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Identifying fossil fuel subsidies in the SEEA for SDG reporting

Authors:

Viveka Palm and Nancy Steinbach, Statistics Sweden, Jane Harkness and Adam Tipper, Statistics New Zeeland

Statistics Sweden
+4610-479 940 00

www.scb.se

Summary

The SEEA community has the opportunity to respond to the data requests of the SDG target 12 C on : Remove market distortions that encourage wasteful consumption and the associated SDG Indicator 12.C.1: Removing fossil fuel subsidies.

The UN Environment expert group on fossil fuel subsidies have prepared guidelines and a proposal for a method to calculate the indicator. Statistics Sweden and Statistics New Zealand have done a first test on the methodology teasing out the particularities of the indicator and assessing whether such data may be able to be compiled via SEEA.

A fully possible indicator to calculate

The indicator is fully possible to extract using existing statistics. However, the issue is to come to test the methods, produce the statistics and analyze the results to make sure the outcome is harmonized and described in enough detail for the users. Given the possibilities to include various forms of support for fossil fuels and also for including other greenhouse gases, we need agreement on what to include.

Adding additional information from the accounts to broaden the analysis:

From a holistic perspective the indicator misses any forms of assistance (subsidies or otherwise) to other activities that exacerbate climate change. E.g. in New Zealand most of our emissions come from enteric fermentation, with the resulting methane emissions accounting for over half of NZs emissions profile. For a broader analysis the SEEA can attempt to include other economic instruments related to climate change as-a focus on fossil fuel subsidies may miss other forms of assistance to wasteful or harmful consumption.

- Retaining the terminology ‘subsidies’ while taking a broader definition than that used by the National accounts may lead to confusion and potentially reduce comparability between different economies. Earlier discussions on the topic has identified that using the term “transactions” becomes more appropriate from a national accounts perspective, but perhaps not so for the users.

- If subsidies, tax credits and tax exemptions are within scope it might also be useful to include information on taxes as supplementary information, particularly for the oil and gas industries, so policy makers can be presented with full information.

A proposal is to make use of table 4.8 in the SEEA CF and adapt it to include implicit subsidies.

Table 4.8
Selected payments to and from government and similar transactions

		Payments received by				
		Government	Corporations	Households	NPISH[a]	Rest of the world
Payments made by	Government	Transfers between levels of government	Subsidies and investment grants	Current and capital transfers	Subsidies; current and capital transfers	Current and capital transfers
	Corporations	Taxes, fines, fees, charges and rent	Rent	Rent	Donations	Donations to NPISH in rest of the world
	Households	Taxes, fees, charges and fines			Donations	Donations
	NPISH[a]	Taxes	Current and capital transfers	Current and capital transfers		Current and capital transfers
	Rest of the world	Taxes and current transfers			Donations	

[a] Non-profit institutions serving households.

Source: SEEA CF p. 118 (PDF version)

London group issue Climate change

A) Methodological issue:

New data is requested under the SDG goal 12 – to monitor the amount of fossil fuel subsidies paid by government to society. The SEEA CF has the capacity to inform on this indicator.

B) Status

The possibility of measuring 'Potentially environmentally damaging subsidies' is referred to in the SEEA CF (§4.147). It mentions that some definitions include implicit (or indirect) subsidies, such as preferential tax rates. The paragraph concludes that a definition of these PEDS are not included in SEEA.
An earlier paragraph (§4.129) clarifies that the SEEA only records transactions that are taking place between institutional units, thus does not estimate the value of implicit subsidies.

However, there are other examples in the SEEA CF where valuation is undertaken even when the transaction between institutional units cannot be directly measured. E.g. estimations of sub-soil assets are conducted and various methods are described. In the SEEA EEA, there will most likely be many various estimation processes proposed to value ecosystem values

where no actual monetary transaction occurs. In the national accounts, imputations are made to value the services which households owning their home and living in it produce for themselves. It therefore appears a rather strange situation that the implicit subsidies should be excluded.

C) History

The London group has discussed environmentally related transactions for a number of years, concluding with the release of the SEEA CF in 2012 that the area was still to be developed. Thus the focus of the SEEA CF for the environmental activity accounts and related flows has been on the extent to which they reflect economic transactions that promote positive environmental change rather than on the negative environmental aspects of some transactions.
The issue of monitoring fossil fuel subsidies came up as soon as the IAEG-SDGs proposed an indicator covering this issue. In 2017, the London group for the first time heard about the work of the UN Environment expert group and was asked to assist.

The discussion during the London group meeting in 2017 depended on the UN environment expert group to propose a methodology and definition of the indicator. The methodology has recently become available and is now able to be tested.

D) Proposal for way forward

The London group is asked to assist in the testing of the proposed methodology and provide insights into constraints and possibilities for the statistical community to help the monitoring of the SDGs in this field.

E) Proposal of changes/additions in the CF

It is proposed that the future revision of the SEEA CF picks up the results of this work through the further testing of the methodology and adapting SEEA table 4.8 to this specific task.

1. Fossil fuel subsidies in the SEEA and the SDGs

Background

During the 23rd meeting of the London Group meeting, we talked about forming a team to test the new ideas on how to measure fossil fuel subsidies for the goal 12.c.1 in the Agenda 2030.

