



# Towards a G7 target to phase out environmentally harmful subsidies

May 2017

## ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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The publication of this document has been authorised by Ken Ash, Director of the Trade and Agriculture Directorate.

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### **Acknowledgements**

*The preparation of this paper was made possible thanks to a financial contribution from the Government of Italy and was overseen by the OECD Trade and Agriculture Directorate (in particular Ronald Steenblik and Franck Jésus). The sections on agriculture were written by Dimitris Diakosavvas and Franck Jésus, with contributions from Guillaume Gruère. The sections on fisheries were written by James Innes, with contributions from Roger Martini. The sections on non-energy minerals were written by Andrew McCarthy of the OECD Environment Directorate, and the section on company cars by Meryem Torun. All other sections were written by Ronald Steenblik. Stéphanie Lincourt, Michèle Patterson and Meryem Torun prepared the document for printing.*

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## **TOWARDS A G7 TARGET TO PHASE OUT ENVIRONMENTALLY HARMFUL SUBSIDIES**

This report has been produced at the request of Italy as an input to the G7 discussions for the Environment stream of its 2017 G7 Presidency. It covers government support to fossil-fuels for which the G7 has already identified a phasing out target date: 2025 (G7 Ise-Shima Summit Declaration 2016);<sup>1</sup> non-energy minerals; company cars and their fuel; agriculture; fisheries; subsidies or cross-subsidies related to waste treatment, and the provision of water and electricity. Support for fossil fuels alone is at least USD 160 billion in OECD countries and the BRIICS (Brazil, Russian Federation, India, Indonesia, People's Republic of China and South Africa), and in 2015 fossil-fuel consumption subsidies globally, as measured by the IEA (2016), were USD 325 billion. Adding environmental externalities pushes the costs to society of producing and consuming fossil fuels above USD 5 trillion a year, according to the IMF (Coady, 2015). Even the most conservative of these estimates, however, underscores the relevance of the phenomenon. With the Paris Agreement calling for mobilising USD 100 billion of climate finance a year, it is clear that the issue of environmentally harmful subsidies (EHS) deserves G7 and global community attention.

This report: (i) reviews the rationale for phasing out EHS; (ii) notes past and current efforts to undertake reforms at the international level; (iii) reviews the sources of information on subsidies to primary industries; (iv) reviews the various approaches and results to identifying the subset of subsidies that are environmentally harmful; (v) discusses the practical issues to establishing a target date and disciplines on EHS; and (vi) briefly sketches a procedural roadmap for making concrete progress on this issue (to be developed more in-depth in a separate report).

### **The rationale for phasing out EHS**

- Subsidies can be useful economic instruments, but many have been identified as economically inefficient and trade-distorting. That is why institutions, both domestic and multilateral, have been set up to monitor and control their use.
- Subsidies can also provoke environmental harm, either directly by incentivising an activity that directly harms the environment, or indirectly by reducing the cost of an activity that uses inputs that impose a heavy burden on the environment.
- Some of the environmental harm is confined to the country providing the subsidy, but some have transboundary effects.
- Subsidies impose a burden on government budgets and taxpayers that is questionable when they are environmentally harmful, socially inequitable or inefficient.
- The fiscal burden of subsidies means that fewer resources can potentially be devoted to other public funding, be it for clean-energy research, innovation or social security.
- There have therefore been a number of international attempts over the years to reduce certain subsidies for environmental reasons.
- A major aim of this report is to document the current state of understanding about the scale and environmental effects of potentially environmentally harmful subsidies, and the challenges to their identification, especially for the purposes of reform.
- However, because subsidies are multi-dimensional in their effects on economic, social and environmental outcomes, the discussion needs to be understood within the larger policy context, particularly pre-existing attempts to reduce or change some of the same subsidies for reasons other than the environmental harm they may cause: the strongest arguments for reforming EHS are likely to relate to subsidies for which their reform is also likely to yield benefits in other areas, such as improving social equity or fiscal imbalances. Still, social equity and fiscal imbalances might be treated by direct subsidies, avoiding the use of subsidies which harm the environment.

## Past and current efforts to undertake reforms at the international level

### *Environmentally harmful subsidies in general*

#### *Early explorations*

That subsidies could stimulate economic activities that are environmentally harmful has been recognised for some time. By the late 1980s and early 1990s, several studies began to appear that underscored the environmental effects of subsidising fossil fuels and electricity (Kosmo, 1987; Larson and Shaw, 1992), of subsidising marine capture fishing (FAO, 1992), and certain kinds of agriculture. Drawing on its experience in measuring subsidies and analysing their effects, the OECD took the lead in this area in 1990s, undertaking a series of studies on various aspects of EHS, culminating in a three-volume study published between 1998 and 2000 (OECD, 1998 and 2000).

#### *The 2001 OECD Ministerial Declaration and the 2009 Declaration on Green Growth*

At the 16-17 May 2001 meeting of the OECD Council at Ministerial level, Ministers considered a major document on Sustainable Development and called on the OECD to identify how obstacles to policy reforms, in particular to the better use of market-based instruments, and to the reduction of environmentally harmful subsidies, can be overcome; and to deepen its analytical work on these instruments. This work programme spawned a series of workshops over the next five years, and several original pieces of work (OECD, 2003, 2005, 2006b).

However, following the June 2006 workshop in Helsinki (OECD, 2007), the topic was not further explored until three years later, when at the June 2009 Ministerial Council meeting, the Ministers Representing the Governments of Australia, Austria, Belgium, **Canada**, Chile, the Czech Republic, Denmark, Estonia, Finland, **France**, **Germany**, Greece, Hungary, Iceland, Ireland, Israel, **Italy**, **Japan**, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, **the United Kingdom**, **the United States and the European Community** declared that:

we ... ENCOURAGE domestic policy reform, with the aim of avoiding or removing environmentally harmful policies that might thwart green growth, such as subsidies: to fossil fuel consumption or production that increase greenhouse gas emissions; that promote the unsustainable use of other scarce natural resources; or which contribute to negative environmental outcomes.”

#### *Target 3 of the Convention on Biological Diversity's Strategic Plan 2011-2020*

The Convention on Biological Diversity (CBD) began considering subsidies that could undermine the convention's goals, as well as positive incentives that could promote the convention's goals for conservation and sustainable use of biodiversity, during the early 2000s. By the time it issued its Strategic Plan for 2011-20, EHS and positive incentives were squarely in its sights. Target 3 of that plan foresees:

By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions.

#### *The European Union's broad initiative on EHS*

The European Union has a long-standing commitment to remove or phase out EHS. In 2010, for example, the Council of the European Union issued a Decision<sup>2</sup> requiring that any public aid to the coal industry intended to facilitate the closure of uncompetitive hard coal mines be phased out by the end of December 2018. The decision includes an obligation for member states granting aid to provide a plan on intended measures to mitigate the environmental impact of the production of coal.

Its current efforts are guided by the “Roadmap for a resource efficient Europe” (EC, 2011), which includes a milestone that “by 2020 EHS will be phased out, with due regard to the impact on people in need”. The Roadmap also requires, by 2012, that Member States identify their most significant EHS, and prepare plans and timetables to phase out EHS. These National Reform Programmes were submitted over the course of 2012 and 2013.

In May 2016, the European Commission launched its Environmental Implementation Review (EIR), a two-year cycle of analysis, dialogue and collaboration to improve the implementation of existing EU environmental policy and legislation. The Commission drafted 28 reports describing the main challenges and opportunities on environmental implementation for each Member State, drawing on the detailed sectoral-implementation reports collected or issued by the Commission as well as the 2015 State of the Environment Report and other reports by the European Environment Agency. EHS are now discussed, along with environmental tax reform, in the *EU Environmental Implementation Review Country Reports*.<sup>3</sup>

The Winter Energy Union Package (November 2016<sup>4</sup>) is stepping up the European Union’s action in removing FFS in line with international commitments under the G7 and G20 and in the Paris Agreement. The market-design reform would remove priority dispatch by electric-power generators of plants fuelled by coal, natural gas or peat, and will limit the need for capacity mechanisms, which have often relied on coal. The Commission will also establish regular monitoring of fossil fuel subsidies in the European Union and expects Member States to use their energy and climate plans to monitor the phase-out of fossil fuel subsidies.

