



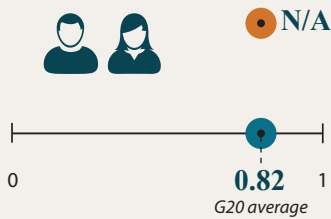
## BROWN TO GREEN: G20 TRANSITION TO A LOW CARBON ECONOMY

# European Union

This profile assesses the European Union's past, present and indications of future performance towards a low-carbon economy by evaluating emissions, decarbonisation, climate policy performance and climate finance. The profile summarises the respective findings from, amongst others, the Climate Change Performance Index (CCPI, operated by Germanwatch and Climate Action Network Europe), the Climate Action Tracker (CAT, operated by Climate Analytics, NewClimate Institute, Ecofys and the Potsdam Institute for Climate Impact Research), and analyses from the Overseas Development Institute (ODI).

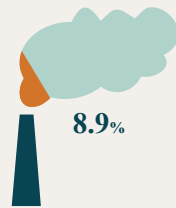


### Human Development Index



Source: UNDP, data for 2015

### Share of global GHG emissions



Source: World Bank Indicators, data for 2012

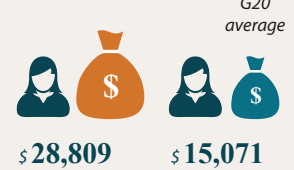
### GHG emissions per capita (tCO<sub>2</sub>e/cap)



### Share of global GDP

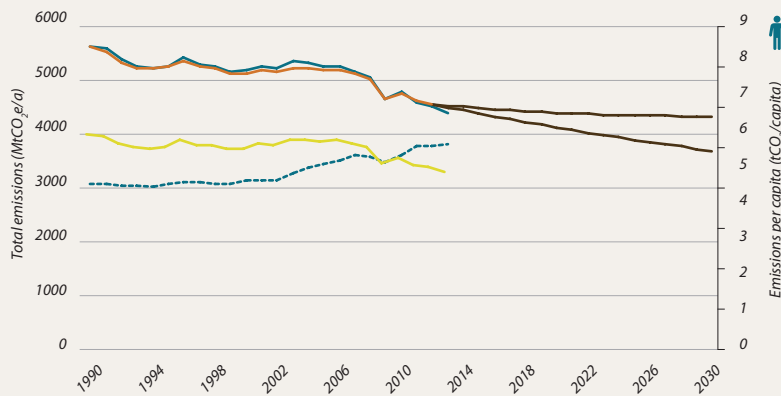


### GDP per capita

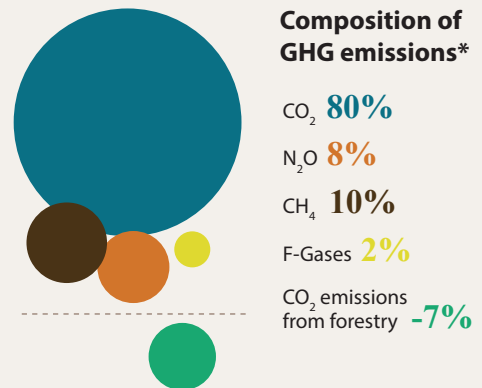
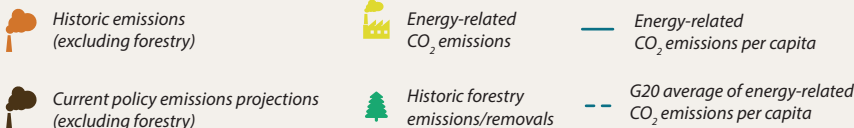


Source: IEA, data for 2013

## GREENHOUSE GAS (GHG) EMISSIONS



Over the assessment period the European Union's greenhouse gas (GHG) emissions have declined from about 5,600 MtCO<sub>2</sub>e to about 4,500 MtCO<sub>2</sub>e. Future projections assume this reduction could continue until 2030. In 2012, carbon dioxide (CO<sub>2</sub>) accounted for approximately three quarters of the EU's total GHG emissions. Energy-related CO<sub>2</sub> per capita emission declined notably since 1996, but are still relatively high compared to other G20 countries.