Now a report from the UN custodian in charge of this goal, UN Environment, has been finalized in cooperation with OECD, IMF, IEA and other interested parties including a few statistical offices (UN Environment 2018a). Some countries have made case studies available, such as Italy, India, Zambia and Egypt. They have investigated their national data and reported interesting findings, such as concluding that countries with high monitoring capacity and an open-data approach can provide an excellent basis for SDG monitoring and that the data efforts would not be considerable (UN Environment 2018b-d).

The anticipated outcome of the work of the UN Environment technical expert group is a definition of what is considered a fossil fuel subsidy, and guidelines on where potential data sources might be found.

For example, regarding OECD countries, data on direct transfers of funds and tax revenues foregone are available at the web-site of the OECD. The data are normally reported by national Ministries of Finance and is a combination of direct transfers available in budgets and for the tax revenues forgone calculated with national reference tax values.

Other data sources might be had from the IMF that calculates induced transfers related to consumer price support.

Aim of paper

This paper aims to take the suggestions from the UN environment report and turn them in to a step by step method to see how such subsidies would fit into the system boundaries and aggregates that are present in the SEEA.

2. Relevant SEEA accounts and data for calculating fossil fuel subsidies

The SEEA framework contains guidance accounting for energy supply and use, air emissions, and environmental economic instruments (such as taxation, protection expenditure, and subsidies) by industry, among others, which are relevant to the measurement and understanding of fossil fuel subsidies.

In terms of environmental economic instruments, many countries calculate energy taxes and environmentally motivated direct subsidies by industry and it is foreseen that the work on meeting the data requirements of the SDGs could build on that experience. These statistics can be of great value to analyze the structure of subsidies and understand what industries are utilizing these various economic instruments.

The input from energy statistics

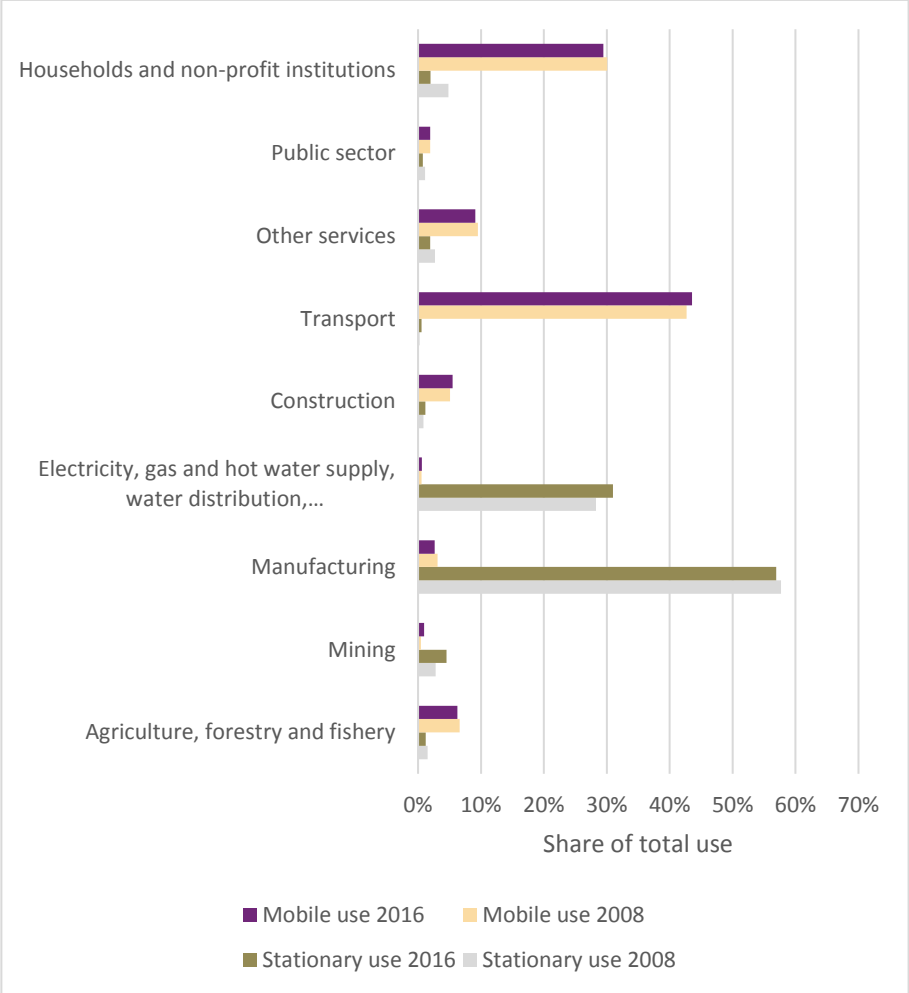
By examining the detailed data used to compile the energy supply and use accounts it is possible to identify the fossil fuel use by industry and direct use by households. In the underlying data, the type of fuels are available, typically divided into stationary purposes, e.g. heating houses, and mobile purposes, e.g. driving vehicles, or for ships, air travel and train travel. A further category for industrial purposes is also available where the fuel is part of an industrial process. Figure 1 presents an example of how the Swedish economy is using fossil fuels, for stationary purposes, or for vehicles.

