

## Taxing Energy Use 2019: Country Note – Denmark

*This note explains how Denmark taxes energy use. The note shows the distribution of effective energy tax rates – the sum of fuel excise taxes, explicit carbon taxes, and electricity excise taxes, net of applicable exemptions, rate reductions, and refunds – across all domestic energy use. It also details the country-specific assumptions made when calculating effective energy tax rates and matching tax rates to the corresponding energy base.*

*The note complements the Taxing Energy Use 2019 report that is available at <http://oe.cd/TEU2019>. The report analyses where OECD and G20 countries stand in deploying energy and carbon taxes, tracks progress made, and makes actionable recommendations on how governments could do better to use taxes to reach environmental and climate goals.*

*The general methodology employed to calculate effective energy tax rates and assign tax rates to the energy base is explained in Chapter 1 of the report. The official energy tax profile for Denmark can be found in Chapter 2 of the report. Chapter 3 additionally shows effective carbon tax rates per tonne of CO<sub>2</sub>, and presents the corresponding carbon tax profiles for all countries. The report also contains StatLinks to the official data.*

### Structure of energy taxation in Denmark

Energy and carbon taxes in Denmark 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 July 2018, the main taxes on energy use in Denmark were the following:

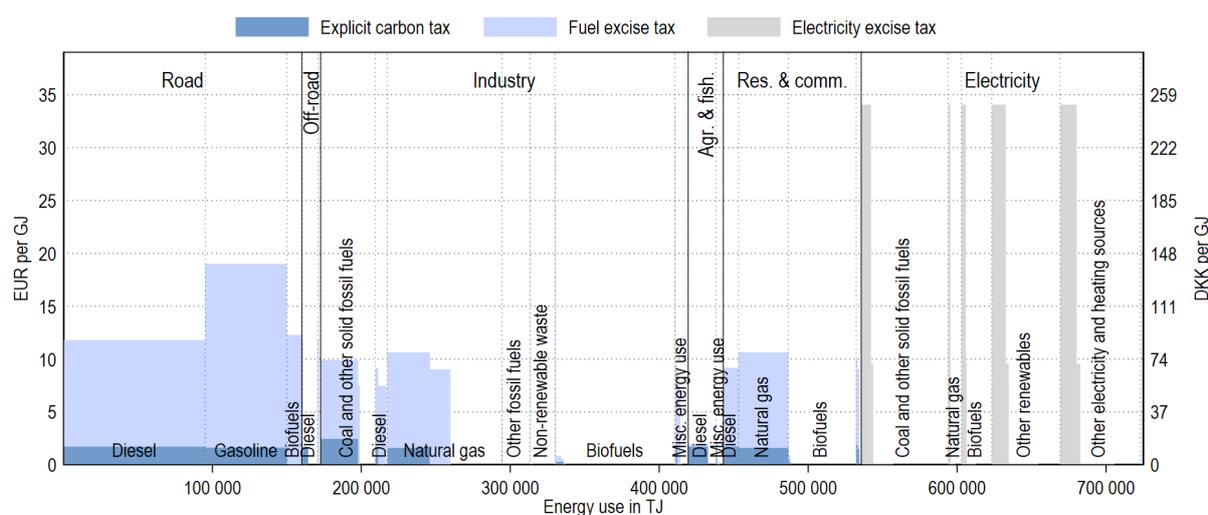
- The Mineral Oil Tax (*Mineralolieafgift*)
- The Gas Tax (*Gasafgift*)
- The Coal Tax (*Kulafgift*)
- The Carbon Tax (*CO<sub>2</sub>-afgift*) with a nominal rate of DKK 173 per tonne of CO<sub>2</sub>
- The Electricity Tax (*Elafgift*)

Denmark participates in the EU emissions trading system (ETS) (OECD, 2018<sup>[1]</sup>). Facilities that are covered by the ETS do not pay the carbon tax (or receive a full refund). Heat inputs into district heating plants are, however, subject to the CO<sub>2</sub> tax, irrespective of whether they are also covered by the EU ETS. Permit prices are not shown in the energy tax profiles.