### *Fisheries*

#### *Early warnings by the FAO and others about the scale of subsidies to marine capture fishing, and their effects*

In 1992 the FAO estimated that the global marine fishing fleet operated at an annual deficit of approximately USD 22 000 million in 1989 (without even considering capital costs), and that the heavy subsidisation enabling this situation was one of the major drivers behind the decline in the state of the world’s fisheries (FAO, 1993). Since then, a number of studies have been undertaken seeking to better define and quantify the value of subsidies to the fisheries sector and the effects they have on fisheries at both the regional (APEC, 2000; Cox, 2000; Munro and Sumaila, 2002) and global level (e.g. Milazzo, 1998; Sumaila et al., 2010; Sumaila et al., 2016). A significant limitation of most studies that attempt to quantify the extent of subsidies at a global level is the absence of consistent and comprehensive reporting on the matter, which requires them to depend heavily upon estimated data.

#### *Attempts at the WTO to clarify language on disciplines on subsidies to fishing*

The WTO Agreement on Agriculture does not cover fisheries and aquaculture sectors, treating them instead as industrial sectors or products. This classification, and the way they are subsequently handled within the definitions, concepts, and thresholds established in the 1994 Agreement on Subsidies and Countervailing Measures (ASCM), has meant that managing fisheries subsidies through multilateral trade regulations at the WTO has been difficult to date. Resolving this issue requires stronger rules that more formally accommodate fish and fish products while respecting the policy concerns of WTO members.

Attempting to address the issue of fisheries subsidies at the WTO has been a long process and no fisheries-specific agreements have been made to date. Early work on fisheries subsidies in the WTO took place primarily in the Committee on Trade and Environment (CTE) where, from 1996, it investigated the environmental benefits of removing trade restrictions and distortions, and discussed fishing subsidies and their relation to WTO from both a trade and an environment perspective. Negotiations to clarify and improve disciplines on fisheries subsidies were then formally initiated by the Doha Ministerial Conference in 2001 and, following the Hong Kong Ministerial Conference of 2005, text proposing an entirely new set of sector-specific disciplines for fisheries subsidies within the ASCM was proposed by the Chairman of the Negotiating Group on Rules in 2007. Disagreement within the group over many issues resulted in a systematic revision process being undertaken in 2009 but there has been no further progress.

Since the middle of 2016 activity in this area has again increased and efforts are currently being made to achieve an outcome for the organisation's Eleventh Ministerial Conference (MC11) taking place in Buenos Aires in December 2017. A number of proposals are currently being worked on by member countries; these include disciplines focusing on subsidies in respect of IUU fishing and overfished stocks, subsidies that contribute to overcapacity, and to a Trade Facilitation Agreement-like approach to phased adoption of disciplines.

#### *Language in the TPP Agreement imposing restrictions on fishing subsidies*

Regional trade agreements are an alternative means of addressing environmental issues from a trade perspective. One example is the draft of the Trans-Pacific Partnership (TPP) agreement, which has not come into force. The international principles set out within the TPP are mostly well aligned with the FAO Code of Conduct for Responsible Fisheries and, with specific regard to fishery subsidies, chapter 20 (Environment), Article 20.16: Marine Capture Fisheries, paragraph 5, states: "The Parties recognise that the implementation of a fisheries management system that is designed to prevent overfishing and overcapacity and to promote the recovery of overfished stocks must include the control, reduction and eventual elimination of all subsidies that contribute to overfishing and overcapacity." The text goes on to specify which subsidies parties are no longer permitted to maintain or grant and that any existing subsidies not in line with the new requirements must be phased out as soon as possible or within three years at the latest.

#### *Sustainable Development Goal Target No. 14.6*

A common point of reference in fisheries subsidies discussions is the United Nations' Sustainable Development Goal (SDG)<sup>5</sup> Target No. 14.6, which calls for eliminating certain forms of fisheries subsidies that contribute to overcapacity and overfishing by 2020. SDG 14 relates to "life below water", and involves a commitment to "Conserve and sustainably use the oceans, seas and marine resources for sustainable development."<sup>6</sup>

SDG 14.6 recognises that appropriate and effective special and differential treatment for developing and least developed countries needs to be an integral part of the WTO fisheries subsidies negotiation. The explicit deadline for achieving the target helps focus current discussions on fisheries subsidies and direct reference to the WTO highlights the significant role it has to play if the goal is to be achieved. In this context SDG 14.4 is also of some relevance as it calls for effective regulation of harvesting and an end to overfishing and destructive fishing practices, to which subsidies certainly contribute.

#### *Fossil fuels, and heat and electricity generated by fossil fuels*

##### *Early warnings about the scale of subsidies to fossil fuels, and their effects*

In the mid-1980s, the World Resources Institute (WRI) commissioned a study of fossil-fuel subsidies around the world, and published its results in a landmark study that examined subsidies for coal, diesel, gasoline, electricity and natural gas in more than 30 (then) developing countries (Kosmo, 1987). Drawing on earlier studies by the UNDP and the World Bank (1984), the study found widespread under-pricing of energy. In a conclusion that would be echoed by government leaders more than 20 years later, it observed that "Subsidies for consumers encourage excessive demand while producer subsidies speed the depletion of non-renewable energy supplies". "Eliminating or reducing subsidies to the most polluting fuels would be a major step towards making headway against these environmental problems," it concluded. "By encouraging energy conservation, more rational pricing policies would mitigate the environmental stress associated with energy use and buy the world precious time to solve these problems" (p. 46).

The WRI's study in turn led to a much more prominent set of studies by analysts for the World Bank (Larson and Shaw, 1992; Larson, 1994). These studies looked also at the under-pricing of energy in the former Soviet Union and Central and Eastern Europe, and estimated that global energy-consumption subsidies exceeded USD 210 billion in 1990 (USD 390 billion in dollars of 2016). The authors estimated, as well, that reductions in CO<sub>2</sub> emissions on the order of 7% could be obtained by the reform of these subsidies. Cognizant of this work, G7 Environment Ministers, meeting informally in Florence, Italy, in March 1994, discussed

fiscal changes that could shift the tax burden from capital and labour to environmentally harmful products and activities (Kirton and Kokotsis, 2016). One of the outcomes of these discussions was hortatory support for reforming EHS.

Views are converging on the need to partially substitute merely financial commitments with a mix of policies that integrate environmental objectives. The implementation of Agenda 21 could be therefore pursued more effectively: by reducing the currently high volume of *environmentally damaging subsidies* both in the industrialized and in the developing countries.<sup>7</sup> [Emphasis not in the original.]

#### *Declarations by the G7, G20, and APEC to phase out “inefficient fossil-fuel subsidies”*

As for fossil-fuel subsidies, efforts to reform them over the ensuing 15 years were mainly carried out on a country-by-country basis, through assistance by the World Bank, and through conditionality associated with IMF loans. New estimates of fossil-fuel consumption subsidies produced by the IEA – first in 1999, and then on a regular basis from 2007 – and modelling work to show the effects of phasing out these subsidies (IEA and OECD, 2009), motivated the Leaders of the Group of Twenty (G20) countries, meeting in Pittsburgh in September 2009, to commit “To phase out and rationalize over the medium term inefficient fossil fuel subsidies while providing targeted support for the poorest”. They then added, by way of justification: “Inefficient fossil fuel subsidies encourage wasteful consumption, reduce our energy security, impede investment in clean energy sources and undermine efforts to deal with the threat of climate change”.<sup>8</sup>

Two months later, APEC Leaders issued a Declaration that included similar language: “We also commit to rationalise and phase out over the medium term fossil fuel subsidies that encourage wasteful consumption, while recognising the importance of providing those in need with essential energy services”.

Attempts to attach a specific date to the term “medium term” have to date not been successful in the G20. G7 Leaders, however, at their May 2016 Summit in Ise-Shima, committed to “the elimination of inefficient fossil fuel subsidies” and encouraged “all countries to do so by 2025”. This statement itself was based on their Energy Ministers’ prior discussion in Kitakyushu, on 1-2 May 2016, the Joint Statement from which (para 34) stated “We are committed to phasing out inefficient fossil fuel subsidies that encourage wasteful consumption, and encourage all countries to do so by 2025”.

#### *Sustainable Development Goal Target No. 12.C*

SDG 12 relates to the importance of ensuring sustainable consumption and production patterns. It contains 11 targets, of which 12.C calls on the nations of the world to:

Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those *harmful subsidies*, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities.<sup>9</sup> [Emphasis not in the original.]

