Daslav Brkic, Consultant, DB Business Development

Giacomo Franchini, Director, SUPPLHI

ANIMP
ASSOCIAZIONE NAZIONALE DI IMPIANTISTICA INDUSTRIALE

Sezione Componentistica D'impianto

Convegno Sezione
Componentistica d'Impianto ANIMP

October 25th, 2022

Energy Industry Global Markets Forecast and Supply Chain Trends **2022**

AGENDA

Market Trends

Top 5 Trends in Supply Chain

Today's Agenda

- A premise about energy markets
- Key factors in future energy demand and supply

  Within the context of the Energy Transition
- Overcoming the current supply crisis

We are used to rapid fluctuations in energy supply and demand

Perceptions vs. reality

Ages of energy shortages

Tight energy supply

Energy demand

Ages of energy abundance

Energy demand

Abundant energy supply

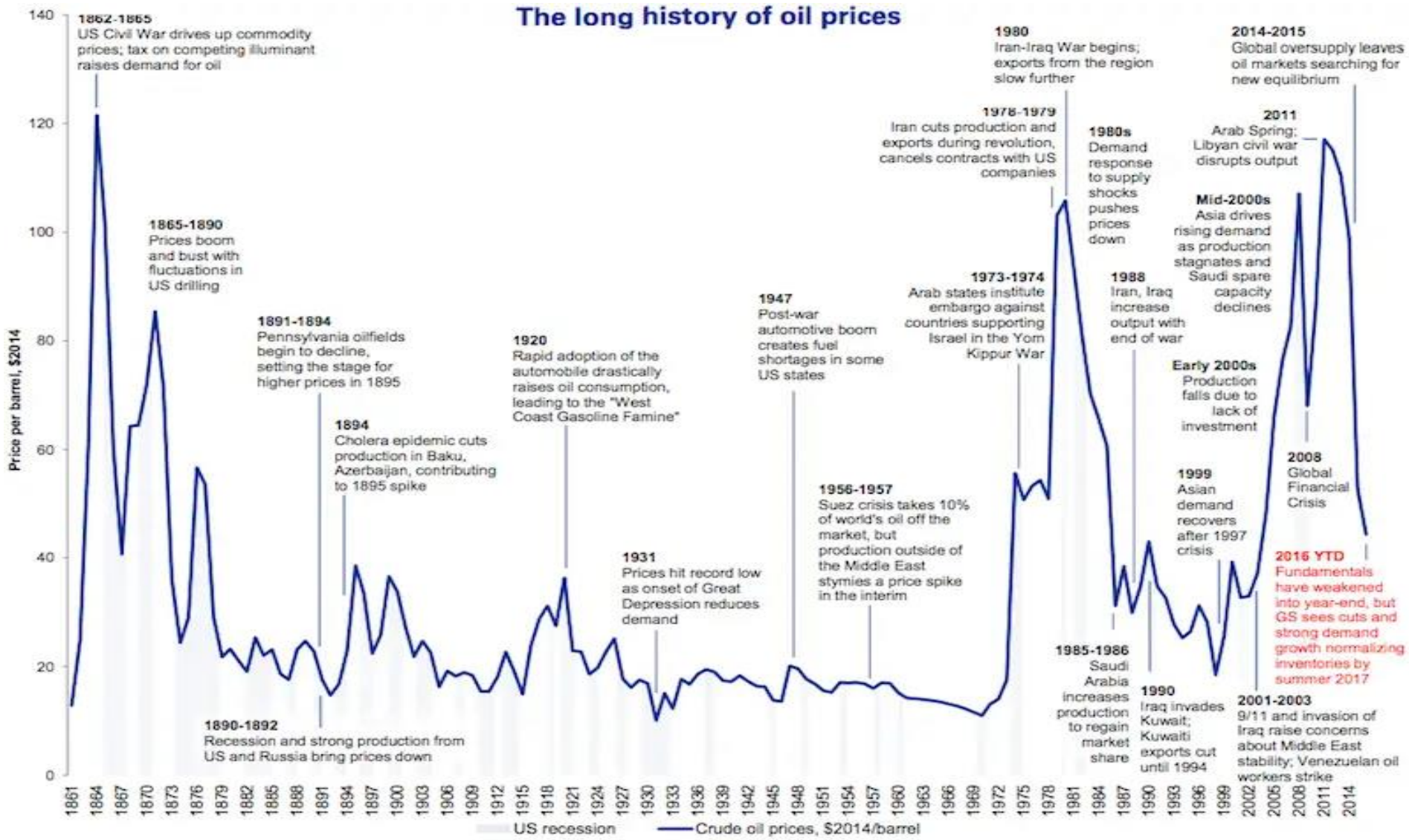
- Recent **discoveries** of new conventional and unconventional oil and gas fields and **technology breakthroughs** have created an abundance of conventional and unconventional reserves – under the ground
- But it takes minimum 10 years to develop a production and delivery value chain

Small changes in supply/demand and risk expectations lead to big changes in energy prices

Elasticity 1:10(*) : For every 1% change in supply/demand we observe a 10% change in pricing

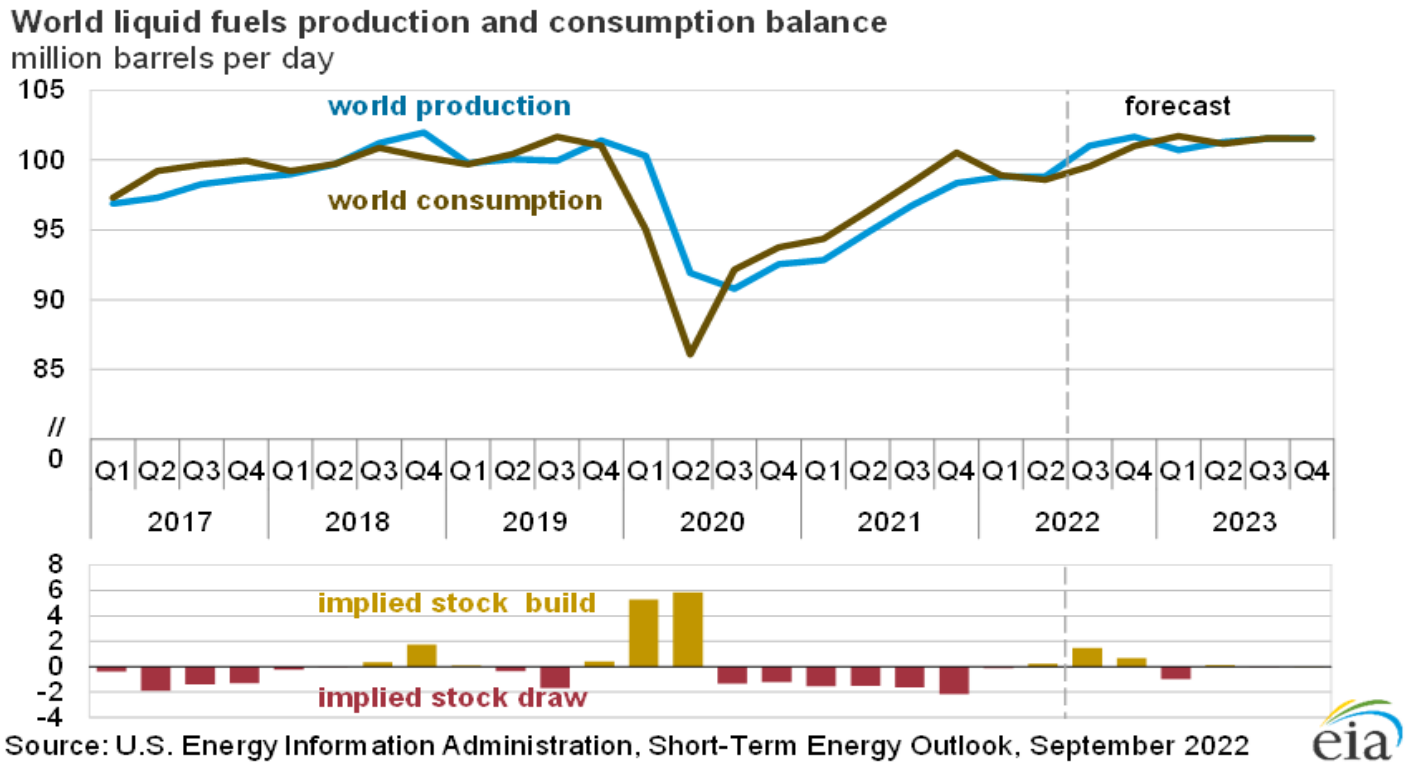
(*) Joint study by MIT and Cambridge University **(September 2022)**

We have a 150 years long history of oil markets ups and downs



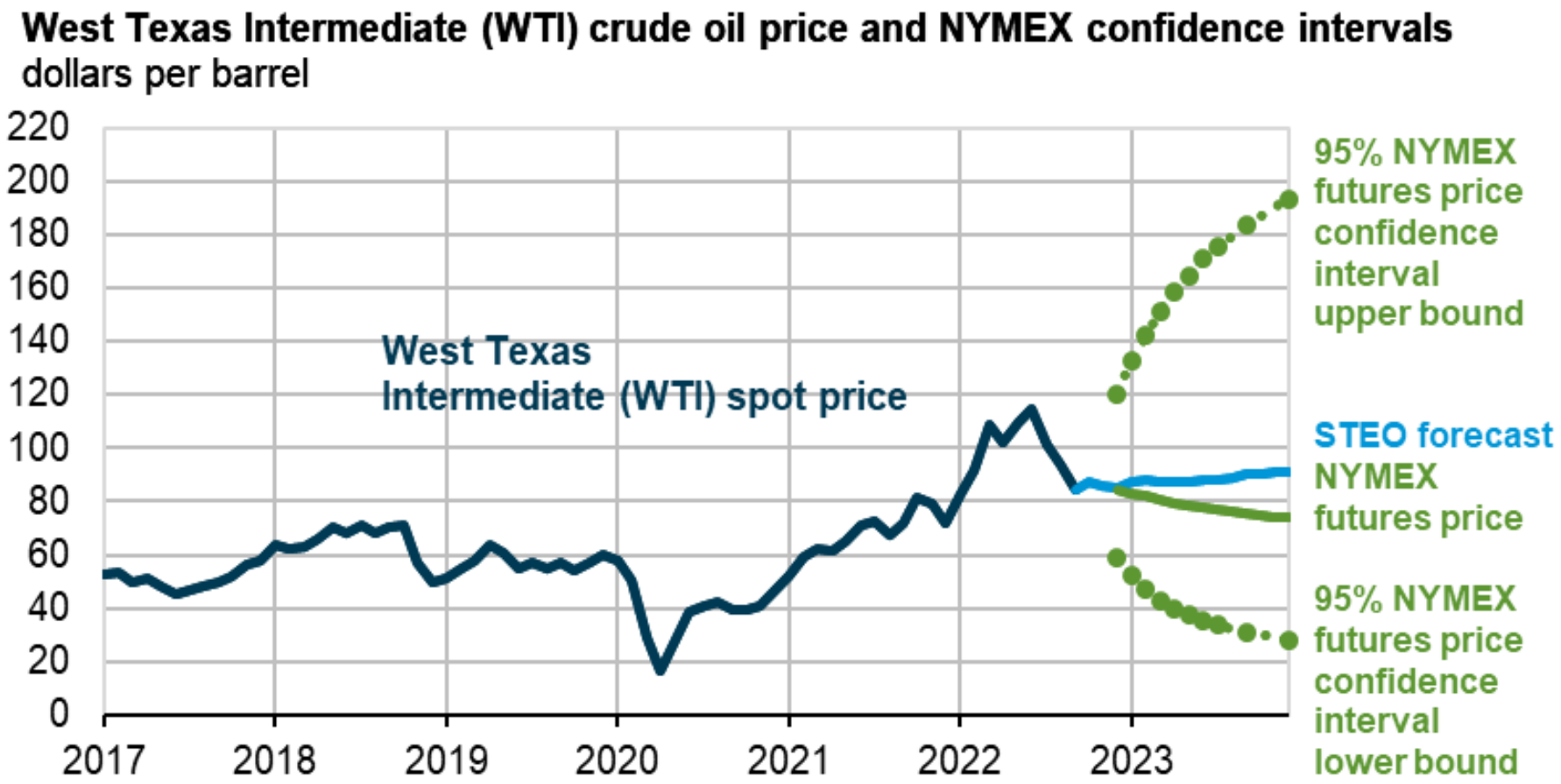
Source: Business Insider

During the recent Covid crisis



- Oil and gas production collapse – for a while
- Many operators went bankrupt
- Plant closures
- Polar cold in Texas in early 2021
- Hurricanes in USA during summer 2021
- Great difficulties in restarting production after the crisis

Oil price recovery - but only for a while



Note: Confidence interval derived from options market information for the five trading days ending Oct 6, 2022. Intervals not calculated for months with sparse trading in near-the-money options contracts.

Sources: U.S. Energy Information Administration, Short-Term Energy Outlook, October 2022, CME Group, Bloomberg, L.P., and Refinitiv an LSEG Business

Source: EIA October 13, 2022

The invasion of Ukraine drove European and Asian gas prices to record highs - but falling, now

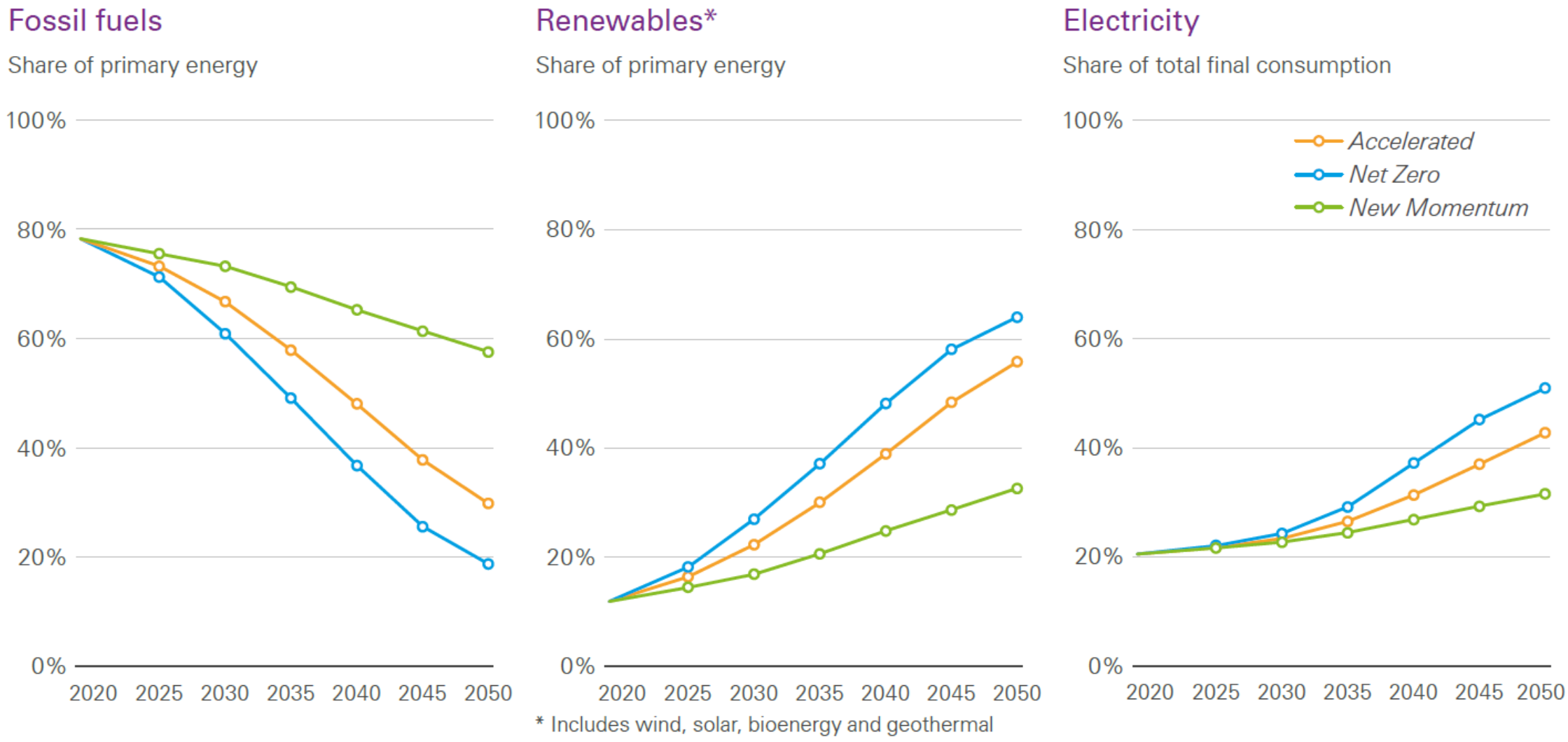
Russia's invasion of Ukraine created a moment of **unprecedented uncertainty and volatility** both for European and Asian spot gas prices.

Source: ISPI (18 October, 2022)

The future of traditional fossil fuels is closely linked to the energy transition

Source: Petroleum Economist, Nov. 2020

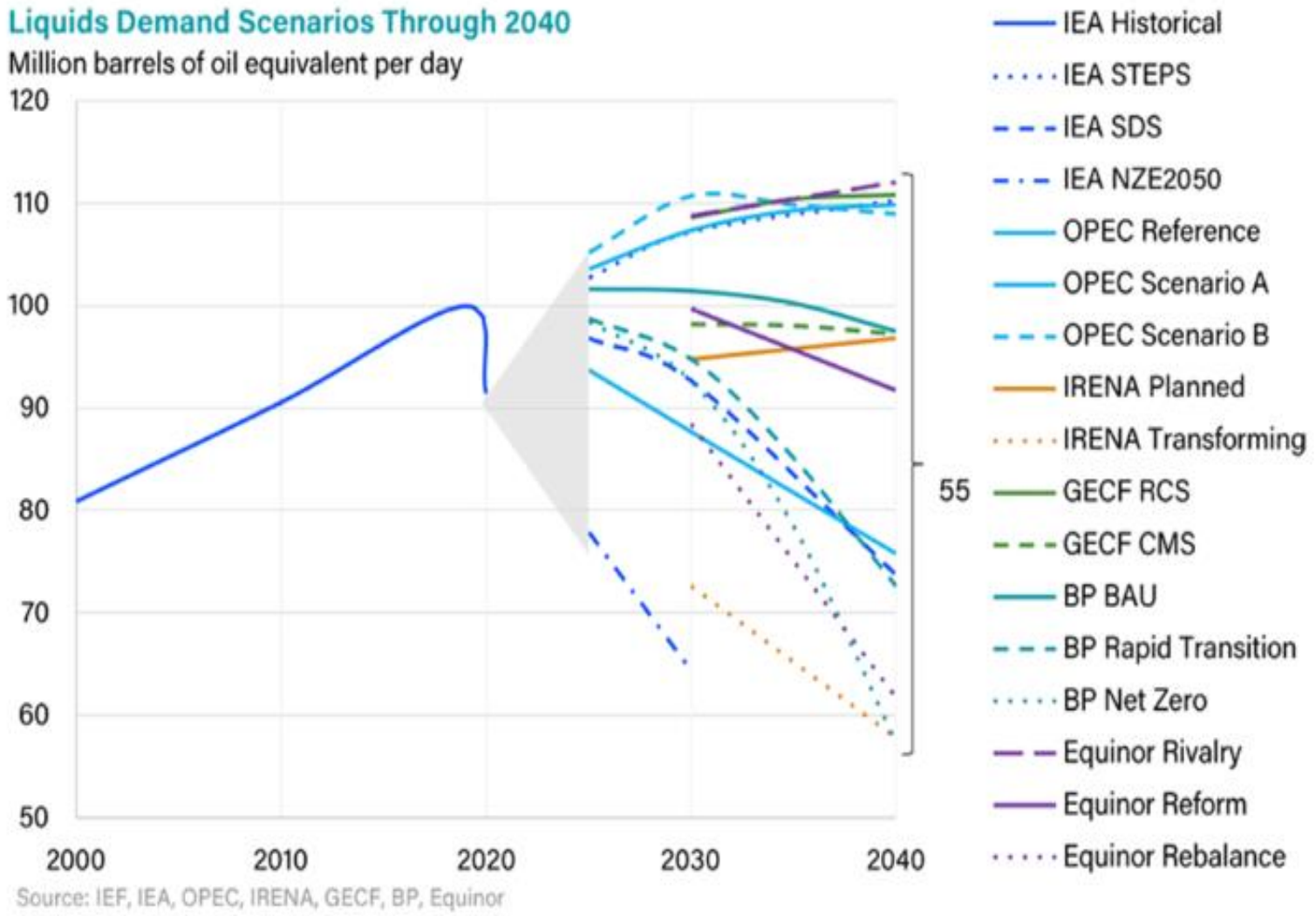
A bold view of the future - according to BP



