

2016

AT A **TURNING POINT**
AFTER THE PARIS AGREEMENT

ITALY CLIMATE REPORT



SUSTAINABLE
DEVELOPMENT
FOUNDATION

EXECUTIVE SUMMARY

Authors: Edo Ronchi, Andrea Barbabella, Raimondo Orsini, Toni Federico.

Working group: Alessia Albani, Camille Aneris, Alessandra Bailo Modesti, Cecilia Camporeale, Daniela Cancelli, Massimo Ciuffini, Antonello Esposito, Valeria Gentili, Ilaria Indri, Delia Milioni, Vittoria Papa, Emanuela Pettinao.

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Sustainable Development Foundation
via Garigliano 61A - 00198, Rome
tel. +39.06.8414815 - fax +39.06.8414853
info@susdef.it - www.susdef.org

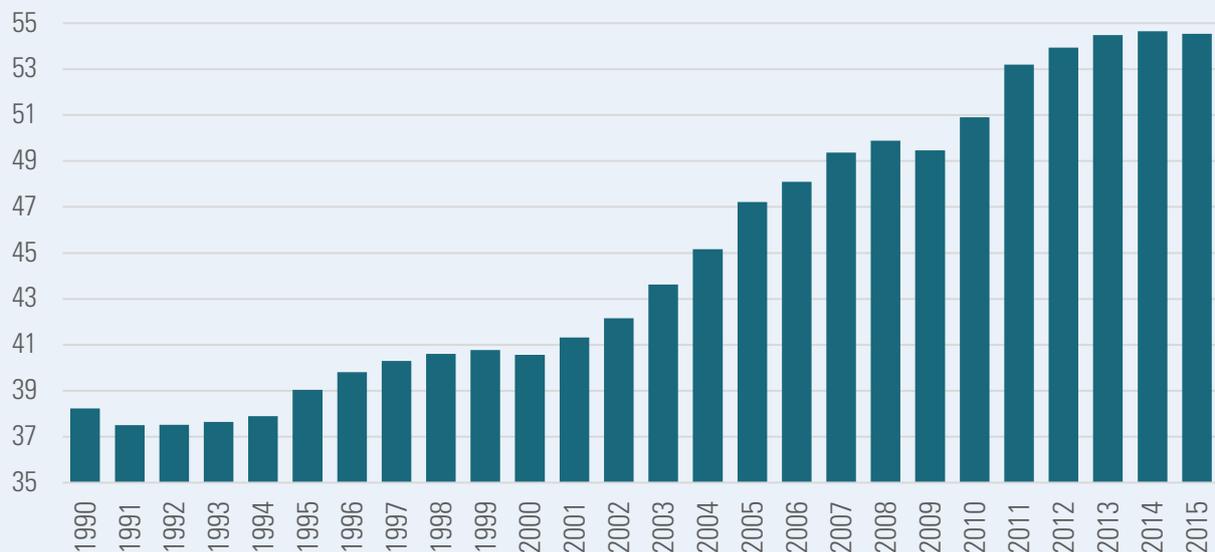
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THE PARIS AGREEMENT IS A TURNING POINT THAT COMMITS ALL COUNTRIES TO INCREASE THEIR CONTRIBUTION TO GREENHOUSE GAS EMISSIONS REDUCTIONS. THE STABILIZATION OF WORLD EMISSIONS BETWEEN 2014 AND 2015 MAY BE THE SIGNAL OF CHANGE.

In December 2015, during the Conference of the Parties hosted in Paris, it was reached an agreement that prescribes to limit global temperature increase well below 2°C, a threshold already set before COP21, pursuing efforts to limit it to 1.5°C and to achieve carbon neutrality in the second half of the century. Global emissions of greenhouse gases in 2014 and in 2015 were essentially flat, despite the approximately 3% annual increase in world GDP: it is the first positive sign after decades of emissions increase (except some slowdowns due to the economic recession). The Paris Agreement became possible thanks to a global changing context. For instance, China has already begun to reduce its emissions while policies and instruments supporting low-carbon technologies are spreading worldwide. Moreover, since the beginning of 2012, the amount of envisaged carbon pricing initiatives increased from 20 to 38 and the total value of existing carbon pricing systems has reached \$50 billion. Furthermore, the amount of countries adopting some kind of target on renewable sources increased from 43 in 2005 to 164 in mid-2015, and investments in this sector with \$286 billion hit a new record in 2015 (+5% compared to 2014 and six times more those in 2004).

