

Introduction

The following document provides background information on taxes on energy use and greenhouse gases in the 71 countries covered in the Taxing Energy Use and Effective Carbon Rates [database](#) that is the basis for the report titled *[Pricing Greenhouse Gas Emissions: Turning climate targets into climate action](#)*, OECD publishing, Paris, 2022. The document also summarises country-specific assumptions made for the construction of the database. The general methodology behind the database is discussed in [Chapter 1](#) of the report. Country-specific results are summarised in the online [country notes](#).

Argentina

Taxes on energy use and greenhouse gases

As at 1 April 2021, the main taxes on energy use and greenhouse gases in Argentina, were the following:

- A Tax on Liquid Fuels and on Carbon Dioxide (*Impuesto sobre los Combustibles Líquidos y al dióxido de carbono*), which contains a carbon tax component for certain fuels;
 - The Tax on Liquid Fuels and Carbon Dioxide applies to liquid fuels, including gasoline, diesel, kerosene and fuel oil, and to solid fuels, including petroleum coke and coal, but not to natural gas:
 - The Tax on Liquid Fuels is expressed at a uniform rate of ARS 19.486 per litre on gasoline and naphtha-related fuels, and at a uniform rate of ARS 12.826 per litre on diesel and kerosene;
 - The executive branch may increase the Tax on Liquid Fuels by 25%, or decrease rates by 10%, based on political economy considerations;
 - The Tax on Liquid Fuels and on Carbon Dioxide is indexed to the Consumer Price Index (CPI);
 - Jet kerosene and aviation gasoline used for domestic aviation are taxed as regular kerosene and gasoline; aviation fuels are not subject to the Tax on Liquid Fuels when used for international flights;
 - The Carbon Tax, with a nominal rate of ARS 518.7/tCO₂e (EUR4.76/tCO₂e as at 1 April 2021), applies to the fuels subject to the Tax on Liquid Fuels and on Carbon Dioxide, as well as to fuel oil, petroleum coke and mineral coal, but not to natural gas;
 - The executive branch may increase the Carbon Tax by 25% based on environmental or energy considerations;
- A uniform Surcharge on Natural Gas (*Recargo al Gas Natural*), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to natural gas use at a rate of 4.46% of the price of natural gas charged at the point of entry into the distribution system;
- A Tax on Electricity (*Impuesto a la Energía Eléctrica*), classified as an electricity excise tax according to the Taxing Energy Use (TEU) methodology, applies to electricity consumption at a uniform rate of ARS 0.00547 per KWh.

Argentina does not operate an emission trading system for greenhouse gas emissions.

The national government is in the process of implementing the Plan to Promote Argentinian Natural Gas Production – Supply and Demand Scheme 2020-2024 (*Plan de Promoción de la Producción del Gas Natural Argentino – Esquema de Oferta y Demanda 2020-2024*). It is unclear how consumer prices on natural gas will be affected in the short-term, but the government have proposed a “normalisation period” for consumers, to minimise price fluctuations.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- Based on domestic sources (Coordination Unit for Infrastructure Trusts (UCOFIN)), it is assumed that unleaded gasoline with more than 92 octanes (*naftas super* and *ultra*) represents close to 100% of total gasoline use, hence only its corresponding rate is included in the database;
- All fuels used for energy transformation purposes other than electricity generation and heating (e.g. coking coal to coke) are untaxed;
- Fishing fuels are not subject to the Tax on Liquid Fuels, nor to the Carbon Tax;
- The energy product coke oven coke is subject to the Carbon Tax applicable to coal products;

- Due to the extension of Argentina's Tariff Emergency (*Emergencia Tarifaria*), it is assumed that the weighted average price of natural gas has remained at 2.4 USD/MMBTU since October 2019. For modelling purposes, the ad valorem rate was transformed into an ad quantum rate of ARS 0.2716¹ per cubic metre of natural gas.
- Due to data constraints, the following tax exemptions and reductions are not included in the database:
 - The tax exemption applied to liquid fuels used in Southern Argentina;
 - The differential tax rates on energy use benefiting the cities of Posadas and Clorinda.

¹ Using OECD 2020 period average exchange rate

Australia

Taxes on energy use and greenhouse gases

As at 1 April 2021, the main taxes on energy use and greenhouse gas emissions in Australia are the following:

- The Excise Duty applies to gasoline and diesel, kerosene, fuel oil and other liquid petroleum-based products, propellant use of LNG and CNG, denatured ethanol (bio-gasoline) and biodiesel.
 - The Fuel Tax Credit (FTC), classified as a credit on fuel excise taxes according to the Taxing Energy Use (TEU) methodology, is equivalent to the full excise duty paid and available to eligible businesses for gasoline, diesel, LPG, heating oil, fuel oil, LNG and CNG used for business purposes.² FTCs also apply to gasoline and diesel consumed by heavy vehicles but are not available where they relate to the use of light vehicles on public roads.
- The Road User Charge (RUC), classified as a fuel excise tax according to the TEU methodology, applies to gasoline and diesel consumed by heavy vehicles travelling on public roads.

Australia does not levy an electricity excise tax, or a fuel-based carbon tax and does not tax greenhouse gas emissions directly.

Australia does not operate an emissions trading system for greenhouse gas emissions.

Excise rates on fuels and petroleum products (excl. aircraft fuels) are adjusted twice a year in line with the consumer price index (CPI).

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- In the off-road sector, fossil fuels' use outside of aviation benefits from the FTC, and hence appear as untaxed in TEU.³ Aviation fuels (jet kerosene and aviation gasoline) are taxed when used for domestic aviation.⁴
- All fuels used for electricity generation benefit from a full FTC.
- In the agriculture and fishing sectors, all fossil fuels benefit from the full FTC, and are thereby untaxed.

² In line with previous vintages of TEU, it is assumed that all eligible entities have claimed and received these refunds. Notice that in TEU a full refund is treated as untaxed energy use.

³ This inter alia applies to business use of fuel by a shipping operator transporting domestic cargo between Australian ports. Resident shipping operators are eligible to claim fuel tax credits for fuel used in voyages within Australian territorial waters, when transporting domestic cargo between Australian ports. When using resident shipping agents, non-resident shipping operators must claim their fuel tax credits through the resident agent. Alternatively, where a shipping agent has not been engaged to supply the fuel, the non-resident shipping operators must be registered (for GST and to receive fuel tax credits) to claim the fuel tax credits on the fuel acquired.

⁴ Fuel tax credits cannot be claimed for aviation fuels, although petroleum or diesel used in an aircraft for business use may be eligible for fuel tax credits. Excise is not payable on fuel used for international travel.

- It is assumed that in the road sector, only non-heavy (“light”) vehicles consume gasoline, and heavy vehicles (“rigid trucks” and “articulated trucks”) represent 46% of total diesel consumption.⁵

⁵ <https://www.abs.gov.au/statistics/industry/tourism-and-transport/survey-motor-vehicle-use-australia/latest-release>

Austria

Taxes on energy use and greenhouse gases

As at 1 April 2021, the main taxes on energy use (*Energieabgaben*) in Austria are the following:

- A Mineral oil tax (*Mineralölsteuer*) applies to petrol, medium heavy oils (e.g. kerosene), gasoil, gaseous hydrocarbons (excl. natural gas), fuel oil and LPG. Excise tax rates vary by lead content, by biogenic substances content and by sulphur content. This tax is classified as “fuel excise tax” according to the Taxing Energy Use (TEU) methodology.
- Energy taxes (*Energieabgaben*) apply to:
 - natural gas (*Erdgasabgabe*) and solid fossil fuels (*Kohleabgabe*), classified as “fuel excise tax” according to TEU methodology.
 - electricity (*Elektrizitätsabgabe*), classified as “electricity excise tax”.

Energy taxes in Austria are levied within the framework of the 2003 EU Energy Tax Directive, which sets minimum rates for the taxation of energy products in member states.

Austria does not yet levy a fuel-based carbon tax (however, the recent eco-social tax reform includes a carbon tax for 2022) and does not tax greenhouse gas emissions directly.

Austria participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- The rate applied to gasoline for automotive purpose is that of fuels with *a lead content does not exceed 0,013 g per litre, a biofuel content of not less than 46 l and a sulphur content not exceeding 10 mg/kg*.
- The rate applied to diesel for automotive purpose is that of fuels with *a biofuel content of not less than 66 l and a sulphur content not exceeding 10 mg/kg*.
- The rate applied to diesel used in residential, industrial and commercial sector (for heating, for stationary combustion engines, for ships and for CHP plants) is that of fuels *labelled, with a maximum sulfur content of 10 mg*. Labelled gas oil is at a reduced rate of 98 EUR per 1000 L, dedicated to heating, propulsion of systems and ship fuel. All diesel consumed in the industry and the residential and commercial sectors is assumed to be *labelled* and hence benefits from a reduced rate or partial refund.
- The rate applied for fuel oil not used for heating is that of fuel *with a biofuel content of not less than 66 litres and a sulphur content not exceeding 10 mg/kg*.
- In the off-road sector, railway fuels (diesel) are taxed at the same rates as in road transport.
- Natural gas used for production, transport and storage is exempt from tax.
- Mineral oil used in commercial aviation and navigation on the Danube, Lake Constance and Lake Neusiedl are tax exempt. Fuels used in private pleasure craft and private planes are taxed (not modelled in TEU due to a lack of consumption data).
- Diesel, LPG and natural gas used in the agriculture sector are assumed to be used half for heating and stationary motors and half as propellant.
- Pure biofuels are exempted. Most use of biodiesel and bioethanol takes place as blends with their fossil fuel equivalents. In this case, biofuels are taxed at the same rate as their fossil fuel equivalents at a reduced rate.
- Biogases⁶ are exempted.

⁶ Biogases in the IEA energy balances are principally gases arising from the anaerobic fermentation of biomass and the gasification of solid biomass (including biomass in wastes).

- Non-renewable wastes are exempted.
- In the industry sector, energy products used in transformation processes (other than heating) are not taxed.
- Charcoal, coal and coke-related gases and refinery gas (used in combined heat and power plants) are not taxed.
- The fuels used to generate electricity are not taxed⁷. Electricity from industrial cogeneration is in principle subject to the general electricity tax (called “electricity excise tax” in TEU):
 - A tax exemption applies to electricity generators for self-produced and consumed energy up to an exemption limit of 5,000 kWh per year, which reaches 25,000 kWh per year if the electricity is self-produced and consumed from renewable sources. Self-produced and consumed electricity from photovoltaic sources are tax-free without a specific limit. It is assumed all self-generated electricity that is self-consumed is tax-exempt.
 - A tax exemption applies to electricity from renewable sources if the electricity is self-produced and consumed by railway companies for operating the rail transport.
 - A tax rebate applies to electricity consumed by railway companies for operating the rail transport.

Due to data constraints, the following refunds or tax exemptions are not included in the Taxing Energy Use (TEU) database:

- For the energy intensive manufacturing sector the paid taxes on electricity, gas, solid fossil fuels, mineral oil and liquid gas are partly refunded (not modelled in TEU due to data constraints). The paid taxes are refunded insofar as their sum exceeds 0.5% of the net production value and/or the minimum tax rates of the EU Energy Tax Directive are met. The refund occurs upon application.

⁷ Full tax refunds apply to solid fuels and natural gas used for electricity generation

Bangladesh

Taxes on energy use and greenhouse gases

As at 1 July 2018 and 1 April 2021, no excise tax on energy products was identified.

Bangladesh does not collect carbon taxes or taxes on other greenhouse gases emissions.

Bangladesh does not have a CO₂ emissions trading system.

The VAT standard rate of 15% applies to fuel and electricity, with a reduced rate of 5% for LPG. VAT rate are not included in the calculation of effective tax rates on energy use and greenhouse gases.

Energy use subsidies

Petroleum and electricity prices are set by the government.

The following subsidies on energy use were identified to be in operation in 2018 and 2020:

- Direct budget transfers are done to the Bangladesh Power Development Board (BPDB), the state-owned electric utility, to compensate the prices set below the cost. This subsidy amounted to BDT 431 601 200 000 for 2017/2018, BDT 79 667 300 000 for 2018/2019, BDT 117 779 100 000 for 2019/2020 and BDT 111 853 500 000 for 2020/2021 according to the annual reports of the BPDB⁸. Other kind of subsidies such as equity injections or loans by the government are not taken into account for the time being.
- The state-owned company Petrobangla also benefit from government subsidies in order to cover the cost of LNG operations⁹. They amounted up to BDT 25 million for 2018/2019 and BDT 35 billion for 2019/2020 according to Petrobangla annual reports¹⁰. No subsidy is reported for 2017/2018.

Other subsidies seem to occur according to literature but are not taken into account in TEU due to lack of data¹¹:

- Subsidies corresponding to the price discount for bituminous coal sold for electricity generation;
- Subsidies corresponding to natural gas price lower than the cost, for all consumers.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- Government subsidies for BPDB have been averaged between the fiscal years to have an estimate from 1 January to 31 December in 2018 and 2020. Then the total amounts have been allocated across all electricity consumption.
- Similarly, government subsidies to Petrobangla have been averaged for 2018 and for 2020 the figure for 2019/2020 has been taken as the 2021 report has not been published yet. Amounts have then been allocated across all natural gas consumption, including quantity used for electricity generation.

⁸ [বাংলাদেশ বিদ্যুৎ উন্নয়ন বোর্ড](#)

⁹ [When subsidies go beyond budget, direct cash transfer can be an option \(tbsnews.net\)](#)

¹⁰ [- - Bangladesh Oil, Gas & Mineral Corporation \(Petrobangla\)-](#)

¹¹ [Layout 1 \(iisd.org\)](#)

Belgium

Taxes on energy use and greenhouse gases

As at 1 April 2021, the main taxes on energy use in Belgium are the following:

- The Excise Tax (*droit d'accise*) applies to gasoline, kerosene, gasoil, heavy fuel oil, LPG, natural gas, coal, coke and lignite and electricity. An Inspection Fee (*redevance de contrôle*) of EUR 10 per 1000 litres additionally applies to diesel consumed for heating purposes. Natural gas, coal, coke and lignite and electricity benefit from an exemption from the excise tax, meaning for these fuels the effective tax rates resulting from the excise tax is zero.
- The Special Excise Tax (*droit d'accise special*) additionally applies to the fuels listed above. Natural gas and electricity benefit from an exemption from the special excise tax, meaning the effective tax rate resulting from this tax is zero.
- The Energy Contribution (*cotisation sur l'énergie*) also applies to the fuels listed above¹². It is classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, unless for electricity when it is classified as an electricity excise tax.
- The stockholding fee (*contribution APETRA*), classified as a fuel excise tax according to TEU methodology, even if not considered as a fuel excise domestically, is levied on oil product sales by the national petroleum agency to finance stock regulation.

Energy taxes in Belgium are levied within the framework of the 2003 EU Energy Tax Directive, which sets minimum rates for the taxation of energy products in member states.

Belgium does not levy a fuel-based carbon tax nor direct tax on GHG emissions.

Belgium participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- The rate applied to gasoline for automotive purpose is that of light oil with a lead content does not exceed 0,013 g per and a low sulphur content;¹³
- The rate applied to gas oil is that of gas oil with a sulphur content equal of inferior to 10 mg/kg;
- The rate applied to LPG used for heating is assumed to be that of butane;
- Gas oil benefits from a refund of EUR 247.6158 when consumed for professional transport of merchandise or people. It is assumed this professional gasoil represents 40%5% of the total road gasoil consumption;

¹² Natural gas and electricity consumption are additionally subject to a Federal Contribution (cotisation fédérale). In line with previous vintages of Taxing Energy Use, this surcharge is not included in TEU.

¹³ The Excise tax rates, the Special excise tax rates and the Energy contribution rates differ by lead content and by sulphur content.

- It is assumed electricity supplied to an end-user connected to the network with a rated voltage > 1 kV, which is taxed at a zero rate, only concerns the industry sector. Non-industry sectors are assumed to be connected to the network with a rated voltage < 1kV;
- Natural gas consumed by firms covered by an “accord de branche” benefit from a lower statutory tax rate on the Energy Contribution compared to other firms. It is assumed the “accord de branche” covers 60% of the industry sector;
- Biogases are assumed to be taxed as natural gas;
- Biofuels are taxed at the same statutory rate as regular fossil fuels in the road sector;
- Waste, solid biofuels (wood products) and other renewables (hydro, solar photovoltaic, wind), as well as nuclear are in practice not taxed as inputs to electricity generation;
- It is assumed that the stockholding fee (*contribution APETRA*) is levied on all oil uses, including for electricity generation or for rail, unlike other excise taxes.

Main tax exemptions:

- All energy products and electricity used for electrolytic processes, chemical reduction, metallurgical processes and mineralogical processes are exempted ;
- All energy products and electricity, except heavy fuel oil, coals, cokes and lignite, used for electricity generation are exempted;
- Energy products for commercial aviation and navigation are exempted, also from the stockpiling fee;
- Fuels and electricity are not taxed when used in combined heat and power (CHP) plants;
- Gasoil, kerosene and electricity used for rail transport are exempted ;
- Electricity and fuels, except gasoline, used for agriculture and fishing are exempted ;
- Coal, coke and lignite consumed by households is exempted;
- Natural gas and LPG used as propellant are exempted.

Due to data constraints, the following tax or exemptions are not modelled:

- Tax on aviation and navigation fuel when non-commercial use;
- Tax exemption on natural gas and electricity use by low-income households.

Other instruments that were considered but are not modelled as taxes in TEU:

- The Federal gas fee (*cotisation fédérale “gaz”*) and Federal electricity fee (*cotisation fédérale “électricité”*) levied by CREG (commission for electricity and gas regulation) are considered as out of scope of Taxing Energy Use and registered separately as network charges at the standard rate (tax rates for industry are not modelled: Industry consumption beyond 20 GWh/year is taxed at 85% of the rate in the 20- 50 GWh band; 80% of the rate in the 50-250 GWh band; 75% of the rate in the 250-1 000 GWh band, and 55% of the rate thereafter).
- The BOFAS fee (*Fonds d’assainissement des sols des stations-service*) on automotive diesel and gasoline which is equal to zero since 2018;
- The Social heating fund fee (*Fond social chauffage*), levied on heating gasoil and fuel.

Brazil

Taxes on energy use and greenhouse gases

As at 1 April 2021, the main taxes on energy use in Brazil, were the following:

- The CIDE-fuels (*Contribuição de intervenção no domínio econômico incidente sobre as operações realizadas com combustíveis*) tax, classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to liquid fuels, including ethanol, and natural gas in principle. In practice, the CIDE tax on liquid fuels currently only applies to gasoline.
- The CDE (*Conta de Desenvolvimento Energético*) tax, classified as an electricity excise tax according to the Taxing Energy Use (TEU) methodology, applies to electricity consumption, and the rate differs by region and by voltage level.¹⁴

Brazil does not levy a fuel-based carbon tax and does not tax greenhouse gas emissions. Brazil does not operate an emission trading system for greenhouse gas emissions.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- Weighted average CDE rates are calculated based on the assumed electricity market shares by region,¹⁵ and on the assumption that the high-level voltage rates apply to the industry sector, the low-level voltage rates apply to household consumption, and the medium-level voltage rates apply to all other economic sectors. Hence, the CDE rate applied to the industry sector is BRL 35.90 per MWh, to the residential sector is BRL 49.17 per MWh, and to all other sectors is BRL 43.77 per MWh.
- Some other taxes in Brazil feature specific regimes for energy products, but are not included in the TEU database. For example, the Brazilian social security contributions (PIS/COFINS) are paid by companies on sales revenues, and most petroleum products are subject to a special PIS and COFINS regime. In addition, the Imposto Sobre Operações Relativas à Circulação de Mercadorias e Serviços de Transporte Interestadual de Intermunicipal e de Comunicações (ICMS), a tax on sales and services, applies to the movement of goods, transportation, communication services and other general supplying of goods. Due to the difficulty of assessing and comparing the impact of these differential rates on the prices of energy products, in particular when the differential rates also apply to other goods and services, these taxes are not included into the TEU database.
- Brazil has implemented RenovaBio, the National Biofuels Policy, through Law No. 13,576/2017. It aims to promote production and use of biofuels in the transportation sector. Biofuel producers receive decarbonisation credits and fuel distributors are obliged to buy such credits according to individual targets. This system is not covered in TEU.

¹⁴ The Agência Nacional de Energia Elétrica (ANEEL) updated the CDE after a public consultation that was concluded at the end of April 2021.

¹⁵ Based on 2015 data, it is assumed the N/NE and the S/SE/CO represent 21.5% and 78.5% of the electricity market, respectively.

Burkina Faso

Taxes on energy use and greenhouse gases

As at 1 April 2021, the main taxes on energy use in Burkina Faso are the following:

- An excise tax on petroleum products (Taxe sur les Produits Pétroliers - TPP), classified as fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies super gasoline and diesel at a rate of 125 and 50 XOF per litre respectively.¹⁶

Burkina Faso does not levy carbon taxes or taxes on other greenhouse gases emissions and does not operate an emissions trading system (ETS).

Energy use subsidies

The prices of liquid and gaseous fuels in Burkina Faso are regulated monthly by the state via the interministerial committee CIDPH (Comité Interministériel de Détermination des Prix des Hydrocarbure).

The following subsidies on energy use were identified to be in operation in 2018 and 2020:

- Electricity subsidies compensate the national electricity company SONABEL for regulated, low tariffs that do not recover generation costs but also for the provision of fuel oil for generation.¹⁷ The amount of the subsidies reached 51 billion XOF in 2018 and 98.1 billion XOF in 2020 according to data from the Institut National de la Statistique et de la Démographie (INSD), “Bulletin trimestriel de conjuncture”. The same source cites that subsidies on petroleum products have zero effect on public finances.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- Gasoline and diesel are assumed untaxed outside the road transport sector but no consumption is reported in the IEA energy balances.
- The 2021 TPP rates are assumed to have remained the same since 2018.
- All gasoline is assumed to be of type super. The share of plain gasoline is no more than 2% according to data from the INSD.
- Diesel is not taxed when used for electricity generation.¹⁸ LPG, kerosene and fuel oil are untaxed.
- Charcoal and biomass are untaxed.
- Import tariffs on petroleum products and VAT are outside of TEU scope.
- Electricity consumption is untaxed according to TEU methodology. VAT of 10% applies to electricity bills above 5000 XOF and there is a fixed amount of audiovisual tax collected with each bill.
- The whole amount of electricity related subsidies identified by INSD is assumed to correspond to compensation (low tariff) subsidies and fuel for generation subsidies at a share of 50% respectively. The fuel generation amount is allocated to fuel oil, the main fossil fuel consumed for electricity generation in main electricity plants.

¹⁶ https://www.wto.org/french/tratop_f/tpr_f/s362-02_f.pdf and validated against OECD revenue statistics 2018

¹⁷ Section 3.2 https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Burkina_Faso_AR- Energy Sector Budget Support Programme_PASE .pdf

¹⁸ https://www.finances.gov.bf/fileadmin/user_upload/storage/RAPPORT_D_EVALUATION_DES_DEPENSES_FISCALES_2020_BURKINA_FASO.pdf

Canada

Taxes on energy use and greenhouse gases

As at 1 April 2021, the main taxes on energy use and greenhouse gases in Canada were the following:

Taxes on Fuels

- At the subnational level, specific fuel taxes, classified as fuel excise taxes in Taxing Energy Use (TEU), may be imposed by provinces and territories on gasoline, diesel and typically on LPG, aviation and other liquid fossil fuels.¹⁹
- At the federal level, a fuel excise tax at the rate of CAD 0.10 per litre and CAD 0.04 per litre applies to gasoline and (taxable) diesel use, respectively.
 - In the off-road sector, diesel (including fuel oil and aviation fuel (kerosene)) and gasoline are taxed at the federal level, unless the fuels are used in international transport. Natural gas is untaxed at the federal level.
 - Diesel is not subject to federal excise taxes when used for heating or in power plants. The fuels used to generate electricity are generally not taxed

Carbon Pricing

- A number of provinces and territories (subnational jurisdictions) have carbon pricing systems in place, including a carbon tax in British Columbia and a cap-and-trade system in Québec, classified as a emissions trading system (ETS) in TEU.
- Provinces and territories that do not have their own carbon pricing system are subject to the federal carbon pricing backstop system. The federal backstop system, which first applied in 2019 under the authority of the *Greenhouse Gas Pollution Pricing Act*, is composed of a regulatory charge on fossil fuels and an output-based pricing system (OBPS) for large industrial facilities. The backstop applies either in whole or in part in provinces and territories that requested it and in provinces and territories that did not enact carbon pricing systems which meet the federal benchmark. The Supreme Court upheld the constitutionality of the Act in 2021. The regulatory charge component of the federal backstop is classified as a carbon tax according to the Taxing Energy Use (TEU) methodology. The OBPS is classified as an ETS in TEU.

¹⁹ <https://www.nrcan.gc.ca/our-natural-resources/domestic-and-international-markets/transportation-fuel-prices/fuel-consumption-taxes-canada/18885#shr-pg0>.

Multiple ETS' and carbon taxes/levies for greenhouse gas emissions exist in Canada. The following table summarises the subnational carbon taxes and ETS' in place in place in Canada in 2021.²⁰

State	Carbon Tax	1 April 2021 Nominal Carbon Tax Rate in CAD/tCO _{2e}	ETS
Alberta	<input checked="" type="checkbox"/>	40	<input checked="" type="checkbox"/>
British Columbia ²¹	<input checked="" type="checkbox"/>	45	
Manitoba	<input checked="" type="checkbox"/>	40	<input checked="" type="checkbox"/>
New Brunswick	<input checked="" type="checkbox"/>	40	<input checked="" type="checkbox"/>
Newfoundland and Labrador	<input checked="" type="checkbox"/>	30*	<input checked="" type="checkbox"/>
Nova Scotia			<input checked="" type="checkbox"/>
Northwest Territories	<input checked="" type="checkbox"/>	30*	
Nunavut	<input checked="" type="checkbox"/>	40	<input checked="" type="checkbox"/>
Ontario	<input checked="" type="checkbox"/>	40	<input checked="" type="checkbox"/>
Prince Edward Island	<input checked="" type="checkbox"/>	30*	<input checked="" type="checkbox"/>
Quebec			<input checked="" type="checkbox"/>
Saskatchewan ²²	<input checked="" type="checkbox"/>	40	<input checked="" type="checkbox"/>
Yukon	<input checked="" type="checkbox"/>	40	<input checked="" type="checkbox"/>

☒=Federal Backstop Carbon Tax/ETS

* Rate will increase to 40 from 1 July 2021.

Electricity

- No taxation of electricity consumption explicitly at subnational or federal level. Fossil fuels used in electricity generation are subject to subnational and federal carbon pricing systems, as described above.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- Biodiesel and biogasoline consumed in the road sector are taxed at the same statutory rates as their fossil fuel equivalents.
- In the agriculture and fishing sectors, diesel is subject to the same federal excise tax as in road transport when used in internal combustion engines, but is untaxed if used for heating purposes. TEU assumes that 50% of diesel use is for propellant purposes, and the other half for heating purposes.
- In the residential and commercial sector diesel used for heating purposes is not subject to the federal fuel excise tax.
- TEU assumes that all industrial diesel use is consumed for heating or electricity generation and therefore untaxed.
- Fuel oil is taxed at same rate as diesel when used as a propellant but untaxed when used for heating.
- Small facilities that do not participate in the subnational ETS would generally be covered by the subnational carbon tax where it applies. As their share in total emissions is rather small, TEU assumes for simplicity that the entire sector is covered by the respective ETS. Such an assumption is not necessary in British Columbia and the Northwest Territories where only the carbon tax is in place. In Nova Scotia and Quebec only the cap-and-trade ETS operates.

²⁰ <https://www.canada.ca/en/revenue-agency/services/forms-publications/publications/fcrates/fuel-charge-rates.html>.

²¹ GGIRCA will cover LNG facilities once operational.

²² The Federal OBPS is partially implemented (electricity generation and natural gas transmission pipelines only).

- Certain surcharges and reductions apply at the local level on gasoline and diesel.
 - To model local surcharges on motor fuel taxes, it is assumed that the Vancouver and Victoria areas represent 50% and 10% of provincial motor fuel consumption, respectively. The Montreal area is assumed to account for 50% of provincial gasoline use in the road sector. Reduced motor fuel excise rates that apply in certain remote areas at Quebec, the Northwest Territories and Nunavut are not modelled as the corresponding energy base is negligible
- In British Columbia, a 0.4% tax applies on the purchase price of a number of energy products to raise revenue for the Innovative Clean Energy (ICE) Fund. This tax is not covered in TEU.