Source BP Energy Outlook 2022, February 2022

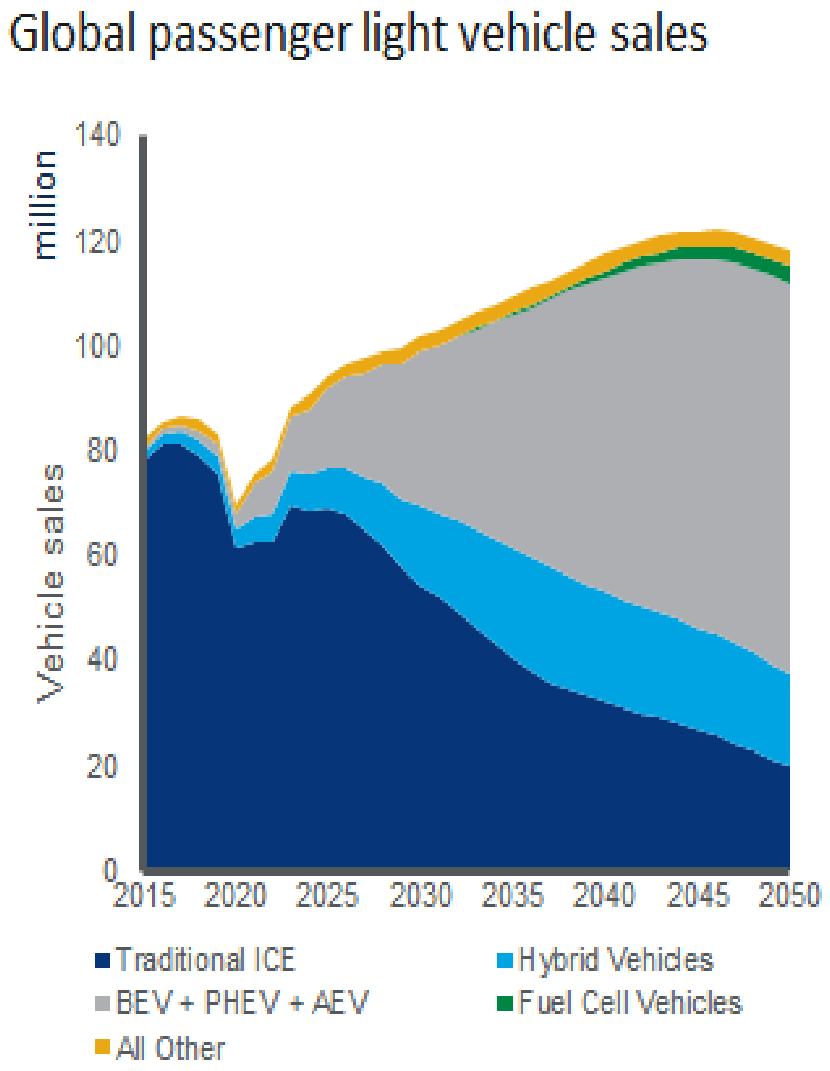
Not everyone agrees

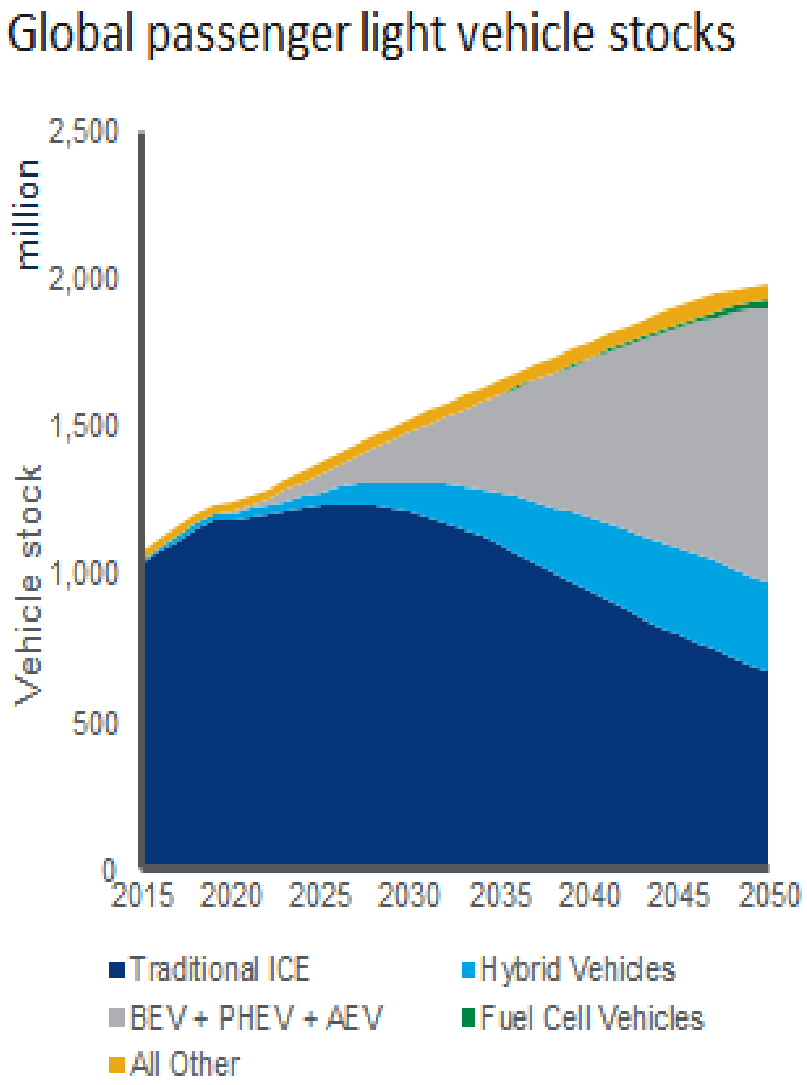
Oil and liquids demand challenge



EVs are growing strongly, with inevitable long-term impact on the oil demand…

(plus the impact of EV two and three-wheelers)





Source Wood Mackenzie

… and the **supporting infrastructure** is being built rapidly

New Shell's EV charging stations in London

Source: Bloomberg (October 14, 2022)

There will be further major **breakthroughs**

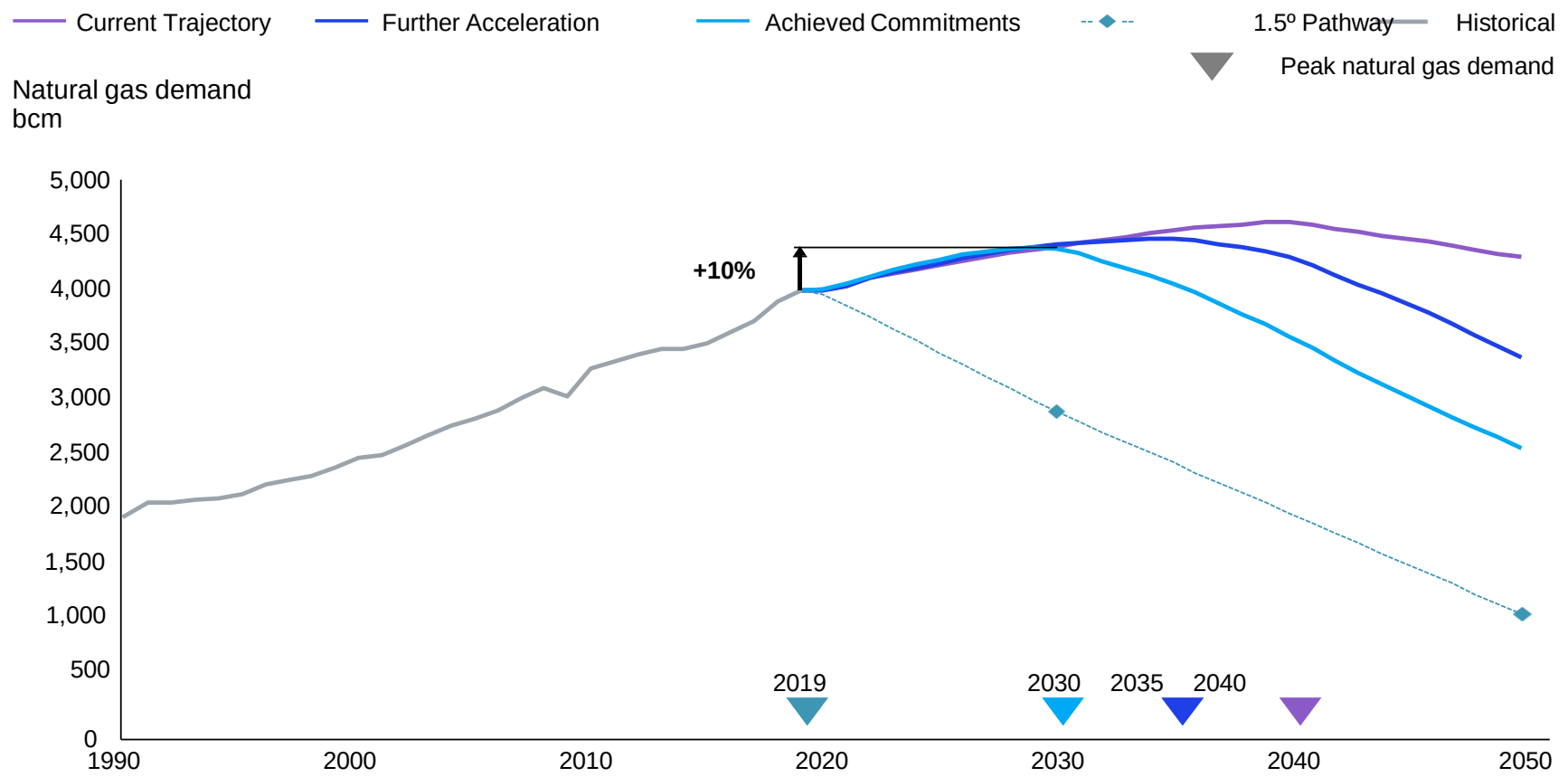
Lightyear 0 solar car (NL)

Source: Lightyear Company website June 9, 2022

Gas demand is projected to grow by approx. 10% in the next decade in all scenarios – and then peak

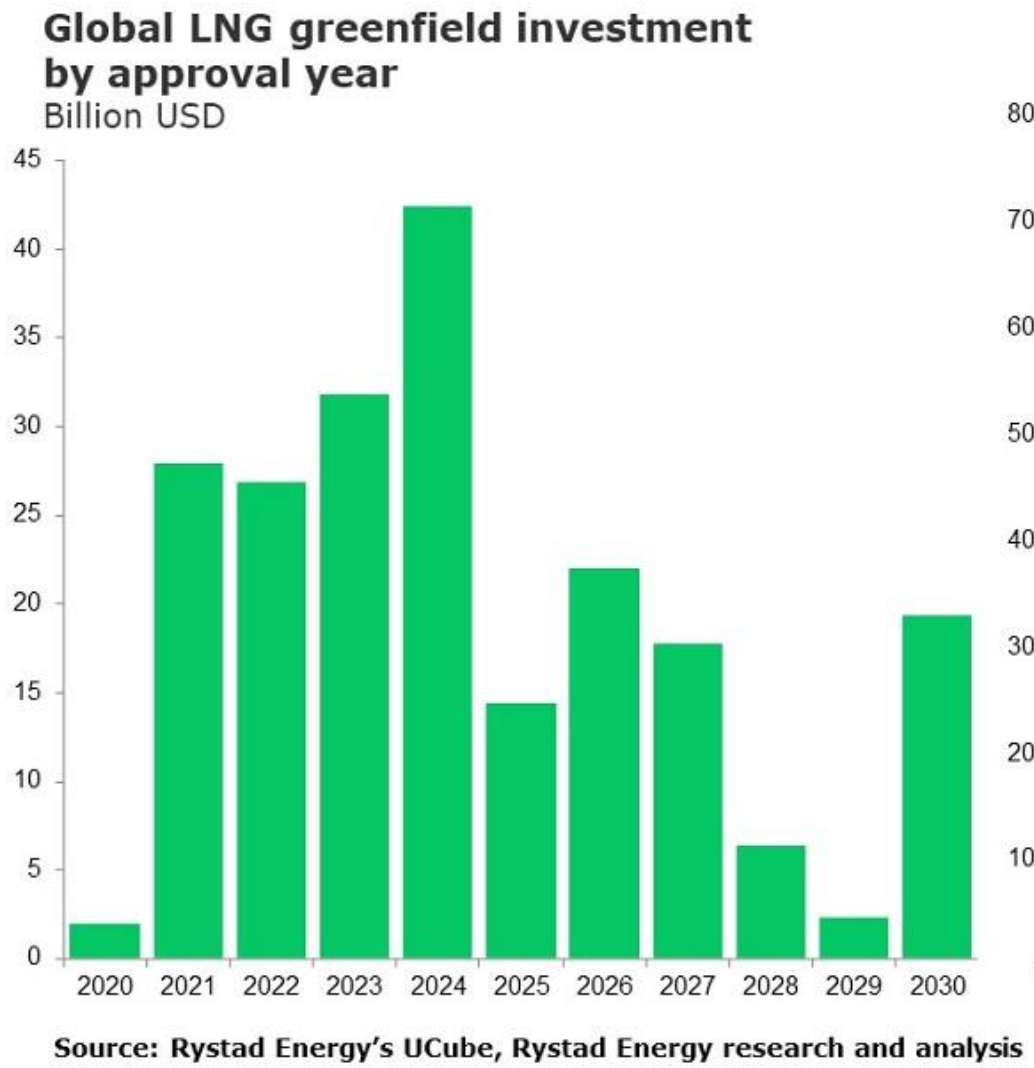
Analysis conducted before the invasion of Ukraine in February 2022

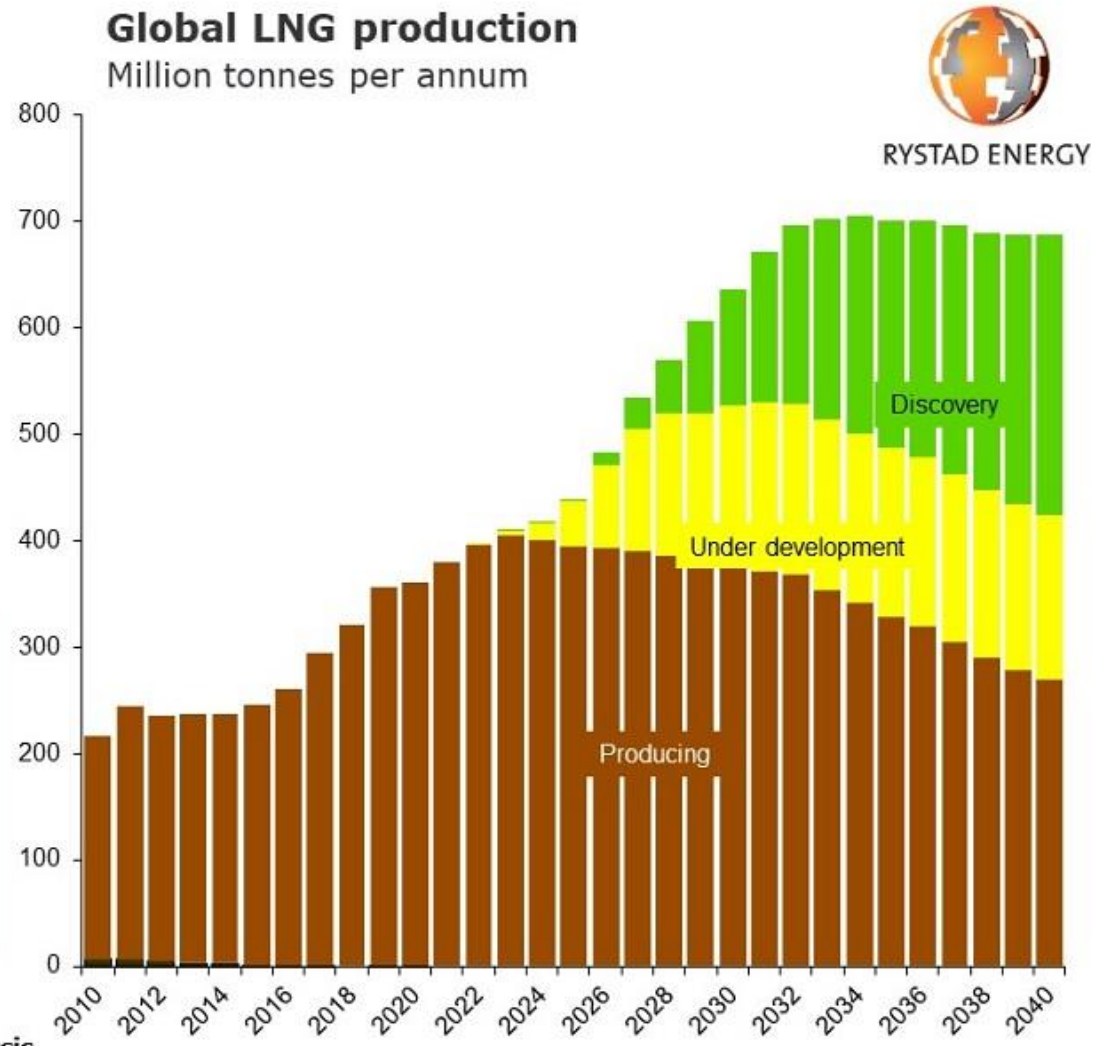
Scenarios diverge after 2030, driven by increasing decarbonization pressure in buildings and industry



Source: McKinsey Energy Insights Global Energy Perspective 2022 (April 2022)

LNG - a key factor in growing gas demand





Source: Rystad Energy, (August 27, 2022)

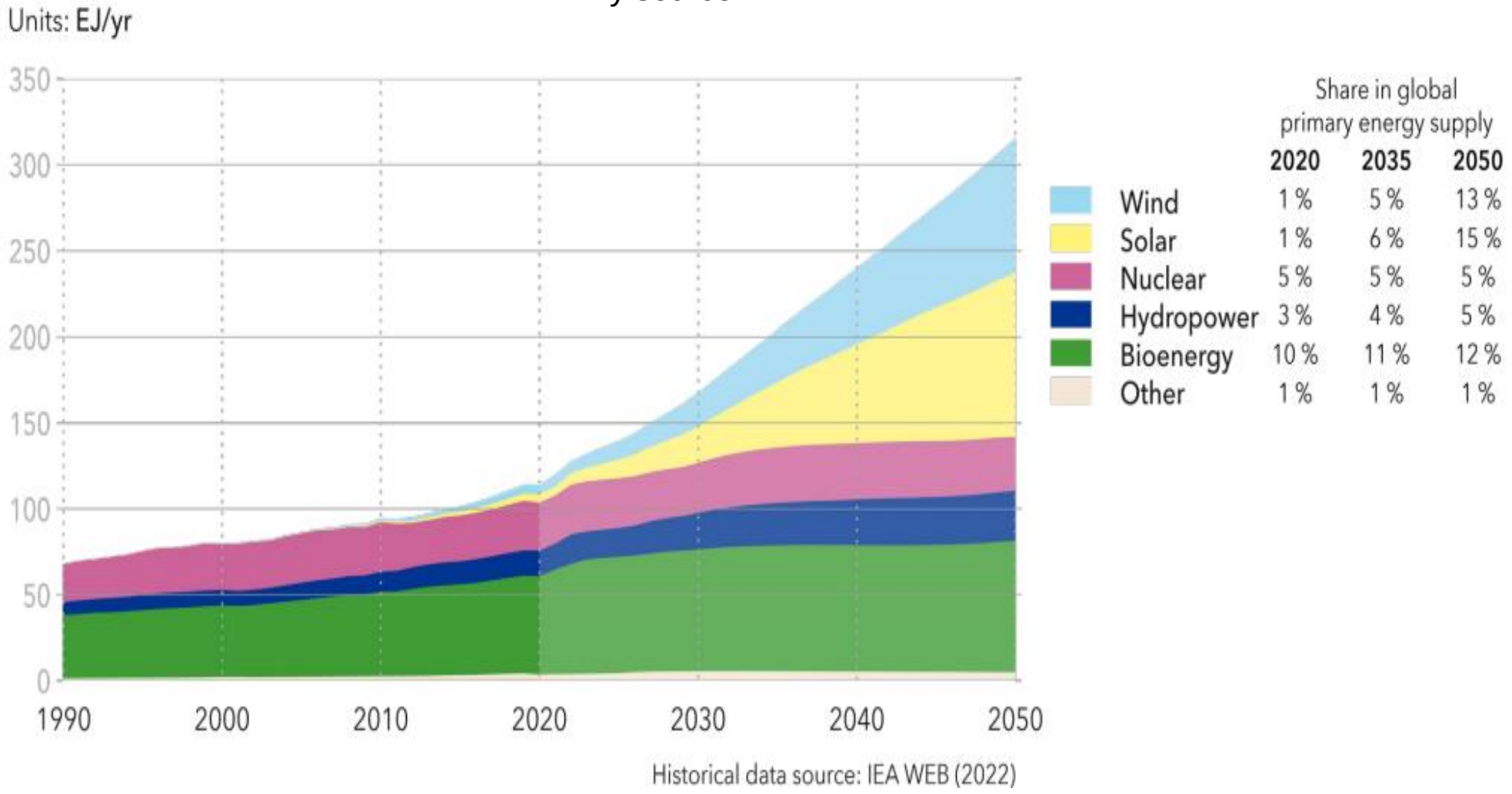
LNG - A cleaner maritime and heavy-transportation fuel

Example: MSC Europa, LNG-powered

Source: LNGPrime June 2022

World non-fossil energy supply to account for a huge portion of power supply

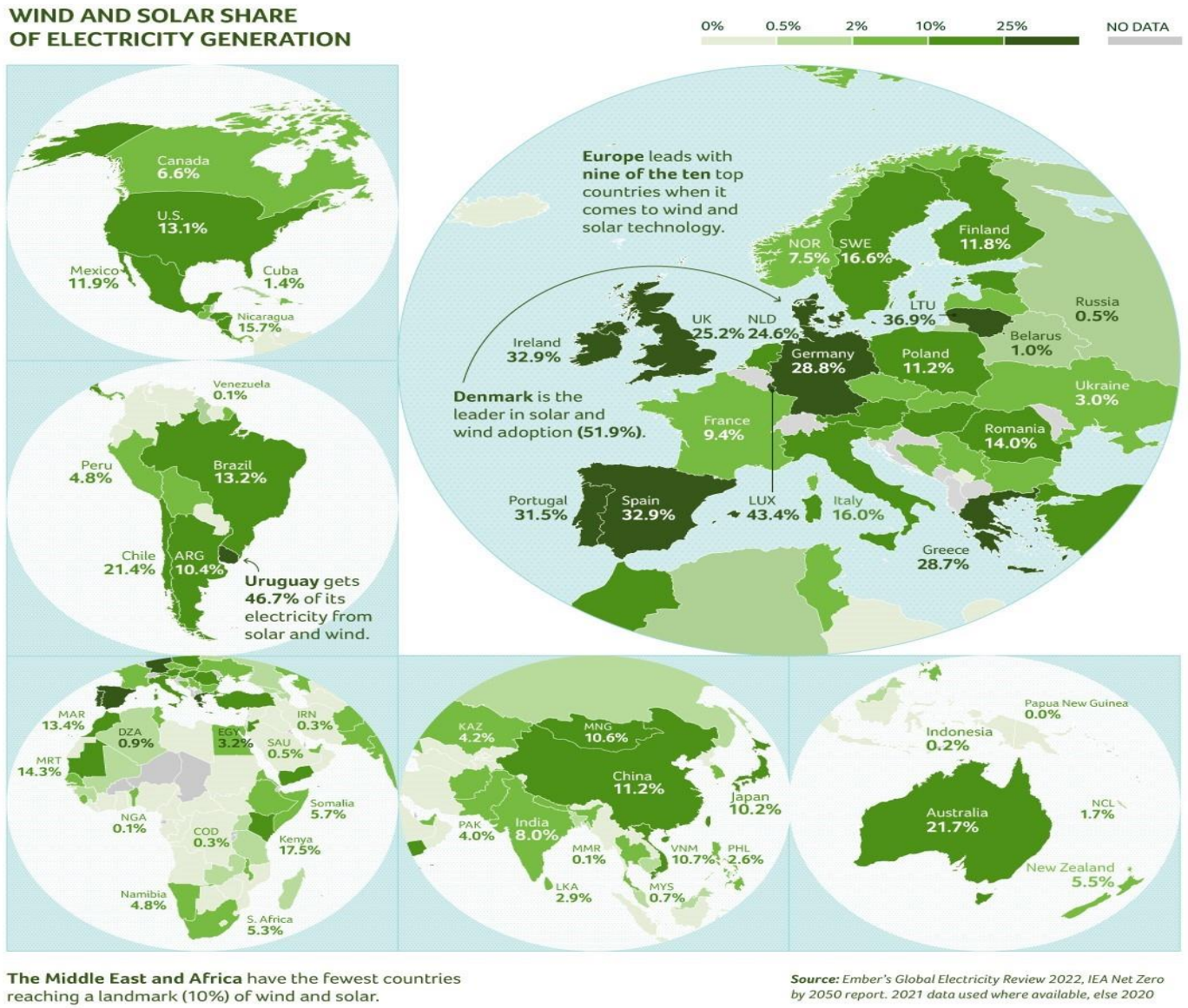
By source



	Share in global primary energy supply		
	2020	2035	2050
Wind	1 %	5 %	13 %
Solar	1 %	6 %	15 %
Nuclear	5 %	5 %	5 %
Hydropower	3 %	4 %	5 %
Bioenergy	10 %	11 %	12 %
Other	1 %	1 %	1 %

