Climate Transparency

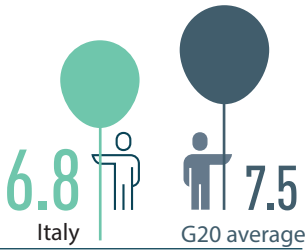
BROWN TO GREEN: 2019
THE G20 TRANSITION TOWARDS A NET-ZERO EMISSIONS ECONOMY

ITALY

Italy's greenhouse gas (GHG) emissions are – per capita – slightly below the G20 average.

Italy's total GHG emissions have only decreased by 18% (1990-2016, excl. land use).

Greenhouse gas (GHG) emissions (incl. land use) per capita[1]
(tCO_2e/capita)



Data for 2016
Source: CAT 2019; PRIMAP 2018; World Bank 2019

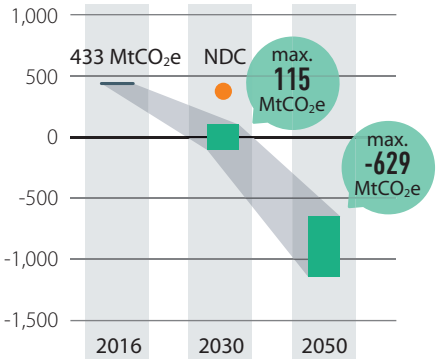
Trend (2011-2016) -16 % -1%

Italy is not on track for a 1.5°C world.

Italy's fair-share range is below 115 $MtCO_2e$ by 2030 and below -629 $MtCO_2e$ by 2050. Under Italy's 2030 NDC target, emissions would only be limited to 364 $MtCO_2e$. 1.5°C-compatibility can be achieved via strong domestic emissions reductions, supplemented with contributions to global emissions-reduction efforts. All figures are drawn rom the Climate Action Tracker and exclude land use.

Projections from policies implemented as of 2017.

1.5°C compatible pathway[2]
($MtCO_2e$/year)



Source: CAT 2019

Recent developments[3]

The government intends to introduce a new auctioning scheme to support renewable electricity generation, totalling EUR5.4 billion.

Italy's draft National Energy and Climate Plan does not include an implementation road map for a coal phase-out by 2025 and has a less ambitious GHG emission target than its National Energy Strategy 2017.

Italy published its peer review on fossil fuel subsidies together with Indonesia in April 2019 but has no roadmap for phasing out subsidies.

Key opportunities for enhancing climate ambition[3]

Italy provided US$11.6 billion of fossil fuel subsidies in 2017 and provides the highest amount of total support to coal consumption in the EU

→ **Phase out fossil fuel subsidies by 2025 at the latest.**

#1

Italy's transport emissions per capita (1.67 tCO_2/cap in 2018) are above the G20 average, with an increasing trend

→ **Ban new fossil-fuel based light-duty vehicles (LDVs) by 2025, phase out emissions from freight transport by 2050, and develop a long-term strategy to shift from individual motorised transport to public and non-motorised transport.**

#2

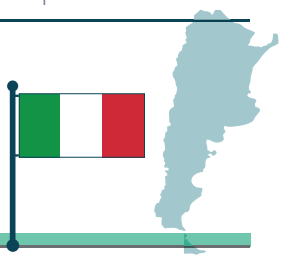
Italy's building emissions per capita (1.8 tCO_2/cap in 2018) are above the G20 average

→ **Develop a strategy to achieve deep renovation rates of 5% annually by 2020 to keep global warming below 1.5°C.**

#3

This country profile is part of the **Brown to Green 2019** report. The full report and other G20 country profiles can be downloaded at: *http://www.climate-transparency.org/g20-climate-performance/g20report2019*

ITALY – SOCIO-ECONOMIC CONTEXT



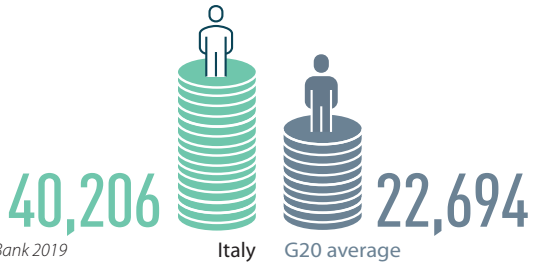
Human Development Index

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

Data for 2017 | Source: UNDP 2018

Gross Domestic Product (GDP) per capita

(PPP US$ const. 2018, international)

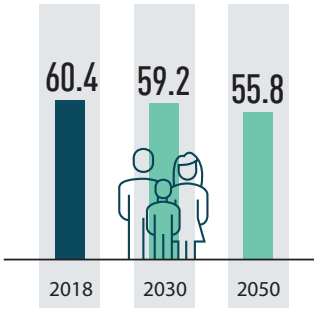


Data for 2018 | Source: World Bank 2019

Population projections

(millions)

The World Bank expects Italy's population to decrease by about 8% by 2050.



Source: World Bank 2019

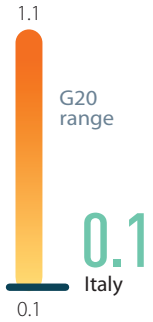
Death through ambient air pollution

(total ambient air pollution attributable deaths)

Almost 29,000 people die in Italy 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 one of the lowest levels in the G20.

28,924
attributable deaths

Data for 2016
Source: World Health Organization 2018



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

JUST TRANSITION[3]

Italy's fossil fuel is supplied predominantly by imported oil and gas. In 2017, the Italian government published and ratified its National Energy Strategy, setting out the country's energy plans up to 2030.

The strategy aims to raise the share of renewables to 28% of primary energy supply and 55% of electricity generation, and to phase out coal in electricity generation by 2025. Around 90% of Italy's coal supply is imported, and therefore the coal phase-out may have less of an impact on upstream workers, compared with other G20 nations.

Nevertheless, while not referring to an explicit 'just transition' policy, the strategy does call for "timely actions to retrain workers and create new jobs and skills".

In June 2018, Italy's new prime minister, Giuseppe Conte, pledged to "work to speed up the process, already in progress, of the 'decarbonisation' of [Italy's] production system".

Legend for all country profiles

Trends

The trends show developments over the past five years for which data are available.

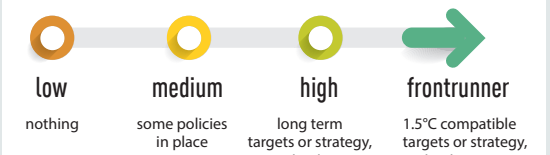
The thumbs indicate assessment from a climate protection perspective.

Decarbonisation Ratings[4]

These ratings assess a country's performance compared to other G20 countries. A high scoring reflects a relatively good effort from a climate protection perspective but is not necessarily 1.5°C compatible.

Policy Ratings[5]

The policy ratings evaluate a selection of policies that are essential pre-conditions for the longer-term transformation required to meet the 1.5°C limit.