## Effective tax rates on energy use in Denmark

The taxes result in effective tax rates that can differ across energy products and uses, as described below. Figure 1 provides an overview of how energy and carbon taxes apply across the six economic sectors as defined in TEU (which is different from the way Danish energy use is reported in other publications).<sup>1</sup> The remainder of this document discusses details on tax rates and tax bases for each of the six economic sectors.

**Figure 1. Effective tax rates on energy use by sector and energy category**



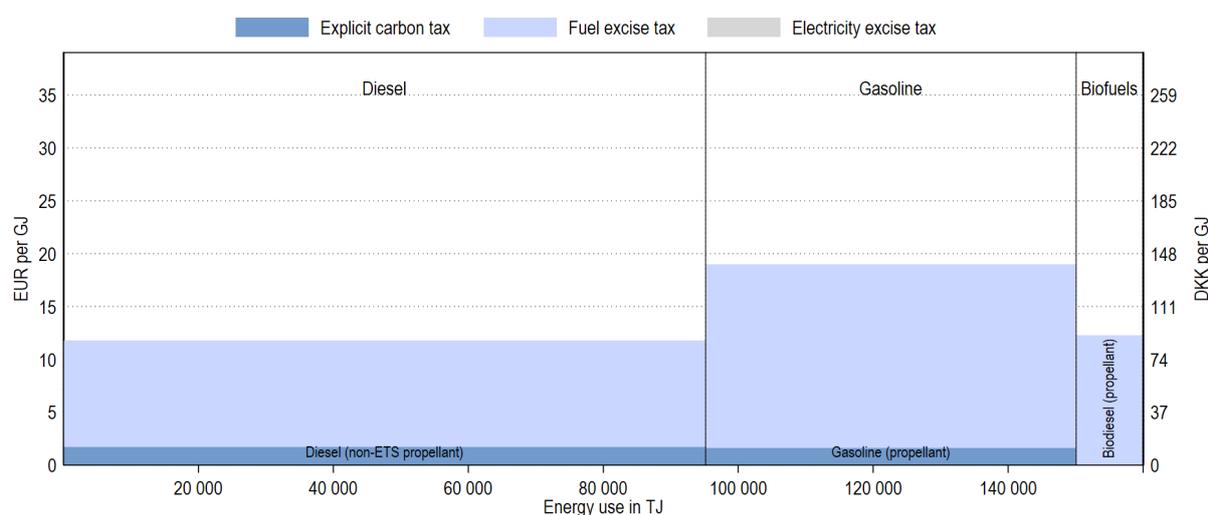
*Note:* Tax rates applicable on 1 July 2018. Energy use data is for 2016 and adapted from IEA (2018<sup>[2]</sup>), *World Energy Statistics and Balances*. Energy categories (labelled at the bottom) that represent less than 1% of a country's energy consumption are grouped into "misc. energy use" and may not be labelled.

<sup>1</sup> In TEU, the industry sector includes all primary energy use associated with district heating, which is usually reported separately or allocated to the sector where the heat is consumed. The electricity sector includes all primary energy use associated with electricity that is produced for sale. This includes thermal waste, i.e. primary energy that is lost in the conversion process.

## Road

In the road sector, gasoline is taxed at a higher rate than diesel fuel.<sup>2</sup> Biogasoline and biodiesel are exempt from the carbon tax.<sup>3</sup>

**Figure 2. Effective tax rates on energy use in the road sector**



*Note:* Tax rates applicable on 1 July 2018. Energy use data is for 2016 and adapted from IEA (2018<sup>[2]</sup>), *World Energy Statistics and Balances*. Energy categories (labelled at the top) that represent less than 1% of a sector's energy consumption are grouped into "misc. energy use" and may not be labelled. Similarly, rate labels (shown at the bottom) are grouped into "misc. rates" using the same threshold.