Global anthropogenic emissions of greenhouse gases from 1990 to 2015 (GtCO₂eq)



Source: Sustainable Development Foundation based on data from IPCC, IIASA, WRI

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THE PARIS AGREEMENT GOAL TOWARDS 1.5°C, COMPARED WITH THE PREVIOUS ONE AT 2°C, CALLS FOR ALL COUNTRIES TO INTENSIFY THEIR COMMITMENTS TO REDUCE GREENHOUSE GAS EMISSIONS AND TO ACCELERATE THE EXIT FROM THE FOSSILS FUELS ERA.

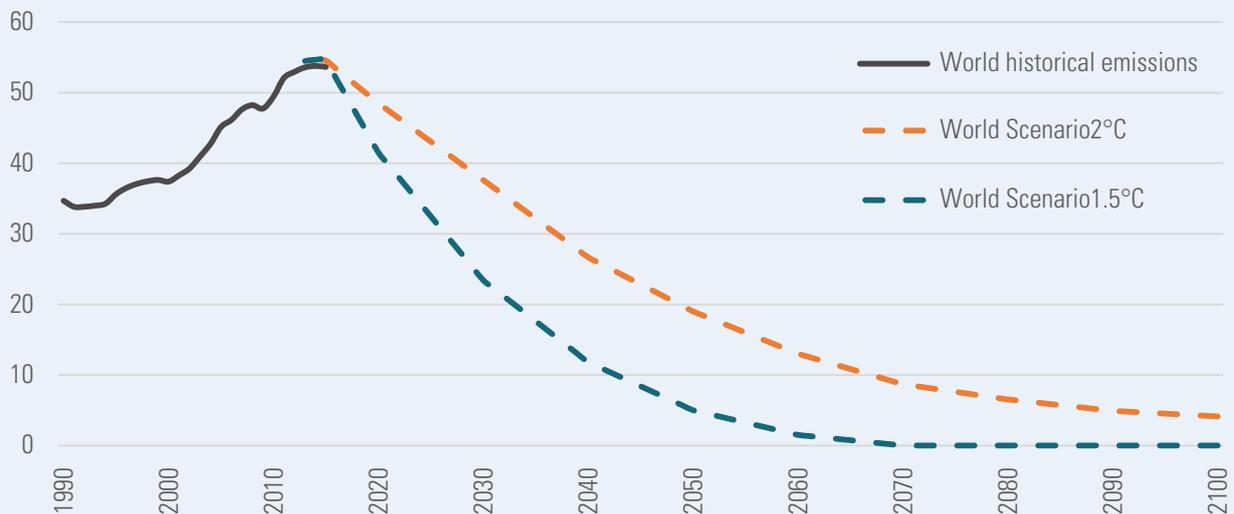
The IPCC draws a scenario consistent with the 2°C target that focuses on the following steps:

- A reduction of global greenhouse gases emissions by almost 45% by 2050 compared to 1990;
- A reduction of greenhouse gas emissions by 90% before 2100;
- A shift from about 7 tCO₂eq of current emissions per capita to about 4/4.5 in 2030 and to 2 tCO₂eq per capita in 2050, in order to reach less than 0.5 tCO₂eq per capita by the end of the century.

The transition to a scenario in line with the objective of maintaining the global temperature increase by 1.5°C requires much more challenging targets:

- An 85% or even higher greenhouse gas emissions reduction by 2050 compared to 1990;
- A zero net global greenhouse gas emissions by 2070;
- To reach less than 3 tCO₂eq per capita by 2030 and 0.5 tCO₂eq by 2050.