For more information see the Annex and Technical Note

MITIGATION BIG PICTURE

ITALY

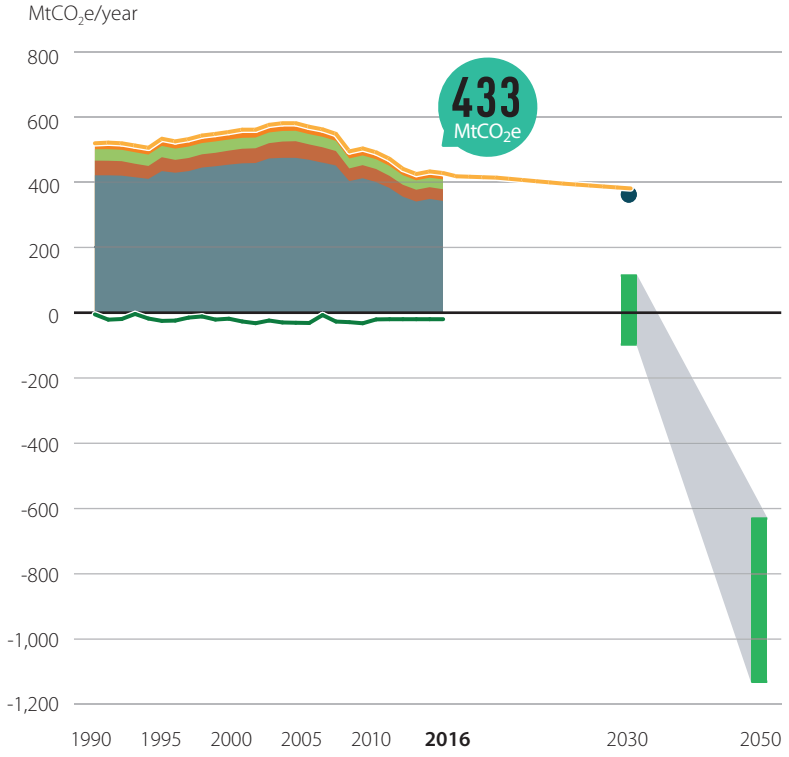
Italy's GHG emissions have dropped by only 18% (1990-2016) and the government's climate targets are not in line with a 1.5°C pathway.

In 2030, global GHG emissions need to be 45% below 2010 levels and reach net zero by 2070.

1.5°C[6]

Source: IPCC SR1.5 2018

Total GHG emissions across sectors[2]



Projections from policies implemented as of December 2014.
Source: PRIMAP 2018; CAT 2019

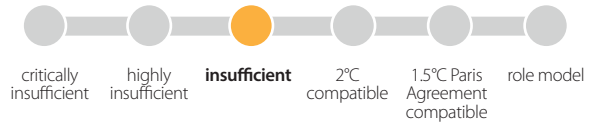
Italy's emissions (excl. land use) decreased by 18% between 1990 and 2016, with most of the reductions coming from the energy sector. The most recent emissions projections show that under current policies, emissions will continue to decline, reaching a 25% reduction below 1990 levels by 2030, which is not enough to meet its national mitigation targets. However, these projections are outdated and do not yet account for important policy developments, such as the rising EU-ETS price since 2018, and the 2017 announcement of a coal phase-out by 2025. 1.5°C-compatibility can be achieved via strong domestic emissions reductions. This can be supplemented with contributions to global emissions-reduction efforts.

Nationally-determined contribution (NDC): Mitigation

Targets	EU wide target: At least 40% reduction in domestic GHG emissions by 2030 compared to 1990 [National 2030 target not included in NDC: 43% below 2005 for ETS sector and 33% below 2005 for non-ETS sector by 2030, equivalent to a total reduction of 38%]
Actions	Not mentioned

Source: UNFCCC, NDC of respective country

Climate action tracker (CAT) evaluation of NDC[2]



Source: CAT 2019

Long-term strategy (LTS) to be submitted to the UNFCCC by 2020

Status	–
2050 target	–
Interim steps	–
Sectoral targets	–

Italy is among the 24 EU countries calling for a net zero emissions EU target for 2050.

Source: UNFCCC, LTS of respective country

MITIGATION ENERGY

ITALY

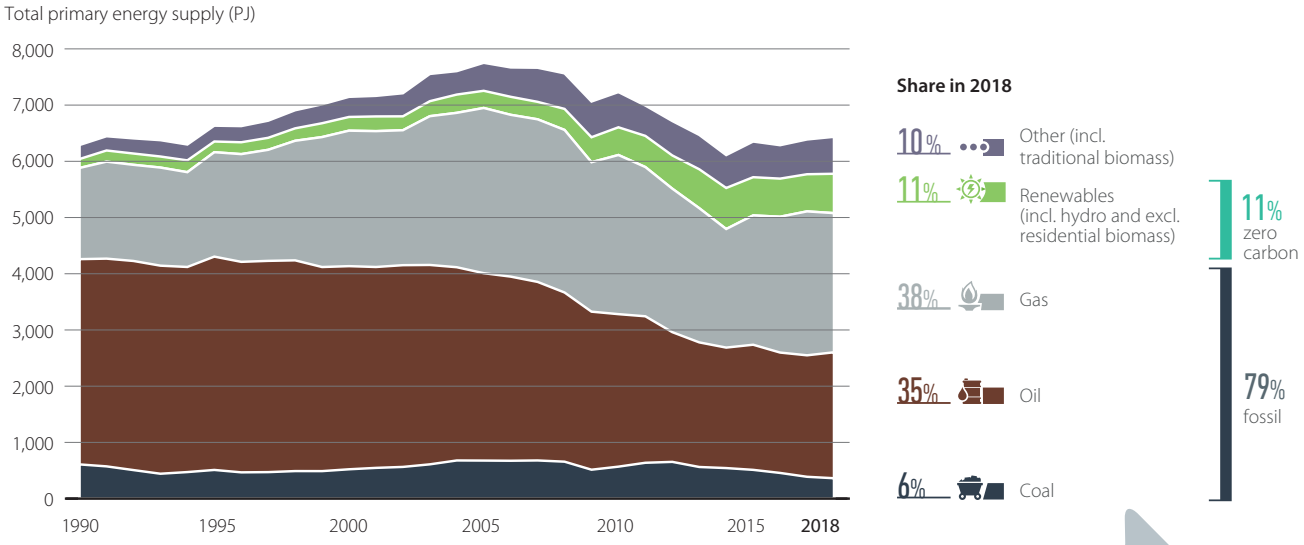
Renewable energy is increasing in Italy but fossil fuels still make up 79% of the country's energy mix (including power, heat, transport fuels, etc).

The share of fossil fuels globally needs to fall to 67% of global total primary energy by 2030 and to 33% by 2050 and to substantially lower levels without Carbon Capture and Storage.

