Host

Energy markets and geopolitics

NOCS AND THE EVOLVING GLOBAL ENERGY MAP: FROM RESOURCE CUSTODIANS TO ARCHITECTS OF ENERGY SECURITY

As global energy markets face increased geopolitical uncertainty and volatility, the need for a secure, stable and resilient energy future has never been more important. ADIPEC has launched this **Energy markets and geopolitics** series to provide market insights into the impact of the ongoing conflict on global energy markets and the way forward for the industry.

The series provides decision-makers with informed analysis, helping the industry navigate disruption, assess risk, and identify pathways to resilience in an increasingly complex energy landscape.

From transition to transformation: rethinking the global energy mix

Roland Rechtsteiner, Partner at McKinsey & Company, discusses the evolving role of oil and gas companies and the key changes shaping the energy sector.

From your point of view, could you give us an insight into global perspectives on where the energy sector is today?

What we have are a few fundamental shifts in the global energy mix. I think, most notably, whilst in the past there was always a conversation about reduced volumes in global oil demand, we now see oil demand plateauing around 2035.

Secondly, with LNG or gas in general, we now have a very clear view that this is not a transition fuel but a destination fuel. We also see that around 2050, about 25% of the global energy mix will still come from gas. And the interesting part is that about 75% of the growth is coming from Asia.

When you think about coal, where we originally thought it would have peaked in 2014, we currently have the highest coal consumption ever, predominantly driven by met coal for steel manufacturing, but on the other side, also by thermal coal, still in many regions.

We also have a very clear view of the power side, where we see power consumption doubling between now and 2050. And whilst the majority of that power consumption will be driven by home and road usage, we see significant future growth, also driven by data centres and any H2 usage. Also, on the H2 side, we see deferred development because the price levels achievable today are not yet within the range of the offtake agreements being signed.

> “The energy transition is continuing, but whilst historically it has been driven by sustainability discussions, it’s now much more driven by affordability, security, and independence.”

Roland Rechtsteiner, Partner at McKinsey & Company

What are the structural shifts that you see in the energy markets?
The energy transition is continuing, but whilst historically it has been driven by sustainability discussions, it's now much more driven by affordability, security, and independence. That is driving a slightly different perspective on which technologies are prevailing in different parts of the world. To achieve energy security, you need energy independence. And that's obviously very different from country to country in terms of what the energy mix will be.

The growth of the energy sector comes with its challenges and headwinds. What are the long-term challenges that you see ahead?
We've seen this in many different regions: the question around which technology will ultimately prevail. Right now, it's a very wide technology mix, but for each technology, it could be twice as much or half as much as the forecast, because we don't know how the technology will develop. The challenge is how to support market developments and investments through government action at the same time. To manage this situation – where you want to build efficient markets and drive different technologies – and at the same time think about what is best for the country, from a sustainability perspective, and how to drive that through government action. I think that's one of the key issues to look at. The second key issue, which is very important for India, is that, given the size and the level of energy demand, it is necessary to achieve as much independence as possible. And again, that might drive different priorities for the energy mix in the future than if it were left purely to cost or competitiveness.

What things are required to make this happen?
There are two things that have to happen. To achieve that independence and energy security, we have to reach a point where, as said before, markets are built competitively, and at the same time, there is government action to support the creation of the right energy mix for the country. And then for the independence again, there will always be connectivity to the global world around energy imports, for instance, on the fossil side, as well as energy exports predominantly on the fossil side as well, where I think it's quite important for India to build a trading ecosystem where it is able to not depend on single markets, but can trade commodities on a global basis. ■

NOCs and the evolving global energy map: from resource custodians to architects of energy security

Executive summary

The global energy system is undergoing its most significant transformation in decades. Geopolitical fragmentation, rising electricity demand, AI-driven data centre growth, supply chain vulnerabilities, and decarbonisation commitments are reshaping how nations think about energy security.

In these circumstances, national oil companies (NOCs) are evolving beyond their traditional role as hydrocarbon producers. Increasingly, they are becoming architects of integrated energy systems responsible for balancing energy security, affordability, and sustainability.

This shift is occurring at a critical moment. NOCs control approximately 50% of global oil and gas production and more than 60% of proven oil and gas reserves, giving them a unique ability to influence the pace and direction of the energy transition. As governments seek secure and affordable energy while pursuing emissions reductions, NOCs are emerging as essential institutions capable of mobilising capital, developing infrastructure, and de-risking long-term investments across multiple energy vectors.

> “For many NOCs, natural gas is no longer viewed simply as another hydrocarbon business. It is increasingly positioned as a strategic transition fuel capable of supporting industrial development, power generation and energy security while enabling emissions reductions through coal-to-gas switching.”