Scenarios to 2100 for global greenhouse gas emissions consistent with the limitation of the increase of global average temperature to 2°C and 1.5°C above pre-industrial levels (GtCO₂eq)



Source: Sustainable development foundation

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According to IPCC assessments, in order to remain within the 2°C threshold, cumulative CO₂ emissions in the current century should not exceed 1,100 Gt. As stated by the IEA, emissions resulting from the exploitation of proved reserves of fossil fuels - coal, oil and gas - should be equal to 2,860 GtCO₂ (2012 data). A recent research, published by the Nature magazine, estimates that in order to achieve the 2°C target, a third of oil reserves, half of the gas reserves, and 80% of coal reserves should remain in the ground. The transition to a 1.5°C scenario would need to half the carbon budget available (500-600 Gt) and would require further severe constraints on the use of proven oil, gas and coal reserves.

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THE IMPLEMENTATION OF THE PARIS AGREEMENT WILL REQUIRE AN UPGRADE OF THE EUROPEAN CLIMATE PACKAGE FOR 2030 WITH MORE AMBITIOUS TARGETS ON GREENHOUSE GAS EMISSIONS, RENEWABLES AND ENERGY EFFICIENCY.

In view of the Paris Conference, Europe has updated its strategic climate framework by setting a new 2030 target for greenhouse gas emissions in line with the limit of 2°C. This new target results in a reduction of greenhouse gas emissions by 40% compared to 1990 and, albeit non-binding for single Member State, it is associated to the rise of commitments for renewables and energy efficiency by up to 27%.

The European Environmental Agency (EEA) has published in 2015 the annual report that tracks progress toward energy and climate goals: the European Union has reduced its emissions beyond the 20% target five years in advance and future projections indicate that this positive trend will continue in the upcoming years (reaching a reduction between -26 and -28% in 2020). However, to achieve the stated objectives by 2030, the enforcement of existing measures, combined with the effective implementation of planned ones, will not be enough. By 2030 emissions reduction will in fact float between -30% and -33%, missing the European target of -40%.

The Agency has evaluated the progress also in relation to other European targets on renewables and on energy efficiency. The energy produced via renewable sources from 2005 to 2014, has increased from 75 to almost 200 Mtoe, going from 9% to 16% of gross domestic consumption. If these progresses will be confirmed in the next upcoming years, the 2020 target for renewables will be easily achieved. Nonetheless, further effort is required to achieve the 2030 target. The European Agency states that “a number of regulatory changes have already affected investor’s confidence in renewables, and market fragmentation still represent challenges for new entrants”.

In regards to energy efficiency, the final energy consumption decreased from 2005 to 2014 by over 9% reaching 1,061 Mtoe. This is the first time we have ever registered a reduction below the 2020 target equal to 1,086 Mtoe and we are very close to the 2030 target, equal to 1,039 Mtoe. Unless drastic U-turns, we will be able to achieve it well in advance.

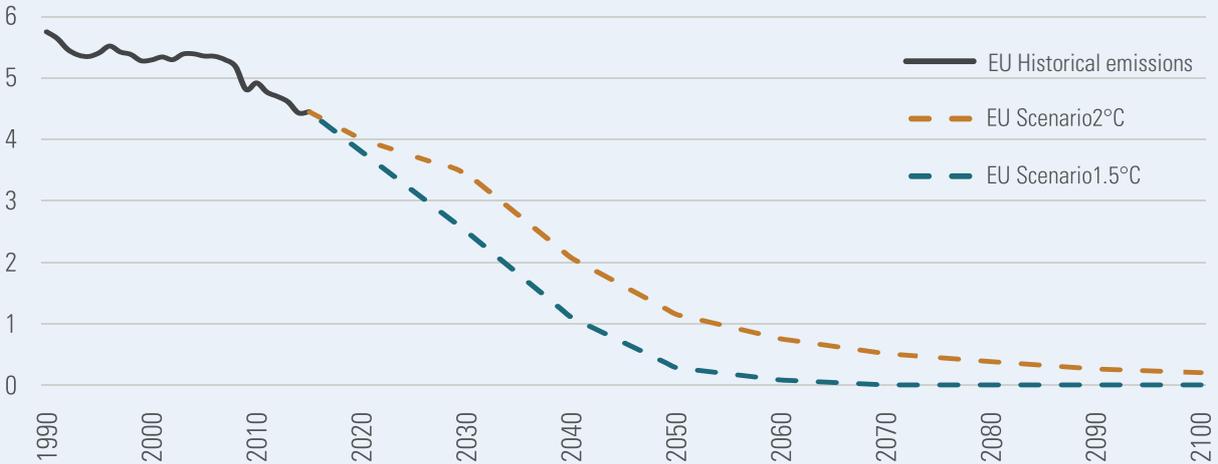
The study conducted by the Agency also highlights a question that has been raised by several observers at the launch of new 2030 objectives: the two 27% targets fixed for both renewables and energy efficiency are not enough since they would not allow reaching the 40% reduction target of greenhouse gas emissions.