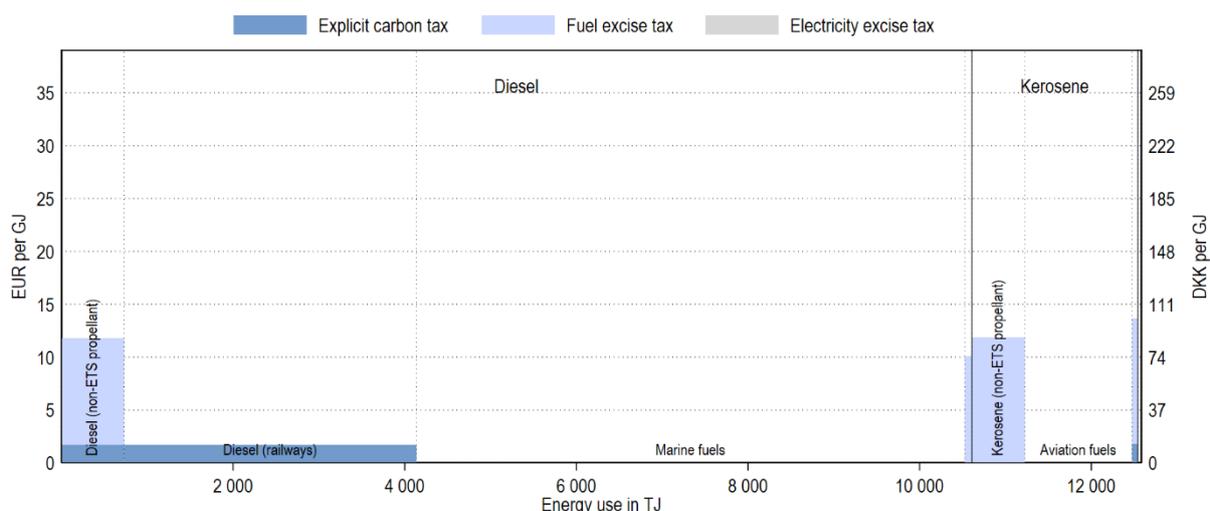
<sup>2</sup> Diesel vehicles are, however, charged a balancing tax. In line with the TEU methodology, this tax is not included in the database.

<sup>3</sup> Note that the IEA reports biogasoline under biodiesel.

### Off-road

In the off-road sector, diesel is in principle taxed at the standard rate for propellant purposes. Diesel used for railway operations is, however, only subject to the CO<sub>2</sub> Tax. Diesel motor fuels for navigation and domestic commercial aviation are untaxed. All EU ETS-covered companies benefit from a full refund on the CO<sub>2</sub> Tax paid, but EU ETS only covers around 10% of fossil fuel use in the off-road sector (OECD, 2018<sup>[1]</sup>).

**Figure 3. Effective tax rates on energy use in the off-road sector**



*Note:* Tax rates applicable on 1 July 2018. Energy use data is for 2016 and adapted from IEA (2018<sup>[2]</sup>), *World Energy Statistics and Balances*. Energy categories (labelled at the top) that represent less than 1% of a sector's energy consumption are grouped into "misc. energy use" and may not be labelled. Similarly, rate labels (shown at the bottom) are grouped into "misc. rates" using the same threshold.