1.5°C[6]

Source: IPCC SR1.5 2018

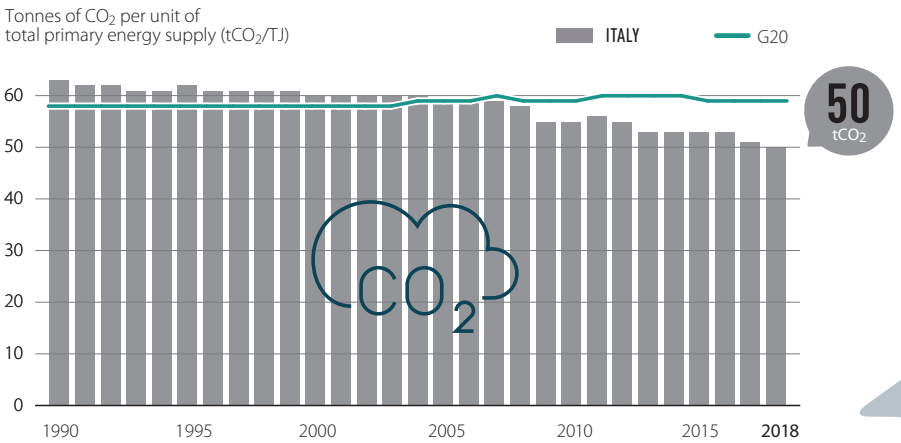
Energy mix[7]



Source: Enerdata 2019

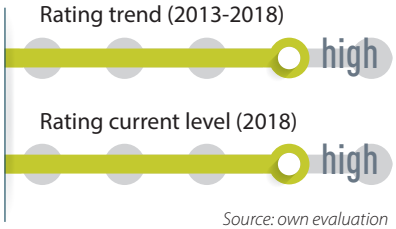
This graph shows the fuel mix for all energy supply, including energy used for electricity generation, heating, cooking, and transport fuels. Fossil fuels (oil, coal and gas) still make up 79% of the Italian energy mix, which is around the G20 average (82%). Renewable energy (11%) and gas are increasingly replacing coal and oil in the energy mix.

Carbon intensity of the energy sector



Source: Enerdata 2019

Rating of carbon intensity compared to other G20 countries[4]



Source: own evaluation

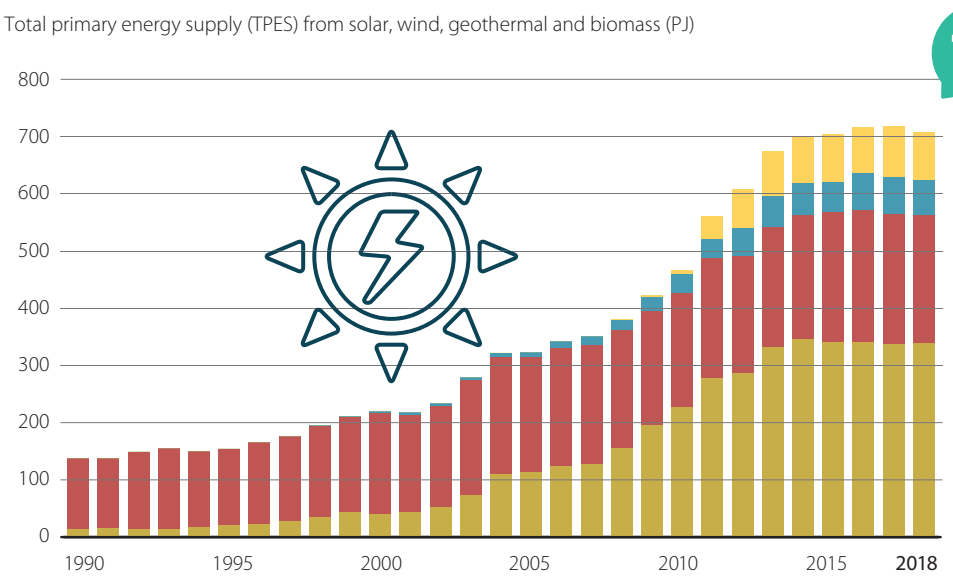
Carbon intensity shows how much CO_2 is emitted per unit of energy supply. The carbon intensity of Italy's energy mix has decreased by 5% over the past five years, the 3rd largest reduction in the G20. This reflects dropping coal and oil use; the level is now below the G20 average at 50 tCO_2/TJ.

MITIGATION ENERGY

ITALY

Solar, wind, geothermal and biomass development[8]

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



Source: Enerdata 2019

11%

Share of TPES in 2018

- 1.29% Solar
- 0.97% Wind
- 3.48% Geothermal
- 5.26% Biomass, excl. traditional biomass

Solar, wind, geothermal and modern biomass account for 11% of Italy's energy supply – the G20 average is 6%. In the last five years, the share of these sources in total energy supply has increased by around 4%, much less than the G20 average (+29% 2013-2018). Bioenergy (for electricity, and biofuels for transportation and heat) makes up the largest share.

Rating of share in TPES compared to other G20 countries[4]

Rating trend (2013-2018): very low

Rating current level (2018): high

Source: own evaluation

Energy supply per capita

Total primary energy supply per capita (GJ/capita)

107 Italy

98 G20 average

The level of energy supply per capita is closely related to economic development, climatic conditions and the price of energy.

At 107 GJ/capita, energy supply per capita in Italy is slightly above the G20 average and has increased (+1%, 2013-2018), as has the G20 average.

Trend (2013-2018) +1% +1%

Data for 2018 | Source: Enerdata 2019; World Bank 2019

Rating of energy supply per capita compared to other G20 countries[4]

Rating trend (2013-2018): low

Rating current level (2018): medium

Source: own evaluation

MITIGATION ENERGY

ITALY

Italy has one of the least energy-intensive economies in the G20. However, both per capita energy supply and energy-related CO_2 emissions have risen slightly in the past five years. These trends need to reverse to be compatible with a 1.5°C pathway.

Global energy and process-related CO_2 emissions must be cut by 40% below 2010 levels by 2030 and reach net zero by 2060.

1.5°C[6]

Source: IPCC SR1.5 2018

Energy intensity of the economy

(TJ/PPP US$2015 million)

Italy	G20 average
3.00	4.86

Trend (2013-2018): -4% | -12%

Data for 2018 | Source: Enerdata 2019; World Bank 2019

This indicator quantifies how much energy is used for each unit of GDP. This is closely related to the level of industrialisation, efficiency achievements, climatic conditions or geography. The energy intensity of Italy's economy is one of the lowest in the G20 but has decreased less (-4%, 2013-2018) than the G20 rate.

Rating of energy intensity compared to other G20 countries[4]

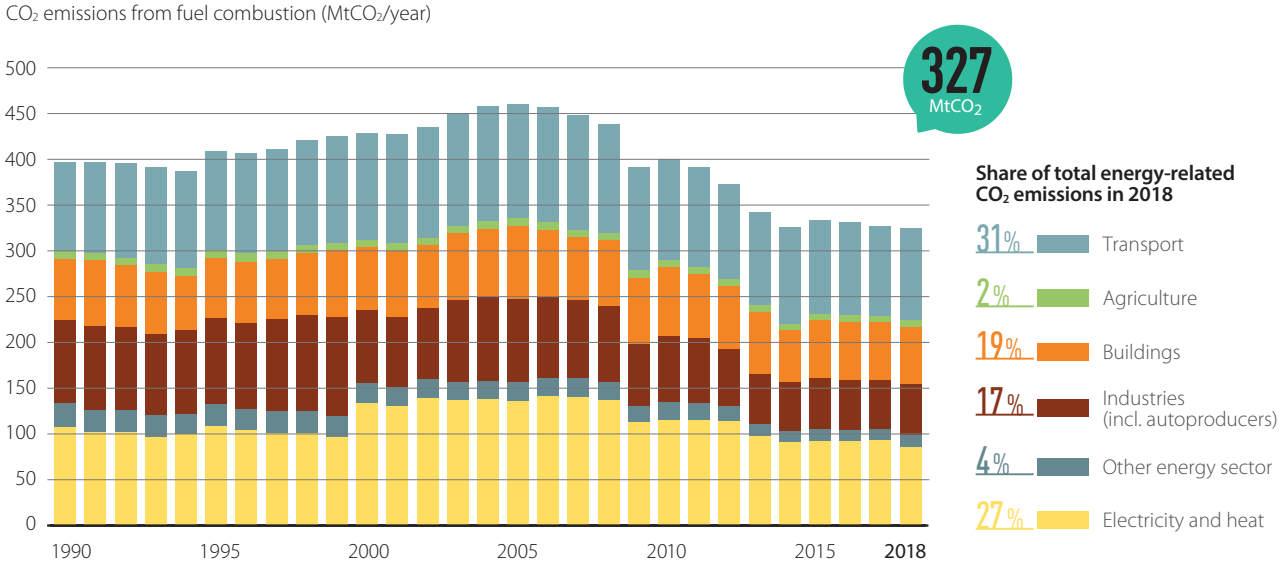
Rating trend (2013-2018): medium

Rating current level (2018): very high

Source: own evaluation

Energy-related CO_2 emissions[9]