Besides, at European level, the scenario consistent with the 1.5°C objective would be much more demanding than the 2°C target, and would require:

- A 50-55% emission reduction by 2030 compared to 1990 (and a 40% reduction if compared to the 2030 package of the 2°C scenario);
- A 90-95% reduction by 2050 (compared to a 79-82% reduction indicated by the Roadmap 2°C);
- To reach zero net emissions between 2060 and 2070, meaning a full balance between emissions and absorption of greenhouse gases (as explicitly required by the Paris Agreement).

Even considering an intermediate scenario in between 1.5°C and 2°C, it appears necessary for the European Union to implement the Paris Agreement and review the 2030 targets package in order to make it more challenging.

Greenhouse gas emissions in EU28, historical data and scenarios to 2100 (GtCO₂eq)



Source: Sustainable development foundation based on data from Eurostat, European Environment Agency, European Commission

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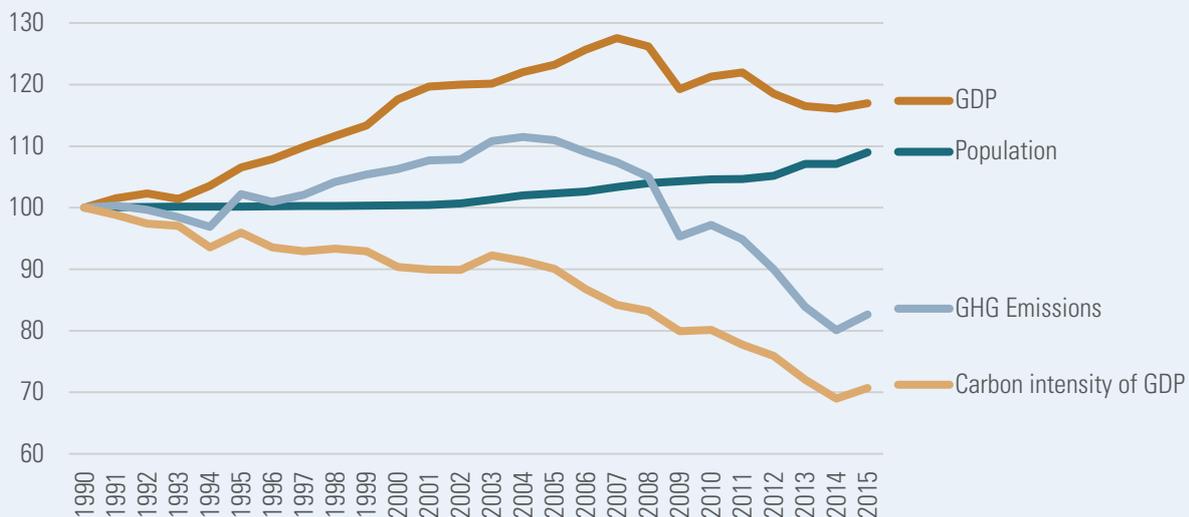
SINCE 2015, GREENHOUSE GAS EMISSIONS IN ITALY HAVE STARTED TO GROW AGAIN AFTER YEARS OF CONSTANT REDUCTION. THIS WAS THE CASE DUE TO A VERY HOT SUMMER, AN INCREASE OF GDP AND CONSUMPTION, THE FALL OF OIL AND GAS PRICES, AND THE SLOWDOWN OF RENEWABLES GROWTH AND ENERGY EFFICIENCY MEASURES.