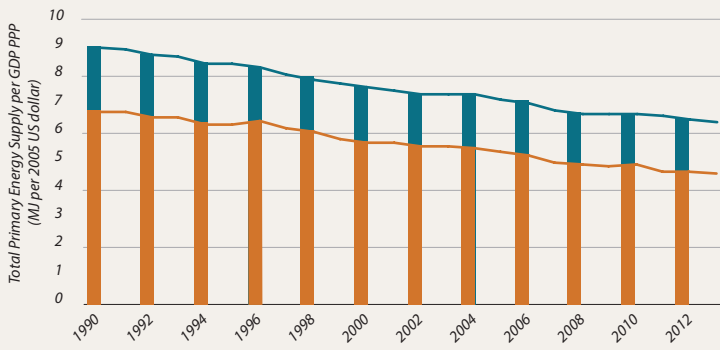


\*CO<sub>2</sub> emissions excl. LULUCF  
Source: Annex I countries: UNFCCC (2015);  
Non-Annex I countries: IEA (2014) and CAT (2015)

Sources: Past energy related emissions from the Climate Change Performance Index (CCPI); past non-energy and future emissions projections from the Climate Action Tracker (CAT). CCPI calculations are primary based on the most recent IEA data; CAT calculations are based on national policies and country communications.

# DECARBONISATION

## Energy intensity of the economy

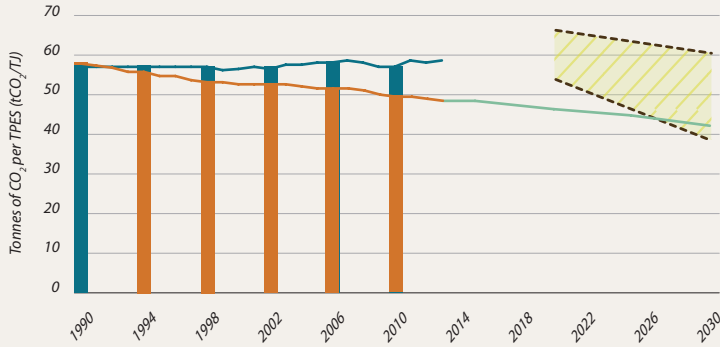


Energy intensity  
Average energy intensity in G20

Source: CCPI, 2016

The energy intensity of the EU's economy (TPES/GDP) has gradually fallen and is already far below the G20 average.

## Carbon intensity of the energy sector

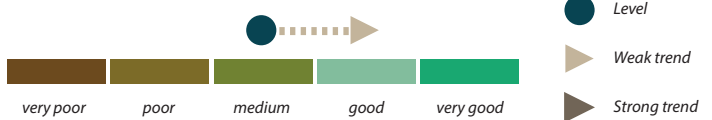


Carbon intensity (past trend)      Average carbon intensity in G20  
Carbon intensity (current policy projection)      Global benchmark for a 2°C pathway

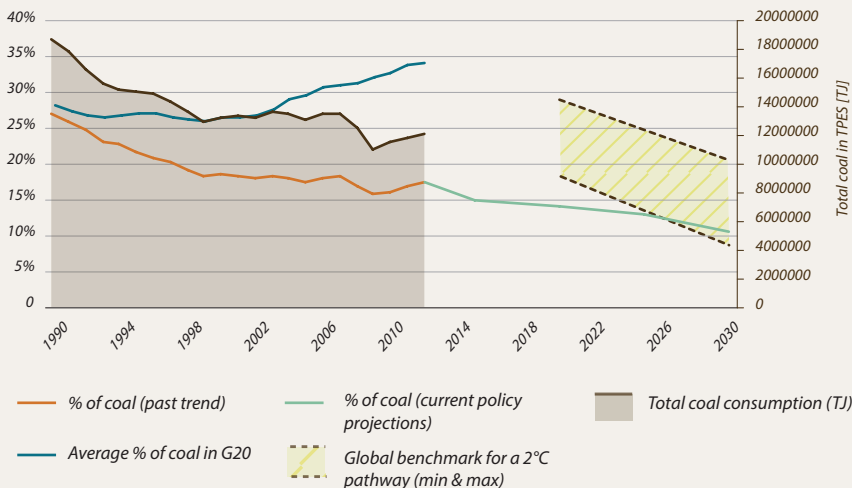
Sources: Past: CCPI; future projections: CAT

In the European Union there has been an observable trend towards fewer emissions per primary energy supply ( $\text{CO}_2/\text{TPES}$ ). It started just above the level of the G20 average and continuously dropped down to about 49  $\text{tCO}_2$  per TJ, below the G20 average. While it is expected that the energy sector's carbon intensity will drop further by 2030, it would still exceed the minimum value for the 2°C compatible benchmark corridor.

