

Italy and Norway: Perspectives for a Further Energy Cooperation

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ABSTRACT

Italy is one of the largest energy consuming countries in the EU. It is characterised by high overdependence on energy imports, especially natural gas, which plays a pivotal role in the domestic energy mix. The energy price spike brought about by the post-Covid recovery and Russia's war on Ukraine has highlighted the urgency to decarbonise the energy sector also by using the financial resources of the National Recovery and Resilience Plan. Italy could pursue further cooperation with Norway in spite of the geographical distance and limited physical energy interconnections. In fact, Italy and Norway could work on several issues related to the energy transition such as the role of (decarbonised) gas, CCS technology and SS-LNG, given the common expertise and interests in the energy sector. Furthermore, they could enhance cooperation on the European industrial policy and the Mediterranean area.

Italy | Energy | Natural gas | Pipelines | European Union | Norway

keywords

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Introduction

Italy is the third-largest energy consumer in the European Union following Germany and France. In 2019, Italy's gross inland consumption was 155.43 million tonnes of oil equivalent (Mtoe). Today, Italy's energy system is dominated by fossil fuels, with natural gas accounting for 42 per cent of total energy supply, oil for 33 per cent, coal for 3.74 per cent (2021 data). Italy is a net energy importer, producing a limited amount of oil and natural gas. Therefore, the country has built a well-diversified energy infrastructure in order to receive adequate volumes of fossil fuels from multiple suppliers. The energy transition will thus be instrumental also in enhancing Italy's energy security.

Over the past decades, Italy has adhered to the EU's growing climate ambitions and published several strategies that outline the pathways to reach climate and energy targets in line with the EU's ones. In December 2019, Italy approved its National Energy and Climate Plan (NECP). In this official document, Italy affirms that it aims at increasing its renewable generation capacity to 96 GW by 2030.¹ In January 2021, the Ministry of the Environment published the Italian Long-Term Strategy on the Reduction of Greenhouse Gas Emissions.² In 2022, Italy also adopted and approved the Ecological Transition Plan (EPT), which aims to draw the future trajectory for

¹ Italian Ministry of Economic Development, *Integrated National Energy and Climate Plan*, December 2019, https://energy.ec.europa.eu/system/files/2020-02/it_final_necp_main_en_0.pdf. For the draft updated plan, see: Italian Ministry of Environment and Energy Security, *Piano nazionale integrato per l'energia e il clima*, June 2023, https://commission.europa.eu/publications/italy-draft-updated-necp-2021-2030_en.

² Italy, *Long-Term Strategy on the Reduction of Greenhouse Gas Emissions. Executive Summary*, January 2021, https://ec.europa.eu/clima/sites/its/its_it_sum_en.pdf.

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an ecological transition in Italy up to 2050.³

To actually achieve its climate and energy targets, Italy will need to increase drastically its annual investments on clean energy technology. On this matter, the economic recovery and the vast investment plan made possible by the NextGenerationEU fund provide the opportunity to deliver climate and energy transition. The institutional framework has also adapted to better address and achieve climate, energy transition and economic recovery. While Italy has increasingly enhanced its climate targets, it also faces challenges (e.g. long permitting procedures and social opposition) that hinder a faster development of clean energy technologies and related infrastructure.

In light of its energy security concerns and climate ambitions, Italy can benefit from cooperating with other countries. In this sense, Italy can enhance energy cooperation with Norway despite the geographical distance and poor physical interconnections. The two countries could cooperate on a series of energy issues aimed at ensuring energy security and decarbonisation both at the bilateral and European level.

1. Overdependence on fossil fuels and imports

Today, Italy is heavily reliant on fossil fuels and imports. Natural gas plays an important role in Italy's energy system. The country is one of the largest gas consumers in the EU and in the Mediterranean area, accounting for 15 per cent of European natural gas demand. Today, 50 per cent of Italy's power generation is produced by gas power plants (compared to 37 per cent in 2000). Its gas consumption hovered between 70–80 billion cubic metres (bcm) over the 2000–2021 period, but the country experienced a chronic reduction of its domestic production from 17 bcm in 2000 to just 3 bcm in 2021. This downward trend has aggravated the Italian reliance on gas imports (93 per cent) to meet its consumption needs. Italy has built several import infrastructures, mainly gas pipelines from Russia, Algeria, Northern Europe, then Libya and more recently Azerbaijan. Italy has also built three liquefied natural gas (LNG) facilities throughout the years.⁴ In 2021, Italy imported 29 bcm from Russia, 22.5 bcm from Algeria, 7.2 bcm from Azerbaijan, 6.8 bcm from Qatar, 3.2 bcm from Libya and 1.9 bcm from Norway.⁵

³ Italian Government - Department for Planning and Coordination of Economic Policy, *Il Comitato interministeriale per la transizione ecologica (CITE) ha approvato la delibera n. 1 del 2022*, 8 March 2022, <https://www.programmazioneeconomica.gov.it/?p=52515>.

⁴ Pier Paolo Raimondi, *Natural Gas in Italy: Features and Perspectives in Light of Russia's War in Ukraine*, Rome, IAI, September 2022, <https://www.iai.it/en/node/15987>.

