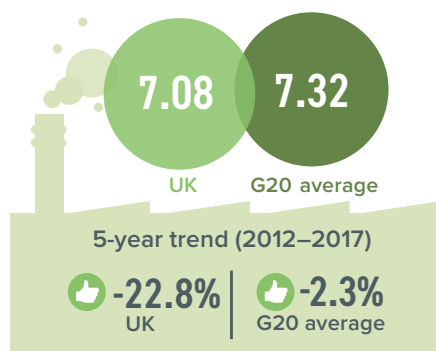




This country profile is part of the **Climate Transparency Report 2020**. Find the full report and other G20 country profiles at: [www.climate-transparency.org](http://www.climate-transparency.org)

## PER CAPITA GREENHOUSE GAS (GHG) EMISSIONS BELOW G20 AVERAGE

GHG emissions (incl. land use) per capita (tCO<sub>2</sub>e/capita)<sup>1</sup>



The UK's total GHG emissions (excl. land use) have decreased by 44% (1990-2017)

Data for 2017. Sources: Enerdata 2020, UN Department of Economic and Social Affairs Population Division, 2020; Gütschow et al., 2019

## NOT YET ON TRACK FOR A 1.5°C WORLD



As an EU member state until 31 January 2020, the UK was committed to contributing to the EU NDC. Given its withdrawal from the European Union, the UK must now submit its own ambitious NDC. As of mid-November 2020 it has not done so, and therefore there is no 1.5°C 'fair-share' compatibility analysis or rating of an UK NDC. The UK has a national target to reduce emissions by 57% below 1990 levels encapsulated in its fifth carbon budget (2028-2032). The period covered in this country profile pre-dates the UK's withdrawal from the EU.

The UK has not submitted an NDC

## KEY OPPORTUNITIES FOR ENHANCING CLIMATE AMBITION

In May 2020, the Committee on Climate Change outlined key near-term opportunities for strengthening climate-related policies that could help with COVID-19 recovery. These include:



**Strengthening energy system networks** to accommodate the electrification of heat and transport, and the construction of new hydrogen infrastructure.



**Retraining programmes** for designers, builders, and installers of low-carbon heating, energy efficiency, and passive cooling options, as well as to prepare for decarbonised manufacturing, construction, and procurement sectors and the replacement of existing fossil fuel-related jobs.



**Deep housing retrofits to improve energy and water efficiency**, building low-carbon, climate resilient and energy and water efficient new homes, and the roll-out of heat pumps and other low-carbon heating in all homes.

## RECENT DEVELOPMENTS



The UK has reversed its 2015 ban on onshore wind and solar PV projects applying for support in renewable energy auctions, starting from the next round of auctions in 2021.



A moratorium was placed on fracking in the UK at the end of 2019; however, this does not cover unconventional extraction techniques used in south-east England.



The extended road capacity resulting from the UK's GBP 27bn Roads Investment Strategy is estimated to negate 80% of the emissions reductions achieved from the projected switch to electric vehicles on the 7,200 km Strategic Road Network between now and 2032.

References: Lee, 2020; Baker and Styles, 2019; UK Government, 2019; Sloman and Hopkinson, 2020

## CORONAVIRUS RECOVERY

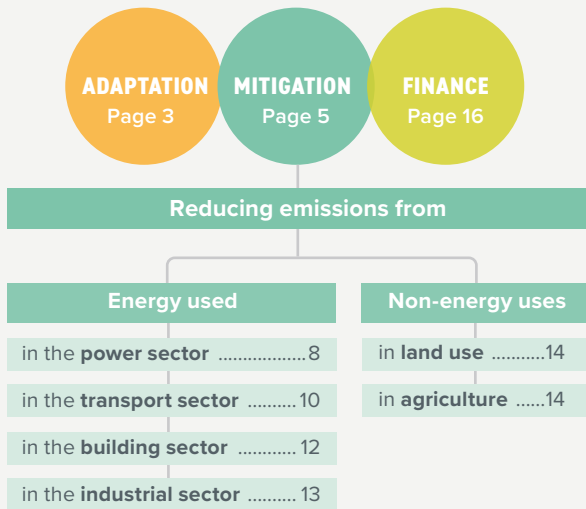
The UK government has announced its intention to "build back greener" from the COVID-19 economic crisis. However, at the time of writing, the level of announced funding and policies has been welcomed only as a "first step" to ensuring the recovery package sufficiently addresses the urgent need for climate action. The GBP 3bn announced to date for improving the energy efficiency of homes and public buildings is a small fraction of the overall GBP 160bn recovery. This GBP 3bn is also less than 10% of the additional annual public investment that has been calculated as necessary for achieving the government's 2050 net-zero emission goal.

Reference: Murphy et al., 2020

\* The period covered in this Profile pre-dates the UK's ultimate withdrawal from the EU on 31 January 2020. Due to availability of data at the time of writing, the UK is still included in emissions data for the EU28. The UK's lack of participation in the EU's policy-making processes in the months preceding withdrawal means, however, that political decisions presented concern only the UK, where possible.

## CONTENTS

We unpack the UK's progress and highlight key opportunities to enhance climate action across:



## LEGEND

**Trends** show developments over the past five years for which data are available. The thumbs indicate assessment from a climate protection perspective.



**Decarbonisation Ratings<sup>4</sup>** assess a country's performance compared to other G20 countries. A high score reflects a relatively good effort from a climate protection perspective but is not necessarily 1.5°C compatible.



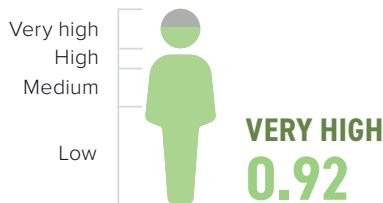
**Policy Ratings<sup>5</sup>** evaluate a selection of policies that are essential pre-conditions for the longer-term transformation required to meet the 1.5°C limit.



## SOCIO-ECONOMIC CONTEXT

### Human Development Index

The Human Development Index reflects life expectancy, level of education, and per capita income. The UK ranks among the highest countries.



Data for 2018. Source: UNDP, 2019

### Gross Domestic Product (GDP) per capita (PPP constant 2015 international \$)

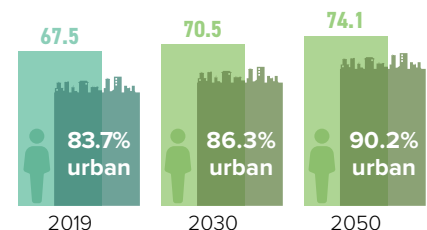


Data for 2019. Source: The World Bank, 2020

### Population and urbanisation projections

(in millions)

The UK's population is expected to increase by about 10% by 2050, and become more urbanised.



Sources: The World Bank, 2019; United Nations, 2018

### Death rate attributable to air pollution

**Ambient air pollution attributable death rate per 1,000 population per year, age standardised**



Over 21,000 people die in the UK every year as a result of outdoor air pollution, due to stroke, heart disease, lung cancer and chronic respiratory diseases. Compared to total population, this is still one of the lower levels in the G20.

**21,135 deaths per year**

Data for 2016. Source: WHO, 2018

## JUST TRANSITION



### CLIMATE EMERGENCY SKILLS ACTION PLAN

In light of the current economic crisis brought on by COVID-19, Green Party MP and co-chair of the IPPR Environmental Justice Commission, Caroline Lucas and her former conservative MP co-chair Laura Sandys have called for a GBP 5bn Just Transition Fund as part of a broader GBP 30bn economic recovery package and the establishment of a "Net-Zero and Just Transition" delivery body that would oversee how the legislated goal of transitioning to a net-zero society would benefit all areas and locations of the UK economy.

**At present, there is no such formal body at the national level tasked with guiding a just transition, although at the sub-national level, Scotland has established an independent Just Transition Commission.** This commission released its interim report in February 2020 which outlined near-term opportunities, including extending the criteria of "Fair Work" to all climate change programmes receiving public money, and the development of a Climate Emergency Skills Action Plan. **The Scottish approach could serve as a model for the UK to follow.**

References: Edie Newsroom, 2020; Scottish Government, 2020

# 1. ADAPTATION

## ADDRESSING AND REDUCING VULNERABILITY TO CLIMATE CHANGE



**Increase the ability to adapt to the adverse effects of climate change and foster climate resilience and low-GHG development.**



The UK is vulnerable to climate change and **adaptation actions are needed.**



**HIGH COST OF EXTREME WEATHER**

On average, 152 fatalities and almost USD 1.5bn losses occur yearly due to extreme weather events.



**SEVERE IMPACTS ON AGRICULTURE SECTOR**

With global warming, society and its supporting sectors are increasingly exposed to severe impacts such as droughts and reduction in crop duration in the agricultural sector.

## ADAPTATION NEEDS

### Climate Risk Index

Impacts of extreme weather events in terms of fatalities and economic losses that occurred. All numbers are averages (1999-2018).

