Strategic Horizon
Strategic Intelligence Institution
STRATEGY. SECURITY. TRANSITION.

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European Energy Strategic Reference 2026

Geopolitics • Transition • Energy

THIRD EDITION · REVISED AFTER THE MARCH 2026 DISRUPTION

Europe is not managing an energy transition. It is managing the most consequential industrial transformation in its post-war history — simultaneously, under geopolitical duress, against a competitive backdrop that has fundamentally changed.

STRATEGIC HORIZON • Intelligence & Policy Advisory

September 2026

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EDITORIAL NOTE

Why this edition exists

The second edition of this report was completed before 28 February 2026. On that date the Strait of Hormuz closed, and by the time it had been open again for a month the assumptions underneath three of the six strategic findings had moved. A reference document that describes a superseded world is worse than no reference document, because it is quoted. This edition therefore rebuilds rather than patches. Three things have changed. The disruption is treated as evidence, not as an event.

Europe lost almost no Hormuz volume and absorbed a fifty per cent gas price move regardless. That single fact revises the dependency finding, the security finding and the investment case, and it is now the organising observation of Chapter 3. The supplier concentration question has its own chapter. The second edition recorded that Europe had replaced Russian gas. It did not record what it had replaced it with, because the answer was not yet visible. It is now: the United States supplies roughly two-thirds of European LNG and is projected at up to 80 per cent of EU LNG imports by 2028, on spot terms, under a legal deadline the Union set itself.

Every quantity is governed by a published data sheet. The second edition carried figures that conflicted with each other, including storage capacity stated in gigawatts where the industry reports gigawatt-hours. All figures in this edition follow Canonical Data Sheet CDS-2026-EU v1.0, and where sources diverge the divergence is stated at the point of use rather than resolved by preference.



The second edition was completed before 28 February 2026. By the time the Strait of Hormuz had been open again for a month, three of the six findings had moved.

CODE	EDITION	ACCESS	DATA CUT-OFF
FR-2026-01	**v3.2 — full revision**	**Open access**	**31 August 2026**

FIGURES	ANALYTICAL ARCHITECTURE	STATUS	SUPERSEDES
Governed by CDS-2026-EU v1.0	**Strategic Horizon Analytical Team**	**Complete — seven chapters**	**v25 MASTER, in its entirety**

EXECUTIVE SUMMARY

Six Strategic Findings

Each finding is stated with what changed since the previous edition, because a reference document that revises its conclusions should say so plainly.

The central security challenge is no longer simply whether Europe can build enough clean-energy capacity. It is whether that transition can remain secure as geopolitical shocks, supplier concentration, critical infrastructure vulnerabilities and technology dependencies increasingly shape the availability, cost and resilience of energy.

Europe is therefore not transitioning from energy dependency to energy independence. It is moving between different forms of dependency — geographic, technological, infrastructural and contractual — while the geopolitical conditions governing those dependencies are becoming less predictable.

The strategic question is not whether Europe can eliminate dependency, but whether it can prevent any single external dependency from becoming a systemic vulnerability.

FINDING ONE

The Dependency was not Broken.

IT WAS MOVED. Russian pipeline gas fell from roughly 45 per cent of EU gas imports in 2021 to around 3 per cent by end-2025, and that is a genuine achievement. It is also the wrong measure of what happened. Counting all Russian gas including LNG, the share is closer to 13 per cent, and EU imports of Russian LNG rose 15 per cent year on year in the first half of 2026. Meanwhile the United States supplies roughly two-thirds of European LNG and has overtaken Norway as the EU’s largest gas supplier on a year-to-date basis in 2026, counting pipeline and LNG together. Europe replaced a concentrated supplier with a concentrated supplier, and no European instrument measured the substitution because none measures concentration.

FINDING TWO

Generation is Ahead Of Schedule.

DELIVERY IS THE BINDING CONSTRAINT, AND IT IS ADMINISTRATIVE. Solar and wind capacity exceeded 2025 targets across most member states. Around 1,700 GW of renewable capacity now sits in connection queues across sixteen countries, against 77 GW connected across Europe in 2025, and roughly 72 TWh was curtailed in a single year for grid constraints. Transmission permitting takes over five years on average and renewable projects up to nine. The constraint is not capital, technology or public support. It is consent duration, and in most member states the binding term is the duration of judicial review rather than administrative processing.

FINDING THREE

The Hydrogen Economy Cleared.

WHAT SURVIVED IS SMALLER AND REAL. Of roughly 520 GW of electrolyser capacity announced worldwide to 2030, under 4 per cent has entered construction, and potential 2030 production fell from 49 to 37 million tonnes in a single year. The failures were concentrated in applications where hydrogen competes with direct electrification and in projects without binding offtake. What survives replaces existing grey hydrogen: refining, ammonia, methanol and direct reduced iron. The cost structure explains why the manufacturing race mattered less than assumed — renewable electricity is 60 to 75 per cent of the levelised cost and the electrolyser is 15 to 35 per cent.

FINDING FOUR

Nuclear is Back, and it is Being Built for Industry Rather Than for the Transition.

Sweden's Riksdag voted on 9 June 2026 to authorise state acquisition of 60 per cent of the project company Videberg Kraft, with three 470 MW SMR units selected for the Värö Peninsula. Finland is advancing SMR work in Helsinki and Kuopio. The industrial consortium behind the Swedish project consists of steel, mining, engineering and defence companies. The strategic exposure is upstream. High-assay low-enriched uranium, required by most advanced reactor designs, was until recently produced commercially only by Russia's TENEX, and Western capacity remains a fraction of what a deployment programme would need. A nuclear revival that reduces gas dependency while creating a fuel-cycle dependency has not improved the sovereignty position.

FINDING FIVE

The Security Question Changed Shape in March 2026.

Europe lost almost no Hormuz volume when the strait closed, and absorbed a fifty per cent gas price move regardless. That is the finding. A system priced at the margin on a common market inherits every supplier failure anywhere in that market, whether or not its own cargoes move. Physical diversification of the flag on the tanker does not address it. Alongside this, the chokepoint grid has extended into subsea cables, LNG terminal cyber exposure and clean-energy supply chains, and the shadow fleet now transits Norwegian and Barents waters routinely.

FINDING SIX

The Investment Gap is Real and it is not the Binding Constraint.

The €303 billion annual gap identified by Draghi stands: €697 billion of current investment against more than €1 trillion required. But European capital markets have demonstrated appetite for these assets and the EIB has exceptionally strong access to bond markets. What is scarce is bankable pipeline, permitting throughput and the decision to deploy. A gap that persists in a market with capital looking for exactly these assets is a governance outcome rather than a financing one.

CENTRAL ASSESSMENT

What the seven chapters add up to

THE ASSESSMENT

Europe is on course to meet its headline 2030 climate commitments and to hold less control over its energy system in 2035 than it held in 2020, and that outcome requires no adverse event.

Every finding above describes the same mechanism: a measurable objective is achieved while an unmeasured position deteriorates. Emissions fall whether the panels are made in Dresden or Xinjiang. Storage adequacy is met whether the target is 90 or 80 per cent. Russian dependency falls to 3 per cent whether the replacement is diversified or concentrated.

The missing instrument is not another fund. It is a second class of measurement, and it costs almost nothing to legislate.

HOW THIS REPORT IS ORGANISED

Seven chapters. The first six follow the architecture of previous editions with the numbering corrected; the seventh is new.

Chapter 3 treats the March 2026 disruption as a tested case rather than a listed risk. Chapter 7 covers the supplier concentration question and the contract terms available before the next long-term agreements are signed.



CHAPTER 1

01

The Strategic Context

1.1 The 2026 snapshot

1.2 The policy architecture

1.3 The dependency legacy

1.4 Energy mix and emissions pathway

1.5 Prices and industrial competitiveness

1.6 The Draghi diagnosis

1.1 THE 2026 SNAPSHOT

Europe enters the second half of 2026 with a system that has changed faster than any comparable period since the 1970s, and with a set of vulnerabilities that are different from those it started the decade with rather than fewer.

Indicator	2026 position	Direction
Renewables in EU electricity generation	Above 45 per cent	Ahead of target
Russian pipeline gas, share of EU gas imports	Around 3 per cent, from 45 per cent in 2021	Achieved
Russian gas including LNG, share of imports	Around 13 per cent	Rising in LNG
US share of European LNG imports	Roughly two-thirds; projected up to 80 per cent of EU LNG by 2028	Concentrating
Industrial electricity price, EU	Roughly EUR 120–145 per MWh against about EUR 55 in the United States	Structural gap
Renewable capacity in connection queues	Around 1,700 GW against 77 GW connected in 2025	Widening
Battery storage, EU fleet	77.3 GWh at end-2025, from 7.8 GWh in 2021	Tenfold in four years
Annual energy investment	EUR 697 bn against more than EUR 1 tn required	EUR 303 bn gap
Gas storage, late August 2026	Around 63 per cent, lowest for the date since 2009	On target — after the target moved from 90 to 80 per cent

Table 1.1. The 2026 position. All figures per Canonical Data Sheet CDS-2026-EU v1.0.

NINE INDICATORS, TWO READINGS

5
REPORT PROGRESS AGAINST A STATED OBJECTIVE

4
REPORT AN EXPOSURE NO INSTRUMENT TARGETS

> 45%
RENEWABLES IN EU ELECTRICITY GENERATION

1,700 GW
IN CONNECTION QUEUES AGAINST 77 GW CONNECTED

€303 bn
ANNUAL ENERGY INVESTMENT GAP

SH ASSESSMENT 1.1

Read as a column of achievements this table is a success. Read as a column of positions it is not, and the same numbers produce both readings.

That is the analytical problem this report exists to address. Nine indicators, of which five report progress against a stated objective and four report an exposure that no European instrument targets. The four are the ones that determine what Europe can do in 2035.



Eleven instruments in four years. One of them carries penalties.

1.2 THE POLICY ARCHITECTURE

11	1	40%
INSTRUMENTS ADOPTED IN FOUR YEARS	CARRIES PENALTIES	THE FIRST STRUCTURAL TEST

REPowerEU set the emergency response in 2022. The Green Deal Industrial Plan followed in 2023, the Net-Zero Industry Act and the Critical Raw Materials Act in 2023 and 2024, the Electricity Market Design reform in 2024, the Clean Industrial Deal and the Affordable Energy Action Plan in February 2025, the Grids Package in December 2025, and the Industrial Accelerator Act in March 2026. Regulation (EU) 2026/261 converted the Russian gas phase-out from political commitment into binding prohibition in January 2026.

Each instrument is individually competent. The Hydrogen Bank auctions are well designed and competitively subscribed. The Electricity Market Design reform addresses real defects in price formation. The Industrial Accelerator Act introduces, for the first time, a test based on market structure rather than on volume or price: conditions on investments above €100 million by companies from non-EU states controlling more than 40 per cent of global manufacturing capacity in strategic sectors.

SH ASSESSMENT 1.2

The architecture is sophisticated and aimed at outcomes.

Almost nothing in it measures position. Targets measure volume, share and emissions. Diversification plans count named suppliers. Security of supply assessments model adequacy under stress. None of these produces a number that rises as one external supplier's share rises, which is why three successive concentrations Russia, Norway, the United States — passed without any instrument flagging them.

The Industrial Accelerator Act is the first correction, and it is pointed at the smaller risk. Its 40 per cent trigger is a concentration test applied to inbound investment and public procurement. It does not apply to supply, which is where the exposure sits. A rule that scrutinises a Chinese investment in a European battery plant while imposing no ceiling on the share of European batteries imported from China is measuring the wrong side of the transaction.

1.3 THE DEPENDENCY LEGACY

Russian pipeline gas supplied around 45 per cent of EU gas imports in 2021. By the end of 2025 it stood near 3 per cent. Six floating regasification units were built in Germany inside eighteen months. Norwegian supply expanded, Azerbaijani flows increased through the Southern Gas Corridor, and the winter European industry was widely expected not to survive was survived. Two facts complicate the record. Russia remains the EU's second-largest LNG supplier, and EU imports of Russian LNG rose 15 per cent year on year to 9.9 million tonnes in the first half of 2026 growth in a supply the Union has legislated to prohibit from January 2027.

And the replacement is more concentrated than the original: the United States supplies roughly two-thirds of European LNG in 2026 and has overtaken Norway as the EU’s largest gas supplier on a year-to-date basis, counting pipeline and LNG together.

THE SUBSTITUTION

45% → 3%
RUSSIAN PIPELINE GAS, SHARE OF EU IMPORTS

+15%
EU IMPORTS OF RUSSIAN LNG, H1 2026

c. 2/3
US SHARE OF EUROPEAN LNG IN 2026

SH ASSESSMENT 1.3 — THE FINDING THIS CHAPTER TURNS ON

The lesson of 2022 was drawn about contract duration when it should have been drawn about portfolio structure.

It was not the long-term contract that created the Russian dependency. It was the absence of a concentration limit, an alternative route at scale, and a credible willingness to switch. European buyers have increasingly treated long-term duration as a dependency risk and have been reluctant to sign new long-term contracts — which produces the same concentration with fewer contractual protections, on spot terms, under a legal deadline the Union set itself.

One comparison this report does not make. The 45 per cent and the projected 80 per cent are measured on different bases: the first covers all gas imports, the second covers LNG imports only. They cannot be ranked against each other and this report does not rank them. What repeats is the structure — one external supplier, no ceiling, no alternative route at scale — and the structure is the finding.





1.4 ENERGY MIX AND EMISSIONS PATHWAY

Renewables passed 45 per cent of EU electricity generation in 2026. Emissions have fallen materially against the 1990 baseline, and the direction of travel on the headline climate metrics is not in dispute. The composition beneath the headline is where the strategic content sits. Solar and wind additions ran ahead of national targets while the equipment was overwhelmingly imported: Chinese factories supply roughly 80 per cent of the world's panels, and Chinese entities file some 75 per cent of clean-energy patent applications.

Battery storage grew tenfold in four years to 77.3 GWh, on cells whose manufacture and whose cathode, anode and refining stages are concentrated in China. Heat pumps are over 80 per cent assembled in Europe, on rotary compressors of which roughly 90 per cent of global manufacturing capacity sits in China.

SH ASSESSMENT 1.4

The emissions pathway is indifferent to where the equipment was made, and that indifference is the problem rather than a technicality.