#### *Attempts to introduce disciplines in some RTAs*

The APEC, G7 and G20 and UN SDG commitments are voluntary and non-binding. Some countries have sought to develop disciplines with more force, including through free-trade agreements (FTAs) or regional trade agreements (RTAs). The New Zealand-Singapore FTA, for example, includes commitments by both parties to avoid new subsidies to fossil fuels. The European Union-Singapore FTA contains similar language relating to subsidies to coal. Language on fossil-fuel subsidies was proposed in the TPP, but it did not survive to the final version.

## *Agriculture*

As of now, there is no international agreement on the identification or the phasing out of agricultural subsidies that may be adversely affecting the environment.

The only international agreement on agriculture subsidies, the WTO's Agreement on Agriculture (AoA), does not identify those subsidies that may have environmental impact. Rather, it classifies subsidies according to their potential impact on trade distortion, in colour "boxes": green (permitted), amber (to be reduced), and red (forbidden). However, Article 12 of Annex 2 of the Uruguay Round Agreement exempts payments under environmental programmes from domestic-support-reduction commitments.

The SDG 2 (End hunger, achieve food security and improved nutrition and promote sustainable agriculture) makes direct reference, in its target 2b, to the World Trade Organization ministerial decision of December 2015, which decided the elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round. While the focus is again on trade-distorting measures, the UN report on Progress towards the Sustainable Development Goals (United Nations, 2016) mentions that "those subsidies [...] *can lead to environmental damage and the inequitable distribution of benefits*". It should be noted, though, that export subsidies are have been very little used in recent years and represent a limited part of the existing distortions in world agricultural markets.

## *Non-energy minerals*

Construction materials (e.g. aggregates), industrial minerals (e.g. fertilisers), and metals all represent important inputs into the economic system, and their production has benefitted from various types of government transfers in many countries. However, there has been relatively little international attention given to subsidies provided to the non-energy mineral sector. These subsidies, to the extent that they stimulate excess production and limit the incentives for material recovery activities, are inconsistent with the resource efficiency goals that a number of G7 countries have at the national level, as well as those enshrined within the internationally agreed Sustainable Development Goals. Improved resource efficiency is an important element of SDG 8 and 9 on economic growth and industrialisation respectively. And it is central to SDG 12 which, among other things, seeks to "achieve the sustainable management and efficient use of natural resources".

## **What information exists on forms of support that may potentially have environmentally harmful effect in the G7?**

### *Agriculture*

#### *OECD PSE-CSE database*

Since 1987, the OECD Secretariat has calculated the level and composition of agricultural support in OECD Members and some non-OECD Members (50 countries covered), using a standard method, which is regularly revised to better reflect policy changes. The OECD Producer Support Estimate (PSE) and related indicators provide measures of the level of support, and the degree of protection and market orientation of agricultural policies. The PSE measures the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income. It provides comparable indicators of the level and composition of support across countries.

Government support to agricultural producers is channelled through a large and diversified range of measures. These various support measures have different implications for agricultural production, trade, environment and incomes.

The OECD PSE method allows classifying support measures according to their potential environmental impact. The OECD (2013a) and the OECD (2005, Annex Box 1) study provide a detailed discussion on the potential impacts of the various PSE categories on the environment, while the OECD (2009b) study provides an extensive discussion of the potential impacts of PSE categories on different types of farmland management.



However, neither the total PSE nor its composition in terms of different categories of policies can be interpreted as indicating the actual impact of policy on production and markets.

#### *Country notifications to WTO on domestic support, market access and export subsidies Support*

The WTO does not identify domestic agricultural support measures according to their potential impact on the environment.

The WTO AoA, which came into force in 1995, represents a significant step towards reforming agricultural trade and making it fairer and more competitive (OECD, 2001c; Diakosavvas, 2004). Under the Agreement, WTO members agree to “schedules” or lists of commitments that set limits on (i) the tariffs they can apply to individual products and on (ii) levels of domestic support and (iii) export subsidies.

The method used by the WTO to assess the Current Total Aggregate Measurement of Support (AMS) is different in concept and calculation from the one used for the PSE (Diakosavvas, 2002). Because the AMS focus is on those domestic support policies deemed to be the most trade-distorting, it covers a narrower set of measures than those included in the PSE. The AMS excludes export subsidies, import restrictions, many policies classified under the blue box or green box<sup>10</sup> and *de minimis* exemptions. Moreover, the way market price support is calculated for the AMS can be misleading as it considers administered support prices, which are often poor proxies for actual producer prices, and constant external reference prices, which do not reflect actual world prices.

#### *Fisheries*

While data exist on support measures for the fisheries sector, those are, at this stage, not yet classified according to their potential impact on the environment.

#### *OECD database of fisheries support estimates*

The OECD’s Fisheries Support Estimate (FSE) database contains information on policies supportive of the capture fisheries sector and classifies them using a consistent and transparent method agreed to by participating countries ([FSE manual](#)). It includes data on most OECD member countries with significant marine fisheries and is currently being expanded to include other participating economies.

The FSE is designed to support improved policy analysis, creation and reform and is an important tool for domestic policy reform as well as to support international discussions and agreements on fisheries policies. The OECD is the only international organisation that measures and reports policy effort in the fisheries sector on an annual basis and the database is publically available on the OECD’s statistics portal at <http://oe.cd/fse-stats>.

Financial data at the country programme level is collected and reported in the database, along with detailed documentation on individual countries’ programmes, which is provided in country-level metadata. At their highest level the FSE indicators are differentiated on the basis of whether support is budgetary or non-budgetary; subsequent classification is according to implementation criteria:

- Transfers to individuals (which include: variable costs, fixed costs, income, capacity reduction)
- General transfers (which include: access to other EEZs, infrastructure, marketing and promotion, community support, education and training, research and development, management of resources)

#### *The Joint Research Centre of the European Union’s annual report on the EU fishing fleet*

The European Union’s annual report on the EU fishing fleet (STECF, 2016) reports annual-level figures for total direct income subsidies at the EU Member State level over the period 2008 to 2014. The data request sent to member states from the JRC states that these figures should include transfers originating from all direct payments to fishers, e.g. compensation for stopping fishing, refunds of fuel duty or similar lump-sum compensation payments. The survey excludes social benefit payments, indirect subsidies (e.g. reduced duty on inputs such as fuel) and investment subsidies.

## *Fossil fuels and electricity*

### *The IEA's estimates of fossil-fuel consumption subsidies*

The International Energy Agency (IEA) has been estimating fossil-fuel consumption subsidies, measured at the economy-wide level, since its first major report on the subject in 1999 (IEA, 1999). Annual reporting commenced with the 2008 edition of its flagship *World Energy Outlook (WEO)* publication, and the estimates generated by its analysts were later posted in spreadsheets on-line. The estimates relate to subsidies that are conferred through policies that maintain domestic prices below international reference prices, after adjusting for transport costs. This method is sometimes referred to in the energy literature as “the price-gap method”.

The *WEO* is published in November of each year and covers estimates through the previous year. Estimates are provided by major fuel (coal, natural gas, oil) and electricity. Although estimates are reported for just 40 countries (as of 2016), the IEA examines prices for many more countries and publishes estimates only for price gaps that exceed its margin of error and for which the affected volumes are significant.

The IEA also undertakes periodic in-depth reviews of IEA member and non-member countries, and often it takes a critical look at specific subsidies to fossil fuels or fossil-fuel-generated electricity.

### *The OECD Inventory of Support Measures for Fossil Fuels*

The OECD *Inventory* was first published in 2011, initially covering 24 OECD countries and a number of sub-national units (states and provinces) within these countries. It was created in order to fill a gap in the information on the types of government support to fossil fuels that are not measured through the IEA's price-gap method. (Those estimates do not capture subsidies to production, for example, nor subsidies to consumption that do not depress domestic prices.) In 2013, the *Inventory* was expanded to cover all 34 OECD countries, and in 2015 to cover in addition the BRIICS. It is currently being updated to cover the newest member of the OECD, Latvia, as well as the accession countries of Colombia and Costa Rica, and a G20 member, Argentina.

Through its GREEN Action Programme in Eastern Europe, the Caucasus and Central Asia, the OECD has also identified numerous measures supporting fossil fuels in the countries of Armenia, Azerbaijan, Belarus, Georgia, Moldova, and Ukraine, covering several years' data through 2015. The final reports relating to this project are being finalised and are expected to become available by the middle of 2017.

