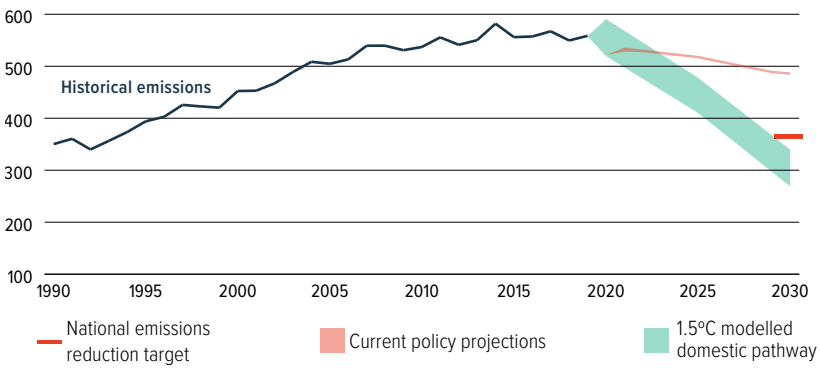
ITALY

Climate Transparency

CLIMATE TRANSPARENCY REPORT: COMPARING G20 CLIMATE ACTION **2022**

NOT ON TRACK FOR A 1.5°C WORLD

1.5°C compatible emissions pathway ($MtCO_2e$/year)[1]

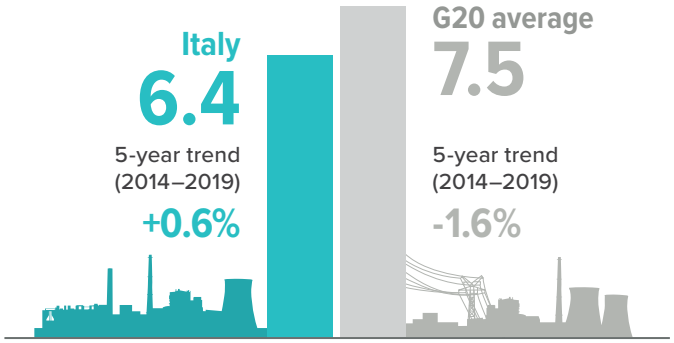


Italy's domestic emission reduction target would decrease emissions 38% below 2005 levels, or to approximately 366 $MtCO_2e$ (excl. LULUCF) by 2030. To keep below the 1.5°C temperature limit, analysis by the 1.5°C Pathways Explorer shows that Italy's emissions would need to be around 208 $MtCO_2e$ by 2030, leaving an ambition gap of about 211 $MtCO_2e$.

Climate Analytics, 2022; Gütschow et al., 2021

PER CAPITA GREENHOUSE GAS (GHG) EMISSIONS BELOW G20 AVERAGE

tCO_2e/capita[2] in 2019



Italy's per capita emissions are 0.86 times the G20 average. Total per capita emissions have increased by 0.6% from 2014-2019.

Gütschow et al., 2021; World Bank, 2022

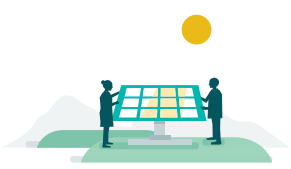
RECENT DEVELOPMENTS

The Ecological Transition Plan projected that Italy would need to halve its GHG emissions by 2030 and increase renewables in the electricity mix to 72% by 2030 and 100% by 2050.

The September 2022 election outcome introduced uncertainty to the country's approach to decarbonisation, as coalition partners do not have aligned positions on climate issues. Energy and climate change, however, will remain important due to the gas price crisis caused by Russia's invasion of Ukraine, and ongoing discussions on the EU's "Fit for 55" target.

In reaction to the ongoing energy crisis, the Italian government decided to lower fuel taxes and allow coal plants scheduled for closure to temporarily operate at higher capacity.

KEY OPPORTUNITIES FOR ENHANCING CLIMATE AMBITION



With some of Europe's best conditions for solar energy, Italy can use this potential to reduce the role of fossil gas, which generates almost 50% of its electricity.

Transport emissions in Italy remain stubbornly high. Rapidly electrifying private vehicles, light-duty vehicles and public transport with renewables-generated sources would reduce air pollution in cities, emissions and the need to import oil.

Facilitating emissions reduction through shifts from road to rail for both passenger and freight transport. Development of reliable and frequent public transport would reduce congestion in the cities, making them more attractive for tourists.

Contents

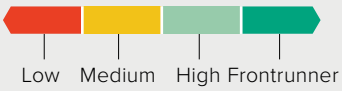
We unpack Italy's progress and highlight key opportunities to enhance climate action across:

Legend

Trends show developments over the past five years for which data are available. A red exclamation mark indicates negative trends from a climate protection perspective.

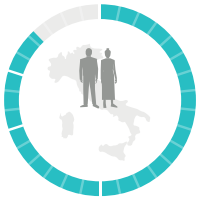
Decarbonisation Ratings[3] assess a country's performance compared to other G20 Members. A high score reflects a relatively good effort from a climate protection perspective but is not necessarily 1.5°C compatible.

Policy Ratings[4] 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



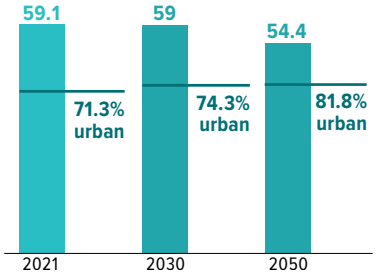
The Human Development Index (HDI) reflects life expectancy, level of education, and per capita income. Italy ranks very high.

0.88 **Very high**

Data for 2019. UNDP, 2020

Population and urbanisation projections

(in millions)

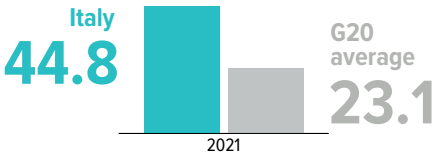


Italy's population is projected to decrease by 8% by 2050, and become slightly more urbanised. People moving to urban areas, however, are at greater risk of heat stress associated with the urban heat island effect.

United Nations, 2018; World Bank, 2022

Gross Domestic Product (GDP) per capita

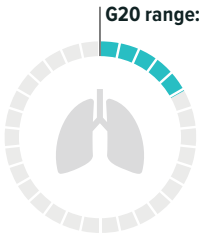
(thousand PPP constant 2015 international $ per person) in 2021



World Bank, 2021

Death rate attributable to ambient air pollution

(death rate per 1,000 population per year, age standardised) in 2019



0.17
per 1,000 people per year

Over 27,900 people die in Italy every year as a result of stroke, heart disease, lung cancer and chronic respiratory diseases as a result of outdoor air pollution. Compared to total population, this is still one of the lower levels in the G20.

Institute for Health Metrics and Evaluation, 2020

A JUST TRANSITION

Italy's National Recovery and Resilience Plan and the Integrated National Energy and Climate Plan (NECP) refer to the need for social inclusion and support to regions affected by the economic transition required to reduce greenhouse gas emissions. The country has announced that it will phase out coal-fired electricity generation by 2025.

Decree-Law No 101 of 3 September 2019 established that, from 2020 to 2024, a portion of the proceeds from the auctions for the allocation of EU ETS quotas, to a maximum of EUR 20m per year, will be channelled to the "Fund for vocational retraining in areas in which coal-fired power plants are located". Additionally, depending on the timeframes in which particular coal plants are taken offline, Italy could also tap into the EU's Just Transition Mechanism, which has aimed to mobilise EUR 65–75bn over the period 2021–2027. For instance, Italy intends to use the Just Transition Fund to support the broader community in the Sulcis Iglesiente area, which is reliant on mining and carbon-intensive industries.

European Commission, 2018; Solidar, 2021

ADAPTATION

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

Many Italian cities have experienced severe flooding events in recent years. Between 2010–2019, for example, **Rome experienced 18 flash flood events and Milan 23.**

During the last 3 decades, the total area affected by fire was approximately **2.6 million hectares with 238,000 fires**. Models project that the burned area will mainly increase in Sardinia, Sicily and southern Italy.

Italy is strongly affected by heatwaves. In August 2021, the maximum temperature rose to **48.8°C (119.8°F)** – Europe's highest maximum temperature on record.

ADAPTATION NEEDS

Impacts of a changing climate

Exposure to warming

1.4°C
Higher

Between 2017 to 2021, the average summer temperatures experienced by people in Italy were 1.4°C higher than the 1986–2005 average global mean temperature increase of 0.3°C.

Changes in the ability to work due to exposure to excessive heat

176m **Labour hours lost**
32% **increase**

In 2021, heat exposure in Italy led to the loss of 176 million potential labour hours, a 32% increase from 1990–1999.

Loss of earnings from heat-related labour capacity reduction

2.4bn **Loss in labour capacity (USD)**
0.11% **of GDP**

Extreme heat can make it unbearable or even dangerous to work in a range of economically important sectors. The potential income loss in 2021 – in the service industry, manufacturing, agriculture, and construction sectors – from labour capacity reduction due to extreme heat was USD 2.4bn, or 0.11% of its GDP.