CO_2 emissions from fuel combustion ($MtCO_2$/year)



Share of total energy-related CO_2 emissions in 2018

31%	Transport
2%	Agriculture
19%	Buildings
17%	Industries (incl. autoproducers)
4%	Other energy sector
27%	Electricity and heat

Source: Enerdata 2019

The largest driver of overall GHG emissions are CO_2 emissions from fuel combustion. In Italy, these have decreased over the last decade. The transport sector is, with 31%, the largest contributor, followed by electricity and heat, and buildings with 27% and 19% respectively.

MITIGATION POWER SECTOR

ITALY

Italy produces 10% of electricity from coal. The decision to phase-out coal power by 2025 is in line with a 1.5°C limit. Renewables already account for 40% of the power mix but a long-term strategy towards 100% is still lacking.

Share in energy-related CO_2 emissions

Data for 2018 | Source: Enerdata 2019

Coal must be phased out in the EU/OECD no later than 2030, in the rest of the world no later than 2040. Electricity generation needs to be decarbonised before 2050, with renewable energy the most promising option.[5]

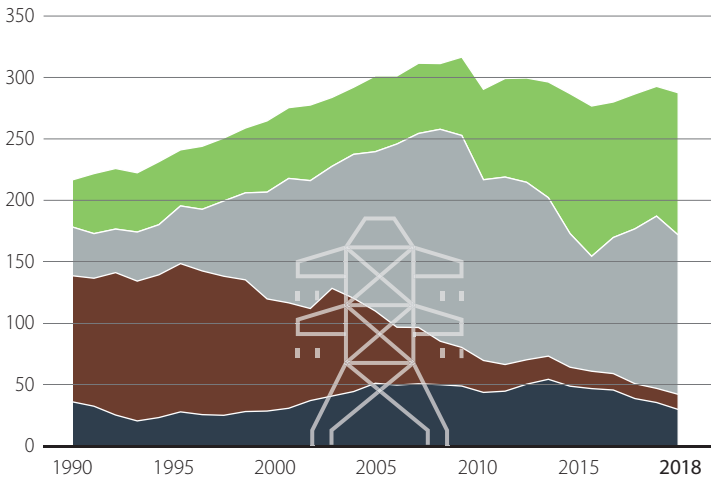
1.5°C[6]

Source: IPCC SR1.5 2018; Climate Analytics 2016; Climate Analytics 2019

STATUS OF DECARBONISATION

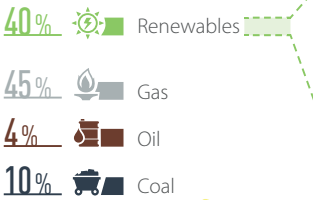
Power mix

Gross power generation (TWh)

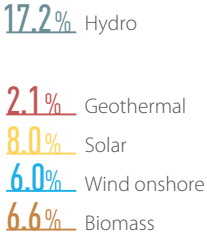


Source: Enerdata 2019

Shares in 2018



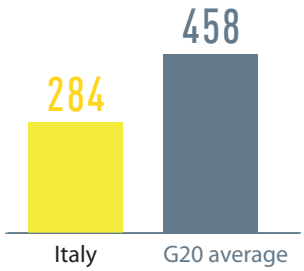
Renewables shares



Italy is increasingly producing power from renewables, mainly from large hydropower (17%). In total, renewables make up 40% of the power mix – the G20 average is 25%. Renewables, but also gas, are increasingly replacing coal and oil. Overall, fossil fuels still account for 59% of the power mix.

Emissions intensity of the power sector

(gCO_2/kWh)



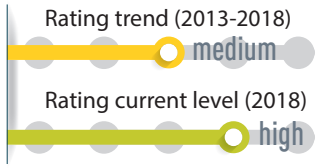
Data for 2018 | Source: Enerdata 2019

Trend (2013-2018)

-8% Italy

-11% G20 average

Rating of emissions intensity compared to other G20 countries[4]

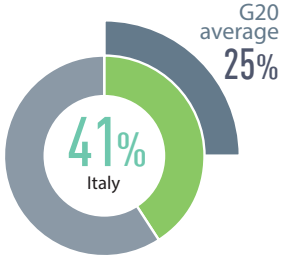


Source: own evaluation

For each kilowatt hour of electricity, 284 gCO_2 are emitted in Italy. This is well below the G20 average, reflecting the high shares of renewables and gas. But the level is decreasing less (-8%, 2013-2018) than the G20 trend (-11%).

Share of renewables in power generation

(incl. large hydro)



Trend (2013-2018)

-8% Italy

+20% G20 average

Rating of share of renewables compared to other G20 countries[4]

Source: own evaluation

Data for 2018 | Source: Enerdata 2019

MITIGATION POWER SECTOR

ITALY

POLICIES[5]

Renewable energy in the power sector

According to its 2019 National Integrated Plan for Climate and Energy, Italy aims to have 55.4% renewables in the electricity mix by 2030, half of it coming from solar. However, no 2050 renewable energy target exists. The government intends to introduce a new auction scheme of EUR5.4 billion for largescale photovoltaic and rooftop systems in 2019.

Source: own evaluation

Coal phase-out in the power sector

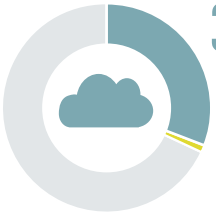
The Italian government announced in its 2017 National Energy Strategy a coal phase-out by 2025. Implementation is due to begin in 2020.

Source: own evaluation

MITIGATION TRANSPORT SECTOR

In Italy, 82% of passenger transport is by private car, and 78% of freight transport is by road. Both sectors are still dominated by fossil fuels. In order to stay within a 1.5°C limit, passenger and freight transport need to be decarbonised.