#### Annual weather-related fatalities



**0.24**  
PER 100,000  
INHABITANTS

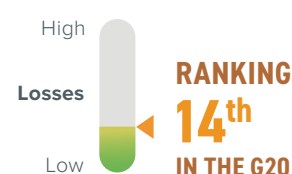


Source: Based on Germanwatch, 2019

#### Annual average losses (USD mn PPP)



**0.07**  
PER UNIT  
GDP (%)



Source: Based on Germanwatch, 2019

## Exposure to future impacts at 1.5°C, 2°C and 3°C

### Impact ranking scale:

! Very low ! Low ! Medium ! High ! Very high

		1.5°C	2°C	3°C
<b>WATER</b>	% of area with increase in water scarcity	!	!	!
	% of time in drought conditions	!	!	!
<b>HEAT AND HEALTH</b>	Heatwave frequency	!	!	!
	Days above 35°C	!	!	!
<b>AGRICULTURE</b>	<b>Wheat</b>	Reduction in crop duration	!	!
		Reduction in rainfall	!	!

Source: Water, Heat and Health: own research. Agriculture: Arnell et al., 2019.

Note: These indicators are national scale results, weighted by area and based on global data sets. They are designed to allow comparison between regions and countries and therefore entail simplifications. They do not reflect local impacts within the country. Please see technical note for further information.

### CORONAVIRUS RECOVERY

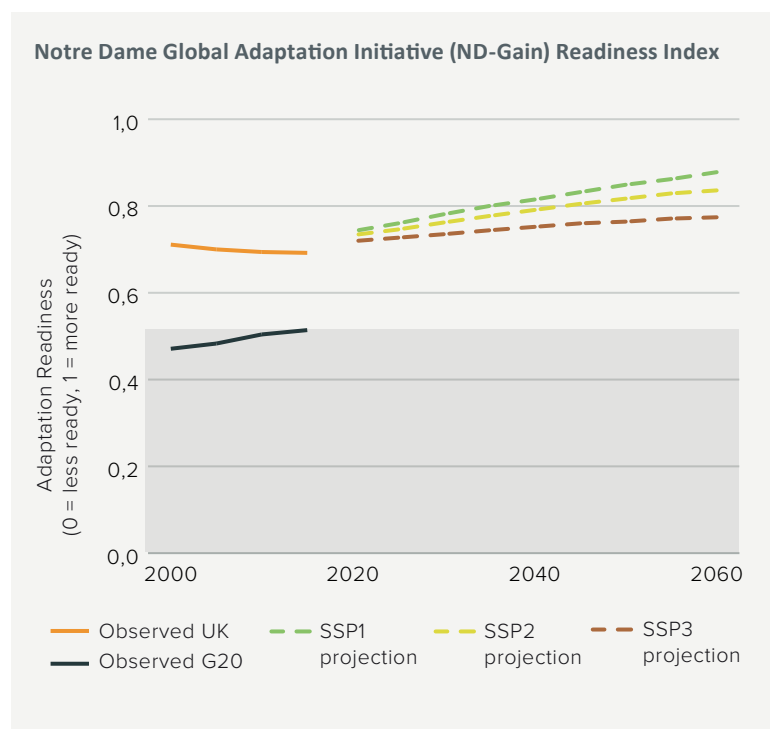
The UK has so far largely ignored recommendations from the Committee on Climate Change (CCC) to incorporate climate adaptation measures into its COVID-19 response.

These recommendations include restoring urban greenspace, investing in green roofs and sustainable drainage industries, and drastic increases in tree planting and peat restoration to improve ecosystem resilience and protect against flooding. One recommendation that has been heeded in part is the announcement of funding for housing retrofits to improve energy efficiency, with many such measures also helping to protect against extreme heat.

Source: Committee on Climate Change, 2020

## Adaptation readiness

The figure shows 2000-2015 observed data from the ND-GAIN Index overlaid with projected Shared Socioeconomic Pathways (SSPs) from 2015-2060.



On average the UK scored well above the G20 average between 2000 and 2015 and is projected to continue doing so given its combination of social, economic and governance structures. While adaptation challenges still exist, the UK is well positioned to adapt to the impacts of climate change. In the projected SSPs, there is very little divergence due to the overall high rate of readiness.

The readiness component of the Index created by the Notre Dame Global Adaptation Initiative (ND-GAIN) encompasses social economic and governance indicators to assess a country's readiness to deploy private and public investments in aid of adaptation. The index ranges from 0 (low readiness) to 1 (high readiness).

The overlaid SSPs are qualitative and quantitative representations of a range of possible futures. The three scenarios shown here in dotted lines are qualitatively described as a *sustainable development-compatible scenario (SSP1)*, a *middle-of-the-road (SSP2)* and a *'Regional Rivalry' (SSP3)* scenario. The shaded area delineates the G20 average in 2015 for easy reference.

Source: Andrijevic et al., 2019

## ADAPTATION POLICIES

### National Adaptation Strategies

The UK's Climate Change Committee strongly criticised the government for a lack of adaptation policy and planning.

Document name	Publication year	Fields of action (sectors)												M&E process
		Agriculture	Biodiversity	Coastal areas and fishing	Education and research	Energy and industry	Finance and insurance	Forestry	Health	Infrastructure	Tourism	Transport	Urbanism	
National Adaptation Programme and the third strategy for climate adaptation reporting	2018	●	●	●	●	●	●	●		●	●	●	●	Adaptation Reporting Power (ARP) introduced under the Climate Change Act 2008 (Last report from 2018)

### Nationally Determined Contribution (NDC): Adaptation

Targets	Actions
Not mentioned	Not mentioned

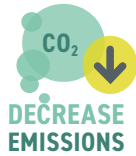
## 2. MITIGATION

### REDUCING EMISSIONS TO LIMIT GLOBAL TEMPERATURE INCREASE



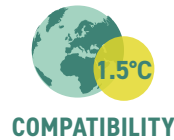
Hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit to 1.5°C, recognising that this would significantly reduce the risks and impacts of climate change.

#### EMISSIONS OVERVIEW



The UK's GHG emissions in 2019 were 44% below 1990 levels (24% below 2010 levels). The government's climate target for 2030 (57% below 1990 levels) is **not yet in line with a 1.5°C compatible pathway**.

Source: Climate Action Tracker, 2020

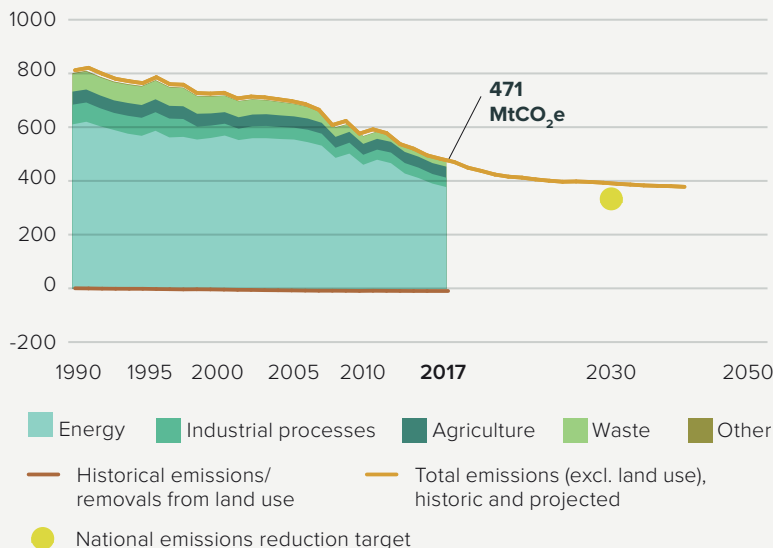


In 2030, global CO<sub>2</sub> emissions need to be 45% below 2010 levels and reach net zero by 2050. **Global energy-related CO<sub>2</sub> emissions must be cut by 40%** below 2010 levels by 2030 and reach net-zero by 2060.

Source: Rogelj et al., 2018

#### GHG emissions across sectors and national emissions reduction target (MtCO<sub>2</sub>e/year)

Total GHG emissions across sectors (MtCO<sub>2</sub>e/year)



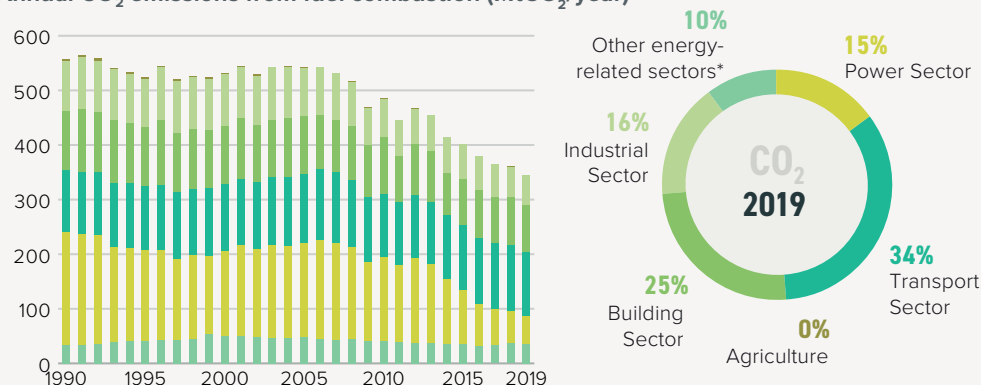
Sources: Gütschow et al., 2019; Climate Action Tracker, 2020

**UK emissions (excl. land use) have decreased by 44% between 1990 and 2017, with reductions in all sectors.** This trajectory of emissions reductions has meant the UK has overachieved the targets stipulated in its first (2008-2012) and second (2013-2017) carbon budgets, and is also projected to meet its third carbon budget (2018-2022).