The return of the energy trilemma

For much of the last decade, energy policy was dominated by decarbonisation. Now, policymakers must balance three competing priorities simultaneously: energy security, affordability, and sustainability.

Recent events have demonstrated why this balance matters. The disruption of Russian gas supplies to Europe, continued volatility in LNG markets, supply chain disruptions, and geopolitical tensions affecting critical shipping routes have exposed vulnerabilities throughout the global energy system. Conflicts in the Middle East have highlighted how quickly regional instability can affect global energy markets and LNG availability. Geopolitical tensions could remove as much as 120 billion cubic metres (BCM) of LNG supply from expected global markets between 2026 and 2030. As a result, expectations of NOCs have changed dramatically. They are no longer evaluated solely on production growth or reserve replacement. Governments increasingly expect them to maintain reliable supplies, stabilise domestic markets, support industrial competitiveness, reduce emissions, and create future energy industries.

The challenge is considerable. Global energy demand is forecast to keep rising, driven largely by emerging economies and rapid electrification. Simultaneously, investors, regulators, and consumers are demanding lower-carbon energy solutions.

120 bcm

The volume of LNG supply that could be removed from expected global markets between 2026 and 2030

Managing today while building tomorrow

Leading NOCs are distinguished by their ability to operate across multiple time horizons. They must respond to immediate energy security concerns while simultaneously investing in infrastructure that may take decades to generate returns, as large-scale energy assets such as LNG terminals, hydrogen networks, carbon capture and storage facilities, transmission grids, and industrial hubs require significant upfront capital, lengthy development timelines, and long operational lifespans.

This dual mandate is particularly evident in natural gas: approximately 300 BCM per year of new LNG export capacity is expected to come online globally by 2030, primarily from the United States and Qatar. Together, these two countries account for roughly 70% of all new LNG capacity currently under development.

At the same time, global gas demand is expected to grow by approximately 380 BCM per year by 2030. Asia Pacific alone is forecast to account for around half of that increase, while the Middle East is expected to emerge as another major source of demand growth. China is projected to contribute to around one-quarter of global gas demand growth through 2030.

For many NOCs, natural gas is no longer viewed simply as another hydrocarbon business. It is increasingly positioned as a strategic transition fuel capable of supporting industrial development, power generation, and energy security while enabling emissions reductions through coal-to-gas switching.

ADNOC and the new NOC model

Among global NOCs, ADNOC provides one of the clearest examples of strategic evolution from a hydrocarbon producer to an integrated energy provider. Its 'Maximum Energy, Minimum Emissions' strategy reflects a broader trend among leading NOCs seeking to balance production growth with decarbonisation.

ADNOC is targeting a production capacity of 5 million barrels per day (mbpd) while pursuing some of the lowest upstream carbon intensity levels globally. The company is also targeting carbon capture capacity of up to 10 million tonnes of CO2 per year by 2030 and is electrifying offshore operations through connection to the UAE's clean energy grid. These investments reflect the growing importance of emissions performance, energy security, and affordability.

At the same time, ADNOC is expanding into LNG, hydrogen, chemicals, and renewable energy. Through its partnership with Masdar, which is targeting a renewable energy portfolio exceeding 100 gigawatts (GW) by 2030 and aims to become a leading producer of green hydrogen globally, ADNOC is building exposure to future growth markets while maintaining its position in conventional energy.

The rationale is straightforward. Even under aggressive energy transition scenarios, global oil and gas demand is expected to remain substantial for decades, while customers, regulators, and investors increasingly require lower-carbon energy solutions. The winners will be those able to deliver both, meeting today's energy demand while positioning themselves for future growth.

ADNOC illustrates a broader shift in the role of NOCs. Competitive advantage is moving beyond resource ownership toward the ability to integrate hydrocarbons, molecules, electrons, carbon management systems, and renewable generation into a coherent energy platform across multiple decarbonisation pathways.

Across the Gulf, Asia, and other resource-rich regions, NOCs are increasingly repositioning as diversified energy companies rather than pure-play oil and gas producers.

50%

Of global oil and gas production is controlled by NOCs

Strategic capital allocation in an era of transition

One of the most significant challenges facing NOCs is capital allocation. Hydrocarbon businesses continue to generate revenues that fund new energy investments, yet uncertainty surrounding long-term oil demand is encouraging diversification. Global oil demand may peak before 2030 in some scenarios, while others anticipate growth extending into the 2040s and 2050s. Despite this uncertainty, NOCs are planning for multiple outcomes, leading to a more balanced capital allocation between legacy energy assets and future growth platforms.

