Saudi Aramco awards $25bn in contracts for gas expansion

Saudi Aramco, the world’s biggest oil producer, has awarded contracts worth more than $25bn for the second phase of the expansion of its Jafurah gas field and the third phase of expanding its main gas network.

The development of the Jafurah field, which is estimated to hold 200 trillion cubic feet of gas, is expected to cost $100bn and boost the state energy firm’s gas production by more than 60 per cent by 2030.

“These contract awards demonstrate our firm belief in the future of gas as an important energy source, as well as a vital feedstock for downstream industries,” said Amin H. Nasser, Aramco president & CEO.

“The scale of our ongoing investment at Jafurah and the expansion of our master gas system underscores our intention

to further integrate and grow our gas business to meet anticipated rising demand.”

Aramco awarded 16 contracts, worth a combined total of around $12.4bn, for phase two development at Jafurah. This phase will include the construction of gas compression facilities, pipelines, the expansion of the Jafurah gas plant, gas processing trains, utilities, sulfur, and export facilities.

The expansion includes the construction of new riyas natural gas liquids (NGL) fractionation facilities in Jubail, including NGL fractionation trains, utilities, storage, and export facilities.

The state-energy giant also awarded 15 lump sum turnkey contracts worth approximately $8.8bn to kick off the phase three expansion of the master gas system. The expansion will increase the size of the network and raise its total capacity by an additional 3.15 billion standard cubic feet per day (bscfd) by 2028 through the installation of around 4,000km of pipelines and 17 new gas compression trains.

Furthermore, Aramco awarded an additional 23 gas rig contracts worth $2.4bn, two-directional drilling contracts worth $612m, and 13 well tie-in contracts at Jafurah, for a total of $1.63bn.

Aramco’s LNG ambitions

Saudi Arabia is working on developing its unconventional gas reserves, which require advanced extraction methods such as those used in the shale gas industry.

Aramco signed 40 corporate procurement agreements worth $6bn with local suppliers in February as the state-owned energy giant seeks to develop the country’s energy services sector while boosting its localisation programme.

The agreements cover the supply of a range of products

comprising strategic commodities, such as instrumentation, electrical, and drilling equipment.

Meanwhile, an additional 15 trillion standard cubic feet of gas (scfd) were proven at Aramco's Jafurah field in February, adding significant volumes to the kingdom's proven gas and condensate reserves.

The company estimates that Jafurah's reserves have reached 229 trillion cubic feet of gas and 75 billion barrels of condensates. Jafurah is the country's largest unconventional non-oil-associated gas field and reportedly the biggest shale gas development outside of the US.

Aramco is expanding its portfolio into LNG at a time when global demand for the fuel has surged, particularly in Europe, which is replacing reduced pipeline supplies from Russia. It forayed into the global LNG market last September by acquiring a minority stake in EIG Partners' MidOcean Energy in a deal valued at $500m.

The state-energy giant signed non-binding agreements with two US energy firms Sempra and NextDecade, for the supply of 5 million tonnes per annum (mtpa) and 1.2 of mtpa LNG, respectively, for 20 years.

How Europe can get the Green Deal done

Since the European Green Deal was introduced in 2019, European Commission President Ursula von der Leyen has touted it as the European Union's new economic-growth agenda. After all, while the strategy's core objective is climate-related – to reduce the EU's greenhouse-gas emissions to net-zero by 2050 – it aims to achieve that by modernising the economy and fostering innovation. But not everyone is convinced.

In recent months, European drivers have complained about the EU's looming ban on the production and sale of cars with internal combustion engines, households have resisted plans to phase out gas boilers, and farmers have revolted against environmental regulations they view as overbearing. With the approach of next month's European Parliament elections, far-right parties are jostling to establish themselves as the official standard-bearers of this growing discontent and preparing to use any power they win to sabotage the green agenda.

The protesters make some legitimate points. The radical transformation that the European Green Deal entails raises difficult questions about who should bear the costs of climate

action, both within and among countries. If those costs end up falling disproportionately on ordinary workers – let alone the poorest and most vulnerable communities – the transformation will exacerbate inequality, with potentially serious social and political knock-on effects. Fortunately, properly designed climate policies can avert that outcome and actually lead to greater social equality.

The European Green Deal has accounted for climate-justice considerations since the beginning. Advocates always knew that they would need to secure the political support of coal-intensive Poland, and they had not forgotten the "yellow vest" revolt that erupted in France in 2018, after President Emmanuel Macron attempted to introduce a carbon tax in road transport.

It is no coincidence that the first flagship initiative under the European Green Deal was the Just Transition Fund, which will dedicate €20bn ($21.6bn) in 2021-27 to support the "economic diversification and reconversion" of the territories expected to be the most negatively affected by the green transition. Nor is it a coincidence that, while creating the first-ever carbon market for buildings and road transport, the European Commission established the Social Climate Fund, which is expected to mobilize at least €86.7bn between 2026 and 2032 to compensate the most vulnerable groups for higher energy prices.