The manufacturing industry and the electricity, gas, and water supply industries are the major users of fossil fuels for stationary purposes, while the transport industry and households account for the highest share of fossil fuels for transport purposes.

The times series indicate that little shift has occurred over the period 2008-2016.

The overall use of fossil fuels in Sweden is decreasing which should show up in the statistics on tax revenues depending on the level of tax exemptions that are put in place.

Figure 1: Fossil fuel use for stationary and mobile purposes, by industry, 2008 and 2016, share of total use in Sweden



Source: SCB, Environmental accounts, 2018

So, what about the taxation of the fuels? That is covered in the statistics on environmental taxes. The calculation of the distribution of environmental taxes such as energy taxes or emission taxes relies on the information of the taxation rules and is then matched with fuels and divided by industry to match the accounts.

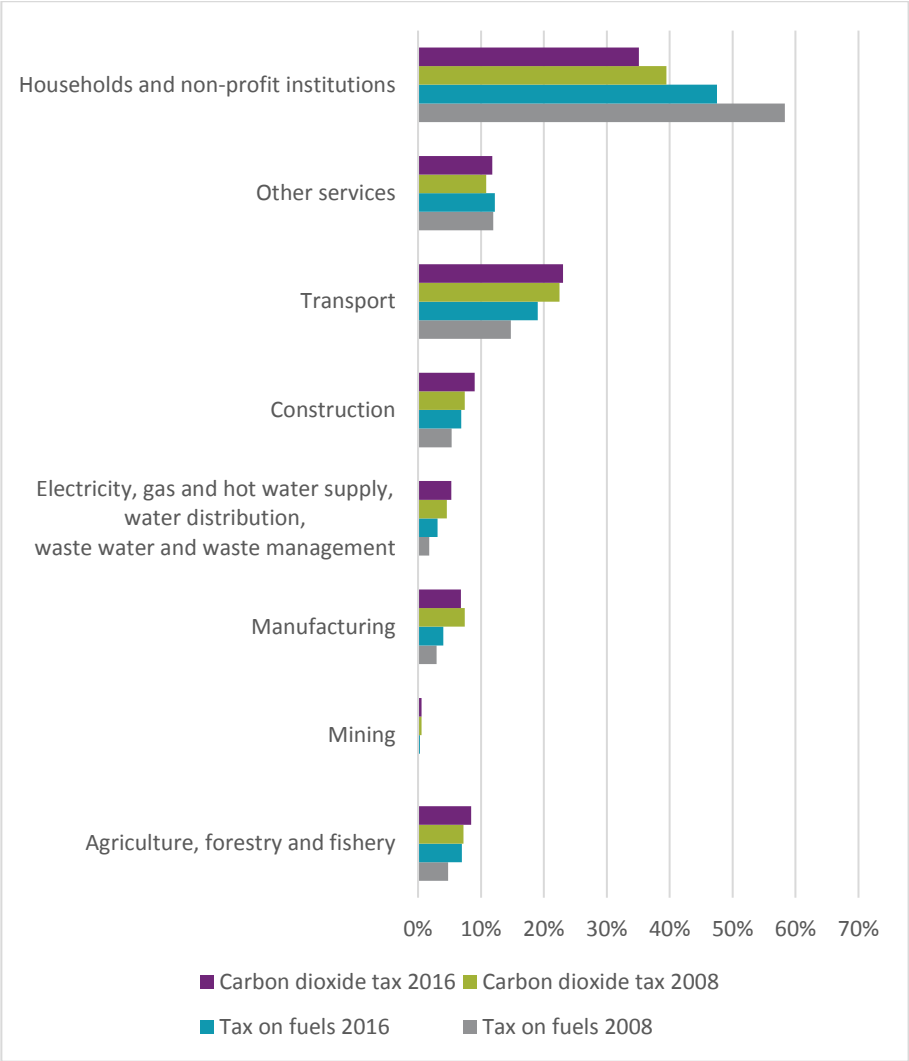
The fuels have different carbon content and so the use of fuels will differ in the climate emissions that follow. This information is also used in the preparation of the emission accounts.

Figure 2 show an example of how taxes on fuel and carbon dioxide taxes are structured in the Swedish economy.

The proportion of fossil fuels used by industry is somewhat different from its proportion of fossil fuel taxes paid (compare figures 1 and 2). What is recognized is the high use of fossil fuels for transport that the households use in the tax revenues. However, manufacturing does

not appear to face the same carbon price, nor the electricity, gas and water supply industries, indicating that exemptions are put in place. There are other economic instruments, such as the EU emissions trading system that concern emissions from the manufacture and electricity sectors.

Figure 2: Taxes on fuels and carbon dioxide taxes by industry, 2008 and 2016, share of total fuel tax and carbon dioxide taxes in Sweden



Source: SCB, Environmental accounts, 2018

3. Method

New issue: direct and indirect transfers, reference fuel taxes

The new steps for environmental accountants with this work is that instead of focusing on what fuels and emissions that are taxed and what economic activities are paying for the taxes, now the focus is on money that directly or indirectly supports fossil fuel production or consumption. As has been shown in a number of reports from IEA and OECD among others, these transfers are large. For example, a study has shown that 6,5% of the Global GDP is being paid in subsidies for fossil fuels (Coady et al, 2017).