### *Other data sources*

The European Commission's biennial reports on energy costs and prices include a dedicated chapter on subsidies to energy. Two had been published as of the end of April 2017;<sup>11</sup> the next one is foreseen for 2019 as a commitment to increase transparency and monitor policy developments.

Several other intergovernmental organisations and regional development banks generate information on fossil-fuel subsidies at the national level. The World Bank has produced a number of country-level studies over the years, and together with the Inter-American Development Bank (IDB) has been working on a large project to identify and measure energy consumption subsidies (those measured by price gaps) for Latin America and the Caribbean. The first published results of that work are expected later in 2017.

The International Monetary Fund (IMF) has produced estimates of what it calls “pre-tax subsidies” and “post-tax subsidies” for most of the countries of the world (Clements et al., 2013; Coady et al., 2015). The “pre-tax subsidies” incorporate the production-support estimates of the OECD, and extend the energy-consumption estimates of the IEA. By contrast, the IMF's “post-tax subsidies” are dominated by its estimates of consumption-related externalities (including those relating to congestion and road-wear-and-tear, costs to society that are not unique to vehicles powered by petroleum fuels or natural gas). These estimates, while not comparable with those for other sectors, do show the order-of-magnitude scale of environmental externalities generated by fossil-fuel combustion.

Various non-governmental organisations, such as the Global Subsidies Initiative (GSI), Oil Change International (OCI), and Overseas Development Institute (ODI), have undertaken studies that reveal new

information on fossil-fuel subsidies. The OCI and the ODI have in particular focussed on credit-related support provided by export-credit agencies and multilateral lending institutions, as well as investments by state-owned energy enterprises in fossil-related infrastructure. However, the data from these studies represent the gross values of the loans, loan guarantees, and SOE investments, not their subsidy-equivalent values.

### *Non-energy minerals*

Subsidies for the production and consumption of non-energy minerals have received relatively little attention to date. In contrast with subsidies to other potentially environmentally harmful activities, there has not been a comprehensive cross-country assessment of the value of support provided to the sector. Recent work undertaken by the OECD on Support for Primary and Secondary Metals represents an initial step in this direction. The report maps out the most common forms of support in the sector, and develops a typology that could serve as a basis for any future quantification efforts.

Existing research on support for mineral extraction and processing has followed several strands, having focussed on either specific countries<sup>12</sup> (Koplow, 1994; Scharf, 1999; Griffith, 2013; Johansson et al., 2014), support measures<sup>13</sup> (Lambrechts et al., 2009; OECD, 2014; Fogarty and Sagerer, 2016), or commodities<sup>14</sup> (OECD, 2008; OECD, 2015a). The picture that emerges is that various mechanisms are used to provide transfers to mining and metals firms, and that the value of this support can be considerable. Several national level assessments estimate that annual transfers may extend into the billions of dollars, but the data are insufficient to quantify support globally.

There have also been a number of complaints made via the WTO dispute-settlement process that relate to support for minerals and metals, and which provide some insight into government support in this sector. The alleged provision of subsidies to metal producers,<sup>15</sup> and the imposition of countervailing duties in response to perceived subsidies<sup>16</sup>, have both been challenged under the Agreement on Subsidies and Countervailing Measures. In addition, potential support provided via export restrictions on unprocessed or partially processed mineral products has been challenged under the General Agreement on Tariffs and Trade (GATT). One recent complaint, concerning Chinese export restrictions on rare earth elements, tungsten, and molybdenum,<sup>17</sup> was upheld by the WTO in 2014, which found that the export duties, quantitative restrictions, and licencing requirements applied were inconsistent with the GATT.

### *Company cars*

Company-owned or company-leased cars provided to employees in lieu of higher wages constitutes a significant share of the car stock in most G7 countries, and the under-taxation of this benefit can create a substantial fiscal burden on governments. Some company-car benefits also include free fuel, usually in the form of a fuel credit card billed to the company. The value of the personal benefit associated with the use of a company car may be underestimated by governments, resulting in a lower effective tax rate than cash wages. This underestimation is further compounded by the fact that in most countries the tax settings are independent of the distance driven.

Tax settings on these cars and fuel benefits also create implicit incentives for the mode of transport and distance driven, to the detriment of the environment and traffic congestion. The absence of a distance component in particular can reduce the marginal cost of driving to zero (where fuel and other charges are paid by the employer), creating strong incentives to drive greater distances and making the offer of a company car preferable to other forms of compensation (Roy, 2014). Several country studies find the average distance driven by company cars to be 1.5 to 3 times that of private cars (Harding, 2014).

Information on the total revenue loss to governments of preferential tax treatment of company cars is not measured on an annual basis. However, several studies provide indicative orders of magnitude. Measured as the tax that would be payable on the difference between the taxable benefits under the benchmark and country tax systems, these foregone tax revenues have been estimated at anywhere from EUR 19–33.7 billion for the OECD as a whole to EUR 54 billion for the EU countries alone (Harding, 2014; European Commission, 2010).<sup>18</sup> Although these revenue-foregone estimates do not take into consideration dynamic effects (for

example, substitution towards smaller and fewer cars would reduce revenues from fuel taxes), they provide an initial indication of the cost to governments of this implicit subsidy.

### How can one identify the most environmentally damaging subsidies?

#### *The OECD's template for identifying EHS*

In 1995, G7 Ministers requested that the OECD carry out a study on the costs and benefits of eliminating or reforming subsidies and tax disincentives to sound environmental practices. The results of that project were published in a series of reports, under the title *Improving the Environment through Reducing Subsidies* (OECD, 1998, 2000). One output of the project was a rudimentary “quick scan” tool, intended to help analysts rank subsidies according to whether they were more likely than others to generate adverse environmental effects, and whether they supported the achievement of their stated objectives (notably, maintaining or increasing employment or industry income). This “quick scan” grew out of attempts to systemise the then available evidence and to identify common factors believed to have a strong bearing on the environmental effects of subsidy removal.

The “subsidy checklist” (Figure 1), published a few years later (OECD, 2005), can be considered an elaboration of this “quick scan”. Its intention is to guide users in identifying the factors that determine the directness of the links between removing a subsidy and its environmental consequences, using the following line of reasoning:

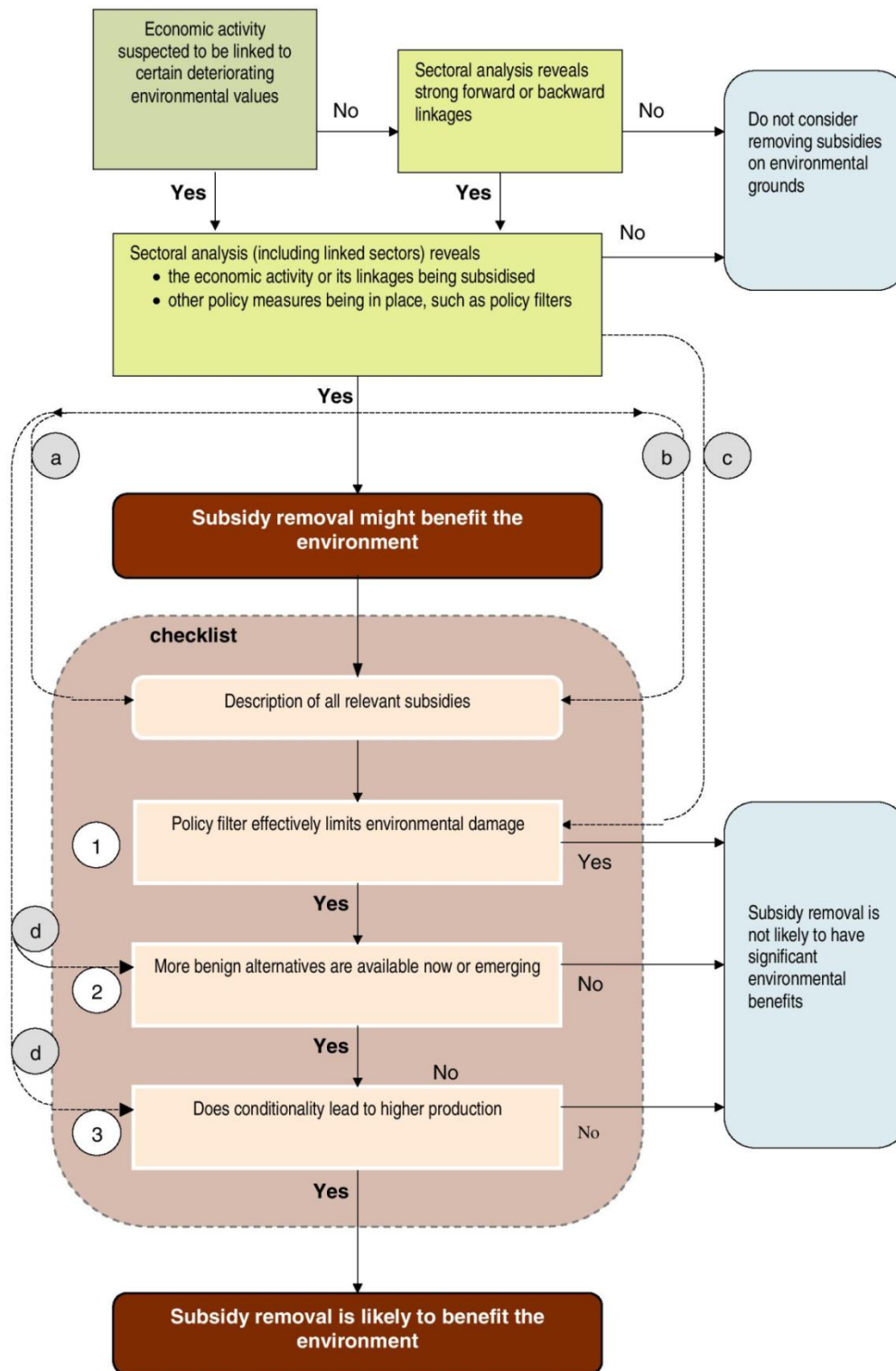
- A subsidy changes the relative volumes of economic activities and, potentially, emissions and rates of exploitation.
- The competitiveness of the subsidised sector may also be influenced by technical change.
- The effects of subsidy removal on emissions or rates of depletion depend also on the prevailing “policy filter” — i.e. measures that pose limitations on production or consumption levels that effectively limit environmental damage caused by the subsidised activity, under investigation.
- The resulting changes in emissions and rates of exploitation due to subsidy removal may improve the (use) values of the environment.
- The effects of existing subsidies on the (use) values of the environment may constitute a political argument to remove that subsidy.

