

INSIGHTS

BY **Anotech**
AN ALTEN COMPANY

#5

MASTERING THE ENERGY MIX

FROM STRATEGY TO EXECUTION:
BALANCING RELIABILITY, DECARBONIZATION AND INDUSTRIAL PERFORMANCE.

2026

**AT ANOTECH
OUR INSIGHTS
HIGHLIGHT OUR
EXPERTISE**

**FOR OUR CLIENTS,
PROOF OF WHAT WE
CAN ACHIEVE
TOGETHER.**

**FOR OUR EXPERTS,
A SHOWCASE OF
THEIR REMARKABLE
EXPERIENCE**

**FOR OUR
COLLABORATORS,
A REMINDER OF WHY
WE STAY COMMITTED.**

**OUR EXPERTISE
MATTERS WHEN IT
CREATES VALUE
FOR YOU.**



For 20 years, **Anotech** has been a **Global Project Services company** empowering leading global Industry companies.

Anotech delivers complex energy projects by integrating project governance, controls, engineering integrity, and execution into a single, accountable delivery model across the full project lifecycle.

Complex energy infrastructure projects requires coordination between governance, engineering, and execution environments. Our services support the critical phases where project performance takes shape.

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EDITORIAL

SHIFTING TECTONIC PLATES: NAVIGATING THE NEW GEOGRAPHY OF ENERGY

From time to time, the ground shifts beneath an industry to such an extent that old maps become obsolete. This is precisely what the energy sector is experiencing today.

Not a single, linear transition from one system to another, but something more akin to tectonic activity: several plates, technology, geopolitics, capital, and demand, rubbing against one another simultaneously, their friction reshaping the terrain on which we all operate.

A MIX, NOT A SINGLE TRAJECTORY

The consensus emerging from the world's most rigorous energy institutions is no longer about whether the energy system will change, but about the **profoundly uneven and nonlinear nature of that change**. The **International Energy Agency's (IEA) World Energy Outlook 2025** is explicit on this point: **there is no single trajectory**, but rather a range of plausible futures, shaped by the policy choices governments make today. The scale of capital now being mobilized is striking, according to the IEA's companion report, ***World Energy Investment 2025***, global energy investments are projected to reach a record high of approximately **\$3,300 billion** in 2025, with nearly **\$2,200 billion** directed toward renewables, nuclear power, grids, storage, and energy efficiency, roughly double the **\$1,100 billion** going to oil, gas, and coal combined. Yet demand for oil and gas continues to grow in several credible scenarios through the middle of the century, and the IEA now describes the coming years as the dawn of an **"age of electricity,"** driven by data centers, artificial intelligence, electric mobility, and air conditioning, a demand that coal, gas, nuclear, and renewables will all have to compete for. The **Boston Consulting Group's** analysis of the "next chapter" of the transition reaches a similar conclusion, albeit from a different angle: the **path to carbon neutrality is no longer linear**, each country now balances **decarbonization, affordability, security, and growth**, and does so differently based on its own resources and political economy.

SOVEREIGNTY RETURNS TO THE FOREFRONT

If there is one word that has made a marked comeback in the vocabulary of both corporate boards and governments, it is **"sovereignty."** The **World Economic Forum's** Energy Transition Index 2026 documents a real shift: readiness for the transition, as measured across **120 countries**, has declined for the first time in more than a decade, even as investments reached record levels, a sign that capital alone no longer guarantees progress when geopolitics comes into play. Trade restrictions affecting energy and clean technology supply chains **tripled** between 2024 and mid-2025, and **more than half** of the minerals critical to the transition, lithium, cobalt, nickel, and rare earths, are now subject to some form of export control, compared to virtually none five years ago. Chokepoints once considered a secondary risk, the **Strait of Hormuz**, the **Strait of Malacca**, and the **Suez and Panama Canals**, are now central to **energy security** assessments. **UNCTAD's** 2026 trade data reveals a parallel trend regarding minerals: dozens of new supply partnerships have been signed since 2022, a healthy sign of diversification, but also a warning that markets could fragment into competing blocs if international coordination were to weaken.

EDITORIAL

Closer to home, **The Shift Project**, the think tank chaired by **Jean-Marc Jancovici**, rames the issue in stark national terms: **French energy consumption** remains about **three times higher than domestic production**, with **fossil fuels** accounting for the bulk of this gap, a reminder that **energy sovereignty** is not an abstraction reserved for resource-rich nations, but a very real constraint for **importing economies** as well, and one that reframes **decarbonization** itself as a matter of **resilience**, rather than merely climate policy.

RISK AND OPPORTUNITY GO HAND IN HAND

None of this should be read as a mere narrative of risks. **Fragmentation comes at a cost**, but it is also redistributive: it rewards organizations and countries capable of **diversifying their supply routes, technologies, and geographic locations**, rather than relying on a single one. **BCG's Center for Energy Impact** and **the IEA** agree on one key observation: the tools needed for a **safer, more electrified, and more resilient energy system** already exist; what remains uneven is the **regulatory environment**, the **financing architecture**, and the **operational capacity** to deploy them rapidly, region by region. And it is precisely in this heterogeneity that **expertise in engineering and technical services** comes into its own.

ANOTECH'S ROLE IN THIS LANDSCAPE

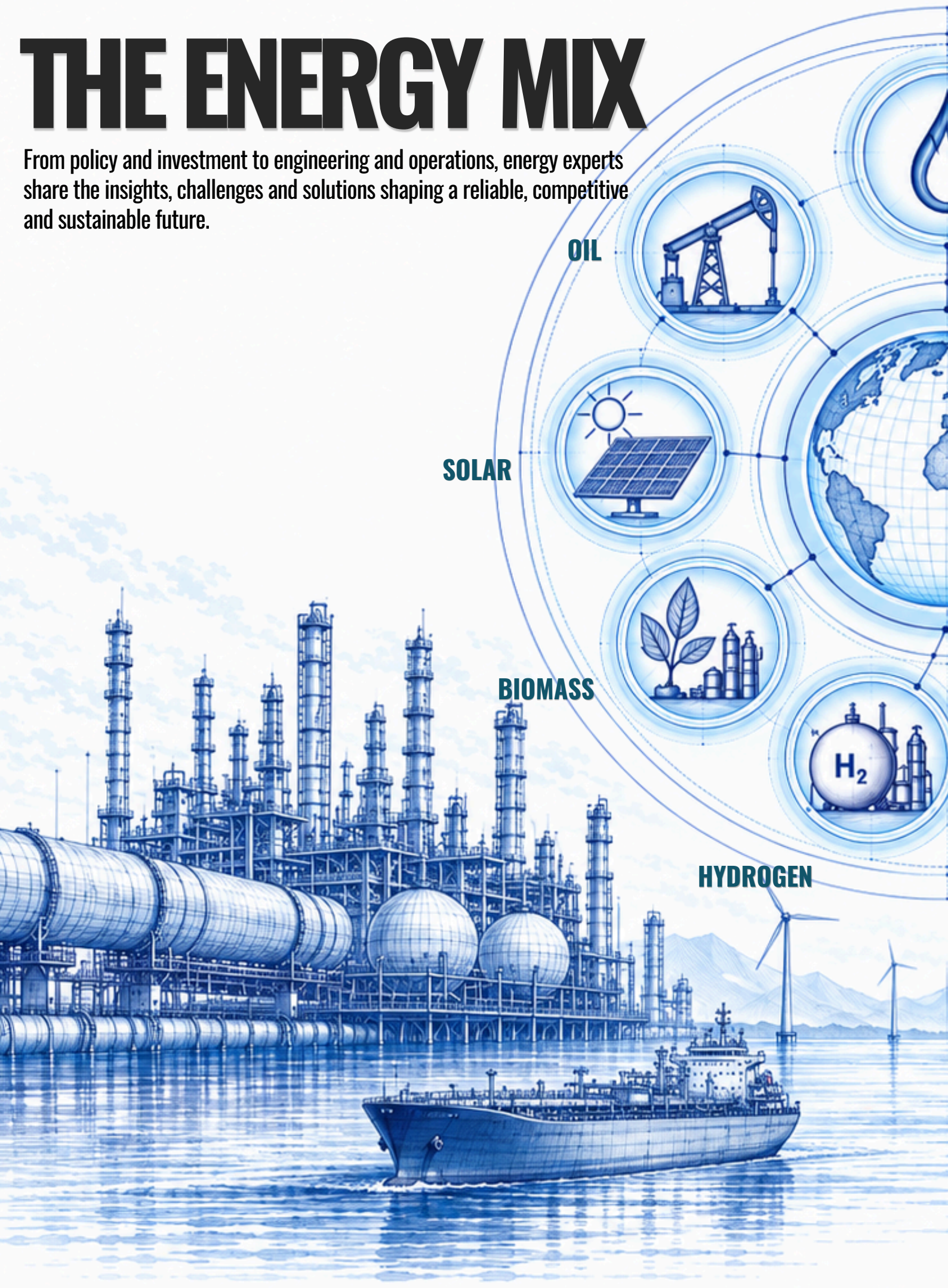
This is exactly the environment for which Anotech was built. Our global reach, spanning Europe, the Middle East, Asia, and the Americas, **is not incidental, it is the operational model that this era demands**. Whether it involves engineering, construction, and commissioning for conventional oil and gas projects, the deployment of new electrical infrastructure, or our role as Owner's Engineer on emerging industrial projects, the guiding principle remains the same: our clients need partners capable of navigating seamlessly between regulatory frameworks, technological choices, and local content requirements, without ever compromising technical rigor. Our agility, the ability to redeploy our expertise wherever a project or region needs it, rather than being tied to a single geography or energy source, is precisely the competency that a fragmented, multi-speed energy world rewards. As the tectonic plates continue to shift, **Anotech's role is not to predict which scenario will prevail, but to remain the partner capable of delivering excellence, regardless of which one emerges**.

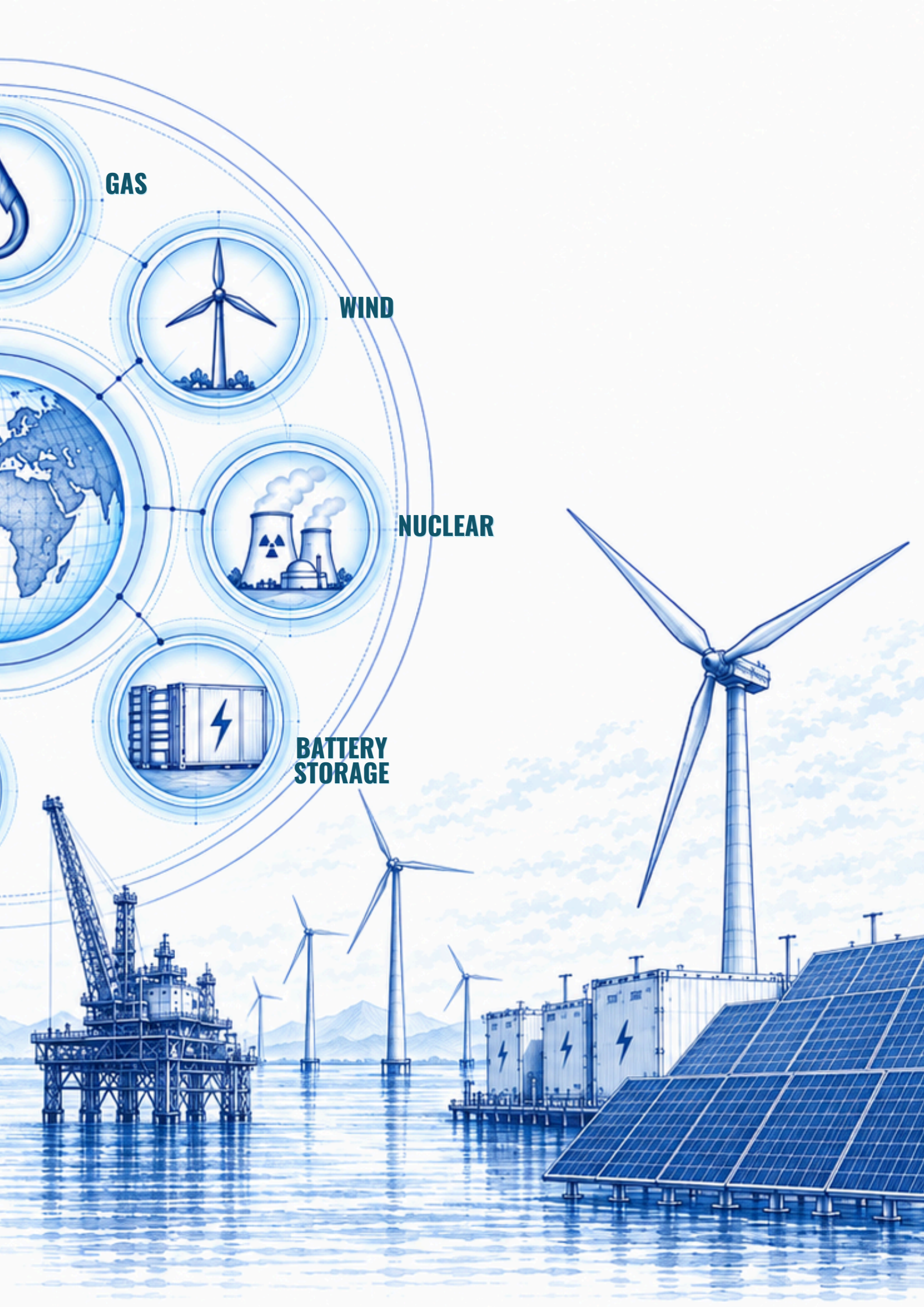


Frédéric JAMMES
CEO of Anotech

THE ENERGY MIX

From policy and investment to engineering and operations, energy experts share the insights, challenges and solutions shaping a reliable, competitive and sustainable future.

