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COMMISSION STAFF WORKING DOCUMENT

Assessment of the draft updated National Energy and Climate Plan of Italy

Accompanying the document

COMMISSION RECOMMENDATION

on the draft updated integrated national energy and climate plan of Italy covering the period 2021-2030 and on the consistency of Italy's measures with the Union's climate-neutrality objective and with ensuring progress on adaptation

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1 SUMMARY

1.1 Overview of key objectives, targets and contributions in the draft updated NECP


The European Green Deal, the fast-evolving geopolitical context and the energy crisis have led the EU and its Member States to accelerate the energy transition, and to set more ambitious energy and climate objectives, with a strong focus on the diversification of energy supplies. These developments are reflected in the legislative framework adopted under the ‘Fit for 55’ package and the REPowerEU Plan.

Italy’s draft updated national energy and climate plan (‘the draft updated NECP’ or ‘the plan’), submitted on 19 July 2023, partially takes into account this new geopolitical and legislative framework.

Table 1: Summary of key objectives, targets and contributions of Italy’s draft updated NECP

		2020	Progress based on latest available data	2030 national targets and contributions	Assessment of 2030 ambition level
	Binding target for greenhouse gas (GHG) emissions compared to 2005 under the Effort Sharing Regulation (ESR) (%)		2021: -17.1% 2022: -18.5% ¹	-43.7%	NECP: -35% to -37%
	Binding target for net GHG removals under the Regulation on Land Use, Land Use Change and Forestry (LULUCF)		Reported net removals of -27470 kt CO ₂ eq. in 2021, and reported approximated net removals of -31690 kt CO ₂ eq. in 2022	-3 158 kt CO ₂ eq. (additional removal target) -35 758 kt CO ₂ eq. (total net removals)	Insufficient ambition based on projections
	National target/contribution for renewable energy: Share of energy from renewable sources in gross final consumption of energy (%)	20.4% (SHARES) 17% (target)	2021: 19.0%	40.5%	IT contribution of 40,5% is slightly above the 39% required according to the formula set out in Annex II of the Governance Regulation.
	National contribution for energy efficiency:				
	Primary energy consumption	158.0 Mtoe	2021: 145.31 Mtoe	115 000 ktoe	IT primary energy consumption contribution is 115,000 ktoe.

¹ The ESR emissions for 2021 are based on final inventory data and for 2022 on approximated inventory data. However, the final ESR emissions for 2021 and 2022 will only be established in 2027 after a comprehensive review.

					EED recast Annex I formula results: 112,161 ktoe
	Final energy consumption	124 Mtoe	2021: 113.27 Mtoe	94 400 ktoe	IT final energy consumption contribution is 94,400 ktoe. EED recast Annex I formula results: 92,119 ktoe.
	Level of electricity interconnectivity (%)	8.8%	4.6%	15% ²	

Source: Eurostat; Italy's draft updated national energy and climate plan

1.2 Summary of the main observations³

Italy's draft updated NECP refers to the revised energy and climate targets recently agreed under the 'Fit for 55' package and the REPowerEU Plan. However, it does not sufficiently elaborate on how these targets will be effectively reached.

Regarding the reduction of greenhouse gas emissions under the Effort Sharing Regulation (ESR), the plan provides emission projections demonstrating that with the additional policies and measures put forward in the draft updated NECP, Italy is not on track to meet its national greenhouse gas target of -43.7% in 2030 compared to 2005 levels. According to Italy's projections, they would underachieve the target by 6.7 to 8.7 percentage points.

On the regulation on **Land Use, Land Use Change and Forestry (LULUCF)**⁴, the draft updated projections in the plan indicate that Italy will fall short of the 2030 ambition, highlighting the need for enhanced climate action. The draft does not clearly set out a pathway to increase the land sector's contribution to the EU's overall enhanced climate target. Despite identifying several relevant policies and measures, net removals are projected to decrease by 2030. The draft does not provide a clear implementation timeframe nor a quantification of the impacts of specific policies and measures. It also lacks information on the status and progress in ensuring higher tier levels and geographically explicit datasets needed to ensure the robustness of net removal estimates.

On Carbon Capture, Use and Storage (CCUS), the plan identifies annual CO₂ emissions that can be captured and stored annually by 2050, but not by 2030. There is no information on the source (ETS emitters or from other sources). Indicative CO₂ storage capacity is

² Calculated by the European Commission based on the ETNSO-E data (Winter Outlook 2022-2023). The 2030 level represents the general interconnectivity target of 15%. The level of ambition cannot be assessed, because the actual 2030 interconnectivity levels will depend on the implementation of the planned interconnectors and changes in the generation capacity. The 2020 figure covers also interconnectors with the neighbouring countries outside the EU.

³ In addition to the notified draft NECP, this assessment also considers informal bilateral exchanges, which are part of the iterative process established under the Governance Regulation.

⁴ Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU (OJ L 156, 19.6.2018, p. 1).

mentioned but not when it would become available. There are no projections for annual injection capacity by 2030. There are plans for the deployment of cross-border dedicated CO₂ transport capacities, but no mention of domestic CO₂ transport.

The draft updated NECP reflects **partial progress towards international commitments under the Paris Agreement**. Italy confirms the commitment to phase out coal use for power generation by 2025 on the mainland but postponed it to 2028 in Sulcis. While the draft updated NECP explains how the fossil fuels subsidies will be phased out, it does not explain by when.

On adaptation to climate change, the draft updated NECP does not contain adequate analysis of the relevant climate vulnerabilities and risks for the achievement of the national objectives, targets, and contributions and the policies and measures in the individual dimensions of the Energy Union. The link to the specific Energy Union objectives and policies, which they support, is not specified and quantified. Adaptation policies and measures to support Italy's achievement of national objectives, targets and contributions under the Energy Union are not properly described in terms of their scope, timing and expected impacts. Adaptation goals need to be broadened beyond reducing the vulnerability of thermoelectric plants to temperature increases and diversifying energy sources.

For renewable energy, the draft updated NECP puts forward a contribution to the overall EU target of 40.5% of renewables in country's gross final energy consumption by 2030. This is slightly above the share of 39% resulting from the formula in Annex II of Regulation (EU) 2018/1999 on the Governance Regulation of the Energy Union and Climate Action (the 'Governance Regulation'). The draft plan includes trajectories for renewables in the electricity, transport and heating and cooling sectors. However, the draft updated plan does not contain trajectories for renewable fuels of non-biological origin (RFNBO). At the same time, Italy's plan provides, for the most part, a comprehensive list of measures that Italy has adopted -or intends to adopt- to support the deployment of renewable energy in line with Directive (EU) 2018/2001 on the promotion of energy from renewable sources, as amended by Directive (EU) 2023/2413 ("revised REDII").

On energy efficiency, the Italian draft updated NECP is **comprehensive, ambitious, informative and detailed**. The increased ambition in Directive (EU) 2023/1791 on energy efficiency and amending Regulation (EU) 2023/955 (recast) ('EED recast') has been taken into account, particularly for the 2030 targets, for the energy savings and for public sector obligations. Italy's plan includes national contributions to the EU's 2030 energy efficiency targets of 94.4 Mtoe for final energy consumption, and of 115 Mtoe for primary energy consumption, both of which are broadly in line with the ambition of the EED recast.

The energy efficiency first principle seems to have been well considered in the plan even if it is not explicitly mentioned in the text. On planned measures, Italy's draft updated NECP puts forward a set of comprehensive measures addressing most of the relevant sectors, including buildings, energy distribution, transport and business. Italy's planned policy and financing measures also provide a sufficient level of detail on expected savings, the contribution of these energy savings to energy saving obligations, and the energy efficiency targets. However, the draft updated NECP does not provide estimates of financial needs or funding sources for most of the proposed measures, and both of these are key to ensuring timely implementation of the measures.

On buildings, the draft updated NECP does not set out more ambitious targets than those included in the Italian 2020 long-term renovation strategy (LTRS). However, it includes new, improved or upscaled measures and funding that could still lead to increased ambition

in this area. Nonetheless, considering past trends in Italian renovation rates, it is not clear how the increased ambition of tripling the current renovation rate for 2050 will be attained without strict implementation of the planned policies.

On the energy security dimension, the draft updated NECP sets out targets and policies to enhance the security of Italy's energy system. Specifically in the gas sector, the plan contains a reduction in imports and a comparatively smaller increase in domestic extraction towards 2030. Domestic extraction is expected to decrease again towards 2040. This is combined with plans to diversify Italy's suppliers more widely, including Algeria, Azerbaijan, and Egypt, with the aim of phasing out Russian gas by 2025, which would be a positive development in line with the REPowerEU plan. The clear description of the gas demand reduction measures that have so far been implemented and the intention to integrate such measures into the medium-term planning towards 2030 is also very welcome. **In the electricity sector,** the draft updated NECP describes planned support to the deployment of power storage but does not set out a specific target for power storage. **In the oil sector,** the draft updated NECP explains that the lower utilisation of oil refineries in Italy has resulted in the conversion of some facilities to biorefineries, an example of how oil infrastructure can be used in the future in line with the EU's climate ambition. The plan does not, however, assess in detail the adequacy of Italy's oil infrastructure (refineries, oil stocks) in the long run, particularly in the light of the expected decline in oil demand and the move towards biofuels.

On the internal energy market, Italy's draft updated NECP notes a series of policy objectives and measures related to key infrastructure developments to enable several objectives of the five dimensions of the energy union tabled in the plan. The completion of the internal energy market is also well tackled with measures that aim at removing price distortions, ensuring the non-discriminatory participation of new market entrants, and covering different flexibility sources (e.g., demand response, storage, self-consumption configurations, energy communities, vehicle-to-grid, and dynamic price contracts for the supply of electricity).

Italy's draft updated NECP refers to completing the liberalisation of the **retail market** by introducing convincing measures to phase-out the regulated price system for households and small businesses in 2024 and promoting the active role of consumers. However, it lacks clear information on the measures that will be identified by the national regulator to substitute the regulated price regime for vulnerable household customers. Italy's draft updated NECP also includes measures to fully replace existing digital electricity meters with second-generation smart meters while transitioning to smart measuring systems in the gas sector.

On energy poverty, the draft updated NECP provides a good overview of the measures currently in place to protect and support both vulnerable consumers and energy-poor households in Italy. These measures include price support measures, income support schemes, and more structural measures. However, the plan does not contain a target for reducing energy poverty and does not report on the number of households currently affected by energy poverty. The main development that has been observed in the draft updated NECP (compared with the initial NECP) is the legal establishment of a national 'energy poverty observatory' in 2021, which began operating in 2022. This observatory has the important task of preparing an official definition of energy poverty and identifying a set of indicators that the government could use to diagnose, monitor, and evaluate energy poverty, incorporating the setting of specific targets for reducing energy poverty by 2030.