Share in energy-related CO_2 emissions



31% direct

1% from electricity

Data for 2018 | Source: Enerdata 2019

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

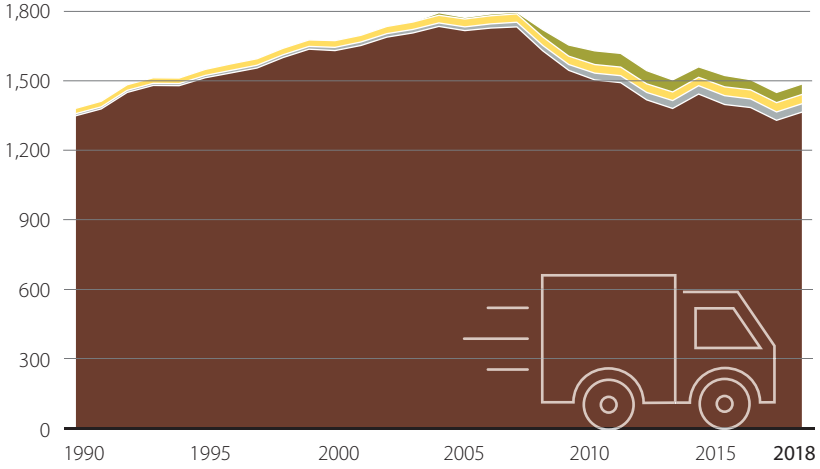
1.5°C[6]

Source: IPCC SR1.5 2018

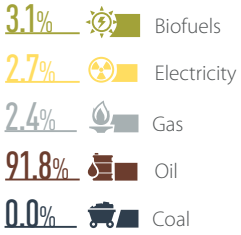
STATUS OF DECARBONISATION

Transport energy mix

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



Share in 2018



Electricity and biofuels make up only 6% of the energy mix in transport – this is around the G20 average.

Source: Enerdata 2019

MITIGATION TRANSPORT SECTOR

ITALY

STATUS OF DECARBONISATION (continued)

Transport emissions per capita[10]

(tCO_2/capita, excl. aviation emissions)

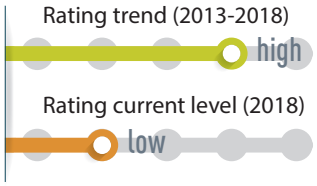
Data for 2018
Source: Enerdata 2019; World Bank 2019

Trend (2013-2018)

-4% Italy

+5% G20 average

Rating of transport emissions compared to other G20 countries[4]



Source: own evaluation

Aviation emissions per capita[11]

(tCO_2/capita)

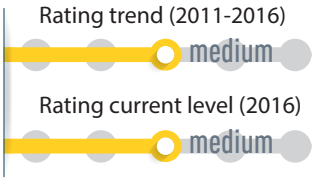
Data for 2016
Source: Enerdata 2019; IEA 2018

Trend (2011-2016)

+3% Italy

+10% G20 average

Rating of aviation emissions compared to other G20 countries[4]



Source: own evaluation

Motorisation rate

(vehicles per 1,000 inhabitants)

869

Data for 2016 | Source: Agora 2018

Market share of electric vehicles in new car sales

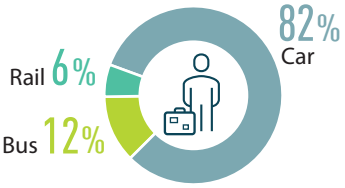
(%)

no data

Source: IEA 2019

Passenger transport

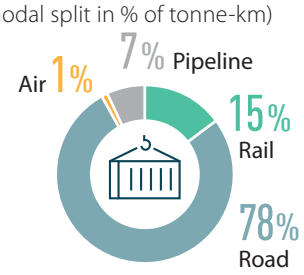
(modal split in % of passenger km)



Data for 2016 | Source: ITF 2019

Freight transport

(modal split in % of tonne-km)



Data for 2015 | Source: Agora 2018

POLICIES[5]

Phase out fossil fuel cars

Italy applies the EU CO_2 efficiency standards for cars, which have recently been tightened. The government aims to put 1 million electric vehicles on the road by 2022. It provided subsidies of EUR60 million in 2019, with EUR70 million planned for 2021/22, for the purchase of new electric and hybrid vehicles, but has no target for phasing out fossil fuel-based LDVs.

Source: own evaluation

Phase out fossil fuel heavy-duty vehicles

According to 2019 EU legislation, manufacturers of heavy-duty vehicles will be required to cut CO_2 emissions from new trucks on average by 15% from 2025 and by 30% from 2030, compared to 2019 levels. A toll differentiating between vehicle class applies on most motorways.

Source: own evaluation

Modal shift in (ground) transport

Italy is striving towards a shift of about 10% of passenger transport demand by 2030 from private cars to public transport, carpooling, bicycles and walking. It supports the shift of freight from road to rail, eg through funding support schemes. In November 2018, the government launched a new high-speed rail transport service of 550km length for goods freight.

Source: own evaluation

MITIGATION BUILDINGS SECTOR

ITALY

Italy's building emissions – including heating, cooking and electricity use – make up a third of total CO_2 emissions. Per capita, building-related emissions are above the G20 average. There is no strategy for energy refurbishment of existing buildings.

Share in energy-related CO_2 emissions

Data for 2018 | Source: Enerdata 2019

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

1.5°C[6]

Source: IEA ETP B2DS scenario assessed in IPCC SR1.5 2018

STATUS OF DECARBONISATION

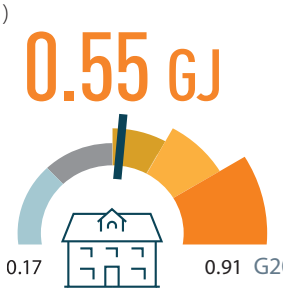
Building emissions per capita
(incl. indirect emissions)
(tCO_2/capita)

-4.9% +1%

Trend (2013-2018)

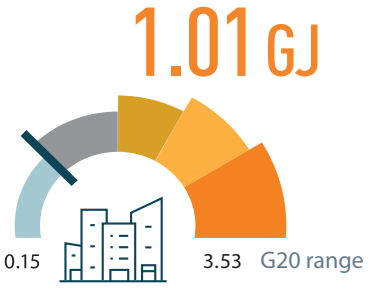
Data for 2018 | Source: Enerdata 2019; World Bank 2019

Residential buildings: energy use per m²
(GJ)



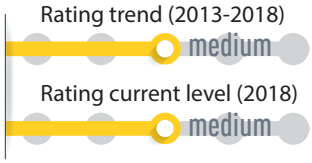
Data: year different per country | Source: ACEEE 2018

Commercial and public buildings: energy use per m²
(GJ)



Data: year different per country | Source: ACEEE 2018

Rating of building emissions compared to other G20 countries[4]



Source: own evaluation

Building-related emissions per capita are above the G20 average. But in contrast to the G20 average, Italy has managed to reduce the level by 5% (2013-2018).

Building emissions are largely driven by how much energy is used in heating, cooling, lighting, household appliances, etc. In Italy, energy use per m² in residential buildings is in the middle range of the G20 countries.

POLICIES[5]

Near-zero energy new buildings

Italy is obliged under EU law for all new buildings to reach near zero energy from 2020 onwards. A building code is in place.

Source: own evaluation

Renovation of existing buildings

Italy has no long-term energy retrofitting strategy. Mandatory national building energy codes apply for both commercial and residential buildings, applicable to any renovated areas of a building.

Source: own evaluation

MITIGATION INDUSTRY SECTOR

ITALY

Italy has one of the least emission-intensive industries in the G20. But industry-related emissions make up almost a third of its total CO_2 emissions and energy efficiency policies for the sector remain insufficient.