**OIL****SOLAR****BIOMASS****HYDROGEN**



GAS

WIND

NUCLEAR

**BATTERY
STORAGE**

A LOOK BACK AT THE DISCUSSIONS ORGANIZED BY CONFRONTATIONS EUROPE ON EUROPE'S NEW ENERGY BALANCES.

RETHINKING ENERGY IN ALL ITS CONTRADICTIONS



At the **European Economic and Social Committee's headquarters in Brussels**, Confrontations Europe organized a meeting early this year dedicated to major energy challenges: security of supply, energy solidarity, and the transformation of electricity and gas infrastructure amid an accelerated energy transition.

Invited by **Michel Derdevet, president of Confrontations Europe**, we attended discussions bringing together network operators, regulators, legal experts, industry representatives, and institutional leaders. This diversity of participants gave the discussions particular depth, reflecting a sector where technical challenges, industrial imperatives, geopolitical considerations, and political ambitions now intersect.

As the discussions unfolded, one observation became increasingly clear: the energy transition now extends well beyond the climate framework alone. It engages questions of **competitiveness, industrial sovereignty, and political coordination** in an environment shaped by geopolitical tensions and the reorganization of energy supply chains.

The discussions revealed a more complex reality: behind the shared objective of decarbonization lie different rationales, sometimes difficult to reconcile, but each legitimate within its own perspective.

Engineers tend to focus on feasibility, reliability, and timelines; **policymakers**, on energy security, sovereignty, and climate objectives; and **industry leaders**, on competitiveness, investment conditions, and business timelines.

Tomas Veyrenc, RTE's Chief Executive Officer in charge of economics, strategy, and finance, thus emphasized the foundational role of interconnections and the scale of investment required to adapt electricity grids to the growing electrification of end uses.

Emmanuelle Wargon, President of the French Energy Regulatory Commission (CRE), for her part, highlighted the **growing tensions** between the **energy transition, industrial competitiveness, and strategic sovereignty**.

Each of these perspectives is legitimate, although they frequently come into tension as they reflect different priorities, constraints, and time horizons.

NETWORKS, SOVEREIGNTY, AND ENERGY REALISM

The energy sector is undergoing a period of profound transformation.

Accelerated decarbonization, tensions, or price pressures are now placing energy back at the center of industrial and strategic challenges.

The discussions quickly brought a central question to the fore: **what should be the true priority today ?**

Modernizing, securing supplies, accelerating electrification, boosting production capacity [...]

A consensus has nevertheless emerged: grids are now the **main driver of the energy transition**. With electrification of end uses still limited, **investments in infrastructure**, interconnections, and transmission capacity are **becoming pivotal**.

Behind this consensus, differences of opinion quickly resurface. While some advocate for **a rapid acceleration of the transition**, others highlight the long timeframes associated with energy infrastructure projects, which require *significant industrial capacity, financing, and the management of physical constraints*. But this transformation is taking place against a backdrop of growing fragmentation.

Speakers warned of the resurgence of *“energy nationalism”* even as European energy systems have historically relied on interconnections and solidarity among member states.

Michel Derdevet noted that **interconnections** remain one of the main tools for **ensuring the stability** of the energy system and reducing overall costs.

This also marked a notable shift in the discourse surrounding the energy mix.

In the short term, a *“100% renewable”* scenario appears to face a number of challenges, reinforcing the case for a more diversified approach.

A broad consensus emerged around the need for a diversified **energy mix**, with natural gas retaining a role in providing flexibility and balancing the system.

Hydrogen, biomethane, and **multi-energy solutions** were also widely seen as promising **pathways for the transition**, while recognizing the importance of aligning ambitions with industrial realities. (timelines, *production capacity, costs, and .*)



THE ENERGY TRANSITION FACES NOT SO MUCH A LACK OF SOLUTIONS AS THE COEXISTENCE OF MULTIPLE CONSTRAINTS, ALL OF WHICH ARE LEGITIMATE BUT OFTEN CONTRADICTORY.



FROM POLITICAL PRINCIPLE TO LEGAL TOOL

The discussions also highlighted a more legal dimension of the energy transition: that of solidarity among European Union member states.

Guillaume Dezobry, *Partner at EY Société d'Avocats, specializing in energy and regulatory law*, revisited the practical scope of the principle of energy solidarity enshrined in Article 194 of the TFEU. Long viewed as more political than truly binding, this principle is now acquiring greater legal force.

This development was notably illustrated by the **OPAL case**, related to the Nord Stream gas pipeline. The 2019 ruling by the General Court of the European Union explicitly recognizes that the **principle of energy solidarity must be taken into account in European decisions concerning energy**.

In other words, energy solidarity is no longer merely a matter of political rhetoric; *it is becoming a legal principle capable of guiding certain regulatory, industrial, and energy decisions at the European level.*

NETWORKS, COMPETITIVENESS, AND INTERCONNECTIONS

Several speakers also highlighted the growing pressures facing the sector: **international competition**, **industrial constraints**, and **geopolitical instability**.

Emmanuelle Wargon emphasized the difficulty of driving the energy transition while maintaining economic competitiveness and **price stability**.

From this perspective, reforms to the European market design will not be effective without massive investments **in infrastructure**.

Grids thus emerge as one of the **main points of tension** in the energy transition.

Tomas Veyrenc highlighted the **strategic role of interconnections: capacity sharing, flow optimization, security of supply, and cost reduction**.

But he also pointed out a **growing paradox**: certain projects are difficult to justify at the national level, even as they become **essential within the context of an interconnected system**.

This is undoubtedly one of the central paradoxes of this transition: energy already functions as an **integrated European system**, while decisions continue to be made based on national, industrial, or political considerations that often diverge.

GOVERNANCE, FINANCING, AND INDUSTRIAL REALITIES

Beyond the **technological challenges**, the discussions highlighted a more structural difficulty: the **energy transition** is also a **governance issue**. Behind the stated ambitions lie **fragmented decision-making mechanisms, political and industrial timelines** that are difficult to reconcile, and **coordination** that remains insufficient among **governments, regulators, and operators**. The issue of **financing** ran through all the discussions. **Aging grids, the growing electrification of end uses, the development of interconnections, and the modernization of transmission capacity** all entail **considerable investment needs**.

Ultimately, the discussions revealed that the **energy transition** faces not so much a lack of solutions as the coexistence of **multiple constraints**, all legitimate but often contradictory. The challenge no longer lies solely in **technological innovation**, but in the ability to reconcile **climate imperatives, energy sovereignty, economic stability, and industrial realities**.

*The discussions highlighted just how much today's energy challenges extend well beyond environmental concerns. It directly affects industrial **competitiveness, strategic sovereignty, economic stability**, and the ability of **European nations** to coordinate **common policies** in an environment that has become more fragmented.*

Ultimately, the discussions did not so much pit incompatible visions against one another as they revealed the difficulty of reconciling different priorities within a single energy trajectory.

*Everyone seems to share the same objectives, decarbonization, energy security, and grid modernization, but the paths envisaged to achieve them remain deeply shaped by **distinct constraints, timelines, and interests**.*



MAURICE GOURDAULT-MONTAGNE ON ENERGY INDEPENDENCE, GEOPOLITICAL RISK AND THE CHANGING BALANCE OF POWER

ENERGY SOVEREIGNTY: SHAPING STRATEGIC AUTONOMY

*In a world that seems increasingly polarized, we had the opportunity to meet **Maurice Gourdault-Montagne**, French ambassador, former Secretary-General of the Quai d'Orsay, and former diplomatic advisor and sherpa to President Jacques Chirac.*

Drawing on a wealth of experience, but above all on a perspective remarkable for its balance and clarity, he has a rare ability to make complex issues understandable.

*Where public debate can sometimes blur the picture, he brings clarity: **everything can be explained, understood and connected.***

*Faced with conflict, dependencies and increasingly fragmented markets, he puts forward a central idea: **a country may possess a major strategic asset**, but if it fails to embrace it and **sustain it over the long term**, that asset risks losing its value.*

*This perspective closely echoes **Anotech's vision**. Working alongside **major players in industry and energy**, we operate at the heart of projects whose success depends as much on **technical excellence** as on a **deep** understanding of the **economic, political and cultural environments** in which they take shape.*

*Giving a voice to leaders capable of connecting these different dimensions reflects our commitment to providing our clients with a **broader understanding of the challenges** they face. **Energy is not simply one of our areas of expertise**; it lies **at the very heart of our business**. Beyond engineering, markets and regulation, Maurice Gourdault-Montagne reminds us that **energy is first and foremost a matter of sovereignty**. It engages the state, **shapes alliances, exposes dependencies** and **influences the balance of power**.*

AN INTERVIEW WITH A STATESMAN WHOSE CAREER OFFERS A VALUABLE PERSPECTIVE ON THE WORLD AROUND US.

WHO'S MAURICE GOURDAULT-MONTAGNE ?



Maurice Gourdault-Montagne, French Ambassador, is a former Secretary-General of the Quai d'Orsay and a former diplomatic advisor and sherpa to **President Jacques Chirac**.

Over the course of a diplomatic career spanning more than forty years, he represented France in Japan, the United Kingdom, Germany and China, among other postings. He also served as the President of the Republic's special envoy to the United Arab Emirates and sat on the boards of **directors of EDF** and **Orano** between **2017** and **2019**.

Energy has been a **central theme** throughout his diplomatic and institutional career, from his first posting in India to his role as Secretary-General of the **Quai d'Orsay**, where he notably dealt with French nuclear exports, including the **EPR project in Jaitapur**.

This experience has particularly shaped his perspective on the project, which calls for the construction of six EPR reactors and represents a major undertaking for strengthening India's electricity generation capacity, supporting the country's electrification and contributing to its long-term development.

HOW WOULD YOU DEFINE ENERGY SOVEREIGNTY TODAY?

Energy sovereignty is a **fundamental element of a country's independence**.

It involves **minimizing dependence on external factors** and preventing **a single supplier** from putting the **national economy** in a vulnerable position. For France, in the absence of significant domestic oil and gas resources, this means **diversifying its partners and sources of supply**. But sovereignty does not rest solely on imports. It also depends on the **energy mix** that we build and control.

In France's case, **nuclear power** is our **main asset**, complemented by **renewable energy**. It is this combination that forms the basis of true **strategic autonomy** and, more broadly, preserves the state's **freedom to make decisions**.

HAVE RECENT CRISES CHANGED THE NATURE OF THE ENERGY CHALLENGE?

The essence of the challenge has not changed: **energy has always been at the heart of the economy and power**. The development of the United States relied heavily on oil; the **1945 Quincy Agreement** already illustrated the close link between security, diplomacy and access to resources. What has changed is the scale and complexity of the international landscape. In the past, a few major industrial powers accounted for the bulk of demand. Today, **emerging countries** are developing their industries, technologies, and military capabilities, which is significantly increasing **global demand**. At the same time, the **war in Ukraine**, the **decline in Russian energy flows to Europe**, and tensions surrounding the **Strait of Hormuz** serve as a reminder that a regional crisis can have **global repercussions**. **Energy sovereignty** is therefore not an abstract concept: it now requires a **constant ability to anticipate and adapt**.

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**ENERGY SOVEREIGNTY IS THEREFORE NOT AN ABSTRACT CONCEPT:
IT NOW REQUIRES A CONSTANT ABILITY TO ANTICIPATE AND ADAPT**

ARE ALL COUNTRIES PURSUING THE SAME STRATEGY?

All are pursuing the same goal: **preserving their autonomy in decision-making**. But this ambition does not take the same form everywhere. **Energy strategies** depend on **available resources, geography, industrial history** and, above all, the **political choices** specific to each country. What distinguishes the **major powers** today has less to do with their desire for independence than with their ability to **anticipate the future**. Some have **abundant resources** and can use them as a **tool of influence**; others must **secure their supplies, diversify their partners** or develop **alternative routes**. Energy thus becomes a reflection of a nation's **vision of power, risk and the long term**.



FRANCE

Nuclear power remains its main strategic asset.



CHINA

Energy security and technology diversification.



UNITED KINGDOM

Nuclear comeback after North Sea oil decline.



UNITED STATES

Energy abundance used as a lever of power.



GERMANY

Nuclear phase-out, lower Russian gas exposure.



INDIA

Growing demand, foreign dependence.



ARE WE WITNESSING A GRADUAL FRAGMENTATION OF ENERGY GLOBALIZATION?

We have not yet moved away from a **global market: prices remain interdependent**, and **any regional crisis has repercussions far beyond its immediate scope**. However, the **system is gradually fragmenting**. The era of **fluid, open and relatively predictable trade** is giving way to more **regional and strategic approaches**. Major powers are now using **energy more explicitly as a tool of influence**, while some producers are seeking to free themselves from collective frameworks in order to **preserve their room for manoeuvre**. We are therefore moving towards **more secure supplies, preferred partners and reorganized dependencies**. Energy globalization remains, but it is becoming **more political, more contentious and less homogeneous**.

SUPPLIER DEPENDENCE

Excessive reliance on a single supplier or supply route.

DIGITAL BOOM

Massive increase in demand driven by data centers and AI.

POLITICAL INSTABILITY

Risk that projects will be called into question with each change in government.

WHAT FORMS OF ENERGY DEPENDENCE DO YOU CONSIDER MOST CRITICAL TODAY?

Vulnerability stems less from dependence itself than from its concentration. When a country relies too heavily on a single supplier, supply route, or external political decision, it accepts that it may lose some of its sovereignty.

The challenge, therefore, is to **take proactive measures** before dependence escalates into a crisis: diversify partners, secure contracts, maintain multiple supply routes, and preserve sufficient domestic capabilities.

Replacing one dependence with another is not a strategy.