A tonne of avoided CO2 counts the same whether the panel came from Dresden or Xinjiang. European industrial statistics compound this by counting assembly, which is where the jobs are, rather than components, which is where the leverage is. Both measurement systems are working exactly as designed and neither produces a number that would have warned anyone.

THE COMPOSITION BENEATH

c. 80%
OF THE WORLD’S PANELS FROM CHINESE FACTORIES

c. 75%
OF CLEAN-ENERGY PATENT FILINGS

c. 90%
OF ROTARY COMPRESSOR CAPACITY

1.5
PRICES AND INDUSTRIAL COMPETITIVENESS

€120–145	c. €55	2–3×
EU INDUSTRIAL ELECTRICITY, PER MWh	UNITED STATES	THE GAP

European industry pays two to three times what American industry pays for electricity. Industrial electricity runs at roughly €120 to 145 per megawatt-hour against about €55 in the United States, and absent deliberate intervention this is a structural disadvantage rather than a cyclical one. The Commission has responded. The Affordable Energy Action Plan projects savings of €45 billion in 2025 rising to €130 billion annually by 2030 and €260 billion by 2040.

Those are savings against a counterfactual rather than a reduction in the level, and the plan's principal short-term measures — lower electricity taxation and network tariff reform rewarding flexibility — depend on voluntary national implementation.

SH ASSESSMENT 1.5

The Union legislates hard where it holds competence and recommends softly where it does not, and the split runs the wrong way.

Regulation (EU) 2026/261 prohibits Russian gas with penalties of at least €40 million or 3.5 per cent of worldwide turnover. The measures that would actually reduce industrial electricity cost are recommendations. The binding instruments point at outcomes and the discretionary ones point at positions, which is the reverse of what the strategic situation requires.



The binding instruments point at outcomes. The discretionary ones point at



A gap of €303 billion a year persisting in a market seeking these assets is a governance outcome.

1.6 THE DRAGHI DIAGNOSIS

€697 bn
CURRENT ANNUAL ENERGY INVESTMENT

> €1 tn
REQUIRED TO MEET 2030 TARGETS

€303 bn
THE ANNUAL SHORTFALL

The Draghi diagnosis The Draghi Report on European Competitiveness of September 2024 remains the most complete diagnosis of the European position and has largely not been acted on. Its central energy finding is the €303 billion annual investment gap: €697 billion of current investment against more than €1 trillion required to meet 2030 targets. Two years on, the gap has not closed and the diagnosis has not been superseded.

What has become clearer is the nature of the constraint.

RECOMMENDATION 1.6-R

Emergency Union legislation on cross-border transmission consent, with binding decision deadlines, constructive approval on expiry and outer time limits on the duration of judicial review rather than on the right of review. Absent such an instrument, the two-year interconnector ambition should be withdrawn rather than repeated, because an unreachable target restated often enough becomes a substitute for policy.

SH ASSESSMENT 1.6

The investment gap is not primarily a capital availability problem, and treating it as one has cost a decade.

European capital markets have shown appetite for clean energy assets and the EIB holds a AAA rating with exceptionally strong bond market access. What is scarce is bankable pipeline, permitting throughput and the political decision to deploy at the required scale. A gap of €303 billion a year persisting in a market actively seeking these assets is a governance outcome.

Which relocates the binding constraint. If capital is available and pipeline is not, then consent duration is the limiting variable — and in most member states the binding term within consent duration is the length of judicial review rather than administrative processing. That is the single most consequential and least discussed number in European energy policy, and Chapter 2 takes it up.

CHAPTER 2

02

The Electricity System

2.1 The renewables build-out

2.2 Grid integration

2.3 Permitting and connection queues

2.4 Smart grids and demand flexibility

2.5 Storage

2.1 THE RENEWABLES BUILD-OUT

European electricity is the one part of the system where the transition is unambiguously working and unambiguously stuck at the same time. Generation is ahead of plan. Delivery is not, and the gap between the two is the largest single constraint on European energy sovereignty this decade.

Renewables passed 45 per cent of EU electricity generation in 2026, and solar and wind additions exceeded 2025 targets across most member states. Costs continued to fall, deployment ran ahead of national plans, and public support held through a period of high prices.

The composition is where the strategic content sits, and Chapter 1 set it out: Chinese factories supply roughly 80 per cent of the world's panels, and Chinese entities file some 75 per cent of clean-energy patent applications. European manufacturers remain competitive in onshore wind European suppliers held 94.5 per cent of the European market in 2025 — but the permanent magnets inside the generators are 85 to 94 per cent Chinese depending on scope.

The build-out is therefore genuine and the industrial position underneath it is not. Both statements are true, and European statistics report only the first.

THE COMPOSITION BENEATH

c. 80%
OF THE WORLD'S PANELS FROM CHINESE FACTORIES

c. 75%
OF CLEAN-ENERGY PATENT APPLICATIONS

94.5%
EUROPEAN SHARE OF THE ONSHORE WIND MARKET

85–94%
OF PERMANENT MAGNETS, CHINESE

SH ASSESSMENT 2.1

Generation was never going to be the binding constraint and treating it as the headline has cost Europe a decade of attention.

Solar and wind deployment is no longer the limiting factor in the sense that matters: capital is available, technology is mature, supply chains function and public consent broadly holds. Cost pressures, grid access and local opposition remain live in specific markets; none of them is the constraint that determines the European trajectory. Every serious constraint on the European transition now sits downstream of the generator — in consent, in wires, in storage and in flexibility.

A policy architecture organised around deployment targets is optimising a variable that is no longer binding.



The build-out is genuine and the industrial position underneath it is not. European statistics report only the first.

2.2 GRID INTEGRATION

1,700 GW
IN CONNECTION QUEUES ACROSS SIXTEEN COUNTRIES

77 GW
CONNECTED ACROSS EUROPE IN 2025

72 TWh
CURTAILED FOR GRID CONSTRAINTS IN ONE YEAR

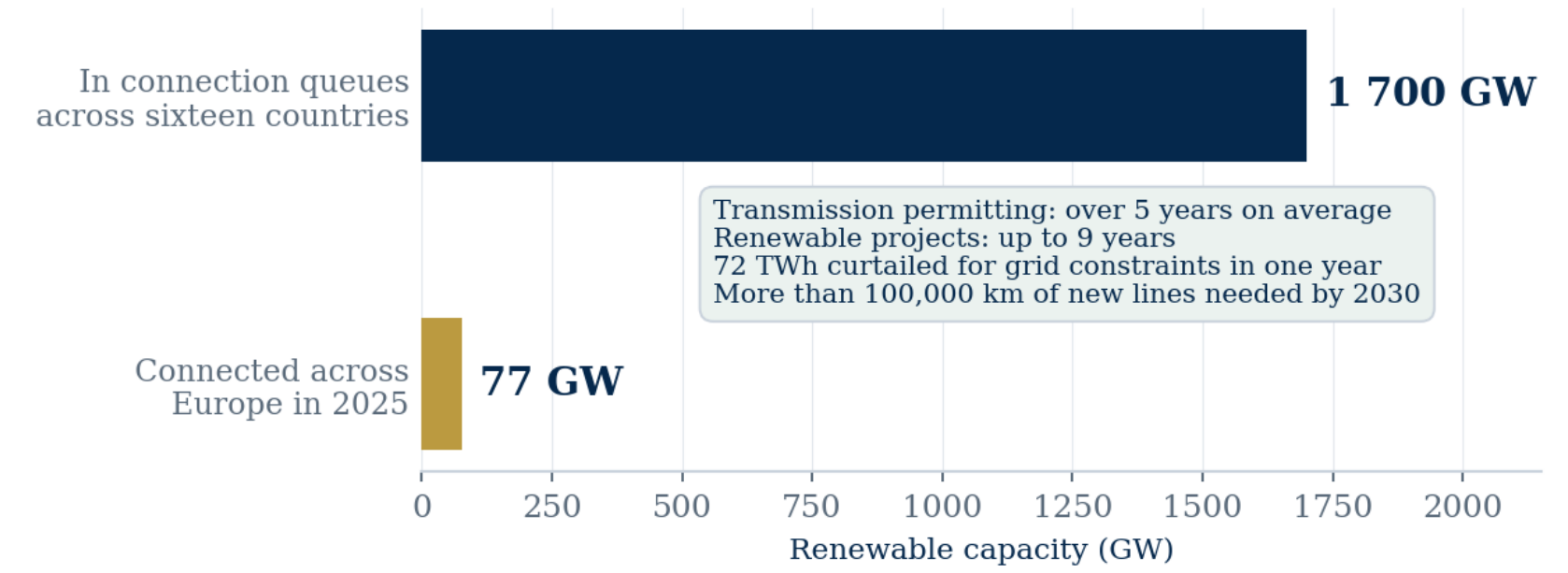


Figure 2.1. The bottleneck. Sources: European Commission; ENTSO-E; IRENA; Beyond Fossil Fuels. Queue figures cover sixteen countries and are not a full EU total.

The physical picture is stark. Around 1,700 GW of renewable capacity sits in connection queues across sixteen countries. Europe connected 77 GW in 2025. Roughly 72 TWh was curtailed in a single year for grid constraints, and ENTSO-E estimates that more than 100,000 km of new onshore and offshore lines are needed by 2030. Grid investment of €584 billion is required by 2030 and around €1.2 trillion by 2040, with roughly €800 billion needed through 2050 on the Commission's wider estimate.

Cross-border interconnection accounts for around 30 per cent of the requirement. The European Grids Package was proposed on 10 December 2025 and ENTSO-E published its position on 27 February 2026; the March 2026 Energy Council confirmed that substantive disagreements persist, particularly over EU-level planning authority and the proposed congestion income rule.

The interconnection record is uneven in a way the headline target obscures. At the beginning of 2026 the Commission recorded sixteen member states above the 15 per cent target for 2030, two between 10 and 15 per cent, and nine still below the superseded 2020 target of 10 per cent. Other assessments published in the same period stated that fourteen countries were falling short; the two counts do not reconcile against a membership of twenty-seven, and this report uses the Commission series while noting the divergence.

The distribution matters more than the average. Ireland stands at zero, Spain at 3.62 per cent, Greece at 6.30, Germany at 10.18 and Sweden at 11.43 — and analysis by Ember found that the countries which would benefit most from interconnection are among those projected to score lowest by 2030.

SH ASSESSMENT 2.2

An average that conceals a zero is not an average worth reporting.

Sixteen member states above target coexists with Ireland at zero and Spain below four per cent, and those two are precisely the systems where interconnection would deliver most: high renewable resource, peripheral position, limited domestic flexibility. The Iberian peninsula remains an electrical island inside a single market, and no target formulated as a member state average creates pressure to fix that.

The coordination loss is quantified and large. Analysis by five European think tanks found that planning European infrastructure jointly to 2050, rather than nationally, would require 505 GW less back-up capacity, 15 per cent less onshore wind and 9 per cent less electrolyser capacity, with savings up to €750 billion. ENTSO-E separately calculates that additional cross-border lines would cut curtailment by around 30 TWh a year.

The cost of planning nationally is therefore known, published and roughly two and a half times the annual investment gap.

THE COORDINATION LOSS

505 GW
LESS BACK-UP CAPACITY UNDER JOINT PLANNING

€750 bn
SAVINGS IDENTIFIED BY FIVE THINK TANKS

30 TWh
CURTAILMENT AVOIDED PER YEAR

SH ASSESSMENT 2.2

An average that conceals a zero is not an average worth reporting.

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GRID INTEGRATION, CONTINUED

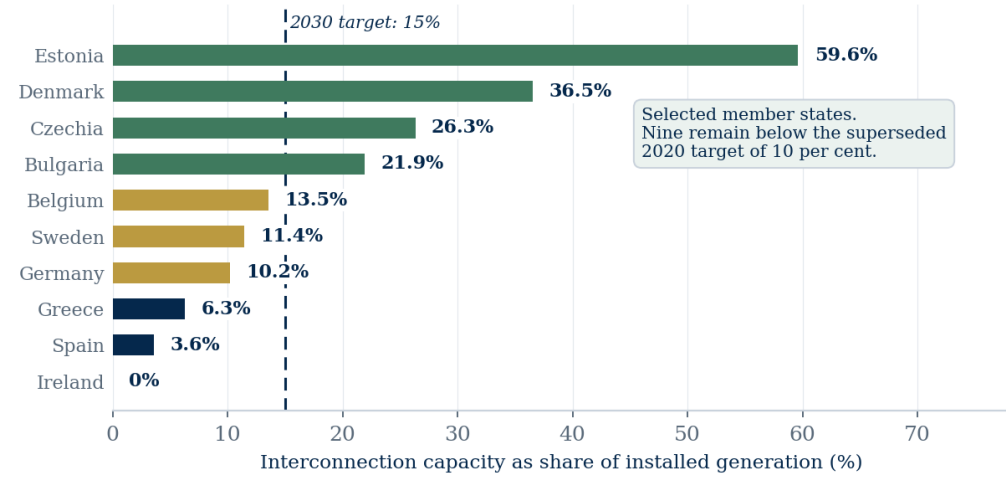


Figure 2.2. Interconnection capacity as a share of installed generation, selected member states, on the Commission's January 2026 assessment. Sources: European Commission, DG ENER calculations from ENTSO-E Winter Outlook 2025–2026.

RECOMMENDATION 2.2-R

Adopt the TEN-E revision's central scenario provision, which shifts infrastructure planning from bottom-up national submissions to a single European reference case. The March 2026 Council debate treated this as a question of competence. On the published evidence it is a question of €750 billion, and the competence argument should be settled against that number rather than against precedent.

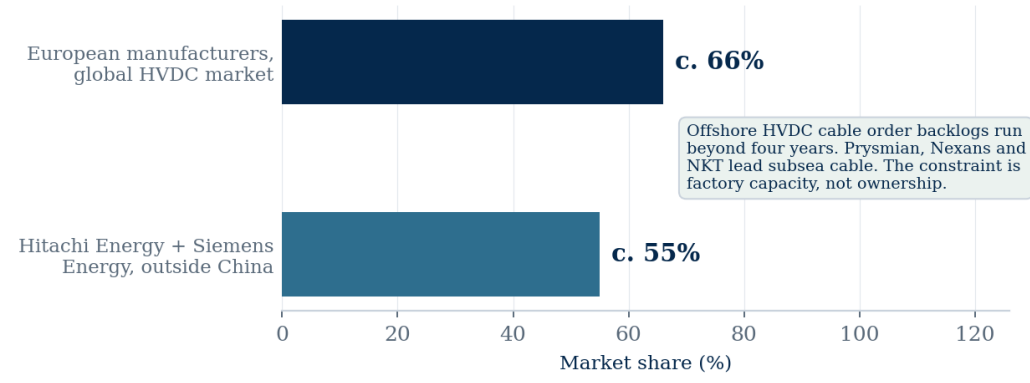


Figure 2.3. The European network manufacturing position. Sources: IEA; MarketsandMarkets; company reporting.