Also, for the countries where there is support being paid to economic activities that goes to fossil fuels or to price compensation, those data needs to be recorded from the state budget and similar documents.

In the guidance provided from UNEP the recommendation is to look for all sorts of subsidies, whether they are possible to quantify or not. From a statistical pilot point of view, there is a need to find the measurable subsidies and see how they can be fitted into the SEEA system, by being divided so that the industry that receives the benefits can be seen, as a first important step.

A high level division of industries is first used in order to facilitate cross-country understanding of the data requirements. It is expected that countries, in time, will disaggregate these industries to a level which is of most national interest and feasible in terms of data quality.

Basically the UN Environment recommends to include following items as separate and distinct fossil fuel indicators in themselves:

1. Direct transfers for fossil fuels,

2. Induced transfers (price support) for fossil fuels, and

3. Tax expenditure for fossil fuels.

Data sources

Information can be sourced from the finance ministry or state budgets that specify the tax rules for fuels and the potential direct transfers of money connected to fossil fuel use per year. For the 44 countries with the largest direct transfers the IEA are collecting this data on a yearly basis.

The finance ministry publishes the instructions that specify the industries or geographical areas that have special treatment because of international treaties, energy intensity or other specific reasons per year. Here, the instructions concerning fuel use for international air travels and shipping are important. In Sweden there are separate taxes on energy and on CO2-emissions and they vary by fuel. In order to calculate the fossil fuel revenue forgone we need to know the use of diesel, petrol, coal, aviation gas and peat.

Information from finance ministry on what is the reference level of taxation that constitute the normal and from which a tax expenditure can be deducted is a crucial number. In this first step we will use the national reference values, but for international comparisons it would be necessary to establish some regional or global reference values. An evaluation is also needed to establish the residence principle and how the transfers follow the national economy.

Energy statistics with fossil fuels, that specify the fuels on a product level so that it is possible to allocate the various tax coefficients to the fuels. If the NSI already calculates energy taxes, this data material is likely to be part of the production of the environmental accounts (see above, figure 2).

Country case Sweden

Direct transfer of funds for fossil fuels

In 2008 Statistics Sweden conducted a pilot study reviewing potentially damaging transfers. At that time the appropriations that was investigated as counteractive to the environmental quality objectives mostly covered transport related appropriations to road, air and sea transport, such as road construction, car allowances, subsidies to municipal airports and allowances for leisure boats. However, none of the appropriations was directly aimed at subsiding fossil fuels (SCB 2008).

A review of the current status show that e.g. transport subsidies have been provided to regional companies for their transport costs, which could be related to fossil fuel expenditures.

During 2017 the subsidies amounted to SEK 400 Million, and most of the money was allocated to companies with men[1]. Otherwise allowances for boats and car allowances appear to be removed, or perhaps included in broader government appropriation groups, the review could not verify.

Induced transfers

In Sweden the pricing of fossil fuels are above the global average and thus no induced transfers are recorded. No evaluation has been conducted yet on the level of preferential loans.

Revenues forgone, - or tax expenditures

In Sweden, the finance ministry calculates the revenue foregone and the probable outcome of the special rules in the tax system, with the reference value being the national reference tax values. Thus, we have a total of tax revenue foregone that could be investigated for statistical purposes.

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[1] In the Swedish budget the appropriations have an equality aspect attached to the funds.

Table 1. Example of tax expenditures in Sweden, 2016-2019

	2016	2017	2018	2019
Reduced Energy Tax Rate for Diesel used in Motor Vehicles	7,97	8,24	8,7	9,2
Energy Tax Exemption for Natural Gas and LPG used as a propellant	0,18	0,19	0,2	0,21
Energy tax relief for biofuels	6,21	7,2	7,98	8,76
Energy-Tax Exemption for electricity used for runway operations	1,3	1,37	1,45	1,53
Energy-Tax Exemption for fuels used for runway operations	0,03	0,03	0,03	0,03
Energy Tax Exemption for Domestic Shipping	0,35	0,37	0,39	0,42
Energy Tax Exemption for Domestic Aviation	0,82	0,86	0,9	0,94
Reduced Energy Tax Rate on Diesel for the Mining Industry	0,25	0,25	0,25	0,26
Energy tax relief for biofuel, peat for heating	5,21	5,47	5,59	5,71
Electricity that is not taxed	-	-	-	-
Reduced energy tax for fuel in power plants	0,2	0,21	0,21	0,21
Reduced Energy Tax Rate on Heating Fuels for Industrial Consumers	0,02	0,02	0,02	0,02
Reduced energy tax for fuels used for heating in industry	0,63	0,63	0,63	0,63
Reduced energy tax for fuels used for heating in agriculture, forestry and aquacultures	0,04	0,04	0,04	0,04
Reduced energy tax on electricity within industry and computer storage	12,28	13,5	14,5	15,34
Reduced energy tax on electricity within agriculture, forestry, and aqua culture	0,51	0,54	0,58	0,61
Energy tax relief on electricity when participating in the CHP within industry	0	0	u	u
Reduced energy tax on electricity use in certain municipalities	0,8	0,65	0,65	0,65
Reduced carbon dioxide tax for diesel fuel in off-road vehicles and shipping within agriculture, forestry and aquaculture	0,82	0,82	0,82	0,69
Carbon tax relief for fuels used in rail	0,02	0,02	0,02	0,02
Carbon tax relief for fuels used in domestic shipping	0,28	0,28	0,29	0,29
Reduced carbon dioxide tax for diesel fuel in mining	0,15	0,15	0,14	0,14
Reduced carbon dioxide tax for district heating to industry	0	0	0	0
Reduced carbon dioxide tax for fuels used for heating within industry outside of the EU ETS	0,26	0,26	u	u
Reduced carbon dioxide tax for fuels used for heating within agriculture, forestry and aquaculture	0,04	0,04	u	u