After the 2004 peak of 581 million tonnes CO₂eq, greenhouse gas emissions in Italy have constantly decreased and reached 417 million tonnes in 2014. This means a -28% reduction compared to the 2004 record and a -20% reduction compared to 1990.

From 2005 to 2014, emissions decreased by an annual average of 2.6% (with the exception of 2010, first year of economic growth after the crisis of 2009). This declining trend continued from 2011 to 2014, and was again interrupted in 2015.

From the analysis of preliminary data on national energy consumption and of several key performance indicators, it seems that in 2015 emissions would amount to around 428 (±5) MtCO₂eq, about 2.5% more than in 2014.

Population, GDP and GHG emissions in Italy from 1990 to 2015 (index value 1990=100)



Source: Sustainable development foundation based on data from Ispra, Istat, Ministry of economic development

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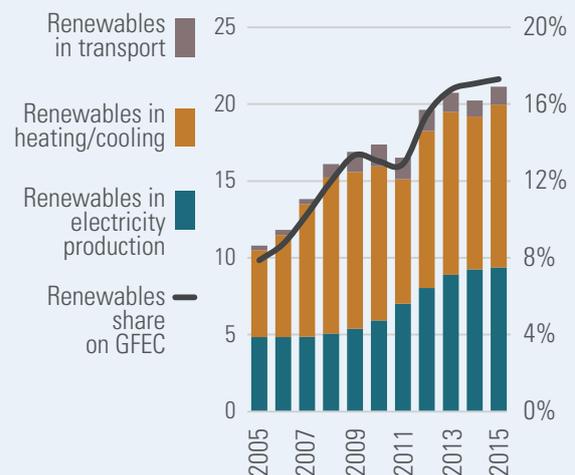
Among the main causes for this decline, we can identify:

- A very hot summer, with an historical peak in power consumption caused by air cooling, followed by a winter colder than the previous year;
- An increase in energy consumption, especially in the transport sector, due to a slight economic recovery occurred in absence of an adequate development of energy efficiency and sustainable mobility tools (between 2011 and 2015 the additional annual energy savings, generated by white certificates that are considered the main national energy efficiency incentive tool, were reduced by 48%);
- A worsening of the energy mix determined by the increase in consumption of fossil fuels, favoured by the drop in oil and gas prices and associated with the lack of growth in renewables.

DESPITE THE PAST GOOD PERFORMANCE, IN ITALY, DURING THE 2013-2015 TRIENNIUM, THE EXPANSION OF RENEWABLES HAS STOPPED, LEADING TO AN AVERAGE ANNUAL GROWTH OF JUST 0.2% PER YEAR (FROM 16.7% TO 17.2% OF FINAL ENERGY CONSUMPTION FROM RENEWABLE SOURCES), WHILE IN 2015 THE SHARE OF ELECTRICITY FROM RENEWABLES HAS DECLINED FROM 43% TO 38%.

Between 2005 and 2012, although Italy put in place notable economic incentives, it has achieved important results in the development of renewable sources, doubling the contribution of these technologies to national energy consumption from 8% to 16%, performing better than the European average: Spain, France and Germany. However, this scenario has changed significantly in the last three years. The growth of renewables in heating and cooling was almost entirely experienced between 2005 and 2008, rising from 5.6 to 10.2 Mtoe and it has remained unchanged until 2015.