The interconnection record is uneven in a way the headline target obscures. At the beginning of 2026 the Commission recorded sixteen member states above the 15 per cent target for 2030, two between 10 and 15 per cent, and nine still below the superseded 2020 target of 10 per cent. Other assessments published in the same period stated that fourteen countries were falling short; the two counts do not reconcile against a membership of twenty-seven, and this report uses the Commission series while noting the divergence.

The distribution matters more than the average. Ireland stands at zero, Spain at 3.62 per cent, Greece at 6.30, Germany at 10.18 and Sweden at 11.43 — and analysis by Ember found that the countries which would benefit most from interconnection are among those projected to score lowest by 2030.

2.3 PERMITTING AND CONNECTION QUEUES

> 5 yrs	up to 9	> 50%
TRANSMISSION PERMITTING, ON AVERAGE	YEARS FOR RENEWABLE PROJECTS	OF 2030 PROJECTS AWAITING PERMITS

Transmission permitting in Europe takes over five years on average, and renewable projects up to nine. More than half of the transmission projects needed by 2030 are still awaiting permits. This is the binding constraint identified in Chapter 1, and it deserves a precise statement of where the time goes.

Administrative processing is part of it and has improved: the Renewable Energy Directive revisions introduced deadlines, and several member states have created acceleration areas with simplified assessment. What has not improved is the duration of judicial review. In most member states there is no outer time limit on how long a challenge may take, and for large cross-border projects the litigation period frequently exceeds the administrative period by a factor of two or more.

RECOMMENDATION 2.3-R

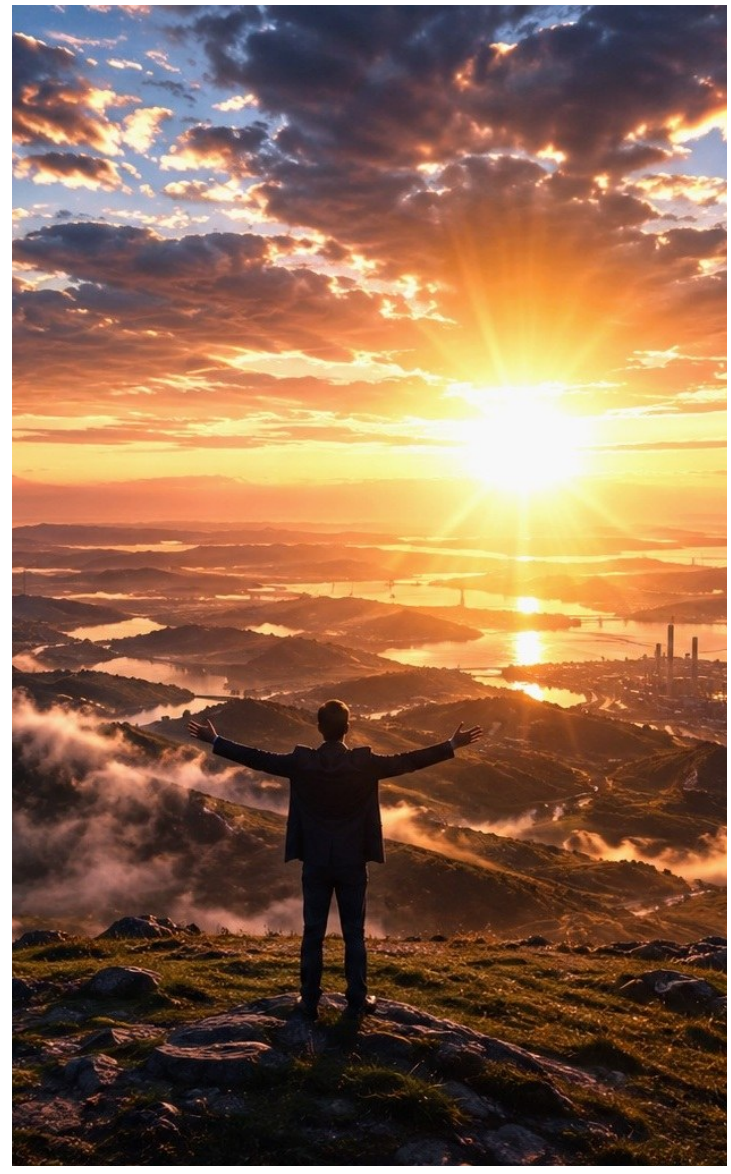
Emergency Union legislation on cross-border transmission consent: binding decision deadlines for authorities, constructive approval on expiry, outer time limits on the duration of judicial review, and EIB guarantee cover for projects that reach the deadline. Absent such an instrument the two-year interconnector ambition should be withdrawn rather than repeated.

SH ASSESSMENT 2.3 — THE FINDING THIS CHAPTER TURNS ON

European permitting reform has repeatedly shortened the part of the process that was not the problem.

Deadlines on administrative decisions are useful and have been delivered. They do not bind the outcome, because a consent that can be litigated without a time limit has no effective completion date. Every acceleration measure adopted since 2022 addresses the authority; none addresses the court. The distinction that makes this politically tractable is between the right of review and its duration.

Limiting who may challenge an infrastructure decision, or on what grounds, is a rule-of-law question and Strategic Horizon does not recommend it. Setting an outer time limit on how long a challenge may take is a procedural question, exists already in several member states for other categories of infrastructure, and is the single change that would most alter the European delivery timetable.



Every acceleration measure adopted since 2022 addresses the authority. None addresses the court.

2.4 SMART GRIDS AND DEMAND FLEXIBILITY

Flexibility is the cheapest capacity Europe is not using. Demand response, smart charging, industrial load shifting and heat pump modulation together represent a resource comparable in scale to substantial generation investment, and it is available on a timescale of months rather than the years required for wires or plant.

The Electricity Market Design reform of 2024 created the legal basis: it requires member states to enable demand response and aggregation, and network tariff reform to reward flexibility is a principal measure of the Affordable Energy Action Plan. The obstacle is implementation. Tariff structures in most member states still charge flexible consumers as though they were inflexible, metering infrastructure is uneven, and aggregators face market access rules that vary by jurisdiction.

RECOMMENDATION 2.4-R

Make network tariff reform rewarding flexibility a binding requirement rather than a recommendation, and require system operators to offer flexible connection agreements as the default for new connections above a defined threshold. Neither measure requires new money and both release capacity within a year.

THE CHEAPEST CAPACITY

months
THE TIMESCALE, AGAINST YEARS FOR WIRES

2024
ELECTRICITY MARKET DESIGN REFORM

national
WHERE TARIFF-SETTING COMPETENCE SITS

SH ASSESSMENT 2.4

Flexibility is the only element of the European system where the instrument exists, the resource exists, the cost is low and deployment is slow anyway.

That combination points at implementation rather than design. The measures are recommendations to member states, tariff-setting is a national regulatory competence, and the beneficiaries of reform are diffuse while the incumbents of the current structure are concentrated. This is the pattern identified in Chapter 1: the Union legislates hard where it holds competence and recommends softly where it does not.

The connection to the queue is direct and under-exploited. A meaningful share of the 1,700 GW awaiting connection is waiting for capacity that flexible connection agreements would release without new wires. Several national operators have begun offering them. Making flexible connection the default for new large loads, with firm capacity as the exception, would shorten the queue faster than any construction programme available on the same timescale.



Flexible connection agreements would release capacity from the queue without new wires.

2.5 STORAGE

77.3 GWh
EU FLEET AT END-2025, FROM 7.8 IN 2021

27.1 GWh
INSTALLED DURING 2025 ALONE

c. 750 GWh
REQUIRED BY 2030

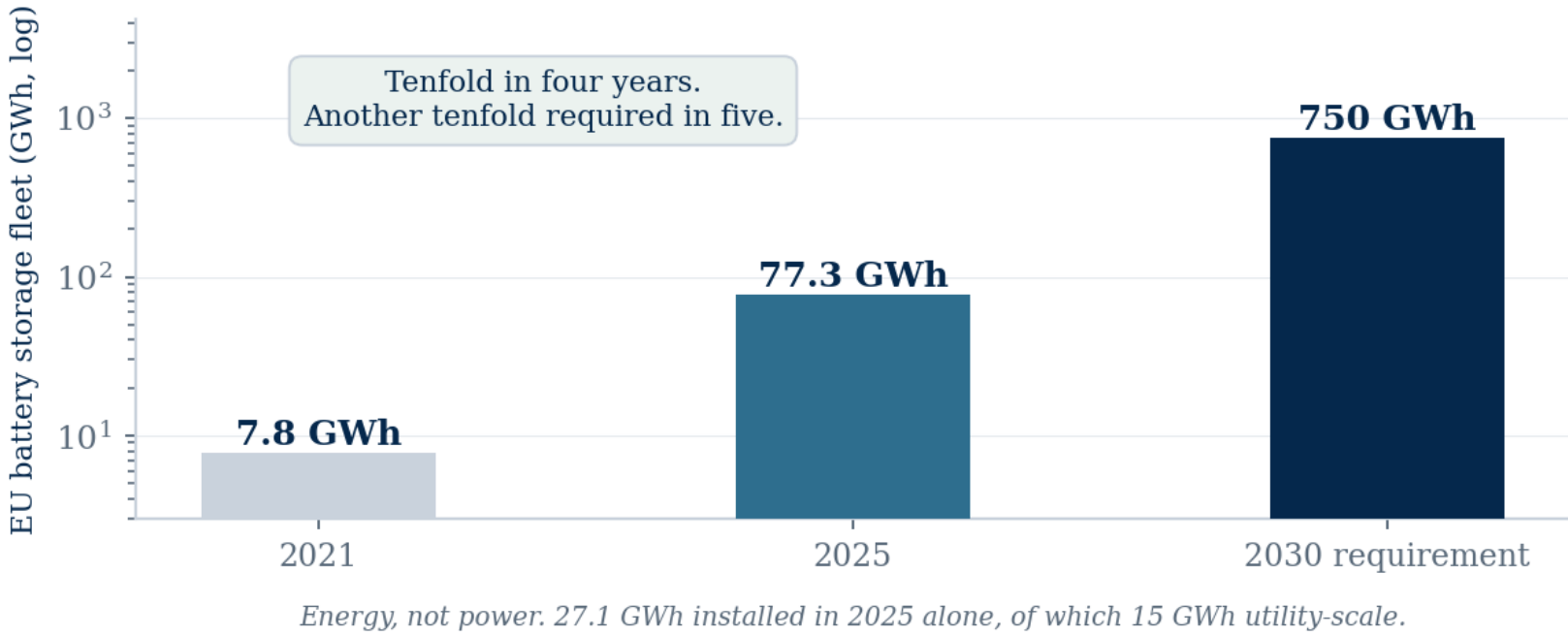


Figure 2.4. EU battery storage on an energy basis. Sources: SolarPower Europe, EU Battery Storage Market Review 2025 (January 2026); S&P Global. Where a power figure is required, S&P Global expects roughly 43 GW of utility-scale batteries online across Europe by end-2026.

European battery storage grew tenfold in four years. The EU fleet reached 77.3 GWh at the end of 2025, from 7.8 GWh in 2021, with a record 27.1 GWh installed during 2025 alone at 45 per cent annual growth. Utility-scale accounted for 55 per cent of new additions, at 15 GWh against 6.5 GWh the previous year, and European battery storage investment reached €17 billion in 2025. The requirement is around 750 GWh by 2030 — a further tenfold increase, from a base that has just achieved one.

Pumped hydro supplies roughly 55 GW of long-duration capacity and is constrained by geology rather than by cost or policy. A note on units. This report states storage in gigawatt-hours throughout, because that is how the industry and every published source report it, and because the previous edition of this report stated the same quantities in gigawatts and produced figures that could not be reconciled with the literature or with each other.

Where a power figure is required it is given alongside the energy figure, because a four-hour and a two-hour system with the same megawatt rating are not the same asset.

RECOMMENDATION 2.5-R

Differentiate storage support by chemistry rather than treating storage as a single technology class, with a defined share of publicly supported stationary capacity reserved for chemistries whose raw material base is not concentrated. The cost is nil; the instrument is a schedule annexed to existing support schemes.

SH ASSESSMENT 2.5

The storage trajectory is the strongest number in European energy and it is not enough, which is an unusual and useful position to be in.

A tenfold increase in four years is not a policy failure by any standard. The requirement is simply larger than the achievement, and the gap will not close on the current growth rate: sustaining 45 per cent annual growth from a 77 GWh base for five more years produces roughly 500 GWh, not 750. The shortfall is a policy question with a known size rather than an unknown risk.

And the chemistry question is a sovereignty question that European storage policy does not ask. The fleet is lithium-ion, whose cells, cathode, anode and refining stages are concentrated in China; Volume 06 of Energy Statecraft scores it at 2.8 on the ETGEM matrix. Sodium-ion scores higher at 3.0 despite being less mature, because its raw material base — sodium, iron, aluminium, hard carbon — carries none of that concentration.

For stationary storage, where the energy density penalty matters least, sodium-ion is the clearest available hedge against the lithium chain, and no European instrument distinguishes between the two.

CHAPTER 3

03

Gas and the Supply Architecture

3.1 The post-Russian architecture

3.2 LNG and the American position

3.3 Norway

3.4 The southern corridor

3.5 March 2026 and what it tested

3.1 THE POST-RUSSIAN ARCHITECTURE

This is the chapter the previous edition got wrong, and the reason is that it was written before the architecture was tested. On 28 February 2026 the Strait of Hormuz closed. What followed revised not the facts of the European supply position but the understanding of how that position transmits risk.