On the contrary, sovereignty requires maintaining a margin of choice at all times.

TO WHAT EXTENT IS THE RISE OF DATA CENTERS REDEFINING ENERGY AND GEOPOLITICAL BALANCES?

They will make energy an even more direct determinant of **technological power**. Their development requires considerable capacity in terms of **generation, transmission and security**, to the point where it may force certain states to **re-engage with partners** they would have preferred to keep at a distance. **Major hubs** are emerging in the **United States, China** and the **Gulf region**, particularly in the **United Arab Emirates**, where energy resources are readily available. But this concentration raises a key question: can these **strategic infrastructures** be **protected over the long term** in regions exposed to **significant tensions**?

Data centers are therefore not just a digital issue; they are becoming an **energy, security and diplomatic issue**.

ARE DEMOCRACIES STILL CAPABLE OF IMPLEMENTING LONG-TERM INDUSTRIAL STRATEGIES?

They have demonstrated that they are capable of doing so.

France's nuclear power plants were built within a **democratic framework**, thanks to **multi-year plans** and **long-term industrial commitments**. The challenge lies in the **mismatch between the electoral cycle and the time horizon of the energy sector**: it takes only a few years to call into question a project that is designed to last for **several decades**.

Changes in government, **coalitions** and political passions undermine this continuity. China, by contrast, can more easily maintain a **ten-year industrial strategy** without regular challenges, as illustrated by the "**Made in China 2025**" plan, which has helped foster the emergence of **national, and subsequently global, leaders in high technology**. For democracies, the challenge is therefore not to abandon debate, but to better **safeguard the long term** through multi-year planning, **long-term contracts**, innovation and **public education**.

WHAT ROLE DID ENERGY ACTUALLY PLAY IN YOUR DIPLOMATIC WORK?

It was ever-present, because it directly affects **sovereignty** and involves the state. In Japan, cooperation with major players in the nuclear industry, particularly through **Framatome**, was essential. In the United Kingdom, I supported the development of the **Hinkley Point** project by showcasing the entire French nuclear industry, from the most specialized components to instrumentation and control systems.

In Germany, I experienced the opposite trajectory: a few weeks after my arrival in Berlin in 2011, **Angela Merkel** announced the **phase-out of nuclear power**.

We then had to assess the industrial consequences and promote our expertise, including in **decommissioning**. Finally, in China, I witnessed the launch of the **Taishan EPR** and observed the country's strategy of technological diversification. Energy was never an isolated issue: **it shaped bilateral relations and France's credibility**.

HOW CAN A STRATEGIC COURSE BE MAINTAINED DESPITE CHANGES IN GOVERNMENT?

First, decisions need to be embedded in **multi-year frameworks** so that projects are not called into question at every **budgetary or electoral cycle**. In the energy sector, the timescale for action necessarily extends beyond political terms of office. This continuity must go hand in hand with **constant innovation**, whether through **SMRs, fusion** or the evolution of existing technologies. But innovation alone is not enough: choices must also be explained and **public opinion** brought on board. **Safety** remains at the heart of the **credibility of French nuclear power**; the challenge, therefore, is to maintain these high standards without allowing **regulatory complexity** to paralyse implementation.

DISPATCHABLE POWER

SAFETY

INNOVATION

EXPERTISE

FULL VALUE CHAIN

CONTROLLABLE ENERGY

DOES FRANCE STILL RETAIN A GENUINE ENERGY ADVANTAGE?

Yes. France still possesses capabilities that few countries can match: a **complete industrial ecosystem, experienced engineers, decades of expertise in nuclear operations**, a widely **recognised safety culture** and a strong **capacity for innovation**.

This is why many countries continue to turn to France when they seek to develop their own nuclear power programmes.

Our recent weakness has had less to do with a loss of expertise than with our own hesitation. It was difficult to promote nuclear power abroad while giving the impression that we were moving away from it at home.

The renewed momentum now under way is helping to restore greater consistency.

In a Europe facing increasingly uncertain energy supplies, **reliable, dispatchable and competitive power** is also a **major asset for industry** and for the **attractiveness of the country** as a place to invest.



IN WHAT WAY ARE DIPLOMATIC CRISES AND ENERGY ISSUES NOW INEXTRICABLY LINKED?

They have always been linked, but the connection is particularly evident today. In the **war between Russia and Ukraine, refineries, storage facilities, pipelines, and electrical infrastructure are targets** because they determine the adversary's ability to hold out. The **Zaporizhzhia power plant** epitomizes this issue. The question of **who controls it** will inevitably weigh heavily in any future negotiations. Whoever controls a power plant, an oil field, or a gas field holds part of the **balance of power**. Energy is therefore at once **a resource, a target, a bargaining chip, and a prerequisite for reconstruction**.

WHAT IS YOUR VIEW OF THE NEW GENERATION THAT WILL BE LEADING THESE TRANSFORMATIONS?

I have a very positive view of them. I have worked with **several generations of engineers**, including some of the **pioneers of France's nuclear industry**.

The new generation inspires confidence, and, above all, it inspires confidence among our **foreign partners**. France continues to have **outstanding training programmes, technical expertise and project support capabilities**. The Chinese often told me that France was a **country of inventors and engineers**.

We still are: **inventors drive innovation, while engineers and technicians turn it into reality**. I would not say that I am optimistic on principle. I am a realist: we have weaknesses, but we can remain confident as long as we keep working.

When asked about optimism, Maurice Gourdault-Montagne answers directly: *'I am a realist.'*

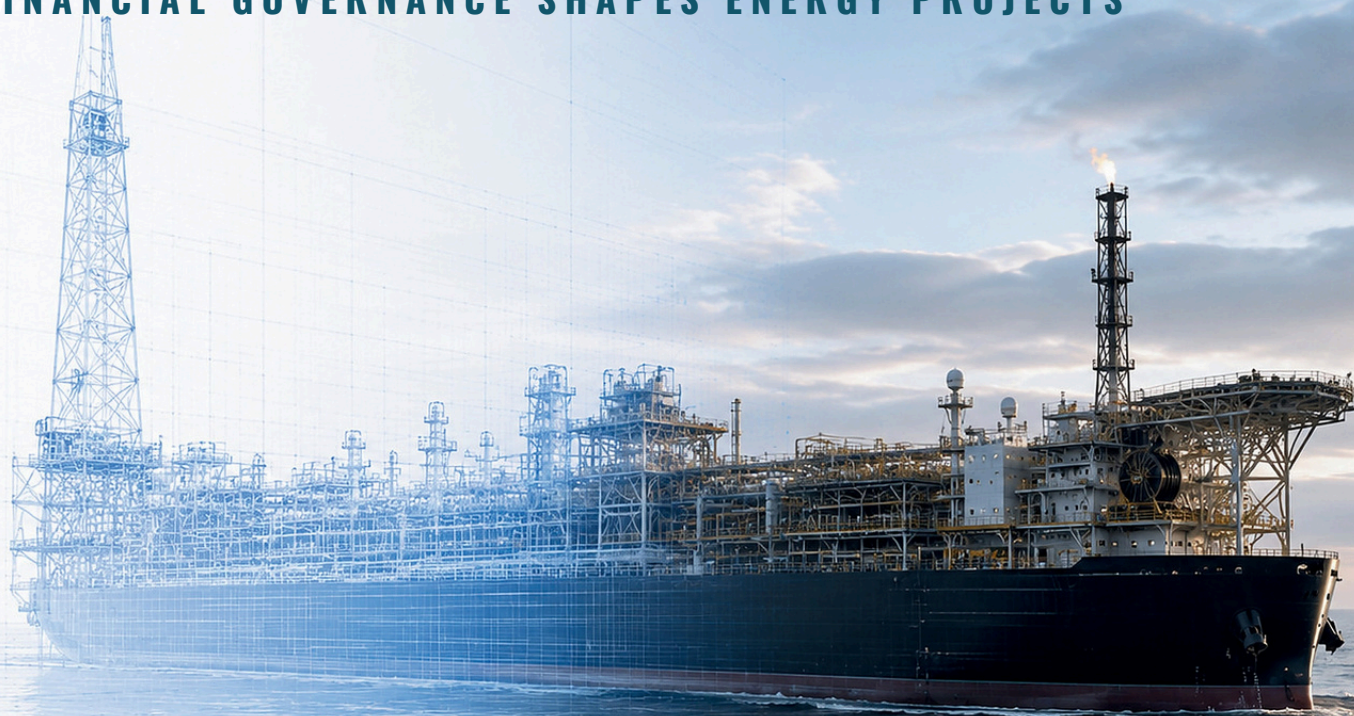
This **realism is by no means a form of resignation**.

On the contrary, it is a way of **navigating complexity** without succumbing either to illusions or to the passions of the moment: seeing the world as it is, **understanding the balance of power, identifying dependencies**, but also **recognising the capabilities we still possess**. Ultimately, his perspective calls for a twofold humility. First, **humility in decision-making: energy policy cannot be governed by shifts in public opinion or political passions**. Second, humility in our relationships with others: **diplomacy requires us to understand that others do not necessarily think as we do**. Energy choices are never solely a matter of technical rationality, and understanding others means accepting their logic, even when it baffles us. Perhaps this is the most valuable lesson from this interview: **sovereignty is not an act of isolation, but an exercise in clarity**. It requires **knowing one's strengths, anticipating one's vulnerabilities and viewing the world with enough empathy** not to reduce it to our own certainties. A demanding realism, free from arrogance or naivety, the kind we will need as we think about energy, power and the future.

THANK YOU, MR GOURDAULT-MONTAGNE, FOR YOUR INSIGHT.



HOW FINANCIAL GOVERNANCE SHAPES ENERGY PROJECTS



FINANCING THE LONG HORIZON

“

**IN THE ENERGY SECTOR,
A FINANCIAL DECISION IS OFTEN ALSO AN
INDUSTRIAL POLICY DECISION.**

In the energy sector, investment goes far beyond a simple return-on-investment approach. It involves critical, capital-intensive, and heavily regulated assets that are subject to technical, industrial, and geopolitical constraints spanning several decades.

In this context, the finance function becomes a key structuring tool : it translates technical uncertainty into an economic trajectory, organizes risk governance, and links investment decisions to the realities of industrial execution.

*An open conversation about these challenges with **Christophe Bordes**, an infrastructure investment specialist with over twenty-five years of experience. Over the course of his career, he has contributed to major energy and industrial projects (infrastructure, nuclear, power, etc.) with leading European energy and infrastructure companies. Well-versed in “capital-intensive projects” with long lifecycles, he pays particular attention to energy related issues.*

In the energy sector, investment decisions cannot be reduced to a simple “*return-on-capital*” calculation. The very nature of these assets profoundly alters traditional analytical frameworks. Energy infrastructure combines **capital intensity, significant regulatory exposure, technological dependence, and exceptionally long time horizons.**

As **Christophe Bordes** points out, a project may require **several years of development and construction** before becoming operational, and then operate for several decades. A financial decision therefore does more than approve an asset; it sets in motion an industrial trajectory, production capacities, skill chains, and, in some cases, a strategy for energy sovereignty. This long-term perspective changes the way risk is assessed. Whereas focus primarily on return on investment, critical energy projects must take into account asset **resilience, cash flow stability, operational sustainability, and the system’s ability** to remain relevant under various industrial and geopolitical scenarios.

THE FINANCE FUNCTION AS A GOVERNANCE INTERFACE

In major energy projects, the finance function acts as an interface between several decision-making domains:

engineering, regulation, public governance, investors, industrial partners, and future operations.

Its role extends far beyond financing or budget monitoring. It structures the initial assumptions, organizes scenarios, formalizes decision milestones, and translates technical risks into economic impacts that are understandable to governance bodies.

Christophe Bordes places particular emphasis on this point: this function becomes critical as early as the initial phases, when uncertainties are still significant. The trade-offs made at this stage have a lasting impact on the project's overall balance: risk allocation, contingency planning, financial sustainability, CAPEX sequencing, and execution capacity.

Financial governance also ensures clear traceability of these trade-offs: why a particular technical option was chosen, based on which assumptions, with what associated costs, and what residual risks.

STRUCTURING UNCERTAINTY

"The goal is not to predict the future perfectly, but to verify that the decision remains sound across a range of plausible future scenarios." Energy systems operate in dynamic environments: evolving regulations, strain on supply chains, availability of critical skills, fluctuations in energy markets, environmental constraints, and technological disruptions.

In this context, the robustness of a decision does not rest on an illusion of precision. For **Christophe Bordes**, one of the main pitfalls lies precisely in believing that a financial model can freeze the future in place. The approach adopted in long-term projects therefore involves working with scenarios.

Three levels of analysis are generally employed:

- a robust base case corresponding to the most likely scenario
- a realistic stress case to test the project's resilience ;
- disruption scenarios incorporating more extreme regulatory, technological, or timing assumptions.

The goal is not to predict the future with perfect accuracy, but to verify that the decision remains sound under several plausible future scenarios. **This approach is particularly critical in sectors related to electrification, energy storage, and nuclear power, where assets must remain competitive and operational for several decades.**

BUDGETARY DISCIPLINE AND FLEXIBILITY IN EXECUTION

"Budgetary discipline does not have to mean rigidity."

Critical energy projects require a constant balance between **budgetary discipline** and **adaptability**. Overly rigid governance undermines execution when adjustments become necessary. Conversely, a lack of discipline quickly leads to cost and schedule overruns that are difficult to recover from.