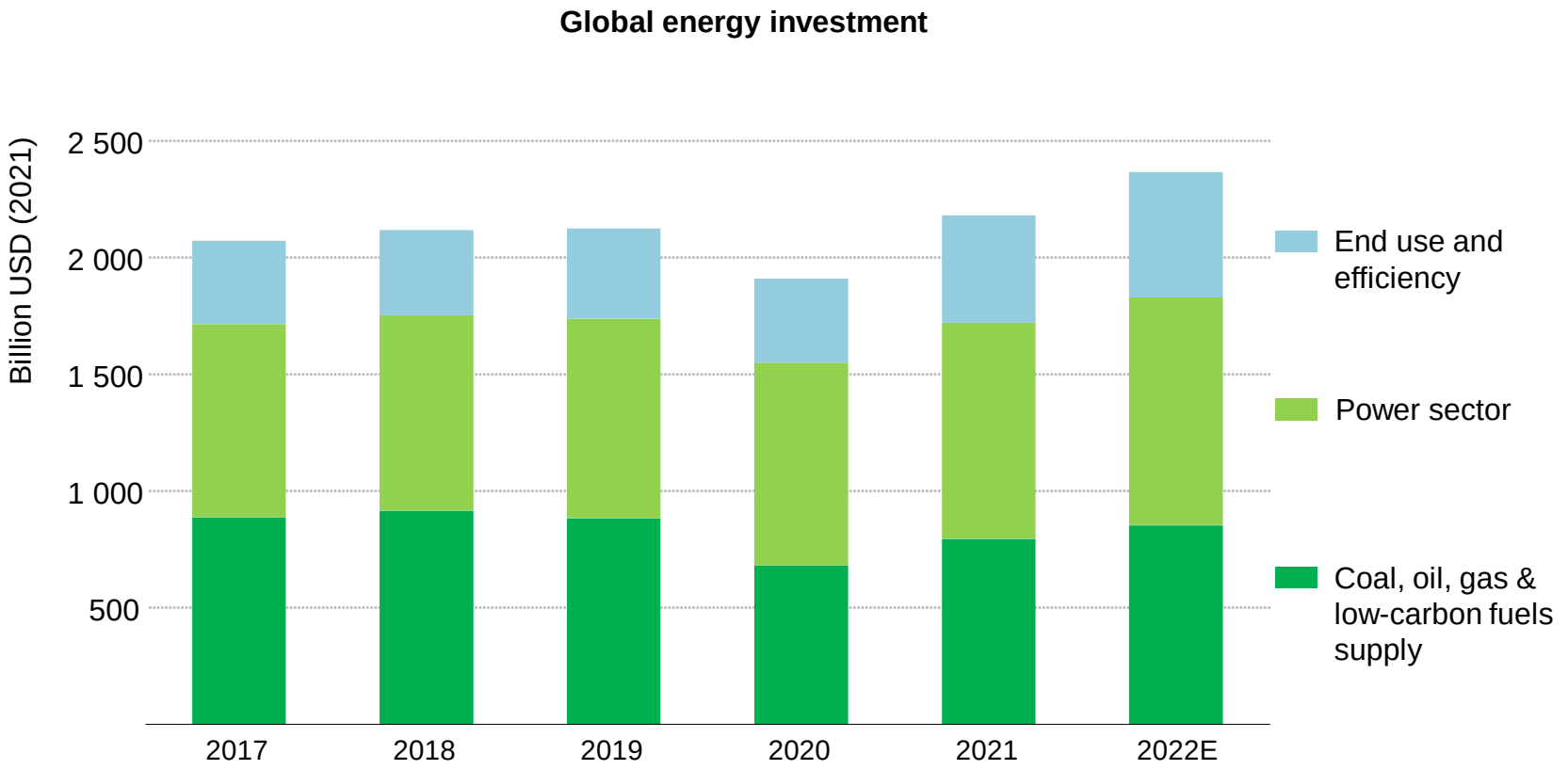
Source: DNV Energy Transition Outlook (October 13, 2022)

Great variations in renewables adoption, globally



Source: Transport Energy Strategies, June 2022

Global energy investment is picking up

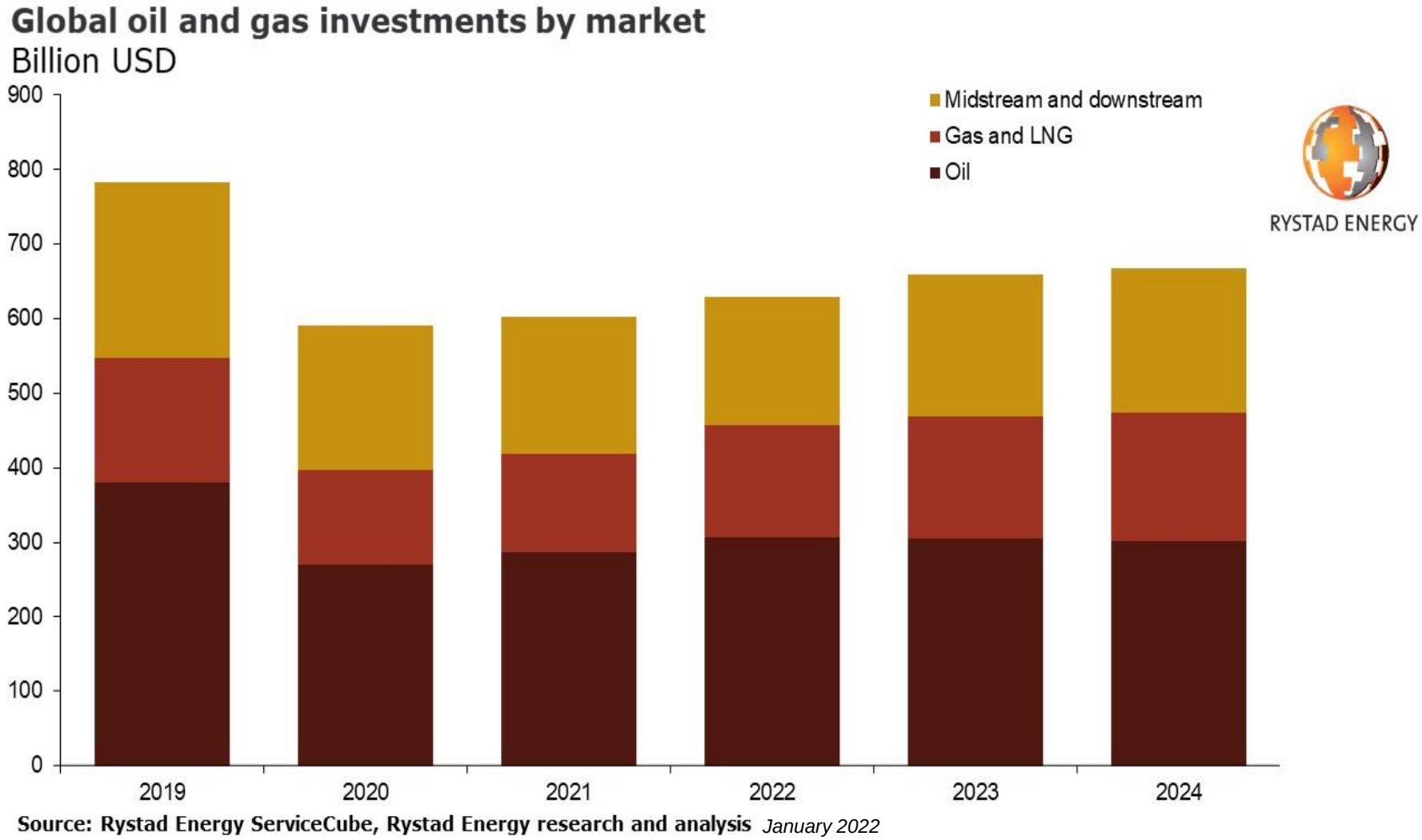


Energy investment is set to rise by 8% in 2022 to reach $2.4 trillion against the backdrop of the global energy crisis, although almost half of the increase in capital spending is linked to higher costs

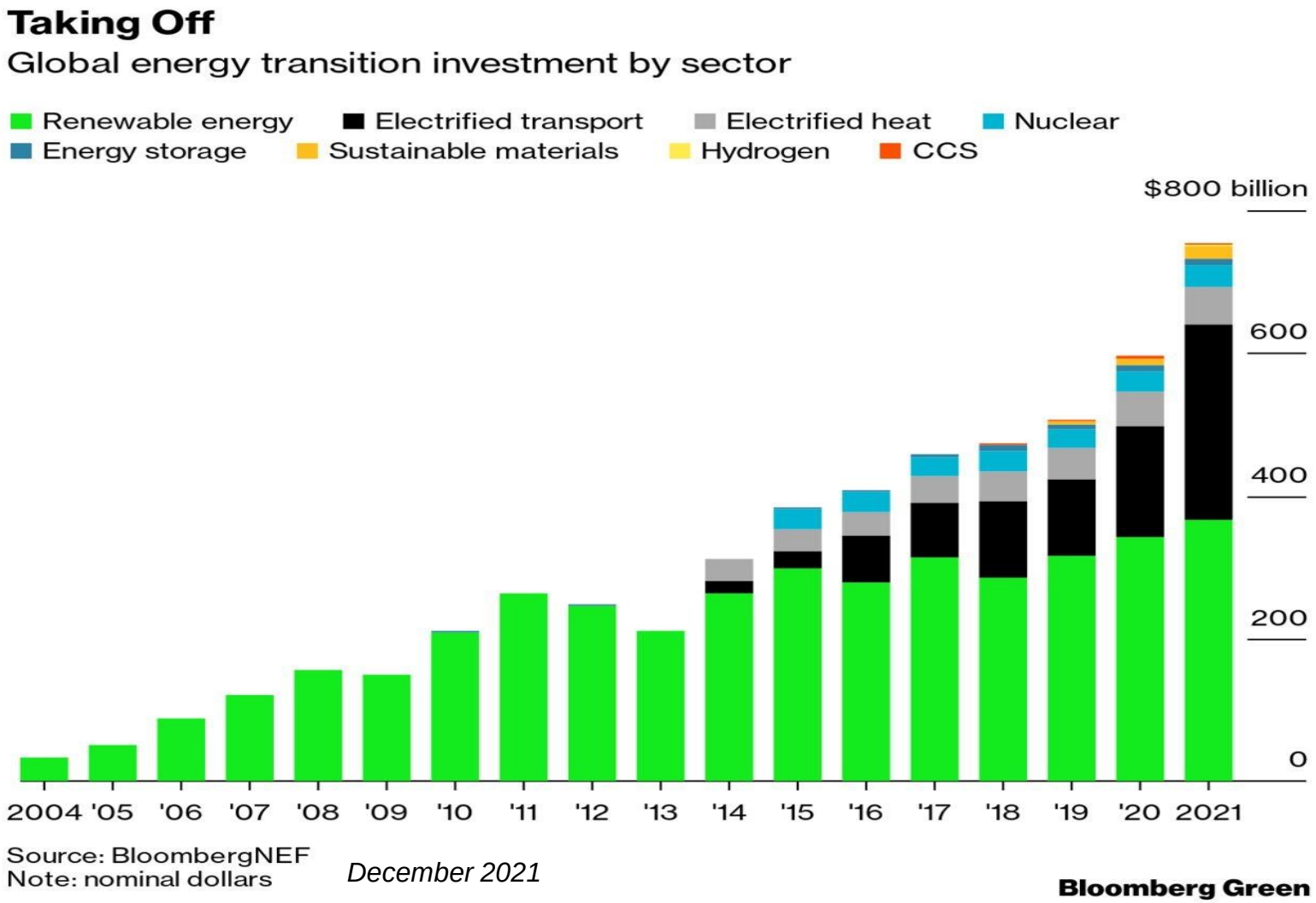
Source: International Energy Agency, July 2022

Traditional **investments** in **upstream oil&gas** will recover, then plateau

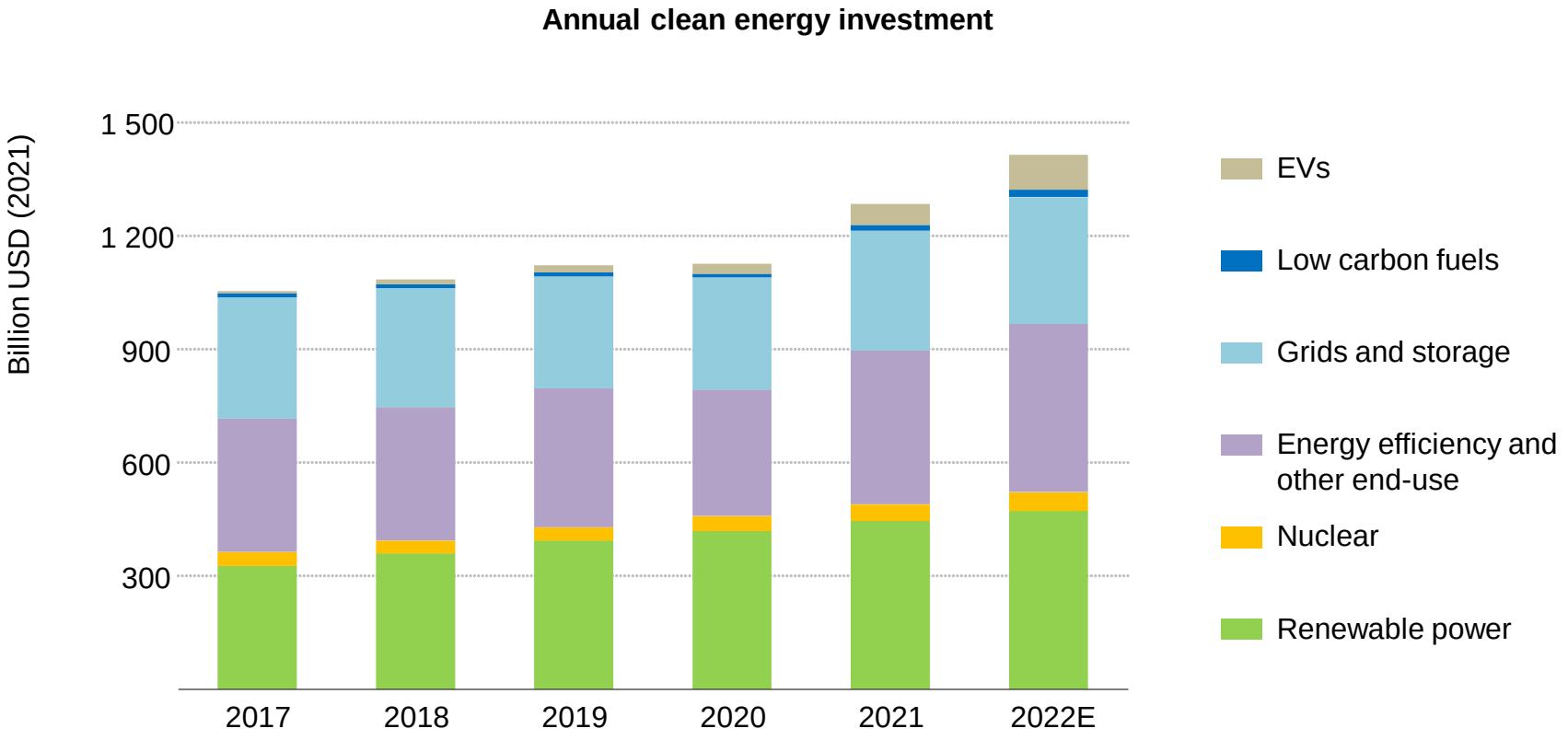
The need for substituting Russian oil&gas has not yet been taken into account
However, many investors are very currently cautious



… whereas the **investments in the energy transition** will continue to grow



Investment in energy transitions is gaining momentum

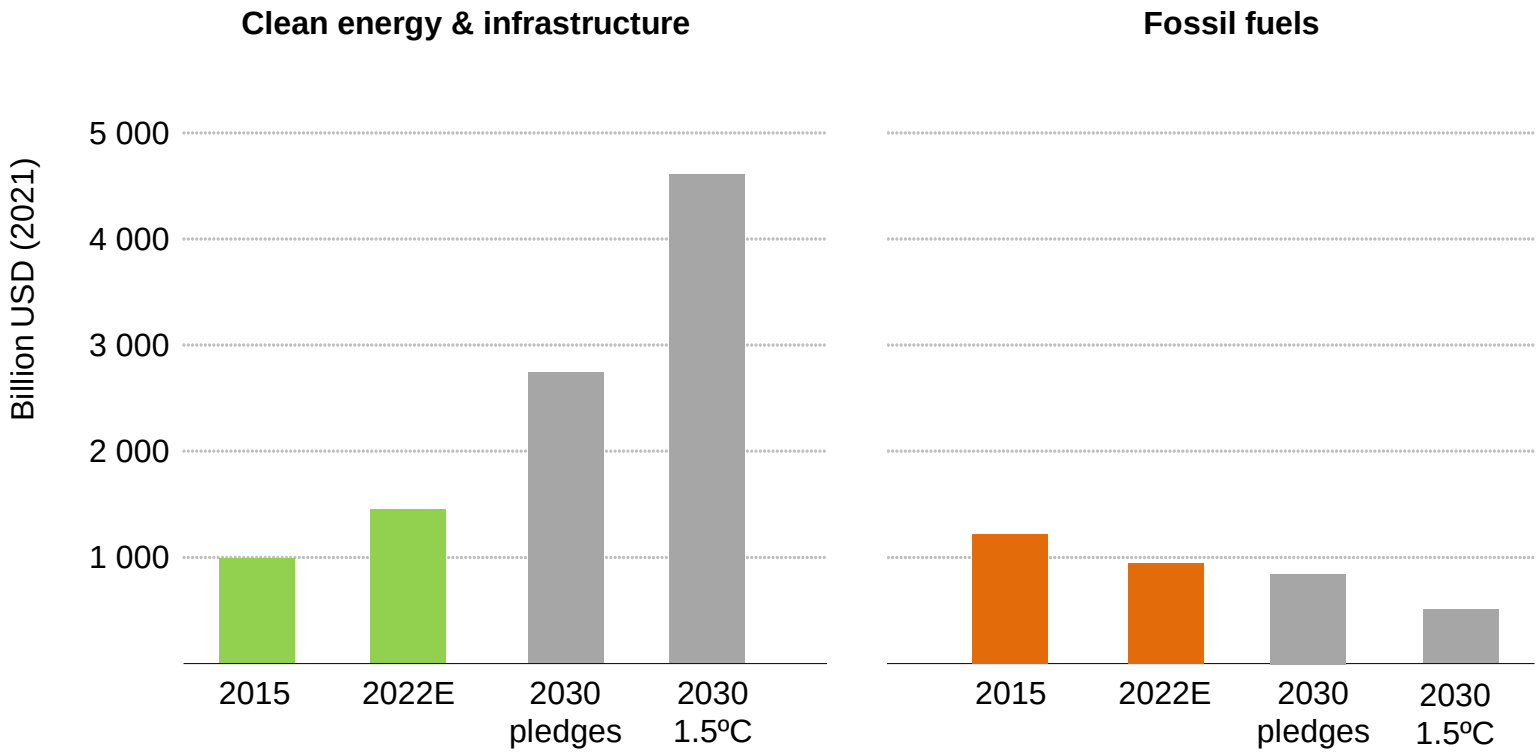


After flatlining for several years, investment in clean energy technologies and infrastructure is stepping up, with renewable power, efficiency and EVs leading the way

Source: International Energy Agency, July 2022

However, the investment trends don’t match up to the energy & climate crises

Global annual energy investment benchmarked against future needs



Investment to bring more clean and affordable energy into the system is rising, but not yet quickly enough to forge a path out of today’s crisis or to bring emissions down to net zero by mid-century.

Source: International Energy Agency, July 2022

Are we ready for the **'Hydrogen Economy'** ?

Salstom 1175 km distance record in 2022

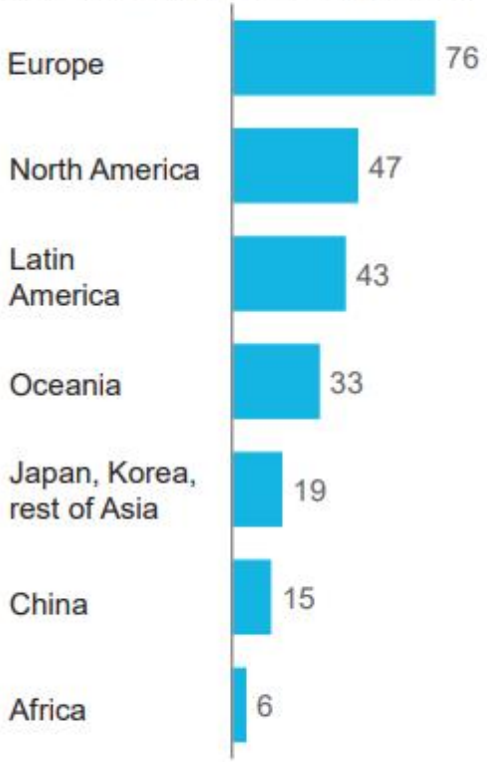
Global hydrogen project announcements (1/3)

As of May 8, 2022

Out of 541 large-scale projects worth USD 240 bn announced globally …

USD 240bn

investments required for announced projects until 2030



# of projects

- **51** Giga-scale production
- **262** Large-scale industrial use
- **128** Transport
- **53** Integrated H_2 economy
- **40** Infrastructure projects

Source: 'Hydrogen Insights' by Hydrogen Council and McKinsey & Co., September 2022

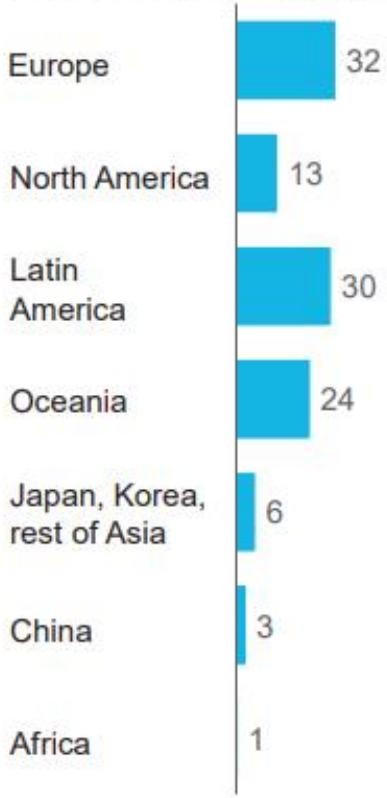
Global hydrogen project announcements (2/3)

As of May 8, 2022

… 165 are undergoing feasibility and FEED studies …

USD 109bn

investments until 2030, related to projects in planning



# of projects

- **33** Giga-scale production
- **86** Large-scale industrial use
- **26** Transport
- **13** Integrated H_2 economy
- **7** Infrastructure projects

Source: 'Hydrogen Insights' by Hydrogen Council and McKinsey & Co., September 2022

Global hydrogen project announcements (3/3)

As of May 8, 2022

… and 189 have achieved final investment decision

USD 22bn

investments until 2030, related to committed projects

Europe	6
North America	8
Latin America	<1
Oceania	<1
Japan, Korea, rest of Asia	6
China	2
Africa	<1