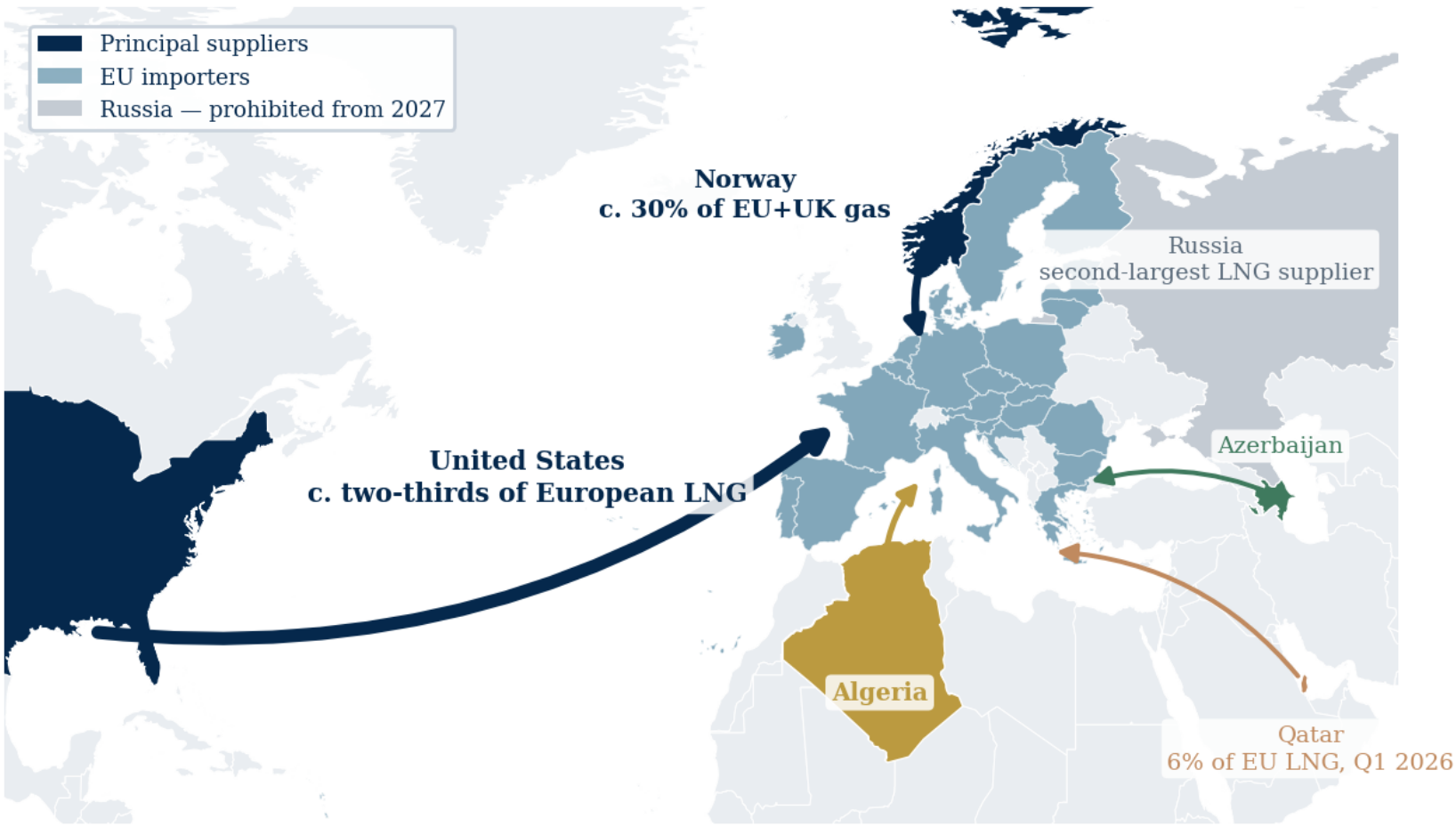


Figure 3.1. The European supply architecture in 2026. Sources: IEEFA European LNG Tracker and EU Gas Flows Tracker (May 2026); Eurostat; Kpler; Reuters. Boundaries from Natural Earth administrative data.

The post-Russian architecture Russian pipeline gas fell from roughly 45 per cent of EU gas imports in 2021 to around 3 per cent by the end of 2025. Six floating regasification units were commissioned in Germany inside eighteen months, Norwegian supply expanded, and Azerbaijani volumes increased through the Southern Gas Corridor. Regulation (EU) 2026/261, published on 26 January 2026, converted the remaining phase-out from political commitment into binding prohibition.

What replaced Russian pipeline gas is more concentrated than the record suggests. The United States supplies roughly two-thirds of European LNG imports in 2026 and has overtaken Norway as the EU's largest gas supplier on a year-to-date basis, counting pipeline and LNG together. Norway supplies around 30 per cent of EU and UK gas demand and announced in August 2026 that it would build no further interconnection.

Qatar supplied 6 per cent of European LNG in the first quarter of 2026, against roughly 15 per cent in pre-war market reporting. And Russia remains the EU's second-largest LNG supplier. Imports rose 15 per cent year on year to 9.9 million tonnes in the first half of 2026 — growth in a supply the Union has legislated to prohibit from January 2027.

SH ASSESSMENT 3.1

Europe legislated a prohibition and increased its purchases from the prohibited supplier in the same period, on spot terms.

That is not hypocrisy and it is not a policy failure in the ordinary sense. It is what happens when a buyer under a public legal deadline declines to sign long-term contracts: the volume has to come from somewhere on short notice, and the cheapest available cargo on a given week is sometimes Russian. The prohibition schedule is the instrument; the purchasing behaviour is the consequence of not having a second one.

3.2 LNG AND THE AMERICAN POSITION

LNG and the American position The American position is documented in full in Energy Statecraft Volume 03 and summarised here in the terms that matter for European planning.

US LNG exports rose from 0.5 billion cubic feet per day at the first Sabine Pass cargo in 2016 to 15.0 Bcf/d in 2025, with a forecast above 18 Bcf/d in 2027. Nearly 60 per cent of every liquefaction project approved worldwide since 2019 has been American. Europe took 68 per cent of American LNG exports in 2025, and IEEFA projects the United States could account for up to 80 per cent of EU LNG imports by 2028.

On IEEFA's assessment American LNG is on average the most expensive supply European buyers take. The trade framework of July 2025 commits the Union to procure American oil, LNG and nuclear energy products worth USD 750 billion through 2028. The United States exported roughly USD 70 billion of energy products to the EU in 2024, and projected American petroleum and gas exports to the bloc for 2026 to 2028 total about USD 207 billion.

RECOMMENDATION 3.2-R

Publish supplier concentration as a monitored security-of-supply indicator with a stated ceiling, applied irrespective of the supplier's political alignment, and report against it annually alongside storage levels. This is the instrument that would have flagged all three concentrations, and it requires a regulation and a reporting obligation rather than money.

THE AMERICAN POSITION

15.0 Bcf/d
US LNG EXPORTS IN 2025, FROM 0.5 IN 2016

68%
OF US LNG EXPORTS WENT TO EUROPE IN 2025

$750 bn
EU PURCHASE COMMITMENT TO 2028

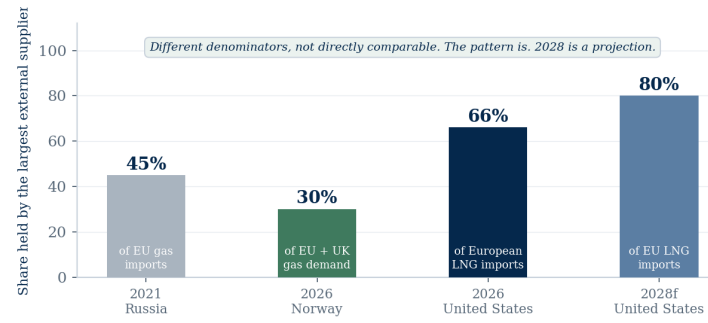


Figure 3.2. Three concentrations. The denominators differ and the shares are not arithmetically comparable. Sources: European Commission; Eurostat; IEEFA; Reuters.

SH ASSESSMENT 3.2 — THE CENTRAL FINDING

Europe has replaced a concentrated supplier with a concentrated supplier and recorded the substitution as diversification.

The comparison in Figure 3.2 is structural rather than arithmetic: the 45 per cent covered all gas imports and the 80 per cent projection covers LNG imports only, and this report does not rank them against each other. What repeats is the pattern — one external supplier, no ceiling, no alternative route at scale, no credible willingness to switch — and no European instrument produced a number that rose during any of the three episodes.

The lesson of 2022 was drawn about contract duration when it should have been drawn about portfolio structure. It was not the long-term contract that created the Russian dependency; it was the absence of a concentration limit and a credible alternative. European buyers have increasingly treated long-term duration as a dependency risk and have been reluctant to sign new long-term offtake, which produces the same concentration with fewer protections, on spot terms, under a deadline the Union set itself.

Section 3.5 and Chapter 7 take this up.



3.3 NORWAY

Norway is the supplier whose position changed most in 2026, and the change was announced rather than negotiated.

At ONS Stavanger on 24 August 2026, Energy Minister Terje Aasland stated that Norway would develop Barents Sea oil and gas whether or not the EU maintained its Arctic moratorium, and that Norway no longer accepted the role of Europe's green battery and would build no new interconnectors. Almost two-thirds of Norway's remaining petroleum resources lie north of the Arctic Circle, and official forecasts show production falling sharply after 2030 without them.

The interconnection decision has a domestic explanation and a commercial one. Since NordLink and North Sea Link opened in 2021, southern Norwegian prices have tracked continental levels while the north stayed cheap; in December 2024 the NO2 zone reached NOK 13.16 per kilowatt-hour. Both governing parties campaigned in September 2025 on not renewing the Skagerrak links. Separately, Nordic data centre consumption is forecast to rise from 8 TWh in 2024 to 28 TWh by 2030 while the regional surplus falls from around 53 TWh to 29 TWh, and Norway has 3.5 GW of capacity reserved for data centres with a 5.4 GW queue.

SH ASSESSMENT 3.3

The refusal was reported as political.

Strategic Horizon assesses that it may also be commercial, and the two readings imply different remedies. A data centre buys around the clock, at a premium, on a long-term contract, inside Norwegian jurisdiction, with no cable required and no exposure to continental price coupling. An interconnector exports the same flexibility at spot prices and imports continental volatility as a side effect, which is what turned Norwegian opinion against interconnection in the first place.

If the refusal is political, a change of government might reverse it. If it is commercial, only an offer that outbids hyperscale compute would — and none exists or is being prepared. European planning assumes access to Nordic flexibility that is being contracted elsewhere. The distinction matters and is easily lost: a power purchase agreement contracts electricity rather than storage capacity. But a Nordic system running at 29 TWh of surplus rather than 53 delivers less through the same reservoirs and the same cables, whether or not any new cable is built.

Strategic Brief SB-2026–04 develops this in full.

NORWAY AT A GLANCE

NOK 13.16
PER kWh, NO2 ZONE PEAK, DECEMBER 2024

8 → 28 TWh
NORDIC DATA CENTRE DEMAND, 2024–2030

53 → 29 TWh
NORDIC SURPLUS, 2024–2030

3.4 THE SOUTHERN CORRIDOR

SGC	TransMed · Medgaz	TurkStream
AZERBAIJAN	ALGERIA	PROHIBITED 2027

The southern routes carry less volume than the Atlantic ones and more strategic weight than their share suggests, because they are the only supply Europe holds that is neither seaborne LNG nor Russian. Azerbaijani gas reaches Europe through the Southern Gas Corridor and volumes have increased since 2022, though the corridor's capacity constrains how much further it can grow without new investment. Algerian supply through the Trans-Mediterranean and Medgaz pipelines serves Italy and Spain directly.

TurkStream remains the last operating Russian pipeline route into the Union, supplying Hungary and Slovakia, and it is covered by the 2027 prohibition. The southeastern European position is the awkward one. Hungary and Slovakia have limited alternative routes, existing long-term contracts, and infrastructure built for east-west flow. The prohibition applies to them on the same date as to everyone else.



The southern routes are the only supply Europe holds that is neither seaborne LNG nor Russian.

SH ASSESSMENT 3.4

A uniform prohibition applied to non-uniform starting positions is a policy that will be complied with unevenly and litigated.

The Union has legislated a single date for members whose alternative routes differ by an order of magnitude. That is defensible as a matter of principle and predictable as a matter of outcome: the states with the fewest alternatives will seek derogations, the derogations will be contested, and the credibility of the deadline will be tested in exactly the cases where it matters most.

An instrument that anticipated this — conditional transition support tied to verified route diversification — would have cost less than the dispute will.

3.5 MARCH 2026 AND WHAT IT TESTED

>150	$126	~17%
TANKERS ANCHORED	BRENT PEAK	QATARI CAPACITY LOST

The Strait of Hormuz closed on 28 February 2026 following military action against Iran. Transits effectively stopped within forty-eight hours, with more than 150 tankers anchored outside rather than risk passage. Brent peaked near USD 126 in March. The IEA described it as the largest supply disruption in the history of the global oil market, and cumulative supply losses reached 12.8 million barrels a day by April.

Missile damage at Ras Laffan removed approximately 17 per cent of Qatari export capacity, with restoration measured in years. Europe lost almost no Hormuz volume. Qatar supplied around 6 per cent of European LNG imports in the first quarter of 2026; the United States and Russia, the two largest suppliers, were untouched by the closure and set a quarterly record. European TTF nonetheless moved from roughly €32 per megawatt-hour in late February to above €50 by mid-March.

National exposure was concentrated rather than shared: Italy took 33 per cent of its 2025 LNG from Qatar, Poland 25 per cent and Belgium 16 per cent. Europe's response was to deepen concentration on its largest supplier, from 58 per cent of LNG imports in 2025 to 63 per cent in the first quarter of 2026.

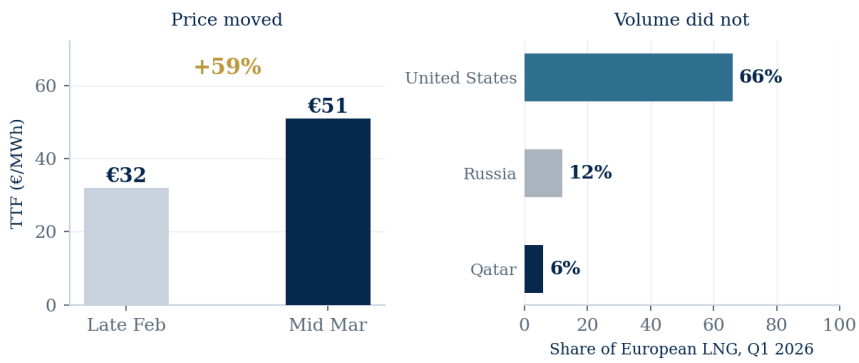


Figure 3.3. What moved and what did not. Sources: IEA Oil Market Report; ICE; IEEFA; Kpler.



