



CONFINDUSTRIA ENERGIA
Federazione del Comparto Energia

Energy Infrastructure for a Safe and Sustainable Transition

Edition # 3

December 2022



Energy and Utilities

Reports on primary energy infrastructure investment in Italy: 2018, 2020, 2022

Situation

- Confindustria Energia, the association of the largest industrial players in the Italian Energy sector with Snam (Gas TSO) and Terna (Electric TSO), wanted to develop a study of the required investment on primary energy infrastructure and promote awareness of their impacts on the wider economy

Actions

- Identified primary energy infrastructure investment (2018-2030) needed to reach the National Energy and Climate Plan and RePowerEU targets
- Analyzed the economic, social and environmental impacts of the planned investment (including biomethane)
- Supported the preparation of the final conference in 2019, 2020 and 2022

Focus of current release:

- Identifying primary energy infrastructure investment needed to reach the new stringent European targets (e.g. fit for 55 and REPowerEU)
- Analyzing the economic, social and environmental impacts of the planned investment (with focus on circular economy and hydrogen)

Results

- Published the final report summarizing the study results in 2018, 2020 and 2022 with a new revision currently ongoing
- Presented the results of the study with participation of government authorities (e.g. Minister of Energy) and major energy players' CEO (Snam and Terna)

Confindustria Energia



Contact: Rafael Schmill, Giorgio Biscardini, Lucia Colombo, Samuel Dossi
Date: 2018, 2020 and 2022

The latest report, focusing on energy security and decarbonization, has received significant coverage in the national press

Event Program

INFRASTRUTTURE ENERGETICHE PER UNA TRANSIZIONE SICURA E SOSTENIBILE

PROGRAMMA

10:00-10:30 - **REGISTRAZIONE DEI PARTECIPANTI**

10:30 - **APERTURA LAVORI**
 Giuseppe Ricci - Presidente Confindustria Energia

10:40 - **INFRASTRUTTURE ENERGETICHE PER UNA TRANSIZIONE SICURA E SOSTENIBILE**
 Giuseppe Ricci - Presidente Confindustria Energia

11:10 - **STRATEGIA NAZIONALE E DECISIONI PER LA SICUREZZA E LA DECARBONIZZAZIONE DEL SISTEMA ENERGETICO**
 Giovanni Pichetto Fratin - Ministro dell'Economia e delle Attività Produttive
 Giuseppe Ricci - Presidente Confindustria Energia

11:40 - **TAVOLA ROTONDA**
 Luca Di Lorenzo - Direttore Area Energia, Infrastrutture e Reti
 Giuseppe Ricci - Presidente Confindustria Energia
 Roberto Cingolani - Presidente Confindustria
 Antonio Di Pietro - Direttore per l'Energia Confindustria
 Stefano Cusani - Presidente Confindustria

12:10 - **CONCLUSIONI**
 Giuseppe Ricci - Presidente Confindustria Energia

Contatti e inviti: Info@CEI.it - Info@CEI.it

Con il patrocinio del Ministero delle Infrastrutture e dei Trasporti e il Ministero dell'Economia e delle Attività Produttive per gli Atti Parlamentari, la Pubblica Amministrazione e il CNR.

La sponsorizzazione è garantita dall'Associazione delle Imprese Industriali del settore e dai partner di Confindustria Energia.

Il servizio alle stampe è assicurato da Confindustria Energia, per gli inviti, allegati al presente, si consiglia di rivolgersi all'ufficio stampa di Confindustria Energia.

Il governo è guidato dal Ministro dell'Economia e delle Attività Produttive.

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Confindustria Energia

Media Impact



Confindustria Energia: servono 182 miliardi di investimenti al 2030 per una transizione sicura e sostenibile

L'analisi dell'associazione guidata da Giuseppe Ricci presentato oggi nel corso di un convegno con aziende e operatori del settore



ENERGIA: CONFINDUSTRIA ENERGIA, PIU' INVESTIMENTI IN TEMPI CERTI, 182 MLD AL 2030



Infrastrutture e transizione energetica, il convegno di Confindustria

È necessario accelerare sugli investimenti e portare avanti la decarbonizzazione senza sacrificare l'occupazione e la competitività delle aziende, spiega Giuseppe Ricci, presidente di Confindustria Energia. Il ministro Pichetto Fratin: "La dipendenza energetica ha frenato la crescita dell'Italia"



Confindustria Energia, per le infrastrutture il nodo dei tempi certi

Full report available at:
<https://www.strategyand.pwc.com/it/en/insights/infrastrutture-energetiche-per-una-transizione-sicura-e-sostenibile.html>