However, emissions projections based on current policies indicate **the UK will fall short of its 57% emissions reduction target for 2030**. The UK will need to scale up climate action to meet its national targets, with even more effort required to become 1.5°C compatible.

#### Energy-related CO<sub>2</sub> emissions by sector

Annual CO<sub>2</sub> emissions from fuel combustion (MtCO<sub>2</sub>/year)



\* 'Other energy related sectors' covers energy-related CO<sub>2</sub> emissions from extracting and processing fossil fuels. Due to rounding, some graphs may sum to slightly above or below 100%.

**CO<sub>2</sub> emissions from fuel combustion are the largest driver of GHG emissions.**

Emissions have decreased significantly over the last decade, primarily driven down by reductions in the electricity sector. The transport sector is now the largest contributor to energy-related emissions (33% in 2018). The buildings sector and industry sector are the next highest contributing sector with 25% and 16% respectively.

Source: Enerdata, 2020

#### CORONAVIRUS RECOVERY

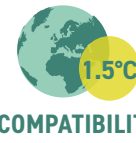
Funding announced so far in response to the COVID-19 crisis has fallen short of fulfilling the government's commitment to "build back greener", with GBP 3.3bn committed towards building retrofits and reducing emissions from industry, compared to the overall GBP 160bn recovery package. Airlines, carmakers and oilfield engineering firms have received over GBP 3.5bn in crisis loans so far, with no "green" conditions attached to it.

References: Harvey, 2020; Elliot, Walker and Harvey, 2020.

## ENERGY OVERVIEW



**Fossil fuels still make up 77% of the UK's energy mix** (power, heat, transport fuels, etc). Over the last decade, the share of coal has significantly declined while renewables' share continues to increase. However, **the approval of new coal mines is currently under consideration by the UK government** which, if used to produce and export thermal coal, would stand in contradiction to the necessary rapid phase-out of coal consumption around the world, by 2040.

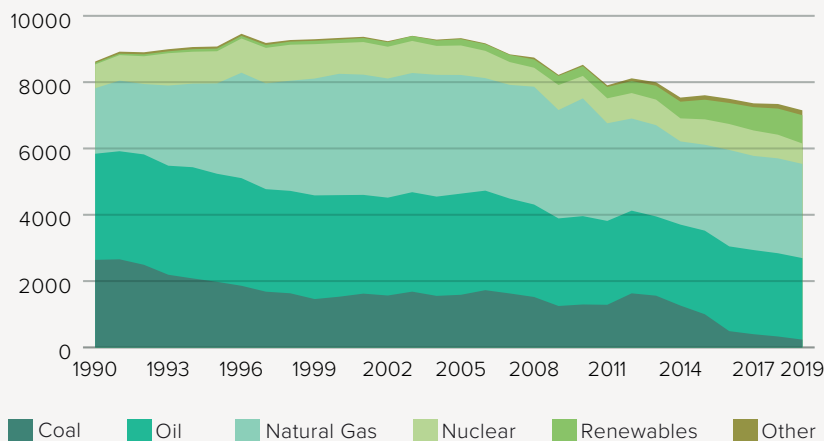


The share of **fossil fuels in the global primary energy mix needs to fall to 67% by 2030 and to 33% by 2050** (and to substantially lower levels without Carbon Capture and Storage).

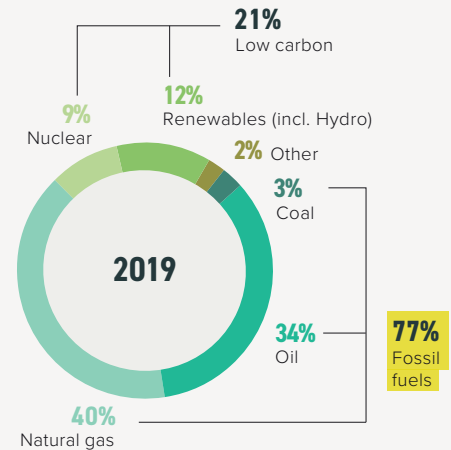
Source: Rogelj et al., 2018

### Energy Mix

Total primary energy supply (PJ)



Source: Enerdata, 2020

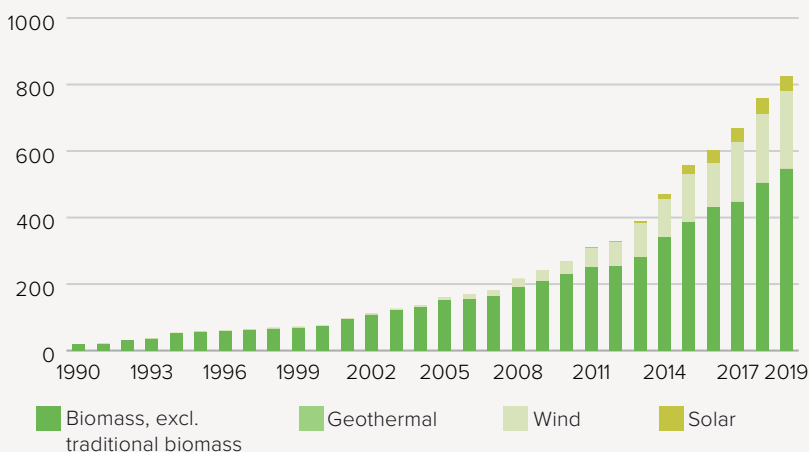


Due to rounding, some graphs may sum to slightly above or below 100%.

This graph shows the fuel mix for all energy supply, including energy used for electricity generation, heating, cooking, but also for transport fuels. Fossil fuels (oil, coal and gas) still make up 77% of the UK's energy mix, which is slightly lower than the G20 average. Total primary energy supply has fallen considerably since the 2000's, coinciding with a steep decline in coal-fired power generation.

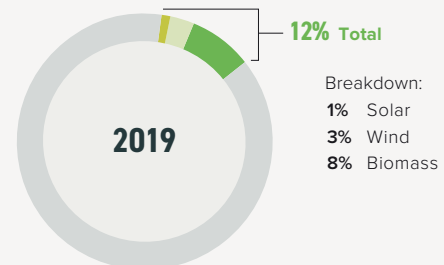
### Solar, Wind, Geothermal, and Biomass Development

Total primary energy supply (TPES) from solar, wind, geothermal and biomass (PJ)



Large hydropower and solid fuel biomass in residential use are not reflected due to their negative environmental and social impacts.  
Due to rounding, some graphs may sum to slightly above or below 100%.

Solar, wind, geothermal and biomass account for 12% of the UK's energy supply



Source: Enerdata, 2020

### Decarbonisation rating: RE share of TPES compared to other G20 countries

5-year trend  
(2014-2019):



Current year  
(2019):

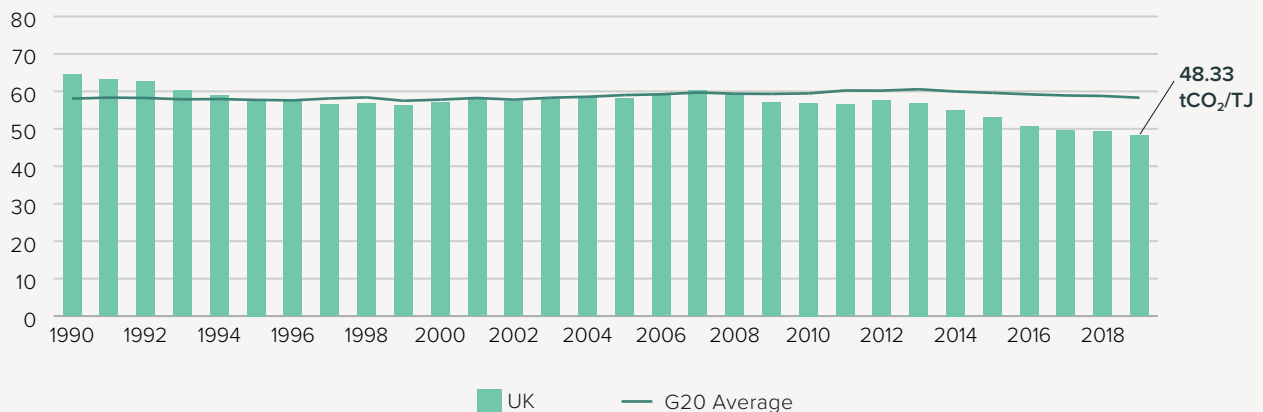


Source: own evaluation

Solar, wind, geothermal and biomass account for 12% of the UK's energy supply – the G20 average is only 6%. The share in total energy supply has increased by around 84% in the last five years in the UK (2014-2019), much more than the G20 average (+28% 2014-2019). Bioenergy (for electricity and heat) makes up the largest share (7.6%).

