 'policy filters' avoid such pressure/damage?** Consider wider policy scenarios, regulations (e.g. quotas) and enforcement/legality of activities.

Should the subsidy be the target of reform?

5. **Does the subsidy fulfil its objectives (social/economic/environmental)?** If not, it needs reform.
6. **Does the subsidy lack an in-built review process and has it been in place for a long time?** If so, it is likely to need reform (i.e. it has already locked in inefficient practices).
7. **Are there public calls for reform or removal or calls to use the funds for other purposes?** This is often an indicator for Points 8 and 9.
8. **How does the subsidy distribute social welfare?** If there are equity issues, it might be worth reforming it.
9. **Do any of the subsidy impacts lead to social or other economic losses?** e.g. tourism loss following over-fishing.
10. **Are there alternative less damaging technologies available which are hindered by the subsidy's existence of the subsidy?** If so, the subsidy might be slowing innovation and creating technological 'lock in'; reform could bring benefits.
11. **Does it offer value for money?** Where there is still a valid rationale for the subsidy, could the same or less money be used to achieve the same objectives with lesser environmental impacts?

Reform scenarios (if subsidy reform has been identified as bringing potential benefits):

12. Would the reform be **understandable for policy-makers and the public?**
13. Consider **what the reform would entail** (measure changed and compensatory measures). It is rarely a simple case of 'getting rid of the subsidy altogether'.

14. Assess the costs and benefits of potential reform in more detail:

- potential **environmental benefits**: include thinking on benefits in other countries and secondary effects, which can be perverse;
- potential **economic costs**: e.g. national (tax, GDP, etc), sector-wide, for winners and losers within the sector (including new entrants/future industry), for consumers/citizens (affordability);
- potential **social impacts**: e.g. jobs, skills, availability of goods/services, health;
- potential **competitiveness and innovation benefits**
- potential **ethical benefits** e.g. as regard fairness of income, appropriateness of support, links to future generations;
- is the reform **practical and enforceable**?

To identify the likelihood of success and whether it is worthwhile using political capital for reform, the following questions can be useful to set priorities for the road map.

Is there a policy/political opportunity for action?

- 15.** Is there a window of opportunity? e.g. policy review process, evaluation, public demand?
- 16.** Is there a potential policy champion?
- 17.** Will there be sufficient political capital for success?

These questions can be answered at different levels. A quick scan can help develop the overall picture, but more detailed analysis is needed to clarify the details, identify what should be the exact nature of the reform and support the call for subsidy reform.

6.4.2 RESISTANCE TO CHANGE

Subsidies create or maintain economic activity and people become dependent on that activity. Changing income distribution between individuals, and their broader economic opportunities, is the driving force behind the political economy of subsidy reform. Those who stand to gain from the *status quo* or who lose from the reform have a significant incentive to lobby for the retention of the existing regime. Subsidies invariably tend to create a **culture of entitlement**: even if they are granted only for a set period of time, renewal is ‘expected.’

What makes resistance to change so successful so often is that the **benefits of subsidies tend to be concentrated in the hands of specific well-organised groups whereas costs are spread widely across (poorly-organised) taxpayers and sometimes consumers** (OECD 2006a).

Subsidy removal can raise legitimate **concerns regarding affordability** e.g. when this would lead to higher prices of essential goods like drinking water. However, careful design of policy reforms can mitigate affordability issues and minimise social impacts. For example, the use of progressive water tariffs allows low charges for low usage and thus addresses the needs of lower income households (see Maltese example in Box 6.11). Transitional assistance is another option (see below).

In the long run, **reform can generate new economic opportunities**. In principle, more efficient allocation of resources creates a stronger enabling environment in which economic activity can flourish. In the short run, however, individuals and communities may find it difficult to re-orient economic decisions and livelihoods. This could be due to geographical isolation of for instance fishing, agriculture and resource-dependent areas with no immediate alternative opportunities for employment or economic diversification. It could also be due to technological lock-in; for instance, phasing out subsidies for private car transport will have little short term effect on car use if people have no reasonable alternative modes of transportation. **Identifying and understanding the very real short-term social impacts of dismantling subsidies is one of the most difficult aspects of reform** (OECD 2006a).