Source: Ministry of finance, Sweden, 2018

To include it into the SEEA we want to be able to divide these national data that are reported by measure or by total fuel consumption so that it can be seen what industry has used the fuel.

The industry breakdown

For the purposes of this paper no specific explorations into the industry breakdown could be done. It is possible to broadly identify that some taxes and subsidies are for specific industries (e.g. reduced carbon dioxide tax for fuel used in mining), while others cut across multiple industries (e.g. Reduced energy tax on electricity use in certain municipalities).

To explore how allocations to industry could be made more precisely, we explored the fossil fuel data on subsidies that has been provided for Sweden in a report by the Swedish Environmental Conservation Society (Friström, 2018). This report has used the data from the Swedish Finance ministry on tax expenditure (Swedish Government, 2016) and other supporting documents on emission rights on budget allocations to airports. It is estimated that around 30 000 million SEK are spend on fossil fuel enhancing activities each year. This is mostly tax revenue foregone and the majority of the tax expenditure concern fuels used in transportation.

Since the energy accounts in Sweden can separate the fuels used for transportation by industry, the subsidies should be possible to allocate by industry. What is household owned cars or industry owned vehicles and how far they travel should be possible to get from the car registration register. Subsidies to air travel can be allocated to air travels. Estimates of what is industry travel and leisure travel are available.

The Swedish report also goes on to suggest changes in the tax system and these discussions are of interest to know what level of detail would be of interest to publish if this is to become statistics. Tax exemption to air travels are governed by international conventions and EU law. Therefore, the need to reform the international rules is being stressed.

The difference in taxation between diesel and petrol is largest type of subsidy in the calculation. The recommendation in the report is to raise the tax on diesel to match the tax on petrol.

The tax differences on energy and carbon dioxide taxes for industry, including heat power, mining industry, shipping and agriculture are noted. For agriculture and fishing industry, the energy costs are rather large parts of the production costs and there some type of compensation is recommended in order to be able to reform the transfers.

The tax exemption for work travel with cars have long been debated and it is recommended to reform it so that it is neutral to type of vehicle and is dependent on the distance. Such neutral systems are in place in for example Norway.

Case study: New Zeeland

The discussion below focuses on the types of support identified in New Zealand by Statistics NZ's environmental-economic accounts and national accounts teams. These have been categorised and noted where they are clearly identifiable in the national accounts or where additional information would be needed:

Fossil fuel transactions observable in the national accounts

Subsidies

A biodiesel production subsidy ran from 2009-2012
A coal research subsidy that had run for some years was also phased out in 2012.
Energy and minerals research. This subsidy exists in the period 2011-2017.
Other subsidies with possible relevance are Research and development subsidies and subsidies for High value manufacturing and services. Industries involved in mineral extraction or exploration or petroleum and coal product manufacturing may successfully apply along with other sectors of the economy[2].
Other subsidies may reduce the operating costs of industries that have a higher emissions profile as identified by the air emissions account. For example, employment subsidies paid to industries with a high reliance on fossil fuels. Probably out of scope but worth bearing in mind.

Note: all subsidies recorded by the national accounts are other subsidies on production, there are no subsidies on products received by units in New Zealand.

Tax credits

The NZ transport agency issues refunds of fuel excise duty on some classes of vehicle/activities. These amount to nearly 5 percent of total fuel excise in the published 2014-16 years.
Road user charges contribute to the upkeep of roads. Some users can apply for refunds, between 1999 and 2005 these refunds averaged around 5 percent of total road user charges.

[2] From 2017 the previous categories of non-industry specific subsidies (biological, energy and minerals, high value manufacturing) are being phased out and replaced with a "partnered/contestible" research fund. In principle, industries involved in mining, exploring, manufacturing of such fuels would be eligible to apply

Transactions not directly observable in the national accounts

Tax exemptions

Anyone using New Zealand's roads contributes towards their upkeep. Most road users pay levies when they buy fuel. Others, such as drivers of light diesel vehicles and heavy vehicles like trucks, pay through **road user charges (RUC)**. Light electric vehicles are exempt until 2021, and heavy electric vehicles until they make up 2 per cent of the heavy vehicle fleet[1i]. Vehicles unsuitable for regular road use are also exempt, in practice this means vehicles used off-road in Agriculture, forestry and tourism are exempt. The industrial survey (AES) does not collect information on companies (income) tax exemptions so it would be difficult to quantify these values.