Share in energy-related CO_2 emissions (not including process emissions)

Data for 2018 | Source: Enerdata 2019

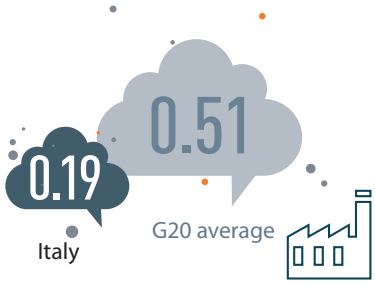
Global industrial CO_2 emissions need to be reduced by 65–90% from 2010 levels by 2050.

1.5°C[6]

Source: IPCC SR1.5 2018

STATUS OF DECARBONISATION

Industry emissions intensity[12] (tCO_2e/US$2015 GVA)

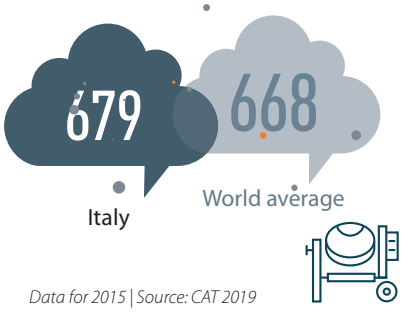


Data for 2016 | Source: Enerdata 2019; PRIMAP 2018; World Bank 2019

-12.3% -10.2%

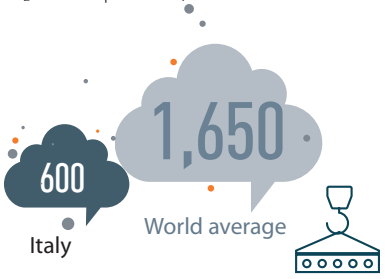
Trend (2011-2016)

Carbon intensity of cement production[13] ($kgCO_2$/tonne product)



Data for 2015 | Source: CAT 2019

Carbon intensity of steel production[13] ($kgCO_2$/tonne product)



Data for 2015 | Source: CAT 2019

Rating of emissions intensity compared to other G20 countries[4]

Source: own evaluation

When comparing industrial emissions with the gross value added (GVA) from the industry sector, Italy performs comparatively well within the G20. Its industry is one of the least emissions intensive in the G20.

Steel production and steelmaking are significant GHG emission sources, and are challenging to decarbonise. Italy's steel industry is less than half as emission intensive as the world average.

POLICIES[5]

Energy efficiency

Mandatory energy efficiency policies in Italy covered only 0-10% of industrial total energy use in 2017. Legislative Decree 102/2014 reserves up to EUR15 million per year over the period 2014-2020 for the co-financing of programmes supporting the implementation of energy diagnosis or the adoption of management systems in small and medium-sized enterprises.

Source: own evaluation

MITIGATION LAND USE

ITALY

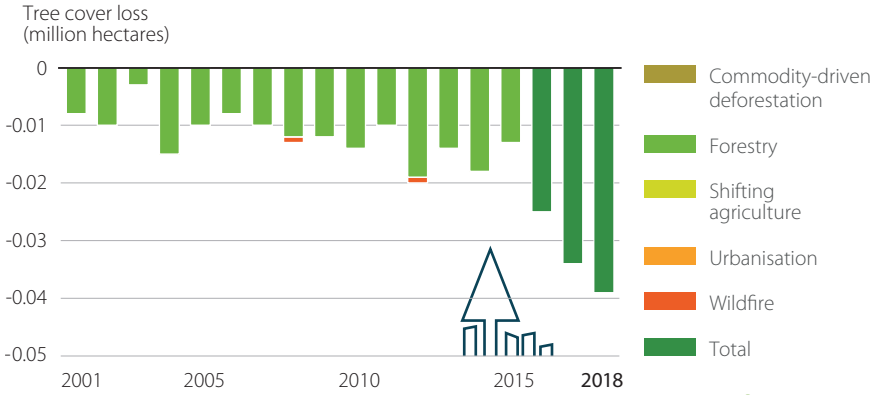
In order to stay within the 1.5°C limit, Italy needs to make the land use and forest sector a net sink of emissions, eg by halting the expansion of residential areas, and by creating new forests.

Global deforestation needs to be halted and changed to net CO_2 removals by around 2030.

1.5°C[6]

Source: IPCC SR1.5 2018

Gross tree cover loss by dominant driver[14]



Source: Global Forest Watch 2019

Note: 2000 tree cover extent | >30% tree canopy | these estimates do not take tree cover gain into account

POLICIES[5]

(Net) zero deforestation

Italy adopted a new Forest Law in 2018. Based on the law, a committee nominated by the Italian Ministry of Agriculture, Food and Forestry Policy has begun to develop the National Forest Strategy 2019-2039.

Source: own evaluation

From 2001 to 2018, Italy lost 299kha of tree cover, equivalent to a **3.2% reduction since 2000**. This does not take tree-cover gain into account. Forest management is the main driver.

MITIGATION AGRICULTURE

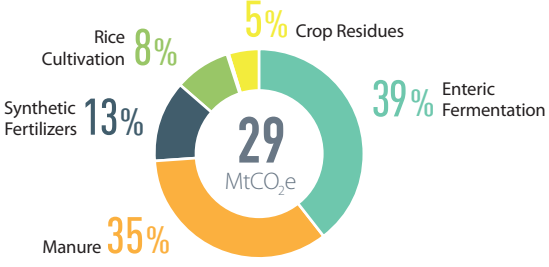
Italy's non-energy agricultural emissions mainly come from digestive processes in animals, livestock manure, and the use of synthetic fertilizers. A 1.5°C pathway requires dietary shifts, increased organic farming, and less fertilizer use.

Global 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 fertilzers and manure) need to be reduced by 10% by 2030 and by 20% by 2050.

1.5°C[6]

Source: IPCC SR1.5 2018

GHG emissions from agriculture (not including energy)



Data for 2016 | Source: FAOSTAT 2019

In Italy, the largest sources of non-energy GHG emissions in the agricultural sector are digestive processes in animals (enteric fermentation), livestock manure, and the use of synthetic fertilizers. A shift to organic farming, more efficient use of fertilizers, and diet changes can help reduce emissions.

ADAPTATION

ITALY

- **Italy is vulnerable to climate change and adaptation actions are needed.**
- **On average, 1,005 fatalities and losses amounting to US$1.4 billion occur yearly due to extreme weather events.**
- **With global warming, society and its supporting sectors are increasingly exposed to severe climate events such as droughts and a reduction in crop duration.**

ADAPTATION POLICIES

Nationally-determined contribution: Adaptation

Targets	Not mentioned
Actions	Not mentioned

Source: UNFCCC, NDC of respective country

National adaptation strategies

Document name	Publication year	Fields of action (sectors)													M&E process (reporting frequency)
		Agriculture	Biodiversity	Coastal areas & fishing	Education & research	Energy & industry	Finance & insurance	Forestry	Health	Infrastructure	Tourism	Transport	Urbanism	Water	
National Climate Change Adaptation Strategy	2015	x	x	x		x		x	x	x	x	x		x	5-year review of the contents to evaluate, through specific monitoring, the additional needs in terms of planning and allocation of the necessary economic and financial resources
National Climate Change Adaptation Plan	2017	x	x	x						x	x		x	x	Guidelines and indicators to monitor state of implementation and the effectiveness of adaptation actions

Source: own research

ITALY

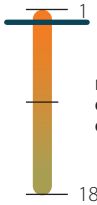
ADAPTATION NEEDS

Climate Risk Index for 1998-2017

Impacts of extreme weather events in terms of fatalities and economic losses that occured

Global Climate Risk Index 2019 | All numbers are averages (1998-2017)

Weather-related fatalities	Per 100,000 inhabitants	Annual average losses (PPP US$ mn)	Per unit GDP (%)
1,005	1.7	1,458	0.1



12 rank out of 181 countries

113 rank out of 181 countries

Source: Germanwatch 2018

Italy has already been struck by extreme weather events such as storms, rain, flooding and heatwaves. As highlighted by the numbers from the Climate Risk Index, such extreme weather events result in fatalities and economic losses. Climate change is expected to worsen the intensity, frequency and impacts of such events.