## Carbon Intensity of the Energy Sector

Tonnes of CO<sub>2</sub> per unit of total primary energy supply (tCO<sub>2</sub>/TJ)



Source: Enerdata, 2020

### Decarbonisation rating: carbon intensity of the energy sector compared to other G20 countries

5-year trend  
(2014-2019):



Current year  
(2019):



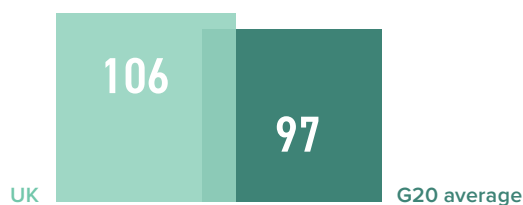
Carbon intensity shows how much CO<sub>2</sub> is emitted per unit of energy supply.

The carbon intensity of the UK's energy mix has decreased to a level of 48 tCO<sub>2</sub>/TJ and is considerably lower than the G20 average. This relatively low level reflects the declining share of coal in the energy mix.

Source: Enerdata, 2020

## Energy supply per capita

(GJ/capita)



Sources: Enerdata, 2020; The World Bank, 2019b

TPES per capita (GJ/capita): 5-year trend (2014-2019)



-7.9%

UK



+1.9%

G20 average

The level of energy use per capita is closely-related to economic development, climatic conditions and the price of energy. Energy use per capita in the UK is 106 GJ/capita, marginally above the G20 average, but has decreased significantly in recent years (-8%, 2014-2019) in contrast to the increasing G20 average (+2%). This is primarily a result of rapidly decreasing coal consumption in the power sector and a steadily increasing share of renewable energy.

### Decarbonisation rating: energy supply per capita compared to other G20 countries

5-year trend  
(2014-2019):



Current year  
(2019):



Source: own evaluation

## Energy intensity of the economy

(TJ/PPP USD2015 millions)



Data for 2018. Source: Enerdata, 2020

Energy intensity of the economy: 5-year trend (2013-2018)



-15.7%

UK



-11.6%

G20 average

This indicator quantifies how much energy is used for each unit of GDP, which is closely-related to the level of industrialisation, efficiency, climatic conditions and geography. The energy intensity of the UK economy is the lowest in the G20 and has **declined at a faster rate (16%, 2013-2018) than the G20 average**. Note, however, that this indicator does not consider energy used for overseas production of imported goods.

### Decarbonisation rating: energy intensity compared to other G20 countries

5-year trend  
(2013-2018):



Current year  
(2018):



Source: own evaluation

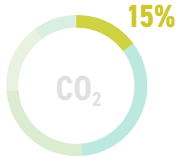




## POWER SECTOR

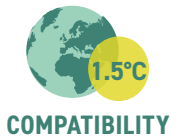
Emissions from energy used to make electricity and heat

The UK went 67 consecutive days in 2020 without generating electricity from coal. A large reason behind this is a COVID-19-related reduction in overall electricity demand, however, it does reflect the broader trend in the UK towards a total phase-out of coal. In 2019, the UK produced only 2% of electricity from coal. The decision to phase out coal power, which has been brought forward from 2025 to 2024, is in line with a 1.5°C limit.



Share in energy-related CO<sub>2</sub> emissions from electricity and heat production

Source: Enerdata, 2020



### Coal and decarbonisation

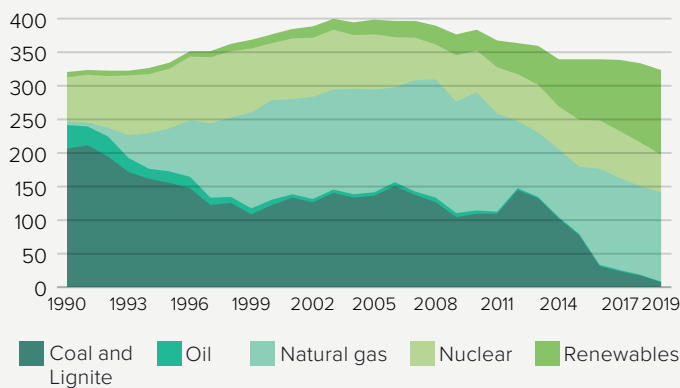
Worldwide, **coal use for power generation needs to peak by 2020** and, between 2030 and 2040, all the regions of the world need to phase out coal-fired power generation. **Electricity generation has to be decarbonised before 2050**, with renewable energy the most promising alternative.

Sources: Rogelj et al., 2018; Climate Analytics, 2016; Climate Analytics, 2019

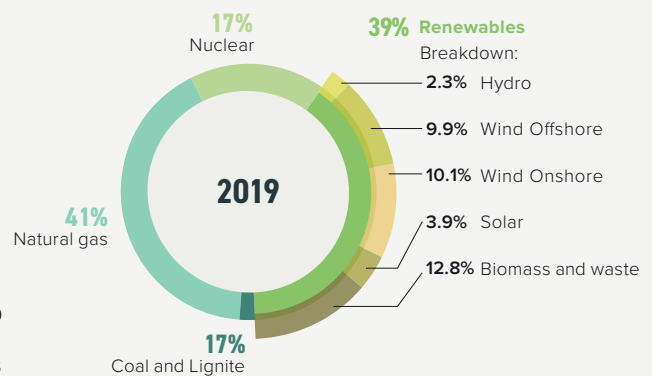
## STATUS OF DECARBONISATION

### Electricity mix

#### Gross power generation (TWh)



Source: Enerdata, 2020



Due to rounding, some graphs may sum to slightly above or below 100%.

The UK is increasingly producing power from renewables, accounting for almost two fifths of the power mix. This has coincided with a steep decline in coal-fired generation over the last five years, while overall power consumption has also fallen considerably since 2006.

### Share of renewables in power generation

(incl. large hydro)



Source: Enerdata, 2020

#### Decarbonisation rating: share of renewables compared to other G20 countries

5-year trend (2014-2019):



Current year (2019):



Source: own evaluation

#### Share of renewables in power generation: 5-year trend (2014-2019)



+85%  
UK

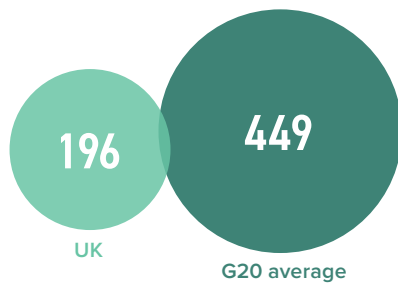


+19.5%  
G20 average



## Emissions intensity of the power sector

Country vs G20 average (gCO<sub>2</sub>/kWh)



Source: Enerdata 2020

### Emissions intensity: 5-year trend (2014-2019)



**-51%**  
UK



**-10.3%**  
G20 average

For each kilowatt hour of electricity generated, 196 gCO<sub>2</sub> are emitted in the UK. This is less than half the G20 average, demonstrating the significant progress the UK has achieved in decarbonising its electricity system. The power sector contributed only 15% of the UK's total energy-related CO<sub>2</sub> emissions in 2019. The emissions intensity has dropped significantly because the level of coal-fired generation has been declining steeply in recent years, reaching 2% in 2019. However, with little coal left in the system, the UK must replace a significant proportion of its gas-fired generation with renewables over the coming years.

### Decarbonisation rating: emissions intensity compared to other G20 countries

5-year trend  
(2014-2019):



Current year  
(2019):



Source: own evaluation

## POLICY ASSESSMENT

### Renewable energy in the power sector



The government's main mechanism for supporting low-carbon electricity generation is the Contracts for Difference (CfD) scheme, which provides renewable generators with a guaranteed long-term electricity tariff to protect them from volatile wholesale prices. In 2020, it was announced that solar PV and onshore wind would be permitted to compete in CfD auctions again, reversing a ban that had been in place since 2015. The CfD scheme secured record low prices for offshore wind projects in 2019, and the current government has a target of 40GW of offshore wind by 2030.

Source: own evaluation

### Coal phase-out in the power sector



In February 2020, the government announced it is planning to bring the date of the UK's coal phase-out forward by one year to 2024. This follows a continuation of coal's rapidly declining role in the power sector, with coal generation constituting just 2% of total electricity generation in 2019. Together with Canada, the UK launched the Powering Past Coal Alliance in 2017, a group of now 104 countries, cities, regions and organisations aiming to accelerate the phase-out of coal-fired power stations.