The various studies that have tried to assess the environmental effects of subsidies have used different analytical techniques, assumptions and data, hence their results are not directly comparable. Nevertheless, the following examples provide some insights into the nature of the findings that have emerged from studies undertaken by the OECD and other investigators.

#### *Subsidies that are potentially environmentally harmful in the agriculture sector*

OECD work on monitoring and evaluation has demonstrated that, in general, the more a policy measure provides incentives to increase the production of specific agricultural commodities, the greater is the incentive towards monoculture, intensification (greater yields), or bringing marginal (environmentally sensitive) land into production, and the higher is the pressure on the environment. On the other hand, the more a policy measure is targeted to a specific environmental goal, the greater is its potential effectiveness in achieving that goal (OECD, 2001a; 2001d; 2004; 2006a; 2010).

Figure 1. OECD flow chart of the checklist for determining the likelihood of environmental benefits from subsidy reform



Source: OECD (2005).

### *Support measures that are very likely to have a negative impact*

Ranking agricultural policy measures according to their potential relative impacts on production shows that, all other things being equal, market price support, output payments (per output unit produced) and variable input subsidies (such as those that apply to fertilisers, pesticides, water or energy) provide the greatest potential incentive to increase commodity production, although this effect is weakened when constraints on output produced or inputs used are in place (OECD, 2013a).

Policy measures that are designed to deliver support based on current parameters, such as area or animal numbers and that require commodity production, have a potentially somewhat weaker influence on production incentives. Policy measures providing support based on historical parameters, such as the overall farm area or income of the farmer, have potentially far less influence on production incentives, while those that provide support based on non-commodity criteria (such as the provision of trees, stone walls and hedges), have potentially the least influence on production and can be targeted to specific environmental objectives.

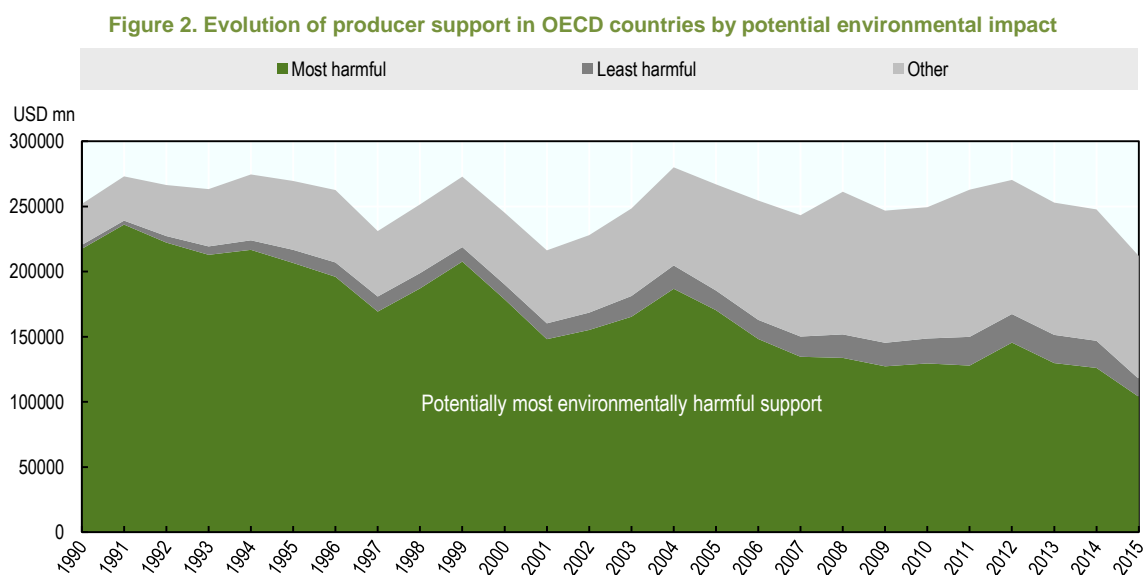
### *Support measures whose impact varies or is yet undefined*

Payments based on area, animal numbers, farm receipts or income, and historical entitlements are only potentially neutral in their effects on the environment, but may be harmful – or even beneficial – depending on specific programme designs and other regulations.

### *How the policy environment may affect support measures' impacts*

The actual impacts (*ex post*) of agricultural support will depend on the many factors that determine the aggregate degree of responsiveness of farmers to policy changes – including any constraints on production. For example, while it is true that market price support mechanisms and payments based on output are potentially the most harmful for the environment, whether they actually are harmful depends on a host of other factors, including whether production quotas are attached to them and whether they incorporate strong cross-compliance requirements, or are constrained by agri-environmental regulations independent of the support payments.

Potentially environmentally harmful types of agricultural support still constitute about half of the total support accorded to agricultural producers. The potentially most environmentally harmful share fell from 75% of the total support in 1995-97 to 50% in 2013-15, while the share of the potentially most environmentally beneficial support rose from 4% to 8% of total support over the same period (Figure 2).



Source: OECD PSE Database, <http://www.oecd.org/agriculture/pse>, 2016.

### *Subsidies that are potentially environmentally harmful in the fisheries sector*

As subsidies distort the relationship between costs and revenues, by either lowering costs or increasing revenues, they temporarily make the act of fishing more profitable and can facilitate a build-up of effort or capacity. From an environmental perspective increased capacity or effort is potentially harmful as it accelerates the rate at which resources are depleted and can lead to overexploitation of the resource. In addition to threatening the long term sustainability of a fishery's target species, excessive fishing pressure can also result in higher total levels of non-target bycatch (e.g. other commercial stocks, or threatened species such as sharks, turtles or seabirds), damage to the substrate, and increased pollution (through excessive consumption of inputs such as fuel, oil or gear).

Support measures that increase fishing capacity, either by reducing the cost of inputs or increasing revenues, have the potential to result in both negative environmental and economic outcomes. These measures include:

- Fuel (or other) tax concessions or exemptions
- Support for vessel, port or other infrastructure construction or modernisation
- Market support (price support, marketing and promotion)
- Foreign access agreements (access to waters or markets)
- Fishery development projects

Examples of support measures for which their impact varies or is yet undefined would include decommissioning schemes or license retirement (which are highly dependent on implementation) and assistance programmes to fishers, such as income support or insurance, education and training.

