POLITECNICO DI TORINO
Repository ISTITUZIONALE

Italy’s National Energy and Climate Plan and Road Transport: An Appraisal

Original
Italy’s National Energy and Climate Plan and Road Transport: An Appraisal / Raimondi, P.P., Noussan, M. (IAI COMMENTARIES). - In: IAI CommentariesELETTRONICO. - [s.l] : Istituto Affari Internazionali, 2024.

Availability:
This version is available at: 11583/3005987 since: 2026-09-07T14:12:53Z

Publisher:
Istituto Affari Internazionali

Published
DOI:

Terms of use:

This article is made available under terms and conditions as specified in the corresponding bibliographic description in the repository

Publisher copyright

(Article begins on next page)

15 October 2026

Istituto Affari Internazionali

© 2024 IAI

ISSN 2532-6570

IAI COMMENTARIES 24 | 43 - JULY 2024

Italy's National Energy and Climate Plan and Road Transport: An Appraisal

by Pier Paolo Raimondi and Michel Noussan

The Italian government has recently submitted the final version of its National Energy and Climate Plan (NECP),[1] which outlines Italian measures to achieve its national climate targets by 2030 in line with the objectives set by the European Union. To do so, Italy has put forward targets, strategies and measures also for the decarbonisation of transport, which remains among the hardest to decarbonise. While Italy's greenhouse gas emissions due to energy consumption have decreased by 21 per cent from 1990 to 2022, those related to transport have increased by 8 per cent in the same period. Moreover, the transport sector accounted for 27 per cent of national emissions in 2022, with road transport alone accounting for 92 per cent of those emissions.[2] Against this backdrop, it is important to assess the main targets and political implications of Italy's NECP related to both private cars and heavy-duty road transport (buses and trucks) in order to identify potential gaps and opportunities to reach Italy's climate targets.

The dominant role of private cars

One area of relevance is private cars, which was responsible for 58 per cent of the total transport emissions in 2022 given its overreliance on fossil fuels, particularly oil products. Italy is one of the largest car markets in Europe with around 41 million vehicles and a median age of the national fleet of 12.8 years.[3] Electrification has emerged as the main

[1] Italian Ministry of the Environment and Energy Security (MASE), *Clima - Energia: l'Italia ha inviato il PNIEC a Bruxelles*, 1 July 2024, https://www.mase.gov.it/node/18830.

[2] Institute for Environmental Protection and Research (ISPRA), *Le emissioni nazionali di gas serra. Settore Transporti 2022*, May 2024, https://emissioni.sina.isprambiente.it/?p=7502.

[3] ACI, *Annuario statistico 2024*, https://www.aci.it/laci/studi-e-ricerche/dati-e-statistiche/annuario-statistico/annuario-statistico-2024.html.

Pier Paolo Raimondi is a Researcher in the Energy, Climate and Resources Programme at the Istituto Affari Internazionali (IAI) and a PhD Candidate at the Catholic University of Milan. Michel Noussan is an Assistant Professor at Politecnico di Torino and a Visiting Professor at SciencesPo Paris.

solution to decarbonise this segment.[4] For this reason, the NECP set very ambitious targets of 4.3 million battery electric vehicles (BEVs) and 2.3 million plug-in hybrid electric vehicles (PHEVs) by 2030. Furthermore, the NECP set a 34.2 per cent share of renewables in the transport sector's gross final energy consumption by 2030.