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

		1.5°C	2°C	3°C
Water	% of area with increase in water scarcity			
	% of time in drought conditions			
Heat & Health	Heatwave frequency			
	Days above 35°C			

Source: own research

			1.5°C	2°C	3°C
Agriculture	Maize	Reduction in crop duration			
		Hot spell frequency			
		Reduction in rainfall			
	Wheat	Reduction in crop duration			
		Hot spell frequency			
		Reduction in rainfall			

Source: Based on Arnell et al 2019

Overall, with rising temperatures, all sectors are adversely affected. In the water sector, water scarcity and time spent in drought conditions drastically increase. Heat wave frequency increases significantly, together with an increase in the number of days when temperatures reach more than 35°C.

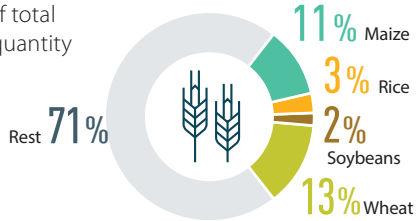
Impact ranking scale

- Very low
- Low
- Medium
- High
- Very high

Blank cells signify that there is no data available

National crop production

(share in % of total production quantity in tonnes)



Maize and wheat represent the largest proportions of crop production out of the four crops analysed. Both crops experience drastic reductions in crop duration. For maize there is a slight increase in rainfall, whereas for wheat, there is a slight reduction. Maize is negatively affected by a drastic increase in hot spell frequency, for wheat the effect is minor.

Data for 2017 | Source: FAOSTAT 2019

FINANCE

ITALY

Italy spent US$11.6 billion on fossil fuel subsidies in 2017, mostly for petroleum. In contrast, revenues through the EU emissions trading scheme generate only a fraction of this amount. There are no financial policies supporting the shift from brown to green.

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

1.5°C[6]

Source: IPCC SR1.5 2018

Nationally-determined contribution: 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

Source: UNFCCC, NDC of respective country

Financial policy and regulation supporting a brown to green transition

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	Not 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.	x	

			Mandatory	Voluntary	Under discussion	Not identified
Enhanced supervisory review, risk disclosure and market discipline	Climate risk disclosure requirements	Disclose the climate-related risks to which financial institutions are exposed		x		
	Climate-related risk assessment and climate stress-test	Evaluate the resilience of the financial sector to climate shocks			x	
Enhanced capital and liquidity requirements	Liquidity instruments	Mitigate and prevent market illiquidity and maturity mismatch				x
	Lending limits	Limit the concentration of carbon-intensive exposures				x
		Incentivise low carbon-intensive exposures				x
	Differentiated Reserve Requirements	Limit misaligned incentives and canalise credit to green sectors				x

Source: own research

Italy has a National Dialogue for Sustainable Finance (2016), with the Italian Central Bank endorsing TCFD principles in 2017, and a national observatory on sustainable finance (ONFS) tasked with assessing the impacts of environmental issues on the Italian financial system. Under the dialogue, a series of working groups comprised of leaders in the financial sector and the research community were convened (along with the United Nations Environment Programme), to take stock of existing green finance practice, identify key challenges, and suggest policy options. There is increased awareness of risks and opportunities within the finance sector and the need for new banking rules to enhance risk analysis.

FINANCE

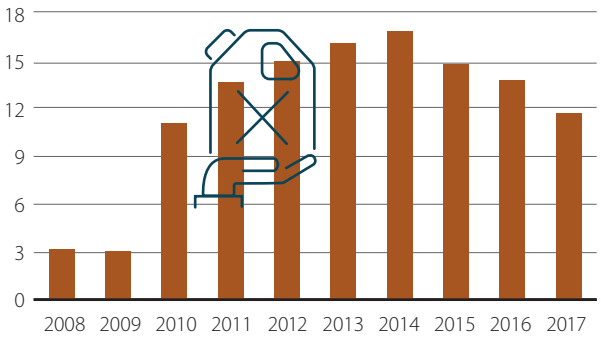
ITALY

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 prices.

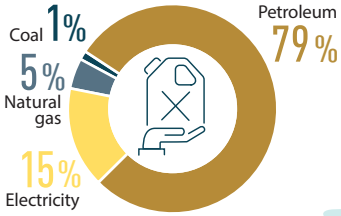
Fossil fuel subsidies

US$ billions



Source: OECD-IEA 2019

Subsidies by fuel type

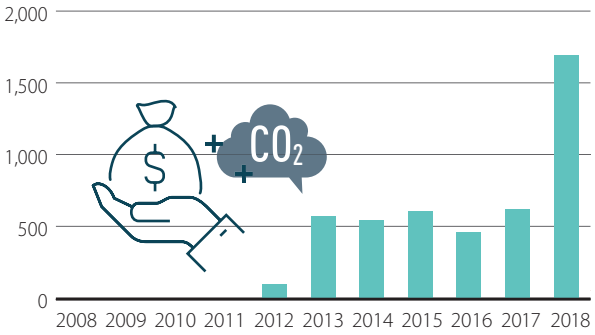


Data for 2017 | Source: OECD-IEA 2019

In 2017, Italy's fossil fuel subsidies totalled US$11.6bn (compared to US$3.1bn in 2008 and the last decade's peak of US$16.8 in 2014). Of the subsidies identified, 98% were for the consumption of fossil fuels, with the remainder for production. The highest subsidies quantified were for petroleum, at US$9.1bn, followed by fossil fuel-based electricity at US$1.8bn. The highest amount of subsidy resulted from the tax rate differential for diesel (US$5.5bn).

Carbon revenues

Carbon revenues (US$ millions)
from explicit carbon pricing schemes

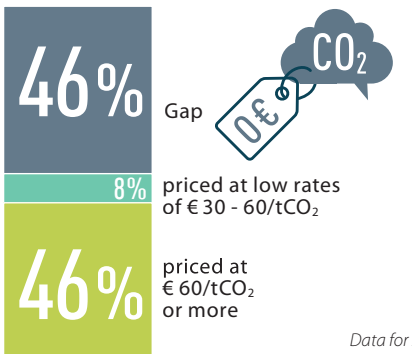


Source: I4CE 2019

Italy has no national carbon tax or emissions trading scheme, but is part of the EU Emissions Trading Scheme (ETS), which generated US$1.7bn in 2018 in Italy alone. The scheme covers 45% of EU emissions (in power, industry and aviation), priced at US$21/tCO$_2$ as of September 2018.