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Introduction



Energy transition targets



Energy security targets

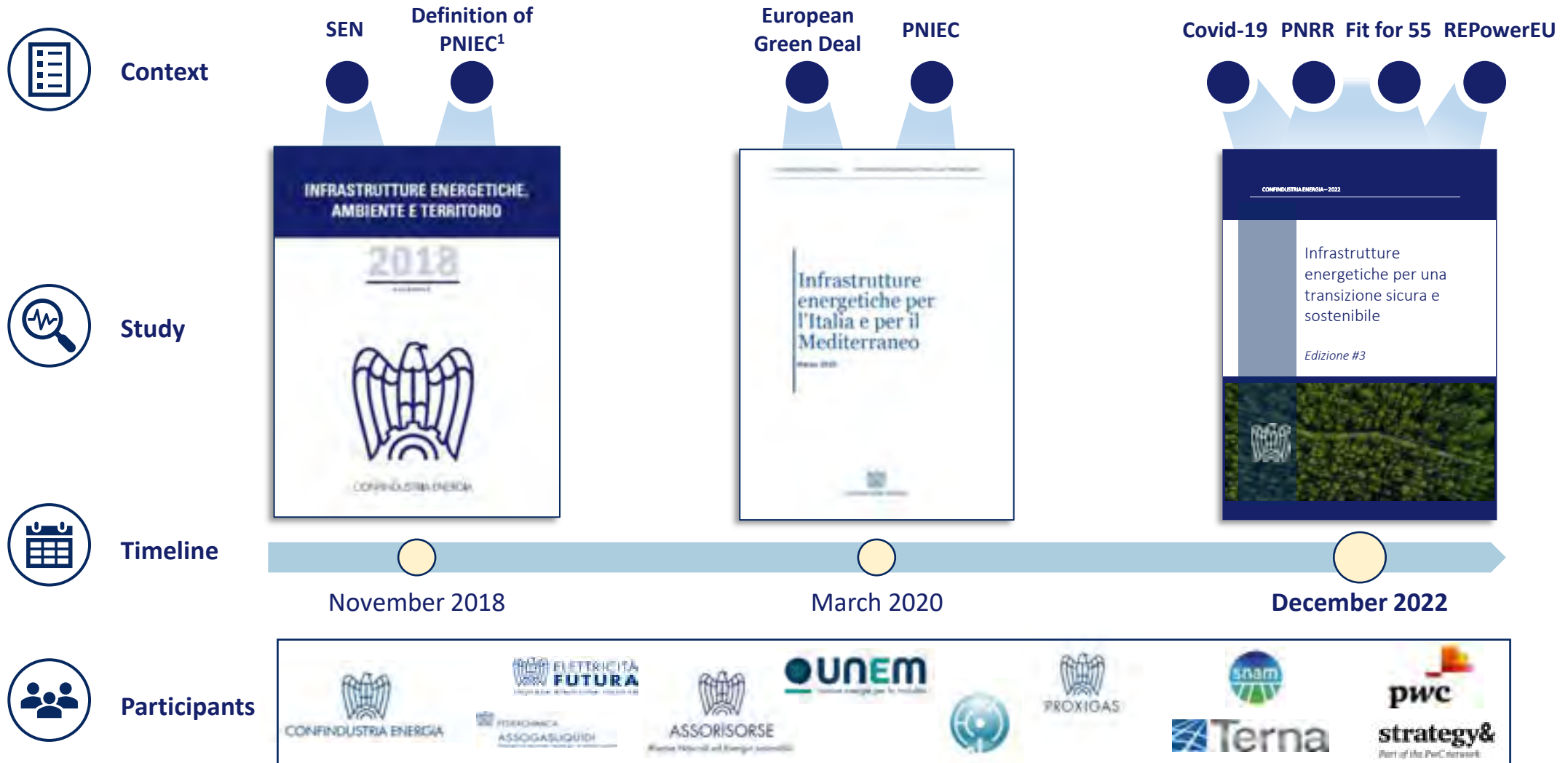


Primary energy infrastructure in Italy to 2030



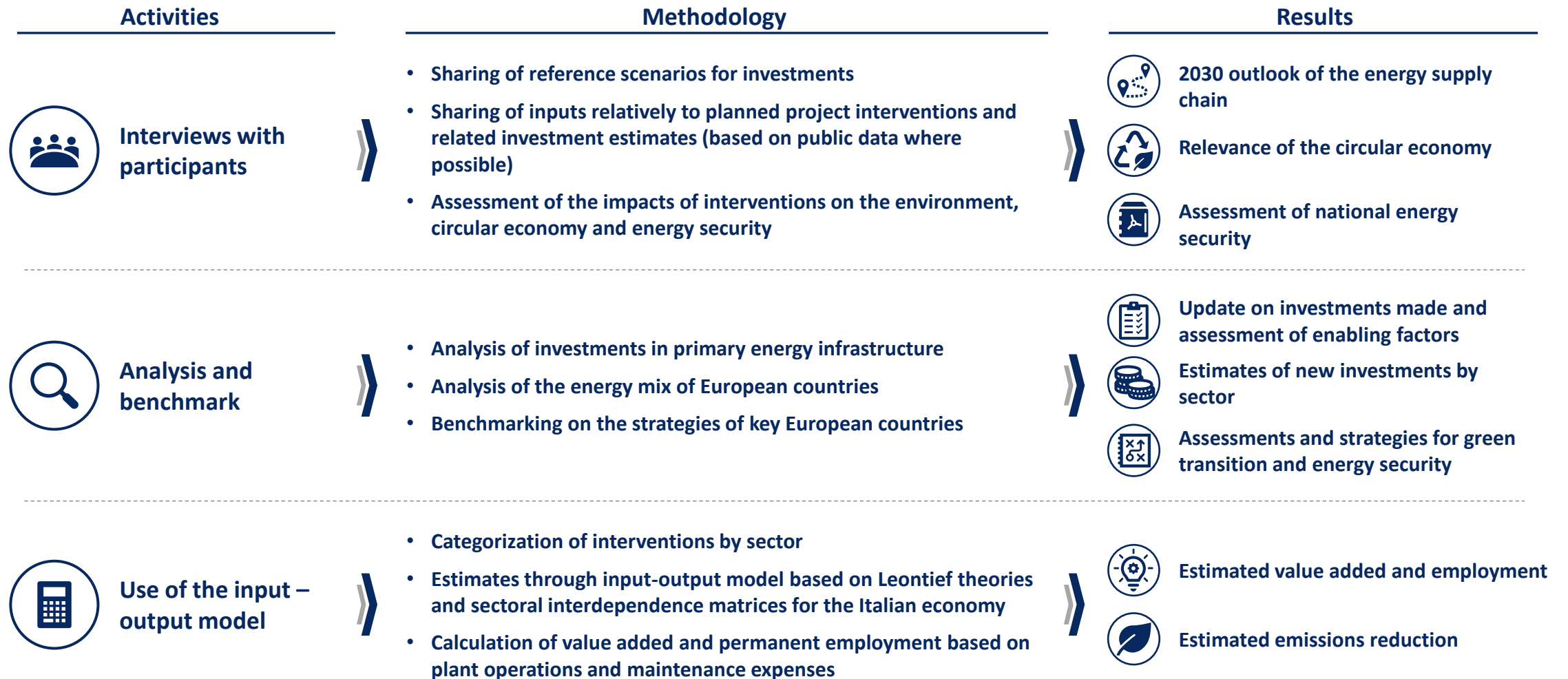
Conclusions and proposals

The 3rd edition of the Study (issued in December 2022) focuses on energy security and circular economy



Note: 1) Piano Nazionale Integrato per l'Energia e il Clima meaning National Integrated Energy and Climate Plan

The analysis is based on input on primary energy infrastructures provided by the key industry players



Note: The Confindustria Energia analysis, prepared by PwC Strategy&, refers to data on primary energy infrastructure to 2030, provided by the Associations and TSOs based on the studies and/or the investment plans they developed

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Primary energy infrastructure in Italy to 2030

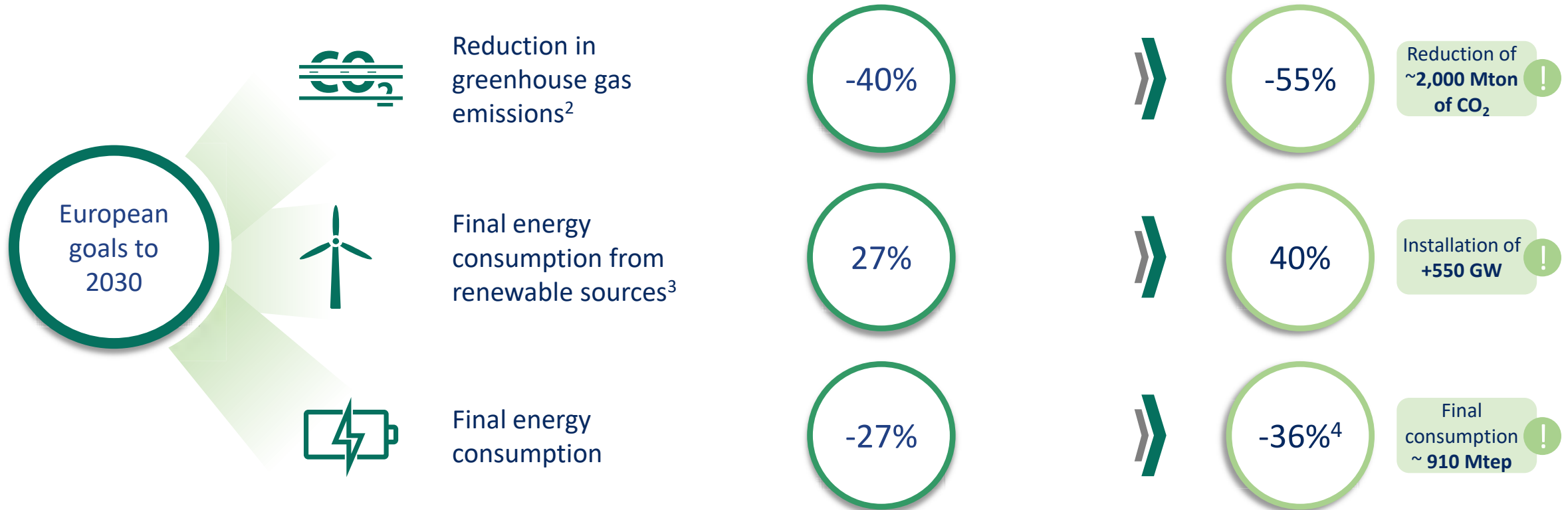


Conclusions and proposals

With the Fit for 55 package, the European Union has increased its ambitions of reducing emissions to 2030

Climate and Energy Framework¹ Targets

Fit for 55 Targets



In November 2022, the European Commission reached a preliminary agreement with the European Parliament to further reduce emissions for sectors not covered by ETS, i.e., emissions from domestic road transport and shipping, buildings, agriculture, waste and small industries (new target -40% to 2030 compared to 2005 vs. -29% as previous target)

1) Targets approved by the European Council (COM-2014, 0015) in 2014 (30% emissions cut for categories included in the ETS); 2) Emissions, energy production and consumption percentages calculated vs. 1990 levels; 3) Percentage considered on final energy consumption (total contribution to the energy mix); 4) Target corresponds to a -39% reduction on primary energy
Source: European Council; European Commission; European environment agency; PwC Strategy& analysis.

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Energy security targets



The European and Italian context



Energy security strategies in Europe



Energy security strategy in Italy

The current geopolitical environment may jeopardize energy security in Europe and Italy...