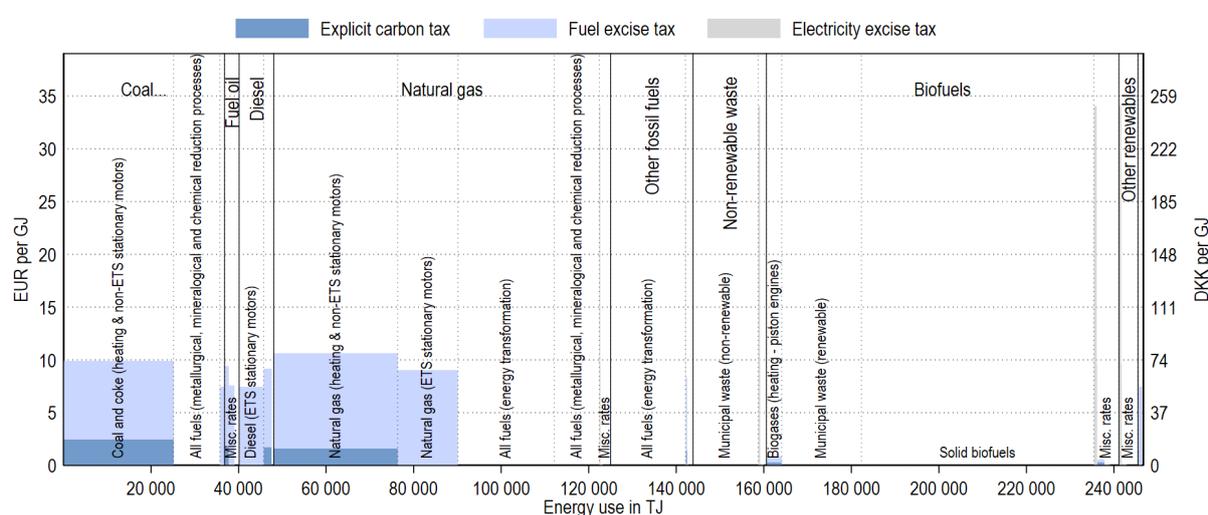
## Industry

In the industry sector, which according to the TEU methodology also includes all primary energy use associated with district heating,<sup>4</sup> fossil fuels are generally taxed. This includes the heat inputs into CHP plants. ETS industries benefit from a full refund on the CO<sub>2</sub> tax paid, with the exception of district heating plants. It is assumed the ETS covers 83% of fossil fuel use in the industry sector (OECD, 2018<sub>[1]</sub>).

However, these fossil fuels are generally not taxed when used:

- For energy transformation processes other than heating (e.g. coking coal to coke);
- in mineralogical and metallurgical processes;
- as inputs in autoproducer electricity plants.

**Figure 4. Effective tax rates on energy use in the industry sector**



*Note:* Tax rates applicable on 1 July 2018. Energy use data is for 2016 and adapted from IEA (2018<sub>[2]</sub>), *World Energy Statistics and Balances*. Energy categories (labelled at the top) that represent less than 1% of a sector's energy consumption are grouped into "misc. energy use" and may not be labelled. Similarly, rate labels (shown at the bottom) are grouped into "misc. rates" using the same threshold.

Non-renewable municipal waste is tax exempt.<sup>5</sup> Biogases are taxed. Other biofuels are untaxed. Electricity produced by autogeneration plants is generally subject to electricity excise taxes under the same conditions as main-producer electricity plants (see next section). This is barely visible in the figure because such consumption is low.

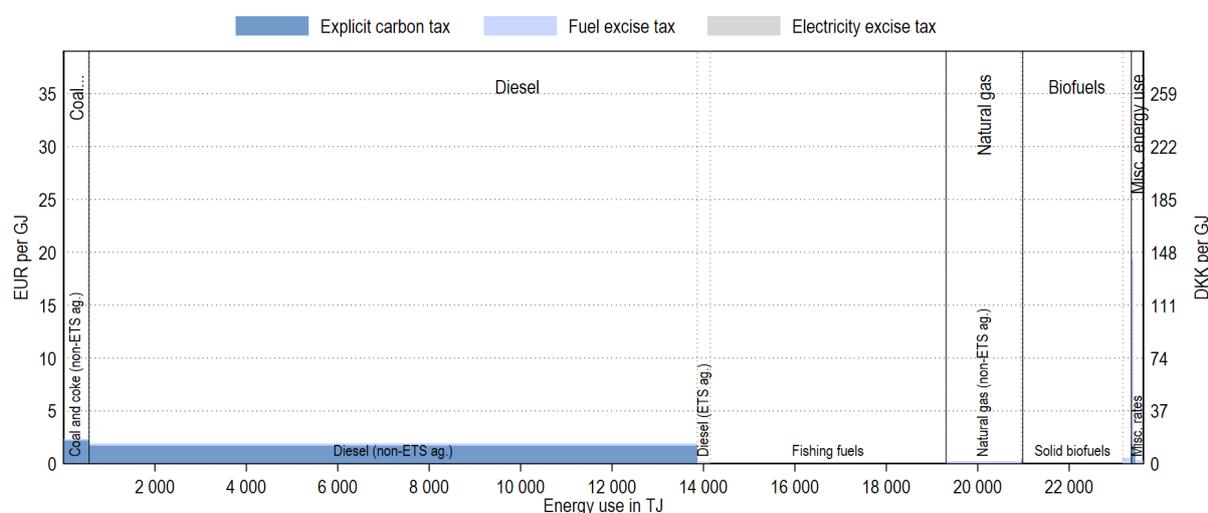
<sup>4</sup> In energy statistics, district heating is often not reported in the industry sector, but as part of the energy sector, similar to the way TEU reports electricity production. Because the TEU methodology includes district heating in the industry sector, in TEU energy use associated with the industry sector is substantially higher than when other sector definitions are used.