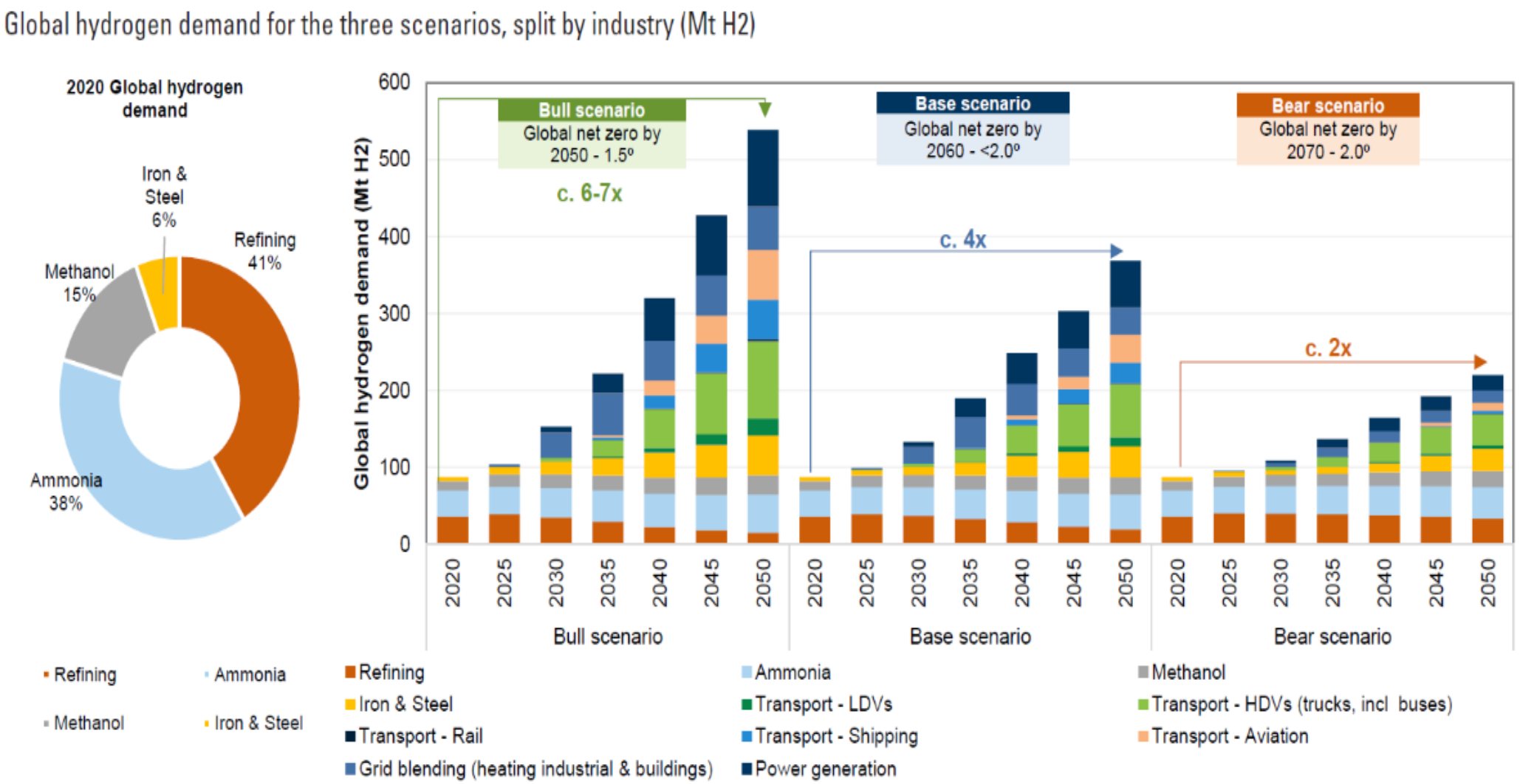
# of projects

- **3** Giga-scale production
- **77** Large-scale industrial use
- **61** Transport
- **29** Integrated H_2 economy
- **19** Infrastructure projects

Source: 'Hydrogen Insights' by Hydrogen Council and McKinsey & Co., September 2022

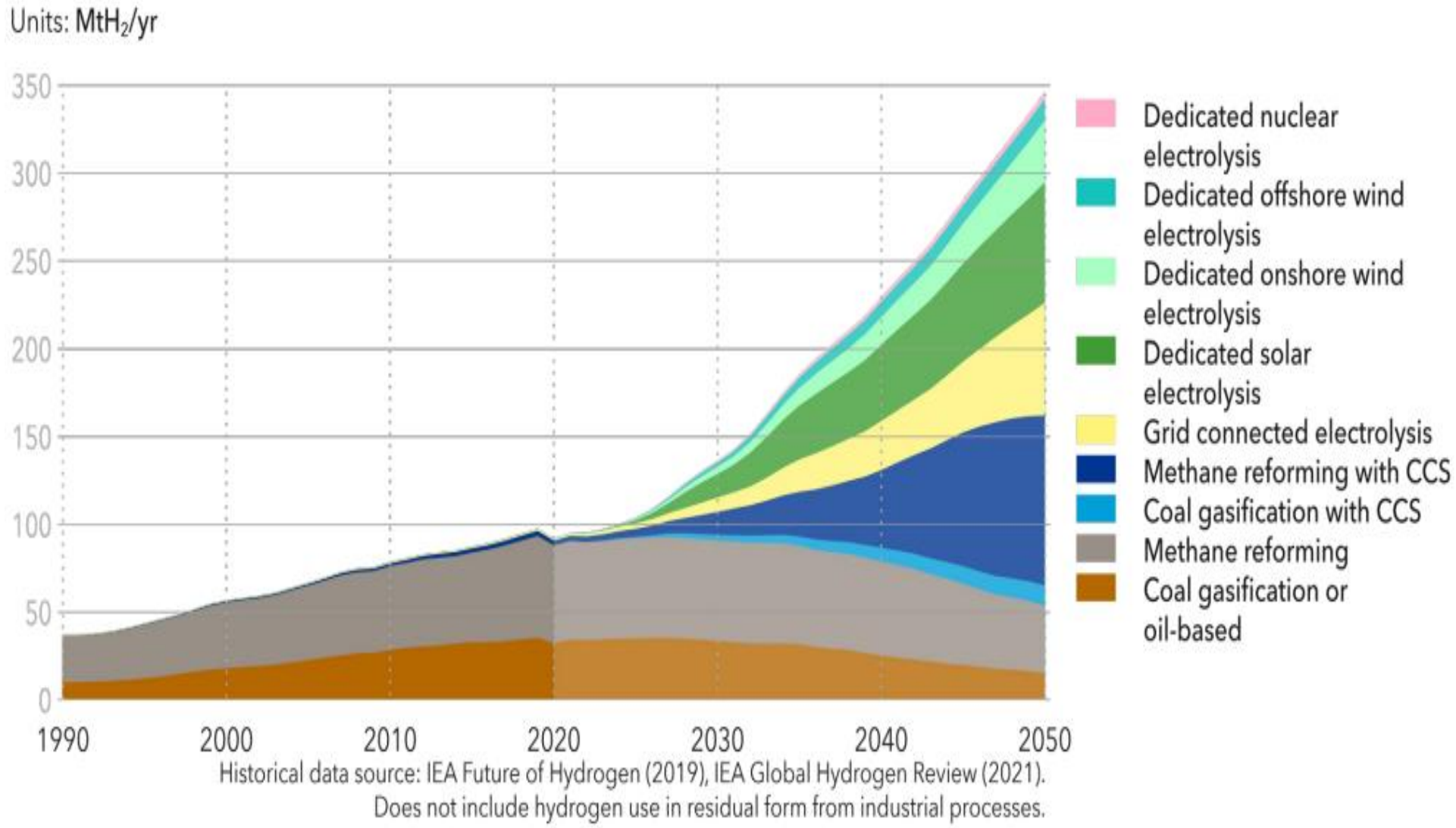
New **hydrogen projects** - an unprecedented momentum

By destination



Source: Goldman Sachs Global Investment Research, January 2022

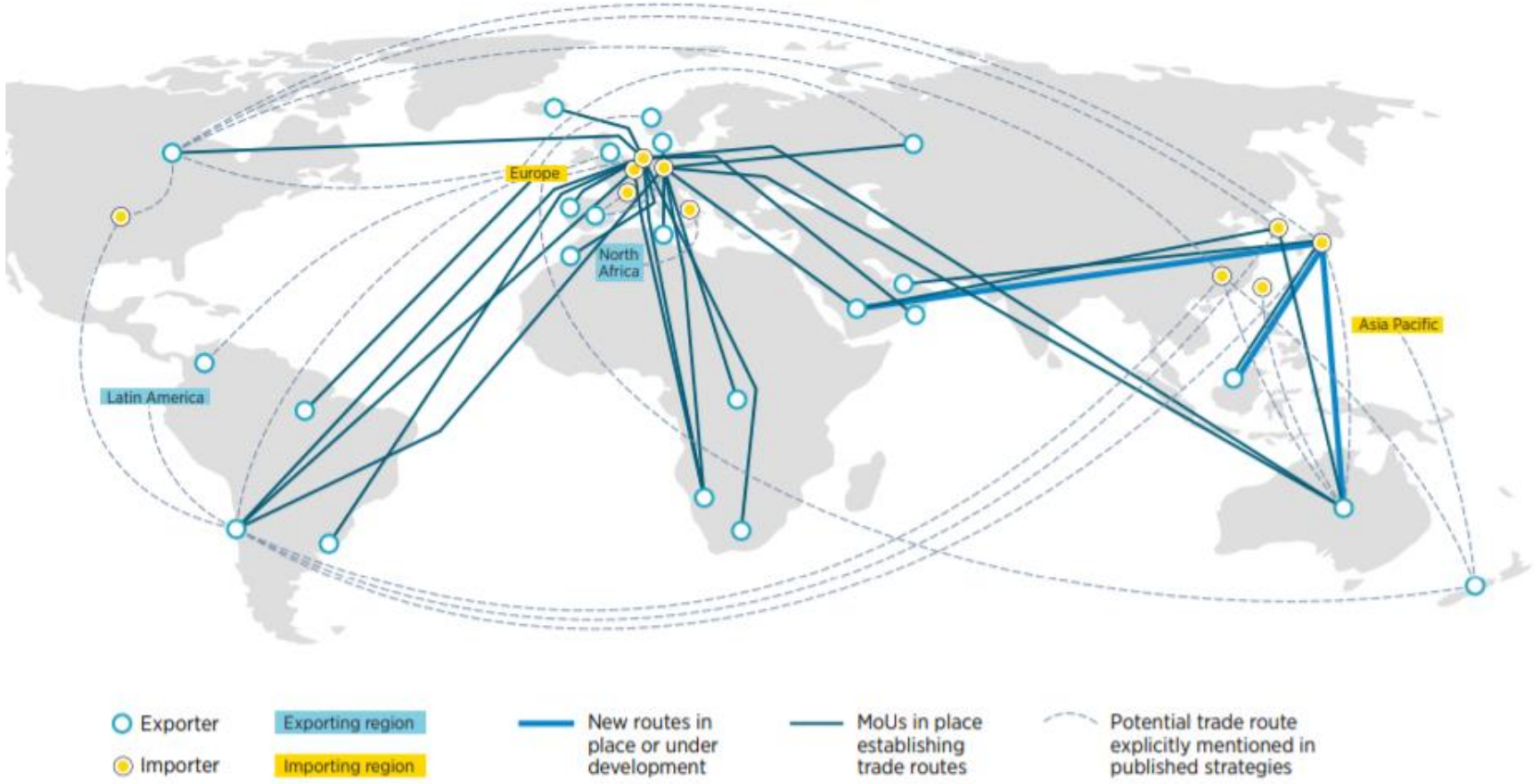
World hydrogen generation - by production route



Source: DNV Energy Transition Outlook (October 13, 2022)

This could give birth to a **global H2 trade route network**

Figure S.2 An expanding network of hydrogen trade routes, plans and agreements



Map source: Natural Earth, 2021

Notes: Information on this figure is based on the information contained in government documents at the time of writing.

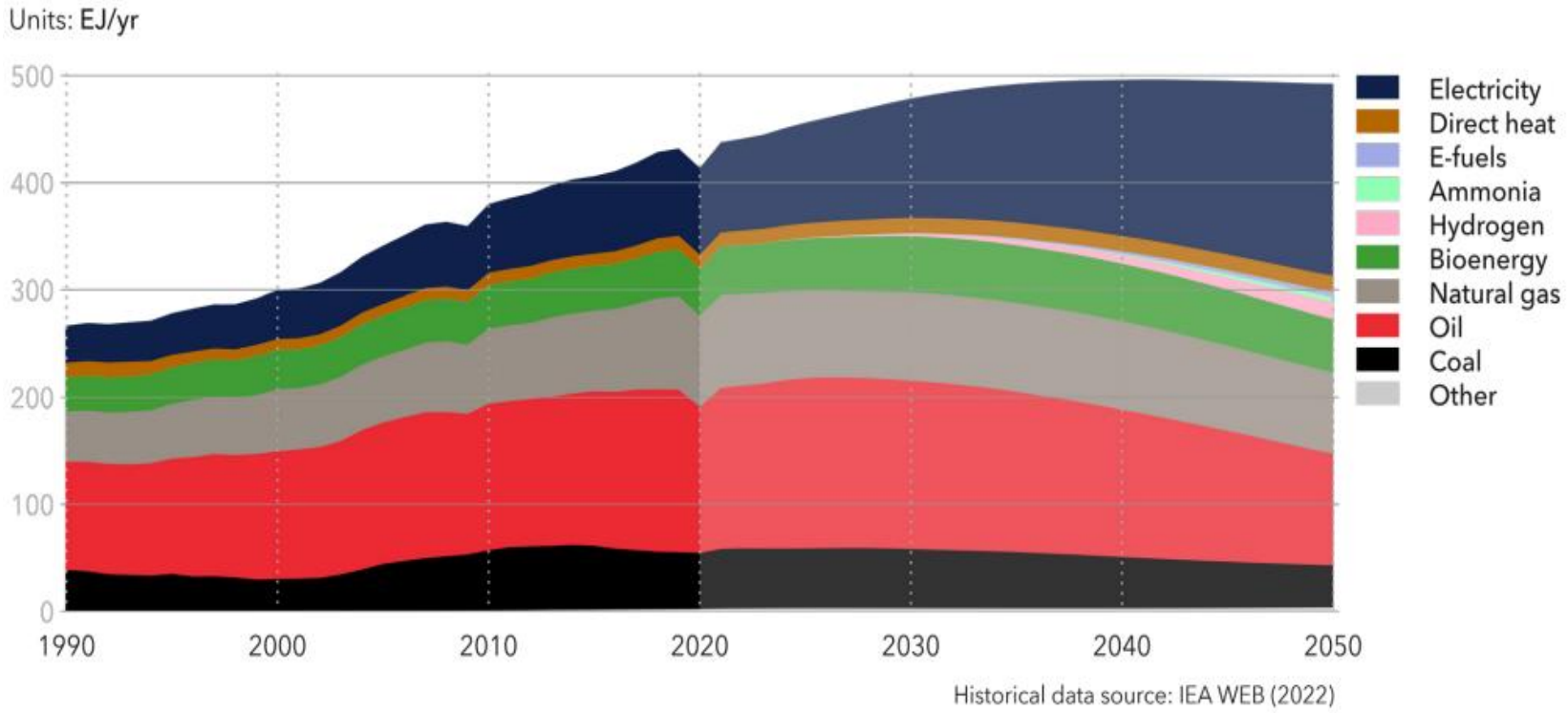
Disclaimer: This map is provided for illustration purposes only. Boundaries and names shown on this map do not imply any endorsement or acceptance by IRENA.

Source: IRENA January 2022

But need a capillary **refuelling infrastructure**

In the end, the **global energy mix** is projected to shift rapidly towards power

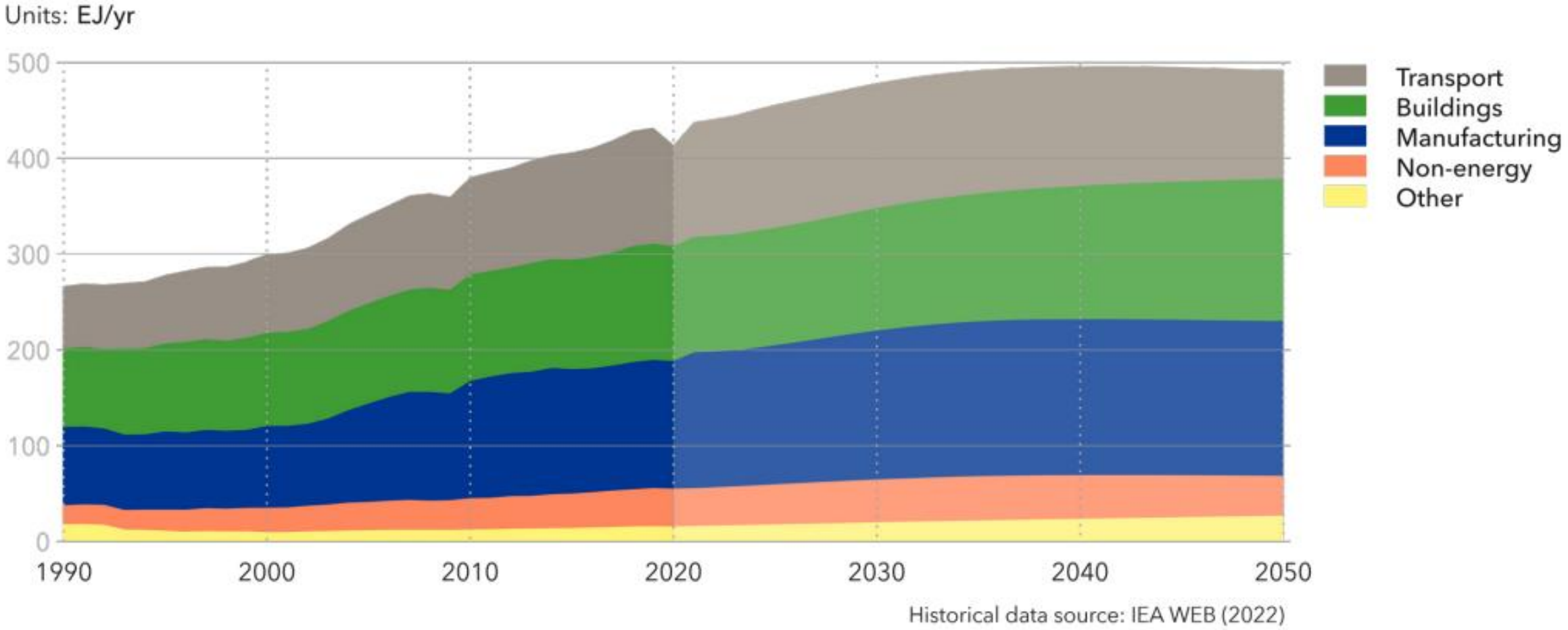
World final energy demand by carrier



Source: DNV Energy Transition Outlook (October 13, 2022)

…whereas the **market demand** destinations will not change a whole lot

World final energy demand by sector



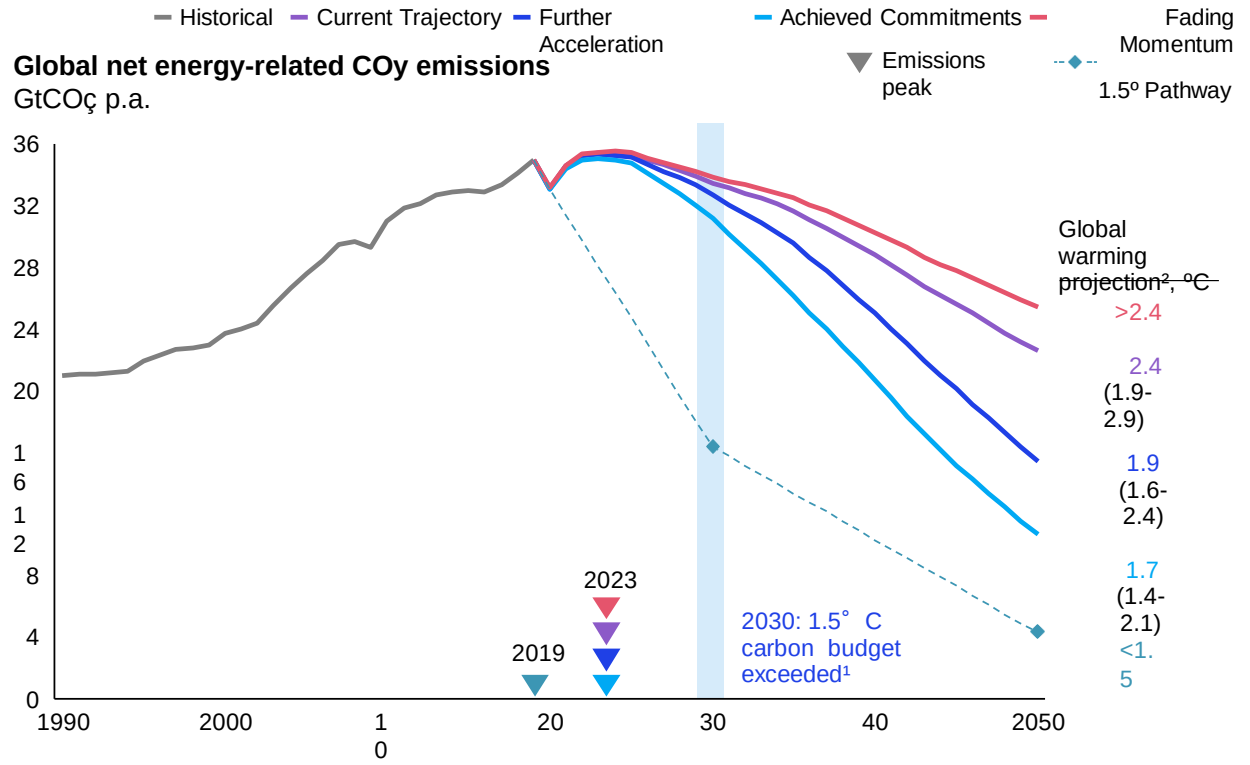
Source: DNV Energy Transition Outlook (October 13, 2022)

Global emissions remain **far from a 1.5º pathway**, even if all countries deliver on their current commitments

Current forecast with existing policies: **+2.2°C**

Knock-on effect and regional differences could drive significantly higher temperature increases locally

Analysis conducted before the invasion of Ukraine in February 2022

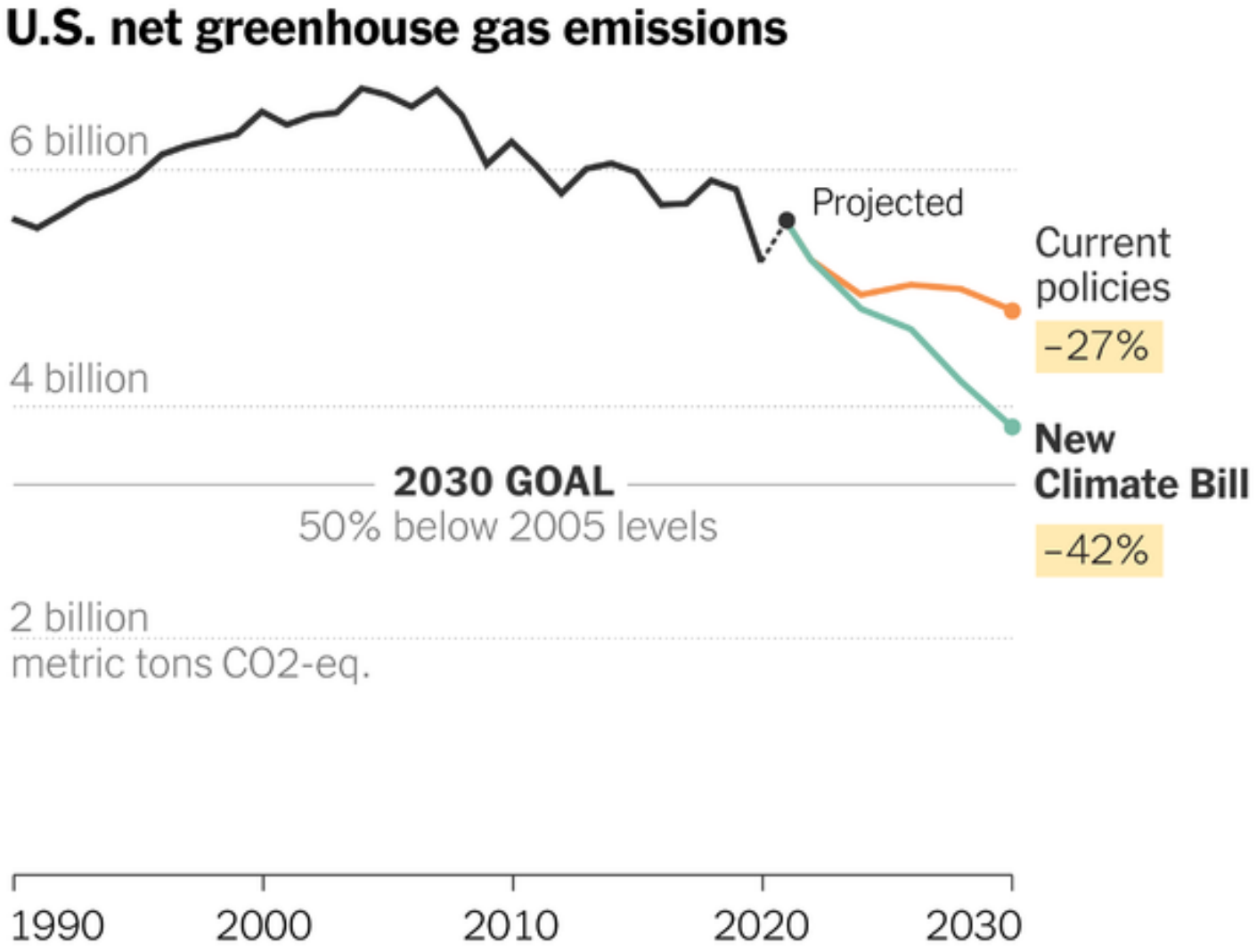


1. 570 Gt of cumulative COç emissions from 2018 for a 66% chance of limiting global warming to 1.5° C
2. Warming estimate is an indication of global rise in temperature by 2100 versus pre-industrial levels (median - 17th/83rd percentile), based on IPCC assessments given the respective emission levels and assuming continuation of trends after 2050 but no net-negative emissions