The European and Italian context



- In 2021, Europe consumed about 412 Bcm of natural gas, of which 155 of Russian imports (40% of total imported gas and 37% of total consumed gas)
- Specifically, Italy consumed about 76 Bcm (+5 Bcm vs. 2020), of which 95.6% from foreign imports (72.75 Bcm including 10 Bcm of LNG)
- Russian gas represents 38.2% of the total gas consumed in 2021, accounting for 29 Bcm of natural gas while 4.4% derives from domestic production
- Other gas suppliers are Algeria (27.8%), Azerbaijan (9.5%), Libya (4.2%) and Northern Europe (2.9% from Norway and the Netherlands)
- LNG accounts for 13.1% of consumption, imported mainly from Qatar (82%)



- 97% of the oil consumed by the European Union is imported (2.2 mln barrels per day)
- 27% of total import comes from Russia
- EU production stands at 1.7 Mton, imports at 440.3 Mton
- The main sector by consumption share is transport, accounting for 65%
- In 2021 Italy consumed 55.3 Mton of petroleum products, 12.5% of which depending on Russian imports
- In 2021, refineries in Italy processed 78 types of crude oil imported from 22 different countries




- The current geopolitical context characterized by the Russian-Ukrainian conflict stimulates new considerations for the energy supply security
- The situation in Italy calls for urgent considerations and actions for gas, commodities, raw materials, and to some extent oil

...while energy prices, already high before the Russian-Ukrainian crisis, continue to rise

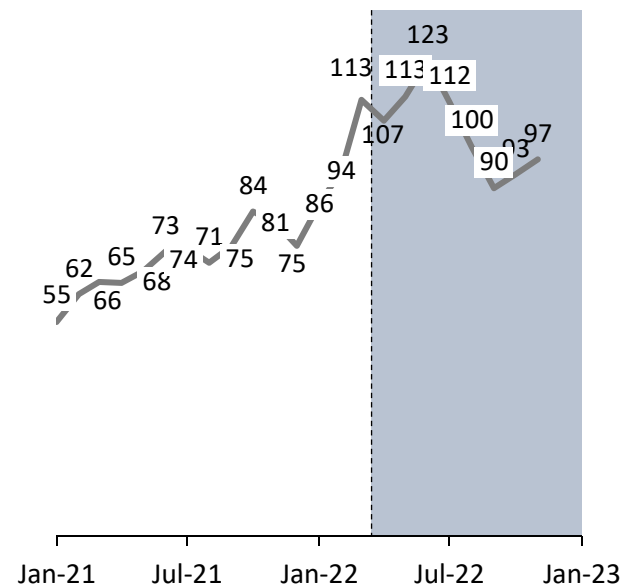
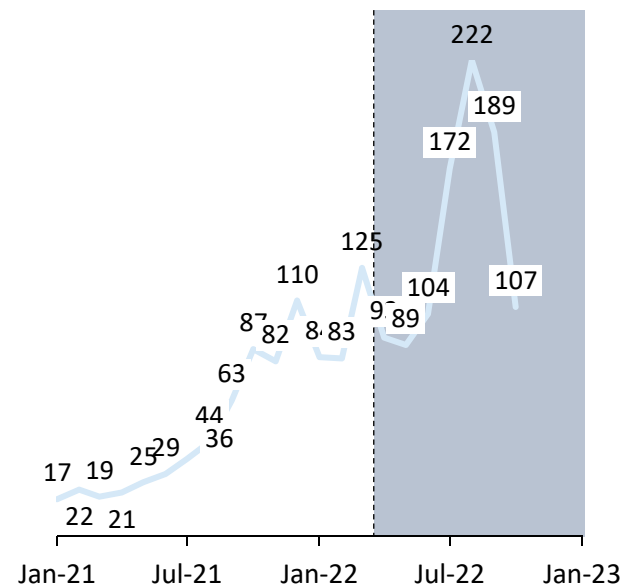
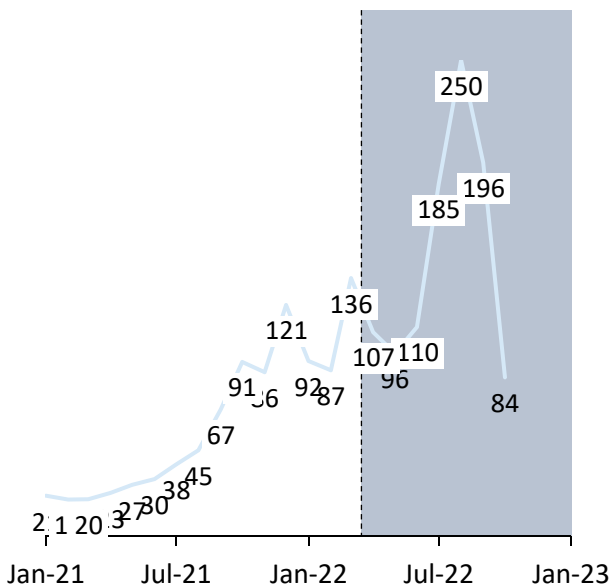
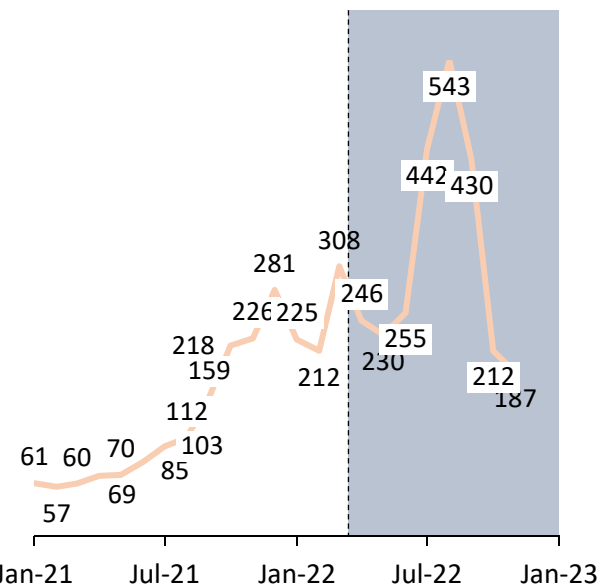
Evolution of average monthly energy prices in Italy and Europe

Purchase Price PUN¹ (€/MWh) 

PSV DA Price - (€/MWh) 

TTF Price - (€/MWh) 

Brent Price - (\$/bbl)



Energy



Gas



Gas








Oil

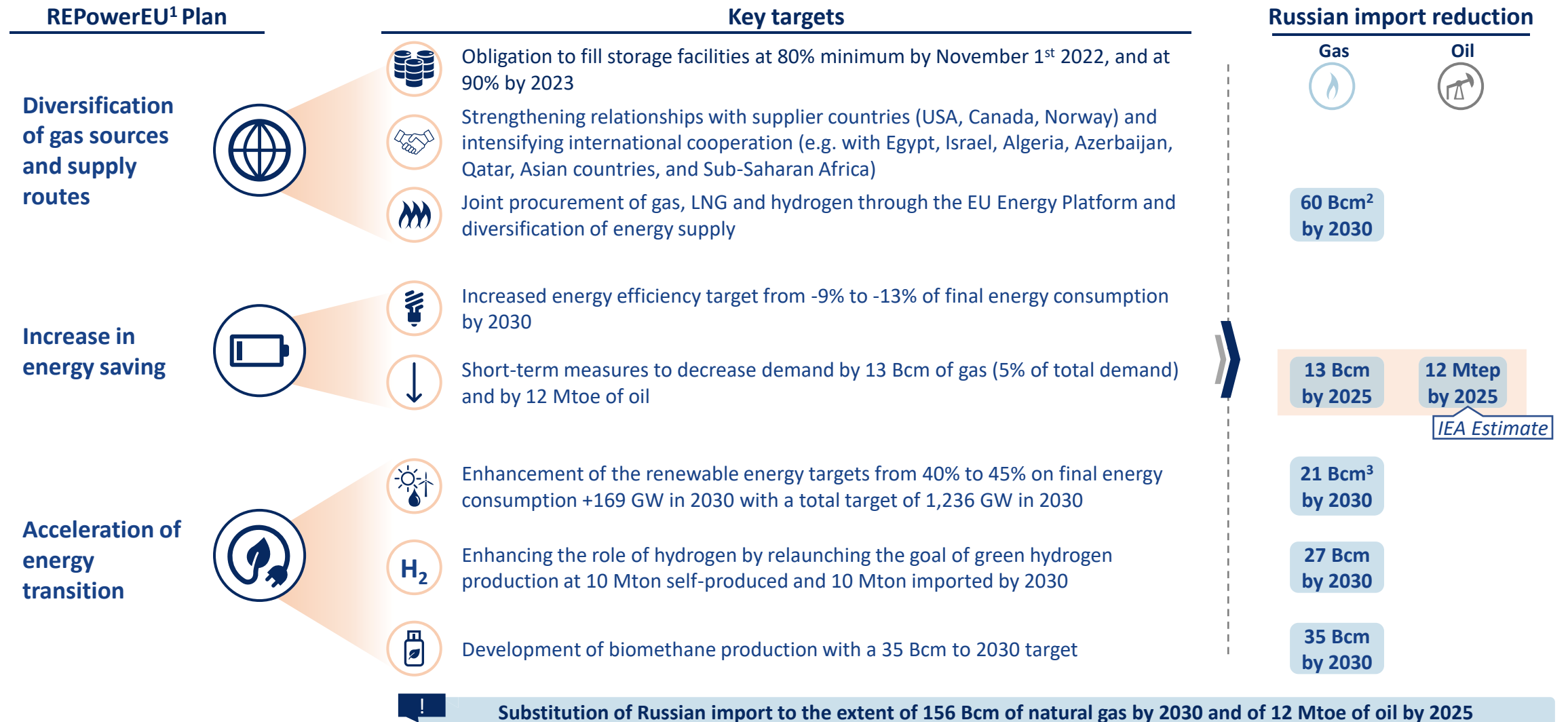
Note: 1) Prezzo Unico Nazionale meaning Single National Price
Source: GME; Simecom; Sole24Ore-Infront; Investing.com; EIA; PwC Strategy & Analysis