⁵ Italian Ministry of Environment and Energy Security-Department of Energy and Climate, *Natural Gas Imports by Country 1990-2021*, https://dgsaie.mise.gov.it/gas_naturale_importazioni.php?lang=en_US.

Russia's war in Ukraine has drastically changed the energy and political paradigm in Europe. In response to the crisis, the EU has launched its REPowerEU Plan that aims at enhancing energy security through diversification and accelerating decarbonisation. The renewed focus on energy security undermined climate policies, especially in the short term, as governments evaluated emergency measures to prevent energy disruptions and protect consumers from high energy prices. For example, the Italian government decided to rely more on coal-fired power plants, which were expected to be closed by 2025, in order to offset potential supply disruptions from Russia and high prices.

At the beginning of the crisis, Italy found itself in a vulnerable position due to its overdependence on (Russian) gas and the Ukrainian gas corridor. Therefore, Italy has been working to ensure adequate supply combining immediate and new alternatives. To increase diversification and energy security, the Italian government led by former Prime Minister Mario Draghi announced its intention to increase gas imports both via pipeline and LNG. So far, Italy has focused its efforts mainly southward (i.e. North Africa and Africa) given its good and long-lasting energy and political relations with key hydrocarbon producers. Italy has strived to maximise the use of the existing energy import infrastructure, which currently have some spare capacity. Moreover, the government announced the intention to increase LNG imports thanks to two floating storage and regasification units (FSRUs). In March 2022, Snam was granted the mandate to buy the two FSRUs. The company bought the Golar Tundra terminal for 350 million US dollars in June 2022⁶ and another one⁷ in July 2022. Both of them have about 5 bcm/y of regasification capacity.

The reconfiguration of energy flows presents opportunities for Italy. Given its geographical position and its good relations with Mediterranean and African producers, Italy may become an energy hub between Mediterranean and African energy producers and European importers. This would position Italy at the top of the supply chain compared to before. In fall 2023, the newly elected Italian government of Prime Minister Giorgia Meloni announced a plan, the so-called "Mattei Plan", to enhance its position in the regional energy market. In order to become an energy hub, Italy will need to expand its domestic infrastructure (e.g., South-North gas pipeline) and international interconnections. The plan, which

⁶ The Golar Tundra is expected to start operations during the spring of 2023 after the regulatory and authorisation process. See Snam, *Snam Purchases 5 Billion Cubic Metre Floating LNG Regasification Terminal from Golar LNG for US\$ 350 Million*, 1 June 2022, [https://www.snam.it/en/media/news-and-press-releases/comunicati-stampa/2022/snam-purchases-5-billion-cubic-metre-floating-lng-regasification-terminal-from-golar-lng-for-us\\$-350-million.html](https://www.snam.it/en/media/news-and-press-releases/comunicati-stampa/2022/snam-purchases-5-billion-cubic-metre-floating-lng-regasification-terminal-from-golar-lng-for-us$-350-million.html).

⁷ BW Singapore, with a regasification capacity of about 5 bcm/y, which will be deployed in the upper Adriatic Sea, close to the coast of Ravenna. The Italian TSO company affirmed that operations are scheduled to commence in the third quarter of 2024. See Snam, *Snam Purchases New Floating Regasification Unit from BW LNG to Contribute to Italy's Energy Security and Diversification*, 6 July 2022, <https://www.snam.it/en/media/news-and-press-releases/comunicati-stampa/2022/snam-purchases-new-floating-regasification-unit-from-bw-lng-to-contribute-to-italy-s-energy-security-and-diversification.html>.

has not yet been published, will need to take into account future gas demand both in the country and in European countries.

The spike in energy prices exacerbated by Russia's war in Ukraine has forced the government to devote large amount of public spending to reduce the burden of high energy bills on industry and families. It is estimated that about 2.1 million household suffered energy poverty. Since September 2021, Rome has allocated 92.7 billion euro, equal almost to 5.2 per cent of GDP, to keep consumer power bills down.⁸ These measures were instrumental to overcome the 2021–22 increase of energy prices, but they have put a heavy burden on the fiscal budget, which makes replicating them in case of future price spikes almost impossible due to limited fiscal space. Furthermore, the government did not focus its efforts on selected groups of households and industry but rather it provided untargeted measures. Thus, the government will need to better target relief measures only to vulnerable groups in the future to streamline resources and avoid negative effects (higher energy demand, regressive economic consequences).

Italy has been a strong advocate for a price cap to offset rising gas prices and reduce inflation growth. Lengthy and harsh discussions took place at the European level as member states disagreed on the potential risks of supply availability of such market intervention. One of the strongest promoters of such measure was former Prime Minister Draghi and the Meloni government continued to support it. Ultimately, member states managed to reach an agreement in December 2022 on a price mechanism to limit extreme gas price peaks while ensuring security of supply and market stability in the EU. The mechanism came into effect in February 2023. To be activated, the mechanism requires the Title Transfer Facility (TTF)⁹ month-ahead price to exceed 180 euro/MWh for three working days and the month-ahead TTF price to be 35 euro/MWh higher than a global LNG reference price at the same time. The mechanism has not been used so far as gas prices have dropped drastically since February, returning to pre-crisis levels.