Source: McKinsey Energy Insights Global Energy Perspective 2022

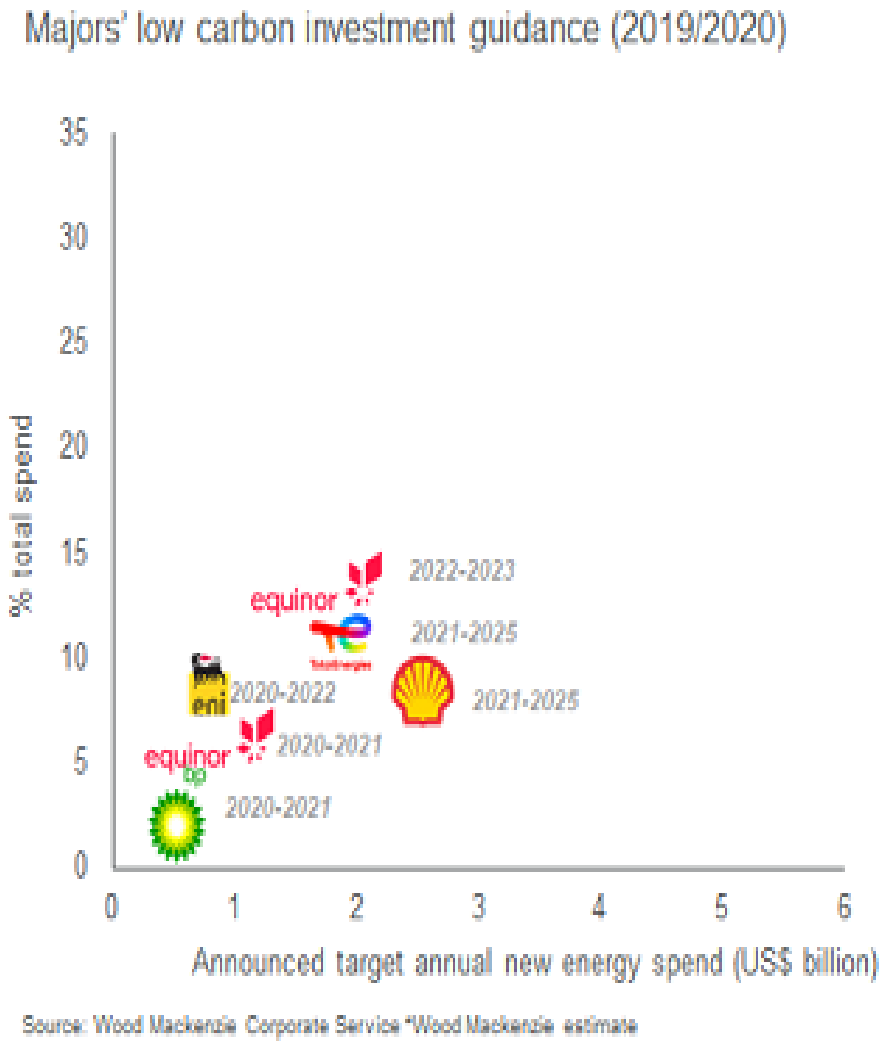
US and EU policies are becoming aligned with the 1.5°C goal

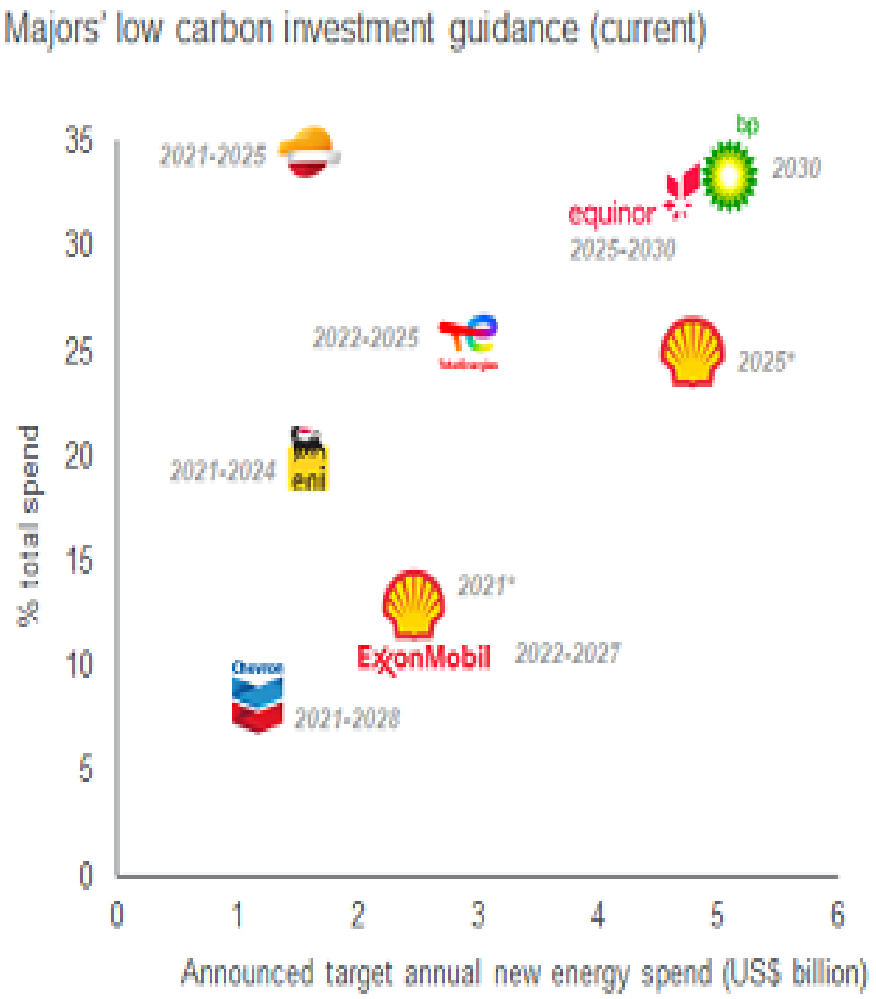
But India and China?



Source: NYT August 12 , 2022

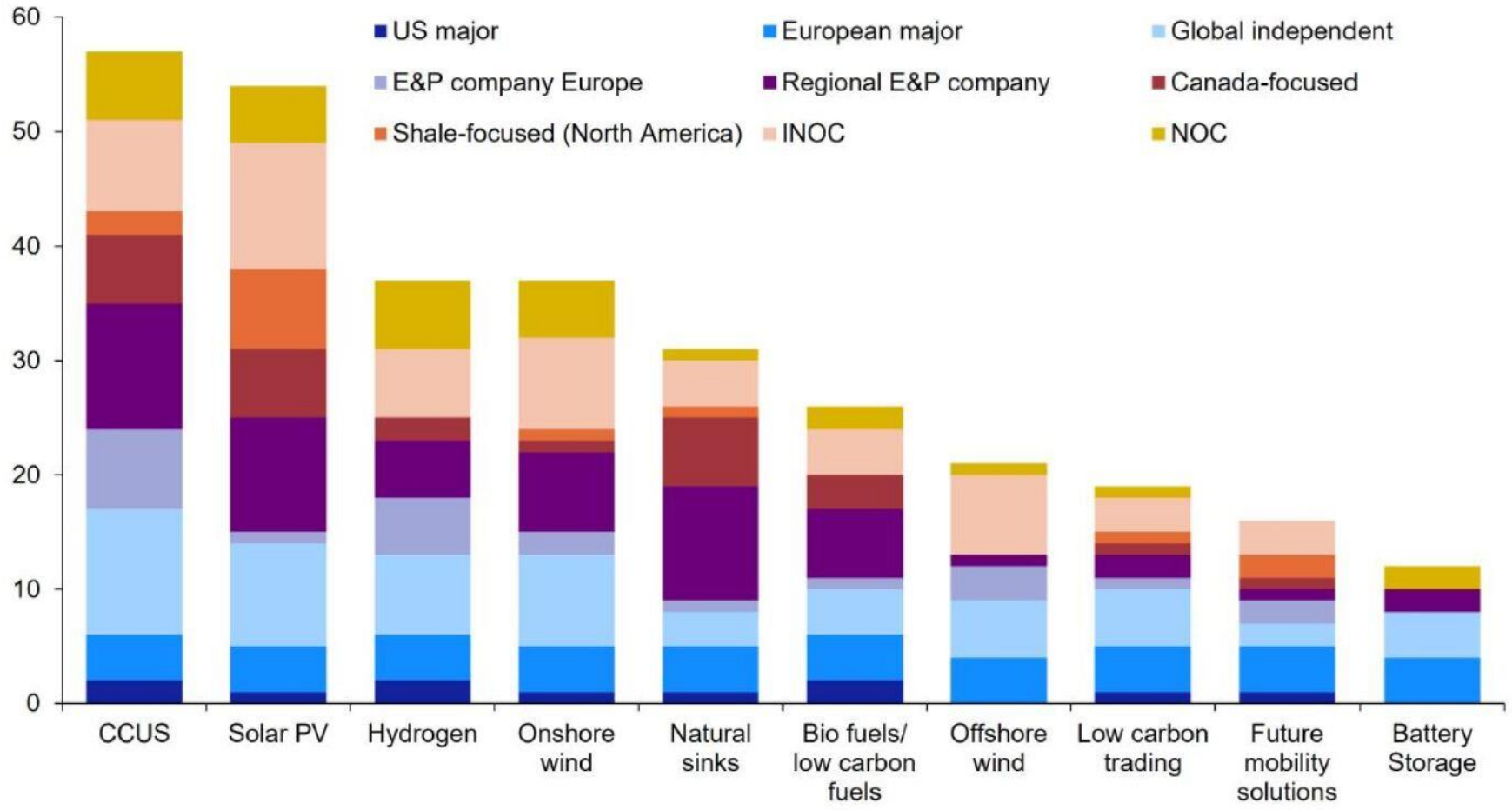
The global investments by energy majors' are evolving from 2021





Source: WoodMac (December 2021)

The **top 130 energy companies** are planning to invest in **low-carbon areas**

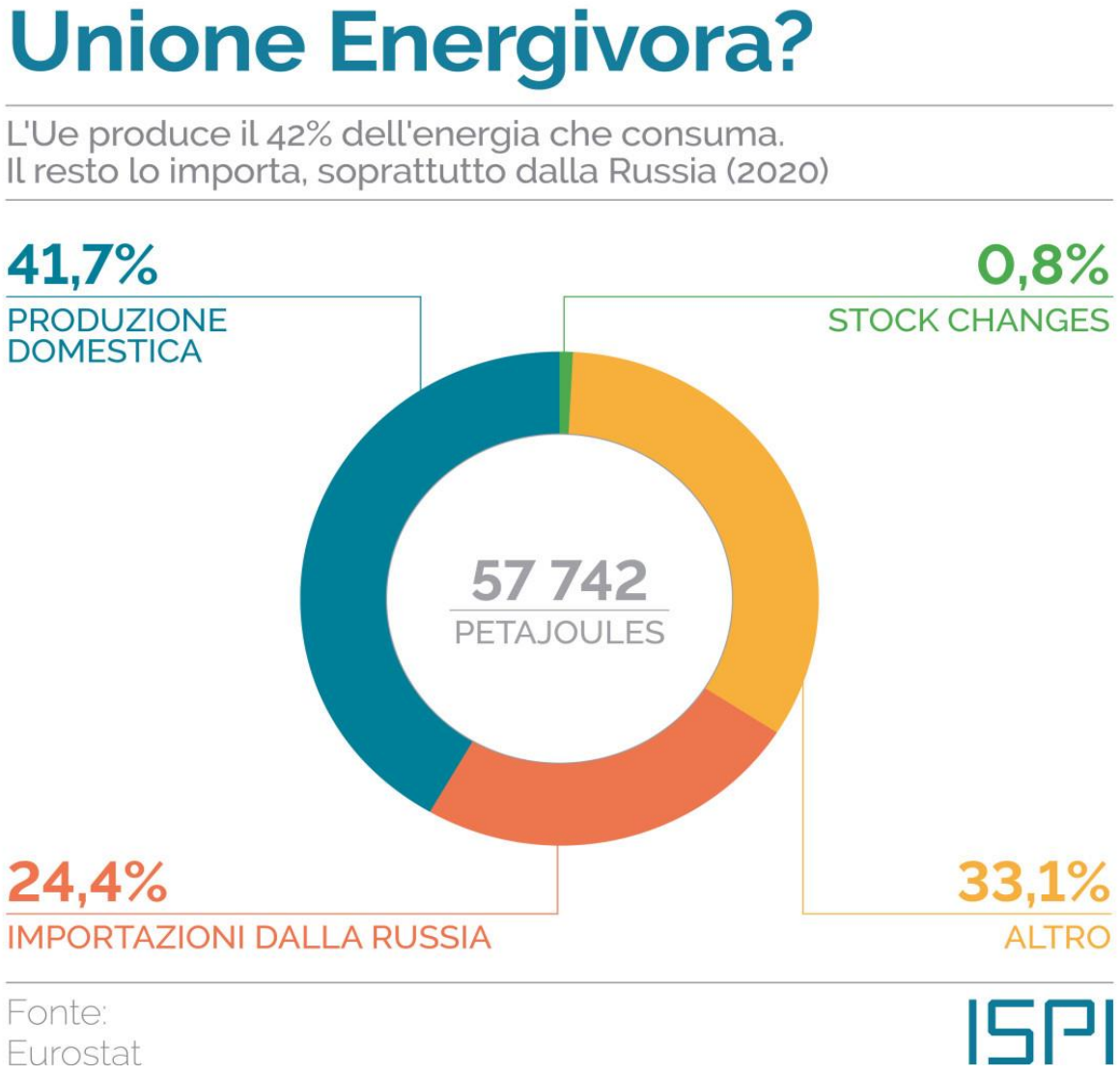


*The chart shows how many oil and gas companies from the top 130 have announced each low-carbon segment as a focus area for future carbon mitigation strategy
Source: Rystad Energy E&P Energy Transition Strategy Analysis dashboard

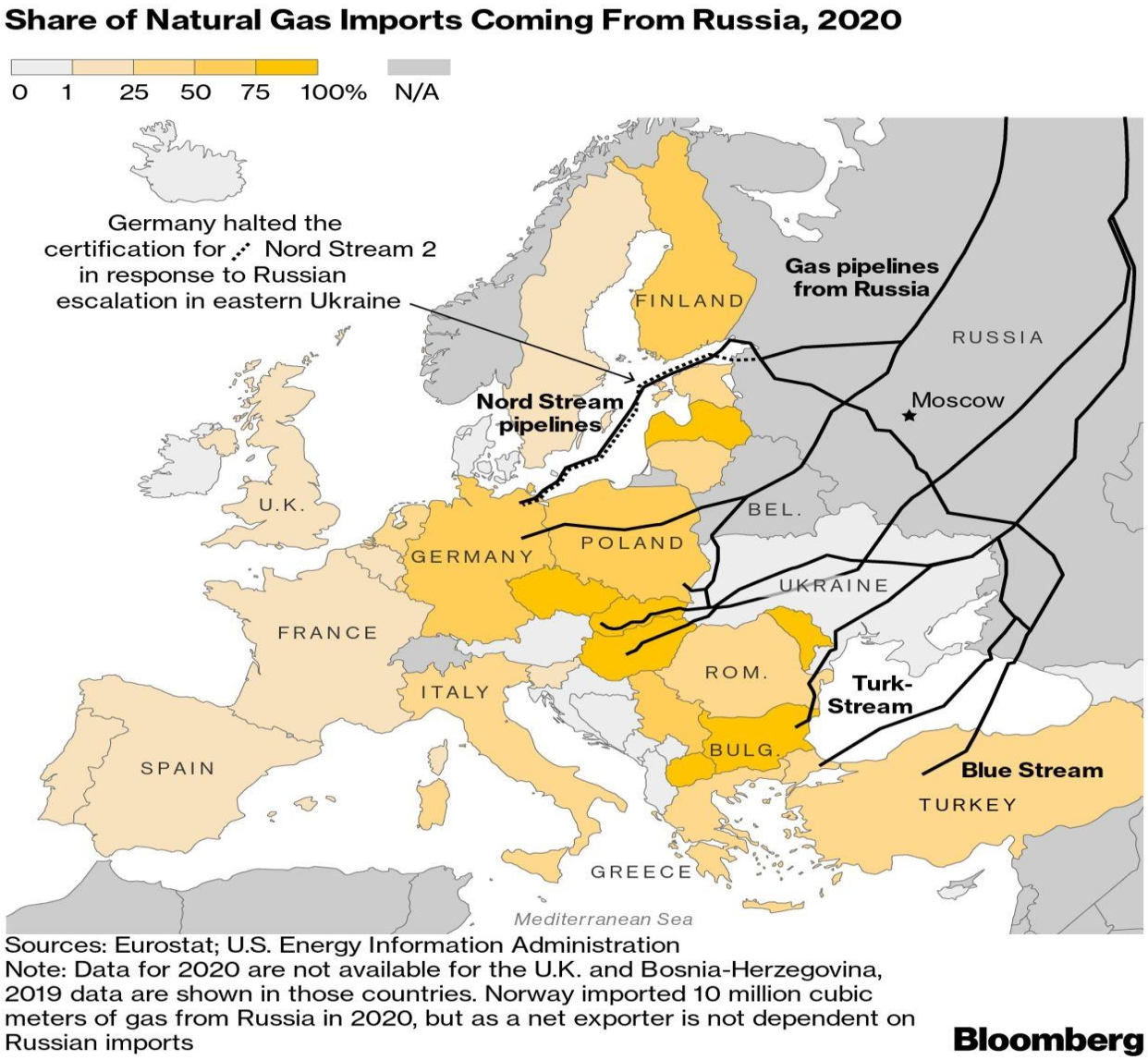
Source: SPE June 2022

And now?

Europe is highly dependant on **energy imports**

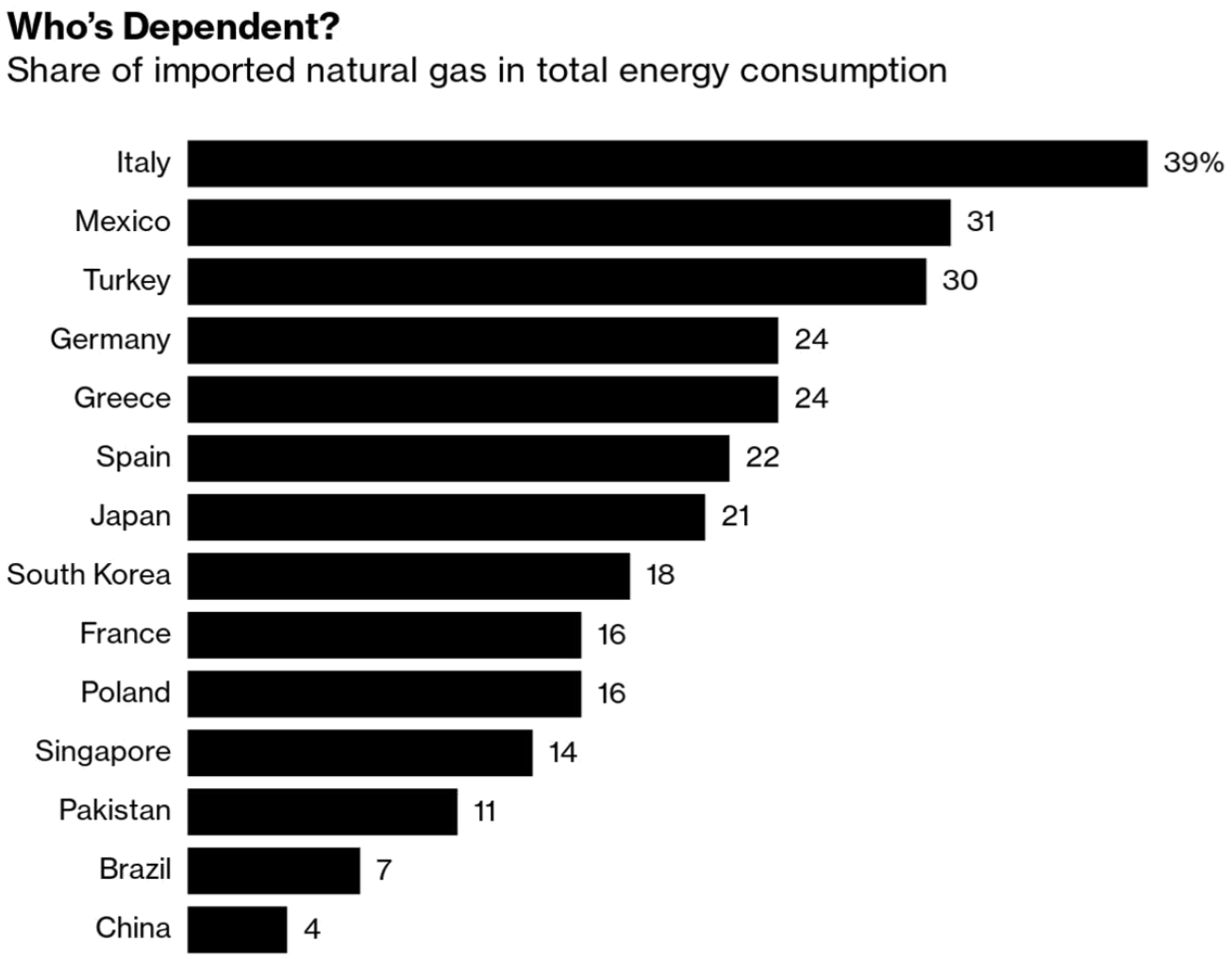


The gas imports from Russian Federation via pipelines



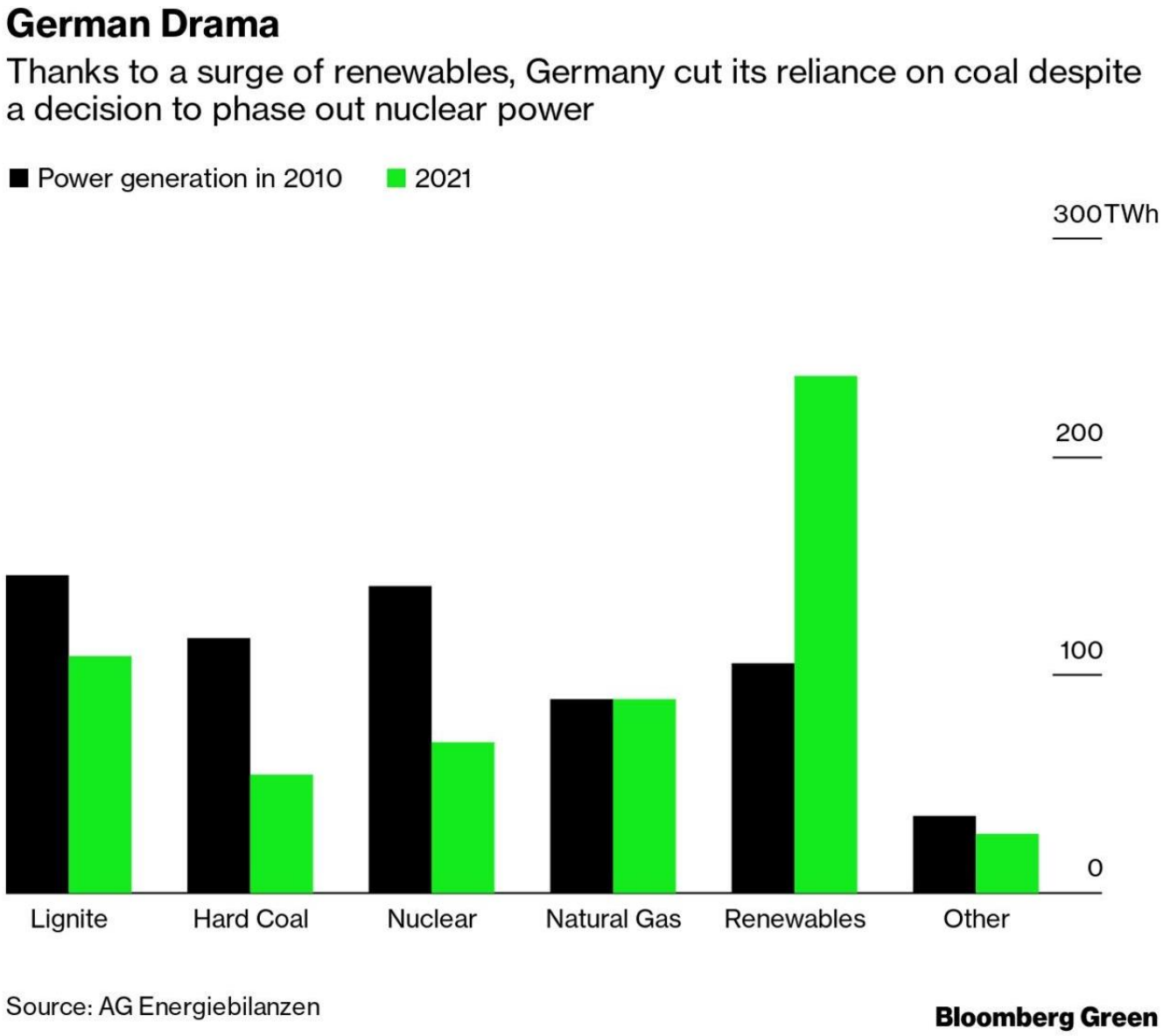
Source: Bloomberg June, 2022

Italy is particularly dependant on **gas imports**



Source: Bloomberg calculations based on 2021 data from BP Statistical Review of World Energy