Both fuel excise duties and road user charges are recorded as taxes (energy and transport respectively) in Statistics NZ's environmental tax account.[3]

Other tax exemptions

Emissions trading units: Certain sectors of the economy must calculate their emissions and submit a return to the environmental protection agency (EPA). They must then acquire and surrender New Zealand Units (NZUs) or other eligible emission units to account for their direct greenhouse gas emissions or the emissions associated with their products. An emission unit can either represent one metric tonne of carbon dioxide, or the equivalent of any other greenhouse gas. Industries obliged to participate in the scheme are those engaged in activities involving; industrial processes, liquid fossil fuels, stationary energy, waste, horticulture, primary industries and synthetic greenhouse gases. However, businesses termed as emissions intensive and trade exposed are allocated units without cost. In practice this is most large emitters who are unable to pass costs onto consumers[4].

Source: ETS annual report 2016,

About allocations, Industrial allocation: NZUs for industry

[3] www.stats.govt.nz/reports/environmental-economic-accounts-2018

[4] In practice the government isn't charging for almost all the credits issued, with well under $1m being received by the government over the last few years.

Asia-Pacific Economic Cooperation: Peer Review on Fossil Fuel Subsidy Reforms in New Zealand (2015)
Link

New Zealand was the second of several volunteer member economies that are expected to participate in the Fossil Fuel Subsidy Reform Peer Review process. The report discussed eight different policy instruments that were considered relevant for evaluation by the APEC Review Panel for New Zealand (APRNZ):

1. Non-resident off-shore drilling rig and seismic ship tax exemption: No New Zealand companies own off-shore rigs or seismic vessels, so any company wishing to explore in New Zealand waters needs to use a rig or seismic vessel provided by a non-resident owner. In 2005, the Government provided a temporary five-year exemption for non-resident off-shore drilling rig and seismic ship operators from paying tax on their profits, which was subsequently extended through to 2014. Cabinet subsequently agreed to further extend this exemption through 2019. The tax exemption was introduced to address an issue created by New Zealand's Double Taxation Agreements (DTA), under which such operators are only taxable in New Zealand if they are present in territorial waters for at least 183 days.

Discussion: This transaction would not be directly observable in the national accounts. The working industry group these units would be code to would either be BB112 Oil and gas extraction or BB114 Exploration and other mining support services. However, the industrial survey (AES) does not collect information on companies (income) tax exemptions so it would be difficult to quantify these values.

This exemption appears in the Treasury's Tax expenditure statement and they have indicated (pers comm) that they may be able to provide figures for revenue forgone in relation to this tax.

2. Tax deductions for petroleum-mining expenditures: New Zealand has a number of provisions for the tax treatment of petroleum exploration and development expenditures, which are meant to provide an attractive investment environment for the petroleum industry in New Zealand. These measures are in accordance with the principles of general taxation governing the New Zealand tax system. Three such provisions were reviewed by the APRNZ:

• The immediate deductibility of an exploration expenditure in the year in which it is incurred;

• The ability for producers to amortize a development expenditure from the date it is incurred; and • The option for development expenditures to be either deducted in a straight line over seven years, or in line with a field's production profile. Allowing the immediate

deduction of exploration expenditures considers the specific characteristics.

Discussion: This transaction would not be directly observable in the national accounts. The working industry group these units would be code to would either be BB112 Oil and gas extraction or BB114 Exploration and other mining support services. However, the industrial survey (AES) does not collect information on companies (income) tax exemptions so it would be difficult to quantify these values.

This exemption appears in the Treasury's Tax expenditure statement and they have indicated (pers comm) that they may be able to provide figures for revenue forgone in relation to this tax.

3. Temporary reduction in royalty rates: A temporary reduction of the royalty rate for natural gas discoveries made between 2004 and the end of 2009. This measure terminated at the end of its effective period.

Discussion: The effect at the total level would be visible in the institutional sector accounts in rent on natural assets. There were declines in 2004 and 2005 but greater decreases after 2009. In New Zealand the data for these figures comes from the Crown's financial and information system so we would need to differentiate between rent paid for fossil fuels and other minerals or other assets.

4. R&D funding for the oil industry: The funded program acquires seismic and technical data on New Zealand frontier basins and makes these data available without cost to the public. Discussion: These transactions are available from the national accounts and recorded as other subsidies on production as shown above. It's worth noting that they may be received by Crown research institutes or universities rather than the mining industry.

5. Financial restructuring of Solid Energy: A state-owned enterprise, which develops and supplies coal in New Zealand and internationally, has under-gone a financial restructuring due to a drastic decline in world coal prices. In September 2013, Solid Energy underwent a financial restructure that gave the company NZD100 million in balance sheet equity and access to liquidity facilities.

Discussion: Due to principles of confidentiality this form of financial assistance would not be directly observable in the accounts. However, this information would generally be in the public domain and the effect of the restructure would be likely to be observable in the production accounts.