Romanello et al., 2022; World Meteorological Organization, 2022

Exposure to future impacts at 1.5°C warming and higher

Different levels of global warming are projected to have a wide range of impacts of varying severity across the world. The percentages at 1.5°C are calculated as an increase/decrease from the reference period of 1986–2006. Using the projected impacts at 1.5°C of warming as a reference, we compare impacts that may occur at higher levels of warming. A negative sign (at 2°C, 2.5°C or 3°C warming) indicates that the impact experienced at that level of warming is projected to be opposite to the type of impact at 1.5°C warming.

Climatic	**At 2°C**	**At 2.5°C**	**At 3°C**
Local **precipitation**: +3.0% at 1.5°C warming	0.3 times	-0.7 times	-1.4 times
Local **snowfall**: -24.0% at 1.5°C warming	1.6 times	1.9 times	2.3 times

Local precipitation is projected to increase by 3% above the average over the baseline period of 1986–2006, if global temperature rises by up to 1.5°C. Under 2.5°C and 3°C warming scenarios, however, precipitation is projected to decline again. These kinds of fluctuations make it very difficult for authorities to plan and implement appropriate responses. Local snowfall is expected to decrease under a 1.5°C scenario by 24% from the reference period (1986–2006). At 3°C of warming, the decrease is expected to be 2.3 times what the decrease would be under a 1.5°C scenario.

Fresh water	**At 2°C**	**At 2.5°C**	**At 3°C**
Surface run-off: +3.3% at 1.5°C warming	-1.0 times	-1.8 times	-2.9 times
River discharge: +3.6% at 1.5°C warming	-0.9 times	-1.7 times	-2.9 times
Total **soil moisture content:** -1.4% at 1.5°C warming	2.2 times	3 times	3.9 times

In Italy, the percentage of surface run-off and river discharge is projected to increase by 3.3% and 3.6%, respectively, above the reference period of 1986–2006 if global temperature rises by up to 1.5°C. Under higher temperatures, however, the trend reverses, and surface run-off and river discharge is projected to slowly decrease from the highs projected at 1.5C. Under 1.5°C of warming, total soil moisture content would decrease by 1.4%. This decline would be 3.9 times greater under a 3°C warming scenario.

Hazards	At 2°C	At 2.5°C	At 3°C
Number of people annually exposed to **heatwaves:** 6,480 at 1.5°C warming	13.9 times	33.5 times	53.8 times
Number of people annually exposed to **wildfires:** 52,764 at 1.5°C warming	1.9 times	2.5 times	3.2 times

The number of people annually exposed to hazards is expected to rise as the temperature increases. For example, the number of people annually exposed to heatwaves in Italy is projected to rise by 6,480 people above the 1986–2006 average, at 1.5°C of warming, and 33.5 times that greater if warming increases to 2.5°C. At 1.5°C of warming wildfires are projected to affect 52,764 more people than affected between 1986-2006, while at 3°C even that increase in people exposed to wildfires is projected to be multiplied by 3.2 times.

Economic	At 2°C	At 2.5°C	At 3°C
Annual expected damage from **river flood:** +0.9% at 1.5°C warming	-7.1 times	-3.8 times	7.9 times
Labour productivity due to heat stress: -1.1% at 1.5°C warming	1.7 times	2.6 times	3.7 times

The annual expected damage river flooding at 3°C is 7.9 times what the damage would be under a 1.5°C scenario. Labour productivity is projected to decline 1.1% under 1.5°C of warming, and this decrease would be 2.6 times larger at 2.5°C of warming.

For further assessments of impacts under different warming scenarios, and a detailed explanation of the methodology, go to https://climate-impact-explorer.climateanalytics.org

Climate Analytics, 2021

ADAPTATION POLICIES

National Adaptation Strategies

Document name	Year	Fields of action (sectors)												Monitoring & evaluation process
		Agriculture	Biodiversity	Coastal areas & fishing	Education & research	Energy & industry	Finance & insurance	Forestry	Health	Infrastructure	Tourism	Transport	Urbanism	Water	
National Climate Change Adaptation Strategy	2015	✓	✓	✓		✓		✓	✓	✓	✓	✓		✓	5-year review to evaluate needs for further resources
Draft National Climate Change Adaptation Plan	2017	✓	✓	✓						✓	✓		✓	✓	The Strategic Impact Assessment procedure never concluded the approval process.

Nationally Determined Contribution (NDC): Adaptation

TARGETS

Not mentioned in the EU's NDC to which Italy contributes

ACTIONS

Not mentioned

MITIGATION

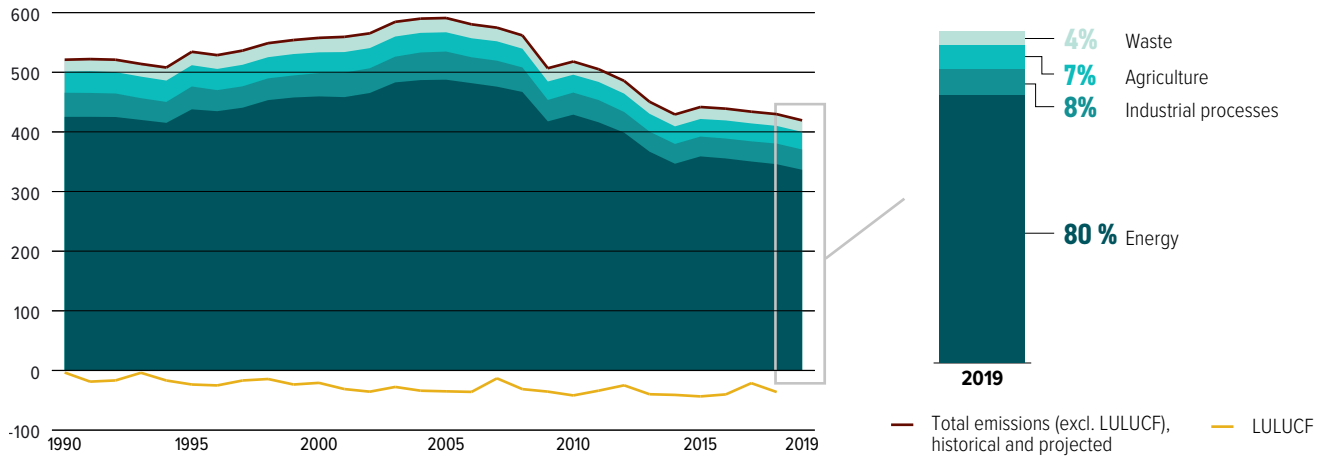
Paris Agreement: Hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit to 1.5°C, recognising that this would significantly reduce the risks and impacts of climate change.

EMISSIONS OVERVIEW

Italy's total **greenhouse gas emissions (excl. LULUCF) have decreased by 19.5%** between 1990 and 2019. In the same period, its total methane emissions (excl. LULUCF) have decreased by 13%.

GHG emissions across sectors[5]

Total sectoral GHG emissions ($MtCO_2e$/year)

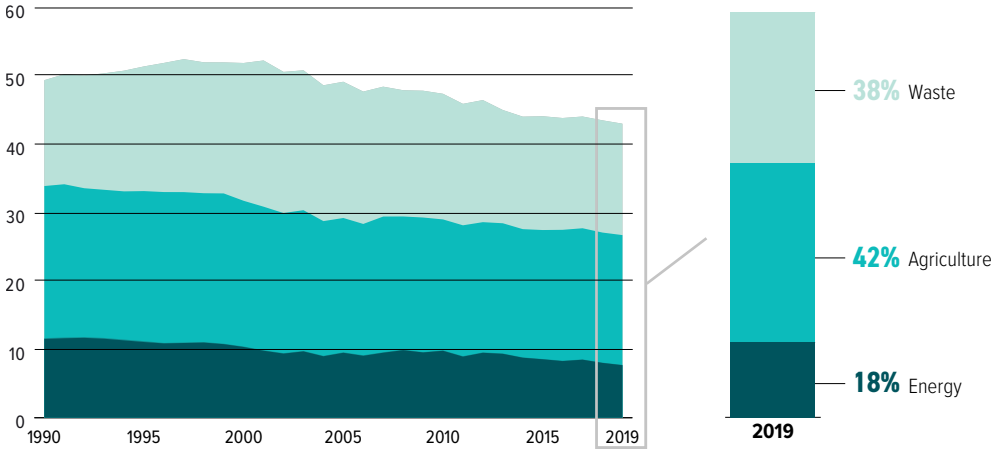


Italy's GHG emissions (excl. LULUCF) decreased by 19.5% between 1990 and 2019 to 419 $MtCO_2e$/yr. When considered by category, increases were largely due to a sustained 13% increase in energy-related emissions between 1990–2005, but growth in emissions was seen in all sectors over the same timeframe. Total GHG emissions peaked in 2005, then fluctuated for the next few years, before beginning to decrease more steadily from 2011 onwards.

Gütschow et al., 2021

Methane emissions by sector

Total CH_4 emissions ($MtCO_2e$/year)



Italy signed the Global Methane Pledge at COP26 in November 2021.