The management approach therefore involves making a clear distinction between:



▶ WHAT IS NON-NEGOTIABLE:

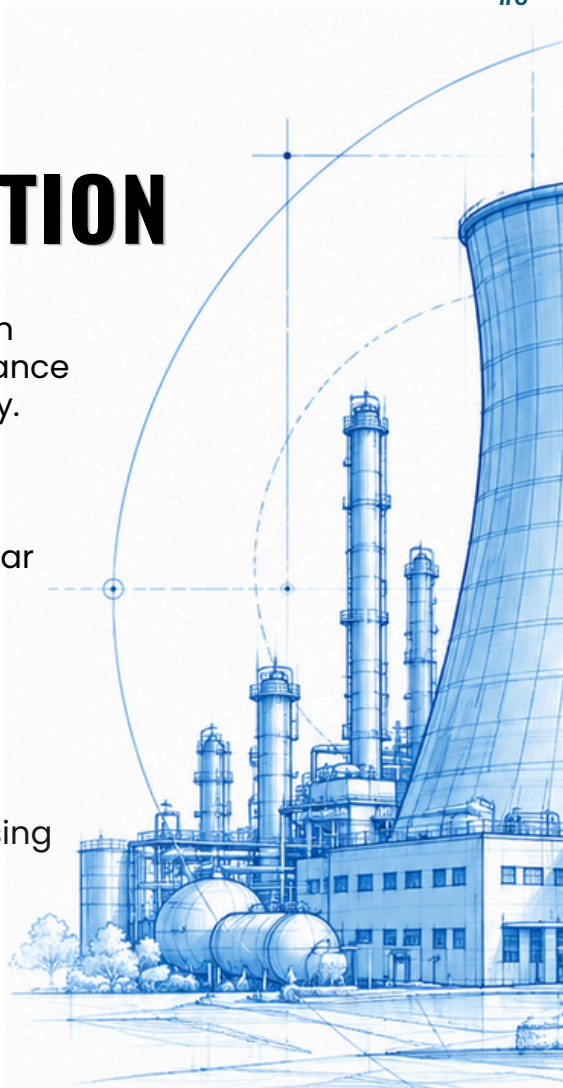
Safety, regulatory compliance, and critical financial thresholds.



▶ WHAT CAN BE ADJUSTED:

sequencing of work, design optimization, phasing of investments, or execution methods.

In this type of environment, the **speed of decision-making** becomes a key factor. The longer a decision is delayed, the greater its potential impact on costs and the schedule.



READING WEAK SIGNALS

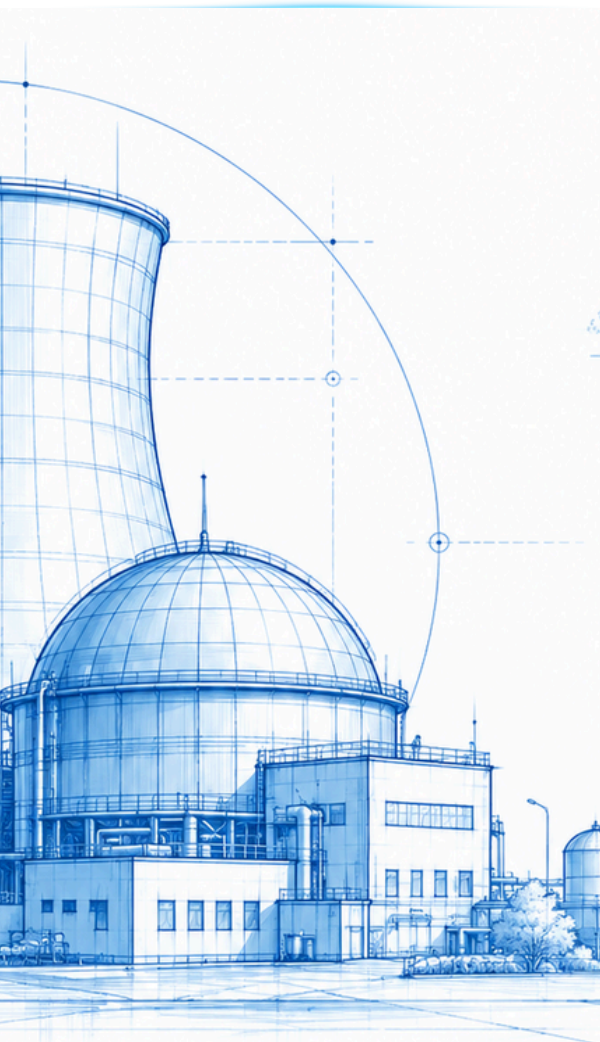
"Remedies cannot be postponed indefinitely."

Throughout the discussion, Christophe Bordes repeatedly returns to the issue of **weak signals**. In his view, problems with major energy projects rarely emerge suddenly. They most often manifest as an accumulation of weak signals. Among the most critical indicators are:

- the silent increase in the estimated cost at completion
- the artificial compression of contingencies;
- the mismatch between physical progress and financial commitment;
- the proliferation of deferred trade-offs.

These warning signs are particularly pronounced in complex projects involving multiple technical and contractual interfaces. When a project rapidly exhausts its contingency margins or financial commitments outpace the actual progress of the work, the issue generally goes beyond a simple budget overrun.

It often reveals a deeper problem: **fragile initial assumptions**, insufficiently structured governance, poorly managed interfaces, or excessive pressure on deadlines.



OVERLOOKED INTERFACES

"Interface risks are often underestimated." During our discussion, **Christophe Bordes** identifies interfaces as one of the main areas of vulnerability in major energy projects. Interfaces between engineering and construction, between critical suppliers and integrators, between initial design and future operations, or between regulatory requirements and constructability constraints: it is often in these transition zones that the most complex and difficult-to-manage cost overruns tend to occur, are concentrated.

These points of friction are frequently underestimated in the early phases, even though they determine a significant portion of the project's robustness. According to **Christophe Bordes**, the most effective management mechanisms rely on **clearly defined accountability for interfaces, a single integrated schedule**, aligned contractual terms, and cross-functional management capable of simultaneously tracking costs, timelines, and risks.

In critical infrastructure projects, interfaces can no longer be treated as residual variables. Both financially and operationally, they must be considered risks in their own right, requiring **dedicated provisions, specific governance** mechanisms, and **continuous coordination across the various layers of the project**.

SOVEREIGNTY AND TRANSFORMATION

During our discussion, **Christophe Bordes** emphasized one point: energy infrastructure is no longer evaluated solely based on its immediate cost or direct profitability. Whether it involves **nuclear power, storage, power grids**, or **batteries**, these assets are now part of a broader strategy of industrial sovereignty and securing critical dependencies.

In sectors related to electrification, the stakes go beyond mere short-term competitiveness. They also involve control over value chains that have become strategic: critical materials, recycling, local industrial capacity, storage, and grid flexibility. This shift is profoundly transforming the financial analysis of projects. **Investment is no longer measured solely by return on investment; it is also measured by industrial, energy, and technological resilience.**

INSTITUTIONAL CREDIBILITY

"Robust financing therefore builds institutional trust."

Throughout our discussion, **Christophe Bordes** repeatedly returns to this idea: in critical energy projects, **financial robustness** serves not only to secure a budget but also to demonstrate that a project can be **managed over the long term**. Authorities seek to assess the **sustainability of the model**; industrial partners look for stability in decision-making and the ability to execute; while investors expect a clear understanding of the **risk-return profile**.

This credibility rests above all on the quality of the **governance framework**: transparent assumptions, clearly defined responsibilities, genuine alignment between physical progress and financial commitment, and the ability to make **swift decisions** when initial deviations arise. In critical infrastructure projects, this transparency becomes a **key factor in building trust** throughout the project's entire lifecycle.

"In the nuclear sector in particular, trying to artificially save time at the outset often results in significant losses later on."

With more than twenty-five years of experience working on major infrastructure and energy projects, **Christophe Bordes** identifies several principles he now considers fundamental: **sound assumptions from the very beginning**, realistic contingency plans, **clear governance**, rigorous execution discipline, and a **long-term vision** capable of withstanding short-term trade-offs.

Throughout our conversation, one point kept coming up: in critical energy projects, **initial shortcuts often end up resulting in much higher costs** during the execution phase. Robustness, therefore, is built neither solely through technology nor solely through financing. It rests on the project's ability to maintain, over time, a **consistent alignment between engineering, governance, industrial execution, and future operations**.

Major energy projects are **never determined by technology alone**. A power plant, a grid, a storage facility, or an electrification system may be technically sound yet still become vulnerable if the trade-offs that shape them lack **consistency, clarity, or a long-term vision**.

This is precisely where the nature of the finance function changes. It no longer serves solely to control budgets or secure financing. It becomes a **discipline of project architecture**: capable of managing uncertainty, making risks manageable, linking industrial constraints to economic realities, and preventing short-term decisions from compromising the system's future robustness. Throughout our conversation, **Christophe Bordes** repeatedly returns to this idea: in the energy sector, the real challenge lies not only in building complex assets, but in maintaining a **sustainable alignment between engineering, governance, execution, and industrial sovereignty**. In infrastructure designed to last for several decades, every trade-off ultimately has systemic consequences.

In critical energy systems, performance therefore depends not only on the quality of the technologies deployed but also on the **quality of the decisions that make them possible**.

INFOGRAPHIC

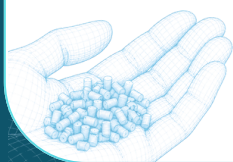
CLOSED VS OPEN NUCLEAR FUEL CYCLES

Within the **ALTEN Energy Business Unit**, this technical perspective is carried by the BU's leadership and experts, with Anotech contributing to the broader ambition of delivering integrated expertise across complex energy environments.

Designed to support long-term energy security and technological control, the closed nuclear fuel cycle relies on the integrated management of nuclear materials. From uranium enrichment to the recycling of plutonium into MOX fuel, it demonstrates how nuclear energy operates as a highly structured industrial system aimed at optimizing every gram of fissile material. This approach helps shed light on the consistency and specific characteristics of the closed fuel cycle, as illustrated by the French model.

ENERGY DENSITY

1 PELLET



≈ 7g of enriched uranium
 ≈ 480 m³ of natural gas
 ≈ 500 kg of oil
 ≈ 2.5 tonnes of coal

MOX FOR PEACE

Under the **2000 Plutonium Management and Disposition Agreement (PMDA)**, the United States and Russia each committed to dispose of 34 tonnes of weapons-grade plutonium, equivalent to several thousand nuclear warheads, by converting it into MOX fuel for use in civilian reactors.

→ Once irradiated, the plutonium's isotopic composition is altered, making it far less suitable for weapons use. This approach enables the transformation of military material into electricity, directly supporting long-term nuclear non-proliferation efforts.

OPEN CYCLE



STORE OR DISPOSE

Interim storage and/or final disposal



PLUTONIUM UNUSED

Not utilized



SINGLE-USE RESOURCE



SIMPLER SYSTEM

Fewer downstream stages



OPERATIONAL SIMPLICITY

Focus on waste management



LINEAR MODEL

Linear energy cycle

PRODUCE – USE – STORE



MINING



+

ENRICHMENT



+

IRRADIATION



+

STORAGE



CLOSED CYCLE



REPROCESS & SEPARATE MATERIALS

Plutonium/uranium/fission separated



PLUTONIUM REUSED

Reintegrated into MOX fuel



MAXIMIZE RESOURCE USE



HIGH COMPLEXITY SYSTEM

Fully integrated value chain



ENERGY & MATERIAL AUTONOMY

Recycling-driven strategy



CIRCULAR MODEL

Nuclear circular economy



OPTIMIZE EVERY GRAM



MINING



+

ENRICHMENT



+

IRRADIATION



+

REPROCESSING



+



RECYCLING (MOX)



NUCLEAR COMPLEXITY: RIGOR AS THE PATH TO MASTERY



*With deep operational experience in the nuclear sector, the leadership of the **ALTEN Energy Business Unit**, which includes **Anotech**, has built its expertise in close connection with nuclear facilities. From mining operations and MOX fuel plants, where mixed oxide fuel is produced from plutonium and depleted uranium, to fuel manufacturing plants and nuclear reactors, as well as daily radiation risk assessments, this experience has unfolded in environments where every decision must comply with strict codes and nuclear safety requirements. Accustomed to both control rooms and industrial field realities, these experts have learned that safety cannot simply be decreed, it must be implemented. This hands-on experience provides a sharp perspective on the growing complexity of nuclear projects. At **ALTEN**, this operational culture is built on a clear conviction: only a rigorous, structured, and pragmatic culture can turn complexity into controlled performance.*

Modern nuclear power faces a paradox. While technologies have advanced, tools have become more sophisticated and digitalized, and safety standards have been reinforced, project delivery timelines have lengthened considerably.

This drift is not the result of technical complacency, but rather the consequence of growing complexity : an accumulation of requirements, overengineered design, poorly synchronized business interfaces, and the difficulty of integrating constructability and manufacturability constraints from the earliest stages. This evolution does not call safety or the human factor into question. Quite the opposite: requirements have increased, while standards and plant performance have reached higher levels. Yet a structural tension remains between **Design to Safety** and **Design to Build**.

DESIGN TO SAFETY VS. DESIGN TO BUILD

DESIGN TO SAFETY

DESIGNING TO MAXIMIZE SAFETY:

Multiplication of barriers, reinforced regulatory requirements, in-depth failure analysis.

→ **Result:** an extremely robust system in theory.

DESIGN TO BUILD

DESIGNING FOR ACTUAL CONSTRUCTION:

Constructability, logical sequencing, accessibility, interface control.

→ **Result:** a system that can be industrialized and delivered within controlled timelines.

When the former dominates without dialogue with the latter, complexity becomes excessive. Construction becomes rigid. Interfaces multiply. The engineering focus shifts from an installation-centered approach to a discipline- and system-centered one, thereby affecting planning.

“

PROJECT COMPLEXITY HAS INCREASED SIGNIFICANTLY OVER TIME, EVEN AS SAFETY REQUIREMENTS, STANDARDS AND INDUSTRIAL PERFORMANCE HAVE CONTINUED TO ADVANCE.