Institutional barriers may also play a role. Unsurprisingly, institutions and bureaucracies that manage subsidy schemes will rarely push for their removal, either because of vested interests or because they lack vision that things could be done differently. The sheer number of players can also create barriers. For instance, the exemption of aviation kerosene from excise taxes (stemming from an international agreement, the 1953 Chicago Convention on Civil Aviation) should clearly be removed to enable pollution charges. However, this would not only affect the vested interests of the airline companies but also require an international conference to seek new consensus among parties to the Convention or else the re-negotiation of a large number of bilateral treaties (van Beers and de Moor 2001).

The level of subsidies, their impacts and the potential benefits from reform are not always clear. Some subsidies are hidden and their impacts are not immediate or direct. There are often complex interactions between different subsidy schemes and with other policy tools. Sometimes, impacts are mitigated by policies or complementary measures. Careful **assessments** are therefore needed to disentangle the complexities arising from multiple policy goals and instruments in order to quantify current costs and potential benefits and to identify priorities and opportunities for reform. **Enhancing transparency** can facilitate such assessments – in fact, it is a crucial precondition for these

assessments – and help spread their message (see Box 6.15 for recent EU regulation enhancing transparency on subsidies). By helping to debunk the myths surrounding subsidies and their reform, such assessments, when widely disseminated, can also be useful to overcome resistance by vested interests.

Box 6.15: Enhancing transparency of farm subsidies in the European Union

A 2006 financial regulation requires ‘adequate ex-post disclosure’ of the recipients of all EU funds, with agricultural spending transparency to begin in the 2008 budget. The Regulation has spurred major watchdog initiatives such as <http://farm-subsidy.org>, <http://caphealthcheck.eu> and www.fishsubsidy.org. These seek to closely monitor compliance by EU Member States and assess the quality of the released data. However, compliance of Member States with the regulation is still uneven.

6.4.3 ORGANISING REFORM

Experience with reforms to date shows that the design of the reform process is a critical success factor. It needs to take the political economy and other barriers into consideration and often hinges on five important conditions:

- **policy objectives** must be defined transparently and rigorously;
- the **distribution of benefits** and costs must be transparently identified;
- government must **engage broadly with stakeholders**;
- government should set **ambitious endpoints**, but, depending on circumstances, timetables for reform may need to be cautious; and
- **fiscal transfers** and/or other flanking measures are often required to facilitate the transition process (OECD 2007a).

The multiple policy objectives often associated with subsidy programmes need to be analysed carefully. Disentangling explicit and implicit objectives can help identify opportunities to introduce separate, better designed and more transparent instruments. During a recent reform of forestry subsidies in Finland, for example, a specific Forest Biodiversity Programme was created which provides regular payments for landowners in return for maintaining or improving specified biodiversity values of the forest. By separately targeting the biodiversity objective, the programme is more transparent, and its cost-effectiveness easier to assess, than general forestry subsidies with several objectives (OECD 2007a).

Information from analytical frameworks (e.g. the OECD's integrated assessment) can only build the case for reform if it is understandable by the general public and widely disseminated. **Increased transparency** is a major factor in the push to reform environmentally harmful subsidies (see Box 6.15 on EU transparency policy and Box 6.16 on German coal subsidy reform). Transparency is a key precondition for well-informed public debate on current subsidy programmes and can also make subsidy reform more appealing. Identifying who benefits from subsidies and highlighting their relative bargaining power can provide a powerful motivating force for change (OECD 2003a).

Governments need to build alliances for change and discourage behaviour that would reduce or distort change. Reform practitioners regularly underline

Box 6.16: Public support to coal mining in Germany

Direct subsidies to coal have been a major issue in Germany. A 1994 decision of the German Constitutional Court ruled that previous industry subsidy – a surcharge on the price of electricity – was unconstitutional. This led to the subsidy being paid directly from the state budget which made its cost to the economy clearer and contributed to pressure for reform. Subsidies were reduced from € 4.7 billion in 1998 to € 2.7 billion in 2005 and will be phased out completely by 2018.