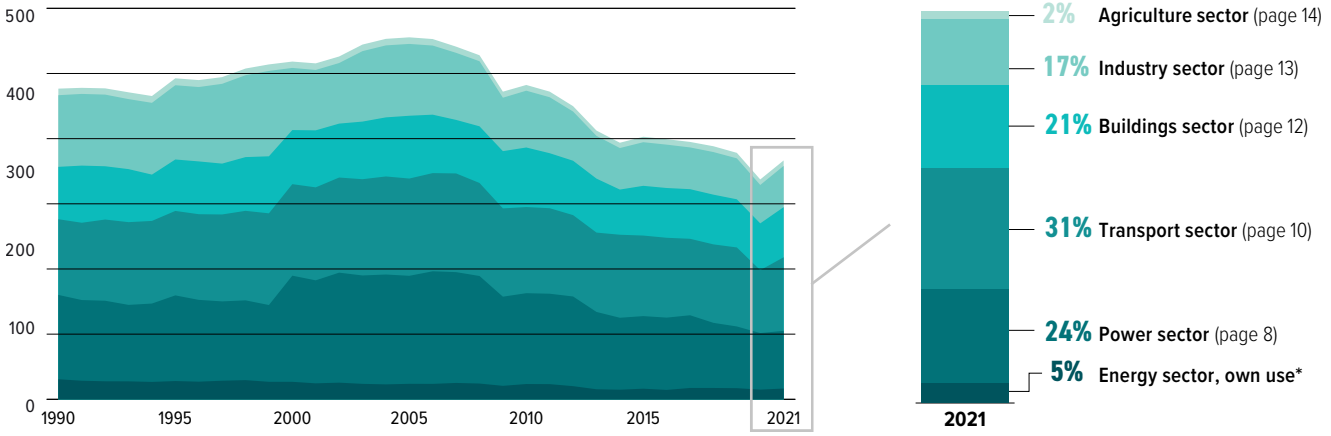
Participating countries pledged to undertake voluntary actions to contribute to a collective reduction of global methane emissions by at least 30% from 2020 levels by 2030. Further scrutiny of plans and implementation will be required.

Methane is a potent, though short-lived, greenhouse gas accounting for an estimated third of global warming. Italy's methane emissions (excl. LULUCF) decreased by 13% between 1990–2019, to 43 $MtCO_2e$/yr. The majority of Italy's methane emissions came from the agriculture sector and waste in 2019, while emissions from the energy sector have decreased since 1990 and now play a more minor role. The decline of methane emissions in the energy sector can be ascribed to a combination of measures including the reduction of flaring, venting, and leaking of methane.

Climate and Clean Air Coalition, 2021; Gütschow et al., 2021

Energy-related CO_2 emissions by sector

Annual CO_2 emissions ($MtCO_2$/year)

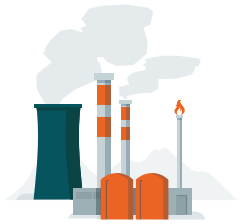


The largest driver of overall greenhouse gas emissions are CO_2 emissions from fuel combustion. At 31% in 2021, the transport sector was the largest contributor. Emissions from the transport and power sectors (24%) have been volatile in recent years, due to the pandemic-driven lockdown and economic recession in 2020, and the subsequent recovery in 2021. The buildings and industry sectors, responsible for 21% and 17% of CO_2 emissions, respectively, were the only two sectors where emissions in 2021 exceeded those in 2019.

Enerdata, 2022

**Includes energy-related CO_2 emissions from extracting and processing fossil fuels.*

ENERGY OVERVIEW



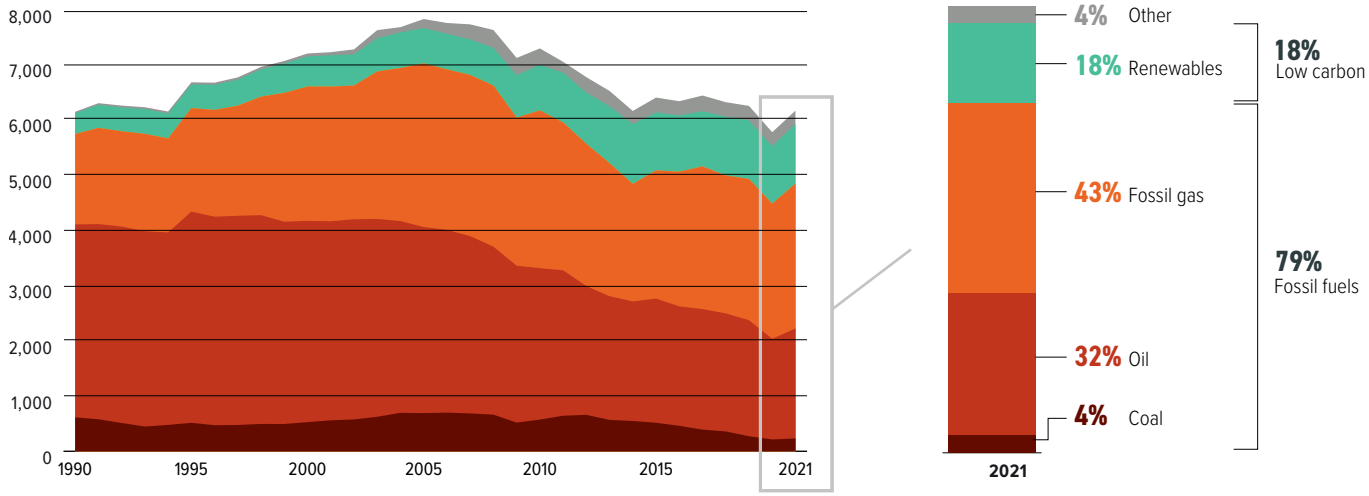
Italy's energy mix is still dominated by fossil fuels (79%). The share of renewable energy has steadily increased over recent years and, **in 2021, reached 17.5% of total primary energy consumption.** Even so, the carbon intensity of Italy's energy mix has barely changed.

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.

Rogelj et al., 2018

Energy mix

Total primary energy supply (PJ)

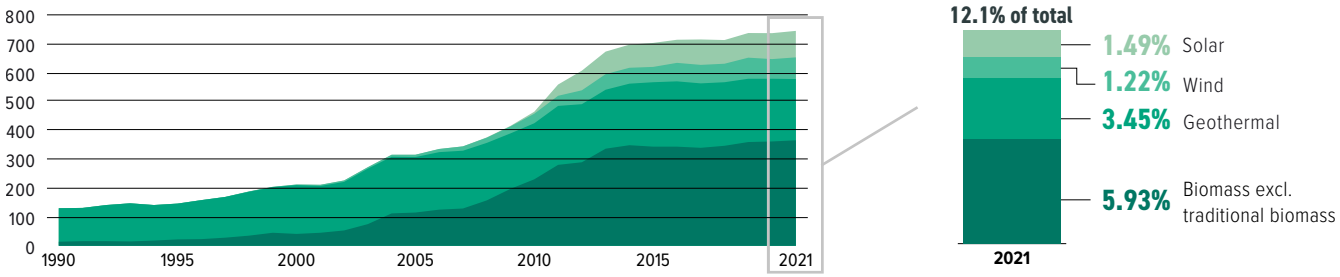


This graph shows the fuel mix for all energy supply, including energy used not only for electricity generation, heating and cooking, but also for transport fuels. Fossil fuels (oil, coal, and gas) make up 79% of Italy's energy mix, which was below the G20 average of 81% in 2021. Since 2005, energy supply has been decreasing. While the share of fossil gas remained stable at around 43% of energy consumption, the share of renewables has been increasing steadily.

Enerdata, 2022

Solar, wind, geothermal and biomass development

As a share of total primary energy supply (TPES) (PJ)

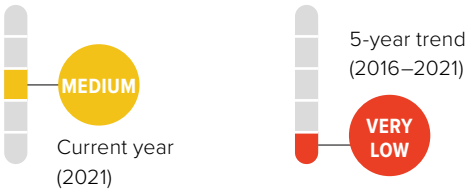


Solar, wind, geothermal and biomass excluding traditional biomass account for 12% of Italy's energy supply – the G20 average is 7.5%. The share in total energy supply has increased by around 7.3% in the last 5 years in Italy (2016–2021). Biomass (excluding traditional biomass) makes up the largest share.

Enerdata, 2022

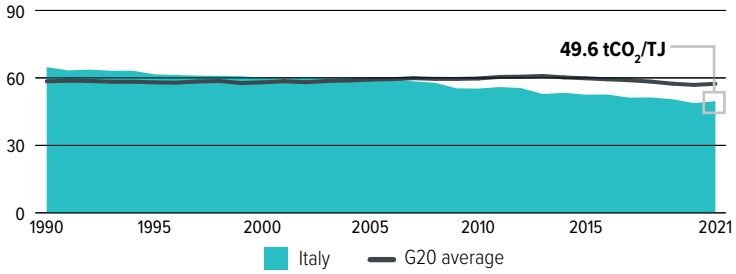
Note: Large hydropower and solid fuel biomass in residential use are not reflected due to their negative environmental and social impacts.

Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



Carbon intensity of the energy sector

Tonnes of CO_2 per unit of TPES (tCO_2/TJ)



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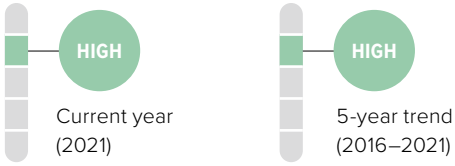


Carbon intensity is a measure of how much CO_2 is emitted per unit of energy supply. Italy's carbon intensity has been decreasing at an average rate of 6.2% over the past five years to 49.6 tCO_2/TJ in 2021. Not only is the rate of decrease higher than the G20 average over the same timeframe, but the carbon intensity of the energy sector is lower than the G20.