The research, innovation, competitiveness, and skills dimension of Italy's draft updated NECP contains only qualitative targets and measures to support research, innovation and investments in clean energy technologies and the digitalisation of the energy value chain. The plan also does not contain a concrete breakdown of investments into research and innovation specific to the energy sector for 2030 and 2050, nor does it set out clear competitiveness targets. The plan does not provide sufficient information on measures and investments needed to support the manufacturing capacities for net-zero technologies, to reinforce the resilience of supply chains and to overcome the identified skills gaps for the clean energy technologies.

Just transition is only partially addressed in the draft updated NECP. The plan provides some analysis of employment and skills impacts of the climate and energy transition but lacks the analysis of social impacts, including the distributional ones. While the plan includes several social measures, it lacks policies and measures to support employment and skills in the context of the transition. Moreover, given that the coal-phase out is being postponed in Sulcis, it is not clear how this will impact the actions planned in the Territorial Just Transition Plans. In addition, the draft updated NECP does not detail the resources specifically devoted to supporting a just transition. Finally, it does not provide sufficient information for the preparation of the Social Climate Plan and how the consistency of the two plans would be ensured.

On its strategic alignment with other planning tools, the draft updated NECP covers only partially the implementation of the measures included in Italy's RRP and those in the new REPowerEU chapter. The measures in the plan reflect the 2023 European Semester Country Specific Recommendations related to energy security and energy efficiency that will allow Italy to reduce dependency on fossil fuels.

The investment needs are partially quantified, based on a top-down economic and energy-modelling tool, focusing mainly on the national energy system, renewable energies, distribution networks, the national transmission network, and the energy storage systems. The draft updated NECP does not provide details on the investment needs and funding sources for the various specific policies and measures proposed. The draft updated NECP is based on a comprehensive **quantitative analysis**, covering all five dimensions of the Energy Union. However, both the with-existing-measures ('WEM') and the with-additional-measures ('WAM') scenarios are only available until 2040. The methodologies used for the projections and impact assessment of policies and measures are explained only in rather general terms. The draft updated NECP does not provide details on the macro-economic assessment.

2 PREPARATION AND SUBMISSION OF THE DRAFT UPDATED NECP

2.1 Process and structure

The draft updated NECP was submitted on 19 July 2023. It is well developed and well written, and follows the structure provided in Annex I of the Governance Regulation. It covers all five dimensions of the Energy Union. However, it does not always spell out clearly Italy's objectives, targets or contributions for the different dimensions. In addition, it does not always back up these objectives, targets or contributions with sound policies and measures that are underpinned analytically, including based on an impact assessment.

Italy's draft updated NECP describes only partially the national context in which the update was drawn up. A significant focus is on increased energy prices resulting from the Russian invasion of Ukraine, but it gives only very little detail on these higher energy

prices and their effects in Italy. The draft updated NECP also refers to recent extreme weather events – such as droughts – and discusses solutions for making Italy more resilient. However, the plan does not set out measures proposed by Italy to address these challenges or provide a timeframe according to which measures could be implemented.

Italy is using the already existing '*Unified Conference of State-Regions-Municipalities*⁵' as its main multilevel dialogue platform to discuss the update of the NECP and its implementation measures. However, no information is provided on the timing and frequency of its meetings, nor on how the input provided will be considered for the final version of the updated NECP.

Italy has involved local and regional authorities to update the NECP, including the 9 cities selected for the EU Mission '*100 climate neutral cities by 2030*'. This resulted in the draft updated NECP containing concrete proposals for energy efficiency in buildings, sustainable mobility, climate mitigation and climate adaptation. However, a significant part of the institutional consultation is yet to take place (e.g., with the national parliament and other relevant administrative structures) and there is no precise information on the communication channels used, nor on the timeline that has been established for these pending institutional consultations.

2.2 Public consultation

The procedure outlined in Italy's draft updated NECP generally planned for early public participation in the decision-making process. The draft updated NECP was open for public consultation through an online platform. A wide range of interest groups were identified and encouraged to take part, including social partners and the general public.

The time frame for the public to prepare and participate effectively is not mentioned, nor is it clear on the type and quality of information that was provided to participants. The draft updated NECP contains a clear but synthetic summary of the public's views, but it does not provide information on which categories of stakeholders expressed what opinions. Moreover, the summary does not explain how the opinions expressed were considered and addressed, or why they were not taken on board.

The plan states that a Strategic Environmental Assessment of the draft updated NECP would start after its submission to the European Commission. The draft plan, and a non-technical summary of it would be made available to the competent actors and interest citizens for them to express their views. The plan does not contain additional information on timing, nor on how this process will feed into the preparation of the final plan.

2.3 Regional consultations for preparing the draft updated NECP

There have been various bilateral interactions with neighbouring countries on specific topics. While it is unclear whether these interactions involved consultations focused specifically on the draft updated NECP, some of their outcomes are included and considered in Section 5 of this staff working document.

⁵ In Italian, Conferenza Unificata Stato Regioni-Città e autonomie locali.

3 ASSESSMENT OF THE AMBITION OF OBJECTIVES, TARGETS AND CONTRIBUTIONS AND ADEQUACY OF SUPPORTING POLICIES AND MEASURES

3.1 Decarbonisation dimension

3.1.1 Greenhouse gas emissions, removals and storage

The draft updated NECP recognises the increased climate targets included in the ESR and the LULUCF Regulation, as part of the ‘Fit for 55’ legislative package but embeds them only partially.

The draft updated NECP confirms Italy’s commitment to achieve climate neutrality by 2050. WEM projections are updated in the draft plan, although they are less ambitious than those submitted in March 2023 under Art. 18 of the Governance Regulation and are only performed with a time horizon of 2040. The plan includes WAM projections until 2040, with such a projection not included in the March 2023 submission. Projections submitted in March 2023 show net GHG emissions (including LULUCF and excluding international aviation) of 269 million tonnes of CO₂ equivalent (CO₂ eq.) by 2050, equivalent to a projected reduction of 48% by 2050, compared to 1990. Moreover, in recent years net GHG emissions in Italy have declined at a very slow pace below the EU average, mainly driven by a lack of significant emission cuts in the energy sector. Despite the commitment to achieve climate-neutrality by 2050, the information provided in the draft updated NECP does not allow for a full assessment as to whether progress by Italy is consistent with the achievement of the EU climate-neutrality objective. However, based on all the available information, progress by Italy towards the EU climate-neutrality objective appears insufficient.

The draft updated NECP does not reflect the required ambition under the ESR, as the policies and measures in the plan do not collectively suffice to reach the country’s obligation for the effort sharing sectors. The ESR sets Italy’s 2030 emissions reduction target at -43.7% compared to 2005 levels. The draft updated NECP projects ESR emissions will be above this target in 2030, in both the WEM and WAM scenarios, highlighting the need for more ambitious climate action in the sectors involved. In the WEM scenario, Italy falls short of the target by 15.4 percentage points, while in the WAM scenario it still underachieves by 6.7 percentage points, even in the most optimistic scenario. In 2021, Italy’s ESR emissions exceeded the annual emission allocation (AEA) by 10.9 Mt CO₂ eq., mainly because emissions from transport and buildings were only moderately affected by the economic downturn. Moreover, efficiency improvements in transport were more than compensated for by increased use of private transport.

The draft updated NECP states that Italy will carry out further technical studies on the effort sharing sectors in preparation of the final update of the plan, in collaboration with all responsible central administrations. The trajectories presented in the draft updated NECP will be used for the consultation process on the final updated plan, which will be carried out through a Strategic Environmental Assessment⁶. This will help to identify additional measures, particularly in the transport, building and agricultural sectors.

⁶ In Italian, Valutazione Ambientale Strategica.

Member States have **flexibilities under the ESR** to comply with their targets. No specific use of ESR flexibilities is mentioned by Italy. To assess whether Member States comply, the use of saved AEAs from previous years is taken into account.

Table 2: ESR target and projections in Italy’s draft updated NECP

ESR target and projections⁷					
	2030 target*	2021 performance (inventory data) *	2022 performance (approximated data) *	2030 WEM projection *	2030 WAM projection *
Italy	-43.7%	-17.1%	-18.5%	-28.3%	-35%/-37%
EU	-40%	-14.5%	-16.9%	-27%	-32%

*Compared with the 2005 emissions as set out in Annex I of Commission Implementing Decision (EU) 2020/2126.

The draft updated NECP does not fully reflect the increased ambition of the new LULUCF Regulation and the 2030 national target requiring Italy to deliver additional -3 158 kt CO₂ eq. of net removals to reach a total value of -35 758 kt CO₂ eq. of net removals in 2030. According to the projections submitted in the draft updated NECP, Italy will only achieve -34 900 kt CO₂ eq. by 2030 compared with 2005 levels, significantly short of the 2030 target of -3 158 kt, highlighting the need for more ambitious climate action. Italy even projects a sharp slowdown in net removals to -29 600 kt CO₂ eq. in 2035 (compared with 2005 levels). Moreover, Italy’s plan does not set a clear pathway to increasing the contribution of the land sector to the EU’s overall enhanced climate target. Even considering additional planned measures, the land sector’s projected contribution to emission reductions by 2030 is the same as in the WEM scenario.

The draft updated NECP only briefly describes the policies and measures to support the LULUCF sector, among which the creation in April 2023 of a public register of voluntary carbon credits should be highlighted. However, it does not provide information on the timeframe for implementing these policies and measures, the source of funding, and, most importantly, the quantification of the impacts. For instance, even though the draft updated NECP refers to the need for biodiversity preservation as a key component of climate action, it lacks a description of both concrete actions to preserve biodiversity and the expected impacts of these concrete actions. Italy’s draft updated NECP does not provide information on the status of – and progress to be made in – ensuring improvements to higher-tier levels/geographically explicit datasets for monitoring, reporting and verification, in line with Regulation (EU) 2018/1999. Overall, the draft updated NECP does not clearly present how its policies and measures for Italy’s LULUCF sector will contribute to the long-term transition to climate neutrality by 2050.