Chile

Taxes on energy use and greenhouse gases

As at 1 April 2021, the main taxes on energy use and greenhouse gas (GHG) emissions in Chile are the following:

- The Specific Tax on Fuels (*Impuesto específico a los combustibles, IEC*), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to road fuels (gasoline, diesel, liquified petroleum gas and compressed natural gas). It is expressed in UTM (*Unidad Tributaria Mensual*²³) per m³ (per 1 000 m³ in the case of CNG). The excise tax was converted from UTM to CLP so as to reflect tax rates as at 1 April 2021, using data from *Servicio de Impuestos Internos (SII)*. It is composed of:
 - A fixed base of tax rates, determined by the Specific Tax on Fuels.
 - A variable component determined by the Stabilisation Mechanism of Fuel Prices (*Mecanismo de Estabilización de Precios de los Combustibles, MEPCO*). It works to soften international oil price fluctuations for domestic consumers through increases and decreases to the fixed base of the Specific Tax on Fuels.
- As part of the Green Tax, a CO₂ tax applies to CO₂ emissions at a uniform rate of USD 5 per tonne of CO₂. The tax, which is classified as an explicit carbon tax in TEU, applies to facilities of which the total thermal power capacity of boilers and turbines is at least 50 MWt.²⁴ There is no tax on emissions from fixed sources for which the primary source of energy is biomass.²⁵
- Although not a tax under Chilean law, it is important to mention that Kerosene for residential use is subject to the Stabilization Fund for Petroleum Prices (*Fondo de Estabilización de Precios del Petróleo, FEPP*), which also serves to smooth price fluctuations for domestic consumers of kerosene. FEPP values may vary on a weekly basis. For the first quarter of 2021, the tax rate was consistently zero, however.

Chile does not directly tax other GHG emissions (such as F-gases or N₂O gases).

Chile does not operate an emissions trading system for GHG emissions from energy.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- The rate applied to gasoline for automotive purpose is that of *Gasolina 93*;
- There is a full refund of diesel used for non-road activities;
- Emissions from fuels used to generate electricity are taxed but final consumption of electricity is not taxed;
- Fuel use data in the IEA energy balances is not linked to facilities. Due to this data limitation, TEU assumes that all consumption of coal and other solid fossil fuels as well as natural gas in the industry and electricity and fishing sectors is subject to the explicit carbon tax, whereas other energy use, especially diesel, LNG and CNG is not concerned by the tax. This assumption that was made by the OECD Secretariat due to data

²³ Official unit of account whose value is adjusted monthly based on the consumer price index.

²⁴ Participation thresholds have been changed by the approved tax reform with law 21 210 in 2020. The green tax will apply to entities that emit more than 25,000 tCO₂ and/or 100 tonnes of particulate matter due to combustion processes per year from 2023 onwards.

²⁵ The Green Tax also applies to PM, NO_x, and SO₂ emissions which are not GHG and therefore out of TEU scope.

limitations; it was not suggested by Chile. The rationale is that the latter fuels tend to be used in smaller installations that are likely to fall below the threshold of the carbon tax. Based on a presentation made by Chile to the OECD's Joint Meeting of Tax and Environment experts, in 2017 only 3% of all covered emissions stem from petroleum products.

- The Specific Tax on fuels is partially refunded for freight transport companies, which own or lease with option to purchase, trucks with a weight equal or higher than 3 860 kg (Law 19 764).

Due to data constraints, the following refunds or tax exemptions are not included in the Taxing Energy Use (TEU) database:

- Stabilisation Fund for Petroleum Prices;
- Exemption of carbon tax if facilities are below the threshold for inclusion (cf. approximation described above).

China

Taxes on energy use and greenhouse gases

As at 1 April 2021, the main taxes on energy use and greenhouse gas emissions in China are the following:

- The Refined Oil Excise Tax (成品油消费税), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to gasoline, naphtha, solvent and lubricating oil at a uniform rate of CNY 1.52 per litre, as well as to diesel, and fuel oil at a uniform rate of CNY 1.2 per litre. Revenues are earmarked for transport funding and green purposes.
 - Aviation kerosene is not taxed.
 - The main fuels used to generate electricity are not taxed. Diesel and fuel oil are taxed but their relative consumption for electricity generation is negligible.

China does not levy an electricity excise tax nor a fuel-based carbon tax and does not tax greenhouse gas (GHG) emissions directly.

China has been operating a national emissions trading system (ETS) that came into effect in February 2021 and initially covers the electricity sector. Regional ETSs have been operating in Beijing, Chongqing, Fujian, Guangdong, Hubei, Shanghai, Shenzhen and Tianjin. They cover CO₂ emissions from varying sectors, most commonly industry and electricity which is however covered by the national ETS since 2021. Depending on the specific system, additional GHG gases and sectors like buildings, transport and aviation may be covered.

Environmental protection taxes apply to air and water pollutants, solid wastes and noise in China. These taxes that may be partially correlated with energy use or greenhouse gas emissions are out of the scope of TEU, and are thus not modelled.

Colombia

Taxes on energy use and greenhouse gases

As at 1 April 2021, the main taxes on energy use and greenhouse gas (GHG) emissions in Colombia are the following:

- The National Gasoline Tax (*Impuesto Nacional a la Gasolina*), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to gasoline, diesel and all other liquid motor fuels that are used in vehicles and in stationary combustion engines. The tax is adjusted annually to inflation.
- The Surcharge on Gasoline and Diesel (*Aceite Combustible Para Motores – Sobretasa a la Gasolina y al ACPM*), classified as a fuel excise tax according to the TEU methodology applies to the same fuels subject to the National Gasoline Tax.
- The National Carbon Tax (*Impuesto Nacional al Carbono*) is set to a nominal rate of COP 17660 (~EUR 4) per tonne of CO₂, which is adjusted annually to inflation plus one percentage point. The tax applies to liquid fossil fuels and LPG that are used as propellant, in stationary combustion engines, or as heating fuels (excludes LPG). It does not apply to coal and other solid fossil fuels nor to natural gas unless used by refineries or in the petrochemical industry. Emitters have the option to meet their carbon tax liability by using offset credits generated from domestic projects.

Colombia does not tax on other GHG emissions (such as F-gases or N₂O gases).

Colombia does not operate an emissions trading system for GHG emissions.

Country specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- The rate applied to fuel oil is that of *ACPM*.
- The rate applied to kerosene, LPG and naphtha are that of *gasolina extra*, and for the surcharge in *municipal y distrital*.
- Diesel and gasoline used for commercial navigation (“marine”) are taxed. Fuels for commercial aviation pay the carbon tax only.
- LPG is subject to the carbon tax if it is sold to industrial users. Natural gas is subject to the carbon tax if it is used by refineries or in the petrochemical industry. Otherwise, LPG and natural gas are not taxed.
- Diesel and gasoline consumed in the agriculture and fisheries sector are taxed at the usual rates.
- Solid fossil fuels such as coal and coke and other fossil fuels, such as crude oil and refinery gas, are not taxed.
- Pure liquid biofuels and solid biofuels are not taxed.
- The final consumption of electricity is not taxed either.

Due to data constraints, the following refunds or tax exemptions are not included in the Taxing Energy Use (TEU) database:

- Reduced rate for taxation of blended diesel with biofuel (from 2% to 10%);
- Variable rates depending on geographical location (reduced rate of surcharge on gasoline, exemption of carbon tax for border area etc);
- Variable rates for the surcharge on gasoline depending on the geographical location;
- Exemption of carbon tax for gasoline and diesel (ACPM) in Guainía, Vaupés and Amazona;

- The deduction of the tax on gasoline from the income tax as TEU generally does not cover tax expenditures or subsidies that operate through the income tax system.

Costa Rica

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use in Costa Rica are the following:

- The single tax per fuel type (*impuesto único por tipo de combustible*) is an excise tax on fuel and petroleum products whose statutory rates vary across different fuels. A regulation fee (*canon de regulacion*) for the activities of fuel supply in the national territory also exists. Both have been classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology.
- Electricity consumption is subject to a 1.75% levy on the price in favour of the Costa Rican Fire Department. There is also a public lighting charge on electricity consumption (*Costo Alumbrado Publico*) charged per kWh consumed. Both have been classified as an electricity excise tax according to the TEU methodology.

Costa Rica does not levy a carbon tax nor a tax on other GHG emissions (such as F-gases or N₂O).

Costa Rica does not have an emissions trading system for GHG emissions

Country specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- The gasoline consumption for automotive purpose is assumed to be split between 48% of *gasolina regular* and 52% of *gasolina super*;
- Diesel consumed is assumed to be of the regular type (diesel 50) as, according to Recope, domestic use of heavy diesel oil use is limited;
- Fuels used for fishing are exempted;
- Coal use is not taxed;
- Biofuels, biogases and biomass use are not taxed;
- The electricity cost in April 2021 is assumed to be CRC 106.42 per kWh.

Due to data constraints, the following refunds or tax exemptions are not included in the database:

- The cross subsidies for fishing and industry;
- The exemption from fuel tax for embassies and the Red Cross, as well as for construction, the fire department, and certain other institutions.

Due to data constraints, the following taxes are not modelled:

- Taxation of asphalt, asphalt emulsion, heavy diesel and naphtha are not modelled; in addition, as there is no recorded natural gas according to the IEA energy balances, taxes on natural gas could not be modelled;
- Exemption of the 1.75% electricity levy for electricity consumption after 1750 kWh and exemption for consumers whose monthly consumption is equal to or less than 100 kWh.

Côte d'Ivoire

Taxes on energy use and greenhouse gas (GHG) emissions

As at April 1, 2021, the main taxes on energy consumption in Côte d'Ivoire were the following:

- The single specific tax ("taxe spécifique unique") on petroleum products, classified as a "fuel excise tax" according to the report's methodology, is levied on gasoline, diesel and fuel oil.
- Several taxes are classified as "electricity excise taxes": the municipal tax on residential and commercial electricity consumption, as well as the tax on electricity consumption and a rural electrification fee.

Côte d'Ivoire does not have a carbon tax, but has been conducting consultations since 2015 to explore its possible implementation.

Côte d'Ivoire does not have a CO₂ emissions trading scheme and does not levy taxes on other GHG emissions (such as fluorinated gases or nitrous oxide).

A VAT rate of 9% applies to all petroleum products (kerosene, diesel, fuel oil, gasoline) unless they are used for electricity generation ("HVO, fuel oil and natural gas for thermal power plants"). A VAT rate of 18% applies to the consumption of electricity and natural gas. Butane is exempt. VAT rates are not included in the Taxing Energy Use and Effective Carbon Rates database.

Customs duties (entry fees, statistical fees) are beyond the scope of the database.

Table 1. Energy taxes on petroleum products

Rates in FCFA per litre	Diesel (automotive)	Diesel (other)	Fuel oil	Gasoline (super carburant)	Kerosene	Jet kerosene	Natural gas	LPG
Single specific tax	124.53	45	10	86.4	0	0	0	0

Source: Arrêté interministériel n°64 du 29 mars 2021 portant modification du tarif de la TSU sur les produits pétroliers²⁶

Energy use subsidies

The following subsidies have been identified as being in effect in 2020:

- Packaged butane is sold at a price set by order and receives a subsidy. "During 2020, the subsidy on sales of butane gas to households amounted to approximately 52.43 billion CFA francs", according to the Yearbook of Hydrocarbon Statistics.
- Finally, fuel oil (HVO) used to generate electricity received a subsidy in 2020.

Country-specific assumptions

In linking the above taxes to the corresponding tax bases, the following country-specific assumptions have been made:

- Diesel used as fuel for cars ("gasol") is less taxed than diesel used in other sectors ("DDO", assumed to be used in the industrial, maritime, agricultural, commercial and residential sectors).
- The consumption of gas oil for fishing, as well as for the production of electricity, is exempted.
- Gasoline consumed as fuel for road transport is assumed to be "super carburant" only. The taxation of "motor gasoline" is therefore not modelled, only that due to lack of data on the percentage of use.
- The consumption of fuel oil and gasoline is assumed to be taxed uniformly regardless of use.

²⁶ [6065248e9244a.pdf \(dgh.ci\)](#)

- The consumption of kerosene and aviation fuels (jet fuel and aviation gasoline) are exempt.
- The subsidy for butane consumption, amounting to CFAF 52.43 billion, is distributed evenly over all consumption in the residential and commercial sectors.
- Solid biofuels (biomass) are not taxed, nor is coal.

Cyprus

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use in the Republic of Cyprus are the following:

- Excise duties, classified as fuel excise taxes according to the Taxing Energy Use (TEU) methodology, apply to gasoline, diesel, kerosene, fuel oil, natural gas²⁷, LPG when used as motor fuel and coal used for heating.²⁸
- An excise tax applies on electricity consumption (per MWh), classified as an electricity excise tax according to the TEU methodology.

Cyprus does not levy carbon taxes or taxes on other GHG emissions. Cyprus participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

Energy use subsidies

Energy end-user prices are fully liberalised.²⁹ No subsidies on energy use were identified to be in operation in 2018 and 2020.³⁰

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- Fuels used as input for electricity generation are tax exempt.³¹ TEU assumes that all electricity inputs benefit from this provision.
- In agriculture, TEU assumes that all LPG use is for heating purposes.
- Fuels used for cement production are tax exempt. TEU assumes that 50% of kerosene, diesel and fuel oil consumed in the non-metallic minerals industrial subsector³² are for cement production.
- Fuels used for shipping and aviation are tax exempt.³³
- Biodiesel is taxed at the fossil fuel equivalent rate when used as motor fuel.
- Charcoal, waste, biogases and solid biofuels are untaxed.

²⁷ However, according to the IEA energy balances there is no domestic consumption of natural gas.

²⁸

<https://www.mof.gov.cy/mof/customs/customs.nsf/All/A2C3593B5465A799422577D6002FEAC4?OpenDocument>

²⁹ <https://www.iea.org/reports/energy-prices-overview>

³⁰ Figure 2-11 estimates fossil fuel subsidies supporting energy demand per capita at 0 euro for Cyprus in 2018. <https://data.europa.eu/doi/10.2833/546611>

³¹

<https://www.mof.gov.cy/mof/customs/customs.nsf/All/A2C3593B5465A799422577D6002FEAC4?OpenDocument>

³² The non-metallic minerals IEA energy balances consumption flow correspond to Division 23 of the ISIC Rev. 4 classification and include besides cement, glass, ceramic, etc.

³³ Fuels used in private pleasure craft and private planes are taxed (not modelled in TEU due to a lack of consumption data).

Czech Republic

Taxes on energy use and greenhouse gas (GHG) emissions

Energy and carbon taxes in the Czech Republic are levied within the framework of the 2003 European Union (EU) Energy Tax Directive, which sets minimum rates for the taxation of energy products in EU member states. Within this framework, as at 1 April 2021, the main taxes on energy use in the Czech Republic are the following:

- The Mineral Oil Tax (*daň z minerálních olejů*), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to oil products.
- The Natural Gas Tax and Certain Other Gases Tax (*daň ze zemního plynu a některých dalších plynů*), classified as a fuel excise tax according to the TEU methodology, applies to natural gas and manufactured gases.
- The Solid Fuel Tax (*daň z pevných paliv*), classified as a fuel excise tax according to the TEU methodology, applies to coal and coke.
- The Electricity Tax (*daň z elektřiny*), classified as an electricity excise tax according to the TEU methodology applies to electricity consumption.

The Czech Republic does not levy a fuel-based carbon tax and does not tax greenhouse gas emissions directly. However, the Czech Republic participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- In the off-road sector, fuels used for domestic navigation and commercial aviation are untaxed. Fuels used in private pleasure craft and private planes are taxed (not modelled in TEU due to a lack of consumption data).
- Natural gas used for storing and transporting natural gas (“pipeline transport”) is exempted.
- Bioethanol and biodiesel used for propellant purposes, typically blended together with fossil fuels, are taxed at lower rates than their fossil fuel equivalents.³⁴
- There is a refund for diesel heating, bringing the tax to CZK 660; the same rate is assumed for kerosene.
- In agriculture, TEU assumes all LPG consumed is for heating and therefore untaxed, while all natural gas is used for heating and taxed at the business rate.
- Diesel used in agriculture benefits from partial tax refunds. The refund is larger for diesel used for livestock farming than for general crop production. TEU assumes that 45% of diesel use in agriculture attracts the former rate.
- Fossil fuels are generally not taxed when used for energy transformation, in mineralogical and metallurgical processes, as inputs in combined heat and power (CHP) plants (with the exception of diesel that is taxed at the heating rate),³⁵ or as inputs in autoproducer electricity plants.³⁶

³⁴ Applicable rates may vary depending on the share of biofuels in the blends, as well as the extent to which biofuels meet sustainability criteria. TEU used the 1 April 2021 rate for E85 where 70 % of ethanol meets the sustainability criteria in blend as an upper bound estimate of the applicable rate.

³⁵ This tax exemption for cogeneration only applies to generators with a minimum efficiency and on condition that the heat is delivered to households. TEU assumes that all CHP plants reported by the IEA comply with these requirements.

³⁶ Certain small autoproducer plants may not be eligible for this exemption (see next footnote)

- Renewable waste and non-liquid biofuels are not taxed. Electricity produced by autogeneration plants with a capacity of more than 2 MW are subject to electricity excise taxes under the same conditions as main-producer electricity plants³⁷.
- Natural gas is taxed for business use, but is untaxed if used by households.
- All energy sources used to generate electricity are untaxed. Electricity consumption, on the other hand, is subject to an electricity excise tax (per MWh), unless when it is used in electrolytical, mineralogical and metallurgical processes, or in rail transport.

³⁷ Electricity produced from taxed natural gas or taxed solid fuels is exempt from the electricity excise tax when such electricity is consumed directly within the facility or is supplied through the grid in which only such electricity is supplied, on condition that the installation's capacity does not exceed 2 MW.

Denmark

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use and GHG emissions in Denmark are the following:

- A Mineral Oil Tax (*Mineralolieafgift*), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to mineral oils, including tar, refinery gas, lubricating oils, methanol and other petroleum-based products. Bio-gasoline and biodiesel are taxed at the rate of the respective road transport fossil fuel but exempt from the carbon tax.³⁸
- A Gas Tax (*Gasafgift*), classified as a fuel excise tax according to the TEU methodology, applies to natural gas, as well as on biogas used for heating purposes.
- A Coal Tax (*Kulafgift*), classified as a fuel excise tax according to the TEU methodology, applies to specified uses of coal and coke products and on non-renewable waste used for heating. The tax does not apply to coal and coke products used as fuels for railway operations.
- A Carbon Tax (*CO₂-afgift*), with a nominal rate of DKK 178.5 per tonne of CO₂e applies to many forms of fossil fuel consumption (see below for interaction with the emissions trading system), including on fossil fuel waste. It includes a Methane tax (*Metanafgift*), also classified as a carbon tax according to the TEU methodology, on the use of biogas for stationary engine combustion.³⁹
- An F-gas tax (*Cfc-afgift*), classified as a carbon tax according to the TEU methodology, applies with a nominal rate of DKK 150 per tonne of tCO₂e.
- The Nitrogen Oxide Tax (*Kvælstofoxiderafgift*) also applies to nitrous oxide (N₂O, a GHG). In principle, the part of this tax that applies to nitrous oxide would therefore be considered a carbon tax according to the TEU methodology. However, due to data constraints this tax was not modelled in TEU.
- An Electricity Tax (*Elafgift*) applies to electricity output. Fuels used to generate electricity are untaxed.

The following taxes and related policy instruments fall outside the scope of Taxing Energy Use as they are not considered taxes on energy use or GHG emissions:

- The Sulphur Tax that applies to fuels with sulphur content above 0.05% in mass.
- The PSO surcharge on electricity.

Energy taxes in Denmark are levied within the framework of the 2003 EU Energy Tax Directive, which sets minimum rates for the taxation of energy products in member states.

All excise tax rates on energy use are indexed since 2016 to net retail prices. Rate adjustments are based on the annual average net retail price two years prior to the calendar year during which the rates apply. Indexing was introduced in Denmark as part of the 2009 Spring Package 2.0 (*Forårspakke 2.0*) tax reform.

Denmark participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors. Facilities that are covered by the ETS do not to pay the carbon tax (or receive a full refund). Heat inputs into district heating plants are, however, subject to the CO₂ tax, irrespective of whether they are also covered by the EU ETS.

Country-specific assumptions

The Mineral oil tax rate applies to gasoline for automotive purposes is that of Lead-free gasoline (lead content not more than 0.013 g per litre);

³⁸ Diesel vehicles are, however, charged a balancing tax. In line with the TEU methodology, this tax is not included in the database.

³⁹ It applies to biogas consumed as motor fuel in stationary piston engine systems with an input power of more than 1,000 kW.

- The Mineral oil tax rate applied to diesel for automotive purposes is that of Sulfur-free diesel oil (sulfur content not more than 0.001%).
- The Mineral oil tax rate applied to aviation gasoline is that of lead-based petrol (lead content above 0.013 g per litre).
- Fishing fuels benefit from a full refund if fishing vessels have a gross tonnage of 5 tonnes or more. It is assumed the entire fishing industry meets this benchmark.
- Diesel motor fuels for navigation and domestic commercial aviation are untaxed.
- The industry, agriculture and electricity sectors are largely composed of VAT-registered companies.
- Refinery gas and LPG used in the industry and the residential and commercial sectors are taxed at the same statutory rate (Mineral Oil Tax of DKK 2.889 per kilogramme).
- Kerosene consumed as heating fuel in the residential and commercial sector is taxed at the same rate as diesel for heating and stationary motors.
- The electricity heating rate is assumed to apply to 10% of electricity consumption in the residential and commercial sector, based on information from the ministry of taxation (TEU 2019).
- Diesel and other motor fuels consumed in the agriculture sector by VAT-registered companies benefit from a reduced fuel excise tax paid (1.6% of the full excise), with the exception of gasoline use. It is assumed most fuels used in this sector are motor fuels.
- Non-renewable municipal waste is tax exempt.

Due to data constraints, the following tax exemptions and allowances are not included in the Database:

- Based on certain conditions, VAT-registered companies can benefit from a partial refund on heating inputs in combined heat and power (CHP) generators.
- Tax exemption on electricity manufactured at production plants whose capacity is less than 150 kW, emergency power plants, electricity produced in trains, ships, aircraft or other means of transport, as well as for electricity from renewable sources if that electricity is consumed directly by the electricity producer.
- CHP/District heating (electricity used for heat production) cannot be modelled due to data constraints.
- Households using 4 000 kWh per year or above pay a reduced rate of DKK 0.008 per kWh, whereas households using less than that pay DKK 0.9 per kWh. Only the second rate is modelled.
- Non-renewable industrial waste is subject to a tax for process use of 4.5 DKK per GJ, but consumption of such waste is small and not reported by the IEA, and hence not included in TEU.
- The Coal Tax (*Kulafgift*), also applies on the heat produced from non-renewable (industrial) waste. This would be a heat output excise tax, similar to the electricity excise tax levied on electricity consumption and would be covered as well. However, Denmark is the only country in the sample that levies such a tax and the energy use affected by the tax (industrial waste) is small and not reported in the IEA's extended energy balances, and hence excluded from TEU.

Dominican Republic

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use in the Dominican Republic are the following:

- A Special Excise Tax on Fuel (SFT) (*impuesto sobre combustible ISC*) applies to petroleum products as stipulated by the Law of Hydrocarbons 112-00. Gasoline, diesel, fuel oil, natural gas, kerosene and aviation fuel are subject to the SFT.
- Additionally, a special tax of DOP 2 is levied on gasoline regular and premium as well as on diesel as stipulated by art. 20 of the Law No. 253-12⁴⁰, in order to promote road development and renovation of vehicle fleet for public transports and carriers.

The Dominican Republic does not collect carbon taxes or taxes on other greenhouse gases emissions. The Dominican Republic does not have a GHG emissions trading system.

There is no specific tax on electricity consumption.

Other related taxes beyond the scope of TEU include:

- A vehicle registration tax, based on CO₂ emissions per kilometre, is levied at the time of registration of motor vehicles.
- A 16% ad valorem tax also apply for most fuels; the rate for aviation gasoline is 6.5%. However, these taxes are not specific taxes on energy use, but apply to a wide range of goods.

Table 2. Energy taxes on petroleum products in the Dominican Republic

Expressed in Dominican Pesos (DOP) per product gallon.

Rates in DOP per gal	Diesel	Diesel Super	Fuel oil	Gasoline	Gasoline Super	Kerosene	Aviation Kerosene	Natural Gas (m ³)	LPG
SFT	28.06	34.53	17.99	63.83	71.85	17.99	6.30	0.80	-

Note: The tax rate unit for natural gas is cubic meters.

Source: MICM

Energy use subsidies

The following subsidies on energy use were identified to be in operation in 2020:

- In accordance with the budget execution documents of the General Budget Office (DIGEPRES), the amounts of current transfers to the electricity sector are recorded to cover subsidies for electricity and fuel. The following table shows the transferred values for years 2018 to 2020:

**Current Transfers to the Electricity Sector
Energy and Fuel Subsidy
Period 2018 - 2020*
(Values in DOP)**

Year	Amount
2018	19,316,817,814.0
2019	21,939,660,512.7
2020	27,858,050,329.8

Source: <https://www.digepres.gob.do/>

*Executed budgets 2018-2020.

⁴⁰ [253-12.pdf \(dgii.gov.do\)](#)

- In electricity, residential tariffs the state compensates distribution companies for the difference between the monthly regulated tariffs and the generation costs through the Tariff Stabilization Fund (*Fondo de Estabilización de la Tarifa Eléctrica - FETE*). In 2020, the implicit contribution to electricity residential user was estimated to be RD 19 071.19 million.⁴¹ Starting from November 2021, the subsidies are scheduled to decrease until zero in 2026.
- Finally, the government also grants subsidies for access of low-income households to (i) LPG (*bono gas*) DOP 2.530 billion in 2020⁴² and (ii) electricity (*bono luz*) DOP 1.940 billion in 2020.
- Currently, fuel subsidies are given through the General State Budget. However, Decree No. 625-11, which establishes some amendments to the Regulations of Law No. 112-00, provides for the creation of a Fuel Price Stabilisation and Compensation Fund (FECOPECO), with the objective of minimizing the impact of fluctuations in oil prices and its derivatives on the country's economy. For purposes of its implementation, there is currently a Bill in the National Congress that seeks, among other things, to provide for the entry into force of this Fund through which these subsidies would be formally regulated.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- Gasoline consumed outside road transport (industry and rail) is assumed to be solely of type regular and attracts the standard tax rate. Consequently, gasoline in the road sector is estimated to be 64% of type premium and 36% of the regular type on 2020, and 62% type premium and 38% regular type for 2021
- Diesel consumption of type super (*Gasol Optimo*) represented 33% of total diesel consumption in 2018 according to official sources. All such diesel consumption is assumed to occur exclusively in the road sector. Adjusting for the use of regular diesel in other sectors (industry, electricity etc.) using IEA Balances data for 2018, the split between diesel super and regular diesel in the road sector has been estimated at 33% and 67%, respectively.
- The electricity subsidy provided for regulated tariff through the Tariff Stabilization Fund has been allocated to all residential consumption. The rest of the total subsidies to electricity sector recorded in the budget has been allocated through all electricity consumption.
- *Bono gas* and *bono luz* subsidies have been allocated to residential LPG and residential electricity consumption respectively.
- Prices for fuels are those set the 27 March 2021.
- Fuels used for electricity generation are exempted from ISC⁴³, and assumed to be also exempted from the additional DOP 2 tax on gasoline and diesel. Other exemptions, such as in free trade area, are not computed due to lack of data.

⁴¹ Sum of monthly estimates from SIE (*estimación subsidio implícito en tarifa otorgado a los usuarios regulados del servicio público de electricidad ofrecido por las empresas distribuidoras: EDESUR, EDEESTE Y EDENORTE*)

⁴² [9282dc02-e5d8-ca77-a4ee-5925a0e3f965 \(transparenciafiscal.gob.do\)](https://transparenciafiscal.gob.do/9282dc02-e5d8-ca77-a4ee-5925a0e3f965), [Portal de transparencia de Supérate - Index \(superate.gob.do\)](https://portal.transparencia.gob.do/supérate)

⁴³ MINISTERIO DE HACIENDA Gastos Tributarios en República Dominicana

Ecuador

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, only one specific tax on energy use in Ecuador was identified:

- The public lighting charge on electricity (“*servicio de alumbrado publico general*”), classified as an “electricity excise tax” according to Taxing energy use (TEU) methodology.