However, these figures clash with the current situation calling for more consistent support and strategy. Indeed, there were around 240,000 BEVs and 250,000 PHEVs circulating on Italian roads in 2023.[5] To reach the targets, the government will need to put in place stable and clear policies as well as fiscal and economic strategies to facilitate the purchase of EVs. Indeed, Italy is lagging behind in terms of BEV annual sales with around 66,000 in 2023 compared to other member states like Germany (520,000), France (310,000) and the Netherlands (130,000).[6] Such slow EV adoption in Italy is due to multiple factors: high upfront costs, the lack of charging infrastructure and the limited perception of the importance of shifting towards cleaner transport modes. At the same time, there have been positive developments in terms of public charging stations that can partially reduce charging infrastructure concerns and range anxiety. Over the past years, the country managed to expand its charging infrastructure network up to slightly over 54,000 points as of March 2024.[7] Despite this encouraging milestone, Italy will need to further expand the network – especially in the Southern regions and rural areas – in order to be ready to support future demand. Alongside, Italy will need to accelerate the renewable deployment for decarbonising its power sector to meet its renewable target for the transport sector by 2030.

A critical barrier for faster EV adoption is lower political commitment, as evident in the inconsistent policies and subsidies (clearly illustrated by the experience of the 2024 bonus)[8] as well as regulatory complexities.[9] The NECP does not provide clear fiscal and market measures to ensure a rapid ramp up of the EV adoption aimed at reaching its 2030 targets.

The NECP final version does not properly address another key component of mitigation strategies in the transport sector: energy efficiency through avoiding car use in the first place. To promote this policy, however, users must be provided with effective alternatives, such as reliable, cheap and convenient public transport

[4] Italian Ministry of Infrastructure and Transport, *Decarbonising Transport. Scientific Evidence and Policy Proposals*, April 2022, https://www.mit.gov.it/node/17330.

[5] International Energy Agency (IEA), *Global EV Data Explorer*, last updated 23 April 2024, https://www.iea.org/data-and-statistics/data-tools/global-ev-data-explorer.

[6] Ibid.

[7] Pier Paolo Raimondi, "Electrification of the Road Transport Sector in Europe and the Case of Italy", in *Atlantic Council Reports*, June 2024, p. 18, https://www.atlanticcouncil.org/?p=775013. See also Motus-E website: https://www.motus-e.org.

[8] Carmine Fotina, "Bonus auto, partenza sprint per le elettriche: già esauriti gli incentivi", in *Il Sole 24 Ore*, 3 June 2024, https://www.ilsole24ore.com/art/bonus-auto-moto-e-furgoni-via-oggi-prenotazioni-i-concessionari-AGWwRNL.

[9] Pier Paolo Raimondi, "Electrification of the Road Transport Sector in Europe and the Case of Italy", cit.

© 2024 IAI
ISSN 2532-6570
IAI COMMENTARIES 24 | 43 - JULY 2024

system, and a safe and liveable road environment that allows people to see active mobility as a viable alternative. Those actions require an effective coordination at different levels, as cities and municipalities need to be supported by the government in developing public transport and active mobility support actions.

Heavy-duty road transport: Trucks and buses

Road freight represents 29 per cent of total transport emissions. Compared to private vehicles, the current technology makes transport vehicles harder to be electrified, especially considering heavy-duty trucks. Conversely, light commercial vehicles are already seeing a penetration of BEVs, especially in fleets that need to operate in dense urban areas.

For this reason, long-distance freight decarbonisation could rely on alternatives to electrification, especially in the short-to-medium term. Biofuels could represent an interesting option, especially when they can be used as drop-in fuels, that is, without mixing them with fossil fuels. Promising fuels include renewable diesel (also called hydrotreated vegetable oil – HVO) or biomethane, which is being supported by dedicated incentives at the national level. Those fuels, when produced from sustainable feedstocks, can represent an effective option, but they should be prioritised to the sectors that cannot be easily electrified, due to the limited amount of available feedstocks. Their strongest advantage is the possibility of exploiting the existing distribution infrastructure and vehicles, thus increasing the speed of deployment and reducing costs, although the supply chain still needs to be upscaled to match the potential demand. Their likeliest applications in transport will probably be aviation and maritime, but also long-distance road transport may need biofuels if no other low-carbon alternatives are feasible. The availability of domestic feedstocks may represent a bottleneck to a broad deployment of biofuels, and international cooperation may be required. Synthetic e-fuels may also be an additional option, although energy consumption across the supply chain remains significant and may hinder their deployment.