The bar has been raised, and requirements have become more stringent, yet the facilities deliver the same level of performance and reliability.

The issue, therefore, is not safety, but the management of requirements.

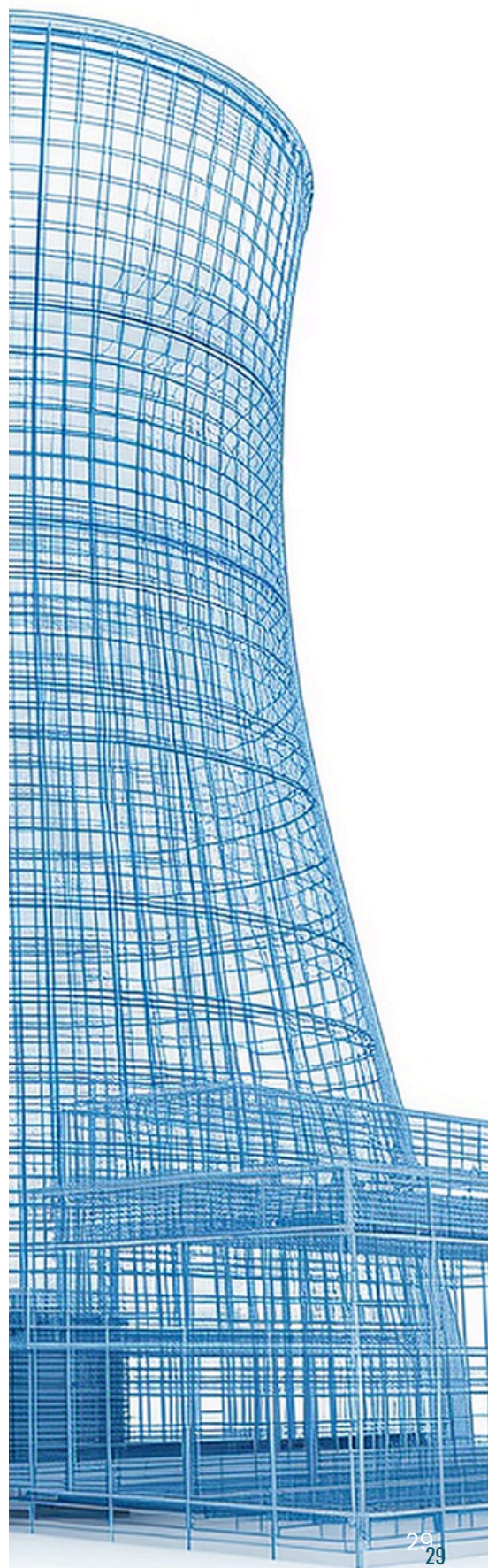
Within the ALTEN Energy Business Unit, Anotech contributes to this vision: requirements must be fully integrated, without being **prioritized uniformly**. Certain derived requirements, notably **constructability**, are sometimes **underestimated**. Yet this industry operates with one of the highest safety margins against incidents and accidents.

And to meet this level of requirement, one must not work in a purely disciplinary or systematic manner, but rather adopt a **holistic approach**.

A simple mechanical analogy illustrates this challenge: a system may be perfectly designed on paper, yet prove impossible to assemble because a critical component cannot physically be installed. The issue is not the quality of each individual discipline, but **the ability to integrate constructability constraints from the outset**.

What this calls for is obviously not a weakening of safety, but a return to fundamentals: regaining overall control of the project, as was done in the past, by integrating the actual capacity to build and operate from the very beginning. There is sometimes a tendency to oversimplify technical aspects and consolidate tasks, which in practice can lead to reduced performance.

The balance that must be restored is therefore simple to articulate, yet demanding to implement: **ensuring safety without creating unnecessary complexity**, and designing with the people who will build, assemble, operate, and maintain the facility in mind. And this is precisely where operational field experience makes the difference.



THE FOUNDATION OF SAFETY

ACCIDENT PREVENTION

CONSEQUENCE MITIGATION

SAFETY CULTURE A CAUTIOUS, QUESTIONING, AND RIGOROUS ATTITUDE

DEFENSE IN DEPTH MULTIPLE LAYERS OF PROTECTION

RADIATIONS

HOW TO MEASURE RADIATION RISKS

The millisievert (mSv) is the unit used to measure the impact of radiation on the human body. Every workstation in a controlled area is monitored for dose rate to ensure annual exposure limits are met. This culture of continuous monitoring establishes a core principle: we never work without knowing precisely the impact of our actions.

OPERATING A REACTOR FIELD REALITY

“

THE HUMILITY TO ASK THE RIGHT QUESTIONS BECOMES THE KEY TO TECHNICAL EXCELLENCE.

This perspective does not stem from abstract analysis. It is grounded in extensive operational and engineering experience in the nuclear sector. Operating a nuclear facility requires a specific discipline. It teaches that **safety** is **never a given**: it is a **constant objective**.

Everything is designed to prevent a single deviation from escalating into a major incident. This once again highlights the fact that, in the event of a nuclear accident, it is never a matter of a single failure. Rather, it results from an accumulation of deviations from established standards.

SAFETY CULTURE BEGINS WITH HUMILITY

Safety culture begins with humility, as it fosters caution, critical thinking, and rigor. Three pillars underpin nuclear safety culture: a **cautious attitude**, a **questioning mindset**, and **procedural rigor**.

In practice, this translates into three essential habits:

- Reading procedures line by line
- Secure communication (request → repetition → confirmation)
- Systematic preparation, even in emergency situations
- And above all: an emergency never justifies rushing.

TRANSPOSING THIS DISCIPLINE THE ENERGY OFFERING AMBITION

Building on this operational experience, ALTEN's Energy experts believe that the challenge today is clear: mastering these requirements, which are the very foundation of excellence.

The objective is not to **mechanically replicate procedures**, but to embed them into projects by prioritizing requirements, anticipating potential failures, and **structuring execution** through consistent **rigor**.

In a broader energy context, this culture becomes a genuine strategic asset.

SEVERAL KEY LEVERS AND SOLUTIONS EMERGE :

ACCIDENT
PREVENTION
BREAKING DOWN
FUNCTIONAL SILOS

SIMPLIFYING
EXCESSIVE
COMPLEXITY IN
NUCLEAR DESIGN

FULLY
INTEGRATING
CUSTOMER
NEEDS

MAINTAINING
CONSISTENT
METHODOLOGICAL
RIGOR

DEVELOPING
RECOGNIZED
EXPERTISE IN
CRITICAL AREAS

BUILDING
AN INTEGRATED
UNDERSTANDING
OF THE CLIENT'S
CHALLENGES

Faced with complexity, the first response is therefore not technological, but organizational.

It involves anticipating, from the earliest stages of a project, the required skills, their level of expertise, and the appropriate organizational structure in order to secure schedules, budgets, and quality. The capabilities developed through the **operation of complex facilities** can therefore serve the engineering of future installations.

Delays typically occur when the necessary skills have not been anticipated or secured at critical stages of the project. Performance is no longer determined solely within an isolated technical scope, but by the ability to orchestrate the system as a whole.

DIGITAL: A LEVER FOR EFFICIENCY, NOT AN END IN ITSELF

In the nuclear sector, as in the energy sector more broadly, digital technology is often presented as a disruptive force. As part of the **ALTEN Energy Business Unit**, Anotech supports a more pragmatic view. In a sector where technical expertise is scarce and resources are limited, the challenge is not to multiply platforms or stack additional digital systems. The real challenge is to free up time for high-value-added activities.

In other words, the objective is to automate what can be automated, structure information, and ensure data reliability, so that engineers and operators can focus on analysis, decision-making, technical expertise, and knowledge transfer. **In this context, digital technology acts as a support function.**

It streamlines. It secures. But it does not replace either professional expertise or safety culture. In an environment as critical as the nuclear sector, human expertise remains central.

Digital technology therefore becomes an **essential performance enabler**, not a **substitute**.

TOWARD AN INTEGRATED ENERGY CHAIN, FROM DESIGN TO OPERATIONS

The strategic opportunity today lies in moving beyond fragmented approaches. By combining expertise in engineering, project management, operations, and systems integration, particularly in operations and **SCADA systems**, it becomes possible to create overall consistency across the entire energy value chain.

The challenge is no longer simply to address an isolated technical segment, but to orchestrate expertise in order to support clients throughout the entire lifecycle of their facilities.

From the design of an energy subsystem to its monitored operation, value is created through **continuity** and **integration**. This integrated approach applies to a wide range of environments: mining, oil extraction, nuclear power plants, combined-cycle gas turbines, dams, transmission and distribution infrastructure, desalination plants, and integrated water projects. In each of these contexts, technical complexity requires a systemic approach and careful coordination of expertise.

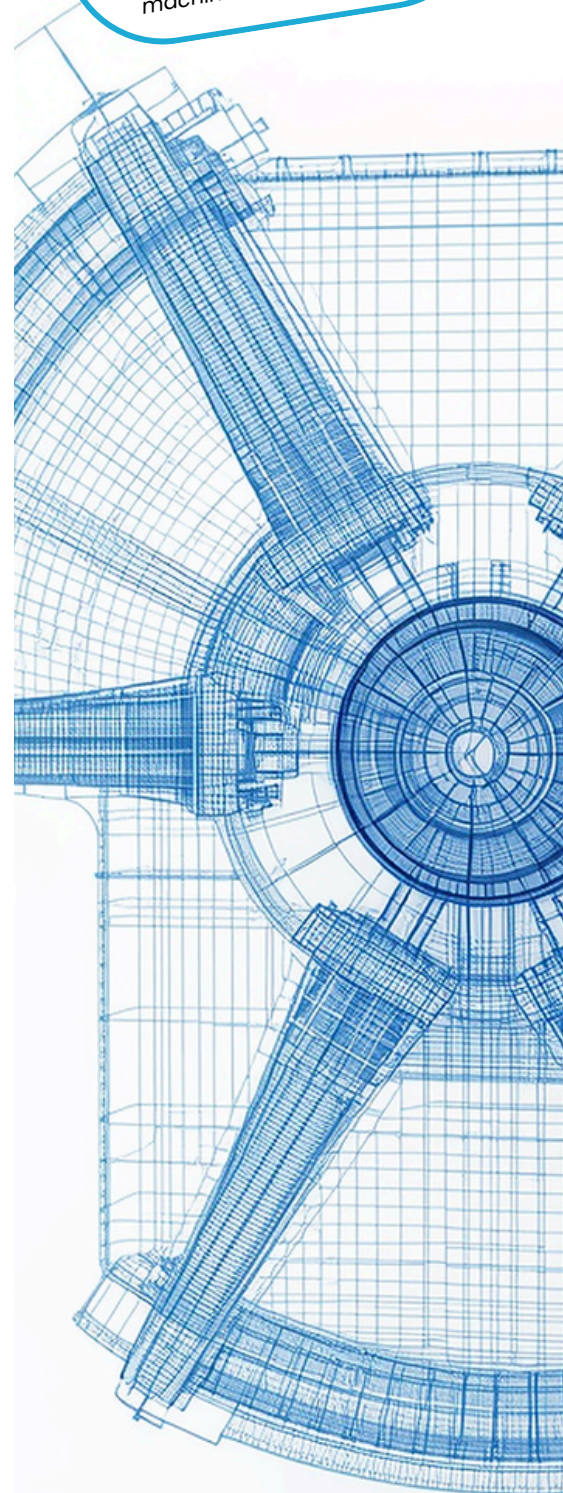
Within the **ALTEN Energy Business Unit**, of which Anotech is a part, the ambition is clear: to **build an end-to-end service capability** able to integrate technical requirements, operational expertise, and a comprehensive industrial vision. Because in complex energy systems, performance does not stem from isolated pockets of excellence, but from overall coherence.

The **nuclear industry teaches** us that **safety is built** upon **demanding requirements**, and that performance relies on foresight and mastery of expertise. Faced with today's energy challenges, excellence cannot simply be declared. It must be built.

This culture, born from the operation of critical facilities, now provides a strong foundation for the ambition carried by the ALTEN Energy Business Unit, to which Anotech contributes: combining **technical rigor, operational expertise, and an integrated systems vision**.

SCADA

Supervisory control and data acquisition is a control system architecture comprising computers, networked data communications and graphical user interfaces for high-level supervision of machines and processes.





BEYOND THE ASSET

LEADERSHIP, GOVERNANCE, AND SAFETY IN HIGH-CRITICALITY OFFSHORE PROJECTS

High-criticality offshore projects leave little room for error. Beyond engineering performance and technological sophistication, their success depends on strong governance, effective interface management, sound decision-making, and leadership capable of maintaining safety under pressure.

To explore these challenges, we spoke with **Darren Ahrens, Managing Director of Ahrens Marine and Offshore Engineering Services and expert advisor** also supporting Anotech's Management as a Technical Advisor. With more than 30 years of international experience across the marine, offshore, and energy sectors, Darren has built his career around the delivery of complex, high-criticality projects.

In this interview, he shares practical lessons on safety governance, interface management, risk anticipation, and leadership, highlighting the factors that help clients reduce execution risks and achieve safer, more reliable, and sustainable project delivery.

WHAT FUNDAMENTALLY DISTINGUISHES A HIGH-CRITICALITY OFFSHORE PROJECT FROM OTHER LARGE INDUSTRIAL PROJECTS?

High-criticality offshore projects operate within a unique convergence of factors that collectively create an environment of **compounding complexity and consequence**. Unlike land-based industrial projects where access, logistics, and emergency response capabilities provide inherent buffers, offshore installations exist in **dynamic, often hostile environments** where the margin for error compresses dramatically. When you are dealing with Hydrocarbon **you do not get a second chance** if there is a loss of containment.