A specific tax on consumption applies to product categories like tobacco and beverages, but it does not cover petroleum or other energy. However, it is worth mentioning that certain environmentally related taxes are in force such as vehicle taxes and taxes on plastic bottles.

For reference, a 12% VAT was in force in 2021, applicable also to oil products, but not electricity. VAT rates are not included in the Taxing Energy Use and Effective Carbon Rates database.

Ecuador does not collect carbon taxes or taxes on other GHG emissions. Ecuador does not have a GHG emissions trading system.

Energy use subsidies

The following subsidies on energy use were identified to be in operation in 2020:

- Fossil fuel subsidies affect a wide range of energy products (gasoline, diesel, fuel oil, aviation fuel, LPG, natural gas) and sectors (road, aviation, agriculture & fishing, generation, industry, residential and commercial). They are less widespread in industry and super gasoline consumed in road transport is one of the few market-priced oil products in the country. The Energy and Mines Observatory calculates the subsidies as the opportunity cost of marketing fuels in Ecuador under regulated prices versus international prices. Note that there have been ongoing efforts to limit oil subsidies and their fiscal burden.

Several electricity subsidies are financed by the government:

- In electricity, a subsidised tariff (dignity tariff) of 0.04 USD/kWh benefits a large fraction of residential customers who consume less than 110kWh/month in the Sierra region and 130kWh/month in those of the Coast / East / Insular regions.
- Another programme relieves registered residential users from the cost of electricity used for cooking up to 80kWh and sanitary water heating up to 20kWh per month.
- People with disabilities and senior citizens above 65 years of age also receive a 50% discount.
- In addition, several measures were taken due to the Covid-19 pandemic (flat rate to customers with consumption greater than 500 kWh, mirror billing for residential customers from 1 to 500 kWh, maintaining the benefit of the Dignity Rate Subsidy to customers who exceeded the established limit), for a cost up to USD 94.10 million in 2020⁴⁴.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- Per unit subsidies are as at 11 February 2021.
- Prices for fuels are as at 11 March 2021.
- Gasoline consumed for road transport is of type extra.
- Diesel consumption is of ‘type 2’ except for industry where it is of ‘type 1’.
- The public lighting charge that applies in 2021 was approximated as a per kWh charge using the amount payable by the consumption band 51-100 kWh (among the highest) at the mid-point of the range, for the different bands of electricity consumers.

⁴⁴ [INFORME TÉCNICO - ECONÓMICO DEL análisis Y DETERMINACIÓN del Costo DEL SERVICIO PÚBLICO DE ENERGÍA ELÉCTRICA Y DEL SERVICIO DE ALUMBRADO PÚBLICO GENERAL \(controlrecursosyenergia.gob.ec\)](#)

Data on several types of electricity consumption subsidies have been included:

- These relate first to the: i) dignity tariff; ii) senior citizens; iii) incapacitated citizens. The January 2019 values were used as a base estimate for the amount of electricity subsidies throughout 2020. It is mentioned that 37% of residential customers benefit from the dignity rate. However, the interaction of this group with the senior and incapacitated citizens is unknown and so is the consumption distribution by residential customers. Due to these constraints, the total amount of the electricity subsidies is uniformly applied on the consumption of dignity tariff residential users.
- The COVID-19 measures for 2020 amounted to USD 94.1 million were additionally allocated across all electricity consumption.

Egypt

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use in Egypt are the following:

Fuel excise taxes according to diesel & gasoline 92.

As at May 2020, development fees have been levied on all types of gasoline (0.3 EGP/per litre) & diesel (0.25 EGP per litre). These taxes have been classified as fuel excise taxes according to the Taxing Energy Use (TEU) methodology.

A low stamp tax, classified as an electricity excise tax according to the TEU methodology, applies to electricity consumption from industrial users.

Egypt does not levy carbon taxes or taxes on other GHG emissions and does not operate an emissions trading system (ETS).

Energy use subsidies

Egypt completed a fuel subsidy reform in 2019 and adopted a fuel price indexation mechanism.⁴⁵ Diesel, fuel oil (except for fuel oil for bakeries & electricity), and gasoline prices are adjusted according to the pricing mechanism, with revisions by the Fuel Pricing Committee capped at 10% per quarter.

Electricity consumption subsidies have been zero since FY2019/2020, although cross subsidies with zero net effect subsidise lower tranches of consumption through higher tranches.

The following subsidies on energy use were identified to be in operation in 2020:

Fuel oil for bakeries & electricity generation.

Residential LPG consumption.

Their total amount in FY2019/2020 reached 18.7bn EGP.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

Kerosene (including jet kerosene) is untaxed.

The shares of gasoline types consumed in the road sector were provided by the Egyptian administration and refer to 2016/2017.

Gasoline (95 local)	Gasoline (95 imported)	Gasoline (92)	Gasoline (80)
0.2%	11.6%	33.7%	54.5%

Diesel is taxed at the standard rates when used for electricity generation.

With input from the Egyptian administration, 85% of the total subsidy amount is estimated to affect LPG residential consumption and the remaining 15% fuel oil for electricity generation. The amounts of subsidies for fuel oil for bakeries and kerosene are negligible.

⁴⁵ IMF Country Report No. 21/163, July 2021

Estonia

Taxes on energy use and greenhouse gas (GHG) emissions

Energy taxes in Estonia are levied within the framework of the 2003 EU Energy Tax Directive, which sets minimum rates for the taxation of energy products in member states.

As at 1 April 2021, the main taxes on energy use in Estonia, are the following:

- An Excise Duty on Fuels (*Kütuseaktsiis*) applies to coal and coke, diesel, gasoline, light heating oil, heavy fuel oil, kerosene, LPG, natural gas, oil shale and liquid biofuels used as propellant or for heating purposes.
- Estonia levies a carbon tax of EUR 2 per tonne of CO₂, which applies to all CO₂ emissions from thermal energy producers, with the exception of biofuel emissions.
- An Excise Duty on Electricity (*Elektriaktsiis*) also applies to electricity output.

Estonia does not levy taxes on other greenhouse gas emissions.

Estonia participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- Liquid biofuels are taxed at the same rate as their fossil fuel equivalent;
- Solid biofuels are untaxed;
- Aviation fuels are untaxed when used for commercial aviation, private use is being taxed. Maritime fuels used for EU navigation are untaxed, private use and use inside Estonian territorial waters is being taxed. The excise duty rate differs whether the fuel is been used as propellant or for heating purposes. Diesel marked with a fiscal marker (an excise is lower compared with standard rate) is allowed to use in agriculture, professional fishing inside Estonian waters and in oil shale mines.
- Fuels used for electricity generation (an input) are not taxed because electricity is taxed. Fuels used for the production of heat in CHP plants are taxed;
- Municipal and industrial waste used for heat generation are not submitted to excise tax, except renewable municipal waste and industrial waste used by thermal producers, which are subject to the carbon tax.

Due to data constraints, the following tax exemptions or refunds were not modelled:

- The tax exemption on natural gas used for the operation of the natural gas network.
- As no diesel consumption for fishing is reported, the exemption is not modelled.

Ethiopia

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 July 2018 and 1 April 2021, the following on energy use in Ethiopia:

- An ad valorem tax is levied on import prices of gasoline, naphtha and jet kerosene, as mentioned in proclamation 307/2002 and 1186/2020. It is classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology.
- A road maintenance fuel levy (RMFL), classified as a fuel excise tax, is levied on gasoline and diesel.
- A municipality fee is also levied on petroleum products.

No tax on electricity consumption has been identified so far.

In addition, it is worth noting that a standard 15% VAT rate applies to energy products, except for electricity, kerosene and LPG (“fuel gas”) which are exempted⁴⁶. VAT rate is registered for information but not included in the calculation of effective tax rates.

Ethiopia does not collect carbon taxes or taxes on other GHG emissions.

Ethiopia does not have a GHG emissions trading system.

Energy use subsidies

The following subsidies on energy use were identified to be in operation in 2018 and 2020:

- Several mechanism are in place to lower the cost of petroleum products, which are sold below their cost. Especially, a fuel price stabilisation fund was established in 2001, is financed by gains resulting from low international prices and by donations from foreign sources. The fund has been in deficit since 2016/2017, with losses around ETB 2.7 billion in 2018/2019 and around ETB 12.7 billion in 2020/2021. Moreover, the government may do direct public transfers. Finally, it appears that the tax rates levied by the Ethiopian Petroleum Supply Enterprise are lower than planned in the law. In total, for 2019 and 2020, the government spent ETB 24 billion⁴⁷ of subsidies.
- Electricity tariffs are also below the cost, according to price gap data from the IMF.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- The ad valorem excise tax rates effectively levied have been assumed to be 9% instead of the 30% mentioned in the official legislative document for 2018 and 2021.⁴⁸ The ad quantum equivalent of the ad valorem tax was generally calculated based on retail prices (after removing VAT) due to a lack of information on import prices.
- Diesel consumption reported is assumed to be “white diesel” for all uses. Fuel oil consumption reported is assumed to be “heavy black diesel” for all uses. Biogasoline consumption reported is assumed to be “ethanol blended petrol”.
- No excises duties are levied on coal and coke products, LPG, diesel, kerosene, fuel oil.

⁴⁶ [Microsoft Word - supplies of goods or services.doc \(amhaacctaudo.com\)](#)

⁴⁷ [Government spends 24Bn Birr on oil price subsidy during past two years – Welcome to Fana Broadcasting Corporate S.C \(fanabc.com\)](#)

⁴⁸ p. 48 [‘Green’ motor taxation: issues and policy options in sub-Saharan Africa \(taxdev.org\)](#)

- Excise tax on gasoline, naphtha and biogasoline is assumed to be levied at the same rate for all type of consumption, whether in the road, residential, commercial or industrial sectors.
- Regarding subsidies, the losses of the Fuel price stabilisation fund for 2018/2019 and 2020/2021 have been allocated to all the energy consumption of gasoline, biogasoline, naphtha, kerosene, diesel, jet fuel and fuel oil. Due to data constraints, the subsidies were allocated proportionately to the energy base of each fuel, i.e. one GJ is subsidised equally independently of the petroleum product combusted to produce it.

Finland

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use and GHG emissions in Finland, were the following:

- An Energy Content Tax (*Energiasisältö-vero*) has a fuel excise tax component that applies to diesel, gasoline and their biofuel equivalents, coal and coke, fuel oil, kerosene, LPG, natural gas, peat.
- The Energy Content Tax also contains an electricity excise tax component that applies specified forms of electricity consumption. The electricity excise applies irrespective of the primary energy source from which the energy is generated. Electricity consumed by industry and agriculture have a lower tax rate compared to electricity consumed by residential and commercial users. Electricity consumed in railway transport is exempt.
- A Security of Supply Payment (*Huoltovarmuus-maksu*), applies to the same fossil fuels (other than peat) and electricity consumption. The component of the Payment that applies to fossil fuels is classified as a fuel excise tax in TEU. The component applying to electricity consumption is classified as an electricity excise tax.
- A Carbon Tax (*Hiilidioksidi-vero*) applies to biogasoline, coal and coke, diesel, fuel oil, gasoline, kerosene, LPG and natural gas at a rate of EUR 62 per tCO₂e for transport fuels and EUR 53 per tCO₂e for other fossil fuels. These nominal rates refer to the full lifecycle emissions of the fuels.⁴⁹ Apart from this fuel-based carbon tax, Finland does not levy specific tax on greenhouse gas emissions

Energy taxes in Finland are levied within the framework of the 2003 EU Energy Tax Directive, which sets minimum rates for the taxation of energy products in member states.

None of the taxes effectively apply to fuel use for electricity production, commercial aviation and commercial navigation on waterways, as well as fishing fuels. Fuels used for energy transformation processes other than heating are untaxed as well.

Finland participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

The Oil Waste Fee (*Öljyjättemaksu*) was repealed in 2020 and collection of the Oil Pollution Fund (*öljysuojarahaston*) was suspended on March 1, 2020, as the capital of the oil protection fund has exceeded EUR 10 million since the beginning of this year. The fee will only be collected again when the fund's capital has fallen below EUR 5 million.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- Peat products are taxed when used in a power or heating plants for heat production or more than 5 000 MWh per year. It is assumed peat products are only taxed when used by industry.

⁴⁹ As a consequence, the effective carbon rate when calculated based on the combustion approach followed in Taxing Energy Use is higher than the nominal rate in Finland that is based on a lifecycle approach.

France

Taxes on energy use and greenhouse gases

As at 1 April 2021, the main taxes on energy use in France were the following⁵⁰:

- The Excise Tax on Coal, Coke and Lignite (*Taxe intérieure de consommation sur les houilles, lignites et cokes (TICC)*), classified as a fuel excise tax according to the Taxing Energy Use methodology, applies to such fossil fuels.
- The Excise Tax on Energy Products (*Taxe intérieure de consommation sur les produits énergétiques – (TICPE)*) applies to liquid and gaseous fossil fuels and biofuels.
- The Excise Tax on Natural Gas (*Taxe intérieure de consommation sur le gaz naturel (TICGN)*) applies to natural gas when used as a propellant⁵¹ and for heating. Apart from this fuel-based carbon tax, France does not levy taxes on greenhouse gas emissions.
- The Carbon Charge Component (*composante carbone*, also known as *Contribution Climat-Énergie*), classified as a carbon tax according to the Taxing Energy Use methodology, applies to all fossil fuel use at a nominal rate of EUR 44.6 per tCO₂, which has remained unchanged since 2018. Note it is not a separate tax but forms part of the TICPE, TICGN and TICC.
- The Excise Tax on Final Electricity Consumption (*Taxe intérieure sur la consommation finale d'électricité (TICFE)*) and additionally two local electricity excise taxes according to TEU methodology:
 - The Departmental Excise Tax on Final Electricity Consumption (*Taxe départementale sur la consommation finale d'électricité-(TDCFE)*)
 - The Communal Excise Tax on Final Electricity Consumption (*Taxe communale sur la consommation finale d'électricité-(TCCFE)*)

Energy taxes in France are levied within the framework of the 2003 EU Energy Tax Directive, which sets minimum rates for the taxation of energy products in member states.

France participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors. Facilities that are covered by the ETS do not to pay the carbon tax (or receive a full refund). Heat inputs into district heating plants are, however, subject to the CO₂ tax, irrespective of whether they are also covered by the EU ETS.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- Estimations are partly based on the ELFE model from CGDD (Commissariat Général au Développement Durable).⁵²
- ETS-covered and electricity-intensive (“hyper-electro-intensive”) industries pay reduced tax rates on electricity based on certain conditions. For illustration purposes, the 7.5 €/MWh reduced rate is included in the Database, and it is assumed it applies to a share of industry users in the electricity sector; The share of industrial users benefitting from the reduced rate is assumed to equate the share of ETS covered industrial facilities.

⁵⁰ The French administration published in July 2020 a detailed report on the pricing of CO₂ emissions in France <https://side.developpement-durable.gouv.fr/Default/doc/SYRACUSE/786528/la-tarification-des-emissions-de-co2-en-france>

⁵¹ The TICGN now also applies to natural gas used as a propellant. The conversion rate from kWh to m³ is assumed to be 11.08 kWh/m³, based on a weighted average dependent on the technical specifications of both gases entering networks, as determined by the *Ministère de la Transition écologique*.

⁵² <https://side.developpement-durable.gouv.fr/Default/doc/SYRACUSE/784690/la-tarification-du-carbone-est-elle-alignee-avec-nos-objectifs-climatiques>

- Electricity consumption by rail benefits from a low rate of 0.5 €/MWh. Since 2021, this rate extends to use by métro, tramway, câble, autobus hybride rechargeable ou électrique et trolleybus. For simplicity, TEU associates the reduced rate to all transport electricity consumption.
- Electricity used for mineralogical, metallurgical, electrolysis and chemical reduction processes is effectively untaxed.
- In respect to modelling the TDCFE and TCCFE:
 - All industrial facilities (ETS and non-ETS) fall above the 250 kVA threshold and do not pay TDCFE, TCCFE
 - All residential and commercial consumers of electricity are for simplicity liable for the TDCFE, TCCFE.
 - The tax rates for TDCFE, TCCFE added on top of TICFE, variable by power and use, are for simplicity constrained to the following:

	professional or business use (€/MWh)	non-business use (€/MWh)	coefficient used
TICFE	22.5	22.5	
TDCFE	1.105	3.315	4.25(out of 4.25)
TCCFE	2.21	6.63	8.5 (out of 4,6,8, 8.5)
Total	25.815	32.445	

- Due to data constraints, the following excise tax rate reductions and exemptions are not included in the Database:
 - A full TICPE refund on fuels used for the extraction and production of natural gas;
 - A lower TICPE rate on gasoline and diesel consumed by taxis;
 - The full TICC refund on coal and coke products used for their extraction and production; on coal and coke products used for biomass recovery and development by ETS-covered industries;
 - The full TICFE refund on: electricity consumed by a company where the value of the electricity consumed represents more than 3% of its total production value or whose annual energy taxes represent more than 0.5% of its added value.
 - Miscellaneous reduced TICFE rates for data centres, aerodromes etc.⁵³

⁵³ For further details on TICFE in France see
<https://www.ecologie.gouv.fr/sites/default/files/guide%20fiscalit%C3%A9%20energie%202021.pdf>
<https://www.ecologie.gouv.fr/fiscalite-des-energies>

Germany

Taxes on energy use and greenhouse gas (GHG) emissions

Energy taxes in Germany are levied within the framework of the 2003 EU Energy Tax Directive, which sets minimum rates for the taxation of energy products in member states. As at 1 April 2021, the main taxes on energy use in Germany, were the following:

- The Energy Tax (*Energiesteuer*), classified as a fuel excise tax according to the Taxing Energy Use methodology, applies to specified uses of coal and other solid fossil fuels, gasoline, diesel and their biofuel equivalents, fuel oil, kerosene, LPG and natural gas. Fuels that are used in industrial processes are not taxed if the conditions for non-taxation of the EU Energy Tax Directive are fulfilled (electrolytic processes, etc.). Fuels are untaxed when used for commercial navigation on waterways or commercial aviation.
- The Electricity Tax (*Stromsteuer*), classified as an electricity excise tax according to the Taxing Energy Use methodology, applies to specified forms of electricity consumption. User-specific rate reductions and exemptions may apply.

Germany does not have a fuel-based carbon tax and does not tax greenhouse gas emissions directly.

However, Germany participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

In 2021, Germany additionally launched its National Emissions Trading System (nETS) for heating and transport fuels to complement the EU ETS. The nETS targets CO₂ emissions that are out of scope of the EU ETS and contains provisions to avoid a double compliance burdens for installations covered by the EU ETS. For 2021 and 2022, the nETS coverage is limited to gasoline, including aviation gasoline, kerosene, excluding jet kerosene, diesel, fuel oil, natural gas, LPG, NGL (propane, ethane, butane) (meaning CO₂ emissions from coal are initially excluded). For 2021, the allowance price per tonne of CO₂ is fixed to EUR 25.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- Biodiesel and biogasoline are taxed at the same rate as their fossil fuel equivalents, but benefit from further reductions in agriculture.
- Due to data constraints, the following exemptions were not modelled:
 - A reduction of EUR 54.02 per 1000 litres on diesel consumed for short-distance railway transport (where total travel distance is less than 50km or total travel time is less than 1 hour).
 - Electricity generation is subject to the electricity tax if the power plant capacity exceeds 2MW. It is assumed that all power plants have a capacity below 2 MW, and are thus untaxed.

Ghana

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use in Ghana are the following:

- The Special Petroleum Tax (SPT) applies to gasoline, diesel, kerosene, LPG and natural gas⁵⁴.
- The Road Fund Levy (RFL) applies to gasoline and diesel consumed in the road sector.
- The Energy Debt Recovery Levy (EDRL) applies to all petroleum products with the exception of kerosene. It was introduced to help pay off the debt of the sole, state-owned refinery.
- The Energy Fund Levy (EFL) applies to gasoline, diesel, kerosene and fuel oil.
- The Price Stabilization and Recovery Levy (PSRL) applies to gasoline, diesel and LPG and aims at equalising transport costs throughout Ghana.
- A Public Lighting Levy (PLL) and a National Electrification Scheme Levy (ESL), at respectively 3% and 2% of the price of the kWh (classified as electricity excise taxes according to the Taxing Energy Use (TEU) methodology), applies to electricity consumption as dictated by the Energy Sector Levies Act (ESLA) of 2015.
- The Unified Petroleum Price Fund (UPPFL) levy, which applies to all petroleum products except fuel oil, is out of the scope of TEU as it is a margin used to pay for the freight for transporting products from Storage Depots to Retail Outlets.

Starting from 1 May 2021, Ghana also introduced two additional taxes on petroleum products with the Energy Sector Levies (Amendment) Act number 1064, which came into effects too late to be included in this report:

- Sanitation and Pollution Levy, which applies to gasoline and diesel. It intends to help to pay capacity charges and feedstock in the energy sector.
- Energy Sector Recovery Levy, which applies to gasoline, diesel and LPG. It intends to finance sanitation and air quality investments.

It also worth noting that Ghana levy several sales taxes : VAT at a rate of 12.5% (gasoline, diesel and LPG are exempted), National Health insurance levy at a rate of 2.5%, GETFund levy at a rate of 2.5% and starting from 1 May 2021 a 1% COVID-19 levy. These measures are, however, out scope of the Taxing Energy Use and Effective Carbon Rates database.

Ghana does not collect carbon taxes or taxes on other greenhouse gases emissions. Ghana does not have a GHG emissions trading system.

Table 3. Energy taxes on energy products in Ghana

Rates in GTQ per gal	Gasoline (premium)	Gasoline (fishing)	Kerosene	Diesel (road)	Fuel oil (RFO)	LPG	Natural gas
Special petroleum tax (SPT)	46		39	46		48	35
Road Fund Levy (RFL)	48			48			
Energy Debt Recovery Levy (EDRL)	49			49	4	41	
Energy Fund Levy (EFL)	1		1	1	1		

⁵⁴ Presented as « natural petroleum gas » in the law

Price Stabilization and Recovery Levy (PSRL)	16			14		14	
Sanitation and Pollution Levy*	10			10			
Energy Sector Recovery Levy*	20			20		18	

Source: NPA prices computation template.

Note : Expressed in pesewas (GHP) per product per litre or kilogram (LPG, natural gas).

* Only starting from 1 May 2021 and hence not included.

Energy use subsidies

The following subsidies on energy use were identified to be in operation in 2020:

- Lifeline residential consumers of electricity and other subsidies due to COVID-19. The budget allocates a social benefit in favour of households who consume less than 50kWh per month. Starting from April 2020, due to COVID-19, the power consumption of lifeline customers was fully covered and the measure was extended until June 2021. The consumption of all other customers was also subsidised by 50% from April to June 2020. In 2020, subsidies to lifeline consumer was GHS 150 076 365⁵⁵, plus subsidies to all consumers, including lifeline, due Covid-19 response of GHS 1 155 959 031⁵⁶.
- Payment of GHS 381 597 248 power utility debts via the management of the Energy Sector Levies and Accounts⁵⁷.
- Fuel oil (RFO) and gasoline for fishing (premix) are sold at below market prices, this being financed with the Price Stabilisation and Recovery Levy under the ESLA.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- Aviation kerosene, natural gas, biogases, charcoal and solid biofuels are assumed to be untaxed;
- Gasoline used for fishing is exempted from all taxes;
- The only tax for natural gas is assumed to be the Special petroleum tax (SPT), which applies also for natural gas used for electricity generation;
- The PLL and NESL electricity tax was converted from an ad-valorem to a specific rate for residential and other consumers using the maximum residential and non-residential tariff published by PURC;
- Lifeline consumers have been assumed to account for 40 % of residential consumption according to budget documents, to which GHS 150 076 365 have been allocated;
- The COVID-19 subsidies of GHS 1 155 959 031 (free electricity for lifeline consumers, 50% relief on electricity bill for other customers) have been allocated to all residential and non-residential consumption ;
- The payment of power utility debts was assumed to cover operational losses and benefits, and interpreted as a general subsidy for electricity output;

⁵⁵ [2021 Budget Statement and Economic Policy](#)

⁵⁶ [2021 Mid Year Review Statement](#)

⁵⁷ [2020 ESLA Report v3.pdf \(mofep.gov.gh\)](#)

- Per litre subsidies of fuel oil and gasoline for fishing are the ones from NPA prevailing on 16/12/2020⁵⁸ and benefit all fuel oil and all premix.

⁵⁸ [NPA - Price Build-Up](#) To be coherent with other countries' subsidies recorded in the base we look at 2020 subsidies

Greece

Taxes on energy use and greenhouse gas (GHG) emissions

Energy taxes in Greece are levied within the framework of the 2003 EU Energy Tax Directive, which sets minimum rates for the taxation of energy products in member states. As at 1 April 2021, the main taxes on energy use in Greece, are the following:

- The Special Consumption Tax ((SCT) – *Ειδικός Φόρος Κατανάλωσης (Ε.Φ. Κ.)*) classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to liquid fuels including biodiesel, LPG, natural gas and coal. Fossil fuels that are used in industrial processes are not taxed if the conditions for non-taxation of the EU Energy Tax Directive are fulfilled (electrolytic processes, etc.). Commercial aviation and marine fuels (commercial navigation) are not subject to the SCT.
- The Special Consumption Tax also applies to specified forms of electricity consumption, classified as an electricity excise tax according to the TEU methodology in this case. User-specific rate reductions and exemptions may apply.

Greece does not have a fuel-based carbon tax and does not tax GHG emissions directly.

However, Greece participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- In road transport, biodiesel is taxed at the same rate as its fossil fuel equivalent. LPG is taxed when used as a motor fuel, although natural gas is not.
- Railway transport fuels are taxed as motor fuels.
- Diesel and kerosene used in private pleasure craft and private planes are taxed (not modelled in TEU due to a lack of consumption data).
- Refinery gas is not taxed when the consumption takes place within the curtilage of an establishment producing energy products.
- Diesel used for stationary combustion engines of industries, hotels, hospitals and welfare institutions benefit from a refund of EUR 125 per 1000 litres compared to motor diesel.
- Natural gas consumed in stationary combustion engines is subject to excise taxes that differ by annual consumption level in gigajoules. The unweighted average of the applicable excise tax rates is estimated as EUR 0.6 per gigajoule as the rate applied to natural gas consumed for such purpose in the database.
- Diesel used for fishing purposes is not taxed.
- During the winter period in Greece (October 15th through April 30th each year), a reduced rate of EUR 280 per 1000 litres is applied to diesel and kerosene used for heating purposes. It is assumed that practically all diesel for heating consumption is taxed at this rate.
- Electricity is untaxed when used for agriculture and fishing purposes or for certain energy intensive industrial processes like chemical reduction, electrolytic and metallurgical processes.
- The SCT on electricity output for high and medium-voltage business consumers is applied at a reduced rate to industry users that exceed 10,000 MWh of consumption. Due to lack of consumption data, TEU assumes that 10% of business and 50% of industrial electricity consumption are in the medium-high voltage over 10,000MWh per year band.
- Coal products and natural gas are not taxed when used to generate electricity but fuel oil, diesel and LPG are taxed.

Guatemala

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use in Guatemala are the following:

- The Tax on the Distribution of Crude Oil and Petroleum Derived Fuels (TDOPDF) or *Impuesto a la Distribución de Petróleo Crudo y Combustibles Derivados del Petróleo* in accordance with Decree 38-92. It applies to gasoline (super, regular and aviation), diesel and gas oil, naphtha, kerosene, jet kerosene and LPG.
- Public lighting fees are imposed on electricity consumption and set by the local municipalities. Due to variable rates between regions, these have not been modelled.

In addition, the standard 12% VAT rate applies to energy products (including biofuels) and both standard and social electricity tariffs in accordance with Decree 27-92. The TDOPDF does not form part of the VAT base. VAT is beyond the scope of the Taxing Energy Use and Effective Carbon Rates database.

Guatemala does not collect carbon taxes or taxes on other GHG emissions.

Guatemala does not have a GHG emissions trading system.

Table 4. Energy taxes on petroleum products in Guatemala

Expressed in Guatemalan Quetzal (GTQ) per product gallon.

Rates in GTQ per gal	Gasoline (super)	Gasoline (regular)	Diesel	Kerosene	LPG	RFO
TDOPDF	4.7	4.6	1.3	0.5	0.5	-

Note: One gallon (gal) is equivalent to 3.785 litres.

Source: Decree 38-92.