SH ASSESSMENT 3.5 — THE FINDING THAT REVISES THE PREVIOUS EDITION

The transmission was price, not volume, and that single distinction revises the European security position.

A system priced at the margin on a common market inherits every supplier failure anywhere in that market, whether or not its own cargoes move. The previous edition of this report listed Hormuz transit as one dependency among several, which implied that a European supply mix with limited Gulf exposure was correspondingly protected. It was not.

Physical diversification of the flag on the tanker does not address a mechanism that operates through price formation. Which means the mitigation is different from the one Europe has been building. Terminals, storage and route diversification address volume risk and Europe has invested heavily in all three. Price transmission is addressed by contract structure — duration, indexation, destination flexibility — and by holding reserve capacity that runs on domestic or overland fuel.

Europe has almost none of the first and does not measure the second.

RECOMMENDATION 3.5-R

Introduce a sovereign reserve cover metric: the share of dispatchable reserve capacity running on domestic or overland fuel, published annually. March 2026 demonstrated that volume security and price security are different exposures requiring different instruments, and Europe currently measures neither of them directly.

CHAPTER 4

04 Hydrogen and Nuclear

4.1 The FID graveyard

4.2 Where the cost actually sits

4.3 Import corridors

4.4 Electrolyser technology

4.5 The electrolyser race and China

4.6 Nuclear and the fuel cycle

4.1 THE FID GRAVEYARD

c. 50
PROJECTS PUBLICLY CANCELLED IN 2025

> 29 GW
SHELVED IN EUROPE BY END-2024

3.6 Mt/yr
BINDING OFFTAKE

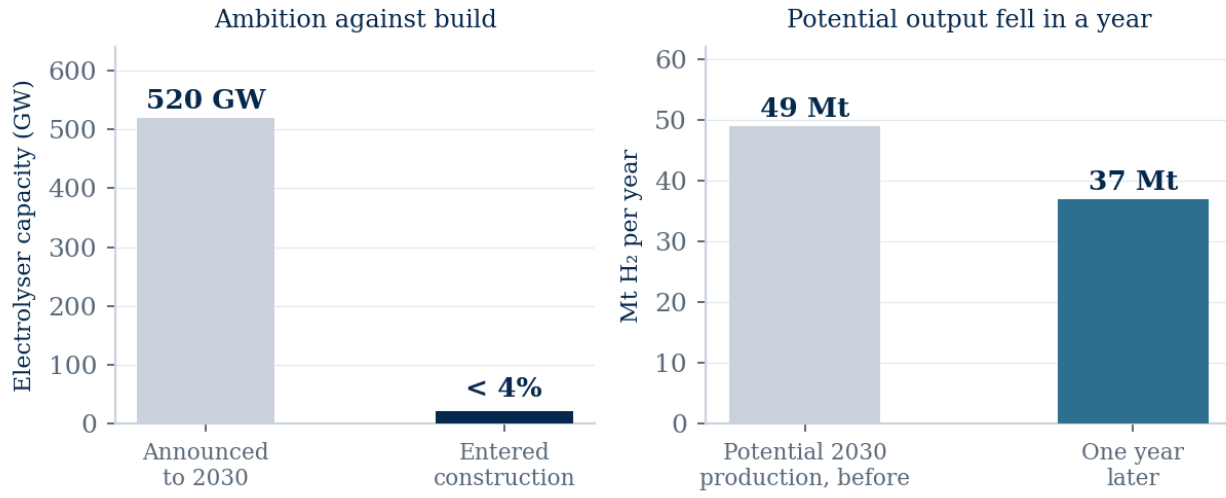


Figure 4.1. The ambition and implementation gap. Sources: IEA Global Hydrogen Review 2025 and 2026; Odenweller and Ueckerdt, Nature Energy (2025); Hydrogen Europe.

Around fifty hydrogen projects were publicly cancelled in 2025, and the real figure is higher because many cancellations are never announced. Shell exited Aukra. BP walked away from the Australian Renewable Energy Hub, from Duqm and from its UK blue hydrogen plans. Air Products cancelled three American projects. Topsoe and First Ammonia tore up a reservation for up to 5 GW of electrolyser capacity in March 2026.

In Europe more than 29 GW of announced electrolyser capacity had been shelved by the end of 2024 alone.

Of roughly 520 GW of electrolyser capacity announced worldwide to 2030, under 4 per cent has entered construction. Binding offtake stands at 3.6 million tonnes a year. Potential 2030 production fell from 49 to 37 million tonnes in a single year, with electrolysis projects accounting for more than 80 per cent of the reduction. Low-emissions hydrogen production nonetheless rose from about 0.8 million tonnes in 2024 to close to 1 million in 2025 — a real industry at roughly one per cent of the size the announcements implied.

The failures separate into four distinct modes, and only two of them are failures of the hydrogen market. Projects built on the expectation that buyers would appear and found none. Projects whose economics depended on subsidy that was then withdrawn. Projects whose industrial customer cancelled first, which is a steel market failure rather than a hydrogen one. And applications where the arithmetic never worked — cars, trucks, building heat — which were a category error from the beginning.



SH ASSESSMENT 4.1

The fourth category should be read as vindication rather than disaster.

Hydrogen cars, trucks and boilers did not fail because hydrogen is unworkable. They failed because a battery or a heat pump performs the same task with fewer conversion losses, and no subsidy closes a thermodynamic gap. The application hierarchy has now been enforced by capital more brutally than any policy could have enforced it. European hydrogen planning is still built on the announcement pipeline rather than on binding offtake, and the two differ by a factor of twenty-five.

The IEA and the Commission publish both figures. Policy cites the larger one. That is how the 2030 targets were set and it is why they will be missed.

RECOMMENDATION 4.1-R

Rebase European hydrogen planning on capacity holding binding offtake rather than on announced capacity, and state which basis is used wherever a hydrogen figure appears in a Commission document.

4.2 WHERE THE COST ACTUALLY SITS

This section did not exist in the previous edition and its absence explains several of that edition's conclusions. Renewable electricity accounts for 60 to 75 per cent of the levelised cost of hydrogen. Electrolyser capital expenditure accounts for 15 to 35 per cent. A shift of USD 10 per megawatt-hour in the power price moves the hydrogen cost by roughly USD 0.50 per kilogram — more than most plausible hardware improvements deliver in a decade.

The arithmetic that follows is uncomfortable. Halving electrolyser capital cost takes a USD 3.50 per kilogram reference case to around USD 2.80 to 3.00 in the best configurations. Grey hydrogen from steam methane reforming costs USD 1.00 to 1.50. The hardware reduction is real and it does not close the gap. The learning curve also ran backwards in the West. A BloombergNEF survey of more than fifty manufacturers found average system-level cost outside China around USD 2,500 per kilowatt against roughly USD 600 for a Chinese-built machine, and Western prices had risen rather than fallen, driven by input inflation and by subsidy delays that prevented the scale-up on which the projected reductions depended.

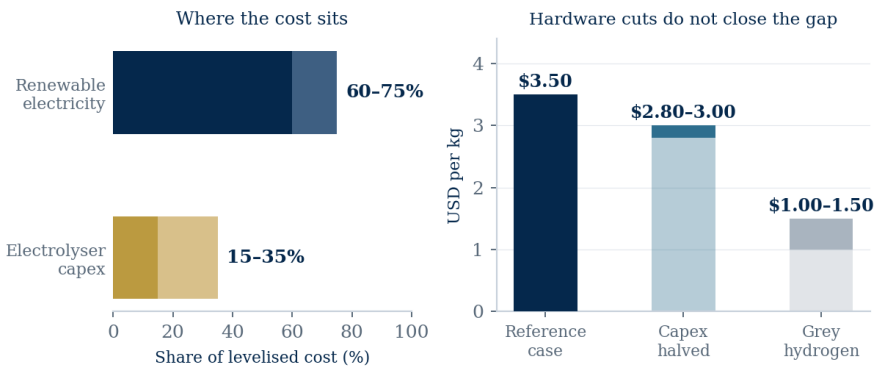


Figure 4.2. The structure of the levelised cost of hydrogen, and the limits of hardware cost reduction. Sources: IEA; BloombergNEF; Hydrogen Council.



SH ASSESSMENT 4.2 — THE FINDING THAT REFRAMES THIS CHAPTER

The innovation that decides the price of hydrogen is not happening in the stack.

It is happening in the electricity system. Cheaper renewables, higher capacity factors, longer full-load hours and lower cost of capital move the number. Catalyst chemistry moves the minority share. This does not make the loss of European electrolyser manufacturing unimportant — it is a serious industrial loss but it does mean the cost problem and the industrial problem are separate problems, and European policy has been treating them as one.

The support architecture assumed a learning rate that did not occur here. Deployment was expected to drive learning and learning to drive cost down. Deployment did not arrive at the required scale, so learning did not occur, so cost did not fall, so deployment did not arrive. Any European instrument still priced on an automatic learning rate is priced on something that did not happen, and the honest planning assumption is flat or slowly declining Western hardware cost with reductions arriving through electricity supply and utilisation instead.

RECOMMENDATION 4.2-R

Redirect European hydrogen research funding from stack cost reduction, where returns are capped by the cost structure, toward dedicated low-cost renewable supply with high capacity factors and toward dynamic operation — stack durability under cycling, partial-load efficiency and fast ramping. Retain PEM and SOEC programmes for the strategic reasons in section 4.5 rather than for cost reasons, and state the distinction openly in funding calls.

4.3 IMPORT CORRIDORS

10 Mt	10 Mt	c. 170
DOMESTIC PRODUCTION TARGET	IMPORT TARGET	AMMONIA PORT TERMINALS WORLDWIDE

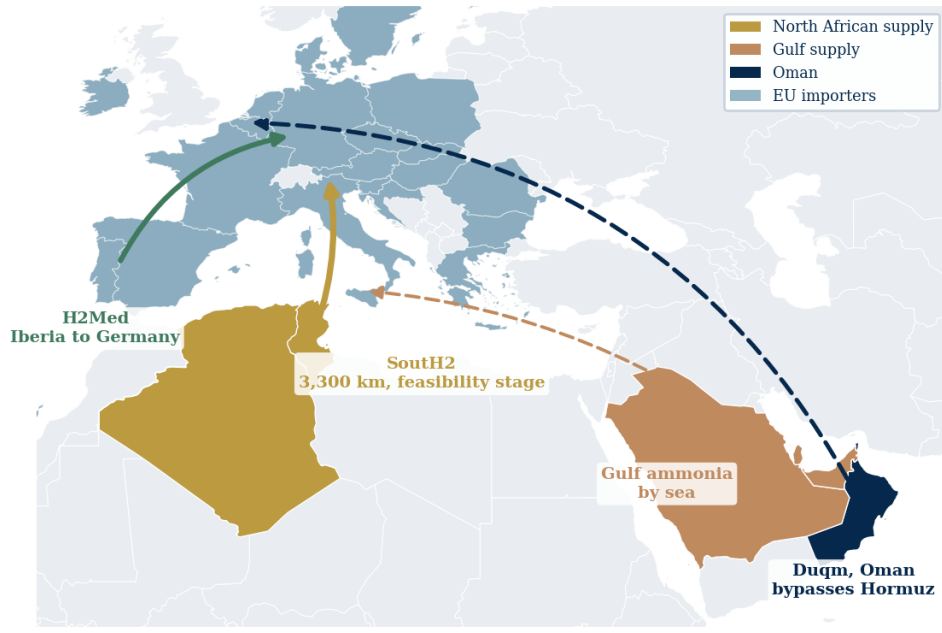


Figure 4.3. Where the molecules would come from. Sources: SoutH2 consortium; H2Med; OGE; Hydrom. Boundaries from Natural Earth administrative data.

European strategy assumes 10 million tonnes of domestic hydrogen production and 10 million imported by 2030. The supply map that would deliver it is visible in outline, and its geography is the geography of the fossil era with different molecules.

SoutH2 runs some 3,300 kilometres from Tunisia and Algeria through Italy to Austria and Germany, over 70 per cent repurposed pipe, projected to deliver 15 to 20 per cent of EU green hydrogen imports by 2030 if final investment decisions close by mid-2027. H2Med would carry up to 8 million tonnes a year from Portugal and Spain via France to Germany. Beyond the pipelines the trade is ammonia rather than hydrogen, because ammonia moves in existing ships to existing terminals around 170 ammonia port terminals already operate worldwide.

Oman's Duqm illustrates what the 2026 disruption taught and who learned it. Duqm ships to the open sea without transiting the Strait of Hormuz, a deliberate design choice by a supplier that watched the strait close. Oman has also declined technological lock-in, keeping ammonia, methanol and liquid hydrogen open rather than committing to one carrier.

RECOMMENDATION 4.3-R

Apply the supplier concentration ceiling recommended in section 3.2 to hydrogen and its derivatives before the contracts are signed rather than after. Structure import agreements around multiple carriers and multiple corridors as a design requirement, and make European engineering, certification and service participation a condition of import infrastructure support.

SH ASSESSMENT 4.3

Europe is assembling a hydrogen import architecture with the same structure as the gas architecture Chapter 3 describes.

Molecules from suppliers carrying varying degrees of political, regulatory and chokepoint exposure, equipment from a strategic competitor, and no European position anywhere in the chain except as the buyer. The difference from gas is that this time the contracts have not been signed, which means the terms are still available. The suppliers are further ahead in strategic thinking than the buyer.

Oman designs around chokepoints and refuses carrier lock-in. The Gulf states structure exports around ammonia precisely because it uses infrastructure that already exists. Europe is still setting volume targets, and a target is not a negotiating position.



4.4 ELECTROLYSER TECHNOLOGY

Four technologies, at four different stages, with four different strategic profiles. Technology

Technology	Installed cost	Status	What has to happen
Alkaline	USD 200–400 / kW	Commodity; 70–90% of global shipments	Nothing. This is a mature product and the cost race is over
PEM	USD 400–600 / kW	Commercial; largest project 20 MW	Iridium loading below 0.3 mg/cm² and a closed recycling loop, for a sub-USD 200/kW target by 2030
SOEC	USD 800–1,200 / kW	Mostly pilot	80–90% efficiency at 600–850°C, but only where industrial waste heat is available
AEM	Early stage	Pre-industrial	Non-precious catalysts already show above 90% efficiency at 1 A/cm²; membrane conductivity is roughly half that of PEM

Table 4.1. Four electrolyser technologies. Sources: IEA; IRENA; BloombergNEF; company reporting.