Italy’s draft updated NECP recognises the role of circular economy in climate-change mitigation and highlights different national policies and measures to help achieve climate targets. These policies and measures go beyond waste management, and cover: (i) activities in design; (ii) circular-economy business models; (iii) extending the lifetime of products; (iv) extended producer responsibility; (v) sustainable finance; (vi) skills; etc. The circular economy and its potential for reducing GHG emissions is well integrated in the draft

⁷ The comparison between the ESR target and emission projections does not take into account the flexibilities available for Member States under the ESR to comply with their 2030 targets. The ESR emissions will be comprehensively reviewed in 2027 (for the years 2021-2025) and 2032 (for the years 2026-2030).

updated NECP but does not seem to be quantified or integrated in the plan's analytical basis.

The draft updated NECP includes policies and measures for improved access to zero- and low-emission mobility. The draft updated NECP refers to provisions for alternative fuel infrastructure for low- and zero-emission vehicles that are broadly aligned with the new Alternative Fuels Infrastructure Regulation. It also includes measures for recharging points and hydrogen refuelling stations. However, some measures clearly lack necessary financial support. For instance, the plan includes measure to promote active mobility in large municipalities by increasing the number of cycling roads, sharing mobility, and mobility management. However, the allocated budget of EUR 15 million seems disproportionately small. Similarly, there is no financial allocation planned in national law for the foreseen sustainable urban mobility plans.

Italy proposes a variety of measures to promote a modal shift to low-carbon modes (e.g., through fiscal measures; reforms to environmentally harmful subsidies; the deployment of infrastructure for zero-emission aircraft; or updates to shore-power infrastructure at ports). Some of these measures are focused on passenger transport (encouraging car-pooling, bicycles, walking, and a shift away from private cars to public transport). Other measures are focused on the transport of goods (such as incentives to promote a shift from road to rail) and promoting the integration of medium- and long-distance transport through rail, sea, and sustainable road transport. The draft updated plan refers to the Sustainable Mobility Fund for financing the transformation of airports, although it does not include specific measures for the electrification of airports. There are also measures in Italy's draft updated plan to introduce zero-emission technologies and related infrastructure in the rail sector through experimentation with hydrogen for non-electrified railroads.

The draft updated NECP does not include measures for the production and deployment of sustainable aviation fuels (SAF) to contribute to the ReFuelEU Aviation Regulation, but it does mention some measures related to sustainable maritime fuels. The plan includes measures to develop the use of liquified natural gas (LNG) for maritime transport and port services. These measures are aimed at decreasing GHG emissions, but their impact is in fact negative considering the upstream emissions they cause. Furthermore, these measures run the strong risk of supporting stranded assets linked to fossil fuels over the long term, including in sectors where electrification is currently the predominant option (ferries and tugboats).

The draft updated NECP describes the planned efforts to capture and store CO₂. It refers to the "*Strategia Italiana di Lungo Termine sulla riduzione delle emissioni di gas a effetto serra*"⁸, which estimated that 20-40 Mt CO₂ could be captured and stored annually by 2050. However, the plan does not provide information on the CO₂ volumes to be captured by 2030, nor does it identify the share of Italy's annual CO₂ emissions that can be captured from EU ETS emitters and from other sources.

The draft updated NECP explains that Italy has begun an analysis of the storage potential in depleted oil and gas fields for fields exploited by the Italian oil and gas company ENI. The analysis suggested that the storage potential in depleted oil and gas fields in Italy could equal approximately 750 Mt of CO₂, depending on when hydrocarbon-extraction activity comes to an end. This capacity could be supplemented with the use of

⁸ https://www.mase.gov.it/sites/default/files/lts_gennaio_2021.pdf

saline aquifers to reach a total storage capacity of 5 000 Mt of CO₂⁹. However, the draft updated NECP does not indicate clearly when CO₂ storage capacity would become available, nor does it indicate projections for annual injection capacity by 2030. According to the draft updated NECP, the use of saline aquifers, even for experimentation, would require changes to the current regulatory framework. The framework is already being updated to speed up the authorisation process, draw up the rules and technical requirements on the transport and storage of CO₂, and draw up rules on the business model for CO₂ storage.

The draft updated NECP refers to plans for the deployment of cross-border dedicated CO₂ transport capacities (the Callisto project) of up to 4.6 Mtpa, to be captured mainly in France and Italy and transported for storage in Italy. At the same time, thanks to the Mediterranean carbon capture and storage plan, significant volumes of CO₂ will also be captured and transported to Greece for storage. The number of Italian emitters of GHGs that will participate in the Mediterranean carbon capture and storage plan is not clearly identified.

Shortcomings in the draft updated plan on tackling non-CO₂ emissions are problematic, because they accounted for 30% of all greenhouse gas emissions within the Effort Sharing sectors in 2021, and in the context of the gap towards the ESR target. The plan provides neither specific nor measurable objectives for the reduction of methane emissions from the energy system. For instance, it does not address methane emissions from fuel combustion and remains unspecific on fugitive emissions, merely mentioning some recent policy developments at the EU and international levels, without elaborating on its national implementation. The plan also fails to prioritise action to reduce emissions from the agricultural sector, despite acknowledging that existing measures have not had significant impacts in the past decade. This is reflected in both of Italy's projections, which show only a minimal decrease of N₂O by 2030, and in the limited information on the measures planned to address agricultural emissions. Conversely, the draft updated NECP does describes waste policies very well as part of the circular economy, and the impact of waste policies on reduced methane emissions is also duly explained. The draft updated NECP describes policies and measures to extract value from organic waste by turning it into biomethane, while reducing methane emissions. On F-gases, the draft updated NECP refers to Regulation (EU) No 517/2014 and the Kigali Agreement but does not explain how it will tackle the still-high level of emissions. It does present some projections for the future development of F-gas emissions but without any background information.

The analytical basis of the draft updated NECP includes an assessment of the impact of policies and measures on the achievement of the GHG mitigation targets, even though their individual impact is not always quantified. The policies and measures are generally described in sufficient details in terms of scope and, less frequently, likely impact. However, their timing is often either not provided or expressed in vague terms. Based on the comparison of WEM and WAM scenarios, the policies and measures proposed in the plan will not allow Italy to reach the GHG emissions targets set in EU legislation.

The draft updated NECP reflects partial progress towards international commitments under the Paris Agreement. The plan refers on several occasions to the need to phase down the use of fossil fuels, especially through electrification, the use of

⁹ Based on scientific literature, not verified by operators.

green hydrogen and biofuels. However, it does not include a clear timeline or commitment. With regards to coal phase-out in the power sector, due to the recent energy crisis there has been a temporary increase in coal use, but the draft updated NECP confirms the previous commitment to phase out coal by 2025 (on the mainland). However, Italy reports difficulties to respect the objectives set in the 2020 NECP and the commitments set in the Territorial Just Transition Plan for Sulcis (Sardinia), where the closure of a coal power plant will be postponed from 2025 to 2028. This is attributed to the Russian invasion of Ukraine and the consequent need to ensure the resilience of the energy system. Furthermore, an expansion of the gas network in Sardinia is indicated, contradicting the measures adopted to limit dependency on imported fossil fuels. The phasing out of fossil fuel subsidies is discussed in detail in the draft updated NECP that explains how Italy has worked on both their mapping and on a governance structure to progressively phase them out, while taking into account the potential social and economic impacts. However, a precise timeline is not reported.

On 11 February 2021, Italy submitted to the Commission its national long-term strategy. The strategy includes the goal of achieving climate neutrality by 2050. The goal is not enshrined into law. In March 2023, Italy reported on the progress on its initial NECP, where the climate-neutrality objective was confirmed. This climate-neutrality goal is reiterated in the draft updated NECP.

3.1.2 Adaptation

According to the draft updated NECP, Italy has not yet completed a comprehensive assessment of all the relevant climate vulnerabilities and risks that may threaten the achievement of national objectives, targets, and contributions in the five dimensions of the Energy Union, nor has it put in place policies and measures to address those risks. The plan mentions water shortages and longer dry periods as a challenging factor in planning energy distribution and producing electricity from hydroelectric plants. Higher temperatures are also identified in the plan as a stressing factor for electricity transmission cables and has a cause of higher demand on cooling systems. The focus on energy security is too limited from the adaptation perspective, as there are competing water uses. In addition, the report mentions the link to water governance (River Basin Management Plans) only for hydropower, and not for the many other aspects of water management, while references to other regulation abound. In particular, the lack of mention of Flood Risk Management Plans is noteworthy in view of the increased occurrence of flash floods, as well as that of Drought Management Plans. The absence of a comprehensive assessment in the plan is possibly because the Italian national adaptation plan (NAP) has not been adopted.

Italy partially identified adaptation goals in its initial NECP from 2019, but those goals were not quantifiable. Compared to that document, the formulation of adaptation goals has only marginally progressed, as a limited number of adaptation goals have now been adopted. However, these have not been quantified or linked to the specific Energy Union objectives or policies. Most of the goals identified are furthermore not actually linked to reducing vulnerabilities to climate change. Only the ones on reducing the vulnerability of thermoelectric plants to temperature increases and diversifying energy sources can be considered to play a positive role in improving the resilience of the energy systems towards anticipated effects of climate change.

Some nature-based solutions are described in the draft updated NECP, but only in relation to Italy's experimental action programme for adaptation to climate change in an urban environment and not for the entire national territory (such as water retention in soil,

flood plains, natural water storage and wetland restoration). Innovative approaches such as insurance policies and fiscal measures to address the climate-protection gap are not considered in the plan. However, the draft updated NECP does consider investments aimed at minimising environmental impacts, for example investments dedicated to urban reforestation and better rain-water management.

The draft updated NECP only refers to the protection of biodiversity by quoting different strategic documents, but it does not contain sufficient analysis of impacts and specific actions to be carried out. For instance, Italy's proposal for a national adaptation plan presents a framework of potential measures focusing on the following sectors: marine environments, terrestrial ecosystems, forests, soil, and land management. However, the information included in the draft updated NECP is not sufficient for a proper assessment of these actions.

3.1.3 *Renewable energy*

The renewable-energy contribution proposed by Italy in the draft updated NECP is for renewables to achieve a share of 40.5% of Italy's national gross final consumption of energy in 2030. This proposal is based on the WAM scenario. Absolute values in terms of energy are also included in the draft updated NECP. This contribution is slightly above the minimum share of 39% resulting from the formula in Annex II of the Governance Regulation. The scenarios set out in the draft updated NECP are detailed and provide yearly overall renewable-energy contribution trajectories and technologies up to 2030, but do not include information beyond this period until 2040. The indicative trajectory to reach the 40.5% contribution in 2030 is well reasoned, including specific reference points for 2022 (a renewables share of 21.2%), 2025 (a renewables share of 27.5%) and 2027 (a renewables share of 32.7%)¹⁰. The submitted reference point for 2022 is above the trajectory (19%) calculated in line with the EU 2030 renewable-energy target of 32%. The reference points for 2025 and 2027 (26% and 31% respectively) are also above the trajectory calculated in line with the increased EU 2030 renewable-energy target of 42.5%¹¹.