Energy use subsidies

The following subsidies on energy use were identified to be in operation in 2020:

Social tariffs are established for residential electricity consumers below the threshold of 88kWh per month, which was temporarily extended to 300 kWh in response to Covid-19⁵⁹. The cost of the program is paid by INDE with occasional contributions by the central government, as it was the case in 2020.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- All super gasoline is assumed to be consumed in the road sector and the split between regular and super is established using consumption data from the year 2021 (52% for regular gasoline). Regular gasoline is assumed to be consumed in other uses.
- The public lighting fees on electricity consumption have not been included due to data constraints.
- The social tariffs electricity subsidy is shown as a subsidy affecting all residential consumption due to lack of more granular data. Additionally, only the central government's transfer to INDE for partial compensation of the financial cost worth GTQ 630 million is considered.⁶⁰ The

⁵⁹ [How is the Contribution applied to the Social Tariff? – INDE](#)

⁶⁰ [MEM emphasizes that temporary contribution to social tariff was effectively executed – MEM](#)

remaining financial burden is not interpreted as a subsidy since INDE can recover the cost with operating revenues for its generation activities.

- Prices of fuels in the road sector are the average 15 March 2021 national prices for the self-service category.

Hungary

Taxes on energy use and greenhouse gas (GHG) emissions

Energy and carbon taxes in Hungary are levied within the framework of the 2003 European Union (EU) Energy Tax Directive, which sets minimum rates for the taxation of energy products in EU member states. Within this framework, as at 1 April 2021, the main taxes on energy use in Hungary are the following:

- Excise taxes (*jövedéki adó*) on energy products (*energiatermékek*) apply to liquid, gaseous and solid fossil fuels, as well as blended liquid biofuels and to electricity.
- The Strategic Stockpiling Fee (*tagi hozzájárulás a Magyar Szénhidrogén Készletező Szövetség részére*) additionally applies to gasoline, kerosene, diesel, fuel oil and natural gas use.

Hungary does not levy a fuel-based carbon tax and does not tax GHG emissions directly.

Hungary participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- The rate applied to fuel are that in the case of the world market price of crude oil exceeds US \$ 50 (USD)/ barrel ;
- Diesel used in agriculture, forestry and aquaculture is subject to excise taxes with a 82 % refund; diesel used for fishing (other than for private pleasure purposes) is untaxed;
- Biodiesel is taxed at the same rate as regular diesel. Bioethanol in E85 benefits from a reduced rate, otherwise bioethanol is taxed as an alcohol product at the normal tax rate.
- Diesel is untaxed when used for commercial navigation, commercial aviation (no reported use), or rail;
- Natural gas and coal used for residential heating are not taxed; LPG is exempted in case of residential and non-residential heating.
- Coal and coke-related gases are not taxed. In accordance with the Council Directive 2003/96/EC (Energy Tax Directive) natural gas used in pipeline transport is not taxed;
- Solid biofuel, biogases, other renewable and non-renewable waste are not taxed;
- Fossil fuels that are used in certain industrial processes are not taxed if the conditions for non-taxation of the EU Energy Tax Directive are fulfilled;
- In accordance with the Energy Tax Directive the fuels used to generate electricity are not taxed, but the electricity sector is covered by the EU ETS; Additionally, as a general rule, the electricity produced is taxed.
- Electricity used by households is exempted. Certain industrial process use (mineralogical process etc.) are also exempted. The use of electricity by businesses, on the other hand, is generally subject to an electricity tax. Electricity from industrial cogeneration is subject to the general electricity tax.

Due to data constraints, the following taxes, refunds or tax exemptions are not modelled:

- Diesel and kerosene used in private pleasure craft and private planes are taxed;
- The refund of HUF 103 per litre from the tax on diesel fuel used in floating machinery pursuant to the Water Transport Act for a person registered as an operator ;
- Reduced rate for natural gas used in public transport and for the purpose of transport in direct connection with discharging public service function. .

Iceland

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use and GHG emissions in Iceland are the following:

- The Oil tax (*olíugjald*), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to all automotive fuels, with the exception of gasoline.
- The General Excise Tax on Fuel (*almennt vörugjald af eldsneyti*) and the Special Excise Tax on Fuel (*sérstakt vörugjald af eldsneyti*) apply to gasoline.
- The Carbon Tax (*kolefnisgjald*) applies to mineral oils and natural gas, but does not apply to coal and other solid fossil fuels.
- A tax on fluorinated gas (*Skattlagning flúoraðra gróðurhúsalofttegunda*), classified as a carbon tax according to the TEU methodology, is levied on all fluorinated greenhouse gases (HFCs, PFCs and SF6) in proportion to their Global Warming Potential (GWP). The tax was introduced in 2020, with a transition period of 1 year when 50% of the full rate is payable.

A tax on hot water sold (*Skattur af heitu vatni*) applies at a rate of 2% of the retail sales price is out of TEU scope⁶¹.

Iceland participates in the European Union (EU) emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors. Energy use that is subject to the EU ETS is exempt from the carbon tax.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- The rate applied to gasoline for automotive purpose is that of unleaded fuel;
- The rate of the F-gas tax is approximately ISK 2 500 per tCO_{2e}, levied on a base of F-gas emissions of 0.3 million of tons of CO_{2e}.⁶²
- Biofuels and biogases are not taxed;
- Coal and other solids fossil fuels are untaxed;
- Geothermal and other renewables are not taxed;
- Mineral oils are submitted to excise tax only if used as propellants; fuels used for fishing and tractors are exempt from the excise tax, but the exemption for tractors is not modelled due to data constraints;
- On the contrary, carbon tax applies to mineral oils, LPG and natural gas for all uses except for activities covered by EU ETS. It is assumed that 10% of food industry and all the non-ferrous industry are covered by EU ETS;
- Aviation and navigation fuel are fully exempted from both carbon and fuel excise tax, but flights can be subject to the EU ETS;
- Fossil fuels used to generate electricity are subject to the carbon tax but their consumption is negligible. The electricity sector is also covered by the EU ETS. The consumption of electricity is not taxed.

⁶¹ This tax may correlate with energy use but as not imposed directly on the energy product and without fixed relationship to fuel volume (like an emissions-based carbon tax for example) it is out of TEU scope.

⁶² Latest estimations, 2018, CAIT. CAIT data: Climate Watch. 2020. GHG Emissions. Washington, DC: World Resources Institute. Available at: <https://www.climatewatchdata.org/ghg-emissions>

Due to data constraints, the following exemptions are not included:

- Fuel excise tax exemption for fuel used in special vehicles (fire trucks etc).

India

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use and greenhouse gas emissions in India, all classified as fuel excise taxes according to the Taxing Energy Use (TEU) methodology, are the following:

- As part of the central excise regime, the Basic Excise Duty (BED) applies to crude petroleum, aviation turbine fuel, petrol, diesel, natural gas and compressed natural gas.
- A Special Additional Excise Duty (SAED) and Additional Excise Duties (Road and Infrastructure Cess and Agriculture Infrastructure and Development Cess) additionally apply to gasoline and diesel fuel.
- All fuels subject to the BED, SAED, the Road and Infrastructure Cess and Agriculture Infrastructure and Development Cess are not subject to the Goods and Services Tax (GST) regime.⁶³ VAT/GST regimes are outside the scope of Taxing Energy Use.
- In 2017, the Government of India enacted the Integrated Goods and Services (IGST) Tax Act with the aim to simplify the tax code pertaining to the taxation of the inter-state supply of goods and services and of imports. However, this GST tax is not modelled because it is out of the scope of TEU.
- A GST Compensation Cess on coal, lignite and peat consumption replaced the Clean Energy (Environment) Cess in 2017⁶⁴, but maintained the same rate of Rs. 400 per tonne. It applies across all sectors, including when these fuels are used for electricity generation.

Electricity consumption is untaxed at the federal level, with responsibility for the structure and level of taxation lying at the state level.⁶⁵

India does not levy a fuel-based carbon tax and does not tax greenhouse gas emissions directly.

India does not operate an emission trading system for greenhouse gas emissions.⁶⁶

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- Concerning aviation turbine fuel, the BED is reduced to 2% (from 14%) when used for supply to schedule commuter airlines (SCA) from the regional connectivity scheme (RCS) airports. The lower ad-valorem rate is included in the database. An estimation of the rate per unit of fuel is based on the unweighted average price of aviation fuel used by domestic airlines across Delhi, Kolkata, Mumbai and Chennai in 2021 (at the time of writing, from January through April, amounting to Rs. 57.72 per kilolitre).
- Concerning CNG, an estimation of the rate per unit is based on the unweighted average price of CNG across Bangalore, Bharatpur, Dewas, Firozabad, Hyderabad, Mathura, Meerut, Mumbai, NCR, New Delhi, Rewari, Sonipat in 2021 (at the time of writing, from March and April, amounting to Rs. 54.99 per kilolitre).

⁶³ All BED, SAED, Road and Infrastructure Cess, Agriculture Infrastructure and Development Cess and IGST rates can be found online at <https://pib.gov.in/PressReleasePage.aspx?PRID=1656647>

⁶⁴ IISD. (n.d). The Evolution of the Clean nergy Cess on Coal Production in India. <https://www.iisd.org/system/files/publications/stories-g20-india-en.pdf>

⁶⁵ Not modelled due to data constraints.

⁶⁶ Gujarat state implemented a pilot particulate emissions trading scheme in 2019. However, as particulate matter emissions are not directly proportional to energy use or greenhouse gas emissions, this trading system does not fall within the scope of TEU 2022.

- It is assumed that CNG is only consumed in the road sector, and is the only type of natural gas used in the road sector.

Indonesia

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use and GHG emissions in Indonesia are the following:

- A provincial Motor vehicle fuel tax (*Pajak Bahan Bakar Kendaraan Bermotor* – PBBKB), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to premium gasoline (RON 88) and to diesel (diesel Solar) used in motorised vehicles.
 - The PBBKB is levied as an *ad-valorem* rate capped at 10% of the sale prices of motor fuels (by presidential decree). The majority of provinces apply a rate of 5%.

In addition, district governments levy the Street Lighting Tax on households, which corresponds to an electricity excise tax. In line with the TEU methodology, this subnational tax is not included in this database as it falls below the revenue threshold for subnational taxes.

Indonesia also levies a VAT at a standard rate of 10%, which for instance applies to aviation fuels. Following the TEU methodology, this is not included in the tax profile.

Indonesia does not levy a fuel-based carbon tax and does not tax GHG emissions directly.

In March 2021, Indonesia launched a trial emissions trading scheme (ETS) until the end of August, covering 80 coal power plants. This is not included in the database.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumption was made:

- North Sumatra increased their PBBKB rate on non-subsidised fuels from 5% to 7.5% in 2021, but due to data limitations at the regional level, a rate of 5% is applied on all motor fuel use. North Sumatra's population – a proxy for energy use - accounts for 5.38% of the national population.

Ireland

Taxes on energy use and greenhouse gas (GHG) emissions

Energy taxes in Ireland are levied within the framework of the 2003 EU Energy Tax Directive, which sets minimum rates for the taxation of energy products and electricity in member states. As at 1 April 2021⁶⁷, the excise duty on energy use in Ireland, were the following:

- The Mineral Oil Tax (MOT) applies to hydrocarbon oils, liquefied petroleum gas (LPG), natural gas used as a propellant⁶⁸, additives, and substitute fuels, i.e. any other liquid products used as fuel for motor or heating purposes including biofuel. MOT is composed of two components:
 - a non-carbon component, classified as a fuel excise according to the Taxing Energy Use (TEU) methodology, applies to all fuels subject to MOT. Currently there is no non-carbon component applied to kerosene and LPG used for non-propellant purposes;
 - a carbon component (“carbon tax”), applies to all fuels subject to MOT. On 1 April 2021, the carbon component on auto-fuels is based on charging EUR 33.50 per tonne of CO₂ emitted, with the carbon component on non-auto fuels increasing from EUR 26.00 to EUR 33.50 on 1 May 2021. The carbon component on auto-fuels increased to EUR 41.00 on 13 October 2021.
- Natural Gas Carbon Tax (NGCT) applies to natural gas consumption when used for non-propellant purposes. The NGCT rate is based on charging EUR 26.00 per tonne of CO₂ emitted when natural gas is combusted, increasing to EUR 33.50 on 1 May 2021.
- Solid Fuel Carbon Tax (SFCT) applies to coal, coke and peat products’ (solid fuels) consumption. The SFCT rate is based on charging EUR 26.00 per tonne of CO₂ emitted when solid fuel is combusted, increasing to EUR 33.50 on 1 May 2021.
- The Electricity Tax, classified as an electricity excise tax according to the TEU methodology, applies to electricity consumption.

Ireland participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors. Industries that participate in the EU ETS are eligible for:

- a partial relief from NGCT, or
- the carbon component of MOT, or
- a full relief from SFCT on peat, and a partial relief from SFCT on coal

as further discussed below.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- Diesel used for railway transport and industry is taxed at the rate of marked gas oil (MGO).
- Mineral oil used as fuel for commercial sea navigation, including sea fishing, and aviation kerosene used for commercial air navigation are relieved from MOT.
- Aviation gasoline used for commercial purposes benefits from a partial refund on the Non-Carbon Component of MOT.

⁶⁷ From 1 May 2021, the effective rates that relate to the amount charged per tonne of carbon dioxide (CO₂) emitted, increased from EUR 26.00 to EUR 33.50. This relates to the NGCT, SFCT and MOTCC on non-propellant fuels.

⁶⁸ As at 1 January 2017, natural gas used for propellant purposes (vehicle gas) is subject to MOT, not NGCT.

- Biofuel is subject to a relief from the carbon component of MOT.
- Natural gas supplied through pipelines is subject to NGCT, except for natural gas used as a propellant which is subject to MOT.
- In the industry sector, EU ETS participants can claim:
 - a partial relief on the SFCT paid on coal and coke products, and a full relief on SFCT paid on peat products,
 - a partial relief on the NGCT paid on natural gas,
 - a relief on the carbon component of MOT paid on mineral oils.
- Solid fuels, natural gas, and mineral oils used in chemical reduction, electrolytic and metallurgical processes benefit from a full tax relief.
- A partial relief from SFCT applies to biomass products⁶⁹. Any solid fuel product with a biomass content of 30 per cent or more is entitled to a partial relief depending on the biomass portion of the product.
- The portion of solid fuels and natural gas used to generate electricity in High Efficiency Combined Heat and Power (HE CHP) cogeneration plants benefits from a full tax relief⁷⁰. The portion of mineral oils used to generate electricity in HE CHP cogeneration plants is subject to a relief from the carbon component of MOT but no such use in CHP is reported by the IEA energy balances.
- Agricultural diesel is taxed at the rate applied to MGO.
- In the electricity sector, reliefs from fuel excise and carbon taxes apply to fuels used for electricity generation, but the sector is covered by the EU ETS.
- Electricity supply is taxed for business and non-business use (e.g. use by a public authority).
- Electricity consumption additionally benefits from a full tax relief when the electricity is:
 - for household use;
 - generated from renewable energy sources:
 - solar, wind, wave, tidal or geothermal origin
 - of hydraulic origin produced in a hydroelectric installation,
 - generated from biomass or from products produced from biomass,
 - generated from fuel cells;
 - comes from High Efficiency Combined Heat and Power cogeneration;
 - used for chemical reduction, electrolytic and metallurgical processes;
 - produced on board navigation vessels;
 - used for the production of electricity, or connected to such production.
- Electricity used by the electricity industry (own use & distribution losses)
 - Electricity supplied by a supplier, for own use, where the average quantity in a calendar year is under 50 megawatt hours is not subject to Electricity Tax;⁷¹
 - Distribution losses are not subject to Electricity Tax.
- Due to data constraints, the following partial tax relief schemes from MOT are not included in the database:
 - The Diesel Rebate Scheme;
 - The partial repayment on heavy oil used in horticulture.

⁶⁹ From 1 November 2016, partial relief from SFCT on biomass products is available. TEU assumes that the biomass content is relieved.

⁷⁰ TEU assumes that all CHP is high efficiency.

⁷¹ TEU assumes all such own use is below 50MWh.

Israel

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use and GHG emissions in Israel, are the following:

- Excise taxes (דלק על הבלוי), classified as fuel excise taxes, according to Taxing Energy Use (TEU) methodology, apply to gasoline, diesel LPG, coal, fuel oil and natural gas.

Israel does not levy a fuel-based carbon tax and does not tax GHG emissions directly.⁷² Israel does not operate an emission trading system for greenhouse gas emissions.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- A refund is granted for diesel at a rate equivalent to 40% of the excise rate for trucks and buses, 50% for agriculture and building, and 69% for industry and fishing boats; which leads to effective rates of respectively 60%, 50% and 31% of the standard rate;
- Energy use other than from gasoline, diesel, kerosene, LPG, coal or petroleum coke, fuel oil and natural gas is exempted;
- Petroleum coke is taxed as the same rate as coal;
- Especially, jet kerosene, refinery gas, biogas, solid biofuels and other renewables are not taxed;
- The fuels used to generate electricity are taxed at the same general rates as the fuels used in other sectors. Electricity consumption is not taxed.

Due to data constraints, the following refunds or tax exemptions are not included in the Taxing Energy Use (TEU) database:

- Diesel reductions for commercial drivers, including trucks and buses, as well as agriculture and building;
- Liquid biofuels taxed at reduced rates (biogasoline M15 or locally produced biodiesel) are not modelled as no biofuel consumption is reported in the IEA energy balances.

⁷² The government of Israel has announced plans to introduce a carbon tax from 2023 <https://www.timesofisrael.com/israel-to-impose-carbon-tax-starting-with-fossil-fuels/>

Italy

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use and greenhouse gas (GHG) emissions in Italy are the following:

- An excise tax on energy, *Ufficio accise sui prodotti energetici e alcolici*, classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to diesel, gasoline, fuel oil, LPG, natural gas and coal and coke. Fuels used to generate electricity are also taxed, but at substantially lower rates.
 - Gasoline and diesel in road transport are taxed at the highest rates per unit of energy and gasoline is taxed at a higher rate than diesel.
 - Bio-gasoline and biodiesel are taxed at the rate of the respective road transport fossil fuel.
 - Fuels used in agriculture and railways pay lower rates while fuels used for domestic navigation (“marine”), commercial aviation and fishing are not taxed in Italy.
- In addition, electricity consumption is in principle subject to an electricity excise tax (per MWh)

Energy taxes in Italy are levied within the framework of the 2003 EU Energy Tax Directive, which sets minimum rates for the taxation of energy products in member states.

Italy does not levy a fuel-based carbon tax and does not tax GHG emissions directly. However, Italy levies a tax on nitrogen oxides (NO_x)⁷³ and sulfur dioxide (SO₂) emissions, which out of TEU scope.⁷⁴

Italy participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumption were made:

- In electricity, the rate is generally higher for non-business use, and lower for business use. Large business users additionally benefit from lower rates for higher consumption volumes. These reduced rates for large users are not modelled due to data constraints.
- Large-scale residential electricity consumption, with a power capacity exceeding 3 kW and monthly consumption greater than 150 kWh, is assumed to apply to 56% of total residential electricity consumption. Small-scale residential electricity consumption is untaxed.
- The taxation of natural gas use by households in Italy is differentiated by consumption level. TEU models these rates based on 2020 consumption data provided by the Italian administration (including . reduced rates paid by households in Southern Italy).
- Due to data constraints, the following tax exemptions and allowances are not included in the Database:
 - The exemption from excise on electricity produced by RES in plants with a capacity up to 20 kW for self-consumption is not modelled due to data constraints
 - According to the Italian catalogue of environmentally friendly subsidies and environmentally harmful subsidies, diesel fuel used for freight and passenger transport benefits from a refund under certain conditions.

⁷³ While N₂O is a direct GHG, it is assumed to not be covered by the tax.

⁷⁴ At the rates of € 209 per ton/year and € 109 per ton/year respectively foreseen by the law 26/12/2007, n. 244, art. 2, co. 385. The tax was established by law no. 449 and must be paid on the emissions of these substances emitted by combustion plants with rated thermal power equal to or greater than 50 MW.

Jamaica

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use in Jamaica are the following:

- The Special Consumption Tax (SCT) applies to certain petroleum products.⁷⁵ More specifically, gasoline, diesel, kerosene, fuel oil, LPG and natural gas are subject to SCT. The SCT on oil products comprises a specific and an ad valorem rate.

For reference, the standard General Consumption Tax (GCT) rate in 2021 in Jamaica is 15%. The GCT is imposed on residential electricity unless consumption is below 150 KWh per month, in which case no rate would be charged. Note that petroleum products are exempt from GCT but tobacco and alcohol, which also attract SCT specific rates, are not. GCT rate are out of scope of the database.

Jamaica does not collect carbon taxes or taxes on other GHG emissions.

Jamaica does not have a GHG emissions trading system.

Table 5. Energy taxes on petroleum products

Expressed in JMD per product L.

Rates in JMD per L	Diesel (road)	Diesel (non-road)	Fuel oil	Gasoline 87	Gasoline 90	Aviation gasoline	Kerosene	Natural Gas	LPG
Special consumption tax	32.485	38.115	9.361	37.776	38.149	63.571	17.415	4.99	5.906

Source: Revenue measures

Energy use subsidies

No subsidies on energy use were identified to be in operation in 2020.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- The specific rates of the Special Consumption Tax (SCT) have been recorded. The ad valorem part of the SCT on oil products is treated as a general, not energy specific, tax and is therefore not taken into account.
- Gasoline consumed in agriculture, industry and residential uses is assumed to be gasoline 87 (octanes) and attract the same tax rate as in the road sector. All gasoline 90 is assumed to be consumed in the road sector and account for 45.2% of its consumption, with gasoline 87 comprising the rest. The share is derived after adjusting for non-road consumption the 2018 share of gasoline 87 according to data from the Ministry of Science, Energy and Technology (published in 2019).
- Prices for fuels are 1 April 2021 retail prices from Petrojam, with GCT removed.

Due to data constraints, the following tax rates or subsidies are not included in the Taxing Energy Use (TEU) database:

- Exemption for gasoline consumed in fishing.

⁷⁵ It also covers alcoholic beverages and most tobacco products.

Japan

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use and GHG emissions in Japan were the following:

- The Petroleum and Coal Tax applies to fossil fuels, consisting of crude oil, coal, oil products imported, and hydrocarbon-based gases, including those fuels used for electricity generation. The Tax has a carbon tax component (Tax for Climate Change Mitigation) with a nominal tax rate of JPY 289 (~EUR 2.20) per tonne of CO₂. Japan does not levy other taxes on greenhouse gas emissions.
- The Diesel Oil Delivery Tax, classified as a fuel excise tax according to the Taxing Energy Use methodology, additionally applies to diesel used in road transport;
- The Gasoline Tax and the Local Gasoline Tax, classified as fuel excise taxes according to the Taxing Energy Use methodology, additionally apply to gasoline used in road transport;
- The Oil Gas Tax, classified as a fuel excise tax according to the Taxing Energy Use methodology, additionally applies to LPG used in road transport;
- The Aircraft Fuel Tax, classified as a fuel excise tax according to the Taxing Energy Use methodology, additionally applies to aviation fuels used domestically;
- The Power Development Promotion Tax, classified as an electricity excise tax according to the Taxing Energy Use methodology, additionally applies to electricity sold.

Emissions trading system (ETS) exist at the subnational level.

Japan's prime minister has asked two different ministries, the Ministry of the Environment and the Ministry of Economy, Trade and Industry, to develop and propose a carbon pricing mechanism that can contribute to growth in co-operation. The Ministry of the Environment resumed discussions at the Subcommittee on Utilization of Carbon Pricing on 1 February 2021. The Ministry of Economy, Trade and Industry started a carbon pricing study group in mid-February 2021.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- The exemption on aviation fuel tax consumed in Okinawa was not modelled due to data constraints.
- Imported coal is exempt from the petroleum and coal tax if it is used in power generation in the Okinawa prefecture, or for generating power for producing sodium hydroxide in sodium hydroxide plants, or for generating power for producing salt through ion-exchange membrane method in salt manufacturing plants. Due to data limitations, these exemptions are not modelled in TEU.

Kenya

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use in Kenya are the following:

The excise duty on petroleum products as set out in the Excise Duty Act of 2015 applies to several product categories like alcohol, cigarettes, cosmetics, motor vehicles and fuels. The duty on petroleum products covers diesel, gasoline, aviation gasoline, fuel oil, kerosene and jet kerosene.

The Road Maintenance Levy (RML) applies to automotive gasoline and diesel as stipulated in Road Maintenance Levy Fund Act of 1993.

The Petroleum Development Levy (PDL) and Petroleum Regulatory Levy (PRL) are modest charges that apply to all petroleum products and natural gas at the same flat rates.

The Energy Regulatory Commission Levy (ERCL) is levied on each kWh of consumed electricity and is passed to ERPA – formerly ERC.

The Rural Electrification Projects Levy (REPL) is passed on to the Rural Electrification Authority (REA).

Kenya does not collect carbon taxes or taxes on other greenhouse gases emissions.

Kenya does not have a GHG emissions trading system.

Table 6. Energy taxes on petroleum products in the Kenya as at 1 April 2021

Expressed KES in per 1000 L, or 1000 KG for LPG	Automotive gasoline	Aviation gasoline	Kerosene	Automotive diesel	Industrial diesel	Fuel oil	LPG
Excise duty	✓ 21 253	✓ 21 953	✓ 11 371	✓ 11 371	✓ 4 083	✓ 331	X
Road maintenance levy	✓ 18 000	X	X	✓ 18 000	X	X	X
Petroleum development levy	✓ 5 400	✓ 5 400	✓ 400	✓ 5 400	✓ 5 400	✓ 400	✓ 400
Petroleum regulatory levy	✓ 250	X	✓ 250	✓ 250	✓ 250	X	X

Source: EPRA pump prices; Legal notice n° 194 of 2020 (excise); legal notice n° 174 of 2020 (PDL); legal notice n°162 of 2018 (PRL); legal notice n° 123 of 2016 (RML)

Energy use subsidies

The following subsidy on energy use was identified to be in operation in 2020:

An LPG subsidy program targets low-income households with the aim of reducing dependence on kerosene, firewood and charcoal and promote access to clean cooking. The amount was KES 349 700 000 for FY 2020/2021 according to budget documents⁷⁶.

⁷⁶ [FY-2020-21-Programme-Based-Budget-Supplementary-II.pdf \(treasury.go.ke\)](#)

It is worth noting that the government has budgeted for rural electrification and connection of public facilities, for the national street lightning programme and extending a connectivity subsidy. These transfers are not proportional to energy use and hence beyond the scope of this database.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- It is assumed that all gasoline consumed in the road transport sector is of type premium. Regular gasoline is consumed in the remaining uses.
- Diesel used for railway is assumed to be taxed as diesel for road, except it is not concerned by road maintenance levy.
- The REPL of 5% is levied as a percentage on the cost of the units of power consumed by a customer. The Small Commercial (SC) energy charge per kWh applicable in April 2021, roughly equal to the standard domestic category, was used to approximate the average cost due to lack of more granular consumption data.
- The subsidy per unit of LPG was calculated by allocating the total amount in financial year 2020-2021 energy use data across all residential consumption.

The following levies were not modelled:

- An anti-adulteration levy for kerosene was introduced with the 2018 Finance Act. Kerosene and diesel have comparable prices in international markets but the differential tax treatment in Kenya, before the levy, resulted in a lower price for kerosene, which led to fraudulent mixing of kerosene with diesel, particularly in road transport.
- A Railway Development Levy (RDL) is levied as a percentage (2% in 2021) of the customs value of goods imported into the country in line with the Miscellaneous Fees and Levies Act, 2016 (MFLA). As an ad-valorem levy contingent on prevailing prices and covering a broad range of products, it does not qualify as a specific energy tax and is not included in the analysis.
- It is also worth noting that petroleum products were exempt from VAT under a transitional period which was extended to 2018 under the VAT Act of 2013. Following the expiration of this exemption and the high burden caused by increased excise rates, the VAT rate was introduced at the rate of 8%, half the standard rate of 16% and its base adjusted (excluding excises, levies and fees) with the 2018 Finance Act. However, the adjusted base was reviewed to include excluding excises, levies and fees, through the Finance Act, 2020. In the electricity sector, a 16% VAT applies on the total amount of the bill. VAT rates are not covered in the database.
- A Merchant Shipping Levy of KSH 0.03 per litre and an Import declaration fee of 2% also apply to fossil fuels products but are not covered. These taxes not included in TEU.
- Regarding electricity, others charges are not included, such as the Fuel cost charge.