<sup>5</sup> 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.

### *Agriculture and fisheries*

In the agriculture and fishing sector, as defined in TEU, coal and coke use benefits from a reduced energy tax rate. Diesel and other motor fuels consumed in the agriculture sector by VAT-registered companies benefit from a reduced fuel excise tax paid, with the exception of gasoline use.<sup>6</sup> All ETS-covered companies benefit from a full refund on the CO<sub>2</sub> tax paid. It is assumed the ETS covers 2.1% of fossil fuel use in the agriculture and fishing sector (OECD, 2018<sup>[1]</sup>). Fishing fuels are untaxed. Solid biofuels are untaxed as in the other sectors.

**Figure 5. Effective tax rates on energy use in agriculture and fisheries**



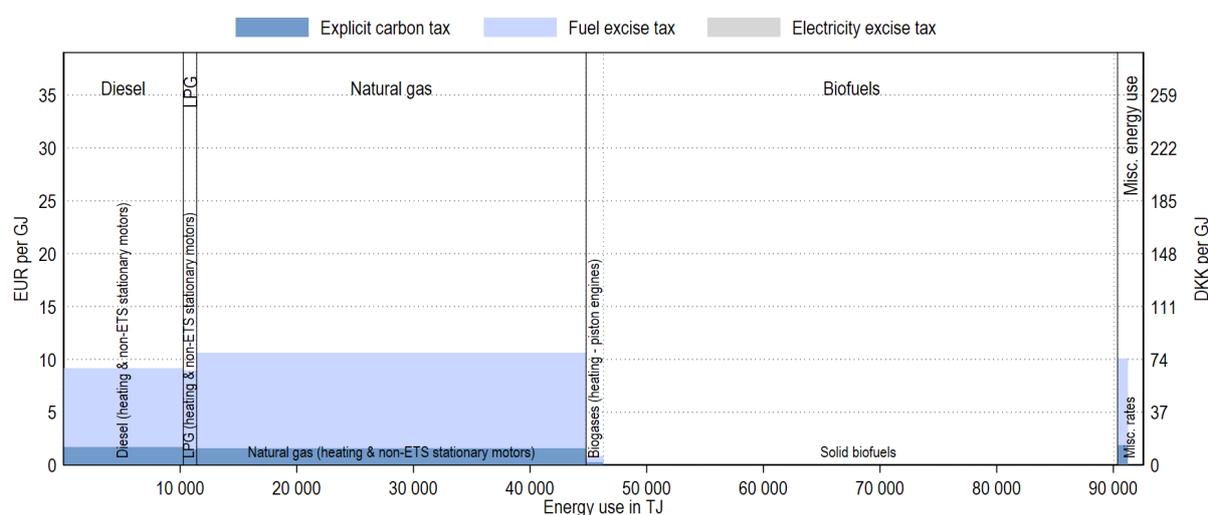
*Note:* Tax rates applicable on 1 July 2018. Energy use data is for 2016 and adapted from IEA (2018<sup>[2]</sup>), *World Energy Statistics and Balances*. Energy categories (labelled at the top) that represent less than 1% of a sector's energy consumption are grouped into "misc. energy use" and may not be labelled. Similarly, rate labels (shown at the bottom) are grouped into "misc. rates" using the same threshold.

<sup>6</sup> It is assumed most fuels used in this sector are motor fuels.

### Residential and commercial

In the residential and commercial sector, as defined in TEU, fossil fuels and biogases are taxed. Solid biofuels are not taxed as in the other sectors.