The scale of investment required is substantial. Global energy investment exceeded US$3 trillion annually, with more than US$2 trillion directed toward clean energy technologies and infrastructure. Hydrogen project pipelines globally now represent several hundred billion dollars of announced investment, while carbon capture utilisation and storage (CCUS) projects under development exceed 400 million tonnes of annual capture capacity, and oil and gas investment remains above US$1 trillion annually.

For NOCs, the challenge is not choosing between traditional and new energy systems but balancing both. Investment continues to flow into upstream production, LNG, refining, and petrochemicals, while simultaneously expanding into renewable energy, hydrogen, CCUS, direct air capture, and digitalisation. Strategic capital allocation is therefore increasingly focused on maximising hydrocarbon cash flow while building exposure to future growth markets.

Human capital is equally important. Future NOCs will require expertise in hydrogen, advanced materials, electrochemistry, digital engineering, power systems, and artificial intelligence (AI). The transformation of the workforce may prove as important as the transformation of physical infrastructure.

300 bcm

The LNG export capacity per year expected to come online globally by 2030

From pipelines to energy corridors

The geography of energy is shifting from linear flows of oil and gas between producing and consuming markets toward a more interconnected architecture of molecules, electrons, and critical materials. Critical materials such as lithium, copper, nickel, and rare earth elements are essential to the energy transition, but their uneven geographic distribution and highly concentrated supply chains create structural constraints and new geopolitical risks. Fragmentation across mining, refining, and manufacturing, particularly in rare earth processing in China and cobalt extraction in the Democratic Republic of Congo, reinforces global supply chain vulnerabilities.

Future energy corridors will therefore expand beyond hydrocarbons to include hydrogen and ammonia trade routes, carbon transport and storage networks, and cross-border electricity interconnections. These are already emerging through Gulf-led hydrogen and ammonia export chains linking the Middle East to Europe and Asia, CCUS hubs in Saudi Arabia and the UAE, and expanding Gulf Cooperation Council electricity interconnections that lay the groundwork for future HVDC links.

At the same time, demand is shifting, with Asia Pacific driving growth through 2030 while the Middle East and North Africa emerge as key exporters of low-carbon fuels, hydrogen, and carbon-managed industrial products. This creates a strategic opening for NOCs to evolve from resource developers into architects of global energy corridors linking future supply and demand centres.

380 bcm

The expected growth in global gas demand per year by 2030

Building the partnership model

No single institution can finance or deliver the energy transition alone. The scale of investment required is unprecedented, demanding deep collaboration between governments, sovereign wealth funds, NOCs, utilities, technology providers, industrial customers, and research institutions. This reflects a shift from vertically integrated energy planning to horizontally coordinated ecosystem governance, where value creation depends on system-wide alignment rather than isolated project execution.

Within this ecosystem, NOCs are uniquely positioned. They combine sovereign backing, engineering capability, strong balance sheets, long-term investment horizons, and access to global markets. These strengths make them natural anchors for scaling emerging technologies such as CCUS, direct air capture, advanced hydrogen production, and deep geothermal energy.

Industrial clusters further illustrate this model. Shared infrastructure hubs such as Ruwais demonstrate how integrated systems of pipelines, power generation, export terminals, and carbon storage can reduce

costs, lower investment risk, and attract private capital. Similar models will be critical in accelerating clean industrial ecosystems globally. These clusters represent early evidence of platform-based energy systems, where infrastructure convergence creates compounding efficiency and capital attraction effects.
Ultimately, the future of global energy will not be defined solely by the pace of renewable deployment or the decline of hydrocarbons, but by institutions capable of managing both simultaneously. NOCs are increasingly positioned to fulfil this role, evolving from resource custodians into integrated energy system architects.
The most successful NOCs will not simply optimise existing hydrocarbon systems. They will build the infrastructure, partnerships, and investment frameworks required to deliver secure, affordable, and lower-carbon energy systems at scale.
In an era defined by geopolitical uncertainty and rising energy demand, collaboration is no longer optional but foundational. NOCs that successfully align energy security with long-term transformation will become the anchors of the next global energy map, emerging as system-level balancing institutions operating at the intersection of energy markets, capital allocation, and geopolitical stability. ■

5 mbpd

The production capacity ADNOC is targeting

Sources and acknowledgments:

ADNOC; AGBI; Carbon Sequestration Leadership Forum (CSLF); GCCIA; IEA; ScienceDirect; S&P Global, World Economic Forum (WEF)

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* All data and information in this report is valid as of 1 June 2026.