Carbon pricing gap[15]

% of energy-related CO$_2$ emissions



Data for 2015 | Source: OECD 2018

Only 54% of Italy's CO$_2$ emissions are priced at EUR30 or higher (the low-end benchmark), creating a carbon pricing gap of 46%. This gap is lower than the G20 average of 71%. The price covers not only explicit carbon taxes but also specific taxes on energy use and the price of tradable emission permits.

FINANCE

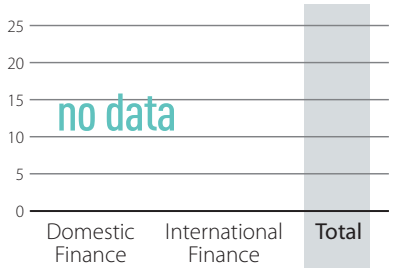
ITALY

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 coal[16]

(million US$)



No finance was identified for coal or coal-fired power production between 2016 and 2017 by the public finance institutions of Italy.

- Domestic Finance
- International Finance

Data year: 2016-2017 average
Source: Oil Change International 2019

Commitments to restrict public finance to coal and coal-fired power[17]

MDB level	National development agencies and banks	Domestic export credit agencies	Export credit restriction in OECD	Comment
–	–	–	X	While there is no explicit policy in place, the Italian Export Credit Agency SACE has found no evidence of public finance for coal since 2015.

X yes – no not applicable

Source: own research

Provision of international public support[18]

Italy's contributions to climate finance have increased since 2013/14, though remained relatively small compared to other G20 members that are obliged to provide climate finance. Italy ranks 7th, ahead of Australia and Canada, for bilateral finance flows and 5th for contributions to multilateral climate funds in 2015/16. It reports that most of its spending supports actions addressing both mitigation and adaptation (cross-cutting).
At the recent Green Climate Fund replenishment meeting, Italy pledged US$338 million, only just exceeding its first contribution to the Fund.

Obligation to provide climate finance under UNFCCC

YES NO

United Nations Framework Convention on Climate Change

Bilateral climate finance contributions

Annual average contribution (mn US$, 2015-2016)	Theme of support			
	Mitigation	Adaptation	Cross-cutting	Other
166.8	14%	22%	64%	0%

Source: Country reporting to UNFCCC

Multilateral climate finance contributions

See Technical Note for multilateral climate funds included and method to attribute amounts to countries

Annual average contribution (mn US$, 2015-2016)	Theme of support			
	Mitigation	Adaptation	Cross-cutting	Other
198.0	14%	10%	76%	0%

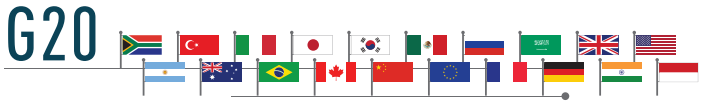
Source: Country reporting to UNFCCC

Core/General Contributions

Annual average contribution (mn US$, 2015-2016)
434.7

Source: Country reporting to UNFCCC

ENDNOTES



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 emission 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.

   The 2030 projections of GHG emissions are from the CAT's June 2019 update and are based on implemented policies, expected economic growth or trends in activity and energy consumption.

   The CAT methodology does not consider GHG emissions from LULUCF due to the large degree of uncertainty inherent in this type of data, and alsoto ensure consistency and comparability across countries.

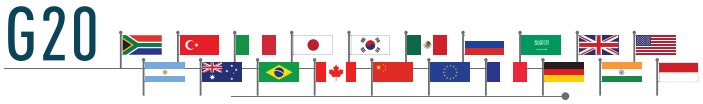
3) See the Brown to Green 2019 Technical Note for the sources used for this assessment.

4) The Decarbonisation Ratings assess the relative performance across the G20. A high scoring reflects a relatively good efforts from a climate protection perspective but is not necessarily 1.5°C compatible. The ratings assess both the 'current level' and 'recent developments' to take account of the different starting points of different G20 countries. The 'recent developments' ratings compare developments over the last five available years (often 2013 to 2018).

5) The selection of policies rated and the assessment of 1.5°C compatibility are informed by the Paris Agreement, the Special Report on 1.5°C of the International Panel on Climate Change (2018), and the Climate Action Tracker (2016): 'The ten most important short-term steps to limit warming to 1.5°C'. The table below displays the criteria used to assess a country's policy performance. See the Brown to Green Report 2019 Technical Note for the sources used for this assessment.

On endnote 5)	low	medium	high	frontrunner
Renewable energy in power sector	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
Coal phase-out in power sector	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)
Phase out fossil fuel cars	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
Phase out fossil fuel heavy-duty vehicles	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
Modal shift in (ground) transport	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
Near zero-energy new buildings	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)
Retrofitting existing buildings	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
Energy efficiency in industry	No policies	Mandatory energy efficiency policies cover more than 26-50% of industrial energy use	Mandatory energy efficiency policies cover 51–100% of industrial energy use	Policies + strategy to reduce industrial emissions by 75%–90% from 2010 levels by 2050
(Net) zero deforestation	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

ENDNOTES (continued)



6) The 1.5°C benchmarks are based on the Special Report on 1.5°C of the International Panel on Climate Change (2018). See the Brown to Green 2019 Technical Note for the specific sources used for this assessment.
7) Total primary energy supply data displayed in this Country Profile does not include non-energy use values. Solid fuel biomass in residential use has negative environmental and social impacts and is shown in the category 'other'.
8) Large hydropower and solid fuel biomass in residential use are not reflected due to their negative environmental and social impacts.
9) The category 'electricity and heat' covers CO_2 emissions from power generation and from waste heat generated in the power sector. The category 'other energy use' covers energy-related CO_2 emissions from extracting and processing fossil fuels (e.g. drying lignite).
10) This indicator shows transport emissions per capita, not including aviation emissions.
11) This indicator adds up emissions from domestic aviation and emissions from international aviation bunkers in the respective country. Emissions by aircrafts in the higher atmosphere lead to a contribution to climate change greater than emissions from burning fossil fuels. In this Country Profile, however, only a radiative forcing factor of 1 is assumed.
12) This indicator includes only direct energy-related emissions and process emissions (Scope 1) but not indirect emissions from electricity.
13) This indicator includes emissions from electricity (Scope 2) as well as direct energy-related emissions and process emissions (Scope 1).
14) 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. The definition of 'forest' used for this indicator is also not identical with the definition used for the indicator on page 3.
15) 'Effective carbon rates' are the total price that applies to CO_2 emissions, and are made up of carbon taxes, specific taxes on energy use and the price of tradable emission permits. The carbon pricing gap is based on 2015 energy taxes and is therefore likely to be an underestimate, as taxation has tended to increase in countries over time.
16) The database used to estimate public finance for coal is a bottom-up database, based on information that is accessible through various online sources, and is therefore incomplete. For more information, see to the Brown to Green 2019 Technical Note.
17) See the Brown to Green 2019 Technical Note for the sources used for this assessment.
18) Climate finance contributions are sourced from Biennial Party reporting to the UNFCCC. Refer to the Brown to Green Report 2019 Technical Note for more detail.

For more detail on the sources and methodologies behind the calculation of the indicators displayed, please download the Technical Note at: http://www.climate-transparency.org/g20-climate-performance/g20report2019

CLIMATE TRANSPARENCY

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http://www.climate-transparency.org/g20-climate-performance/g20report2019