**Figure 6. Effective tax rates on energy use in the residential and commercial sector**



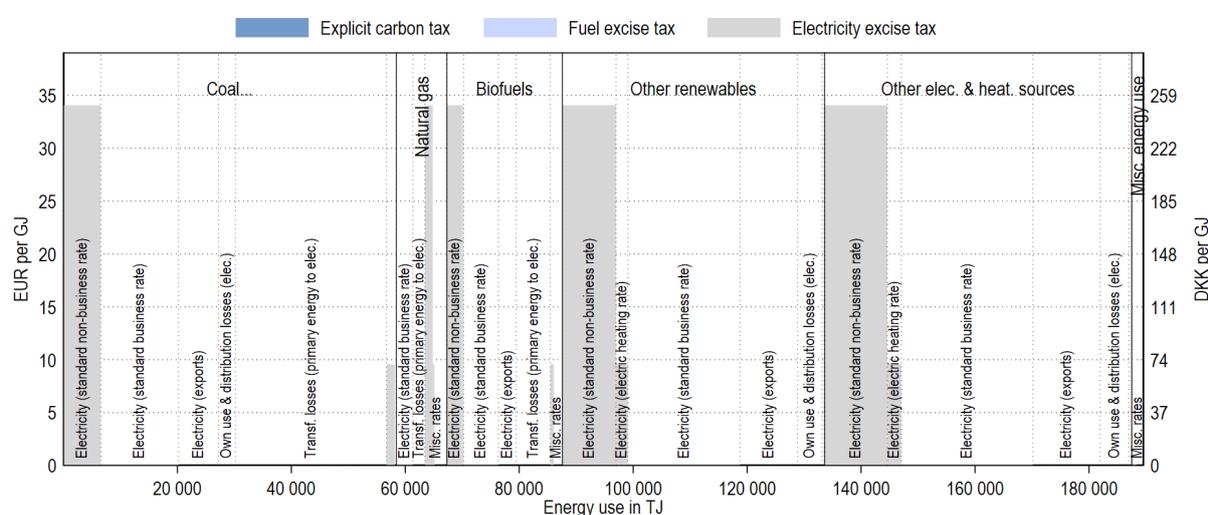
*Note:* Tax rates applicable on 1 July 2018. Energy use data is for 2016 and adapted from IEA (2018<sup>[2]</sup>), *World Energy Statistics and Balances*. Energy categories (labelled at the top) that represent less than 1% of a sector's energy consumption are grouped into "misc. energy use" and may not be labelled. Similarly, rate labels (shown at the bottom) are grouped into "misc. rates" using the same threshold.

## Electricity

All energy sources used to generate electricity are untaxed. This implies that the primary energy that is lost as part of the electricity generation process (“thermal waste”) is not taxed.

Electricity consumption, on the other hand, is generally subject to an electricity excise tax. The rate is highest for non-business use. Electricity used for electric heating benefits from a reduced rate, but the associated tax base is quite small and not always labelled in the figure. The standard business use is substantially lower than both non-business and electric heating rates and is barely discernible in the figure.<sup>7</sup> Own use by the electricity industry is not taxed, and neither are exports, which may, however, be subject to electricity taxes in other countries.

Figure 7. Effective tax rates on energy use in the electricity sector



Note: Tax rates applicable on 1 July 2018. Energy use data is for 2016 and adapted from IEA (2018<sup>[2]</sup>), *World Energy Statistics and Balances*. Energy categories (labelled at the top) that represent less than 1% of a sector’s energy consumption are grouped into “misc. energy use” and may not be labelled. Similarly, rate labels (shown at the bottom) are grouped into “misc. rates” using the same threshold.

## References

- IEA (2018), “Extended world energy balances”, *IEA World Energy Statistics and Balances* (database), <http://dx.doi.org/10.1787/data-00513-en>. [2]  
(accessed on 16 October 2018)

<sup>7</sup> There are exemptions for electricity output generated by very small plants (less than 150 kW capacity), 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. Due to data limitations, TEU does not take these exemptions into account.

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OECD (2018), *Effective Carbon Rates 2018: Pricing Carbon Emissions Through Taxes and Emissions Trading*, OECD Publishing, Paris, <https://dx.doi.org/10.1787/9789264305304-en>. [1]