Gross final energy consumption from renewables in Italy between 2005 - 2015 (% of total consumption right axis, Mtep left axis)

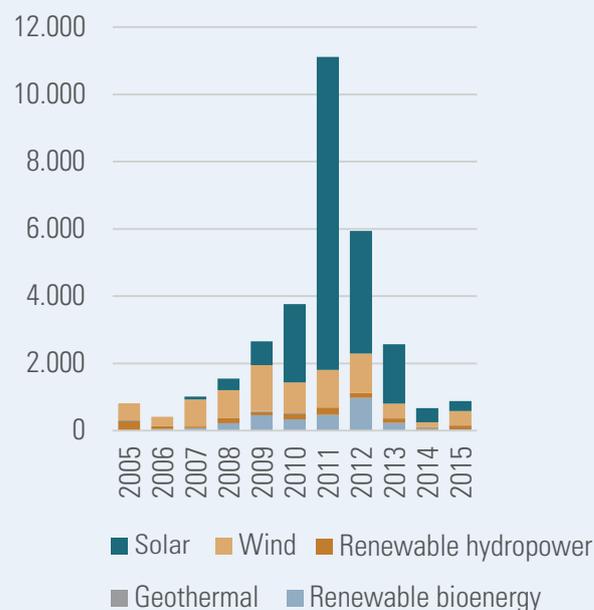


Source: Sustainable development foundation based on data from GSE

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Renewables in the transport sector have risen between 2005 and 2010, passing from 0.3 to 1.4 Mtoe, then they stabilized and later began to gradually decline up to 1.2 Mtoe in 2015. The power sector also registered a reduction in the contribution of renewable sources, whose additional production has increased from about 1,000 ktoe in 2011 and 2012 to 365 ktoe in 2014 and to only 122 additional ktoe in 2015. The share of electricity from renewable sources has grown quickly from 2007 to 2014, rising from less than 20% of national electricity production to 43%, and for the first time, in 2015, it declined to 38% (non-normalized data affected by a significant reduction in hydropower production, characterized by strong annual fluctuations, and in wind power which lost nearly 500 GWh of electricity production).

New installed power capacity of renewables per year in Italy from 2005 to 2015 (MW)



Source: Sustainable development foundation based on data from Terna

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ITALY WILL REACH THE EUROPEAN ENERGY AND CLIMATE TARGETS AT 2020, BUT NOT THE ONE INTRODUCED BY THE NATIONAL ENERGY STRATEGY ON RENEWABLES. NONETHELESS, NEW POLICIES AND MEASURES ARE NEEDED IN ORDER TO ACHIEVE THE 2030 EUROPEAN TARGETS.

The national target for reducing greenhouse gases by 2020, assigned by the European Union to Italy and calculated by summing the target for national systems subject to the ETS Directive with the one of non-ETS sectors, equal to approximately 470 MtCO₂eq (about -10% compared 1990), has already been achieved.

Furthermore, as part of the Climate-Energy package 2020, it was attributed to Italy the target of 17% of gross final consumption covered from renewables: in 2015, achieving a 17.3%; Italy exceeded this target.

However, based on registered results, in 2013 the National Energy Strategy (SEN) has revised and aligned the target with the European average of 20%. Eventually, if the 0.2% average rate of increase registered in the last three years will be confirmed, Italy will not be able to reach the European average. As for energy efficiency, the European target is a 20% reduction in energy consumption by 2020 compared to the projections. Italy has set in its 2014 National Energy Efficiency Plan, the 2020 target at 158 Mtoe for primary energy and 124 Mtoe for final energy consumption. Although these targets have already been achieved, the European Commission considers them too weak since not in line with the overall European target.

Greenhouse gas emissions in Italy: historical data and projections to 2030 (MtCO₂eq)



Source: Sustainable development foundation based on data from European Environment Agency

In 2015, with the new Climate-Energy Package, the European Union has set new 2030 targets for greenhouse gas emissions, renewables and energy efficiency. Several factors determine the assessment of the current Italian trend and the evaluation of the chances to reach the 2030 target on greenhouse gas emissions, these are: the causes of emissions growth registered in 2015 (paragraph 4), and whether emissions will decline quickly (otherwise Italy will be off-line). Additionally, the trend of renewables - if the impasse of the last three years remains unresolved, Italy will be off line with the target. Finally, the energy consumption trend, which is determined by saving and efficiency policies as well as by GDP growth and the price for oil and gas.