Korea

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use and greenhouse gas (GHG) emissions in Korea are the following:

- The Individual Consumption Tax (개별소비세 – ICT), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to kerosene, heavy fuel oil, propane gas, butane gas and natural gas. Bituminous coal used for electricity generation is also subject to this tax while solid fossil fuels used for other purposes are untaxed.
- The Transportation-Energy-Environment tax (교통·에너지·환경세 – TEET), classified as a fuel excise tax according to the TEU methodology, applies to gasoline and diesel at uniform rates of KRW 529 per litre and KRW 375 per litre, respectively. These rates are specified by Presidential Decree. Biodiesel is untaxed.
- The Education Tax, classified as a fuel excise tax according to the TEU methodology, applies to kerosene, heavy fuel oil and butane gas at a rate of 15% of the ICT tax on liquid fuels and 30% of the ICT tax on gaseous and solid fuels. The Education tax also applies to gasoline and diesel at a rate of 15% of the TEET.
- The Local Automobile Tax (자동차세) also applies to gasoline and diesel at a rate of 26% of the TEET rate.
- Korea does not levy a tax on electricity output, but natural gas and bituminous coal used to generate electricity are taxed. Natural gas used to generate electricity is taxed at a higher rate than when used for other purposes.

Korea does not levy a carbon tax on GHG emissions.

Korea operates a national emissions trading system (ETS) for GHG emissions.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- The excise tax rate applied to LPG for propellant purposes is that of butane gas (which is subject to the Education tax), whereas the excise tax rate applied to LPG consumed for all other purposes is that of propane gas (which is not subject to the Education tax).
- The excise tax rate on bituminous coal used for electricity generation differs according to its net calorific value. The unweighted average of all available rates is included in the database (KRW 46 per kilogramme of bituminous coal).
- A reduced ICT rate of 8.4 won/kg also applies to natural gas rate for electricity generation consumed by integrated energy suppliers, new and renewable energy suppliers and persons setting up electric installations for private use, but is not modelled due to data constraints.

Kyrgyzstan

Taxes on energy use and greenhouse gases

As at 1 July 2018 and 1 April 2021, there is a single specific tax on energy use in Kyrgyzstan:

- The excise duty (акцизный налог) applies to gasoline, diesel, fuel oil, jet kerosene, and since 2020 to lubricant.

No tax on electricity consumption have been identified.

In addition, it is worth noting that there a standard 12% VAT rate applies to energy products, except for residential electricity. VAT rates are not included in the database.

Kyrgyzstan does not collect carbon taxes or taxes on other greenhouse gases emissions.

Kyrgyzstan does not have a GHG emissions trading system.

Table 7. Energy taxes on petroleum products

Rates in KGS per 1000 KG	Gasoline	Diesel	Fuel oil	Jet kerosene	Lubricant
Excise duty - 2018	5 000	800	1 000	2 000	0
Excise duty - 2021	10 000	2 000	2 000	2 000	2 000

Source: Tax code, art. 287.

Energy use subsidies

The following subsidies on energy use were identified to be in operation in 2018 and 2020:

- The electricity tariffs are set below the cost of production, which translates into consumer subsidies. This is finance by higher exports prices⁷⁷.
- The government may set ceiling for retail prices of energy products during the winter, such as for coal and heating oil (fuel oil) in 2020/2021⁷⁸.

It is also worth noting that there are also electricity cross-subsidized tariffs between residential consumers, which pay only 41% of the cost, and large residential consumers and non-residential consumers. This kind of cross-subsidies is not taken into account, according to TEU methodology.

Country specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- Electricity subsidies are modelled by using IMF price gap data. The other price gap recorded by IMF for Kyrgyzstan are not taken into account as no underlying administrative measures to lower the prices have been found.⁷⁹ No estimates have been found on the impact of ceiling for retail prices of energy products during the winter.

⁷⁷ <https://pubs.naruc.org/pub.cfm?id=53867743-2354-D714-5185-3C1CE75E8EA7> ; Kyrgyz Republic: Selected Issues in: IMF Staff Country Reports Volume 2019 Issue 209 (2019)

⁷⁸ Antimonopoly Regulation Service under the Ministry of Economy and Commerce of the Kyrgyz Republic (antimonopolia.gov.kg) ; Antimonopoly Regulation Service under the Ministry of Economy and Commerce of the Kyrgyz Republic (antimonopolia.gov.kg)

⁷⁹ IEA documentation on prices and tax mentioned that oil products prices are liberalized. [EPT_Documentation.pdf \(windows.net\)](#)

- Coal, natural gas and LPG are not explicitly mentioned in the tax code under section X on excise duty. They are assumed to be untaxed. The taxation of natural gas condensate has not been modelled so far as it could not be linked directly to a category in IEA energy balance.
- Excise tax is assumed to be levied at the same rate for all type of consumption, whether in the residential, commercial, industrial or energy and heat generation sectors. No exemptions were recorded.

Latvia

Taxes on energy use and greenhouse gases

Energy and carbon taxes in Latvia are levied within the framework of the 2003 European Union (EU) Energy Tax Directive, which sets minimum rates for the taxation of energy products in EU member states. Within this framework, as at 1 April 2021, the main taxes on energy use in Latvia are the following:

- Excise taxes (*akcīzes nodoklis*) apply to mineral oils and natural gas. Certain uses benefit from reduced rates or are tax exempt as further discussed below.
- The procedure of taxation applicable for coal, coke and lignite is prescribed by the *Natural Resources Tax Law*. In TEU this tax is classified as a fuel excise tax. Coal utilised for electricity production and combined heat-power production is tax exempt.
- The electricity tax (*elektroenerģijas nodoklis*) applies to electricity consumption. The carriage of goods and public carriage of passengers, including on rail transport and in public carriage of passengers in towns, household users, and street lighting services are tax exempt.
- The taxation procedure of CO₂ emissions in combustion installations that fall below the threshold for inclusion in the EU emissions trading system (ETS) is prescribed by the *Natural Resources Tax Law* (see below). Such are taxed at a rate EUR 12 per tonne of CO₂, unless installations are using renewable energy or peat. In TEU this tax is classified as an explicit carbon tax.
- Taxation applicable for the use of water for electricity production in hydropower plants (HPP). All HPP are taxed at a rate of 0.00853 EUR per 100 m³ water flow through the hydro technical construction. However, as it was not possible to translate this tax into a rate per unit of energy use, it was decided, in consultation with country delegates, to not include the tax in TEU.
- Taxation of volatile organic compounds and other hydrocarbons (C_nH_m) prescribed by the *Natural Resources Tax law* is assumed not to cover methane emissions.

Latvia participates in the EU ETS. The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

Latvia also taxes the extraction of local natural resources, in particular peat. In line with the TEU methodology, such taxes are not included. Note that peat production in Latvia is minimal.

Latvia levies car-registration and car-circulation taxes, the rate of which is based on their CO₂ emissions or motor volume for older cars. These taxes are outside the scope of TEU and not included. Taxes on waste disposal are also out of TEU scope.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- Fuels used for commercial navigation (“marine”) and commercial aviation (no use reported) are untaxed;
- Fishing fuels are not taxed;
- Natural gas is taxed if used as propellant, but there is a reduced rate if used in the agriculture sector for providing heat for greenhouses, industrial scale henhouses/sheds

and incubators. TEU assumes that all natural gas use in the agricultural sector benefits from the reduced rate;

- Pure biodiesel and blended biogasoline (E85) benefit from a reduced rate ;
- Solid biofuels and biogases are not taxed ;
- Fossil fuels are generally not taxed when used by households for non-transport purposes;
- Combustion installations that are not part of the EU ETS are additionally subject to the CO₂ tax. The CO₂ tax applies to all fossil fuels except peat and renewable energy;
- Natural gas is exempted for dual use and mineralogical processes; It is taxed when used for electricity generation. Coal and coke and mineral oils are exempted if used in combined heat and power plants;
- Fossil fuels used to generate electricity for sale generally benefit from exemptions from excise taxes and the Natural Resources Tax Law. However, the electricity sector is covered by the EU ETS;
- The use of electricity is subject to a tax if the electricity is used by businesses. Electricity from autonomous producer plants is generally subject to the electricity tax. Electricity used by households is not taxed. As is standard, electricity exports are not subject to the electricity tax in Latvia, but may be subject to electricity taxes elsewhere.

Due to data constraints, the following refunds or tax exemptions are not included in the Taxing Energy Use (TEU) database:

- Fossil fuels used in private pleasure aviation or navigation are taxed but not modelled in TEU due to a lack of consumption data.

Lithuania

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use in Lithuania are the following:

- Excise duties, classified as fuel excise tax according to the Taxing Energy Use (TEU) methodology apply to liquid, and solid fossil fuels, including lubricating oils, LPG and natural gas;
- A levy on electricity consumption by end users, classified as an electricity excise tax according to the TEU methodology.

Energy taxes in Lithuania are levied within the framework of the 2003 European Union (EU) Energy Tax Directive, which sets minimum rates for the taxation of energy products in EU member states.

Lithuania does not levy a fuel-based carbon tax and does not tax GHG emissions directly. However, Lithuania participates in the EU emissions trading system (ETS).

Country specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- The rate applied to gasoline for automotive purpose is that of unleaded gasoline;
- Biofuels complying with the applicable European Standards (EN 14214 and CEN/TS 15293) benefit from an excise duty exemption.⁸⁰ TEU assumes that 100% of biodiesel are taxed and 99% of biogasoline are taxed whereas 1% is E85 petrol and therefore untaxed.
- Fuel used for commercial aviation and navigation is exempted. Diesel used in private pleasure aviation or navigation is taxed but not modelled in TEU due to a lack of consumption data.
- Municipal waste, solid biofuels and other renewables are not taxed.
- Diesel used in the agriculture and fisheries benefit from a reduced excise duty.
- Fossil fuels that are used in industrial processes are not taxed if the conditions for non-taxation of the EU Energy Tax Directive are fulfilled.
- LPG for domestic use is untaxed; Natural gas supplied to households and aid receivers, used as propellant, as well as used in combined heat and power (CHP) plants is exempt from the excise duty. Due to data constraints, the exemption for aid receivers' natural gas consumption is not modelled. In commercial and public sectors, 6% of the consumption is assumed to be at the non-business rate, which leads to an overall share of 1% of natural gas effectively taxed at non-business rate.
- The fuels used to generate electricity are not taxed, but the electricity sector is covered by the EU ETS.
- The use of electricity, on the other hand, is generally taxed. Electricity from industrial cogeneration is subject to the general electricity tax. In commercial and public services sector, the consumption is assumed to be taxed at 2% at the non-business rate and at 98% at business rate, which leads to an overall share of 1% of electricity effectively taxed at non-business rate.
- Electricity is exempted for households' and aid receivers' consumption, for certain uses (chemical, electrolysis, metallurgical), and when produced from renewable sources. Due to data constraints, the exemption for aid receivers' electricity consumption is not modelled. All electricity generated from wind, hydro, solar, solid biomass or biogas is therefore assumed to be untaxed.

⁸⁰ The excise duty rate of the blended fuel is reduced in proportion to the percentage of additives of biological origin in the product.

- As is standard, electricity exports are not subject to the electricity tax in Lithuania, but may be subject to electricity taxes elsewhere.

Luxembourg

Taxes on energy use and greenhouse gas (GHG) emissions

Energy taxes in Luxembourg are levied within the framework of the 2003 European Union (EU) Energy Tax Directive, which sets minimum rates for the taxation of energy products in EU member states. Within this framework, as at 1 April 2021, the main taxes on energy use in Luxembourg are the following:

- The energy tax applies to mineral oils, natural gas and coal. Mineral oils, bituminous coal and coke and LPG are subject to excise tax (*droit d'accise*) prescribed by Belgian law, plus autonomous excise tax (*droit d'accise autonome*) and additional autonomous excise tax (*droit d'accise autonome additionnel*) fixed by Luxembourg. Another excise duty applies to natural gas (*taxe sur la consommation de gaz naturel*). These taxes have been classified as fuel excise taxes according to the Taxing Energy Use (TEU) methodology.
- Electricity consumption (*taxe sur la consommation d'électricité*) is taxed at a lower rate when used in the industry sector than when used in the residential sector.
- An explicit carbon tax (*taxe CO₂*) has been introduced starting from 2021 at a nominal rate of EUR 20 per tonne of CO_{2e}⁸¹ and set to increase by EUR 5 in the two subsequent years. It applies to mineral oils, LPG and natural gas.

Luxembourg does not levy a direct tax on other GHG emissions (such as F-gases or N₂O).

Luxembourg participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

Country specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- The rate applied to gasoline and diesel for automotive purpose is that of gasoline and diesel with sulphur content equal to or less than 10 mg/kg; notice that a large part of energy use reported in the road sector is due to fuel tourism/transit traffic. A substantial share of fuel use in road transport is in reality consumed in neighbouring countries, but allocated to Luxembourg in the energy balances (and TEU) because Luxembourg is where the fuel is sold. Natural gas in road is tax exempt, but the IEA's extended world energy balances report no such use for the road sector in Luxembourg.
- In the road sector, biofuels are taxed at the same tax rates as their fossil fuel equivalents but exempt from the carbon tax;
- Biogases, waste, solid biofuels and other renewables are not taxed ;
- Diesel consumed by railways is not taxed ;
- Bituminous coal and coke products are taxed only for business heating ;
- Autonomous excise taxes (including additional ones) and carbon taxes are levied on domestic aviation fuel. Note that only aviation gasoline use is reported in the IEA energy balances and this would be taxed at the rate of leaded petrol.
- All fossil fuel (including natural gas) and electricity consumption for agriculture are untaxed.
- The carbon tax does not apply to mineral oils, LPG and natural gas used in activities covered by ETS ; the share of activities covered by ETS are estimated at a combined 81% in the industry sector⁸².

⁸¹ The nominal rate for gasoline and diesel however is above EUR 30 per tCO_{2e}.

<https://douanes.public.lu/content/dam/douanes/fr/accises/Taux-Accises-LU-2021-123.pdf>

⁸² OECD (2021), Effective Carbon Rates 2021: Pricing Carbon Emissions through Taxes and Emissions Trading, OECD Publishing, Paris, <https://doi.org/10.1787/0e8e24f5-en>.

- Rates for natural gas vary depending on the consumption volume. However, since data on natural gas consumption volumes were not available, TEU assumes that Category C1 applies to all non EU ETS business heating, and all non EU ETS industry activities, in order to be comparable with the Category C1 bis which concerns all activities covered by ETS. Category A is assumed to apply to non-business heating.
- Fuels are not taxed when used: (i) in combined heat and power (CHP) or auto-producer electricity plants; (ii) as electricity inputs ;
- Electricity consumption is generally subject to an electricity excise tax (per MWh). Electricity produced by auto-generation plants are generally subject to electricity excise taxes under the same conditions as main-producer electricity plants. The rate is higher for non-business use, and lower for business use. However, both rates correspond to the minimum admissible under the Energy Tax Directive. Own use by the electricity industry is not taxed, and neither are exports, which may, however, be subject to electricity taxes in other countries ;
- Rates for electricity vary depending on the consumption volume. However, since data on electricity consumption volumes was not available, TEU assumes that category B applies to all business use and category A to all non-business use.
- The public service obligation compensation mechanism (*Mécanisme de compensation pour obligation de service public*) that compensates electrical companies for the obligation to purchase all electricity produced from renewable sources or high efficiency CHP units is considered outside the scope of the database.

Madagascar

Taxes on energy use and greenhouse gas (GHG) emissions

The following energy consumption taxes were in effect as at July 1, 2018 and April 1, 2021 in Madagascar:

- The tax on petroleum products (TPP) is levied on imports of aviation gasoline, motor gasoline, kerosene, jet kerosene, gas oil, fuel oil, GLP, and natural gas. It is classified as an "excise tax on motor fuels and combustibles" according to the Taxing Energy Use (TEU) methodology.
- Several other taxes are levied on petroleum products and classified as "excise duties on motor fuels and combustibles":
 - The tax for the environment fund and the fee for the Malagasy hydrocarbon office (OMH), levied on the consumption of butane, aviation gasoline, motor gasoline (supercarburant and gasoline), kerosene (kerosene), jet kerosene, gas oil (gas-oil), fuel oil and naphtha.
 - The tax for the road maintenance fund (FER), levied on the consumption of motor gasoline and diesel only.
- A fee for the National Sustainable Energy Fund is levied on electricity consumption at a rate of 1.25%. It is classified as an electricity excise tax.

Madagascar does not have a carbon tax as such, nor does it have a CO₂ emissions trading scheme. Madagascar has no taxes on other greenhouse gas emissions (such as fluorinated gases or nitrous oxide).

Table 8. Energy taxes on petroleum products in Madagascar as at 1st July 2018 and 1st April 2021

Rates MGA litre	in per	Gasoline (super carburant)	Kerosene (pétrole lampant)	Diesel	LPG	Fuel oil	Natural gas	Jet kerosene
Tax on petroleum products		503	10	228	123	128	120	118
Tax for the environment fund		1	1	1	1	1		1
Levy for OMH		8,6	8,6	8,6	8,6	8,6		8,6
Tax for the road fund		288		129				

Source: tarif des douanes (TPP), Arrêté 26 avril 2018 fixant les modalités de perception et de recouvrement ainsi que le régime des droits et avances dus à l'OMH (taxes pour le fonds environnement et redevant OMH), arrêté N° 16036 /2017 du 05 juillet 2017 relatif au mécanisme d'ajustement automatique des prix maxima affichés à la pompe (taxe pour le FER).

Energy use subsidies

The following energy consumption subsidies have been identified as being in effect in 2018 and 2020:

- The government establishes price ceilings for motor gasoline (premium fuel), kerosene (kerosene), and diesel fuel (gas oil). This results in an implicit subsidy to the consumer when selling prices are below real costs due to international prices. The government has therefore incurred arrears of payment to the oil companies, which have been financed in recent years by issuing special treasury bills (BTS-CP). This debt has been at least partially repaid thanks to low international prices in 2020 and unchanged ceiling prices. Until 2019, the OMH specified the adjustment made to retail prices in relation to the reference price.
- Electricity production is also subsidized, due to the recurrent deficit of Jirama, the state-owned company in charge of electricity. The government finances it directly through budget transfers and indirectly by absorbing its debts as a shareholder. A subsidy of MGA 309 billion is mentioned in the rectifying finance law for 2018.

Country-specific assumptions

In linking the above taxes to the corresponding tax bases, the following country-specific assumptions were made:

- Subsidies for motor gasoline, kerosene, and diesel recorded for 2018 are those listed in the OMH "Price Structure" publication dated June 2018.
- Coal and hard coal are not explicitly mentioned in the law, so it is assumed that their consumption is not taxed.
- The tax on electricity consumption was applied to Jirama's prices for the residential BT category PS = 3 kW zone1 of July 1, 2018.
- Taxes on petroleum products are supposed to be levied in a similar way for any type of consumption, whether residential, commercial, industrial, or even electricity generation. No exemptions were recorded.

Due to data constraints, the following taxes or exemptions are not modeled:

- The exemption for fuels consumed by the chemical industry in accordance with Article 216 of the Customs Code on the "customs regime for exercised plants".
- The exemption for fuels used by civil and military aviation for long distance or foreign flights.

- Local taxes on electricity consumption, consumption tax, work fund surcharge, and sanitation tax. As they seem to vary according to location, they have not been included.

The following measures are outside the scope of the database and have therefore not been included:

A standard VAT rate of 20% applies when selling energy products. Kerosene and propane are exempt, and butane has a reduced rate of 5%. VAT rates are not included in the database.

- Customs duties are levied on coal and hard coal at the standard rate. They are not levied on petroleum products.

Malaysia

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 July 2018 and 1 April 2021, no excises taxes were levied on energy use in Malaysia.

Malaysia does not collect carbon taxes or taxes on other GHG emissions. Malaysia does not have a GHG emissions trading system. Malaysia is currently considering implementing carbon pricing instruments.

Energy use subsidies

The following subsidies on energy use were identified to be in operation in 2018 and 2020:

- After elimination in December 2014, fuel subsidies were reintroduced in June 2018 for all consumers, regarding RON 95 and diesel. LPG consumption for household has always remained subsidised for 10 kg, 12kg and 14 kg cylinder. The government spent RM 7.045 billion in petroleum subsidies in 2018, of which RM 2.737 billion was allocated for petrol, RM2.11 billion for diesel and RM2.198 for LPG. Meanwhile, a total of RM 1.777 billion (RM 0.192 billion for gasoline, RM 0.145 billion for diesel and RM 1.44 billion for LPG) has been spent for the year 2020. This significant decrease in petroleum subsidies was due to the continued decline in global crude oil prices following the global economic uncertainty caused by the COVID-19 outbreak.
- This system was supposed to be replaced by a new subsidy mechanism targeted to households in the bottom 40% income (B40) and the middle 40% income (M40), for cars and motorcycles owners, but finally remained for all⁸³.
- Fuel subsidies are in place for fishing vessels. In 2018, subsidies amounted to RM 534 million for diesel and RM 66.5 million for gasoline⁸⁴. In 2020, the amounts were 422 million for diesel and 46.4 million for petrol⁸⁵.
- Fuel subsidies are also in place for certain kinds of transports (bus, taxi, ambulance etc) for drivers with a fleet card⁸⁶.
- Low-income households benefit from a discount on electricity bills of RM 20 until the end of 2018, a reform was then implemented to increase the subsidy to RM 40 while better targeting the poorest households⁸⁷. These subsidies are fully financed by the government. In 2018, the total cost was RM 140 million⁸⁸ and the forecast for 2019 was RM 80 million⁸⁹. In 2020, the total amount of subsidies is estimated to RM 104 million⁹⁰.
- In reaction to Covid-19 pandemic, the government set several programs to alleviate the electricity bill from April 2020⁹¹, for a total of RM 2 778 million:
 - non-households consumers, with (i) a 15% discount on monthly electricity bills for six categories of businesses (hotel operators, travel agencies, local airlines offices,

⁸³ [eaaa4190-en.pdf \(oecd-ilibrary.org\)](#) ; [Government cancels Petrol Subsidy Programme for B40 / M40. Fairer for the T20 class? | WapCar](#)

⁸⁴ [LKIM-2018-Complete-141119.pdf](#)

⁸⁵ [LAPORAN-TAHUNAN-LKIM-2020.pdf](#)

⁸⁶ [Portal Rasmi KPDNHEP - Diesel Bersubsidi \(Fleet Card\)](#)

⁸⁷ [Discounts, Rebates & Offers - Tenaga Nasional Berhad \(tnb.com.my\)](#)

⁸⁸ [B.30_P.30.pdf — Malaysian Government Document Archives \(sinarproject.org\)](#)

⁸⁹ [bs19.pdf \(mof.gov.my\)](#)

⁹⁰ [BP.23.pdf \(treasury.gov.my\)](#)

⁹¹ [ST.199.2021 - ST 199.2021.pdf \(parlimen.gov.my\)](#)

shopping malls, convention centres and theme parks) from April to September 2020, and (ii) a 2% discount for commercial, industrial, agricultural sectors

- households consumers with a gradual discount of 15% to 50% on electricity usage with a maximum limit of 600 kilowatts per month starting from April 2020.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- The amount of fishing fuel subsidies has been allocated separately to all the gasoline and diesel consumption reported for fishing.
- The total amount of subsidies, less specific fishing subsidies, was equally allocated across all diesel and gasoline consumption reported, except diesel used for electricity generation and RON 97 consumption.
- Similarly, LPG subsidies were allocated across all LPG residential consumption.
- Electricity subsidies targeted low-income households were distributed across all residential electricity consumption, and subsidies due to COVID-19 across all electricity consumption, except for rails and own use.
- The share of RON 95 consumed is assumed to be 93% of gasoline consumption reported⁹².

It is worth noting that Malaysia had a Goods and Service Tax (GST) in force until August 2018. Tax holiday with zero rates was declared in June and August 2018 as a transition period. Under Sales and Services Tax (SST), specific quantity based rates are imposed on certain petroleum products (diesel, gasoline, natural gas) instead of the standard 10% rate. Sales tax is imposed on gasoline, diesel and LPG at rates of RM 0.60 per litre, RM 0.40 per litre and RM 0.01 per kilogram respectively under Sales Tax (Rates of Tax) Order 2018⁹³. However, those products are exempted from sales tax payments in accordance with provision 35(3) under Sales Tax Act 2018. A 6% reduced rate of service tax is levied on residential electricity consumption. Sales tax and services tax rates outside the scope of the database.

The surcharge for the renewable energy fund on electricity consumption is not included according to Taxing Energy Use methodology.⁹⁴

⁹² [ch=research&pg=research&ac=1088224&bb=1107561](https://bursamarketplace.com/ch=research&pg=research&ac=1088224&bb=1107561) (bursamarketplace.com)

⁹³ [MySST \(customs.gov.my\)](https://mySST.customs.gov.my/)

⁹⁴ <https://www.tnb.com.my/kumpulan-wang-tenaga-boleh-baharu-kwtbb/>

Mexico

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use and GHG emissions in Mexico, are the following:

- According to the *Ley del Impuesto Especial sobre Producción y Servicios*⁹⁵, gasolines and diesel as automobile fuels are taxed with a federal quota (Artículo 2o., fracción I, inciso D), a local quota (Artículo 2o.-A, fracciones I, II y III) and a tax based on the carbon content of each fuel (Artículo 2o., fracción I, inciso H), and these are paid at the time of import or sale, regardless of the end use.
- The federal IEPS (*Impuesto especial sobre producción y servicios* – (IEPS)), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to automotive gasoline, automotive diesel and their biofuel equivalents.
- The local IEPS applies to gasoline and diesel, and is earmarked to states and municipalities.
- The carbon tax (*Impuesto al contenido de carbono en combustibles fósiles*) with nominal rate of MXN52/tCO₂e applies to gasoline, kerosene, diesel, gasoline, coal, coke, LPG, petroleum coke, aviation gasoline and aviation kerosene, including when these fossil fuels are used to generate electricity. Since its implementation in 2014, natural gas is zero-rated under the carbon tax.
- At the subnational level:
 - The states of Tamaulipas and Zacatecas levy regional carbon taxes that apply to stationary sources at the rates of MXN260/tCO₂e and MXN250/tCO₂e, respectively.⁹⁶
 - The state of Baja California levies carbon dioxide emissions generated by the use of goods or consumption of polluting products in the State. The tax base is calculated according to the emission factor of gasoline, diesel, natural gas and liquefied petroleum gas, and the tax rate is MXN 170 per tCO₂e⁹⁷. However, this tax is currently being reviewed by the Supreme Court to determine whether it is unconstitutional, since excise taxes on fuels are reserved to the Federal government.

Mexico does not levy taxes on electricity consumption.

Mexico launched an emissions trading scheme (ETS) pilot in 2020, which is due to become operational in 2023.

Country-specific assumptions

Due to data constraints, when matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- The unweighted average of federal and local IEPS rates on below 92 octane gasoline and above 92 octane gasoline is assumed to be the IEPS rate on gasoline.
- The carbon tax applied to LPG consumption is assumed to be the sum of 90% of the carbon tax applied to propane gas and 10% of the carbon tax applied to butane gas.
- Diesel for marine use benefits from a credit tax against Income Tax, The Federation Revenues Act of 2020 limited this benefit to companies with less than 60 million pesos of annual revenues. The OECD Secretariat assumes that all marine use falls below this threshold.

⁹⁵ Ley Impuesto Especial sobre Producción y Servicio

http://www.diputados.gob.mx/LeyesBiblio/pdf/78_241220.pdf

⁹⁶ The World Bank. 2021. "State and Trends of Carbon Pricing 2021" (May), World Bank, Washington, DC. Doi: 10.1596/978-1-4648-1728-1. License: Creative Commons Attribution CC BY 3.0 IGO

⁹⁷ Baker McKenzie. (2020, May 13). "Mexico: Baja California enacts a gas-emission tax". Retrieved from <https://www.lexology.com/library/detail.aspx?g=0423c519-c97f-4b79-8ec2-a58810e3610b>

- Fossil fuels used in the industrial sector are also taxed. In the case of diesel, a tax credit is available for most industrial end uses. Similar tax credits are also available in the agricultural and fishing sectors. Since 2020, the benefit applies only to taxpayers with annual income of less than 60 million pesos. The resulting IEPS from diesel purchases is credited against the Income Tax. For simplicity the Secretariat assumes that 50% of industrial use does not qualify for the tax credit but all other aforementioned uses pay only for the carbon tax component. Agriculture and fishing may benefit from additional reductions. These additional reductions are not modelled due to data constraints.
- To model subnational carbon taxes, the OECD Secretariat assumes that the states of Baja California, Tamaulipas and Zacatecas account for 4%, 3.6% and 1% of Mexico's energy use respectively, uniformly across energy products and energy users.⁹⁸
- TEU models the emissions-based carbon taxes levied in the states of Tamaulipas and Zacatecas to cover the emissions in the industry and electricity sector and assumes all facilities are above the threshold and regulated. Exemptions for facilities emitting up to 25tCO_{2e} per month or which have undertaken 20% of emissions reductions from the previous year are available respectively but due to data constraints they are not modelled. Given the share of the states in Mexico's energy balance the impact on country-level estimates is negligible.