Source: IEEP et al. 2007

stakeholder engagement as another key precondition for durable reform. Multi-stakeholder processes based on a deliberate outreach and communications strategy can help to reach consensus – or at least common understanding – on new approaches or options for reform. The overarching goal is less about convincing stakeholders who gain most from the status quo and more about using the planning and implementation process to minimise opposition to change and maximise forces in favour of it (OECD 2003a).

There is also a critical need to establish a process to build cooperation and horizontal analysis between government departments and agencies whose mandates, policies and programmes may overlap within the subsidised sectors. Subsidy reform often requires a **'whole-government approach'** linking relevant institutional actors to ensure policy coherence (OECD 2003a).

Changes in the policy landscape can open **windows of opportunity** (see also Chapter 2), even if sweeping electoral victories of parties with a strong reform agenda are rare. Even in such cases, practitioners caution against jumping straight to the 'best' solution, for several reasons, including the limited capacity of governments to undertake major reforms on many fronts at the same time; and the limited capacity for short-term adaptation by affected communities. In practice, demonstrating actual benefits delivered through more gradual reforms can be more compelling than up-front projections of expected benefits (even if these are larger). For the same reasons, dramatic reforms may also increase the likelihood of policy reversal (OECD 2005).

Having said this, cases of fast and successful reform do exist (see Boxes 6.12, 6.13 and 6.17). Despite the earlier words of caution, a key advantage of eliminating or changing subsidies immediately, without prior warning, is that recipients cannot take advantage of the phase-out period to increase their entitlements, thus leading to associated environmental damage.

Usually however, political change is more gradual. Peer pressure, civil society and regional or international organisations can increase interest and participation. Mandatory requirements under regional or international treaties (e.g. WTO) can also provide useful leverage for change. Political leadership can use growing public and other support, wherever it exists, as a springboard to build a broad coalition for reform with **ambitious endpoints and a gradual but credible phase-in of changes over an extended time period.**

Policy packages for this purpose can include transitional payments to those most affected by the reform (see below) as well as changes to the regulatory environment of the industry to both ease the adjustment process and possibly improve long-term efficiency (see Box 6.17 for lessons learnt in New Zealand). When backed up with a credible long-term road map for reform, such packages may reduce opposition to policy changes. However, designing adequate sequencing can be difficult and big reform packages are often politically difficult to sell (OECD 2005).

Many packages include some form of **transitional assistance**, even while the reform of an existing policy situation does not by itself justify this – it is impossible and undesirable to compensate all members of society

from harm caused by economic change. In practice, political economy considerations sometimes dominate discussions about the rationale of transition support programmes. However, simply buying out groups who lobby most effectively against reform carries the risk that the transition support will eventually replicate and perpetuate some of the initial subsidy's adverse effects. Moreover, it may actually reduce long-term public support for the reform. For these reasons, great care is needed in the design of transitional support. Those with the loudest voice are not necessarily those with the highest need.

Transitional support can increase the resilience of affected communities to economic change e.g. by helping producers who want to leave the industry to do so with dignity and financial standing, through grants, job training, buyouts or early retirement plans. It can also enhance the sector's human and social capital and thus improve the competitiveness or viability of those who stay in the sector (OECD 2005). Investment programmes can be helpful for attracting new industries to regions affected by the reform. Firm **sunset clauses** can help to ensure that transitional support does not nourish a sense of permanent entitlement.

Box 6.17: Removal of agricultural and fisheries subsidies in New Zealand

New Zealand was one of the first – and is still one of the few – OECD countries to have completely dismantled its system of agricultural price supports and other farm subsidies. These reforms were driven by concerns for the economic unsustainability of the subsidy programmes rather than for the environment.

The two decades prior to 1984 had seen a gradual acceleration in agricultural production grants and subsidies. In the 1960s agricultural support amounted to just 3% of farm income. By 1983 it was nearly 40% in the sheep sector alone and New Zealand's general macroeconomic situation had also deteriorated markedly. Increased agricultural output was generally worth less than the actual costs of production and processing.

In 1984 the new Government abolished tax concessions for farmers and minimum price schemes for agricultural products. Land development loans, fertiliser and irrigation subsidies and subsidised credit were reduced and then phased out from 1987, along with assistance for flood control, soil conservation, and drainage. Subsidy removal was combined with wider reforms across the economy (including floating of the currency, phased tariff liberalisation to lower input prices etc.). Their removal was an important contributing factor to improvement in the sector's circumstances.