Source: own evaluation



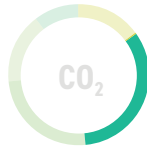
## TRANSPORT SECTOR

Emissions from energy used to transport people and goods

Emissions from the transport sector in the UK were a mere 5% below 1990 levels in 2019, after peaking in 2007. The announcement of plans to bring forward the phase-out date for the sale of fossil fuel cars from 2040 to 2030 is welcome, in line with the latest advice from the Committee on Climate Change. **However, greater urgency is needed to reduce emissions across other transport sub-sectors, like aviation and heavy-duty vehicles.** The government is working on its Transport Decarbonisation Plan scheduled for publication in Autumn 2020.

Share in energy-related CO<sub>2</sub> emissions from transport sector

Source: Enerdata, 2020

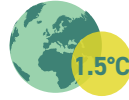


**0.26%**

Electricity-related emissions

**33%**

Direct emissions



**COMPATIBILITY**

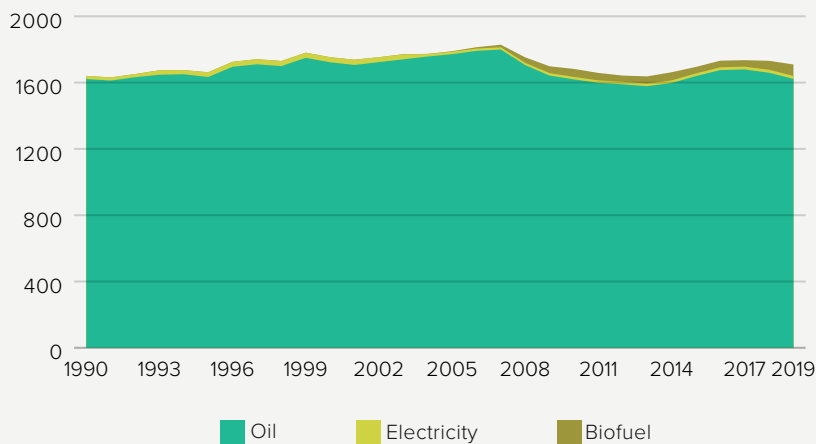
The share of low-carbon fuels in the transport fuel mix must increase to about 60% by 2050.

Source: Rogelj et al., 2018

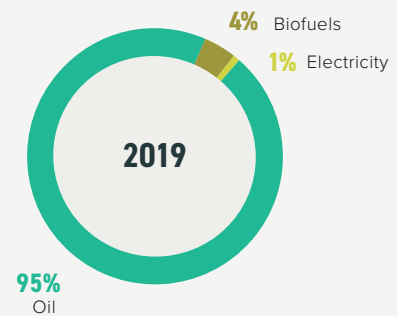
## STATUS OF DECARBONISATION

### Transport energy mix

Final energy consumption of transport by source (PJ/year)



Source: Enerdata, 2020



Due to rounding, some graphs may sum to slightly above or below 100%.

Electricity and biofuels made up only 5% of the energy mix in transport in 2019.

### Transport emissions per capita

excl. aviation (tCO<sub>2</sub>/capita)



Data for 2018. Sources: Enerdata, 2020; The World Bank, 2019b

### Decarbonisation rating: transport emissions compared to other G20 countries

5-year trend (2013-2018):



Current year (2018):



Source: own evaluation

### Transport emissions: 5-year trend (2013-2018)



**+2.1%**  
UK



**+5.5%**  
G20 average

## Aviation emissions per capita<sup>6</sup>

(tCO<sub>2</sub>/capita)



Data for 2017. Source: Enerdata, 2020

### Aviation emissions: 5-year trend (2012-2017)



**+0.5%**  
UK



**+18.7%**  
G20 average

### Decarbonisation rating: aviation emissions compared to other G20 countries

5-year trend  
(2012-2017):



Current year  
(2017):



Source: own evaluation

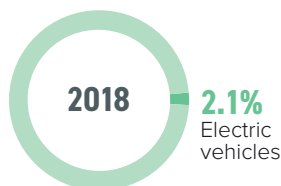
## Motorisation rate

**585 VEHICLES PER 1,000 INHABITANTS (2016)**

Source: Vieweg et al., 2018

85% of the passenger kilometres travelled is by car and there is more than one car for every two people in the UK.

### Market share of electric vehicles in new car sales (%)



Source: IEA, 2019

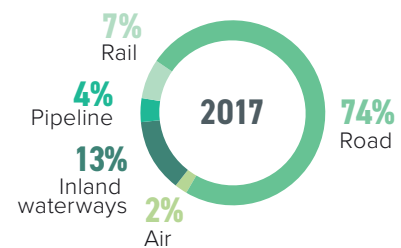
### Passenger transport (modal split in % of passenger-km)



Source: Vieweg et al., 2018

## Freight transport

(modal split in % of tonne-km)



Source: Vieweg et al., 2018

## POLICY ASSESSMENT

### Phase out fossil fuel cars



The UK has announced plans to bring forward its phase out of “conventional” diesel and petrol cars from 2040 to 2030. If followed through, this would make the UK a world leader in this regard, and is in line with the timeframe advocated by the Committee on Climate Change (Committee on Climate Change, 2019b). Despite a rapid adoption of electric vehicles (EV) being required to significantly bring down transport emissions over the coming decade, the UK has reduced subsidies offered for EVs twice since 2018 (Randall, 2020). First from GBP 4,500 to GBP 3,500, and recently to GBP 3,000. The subsidies were extended in early 2020 for three years and maintained at the same rate for electric vans, taxis and motorcycles (Kavanagh, 2020).

Source: own evaluation

### Phase out fossil fuel heavy-duty vehicles



The government has not set any long-term targets for HDVs, despite the National Infrastructure Commission recommending a ban on the sale of diesel HDVs by 2040 in order for the sector to comply with the government's 2050 net-zero target (Science and Technology Parliamentary Committee, 2019). The measures that have been announced are lacking rigour or are merely of an exploratory nature where there is, for example, only: a voluntary commitment to reduce HDV emissions by 15% below 2015 levels by 2025, and a research project to identify and assess zero emission HDV technologies (UK Department of Transport, 2018). Since 2018, the UK Heavy Road User levy changed to ensure that the cleanest trucks pay less on UK roads.

Source: own evaluation

### Modal shift in (ground) transport



The UK published its Rail Freight Strategy in 2016, aiming to increase the role of rail transport in freight transportation and ease the burden on the road network. However, the strategy is lacking concrete targets and sweeping actions, and the potential impact on encouraging modal shift is therefore not clear (Department for Transport, 2016). Similarly, the government's 2017 Freight Carbon Review contained little in terms of immediate and tangible steps to encourage modal shift, with only a commitment to “assess the costs and benefits of opportunities identified in the Rail Freight Strategy” (Department for Transport, 2017). The GBP 1.2bn Cycling and Walking Investment Strategy provides funding over the period 2016-2021 for new infrastructure and upgrades, and was boosted by GBP 2bn in additional funding in the 2020 budget (UK Government, 2017); however, there is no long-term strategy to support a shift to public transport.

Source: own evaluation



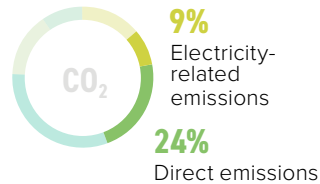
## BUILDING SECTOR

Emissions from energy used to build, heat and cool buildings

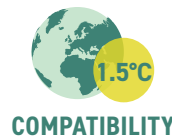
The UK's building emissions – including heating, cooking but also electricity use – make up roughly a quarter of total CO<sub>2</sub> emissions. Per capita, **building-related emissions are significantly higher than the G20 average, but are declining.**

### Share in energy-related CO<sub>2</sub> emissions from building sector

Building emissions occur directly (burning fuels for heating, cooking, etc) and indirectly (grid-electricity for air conditioning, appliances, etc)



Source: Enerdata, 2020



Global emissions from buildings need to be **halved by 2030**, and be 80-85% below 2010 levels by 2050, mostly through increased efficiency, reduced energy demand and electrification in conjunction with complete decarbonisation of the power sector.

Source: Rogelj et al., 2018

## STATUS OF DECARBONISATION

### Building emissions per capita

(incl. indirect emissions) (tCO<sub>2</sub>/capita)



Source: Enerdata, 2020

Building-related emissions per capita in the UK are higher than the G20 average. In contrast to the G20 average, the UK has managed to decrease per capita emissions by 27% for the buildings sector (2014-2019).

#### Building emissions: 5-year trend (2014-2019)



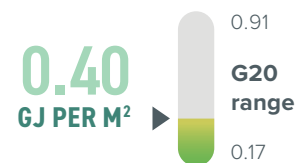
### Decarbonisation rating: building emissions compared to other G20 countries



Source: own evaluation

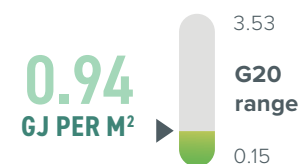
### Residential buildings

Energy use per m<sup>2</sup>



### Commercial and public buildings

Energy use per m<sup>2</sup>



Building emissions are largely driven by how much energy is used in heating, cooling, lighting, household appliances, etc. **In the UK, energy use per m<sup>2</sup> is in the middle range of the G20 countries**, reflecting its temperate climate.