Another transport fuel that is increasingly seen as a potential alternative to oil products in heavy transport is liquefied natural gas (LNG). The NECP reports that LNG use in transportation reached 0.22 billion cubic metres in 2021,[10] a four-time increase from the 0.05 bcm level of 2018. There are currently around 2,000 vehicles running on LNG, mostly in heavy freight transport, and they can rely on a network of 59 refuelling stations, with a further 41 under development. These figures may represent an interesting opportunity for a quick penetration of bio-LNG, which is already being developed in many sites in Italy, as biomethane is directly liquefied at production sites that are far from the natural gas grid.

The NECP also supports the development of hydrogen for high-

[10] MASE, *Piano nazionale integrato per l'energia e il clima*, June 2024, p. 148, https://commission.europa.eu/node/32214_en.

© 2024 IAI
ISSN 2532-6570

duty vehicles, in particular through a financial backing of hydrogen refuelling stations (with 230 million euros for at least 40 refuelling stations).[11] This could be a potential chicken-and-egg problem, where the lack of infrastructure hinders the deployment of a particular powertrain. However, in this case, proposed commercial models of hydrogen trucks have faced delays in the last few years.[12] Thus, it is unsure if the availability of a refuelling infrastructure may be enough to allow an effective deployment of hydrogen trucks. The plan also mentions support for high-speed electric charging stations, that are primarily addressing private cars, but can also be of use for heavy-duty vehicles.

Although many measures focus on supporting alternative fuels, the NECP also presents some policies that are focused on shifting freight transport modes. Two measures[13] support the shift of long-distance road freight towards alternative sea routes and rail (with an estimated cumulated benefit of 3.9 Mtoe of savings by 2030), while another measure supports the deployment of cargo bikes for companies dedicated to last-mile deliveries in urban areas.

Finally, another mode that is usually included in heavy road transport is public transport by bus. Although buses represent a marginal share of transport emissions in absolute terms (less than 3 per cent), they often operate in urban environments, and cleaner technologies that can also reduce pollutant emissions provide additional benefits. Furthermore, as already mentioned, enhancing cleaner solutions in public transport, alongside the expansion of this alternative, would favour a reduction of emissions by private cars. Urban buses are seeing an increase in electric vehicles, but long-distance buses still rely completely on diesel. The main limitations of the current electric vehicles remain the limited range and the time required for the battery charging process. For this reason, alternative options may be needed, just like for trucks, including liquid biofuels or liquified biomethane. Some cities are experimenting with hydrogen buses, but evidence suggests higher costs compared to direct electrification, due to a lower efficiency of the supply chain.

Looking ahead

Transport remains a very tough sector to decarbonise as proven by the fact that it has been the only sector with rising emissions over the past decades. The limited time to reach the very challenging targets set for 2030 demands strong and consistent policies to accelerate decarbonisation. However, Italy also faces financial constraints, hence requiring an effective and clear strategy based on supporting the most efficient solutions in each transport segment as alternatives to

[11] Ibid., p. 244.

[12] Daniel G. Lifona, "MAN apuesta por los camiones eléctricos: 'El hidrógeno no es viable'", in *Expansión*, 10 January 2024, https://www.expansion.com/empresas/motor/2024/01/10/659eba48468aeb1c578b4591.html.

[13] The measure "Marebonus" provides economic support to multimodal solutions including maritime transport modes, such as Ro-Ro and Ro-Pax, while the measure "Ferrobonus" includes economic incentives to companies that choose rail intermodality against traditional road freight transport.

IAI COMMENTARIES 24 | 43 - JULY 2024
ISSN 2532-6570
© 2024 IAI

oil products. Otherwise, there will be a waste of money and time. As outlined above, while electrification currently represents the most promising option for light-duty vehicles, other transport segments will probably require a combination of solutions, including liquid biofuels, biomethane, electrification and possibly synthetic fuels.