6. Indemnity for mining land reclamation: An indemnity was provided to Solid Energy for the company's costs for environmental remediation. In September 2014, following further deterioration in coal prices and no near-term improvement forecast, the Crown

provided an indemnity to Solid Energy for the company's cost for environmental remediation. Solid Energy is required to remediate the environmental damage caused by its mining operations and carries a liability on its balance sheet that reflects outstanding land remediation. The indemnity covers remediation costs up to a Net Present Value of NZD 103 million (USD 85.83 million), with forecast costs of NZD 6 million (USD 5 million), and NZD 11 million (USD 9.17 million) in FY2015 and FY2016 respectively (The Treasury, 2014). There is no overall impact on the Crown's fiscal position because the indemnity simply transfers a liability from an entity that is 100% owned by the Crown to the Crown itself. No change is proposed to the requirements or timing of the remediation work program which has been agreed between the company and the relevant local authorities. The only difference is that these costs will now be met directly by the Crown.
Discussion: See comment 5 above.

7. Motor spirit excise duty refund: A refund of a motor-spirit excise tax is allowed for eligible off-road vehicles, including off-road agricultural and commercial vehicles and marine transport.

Discussion: This can be identified in the National accounts taxation system – see tax credits above.

8. Funding of international treaty obligations to hold oil stocks: The New Zealand Government is required to hold stocks for 90 days of net imports as part of its IEA treaty obligations.

- This requirement is partially met using emergency ticket contracts for purchasing oil abroad at current market prices. Using tickets allows for variability in domestic production which may potentially increase, levels of import of oil and refined products, and demand which may decrease in response to conservation or energy efficiency measures.
- NZ commercial operators contribute to between half of the requirement to the entire requirement in some years. However, the Government has no obligation for commercial operators to do so; and, there is no effective means of verification or enforcement. Meeting the IEA treaty obligation through ticket purchases appears a less expensive option than holding the stocks physically. Purchase of tickets costs approximately one-tenth of the annualized costs of adding storage and holding physical stocks.14
- Tickets are now financed through higher levies on refined products (NZD 0.110 cents per litre or USD 0.082 per litre). The recent Energy (Fuels, Levies, and References) Amendment Bill expands the purpose of the current Petroleum and Engine Fuels Monitoring Levy to provide a funding mechanism for the Crown's financial obligations under the IEA treaty obligations. This provision was

previously funded through general taxation pending an expected legislative change to funding from a levy on petroleum sales.

Discussion: As the levies for financing tickets are akin to a user fee and raise the price of petroleum products the funding arrangement is unlikely to result in wasteful consumption.

Other funding and support

No other funding or support to industry or households that might encourage wasteful consumption was identified. The Energy Efficiency and Conservation Authority (EECA) offers resources and funding to energy consumers but this is aimed at reducing expenditure and consumption of energy.

4. Discussion and conclusion

In this paper we developed two case studies, for Sweden and New Zealand, to show that identifying information on fossil fuel subsidies using the SEEA framework is possible. In terms of developing an indicator from the available data, some further considerations may be required to ensure it is comprehensive and meaningful, for example:

- A focus on subsidies may miss other forms of assistance to wasteful or harmful consumption, or other forms of assistance (subsidies or otherwise) to other activities that exacerbate climate change. E.g. in New Zealand most emissions come from enteric fermentation, with the resulting methane emissions accounting for over half of NZs emissions profile. However, agriculture is excluded from the Emissions Trading Scheme.

- Retaining the terminology 'subsidies' while taking a broader definition than that used by the national accounts may lead to confusion and potentially reduce comparability between different economies.

- If subsidies, tax credits and tax exemptions are within scope it might also be useful to include information on taxes as supplementary information, particularly for the oil and gas industries, so policy makers can be presented with full information. This is more a question of presentation of data, than of the indicator itself.

The SEEA, as a holistic statistical system, should be able to respond to the data demand of the specific indicator of the SDGs on fossil fuel subsidies, and still retain the function of recording a more complete picture of climate change issues.

By adapting the SEEA table 4.8 to the issues of fossil fuel subsidies, or in extension, fossil fuel transfers, advantages of the national- and environmental accounts can be had.

Table 4.8
Selected payments to and from government and similar transactions

		Payments received by				
		Government	Corporations	Households	NPISH[a]	Rest of the world
Payments made by	Government	Transfers between levels of government	Subsidies and invest-ment grants	Current and capital transfers	Subsidies; current and capital transfers	Current and capital transfers
	Corporations	Taxes, fines, fees, charges and rent	Rent	Rent	Donations	Donations to NPISH in rest of the world
	Households	Taxes, fees, charges and fines			Donations	Donations
	NPISH[a]	Taxes	Current and capital transfers	Current and capital transfers		Current and capital transfers
	Rest of the world	Taxes and current transfers			Donations	

[a] Non-profit institutions serving households.

Source: SEEA CF p. 118 (PDF version)

To progress the development of this indictor, we first want to ask pilot countries to find the taxation rules and the direct transfers to fossil fuels in their country which is information that the tax authorities or the finance ministry can provide.

The second step is to apply those rules on the energy statistics in order to obtain an estimate of the direct and indirect transactions to fossil fuels. For many countries these calculation have already been done according to OECD procedures (OECD, 2018). The direct transfers are reported by IEA. (IEA, 2017).