In regards to renewables, the 2030 target of 27% is legally binding only at Community level and not for each Member State. However, considering the negative growth trend of the last three years, Italy will not be able to achieve it. As for energy efficiency, the target is a 27% reduction of energy consumption (possibly up to 30%) compared to the reference scenario. This scenario though, suffers from an inadequate assessment of the effects of the economic crisis, making the target not very challenging as achievable with a minimum reduction of current levels.

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AFTER THE PARIS AGREEMENT, THE VISION BEHIND OUR ENERGY AND CLIMATE POLICIES HAS TO BE REDEFINED TACKLING ACCOUNT OF NEW AND GREATER COMMITMENTS FOR REDUCING GREENHOUSE GAS EMISSIONS.

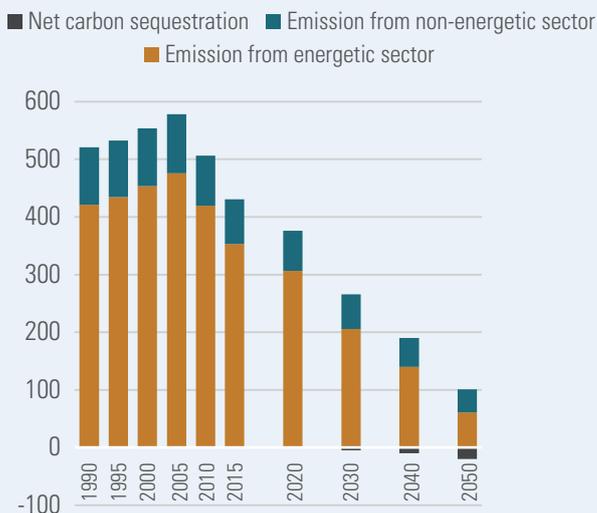
According to the 2°C climate Roadmap elaborated by the Sustainable Development Foundation for Italy:

- In 2020 emissions should be about 30% lower than in 1990, decline to -38 % by 2030 and reach even more than -70 % by 2050;
- In per capita terms, it goes from about 9 tCO₂eq in 1990 to slightly under 7 in 2015, to reach as planned 5 t in 2030 and 2,2 t in 2050.

Differently, the climate Roadmap adjusted to the 1.5°C objective calls for:

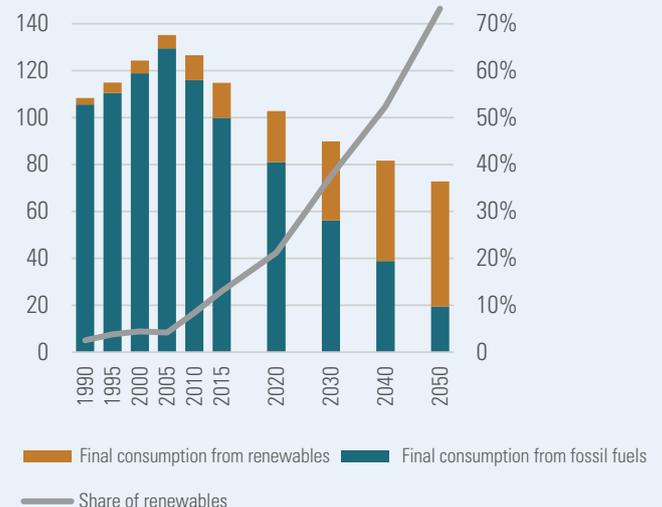
- Compared to 1990, emissions should fall by 38 % in 2020, by 60% in 2030 and by 90 % in 2050, leading to a neutral carbon budget by 2070;
- In per capita terms, from the current 7 tCO₂eq level of emissions we should get off at almost 3 in 2030 moving well below 1 tCO₂eq in 2050 and, clearly, to zero net emissions by 2070.