The renewable electricity generation is projected to reach 65% of all electricity generated in 2030 (228 TWh without taking into account electricity used for hydrogen production via electrolysis), with solar power becoming the main source of renewable electricity and almost quadrupling its installed capacity from 2021 (when solar power accounted for only a 28.3% share and 79.9 GW of installed capacity, of which 0.87 GW was concentrated solar power). This will put solar power in Italy ahead of wind (18.3% share and 28.1 GW of installed capacity in 2030, of which 2.1 GW was offshore) and the current main source of renewable energy in the country which is hydropower (13.37% share and 19.1 GW of installed capacity in 2030). Bioenergy is expected to account for 2.74% of electricity generated in Italy by 2030 and 3 GW of installed capacity, compared with 4.1 GW in 2021. Geothermal electricity will also slightly increase to reach a 2.28% share of electricity generate in 2030 and 1 GW of installed capacity, up from 817 MW installed in 2020). Although the plan includes detailed information on support to renewable

¹⁰ Reference points of 18% by 2022, 43% by 2025 and 65% by 2027 pursuant to Article 4(a)(2) of Regulation (EU) 2018/1999.

¹¹ Given that the provisionally agreed RED was not yet in force by the deadline for the submission of the draft NECPs, the value for 2022 has been compared to the trajectory values calculated on the basis of the 2030 EU renewable energy target of 32%. The reference points for 2025 and 2027 are compared to the trajectory calculated on the basis of the increased EU target of 42.5% in line with the revised RED.

energy innovative technologies, it does not link this information to the **innovative target for renewable energy deployment** and does not explain how the target will be achieved.

The use of renewable energy in the heating and cooling sector is projected to reach a share of 26.3% by 2025 and 36.7% by 2030. The draft updated NECP indicates that the new heating and cooling target of the revised RED II leads to a binding target for Italy of 29.6% for 2030 and a 39.1% indicative target. However, it is not clear whether these targets are considered as national targets Italy aims to achieve. In addition, the role of waste heat, waste cold, and renewable electricity in accounting for the annual average increase in renewable energy in the heating and cooling sector remains unclear. Bioenergy will remain dominant, providing 9.88 Mtoe to heating and cooling in 2030, with an ambitious target of 3.7 Mtoe for biomethane consumption in particular (82 ktoe in 2021). The draft updated NECP also sets out Italy's plans to promote the replacement of old appliances with more efficient technologies that release fewer emissions by setting strict requirements for access to support schemes for the purchase of boilers and stoves.

Heat pumps will see their gross final consumption of electricity more than double by 2030 compared with 2020, reaching 6.68 Mtoe. However, the electricity needed to run these heat pumps and the projected capacity increase in electricity to run these heat pumps are not included in the draft updated NECP. For **district heating and cooling**, Italy is projecting an indicative increase in the share of renewables to almost 48% by 2030. The plan includes indicative estimates of 27% of renewable-energy use in **industry** and 42.5% of renewable-energy use in **buildings** in 2030. However, it is unclear whether these are projections based on the policy scenario of the draft updated NECP, or actual targets that Italy aims to achieve. The draft updated NECP contains no information on the role of waste heat and renewable electricity and their impacts on setting and achieving targets.

In the transport sector, the share of renewable energy is projected to reach 30.7% in 2030 energy terms (RES-T). The draft updated NECP also includes a detailed table with projections of the renewable fuels contributing to the target under the revised RED II. However, Italy has not provided the equivalence of the target in GHG emissions reduction by 2030. In addition to the direct electrification of transport, Italy intends to further promote the use of advanced biofuels, stating that they would contribute not only to the decarbonisation of future vehicles, but also of existing ones and that they would help decarbonise those transport modes that are difficult to decarbonise, such as maritime and aviation. The main measures included in the plan to achieve this are a mandatory quota for the consumption of renewable fuels, including biofuels and biomethane, and other measures aiming at increased energy efficiency in transport and an increase of renewable electricity use in road and rail.

Italy expects renewable electricity in transport to multiply by more than five times between 2021 and 2030 (rising from 295 Ktoe in 2021 to 1 576 Ktoe in 2030 without multipliers). This increase will mostly be driven by greater uptake of electric vehicles. Italy aims at achieving a **combined share of RFNBOs and advanced biofuels** of 10% in 2030, out of which at least 2 percentage points (i.e., one fifth) are RFNBOs. Multipliers are included in this calculation. The contribution of conventional biofuels will be limited to 2.3% and biofuels with a high risk of indirect land use change will be phased out in accordance with the revised REDII. Although Italy's plan underlines the importance of electrification of transport, especially for road and rail transport, it does not provide detailed information on the measures that Italy intends to take to support the uptake of renewable electricity in the transport sector. The NECP sets a target of 6.6 million of **electrically powered vehicles** by 2030, of which around 4.3 million will be battery powered electric vehicles (BEVs) compared to 183,467 BEVs in circulation in March 2023. Italy also introduced mandatory

quotas for clean vehicles in public procurement and promotes the purchase and use of electric vehicles for public transport. The contribution of electrification to road transport is expected to reach 0,95 Mtoe by 2030. To meet the electricity demand for this fleet, at least 7,500 super-fast charging stations on non-urban roads (excluding motorways) and at least 13,755 fast charging stations in urban centres are planned to be installed. Details about measures related to electro-mobility (both relating to vehicles and to recharging infrastructure) are included in the NECP; but these details relate mostly to existing measures.

Italy's draft updated NECP states that the country will have 5 GW of hydrogen electrolyzers in 2030, based on the country's **national hydrogen strategy** preliminary guidelines. The plan also sets out measures for RFNBO use in demand sectors mostly in transport and industry. For industry, Italy calculates that if RFNBOs achieved a 42% share of final energy consumption in the industry sector stemming from the revised RED II, this would correspond to 0.115 Mtoe and would require 3GW of electrolyser capacity. Italy identifies a tariff mechanism as the main measure necessary to support renewable hydrogen to cover the operating costs for the production of renewable hydrogen. Other measures have already been adopted, such as the simplification of permitting for hydrogen production facilities, support to R&D and investments under the RRP for the production of hydrogen in brownfield sites and for the use of hydrogen in hard-to-abate sectors. Italian companies and projects participate to both the Hy2Tech and Hy2Use Important Project of Common Interest.

Italy's draft updated NECP does not list **international partnerships** between Italy and future exporters of RFNBOs. It only refers to the South H2 corridor project in the context of the so-called European Hydrogen Backbone¹², which will seek to link hydrogen-production facilities and import infrastructure to final demand and neighbouring countries. In addition, the draft updated NECP refers to the SunsHyne Corridor project, which seeks to import green hydrogen produced in north Africa to Europe. The SunsHyne Corridor project was launched in the end of 2021 by five European operators of transmission systems, including Italy's Snam, Austria's TAG, Slovakia's Eustream, Czechia's NET4GAS and Germany's OGE.

On **policies and measures**, Italy intends to continue promoting the deployment of renewable energy through long-term support schemes. In the **electricity sector**, the country's objective is to accelerate the production of electricity from renewable energy through the use of 'reverse auctions'. These reverse auctions which will also include a mechanism for the automatic adaptation of tariffs to cover any increase in operational costs, maintenance costs and inflation. Italy also intends to promote the use of PPAs by setting up a specific platform to match suppliers with off-takers and standardising contracts. On Guarantees of Origin (GOOs), Italy aims to promote greater use of this instrument and intends to propose adaptations to the current legislative decrees for issuing GOOs also for the biomethane and hydrogen sectors.

Italy has also provided generic information on the possibility of setting up **joint projects** with neighbouring Member States (Malta, Croatia, Austria, Greece and France). These joint projects would mostly focus on offshore renewable energy, the development of the ship-building value chain, and the interconnection the gas and electricity grids. On the EU's Renewable Energy Financing Mechanism and Connecting European Facility 'RES', the plan mentions the possibility to assess their use at a later stage.

¹² The European Hydrogen Backbone (EHB) initiative (<https://ehb.eu/>).

The draft updated NECP lacks information on measures to accelerate deployment of solar energy in line with the EU's Solar Energy Strategy by simplifying and accelerating permit-granting procedures for solar energy. At the same time, the plan presents sufficient and well-described measures for promoting **individual and collective self-consumption of solar energy and for promoting renewable energy communities** (managing up to 5 GW) as means to achieve the objectives of the EU Solar Strategy. These measures include: exemptions from network and system charges for energy communities; support schemes for renewable energy produced by energy communities up to 1 MW; support under the RRP to renewable energy coupled with storage solutions; assistance to -and information on- energy communities; a 60% mandatory share of renewable energy in new or substantially renovated buildings (65% for public buildings); and the creation of a dedicated IT tool ('Photovoltaic Self-Consumption Portal').

Italy has not indicated in the draft updated NECP whether it has put in place a strategy on **energy system integration**. However, it did indicate that it intends to introduce measures to promote demand response and storage to increase the flexibility of the grid linked to greater integration of renewables into the electricity grid.

Measures for renewable heating and cooling set out in the draft updated NECP include the continuation of tax credits for energy efficient renovation of buildings (i.e., promoting the installation of renewable-energy equipment in buildings), white certificates, support to public authorities for the production of renewable heat, and the mandatory integration of energy from renewable sources in buildings. Italy is also finalising a renewable heat obligation on heat providers, which will apply as of January 2024. New measures have also been introduced to support the construction and upgrading of district heating networks across the country.

On the industry sector, some measures included in the draft updated NECP will increase the penetration of renewables, notably those relating to the promotion of PPAs and to the increased use of renewable hydrogen in hard-to-abate sectors. However, no information is provided in the plan on specific measures to promote renewable-based electrification of industrial processes, or to replace fossil fuels used for industrial heating.

On bioenergy, Italy has announced a significant acceleration, with the focus on the production of renewable gases (biomethane and hydrogen) and other biofuels including hydrotreated vegetable oil. However, the draft updated NECP mentions that the total capacity will probably decrease in the coming years (from 4.106 MW in 2021 to 3.052 MW in 2030), due to the extensive conversion of biogas plants to biomethane plants, and the use of only bioliquid plants that comply with sustainability requirements. The draft updated NECP provides the projected shares of bioenergy by sector (electricity, heating and cooling, and transport), but it does not include projections on bioenergy demand and supply by sector, nor does it provide data for imports and the source of forest biomass used for energy.