In light of the energy crisis and Russia's war in Ukraine, energy security and energy prices have regained a newfound political relevance. Governments have taken several measures to address these issues. While there were concerns that certain policy responses could undermine energy transition and decarbonisation pathways, decarbonisation policies have started to be considered also instrumental for enhancing energy security. Indeed, increasing the deployment of clean energy technologies will result in reducing fossil fuels imports. This is particularly true for Italy given its high import dependencies.

⁸ Giovanni Sgaravatti, Simone Tagliapietra and Cecilia Trasi, "The Fiscal Side of Europe's Energy Crisis: The Facts, Problems and Prospects", in *Bruegel Blog*, 2 March 2023, <https://www.bruegel.org/node/8785>.

⁹ The TTF is the main reference virtual market for gas trading in Europe. It is based in Amsterdam, The Netherlands.

2. The Italian energy transition: Targets and challenges

The main strategic document that outlines the Italian energy targets is the aforementioned National Energy and Climate Plan, which defines 2030 targets for greenhouse gas (GHG) emissions, renewable energy and energy efficiency. The NECP sets a share of 30 per cent of renewable energy sources (RES) in final energy consumption, including 55 per cent in electricity, 22 per cent in transport and 33.9 per cent in heat consumption. Installed solar photovoltaic (PV) and wind capacity would need to more than double between 2020 and 2030 under the NECP scenario. Italy would have to install 31 GW of PV and 8 GW of wind. It would need to increase renewable capacity by nearly 4 GW per year on average between 2020 and 2030. Furthermore, the NECP was approved in 2019, hence Italy needs to update it to align it with the targets – Fit for 55 (FF55) package and the REPowerEU Plan – set by the Commission over the past two years. According to the government, to achieve the more ambitious targets of the FF55 package, Italy will need to install 58 GW of additional renewable capacity by 2030, of which three-quarters would be PV. This will translate to an even faster annual average growth of 5 GW. Former Minister of Energy Transition Roberto Cingolani stated that the new NECP would envisage 114 GW of production capacity from RES (vs. 55 GW in 2020). Under the new NECP, 27 GW would be dispatchable and 87 GW from non-dispatchable energy (table 1).

Table 1 | Italy's current renewables electricity capacity and 2030 indicative targets

| RES capacity (GW) | 2022 status | 2030 NECP targets | 2030 FF55 target (provisional) | New NECP |
|-----------------------------|-------------|-------------------|--------------------------------|-----------------------------|
| Variable sources | 35.9 | 71 | 87 | 107.2 |
| PV | 24.2 | 52 | 64 | 79.1 ^(a) |
| Wind | 11.7 | 19 | 23 | 28.1 ^(b) |
| Non-variable sources | 27.4 | 24 | 27 | 23.1 |
| Hydro | 22.8 | 19 | | 19.1 |
| Other | 4.6 | 5 | | 4 |
| Total | 63.3 | 95 | 114 | 131.2 ^(c) |

Source: International Energy Agency (IEA), *Italy 2023 Energy Policy Review*, May 2023, p. 88, <https://www.iea.org/reports/italy-2023>; Italian Ministry of Environment and Energy Security, *Piano nazionale integrato per l'energia e il clima*, cit., p. 77.

Notes: (a) plus 0.8 of concentrated solar power (CSP); (b) of which 2.1 from offshore; (c) the total of the new NECP includes also CSP.

In July 2023, the Italian government submitted the draft of the new NECP, which set a share of 40 per cent for renewables in the total final consumption. The renewable share climbs up to 65 per cent of final electricity consumption. The updated version of Italy's NECP should be approved by June 2024.¹⁰ In 2017, Italy

¹⁰ Gilberto Pichetto Fratin, "Decarbonizzare è l'unica via per un futuro vivibile", in *La Repubblica*, 1 June 2023, <https://www.repubblica.it/green-and-blue/dossier/festival-greenandblue-2023/2023/06/01/>

with long and complex permitting procedures and increasing local opposition resulting in only 6 GW of new capacity. The slowdown led to the average yearly addition of 1.2 GW between 2015 and 2020, which is well below the required 4 GW by the NECP.

Some simplification measures resulted in a slight increase in installed renewable capacity in late 2021 and 2022. In 2022, Italy installed around 3 GW of renewable capacity (2.5 GW of solar PV and 526 MW of wind) recording a strong increase compared to the previous years.¹² Still, the country is far below the annual installed capacity required to reach its 2030 targets. To overcome regulatory barriers, Italy has implemented several decrees (*Semplificazioni*, *Semplificazioni bis*, *Energia*). Yet, the country lacked a systemic approach to the issue, with the risk of not tackling some major issues.¹³ The Draghi government introduced additional measures through an ad hoc decree (law decree 199/2021), which implements Directive 2018/2001. However, the fall of the government leaves some uncertainty over implementation acts.¹⁴ The new government has prioritised energy security and affordability over climate transition.

The fundamental overhaul of the energy system will need to be coupled with the decarbonisation of the industrial sector, which is responsible for around 20 per cent of Italy's total CO₂ emissions. The country is particularly endowed with the so-called "hard-to-abate" industries (i.e. cement, steel, glass, ceramic) – especially in the north-eastern part of the country. Since electrification faces significant challenges in these sectors, it will be necessary to deploy and use other technological solutions, such as hydrogen and carbon capture and storage (CCS).