February 24th 2022 – beginning of the Russia-Ukraine conflict

Globally, the Russian-Ukrainian conflict is redrawing the energy map

Main consequences	Description and evolution of energy scenarios
 <p data-bbox="341 386 766 468">Rise of the United States as an LNG exporter</p>	<ul data-bbox="919 382 1829 472" style="list-style-type: none"><li data-bbox="919 382 1829 419">• Agreements to export LNG to Europe for 50 Bcm in 2030<li data-bbox="919 436 1531 472">• Increased U.S. oil and gas production
 <p data-bbox="341 596 784 634">New export routes for Russia</p>	<ul data-bbox="919 525 2308 705" style="list-style-type: none"><li data-bbox="919 525 2308 605">• Shift of Russian exports to countries with large levels of consumption that didn't impose sanctions such as China, India, and Pakistan<li data-bbox="919 622 2270 705">• Uncertainty in the short term related to gas supply towards Europe and need for large investments in new export infrastructure
 <p data-bbox="341 791 759 872">Alternatives for the energy mix in Europe</p>	<ul data-bbox="919 743 2303 923" style="list-style-type: none"><li data-bbox="919 743 2303 823">• Diversification of energy supplies by strengthening cooperative relationships with major suppliers (Norway, Algeria, Qatar) and by developing the necessary infrastructure<li data-bbox="919 841 2244 923">• Further development of renewable energy and incentives for biomethane and green hydrogen production
 <p data-bbox="341 1015 665 1096">Global economic and financial impact</p>	<ul data-bbox="919 991 2333 1123" style="list-style-type: none"><li data-bbox="919 991 2201 1028">• Further rise in energy prices and inflationary impact on operators and consumers<li data-bbox="919 1045 2333 1123">• Criticalities of raw materials supply chains, impact on production chains, and slowdown of economic recovery post-Covid-19
 <p data-bbox="341 1196 677 1315">Urgent measures and reforms of the energy market</p>	<ul data-bbox="919 1210 2288 1305" style="list-style-type: none"><li data-bbox="919 1210 2288 1248">• Potential introduction of a price-cap or single purchase mechanism for gas (<i>short term</i>)<li data-bbox="919 1265 1964 1305">• Structural reform of the electricity and gas market (<i>medium term</i>)

REPowerEU has introduced new energy security measures to release the European Union from the dependence on Russian gas



1) Plan presented by the European Commission on May 18; 2) 50 Bcm from diversification through LNG and 10 Bcm from pipelines; 3) In addition to the 100 Bcm foreseen by the Fit for 55 (30% of European gas consumption)
 Source: European Commission; Confindustria Energia; Participants to the study, PwC Strategy& Analysis