### CCPI evaluation of carbon intensity of energy sector



## Share of coal in Total Primary Energy Supply (TPES)



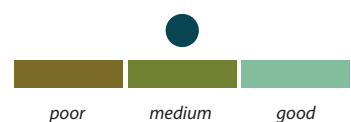
Source: CAT



In the European Union, the share of coal accounted for 27% in 1990 but has since decreased.

In 2012 coal accounted for 18% of the total primary energy supply, which is nearly half of the G20 average share. Projections assume this development will continue and be on a 2°C-compatible pathway, even though it will still be above the minimum value of the benchmark corridor in 2030.

### Evaluation of coal share in TPES

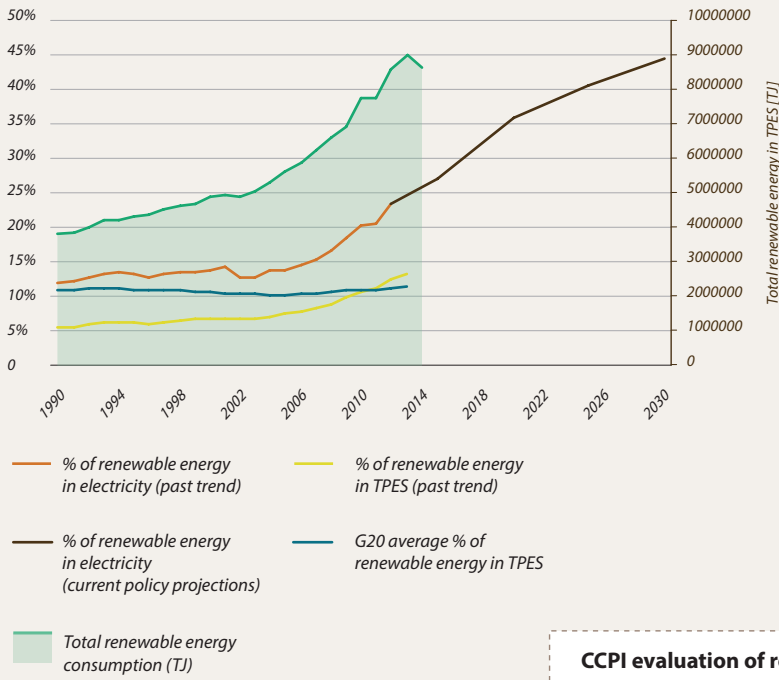


Source: own evaluation

## Renewable energy in TPES and electricity sector

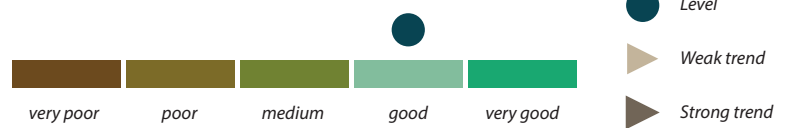


The share of renewable energy in electricity remained relatively constant around 12% -14% between 1990 and 2005. Since then, it has nearly doubled to 24% in 2012. Further growth can be expected in the next decade. The share of renewables in the EU's total primary energy supply has slightly increased over the past years and, since 2010, has been above the G20 average.