Hydrogen – targets and external dimension: Developing hydrogen has become one of Italy's energy priorities. The Ministry for the Economic Development issued the preliminary guidelines for a national hydrogen strategy, which was expected to be finalised in 2021 but it was delayed. Within the guidelines, Italy set the objective of covering 2 per cent of the final energy consumption with hydrogen by 2030¹⁵ and up to 20 per cent by 2050. These figures would be achieved by 5 GW of electrolyser capacity. However, there is some uncertainty whether this share will be reached only by green hydrogen (produced by renewables) or if there would be a contribution of blue hydrogen (produced by natural gas coupled with CCS). The guidelines consider the possibility to develop "hydrogen valleys" where hydrogen can be produced and consumed in order to foster hydrogen penetration.

¹² For example, Italy installed less than 2 GW of wind and 3 GW of solar between 2015 and 2020.

¹³ Energy & Strategy Group, *Renewable Energy Report 2022*, May 2022, <https://cdn.motor1.com/pdf-files/rer22.pdf>.

¹⁴ Luca Fraioli, "Con la crisi di governo rischio stop ai fondi per l'ambiente", in *Repubblica*, 25 July 2022, https://www.repubblica.it/green-and-blue/2022/07/25/news/crisi_governo_politiche_ambientali-359125650.

¹⁵ Italian Ministry of Economic Development, *Strategia nazionale idrogeno. Linee guida preliminari*, November 2020, https://www.mimit.gov.it/images/stories/documenti/Strategia_Nazionale_Idrogeno_Linee_guida_preliminari_nov20.pdf.

The government plans up to 10 billion euro in investments between 2020 and 2030 dedicated to production (5–8 billion), distribution infrastructure (2–3 billion) and R&D (1 billion). Moreover, the government will need to add additional investments for dedicated RES capacity – especially if hydrogen will be entirely delivered through electrolysis. While awaiting the official hydrogen strategy and the consequent investment plan, Italy decided to allocate 3.6 billion euro to hydrogen within its NRRP. The amount will be divided in 2 billion for hydrogen in hard-to-abate sectors (especially road transport and rails), 0.5 billion for hydrogen production, and 0.16 for R&D. These figures are significantly lower vis-à-vis its European peers (France and Germany), which intend to allocate 8.2 and 10.3 billion euro for this decade, respectively.

Hydrogen fits also well in Italy's ambition to become an energy hub as the country could import cheap hydrogen from Southern Mediterranean countries. The Italian plan to import hydrogen from North African countries is in line with the European Hydrogen Strategy, the EU external energy strategy and the recent REPowerEU targets. The REPowerEU Plan has indeed set a target of 10 Mt of renewable hydrogen imports by 2030 as Europe is set to become a key player in the hydrogen trade due to its limited domestic constraints. According to the latest International Renewable Energy Agency (IRENA) report, of the hydrogen that will be internationally traded in 2050, around 55 per cent will travel by pipeline. This pipeline-enabled trade will be concentrated in Europe (85 per cent).¹⁶ North African countries could become important hydrogen suppliers because they are among the least-expensive producing regions.

In May 2023, the ministries for energy of Italy, Austria and Germany signed a joint letter of political support for the development of a "southern hydrogen (SouthH2) corridor" and for the respective infrastructure projects to obtain the status of Project of Common Interest (PCI) by the EU. Snam has formed a partnership with its Austrian and German counterparts to develop the SouthH2 Corridor, which consists of a hydrogen-ready pipeline corridor connecting North Africa to central Europe. The Corridor's potential capacity is of 4 Mt/year, which would cover 40 per cent of REPowerEU's import target for renewable hydrogen.¹⁷ This project is expected to be fully operation by 2030. To reduce the investment costs, 70 per cent of the project is set to use repurposed gas assets.

Connecting Northern African hydrogen supply with high demand regions in Europe, especially in Central Europe, has provides advantages both politically

¹⁶ International Renewable Energy Agency (IRENA), *Global Hydrogen Trade to Meet the 1.5°C Climate Goal. Part I: Trade Outlook for 2050 and Way Forward*, Abu Dhabi, IRENA, July 2022, p. 7, <https://irena.org/publications/2022/Jul/Global-Hydrogen-Trade-Outlook>.

¹⁷ Irina Breilean, "SouthH2-Corridor Could Ease European Hydrogen Supply Tightness As Pipeline Moves Forward", in *ICIS News*, 9 May 2023, <https://www.icis.com/explore/resources/news/2023/05/09/10883496/south2-corridor-could-ease-european-hydrogen-supply-tightness-as-pipeline-moves-forward>.

and economically. Politically, it would provide alternative income source to hydrocarbon producing countries, contributing to their domestic decarbonisation and forging a new Euro-Mediterranean partnership in line with the Green Deal. Economically, producing and importing green hydrogen from North Africa would mean exploiting fully the cost advantage of solar production and land availability in the Southern Mediterranean. According to Snam, this option could reduce the cost of supply by 10–15 per cent with respect to national production.¹⁸ Therefore, Italy has worked with producing countries to develop hydrogen as part of its security and diversification strategy following Russia's war in Ukraine. In May 2022, Algeria's Sonatrach and Italy's Eni signed a memorandum of understanding to boost the development of gas fields and decarbonisation through green hydrogen.¹⁹