The draft updated NECP does not address the domestic supply of forest biomass for energy purposes in 2021-2030 under the revised sustainability criteria based on the revised RED II. Italy announced in the plan that the installation of new biomass heating systems will have to favour high environmental quality and high efficiency systems. Italy also refers in the draft updated NECP to its intention to promote the use of agricultural residues and local biomass that have a short-chain-traceability procedure, and therefore promote environmental and social sustainability. In the heating sector, Italy's draft updated NECP projects a decrease in the use of bioenergy and, starting in 2025, an increase in the use of biomethane for heating purposes. Specifically, Italy announced its plans to promote the

injection of biomethane into the gas grid and to use it in the heating sector. Italy also projects that total national production of both biogas for thermal and electrical purposes and biomethane for combustion and use in transport will amount to around 5.95 bcm in 2030.

The draft updated NECP includes **mapping of the areas** that will be critical for Italy to focus on for it to achieve its national contribution to the Energy Union's renewable energy target. Italy does this by designating in its draft updated NECP a list of so-called renewables-acceleration areas and dedicated infrastructure. The updated NECP also includes detailed information on the measures recently adopted to streamline the permitting process, including its digitalisation and standardisation process together with simplified rules for repowering. However, the draft updated NECP contains no information on earlier plans to make the building of small installations simpler. It also fails to include a reference to a contact point for project promoters.

3.2 Energy efficiency (including buildings) dimension

Energy savings are presented as a key pillar of the draft updated NECP, with Italy targeting a reduction in energy consumption of 2 Mtoe/year until 2030 compared with the 2017-2019 average¹³. This corresponds to a corrected national contribution of 115 Mtoe for primary energy consumption and 94.4 Mtoe for final energy consumption. The targets are set at a level which corresponds to the results of the formula in the Annex I of the EED recast, including the application of the +2.5% flexibility¹⁴. However, the draft updated NECP shows that the current policy scenario projections in terms of energy consumption in 2030 are higher, thereby indicating that the reported 2030 energy efficiency targets will not be met only with the measures included either in the WEM or in the WAM scenario. In this context, the plan lacks ambitious policy and financing measures able to deliver on the proposed national contributions to the EU 2030 targets. The target for 2030 is also set at a lower level as compared to the Italian 2020 energy efficiency targets (-27% and -24% for primary and final energy consumption respectively)¹⁵.

The target on reducing total final energy consumption of all public bodies is well described, which also includes relevant information regarding its calculation and the measures planned, and also on the inclusion or exclusion of public transport or armed forces. Similar to the 2014-2020 period, Italy has opted, for the default approach to implementation of the provisions of Article 5 EED (Article 6 EED recast) on the **exemplary role of public bodies' buildings**. The extension of the obligation of the annual renovation of 3% of the total floor area from central government buildings to all public buildings is clearly mentioned in the NECP. The plan also provides satisfactory information on the measures that will be implemented to deliver the **energy savings obligation** required post-2020 under Article 7 EED (Article 8 EED recast).

Italy adopts a mixed approach, including both an **energy efficiency obligation scheme (EEOS)** and alternative measures. The expected contribution of each measure towards the target is quantified and it is expected to be sufficient to meet the 2030 requirement. The total 2021-2030 cumulative end-use saving requirement is 73.42 Mtoe, which represents

¹³ The 2017-2019 average has been calculated based on the EED recast FEC definition, and the savings per year have been calculated for the period 2021-2030.

¹⁴ According to Article 4(4) EED recast, a Member State shall ensure that its contribution in Mtoe is not more than 2.5% above what it would have been had it resulted from the EED recast Annex I formula.

¹⁵ The comparison has been done among reported targets by IT as calculated by the EED Formula (+2.5% flexibility) and the 2020 targets as included in the NEEAP 2017 (158 Mtoe PEC, 124 Mtoe FEC).

an important increase compared to the 51.4 Mtoe planned for 2030 in the final NECP from 2020. Both the target and the annual energy savings' rate have been recalculated based on the new provisions and the increased ambition of the EED Recast. In addition to the white certificates, the draft updated NECP lists twelve main alternative measures targeting all the sectors, and in most cases presented as packages of measures. Significant savings are expected to be achieved by the tax deductions for building energy renovations, which are projected to deliver 44% of the overall cumulative savings requirement for the period 2021-2030. The NECP presents in detail and with sufficient quality the planned measures to achieve the 2030 energy efficiency goals and their expected savings. However, there are no clear references to the “**energy efficiency first principle**”.

The anticipated impact of the measures towards complying with **energy efficiency targets** of Article 4 of the EED recast is quantified in terms of savings (annual and cumulative), and. And according to the estimates provided in the draft updated NECP, these measures will help Italy to fully achieve its target. Considering the key role of such instruments in delivering the necessary energy savings, close and timely monitoring of their implementation will be crucial. In accordance with Article 8 of the EED recast **energy savings obligations**, part of the cumulative end-use energy savings referred to above (73.42 Mtoe in 2021-2030), which is at least equivalent to the share of households affected by energy poverty, will be implemented by vulnerable customers, people in low-income households and, where applicable, people living in social housing.

Although the level of detail provided on expected savings in Italy's draft updated NECP is generally good, the detailed contribution of the measures to address sustainable mobility is not sufficiently clear. The same can be said of the contribution made by the energy-efficiency investments under EU cohesion policies. Moreover, there is potential to further target the development and **efficiency of district heating and cooling** and combined heat and power (CHP), as well as to increase the efficiency of power generation. A number of cross-sectoral measures, including for instance information and training, are also indicated, and as well as measures to favour the uptake of energy and measures to improve the availability of information on the energy performance of the building stock. The plan includes measures to favour the uptake of energy efficiency in the public sector, in particular by making use of green public procurements and energy performance contracting.

It should be noted that Italy's draft updated NECP does not raise the ambition of Italy's 2020 **LTRS** targets, but it does include new measures and funding that could nevertheless result in more ambitious targets. The draft updated NECP recalls the main key elements of the 2020 LTRS, such as data on the building stock and the national targets for 2030, 2040 and 2050 expressed in terms of an annual deep-renovation rate. The draft updated NECP also specifies that the current targets will probably be revised towards more ambitious ones in light of the adoption of the EU's 'Fit for 55' package. The Italian draft updated NECP refers to measures specifically targeting the **building sector** (e.g., tax deductions for energy-efficiency retrofits). Most of these measures were already in place but have now been improved or upscaled in the draft updated NECP. The tax reductions for building renovation have also been upscaled in the draft updated NECP with new measures, which have led to an almost-doubling of the expected cumulative energy savings in the building sector by 2030. The draft updated NECP also includes new legislative measures in light of the upcoming revision of Directive 2010/31/EU on the energy performance of buildings, which is expected to have a significant impact on the expected energy savings. These Italian measures will be further refined to help Italy to meet a more ambitious target set out in the upcoming revision of Directive 2010/31/EU, but it is not possible to assess at

this stage whether and how the revision will suffice to meet the new ambitions. Also, considering past trends in renovation rates in Italy, it is not clear how the increased ambition will be effectively implemented on the ground.

Finally, it is regrettable that the financial needs of each of the energy-efficiency measures listed in the draft updated NECP are not always quantified, and that the financing sources or mechanisms are not always mentioned.

3.3 Energy security dimension

Energy security is an important aspect in Italian energy policy with imported fossil fuels representing the bulk of Italy's energy mix. In 2021, fossil fuels comprised 79% of the country's gross available energy, which is significantly higher than the EU average¹⁶. According to the draft updated NECP, this share is expected to decrease substantially to between 71% (WEM scenario) and 63% (WAM scenario). Italy has also historically been a net importer of its electricity needs. Energy import dependence on third countries has been broadly stable at 73% from 2013 to 2021¹⁷.

Natural gas plays a very important role in the Italian energy system, constituting the main energy source in 2021 covering 41% of the primary energy mix and 51% of the electricity mix (against 24% and 20% for the EU27, respectively).¹⁸ At the same time, Italy has experienced an increasing gas import dependency on third countries, from 79% in 2013 to 93% in 2021¹⁹. Import dependency from Russia was 40%²⁰ in 2021, making it Italy's largest supplier (followed by Algeria and Qatar). The plan foresees to phase out Russian gas by 2025, notably through an increase in imports from other producing countries (Algeria, Azerbaijan, Egypt, Congo, Qatar and Angola) but also through an increase in domestic production by an estimated 1.4 bcm annually by 2025.

Overall, natural gas imports are expected to decrease from 58 519 ktoe in 2021 to 39 580 ktoe in 2030 and to decrease further to 35 151 ktoe in 2040, which is a very positive development. To support energy **diversification**, Italy has commissioned a new floating storage regasification Unit (FSRU) in Piombino with a capacity of 5bcm/y. An additional unit is expected to start operating in Ravenna by 2024 with a 5bcm/y capacity. The draft updated NECP also mentions the upgrade of 3 LNG terminals (Panigaglia by 2 bcm, Livorno by 1 bcm and Rovigo by 2 bcm), as well as a potential 5.7 bcm/year of biomethane production by 2030. Domestic production of natural gas in Italy is expected to increase from 2 608 ktoe in 2021 to 3 202 ktoe in 2030, and then to decrease to 2 381 ktoe in 2040.

The draft updated NECP generally provides a detailed overview of the measures to be taken to strengthen Italy's **security of gas supply** in the coming years. This includes the diversification of gas supply sources, the update of the preventive action plans and emergency plans and actions for stabilising the savings measures taken in winter 2022-2023 for the domestic heating sector on the basis of Regulation (EU) 2022/1369²¹ on coordinated demand-reduction for gas.

¹⁶ Eurostat data.

¹⁷ Eurostat data.

¹⁸ https://energy.ec.europa.eu/data-and-analysis/eu-energy-statistical-pocketbook-and-country-datasheets_en

¹⁹ Eurostat data.

²⁰ https://economy-finance.ec.europa.eu/system/files/2023-05/IT_SWD_2023_612_en.pdf

²¹ OJ L 206

Italy's draft updated NECP also considers promoting **renewable gases** for all end uses, even if these renewable gases are not connected to the gas pipeline network. Following the invasion of Ukraine, Italy managed to reduce its gas demand by 16% between August 2022 and March 2023, more than the -15% voluntary objective and slightly less than the EU-27 average (-18%)²². The Commission notes with approval that Italy's draft updated NECP describes the measures to reduce gas demand that Italy has implemented and that Italy intends to integrate these measures into its medium-term planning towards 2030.