#### *How the policy environment may affect support measures' environmental impacts*

How support measures ultimately manifest within a fishery is directly dependent upon the policy environment. Under open-access conditions, or where effort is not effectively constrained, subsidies facilitate the inefficient use of inputs in the production process, excessive capital investment and a build-up of effort beyond the point where it would normally be feasible. As a consequence, this can result in excessive levels of catch, increased pollution, and the dissipation of rents. Indirectly, it may also contribute towards IUU fishing.

Fisheries-management systems can address the negative effects of certain subsidies (e.g. setting a total allowable catch and allocating individual transferable quotas limits overfishing and excessive capital investment), but only when they are effective, enforced and provide the right incentive to fishers to operate at an optimal level of capital investment and effort. The existence of IUU fishing bears witness to the fact that management systems, while ubiquitous today, are not universally effective. Besides, these management systems may not always provide the proper incentives to maintain optimal capacity levels.

Moreover, fisheries support in turn can put pressure on the management system by giving incentives to increase desired effort above allowed levels, encouraging both IUU fishing and lobbying to increase allowed effort. In the end, the effect of support on capacity and fishing effort is conditioned on, but not entirely mitigated by, the quality of the management system in place.

### *Subsidies that are environmentally harmful in the fossil fuels sector*

#### *Support measures that are very likely to have a negative impact*

As underscored by the G20 and APEC, “inefficient fossil fuel subsidies that encourage wasteful consumption” are likely to lead to increase emissions of carbon dioxide. Many countries are also concerned about pollutant emissions, like particulate matter, that may be increased as a result of subsidising fossil fuels or electricity generated by them.

Subsidies to the production of fossil fuels can also lead to increased environmental harm. There are direct environmental effects and risks inherent in the extraction and transformation process itself. These effects vary considerably by location, extraction method and fuel.

*Support measures whose impact varies, is mixed, or is yet undefined*

Many countries, including some G7 countries, provide support to low-income consumers of fossil fuels. To the extent that consumption of fossil fuels may be increased, there will be some associated environmental consequences. However, such support is often justified for social reasons, and the incremental environmental impacts are considered to be small. In many developing countries, subsidies to liquefied petroleum gas (LPG) are justified not only for social reasons but also because the alternative fuel for the recipients is likely to be crude biomass, the use of which can lead to increased pressure on forests and significantly higher levels of indoor air pollution.

*How the policy environment may affect support measures' environmental impacts*

On the consumption side, a cap on carbon emissions constrains the use of fossil fuels, and electricity generated from fossil fuels, in the country or region that enforces those limits. All else equal, emissions of air pollutants will also be less than they would be in the absence of the cap, though those emissions can be even more affected by the stringency of air-pollution regulations. Globally, however, the effect of a country acting on its own to limit its domestic carbon emissions may be offset to some degree by the fossil fuels used elsewhere to produce goods or services that the country or region imposing the carbon cap imports because those goods or services become cheaper to produce elsewhere.

On the production side, environmental regulations — e.g. pertaining to land disturbance and reclamation, or water pollution — will have a large bearing on the environmental damage caused by subsidised fossil-fuel extraction, processing and transport. However, to the extent that subsidising the production of fossil fuels lead in aggregate to greater overall global supply than would otherwise be the case, international prices for those fuels may thereby be depressed, which in turn would encourage greater consumption.

*Subsidies that are potentially environmentally harmful in the non-energy minerals extraction sector*

The environmental consequences of mineral ore extraction, beneficiation, smelting, and refining have been described in a number of life-cycle assessments (Mudd, 2009; UNEP, 2013; Nuss and Eckelman, 2014). These activities have both local and global effects. Surface disruptions associated with mining activity can have adverse consequences for habitat preservation and the quality of local ground and surface water. Beneficiation and processing of mineral ores requires considerable amounts of energy and water; data from the IEA indicate that the mining and metals sector represented around 7.5% of global energy consumption in 2014 (IEA, 2016). Metal production also generates an array of often toxic waste products that require storage within the environment. Mining wastes, processing tailings, particulate emissions, and smelter slimes all pose a significant threat to local air, water, and soil quality.

There is little research examining the environmental consequences of support for non-energy minerals. Establishing the responsiveness of metal production and consumption to changing input and output prices is a necessary first step in such an exercise; any support measure that serves to stimulate additional production will also tend to bring about increased environmental pressures and discourage material recovery through recycling, which has a significantly smaller environmental footprint. The environmental consequences of support will also be modulated by other factors, including the incidence of the support measure, the stringency of the environmental policy landscape in the subsidizing country, and the proportion of global supply that country represents. Production of many minerals and metals is highly concentrated in a handful of countries; subsidies provided by large producers may be of particular environmental concern due to their effect on world markets.



### *Subsidies that are potentially environmentally harmful in the water sector*

Water subsidies are most problematic where they lead to unsustainable rates of water use within the relevant water-catchment area. Water scarcity is a serious threat in at least some regions of many countries, including some of the drier parts of the G7 countries. The most common subsidies are those provided through not fully charging for the cost of providing treated water, or that facilitate the over-exploitation of aquifers, such as through the provision of special, subsidised electricity prices for groundwater pumps (Muller and Bellmann, 2016). Such subsidies can incentivise the growing of crops that are more water-intensive than would be cultivated were farmers required to pay the full value of the water, or excess consumption of water by industries or households.

As with subsidies in many areas, the effects depend on local circumstances and the conditions attached to the subsidies. As pointed out by the OECD (2005), government expenditure on existing network infrastructure can be used to increase the capacity or efficiency of water storage, supply or distribution. Whether it leads also to increased levels of water withdrawal depends on the particular specification of the subsidy scheme.

### *General observations<sup>19</sup>*

The foregoing brief review of subsidies to numerous sectors with the potential to adversely affect the environment is just illustrative of the complexity of the links between the subsidised activity and environmental outcomes. Stripped of their specific circumstances, what previous analysis have concluded is that there are some common considerations that affect the degree of environmental harm.

*Point of impact.* Subsidies are targeted at something – output, firm or household income, profits, variable inputs, or factors of production. For a given amount of money, these points of impact (also called initial or statutory incidence) can affect the economic and environmental consequences of the subsidy, but in turn depend on the market’s structure.

*Market structure.* The final incidence of a subsidy may differ from its initial incidence. For example, a subsidy granted to an industry with little bargaining power may be passed on to its customers, or captured by its suppliers through higher input prices. Such considerations are especially relevant when removing a subsidy, as they have a bearing on whether flanking measures are needed to avoid social hardship.

*Degrees of freedom.* Subsidies that stimulate output, but leave the producer (consumer) free to choose its mode(s) of production (consumption), provide more degrees of freedom to choose environmentally benign modes of production (consumption). By contrast, a subsidy that is conditional on using a certain mode of production or certain input is likely to discourage the recipient from looking for more environmentally benign processes or products.

*Lock-in effects.* Subsidies tend to impose rigidities, especially if they are designed to shelter industries that are not economically viable. They may have especially long-lasting effects if tied to production-specific capital. Once that capital is in place, firms or households will view it as a sunk cost, creating a barrier to changing the resulting production or consumption pattern (see, for example, Naughten et al., 1997).

*The supply elasticities of factors of production.* Subsidies tend to be capitalised into the price of the least elastic factor of production – land in the case of agriculture, or quotas in the case of fishing. Thus a subsidy can affect the relative prices and use intensity of the relevant factors of production, and hence environmental impacts. This phenomenon leads to “the transitional gains trap” (Tullock, 1975), making reform difficult and costly because removing the subsidy can substantially reduce the capital value of production- or consumption-specific assets.

*The alternative to the subsidised activity.* Once subsidies to an activity are removed, a differing pattern of production or consumption, or both, will emerge. Removing subsidies to a high-cost coal producer, for example is likely to lead to a different geographical distribution of production. This may in turn rearrange patterns of trade, but not necessarily cause a reduction in overall coal use. On the other hand, because of differences in endowments and production techniques, the net effect is indeterminate.

*The political and economic environment.* Subsidies rarely are provided in an otherwise unregulated context. Various sectoral or environmental policies, and institutional arrangements, including limits on the use of inputs or output quotas, can have a profound effect on environmental outcomes.