Italy shows both strengths and weaknesses to emerge as the transit hub for European decarbonised imports. Surely, its vast gas network (32,700 km) and existing interconnections with several foreign networks make it a credible candidate to become the bridge between the Mediterranean shores. The main goal here for Italy would be to repurpose most of the existing infrastructure to foster trade in and demand for hydrogen, while creating in parallel new dedicated infrastructure. For example, the TransMed pipeline from Algeria could be adapted to fully transport hydrogen, while new hydrogen pipelines could be built at Passo Gries and Tarvisio, allowing for transit to Austria and the North-West European industrial clusters.²⁰ In late 2021, Snam bought from Eni a 49.9 per cent stake in the TransMed pipeline, which could enable potential development initiatives within the hydrogen value chain from North Africa.²¹ Potentially, Italy could benefit from the EastMed pipeline in the future as it would be built hydrogen-ready.

Despite its infrastructural strengths, Italy's limited storage availability is a barrier to the pursuit of a regional hub status.²² Moreover, Italy suffers from the lack of a European legislation that would set common regulatory and quality standards; otherwise, each country will continue to apply its quality standards and different rules on hydrogen blending levels, risking cross-border flow restrictions and market segmentation.²³

¹⁸ Luca Franza, *Clean Molecules across the Mediterranean*, Rome, IAI, April 2021, <https://www.iai.it/en/node/13116>.

¹⁹ Eni, *New Agreement Reached by Sonatrach and Eni to Accelerate the Development of Gas Projects and Decarbonisation via Green Hydrogen*, 26 May 2022, <https://www.eni.com/en-IT/media/press-release/2022/05/new-agreement-eni-sonatrach-gas-development-green-hydrogen-draghi-tebboune.html>.

²⁰ Marco Giuli, *Italy in the International Hydrogen Economy*, Rome, IAI, February 2022, <https://www.iai.it/en/node/14708>.

²¹ Snam, *Eni and Snam Launch Partnership on Gas Pipelines between Algeria and Italy*, 27 November 2021, <https://www.snam.it/en/media/news-and-press-releases/comunicati-stampa/2021/eni-and-snam-launch-partnership-on-gas-pipelines-between-algeria-and-italy.html>.

²² Marco Giuli, *Italy in the International Hydrogen Economy*, cit.

²³ European Commission, *Proposal for a Directive on Common Rules for the Internal Markets in Renewable and Natural Gases and in Hydrogen* (COM/2021/803), 15 December 2021, <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=celex:52021PC0803>.

European countries will need to cooperate with Southern Mediterranean countries in order to install enough renewable capacity to export green hydrogen. Despite their multiple advantages (high renewable potential, vast land availability and low-density rate, geographical proximity and existing export infrastructure), these countries have generally lagged behind in renewable installation. Market (fossil fuel subsidies), infrastructure (low electricity interconnection), political (regulatory framework) constraints undermine international investments in RES in those countries.

Nonetheless, Italy needs to adopt a clear regulatory framework (e.g. releasing its hydrogen strategy) in order to position itself as a favourable energy cooperation option in the Mediterranean. It faces growing competition from other Mediterranean countries (i.e., Spain and Greece), which seek to gain a leading role in the upcoming hydrogen economy and positioning themselves as major hydrogen hubs.

Carbon capture and storage (CCS): While CCS technology could be useful for decarbonising hard-to-abate sectors, Italy has lagged behind in defining its role in its climate strategy. The 2019 NECP does not include any CCUS plan and envisages a role of natural sinks in absorbing emissions above the 2030 targets. By contrast, the Long-Term Strategy considers CCS a necessary technology to offset emissions for hard-to-abate sectors. The Long-Term Strategy envisages that 20–40 Mt CO₂-eq could be captured via CCS technology in 2050 in particular in industry (energy and non-energy). The role of CCS is also included in the 2023 NECP draft, which is a main new development. Italy presents some natural features that make CCS technologies technically possible, namely depleted offshore oil and gas fields (estimated at around 750 Mt of CO₂). Nonetheless, the role of CCS in Italy has not gained general consensus in the political and social landscape. Local communities have opposed the development of such technologies and its required infrastructures because of safety concerns. Therefore, Italy has not been able to develop the sector as much as other European countries in the North Sea. Another reason for limited developments in CCS in Italy is a lack of strategy and regulatory framework that sustain and encourage investment for the development and deployment of such a technology in Italy. Indeed, the legislation regulating the sector and authorisation procedures dates back to 2011 (law decree 162/2011,²⁴ which implemented Directive 2009/31/CE) and is limited to the experimental phase. So far, the main (and only) project is “Ravenna CCS”, developed by Eni, which aims at exploiting decommissioned offshore gas fields. The project should be one of the world’s largest CCS hubs having an initial storage capacity of 4 Mt/year, to be expanded to 10 Mt/year, for a total storage capacity of 500 Mt CO₂. The first storage is expected in 2026. This would certainly increase the role of the Mediterranean Sea

²⁴ Law Decree No. 162 of 14 September 2011: *Attuazione della direttiva 2009/31/CE in materia di stoccaggio geologico del biossido di carbonio*, <https://www.normattiva.it/uri-res/N2Ls?urn:nir:sta:to:legge:2011-09-14;162>.

for the overall European decarbonisation replicating the positive developments in the North Sea.