On the **electricity sector**, the key objective in the draft updated NECP is to maintain system adequacy, especially in a context of major changes to the national and European electricity-generation mix. A second key objective is to increase the resilience of the system against impacts of climate change that are causing disruptions linked to the occurrence of extreme weather events. Italy's electricity transmission grid is interconnected with other countries through 26 lines. In 2022, more than 53 GWh was imported into Italy and around 28 GWh exported. There are ongoing projects to increase the interconnection capacity by an additional 1,900 MW.

Moreover, on the electricity system as a whole, key **policies and measures** indicated in the draft updated NECP for security of supply are: update of the security plan for the electricity sector; improved resilience of the system by improved analytical methods for risk assessments; new instruments for maintenance of operations; development of storage capacity; and cybersecurity measures in accordance with Regulation (EU) 2019/941 on risk-preparedness in the electricity sector.

The expected increase in **renewable electricity** production is making it more complex to manage Italy's grid and creating a growing demand for flexibility for grid balancing. The draft updated NECP outlines a number of measures to mitigate these challenges, four of which are particularly pressing: (i) the north-south zonal congestion; (ii) the reduction in the adequacy margin of the system; (iii) the reverse flow from primary cabins to the national transmission network; and (iv) the instability of the medium-voltage and low-voltage electricity-distribution network. Given those challenges, the draft updated NECP refers to measures that Italy will take to modernise existing power lines on the eastern and western backbones of the country, and to the southern regions and the islands. It also refers to measures Italy will take to take advantage of direct-current transmission technology (HVDC). In addition, security of supply is expected to improve with the implementation of projects related to the energy transition of Italy's national transmission network.

The draft updated NECP also refers to Italy's plans to increase **electricity storage capacity** to ensure the integration of renewables into the electricity market and to efficiently manage overgeneration. These measures reduce the risk of electricity shortages or imbalances in the grid. According to a study on energy storage commissioned by the European Commission, the current operational Italian power storage capacity is around 8 806 MW (mainly pumped hydro) and the main barrier identified was the lack of information on ancillary services to develop a storage business plan based not only on the energy market²³.

²² DG ENER Chief Economist Team based on ESTAT NRG_CB_GASM (sub-series IC_CAL_MG subtracted by TOS) in TJ (as of 29 September 2023, 11:00).

²³ This figure is derived from the database which accompanied the ENTEC study on Storage funded by the European Commission and published in November 2022, by taking into account only the "operational" facilities: https://op.europa.eu/en/publication-detail/-/publication/dfcaa78b-c217-11ed-8912-01aa75ed71a1/language-en?WT_mc_id=Searchresult&WT_ria_c=37085&WT_ria_f=3608&WT_ria_ev=search&WT_URL=https%3A//energy.ec.europa.eu/.

Oil remains a significant source of energy in Italy (accounting for 33% of the primary energy mix in 2021 vs 36% in 2015). In 2021, oil consumption was highest in the transport sector (60%), followed by industry (22%) and in particular Italy's significant petrochemical industry. Local crude-oil production covers about 10% of Italy's domestic oil demand, and the rest is imported through diversified sources (Italy's top three oil suppliers in 2021 were: Azerbaijan (22%), Libya (17%) and Iraq (15%)). Italy is a net exporter of oil products, with 11 refineries, 16 crude-oil tanker ports, and approximately 405 oil-storage terminals across the country. Italy also has 2 oil pipelines, in particular the Transalpine Pipeline from Trieste which supplies Austria and Germany. The Transalpine Pipeline also plays a key role in diversifying Czechia's oil deliveries, much of which come through the sprawling Druzhba pipeline, which covers much of eastern Europe.

Italy expects oil production in 2030 to be 30% below its 2020 level, but also projects oil demand to fall from 51 Mtoe in 2021 to 36 Mtoe in 2030 as a result of electrification and the uptake of biofuels. However, no target is set for alternative fuels to support this ambition. The petrochemical industry is very important for security of supply in the region. The draft updated NECP states that lower utilisation of refineries has resulted in conversion of facilities into biorefineries, which could be used as example of future use of oil infrastructure without compromising on EU climate ambition. However, the draft NECP does not assess in detail the adequacy of the oil infrastructure in the long run (refineries, oil stocks) with the expected oil demand decline and the move toward biofuels.

The draft updated NECP briefly covers the cybersecurity dimension, which will be subject to an update in Italy's national risk-preparedness plan for the electricity sector, and which is also mentioned as an area for research in the coming years. The resilience of Italy's supply chains in terms of access to critical raw materials needed for the green transition is also covered in the draft updated NECP, notably with a reference to the Italian Energy Materials Acceleration Platform, which deals in particular with the materials needed for batteries, electrolysers, and solar PV.

The implications for energy security of climate change are only briefly addressed in the draft updated plan, despite being described as one of Italy's primary objectives in the electricity sector. There are no details about the measures Italy plans to take, for example, in: (i) water-resource management; and (ii) addressing the impacts of water-resource management for the hydropower sector.

The draft updated NECP only very briefly describes measures that Italy will take in the event of **security of supply crisis for electricity and for gas**. Nevertheless, Italy submitted its national risk assessment, its preventive action plan, its emergency plan, as well as the common risk assessments for Ukraine (which it coordinated), Norway, Algeria, Caspian and Libya risk groups (the latter of which it also coordinated).

3.4 Internal energy market dimension

On **infrastructure developments**, three gas infrastructure projects in Italy are identified by the REPowerEU plan as critical for phasing out Italy's dependence on Russian gas imports, namely: the expansion of the Trans-Adriatic Pipeline; an upgrade in the Italian transmission network on the Adriatica Line; and an upgrade in the Italian transmission network on the Mattagiola-Massafra pipeline. Two new FSRU regasification terminals have been authorised in 2022: the FSRU terminal in the port of Piombino, which started operation in 2023 and the FSRU off the coast of Ravenna, whose commissioning is planned for 2024. The objective is to increase the independence of the Italian system from imports from Russia.

The TAP expansion is also referred to in the draft updated plan and aims to double the capacity of the Southern Gas Corridor, one of the key infrastructure routes enhancing diversification of South-East Europe and enabling imports of non-Russian gas to the EU. The plan also mentions internal pipeline projects, namely Adriatica Line and Mattagiola-Massafra, which are also Project of Common Interest (PCI) projects on the 5th Union list, that have been confirmed as regionally significant investments bringing security of supply and market integration benefits to Italy and the region. This import route can also play an essential role in supporting the diversification efforts of several other Member States in central eastern and south-eastern Europe, in particular Austria, Slovakia, Czechia, and Slovenia. Clear timeline for the completion of these projects is sometimes missing.

Its geographical location gives Italy an opportunity to be a European entry point for renewable hydrogen produced in the northern Africa. However, this would also require Italy to build a robust **hydrogen backbone infrastructure**. The draft updated NECP mentions the Italian Hydrogen Backbone project concerning the commissioning of approximately 2330 km (around 73% repurposing and 27% new built) which would allow the import of large volumes of hydrogen from north Africa, as well as exports of hydrogen to Austria and Switzerland.

Through limited additional investments, the Italian Hydrogen Backbone could potentially enable other entry or exit points in the northeast and/or south of the Italian system. To this end, the Italian transmission system operator has coordinated with the Austrian and German transmission system operators to develop a dedicated hydrogen corridor between the three countries. The Italian Hydrogen Backbone is planned to be developed in conjunction with the following projects: H2 Readiness of the TAG pipeline system, H2 Backbone WAG and Penta West (Austria) and HyPipe Bavaria – The Hydrogen Hub (Germany), respectively.

Nevertheless, Italy did not submit any **PCI or Project of Mutual Interest (PMI)** candidate hydrogen project with the northern African countries. It is thus unclear what would be the source of hydrogen to be injected in the Italian Hydrogen Backbone corridor, and when large-scale hydrogen supply sources in northern Africa will be connected with the hydrogen corridor between Italy, Austria and Germany.

The developments in **electricity infrastructure** referred to in the draft updated NECP address the key challenges facing Italy's electricity sector, i.e., the integration of renewable energy, system congestion, and security of supply. The emphasis in the draft updated NECP is on strengthening domestic transmission lines, which should help to reduce future congestion in the transmission network and double the current trading capacity between market areas from around 16 GW today to over 30 GW. The draft updated NECP also points out the great need for further development of the country's distribution networks.

On the integration of the internal energy market, the draft updated NECP includes policy objectives and measures to foster both market integration and the deployment of renewable-energy sources. These measures include: removing price distortions; measures to ensure the non-discriminatory participation of new market entrants; and measures to cater for different flexibility sources in the energy markets (e.g., demand response, storage, self-consumption configurations, energy communities, vehicle to grid, and dynamic price electricity supply contracts). However, no clear objectives for the deployment of flexibility sources or neither a sound assessment of the flexibility needs is included. Additionally, the draft updated NECP refers to Italy's intention to fully replace of existing digital meters with second-generation smart meters in electricity, while also transitioning to smart measuring systems in the gas sector.

On the **retail market**, the draft updated NECP refers to Italy's plans to: (i) complete the liberalisation of the market by introducing measures to phase-out the regulated price system for households and small businesses in 2024, which have been reflected in relevant RRP commitments; and (ii) promote the active role of consumers. Those measures seem well suited to helping Italy achieve these objectives. However, there is a lack of clear information in the draft updated NECP on the measures that will be identified by Italy's national regulator to overcome the regulated price regime for vulnerable household customers.

Italy set out in its draft updated NECP plans for several consumer-oriented measures to support the liberalisation process, aligned with the stated objectives. These measures build upon existing tools and include: an online consumption portal for consumers and an integrated information system; a register of electricity and gas suppliers; revised regulation of the so-called supplier of last resort; measures for vulnerable households; a photovoltaic self-consumption portal; measures to enforce penalties for misconduct; and improved tools to help consumers compare offers. Italy is also planning information campaigns to raise awareness and educate consumers on how to actively participate in the energy market.

In response to the energy crisis stemming from Russia's war of aggression against Ukraine, Italy has implemented several **emergency measures** to support households and businesses. These measures were introduced as an emergency response and were developed to address potential recurring issues. In particular, they include: payment plans to help end-consumers pay for their energy bills; tariff charge reductions; improved energy bonuses for people facing economic hardship or severe health conditions requiring life-saving electrical equipment; and a temporary electricity price cap.