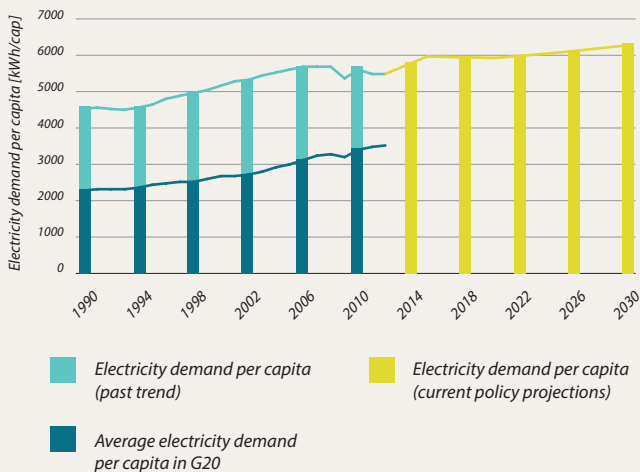
Sources: CCPI and CAT

### CCPI evaluation of renewable share in TPES



## Electricity demand per capita

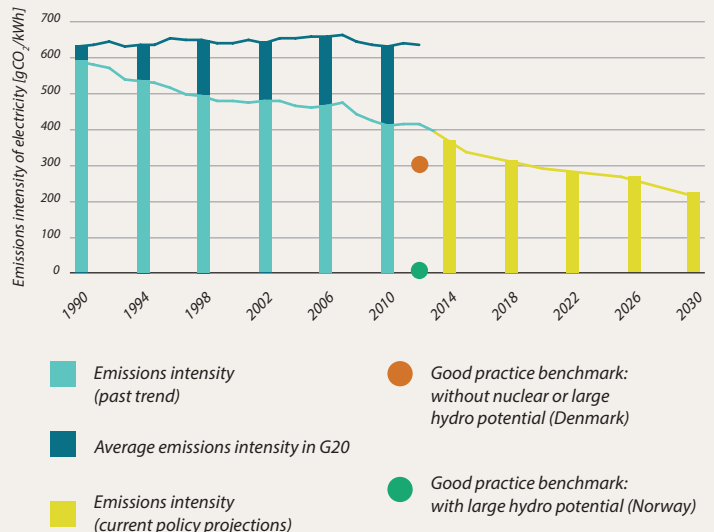
The EU's electricity demand per capita has been rising since 1990 showing the same upward trend as the G20 average. However, at around 5500 kWh per capita in 2012, the EU's electricity demand is far above the G20 average, and is expected to continue rising until 2030.



Source: CAT, 2015

## Emissions intensity of the electricity sector

The emissions intensity of the EU's electricity has dropped by a third since 1990. Compared to other G20 member countries, current levels are relatively good and can be expected to drop further.



Source: CAT, 2015

### Evaluation of the electricity emission intensity



Source: own evaluation

## CLIMATE POLICY PERFORMANCE

### Checklist of the climate policy framework

Low emissions development plan for 2050*	✓
2050 GHG emissions target	✓
Building codes, standards and incentives for low-emissions options	✓
Support scheme for renewables in the power sector	✓
Emissions performance standards for cars	✓
Emissions Trading Scheme (ETS)	✓
Carbon tax	✗

\* Understood as decarbonisation plans and not specifically as the plans called for in the Paris Agreement

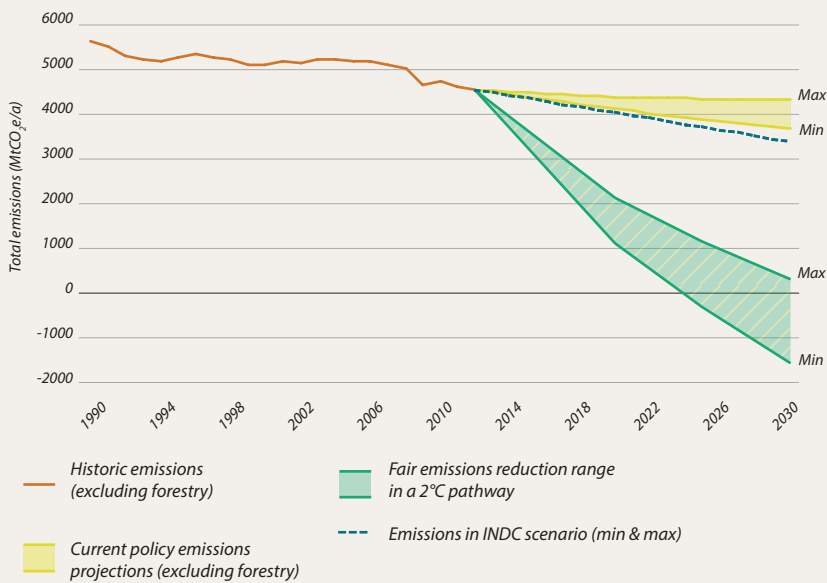
Source: Climate Policy Database, 2016

### Climate policy evaluation by experts

The EU as a whole is not part of the CCPI policy evaluations.