## Practical issues to establishing a target date and disciplines on EHS

### *The question of timing*

What do past domestic experiences with phasing out subsidies tell us about the macroeconomic conditions that favour undertaking successful subsidy reform? To date there have been no systematic analyses of this relationship. Ultimately, the question cannot be disentangled from political economy. Often, subsidy reforms have been pushed through because of economic necessity. Many of the recent reforms of fuel subsidies among the member countries of the Gulf Co-operation Council, for instance, have been initiated in response to reduced national income as a result of falling prices for their main export commodity, petroleum. But the low international prices also have made it easier for some countries to move domestic prices closer to export price parity, because the gap is smaller than it had been a decade ago.

Purely economic events are not the only factors that affect the timing of action on subsidies. Crises, including environmental crises or crises related to resource scarcity, can also help forge consensus on the need for reform. In the case of the reforms of natural-gas price regulation that took place in the United States in the 1970s and 1980s, for example, forced curtailments of delivery in the winter months brought the necessity for change into sharp focus, prompting relatively swift Congressional action. In the case of fisheries, collapses of fish stocks have similarly added urgency to some reforms.

The chances of being able to take advantage of propitious moments for reform are likely to be higher if the information necessary to design a reform package is in place, and the public is made aware in advance of the reasons why reform is necessary. In short, advance preparation facilitates more nimble and well-designed responses.

### *How long have previous reforms typically taken?*

The length of time between the start of a subsidy-reform effort and its conclusion can vary extremely widely. The shortest reforms have been those that have involved relatively small subsidies that imposed few losses on recipients when they were withdrawn. Some of these have been implemented literally overnight. Most others have taken much longer, usually over several episodes (Inchauste and Victor, 2017). The amount of time has depended on many factors: the size of the subsidies (in absolute terms and relative to GDP), the number of years that they had been provided, the extent to which their value had been capitalised into assets, such as land or harvesting rights; and whether it was possible to ameliorate the losses of affected individuals (particularly the poorest among them).

Subsidies to fossil fuels provide numerous examples of the range of experiences. The deregulation of inter-state natural gas prices in the United States – a major undertaking given the size of the US economy – was initiated in 1978 and completed by 1992. At the opposite end of the spectrum, in December 1965 the Netherlands government announced the complete termination of subsidised coal mining in its southern province of Limburg; the last mine closed its doors a little more than a decade later. Germany, by contrast, has taken much more than a decade to phase out its subsidised hard-coal mining, to ensure minimal forced unemployment and avoid social disruption.

In the generally smaller fisheries sector, the periods between commencement and completion of reform processes has also varied. The OECD's 2011 analysis of national experiences of fisheries policy reforms in several OECD countries (Iceland, Korea, Mexico, New Zealand, and Norway) – not all of which involved reductions in subsidies – shows that there was often a several-year period of reflection on how the reforms would be approached, followed by the progressive implementation of replacement measures or management instruments. In a few cases, major reforms – such as the introduction of cost-recovery for management expenses incurred in New Zealand's commercial fisheries – took less than a decade. But often the full process of change took 15 to 25 years to fully carry through.

Clearly the lesson is that the time required to carry out reforms depends on a host of factors, including the complexity of the reforms, the relative number of people (consumers and workers, citizens at large, and special interests) affected and the distribution of benefits, and the availability of alternatives. But for most reforms, progressing through the steps of identifying the need for reform, designing a reform package, building support for it, and implementing it, normally takes years if not decades.

### *The possible international consequences of simultaneous reform<sup>20</sup>*

Co-ordinated reform among many nations helps strengthen the hand of domestic reformers. However, if it occurs on a large scale (relative to global markets), and rapidly, it may induce changes in domestic and international prices of the targeted commodities. These price effects may, in turn, affect the patterns of investment and production.

Magne et al. (2014), in a simulation of multilateral reform of fossil-fuel consumption subsidies, find that it would make fossil-fuel energy more expensive to end-users in the (mainly non-OECD) countries that implement it. The consequent reduction in fossil-fuel demand in those countries would exert a downward pressure on reference international oil prices, by 11% in 2035. OECD countries, by contrast, would experience lower energy prices and increase their consumption of natural gas and coal, albeit by a moderate amount. However, the decline in fossil-fuel consumption in non-OECD countries would more than offset the increased consumption stimulated in OECD countries. The overall impact of the reform would be a decline in international fossil-fuel prices, relative to baseline levels, but a reduction in fossil fuel consumption globally.

A specific issue relevant to large countries that warrants further work when evaluating the environmental effects of policies (or taxes designed to internalise the costs of negative environmental externalities) is the importance of taking into account global market spill-overs. To take one example, Williams and Shumway (2000) examined the impact of the North American Free Trade Agreement between the United States of America and Mexico on agricultural chemical use. Their findings questioned the assumption that a reduction in producer subsidies in agriculture may be beneficial to the environment where the reduction in support is due to trade liberalisation which also opens up additional market opportunities. The economic incentives from the trade opportunities may lead to larger amounts of chemicals being used, despite the lower level of support, they concluded.

Johansson, Cooper, and Peters (2006) also considered the potential agri-environmental impacts in one country, the United States, of the removal of agricultural trade distortions by all countries. In principle, for a country with a relatively low initial level of agricultural support and a comparative advantage in agricultural production, the resulting increase in agricultural production could intensify environmental problems in spite of the elimination of agricultural support. These authors found that the estimated changes in US agricultural production under the ambitious assumption of global agricultural trade liberalisation were well within the bounds of average annual variation for agricultural commodity production. They concluded that, for the United States as a whole, environmental impacts stemming from such hypothesized trade shocks would also fall within the average annual variation. However, the estimated changes in commodity production and subsequent environmental impacts would not be uniform across the landscape, with increases in agricultural production and the environmental indicators in some regions or sectors and decreases in others.

The issue of global effects was also highlighted in the debate over the mitigation effect on greenhouse gas (GHG) emissions of substituting biofuels for fossil fuels, once indirect land-use change was taken into account. Because the demand for food is not reduced by a policy that diverts land from food to non-food use and so remains constant, switching agricultural resources previously used for food to biofuel production will lead to an increase in food prices, which in turn will induce an expansion in food production in other countries. Whether global GHG emissions are reduced or not then becomes an empirical matter.

As an example, Elobeid et al. (2013) examine the effectiveness of two policies designed to reduce the negative environmental impacts of agricultural production.<sup>21</sup> They run two scenarios: the first is a fertiliser scenario in which a nitrogen tax increases the price of nitrogen in the United States by 10% over the baseline, while the second is an afforestation scenario designed to sequester carbon dioxide by converting 50 million acres of cropland mostly in the Corn Belt to forests. In the fertiliser scenario, nitrogen fertiliser use falls by

just under 0.2%, illustrating the inelasticity of demand for fertilisers used in producing corn (maize). Higher crop prices induce an expansion in crop areas and rates of fertiliser use “such that world fertilizer use shows only a minor reduction” (p.7). In the afforestation scenario, which also drives up crop prices, the induced additional production in the rest of the world is estimated to lead to an increase in global GHG emissions (largely resulting from land-use change as the increase in cropland area outside the United States is assumed to come largely from native vegetation). What these results suggest is that the standard OECD conclusions about the effects of reform may need to be nuanced at least in the case of large countries and particularly for negative environmental effects with trans-border consequences.

### *Challenges to achieving international consensus on a path forward for reforming EHS*

As is shown by experience with past plurilateral and multilateral efforts to impose binding disciplines on the use of subsidies, or to even agree on a non-binding schedule to reduce or reform them, achieving concerted international action on subsidies is not easy.

For one, countries may disagree on the scope and definition of the term “subsidy” or of any related term. It is hard to imagine the WTO’s Agreement on Subsidies and Countervailing Measures (ASCM) being workable without an agreed definition of “subsidy” and of concepts like “specificity”. But the ASCM is what is known as hard, or formal international law. By contrast, the G7 and G20 Leaders’ Commitments on inefficient fossil-fuel subsidies – which are non-binding – have defined neither the term “subsidy” nor “inefficient” for their purposes.

Another challenge is data. Data on subsidies, particularly on data needed to estimate subsidies related to capital investments, are incomplete. And even where data are available, calculating some types of subsidies is highly resource-intensive. Incomplete or imperfect data do not pose an absolute barrier to starting reform – in some cases, reforms can identify what subsidies are in need of reform based on their design or effects, even if the absolute value of the subsidies is not known – but having good data makes the task easier and the analysis of the effects of the subsidies more credible. Many of the environmental effects of subsidies are context-specific, may work in opposing directions, and may depend on interactions with other policies.