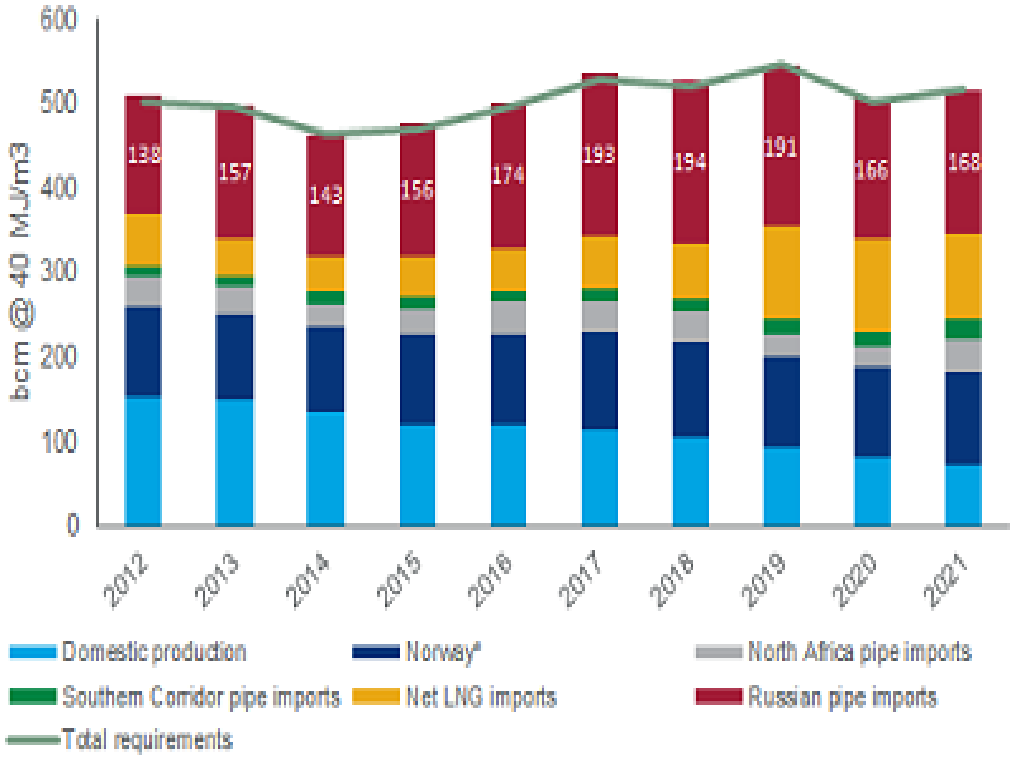
Germany has invested more in renewables



Source: BloombergNEF, Agosto 2022

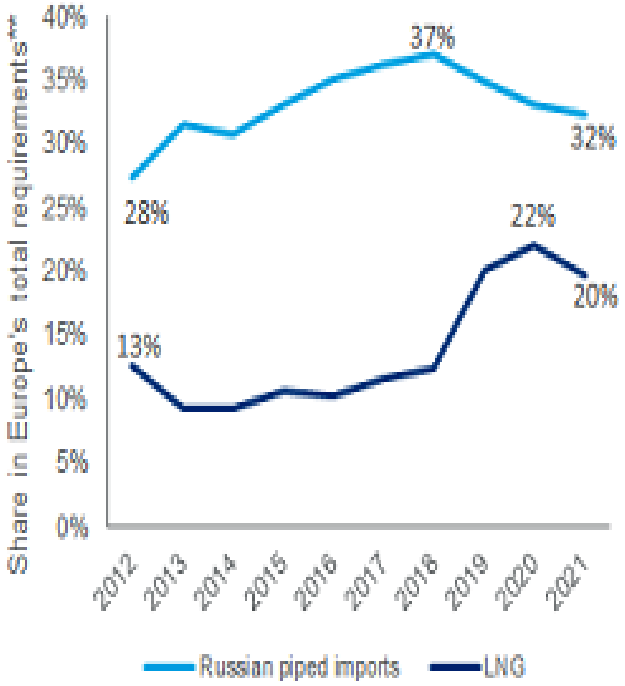
Growing needs in EU for natural gas imports

Europe gas supply mix



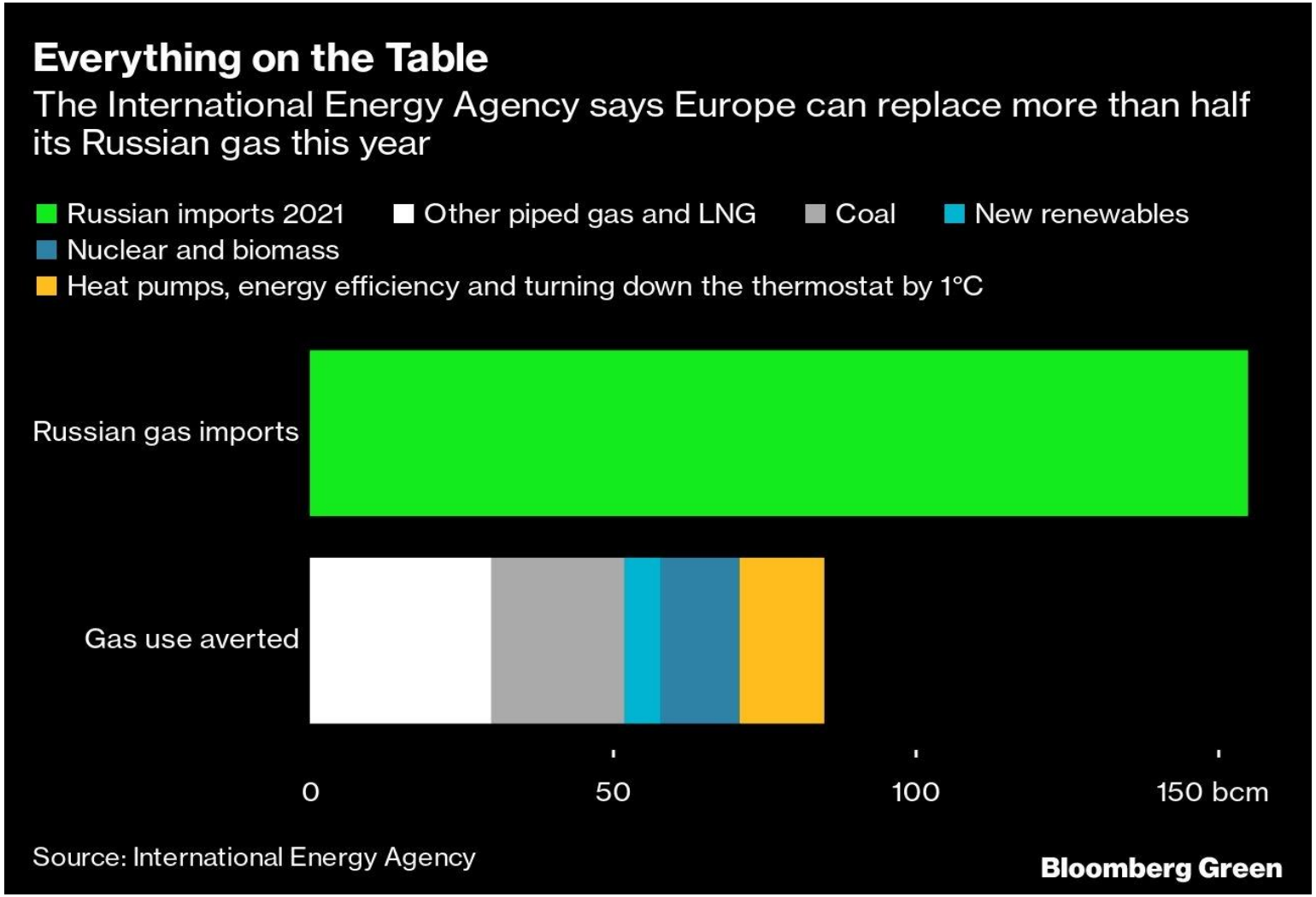
Source: Wood Mackenzie, IEA, ENTSOG, official statistics, TSOs, utilities
*Including Norway demand, excluding Snohvit LNG
**Gas requirements include European demand and exports to Ukraine
For more details and historical data, see our insight Europe gas 2021 in review

Europe's dependency on LNG and Russian piped gas

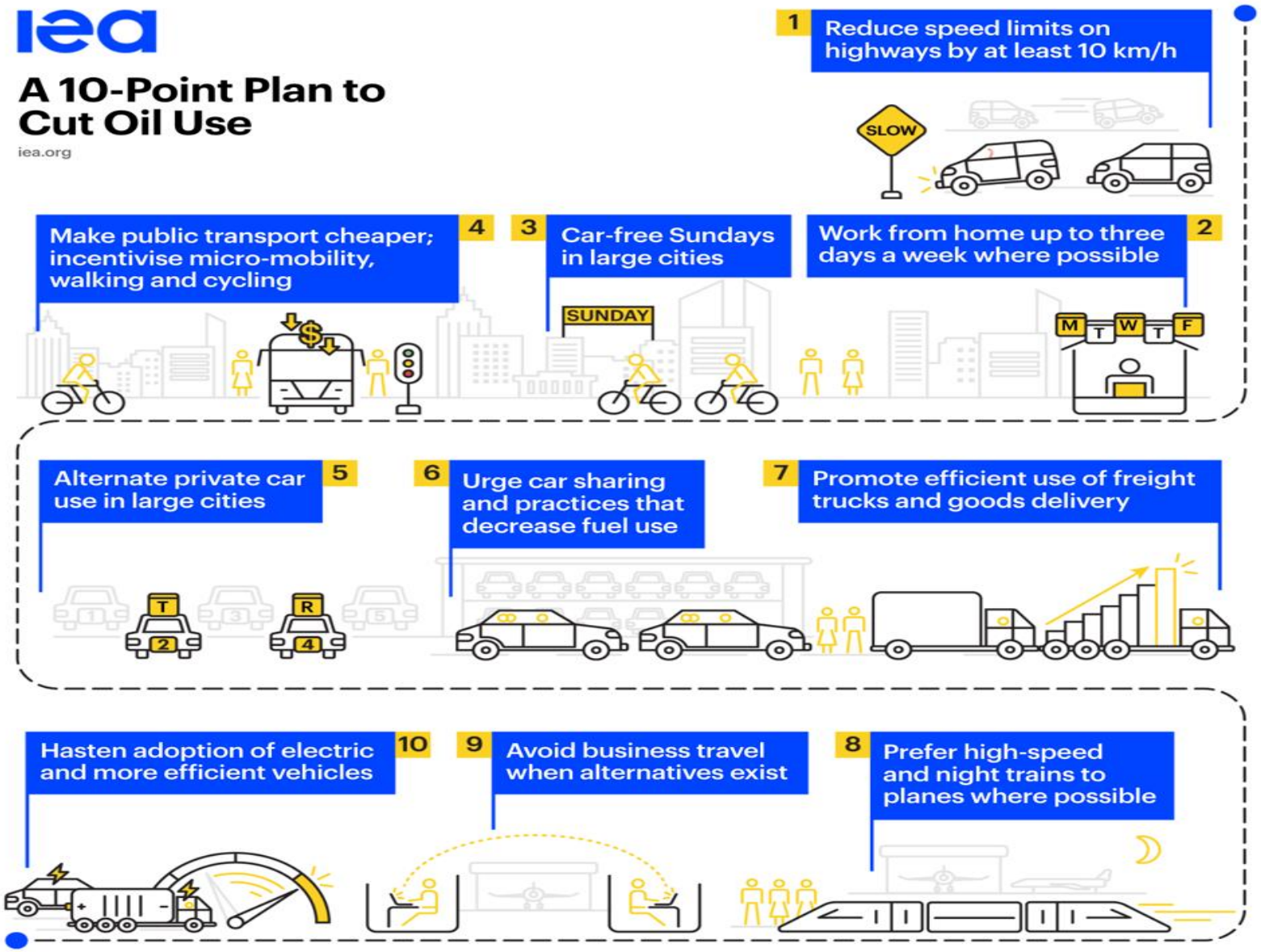


Source: WoodMac Feb. 2022

And in the current **war** situation?
IEA plan to wean EU off Russian gas



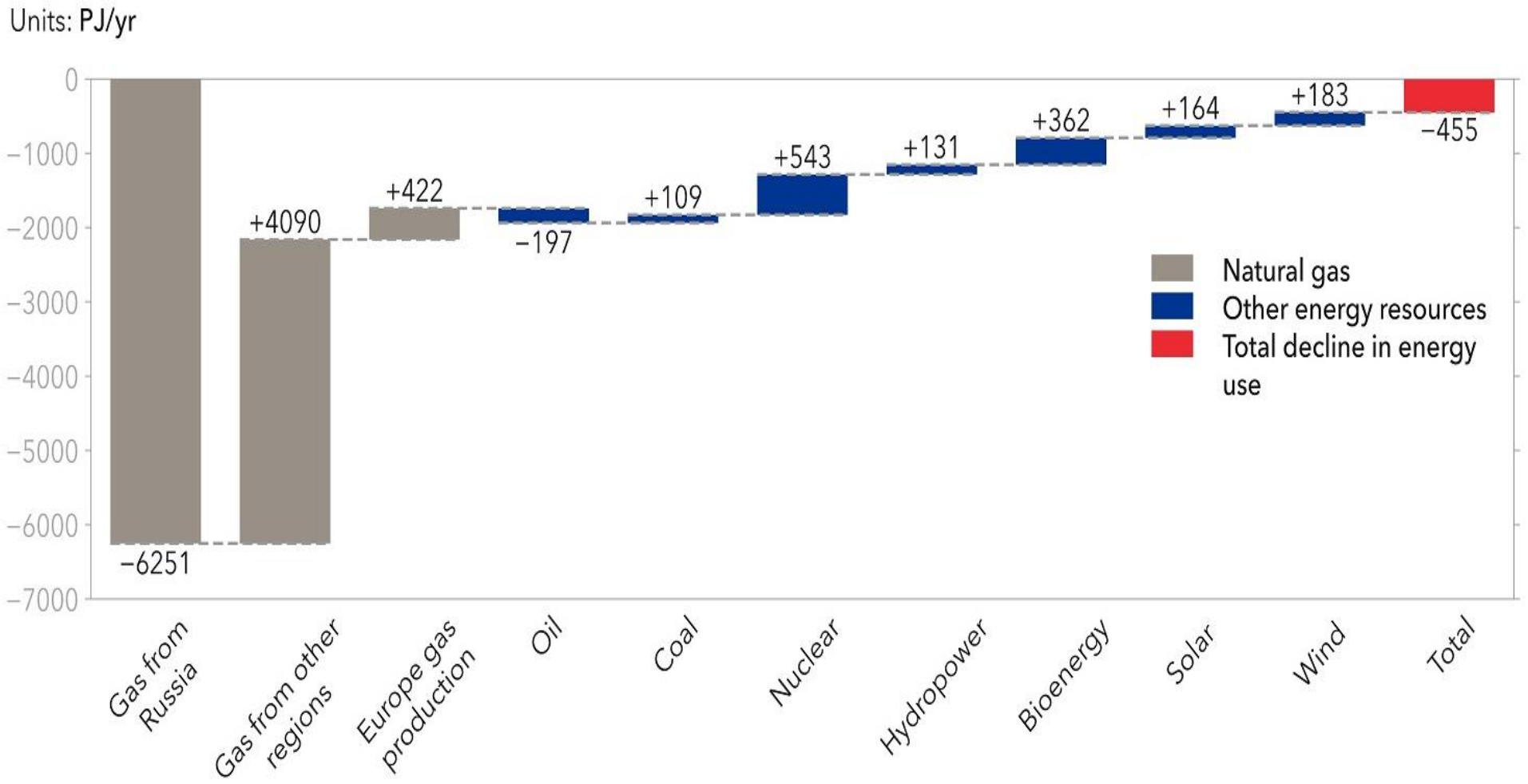
Source: IEA via Bloomberg March 26, 2022



Source: IEA March, 2022

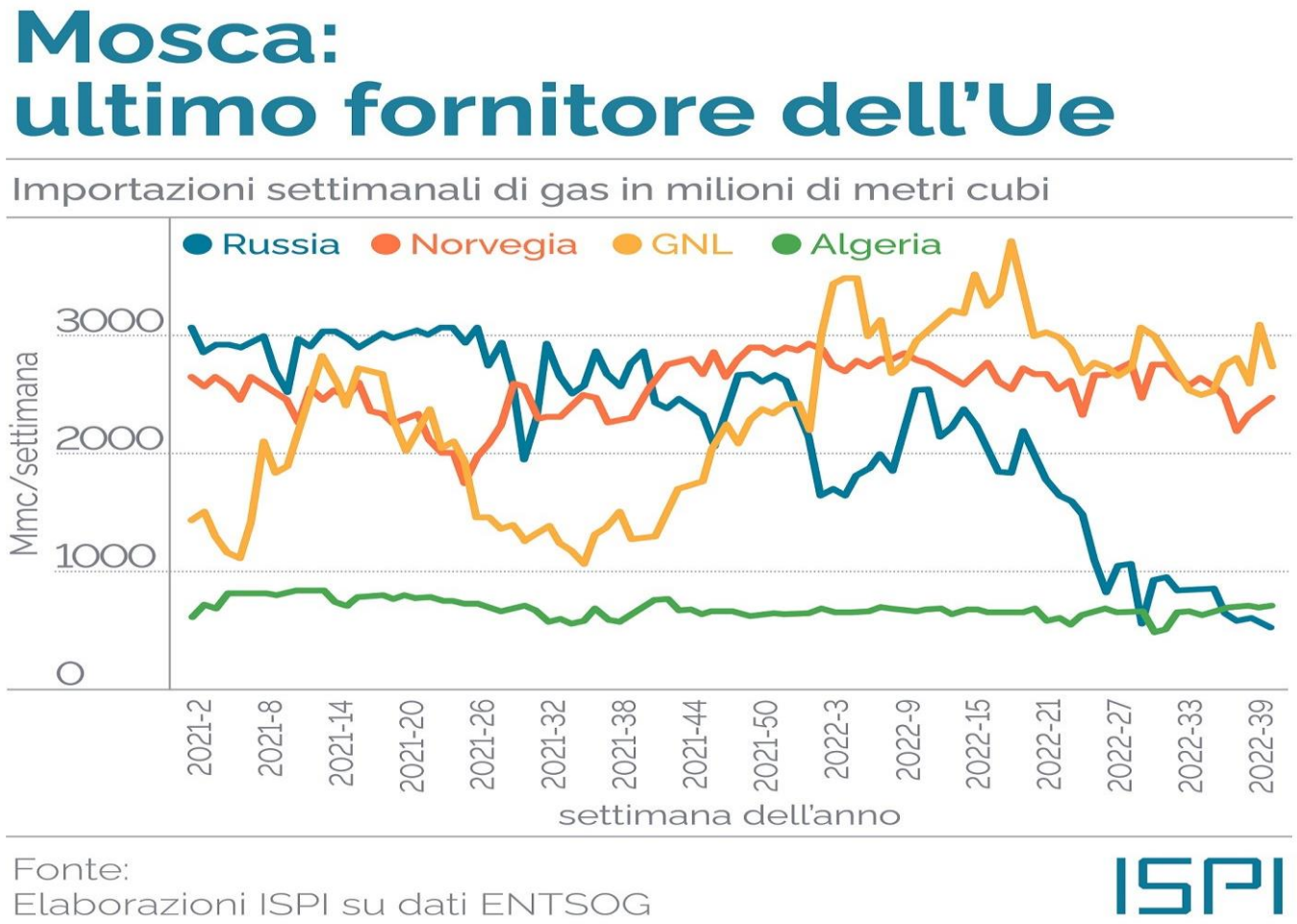
DNV believes EU can **replace Russian gas** entirely by **2024**

Impact of the Ukraine war on European primary energy mix in 2024, compared with a pre-war model run