In the third step we want to divide the national statistics by industry. The fuels that are of interest are the same fuels that are part of the energy accounts. For countries that produce energy accounts, the detailed data that make up the accounts should be possible to use to allocated the direct and indirect transfers by industry.

The fourth step concerns the analysis of the data and the lessons learned in the process. With the pilots it should be possible to develop the fossil fuel subsidy reporting into a more detailed part of the SEEA that can be used for various assessments.

Annex 1: Target 12 C in the SDGs

Target 12.C: Remove market distortions that encourage wasteful consumption

UN definition: "Rationalise 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"

SDG Indicator 12.C.1: Removing fossil fuel subsidies

Definition: Indicator 12.C.1 is the "*amount of fossil-fuel subsidies per unit of GDP (production and consumption) and as a proportion of total national expenditure on fossil fuels*".

Goal: By 2030 "*rationalise inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances*".

Annex 2: Examples of data sources

Table 1. Example of data sources needed (extract from OECD inventory method)

indicator	Indicator of support
PSE	Producer Support Estimate
GSSE	General Services Support Estimate
CSE	Consumer Support Estimate

stage	Stage of support
EXTRACT	Extraction or mining stage
TRANS	Transportation of fossil fuels (e.g., through pipelines) and bulk storage
REFIN	Refining or processing stage
GENER	Use of fossil fuels in electricity generation
INDUS	Use of fossil fuels in the industrial sector
END	Other end uses of fossil fuels (e.g. transport and residential sectors)

fuel_cat	Fuel category concerned by the program	Group	
Coal Mining	All coals	Coal	Coal Mining
HARDCOAL	Hard Coal	Coal	Coal Mining
BROWN	Brown Coal	Coal	Coal Mining
ANTCOAL	Anthracite	Coal	Coal Mining
COKCOAL	Coking Coal	Coal	Coal Mining
BITCOAL	Other Bituminous Coal	Coal	Coal Mining
SUBCOAL	Sub-bituminous Coal	Coal	Coal Mining
LIGNITE	Lignite	Coal	Coal Mining
OILSHALE	Oil Shale	Coal	Coal Mining
PEAT	Peat	Coal	Coal Mining
PATFUEL	Patent Fuel	Coal	
OVENCOKE	Coke Oven Coke and Lignite Coke	Coal	
GASCOKE	Gas Coke	Coal	
COALTAR	Coal Tar	Coal	
BKB	BKB/Peat Briquettes	Coal	
CRNGFEED	Crude/NGL/Feedstocks	Oil & Gas	Crude
CRUDEOIL	Crude Oil	Oil & Gas	Crude
NGL	Natural Gas Liquids	Oil & Gas	Crude
REFFEEDS	Refinery Feedstocks	Oil & Gas	
ADDITIVE	Additives/Blending Components	Oil & Gas	
NONCRUDE	Other Hydrocarbons (oil sands etc.)	Oil & Gas	Crude
REFINGAS	Refinery Gas	Oil & Gas	
ETHANE	Ethane	Oil & Gas	
LPG	Liquefied Petroleum Gases	Oil & Gas	

NONBIOGASO	Motor gasoline excl. biofuels	Oil & Gas	
AVGAS	Aviation Gasoline	Oil & Gas	
JETGAS	Gasoline-type Jet Fuel	Oil & Gas	
NONBIOJETK	Kerosene type jet fuel excl. biofuels	Oil & Gas	
OTHKERO	Other kerosene	Oil & Gas	
NONBIODIES	Gas/diesel oil excl. biofuels	Oil & Gas	
RESFUEL	Fuel oil	Oil & Gas	
NAPHTHA	Naphtha	Oil & Gas	
WHITESP	White Spirit & SBP	Oil & Gas	
LUBRIC	Lubricants	Oil & Gas	
BITUMEN	Bitumen	Oil & Gas	
PARWAX	Paraffin Waxes	Oil & Gas	
PETCOKE	Petroleum Coke	Oil & Gas	
ONONSPEC	Other oil products	Oil & Gas	
NATGAS	Natural Gas	Oil & Gas	Crude
GASWKSGS	Gas Works Gas	Oil & Gas	
COKEOVGS	Coke Oven Gas	Oil & Gas	
BLFURGS	Blast Furnace Gas	Oil & Gas	

level	**Level of support**
central	Central level
federal	Federal level
sub	Sub level (e.g. states, provinces, regions, etc.)
both	Both central/federal and sub-national level

method	**Method**
RF	Revenue Foregone
XXX	Please indicate otherwise

units	**Units**
XXX	Indicates the units in which the annual estimates are expressed (normally local currency).

comments	**Comments**
XXX	Contains (technical) comments meant for users (for public use).

sources	**Sources**
XXX	Indicates the sources used to compile the annual estimates for each measure.

Page	**Page**
XXX	Page number on which the latest budgetary figures were found.

ID	ID
XXX	Unique identifier of the measure (if used by the country).

native_name	Native name of the program
XXX	How the measure is defined or identified in the native language of the country

description	Description of the program
XXX	Long description of the measure. For use in official documents. Must be in HTML format and ending with a line break <b/> with no trailing spaces.

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