Enerdata, 2022

Energy supply per capita

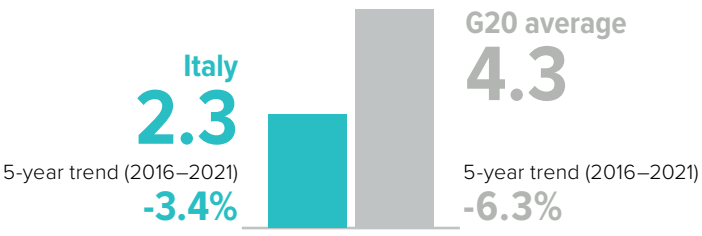
TPES per capita (GJ/capita) in 2021

The level of energy supply per capita is closely related to economic development, climatic conditions and the price of energy. In 2021, energy supply per capita in Italy was 104.2 GJ, slightly above the G20 average of 99.4 GJ. It has been decreasing on average by 3.9% between 2016–2021. This is the opposite of the average trend for the G20, where primary energy supply per capita has been increasing by, on average, 1.7%.

Enerdata, 2022; World Bank, 2022

Energy intensity of the economy

(TJ/million US$2015 GDP) in 2021



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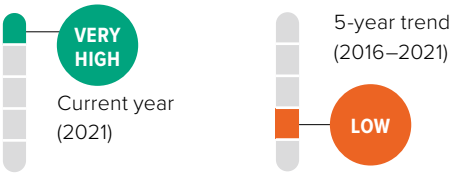
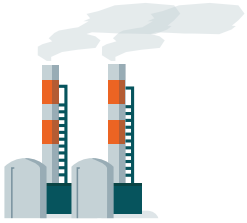


This indicator quantifies how much energy is used for each unit of GDP. This is closely related to the level of decarbonisation, efficiency achievements, climatic conditions or geography. Italy's energy intensity is lower than the G20 average but has been decreasing at a slower rate of 3.4% between 2016–2021 as compared to the G20 average decrease of 6.3%.

Enerdata, 2022; World Bank, 2021

POWER SECTOR

Emissions from energy used to make electricity and heat



Italy produced **58% of its electricity from fossil fuels** in 2021: half generated from fossil gas and 5% from coal. The coal power phase-out by 2025 is in line with a 1.5°C pathway. Renewables accounted for 42% of the power mix in 2021 and, despite a goal of 100% renewable power generation by 2050, there are no facilitative policies or long-term strategies in place.

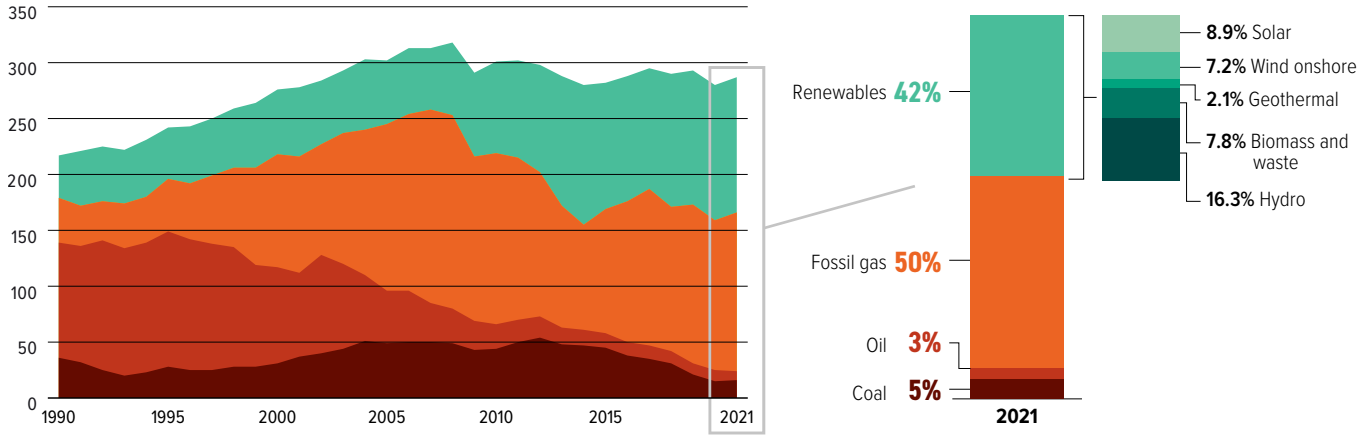
Power generation's share of direct energy-related CO_2 emissions in 2021: **24%**

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. By 2040, the share of renewable energy in electricity generation has to be increased to at least 75%, and the share of unabated coal reduced to zero.

Climate Action Tracker, 2020; Rogelj et al., 2018

Electricity generation mix

Gross power generation (TWh)

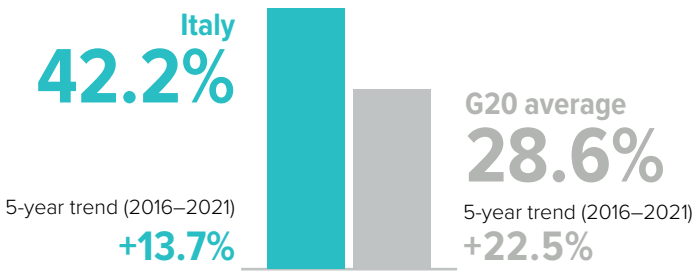


Italy generated 58% of its electricity from fossil fuels in 2021. The share of renewables in Italy's power sector has been increasing, accounting for approximately 42% of the power mix in 2021. Oil and coal-fired power generation has been decreasing, accounting for just 8.2% combined. Fossil gas generates almost half of Italy's electricity, making it extremely vulnerable to high gas prices.

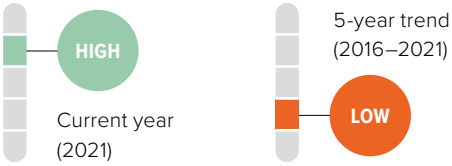
Enerdata, 2022

Share of renewables in power generation

(incl. large hydro) in 2021



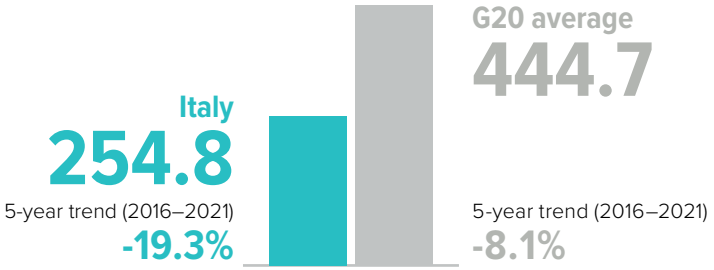
Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



Enerdata, 2022

Emissions intensity of the power sector

(gCO_2/kWh) in 2021



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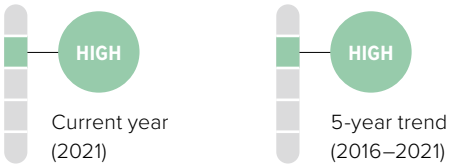


For each kilowatt hour of electricity, 254.8g of CO_2 are emitted in Italy, and the sector's emissions intensity has dropped from 306 gCO_2/kWh in 2016. This was driven by the decreasing role of coal and oil, but faster decarbonisation was prevented by the large share of fossil gas. Combined, fossil fuels still account for 58% of the power mix.

Enerdata, 2022

POLICY ASSESSMENT

Renewable energy in the power sector

In accordance with its Ecological Transition Plan, approved in March 2022, Italy has set targets to increase the share of renewable energy generation in the power sector to 72% by 2030, and approximately 100% by 2050. To achieve this, Italy has concurrently simplified administrative processes related to the installation of rooftop solar and wind farms. Italy intends to phase out coal by 2025. However, there is no clear phase-out date for fossil gas.

Italian Parliament, 2022; Ministry for Ecological Transition, 2022

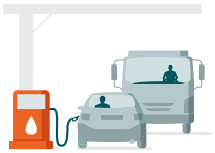
Coal phase-out in the power sector

Italy intends to fully phase out coal use in electricity generation by 2025. The share of coal in electricity generation has fallen steadily since 2012, and made up only 5% of total electricity generation in 2020 and 2021.

Ministry for Ecological Transition, 2022

TRANSPORT SECTOR

Emissions from energy used to transport goods and people



Emissions from transport are still on the rise. Around 91% of passenger transport and 90% of freight transport went by road in 2019. **Both sectors are still dominated by fossil fuels.** In the first half of 2022, electric vehicles (EVs) made up only 9.8% of car sales.

The share of low-carbon fuels in the transport fuel mix must increase to between 40% and 60% by 2040 and 70% to 95% by 2050.