Energy security targets



The European and Italian context

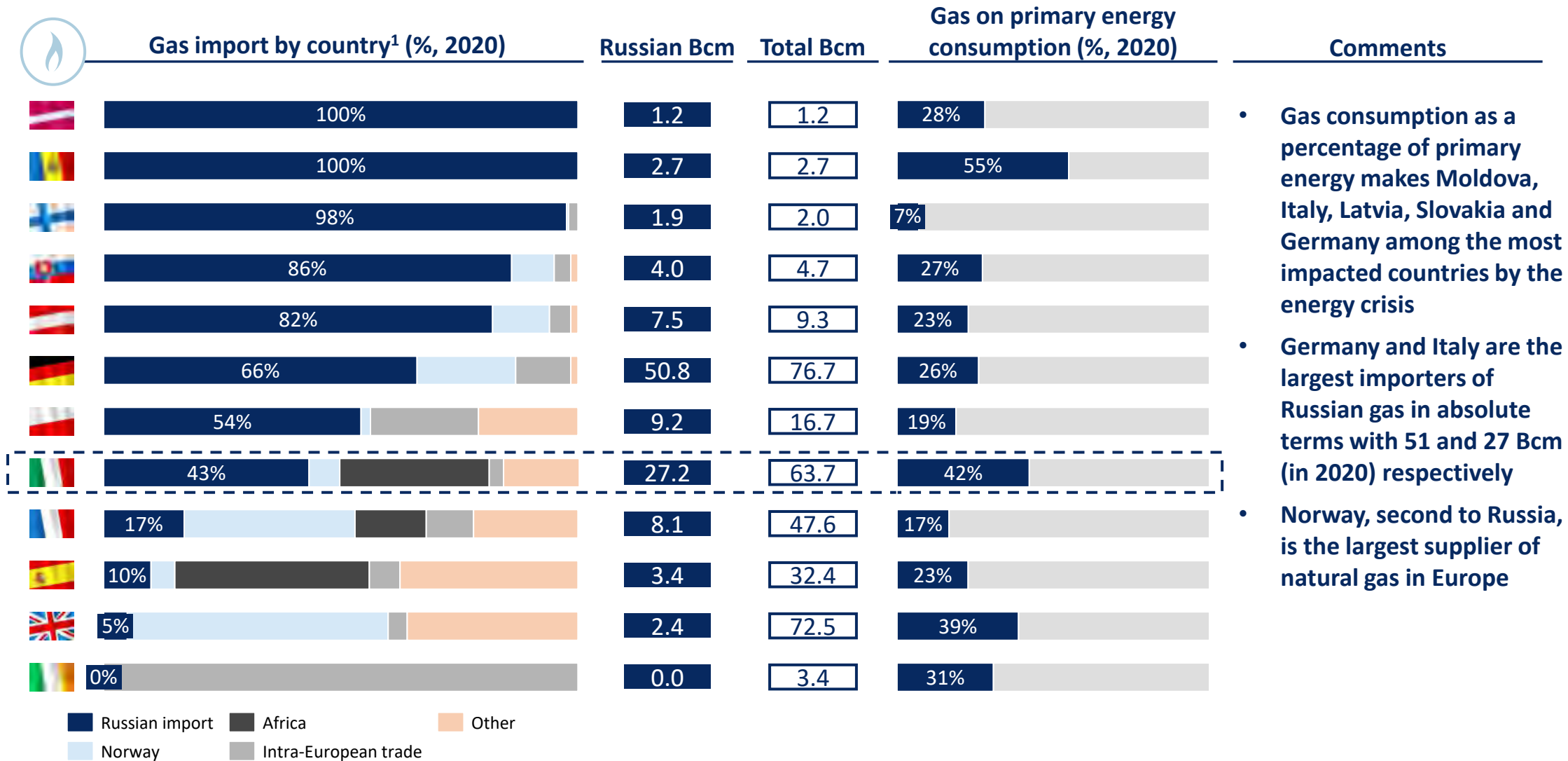


Energy security strategies in Europe



Energy security strategy in Italy

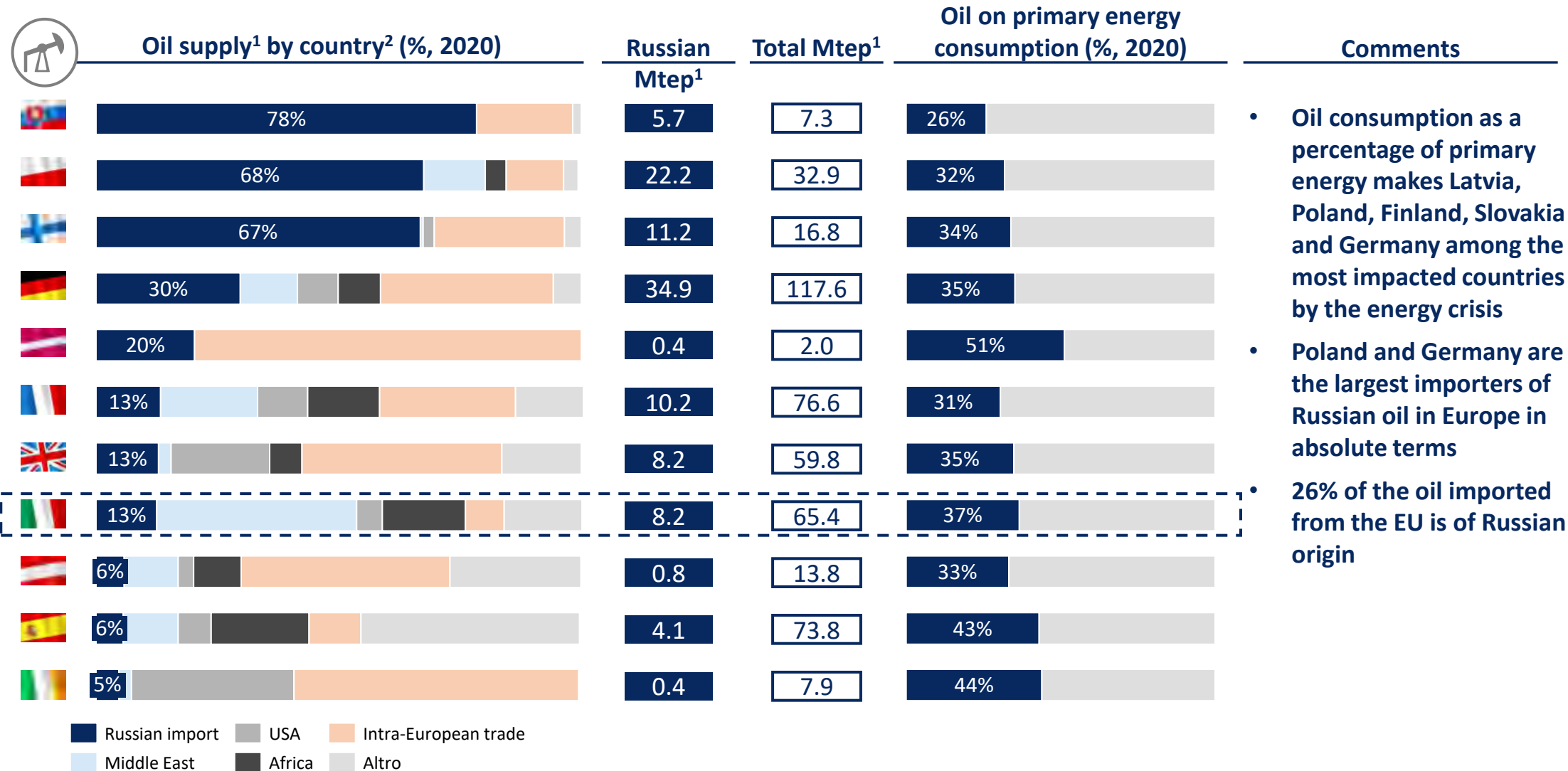
Dependence on Russian gas varies among European countries with negative impacts depending on the share of national gas consumption



1) Natural gas imports via pipeline and LNG are considered (domestic production is not considered)

Source: Eurostat; Bruegel/European Network of Transmission System Operators for Gas/UK; Our World in data – Oxford University; Dukes; IEA; Enerdata; PwC Strategy & Analysis

Also with regard to oil, Russian supply is a key component of the primary energy consumption for several European countries



11) Including crude oil and petroleum products; 2) Not including domestic production

Source: Bruegel/European Network of Transmission System Operators for Gas/UK; Eurostat; Our World in data – Oxford University; Dukes; BP; PwC Strategy & Analysis

To analyze energy strategies in Europe, we analyzed Poland, Germany, France, Britain and Spain

Assessed nations

Structural characteristics



- Geographical proximity to Russia
- High dependence on Russian imports
- Significant role of domestically sourced coal in the energy mix



- Similarity with Italy in terms of dependence on Russia for gas imports
- High dependence on imports of raw materials
- Centrality of the country in the European political and economic dynamics



- Relevant electric component in energy consumption and limited dependence on imports
- Significant use of nuclear power for electricity production
- Export of electricity to Italy through existing interconnection lines

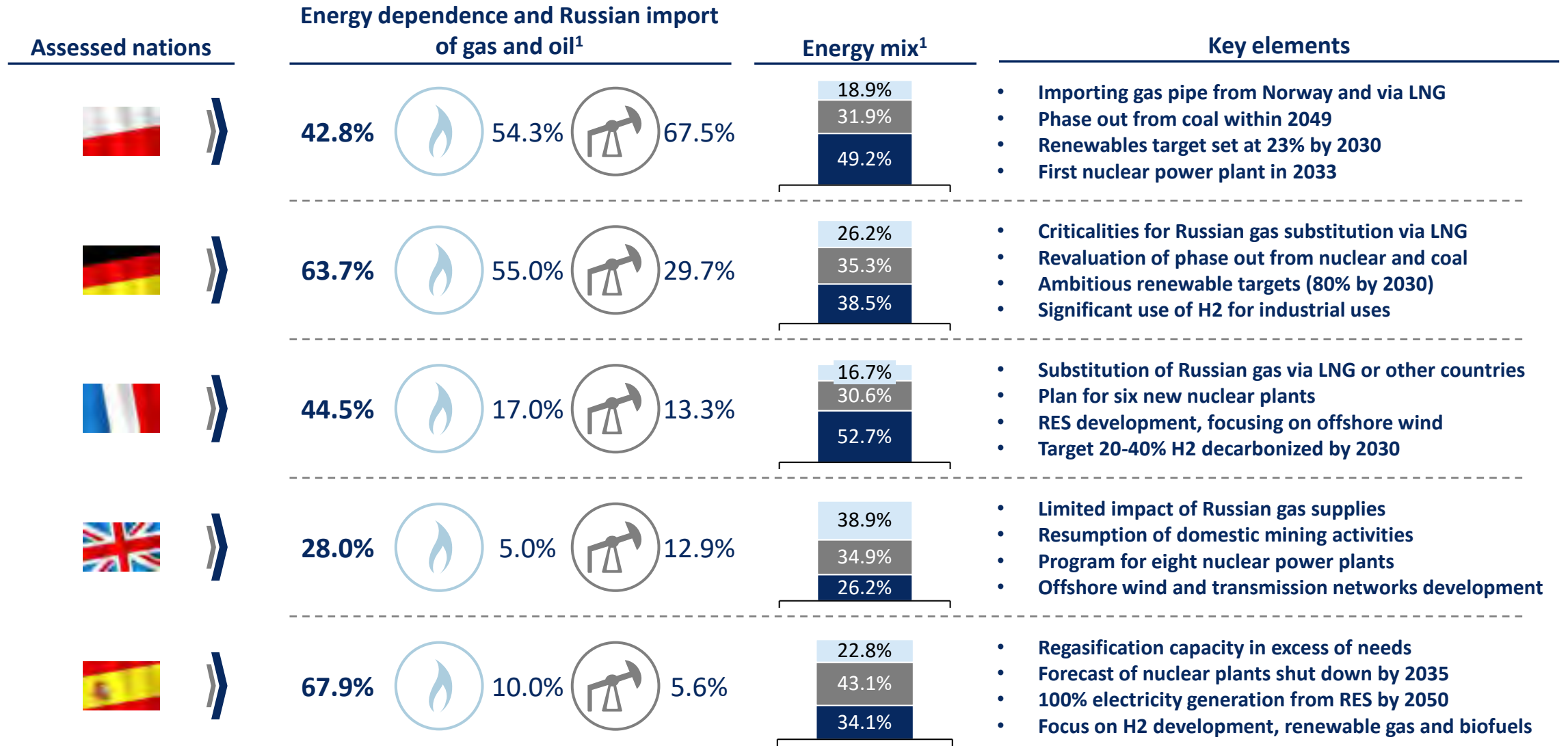


- Diversified energy mix and further development of renewables and nuclear power
- Limited dependence on Russian gas and resumption of exploration activities in the North Sea
- Significant share of gas and oil in the overall energy consumption