The question is never whether safety and reliability can be compromised for schedule or cost, the question is how to **structure governance and decision-making processes** to ensure this compromise never occurs, even under **intense commercial pressure**.



THREE FUNDAMENTAL DISTINCTIONS DEFINE THESE PROJECTS:



IRREVERSIBLE COMMITMENT

Limited reversibility once key decisions are made offshore



CONSEQUENCE AMPLIFICATION

Environmental interaction amplifies every failure mode



OPERATIONAL ISOLATION

Compressed emergency response windows in remote settings

CAN YOU SHARE AN EXAMPLE OF A PROJECT DECISION DRIVEN PRIMARILY BY SAFETY CONSIDERATIONS, EVEN WHEN IT CONFLICTED WITH COST OR SCHEDULE OBJECTIVES?

One of the most instructive examples involves a FPSO project where, during final integration testing, the project team identified that the **Emergency Shutdown (ESD) system response time marginally exceeded the design safety case requirements** under specific simultaneous failure scenarios. The excess was measured in seconds within the margin of measurement uncertainty and rectification required significant electrical and control system rework that would delay first oil by approximately six weeks and add substantial retrofit costs.

The **commercial pressure** was immense. The delay coincided with a favourable commodity price environment. Partner companies faced financing commitments tied to production startup dates. The argument was made persuasively that the **probability** of the specific failure scenario was extremely low, that operational procedures could provide additional layers of protection, and that the issue could be addressed during the first scheduled shutdown.

SEVERAL FACTORS INFLUENCED THIS DECISION, EACH REVEALING IMPORTANT GOVERNANCE PRINCIPLES:



REGULATORY NON-NEGOTIABILITY

The safety case was approved based on specific performance criteria. Operating outside those criteria created regulatory exposure that could jeopardize the operating license.



ORGANISATIONAL CREDIBILITY

Compromising on a known deficiency would have sent a devastating signal about the true priorities of the organisation. Years of safety culture credibility would evaporate in a single decision.



LONG-TERM RISK EXPOSURE

Even a single fatality under known system deficiency would create catastrophic legal, reputational, and operational consequences far exceeding the cost of delay.

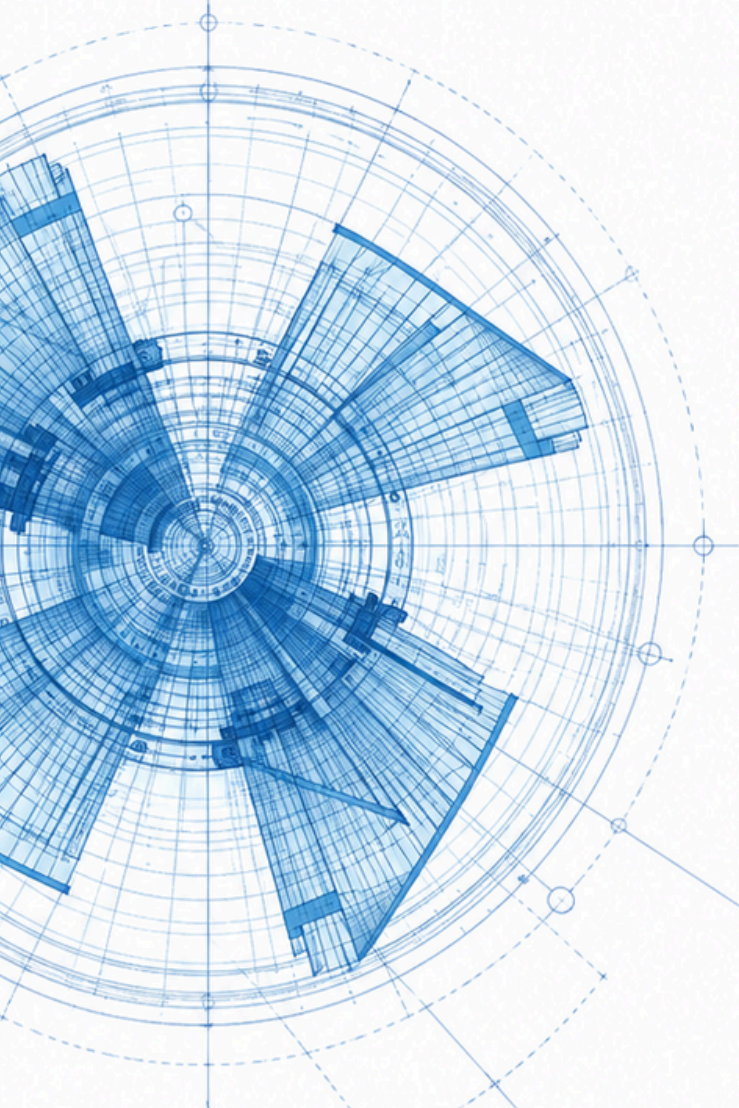


STAKEHOLDER TRANSPARENCY

The team brought the issue to partners and regulators immediately, framing it as technical integrity. This transparency built confidence in governance.

The decision cost approximately **\$40 million** in deferred revenue and direct rework expenses. Five years later, no one discusses the six-week delay. The platform has operated with **exceptional safety performance**. The decision has become a **cultural touchstone** within the organization, evidence that leadership statements about safety priorities are backed by action when tested.

The broader lesson: Projects that successfully navigate these decisions establish **clear decision frameworks before pressure situations arise**. They define in advance which parameters are truly non-negotiable, ensure that technical authorities have **organisational protection** when raising concerns, and create forums where commercial and technical perspectives can be aired transparently before decisions are made.



AT WHAT POINT DOES SAFETY CEASE TO BE JUST AN HSE TOPIC AND BECOME A CORE PILLAR OF PROJECT GOVERNANCE AND DECISION-MAKING?

The transition of safety from a compliance function to a governance occurs at the moment a project organization recognises a fundamental truth: in high-criticality offshore projects, major accident prevention cannot be delegated to safety professionals. It must be owned by line management, embedded in every engineering decision, and visible in every commercial negotiation.

When safety is embedded as a core pillar of governance, it influences:

- Technology selection and design margins
- Contracting and packaging strategies
- Construction sequencing and integration logic
- Readiness and handover criteria

The maturation journey requires deliberate organizational design. Safety must have visibility, voice, and veto authority at critical decision gates. Risk registers must translate into resource allocation decisions. **Safety performance must be weighted equally with cost and schedule in performance evaluations.**

Offshore projects involve a dense network of critical interfaces. Which interfaces are most underestimated, and how do you manage them effectively?

In complex offshore projects, interfaces are often the main source of execution risk. They are effectively a project within the project. On one previous project, we mapped around 850 critical interfaces.

The most underestimated are usually not the obvious physical ones, but three less visible categories.

MOST UNDERESTIMATED INTERFACES



CONSTRUCTION TO OPERATIONS

Handover risk, transfer of knowledge, and ambiguity over ownership of emerging issues.



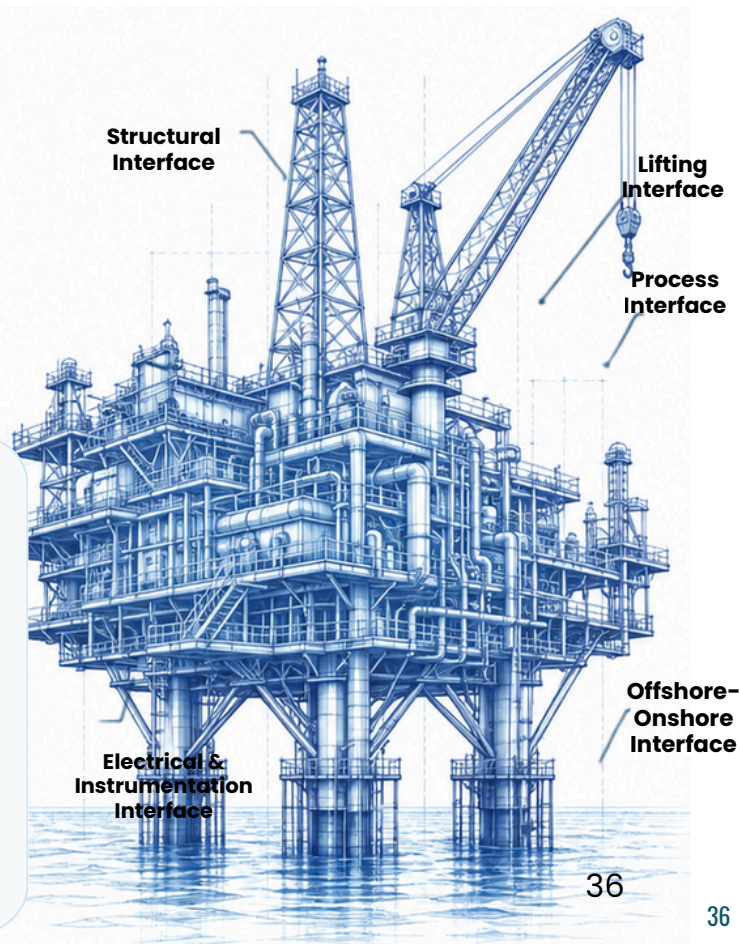
DATA ACROSS DISCIPLINES

Mismatches between process, structural, electrical, instrumentation, and as-built reality.



JOINT VENTURES AND MULTI-PARTY CONTRACTS

Different risk appetites, slower decisions, and conflicting incentives.



LEADERSHIP PREVENTS MAJOR ACCIDENTS

Beyond procedures and standards, what role does individual leadership play in preventing major accidents offshore?

Procedures, standards, and safety systems are essential, but they are **not sufficient**. Major accidents repeatedly show that **leadership behaviour**, especially in ambiguous or high-pressure situations, can determine whether an organisation recovers or fails. Over time, unsafe practices can become **normal**. Preventing major accidents therefore depends not only on systems, but on **daily leadership choices**.

FOUR DIMENSIONS OF SAFETY LEADERSHIP



01 CREATING PERMISSION TO STOP AND SPEAK

Workers must feel safe to challenge decisions and raise concerns.



03 BALANCING CONFIDENCE AND HUMILITY

Leaders must acknowledge uncertainty and resist production pressure.



02 MAINTAINING HEALTHY SCEPTICISM

Optimistic assumptions must be **questioned** and **evidence demanded**.



04 SUSTAINED PRESENCE AND ENGAGEMENT

Leadership influence comes through visible, consistent field engagement.

Ultimately, the key lesson from high-criticality offshore projects is that technology, standards, and procedures are essential, but they are **never sufficient on their own**. Sustainable performance depends on the people who apply these practices/their competence, judgment, ability to challenge assumptions, and willingness to prioritize safety and long-term value over short-term pressures.

The most serious project failures are often linked less to a lack of technical solutions than to **weak interfaces, delayed decisions, normalized deviations**, or organisational cultures where concerns are not raised early enough. By contrast, successful projects create environments where technical excellence is valued, accountability is clear, and people feel empowered to **stop, question, and escalate** when necessary. This is fully aligned with Anotech's approach.

By providing experienced technical specialists, project leaders, and interface-focused expertise at critical stages, Anotech helps clients strengthen project governance, anticipate risks, improve coordination, and make better-informed decisions. The client impact is tangible: **reduced execution risk, fewer delays and costly rework, safer operations, smoother handovers**, and improved asset reliability. Beyond delivering a project, the objective is to support sustainable operations that protect people and the environment while creating **long-term value throughout the asset lifecycle**.

ONSHORE WIND : OPERATIONS AS A CRITICAL SYSTEM

In the onshore wind industry, the perception of an industrialized and standardized sector often masks a far more demanding operational reality. On-site performance depends not only on turbine design or technological choices, but above all on the ability to orchestrate an execution system under multiple logistical, human, and environmental constraints.

*Drawing on an in-depth exchange with **Jean-Philippe V., Site Manager and Anotech Expert**, this article explores the operational realities of onshore wind projects. His field experience reveals the full industrial logic of the sector: a discipline built on coordination, anticipation, and the careful management of interfaces.*

FOCUSED ON THE DOWNSTREAM PHASE... BUT CONSTRAINED BY CONTRACTUAL PRESSURES.

The installation of a wind farm takes place at an advanced stage of the value chain. By the time the field teams arrive, the turbines have already been selected, the necessary permits secured, and the civil engineering work completed.

Construction therefore takes place in a later phase, but is governed by one major constraint : **the start-up date**. *"This production date is the most important one. If it isn't met, there are contractual penalties."*

This tipping point turns the installation into a critical sequence. The goal is not simply to build, but to **deliver** an operational system within a tight deadline.



A PROJECT ORGANIZATION BASED ON INTERDEPENDENCE

On-site, the organization does not follow a traditional hierarchy. Instead, it relies on the **close coordination of several specialized roles**, including operational management, site managers and supervisors, a dedicated safety function, assembly teams, hoisting operators, and electrical teams involved during the final phase.

Around thirty people may be working on-site at the same time. What holds this group together is not only the contractual framework, but also the **recurring nature of these collaborations**. As one professional explains, *"It's a small world. We often run into the same companies. We know each other."* This continuity **builds trust** and helps offset the project's technical complexity.

INDUSTRIALIZATION CONSTRAINED BY HEAVY EQUIPMENT

The assembly of a wind turbine follows a clearly defined sequence, but its progress depends heavily on the **physical capabilities of the equipment** involved. The process begins with a pre-assembly phase using intermediate cranes, followed by the main lifting operations, which require **very high-capacity cranes**. The tower, nacelle, and blades are then assembled progressively.

Between each stage, the equipment must be **dismantled, transferred, and set up again**. This creates a **stop-and-start rhythm** in which every operation directly conditions the next.

INTEGRATED DEFINITION WIND TURBINE ASSEMBLY

Assembly consists of the sequential assembly of heavy industrial components: metal tower sections, nacelles incorporating generators and systems, aerodynamic blades. The entire assembly is connected to an electrical system and a power grid.