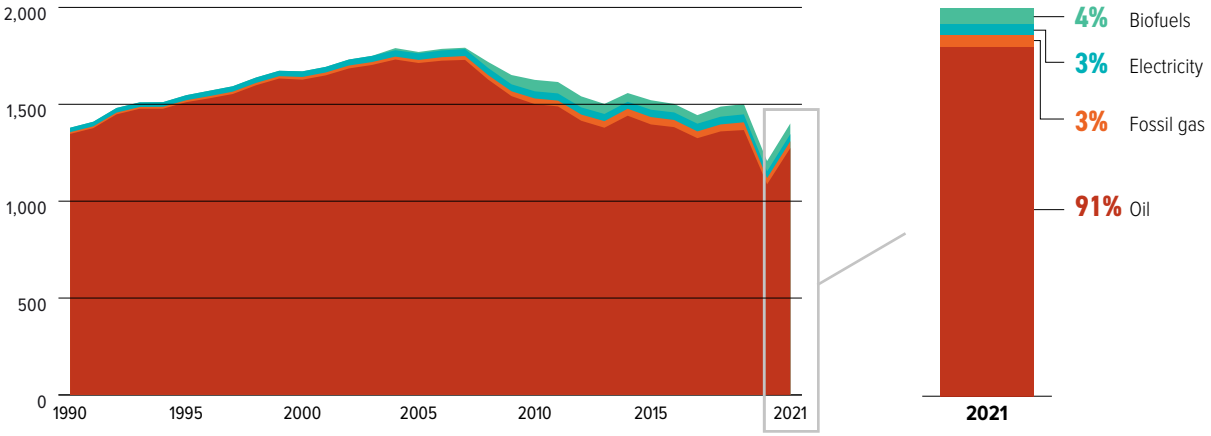
Climate Action Tracker, 2020a; Rogelj et al., 2018

Transport's share of energy-related CO_2 emissions in 2021:

30.8% Direct **0.8%** Indirect

Transport energy mix

Final energy consumption by source (PJ/year)

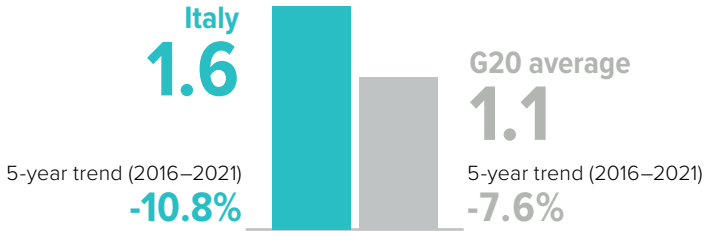


Electricity and biofuels make up only 6.6% of the energy mix in transport.

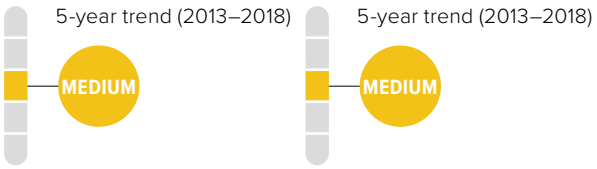
Enerdata, 2022

Transport emissions per capita

(excl. aviation) (tCO_2/capita) in 2021



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members

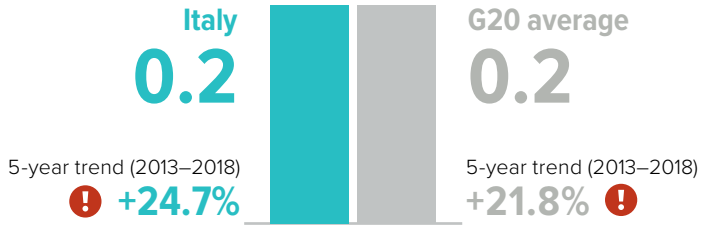


Per capita emissions in 2021 and the 5-year trend have been impacted by COVID-19 pandemic response measures and resulting economic slowdowns. For a discussion of broader trends in the G20 and the rebound of transport emissions in 2022, please see the Highlights Report at www.climate-transparency.org

Enerdata, 2022; World Bank, 2022

Aviation emissions per capita[6]

(tCO_2/capita) in 2018



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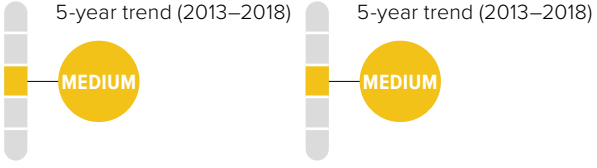
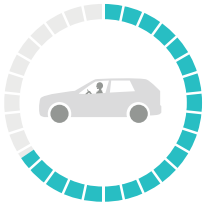


Enerdata, 2022; IEA, 2021a; World Bank, 2022

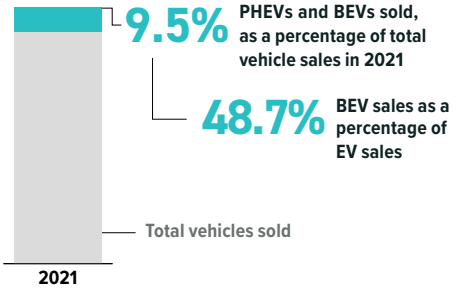
Motorisation rate



657
vehicles per 1,000 inhabitants in 2019

Enerdata, 2022

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

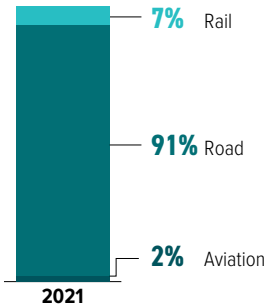


Battery-Electric Vehicles (BEVS) have greater emissions mitigation potential when they are powered by electricity produced by renewables because they have no internal combustion engine (ICE), whereas plug-in hybrids (PHEVs) still produce emissions when using the ICE.

IEA, 2022

Modal split passenger transport

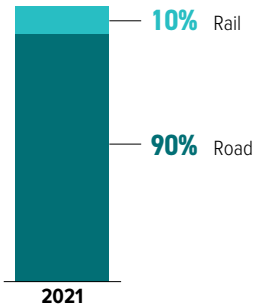
(% of passenger-km): road, rail and air



Enerdata, 2022

Modal split freight transport

(% of tonne-km): road, rail



Due to data availability, only road and rail transport are included in the freight transport category. Other freight modes, e.g. waterways, are excluded due to lack of data for all countries.

Enerdata, 2022

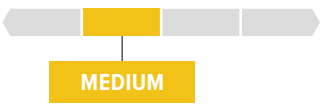
POLICY ASSESSMENT

Phase out fossil fuel cars

Italy applies EU CO_2 emissions performance standards for cars and vans, and will accordingly ban the sale of fossil-fuel-based light duty vehicles by 2035, after which only electric and synthetic-fuel-based vehicles will be allowed. Italy has created a EUR 8.7bn automotive fund to shift the automotive sector towards a low emissions trajectory up to 2030. Almost EUR 2bn of that fund is assigned to subsidising BEVs and PHEVs. New full-electric BEVs costing up to EUR 35k will be subsidised up to EUR 6k, and a PHEV costing up to EUR 45k will be subsidised up to EUR 2.5k. These subsidies include the EUR 2k which is linked to the scrapping of an ICE car.

Automotive News Europe, 2022; European Parliament, 2022; Gazzetta Ufficiale Della Repubblica Italiana, 2022

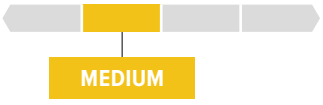
Phase out fossil fuel heavy-duty vehicles



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, below 2019 levels.

European Parliament and the Council of the European Union, 2019

Modal shift in (ground) transport

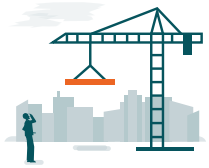


Italy is striving towards a shift of about 10% of passenger transport demand by 2030 from private cars to public transport, carpooling, bicycles and walking. It supports the shift of freight from road to rail, e.g., through funding support schemes. Some of the measures could be co-financed through the Recovery and Resilience Fund, under the framework of which Italy intends to spend EUR 32bn on extending the rapid train network, investing in public transport, as well as new cycling lanes.

European Union, 2021; Government of Italy, 2020

BUILDINGS SECTOR

Emissions from energy used to build, heat and cool buildings



Direct and indirect emissions from the buildings sector in Italy account for 19.8% and 11.4% of total energy-related CO_2 emissions, respectively. Per capita emissions from the buildings sector are 1.12 times the G20 average.

Buildings sector's share of energy-related CO_2 emissions in 2021:

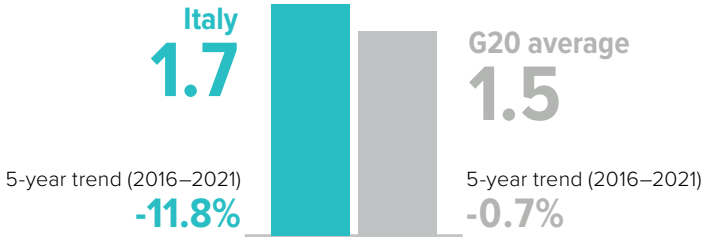
19.8% Direct **11.4%** Indirect

By 2040, global emissions from buildings need to be reduced by 90% from 2015 levels, and be 95–100% below 2015 levels by 2050, mostly through increased efficiency, reduced energy demand and electrification in conjunction with complete decarbonisation of the power sector.

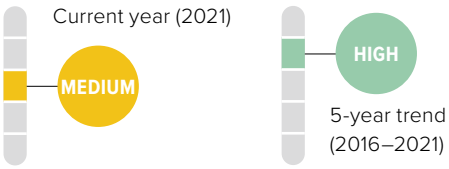
Climate Action Tracker, 2020; Rogelj et al, 2018

Buildings sector emissions per capita

incl. indirect emissions (tCO_2/capita) in 2021



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members

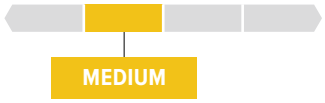


Buildings emissions occur directly (burning fuels for heating, cooking, etc) and indirectly (from grid-electricity for air conditioning, appliances, etc.). Buildings-related emissions per capita are slightly above the G20 average as of 2021. This reflects the high fossil fuel share of the electricity mix. However, in contrast to the G20 average, Italy has decreased the level by an average of 11.8% annually between 2016–2021, 17 times faster than the G20 average reduction of 0.7%.