- Highly diversified energy mix
- Lower level of dependence on Russian imports than other EU economies
- Geographical location and climatic conditions similar to Italy

Overview of current energy strategies of major European countries



1) Data related to 2020 - Percentage on total primary energy consumption
 Source: Eurostat; Dukes; Our World in data – Oxford University (BP Energy Statistical Review); PwC Strategy & Analysis



Energy security targets



The European and Italian context



Energy security strategies in Europe



Energy security strategy in Italy

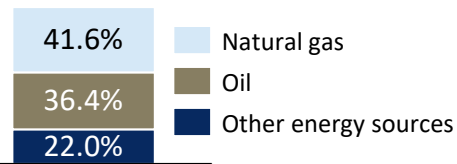
The Italian pathway towards a safe and sustainable energy transition

Parameters in Italy

Import from Russia¹



Energy mix¹



Energy Dependency

73.5%

(vs. EU average – 57.5%)

Strategic Priorities

Energy security measures



Acceleration of the ecological transition



Cooperation, regulation and financial aid



Areas of intervention



Diversification of supplies and of domestic gas production



Development of gas import and transport infrastructure



Increase of oil and gas storage capacity



Acceleration of renewable energy development



Development of H₂, biomethane and low carbon fuels supply chains



Adaptation of power grids and storage development



Development of cooperation and regulation of energy markets



Financial aid instruments for domestic and industrial consumers

Evolutionary aspects

- **Development of innovative technologies (e.g. CCS) and enhancement of national know-how**
- **Encouragement of the circular component in products and services**
- **Reform of the energy markets and their governance**
- **Increased geopolitical role of Italy among European and Mediterranean countries**
- **Energy prices suppression for domestic and industrial consumers**
- **Financial instruments for investments in infrastructure and circular economy**

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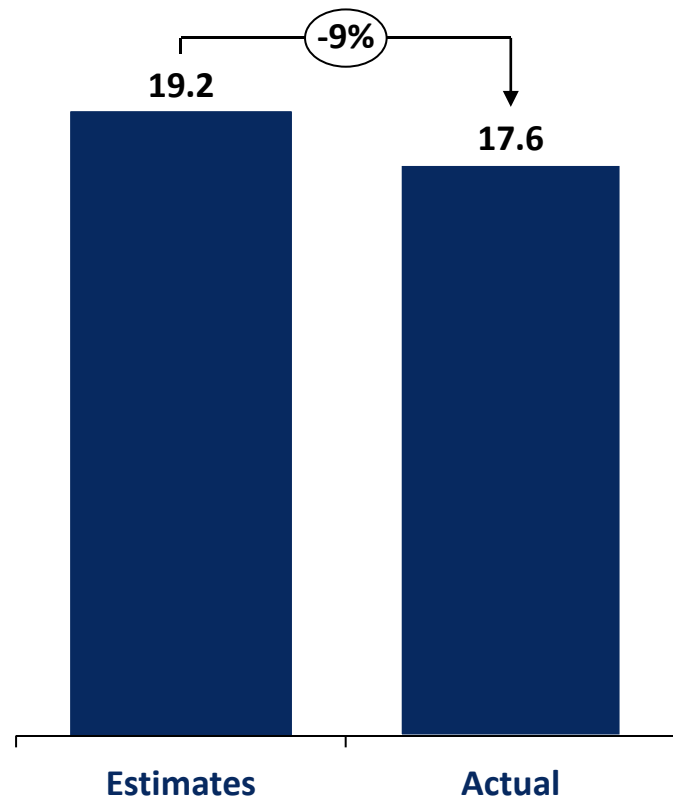
Primary energy infrastructure in Italy to 2030



Conclusions and proposals

Investments in primary energy infrastructure over the 2020-2021 biennium were 9% lower than estimates in the 2nd edition (2020 Study)

Primary energy infrastructures estimates vs. actual biennium 2020-2021 (Bn€)



- Actual investments for the 2020-2021 biennium stood at €17.6Bn compared to the €19.2Bn estimated in the 2020 Study, based on the 2019 PNIEC
- The difference between estimates and actual data (-9% vs. -3% in the 2018-2019 biennium), can be attributed to the effects related to the Covid-19 pandemic, as well as to delays in permitting (RES) and in the definition of PiTESAI areas (E&P)
- Actual figures for the four-year 2018-2021 period stood at €32Bn of investments



Covid-19



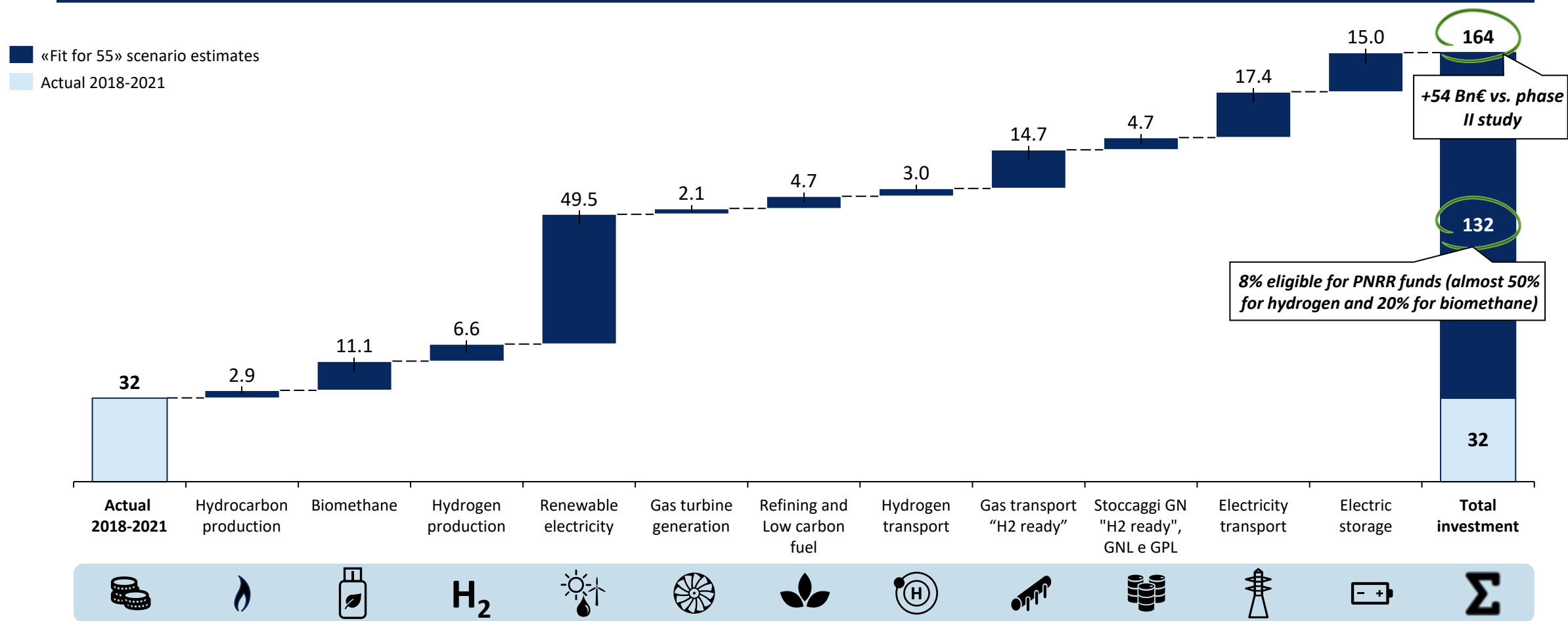
Permitting



Regulatory frameworks

In the “Fit for 55” scenario, investments in infrastructure over the 2022 - 2030 period are estimated at €132Bn