On energy poverty, the draft updated NECP still lacks a specific target and does not report the number of households in Italy currently affected by energy poverty, even though this information is officially documented in government reports and was presented in detail in the 2020 NECP. The main development since 2020 in this area has been the legal establishment of a national energy-poverty observatory in 2021, which began operating in 2022. This observatory is expected to be a valuable tool in effectively coordinating the responsibilities of various administrations, authorities, and government levels related to energy poverty, thus preventing any overlapping and fragmentation of efforts. However, it is unclear how the observatory will effectively integrate the network of already established and knowledgeable entities active in this area, including universities, energy companies, and Non-Governmental Organisations active on the ground.

The draft updated NECP also refers to a new **regulatory framework introduced in 2021 for protecting vulnerable and energy-poor customers**, determining the criteria for what constitutes a vulnerable customer. However, the criteria used to designate household customers as vulnerable seems to be based solely on age, particularly for those just older than 75 years of age, without any consideration of their income.

More generally, the draft updated NECP provides a **good overview of the policies and measures** currently in place to protect and support both vulnerable consumers and energy-poor households, namely policies aimed at reducing household energy expenses (e.g., through bonuses or social tariffs). Italy's bonus-disbursement mechanism is based on the interoperability of databases, which has enabled the identification of more eligible families and led to a significant increase in bonuses disbursed (beneficiaries have risen from 800,000 to 2.5 million). The draft updated NECP also mentions: (i) financial assistance in the form of subsidies provided to households in Italy with low incomes; and (ii) the establishment, starting in 2024, of a dedicated electricity/gas supply plan for vulnerable

customers the pricing of which would reflect wholesale-market energy costs. This would be part of the transition away from regulated prices for household customers.

On the issue of **interaction with the energy-efficiency dimension**, although the draft updated NECP mentions specific energy-efficiency measures targeting energy poverty (such as the tax deduction system supporting building renovations) these do not, so far, provide preferential aid-intensity for vulnerable households. Nevertheless, the draft updated NECP indicates that Italy plans a reform of the tax deduction system to better support energy efficiency in vulnerable households.

3.5 Research, innovation, competitiveness, and skills dimension

3.5.1 Research and innovation

Italy's draft updated plan includes national objectives for R&I in clean-energy technologies in the short (2024), medium (2025-2030) and long term (2050). However, these objectives are set out in qualitative terms only (e.g., in terms of priority technology areas). To identify the priority areas and further develop these objectives for both the short and long term, Italy has taken the work of the strategic energy technology plan (SET plan) into consideration and aims to facilitate the participation of Italian industry and research centres in future research programmes under the SET plan, Horizon Europe, and Mission Innovation.

Public research in the Italian energy sector is implemented through three main programmes/initiatives: electrical system research, the Italian Mission Innovation programme; and research on hydrogen under the national RRP. In its draft updated NECP, Italy stated that it plans to focus most of its future R&I funding on achieving its targets for the energy transition and renewable energy, for instance through wind and power systems, hydrogen technologies, wave power, and biogases.

However, the draft updated NECP has not translated these objectives into quantitative targets for 2030 and 2050, for instance in the form of concrete annual spending allocations for R&I related to clean-energy and climate technologies. The draft updated NECP also fails to provide a spending target for medium-to-long-term overall R&I funding (e.g., on estimated expenditure after the 2022-2024 plan for electrical system research) or detailed by priority area.

There is already good cross-border cooperation taking place between Italy and other EU Member States, and there is significant potential for building further on this cooperation, for example in carbon capture and storage R&I based on the Ravenna project². Italy is present in 10 implementation working groups (IWGs) under the SET plan and is an active member of the SET plan steering group. The country also plans to participate in the future SET plan IWG on hydrogen. Italy has collaborated with other Member States, often resulting in joint participation in Horizon projects such as the Clean Energy Transition Partnership, Driving Urban Transitions Partnership, and Clean Hydrogen Partnership, as well as the Mission Innovation initiative. The NECP does not elaborate on future-oriented objectives for regional cooperation.

In the field of nuclear energy, Italian research organisations and industrial entities are involved in several collaborative projects and initiatives, including under the Euratom research programme, the SET plan, and EUROfusion. Italian research organisations and universities are also working closely with other EU and international partners to develop advanced nuclear technologies and concepts such as small modular reactors and Generation-IV reactors.

The draft updated NECP explains that carbon capture and utilisation and storage (CCUS) technologies will be a priority for Italian R&I. The first CCUS offshore plant is about to start operations in Ravenna. Based on its performance, Italy plans to set clearer targets and long-term strategies for CCUS. The plan further details the potential for regional cooperation in R&I on CCUS through important projects of common European interest with France and Greece as part of the TEN-E Regulation.

3.5.2 Competitiveness

Italy states in its draft updated NECP that the current innovation framework for low-carbon technologies points to a substantial industrial *de-specialisation* in terms of technologies such as solar PV, wind, batteries/storage, hydrogen, nuclear and carbon capture and storage. The exception seems to be solar, thermal, geothermal and wave energy. Italy's draft updated NECP identifies that the fragmentation of actions and lack of coordination between research institutions and industry in the country are obstacles to innovation. The situation could lead to technological dependence and growing trade deficits in high-tech products. Italy's objective and ambition is to: promote Italian specialisation in strategic decarbonisation technologies; increase its investments in R&I in manufacturing processes; and promote the local clean-energy production chain.

Italy intends to set more competitiveness targets based on the Net Zero Industry Act²⁴. However, the plan does not provide enough information the investments needed for the manufacturing of key components and equipment for net zero technologies and how to ensure the resilience of supply chains of key net-zero equipment and component to reach its climate and energy targets.

The draft updated NECP also includes national competitiveness objectives and plans for specific Italian industrial sectors to expand into foreign markets, namely geothermal energy, and infrastructure for the production and use of renewable hydrogen and other renewable gases. In the medium-term, in addition to R&I activities, the draft updated NECP refers to a planned focus on introducing new technologies to the economic fabric of the country with the help of emerging actors in the energy landscape, such as living labs and start-ups.

The draft updated NECP has put in place measures aimed at facilitating companies' access to credit and increasing the competitiveness of the industrial production system, namely by supporting investments to purchase or lease machinery, equipment, plant, software, and digital technologies. The draft updated NECP refers to a 'New Sabatini' measure aimed at promoting these investments, but the plan does not provide sufficient information on its future implementation. Similarly, for the tax-credit measure included in Italy's 'National Industry 4.0' plan, the draft updated NECP provides limited information on Italy's post-2025 budget. In terms of access to finance for start-ups, scale ups, and innovative SMEs, the draft updated NECP acknowledges the lack of a mature venture-capital market in the country. However, it does not specify any timeline or specific targets and measures to tackle bottlenecks in finance for businesses.

The draft updated NECP discusses environmental sustainability, recyclability and circularity, the need to reduce dependency and effectively diversify the sourcing of imported raw materials and components required to manufacture clean energy

²⁴ COM(2023) 161 - Proposal for a regulation of the European Parliament and of the Council on establishing a framework of measures for strengthening Europe's net-zero technology products manufacturing ecosystem (Net Zero Industry Act).

technologies. However, it includes only limited information on Italian R&I activities in the field of energy materials planned for the period after 2022-2024 plan for electrical system research.

The draft updated NECP mentions a plan for cyber research in the electricity sector to foster innovation in energy infrastructure. However, the draft updated NECP provides limited information on dedicated expenditure necessary to achieve these measures. Nevertheless, Italy's draft updated NECP provides information related to the EU action plan on digitalising the energy system to make its energy system more digital. This information includes measures in Italy's national energy research programming for the period up to 2030 to promote developments such as: a 'smarter' electricity grid; the 'digital twin'; and big data for electricity storage and cybersecurity. For instance, under the country's national research programme for innovation and competitiveness for the green and digital transition 2021-2027⁴, Italy has earmarked a budget of EUR 800 million: to increase the electricity grid's capacity to absorb a growing share of renewable energy; and for the smart transformation of electricity transmission and distribution networks.

3.5.3 Skills

The draft updated NECP acknowledges the issue of skills shortages for the energy and digital transition but does not set out clear and quantifiable objectives. On the hydrogen and circular economy, the mentions some actions that aim to improve skills and create new jobs. However, it does not include measures and investments to address the identified gaps to boost European competitiveness in clean energy technologies, equipment, and components, connecting, for instance, with the SET Plan revision, relevant European Year of Skills initiatives, the Pact for Skills large scale partnerships, and the new innovation agenda.

4 JUST TRANSITION

The draft updated NECP only partially addresses just transition aspects. It provides some analysis of the employment and skills impacts of the energy and climate transition in the context of work done by the *National Institute for the Analysis of Public Policies* on future skills and occupations and the link with vocational education training system. Also, it presents impact on employment up to 2030 due to the decarbonisation of the electricity sector. However, social impacts including distributional ones on vulnerable groups are not addressed. Similarly, the draft updated NECP does not provide sufficient information for the preparation of the Social Climate Plan, as assessed in Section 7.

Measures supporting access and preservation of quality employment during the transition are not included in the draft updated NECP, while access to quality, affordable and inclusive education, training, and life-long learning is mentioned, but only in the context of measures financed by the Just Transition Fund. Given that the coal phase-out timeline in Sulcis will be postponed by three years (from 2025 to 2028) it is not clear how this will impact the remaining actions planned in the Territorial Just Transition Plan (TJTP).

As assessed in Section 3, the draft updated NECP includes a range of social measures to support, amongst others, energy communities, social housing, tax-benefit system as well as provision of advice, technical assistance, and information campaigns for consumers. It includes specific references to the most vulnerable households and incentives to increase

their energy efficiency. Incentives for the use of sustainable transport are also included but are not very targeted.

Finally, the draft updated NECP does not elaborate on the resources specifically devoted to supporting the just transition except that it mentions the Just Transition Fund and that up to a maximum of EUR 20 million per year shall be allocated between 2020 and 2024 to the ‘Fund for the conversion of jobs in areas where coal-fired power plants are located’ from ETS revenues.

5 REGIONAL COOPERATION

The draft updated NECP recognises the strategic importance of regional cooperation, especially in the context of the recent energy crisis. The plan especially focuses on regional consultation and coordination in energy security, with particular focus on the Mediterranean area. On energy security, Italy has already signed one solidarity agreement for the security of gas supply with Slovenia (the remaining ones are with Austria, Germany, Greece and Croatia). In a similar vein, the NECP also states that Italy is currently in negotiations with Austria, Greece, France, and Switzerland on measures of last resort that a state crisis can implement.