Social impacts were not as great as widely predicted. Around 1% of farmers left the industry, considerably less than the projected 16%. Substantial environmental improvements were observed through decreased use of agricultural chemicals and in livestock as well as by taking marginal land out of production.

Source: Vangelis in OECD 2005

New Zealand also undertook a major reform of its fisheries policy in the early 1990s. Subsidies were eliminated virtually overnight. However, subsidy reduction alone would not have been enough to create a sustainable fishing sector and would have caused substantial financial and social distress. It would also have had a negative impact on stocks due to overfishing resulting from fishermen increasing effort in order to try and cover marginal costs. For these reasons, the reduction was combined with a major change in the management regime, i.e. the introduction of rights-based management and individual transferable quotas, combined with a minimum buy-out of existing rights. These measures gave those remaining in the sector a good chance of creating a profitable business environment, while allowing those who wished to leave to be bought out.

Source: Cox in OECD 2007

6.5 TARGETING SUBSIDY REFORM AT TOMORROW'S PRIORITIES

Over the last two decades, we have come to understand the scale of subsidies in different sectors, the extent and mechanics of their environmentally harmful effects and how cost-effective they are (or not) in achieving their goals. Some progress has been made in removing and/or reforming subsidies but with few exceptions, the progress is piecemeal and fragmented.

Globally, subsidy reform is unfinished business.

Persistent myths surround subsidies and their reform and can block change. Many of these myths can and should be debunked:

- **Claim: subsidy reform will harm competitiveness.** Keeping subsidies is bad for a sector's long-term competitiveness as it becomes dependent on subsidy and this puts strains on public finances.
- **Claim: subsidy reform will result in job losses.** In the short-term, this can be the case for the specific sector. However, compensatory measures can address some adverse impacts and incentives can be put in place to attract investment. There are also possible employment gains from use of monies elsewhere: the actual net effect depends on relative labour intensities of the activity replaced compared to the new activity. In the long term, increased competitiveness via innovation (e.g. energy efficiency) or increased availability of resources (e.g. fish) should help support or create jobs.
- **Claim: subsidy reform will have negative implications for social equity.** This claim is often made about energy subsidies yet poorer households spend less on energy than middle income households. Yet there are more targeted and effective ways of helping the poor than subsidies that tend to benefit all users.
- **Claim: subsidy reform will lead to a loss of livelihoods e.g. for poor farmers and fishermen.** Empirical studies show that many existing subsidy programmes are not well-targeted at social objectives: even if the poor draw some benefit, most of it goes to the relatively rich.
- **Claim: many people do not wish to change their livelihood (e.g. from fishing or mining).** In some cases, this is indeed true but in others there is interest in other forms of employment. Acceptability is linked to options for employment substitution.
- **Claim: reforming environmentally harmful subsidies is almost impossible because of vested interests.** In reality, the picture is mixed. Evidence shows that reforming subsidies is possible and that negative effects on the economic and social system can be reduced or compensated or else be borne by people within acceptable limits.
- **Claim: subsidies are good for the environment.** Financial transfers that are well-targeted at environmental objectives and cost-effective can play an important role in improving incentives for conservation of ecosystems and biodiversity (see Chapter 5). Yet many existing subsidies are environmentally harmful: their prior or simultaneous removal or reform will improve the cost-effectiveness of environmental incentive payments. Moreover, even 'green' subsidies may not be well-targeted and/or not be cost-effective. Adjusting them for better performance will ultimately make their case stronger.

The G-20 Heads of State have recently committed to phase out and rationalise inefficient fossil fuel subsidies over the medium term while providing targeted support for the poorest. This commitment is to be commended as an important step towards effectively addressing the threat of climate change and should be implemented. It also needs to be replicated and extended to other subsidies with direct and important harmful effects on ecosystems and biodiversity.

Priority areas for reform, from a global ecosystems and biodiversity perspective, include the **removal of capacity- or effort-enhancing fisheries subsidies** and the **continued and deepened reform of production-inducing agricultural subsidies**, in particular in most **OECD countries**. Reasons include the size of their environmentally harmful effects and/or their sheer magnitude and the resulting strain on scarce resources, as well as high opportunity costs.