⁹⁸ Estimates derived from Mexico's electricity consumption and GDP by state.

<https://unidadinformacion.iteso.mx/2020/03/30/consumo-de-energia-electrica-por-entidad-federativa-2/>
<https://www.inegi.org.mx/programas/pibent/2013/#Tabulados>

Morocco

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use in Morocco are the following:

- The Domestic Tax on Consumption or *Taxes intérieures sur la consommation (TIC)* applies to a range of product categories like energy beverages, wine, sugar and fuels. Specifically, the tax applies to coal and petroleum coke, fuel oil, diesel, gasoline, kerosene, LPG and natural gas.
- The tax for the promotion of the national audiovisual landscape or *Taxe pour la promotion du paysage audiovisuel national - (TPPAN)* applies on electricity consumption of residential, commercial and public users.

Morocco does not collect carbon taxes or taxes on other greenhouse gases emissions, nevertheless, the principle of a carbon tax was mentioned in a law adopted in July 2021⁹⁹.

Morocco does not have a GHG emissions trading system.

Table 9. Energy taxes on petroleum products in the Morocco

Expressed in MAD per product 100 L or 100 KG.

Rates in MAD per 100 L or 100 KG	Diesel	Fuel oil	Gasoline	Gasoline super	Kerosene	Aviation Kerosene	Natural Gas	LPG
TIC	242.2	101.78	357.2	376.4	44	0	0	4.6

Note: rates for fuel oil and LPG are per 100 KG

Source: Taxes Intérieures De Consommation (TIC) Applicables Aux Produits Pétrolier, from Tarif des droits de douane

Energy use subsidies

The following subsidies on energy use were identified to be in operation in 2020:

- The price of LPG (butane) is regulated and the state compensates importing companies and filling centres for the difference against import prices while it also reimburses transport costs. The cost of the subsidy in 2020 was 8 694 million Moroccan Dirhams (MAD).
- In the electricity sector, a financial restructuring plan with consecutive tariff increases and a lump-sum payment for abandoning fuel oil for generation have boosted the profitability of the state utility ONEE. The state-owned water and electricity utility, ONEE, appears to be subsidized, including in the electricity branch¹⁰⁰, but in absence of exact information on the use of these subsidies and thus on their eligibility, there were not recorded.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- Fuel oil, petroleum coke, bituminous coal and natural gas used for electricity production are exempted.

⁹⁹ [Maroc - Loi cadre n°69-19 du 26 juillet 2021 portant réforme fiscale \(www.droit-afrique.com\)](#)

¹⁰⁰ [Country Data - Fossil Fuel Subsidies \(fossilfuelsubsidytracker.org\)](#)

- Fuel oil n°2 ("fuel oil lourd") is assumed to be the type of fuel oil used for all industrial consumption reported and fuel oil n°7 ("fuel oil léger") for households consumption.
- All gasoline consumed is assumed to be regular gasoline.
- In electricity, charges related to meter maintenance and counter rental are payable by residential consumers but are not in the scope of the analysis. The audio-visual tax TPPAN applicable to residential, commercial and public users is modelled at an upper bound at the maximum rate per kWh due to data constraints on the consumption distribution.
- A per unit (100 KG) subsidy for LPG has been computed by allocating the total amount of the subsidy across all consumption of LPG (including agriculture, industry, residential, commercial and public services) using the 2018 IEA Energy Balances.
- With respect to fuel prices, the estimated prices of diesel and gasoline in Casablanca in March 2021¹⁰¹ and the fixed LPG price were recorded after the removal of the 10% VAT rate.

Due to data constraints, the following tax rates or subsidies are not included in the Taxing Energy Use (TEU) database:

- Exemption from TIC for fuels consumed in the Saharan provinces (no information on the share of consumptions located in this region).
- Exemption from TIC for fuels consumed domestically for fishing (no consumption reported in the energy base).
- Taxation of gasoline super ("supercarburant").

VAT rate are not included in the database. VAT is generally payable at 20%, however oil and gas hydrocarbons are subject to a VAT of 10% and electricity to a VAT of 14%.

¹⁰¹ [Hausse de plus de 1 DH le litre des prix des carburants en moins d'un an - Medias24](#)

Netherlands

Taxes on energy use and greenhouse gas (GHG) emissions

Energy and carbon taxes in the Netherlands are levied within the framework of the 2003 European Union (EU) Energy Tax Directive, which sets minimum rates for the taxation of energy products in EU member states. Within this framework, as at 1 April 2021, the main taxes on energy use and greenhouse gas (GHG) emissions in the Netherlands are the following:

- The Coal Tax (*Kolenbelasting*), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to coal and coke products.
- The Excise Duty, classified as a fuel excise tax according to the TEU methodology, applies to liquid fuels, including biodiesel and biogasoline.¹⁰²
- The Energy Tax (*Energiebelasting*) applies to natural gas (classified as “fuel excise” in TEU) and electricity consumption (classified as an “electricity excise tax” according to the TEU methodology).¹⁰³

The Netherlands participates in the EU ETS. The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

Starting in 2021 the Netherlands implemented a new carbon levy in industry that adds a floating contribution on top of the EU ETS allowance price to yield a fixed price on Dutch emissions covered by the system. It sets out an ambitious price trajectory until 2030. In 2021, prevailing EU ETS permit prices have been above the carbon levy price floor set at EUR 30 per tonne of CO₂e.

The Netherlands does not tax other GHG (such as F-gases or N₂O) directly.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- In road transport, biofuels benefit from a partial refund on the statutory rate specified for their fossil fuel equivalents.
- In the off-road sector, fossil fuels used for railway transport (mainly diesel) are taxed at their propellant rates. Fuels used for commercial domestic navigation (“marine”) are not taxed. Fuels used for commercial aviation are not taxed either.
- In the industry sector, natural gas used in combined heat and power (CHP) generation is exempt. In addition, natural gas used in metallurgical processes and mineralogical processes benefits from a full refund. The energy industry’s own use, e.g. for the extraction of natural gas, is not taxed. Other fossil fuels, mainly by-products of industrial processes, such as blast furnace gas and refinery gas, are generally not taxed.
- Fishing fuels (diesel) are not taxed;
- In agriculture, diesel use is taxed. LPG is taxed, and so is natural gas although horticulture which accounts for the vast majority of such agricultural consumption benefits from reduced rates.

¹⁰² In addition, the Strategic Stockpiling Fee (Voorraadheffing) of EUR 8.00 per 1000 litres applies to the same fuels subject to the excise duty, with the exception of fuel oil and biofuels.

¹⁰³ The taxation of natural gas and electricity output is based on a bracket system, which provides a schedule of marginal rates that decrease with consumption volumes. Natural gas and electricity use are additionally subject to the Sustainable Energy Surcharge (Opslag Duurzame Energie - ODE), and its taxation is also based on the bracket system. The energy base in TEU has been partitioned in accordance with the consumption volume shares of the respective user groups, according to Statistics Netherlands 2019 “Elektriciteit en aardgas naar energiebelastingschijf” <https://www.cbs.nl/nl-nl/maatwerk/2019/14/elektriciteit-en-aardgas-naar-energiebelastingschijf>

- The fuels used to generate electricity are not taxed, but the electricity sector is covered by the EU ETS. Electricity used for chemical reduction and electrolytic and metallurgical processes are not taxed. As is standard, electricity exports are not subject to the electricity tax in the Netherlands, but may be subject to electricity taxes elsewhere. The electricity industry's own use, as well as transmission and distribution losses are not taxed either.

Due to data constraints, the following refunds or tax exemptions are not included in the Taxing Energy Use (TEU) database:

- Fossil fuels used in private pleasure craft and private planes are taxed but not modelled in TEU due to a lack of consumption data.

New Zealand

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021,¹⁰⁴ the main taxes on energy use in New Zealand are the following:

- Excise taxes, earmarked to the National Land Transport Fund (NLTF), apply to gasoline, LPG and CNG, methanol when used for propellant purposes.
 - Gasoline and diesel used in the Auckland region is additionally subject to a surcharge of NZD 0.10 per litre.
- In addition, several levies apply at very low rates, compared to the excise taxes.
 - The Motor Vehicle (MV) levy additionally applies to gasoline when used for propellant purposes.
 - The Petroleum or Engine Fuel Monitoring (PEFM) levy additionally applies to gasoline, as well as to automotive diesel and biodiesel.
 - The Local Authorities Fuel (LAF) tax applies to gasoline and methanol, as well as to automotive diesel and biodiesel.
 - The Gas Safety, Monitoring, and Energy efficiency (GSMEE) levy applies to natural gas used for purposes other than electricity generation and non-energy use in transformation processes (e.g. methanol production).

New Zealand does not levy a fuel-based carbon tax. New Zealand operates an emissions trading system that covers CO₂ and other greenhouse gas emissions from energy use, industrial processes, forestry, agriculture, and waste. Importers of HFC and PFC in goods and motor vehicles, who are not required to be participants in the ETS, pay the Synthetic Greenhouse Gas (SGG) Levy at a level updated annually to reflect prevailing ETS costs¹⁰⁵.

The Energy resource levy applies to South Island lignite, other coal products and natural gas produced from certain fields, irrespective of where these fuels are consumed (domestically or abroad). As a supply-side tax, in line with TEU methodology and previous vintages, it is not covered in TEU¹⁰⁶.

Road user charges, based on distance travelled and the type and weight of the vehicle, apply to the consumption of diesel for road use. Since road user charges affect different behavioural margins than a tax on fuel use (e.g. distance-based charges do not create a direct incentive to economise on fuel use), they are not included in the TEU database and do not show in the energy tax profiles for New Zealand.

Country assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- Based on population data, TEU assumes that 35% of energy use in the road sector takes place in the Auckland region, which has an additional fuel tax;

¹⁰⁴ Changes to gasoline and diesel taxes after that date are not taken into account.

¹⁰⁵ <https://www.epa.govt.nz/industry-areas/emissions-trading-scheme/ets-reports/synthetic-greenhouse-gas-levy/>

¹⁰⁶ The levy would translate into no more than 0.1EUR/GJ in the case of lignite and other coal types and is set at 0.45NZD/GJ for natural gas.

- Diesel used for railway transport is taxed. Diesel used for domestic navigation (“marine”) is subject to the PEFM, albeit at a significantly lower rate than when used for road purposes. Commercial aviation fuels are not taxed except for Auckland regional excise tax - this exception is not modelled;
- Fossil fuels used in the industry, residential and commercial sector are not taxed, with the exception of gasoline, which is subject to the PEFM levy and the LAF tax;¹⁰⁷
- Fuel oil, coal and coke are not taxed;
- Solid biofuels and other renewables are not taxed. Biogasoline (methanol) is taxed at a lower rate than regular gasoline, it is assumed all biogasoline consumed is methanol.
- LPG is not taxed except if used as a propellant for automotive purpose;
- No specific taxes on energy use apply in the electricity sector.
- For simplicity, TEU will illustrate SGG coverage under the New Zealand ETS.

¹⁰⁷ Gasoline use benefits from a full refund on the excise tax and the MV levy, and is thereby only subject to the PEFM levy and the LAF tax (New Zealand Transport Agency, 2018).

Nigeria

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, there were no specific taxes on energy use in Nigeria.

Petroleum products, and fuels more generally, are not taxed and neither is electricity consumption.

Nigeria does not collect carbon taxes or taxes on other GHG emissions.

Nigeria does not have a GHG emissions trading system.

Energy use subsidies

The following subsidies on energy use were identified to be in operation in 2020:

- Electricity end-user tariffs that distribution companies are allowed to charge their customers fell short of end-user cost-reflective tariffs. According to the updated Power Sector Recovery Plan (PSRP), a transition to full cost reflectivity is envisaged by end of 2021 and the federal government is responsible for subsidising the difference in the interim. According to the NERC 2020 financial report, shortfalls amounted to NGN 273.42 billion in 2020¹⁰⁸.
- The price of gasoline is regulated and does not recover supply costs. In March 2020, the government announced the removal of fuel subsidies and the adoption of market-based prices. Nevertheless, it appears that subsidies could continue as NNPC register high shortfalls and admit receiving subsidies. The petrol subsidy has cost NGN 864 billion in the first nine months of 2021 up from NGN 107 billion in 2020 according to the World Bank¹⁰⁹. The minister of finance announced plans to end subsidy by the middle of next year and replace it with NGN 5,000 monthly payments to the poorest families.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- The shortfall in electricity tariffs is modelled as a subsidy across all electricity output without distinguishing between users due to consumption data constraints. The market (remittance) shortfall owing to non-payment by customers is not illustrated.
- The subsidies for gasoline has been allocated across all gasoline consumption reported.
- The tax on gas flaring was not modelled due to data limitations.

The following taxes were not included as they are outside the scope of the database:

- Oil and gas companies in the upstream sector are taxed under the Petroleum Profits Tax Act (PPTA) yielding substantial revenue for the Nigerian government.
- A standard VAT rate of 7.5% applies to electricity consumption.

¹⁰⁸ [DisCos record N273.42 billion shortfall in 2020, receive N542.73 billion from customers - Nairametrics](#)

¹⁰⁹ [Nigeria should end fuel subsidy, speed reforms, World Bank says | Reuters](#) ; [World Bank Document](#)

Norway

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use and GHG emissions in Norway, are the following:

- The Road Usage Tax on Engine Fuel (*Veibruksavgift på drivstoff*), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to biodiesel, bioethanol, diesel, gasoline and LPG;
- The Base Tax on Mineral Oil (*Grunnavgift på mineralolje*), classified as a fuel excise tax according to the TEU methodology, applies to liquid mineral oils at a uniform rate of NOK 1.74 per litre and a reduced rate for specific industry purposes;
 - Fuel use subject to the road fuel tax is not subject to the mineral oil tax.
- A CO₂ Tax (*CO₂ –avgift*) applies to aviation gasoline and kerosene, diesel, fuel oil, gasoline, kerosene, LPG, mineral oil, natural gas at a general rate of NOK 591/tCO₂e;
- An F-gas tax, classified as a carbon tax according to the TEU methodology, applies to HFC and PFC emissions with a nominal rate of NOK 591 per tonne of CO₂e¹¹⁰.
- An Electricity Tax (*Avgift på elektrisk kraft*) applies to electricity output.

Norway participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

In principle, fossil fuel use that is subject to the EU ETS is wholly exempt from the CO₂ tax on mineral products. This exemption does not apply to domestic aviation that is subject to both a CO₂ tax and the EU ETS and to natural gas within the EU ETS that in addition is subject to a reduced carbon tax rate. In addition, fossil fuels used by the offshore industry, which accounts for the majority of natural gas use in Norway, is subject to both a carbon tax (at a rate of NOK 543 per tonne of CO₂) and the EU ETS.

Assumptions and caveats

- Natural gas and LPG used in greenhouses are untaxed, but other uses of natural gas and LPG in the agricultural sector are subject to the CO₂ tax. TEU estimates that 84% of natural gas and LPG use in agriculture benefits from this exemption using physical consumption data provided by the Norwegian administration;
- Liquid biofuels are subject to the Road Usage Tax on Engine Fuel, but are exempt from the CO₂ tax.
- It is assumed that the EU ETS covers 35% of fossil fuel use in the off-road sector, 5% of fossil fuel use in the residential and commercial sector and the industry sector.
- Based on the planned budget for 2021¹¹¹, which projects F-gas tax revenues of NOK 335 million, the F-gas tax is estimated to apply to 0.57 million tonnes of CO₂e emissions. Similarly, tax revenues of 430 million NOK in 2018 lead to an estimated base of 0.86 millions of tonnes of CO₂e.
- Due to data constraints, the following tax exemptions¹¹² are not modelled:
 - The Road Fuel tax exemption on fuel used for a boat or snowmobile in areas without roads
 - The Mineral oil tax exemption for the herring flour and fishmeal industry;

¹¹⁰ The rate was NOK 500 per tonne of CO₂e in 2018

¹¹¹ Prop. 1 S (2020–2021) (regjeringen.no)

<https://www.regjeringen.no/contentassets/3a26510c180f4657ae1d1892ef96e6d8/no/pdfs/prp202020210001gulddpdfs.pdf>

¹¹² However, the amount of the exemptions is insignificant.

- Norway levies a tax on NO_x emissions, but the tax does not apply nitrous oxide (N₂O) and is hence outside the scope of the database.
- In addition to an income tax, income generated from petroleum extraction is taxed at 56%, but this tax is out of the scope of the database.

Panama

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 July 2018 and 1 April 2021, the main taxes on energy use in Panama are the following:

The Tax on consumption of fuels and petroleum derivatives (*Impuesto al Consumo de Combustible y Derivados del Petróleo*) is levied on diesel, gasoline, biogasoline, fuel oil and kerosene consumption.

No tax on electricity consumption has been identified.

Panama does not collect carbon taxes or taxes on other GHG emissions.

Panama does not have a GHG emissions trading system.

Table 10. Energy taxes on petroleum products in Panama as at 1 July 2018 and 1 April 2021

Expressed in PAB per product GAL.

Rates in PAB per GAL	Diesel	Fuel oil	Gasoline	Biogasoline	Kerosene	LPG
ICCDP	0.25	0.15	0.6	0.54	0.13	0

Note: rates are the same in 2018 and 2021

Source: art. 1057-G Código fiscal.

Energy use subsidies

The following subsidies on energy use were identified to be in operation in 2018 and 2020:

- Two funds – the *fondo de estabilización tarifaria (FET)* and the *fondo tarifario de occidente (FTO)* - help to stabilize the prices, up to PAB 152.7 million in 2018 and PAB 254.5 million in 2020, and are financed by the government¹¹³.
- LPG cylinders are usually subject to price cap and subsidised up to PAB 104.7 million in 2018¹¹⁴ and PAB 75.6 million 2020¹¹⁵.
- Certain categories of users (agriculture sector, senior citizens etc.) may also benefit from electricity tariffs discount. As these take the form of cross-subsidies, they are not taken into account according to the TEU methodology.
- Gasoline and diesel consumption are subject to price cap set by government but not related budgetary transfers could be identified, suggesting that the price gap was not binding.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

¹¹³ [INFORMACIÓN SOBRE LOS SUBSIDIOS A CLIENTES DEL SECTOR ELÉCTRICO EN PANAMÁ \(asep.gob.pa\)](https://asep.gob.pa/informacion-sobre-los-subsidios-a-clientes-del-sector-electrico-en-panama)

¹¹⁴ <https://www.mef.gob.pa/wp-content/uploads/2020/12/Informe-de-la-Cuenta-General-del-Tesoro-Vigencia-Fiscal-2018.pdf>

¹¹⁵ <https://www.mef.gob.pa/wp-content/uploads/2022/04/Informe-de-la-Cuenta-General-del-Tesoro-Vigencia-fiscal-2021.pdf>

- The electricity subsidies have been computed by allocating the total amount of the subsidy across all consumption from households and commercial sectors, assuming that the industrial sector was not concerned.
- Fuel excise taxes are assumed to apply for all fuel uses.

Due to data constraints, the following tax rates or subsidies are not included in the Taxing Energy Use (TEU) database:

- Exemption for fuel used by public administration.

A VAT standard rate of 7% applies to electricity and motor gasoline, other petroleum products being exempted. VAT is outside the scope of the database.

Paraguay

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 July 2018 and 1 April 2021, the main taxes on energy use in Paraguay are the following:

- The *impuesto selectivo al consumo (ISC)*, classified as a “fuel excise tax” according to Taxing energy use (TEU) methodology, applies as an ad valorem on gasoline, aviation gasoline, kerosene, jet kerosene, diesel, fuel oil and LPG.

No tax on electricity consumption has been identified.

Paraguay does not collect carbon taxes or taxes on other GHG emissions.

Paraguay does not have a GHG emissions trading system.

Table 11. Energy taxes on petroleum products in Paraguay as at 1 July 2018 and 1 April 2021

Rates percent Litres	in per litre	Diesel	Fuel oil	Gasoline	Kerosene	Jet Kerosene	LPG
ISC		18%	10%	34%	10%	0%	10%

Note: gasoline for octane between 88 and 97 octanes

Source: decreto 5928/16 and decreto 640/13 (for 2018) and decreto 3109/2019 (for 2021)

Energy use subsidies

The following subsidies on energy use were identified to be in operation in 2018 and 2020:

- Subsidies to ANDE and ESSAP were granted due to Covid-19 in 2020, for a total of USD 104 million according to 2020 budget¹¹⁶.
- No other subsidies have been identified but the electricity sector seems subsidised according to IMF data, and the national company ANDE seems to generate losses¹¹⁷.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- Tax rates are assumed to be the same for 2018 and 2021¹¹⁸.
- The ad valorem taxes are computed by applying the rates directly to the prices published by Petropar for the 5 June 2018 and prices provided by delegates for 2021.
- Gasoline consumed for automotive purpose is assumed to be shared between 25% of petrol with less than 88 octanes (“nafta 85”) and 75% of petrol with more than 88 octanes (“nafta 90” and “nafta 95”) according to 2021 sales data¹¹⁹. Gasoline used in industry is assumed to be “virgen nafta”. Taxation of petrol with 97 octanes or more is not modelled due to the low consumption. Aviation gasoline taxation is not modelled due to lack of consumption data reported.

¹¹⁶ [archivo.php\(hacienda.gov.py\)](http://archivo.php(hacienda.gov.py))

¹¹⁷ [archivo.php\(hacienda.gov.py\)](http://archivo.php(hacienda.gov.py)) p. 210, “Alleviating ande’s deficit will cost US\$ 1 billion” - El Independiente

¹¹⁸ By looking at decreto 640/13

¹¹⁹ [Fuel Products\(mic.gov.py\)](http://Fuel Products(mic.gov.py))

- Diesel consumed domestically is assumed to be shared between 16% of type I (premium) and 84% of type III (regular) according to 2021 sales data.
- Biogasoline is assumed to be taxed as gasoline.
- Prices for kerosene and fuel oil were assumed to be the same as diesel, due to lack of data.
- Coal and petroleum coke are assumed to be untaxed.
- Gasoline, biogasoline, diesel, kerosene and fuel oil are assumed to be taxed equally for all uses.
- For Type III Diesel, a reduced tax base of PYG 3,777.78 per liter is considered, according to Art 15 of Decree No. 3109/19.
- For Type I Diesel, 75% of the tax base is fixed at PYG 3,777.78 per liter; the remaining 25% is calculated on the market price, according to Art 15. of Decree No. 3109/19.
- For virgin gasoline, a reduced tax base is established, taking into account 60% of the market price of RON 85 gasoline, according to Decree No. 3785/20.
- The Covid-19 subsidies to the national electricity company ANDE is assumed to be 50% of the total amount provided in 2020 to ANDE and ESSAP, and is allocated across all electricity consumption.
- The standard VAT rate of 10% applies to electricity, petroleum products being exempted according to art. 100 of law 6380/19. VAT is beyond the scope of the database.

Peru

Taxes on energy use and greenhouse gas (GHG) emissions

As at July 1, 2018 and April 1, 2021, the main energy taxes in Peru are the following:

- The Selective Consumption Tax (*Impuesto Selectivo al Consumo- ISC*) on fuels, classified as a fuel excise tax under the *Taxing Energy Use Methodology* (TEU), taxes the consumption of coal, diesel, including blends of diesel with biodiesel, gasoline, including biogasoline, and fuel oil. Pure biodiesel, LPG and vehicular natural gas (VNG) are not taxed with ISC.
 - The Fuel Harmfulness Index (*índice de Nocividad a los Combustibles - INC*) is one of the criteria used to establish the ISC that is levied on fuels and vehicles, better incorporating the environmental criterion and the polluter-pays principle, that is, that users of fuels will have to pay more taxes for using a more polluting fuel than another. Carbon dioxide is not included in the INC.
- The *Impuesto al rodaje*, classified as a special tax on gasoline, is levied at a rate of 8% on the consumption of gasoline only at the producer level, applied on the ex-plant price or the CIF value in the case of importation.

It is worth noting they are two contributions set by the General Law of Rural Electrification and the Law of the Electrical Social Compensation Fund levied on electricity consumption, which have been classified as electricity taxes according to TEU methodology. No other taxes on electricity consumption have been identified.

Peru does not levy taxes on carbon dioxide or other greenhouse gas emissions. However, in setting the structure of the ISC rates, an index expresses a scale of harmfulness of various fuels used in the domestic market, taking as a reference base the cleanest fossil fuel available in the country (VNG).

Peru does not have a GHG emissions trading system.

Energy use subsidies

The following subsidies on energy use were identified to be in operation in 2018 and 2020:

- The Fuel Prices Stabilization Fund (*Fondo para la Estabilización de Precios de los Combustibles Derivados del Petróleo - FEPC*), created in 2004, set bands prices to prevent the high volatility of international oil prices from being transferred to Peruvian consumer prices. For instance, it subsidized the prices of LPG, as well as diesel and fuel oil used for power generation in 2018.
- The Fund for Energy Social Inclusion (*Fondo de Inclusión Social Energético – FISE*) manages, among others projects, the LPG Voucher programs and refunds for residential electricity tariff. Nevertheless, as the fund is financed by several taxes on energy products (surcharge on the monthly billing of free electricity users of the interconnected system, surcharge on the supply of liquid products derived from hydrocarbons and gas liquids, surcharge on the monthly billing of charges to natural gas pipeline transportation), they are considered cross-subsidies and not included in TEU.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- Subsidies recorded are currently the average of per unit value of compensation fixed by the Fuel price stabilisation fund as at the first day of each month in 2018 and 2020 according to

data from the Ministry of energy and mines. No data were recorded for 2020, as the fund in average levied more contribution than it provided subsidies. On the contrary, subsidies were recorded in 2018 for LPG used by households, as well as diesel and fuel oil for electric generation.

- Fuel excise taxes are assumed to apply across all fuel uses.
- Return of the ISC to the hauliers. the benefit of a refund equivalent to 53% of the Selective Consumption Tax (ISC) which is part of the selling price of B5 and B20 diesel fuel with a sulphur content of 50 ppm or less, purchased from wholesale distributors and/or retailers or retailers of fuels with electronic proof of payment, for a period of three years from 1 January 2020. It is assumed 20% of the consumption on road is concerned.
- The special tax on gasoline is applied to prices without VAT and profit margin.

Due to data constraints, the following tax rates or subsidies are not included in the TEU database:

- Exemption from ISC and IGV applicable to oil, natural gas and its derivatives in Amazonia, according to Law N°27037.

The following measures have not been taken into account as they are out of the scope of TEU:

- The standard VAT rate of 18% applies to petroleum products. The ISC is part of the VAT tax base.
- Tax benefits to mining and hydrocarbons. This benefit consists in the refund of the VAT and Municipal Promotion Tax to the holders of the mining and hydrocarbon activity during the exploration phase. Through Emergency Decree 021-2019 extending the validity of Laws 27 623 and 27 624 it has extended this benefit until 31 December 2022, concluding that this will ensure the sustainability of exploration investments.
- Depreciation of Investment in the electricity generation activity based on water resources or based on other renewable resources. (Legislative Decree N° 1058).

Philippines

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use in the Philippines are the following:

- Excise taxes apply to coal and coke, fuel oil, diesel, gasoline (including aviation gasoline), liquid biofuels when used as propellants, LPG, kerosene (including aviation kerosene), and other petroleum products in accordance with the “Tax Reform for Acceleration and Inclusion (TRAIN)” Act.
- Electricity consumption attracts a local franchise tax for all customer classes plus an energy tax for residential users.

Philippines does not collect carbon taxes or taxes on other GHG emissions.

Philippines does not have a GHG emissions trading system yet, but a cap-and-trade system is under consideration.

The statutory rates of excise taxes on fuels have undergone staggered increases until 2020 as foreseen in the TRAIN Act, with the table below summarising the information for the main energy products.