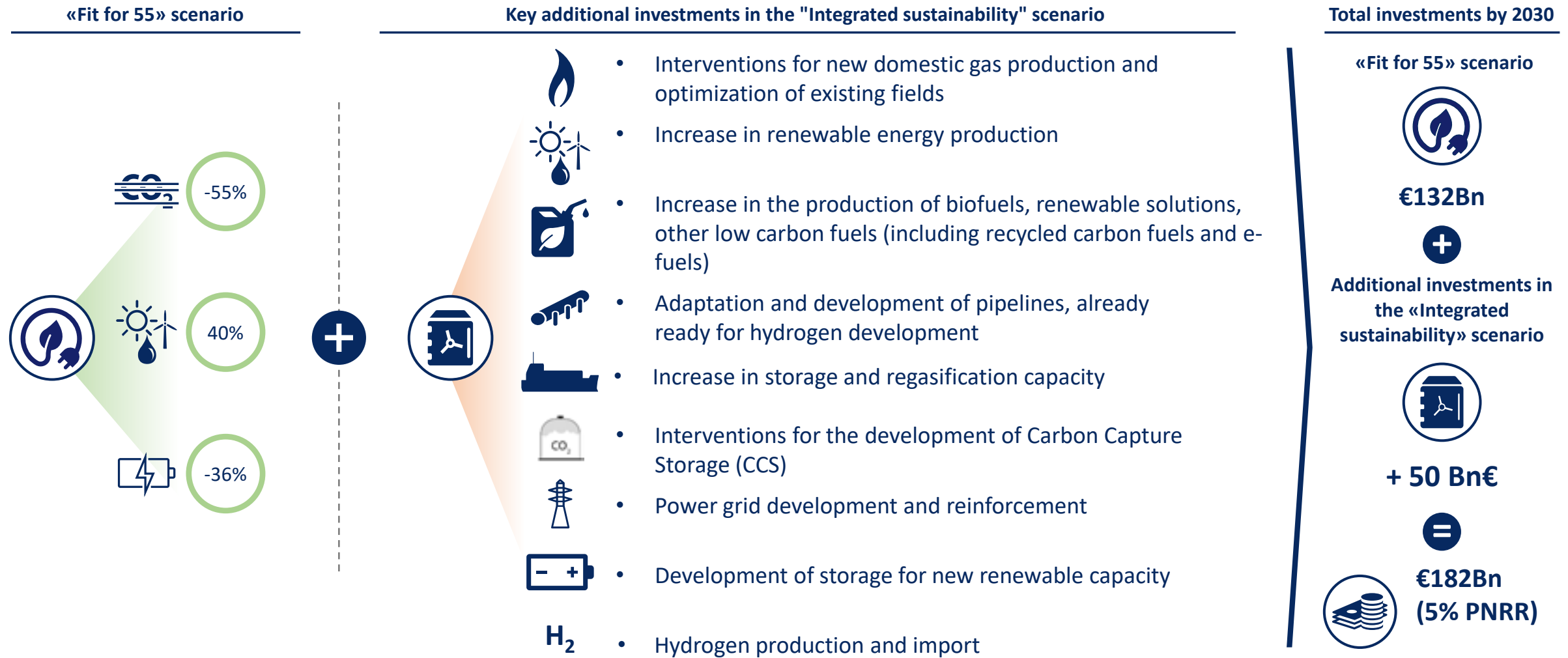
Actual investments Bn€, 2018 - 2021) and estimated investments (Bn€, 2022 - 2030)



Nota: investment estimates don't take into account the current increase in raw material costs; actual figures and total investments rounded off
 Source: Confindustria Energia, Participants to the study, PwC Strategy & Analysis

Compared with the “Fit for 55” scenario, the “Integrated sustainability” scenario includes investments targeting energy security and social sustainability

Further details about additional investments on the next page



Source: Confindustria Energia; Participants to the study, PwC Strategy& Analysis

Projected 2022-2030 investments under the “Integrated sustainability” scenario bring greater economic, employment and environmental benefits

Investment estimates
(from 2022 to 2030)



~ 132
Bn€

Total value added
(from 2022 to 2030)



~ 231
Bn€

Average employment
(from 2022 to 2030)



~ 297k
ULA¹

GHG emissions reduction
(to 2030)



~ 86MtCO₂
/ year



«Fit for 55»
scenario #1



«Integrated
sustainability»
scenario #2

~ 182
Bn€

~ 323
Bn€

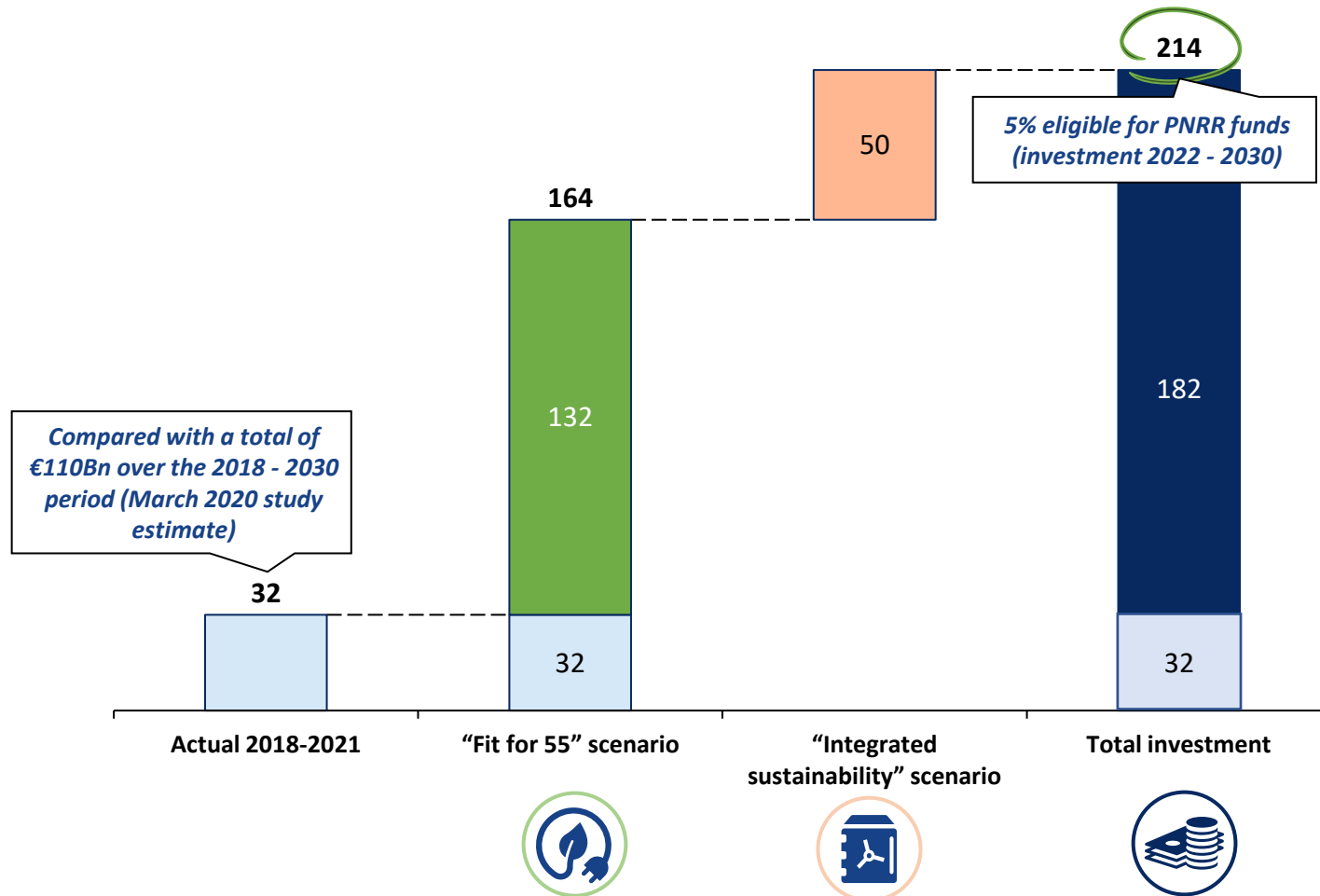
~ 378k
ULA²

~127MtCO₂
/ year³

- 1) Average employment supported by new investments that does not consider structural employment losses due to plant closures
- 2) Scenario that best ensures that current employment is maintained and supports +80kULA for investments
- 3) It contributes about 80% to the overall reduction that Italy will need to achieve to reach the 2030 Fit for 55 target