Vision 2050: greenhouse gas emissions in Italy from 1990 to 2050 (MtCO₂eq)



Source: Sustainable development foundation

Vision 2050: final energy consumption and share of renewables in Italy from 1990 to 2050 (Mtep left axis, % right axis)



Source: Sustainable development foundation

A NEW NATIONAL ENERGY STRATEGY TO 2030 FOR ITALY AFTER THE PARIS AGREEMENT: -50% OF EMISSIONS, 35% OF RENEWABLES AND 40% OF ENERGY EFFICIENCY.

After the Paris Agreement, in the light of more challenging commitments subscribed by Italy and of the recent difficulties and delays, it is necessary and urgent to establish a new National Energy Strategy (SEN).

The 2030 target for greenhouse gas emissions might be placed among the paths identified with the 1.5°C and 2°C scenarios, with an emission reduction of 50 % compared to 1990. In order to achieve this target, final energy consumption should drop from the current 115 Mtoe to 90 Mtoe by 2030, counting on the relevant contribution of energy efficiency policies: in other words, a reduction by almost 40 % compared to the business as usual scenario is needed. Meanwhile, over the next 15 years, the contribution of renewables in final energy consumption is expected to double, rising from 17.3 % to 35 %. Moreover, only looking at the power sector, renewables should meet at least 2/3 of the demand for electricity. In other words, this would be equal to an additional 1 Mtoe of renewable energy production every year, of which 8 TWh of electricity production, in line with the best performance of the last fifteen years.

To reach the new and more challenging targets required by the Paris Agreement, the new SEN 2030 should also clearly identify policies and measures to implement. Only by way of example, we can indicate some specific proposals:

- To launch an environmental fiscal reform, overcoming the European ETS mechanism, which to date has not produced the expected results, and introducing an effective carbon tax as well as a reallocation mechanism of environmentally-harmful incentives without increasing the tax burden, but rather, reducing taxes on businesses and jobs;
- To recognize the true cost of fossil fuels and allowing the promotion of renewables without increasing the energy bills, through the implementation of a carbon tax. This should be accompanied by measures aimed at removing regulatory and bureaucratic barriers that make Italian renewables among the most expensive in Europe, and by developing new mechanisms of credit access and introducing rules capable to improve the efficiency of existing facilities;
- To review energy efficiency supporting scheme, in order to promote structural and effective interventions, starting from the deep renovation of the existing building, designing mechanisms favourable in terms of social equity; launching a national plan for the renovation of the public building stock which can act as a driving force for the construction industry, pursuing a policy of zero soil consumption and recovery of existing infrastructures;
- To implement effective policies for developing sustainable mobility - giving priority to intervention in urban areas,

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focusing on public transport and rail, developing new innovative models of transport sharing and encouraging the deployment of gas vehicles, hybrid and electrical and promoting the use of LNG and other low-impact fuels for freight transport;

- To support the active role of Agriculture in the fight against climate change - promoting the multifunctional approach and expansion of agro-energy in compliance with environmental constraints and food production priority, developing low-impact farming practices able to increase the carbon capture potential of agroforestry systems, supporting adaptation and land protection policies that are increasingly important in an era in which the impacts of climate change are becoming more stringent;
- To promote the development of a circular economy, which allows significant energy savings and consequent CO₂ emissions reduction. A circular economy would also be able to meet ambitious recovery and recycling targets, to minimize waste production, to reduce dependence on foreign sources of raw materials and to promote eco-design and the production of highly recyclable, repairable and low environmental impact products;
- To invest in innovation and research oriented to the green economy - promoting the Italian excellence and the competitiveness on the international market which is increasingly oriented to the green, investing in new low carbon technologies needed both in the transition and in the consolidation of an economic system with low or zero greenhouse gas emissions.

The Paris Agreement and the new and more demanding targets for reducing greenhouse gas emissions are necessary to prevent severe effects on humankind and to promote the development of a green economy, with new opportunities to innovate, differentiate and grow in favour of businesses and the employment.

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