Enerdata, 2022; World Bank, 2022

POLICY ASSESSMENT

Near zero energy new buildings



European legislation requires all new buildings within Member States to be nearly zero energy buildings (NZEB). However, how NZEB is defined is left to the Member States. Italy is obliged under EU law for all new buildings to reach near zero energy from 2020 onwards; and has put in place a building code.

The European Parliament and the Council of the European Union, 2018

Renovation of existing buildings

Over 60% of residential buildings were built before the first energy saving law of 1976. Mandatory national building energy codes apply to both commercial and residential buildings. Italy's objective is to reduce buildings emissions by 52–87 $MtCO_2e$ by 2030 and aims for energy-related renovations of the buildings stock by 2050. The Ecobonus scheme that subsidises (as tax deductions) up to 110% of energy-saving-related renovations of existing housing stock has been extended to the end of 2022. Italy plans to spend up to EUR 12bn on large-scale renovation of existing buildings under the Recovery and Resilience Facility.

European Union, 2021; Government of Italy, 2020; Lombardini, 2021

INDUSTRY SECTOR

Emissions from energy use in industry

Direct emissions and indirect emissions from industry in Italy make up 17.3% and 10% of energy-related CO_2 emissions, respectively. Italy's industry is covered by the EU Emissions Trading Scheme (ETS) which requires emitters to purchase allowances for each tonne of CO_2 they emit. To avoid carbon leakage, however, many sectors are granted certificates for free, undermining the effects of pricing carbon and weakening the price signal.

Industrial emissions need to be reduced by 65–90% from 2010 levels by 2050.

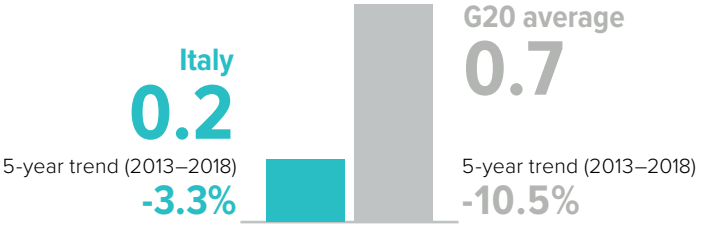
Rogelj et al., 2018

Industry sector's share of energy-related CO_2 emissions in 2021:

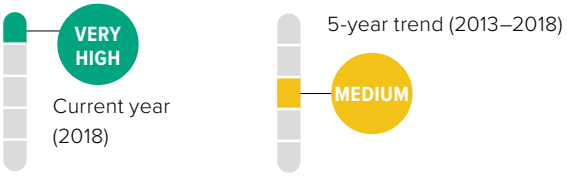
17.3% Direct **10%** Indirect

Industry emissions intensity[7]

(kgCO_2e/USD2015 GVA) in 2019



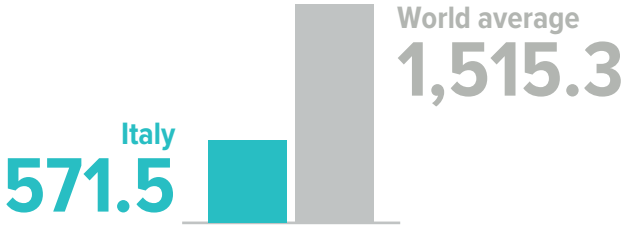
Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



Enerdata, 2021; World Bank, 2022

Carbon intensity of steel production[8]

(kgCO_2/tonne product) in 2019



Steel production and steelmaking are significant GHG emissions sources, and challenging to decarbonise. In May 2021, a 30% hydrogen/70% fossil gas blend was successfully trialled at an unaltered steel plant in Milan province. This is a first step toward using hydrogen to power hard-to-abate industrial applications, like steel-making.

Enerdata, 2022; World Steel Association, 2021

POLICY ASSESSMENT

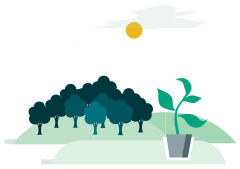
Energy efficiency

Italy's National Energy and Climate Plan contains multiple policy elements aimed at improving industrial energy efficiency through scaling up and re-evaluating the design of existing measures, such as the White Certificate programme and the Conto Termico. Italy has a low industry energy intensity compared to the G20, but may need to revise existing policies under the updated EU NDC. The European Commission rates Italy's plan as sufficient and recommends monitoring for successful implementation.

European Commission, 2019; Government of Italy, 2020; Graeber, 2021

LAND USE SECTOR

Emissions from land use change and forestry



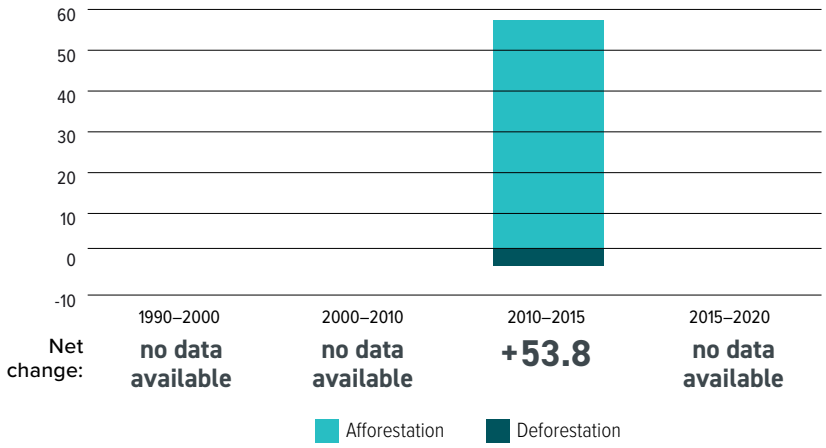
To stay within the 1.5°C limit, Italy needs to make the land use and forestry sector a net sink of emissions, e.g. by speeding up afforestation and scaling up its sustainable forestry management strategy.

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

Rogelj et al., 2018

Annual forest expansion, deforestation and net change

Forest area change in 1,000 ha/year

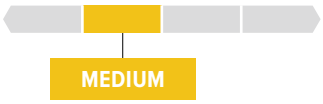


Between 2010–2015, Italy increased its forested areas, but data is not available for other periods.

Global Forest Assessment, 2020

POLICY ASSESSMENT

Target for net zero deforestation



Italy's National Forest Strategy, released in February 2022, follows the guiding principles from the EU Forestry Strategy and includes measures to both slow down deforestation and actively engage in increasing the national forest area cover. The Strategy allocated EUR 30m annually from 2022–2024, after which the financing is increased to EUR 40m per year.

Ministero delle Politiche Agricole Alimentari e Forestali, 2022

AGRICULTURE SECTOR

Emissions from agriculture

Two-thirds of Italy's agricultural emissions are from enteric fermentation i.e. the digestive processes of livestock (mainly cattle) and livestock manure, making changes in these two areas crucial to reducing agriculture's non-energy agriculture emissions.

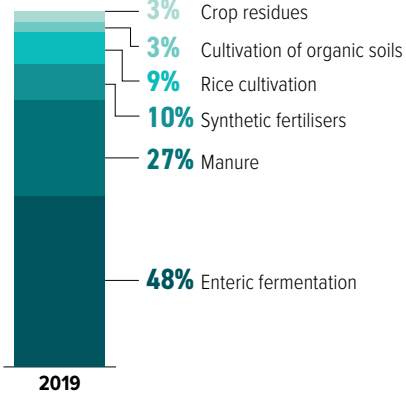
Methane emissions need to decline by 10% by 2030 and by 35% by 2050 (from 2010 levels). Nitrous oxide emissions (mainly from fertilisers and manure) need to be reduced by 10% by 2030 and by 20% by 2050 (from 2010 levels).

Rogelj et al., 2018

Emissions from agriculture

excluding energy emissions, in 2019

33.8
$MtCO_2e$ in 2019



In Italy, the largest sources of GHG emissions are enteric fermentation (48%) and livestock manure (27%), with synthetic fertilisers (10%) and rice production (9%) almost tied for fourth place. Making adjustments to livestock diets, improving manure storage and handling, reducing or more efficiently using synthetic fertilisers could all help reduce emissions from this sector.

FAO, 2022

MITIGATION: TARGETS AND AMBITION

The science from the IPCC on the risks of exceeding 1.5°C warming is clear. The UN science body has projected that to keep the 1.5°C goal alive, the world needs to roughly halve emissions by 2030.

However, despite the Glasgow Climate Pact (1/CMA.3) agreement to "revisit and strengthen" 2030 targets this year, progress on more ambitious targets has stalled. Without far more ambitious government action, the world is heading to a warming of **2.4°C with the current 2030 targets** and even higher warming **of 2.7°C with current policies.**

Climate Action Tracker, 2021a, 2022c; IPCC, 2022; UNFCCC, 2021

AMBITION: 2030 TARGETS

Nationally Determined Contribution: Mitigation

TARGETS

Italy contributes to the EU-wide target of reducing net GHG emissions by at least 55% by 2030 below 1990 levels.

ACTIONS

As an EU Member State, Italy is committed to the EU's NDC.