Investments between 2018 and 2030 stand at €164Bn (“Fit for 55”) and at €214Bn (“Integrated sustainability”), nearly twice as those estimated in 2020

Actual investments (Bn€, 2018-2021) and estimated investments (Bn€, 2022-2030)



- Achieving the Fit for 55 and REPowerEU targets requires a strong acceleration of new investments over the next years
- Only 5 percent of 2022 - 2030 investments is eligible for PNRR funds, which is hoped to be revised
- The dynamics of supply chain costs and interest rates may have a significant impact on the final value of investments as well as on borrowing costs
- The “Integrated sustainability” scenario contributes to safeguard employment in the sectors undergoing conversion at potential risk of closure (approx. 500k ULA1)

1) Data refer to employment in the energy, automotive and hard-to-abate sectors at risk of closure, downsizing and relocation
Source: Confindustria Energia, Participants to the study, PwC Strategy & Analysis

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National energy transition in the European context

Prospects for the national energy transition

- The sharp reduction in recent years of investments in infrastructure concerning energy sources not yet decarbonized, but necessary for the progressive achievement of climate goals, has proven to be the main cause of the demand/supply imbalance in the energy market. The uncertainty about supplies has further exacerbated price volatility in recent months, particularly for gas
- The rapid decrease and expected total replacement of gas supplies from Russia, the largest exporter to Europe, has further highlighted the necessity of new infrastructure for the diversification of energy supplies which, together with an enhanced use of renewables, will enable a sustainable and secure energy transition
- Compared to other European countries, the national energy system shows a stronger dependence on imports and for the near future it foresees technological options limited to the use of renewables and of gas for electricity production and for consumption in some relevant industrial and civil sectors
- Nevertheless, Italy benefits a geographic location which is ideal for further growth of renewable sources and diversification of gas import routes. In addition to this, Italy can rely on untapped natural gas reserves, increasable storage capacities, as well as transport and transmission networks spread throughout the territory. The European leadership in biofuel production and significant excellence in circular economy processes are additional levers for a sustainable energy transition
- Gas will maintain an essential role in Italy in the medium term, despite the expected development in electric renewables, and won't be completely replaceable by biomethane and hydrogen. Therefore, the implementation of CO2 storage and utilization systems will also be necessary to accelerate the decarbonization process in some industrial sectors
- It is crucial for the security of supply and transport decarbonization that new biofuels and low carbon fuels, which are necessary and complementary to electric mobility, continue their development path. In this context, the review (2026) of the European framework, which foresees zero emissions for cars by 2035, will be decisive. Such fuels can also play a significant role in heavy transport, shipping and aviation



«Integrated sustainability» scenario and enabling factors

“Integrated sustainability” scenario

- The “Integrated sustainability” scenario best captures the potential of the national energy sector for the future strategic choices that the country will have to take and represents the proposal of Confindustria Energia in view of the elaboration of the new PNIEC and the adaptation of the PNRR to the REPowerEU
- Indeed, it presents greater benefits on the country system in terms of economic growth as well as environmental and employment impact. Investments are evaluated according to technology neutrality criteria, aimed at achieving the decarbonization, energy security and social sustainability targets through flexible and resilient primary energy infrastructures
- The scenario assesses at €182Bn the investments over the 2022-2030 period, which translates into a total added value of €320Bn, the employment of 380k ULAs and emission reductions of -130 Mton CO₂/year in 2030, accounting for around 80% of the overall reduction Italy will need to achieve to reach the 2030 Fit for 55 target
- It provides specific details concerning the €62Bn of investments for those projects that are expected to be launched in the short term. This represents a concrete signal toward accelerating the development of energy infrastructure in order to catch up on the delays experienced in recent years and to provide an answer to increasingly challenging environmental goals
- It considers the new skills needed for the use of renewable technologies in combination with the transformation of traditional supply chains towards sustainable energy products, so as to limit the risks of disruption in supply and the employment issues arising from production discontinuities in existing plants
- Furthermore, it proposes the extensive adoption of the circular economy model as an integral part of the development of projects, thus optimizing resources and reducing reliance on the use of raw materials. The evaluation of the economic impacts and of the environmental benefits of applying circularity to the energy supply chains confirms the appropriateness of this choice
- The implementation of investments within the planned timeframe requires overcoming extraordinary measures concerning taxation borne by energy operators to avoid a slow down in investments. Furthermore, it requires the definition of an articulated framework of "enabling factors" from a regulatory, permitting and financial standpoint



Enabling factors



Update of national and regional targets consistently with EU targets, simplification and acceleration of the permitting process to enable the repowering and start-up of new renewable plants as well as related grid infrastructure and necessary storage systems as part of a comprehensive electricity market reform including PPAs



Coordination of central and local authorization processes aimed at accelerating domestic gas production by exploiting its maximum potential, also leveraging the introduction of site-specific analyses. Acceleration of the authorization processes for the implementation of the first CO2 storage systems in Italy



Definition of a favorable regulatory environment for the production (with new plants or conversion of existing ones), feed-in, and use of biomethane to meet the new 2030 targets, and provision of similar incentives for low-carbon, bio, and renewable products that contribute to the decarbonization of the transportation sector



Creation of a hydrogen market to facilitate volume scale-up, through the Hydrogen Valleys envisioned in the PNRR, the development of national supply chains (electrolyzers, storage and transport) supported by the IPCEI, import infrastructure, and the inclusion of decarbonized hydrogen use in the transition phase



Support to the development of gas infrastructure with a view to diversification and security of supply with particular reference to transport, storage and regasification, as well as to the entire supply, distribution and utilization chain of LNG and its bio-renewable and synthetic evolutions



Review of European directives concerning CO2 fleet regulation and energy performance of buildings (EPBD) in order to enable investments and support reconversion processes (fast track permitting, incentives for reuse of areas) for the production of low carbon, bio and renewable products



Definition of a regulatory framework that enables the development of the circular model, in implementation of the National Strategy for the Circular Economy and in particular in the recovery and valorization of residues, waste and by-products



Support to innovative recycling and reuse supply chains in the development of technologies needed for the reprocessing of secondary materials and the recovery of critical raw materials



Expansion of the market for recycled, regenerated and reused materials through the creation of rewarding markets leveraging also a different taxation applicable to the circular component

Concluding remarks and proposals

- In order to achieve the 2030 climate goals and simultaneously ensure the security and competitiveness of energy supplies, phasing-out Russian imports, it is necessary to accelerate both in Italy and Europe the full implementation of the “Integrated sustainability” criteria in its environmental-economic-social dimensions and of the enabling factors mentioned in the Study
- Due to its limited support (5%) to planned investments, it is hoped that the PNRR will be revised or that similar financial instruments for the implementation of infrastructure complementary to renewable sources, and necessary for the sustainable and resilient energy transition outlined by the REPowerEU, are identified
- The update of the PNIEC and the revision of the PNRR offer the opportunity for a discussion with the Government on coordinated programs for the realization of energy infrastructure, which may serve as a reference for investment decisions in the medium to long term as part of a strategy projected beyond the current emergency phase
- The negotiation process with European institutions on the open chapters of “Fit for 55” and “REPowerEU” are the context in which to define Italy's contribution to the EU energy transition, support the enabling factors of European competence, and propose a geopolitical vision of greater collaboration with the Mediterranean countries, an area of traditional presence of Italian operators, in order to diversify energy supplies and to incentivize sustainable and integrable infrastructural development models
- On the subject of energy security, an approach that pursues the goals of decarbonization and circularity by enhancing national and EU production chains, following the guidelines of the EU Critical European Raw Material Act, is of paramount importance in order to reduce dependence on non-EU countries for the supply of the critical materials needed for renewable energy plants and for the digital systems of modern transportation and transmission networks
- A favorable public environment is crucial for the implementation of energy infrastructure and the development of circular economy. Sharing with local communities the strategic priorities, the design criteria adopted to minimize environmental impacts, and the ex-ante definition of the economic and employment impacts, together with a close coordination between national and regional authorizing bodies, are necessary prerequisites for implementing the proposed initiatives in the respect of the planned timeline