Against this backdrop, concerning private cars, the NECP lacks a clear regulatory and fiscal framework to actually reach its 2030 targets. Streamlining existing funds to favour best option and the expansion of the related infrastructure is essential, while the government should start to develop fiscal reforms on fuel taxes and incentives to accelerate the ramp up of EVs in companies' fleet and long-term rental. At the same time, alternative solutions, such as biomethane, biofuels and hydrogen, can be expanded in heavy-duty road transport where electrification faces larger obstacles.

Finally, many policies and investments are focused on infrastructure for alternative energy sources, to limit the dominance of oil products in transportation. While these efforts are important and necessary, we believe that additional effort on reducing mobility demand and supporting public transportation and active mobility, especially in urban areas, may bring significant benefits. Those benefits would go well beyond GHG emissions savings, by decreasing local pollution, increasing safety for all road users, decreasing congestion and improving life quality in Italian cities.

An effective and timely decarbonisation of transport requires a combination of actions at different levels and across different domains. While it is becoming clearer that to reach 2030 and 2050 climate targets the contribution of a variety of technologies and solutions is required, it is equally true that government will need to design clear and comprehensive strategy to fully exploit the strengths of and potential benefits generated by each single technology for each subsector in order to achieve targets in a timely, orderly and efficient matter.

26 July 2024

© 2024 IAI
ISSN 2532-6570

© 2024 IAI

ISSN 2532-6570

Istituto Affari Internazionali (IAI)
The Istituto Affari Internazionali (IAI) is a private, independent non-profit think tank, founded in 1965 on the initiative of Altiero Spinelli. IAI seeks to promote awareness of international politics and to contribute to the advancement of European integration and multilateral cooperation. Its focus embraces topics of strategic relevance such as European integration, security and defence, international economics and global governance, energy, climate and Italian foreign policy; as well as the dynamics of cooperation and conflict in key geographical regions such as the Mediterranean and Middle East, Asia, Eurasia, Africa and the Americas. IAI publishes an English-language quarterly (*The International Spectator*), an online webzine (*AffarInternazionali*), two book series (*Trends and Perspectives in International Politics* and *IAI Research Studies*) and some papers' series related to IAI research projects (*Documenti IAI*, *IAI Papers*, etc.).

Via dei Montecatini, 17
I-00186 Rome, Italy
Tel. +39 066976831
iai@iai.it
www.iai.it

Latest IAI COMMENTARIES

Editor: Leo Goretti (l.goretti@iai.it)

24 | 43 Pier Paolo Raimondi and Michel Noussan, *Italy's National Energy and Climate Plan and Road Transport: An Appraisal*
24 | 42 Alessio Sangiorgio, *Expanding German-Italian Decision-makers' Coordination in the Energy Sector*
24 | 41 Lorenzo Colantoni, *The EUDR and Forest Protection at the Crossroads*
24 | 40 Pier Paolo Raimondi, *Industrial Decarbonisation Strategies in Italy and Germany: The Case for Cooperation in Green Steel*
24 | 39 Federico Petrangeli, *The Russian Central Bank's Frozen Assets: A "Godsend" for Kyiv's Military Assistance?*
24 | 38 Tiziano Breda, *A Rigged Election Could Trigger Turmoil in Venezuela*
24 | 37 Diego Maiorano, *India's 2024 Elections: Has Democratic Backsliding Come to a Halt?*
24 | 36 Emanuela Bozzini and Daniela Sicurelli, *The EU and the Pandemic Treaty: From Agenda-Setter to Troubled Deal-Maker*
24 | 35 Francesca Borri, *Gaza's Day After Starts in Ramallah*
24 | 34 Darlington Tshuma, *"Energising Africa": Italy vis-a-vis Ethiopia's Renewable Energy Development*