These policy initiatives reflect the advice one would find in the economic literature on carbon dividends. But they will prove insufficient to offset the profound distributional effects of climate policy, particularly as decarbonisation accelerates and includes sectors that directly affect ordinary people's daily lives, such as buildings and transport. That is why Europe also needs a new green social contract, which focuses primarily on these sectors.

To this end, the EU should streamline and simplify existing funding instruments to deliver even more decisive support for the transformation of coal and carbon-intensive regions. It should also take steps to ensure that EU countries make

better, more targeted use of carbon-market revenues to support the uptake of green alternatives, from electric vehicles to home heating systems. And it should push for a "Rural Green Deal" that supports small farmers while requiring the agri-food industry to transform its systems. While such EU-level action would not eliminate the distributional consequences of climate policy, it would help significantly.

The EU must also turn decarbonisation into a real economic opportunity by developing a solid green industrial policy. This will require, first and foremost, revitalising the "boring" EU single-market agenda, in order to leverage the bloc's greatest asset – a huge shared market for goods, financial services, energy, workers, and ideas – to incentivise new investments in clean tech.

Interventions in specific technology areas will also be needed. Rather than mimic the broad-based US Inflation Reduction Act, the EU should make the most of its limited resources by delivering targeted support in areas where it already has a solid comparative advantage on which to build. While some incumbent industries might need support as they decarbonise, supporting breakthrough innovations should be the primary goal.

The European Green Deal has come a long way since it was conceived five years ago. But if the EU is to achieve its 2030 climate goals and achieve net-zero emissions by 2050, it must act now to ensure that it can weather the inevitable political headwinds. A new green social contract and industrial policy can make all the difference. – Project Syndicate

- *Simone Tagliapietra, a senior fellow at the Brussels-based think-tank Bruegel, is an adjunct professor at the Johns Hopkins University School of Advanced International Studies, Bologna.*

Potential Qatar-Greece investment ties seen in energy, high-tech industries

Greece’s economic resurgence with Prime Minister Kyriakos Mitsotakis at the helm is seen to open potential Qatari investments in a wide range of sectors, including energy, tourism, and high-tech industries.

In an exclusive interview with Gulf Times, Energy and Environment Holding CEO Roudi Baroudi underscored the growing bilateral ties of both countries, saying Qatar is well-positioned to capitalise on Greece’s economic stability, which has been attracting foreign direct investments (FDI).

“After the bond and fiscal crisis that Greece went through in 2012-2014, it took them a few years of solid reconsolidating their books with the assistance of the IMF, the World Bank, and especially the EU…the stupendous economic growth brought about by Prime Minister Mitsotakis has brought a lot of FDI back.

“Qatar has always had certain private investments in the financial and energy sectors. Today, Greece is a hub for diverse investment opportunities and its economy is open to different markets other than just tourism, real estate, and industry, but they have direct access to Europe, as well, in terms of oil and gas,” Baroudi explained.

Baoudi noted that the energy sector, particularly liquefied natural gas (LNG), is vital in enhancing further Qatar-Greece investment opportunities and economic ties. He also said Qatar’s decades-long expertise in the LNG industry could help catalyse Greece’s bid to become a major logistics centre.

“Greece has probably the largest ships, crude tankers, and gas

tankers in the world, making them one of the leaders in the global maritime business. Qatar's LNG capabilities are already well-established with more than a dozen LNG ships working for QatarEnergy subsidiaries," Baroudi noted.

At the Qatar Economic Forum held in Doha last month, HE the Minister of Finance Ali bin Ahmed al-Kuwari emphasised that Qatar's energy sector is performing "very well," citing QatarEnergy's plans for a new LNG expansion project that would further raise the country's LNG production capacity to 142mn tonnes per annum.

Al-Kuwari said, "We are going to increase Qatar's (liquefied natural gas) production by 85% in a phased manner until 2030. We are going to be reaching 142mn tonnes per annum of LNG."

According to Baroudi, recent developments in Qatar's energy industry could extend potential investment opportunities with Greece beyond shipping to LNG infrastructure. "Qatar's expertise could be crucial as Greece expands its LNG port to supply gas to neighbouring countries following the Ukraine-Russian war. QatarEnergy is also making strategic investments in the Eastern Mediterranean, such as in Cyprus and Egypt as part of a larger regional strategy," he said.

Baroudi also pointed to knowledge exchange as another avenue for collaboration and investment in terms of port management. "There is no question that Hamad Port will benefit a lot from further co-operation with the Port of Piraeus, which is Greece's largest port, and the second largest in the Mediterranean," Baroudi stated.

Asked about potential partnerships outside the energy sector and port management, Baroudi said both countries could also forge joint opportunities in digital connectivity, artificial intelligence (AI), and clean tech. Among other industries, Baroudi also noted that Qatar could expand its tourism and hospitality footprint amidst Greece's favourable economic

environment.

Economic development in an age of great-power competition

Now that the United States has introduced a new set of import tariffs on Chinese goods, the world's two largest economies appear to be on the brink of open economic warfare – and developing countries are in danger of getting caught in the crossfire. Beyond the risk that they could face sanctions or other trade restrictions if one superpower perceives them to be helping the other, Sino-American trade tensions are eroding the value of many of these economies' comparative advantages, such as cheap labour and land. Coping with these challenges will require skillful economic statecraft.