COMPLEXITY DRIVEN BY UNCERTAINTIES, NOT BY TECHNOLOGY

Unlike other energy sectors, the complexity on the ground here does not stem from the technology, but from the **operational environment**. Several factors contribute to this instability:



1. LOGISTICAL CONSTRAINTS



2. WEATHER DEPENDENCY



3. EQUIPMENT QUALITY



4. ON-SITE RISKS

ANTICIPATE RATHER THAN REACT: CONTINUOUS OPERATIONAL PLANNING

In the face of these uncertainties, the response is **organizational rather than technical**. Field management must continuously adjust delivery sequences, anticipate traffic constraints, and synchronize operations with **available weather windows**. Planning therefore becomes a **dynamic process** that evolves with conditions on the ground. As one professional explains, *"If we fall behind at the wrong time, we could lose a week."*

STANDARDIZATION OF PRACTICES, VARIABILITY IN EXECUTION

Managing this complexity requires a high degree of **standardization**. Each task is governed by detailed procedures, personnel follow **mandatory and progressive training**, and operations are systematically documented. Every stage is **monitored, validated, and tracked**, providing a reliable framework for safe execution despite changing field conditions.

SAFETY: A FOUNDATIONAL, NON-NEGOTIABLE PRINCIPLE

In this environment, safety is not a support function; it is **embedded at the heart of operations**. It relies first on the **qualification of personnel** through specialized training, technical authorizations, and progressive skill development. It also depends on **collective discipline**, reinforced through daily coordination meetings, constant reminders of the rules, and shared responsibility.

"We arrive together, we leave together." This repeated emphasis on common rules helps ensure the **reliability of the system** as a whole.

COMMISSIONING: THE FINAL CONVERGENCE OF THE SYSTEM

Commissioning is a **critical point of convergence**. At this stage, the machine is tested, the systems are configured, and performance is validated. It is also a particularly demanding phase because **any delay can affect the availability of specialist teams**.

"If the machine isn't ready, the teams will leave. And we don't know when they'll be back."

Commissioning therefore reveals the **discrepancies** that may have accumulated throughout the project and determines whether the installation is truly ready to operate.

INDUSTRY TRANSFORMATION: TOWARD A MORE STANDARDIZED SECTOR

The sector is becoming increasingly structured, with **stricter safety requirements**, greater formalization of working methods, and more technically specialized roles. Empirical practices have gradually given way to **controlled and documented processes**.

"We used to do things differently. Today, that's no longer possible." This transformation is bringing onshore wind power closer to the **industrial standards** already established in mature energy sectors.

A SYSTEMIC PERSPECTIVE: BEYOND THE CONSTRUCTION SITE

An onshore wind construction site cannot be understood in isolation. It forms part of a **broader system** that includes a global supply chain, upstream regulatory constraints, and long-term operation and maintenance.

The installation phase acts as a **critical link** between a project as it was designed and the **operational industrial asset** it is intended to become.

Onshore wind power reveals an often underestimated reality: industrial performance does not depend on technology alone, but on the ability to deliver in an uncertain and constantly changing environment. Through **Jean-Philippe V.'s** experience and perspective, we gain a clearer understanding of the Site Manager's true role. Far beyond operational coordination, the Site Manager acts as the **guarantor of coherence across a complex system**, where every local decision can affect the project as a whole. Thanks to his insight, one conclusion stands out: the challenge is no longer simply to build a wind farm, but to **master execution as a system in its own right**.



BATTERY ENERGY STORAGE SYSTEMS

EXECUTION, INTERFACES AND GROUND REALITIES

As utility-scale **Battery Energy Storage Systems (BESS)** continue to expand across the power sector, execution challenges increasingly shift toward civil engineering control, interface management, and adaptation to field realities. Beyond the electro-technical infrastructure itself, these projects rely on the ability to maintain consistency between design assumptions, construction constraints, and operational requirements. Through his **field experience**, **Pascal C.** provides an operational perspective on the execution dynamics that structure large-scale BESS projects.

CORE RESPONSIBILITIES

- Civil works coordination
- Construction follow-up
- Schedule monitoring
- Quality control & HSE
- Construction meetings
- Technical modifications management
- Interface coordination between field and design

HOW WOULD YOU DEFINE THE ROLE OF A CIVIL SUPERVISOR ON UTILITY-SCALE BESS PROJECTS?

The role of the Civil Supervisor is to **oversee the civil engineering scope** within an environment where several technical disciplines operate simultaneously. This includes work coordination, schedule monitoring, quality control and HSE follow-up, as well as participating in and leading construction meetings.

The position also involves validating and managing technical modifications related either to field conditions or to design evolutions. In this type of infrastructure, supervision does not only consist of **monitoring construction activities**. It also involves maintaining **consistency** between **engineering studies**, execution, and the operational constraints encountered on site.

WHAT MAKES CIVIL ENGINEERING STRUCTURING IN BESS PROJECTS?

In **battery storage infrastructure**, several elements become critical for execution control. Compliance with execution drawings remains a key aspect, together with the quality of the materials implemented on site and the tests carried out throughout the different construction phases. **Schedule compliance** also becomes a major issue in environments where several companies operate simultaneously. **Coordination** between these stakeholders is therefore essential to maintain construction continuity and consistency across technical interfaces.

WHICH EXECUTION RISKS REQUIRE PARTICULAR ANTICIPATION DURING THE EARLY CONSTRUCTION PHASES?

Geotechnical conditions represent a significant point of attention in this type of operation. Ground non-homogeneity may lead to adjustments in backfilling works and can directly impact the execution schedule. *“Field conditions impose adjustments that can affect both technical choices and the schedule.”*

This reality illustrates the gap that may exist between initial design assumptions and the actual conditions encountered on site.



THE ROLE IS FOCUSED ON MONITORING, COORDINATION, AND ADAPTATION TO CONSTRUCTION-SITE REALITIES.

MAIN EXECUTION CONSTRAINTS

TECHNICAL

- Ground non-homogeneity
- Backfilling adjustments
- Design adaptation

OPERATIONAL

- Multi-contractor coordination
- Schedule pressure
- Interface management

GOVERNANCE

- Civil engineering interfaces
- Process engineering coordination
- Future operator integration

DO INDUSTRIAL PRACTICES FROM OTHER SECTORS REMAIN APPLICABLE TO BESS PROJECTS?

Each project has its own specificities, but **certain fundamentals remain common**. Infrastructure, industrial, and heavy process projects share several similar execution logics, particularly regarding construction coordination, technical follow-up, and operational organization.

Discipline and **safety requirements** may vary depending on the companies involved, but the criteria applied generally remain comparable to those found in other industrial environments.

HOW ARE TECHNICAL INTERFACES MANAGED ACROSS ENGINEERING, CONSTRUCTION, AND FUTURE OPERATIONS?

The organization generally relies on several levels of coordination between disciplines. Projects involve both **civil engineering** and **process engineering** expertise, with regular exchanges between engineering teams, construction teams, and future operators. This structure helps **ensure follow-up** of the technical **interfaces** between **civil works, equipment**, and future **operational constraints**.

HOW ARE TRADE-OFFS BETWEEN TECHNICAL CONSTRAINTS, COST, AND SCHEDULE GENERALLY HANDLED?

Trade-offs regularly occur during project execution. The process first relies on identifying a technical solution adapted to the situation encountered. A cost estimate is then prepared before organizing a meeting to finalize the decision. In this context, **schedule compliance** generally remains the main priority.

WHAT SHOULD DECISION-MAKERS ANTICIPATE BEFORE LAUNCHING A UTILITY-SCALE STORAGE PROJECT?

The quality of upstream studies remains essential, particularly when they are conducted in consultation with all stakeholders involved. The selection of **construction teams, engineering consultants, subcontractors**, and **suppliers** also represents an important factor in ensuring execution continuity under appropriate technical and organizational conditions.

INSTALLATION ENGINEERING

WHERE PIPELINE DESIGN MEETS OFFSHORE BEHAVIOUR

For subsea installation engineers, a pipeline is never only a designed asset. Before reaching the seabed, it becomes a suspended mechanical system exposed to hydrostatic pressure, vessel dynamics and installation constraints. **Ana D.**, senior installation engineer specialised in subsea pipelines, works precisely within that transition zone between engineering assumptions and execution realities.

For **Ana D.**, the distinction between design and installation remains fundamental. The installation phase begins once the pipeline itself has already been defined: diameter, wall thickness, pipe properties or expected service life. From there, the challenge shifts toward execution, understanding how the line behaves between the vessel and the seabed.

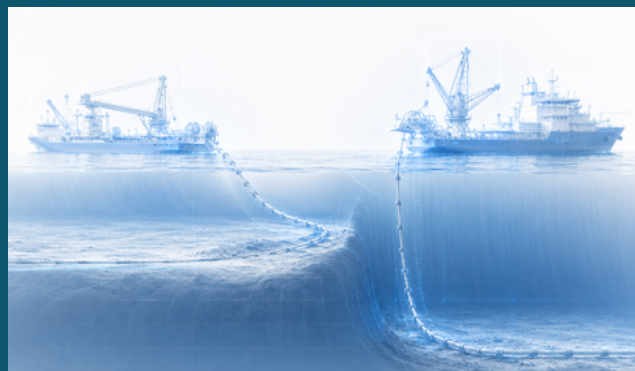
That transition becomes particularly sensitive in deepwater projects.

"When you have deep water, there is more hydrostatic pressure. More of pipeline is in catenary."



“

**INSTALLATION ENGINEERING BEGINS
ONCE THE PIPELINE ITSELF HAS
ALREADY BEEN DEFINED.**



As water depth increases, the suspended section of the line grows longer and heavier, increasing both top tension and instability risks during installation.

"If you have like I have now in the project 1650 meters, then you have a long pipeline and it's really heavy and it's prone to buckling."

Installation methodologies evolve accordingly.

"In shallow water, you do the S-lay method of laying. And in deep water you do the J lay, reel-lay or S-lay for deep water."



“

DEEPWATER CHANGES THE BEHAVIOUR OF THE LINE BEFORE IT CHANGES THE INSTALLATION METHOD.

In that environment, installation engineering becomes less a procedural discipline than a continuous exercise in behavioural control. Modelling therefore occupies a central role in the process.

“I put everything aside, the pipe properties, the vessel configurations, the environment like waves, currents, and I see what is happening.”

The objective is not optimisation for its own sake, but verification : ensuring the line remains within acceptable operational and client-defined criteria before offshore execution begins.

The interview also highlights another structural reality of subsea projects: calculations rarely remain within a single discipline for long.

“If I make an error [...] it is a whole chain of people and disciplines that is affecting.”

Precision therefore becomes more than an engineering requirement.

It becomes a coordination requirement across the project itself.

“You really need to be detailed, precise and self-check yourself a lot.”

Having also worked on offshore wind cable installation, Ana D. describes offshore Oil & Gas as more multidisciplinary and technically demanding, while offshore wind operations appear faster-paced and more volume-driven. Still, her preference remains clear:

“It's more challenging. You learn a lot.”

Between vessel and seabed, installation engineering ultimately reveals one of the core realities of offshore projects : infrastructure is not only designed, it **must remain mechanically controllable** throughout execution.

“

A PIPELINE IS NEVER ONLY A DESIGNED ASSET ONCE INSTALLATION BEGINS

FROM OIL & GAS TO OFFSHORE WIND

HOW TECHNICAL SAFETY IS MOVING UPSTREAM INTO DESIGN

For more than thirty years, **Pierre S.** has evolved through some of the energy sector's most demanding industrial environments, from nuclear and chemical industries to oil and gas and large-scale energy infrastructure projects. Moving between engineering design, commissioning phases, risk analysis and field exposure, he has progressively developed a transversal understanding of how complex systems are conceived, operated and secured across their full lifecycle.

Today, he works on **offshore HVDC substations**, a new generation of electrical infrastructures designed to support the expansion of offshore wind. Through his perspective, these platforms reveal a broader transformation affecting industrial safety itself: in increasingly automated and remotely operated systems, safety can no longer rely primarily on operational reaction. It must be embedded directly into engineering and design.

“

**IT'S REALLY SAFETY BY DESIGN...
DESIGNING ROBUST INSTALLATIONS.**

There are disciplines within **industrial projects** that remain largely invisible despite shaping the operational integrity of entire infrastructures. **Technical Safety is one of them.**

Unlike conventional HSE functions generally associated with procedures, supervision or behavioral safety, Technical Safety intervenes much earlier in the project lifecycle. Its objective is not simply to react to risk, but to **structure installations in ways that reduce vulnerability before operations even begin.**

This philosophy requires a rare combination of engineering understanding and operational awareness. Throughout his career, Pierre S. has worked across both design environments and field-related activities, including commissioning phases and operational exposure on complex industrial projects.

“I was really both... design... and plant start-ups and operations.” he said.



That dual perspective fundamentally shapes the way Technical Safety is approached. A technical decision validated during engineering phases may later generate operational limitations, circulation constraints or emergency response difficulties once the infrastructure enters service.

In that sense, **Technical Safety acts as an interface between theoretical engineering logic and operational reality.** The discipline operates directly within engineering phases through risk reviews, design analysis, equipment positioning, layout validation and protection philosophy assessment.



The objective remains constant throughout the lifecycle of the infrastructure: *"Integrate upstream that the acceptable level of risk is already acceptable."*

Over the past decades, this approach has become increasingly critical as **energy systems have grown more integrated, more automated and more technically constrained.**

Pierre S.'s trajectory across nuclear, oil and gas, chemical industries and offshore infrastructure also reflects another industrial dynamic: **the transferability of methodologies between sectors.**

”

MOST PEOPLE WORKING NOW IN OFFSHORE WIND COME FROM OIL AND GAS.