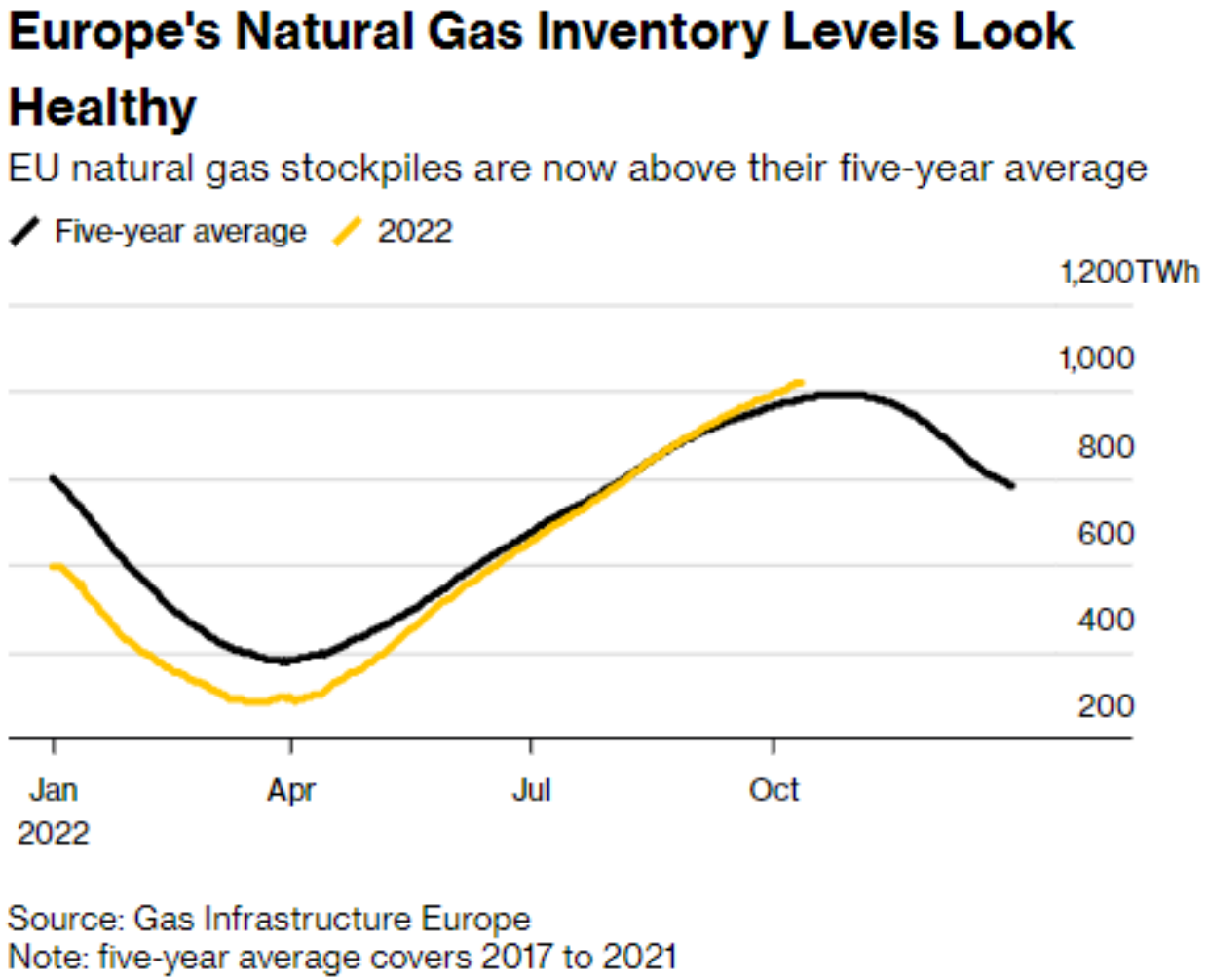
Source: DNV April 2022

A substantial part of Russian gas imports has already been replaced – but not entirely
And ‘General Winter’ is a big unknown



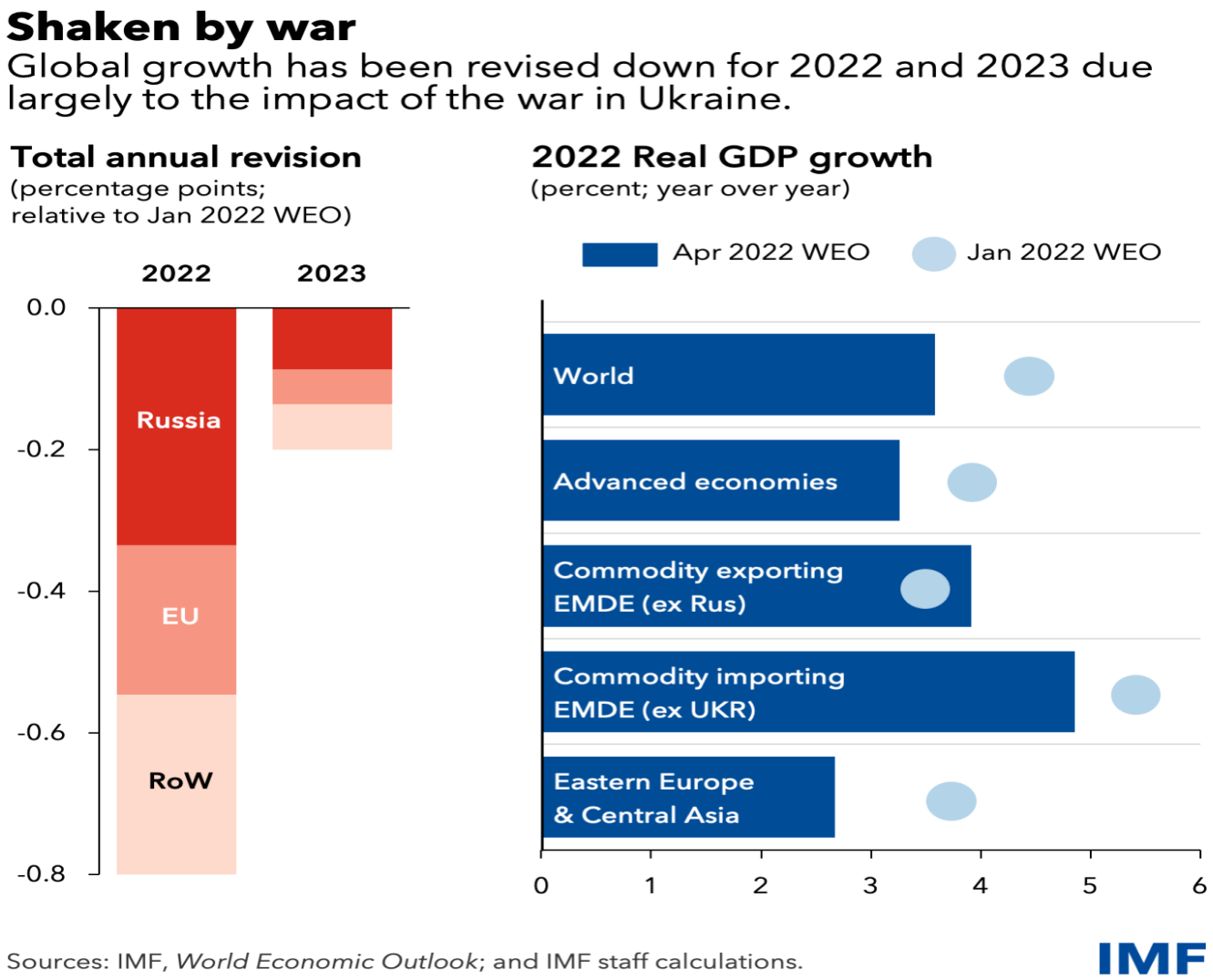
Source: ISPI (7 October, 2022)

EU storage is at reasonable historical level ... but the needs of 2022-3 winter and after 2023?



Source: Bloomberg (19 October 2022)

The global economy will suffer, though



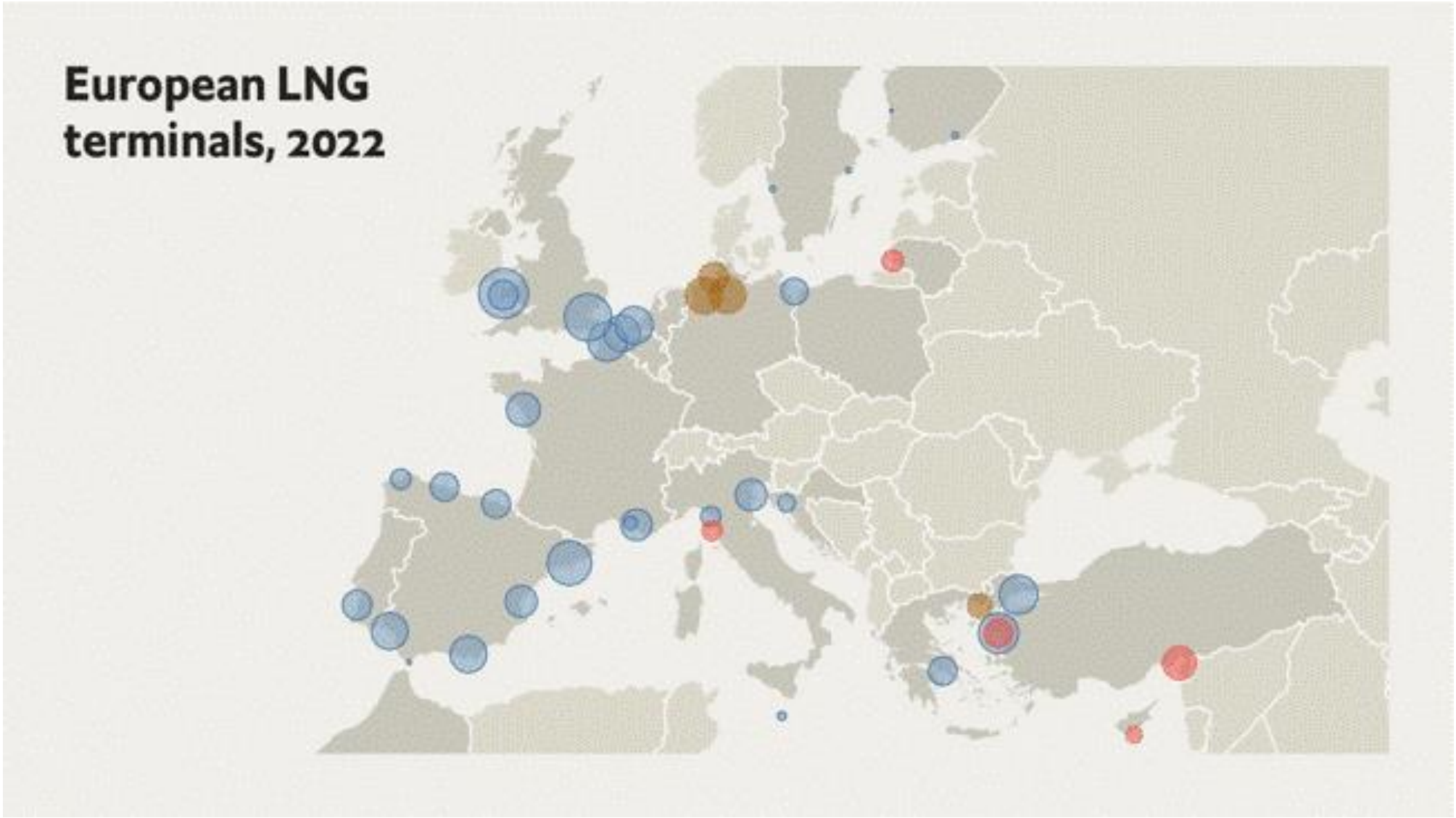
Source: IMF June 2022

We need to:
1 Maximize all forms of energy savings

2 Build LNG regas terminals as quickly as possible

Source: BloombergNEF, June 2022

There are more than 150 LNG regas terminals in EU and globally



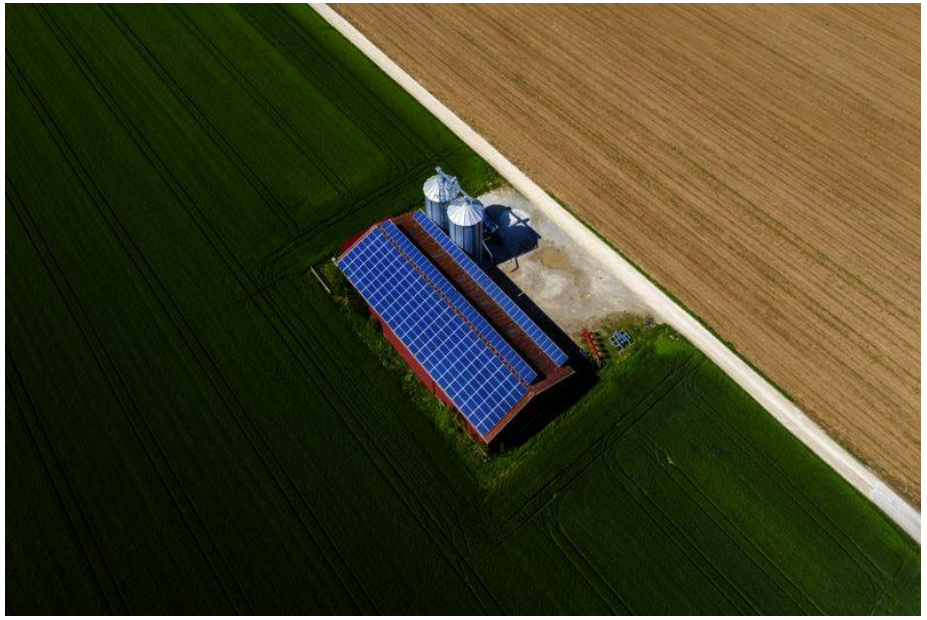
Source: The Economist, June 2022

3 Develop new gas projects to Italy and EU

Source: Corriere della Sera, June 2022

4 Invest in new unconventional gas sources - e.g. bio-gas

5 Invest massively in renewables and facilitate their permitting



Lessons from the 1973-4 energy crisis

- Shortage due to the **embargo** from Arab oil-producing countries in support of Yom Kippur war against Israel

But:

- Higher oil prices encouraged **innovation** and **new ways of living** by **saving energy**

- **Made possible the commercial exploitation of new reserves…**
  - Alaska
  - North Sea
  - Canadian oil sands
  - Offshore oil and gas production
  - Etc.

- **….which somewhat reduced the power of OPEC**

Conclusions

HYDRON, hydrogen bus made by Rampini

Eni's Corral FLNG off Mozambique

- The shortages created by the war in Ukraine are a major problem, but the consensus is that they will be solved over the next few years
- We could face **breakouts** and supply interruptions caused by the war and by **under-investment** in the industry
- **The energy transition** remains a key factor in the medium to long term. New energy forms will replace the traditional ones, but with huge **uncertainties** regarding:
  - Exact direction
  - Quantification
  - Timing
- **Traditional fuels,** particularly **Natural Gas,** will remain as base-load and later as '**companion**' or '**transition**' fuels for a long time
- **Multiplicity of choices** remains the best way forward to solve the current **supply crunch**
- With current policies **we will not reach** the **climate-change goal of +1.5°C**

AGENDA

Market Trends

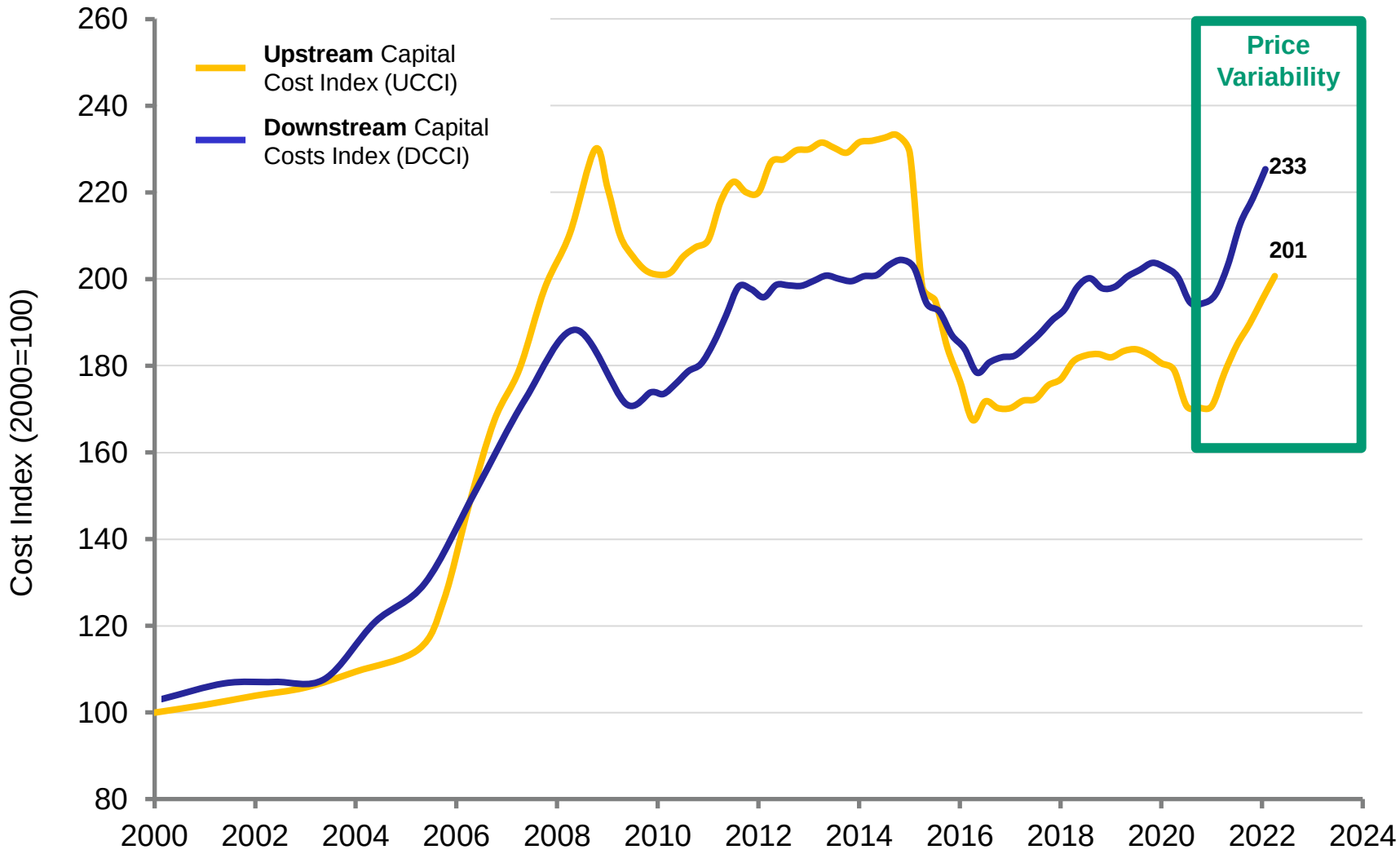
Top 5 Trends in Supply Chain

TOP 5 Trends in B2B Industrial Supply Chain, 2022/2023

PRICES VARIABILITY	1
TRANSPARENCY	2
QUANTIFICATION OF ESG AND GHG EMISSIONS	3
ENERGY TRANSITION AND NEW SECTORS	4
INDUSTRIAL POLITICS	5

Source: SupplHi analysis

1 Prices Variability

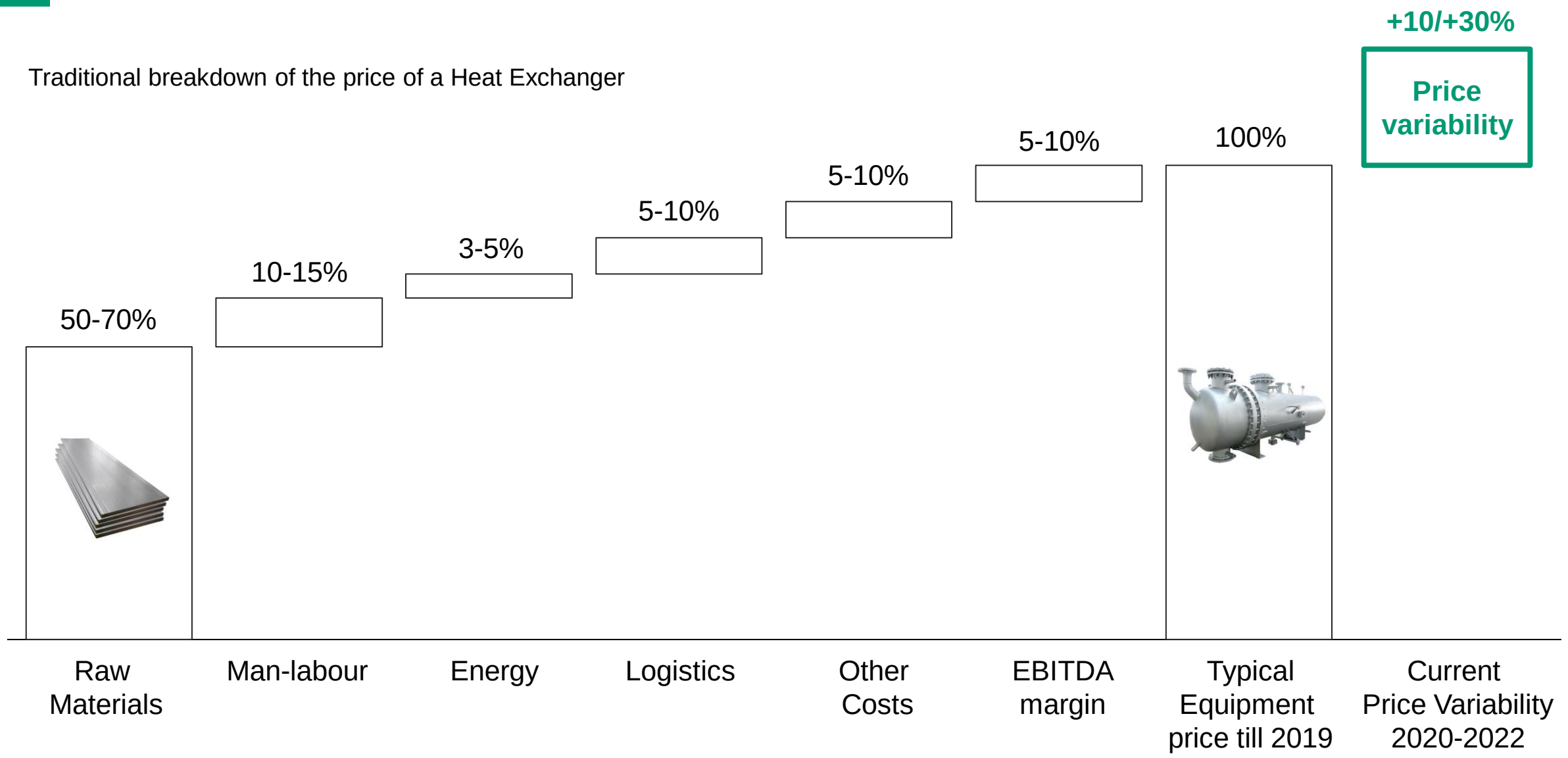


- End-Users have "**cash**" for investments but require:
  - Low Costs
  - Short Schedules
  - Limited Price Variability
  - High Sustainability levels
- The **"CAPEX Challenge"** what the market can pay to let projects fly
- Presence of short-time **price validities**
- Increasing **openness to:**
  - **discuss minor variabilities**
  - **open book** in the initial project phases
- Price variability is **not present in all geographies!**