The strongest arguments for reforming EHS are likely to be related to cases in which reforms are also likely to yield benefits in other areas, such as improving social equity or fiscal imbalances. This suggests that, as for many subsidy-reform processes, parallel development with other mechanisms that provide targeted support for the poorest affected by the reforms is likely to reduce resistance to the reforms.

### **Towards an international roadmap for co-ordinated phasing out of EHS**

Numerous countries, particularly in Europe, have scrutinised their subsidies and taxes in the search for opportunities to both reduce environmental harm and improve their fiscal balance, including through tax shifting. Recent examples include the study by Italy’s Environment Ministry (2017), the German Environmental Agency (2016) and the study by Switzerland’s Federal Council (Conseil Fédéral Suisse, 2013). However, there are advantages for countries to work together on politically sensitive issues, such as subsidy reform, both because it helps demonstrate to each country’s own citizenry that it is not “unilaterally disarming” and because it facilitates mutual learning among the countries involved.

The model of the G7 seen in most of its initiatives relies typically on what might be called “results-oriented partnerships” rather than formal instruments. That leaves many choices open to exactly how it might undertake work on EHS. As explained by Benvenisti (2012, p.300), an advantage of these types of intergovernmental understandings is that they do not involve

the signing of new treaties or the creation of IOs [intergovernmental organisations] which are subjects of international law. Nor do these co-ordinated policies necessitate making novel assertions about customary international law. Such intergovernmental action can simply be based on each government’s discretionary power under its domestic law.

This suggests, in short, that if there were interest among the G7 to work collectively towards reform of EHS, it would need to be done through a non-binding process. An important aim of such a process would be to create transparency and accountability among G7 members, which would also likely generate a greater appetite for reform and possibly lead the path to a broader international process of reform.

The first step would be to take stock of existing subsidies that could be considered potentially environmentally harmful, and estimate their fiscal and environmental effects. The utility of this step would be to develop the baseline information necessary to establish a timeline for reforms. Such a stocktaking exercise could draw on existing international databases for some of the information, as well as information provided by the participating countries, but would benefit from additional research in the case of potentially harmful subsidies for which data have not yet been compiled or are not compiled systematically and periodically.

The second step would be to narrow down the identified potentially EHS, ranking them so as to establish which should be prioritised for reform. The intended outcome would be to enable countries to identify and target those subsidies that are inefficient in achieving their goals, and which would therefore generate the greatest benefits for the economy and the environment through their reform. Various aids to conducting such an exercise have been created and applied over the last couple of decades (e.g. OECD, 2005; Valsecchi et al., 2009) and could be used for this purpose. Another model is that applied in the Eunomia study on behalf of the European Commission (Eunomia, 2016), which provided information on “good practice” in the application of environmental taxes and elicited views from EU Member States as to the extent to which implementing such “good practice” was deemed feasible from a political perspective in their own countries. Respondents were also asked to identify new or higher taxes with some prospect for being introduced, and over what period. A similar approach could be taken with respect to EHS.

Step 3 would then involve each country developing integrated reform packages, ones that consider not just the environmental effects but also the economic and social costs and benefits of existing policies and their reform.<sup>22</sup> Alternative uses of the savings from reform could also be considered in this step. The overall aim would be to develop a better understanding of the trade-offs involved, where possible through quantitative analysis.

Whether to develop a common target for the reform of EHS would be a separate issue. Establishing norms among a group of like-minded reforming countries helps create a benchmark against which not only the members can measure their each other’s progress but also signals a willingness to other actors that they are willing to be held accountable. Unlike some of the other stages, however, the development of common goals, and criteria for evaluating progress towards the achievement of those goals, is a political process necessitating negotiations among participating parties. In short, if at some point G7 countries find themselves in a position to begin discussing their ambition for reforming EHS, including setting a target date for completing the reforms, that part of the process would have to be worked out and implemented by the G7 itself.

Once a common set of goals is developed, institutionalising a process for monitoring and evaluating progress towards them is essential for success, especially if there is a strong risk of backsliding. How that is accomplished can take many forms. In the G20, for example, the monitoring of progress towards their goal of phasing out inefficient fossil fuel subsidies that encourage wasteful consumption is done through self-reporting, complemented by a voluntary process of peer review. Alternatively, the monitoring and evaluation could be carried out by an independent party overseen by the participating countries.

For any new international initiative on potentially EHS, of course, care would need to be taken to avoid duplicating or interfering with the work of international institutions that are already addressing some aspects of the issue. The WTO, for example, has disciplines on production-related subsidies that affect all sectors producing goods that enter international trade, including some subsidies that support environmentally harmful activities. And, as described earlier in the report, there are specific international processes addressing inefficient subsidies to fossil fuels; subsidies that undermine attempts to protect biodiversity; and subsidies that lead to excess fishing capacity and fishing effort, or illegal, unreported or unregulated (IUU) fishing. The challenge for any inter-governmental network working in this sphere, such as the G7, is to avoid duplication while at the same time showing leadership and accountability, lending welcome support to the efforts of the other groups and benefiting from the results of those groups.

## Notes

1. The full sentence, on page 28 of the Declaration, states: “We remain committed to the elimination of inefficient fossil fuel subsidies and encourage all countries to do so by 2025.” The full text of the document can be downloaded from [www.mofa.go.jp/files/000160266.pdf](http://www.mofa.go.jp/files/000160266.pdf).
2. (2010/787/EU), <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010D0787&from=EN>.
3. See, for example, the Country Report for Slovakia (3 February 2017), at <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017SC0058&from=EN>.
4. See the Clean Energy website: <https://ec.europa.eu/energy/en/news/commission-proposes-new-rules-consumer-centred-clean-energy-transition>.
5. The United Nations’ 2030 Agenda for Sustainable Development “is a plan of action for people, planet and prosperity”, adopted by Heads of State and Government and High Representatives, meeting at the United Nations Headquarters in New York from 25-27 September 2015.
6. <https://sustainabledevelopment.un.org/sdg14>.
7. [www.g8.utoronto.ca/environment/1994florence/index.html](http://www.g8.utoronto.ca/environment/1994florence/index.html).
8. [www.g20.utoronto.ca/2009/2009communique0925.html](http://www.g20.utoronto.ca/2009/2009communique0925.html).
9. <https://sustainabledevelopment.un.org/sdg12>.
10. So-called “green-box” measures are generally considered among the least environmentally harmful; see Steenblik and Tsai (2009).
11. COM(2016) 769 final; <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016DC0769&from=EN>, COM(2014) 21 /2, [https://ec.europa.eu/energy/sites/ener/files/documents/20140122\\_communication\\_energy\\_prices.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/20140122_communication_energy_prices.pdf).
12. In chronological order: United States, Canada, Australia, Sweden.
13. In chronological order: foregone tax revenues, export restrictions, and foregone revenues associated with the provision of geoscientific data.
14. Steel in both cases.
15. Dispute settlement #519, lodged by the United States in January 2017, concerns alleged subsidies to Chinese aluminium production through, (i) the public provision of concessionary loans and finance, and (ii) the public provision of production inputs (coal, alumina, and electricity) for less than adequate remuneration.
16. Dispute settlements #436 and #514, lodged by India and Brazil in 2012 and 2016 respectively, concern countervailing measures imposed by the United States on finished steel products in response to perceived subsidies in those countries.
17. See dispute settlement #431.
18. The explanation of the discrepancies lies in different approaches. Both rely on the same source of information on the value of particular cars, but the EU estimation pertains to one year (2008), whereas the OECD estimate is a range for several years (2007-11). Moreover, while the EU estimate takes into account only a few variables, the OECD estimate is based on modelling that takes into consideration the depreciation rate, insurance, repair and maintenance costs, etc. on the company cars.
19. This section draws heavily on OECD (2005).
20. This partial review of the agricultural literature in this section was written by Alan Matthews, Professor Emeritus of European Agricultural Policy in the Department of Economics at Trinity College, Dublin, Ireland.
21. In their example, the authors are interested in addressing the negative environmental impacts from increased agricultural production in response to biofuel policies, but this does not affect the general point.
22. Reforming subsidies does not mean just cutting back on government expenditure. Some subsidies can play an important role in stimulating the transition to more sustainable practices, and in compensating the most members of society most vulnerable to a change in policy. In the case of subsidies directly affecting the extraction or harvesting of natural resources, this means re-evaluating not only the subsidies themselves, but also the resource’s management and the economic context – in short, taking an integrated approach to reform (WWF, 2011).

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