The WTO negotiations on fisheries subsidies and agricultural domestic support have significant potential, if successfully concluded, to support the accelerated removal of environmentally harmful subsidies. **Governments should redouble their efforts to successfully conclude the negotiations on the Doha programme of work.**

Depending on national circumstances, most OECD countries need to complement these global priorities with additional and prioritised reform efforts in other sectors. In addition to energy subsidies, especially on fossil fuels, these should address the following subsidies that harm biodiversity and ecosystem services:

- **transport subsidies** e.g. habitat fragmentation linked to subsidies for road building;
- **water subsidies** that result in unsustainable water consumption.

For **non-OECD countries**, the sectors mentioned are also interesting candidates for subsidy removal or reform but concrete priorities will obviously depend on national circumstances. Relevant factors include the importance of specific sectors, the existing subsidy landscape including the design of individual programmes, and how existing programmes interact with the broader policy and institutional framework.

The stimulus programmes that are now in place in many countries will require stringent budgetary consolidation in the future. Subsidy reform needs to be an important element of this process.

Box 6.18: Minimum criteria for subsidy programme design

- *Targeted*: Subsidies should go only to those who they are meant for and who deserve to receive them;
- *Efficient*: Subsidies should not undermine incentives for suppliers or consumers to provide or use a service efficiently;
- *Soundly based*: Subsidies should be justified by a thorough analysis of the associated costs and benefits;
- *Practical*: The amount of subsidy should be affordable and it must be possible to administer the subsidy in a low-cost way;
- *Transparent*: The public should be able to see how much a subsidy programme costs and who benefits from it;
- *Limited in time*: Subsidy programmes should have limited duration, preferably set at the outset, so that consumers and producers do not get 'hooked' on the subsidies and the cost of the programme does not spiral out of control.

Source: UNEP 2008a

Focusing on the short term, all countries need to:

- establish **transparent** and **comprehensive subsidy inventories**;
- **assess** their **effectiveness** against stated objectives, their **cost-efficiency** and their **environmental impacts**, and, based on these assessments;
- develop **prioritised plans of action** for subsidy removal or reform, for implementation at medium term (to 2020).

Windows of reform opportunity that arise within existing policy cycles should be proactively and systematically seized.

Looking beyond budgetary consolidation, **funds that become available from subsidy reform can also be used in areas of more pressing funding needs.**

From the perspective of TEEB, critical needs are to **reward the unrewarded benefits of ecosystem and associated biodiversity**, in particular:

- **payments to biodiversity stewards for a range of ecosystem services** (see Chapter 5);
- provision of funds to **expand the protected area network** (corridors, marine protected areas, etc) and improve its management (see Chapter 8);
- **investment in ecological infrastructure** (e.g. restoration), notably where this helps in adaptation to climate change (e.g. flood control, sea level rise, storm surges – see Chapter 9) or poverty (see Chapter 1).

Care should be taken to ensure that these new programmes do not fall into the design traps of past subsidies (see Box 6.18). They should:

- be based on **clear, targeted and measurable objectives** and associated **indicators**;
- ensure **cost-effectiveness**, for instance by using smart economic mechanisms (e.g. reverse auctions);
- include **monitoring, reporting and evaluation provisions** and
- include **sunset and review** clauses to help avoid their continuation beyond their useful life.

Lastly, many parties are involved in the reform process. Too often, short term, national or private interests dictate the terms. Focusing on wider economic and social benefits and costs in a longer-term perspective is essential to reform the subsidy landscape and point economic signals in the right direction – to help current and future generations meet the challenges of the coming years.

Chapter 6 has shown the prevalence, scale and impact of subsidies and the need for their reform – both on economic efficiency grounds and to reduce pressure on natural resources, ecosystems and biodiversity. Commitment to a transparent inventory of subsidies and to developing and implementing a road map for their reform would be a critically important step to help address environmental issues and financial issues in a time of limited financial resources.

Chapter 7 discusses the potential to avoid degradation and loss of ecosystem and biodiversity by regulatory and market mechanisms. The analysis includes coverage of resource charges and the associated polluter pays and full cost recovery principles, issues which are closely related to the subsidies landscape discussed in Chapter 6.

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