Climate Action Tracker (CAT) evaluation of targets and actions

Critically insufficient	Highly insufficient	**Insufficient**	Almost sufficient	1.5°C Paris Agreement compatible

The CAT evaluates and rates several elements of climate action: policies and actions, targets, and a country's contribution to climate finance (where relevant) and combines these into an overall rating. As Italy is an EU Member State, the CAT includes Italy in its rating of the EU NDC.

The CAT rates EU's climate targets, policies, and finance as "insufficient". The "insufficient" rating indicates that the EU's climate policies and commitments need substantial improvements to be consistent with the Paris Agreement's 1.5°C temperature limit. The EU's 2030 emissions reduction target and its policies and action are consistent with 2°C of warming when compared to modelled domestic pathways. The EU is also not meeting its 'fair share' contributions to climate action.

To improve its rating, the EU should strengthen its 2030 target to at least 62% (excl. LULUCF) below 1990 levels, adopt policies necessary to reach this goal, and significantly increase its support for climate action in developing countries.

This CAT analysis of the EU was updated in June 2022.
For the full assessment of the country's targets and actions, and the explication of the methodology, see www.climateactiontracker.org

Climate Action Tracker, 2022a

AMBITION: LONG-TERM STRATEGIES

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

Status	Not submitted
Net zero target	Agreed to EU's 2050 "climate neutrality" goal
Interim steps	No
Sectoral targets	No

FINANCE

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

In 2019, Italy spent USD 10.3m on fossil fuel subsidies for oil and gas. Revenues from carbon pricing greatly increased since 2012 (USD 98m), then plateaued from 2018, reaching USD 1.54m in 2020. Between 2019–2020, Italy provided an average of USD 3.3bn in public finance per year to energy projects.

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

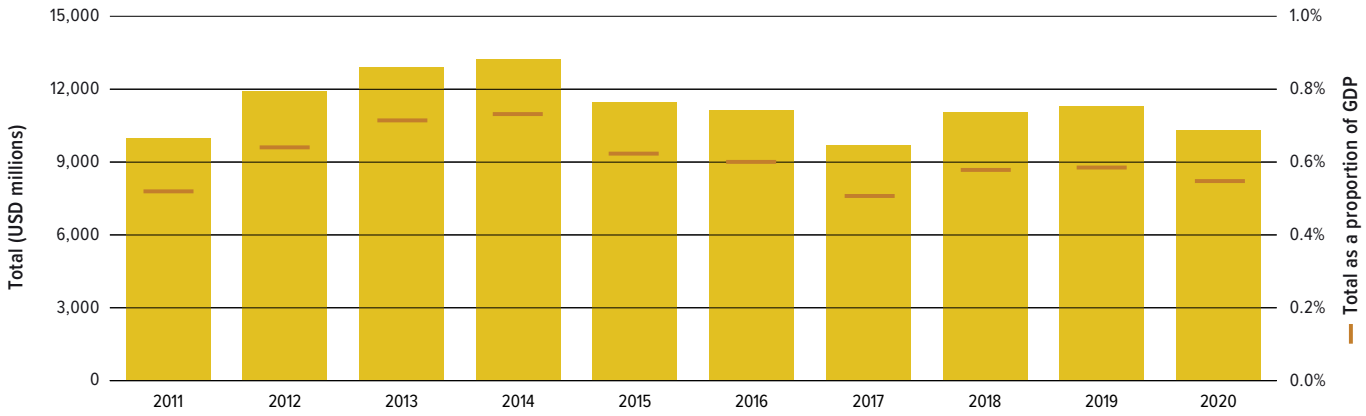
Rogelj et al., 2018

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 relative to national budgets

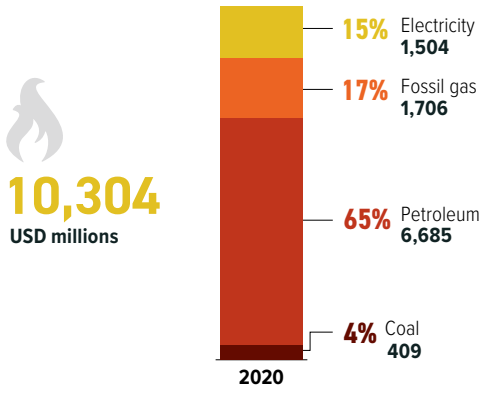
(USD millions)



OECD-IEA Fossil Fuel Support Database, 2022

Fossil fuel subsidies by fuel type

(USD millions) in 2020



Fossil fuel subsidies in Italy have remained steady over the past decade, after a peak in 2014. They have been directed almost exclusively at consumption. Petroleum received most of the support, at 65%, while fossil gas and electricity generation received 17% and 15%, respectively.

The largest single subsidy measure in Italy was the differential excise tax treatment for diesel, which was taxed 23% less than motor gasoline. This had stabilised after a fall in 2013, but fell again in 2020 – potentially due to falls in price and energy consumption during COVID-19. In response to the pandemic, however, new support measures were introduced for both consumption and production, largely through tax reductions for electricity and fossil gas.

While 2020 is the most recent year for which the OECD has published data, news reports suggest that Italy increased energy subsidies by more than USD 9.5bn between July 2021 and February 2022. These included both tax cuts for fossil gas and increased support for renewable energy.

Energy Policy Tracker, 2022; OECD-IEA Fossil Fuel Support Database, 2022; Smith, 2022

Carbon pricing and revenue

Italy is part of the EU Emissions Trading Scheme (ETS), which covers emissions from electricity, industry, and parts of aviation. In 2021 it generated USD 3.4bn in 2021 in Italy alone. According to the EU ETS directive, at least 50% of the revenues need to be spent to achieve climate related objectives.

I4CE, 2022

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.

In March 2021, the public authority for the Italian securities market, the Commissione Nazionale per la Societa' e la Borsa (CONSOB), announced its support for the principles of the Task Force on Climate-Related Financial Disclosures (TCFD) – a body established in 2015 by the Financial Stability Board to develop climate disclosure recommendations.

In doing so, it encouraged voluntary disclosure under those principles. As a member of the EU, Italy is subject to EU-wide disclosure regulations and the EU Green Taxonomy, a list of sustainable activities to support investors to make green choices.

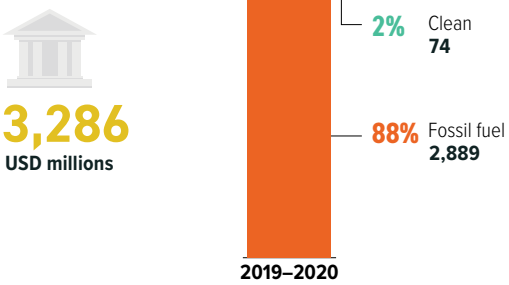
Task Force on Climate-Related Financial Disclosures, 2021

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 Members 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 energy

USD millions (2019–2020 average)



Between 2019 and 2020, Italy provided an average of USD 3.3bn in public finance per year to energy projects. Of this amount, 88% went to fossil fuels, almost exclusively to fossil gas. The largest single support measure was provided to Russia's state-owned energy group, Gazprom: USD 1.2bn was invested in the Amur Gas Processing Plant in Russia. Other significant projects include USD 1.6bn to developing LNG infrastructure in Mozambique, and USD 490m to the Viking Link Interconnector transmission line between England and Denmark.

At COP26 in Glasgow, alongside over 30 governments, Italy pledged to end direct international public finance to fossil fuels by the end of 2022 and reaffirmed its commitment with the G7 meeting in May 2022.

Oil Change International, 2022

Provision of international public support

USD millions, annual average 2017 and 2018

Bilateral, regional and other channels:

Annual average contribution

330.19

Multilateral climate finance contributions:

Annual average contribution

292.77

Core/general contributions:

Annual average contribution

531.16

Annex II countries to the UNFCCC, including Italy, are obligated to provide climate finance and have committed to collectively mobilise USD 100bn a year to 2025, when this goal will be renewed, even though the target has never been met, and has been criticised as inadequate.

Italy's contributions to climate finance have slowly increased since the 2013–2014 period. It reports most of its spending to actions supporting both mitigation and adaptation (cross-cutting). In 2017–2018 it nearly doubled its bilateral climate finance, though amounts remain relatively small compared to other G20 Members obliged to provide climate finance. It ranked seventh ahead of Canada and Australia for bilateral finance flows and fifth for contributions to the multilateral climate funds in 2017–2018, in absolute values.

Fair share of the USD 100bn climate finance goal:

This fair share analysis allocates responsibility for provision of the USD 100bn climate finance goal to each Annex II country based on their gross national income (GNI), cumulative territorial CO_2 emissions since 1990, and population size. It uses the UNFCCC Biennial Report data for 2017–2018 and climate-related finance data provided by the OECD Development Assistance Committee for 2019 and 2020.

Italy has not paid its fair share of the USD 100bn climate finance goal, contributing only about a third of what it should. The country accounts for a shortfall of at least USD 2bn in achieving the 100bn a year target.

Climate finance provided (USD billion) by Italy and its fair share of the USD 100bn goal:

1.20	2017–2018 average	**25%**	Progress towards fair share
1.27	in 2019	**27%**	Progress towards fair share
1.43	in 2020	**30%**	Progress towards fair share

Looking ahead, the country seems set on remaining a climate finance laggard. At the Green Climate Fund replenishment meeting, Italy pledged USD 338m, only just exceeding its first contribution to the Fund. At COP26 it pledged to contribute USD 1.4bn a year over 2021–2025, an amount still far below the country's fair share.