The draft updated NECP emphasizes the relevance of regional collaboration on a number of projects: the Hydrogen Italian Backbone to transport hydrogen produced in the northern African countries to Italy and further to northern and central-eastern Europe; the submarine power lines with countries, such as the ELMED project, or cross-border electricity interconnectors with Austria (Würmlach-Somplago; Lienz-Veneto region); the joint carbon capture and storage infrastructures with France and Greece; the ongoing discussions on the diversification of gas supplies within the East Mediterranean Gas Forum; and co-operation on offshore renewables with Greece, Spain, France, Croatia and Slovenia.

The draft updated NECP does not discuss Italy’s participation in measures or initiatives under some of the available cooperation mechanisms in the area of renewables and infrastructure, such as those deriving from regional fora. However, it does set out a solid plan to promote Italy’s diversification and security of energy supply, focusing in particular on extended collaboration with Tunisia, France, Azerbaijan, and Austria. The plan also provides for new internal energy connections within regions, minor islands, and provinces within the country. Importantly, Italy’s draft updated NECP mentions two areas that will be a particular focus for its future work: the resilience of critical transmission infrastructure; and renovation. Both of these areas are especially important given the need to ensure compatibility with hydrogen and other renewable-energy sources.

6 INTERNAL COHERENCE AND POLICY INTERACTIONS WITHIN THE DRAFT UPDATED NECP

The draft updated NECP reflects synergies within and between the five dimensions of the Energy Union, recognising how planned policies and measures address multiple dimensions in parallel. For example, measures addressing the diversification of energy sources are also described as contributing to the deployment of renewable sources and measures related to energy efficiency are directly linked to consumer empowerment and energy poverty. Digitalisation of the energy system is also mentioned as a priority, although not elaborated on in any specific terms. Overall, the plan would still benefit from

a more thorough analysis of consistency, complementarity and synergy of policies and measures in each dimension and between them, possibly with a quantitative analysis of interactions of certain objectives.

7 STRATEGIC ALIGNMENT WITH OTHER PLANNING INSTRUMENTS

Italy formally submitted a modified RRP and REPowerEU chapter on 7 August 2023.

The modified RRP and REPowerEU chapter touch upon 60% of the measures in the existing RRP, including most of the energy-related measures in the draft updated NECP. Moreover, Italy has submitted 22 proposals for investments and 5 proposals for reform of its REPowerEU chapter. The draft updated NECP explicitly mentions the REPowerEU chapter and the amended RRP on several occasions. In particular, the template presented at the end of Italy's draft updated NECP provides further detail on Italy's contribution to the NECP targets²⁵, which is appreciated.

However, the draft updated NECP incorporates only partially the **relevant reforms and investments of the RRP**. It includes 56 out of the 96 climate-relevant measures in Italy's RRP (of the 96 climate-relevant measures, 42 have 40% climate tracking, and 54 have 100% climate tracking), covering 74 RRP investments. This is the case, for example, for a higher and streamlined deployment of renewables pursued in the RRP through simplification of permitting procedures and through investments into a stronger grid, as well as the development of new technological infrastructures and digital services. Overall, 18 measures out of those that are 100%-climate tagged are not fully reflected in the NECP.

In addition, some of the measures that are reflected lack the necessary granularity and detail to allow a full comparison with those in the RRP. This is for instance the case for Investment 5.3 in Mission 2 Component 2, where the NECP no longer makes explicit reference to electric buses as is the case in the RRP, but instead refers more generally to the need to improve electric public vehicles. Moreover, the draft updated NECP does not provide evidence on the milestones that are most relevant to deliver on the RRP investment of EUR 14 billion to support the Superbonus 110% housing tax reduction. The NECP informs that the Superbonus per se has been prolonged until 2025, foreseeing a tax deduction deferred by 4 years and with decreasing instalments (110%, 90%, 70% and 65%). However, it does not provide any reference to the funding sources covering the extension of such scheme.

Compared to the RRP, the NECP also lacks ambition in railway transport, as it does not provide specific details on modal shifting, electrification of railway routes, or strengthening specific routes. Furthermore, while the RRP includes measures supporting innovative technologies in agro-industrial production, zero-emission transport solutions, and waste reduction in the agri-food sector, the NECP does not cover them adequately.

In terms of coherence with **national air pollution control programme**, the draft updated NECP does mention some policies and measures to address air pollutant emissions in the heating, transport and agricultural sector. The plan refers notably to emissions from biomass residential heat generation, and to measures to promote more efficient installations (including the replacement of old ones). However, other elements related to air quality are missing, and so is the assessment of the impacts of planned policies and

²⁵ A table (pages 386)

measures on projected emissions of the main air pollutants regulated under Directive 2016/2284²⁶.

The draft updated NECP is also only partially consistent with the adopted **Territorial Just Transition Plans** and demonstrates a backtracking on the coal phase-out compared to the previous NECP. The closure of the Sulcis coal power plants in Sardinia is postponed from the end 2025, as also originally planned, to the end of 2028, mostly due to the absence of enabling infrastructure such as local storage and transmission links with the rest of the country. This may have a particular impact on the implementation of the Just Transition Fund since the phase-out of the Sulcis coal power plant might not be completed by the end of eligibility period of the Just Transition Fund.

The draft updated NECP provides inadequate analytical basis for the preparation of the **Social Climate Plan** that will address the impacts of the new emissions trading system for fuel combustion in buildings, road transport and additional sectors (ETS2) on vulnerable households, transport users and micro enterprises. The draft NECP contains a section dedicated to the Social Climate Fund (SCF); however, it contains no information on the methodology to estimate the impacts of the new ETS2 on vulnerable groups, the methodology and indicators to identify future beneficiaries of the SCF, or the assessment of the number of households in transport poverty. Although the plan contains several measures that would be, in principle, eligible under the SCF, such as energy efficiency schemes or soft mobility measures, no explicit link is made with the social climate plan. Thus, the current draft does not explain how the social climate plan will build on the NECP update and how consistency between the two plans will be ensured.

In the draft updated plan, Italy. does not provide the quantification of the climate impacts of measures currently included in the **CAP Strategic Plan** (CSP), thus the plan does not explain whether the CSP is in line with the new LULUCF and ESR targets and whether additional measures are necessary.

Compared to the current National Adaptation Strategy, the plan is less detailed and less ambitious on the respective actions in the climate mitigation and energy sectors. The consistency with other relevant sectorial plans and policies is hardly addressed, such as those under the water acquis and more generally under the zero-pollution header (except for air pollution).

In the draft updated NECP, Italy addresses the 2022 and 2023 country-specific recommendations to enhance diversification and reduce their dependency on fossil fuels by taking specific actions such as shortening and simplifying permitting procedures to accelerate the deployment of renewables and pursuing efforts on energy efficiency including on manufacturing processes and decarbonisation of industry. However, the NECP fails to sufficiently address the elimination of environmental harmful subsidies, including those for fossil fuels, which are also subject to country-specific recommendations in 2022 and 2023.

²⁶ Directive 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants.

8 FINANCING THE ENERGY AND CLIMATE TRANSITIONS

8.1 Investment needs

The draft updated NECP includes quantified information on the expected investment necessary to implement Italy's updated planned policies and measures, focusing mainly on the national energy system, renewable energies, distribution networks, the national transmission network, and the energy storage systems. Investment needs for energy efficiency measures are not always quantified. Overall, the plan estimates that, for the period 2023-2030, around EUR 217 billion of additional cumulative investments are needed in the WEM scenario, amounting to a 36% increase in the time frame taken into consideration. This estimate does not include transport infrastructure, nor policies for GHG emission reduction in other sectors. Moreover, no estimates are provided for the WAM scenario in the draft updated NECP. The quantitative analysis has been carried out using a top-down model, which does not provide information about the underlying policies and measures.

8.2 Funding sources

The draft updated NECP occasionally outlines the main sources of financing that Italy will use to implement its planned key policies and measures. However, this is not done in a consistent way for all measures. There is also no consolidated overview at NECP level. It is therefore not possible to identify potential gaps in terms of funding. The draft updated NECP also fails to distinguish between public and private sources of funding and fails to specify the lifetime of the measure or the share of funding for the measure that will come from the EU budget by explicitly specifying the RRF contribution.

The draft updated NECP refers to innovative financing schemes, such as competitive bidding and contracts for difference for renewable energy. Nevertheless, the type of support schemes that will be applied is specified only for some of the measures and not across the whole spectrum. The draft updated NECP recognises the relevance of green bonds (both private and public) and of guarantee schemes for sustainable investments, e.g., in the circular economy. Nonetheless, it does not provide information on how Italy will use these instruments in practice, nor on how they will affect the public budget.

9 ROBUSTNESS OF THE ANALYTICAL BASIS OF THE DRAFT UPDATED NECP

While the draft updated NECP is based on a complete quantitative analysis, the methodologies used for both projections (WEM and WAM) and the impact assessment of specific policies and measures are not fully explained and referenced. For instance, no full description of parameterisation for the WEM and WAM scenario is provided, and data sources are not always documented. Nevertheless, a description is provided of both WEM and WAM scenarios, with detailed projections on emissions and primary energy consumption for relevant sectors of the economy (as energy, transport, agriculture, industry). The projections cover the period until 2040. The sources of large part of the analysis are ISPRA, Gestore dei Mercati Energetici and Ricerca sul Sistema Energetico, but no details on the type of model used is provided. The WEM scenario is based on the parameters recommended by the Commission, but there are some discrepancies, e.g., on GDP levels.

The WEM projection covers the five dimensions of the Energy Union, with most of the required variables present and well documented. The WAM scenario includes the policies and measures introduced in the NECP, with an assessment of the impact of these policies and measures on the energy system, greenhouse gas emissions and macroeconomic parameters, including social aspects. The new ETS for buildings, road transport and additional sectors (ETS 2) has not been considered in projection scenarios.

The draft updated NECP contains a **macro-economic assessment**, that is not developed enough. In particular, the impact assessment is based on a static input-output model that only captures the impact of larger investment, which boosts GDP and employment. These types of models assume fixed technical relationships, prices, and wages over time, making them less suitable for assessing important feedback effects in the economy, such as those on consumption and government budgetary items. In this context, the accuracy of the projections decreases with the length of the period considered, as the structure of the economy evolves in response to the policy. No sensitivity analysis or alternative scenarios are presented to gauge the plausibility of the projections. Moreover, there is no discussion of the welfare costs, e.g., in terms of lower consumption to achieve this transition. Finally, there is no assessment of the impact on public budget, and it is not clear how public spending would be financed. Projections are not presented in a transparent way as the assumptions used for the analysis are not clearly documented.