The CCPI evaluates a country's performance in national and international climate policy through feedback from national energy and climate experts.

### Compatibility of national climate targets (INDCs) with a 2°C scenario

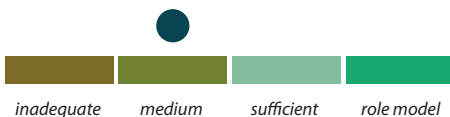


Under its INDC, on 6 March 2015 the EU proposed a binding, economy-wide target to cut domestic greenhouse gas emissions by at least 40% below 1990 levels in 2030. No individual EU member state has its own INDC.

The Climate Action Tracker (CAT) rates the EU emissions target as “medium”, meaning the INDC is inconsistent with limiting warming below 2°C. It would require other countries to make a comparably greater effort, and much deeper emissions reductions.

The overall level of GHG emissions reductions proposed in the EU28 INDC does not fall within the range of approaches for fair and equitable emission reductions. Current policies are projected to reduce domestic emissions by 23–35% below 1990 levels in 2030, and do not put the EU on a trajectory towards meeting either its 2030 or 2050 targets. The EU's Emissions Trading Scheme is an important instrument to achieve its 2020 and 2030 targets. However, an accumulated surplus of emissions allowances could dilute the 40% GHG target by 7% in 2030. It is therefore important that the EU creates a robust market reserve for eliminating that surplus, to keep in line with the 40% GHG target.

### CAT evaluation of the EU's Intended National Determined Contributions (INDC)



Source: CAT, 2015

## FINANCING THE TRANSITION

### Investment attractiveness



Allianz Energy and Climate Monitor not covered

RECAI\* (E&Y index) Category (own assessment) not covered

Trend\*\* no data

\*Adapted from RECAI and re-classified in 3 categories (low, medium, high) for comparison purposes with Allianz Monitor.

\*\*Taken from RECAI issue of May 2016

The European Union as a whole is not covered by the investment attractiveness indices.

Sources: Allianz Energy and Climate Monitor and RECAI reports

The Allianz Energy & Climate Monitor ranks G20 member states on their relative fitness as potential investment destinations for building low-carbon electricity infrastructure. The investment attractiveness of a country is assessed through four categories: Policy adequacy, Policy reliability of sustained support, Market absorption capacity and the National investment conditions. The Renewable Energy Country Attractiveness Index (RECAI) produces score and rankings for countries' attractiveness based on Macro drivers, Energy market drivers and Technology-specific drivers which together compress a set of 5 drivers, 16 parameters and over 50 datasets.

### Historical investments in renewable energy and investment gap

Not assessed

### Carbon pricing mechanisms

#### Emissions Trading Schemes (ETS)

An ETS caps the total level of GHG emissions and allows industries to trade allowances based on their marginal abatement cost. By creating a supply and demand for allowances, an ETS establishes a market price for GHG emissions.

#### Carbon Tax

A Carbon tax directly sets a price on carbon by defining a tax rate on GHG emissions or – more commonly – on the carbon content of fossil fuels. Unlike an ETS, a carbon tax is a price-based instrument that pre-defines the carbon price, but not the emissions reduction outcome of a carbon tax.

The EU-ETS, which covers 2 GtCO<sub>2</sub>e of emissions and 45% of the EU's emissions, remains the world's single largest regional carbon pricing instrument. In 2014, the EU approved a reform to strengthen and revitalise its carbon market. As a means of controlling the supply of allowances and enhancing the price stability within the EU-ETS, the EU will launch its Market Stability Reserve in 2019. The European Commission has also proposed implementing a series of post-2020 reforms to enhance the overall ambition of the scheme.



Sources: World Bank and Ecofys, 2016; other national sources

### Fossil fuel subsidies

Not assessed

### Public climate finance

EU is not listed in Annex II of the UNFCCC, and it is therefore not formally obliged to provide climate finance. While climate-related spending by multilateral development banks may exist, it has not been included in this report.