The research frontier is narrower than the coverage suggests. In PEM the binding constraint is iridium and platinum loading; a non-noble cathode catalyst reaching 4 A/cm² at 2.36 V remains a laboratory result rather than a product. In AEM the constraint is membrane conductivity, because hydroxide ions move more slowly than protons. In SOEC the constraint is not the stack at all but proximity to high-grade waste heat: coupled to concentrated solar or industrial heat, SOEC could reach around USD 3.50 per kilogram by 2050; coupled to photovoltaics with electric heating it exceeds USD 5.

THE HARDWARE RACE

USD 2,500
PER kW, SYSTEM COST OUTSIDE CHINA

c. USD 600
PER kW, CHINESE-BUILT MACHINE

70–90%
ALKALINE SHARE OF GLOBAL SHIPMENTS



The metal, the manufacturing and the volume are Chinese.

4.5 THE ELECTROLYSER RACE AND CHINA

While the projects were failing, the manufacturing question was settled. In under a decade China moved from 5 per cent of global electrolyser manufacturing capacity to 60 per cent. A World Bank technical paper of February 2026 put the Chinese share of global alkaline manufacturing — the workhorse technology for large-scale production — at 86 per cent, with rapid expansion into PEM. Chinese annual manufacturing capacity reached 39 to 40 GW by the end of 2024 against global demand of roughly 10 GW.

Exports rose from 18.5 MW in the first half of 2025 to at least 321 MW in the first half of 2026, a seventeenfold increase. The moment that settled it came on 13 May 2026, when HydrogenPro, a Norwegian manufacturer, mothballed the 500 MW factory in Tianjin it had taken full control of six months earlier and moved production onto the lines of LONGi under a joint OEM agreement. The company retains its proprietary technology and assembles European-destined systems in Germany.

The metal, the manufacturing and the volume are Chinese.

RECOMMENDATION 4.5-R

Reorient European electrolyser policy from manufacturing share to system integration, EPC capability and certification authority. Condition public support on European engineering, installation and service content rather than on stack origin, which is no longer securable, and retain domestic capability in PEM and SOEC where the Chinese position is not yet consolidated. Anchor the position in certification and standards authority rather than in price competitiveness, because the cost advantage in EPC will not survive the globalisation of Chinese project delivery capability.

SH ASSESSMENT 4.5

A European electrolyser manufacturer giving up its own factory to build on a Chinese competitor's assembly line is a concession statement rather than a commercial footnote.

The mass-market alkaline race is effectively over. PEM and SOEC are not yet consolidated, and that is where the remaining European position sits — but it should be defended for strategic reasons, not on a cost argument that section 4.2 shows will not hold. The mitigating detail is usually omitted and matters. Because engineering, procurement and construction dominate installed cost and tariffs bite on the equipment, a Chinese unit installed outside China runs USD 1,500 to 2,400 per kilowatt against USD 2,000 to 2,600 for one made and installed outside China.

The delivered advantage is far smaller than factory-gate prices imply. Europe cannot win the manufacturing race and retains real leverage over the two-thirds of project cost that is engineering, integration and construction. That leverage has a time limit, and the report states it rather than assuming otherwise. Engineering, procurement and construction is not a permanently defensible position.

Chinese EPC capability has globalised in every sector where Chinese manufacturing led first — power plants, transmission, rail, port infrastructure — and the Belt and Road record suggests a lag of roughly a decade between manufacturing dominance and delivered-project dominance. The recommendation below is therefore a window rather than a settlement, and it should be treated as one: European EPC and certification authority are defensible for as long as they are built into regulation and standards rather than left to



The Swedish consortium behind Videberg Kraft is steel, mining, engineering and defence — and not one data centre operator.

4.6 NUCLEAR AND THE FUEL CYCLE

9 June 2026	3 × 470 MW	c. 12 TWh
RIKSDAG AUTHORISES 60% STATE STAKE	ROLLS-ROYCE SMR, VÄRÖ PENINSULA	PER YEAR FROM THE EARLY 2030s

Nuclear returned to European policy in 2026, and the return is real. Sweden's Riksdag voted on 9 June 2026 to authorise state acquisition of 60 per cent of the project company Videberg Kraft; the acquisition itself follows the authorisation rather than coinciding with it. Rolls-Royce SMR has been selected for three 470 MW units at the Värö Peninsula, around 1,500 MW producing roughly 12 TWh a year from the early 2030s.

Finland is advancing SMR work in Helsinki and Kuopio, some of it for district heating. France continues its programme. The motivation deserves precision because it is widely misreported. The Swedish industrial consortium behind Videberg Kraft consists of ABB, Alfa Laval, Boliden, Hitachi Energy, Höganäs, SSAB, Saab, Stora Enso and Volvo — steel, mining, engineering and defence, and not one data centre operator.

The official justifications refer consistently to electrifying transport and industry. This is an industrial electrification programme, not an AI infrastructure programme and not primarily a climate programme. The fuel-cycle exposure needs to be stated precisely, because it is routinely misattributed. The Rolls-Royce SMR selected for Värö is a pressurised water reactor using conventional low-enriched uranium below 5 per cent.

4.6 NUCLEAR AND THE FUEL CYCLE, CONTINUED

It does not require HALEU, and neither do the light-water SMR designs under consideration elsewhere in Europe. The Swedish and Finnish programmes are exposed to conventional enrichment supply, not to the HALEU bottleneck. That conventional exposure is real and separate. Russia held roughly 40 per cent of global enrichment capacity before 2022, and European capacity sits with Urenco and Orano — substantial, allied, and expanding, with Orano adding four cascades at Georges Besse II by 2030 and Urenco expanding in the United States.

This is a manageable dependency with identified European suppliers. HALEU is the separate and sharper exposure, and it applies to the reactor classes Europe has not yet committed to. High-assay low-enriched uranium, required by most non-water-cooled advanced designs, is available commercially at scale only from Russia's Tenex, and only Russia and China hold the infrastructure to produce it in quantity.

Centrus produced over 920 kilograms from a demonstration cascade at Piketon between October 2023 and mid-2025 and targets 12 tonnes a year by 2029. Urenco is building at Capenhurst in the United Kingdom for the early 2030s. The US Department of Energy allocated USD 2.7 billion over ten years in January 2026 and projects American demand rising to 50 tonnes a year by 2035.

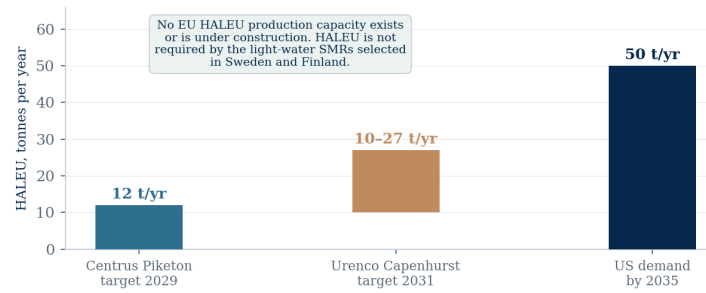


Figure 4.4. HALEU supply and demand. Sources: US DOE; Centrus; Urenco. HALEU applies to non-water-cooled advanced designs, not to light-water SMRs.

SH ASSESSMENT 4.6

The European Union has no HALEU production capacity, none under construction, and no announced programme.

The Western capacity being built is American and British. This does not constrain the SMR programmes now selected in Sweden and Finland, which run on conventional LEU. It constrains the reactor classes beyond them — fast reactors, high-temperature designs, most of what is meant by fourth generation — and it constrains them before the decision to pursue them has been taken, which is the useful moment to notice it.

The timing is the reason to act now rather than at selection. Centrus reaches 12 tonnes a year in 2029 and Urenco Capenhurst in the early 2030s, against American demand alone of 50 tonnes by 2035. A European utility choosing an advanced design in 2030 would be entering a market where Western fuel supply is already short and allocated, and where the alternative supplier is the state the Union has legislated to exclude from its gas market.

The exposure is created at technology selection, not at commissioning.

RECOMMENDATION 4.6-R

Distinguish the two fuel-cycle questions in European nuclear policy. Conventional enrichment for light-water SMRs is a manageable allied dependency and should be secured contractually. HALEU is a different problem and should be resolved before, not after, any European commitment to advanced non-water-cooled designs: either through a European supply programme, or by an explicit decision to accept allied dependency with contracts in place. The current position resolves neither, and the cost of that appears at technology selection.

CHAPTER 5

05 Energy Security

5.1 The threat landscape

5.2 Baltic Sentry and NATO doctrine

5.3 Subsea infrastructure

5.4 Hybrid warfare and critical infrastructure

5.5 State-sponsored cyber actors



Four of the five operate below the threshold of armed attack, and three of them are difficult or impossible to attribute under existing law.

5.1 THE THREAT LANDSCAPE

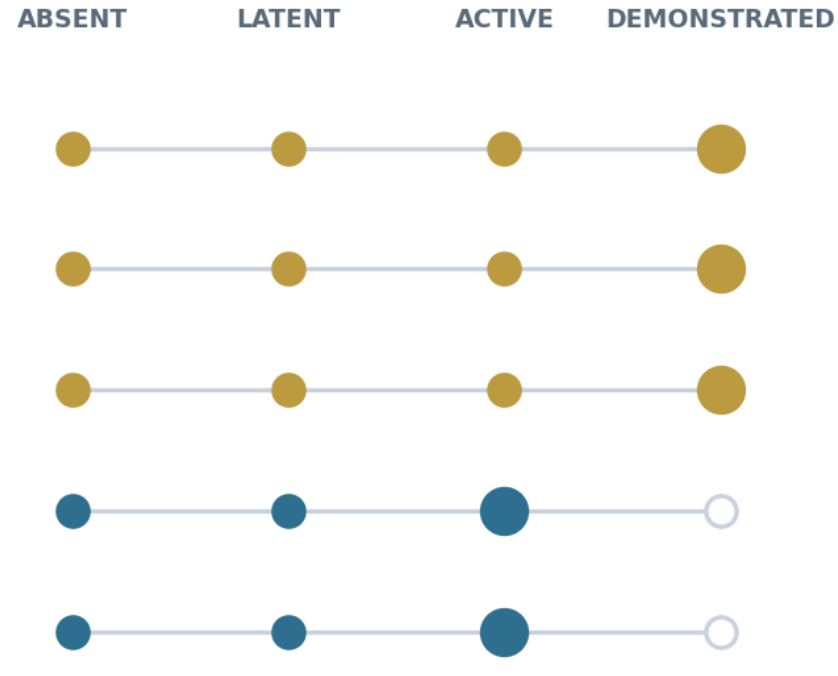


Figure 5.1. The threat surface. Categories assessed as absent, latent, active or demonstrated against European infrastructure. Sources: NATO; European Commission; ENISA; Strategic Horizon assessment.

Five categories now carry material European exposure. Physical chokepoint transit, demonstrated at Hormuz in 2026. Subsea cable and pipeline damage, demonstrated repeatedly in the Baltic since October 2023. Terminal and grid cyber intrusion, active. Clean-technology supply chain restriction, demonstrated by the Chinese export controls of April and November 2025. And shadow fleet operations in European waters, which were not a category in 2020.

The common feature is that four of the five operate below the threshold of armed attack, and three of them are difficult or impossible to attribute under existing law. That is not incidental; it is the design.

SH ASSESSMENT 5.1

European energy security doctrine was built for supply interruption and is being tested by attribution failure.

Strategic reserves, storage obligations and diversification requirements all address a supplier that stops delivering. None of them addresses a commercial vessel that drags an anchor across a cable in international waters, or an export licensing regime that slows without stopping, or a price move transmitted through a market rather than a pipeline.

The instruments answer the previous question.

5.2
BALTIC SENTRY AND NATO DOCTRINE

14 Jan 2025
BALTIC SENTRY LAUNCHED

€347 m
SUBSEA PACKAGE, 5 FEBRUARY 2026

€20 m
RAPID REPAIR PILOT

NATO launched Baltic Sentry on 14 January 2025, following damage to the Estlink 2 interconnector on 25 December 2024. The mission deploys frigates, maritime patrol aircraft and naval drones for surveillance and deterrence across the Baltic, under the authority of the Supreme Allied Commander. It has worked, within its area. The deterrent effect was visible through 2025. It was not complete: on 31 December 2025 Finnish special forces boarded the cargo vessel Fitburg on suspicion of dragging its anchor across cables linking Finland and Estonia, and five days later Latvian authorities boarded another vessel suspected of damaging a link to Lithuania.

The European Commission followed on 5 February 2026 with a €347 million subsea infrastructure package and a Cable Security Toolbox — the largest EU-level investment in subsea protection to date. Of that, roughly €327 million goes through the Connecting Europe Facility to new cable infrastructure and €20 million to a Rapid Repair Pilot pre-positioning modular repair equipment in Baltic ports.



SH ASSESSMENT 5.2

Baltic Sentry protects the sea where the incidents happened.

The infrastructure Europe is about to build runs somewhere else. The planned SoutH2 hydrogen corridor crosses the Mediterranean. H2Med runs through the Bay of Biscay. The offshore HVDC links that carry North Sea wind to demand centres cross waters outside the Baltic mission area. A deterrence architecture defined by the location of past incidents rather than by the location of future assets is a lagging instrument, and the assets have a thirty-year life.

The repair capability is the weak link and the package acknowledges it only partially. €20 million pre-positions equipment that still requires specialised vessels to deploy, and Europe has few of them. Repairs currently take weeks. For a telecommunications cable that is disruptive; for an HVDC interconnector carrying several per cent of a national system it is a capacity adequacy event.

The asymmetry between the cost of cutting and the cost of repairing has not narrowed.

RECOMMENDATION 5.2-R

Extend the Baltic Sentry model into a standing NATO-EU Joint Infrastructure Protection Framework covering the Mediterranean and North Sea corridors where hydrogen and HVDC infrastructure is planned, and fund a dedicated European cable repair vessel capability rather than pre-positioned equipment that requires vessels Europe does not have.



Every HVDC interconnector, offshore wind export cable and planned hydrogen corridor adds to an estate that is unmonitored along most of its length.