3. Adjusting the institutional framework

Despite some challenges, Italy has changed and adapted its institutional organisation to improve its governance of energy and climate policy. In 2021, the Ministry of Ecological Transition (MiTE) was established on 1 March 2021. The MiTE and its Directorate General for Infrastructure and Safety of Energy and Geomineral System are now in charge of energy matters, replacing the Ministry of Economic Development (MISE) and its Directorate General for Security of Supply and Energy Infrastructures. Another key department is the MiTE's Department for Energy and Climate.²⁵ The new government changed the name of the former Ministry of Infrastructures and Mobility to Ministry of Sustainable Infrastructures and Mobility in line with a principle of environmental sustainability.

While the top government competences concerning energy policy were attributed to the MiTE, the Ministry for the Environment, Land and Sea is in charge of national climate and environmental policies. Lastly, the Inter-ministerial Committee for Economic Planning and Sustainable Development has been established and it is in charge of national economic and budgetary decisions regarding the energy sector and coordination of national policies related to the energy transition, among others.

Regarding the EPT, the MiTE will need to provide an annual report to the Parliament by the end of May of each year on the implementation status of the Plan, presenting measures, finance sources and actions. Following the election in September 2022, the new government changed MiTE's name to Ministry of Environment and Energy Security (MASE) in October 2022, marking the renewed focus on energy security.

There are key agencies that oversee and manage the Italian energy sector and spur energy transition. ARERA (Autorità di Regolazione per Energia Reti e Ambiente) has been the regulator of the gas and electricity sectors since 2018, while the promotion of research and innovation technologies in sustainable development and energy (renewables, energy storage, smart grids, energy efficiency, and nuclear) is under the responsibility of ENEA (the Italian National Agency for New Technologies, Energy and Sustainable Economic Development).

Compared to other European countries like Germany or France, energy transition and climate change is still not a defining factor for electoral decisions and the country lacks a strong green political party – despite the high interest of Italians in the matter.²⁶ However, traditional political parties have increasingly started to

²⁵ MiTE website (archived): *Archivio Articolazione degli Uffici*, <https://www.mase.gov.it/pagina/archivio-articolazione-degli-uffici>.

²⁶ Margherita Bianchi and Giulia Gozzini, "G20, COP26 and the Climate Emergency: Insights from

take a stand on energy and climate topics. Also in the European debate, Italy – and Italian political parties – have started to express their position on several key dossiers in the EU climate debate (e.g., Taxonomy, ban of internal combustion engine (ICE) vehicles, building directive). After many months under the radar during the heated discussion over EU Taxonomy, Italy has requested that the proposed stringent emission criteria for gas to be reconsidered at the end of 2021. Italy indeed maintains it is penalised by these criteria given the role of gas in the Italian energy system. The required standards for gas activities to be considered sustainable are extremely rigid and penalise those member states that are already ahead with the transition (e.g. Italy), while favouring those who currently rely more on coal (e.g. Poland and Germany). The new government has also expressed opposition on key dossiers such as the new Building Directive and the ban of ICE vehicles. Moreover, the government is reconsidering nuclear energy as a way to increase energy security despite the two referenda that halted the development of any nuclear capacity in the country in 1987 and 2011.

4. Recovery funds: An opportunity to boost energy transition

To reach climate targets, countries will need to increase drastically their annual investments although the draft of the new NECP does not specify the needs. Nonetheless, an important contribution may come from the European recovery funds, created in the aftermath of the economic crisis caused by Covid-19. Indeed, the economic challenges, caused by the 2020 pandemic, have not cooled down the EU climate ambition and proved to be the chance to foster investments into green and climate transition for a better economic recovery.

Italy can benefit particularly from the NextGenerationEU to boost its energy transition. Under its 191 billion euro National Recovery and Resilience Plan (NRRP) (figure 1), Italy plans to allocate over 55 billion euro to its “green transition”. The plan was approved by the European Commission in June 2021. The funding is tied to a strict timeline that will end in 2026. Of 55 billion euro funds for green transition, Italy aims to devote 32.1 billion to sustainable mobility (including electric charging and hydrogen refuelling infrastructures), 12.1 billion to energy efficiency in residential buildings and 11.2 billion to renewables and circular economy. With regards to RES, there are four areas of actions: the development of agrivoltaic²⁷ (1.1 billion euro), energy community in small cities (2.2 billion euro), promotion of innovative plants (0.68 billion euro) and development of biomethane (1.92 billion euro).²⁸ The NRRP investments focus more on specific projects aiming at supporting

Italian Public Opinion”, in *IAI Commentaries*, No. 21|49 (November 2021), <https://www.iai.it/en/node/14278>; IAI-LAPS, *Gli italiani e l'emergenza climatica*, Rome, IAI, September 2021, <https://www.iai.it/en/node/14117>.