Table 12. Excise tax rates on energy products

Tax rates by year (in PHP per litre)	Diesel	Fuel oil	Gasoline	Kerosene	Aviation Kerosene	LPG (kg)	Natural gas	Coal and coke (kg)
2018	2.50	2.50	7.00	3.00	4.00	1.00	-	0.05
2019	4.50	4.50	9.00	4.00	4.00	2.00	-	0.10
2020-...	6.00	6.00	10.00	5.00	4.00	3.00	-	0.15

Note: Tax rates are on a Philippine peso (PHP) per litre basis except for LPG, coal and coke (PHP/kg), LPG for other purpose than motive power

Source: TRAIN Act

Energy use subsidies

The following subsidy on energy use was identified to be in operation in 2020:

- The National Power Corporation (NPC), responsible for Missionary Electrification and the Small Power Utilities Group, received PHP 1.688 million as a budgetary support from the national government¹²⁰.

It is also worth noting there are two special electricity consumption rates in favour of senior citizens and low-income households (lifeline), cross-subsidised by other consumption classes. Cross-subsidies are not modelled according to TEU methodology.

The diesel subsidies to operators of public utility jeepneys (PUJs) under the Pantawid Pasada program were no longer in force since 2020 and was resumed on November 2021 to mitigate the impact of oil price increases.

¹²⁰ [E8.pdf \(dbm.gov.ph\)](#)

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- Natural gas is assumed to be locally extracted natural gas and thus always exempted.
- Liquid biofuels are taxed when used as propellants and their consumption in the agriculture and fishing sector is assumed exclusively for such motive power.
- LPG used for motive power is taxed at the equivalent rate as the excise tax on diesel fuel oil, that is PHP 6 per kg since 2020.
- The amount received by NPC was modelled as a universal subsidy towards all electricity output.
- To determine the per kWh rate of the local franchise tax of 0.50% on electricity the maximum typical consumption of 5000 kwh was used as an upper bound. The energy tax is unchanged since 2018, and thus the tax estimate is also unchanged: a consumption weighted average per KWh using 2015 MERALCO data on consumption and applying the MERALCO progressive tax rates. The maximum rate is assumed to apply for customers in the highest consumption band, while for the remaining categories, users are assumed to max out on their consumption band for the calculation of the effective rates.
- With respect to fuel and LPG prices, the average prices as at 01/05/2021 in Manila were recorded after removing 12% VAT.

Due to data constraints, the following tax rates or subsidies are not included in the Taxing Energy Use (TEU) database:

- Special rates for indigenous petroleum are not modelled.

The following measures is beyond the scope of the database:

- The standard VAT of 12% applies to electricity consumption and most fuels (biofuels are exempt and sale of electricity generated from renewable energy sources is subject to a zero percent VAT).

Poland

Taxes on energy use and greenhouse gas (GHG) emissions

Energy and carbon taxes in Poland are levied within the framework of the 2003 European Union (EU) Energy Tax Directive, which sets minimum rates for the taxation of energy products in EU member states. Within this framework, as at 1 April 2021, the main taxes on energy use in Poland are the following:

- Excise duties (*Podatek akcyzowy*) apply to liquid and solid fossil fuels, LPG, specified uses of natural gas, biodiesel and biogasoline, as well as to electricity.
- The Fuel Surcharge (*Oплата paliwowa*), classified as fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to gasoline, diesel, biodiesel, biogasoline and LPG when used for automotive purposes.
- Poland has environmental taxes on emissions from various gases (*opłaty za gazy wprowadzane do powietrza*) including GHG emissions such as carbon dioxide, methane, nitrous oxide and F-gas (sulphur hexafluoride, perfluorocarbons, hydrofluorocarbons and halogenated hydrocarbons). They are classified as a carbon tax according to TEU methodology.¹²¹

Poland participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- Biogasoline and biodiesel used as propellant are taxed at the same statutory rates as their fossil fuel equivalents; pure biofuel benefits from a reduced rate, which is not modelled;
- Solid biofuel and municipal wastes are not taxed;
- Fossil fuels for commercial navigation and aviation are not taxed;
- Coal and coke products, natural gas, as well as electricity, are not taxed if used in industrial processes under the conditions for non-taxation of the EU Energy Tax Directive are fulfilled (mineralogical, electrolytic and metallurgical processes, chemical reduction);
- Coal and coke are untaxed, except when used for heating by business and stationary motors; coal and coke products consumed by households and in agriculture and fisheries are not taxed.
- Natural gas is untaxed unless when used for heating purposes;
- Coal and coke-related gases are not taxed;
- Fuels used in combined heat and power (CHP) plants and to generate electricity are not taxed;
- Electricity produced from renewable sources is exempted from excise duty.
- CO₂ emissions from facilities covered by the EU ETS are exempt from the carbon tax. The share of firms covered by the EU ETS is estimated to be 64 % in industry while the electricity sector is fully covered;
- The rates for environmental taxes per tCO₂e¹²² are PLN 0.011 (PLN 0.010 in 2018) for methane, PLN 0.344 (PLN 0.325 in 2018) for nitrous oxide and approximately PLN 19.491 (PLN 18.386 in 2018) for F-gases based on an unweighted average of all rates. The tax base affected was estimated at 15 600 ktCO₂e.

¹²¹ Poland also levies other taxes such as charges for non GHG gases or dust from the combustion of fuels or from boilers which vary according to the type of vehicles or boilers. These are out of the scope of TEU and not included.

¹²² With GWP (AR5)

- For carbon dioxide, the rate per tCO₂e was PLN 0.31 in 2021 (PLN 0.29 in 2018).

Due to data constraints, the following refunds or tax exemptions are not included in the Taxing Energy Use (TEU) database:

- Taxation of fossil fuel used for private aviation and navigation;
- Exemption for electricity produced from generators with a total capacity not exceeding 1 MW per entity consuming this energy;
- Exemption for energy products used for energy-intensive businesses in which a system has been put in place to meet environmental targets or to improve energy efficiency.

Portugal

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use in Portugal are the following:

- The energy tax (*imposto sobre os produtos petrolíferos e energéticos - ISP*), classified as a fuel excise tax according to Taxing energy use (TEU) methodology, applies to gasoline, diesel, kerosene, natural gas, fuel oil, coal and coke, LPG and lubricant oils.
- The energy tax (*imposto sobre os productos petroliferos e energéticos*) also applies to electricity consumption and is classified as an electricity excise tax.
- The CO₂ tax, classified as carbon tax, applies to gasoline, diesel, kerosene, natural gas, fuel oil, coal and coke and LPG at a nominal rate of EUR 23.921 per tonne of CO₂¹²³.
- The Road Service Tax (*contribuição de serviço rodoviário*), classified as a fuel excise tax, applies to oil products used in road transport, in addition to the carbon and the energy tax.

Energy and carbon taxes in Portugal are levied within the framework of the 2003 European Union (EU) Energy Tax Directive, which sets minimum rates for the taxation of energy products in EU member states.

Portugal has no tax on other GHG emissions (such as F-gases or N₂O).

Portugal participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors. Facilities that are covered by the ETS do not to pay the carbon tax (or receive a full refund) except for coal used for electricity generation.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- The contribution to service road is assumed to apply on diesel, gasoline and LPG used for automotive purpose only and not for stationary motors or heating;
- Commercial diesel used as propellant benefits from a partial refund and it is assumed 20% of the consumption on road is commercial diesel. Diesel in agriculture and stationary motors is taxed at a lower rate. Diesel used for rail is untaxed.
- Fishing fuels are untaxed.
- Fuels used for commercial navigation and commercial aviation are not taxed.
- Other fossil fuels that are used in petroleum refining processes are not taxed.
- Solid biofuels, non-renewable waste, and other renewables (mainly solar thermal) are not taxed. Biofuels are not taxed if they are produced by approved “dedicated small producers” or are classified as advanced biofuel. Due to lack of data, we assume that all biofuels meet these conditions in the road sector.
- ETS-covered firms do not have to pay the CO₂ tax, except for coal-fired power plantw. It is assumed the ETS covers 61% of fossil fuel used in the industry sector, all the agriculture sector and all the electricity sector for main producers;
- Certain fuels used for electricity generation, including in CHP plants, are subject to ISP and carbon tax with a special rate. It concerns coal (in 2021, 75% of ISP rate and 75%

¹²³ [Ordinance 277/2020, 2020-12-04 - DRE](#)

of the difference between a reference rate of EUR 30 per tonne of CO₂ and the carbon tax rate, with this difference capped at EUR 5 per tonne of CO₂), heavy fuel oil (in 2021, 50% of regular rates) and natural gas and LPG (in 2021, 20% of regular rates). Refinery gas used for electricity generation are assumed to be taxed as liquefied petroleum gas. The carbon tax does not apply if the sector is covered by EU-ETS, except for coal inputs for electricity generation. Gas oil used for this purpose is still untaxed, except in autonomous regions (not modelled) and others energy sources such as renewables are also untaxed;

- Electricity consumption is generally subject to the energy tax (per MWh). Electricity produced by autogeneration plants is generally subject to the electricity excise tax under the same conditions as main-producer electricity plants. Own use by the electricity industry is not taxed, and neither are exports, which may, however, be subject to electricity taxes in other countries.

Due to data constraints, the following taxes, refunds or tax exemptions are not included in the Taxing Energy Use (TEU) database:

- The taxation of fuel used for private aviation and navigation;
- All special rates in the autonomous regions, including rates for gas oil and heavy fuel oil used for electricity generation;
- The exemption for natural gas and LPG consumed for public transportation (as no consumption is reported);
- The exemption for facilities, which develop an energy consumption rationalisation agreement (ARCE) to reduce emissions under the System for Management of Intensive Energy Demand (SGCIE).

Rwanda

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use in Rwanda are the following:

- An excise duty, classified as fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to gasoline and other oil products (diesel, kerosene and fuel oil) at a rate of 183 and 150 RWF per litre respectively, with the exception of aviation kerosene.¹²⁴
- A Road Maintenance Fund levy applies to liquid fossil fuels at a rate of 115 RWF per litre. The RMF is also partially financed through road toll charges, which are outside the TEU scope.¹²⁵
- A strategic reserve levy applies to liquid fossil fuels at a rate of 32.73 RWF per litre.
- Rwanda also collects an infrastructure development levy and an African union levy. These apply ad-valorem on eligible imports of a wide range of goods besides fuels. Therefore, they fall outside of TEU scope.
- Rwanda does not levy carbon taxes or taxes on other GHG emissions and does not operate an emissions trading system (ETS).

Energy use subsidies

The Rwanda Utilities Regulatory Authority (RURA) coordinates the setting of nation-wide maximum retail prices for oil products. It does so in collaboration with fuel suppliers and ministries, passing-through global oil price changes¹²⁶.

The following subsidies on energy use were identified to be in operation in 2018 and 2020:

- Electricity subsidies are transferred to the Energy Utility Corporation Limited (EUCL), the subsidiary of the Rwanda Energy Group (REG) devoted to electricity utility service, from the government. The government, through RURA, determines the tariffs to be charged to end users and a contribution to cover the shortfall between the company's revenue requirement and the set tariff is given through subsidies. The amount of the subsidies reached 10.4 billion RWF in 2018¹²⁷ and 10.5 billion RWF in 2020¹²⁸ according to the annual reports and financial statements from REG.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- LPG and coal are untaxed. Additional tax incentives on taxation outside TEU scope (import tariffs and VAT exemptions) have been granted to LPG.
- Fuels used for electricity generation are untaxed. This includes diesel, fuel oil, natural gas and peat.
- Gasoline and diesel are taxed with the same rates they attract in road transport when consumed for other purposes (residential, industry).
- Charcoal and biomass are untaxed.

¹²⁴ <https://www.rra.gov.rw/index.php?id=178&L=2> and validated against [OECD/AUC/ATAF \(2021\), Revenue Statistics in Africa 2021](#), 2018 revenues

¹²⁵ In 2018, RMF revenues reached roughly RWF 49billion, about 75% of which were attributable to the fuel levy. https://www.wto.org/english/tratop_e/tpr_e/s384-03_e.pdf

¹²⁶ https://www.wto.org/english/tratop_e/tpr_e/s384-03_e.pdf & https://greenfiscalspolicy.org/policy_briefs/rwanda-country-profile/

¹²⁷ page 25 https://www.reg.rw/fileadmin/user_upload/EUCL_FINANCIAL_STATEMENTS_FOR_2017_2018.pdf

¹²⁸ table 2.11 https://www.reg.rw/fileadmin/REG_ANNUAL_REPORT_2020-2021_V3.pdf

- The 2021 excise rates coincide with those of 2018¹²⁹. The RMF levy is unchanged since 2016¹³⁰ and the strategic reserve levy since its introduction in 2015.
- In the aftermath of the COVID-19 outbreak, import duties on oil products have been reduced, however these fall outside of TEU scope and are intended to be temporary in order to decrease inflation of fuel prices¹³¹.
- Natural gas production in Rwanda takes place at Lake Kivu in the Eastern African Rift Zone. The lake contains high concentrations of naturally occurring methane gas which is currently used for electricity generation. No quantification of a subsidy for foregone revenue is modelled due to data constraints. No official quantification of an associated subsidy was found.¹³²
- Electricity consumption is untaxed according to TEU methodology. Electricity tariffs may be subject to VAT, which is however outside TEU scope.¹³³ A regulatory fee that is paid by flat-rate industrial consumers and potentially within TEU scope, is not included due to data constraints.
- The whole amount of electricity subsidies identified corresponds to compensation for low tariffs and is assigned to all electricity output.
- Grants to the Energy Development Corporation Limited (EDCL), which comprises the development, transmission and energy access subsidiary of REG, are outside of TEU scope. Electrification infrastructure and connection subsidies are outside TEU scope.

¹²⁹ https://www.wto.org/english/tratop_e/tpr_e/s384-03_e.pdf

¹³⁰ <https://rmf.gov.rw/index.php?id=57> &

https://rmf.gov.rw/fileadmin/document/Modified_law_on_Road_Maintenance_Levy_2a_2_.pdf

¹³¹ https://www.rura.rw/fileadmin/publication/Announcement_on_Pump_prices_for_december_2021.pdf

¹³² Back of the envelope estimates yield a 5 mIn EUR upper bound and negligible proportion of the GDP.

¹³³ <https://www.reg.rw/customer-service/tariffs/>

Slovak Republic

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use and GHG emissions in the Slovak Republic are the following:

- A fuel excise tax, applies to certain forms of use of mineral oils (*Spotrebná daň z minerálneho oleja*), as well as gas (*Spotrebná daň zo zemného plynu*) and coal (*Spotrebná daň z uhlia*), but not to the fuels used to generate electricity;
- An electricity excise tax (*Spotrebná daň z elektriny*) applies to electricity use (tax per MWh) when consumed by businesses.

Energy taxes in Slovakia are levied within the framework of the 2003 European Union (EU) Energy Tax Directive, which sets minimum rates for the taxation of energy products in EU member states.

The Slovak Republic does not levy a fuel-based carbon tax and does not tax GHG emissions directly.

The Slovak Republic participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

Country specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- Biodiesel and biogasoline are taxed at lower statutory rates than their fossil fuel equivalents;
- Wastes and non-liquid biofuels are not taxed;
- Coal and coke products are taxed when used for business heating only;
- Natural gas is taxed at a lower rate when used for heating purposes, and LPG for heating is exempt;
- Fuels used for certain uses (chemical reduction, mineralogical, metallurgical, and electrolytic processes are untaxed, as well as fuels used in CHP.
- Other fossil fuels (mainly by-products of industrial processes such as blast furnace gas, coke oven gas, converter gas, and refinery gas) are not taxed;
- All energy sources used to generate electricity are untaxed.
- Electricity consumption is subject to an electricity excise tax (per MWh), when used for business purposes other than rail transport and for certain uses (chemical reduction, etc), and when not generated by renewables sources. Electricity produced by autogeneration plants is subject to electricity excise taxes under the same conditions as main-producer electricity plants. Electricity exports are not taxed in the Slovak Republic, but may be subject to electricity taxes elsewhere.

Due to data constraints, the following refunds or tax exemptions are not included in the Taxing Energy Use (TEU) database:

- Various exemptions of electricity consumption are not modelled due to data constraints; such as exemption for electricity produced from renewable energy; from autogeneration for own use for installation below 5MW or from cogeneration plant if it is supplied directly to the final consumer of electricity or consumed by the person who produced it for a maximum period of 12 years after the cogeneration plant has been put into service.

Slovenia

Taxes on energy use and greenhouse gas (GHG) emissions

Energy and carbon taxes in Slovenia are levied within the framework of the 2003 European Union (EU) Energy Tax Directive, which sets minimum rates for the taxation of energy products in EU member states. Within this framework, as at 1 April 2021, the main taxes on energy use and greenhouse gases (GHG) in Slovenia are the following:

- An energy tax (*Trošarina na energente*), classified as a fuel excise tax according to taxing energy use methodology, applies to specified uses of oil products, natural gas and coal and coke consumption, as well as a surcharge on energy end-use efficiency and a surcharge for the promotion of electricity generation from renewable energy sources and high-efficiency cogeneration;
- A carbon tax with a nominal rate of EUR 17 per tonne of CO₂ applies to the same fossil fuels subject to the energy tax;
- An electricity tax (*Trošarina na električno energijo*) applies to energy use (per MWh), as well as a surcharge for the promotion of electricity generation from renewable energy sources, except if used for chemical reduction and electrolytic and metallurgical processes.

Slovenia does not tax other GHG such as fluorinated gases or N₂O emissions.¹³⁴

Slovenia participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors. The firms that participate in the ETS are additionally subject to all applicable excise taxes, including the carbon tax.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- Diesel used for commercial transport purposes is taxed at a lower statutory tax rate. It is assumed this represents 33% of the diesel and biodiesel used for road transport¹³⁵ ;
- Biodiesel and biogasoline that are blended with their fossil fuel equivalents are taxed at the same statutory rates; pure biofuels and biogases are exempted ; TEU assumes that biodiesel consumed in industry (CHP) is pure.
- Diesel used in rail and stationary motors for business purposes benefit from a 50% refund ;
- Fuel oil and coal products are taxed only when used for heating purposes ;
- Gas oil, LPG and natural gas benefit from a lower statutory tax rate for heating than for propellant¹³⁶ ;
- Commercial aviation and navigation fuels are untaxed ;
- In principle, fossil fuels in the industry sector are subject to both fuel excise and carbon tax. Firms that participate in the EU ETS are subject to a minimum level of taxation according to the 2003 EU Energy Tax Directive.
- Fuels as well as electricity, used in chemical reduction, electrolytic and metallurgical processes are not taxed.
- Gasoline and diesel used in the agriculture and fishing sector are subject to a 70% refund of the excise tax; all fuels used for agriculture are submitted to a carbon tax;

¹³⁴ Slovenia levied a carbon tax on fluorinated greenhouse gases from 2008-2016.

¹³⁵ Steadily increasing from 29% in 2018, to 30% in 2019 and 32.6% in 2020.

¹³⁶ From 23 June 2021 to 31 December 2025 the excise duty on natural gas for propulsion of road vehicles is 0 EUR. This is a temporary measure aimed at promoting alternative fuels in transport. Other surcharges and the carbon tax still apply.

fuels used for the propulsion of fishing vessels are exempted from the carbon tax but no such use is reported in the IEA energy balances; other taxes do not apply to gasoline used in the agriculture and fishing sector;

- Other renewables, wastes and solid biofuels are not taxed ;
- Inputs into combined heat and power plants that are used for production of heat are subject to carbon tax that equals the minimum level of taxation according to the 2003 EU Energy Tax Directive
- All energy sources used to generate electricity are untaxed, as well as inputs into autoproducer electricity plants and combined heat and power (CHP) plants for the production of electricity. Electricity consumption is generally subject to an electricity excise tax (per MWh). Electricity produced by autogeneration plants is subject to electricity excise taxes under the same conditions as main-producer electricity plants. Electricity consumption is not taxed when used for chemical reduction, electrolytic and metallurgical processes. Electricity exports are not taxed in Slovenia, but may be subject to electricity taxes elsewhere.

Due to data constraints, the following refunds or tax exemptions are not included in the Taxing Energy Use (TEU) database:

- Fuels used for commercial domestic navigation are untaxed, but the IEA does not report any energy use for domestic navigation.
- Fuels used for private aviation are taxed but not modelled.

South Africa

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use and GHG emissions in South Africa were the following:

- The Fuel Levy, classified as a fuel excise tax in TEU, applies to gasoline, diesel and its biofuel equivalent, as well as to kerosene. The Road Accident Fund (RAF) Fuel Levy and the Customs and Excise Levy, equally classified as a fuel excise tax, apply to gasoline and diesel, and the latter's biofuel equivalent. Diesel consumed for domestic navigation, and fishing purposes benefit from a full refund of the Fuel Levy and the RAF Fuel Levy. Diesel consumed for agriculture, forestry, as well as on-land mining purposes, and open cycle gas turbines electricity generation plants used for peaking demand benefit from a partial refund on the Fuel Levy, as well as from a full refund on the RAF Fuel Levy.¹³⁷ Freight rail and harbour vessels benefit from a full refund on the RAF Fuel Levy.
- The Demand Side Management Levy (DSML), classified as a fuel excise tax in TEU, additionally applies to gasoline (95 unleaded petrol in the inland area).
- The Illuminating Paraffin (IP) Tracer Dye levy, classified as a fuel excise tax in TEU applies to diesel to avoid its mixing with kerosene for use in primary production activities.
- The Petroleum Pipelines (PP) Levy, classified as a fuel excise tax in TEU, applies to gasoline and diesel, and the latter's biofuel equivalent (biodiesel).
- The Fuel Levy on the sale of aviation fuels is the only fuel excise tax applicable to aviation fuels.
- A carbon tax is in effect since 1 June 2019. The nominal 2021 rate is R134/tCO₂e (~EUR 7.8). The gradual implementation of the tax provides for the first phase from 1 June 2019 to 31 December 2022 and the second phase from 2023 to 2030. The carbon tax rate increases annually by inflation plus 2 per cent until 2022 and annually by inflation thereafter. Significant activity-specific tax-free emissions allowances range from 60 per cent to 95 per cent apply for the energy combustion, industrial process and fugitive emissions, and 100% tax-free allowances apply for certain emitters including agriculture, forestry and other land use and waste sectors, implying that effective carbon tax rates are substantially lower. Emissions covered by the carbon tax are those that need to be reported in terms of the Department of Forestry, Fisheries and Environment's Mandatory Reporting Regulations.¹³⁸
- The Environmental Levy on electricity generated from fossil fuels and nuclear in the Republic, classified as an electricity excise tax according to the TEU methodology, applies to electricity consumption. The final consumption of electricity is taxed, unless the electricity was generated from renewable energy sources, from power plants with an installed capacity of not more than 5 MWh, or from combined heat and power cogeneration (CHP). The fuels used to generate electricity are generally not subject to fuel excise taxes.¹³⁹ The carbon tax will also not have any impact on the price of electricity in the first phase.

South Africa does not have an emissions trading system for GHG emissions.

¹³⁷ Diesel that benefit from refunds is still subject to the SACU levy, the IP Tracer Dye Levy and the PP Levy.

¹³⁸ The carbon tax design is aligned to the mandatory emissions reporting to DFFE and any natural or juristic persons who exceed the DFFE thresholds for reporting, which also functions as the carbon tax threshold, are subject to the carbon tax. Tax bases are the following greenhouse gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆). The tax is administered by the South African Revenue Services in the same way as other environmental levies.

¹³⁹ Diesel used for electricity generation is subject to fuel excise taxes and only diesel used in peaking plants benefits from a partial refund on the Fuel Levy (but enjoys a full refund on the RAF Fuel Levy). However, diesel consumption for electricity generation is low relative to other energy sources.

Country-specific assumptions

Due to data limitations,¹⁴⁰ the OECD Secretariat made the following simplifying assumptions when including the carbon tax in the database:

- As an upper bound estimate of the applicable net carbon tax rate, the basic tax free allowance of 60%, corresponding to a carbon tax rate of R 53.6 per tonne of CO₂e, was applied to:
 - 90% of fossil CO₂e emissions from the industry sector as defined in Taxing Energy Use (incl. energy industries, such as heat production and petroleum refining), as well as manufacturing industries and construction;
 - 100% of fossil CO₂ emissions related to energy combustion in the agriculture and fishing sector, as well as the commercial sector, and non-specified energy use;¹⁴¹
 - 100% of industrial process emissions.
- As an upper bound estimate of the net carbon tax rate, the basic tax free allowance of 75%, corresponding to an carbon tax rate of R 33.5 per tonne of CO₂e, was applied to the transport sector as follows:
 - 90% of domestic aviation, domestic waterborne navigation, and railways;
 - 100% of fossil CO₂ emissions from road sector and other transport because petrol and diesel fuel use in road transport are all taxed at the refinery gate as they are administered through the fuel levy mechanism.
- Activities with a basic tax free allowance of 100% have been considered as effectively untaxed (corresponding to a net carbon tax rate of R 0).
 - GHG emissions from residential use;
 - Non-CO₂ GHG emissions from agriculture, forestry, and other land use;
 - Non-CO₂ GHG emissions from waste.
- GHG emissions from the electricity sector as defined in Taxing Energy Use are assumed to be effectively untaxed because in the first phase of the carbon tax (until end 2022) the South African electricity company benefits from a credit against its carbon tax liability.

¹⁴⁰ Such limitations include a lack of information on which share of emissions are not reportable or below the threshold and hence not taxed.

¹⁴¹ Other emissions from agriculture, forestry and other land use and waste sectors benefit from a 100% free allowance.

Spain

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use and GHG emissions in Spain, are the following:

- A Tax on Hydrocarbons (*Impuesto sobre Hidrocarburos*), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to specified uses of liquid and gaseous fuels, including biofuels, as well as to coal tar, crude oil, waste oils and coal and coke-related gases. Hydrocarbons are untaxed when used for commercial navigation on waterways, commercial aviation¹⁴², railways or are used to produce electricity in power plants or to cogenerate electricity and heat in combined power plants.
- A Special Tax on Coal (*Impuesto Especial sobre el Carbón*), classified as a fuel excise tax according to the TEU methodology, applies to specified uses of coal and coke products (excluding peat).
- A Tax on Fluorinated Gases (*Impuesto Sobre Gases Fluorados*)¹⁴³, classified as a carbon tax according to the TEU methodology, is proportional to the each gas' global warming potential (up to a maximum tax of EUR 100 per kg). Spain does not levy specific taxes on other greenhouse gases¹⁴⁴.
- The Special Tax on Electricity (*Impuesto Especial sobre la Electricidad*), classified as an electricity excise tax according to the TEU methodology, is an ad-valorem tax applied to electricity consumption by end users.

Energy taxes in Spain are levied within the framework of the 2003 EU Energy Tax Directive, which sets minimum rates for the taxation of energy products in member states.

Spain participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

Spain has established taxes on the production of spent nuclear fuel and radioactive waste resulting from nuclear power generation and the storage of spent nuclear fuel and radioactive waste in centralised facilities¹⁴⁵. Due to limitations for translating them into a rate per unit of energy use, they are not included in TEU.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- The F-gas tax is assumed to be levied on all F-gases at an estimated average rate of 13 EUR per tonne of CO₂ equivalent. The estimation is based on 2018 tax revenues worth 110 million EUR¹⁴⁶ and an emissions base of 8.31 ktCO_{2e}¹⁴⁷.
- The Tax on Hydrocarbons on waste oil is applied to non-renewable municipal waste.

¹⁴² Diesel and kerosene used in private pleasure craft and private planes are taxed (not modelled in TEU due to a lack of consumption data).

¹⁴³ <https://boe.es/buscar/act.php?id=BOE-A-2013-11331&p=20180704&tn=1#a5>

¹⁴⁴ Taxes on the emission of gases into the atmosphere in the region of Andalusia, Aragon (stationary sources) and Catalonia (vehicles) are not included due to data constraints.

¹⁴⁵ <https://boe.es/buscar/act.php?id=BOE-A-2012-15649&p=20210521&tn=1#tii>, Ley 15/2012, de 27 de diciembre, de medidas fiscales para la sostenibilidad energética.

¹⁴⁶ <https://pinedatabase.oecd.org/> &

https://sede.agenciatributaria.gob.es/Sede/datosabiertos/catalogo/hacienda/Informes_anuales_de_Recaudacion_Tributaria.shtml Table 6.2

¹⁴⁷ CAIT data: Climate Watch. 2020. GHG Emissions. Washington, DC: World Resources Institute. Available at: <https://www.climatewatchdata.org/ghg-emissions>

- In road transport, biodiesel and biogasoline are taxed at the same statutory rate as their fossil fuel equivalents.
- Fishing fuels and biofuels are not taxed.