5.3 SUBSEA INFRASTRUCTURE

≥ 11	Sept 2022	Oct 2023
CABLES SEVERED OR DAMAGED IN THE BALTIC SINCE OCTOBER 2023	NORD STREAM SABOTAGE	BALTICCONNECTOR DAMAGED

Since October 2023, vessels associated with the Russian shadow fleet have severed or damaged at least eleven cables in the Baltic region. The operational pattern is consistent: a commercial vessel in international waters drags its anchor across the seabed, attribution remains difficult under maritime law, and repairs take weeks. The Nord Stream sabotage of September 2022 established the precedent that submarine energy infrastructure can be destroyed with limited attribution and no immediate accountability.

The October 2023 damage to the Balticconnector gas pipeline extended it to gas. The Estlink 2 incident extended it to electricity interconnection. European exposure is growing on this axis faster than any other, because the assets are being built. Every HVDC interconnector, every offshore wind export cable and every planned hydrogen corridor adds to a subsea estate that is by construction unmonitored along most of its length.

SH ASSESSMENT 5.3

Europe is building its energy sovereignty on the seabed, which is the one domain where it cannot establish attribution.

The grid interconnection that Chapter 2 identifies as the contest still open, the hydrogen corridors of Chapter 4 and the offshore wind that underpins the generation record all share a physical medium in which a state actor can impose cost with deniability. This is not an argument against building them. It is an argument that the protection architecture and the repair capability should be procured with the assets rather than after the first incident.

5.4 HYBRID WARFARE AND CRITICAL INFRASTRUCTURE

The pattern across the incidents of 2023 to 2026 is deliberate ambiguity. A vessel with unclear ownership, sailing under a flag of convenience, with insurance that cannot be verified, causes damage that could plausibly be accidental, in waters where jurisdiction is contested. Shadow fleet activity has extended beyond the Baltic. Sanctioned tankers, some without ice class and with unclear insurance, now transit the Norwegian and Barents seas routinely; Norway began inspecting them in August 2025.

The Nordic Council of Ministers and Nordic Energy Research published an assessment in June 2026 finding a gap between the region's reputation for preparedness and its actual position, and identifying Melkøya as the most acute single point of failure in the northern Nordic energy system. That report also recorded an institutional gap: the Nordic Regional Coordination Centre's mandate covers operational efficiency rather than security, and does not extend to threat intelligence, hybrid incident response or physical protection.

THE NORTHERN EXPOSURE

Aug 2025
NORWAY BEGINS INSPECTING SANCTIONED TANKERS

June 2026
NORDIC PREPAREDNESS ASSESSMENT PUBLISHED

Melkøya
MOST ACUTE SINGLE POINT OF FAILURE, NORTHERN NORDIC SYSTEM

SH ASSESSMENT 5.4

The most integrated electricity region in the world has published a finding that it is not organised for the threat it faces, and the finding has produced no institutional change.

The Nordic system is interconnected but, on its own institutions' assessment, far from unitary, and that constraint limits how much the Nordic countries can support each other when one comes under sustained strain. If that is true of the Nordics it is true a fortiori of the Union, whose electricity market is less integrated and whose security coordination is thinner.





5.5 STATE-SPONSORED CYBER ACTORS

The cyber exposure has shifted from information systems to operational technology, and the difference matters. An intrusion into a utility's billing system is a data breach. An intrusion into the control system of an LNG regasification terminal, a transmission substation or a gas compressor station is a physical availability risk. The European attack surface has expanded with the infrastructure. Six German floating regasification units built in eighteen months, hundreds of new grid-scale battery installations, and a rapidly growing population of remotely managed distributed assets each add control interfaces.

Grid-scale power electronics — inverters, converters, control systems — are the layer where this concentrates, and Volume 06 of Energy Statecraft scores them at 2.8 on the ETGEM matrix, with supply chain concentration and geopolitical exposure both at 2.

SH ASSESSMENT 5.5

The cyber question and the supply chain question are the same question at the control layer, and European policy treats them as two.

Cybersecurity regulation addresses how a device is protected. Supply chain policy addresses where it was made. For grid-scale inverters and converters these are one issue: firmware provenance, update authority and remote access rights are determined by the manufacturer, and the manufacturer is determined by procurement. A NIS2 obligation on an operator does not reach a design decision taken by a supplier outside the Union.

RECOMMENDATION 5.5-R

Extend critical infrastructure certification requirements to cover firmware provenance and remote update authority for grid-connected power electronics above a capacity threshold, and require operators to hold the technical capability to operate assets with external connectivity disabled. Both are procurement conditions rather than new institutions.

THE CONTROL LAYER

6
GERMAN FSRUs BUILT IN EIGHTEEN MONTHS

2.8
ETGEM SCORE, GRID-SCALE POWER ELECTRONICS

2 · 2
SUPPLY CHAIN AND GEOPOLITICAL EXPOSURE SCORES

CHAPTER 6

06

Investment and Finance

6.1 The investment gap

6.2 Public instruments

6.3 The European Investment Bank

6.4 Private finance and capital markets

6.5 Green bond markets and SME access

6.1 THE INVESTMENT GAP

€303 bn

the annual shortfall between what Europe invests in energy and what its own targets require

€697 bn	> €1 tn	€584 bn	c. €1.2 tn
CURRENT ANNUAL ENERGY INVESTMENT	REQUIRED EACH YEAR	GRID INVESTMENT REQUIRED BY 2030	GRID INVESTMENT REQUIRED BY 2040

The Draghi figure stands: €697 billion of current annual energy investment against more than €1 trillion required, a gap of €303 billion a year. Grid investment alone requires €584 billion by 2030 and around €1.2 trillion by 2040.

The instruments are two orders of magnitude smaller than the gap. That is not a criticism of their design — the Innovation Fund and the Hydrogen Bank are competently run and allocate capital to real projects — but it establishes what they can and cannot do. They are demonstration and de-risking instruments. They are not, and were never structured to be, the mechanism that closes a €303 billion annual gap.

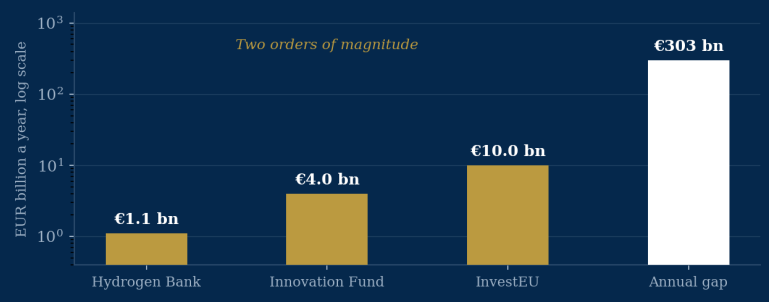


Figure 6.1. European instruments against the annual gap, log scale. Fund figures are approximate annual deployment rather than total envelopes. Sources: European Commission; Draghi Report; Innovation Fund and Hydrogen Bank auction results.

The gap will be closed by private capital or not at all, and the public instruments exist to make private capital deployable rather than to substitute for it. Stated that way the policy question changes. It is not how large the next fund should be; it is what prevents institutional capital from deploying at the required rate into assets it already wants. The answers are known: pipeline that has not cleared consent, revenue structures that do not match liability profiles, and regulatory frameworks that change between financial close and commissioning.

The gap will be closed by private capital or not at all, and the public instruments exist to make private capital deployable rather than to substitute for it.

SH ASSESSMENT 6.1

6.2 PUBLIC INSTRUMENTS

The European instrument architecture is dense: the Innovation Fund, the Modernisation Fund, the Hydrogen Bank, InvestEU, the Recovery and Resilience Facility, the Just Transition Fund, the Connecting Europe Facility and national schemes operating alongside them.

The Hydrogen Bank illustrates both the competence and the limit. Three auctions have run: €720 million awarded to seven projects in 2024, €992 million to fifteen in 2025, and €1.09 billion to nine projects covering 1.1 GW in 2026, the last more than six times oversubscribed with 58 bids from eleven countries. Winning bids rose from €0.37–0.48 per kilogram in the first round to €0.57–3.49 in the third.

And of the first €2 billion offered across two rounds, €902 million went unused — €384 million withdrawn before grant signature and a further €230 million after.



Heavy oversubscription with rising clearing prices and falling delivery.

AUCTION ONE, 2024

€720 m to seven projects

Winning bids cleared at €0.37 to 0.48 per kilogram.

AUCTION TWO, 2025

€992 m to fifteen projects

Of the first €2 billion offered across two rounds, €902 million went unused.

AUCTION THREE, 2026

€1.09 bn to nine projects, 1.1 GW

More than six times oversubscribed, with 58 bids from eleven countries. Winning bids rose to €0.57 to 3.49 per kilogram.

THE WITHDRAWALS

€384 m and €230 m

Withdrawn before grant signature, and after it.

SH ASSESSMENT 6.2

Heavy oversubscription with rising clearing prices and falling delivery is what a market looks like when demand for subsidy is strong and underlying economics are deteriorating.

The auction mechanism is working correctly and reporting accurate information. The information is that the projects are getting harder rather than easier, and that a material share of awarded support cannot be converted into built capacity. Citing subscription rates as evidence of success while not citing the withdrawal rate presents half of what the instrument is telling us.

RECOMMENDATION 6.2-R

Publish award-to-commissioning conversion rates for every EU energy funding instrument as a standing metric. An instrument whose awards convert at 55 per cent is providing different information from one that converts at 90 per cent, and neither the Commission nor the market currently sees the number.



6.3 THE EUROPEAN INVESTMENT BANK

The EIB holds a AAA rating and exceptionally strong access to bond markets, and has committed to align its lending with the transition. It is the single most capable public financial institution in the European system and it is not capital-constrained. What constrains it is the same thing that constrains everyone: bankable projects that have cleared consent. An institution that can raise money more cheaply than any commercial lender cannot deploy that advantage into a project that does not have a permit.

RECOMMENDATION 6.3-R

Establish EIB guarantee cover for consent-stage delay on cross-border transmission projects that have met statutory deadlines, paired with the outer time limits on judicial review recommended in section 2.3. The two instruments only work together: a guarantee without a deadline is an open-ended liability, and a deadline without a guarantee still leaves the developer carrying the residual risk.

SH ASSESSMENT 6.3

The EIB is the clearest available proof that the European investment gap is not a capital problem.

If capital scarcity were the binding constraint, an institution with AAA funding costs and a transition mandate would be lending at its limit. It is not. The constraint is upstream, in consent and pipeline, which is why Chapter 2's permitting recommendation is also this chapter's financing recommendation. One instrument the EIB could deploy and does not, at scale, is guarantee cover for consent risk.

Developers price the risk that a project will be delayed or defeated in litigation after financial close, and that risk premium raises the cost of every European infrastructure project. A public guarantee against consent-stage delay would transfer a risk the public sector partly creates back to the public sector, and would reduce the cost of capital across the pipeline more efficiently than an equivalent volume of grant.

6.4 PRIVATE FINANCE AND CAPITAL MARKETS

“Three structural frictions limit deployment rather than willingness.”

FR-2026-01 · SECTION 6.4

1 **Revenue certainty.** Merchant exposure in power markets does not match liability-driven investment mandates, and contract-for-difference coverage varies by member state.

2 **Ticket size.** Many transition assets are too small for institutional direct investment and the aggregation vehicles are underdeveloped.

3 **Regulatory stability.** Solvency II and the prudential treatment of infrastructure equity have improved but remain a live consideration in allocation decisions.

European institutional capital has demonstrated appetite for energy transition assets. Pension funds, insurers and infrastructure funds hold mandates that match the asset class on duration and inflation linkage, and the sector has attracted sustained inflows.



European institutional capital has demonstrated appetite for the asset class. The frictions are structural, not attitudinal.



6.5 GREEN BOND MARKETS AND SME ACCESS

The European green bond market is the deepest in the world and the EU Green Bond Standard, applicable since December 2024, is the most rigorous framework in existence. Issuance is strong at the sovereign and large-corporate level. The access problem is at the other end. The firms that install heat pumps, retrofit buildings, build distribution-level storage and manufacture components are overwhelmingly small and medium enterprises, and they cannot access bond markets at all.

Their capital comes from bank lending, and bank lending for transition assets remains priced on collateral rather than on cash flow.

SH ASSESSMENT 6.5

Europe has built a sophisticated capital market for the largest transition assets and left the delivery layer on bank credit terms designed for something else.

The €303 billion gap is often discussed as though it were composed of gigawatt-scale projects. A substantial share of it is distribution networks, building retrofit and small storage, executed by firms with no access to the instruments the Union has spent five years perfecting. A green bond standard that cannot reach an installer is a standard for the part of the problem that was already financeable.

RECOMMENDATION 6.5-R

Direct a defined share of InvestEU and EIB intermediated lending to standardised transition products for SMEs, priced on project cash flow with public first-loss cover, and require participating banks to report deployment. The instrument exists; the allocation and the reporting obligation do not.

WHERE THE ACCESS FAILS

Dec 2024
EU GREEN BOND STANDARD APPLICABLE

Sovereign
AND LARGE-CORPORATE ISSUANCE IS STRONG

SMEs
INSTALL, RETROFIT AND MANUFACTURE — AND CANNOT ISSUE

CHAPTER 7

07

Concentration and Contract Architecture

7.1 The concentration nobody measures

7.2 The contracts Europe is not signing

7.3 What should go into them

7.4 The instruments that would have caught it

7.1 THE CONCENTRATION NOBODY MEASURES

2021	TODAY	2028 PROJECTED
45%	**c. 30%**	**up to 80%**
Russia, share of EU gas imports	Norway, share of EU and UK demand	United States, share of EU LNG imports

No European instrument produced a number that rose during any of them.

Chapter 3 recorded three successive supplier concentrations: Russia at roughly 45 per cent of EU gas imports in 2021, Norway at around 30 per cent of EU and UK demand today, and the United States at roughly two-thirds of European LNG with up to 80 per cent of EU LNG projected by 2028. No European instrument produced a number that rose during any of them.

This is not an oversight by any particular institution. Storage targets measure volume. Diversification plans count named suppliers. Security of supply assessments model adequacy under defined stress scenarios. Each is doing what it was designed to do, and none of them computes market structure. The Industrial Accelerator Act of March 2026 introduced the first structural test in the European toolkit — conditions on investments above €100 million by companies from states controlling more than 40 per cent of global manufacturing capacity — and applied it to inbound investment and public procurement rather than to supply.



Three successive concentrations, none of them registered by a European metric.