Colenbrander et al., 2022; COP26 Presidency, 2021

Note: Data on the 'provision of international public support' corresponds to 2017–2018 as per the UNFCCC Fourth Biennial Report (BR). Parties are to submit data by December 2022 for subsequent years in the Fifth BR.

Endnotes

For more detail about sources and methodologies, please download the CTR Technical Note at: www.climate-transparency.org/g20-climate-performance/g20report2022

Where referenced, "Enerdata, 2022" refers to data provided in July 2022 and, due to rounding, graphs may sum to slightly above or below 100%.

1 The '1.5°C compatible pathway' is derived from global cost-effective pathways assessed by the IPCC's SR15, selected based on sustainability criteria, and defined by the 5th–50th percentiles of the distributions of such pathways achieving the long-term temperature goal of the Paris Agreement. Negative emissions from the land sector and novel negative emissions technologies are not included in the assessed models, which consider one primary negative emission technology (BECCS). In addition to domestic 1.5°C compatible emissions pathways, the 'fair share' emissions reduction range would almost always require a developed country to provide enough support through climate finance, or other means of implementation, to bring the total emissions reduction contribution of that country down to the required 'fair share' level.

2 '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) data tables, converted to the categories from the IPCC 1996 guidelines, in particular separating Agriculture from LULUCF, which under the IPCC 2006 Guidelines is integrated into Agriculture, Forestry, and Other Land Use (AFOLU).

3 The Decarbonisation Ratings assess the current year and average of the most recent 5 years (where available) to take account of the different starting points of different G20 Members.

4 The selection of policies rated and the assessment of 1.5°C compatibility are primarily informed by the Paris Agreement and the IPCC's 2018 SR15. The Policy Assessment Criteria table below (on page 19) displays the criteria used to assess a country's policy performance.

5 In order to maintain comparability across all countries, this report harmonises all data with PRIMAP 2021 dataset to 2018. However, note that CRF data is available for countries which have recently updated GHG inventories.

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).

Policy Assessment Criteria

	LOW	MEDIUM	HIGH	FRONTRUNNER
Renewable energy in power sector	No policies 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 targets and policies 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 policies 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 fuel-based light-duty vehicles by 2035 worldwide
Phase out fossil fuel heavy-duty vehicles	No policies	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)
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
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
Net zero deforestation	No policies or incentives 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

Bibliography

Automotive News Europe. (2022). *Italy to Give EV buyers Subsidy of up to 6,000 Euros.* https://europe.autonews.com/automakers

Climate Action Tracker (CAT). (2020). *Paris Agreement Compatible Sectoral Benchmarks Study.* https://climateactiontracker.org

---. (2021a). *Climate Summit Momentum: Paris Commitments Improved Warming Estimate to 2.4°C.* https://climateactiontracker.org

---. (2022a). *Climate Action Tracker Country Assessments.* https://climateactiontracker.org/countries/

---. (2022b). *Despite Glasgow Climate Pact 2030 Climate Target Updates Have Stalled.* https://climateactiontracker.org/

Climate Analytics. (2021). *Climate Impact Explorer.* https://climate-impact-explorer.climateanalytics.org/

---. (2022). *1.5°C National Pathways Explorer.* http://1p5ndc-pathways.climateanalytics.org/

Climate and Clean Air Coalition. (2021). *Global Methane Pledge.* https://www.ccacoalition.org/en/resources/global-methane-pledge

Colenbrander, S. et al. (2022). *A Fair Share of Climate Finance? An Appraisal of Past Performance, Future Pledges and Prospective Contributors.* https://cdn.odi.org/

COP26 Presidency. (2021). *Compilation of 2021-2025 Climate Finance Commitments.* https://ukcop26.org/

Enerdata. (2022). *Global Energy and CO_2 Data.* https://www.enerdata.net/research/

Energy Policy Tracker. (2022). *G20 Countries.* https://www.energypolicytracker.org/region/g20

European Commission. (2018). *The Just Transition Mechanism: Making Sure No One is Left Behind.* https://ec.europa.eu/

European Parliament. (2022). *CO_2 Emission Standards for Cars and Vans 2021/0197(COD).* https://oeil.secure.europarl.europa.eu/

European Parliament and the Council of the European Union. (2018). *Directive (EU) 2018/844 of the European Parliament and of the Council of 30 May 2018 Amending Directive 2010/31/EU on the Energy Performance of Buildings and Directive 2012/27/EU on Energy Efficiency.* https://eur-lex.europa.eu/

---. (2019). *Regulation (EU) 2019/1242 Setting CO_2 Emission Performance Standards for New Heavy-Duty Vehicles.* https://eur-lex.europa.eu

European Union. (2021). *Laying The Foundations for Recovery: Italy.* https://ec.europa.eu

Food and Agriculture Organization (FAO). (2022). *Emissions Totals: Agriculture.* https://www.fao.org/faostat/en/

Gazzetta Ufficiale Della Repubblica Italiana. (2022). *Decreto Del Presidente Del Consiglio Dei Ministri 6 Aprille 2022. Riconoscimento degli incentivi per l'acquisto di veicoli non inquinanti.* https://invitaliacdn.azureedge.net/

Global Forest Resources Assessment. (2020). *Annual Forest Expansion, Deforestation and Net Change Indicator.* Food and Agriculture Organisation. https://fra-data.fao.org/WO/fra2020/forestAreaChange/

Government of Italy. (2020). *National Recovery and Resilience Plan.* https://italiadomani.gov.it/content/dam/sogei-ng/documenti/PNRR%20Aggiornato.pdf

Graeber, D. (2021). *Italian Steel Plant First to Use Hydrogen-Gas Blend.* https://www.naturalgasworld.com/

Gütschow, J. et al. (2021). *The PRIMAP-hist National Historical Emissions Time Series (1850-2018), V.2.2.* Zenodo Open Access Repository. https://zenodo.org/record/4479172

Institute for Climate Economics (I4CE). (2022). *Global Carbon Accounts 2021.* https://www.i4ce.org/

Institute for Health Metrics and Evaluation (IHME). (2020). *Global Burden of Disease Study 2020*. https://vizhub.healthdata.org/gbd-results/

Intergovernmental Panel on Climate Change (IPCC). (2022). *Sixth Assessment Report, WGII Summary for Policymakers. Headline Statements*. https://www.ipcc.ch/report/ar6/wg3/resources/spm-headline-statements/

International Energy Agency (IEA). (2021a). *Aviation*. https://www.iea.org/reports/aviation

---. (2022a). *Global Electric Vehicle Outlook 2022*. https://www.iea.org/reports/global-ev-outlook-2022

Italian Parliament. (2022). *Misure Urgenti per il Contenimento dei Costi dell'Energia e il Rilancio delle Politiche Industriali*. https://temi.camera.it

Lombardini, M. (2021). *Italy's Energy and Climate Policies in the Post COVID-19 Recovery*. https://www.ifri.org/

Ministero delle Politiche Agricole Alimentari e Forestali. (2022). *Strategia Forestale Nationale*. https://www.reterurale.it

Ministry for Ecological Transition. (2022). *National Recovery and Resilience Plan: Green Revolution and Ecological Transition Component* https://italiadomani.gov.it/

Ministero dell'Economia e delle Finanze. (2021). *Relazione del Ministro della Transizione Ecologica sullo stato di Attuazione degli Impegni per la Riduzione delle Emission di Gas Ad Effetto Serra L.39/2011, art. 2, c,9*. https://www.dt.mef.gov.it

OECD-IEA. (2022). *Fossil Fuel Support Database*. https://www.oecd.org/fossil-fuels/data/

Oil Change International. (2022). *Shift the Subsidies Database*. https://priceofoil.org/shift-the-subsidies/

Rogelj, J. et al. (2018). "Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development", in Masson-Delmotte, V. et al. (eds) *Global Warming of 1.5°C. An IPCC Special Report on the Impacts of Global Warming of 1.5°C*. IPCC. https://www.ipcc.ch/

Romanello, M. et al. (2022). *The 2022 Report of The Lancet Countdown on Health and Climate Change*. https://www.thelancet.com/countdown-health-climate

Smith, I. (2022). *Cost of Living Crisis: What are European Countries Doing to Avoid Soaring Energy Bills?* https://www.euronews.com

Solidar. (2021). *Just Transition Monitor. Mapping the State of Just Transition in the European Union*. https://www.solidar.org

Task Force on Climate-Related Financial Disclosures (TCFD). (2021). *2021 Status Report*. https://assets.bbhub.io

United Nations. (2018). *World Urbanisation Prospects*. UN Department of Economic and Social Affairs, Population Division. https://population.un.org/wup/

United Nations Development Programme (UNDP). (2020). *Human Development Index Database*. https://hdr.undp.org/data-center

United Nations Framework Convention on Climate Change (UNFCCC). (2021). *Decision 1/CMA.3, Glasgow Climate Pact*. https://unfccc.int/documents/460950

The World Bank. (2021). *GDP Per Capita (constant 2015 US$)*. https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD

The World Bank. (2022). *Population, Total*. https://data.worldbank.org/indicator/SP.POP.TOTL

World Steel Association. (2021). *Steel Data and Statistics*. https://www.worldsteel.org/

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