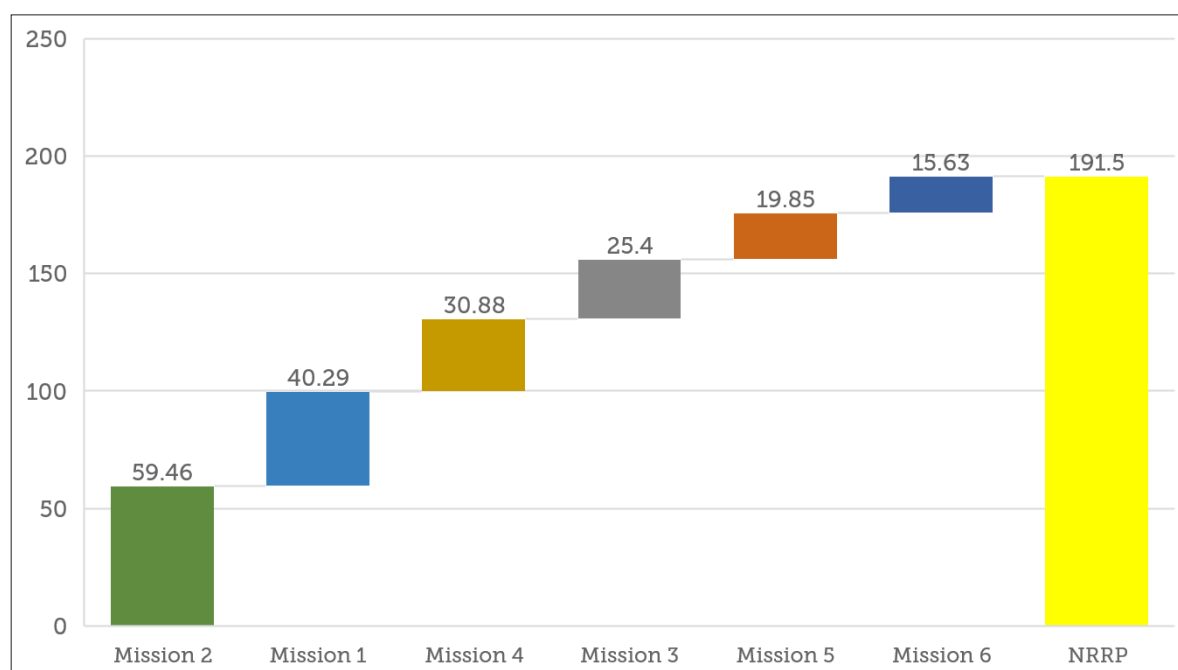
²⁷ It refers to the joint development of the same land area for solar photovoltaic and agriculture.

²⁸ Luca Brugnara e Cristina Orlando, *108 misure verdi: cosa fa il PNRR per la transizione ecologica*, Osservatorio sui Conti Pubblici Italiani, 12 May 2022, <https://osservatoriocpi.unicatt.it/ocpi->

start-ups in specific sectors rather than envisaging a solid plan for the development of RES. The grants are open to private actors and the public sector alike.

Nonetheless, the spiralling of energy commodity prices (exacerbated by the war in Ukraine and energy crisis) have jeopardised the implementation of the plan. Therefore, countries are expected to include REPowerEU measures in their national recovery plans in order to adapt to the new geopolitical context.

Figure 1 | Italy's NRRP by spending sector (billion euro)



Source: Italy, *Piano nazionale di ripresa e resilienza*, May 2021, p. 23, <https://www.agenziacoesione.gov.it/?p=39881&lang=en>.

Note: Mission 1 (Digitalisation, Innovation and Culture), Mission 2 (Green and Ecological Transition), Mission 3 (Infrastructure for Sustainable Mobility), Mission 4 (Education and Research), Mission 5 (Cohesion and Inclusion), Mission 6 (Health).

5. Takeaways for Norway and potential avenues for cooperation

At first glance, energy cooperation between Norway and Italy can appear an odd undertaking. Their different geographical position and energy conditions (exporter-importer) with limited physical energy interconnections may be seen as major barriers for further energy and climate cooperation. These factors prevent a sharp increase in direct energy trade. However, Norway is a key energy partner for the EU and a major energy supplier (oil, gas and electricity). In the aftermath of Russia's war to Ukraine, Norway has strengthened its pivotal role in the EU energy

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security architecture by increasing gas supplies to the EU markets – especially to Northern European countries.

The two countries could expand bilateral cooperation on natural gas and its role in the energy transition, given the dominant role of natural gas in both countries' energy sector. Natural gas will likely remain a key source of the domestic energy mix as Italy seeks to retire coal-fired capacity and use natural gas as the principal source of dispatchable power since it does not have any nuclear capacity. Under such a scenario, alongside the completion of the decoupling from Russia's energy imports, Norway represents a key collaborating partner for the EU and Italy to ensure adequate supply to the Union in the short term and decarbonise energy production in the long term.

Furthermore, the two countries share some important features and interests in certain sectors that could spur increased cooperation. They are both part of the same European energy market. Norway is a member of the European Economic Area Agreement (EEAA) and has therefore adopted EU energy market rules in its legislation. Further and deeper discussions among the two countries could cover multiple regulatory aspects regarding common technological and energy developments, such as market reforms, decarbonised gases but also regarding the European response to the US Inflation Reduction Act (IRA). On the latter, the EU should avoid a subsidy race and replicate others' industrial policies as this could result in a loss of money and time as well as the risk of fragmentation of the EU's single market. The Union should develop its approach towards industrial policy based on its own characteristics, that is, centred on competition policy in order to prevent distortive effects within its market and borders.²⁹ On this, Italy and Norway can certainly work together in light of their own positions and interests. In this sense, the EU–Norway Green Alliance, the most comprehensive form of bilateral engagement under the European Green Deal,³⁰ can be a positive framework for further bilateral cooperation.