Source: Castro-Alvarez et al., 2018

## POLICY ASSESSMENT

### Near zero energy new buildings



In 2019 the UK government commenced consultation on a sweeping set of reforms called the Future Homes Standard, which aims to build on the current aspirational target to halve the energy use of new buildings by 2030. The Future Homes Standard will only come into force in 2025, however, and does not explicitly aim for new buildings to be zero energy energy, rather targeting a 75-80% reduction in CO<sub>2</sub> emissions beyond existing standards. New, more stringent building regulations for ventilation and the conservation of fuel and power are set to come into effect in 2020. The government has brought forward, to 2020, a ban on gas boilers in all new homes.

Source: own evaluation

### Renovation of existing buildings



The UK government has an aspirational target of increasing the energy efficiency of all social housing and "as many private rented homes as possible" to EPC Band C by 2030, and for the rest of the housing stock by 2035. These targets formed part of the UK's 2017 Clean Growth Strategy, but already in 2019 a parliamentary select committee inquiry found that the government was not on track to meet them. A July 2020 announcement of GBP 3bn in funding to improve the energy efficiency of homes and public buildings is a step in the right direction. Legislating the current aspirational targets into a standalone building renovation strategy and delivering on the amount of pledged funding to encourage renovations would help to ensure the necessary scale of emissions reductions are achieved.

Source: own evaluation



## INDUSTRY SECTOR

Emissions from energy in the industrial sector

Industry-related emissions make up roughly 18% of CO<sub>2</sub> emissions in the UK, and were 43% below 1990 levels in 2019, although this is partly due to offshoring of production. Under current government projections, industry emissions are expected to fall a further 20% below 2019 levels by 2030. However, many of the outlined measures are of a voluntary nature, meaning compliance is not guaranteed.

Share in energy-related CO<sub>2</sub> emissions from industrial sector

Source: Enerdata, 2020

16% Direct emissions



4% Electricity-related emissions



COMPATIBILITY

Industrial emissions need to be reduced by 75-90% from 2010 levels by 2050.

## STATUS OF DECARBONISATION

### Industry emissions intensity<sup>7</sup>

(tCO<sub>2</sub>e/USD2015 GVA)



Data for 2016. Sources: Gütschow et al., 2019; Enerdata, 2020

#### Industry emissions: 5-year trend (2011-2016)



-29% UK



-12% G20 average

Decarbonisation rating: emissions intensity of industry compared to other G20 countries

5-year trend (2011-2016):



Current year (2017):



Source: own evaluation

### Carbon intensity of cement production<sup>8</sup>

(kgCO<sub>2</sub>/tonne product)



The UK's cement industry is more emission-intensive than the world average.

Data for 2016. Sources: CAT decarbonisation data portal, 2020; Climate Action Tracker, 2019

### Carbon intensity of steel production<sup>8</sup>

(kgCO<sub>2</sub>/tonne product)



Steel production and steelmaking are significant GHG emission sources, and challenging to decarbonise, however, a tonne of steel now requires 40% less energy to produce than it did 40 years ago.

Data for 2016. Sources: World Steel Association, 2018; CAT decarbonisation data portal, 2020

## POLICY ASSESSMENT

### Energy Efficiency



Mandatory energy efficiency policies in the UK covered only 0-10% of industrial total energy use in 2018. However, in 2017 the government released a series of eight action plans for the industry sector targeting, among other things, energy efficiency measures like clustering of industrial sites and electrification of heat. The measures outlined in these plans are voluntary, however, and

Source: own evaluation

therefore compliance is not assured. The UK's Industrial Strategy was also released in 2017, which aims to transform construction techniques to improve efficiency, and to build on the sector-specific action plans to further cut energy use. However, these are also not mandatory and do not contain measurable targets.



## LAND USE SECTOR

### Emissions from changes in the use of the land



**NET SINK OF EMISSIONS**

To stay within the 1.5°C limit, **the UK needs to make the land use and forest sector a net sink of emissions**, e.g. by halting the expansion of residential areas, converting cropland into wetlands, and by creating new forests. The current afforestation target of 30,000 ha/yr by 2025 must be met to be to ensure the UK is on track to meet its net-zero 2050 target according to the Committee on Climate Change.



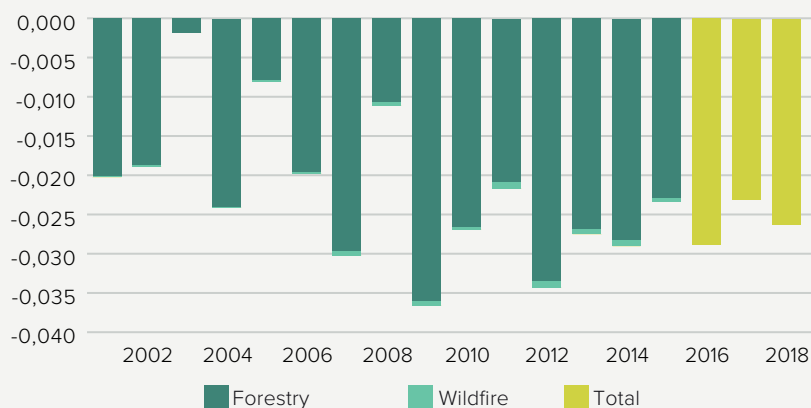
**COMPATIBILITY**

**Global deforestation needs to be halted** and changed to net CO<sub>2</sub> removals by around 2030.

Source: Rogelj et al., 2018

## Global tree-cover loss

Gross tree-cover loss by dominant driver (million hectares)



This indicator covers only gross tree-cover loss and does not take tree-cover gain into account. It is thus not possible to deduce from this indicator the climate impact of the forest sector. 2000 tree cover extent – >30% tree canopy.

Source: Global Forest Watch, 2019

From 2001 to 2018, **the UK lost 429 Mha of tree cover, equivalent to a 12% decrease since 2000**. Forestry is the main driver. This does not take tree-cover gain into account.

Source: World Resources Institute, 2020

## POLICY ASSESSMENT

### Target for net-zero deforestation



The government has an afforestation target of reaching 30 Kha/yr by 2025, in line with the recommendation of the Committee on Climate Change. A consultation has been launched by the government asking for views on how best to achieve the target, as tree planting has fallen well short of this level, averaging 10,000 ha/yr over the last five years. At the end of 2019, a GBP 50m grant scheme was announced to boost tree planting rates.

Source: own evaluation



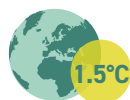
## AGRICULTURE SECTOR

### Emissions from agriculture



**DIETARY SHIFTS ARE NEEDED**

The UK's agricultural emissions are mainly from **digestive processes in animals, livestock manure and the use of synthetic fertilisers**. A 1.5°C pathway requires dietary shifts and less fertiliser use.

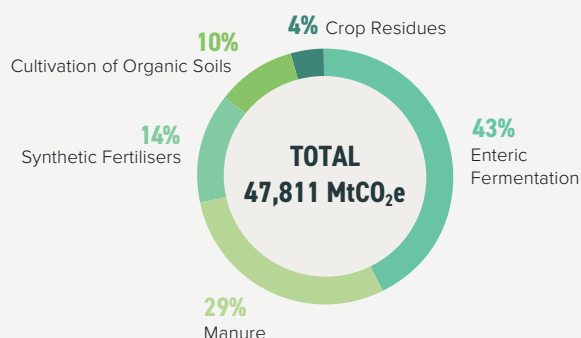


**COMPATIBILITY**

**Methane emissions (mainly enteric fermentation) need to decline** by 10% by 2030 and by 35% by 2050 (from 2010 levels). Nitrous oxide emissions (mainly from fertilisers and manure) need to be reduced by 10% by 2030 and by 20% by 2050 (from 2010 levels).

Source: Rogelj et al., 2018

## Emissions from agriculture (excluding energy)



Data for 2017. Source: FAO, 2019

In the UK, the largest sources of GHG emissions in the agricultural sector are digestive processes in animals (enteric fermentation), livestock manure and the use of synthetic fertilisers. A more efficient use of fertilisers and dietary changes can help reduce emissions.

Due to rounding, some graphs may sum to slightly above or below 100%.

## MITIGATION: TARGETS AND AMBITION

The combined mitigation effect of nationally determined contributions (NDC) submitted by September 2020 is not sufficient and will lead to a warming of 2.7°C by the end of the century. This highlights the urgent need for all countries to submit more ambitious targets by 2020, as they agreed in 2015, and to urgently strengthen their climate action to align to the Paris Agreement's temperature goal.

## AMBITION: 2030 TARGETS

### Nationally Determined Contribution (NDC): Mitigation

Targets	Actions
No target	Not mentioned

Given the UK's departure from the EU, it is now obliged to formulate and submit its own NDC. The UK's national emission reduction target is a 57% reduction in emissions from 1990 levels.