Risk identification methods, HAZOP studies and structured safety approaches historically developed in offshore hydrocarbons progressively migrate toward offshore electrical infrastructure projects.

For Pierre S., offshore substations therefore represent more than a technological transition.

"These are the first large HVDC electrical substations... it's really innovative."

What makes these infrastructures particularly significant is not only their electrical complexity, but the operational philosophy surrounding them. Offshore substations are designed around limited human occupancy, forcing engineering teams to rethink the relationship between infrastructure, operations and safety.

”

IN OSS, WE REALLY TRY TO MAKE EVERYTHING PASSIVE... WE TRY TO LIMIT HUMAN INTERVENTION.

This evolution reflects a broader transformation currently affecting offshore energy systems. The more infrastructures become remote and optimized, the less safety can depend on operational response alone.

It increasingly becomes a matter of architecture, anticipation and system design.

In offshore substations, safety is no longer added onto the infrastructure after conception.

It begins with the way the system itself is imagined.

INFOGRAPHIC

DESIGNING SAFETY INTO OFFSHORE ELECTRICAL INFRASTRUCTURE

In offshore substations, where human presence is intentionally reduced and operational intervention becomes limited, safety can no longer rely primarily on reaction. It must be anticipated upstream, integrated directly into the design itself. Through Pierre S.'s perspective, offshore wind reveals not only new engineering challenges, but also a broader shift in the philosophy of Technical Safety.

TECHNICAL SAFETY IN OSS

Focus on integrating risk reduction directly into the design of offshore electrical infrastructures, with the objective of ensuring safe operation in environments where human intervention is limited, remote and highly constrained by offshore conditions.

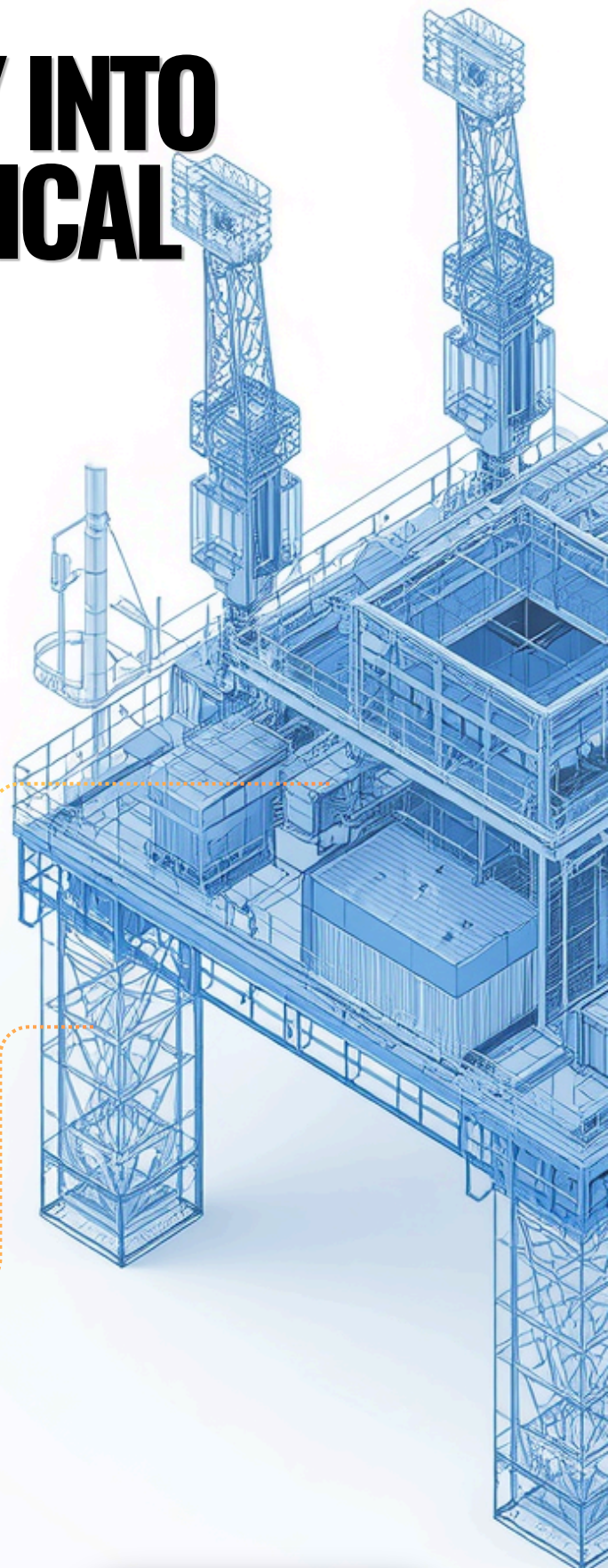
OPERATIONAL REALITY

Limited human presence
Remote offshore environment
Maintenance-based occupancy

Consequence

Safety cannot rely primarily on human intervention.

"In general, they are uninhabited during the year.
They are operated five weeks per year."



MAJOR RISKS IDENTIFIED



EVACUATION

Considered during:
Layout design
Circulation paths
Helicopter access
Lifeboat evacuation

"Among the major risks, evacuation means are the first thing that must already be considered."

DESIGN PRIORITIES

Passive protection systems
Safety integrated during design
Anticipation of operational constraints
Robust infrastructure philosophy

"In OSS, we really try to make everything passive, we try to limit human intervention."

CAPEX VS SAFETY

Industrial pressure

- footprint reduction
- weight optimization
- CAPEX reduction

"A platform is always compact... we reduce the surfaces, therefore the weight, therefore the cost."

INDUSTRIAL TRANSITION

Example of Transferred methodologies

- Hazard Identification (HAZID)
- HAZOP
- Quantitative Risk Assessment (QRA)
- ...

"Most people working now in offshore wind come from oil and gas."

SYSTEMIC CHALLENGE

As offshore infrastructures become:

- more automated
- more compact
- less dependent on operators

→ Safety progressively shifts upstream into engineering and design phases.



FIRE PROTECTION

Focus areas:
Transformer protection
Extinguishing systems
Equipment positioning

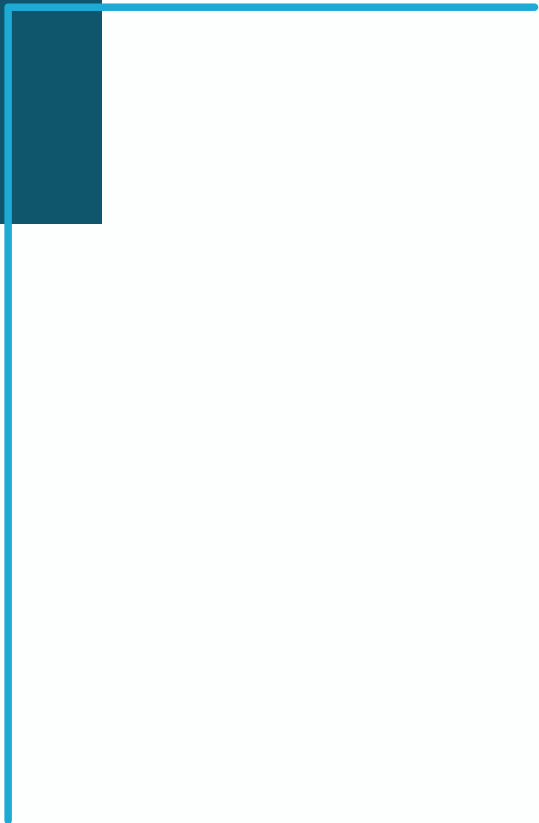
"The transformer must not catch fire... we have to design fire protection systems."



ENVIRONMENTAL RISK

Critical concern:
Containment of technical fluids
Offshore pollution prevention

"Leaks that could pollute the sea must not be neglected."



A blue-tinted wireframe image of a large ship, possibly a research vessel or offshore supply ship, sailing on the ocean. The ship's structure is overlaid with a grid pattern, giving it a technical, digital appearance. The background shows the ship's wake on the water.

OUR REAL PROJECT REFERENCE

GLOBAL COMMISSIONING SUPPORT ENGINEERED FOR COMPLEX OFFSHORE DELIVERY



PROJECT SNAPSHOT

FPSO REDEPLOYMENT

- Asset life extension
- System upgrades & integration
- Fast-track program



TYPE

- FPSO – 257m length
- 70,000 barrel per day
- Built in 2014 by Samsung



KEY CHALLENGE

CONSTRAINED EXECUTION ENVIRONMENT

- Limited time & utilities
- High system interdependencies
- Strong regulatory exposure

➔ REQUIRES DISCIPLINED ANTICIPATION AND EXECUTION CONTROL



KEY DELIVERY METRICS

280 000+ *

MAN-HOURS DELIVERED

80+

COMMISSIONING PROCEDURES

**FULL COMMISSIONING
LIFECYCLE COVERED**



120+

TECHNICAL RECOMMENDATIONS

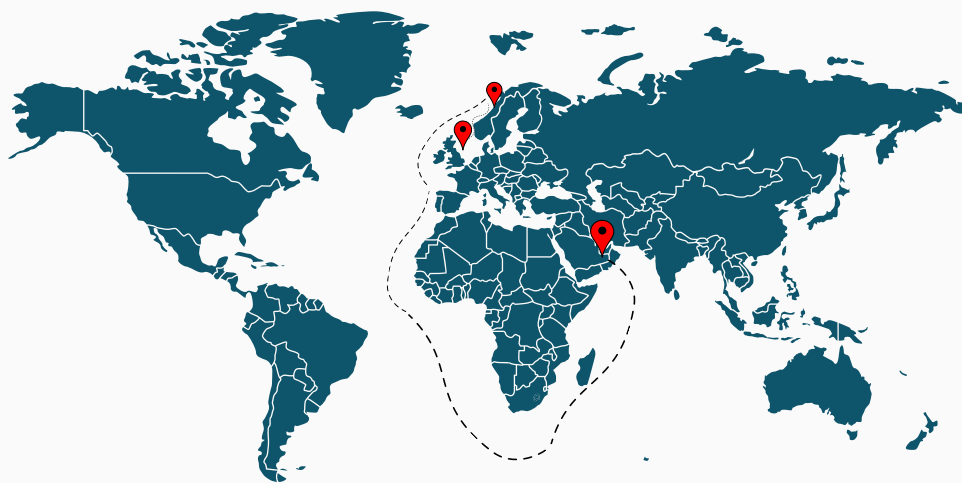
130+

SYSTEMS/TOPICS REVIEWED

* OVER A 6-MONTH PERIOD



GLOBAL EXECUTION MODEL



UNITED ARAB EMIRATES

Engineering & Commissioning support
Preparation & planning
Revamping living quarter & safety systems
Technical coordination

NORWAY

Deepsea lifting operations
Commissioning of critical systems

UK NORTH SEA

Project Execution
Offshore commissioning

GLOBAL ANOTECH TIMELINE



JANUARY 2025

Independent cold-eye review completed.

JUNE 2025

Mobilisation phase, including commissioning and mechanical completion management.

DECEMBER 2025

Over 120 systems commissioned within a 6-month period.

FEBRUARY 2026

Sail-away:
Dubai → Namibia (crew change) → Norway.

APRIL 2026

- closing of yard operation and preparation of Norway transfer
- Support provided for yard commissioning in Norway.

JUNE 2026

Offshore commissioning operations in the North Sea, UK.

➔ INTEGRATED DELIVERY & CONTINUOUS COORDINATION

SCOPE OF SUPPORT

- Commissioning planning & integration
- System prioritization
- Mechanical completion management
- Procedures & documentation review
- Vendor coordination & FAT
- Preservation strategy
- Utilities & temporary systems
- Operations handover

Led by our Anotech experts

DELIVERY APPROACH

- ANTICIPATION**
Early risk identification
- PRAGMATISM**
Execution based on site constraints
- INDEPENDANCE**
Objective "cold-eyes" review
- INTEGRATION**
Commissioning as a project driver
- AGILITY**
100% mobility, to meet project needs



KEY CHALLENGES

CHALLENGES IDENTIFIED DURING THE COLD EYE REVIEW AND HOW WE ADDRESSED THEM.



DRY-DOCKING PHASE

OPTIMIZED WORKLOAD SEQUENCING TO SUPPORT COMPRESSED TIMELINES.



MANNING & VENDOR REQUIREMENTS

ALIGNED RESOURCE PLANNING WITH SCHEDULE AND STAFFING DEMANDS.



SCHEDULE

IMPLEMENTED DETAILED PLANNING WITH CLEAR COMMISSIONING PRIORITIES.



REPORTING

STRUCTURED REPORTING WITH ACTIONABLE PROJECT INSIGHTS.



ENGINEERING DELIVERABLES

ACCELERATED DOCUMENT MANAGEMENT TO SECURE COMMISSIONING READINESS.



REGULATORY ALIGNMENT

ENSURED ALIGNMENT WITH NORSOK AND UKCS REQUIREMENTS.



TECHNICAL VALUE



Risk Reduction

→ Early identification of constraints



Execution Clarity

→ Defined commissioning scope



Interface Control

→ Improved coordination



Compliance Support

→ Strengthened documentation



HSE Excellence

→ Zero incidents during execution



EXPERIENCE LEVERAGE

BUILT ON PRIOR OFFSHORE EXECUTION :



Multi-asset environments



Multi-country coordination



High-pressure delivery



Transportation & Preservation task

→ DRIVING PREDICTABILITY AND RELIABILITY

REVAMPING EXECUTION COMPLETED THROUGH SAIL AWAY,
ON TIME AND READY FOR OPERATIONS.

WE ENSURES
THE RIGHT TECHNICAL EXPERTISE IS
DEPLOYED WHERE EXECUTION MATTERS MOST.