Sri Lanka

Taxes on energy use and greenhouse gases

As at 1 April 2021, the main taxes on energy use in Sri Lanka are the following:

- Excise duties on gasoline and diesel according to the Excise (Special Provisions) Act No. 13 of 1989

Electricity consumption is not taxed.

Sri Lanka does not collect carbon taxes or taxes on other greenhouse gases emissions.

Sri Lanka does not have a GHG emissions trading system.

Energy use subsidies

The following subsidies on energy use were identified to be in operation in 2020:

- Electricity is sold by the state-owned CEB at prices below cost-recovery levels. Operating losses from the CEB amounted LKR 62.6 billion in 2020.
- A Fuel Price Stabilization Fund (FPSF) was set up in March 2020 to help stable petroleum prices over the medium term. It began with an initial capital of LKR 50 billion raised via issuing treasury bills and will be credited surcharge on Customs Duty collected on fuel imports¹⁴⁸. It ended up with a LKR 26.7 billion negative balance in the year ended in 2020¹⁴⁹. The surcharge was set from March 2020 to January 2021, when it was ended due to high prices global oil prices. A financial support (LKR 48 billion) to CEB through Fuel Price Stabilization Fund (FPSF) helped to do payments made by the CEB to the Ceylon Petroleum Corporation (CPC) and Independent Power Producers (IPPs).

Regarding other energy products, it is worth noting that:

- There is no discretionary control of LPG prices, and therefore it is not subject to any subsidy.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- The Ports and Airports Levy (PAL) and Nation Building Tax (NBT) are broad-based ad valorem taxes resembling VAT and are therefore not included.
- Diesel used for electric generation is assumed to be untaxed.
- Estimates of per unit electricity subsidies were back-calculated from the net loss in 2020 recorded by Ceylon Electric Board. A non-fuel electricity subsidy was allocated as a universal subsidy across all electricity output.
- Fuels subsidies are assumed to amount to LKR 76.7 billion. Fuel subsidies were interpreted to affect the following fuels and sectors: automotive gasoline, diesel (road, rail, industry), fuel oil (agriculture, industry, domestic navigation) and residential kerosene. Additionally, fuels used as inputs to electricity generation and specifically diesel, fuel oil, naphtha were included. Due to data constraints, the subsidies were allocated proportionately to the energy base of each fuel, i.e. one GJ is subsidised equally independently of the petroleum product combusted to produce

¹⁴⁸ [98371b11-4978-45a1-adc2-abdf6f4229ff \(treasury.gov.lk\)](https://www.treasury.gov.lk/98371b11-4978-45a1-adc2-abdf6f4229ff)

¹⁴⁹ [Fuel Price Stabilisation Fund made redundant as govt. ends collecting incomes due to rising oil prices - Business News | Daily Mirror](#)

it. LKR 48 billion have been allocated to fuel used for electricity generation (so an upper bound estimates as this includes also payments to IPPs) The remaining LKR 28.7 billion have been allocated to all the fuels mentioned previously, including for electricity generation.

- Prices for fuels are those set on 10 September 2019, and assumed to be unchanged until the 1 April 2021.

The following measure is outside the scope of the database:

- The standard rate of VAT is 8%, in 2021 and applies to gasoline, natural gas and solid biofuel (coal, charcoal) while several energy products are exempted (electricity, crude oil, kerosene, LPG, aviation fuel, diesel fuel oil and oil for ships). =

Sweden

Taxes on energy use and greenhouse gases

As at 1 April 2021, the main taxes on energy use in Sweden are the following:

- The Energy Tax (*Energiskatt*), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to most fossil fuel use, as well as a low blends of biofuels in gasoline and diesel.
- The electricity tax (*Energiskatt*); this tax per kwh is classified as an electricity excise tax according to the TEU methodology. Electricity used in the industrial manufacturing process, by computer centres and in agriculture is taxed at a substantially lower rate than electricity used by the residential and commercial sectors.
- The Carbon Dioxide (CO₂) Tax (*Koldioxidskatt*), classified as an explicit carbon tax according to the TEU methodology, applies to most fossil fuel use, as well as low blends of biofuels in gasoline and diesel, at a nominal rate of SEK 1 200 (~ EUR 118) per tonne of CO₂.

Sweden also levies a sulphur tax (*Svavelskatt*) on fossil fuel, which falls outside the scope of TEU as it is not considered as a tax on energy use or greenhouse gas emissions.

Energy and carbon taxes in Sweden are levied within the framework of the 2003 European Union (EU) Energy Tax Directive, which sets minimum rates for the taxation of energy products in EU member states.

Sweden does not levy tax on other GHG emissions (such as F-gases or N₂O).

Sweden participates in the EU emissions trading system (ETS). The EU ETS provides a common carbon price for large emitters in the electricity and the industry sectors.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- The rate applied to gasoline and gas oil for automotive purpose is that of environmental class 1; the rates applied to fuel oil, gas oil and kerosene for other uses than automotive purpose are assumed to be those of labelled oil;
- Unsustainable and low-blended biofuels are taxed at the same statutory rates as their fossil fuel equivalents. Sustainable high-blended biofuels (including heating biofuels) are exempt from both carbon tax and energy tax. TEU assumes that 35% of liquid biofuels consumption in the Swedish road sector is high-blended and sustainable, whereas 65% is considered low-blended or unsustainable;
- Fossil fuels used for commercial navigation, commercial aviation, or rail are untaxed;
- Fossil fuels that are used in industrial processes are untaxed if the conditions for non-taxation of the EU Energy Tax Directive are fulfilled (“dual use and related exemptions”);
- Fossil fuels (except gasoline and highly taxed oil i.e. not labelled) consumed for manufacturing process in industrial activity are eligible to a 70% refund on energy tax and a carbon tax exemption if they are also within EU ETS. Except gasoline, it is assumed all other fossil fuels are labelled and so eligible to refunds (cf. first point);
- Fossil fuels consumed for heating (whether in cogeneration or not, except gasoline and highly taxed oil i.e., not labelled) are eligible to a 9% refund on carbon if the heat is used in a sector covered by EU ETS. Except gasoline, it is assumed all other fossil fuels are labelled and so eligible to refunds (cf. first point). It is assumed that the ETS coverage in the industrial sector is 50% for diesel, 100% for coal, and 89% for other fuels. TEU ignores the 1% of fossil fuel emissions that are covered by ETS in the residential and commercial sector;

- Diesel used as motor fuel in the agricultural sector benefits from a reduced carbon tax rate (SEK 1 930 per 1000L refund);
- The fuels used to generate electricity are not taxed, but the electricity sector is fully covered by the EU ETS;
- The use of electricity is subject to a tax per kWh. The tax rate is lower for the residential and commercial sectors in certain municipalities in Northern Sweden (the tax rate is lower by SEK 96 per MWh). The tax rate on the industrial manufacturing processes, computer centres etc. correspond to the minimum level that is admissible under the EU Tax Directive. As is standard, electricity exports are not subject to the electricity tax in Sweden but may be subject to electricity taxes elsewhere.

Due to data constraints, the following refunds or tax exemptions are not included in the Taxing Energy Use (TEU) database:

- Diesel and kerosene used in private pleasure craft and private planes are taxed;
- Fossil fuels consumed for heating (whether in cogeneration or not, except gasoline and highly taxed oil i.e. not labelled) are eligible to a 70% refund on energy tax if the heat is used during manufacturing process in industrial activity or agricultural activity, and to a full exemption on carbon tax if the heat is used during manufacturing process in industrial activity within the EU ETS.

Changes after 1 April 2021

As at 1 July 2021, the energy tax level for fossil fuels used by the industry (within and outside of EU ETS) as well as for fossil fuels used by agriculture, horticulture and pisciculture and in forestry was increased to 65%. As at 1 January 2022, the lower energy tax exemption will be fully abolished (100% energy tax). The corresponding changes are also made to the energy tax for fuels used for heating and cooling deliveries to these sectors.

Switzerland

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use in Switzerland, are the following:

- The Tax on Mineral Oils (*impôt sur les huiles minérales*), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to crude oil, diesel, fuel oil, gasoline, kerosene, LPG, natural gas and waste oil. The Surtax on Mineral Oils (*surtaxe sur les huiles minérales*) applies to these liquid and gaseous fuels when used in road or off-road transport.
- The CO₂ tax (*Taxe sur le CO₂ sur les combustibles fossiles*), classified as a carbon tax according to the TEU methodology, applies to coal and coke, diesel, fuel oil, gasoline, LPG, natural gas when used for heating purposes and to fuel stationary motors at a uniform rate of CHF 96 per tCO₂. The rate has remained unchanged since 2018, but will increase to CHF 120 per tCO₂ in 2022 if emissions fall by less than 33% below the base year 1990.
- Electricity consumption is subject to the Federal Compensatory Feed-in Remuneration Fee (*rétribution à prix coûtant du courant injecté - RPC*), which is classified as an electricity excise tax according to the TEU methodology.

Switzerland operates an emissions trading system (ETS) on GHG emissions. Energy use that is covered by the ETS is exempt from the carbon tax.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumption was made:

- The Swiss Electricity Federal Council provides data on the local taxes paid by network provider and by electricity consumption category. Based on the pre-defined electricity consumption categories, TEU includes unweighted averages for the local taxes paid by households (categories H1 through H8), by business (categories C1 through C3) and by industries (categories C4 through C8).
- Biofuels benefit from a tax relief as far as they fulfil certain ecological and social conditions according to Swiss MOT law/ordinance. They are normally produced and/or imported pure and are later blended with fossil fuels
- Diesel and gasoline used for domestic aviation, domestic navigation as well as diesel used for railway transport are taxed at the standard rates for propellants. Natural gas used for pipeline transport is taxed at the standard rate for non-propellant use inside the ETS.
- Natural gas used in the agriculture and fisheries sector is not taxed.

Turkey

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use and GHG emissions in Turkey are the following:

- A Special Consumption Tax (SCT) (*Özel Tüketim Vergisi (ÖTV)*), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to biodiesel, diesel, fuel oil, gasoline, LPG, railway diesel, marine diesel, marine fuel oil and natural gas.
 - Fuels used to generate electricity and for commercial aviation are not taxed.
- The Electricity and Coal Gas Consumption Tax rate of 1% is applied to sales price of the electricity consumed in manufacturing and production, transportation, loading, unloading, cooling, wired and wireless telegraph and telephone works, 5% of the sales price of the electricity consumed for other purposes, and 5% of the sales price of the coal gas.¹⁵⁰ This tax is collected by municipalities.
- An Electricity Consumption Tax (ECT) (*Elektrik tüketim vergisi*), applies to electricity consumption as an *ad-valorem* rate of 1% for industry and transport users, and at an *ad-valorem* rate of 5% for all other users.
 - The Municipality Revenues Law (Law #2464) also contains a Coal Gas Consumption Tax (*Havagazı tüketim vergisi*),¹⁵¹

Turkey does not levy a fuel-based carbon tax and does not tax greenhouse gas emissions directly.

Turkey does not operate an emissions trading system (ETS).

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- The *per-unit* electricity tax rate is estimated as the product of the Weighted Average Market Clearing Price (MCP) of electricity in 2020 (TRY 318.70 per MWh) and the *ad-valorem* electricity rate applied to industry and transport users (1%) and to all other users (5%);
- Electricity and Coal Gas Consumption Tax rate of 1% is applied to sales price of the electricity consumed in manufacturing and production, transportation, loading, unloading, cooling, wired and wireless telegraph and telephone works and 5% of the sales price of the electricity consumed for other purposes. Due to data constraints, the low rate is applied to all industry and transport uses and the higher rate to all other uses.
- Natural gas used in pipeline transport is taxed.
- Fossil fuels used in the agriculture and fisheries sector are taxed.
- The rates for LPG used as propellant and in heating and stationary motors were reduced with the official gazette of 20/05/2021 but for comparability the 1 April 2021 rates were recorded in the TEU database.
- Kerosene and aviation kerosene are taxed but at zero rate. They are included in the list (I) attached to the Law 4760¹⁵².
- Solvent naphtha (non-energy use) is taxed in the list (I) attached to the Law 4760. Naphtha for energy use is assumed to be untaxed.

¹⁵⁰ This rate is no longer relevant in practice as Turkey has stopped using coal gas.

¹⁵¹ Electricity and Coal Gas Consumption Tax has been regulated between articles 34-39 of the Municipality Revenues Law No. 2464

¹⁵² https://www.gib.gov.tr/fileadmin/mevzuatek/otv_oranlari_tum/ozeltuketimoranlari-OpenPage.htm

Uganda

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, there is a single specific tax on energy use in Uganda:

- The Petroleum Excise Duty (PED) applies to gasoline, diesel and other gas oils, illuminating kerosene and aviation fuels.

Uganda does not collect carbon taxes or taxes on other greenhouse gases emissions.

Uganda does not have a GHG emissions trading system.

In April 2021, the Ugandan Parliament passed the Excise Duty (Amendment) Bill of 2021, which increased the tax on petrol and diesel by 7.4% and 9.7%, respectively starting from 1 July 2021 (not modelled).

Table 13. Energy taxes on petroleum products in Uganda

Rates in UGX per L	Gasoline	Diesel (road)	Other gas oils	Illuminating Kerosene	Jet kerosene (commercial)
PED	1350	1030	630	300	0

Note: FY 2020/2021, the financial year (FY) in Uganda starts on the 1st of July. Expressed in Ugandan shillings (UGX) per product litre.

Source: Excise duty (amendment) Act 2018 and 2020.

Energy use subsidies

No subsidies on energy use were identified to be in operation in 2021.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- Gasoline, diesel and kerosene are taxed uniformly across sectors (road, industry ...), except diesel and fuel oil used for electricity generation which are exempted;
- Fuel oil is not explicitly mentioned in the excise duty bill. It is assumed to be taxed as “other gas oil”;
- LPG is not explicitly mentioned in excise duty bill and is assumed to be untaxed;
- Jet kerosene consumed is assumed to be consumed only from commercial companies. Taxation of jet kerosene used for private aviation is not modelled.

Due to data constraints, the following refunds or tax exemptions are not included in the Taxing Energy Use (TEU) database:

- Sales to diplomats and embassies exempted from fuel excises.

The following measures is out of scope of the database:

- The standard VAT rate is 18%. Petroleum products are exempted from VAT, but VAT is applied to and other energy products such as electricity, charcoal or wood.

Ukraine

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 July 2018 and 1 April 2021, taxes on energy use in Ukraine are:

- An excise tax (*АКЦИЗНИЙ ПОДАТОК*), classified as “fuel excise tax” according to Taxing energy use (TEU) methodology, applies to gasoline, jet kerosene, kerosene, diesel, fuel oil and LPG.
- An environmental tax (*ЕКОЛОГІЧНИЙ ПОДАТОК*), classified as “carbon tax”, applies to all carbon dioxide emissions from stationary sources.
- An excise tax (*АКЦИЗНИЙ ПОДАТОК*), classified as “electricity excise tax”, with an ad valorem rate also applies to electricity consumption.

Ukraine does not levy taxes on other GHG emissions.

Ukraine does not have a GHG emissions trading system yet, but is currently developing one, which could be implementing starting from 2025.

Table 14. Energy taxes on petroleum products and natural gas

Rates in UAH per 1000 L	Gasoline	Diesel	Fuel oil	Jet kerosene	LPG	Natural gas
Excise tax	213.5	139.5	139.5	21	52	0

Note: rates for 2018 and 2021, fuel oil assumed to be taxed as diesel, biogasoline assumed to be taxed as gasoline

Source: Tax code

Energy use subsidies

Energy subsidies affecting domestic prices were incorporated using data from the Inventory of Support Measures for Fossil Fuels¹⁵³

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

- The carbon tax is assumed to apply to all fuels, including fuels such as biogas, consumed in all sectors (that is to say agriculture and fishing, industry, electricity and heat generation) except residential, commercial, road and off road displacements. The carbon tax is modelled by translating the tax rates per tons of CO₂e (UAH 0.41 in 2018, UAH 10 in 2021) to tax rates per of usual metrics (1000 litres) with IEA conversion factors.
- Fuels excises are assumed to apply similarly to all uses.
- Electricity generated from renewables and from cogeneration plants, whether it comes from autoproducers or main plants, are assumed to be untaxed. It is worth noting that the exemption for electricity coming from renewables will seemingly be deleted¹⁵⁴ but was still in force as at April 2021 and July 2018.
- Own uses and transformation processes are untaxed. Distribution losses are also assumed to be untaxed.

¹⁵³ [OECD Inventory of Support Measures for Fossil Fuels: Country Notes – Ukraine \(oecd-ilibrary.org\)](#) ; [Fossil Fuel Support - UKR \(oecd.org\)](#)

¹⁵⁴ [Ministry of Energy supported the introduction of an excise tax on renewable energy — EXPRO Consulting](#)

- The “coal and coke” label stands for anthracite, bituminous coal and coke oven coke. The “coal gas” label stands for blast furnace gas, coke oven gas and converter gas.

Due to data constraints, the following refunds or tax exemptions are not included in the Taxing Energy Use (TEU) database:

- Sales to diplomats and embassies exempted from fuel excises.
- Sales or transfer of certain fuels within the same enterprise exempted from fuel excises.
- The first 500 tons of CO₂ emissions from the registered emitters exempted from carbon tax, starting from 2019, as no information available on the share of this consumption in the total consumption by fuels.
- Decreased excise tax for operations related to the sale of aviation gasoline and jet fuel (produced in Ukraine as well as imported), as no aviation gasoline and jet fuel consumption recorded in the energy base.
- Excise tax relief for operations related to the sale of LPG at specialised auctions for the needs of households.

The following measures is outside the scope of the database:

- The standard VAT rate is 20%.

United Kingdom

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use in the United Kingdom, were the following:

- A Fuel Duty, classified as a fuel excise tax according to the TEU methodology, applies to liquid fuels (including bioethanol and biodiesel), as well as to LPG and natural gas (including biogases) when used as motor fuel. Diesel used in commercial navigation (“marine”) is relieved from Fuel Duty. Commercial aviation fuels are untaxed, but diesel and kerosene used in private pleasure craft and private planes are taxed. Fuels used for fishing are untaxed. Kerosene used for heating is untaxed.
- A Climate Change Levy (CCL) applies to solid fossil fuels, LPG, natural gas and electricity when supplied to business and public sector users. CCL does not apply to solid fuels, LPG, and natural gas in industry, and when supplied for use in metallurgical and mineralogical processes or for non-fuel uses.

The United Kingdom operates an emissions trading scheme (ETS) for greenhouse gas emissions that covers large emitters from the industry and electricity sectors. Permit prices resulting from the ETS apply in addition to energy and carbon taxes.

- The Carbon Price Floor (CPF) – implemented through Carbon Price Support (CPS) rates of CCL and Fuel Duty – is a domestic instrument covering the electricity sector, which is charged in addition to UK ETS participation. The CPS, which is classified as a carbon tax according to the TEU methodology, is set at a nominal rate of GBP 18.00 per tonne of CO₂.

Other than the CPS, the United Kingdom does not levy taxes on GHG emissions.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumption was made:

- The CPS exemption for fossil fuels used in a combined heat and power station to generate good quality electricity consumed on-site is assumed to apply to all CPS excisable fossil fuel use;
- All autogeneration electricity plants are assumed to be tax exempt;
- Kerosene in agriculture is assumed to be 50% used for heating (untaxed) and 50% used for stationary motors and off-road engines.
- Due to data constraints, a number of the following tax exemptions are not included in the database, including:
 - The reduced CCL rates for participants in Climate Change agreements.
 - Tax exemptions and reduced rates for Northern Ireland.

United States

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use and GHG emissions in the United States were the following:

- The Highway Motor Fuel Tax (HMFT), classified as a fuel excise tax according to the Taxing Energy Use (TEU) methodology, applies to motor fuels. The HMFT is set at USD 0.183 per gallon on gasoline, biogasoline (ethanol), CNG and LPG, and at a rate of USD 0.243 per gallon on (undyed) diesel, biodiesel, (undyed) kerosene and LNG.
- The General Aviation Fuel Tax (GAFT) applies to gasoline and kerosene used for non-commercial aviation purposes at a rate of USD 0.193 per gallon and USD 0.218 per gallon, respectively.
- The Commercial Fuel Tax (CFT) applies to aviation fuels when used for commercial aviation purposes at a rate of USD 0.043 per gallon.
- The Inland Waterways Trust Fund financing rate (IWTF Tax), classified as a fuel excise tax according to the TEU methodology, applies to all fuels used for domestic navigation purposes at a rate of USD 0.29 per gallon.
- The Leaking Underground Storage Tank (LUST) Trust Fund Tax, classified as a fuel excise tax according to the TEU methodology, applies to all excisable motor, aviation and marine fuels, with the exception of CNG and LPG, at a rate of USD 0.001 per gallon.
- The Oil Spill Liability Tax (OSLT), classified as a fuel excise tax according to the TEU methodology, applies to crude oil at a rate of USD 0.09 per barrel (USD 0.002 per gallon).
- At the subnational level, states levy taxes on transport fuels, and these are added to the federal tax rates.¹⁵⁵ TEU includes state taxes in road transport¹⁵⁶ and domestic aviation.¹⁵⁷

The United States does not levy excise taxes on electricity consumption, does not have a fuel-based carbon tax, and does not tax GHG emissions directly.

In the United States, several emissions trading systems (ETS) exist at the subnational level including the California cap-and-trade, the Massachusetts ETS and the Regional Greenhouse Gas Initiative (RGGI) spanning multiple states.

Country-specific assumptions

When matching the taxes specified above (net of applicable exemptions, rate reductions, and refunds) to the corresponding tax base, the following country-specific assumptions were made:

- Fossil fuels used in electricity generation are not taxed.
- Diesel use by railways is not taxed.¹⁵⁸
- Energy use in the industry sector is not taxed.¹⁵⁹
- Energy use in the residential and commercial sector, agriculture and fisheries is not taxed.

¹⁵⁵ As the IEA energy balances only provide energy use data at the country level, TEU calculates subnational tax bases based on data from the US Energy Information Administration (EIA), which also provides information on state excise taxes.

¹⁵⁶ <https://www.eia.gov/petroleum/marketing/monthly/xls/fueltaxes.xls>

¹⁵⁷ <https://www.eia.gov/petroleum/marketing/monthly/xls/aviationtaxes.xls>

¹⁵⁸ Diesel marked for off-road use is taxed in Arkansas, Mississippi and North Dakota. TEU does not include these subnational taxes as rates are low and the corresponding fuel consumption is negligible.

¹⁵⁹ TEU does not include severance taxes. In addition, TEU does not include Alaska's surcharge of \$0.0095 per gallon on refined fuel used in an engine, machine, or contrivance that creates heat, energy, or power, as the corresponding energy base is negligible.

- In road transport, natural gas (in the form of LNG) is taxed at the diesel equivalent rate, while LPG at the gasoline equivalent rate. The extent to which US states also tax these fuels in road transport varies across the country. As their relative consumption in the sector is negligible, the secretariat makes the simplifying assumption that all states tax natural gas and LPG at the diesel and gasoline equivalent rates respectively.
- Kerosene use is taxed at both federal and state level. Rates are lower for domestic commercial aviation, which is assumed to be responsible for 90% of aviation fuel consumption.
- Local surcharges above state-wide minima for excise tax rates may not always be covered due to data constraints (this is, for instance, relevant in parts of Hawaii).
- Biodiesel and biogasoline consumed in the road sector are taxed at the same statutory rates as their fossil fuel equivalents. Tax credits for alternative fuels are not considered because TEU does not cover refunds that operate through the income tax system.
- Due to data limitations, TEU does not take into account that in the road sector, fuels used by state and local governments; non-profit educational organisations; certain private local mass transit buses as well as private intercity buses serving the public are generally tax exempt. In addition, various tax credits apply to alternative fuels (e.g. natural gas and LPG) as well as to biogasoline and biodiesel consumption. TEU does not take these tax credits into account.

The following measures is out of scope of the database:

- A manufacturer's tax is imposed on the first sale of coal mined in the United States¹⁶⁰. The producer of the coal is liable for the tax. This severance tax is out of scope according to TEU methodology.

¹⁶⁰ <https://www.irs.gov/publications/p510>

Uruguay

Taxes on energy use and greenhouse gas (GHG) emissions

As at 1 April 2021, the main taxes on energy use in Uruguay are the following:

- The excise tax or *Impuesto Específico Interno* (IMESI) applies to several product categories like beverages, tobacco and fuels. Specifically, the tax applies to gasoline (including aviation gasoline and biogasoline) and kerosene (excluding aviation kerosene) in accordance with the decree n° 24/021.
- The tax in support of the *Unidad Reguladora de Servicios de Energía y Agua* (URSEA) and the *inflammable* (combustion) tax. They are low ad-valorem taxes, respectively fixed at 0.2% and 0.6% of the ex-VAT price and apply to LPG, fuel oil, diesel, kerosene (including aviation kerosene) and gasoline.

Currently, electricity consumption attracts a 0% IMESI although there is a provision for a maximum rate of 10%. VAT of 22% applies to electricity consumption¹⁶¹ as well as several fuels not paying IMESI e.g. diesel, fuel oil, LPG, natural gas and charcoal. On the contrary, fuels that attract the IMESI are associated with a 0% VAT. VAT is not included in the effective rates calculation in TEU, to be consistent with the general approach of this report.

Starting from 2022, Uruguay will levy a carbon tax on gasoline at a rate of 5 645.45 per tonne of CO₂.¹⁶² Uruguay does not levy taxes on other greenhouse gases emissions. Uruguay does not have a GHG emissions trading system.

Table 15. Taxes and energy products applicability matrix

Taxes	Diesel	Fuel oil	Gasoline	Kerosene	Aviation Kerosene (Jet A1)	LPG	Natural gas
IMESI	X	X	✓	✓	X	X	X
URSEA	✓	✓	✓	✓	✓	✓	X
Inflammable	✓	✓	✓	✓	✓	✓	X
VAT	✓	✓	X	X	X	✓	✓

Source: DGI

Energy use subsidies

The following subsidies were identified in 2020, but not recorded according to the current methodology of TEU as they are all assumed to be cross-subsidies, the cost being compensated elsewhere in the companies' activities¹⁶³:

Diesel consumed by public passenger road transport benefits from subsidies, which are funded by charging a fee (*fideicomiso del boleto*) of 3.484 Uruguayan pesos (UYU) per litre of automotive diesel in 2020. This is considered as a cross subsidy fully compensated and therefore neither the subsidies nor the tax are included in TEU.

¹⁶¹ With exception of the fixed charge of the residential tariffs and the monthly charge of the basic residential, according to art. 53 bis DTO 220/998

¹⁶² Decree n° 441/021 cf. <https://www.impo.com.uy/bases/decretos/441-2021/2>

¹⁶³ <https://legislativo.parlamento.gub.uy/temporales/5031622.PDF>

LPG use is subsidised through two mechanisms: (i) households benefitting from certain social aids may get a 15% discount on 13 kg bottles of LPG. In practice, the number of claims is lower than planned and amounted to UYU 1.85 million in 2019 (no data for 2020); (ii) LPG is sold by ANCAP at a price below the real cost, whereas higher prices are set for other fuels to compensate. The amount of subsidy was up to UYU 888 million in 2019 (no data for 2020). Both subsidies are compensated by higher gasoline and diesel prices, the supplementary cost for these fuels being estimated respectively to UYU 0.54 and 0.45 per litre in 2019 (no data for 2020). They are considered as cross-subsidies and not included in TEU. In 2021, the government expressed its will to revise the general LPG subsidy.

Losses from Portland activities related to cement can be seen as an implicit subsidy, but are out of the scope.

In the electricity sector, certain productive sectors (e.g. dairy production, rice production, industrial companies with a high annual expenditure in electricity related to gross production value, companies that can prove maintaining or increasing export volumes and jobs) and also vulnerable residential consumers (e.g. 'Tarifa Básica Residencial') receive price discounts. The discounts are considered in the cost structure that is utilized to determine price adjustments leading to cross subsidisation between sectors and categories of users.

Country-specific assumptions

When matching the taxes specified above to the corresponding tax base, the following country-specific assumptions were made:

All premium gasoline is consumed in the road sector, as it is special low-sulphur diesel. Market shares in the road sector are assumed to be 10% for premium gasoline and 90% for regular gasoline.

The URSEA and inflammable taxes are ad-valorem and their amounts are contingent on the prevailing prices.

Prices for fuels are the maximum prices set in December 2020 by decree n° 364/2020.

Due to data constraints, the following discount is not modelled:

- The discount on excise tax payable for gasoline acquired at the border zones of Argentina and Brasil since February 2021, according to the resolution DGI n° 147/021.