### Climate Action Tracker (CAT) evaluation of national emission reduction target and actions

Critically Insufficient	Targets with this rating are in the least stringent part of a country's 'fair-share' range and not consistent with holding warming below 2°C, let alone with the Paris Agreement's stronger 1.5°C limit. If all government targets were in this range, warming would reach over 2°C and up to 3°C.
Highly Insufficient	
● Insufficient	
2°C Compatible	The UK has made considerable recent progress increasing the ambition of its climate-related policies, but further work is needed. In particular, policies targeting the transport, buildings and industry sectors are still lacking and will be needed to ensure the UK meets its legally binding (as of 12 June 2019) 2050 net-zero target.
1.5°C Compatible	
Role Model	

*Evaluation as at October 2020, based on the UK's national emission reduction target.*

*Source: Climate Action Tracker*

## TRANSPARENCY: FACILITATING AMBITION

Countries are expected to communicate their NDCs in a clear and transparent manner in order to ensure accountability and comparability.

The NDC Transparency Check has been developed in response to Paris Agreement decision (1/CP.21) and the Annex to decision 4/CMA.1. While the Annex is only binding from the second NDC onwards, countries are "strongly encouraged" to apply it to updated NDCs, due in 2020.



### NDC Transparency Check recommendations

For more visit [www.climate-transparency.org/ndc-transparency-check](http://www.climate-transparency.org/ndc-transparency-check)

The period covered in this Profile pre-dates the UK's withdrawal from the EU on 31 January 2020. The UK must formulate and submit its own NDC, but has not done so as of October 2020.

## AMBITION: LONG-TERM STRATEGIES

Status	Submitted to UNFCCC in 2018
2050 target	80% reduction from 1990 levels
Interim steps	Yes: at least -57% by 2030
Sectoral targets	Yes
Net-zero target	Yes

The Paris Agreement invites countries to communicate mid-century, long-term, and low-GHG emissions development strategies by 2020. Long-term strategies are an essential component of the transition toward net-zero emissions and climate resilient economies.



### 3. FINANCE

#### MAKING FINANCE FLOWS CONSISTENT WITH CLIMATE GOALS



**Make finance flows consistent with a pathway towards low-GHG emissions and climate-resilient development.**



The UK spent USD 14bn on fossil fuel subsidies in 2017, mainly on natural gas and petroleum. The carbon tax generates, in contrast, only USD 1-2bn annually in revenues.



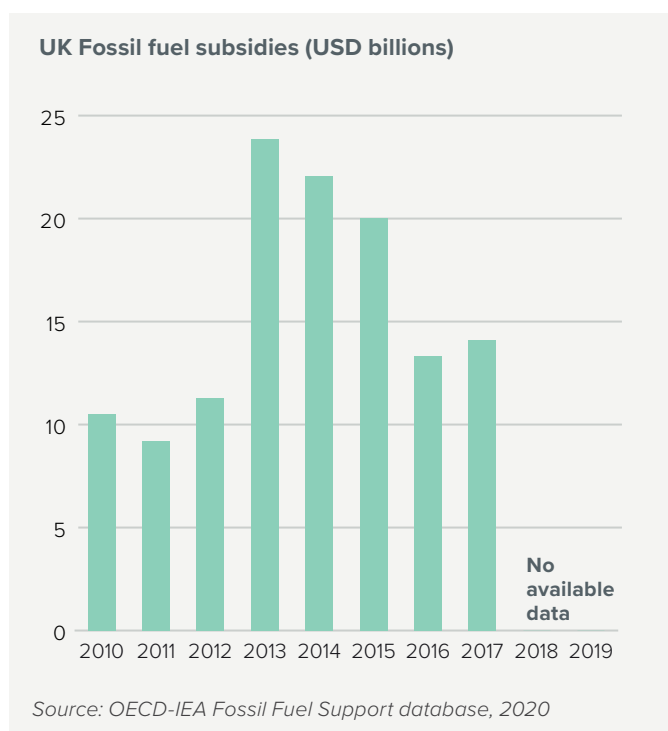
Investment in green energy and infrastructure needs to outweigh fossil fuel investments by 2025.

Source: Rogelj et al., 2018

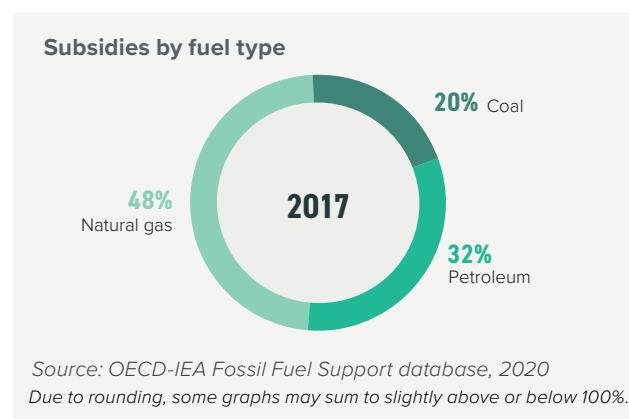
### FISCAL POLICY LEVERS

Fiscal policy levers raise public revenues and direct public resources. Critically, they can shift investment decisions and consumer behaviour towards low-carbon, climate-resilient activities by reflecting externalities in the price.

#### Fossil Fuel Subsidies



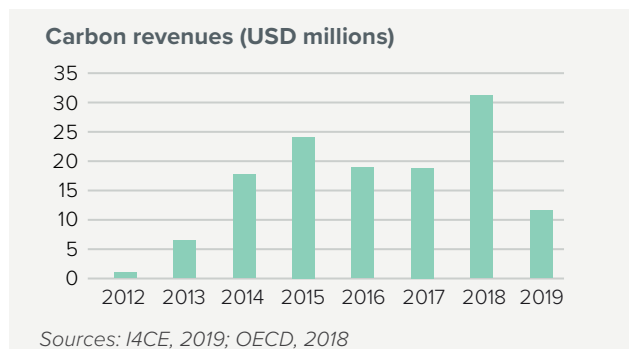
#### Fossil Fuel Subsidies by fuel type



To date (August 2020) recent data on fossil fuel subsidies is not available for the UK; the latest available data for the country is for 2017. In 2017, UK's fossil fuel subsidies totalled USD 14.1bn (compared to USD 10.5bn in 2010 and the last decade's peak of USD 23.9 in 2013). 54% of the subsidies identified were for the consumption of fossil fuels, and 46% were for their production. Petroleum garnered the largest number and value of subsidies at USD 6.8bn followed by natural gas at USD 4.4bn. The largest subsidy is the reduced rate of value-added tax applied to domestic fuels and power (coal, petroleum and natural gas), which amounted to USD 6bn.

#### Carbon Pricing and Revenue

In 2013, the UK introduced a national carbon tax (Carbon Price Floor) that generated USD 1.2bn in 2019. The Carbon Price Floor covers 23% of power sector emissions, priced at USD 24/ tCO<sub>2</sub>. The UK is also party to the European Emissions Trading Scheme; however, due to Brexit taking place, no auction has been carried out for the UK in 2019. Looking forward, the UK is also considering a link between any future UK ETS and the EU ETS.



#### CORONAVIRUS RECOVERY

With the onset of the COVID-19-induced economic crisis, there have been growing calls from key stakeholders for the government to establish a Green Investment Bank that could help finance climate-related projects that might otherwise struggle to access capital.

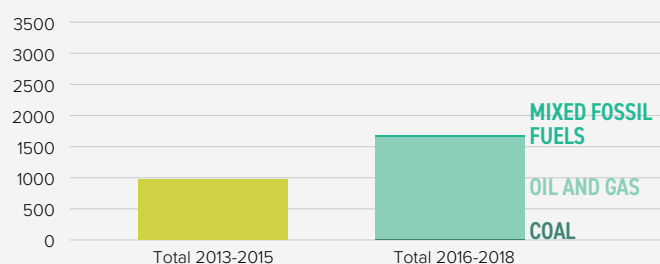
References: Hook and Thomas, 2020; Ward, 2017

## PUBLIC FINANCE

Governments steer investments through their public finance institutions, including via development banks both at home and overseas, and green investment banks. Developed G20 countries also have an obligation to provide finance to developing countries, and public sources are a key aspect of these obligations under the UNFCCC.

### Public finance for fossil fuels

Public finance provided to fossil fuels (in USD millions)



The database used to estimate public finance for fossil fuels is a bottom-up database, based on information that is accessible through various online sources and is, therefore, incomplete.

Source: Oil Change International, 2020

Between 2016 and 2018, the UK provided an average of USD 1.7bn per year in public finance for fossil fuels, the large majority of which was directed to the oil and gas sector. This marked a substantial ramping up in public finance for fossil fuels compared to the previous period 2013-2015, when less than an average of USD 1 bn per year is estimated to have been provided to fossil fuels. The UK was able to continue to support coal projects due to the loopholes existing in the ECAs OECD Coal-Fired Electricity Generation Sector Understanding. Also note, the UK has majority government-owned banks providing significant levels of public finance for energy, whose support is not captured in the data adopted for this analysis. In a welcome recent development, the UK announced it would no longer fund foreign fossil fuel projects through its export credit agency UK Export Finance (UKEF) (Ambrose, 2020).