Source: IHS Markit

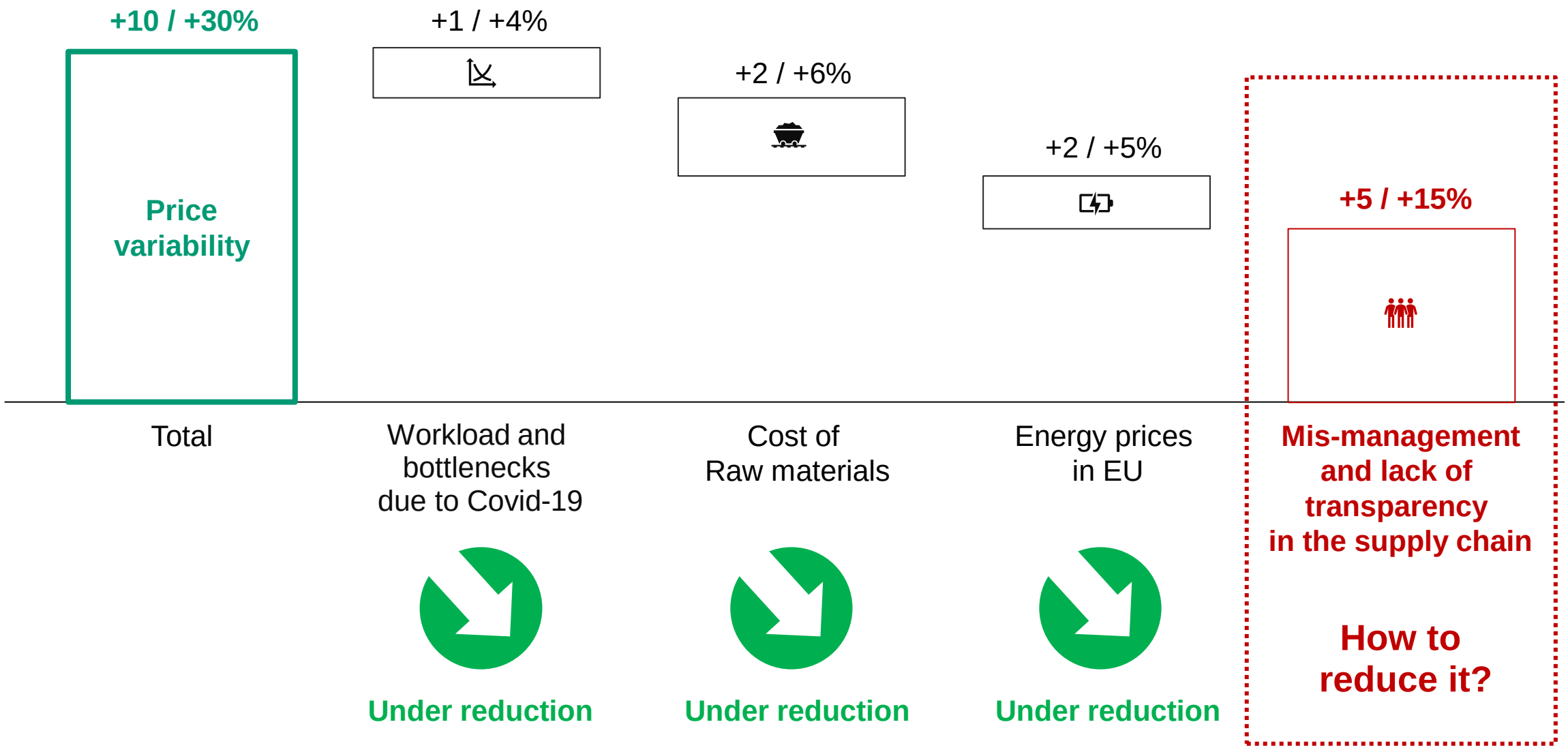
1 What makes the price of a component

Traditional breakdown of the price of a Heat Exchanger



Source: SupplHi analysis

1 How to explain the Price Variability?



Source: SupplHi analysis

2 The lack of Transparency is an opportunity killer

Open book approach since early bid phases

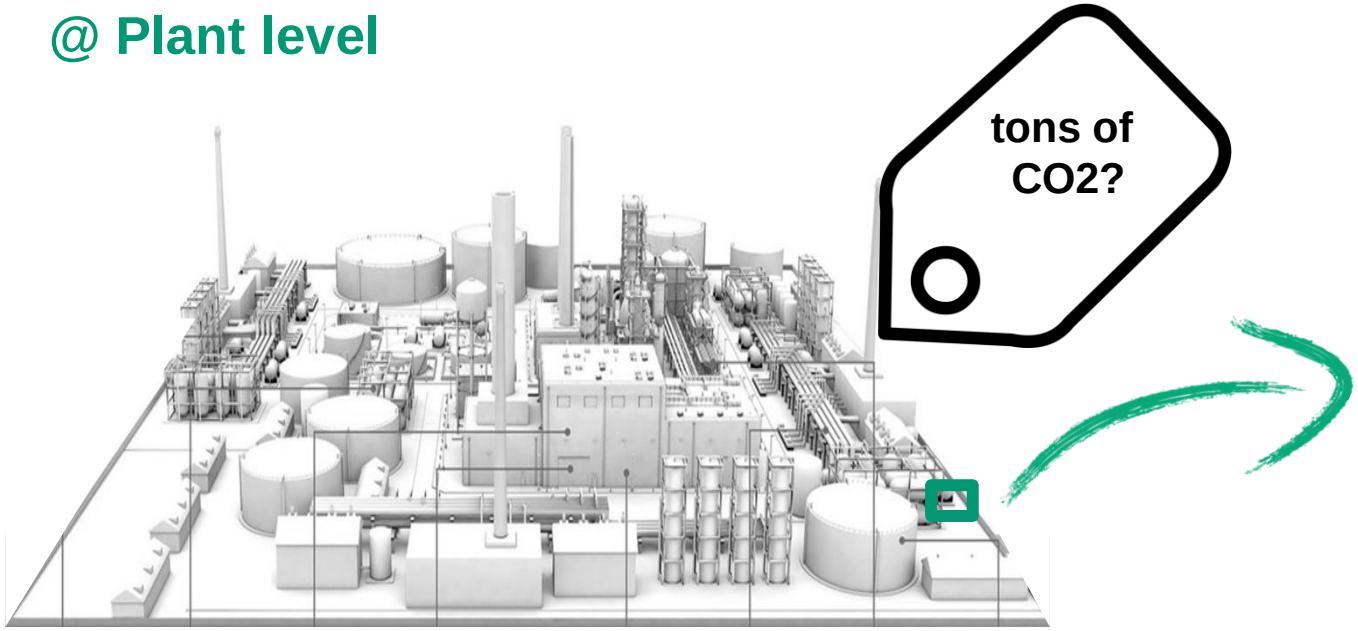
Supply chain **agreements** minimize bid and project **schedules**

Vendors, for their part, to participate in the risks and **T&Cs of the End-User**

Back to **Project Management's** foundations

3 Scope 3 GHG Emissions require Transparency

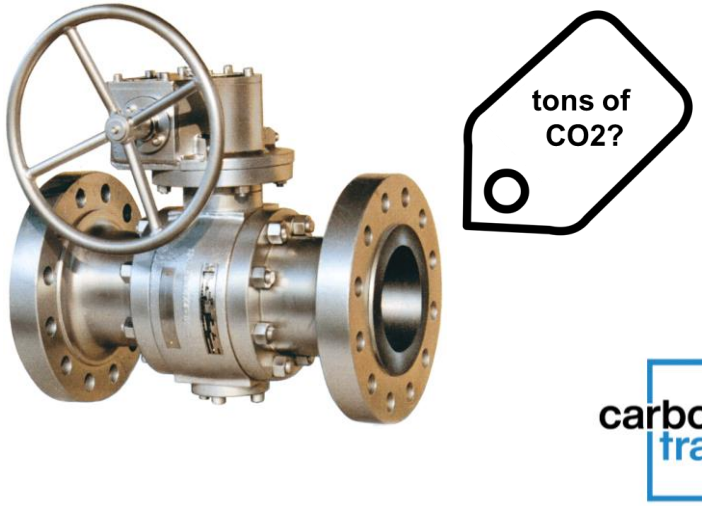
@ Plant level



Each project must have its own Carbon Footprint certificate over its entire lifetime:

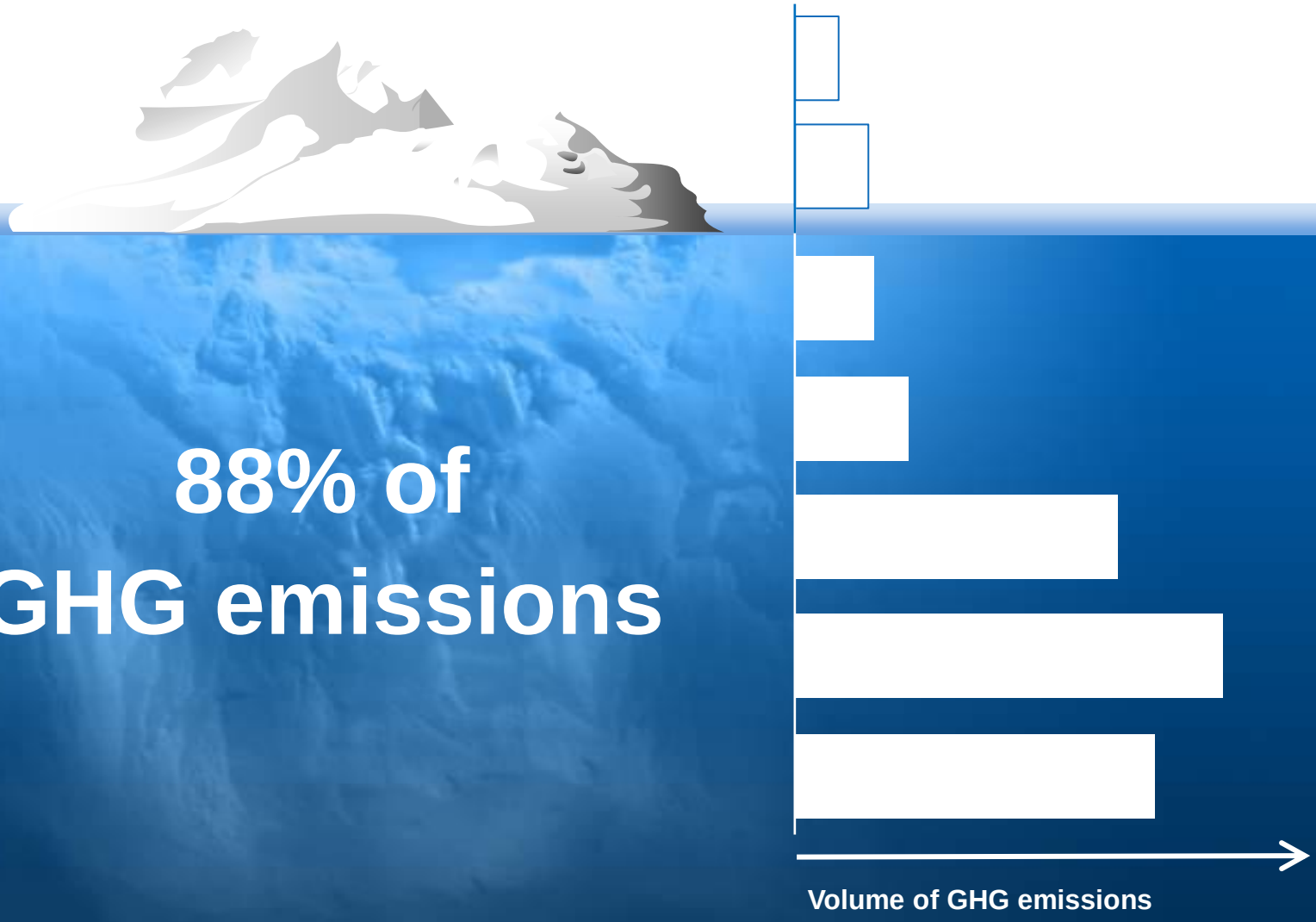
- Production of raw materials
- Fabrication of equipment
- Logistics
- Installation
- Usage

@ Equipment level



carbon tracker

3 GHG Emissions are deep in the Supply Chain



Source: SupplHi analysis on *Carbon Tracker*

3 Sustainability and GHG emissions are a key competitive asset

1. Funded projects are only possible with **certified "green" content** and the auditors are very focused around **Environmental + Social sustainability** (human rights on the entire chain from manufacturer to installation)

2. The **US market** is moving very fast in the “certification of everything”, while **Europe is lagging behind**. Are we likely to be out of important markets in <5 years?

3. Large enterprises are **pledging CO2 neutrality** (2030 / 2040 / 2050). Buyers without the **engagement of their Suppliers** cannot achieve the declared results

Visibility on **Vendors’ capabilities**

- visibility on strengths and weaknesses
- recognition, "feedback and reward" model
- collaborative improvement programs

Product Traceability is the missing enabler

3 Our Unique Collaborative Approach to ESG Sustainability

ESG Supply Chain Guidelines

2019-2022 GUIDELINES' CO-CREATORS

The workgroup is always open to new actors

SUPPLHI

ANIMP Associazione Nazionale di Impiantistica Industriale

Bonatti

Fincantieri

Bureau Veritas

Arkad SpA

Maire Tecnimont

Rosetti Marino

DNV

sace gruppo cdp

Saipem

BNP Paribas

Lloyd's Register

Itinera

Tenaris

TEN Technip Energies

intertek

wood.

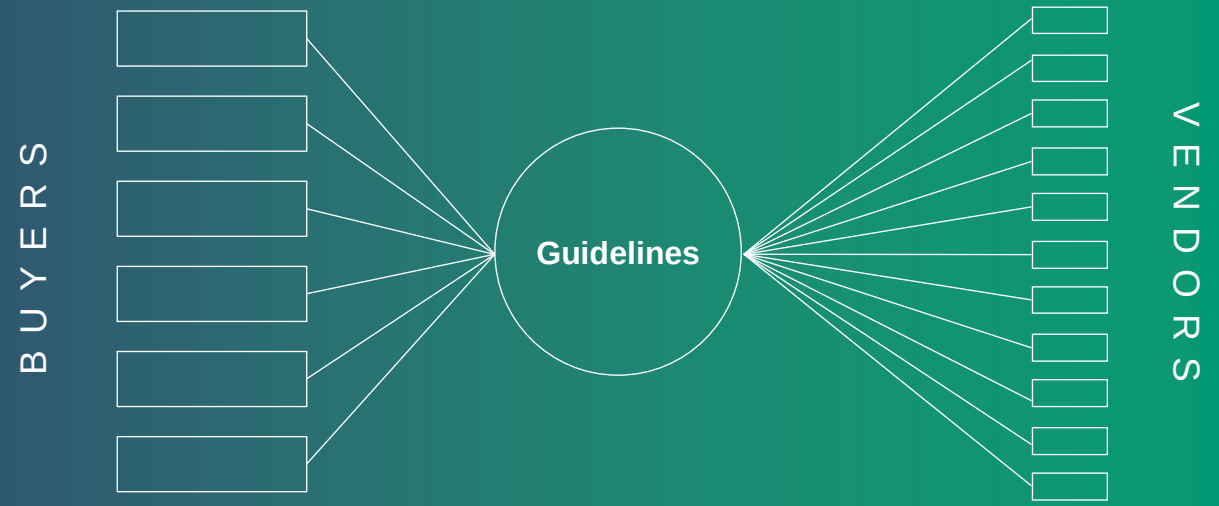
Intesa Sanpaolo

Monte dei Paschi di Siena Banca dal 1472

UniCredit

OPEN INNOVATION

FOR AN INDEPENDENT SUPPLY CHAIN ESG MODEL



- Based on international best practices
- Free-of-charge for Vendors
- Industry-shared Standard Assessment Visits

4 Energy Transition pushing Vendors to new Sectors

MINING

- **Booming demand** to extract and process raw materials (copper, nickel, vanadium, cobalt, rare-earth metals) that sustain the **energy transition**

PHARMA

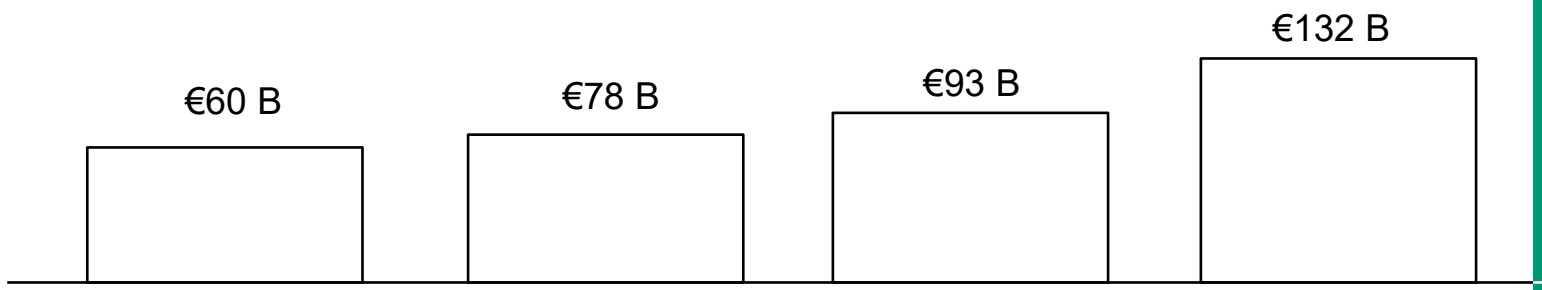
- Especially **Biotech**, with frequent **stop&go of new plants** to anticipate the constantly evolving needs of the market
- Strong focus on **tight schedules**

NAVAL

- **Green ammonia** and **methanol** projects for Marine Fuel

5 At the core of “Made in Italy”

Value of Production, 2018

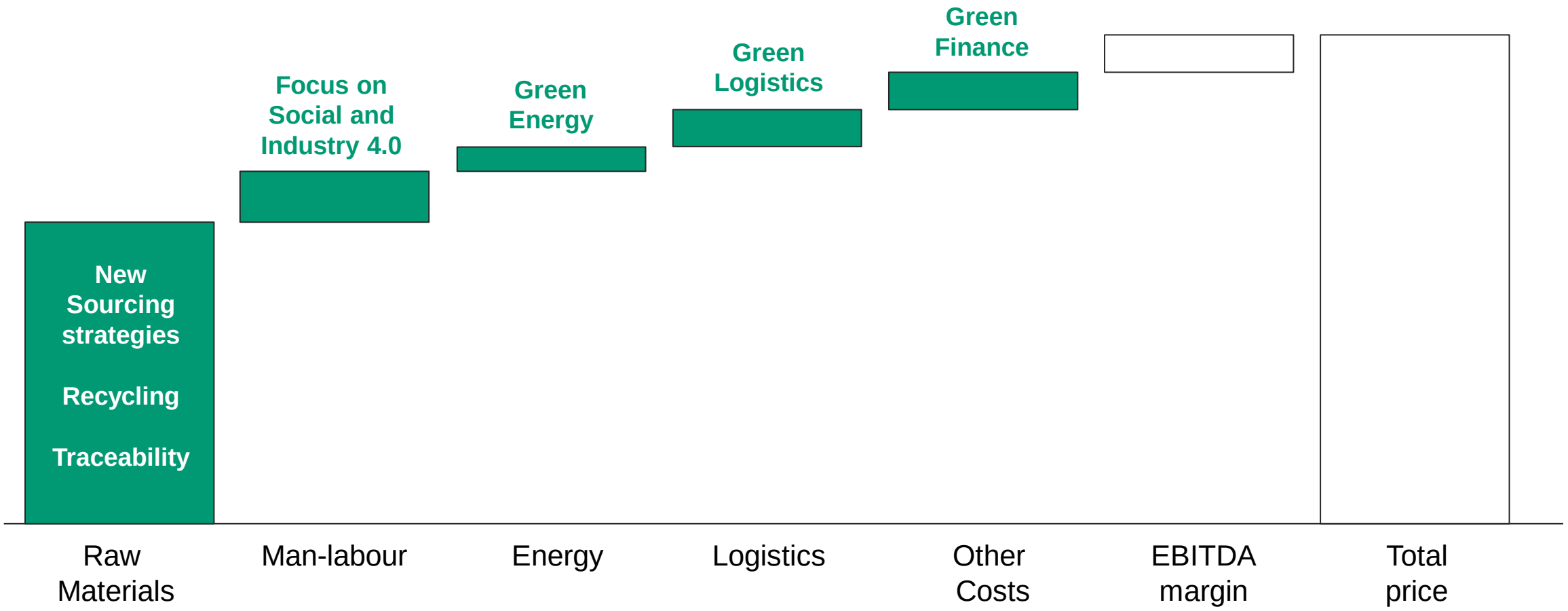


	Furniture	Fashion	Automotive	Agri-food	Plant Engineering
					€190 B • Contractors for **Oil&Gas, Power, Construction, Steel & Metals, Shipbuilding** • Equipment manufacturers • Services Providers
Incidence on total GDP	 4%	 5%	 6%	 8%	 11%
# companies	70k	82k	6k	7k	10k
# employees	300k	500k	250k	400k	350k Italy (+280k abroad)
	Furniture	*Fashion*	*“Ferrari”*	*Food*	**88% of companies have <€50 M revenues (SMEs)**

Source: SupplHi analysis on Cribis D&B, FederlegnoArredo, Quattroruote, AlixPartners and ICE public data

5 A Transition leading us to an Industrial Revolution?

Example of breakdown of the price of a Plant Engineering Equipment

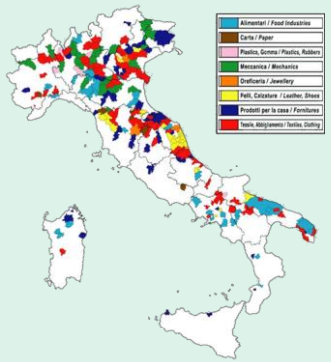


Source: SupplHi analysis

5 The need of Industrial Politics for “Made in Italy”

INDUSTRIAL DISTRICTS (1970s)

- **Physical proximity and shared infrastructure**
- **Co-opetition (collaboration & competition)**
- **Complementarity & dependency**



LAST DECADES (1990-2025)

- **Distancing** and **offshoring**
- Constant **de-risking and 0-commitment policies**
- **Stagnant productivity**
- Constant **cost reduction expectations** facing imported production factors (raw materials, energy, …)
- **Slow approval processes**

NEW NEEDS (2025-2040)

- **Re-shoring**
- **Collaboration at all Tiers**
- **Digital proximity and shared infrastructure (Product Traceability, cyber-security)**
- **Sustainability-by-design**
- **“Supply Chain Welfare”**
- **Speed of decision making**

Disclaimer

ANIMP and the Authors hereby declare and stress that the scope of this work must not be deemed and/or construed by the readers as the proved outlook of the future market evolution, which remains subject to unforeseeable events beyond ANIMP and the Authors control.

ANIMP and the Authors put great effort into providing the consolidated information received regarding the subject market, as made available by the Companies which in fact provided such information and ANIMP and the Authors cannot nor shall not be held liable in anyway for the content provided in this document.

ANIMP and the Authors hereby accept no liability whatsoever for any and all misrepresentation that the Companies might have made of their data, products or business information, as well as for any and all misrepresentation and assumption that readers may make and which shall remain subject to their own whole autonomy and internal corporate governance procedures.

Considering the cultural divulging nature of this work, ANIMP and the Authors shall not be liable for any direct and/or indirect or consequential damages of any nature such as, but not limited to, loss of revenue, profit and/or anticipated profit, production and/or product, productivity and/or facility downtime, business opportunity, whether by way of indemnity or in contract or in tort (including negligence) or under any I. P. and Confidentiality and/or other Laws.

ANIMP and the Authors suggest to use this information wisely.

ANIMP
ASSOCIAZIONE NAZIONALE DI IMPIANTISTICA INDUSTRIALE

Sezione Componentistica D'impianto

Sezione Componentistica d'Impianto
ANIMP

October 25th, 2022

Thank you for your attention