SH ASSESSMENT 7.1 — THE FINDING THIS REPORT TURNS ON

The exposure that has cost Europe most in this decade is the one quantity the system does not compute.

Every finding in this report describes the same mechanism. Emissions fall whether the panels are made in Dresden or Xinjiang. Storage adequacy is met whether the target is 90 per cent or 80. Russian dependency falls to 3 per cent whether the replacement is diversified or concentrated. In each case a measurable objective is achieved accurately while an unmeasured position deteriorates, and no second number exists to contradict the first. The remedy costs almost nothing, which is the uncomfortable part.

A concentration ceiling is a regulation and a reporting obligation. A component-layer content rule is a schedule annexed to an existing act. A reserve cover metric is an addition to an assessment the Union already publishes. None requires new money, treaty change or a concession from any external party. That they remain unadopted while €100 billion of clean-technology manufacturing support is deployed is the clearest illustration of the argument in this report.

7.2

THE CONTRACTS EUROPE IS NOT SIGNING

A buyer under a public legal deadline, declining to commit, in a market that has priced the risk, is a buyer that will sign later and worse.



Regulation (EU) 2026/261 converted the Russian gas phase-out into binding prohibition with dates and penalties. Around 35 billion cubic metres a year must be replaced on a schedule every counterparty can read in the Official Journal. European utilities are meanwhile declining the fifteen and twenty-year offtake agreements that American and Qatari sellers require, citing the dependency concerns that drove them out of Russian gas.

The pressure from the selling side is structural rather than rhetorical: American export projects cannot reach financial close without long-duration offtake. The buyers' reasoning is sound on its own terms. Demand is falling — EU gas consumption is forecast down about 14 per cent between 2025 and 2030 on IEEFA figures, with LNG demand down roughly 23 per cent, while Ember's analysis of national plans gives a 7 per cent fall on a different baseline.

Import capacity is going the other way, forecast up 24 per cent, and by 2030 European LNG import capacity could exceed total gas demand. Nine of the EU's thirty LNG terminals ran below 30 per cent utilisation in the first quarter of 2026.

SH ASSESSMENT 7.2

A buyer under a public legal deadline, declining to commit, in a market that has priced the risk as resolved, holds the weakest position available in a negotiation.

Every element of that sentence except the last is a European choice. The deadline is Union law. The refusal is member state and utility policy. The market's complacency is exogenous and will correct itself, probably at the least convenient moment. Europe is building terminals it will not fill while refusing contracts it will need. The two decisions are usually discussed separately and they are the same decision seen twice: infrastructure is treated as security and contracts are treated as dependency.

It is the reverse. A terminal at 25 per cent utilisation secures nothing; a contract with a concentration ceiling and destination flexibility secures a great deal.

7.3 WHAT SHOULD GO INTO THEM

On present trajectory Europe will sign, later, at worse terms, under time pressure created by its own legislation. The question is what the agreements contain when it does.

CLAUSE	WHAT IT DOES	WHY IT IS AVAILABLE NOW
Supplier concentration ceiling	Caps the share any single external supplier may hold across a national or Union portfolio, irrespective of alignment	A market entering surplus gives buyers leverage that disappears when the surplus does
Destination flexibility	Permits resale and redirection, so declining domestic demand does not become a stranded obligation	This removes the principal buyer objection to long-term contracts, which is volume risk
Review and adjustment triggers	Reopens price and volume on defined events, including a change of policy in the supplying state	American industrial policy has inverted twice in four years; the risk is documented rather than speculative
Methane and origin verification	Ties supply to verified production standards, aligning the contract with EU regulation rather than against it	Washington is already pressing Brussels to soften the methane regulation; writing it into contracts settles the question commercially
Chokepoint and force majeure definition	Specifies what constitutes an interruption and who carries it, given that 2026 produced a five-month closure	Standard clauses were drafted before chokepoint closure became a recurring event

Table 7.1. Five clauses. Sources: Strategic Horizon analysis; Strategic Brief SB-2026-07.



The terms are available while the market is in surplus. They are not available afterwards.

7.4 THE INSTRUMENTS THAT WOULD HAVE CAUGHT IT

Seven measurement instruments are recommended across this report and the Strategic Horizon Energy Statecraft series. Six are not adopted and one is adopted at the wrong layer. Between them they would have exposed every vulnerability this report records, at the point each was still reversible.

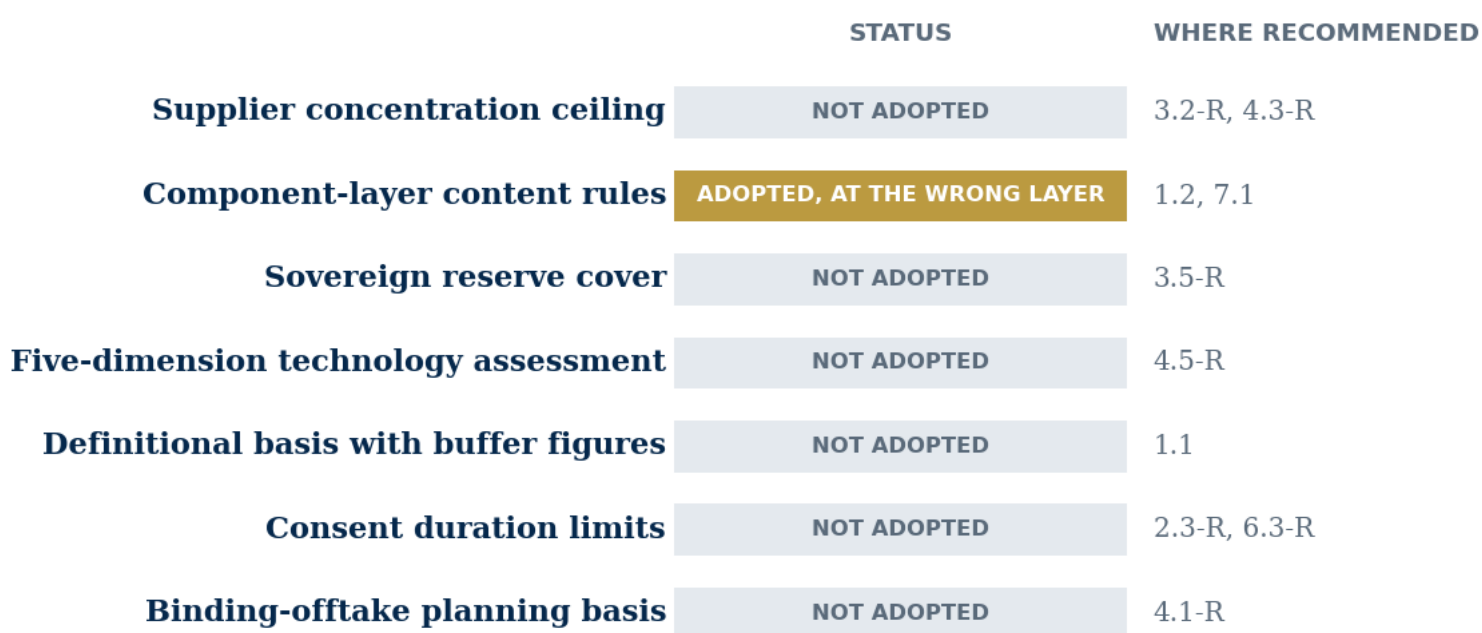


Figure 7.1. Seven measurement instruments recommended across the Strategic Horizon Energy Statecraft series, against their adoption status as of August 2026.

Supplier concentration ceiling	Russia at 45 per cent, Norway at 30, the United States heading to 80. All three	NOT ADOPTED
Component-layer content rules	Compressors, magnets, cells, wafers. The Industrial Accelerator Act regulates final assembly	WRONG LAYER
Sovereign reserve cover	That Europe replaced a reserve layer with one sharing a chokepoint with the commodity it insures against	NOT ADOPTED
Five-dimension technology assessment	Solar, batteries and electrolysers, while deployment was still choosing between suppliers	NOT ADOPTED
Definitional basis with buffer figures	That spare capacity and storage adequacy are conventions rather than inventories	NOT ADOPTED
Consent duration limits	The permitting constraint, which is the binding one on the grid	NOT ADOPTED
Binding-offtake planning basis	That hydrogen targets were set against announcements rather than contracts	NOT ADOPTED

Table 7.2. What each instrument would have exposed, and where it was recommended.

Count the thing that is getting worse.

Everything else follows from it, and nothing else substitutes for it.

CONCLUSION

What to Count



One position remains open and it is the last one of scale.

This report has described a European energy system that is succeeding on most measures it has chosen and losing on several it has not. Renewables passed 45 per cent of generation. Russian pipeline gas fell from 45 per cent of imports to 3. Battery storage grew tenfold in four years. Emissions are falling. The regulatory architecture was rebuilt in under four years and the individual instruments within it are competently designed.

None of that is in dispute and none of it should be minimised. Over the same period Europe lost solar manufacturing, battery manufacturing and the alkaline electrolyser race; rebuilt its gas dependency on a more concentrated supplier under a deadline it set itself; accumulated 1,700 GW in connection queues it cannot clear; and began a nuclear programme with no fuel-cycle capacity of its own. Each of those is documented in a chapter above.

None of them appears as a deteriorating number in any European reporting framework.

THE STRATEGIC HORIZON VERDICT

Europe is on course to meet its headline 2030 climate commitments and to hold less control over its energy system in 2035 than it held in 2020, and that outcome requires no adverse event to produce it.

It is the default. It is not a failure scenario in the ordinary sense, which is precisely why it is the likely one: nothing in the European decision-making process registers it as failure until it is irreversible. A transition can succeed on every published metric and leave the system that delivers it in somebody else's hands. The decisive argument was never about money. Europe has spent this decade debating the size of funds while the positions were decided by what nobody was counting. The seven instruments in Table 7.2 together cost less than a single year of any major European clean-technology programme.

Six of them are unadopted and the seventh is pointed at the wrong layer. One position remains open and it is the last one of scale. European manufacturers hold roughly two-thirds of the global HVDC market, with order backlogs beyond four years and no readily scalable substitute for the long-distance transmission applications the technology serves. The binding constraints are factory capacity and consent duration — both within European control, both solvable with capital and legislation the Union already possesses. That window is not indefinite: manufacturing leadership has historically been followed by project delivery leadership within a decade, and the European position should be anchored in standards and certification authority rather than in cost.

This report has argued from six directions that the grid is the contest still open. It is still open, still European to lose, and still being managed as an engineering matter. If this report has one instruction, it is this. Count the thing that is getting worse. Everything else follows from it, and nothing else substitutes for it.

ON THE LIMITS OF THIS REPORT

Limits, review and principal sources

All figures follow Canonical Data Sheet CDS-2026-EU v1.0, and the divergences recorded there apply here: EU gas demand to 2030 falls 14 per cent on IEEFA and 7 per cent on Ember against different baselines; the interconnection assessment differs between the Commission series used here and other published counts; and Urenco states a Capenhurst HALEU output of up to 27 tonnes a year against the IAEA's approximately 10 tonnes by 2031.

The concentration shares in Figure 3.2 use different denominators and are not arithmetically comparable. The commercial reading of the Norwegian interconnection decision in section 3.3 is inference from the structure of the alternatives rather than from any Norwegian statement. Two quantities carried in the previous edition remain unresolved and are not used: the EU emissions reduction figure, whose baseline year could not be verified, and the capital structure of Chinese provincial renewable project companies.

The Hormuz disruption that began on 28 February 2026 remains unresolved at the time of writing. This report has been reviewed within the Strategic Horizon analytical architecture but not by a domain expert outside it. The corrections applied to the previous edition are published in FR-2026–01 Correction Register v2.0. Figures per Canonical Data Sheet CDS-2026-EU v1.0.

PRINCIPAL SOURCES

Principal sources: Draghi Report on European Competitiveness; European Commission; Eurostat; Regulation (EU) 2026/261; IEEFA European LNG Tracker and EU Gas Flows Tracker (May 2026); SolarPower Europe; ENTSO-E; IEA; European Heat Pump Association; Beyond Fossil Fuels; SolarPower Europe; S&P Global; ENTSO-E Grids Package position (February 2026); Ember; Agora Energiewende; IEA Oil Market Report; Kpler; ICE; World Bank ESMAP; World Nuclear Association; IAEA; BloombergNEF; Nature Energy; NATO; ENISA; Nordic Energy Research and Nordic Council of Ministers; Urenco; Centrus Energy; US Department of Energy. © Strategic Horizon 2026. FR-2026–01 v3.2. Reviewed by Dr. Attila L. Menyhárt. Open access.

FINAL ASSESSMENT

The grid is the contest still open.

It is still open, still European to lose, and still being managed as an engineering matter.

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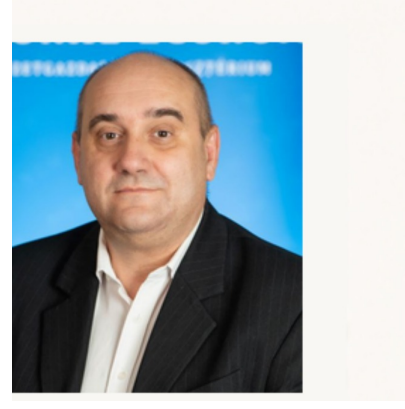
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REVIEW

Reviewed by **Dr. Attila L. Menyhárt**. Internal adversarial and strategic review conducted within the Strategic Horizon analytical architecture. Not reviewed by a domain expert outside it.

DATA GOVERNANCE

All figures follow Canonical Data Sheet **CDS-2026-EU v1.0**. Corrections applied to the previous edition are published in **FR-2026-01 Correction Register v2.0**.

VISUALISATIONS

All charts and maps are original Strategic Horizon visualisations produced in Python using matplotlib and geopandas, from publicly available data in the sources cited. Boundaries from Natural Earth administrative data.

PRINCIPAL DATA SOURCES

Eurostat · European Commission · IEA · ENTSO-E · ENISA · NATO · ACER · IEEFA · Kpler · ICE · S&P Global · Ember · Agora Energiewende · SolarPower Europe · WindEurope · GIE · GIIGNL · IAEA · World Nuclear Association · Urenco · Centrus Energy · US Department of Energy · EEA · BloombergNEF · Nature Energy · OECD and NEA · Nordic Energy Research · Nordic Council of Ministers · World Bank ESMAP · Beyond Fossil Fuels · European Heat Pump Association

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