### Provision of international public support

(annual average 2017 and 2018)

Climate finance contributions are sourced from Party reporting to the UNFCCC.

#### Bilateral, regional and other channels

Annual average contribution: **1,115.62** MN USD

Theme of support:



#### Multilateral climate finance contributions

Annual average contribution: **244.22** MN USD

Theme of support:



#### Core / General Contributions

Annual average contribution: **2,731.15** MN USD

The UK ranks 6th for its bilateral climate finance commitments and for its commitments to multilateral climate funds, in absolute terms. In 2017/18 there was a levelling off of bilateral spending and a halving in flows through multilateral climate funds (with core general contributions increasing). **The UK has achieved balance in adaptation and mitigation in its bilateral flows. All multilateral climate funds flow to cross-cutting objectives.** The UK announced a doubling of its initial contribution to the Green Climate Fund during this replenishment round in late 2019, amounting to USD 1.9bn, making it the largest contributor to the Fund.

## FINANCIAL POLICY AND REGULATION

### Financial policy and regulation

Through policy and regulation governments can **overcome challenges to mobilising green finance**, including: real and perceived risks, insufficient returns on investment, capacity and information gaps.

Category	Instruments	Objective	Under Discussion/ implementation		None identified	
Green Financial Principles	n/a	This indicates political will and awareness of climate change impacts, showing where there is a general discussion about the need for aligning prudential and climate change objectives in the national financial architecture.	●			
			Mandatory	Voluntary	Under Discussion/ implementation	None identified
Enhanced supervisory review, risk disclosure and market discipline	Climate risk disclosure requirements	Disclose the climate-related risks to which financial institutions are exposed		●		
	Climate-related risk assessment and climate stress-test	Evaluate the resilience of the financial sector to climate shocks				●
Enhanced capital and liquidity requirements	Liquidity instruments	Mitigate and prevent market illiquidity and maturity mismatch				●
	Lending limits	Limit the concentration of carbon-intensive exposures				●
		Incentivise low carbon-intensive exposures				●
	Differentiated reserve requirements	Limit misaligned incentives and channel credit to green sectors				●

The Bank of England Prudential Review Authority has reviewed climate-related risks to UK banks and the insurance sector, and is a founding member of the NGFS. In 2017 the UK government launched a **Green Finance Taskforce encouraging implementation of the TCFD recommendations**. In 2019 it launched a Green Finance Strategy clarifying remits of regulators around climate change and setting mandatory TCFD alignment for all listed companies by 2022, with the Financial Conduct Authority, Prudential Regulation Authority, Pensions Regulator and Financial Reporting Council welcoming the recommendations. In June 2020, the BoE published its first climate-related financial disclosure, setting out the Bank's approach to managing the risks from climate change across its entire operations, including the steps taken to improve its understanding of these risks in future years.

### Nationally Determined Contribution (NDC): Finance

Conditionality	Not applicable
Investment needs	Not specified
Actions	Not mentioned
International market mechanisms	No contribution from international credits for the achievement of the target

## ENDNOTES





For more detail on the sources and methodologies behind the calculation of the indicators displayed, please download the Technical Note at: [www.climate-transparency.org/g20-climate-performance/g20report2020](http://www.climate-transparency.org/g20-climate-performance/g20report2020)

- 1 'Land use' emissions is used here to refer to land use, land use change and forestry (LULUCF). The Climate Action Tracker (CAT) derives historical LULUCF emissions from the UNFCCC Common Reporting Format (CRF) reporting tables data converted to the categories from the IPCC 1996 guidelines, in particular separating Agriculture from Land use, land use change and forestry (LULUCF), which under the new IPCC 2006 Guidelines is integrated into Agriculture, Forestry, and Other Land Use (AFOLU).
- 2 The 1.5°C 'fair-share' ranges for 2030 and 2050 are drawn from the CAT, which compiles a wide range of perspectives on what is considered fair, including considerations such as

- responsibility, capability, and equality. Countries with 1.5°C 'fair-share' ranges reaching below zero, particularly between 2030 and 2050, are expected to achieve such strong reductions by domestic emissions reductions, supplemented by contributions to global emissions reduction efforts via, for example, international finance. On a global scale, negative emissions technologies are expected to play a role from the 2030s onwards, compensating for remaining positive emissions. The CAT's evaluation of NDCs shows the resulting temperature outcomes if all other governments were to put forward emissions reduction commitments with the same relative ambition level.
- 3 In order to maintain comparability across all countries, this report utilises the PRIMAP year of 2017. However, note that Common Reporting Format (CRF) data is available for countries which have recently updated GHG inventories.
  - 4 The Decarbonisation Ratings assess the current year and average of the most recent five years

(where available) to take account of the different starting points of different G20 countries.

- 5 The selection of policies rated and the assessment of 1.5°C compatibility are informed by the Paris Agreement, the IPCC's 2018 SR15 and the Climate Action Tracker (2016). The table below displays the criteria used to assess a country's policy performance.
- 6 This indicator adds up emissions from domestic aviation and international aviation bunkers in the respective country. In this Country Profile, however, only a radiative forcing factor of 1 is assumed.
- 7 This indicator includes only direct energy-related emissions and process emissions (Scope 1) but not indirect emissions from electricity.
- 8 This indicator includes emissions from electricity (Scope 2) as well as direct energy-related emissions and process emissions (Scope 1).

On endnote 5.	 Low	 Medium	 High	 Frontrunner
<b>Renewable energy in power sector</b>	No policy to increase the share of renewables	Some policies	Policies and longer-term strategy/target to significantly increase the share of renewables	Short-term policies + long-term strategy for 100% renewables in the power sector by 2050 in place
<b>Coal phase-out in power sector</b>	No target or policy in place for reducing coal	Some policies	Policies + coal phase-out decided	Policies + coal phase-out date before 2030 (OECD and EU28) or 2040 (rest of the world)
<b>Phase out fossil fuel cars</b>	No policy for reducing emissions from light-duty vehicles	Some policies (e.g. energy/emissions performance standards or bonus/malus support)	Policies + national target to phase out fossil fuel light-duty vehicles	Policies + ban on new fossil-based light-duty vehicles by 2035 worldwide
<b>Phase out fossil fuel heavy-duty vehicles</b>	No policy	Some policies (e.g. energy/emissions performance standards or support)	Policies + strategy to reduce absolute emissions from freight transport	Policies + innovation strategy to phase out emissions from freight transport by 2050
<b>Modal shift in (ground) transport</b>	No policies	Some policies (e.g. support programmes to shift to rail or non-motorised transport)	Policies + longer-term strategy	Policies + longer-term strategy consistent with 1.5°C pathway
<b>Near zero energy new buildings</b>	No policies	Some policies (e.g. building codes, standards or fiscal/financial incentives for low-emissions options)	Policies + national strategy for near zero energy new buildings	Policies + national strategy for all new buildings to be near zero energy by 2020 (OECD countries) or 2025 (non-OECD countries)
<b>Energy efficiency in Industry</b>	0-49% average score on the policy-related metrics in the ACEEE's International Energy Efficiency Scorecard	50-79% average score on the policy-related metrics in the ACEEE's International Energy Efficiency Scorecard	80-89% average score on the policy-related metrics in the ACEEE's International Energy Efficiency Scorecard	Over 90% average score on the policy-related metrics in the ACEEE's International Energy Efficiency Scorecard
<b>Retrofitting existing buildings</b>	No policies	Some policies (e.g. building codes, standards or fiscal/financial incentives for low-emissions options)	Policies + retrofitting strategy	Policies + strategy to achieve deep renovation rates of 5% annually (OECD) or 3% (non-OECD) by 2020
<b>Net-zero deforestation</b>	No policy or incentive to reduce deforestation in place	Some policies (e.g. incentives to reduce deforestation or support schemes for afforestation / reforestation in place)	Policies + national target for reaching net-zero deforestation	Policies + national target for reaching zero deforestation by 2020s or for increasing forest coverage

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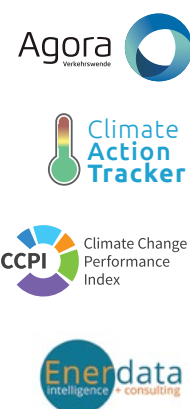


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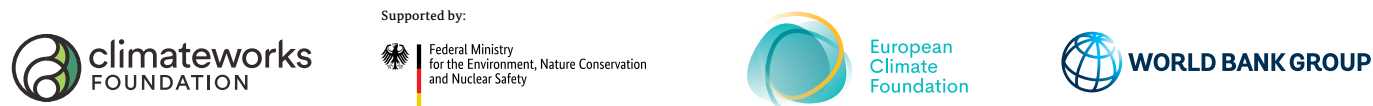
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