Such cooperation can certainly benefit from the long-lasting and good energy relations between Italian and Norwegian energy companies. For example, Eni is involved in several energy projects in Norway. The two countries could enhance their cooperation on “soft” issues, such as sharing lesson learnt and best practices as well as in technological cooperation in key sectors for decarbonisation. For example, the two countries can strengthen cooperation on the development of clean energy technologies, such as hydrogen, CCS and offshore wind given Italy's interests and Norway's experience. Norway is expanding its CCS capacity and offshore wind development which can also be used for production of hydrogen.

²⁹ Pier Paolo Raimondi, “Walking out of the Woods: EU Industrial Policy between Energy Crisis and Decarbonisation”, in *IAI Commentaries*, No. 22|64 (December 2022), <https://www.iai.it/en/node/16355>.

³⁰ Under the Green Alliance, both parties commit to climate neutrality and to align their domestic and international climate policies to pursue this goal.

Bilateral cooperation at the governmental level as well as among private companies are certainly welcome in order to exploit the great potential of CCS and offshore wind also in the Mediterranean Sea.

The two countries could increase cooperation in designing a clear framework for the production, transportation and consumption of hydrogen. Also, given the role of the energy companies in the two countries, they could increase cooperation in R&D and joint investments to develop the hydrogen economy. Further cooperation could also include regulatory aspects as Italy seeks to import hydrogen from the southern neighbourhood and Norway aims at providing hydrogen supplies to Northern European countries.

Another potential area of cooperation could be the small-scale LNG (SS-LNG) industry. Indeed, Italy is looking into this sector as a way to use natural gas in remote areas. Rome has seen SS-LNG investments growing from 300 million euro in 2017 to 1.8 billion euro by April 2019. Norway has a long expertise in this sector that began in the late 1980s, when the government, through the Norwegian SWF funding, started to address the environmental footprint of its North Sea energy production well before the trend became a potent international political force through the intervention by the United Nations Framework Convention on Climate Change (UNFCCC) and the International Maritime Organization (IMO). Such political will drove the creation of the SS-LNG in Norway. With its expertise, Norway could share best practice and lesson learnt. This is the case of some pan industry innovation programmes created by the Norwegian government, such as Network LNG Norway, which could cooperate with Italian industry, academia and Italian energy companies.

Lastly, bilateral cooperation could be enhanced in the Mediterranean region. This is a strategic priority for Italy in terms of energy security as it has expanded its dependence on energy supplies from Mediterranean countries after Russia's war in Ukraine, but also regarding sociopolitical aspects, such as migration and the growing presence of third countries like China and Russia. This is certainly a common European concern, hence Norwegian as well, as it entails numerous consequences for Europe's stability and foreign policy. In this sense, Norway can be a valuable partner in fostering stability in the region as it is heavily engaged in peace and reconciliation processes in Africa. Regarding the energy dimension, Mediterranean energy supplies have so far been instrumental for Italy's energy security, but they could gain relevance also for other countries – especially in Central and Eastern Europe – in the event of higher volumes from North African countries and transit through Italy. On this matter, Norway and Italy can work together on increasing energy supplies from North Africa and addressing climate issues, such as methane emissions in key producing countries like Algeria, given common interests and relations in these countries.

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List of acronyms

| | |
|--------|-----------------------------------------------------------------------------------|
| ARERA | Autorità di Regolazione per Energia, Reti e Ambiente |
| Bcm | Billion cubic metres |
| CCS | Carbon capture and storage |
| CCUS | Carbon capture use and storage |
| EEAA | European Economic Area Agreement |
| ENEA | National Agency for New Technologies, Energy and Sustainable Economic Development |
| EPT | Ecological Transition Plan |
| EU | European Union |
| FF55 | Fit for 55 package |
| FSRU | Floating storage and regasification unit |
| GDP | Gross domestic product |
| GHG | Greenhouse gas |
| GW | Gigawatt |
| ICE | Internal combustion engine |
| IMO | International Maritime Organization |
| IRA | Inflation Reduction Act |
| IRENA | International Renewable Energy Agency |
| LNG | Liquefied natural gas |
| MASE | Ministero dell'Ambiente e della sicurezza energetica |
| MISE | Ministero dello Sviluppo economico |
| MiTE | Ministero della Transizione ecologica |
| Mt | Million tonnes |
| Mtoe | Million tonnes of oil equivalent |
| MWh | Megawatt hour |
| NECP | National Energy and Climate Plan |
| NRRP | National Recovery and Resilience Plan |
| PCI | Project of Common Interest |
| R&D | Research and development |
| RES | Renewable energy source |
| SS-LNG | small-scale LNG |
| TSO | Transmission system operator |
| TTF | Title Transfer Facility |
| UNFCCC | United Nations Framework Convention on Climate Change |

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