Comparative and competitive advantages are dynamic by nature; they can be acquired or lost over time. As Harvard's Michael

Porter put it in 1990, “National prosperity is created, not inherited. It does not grow out of a country’s natural endowments, its labour pool, its interest rates, or its currency’s value, as classical economics insists.” Rather, an economy’s competitiveness “depends on the capacity of its industry to innovate and upgrade.”

As a growing number of governments pursue industrial policies – from short-term protective measures, like tariffs, to more forward-looking initiatives, such as targeted subsidies and deep structural reforms – the capacity to innovate and upgrade depends significantly on the state’s ability to work with the market to boost competitiveness. This poses a challenge for advanced economies no less than it does for developing countries.

Consider Europe, which was forced to rethink its prevailing business model – selling high-quality engineering products – after Russia’s full-scale invasion of Ukraine in 2022. As supply chains were disrupted, and energy costs and inflation soared, Europe’s reliance on others for critical goods, including inputs for its own manufacturing, became an enormous economic liability. Add to that China’s growing dominance in electric vehicles, and Europe finds itself increasingly anxious about its future competitiveness.

To be sure, many European economies remain highly competitive: Europe dominates the top 20 of the International Institute for Management Development’s 2023 World Competitiveness Rankings, with Denmark, Ireland, and Switzerland leading the pack. But Europe’s larger economies have been sliding in the rankings. Germany dropped seven spots between 2022 and 2023, to 22nd place, and France fell five spots, to 33rd.

One problem, pointed out in a report from the McKinsey Global Institute, is that while Europe leads in sustainability and inclusivity, per capita GDP (at purchasing power parity) is lagging. In 2022, it was 27% lower than in the United States,

with about half that difference attributable to cultural norms – Europeans work fewer hours per capita over their lifetimes – and the other half resulting from differences in productivity levels. Boosting productivity is now a central concern of European policymakers and will have to be addressed partly through the development of high-tech industries.

This approach has certainly worked for the US, which spends 3.5% of its GDP on research and development – a smaller share than South Korea (4.9%) and Israel (5.6%), but significantly larger than China (2.4%) and the European Union (2.2%). All of these economies are devoting considerable attention to dual-use R&D in strategic areas like artificial intelligence, green tech, and quantum computing. What stands out about the US is that, while the government is providing funding and incentives, not least through the 2022 Inflation Reduction Act, it is the private sector that is driving plans to invest $400-500 billion in R&D over the next decade.

As a report by the Boston Consulting Group notes, R&D is part of a "virtuous cycle of innovation" that sustains America's technological leadership. For example, the US claims 46% of the global market for semiconductor design. Thanks to its advanced technologies, the US semiconductor industry has a gross profit margin of 59%, which is 11 percentage points higher than competitors. In 2020, US semiconductor revenues reached $208 billion – twice the revenues of the second-leading country.

But not just anyone can emulate America's high-tech success, which is partly a function of its large and dynamic capital market. In 2022, the total market capitalization of the US stock market was 2.5 times higher than that of Europe. As a share of GDP, total market value in the US exceeded 158% in 2022, lower than Taiwan (195% of GDP), but higher than every other economy, including China (65.4%), Japan (126%), Germany

(45.5%), and India (103.7%).

With its deep capital markets, the US is well-positioned to generate funding for high-risk R&D and, more importantly, reward and retain talent. Other economies – including China, the EU, Japan, and most developing countries – cannot compete on this front, not least because their banking systems remain far more risk-averse.

Recognizing America's comparative advantages in high-tech sectors, China focused on building prowess in mid-tech areas of engineering and operational production and distribution, which opened the way to comprehensive competition at scale. Since 2014, China has led the world in exports of high-technology goods, accounting for more than 30% of the global market share. Since 2000, it has tripled its share of gross value added.

For developing countries, this means that it will be very difficult to compete in mid-tech industries, not just the high-tech sectors that the advanced economies (and, increasingly, China) dominate. Add to that their limited capacity to finance investment and their dependence on access to global or regional markets to achieve economies of scale, and economic statecraft becomes all the more challenging.

Some priorities are clear. To achieve technological upgrading, countries must invest as much as possible in digital infrastructure and education, as well as projects related to the United Nations Sustainable Development Goals. To cope with rising protectionism among major economies, they will most likely also increase support for domestic "champions," even if it means perpetuating market fragmentation.

Overall, however, we will probably see a lot more experimentation in development strategies in the coming years. Developing countries will just have to hope that the US and China come to some sort of grand bargain before their

competition escalates into conflict.

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‘Saudi Aramco in LNG talks with US Tellurian, NextDecade’

Reuters

London

Oil giant Aramco is in talks with US firms Tellurian and NextDecade on two separate LNG projects as the Saudi firm

seeks to boost its gas trading and production, three sources close to the talks told Reuters.

US gas production has boomed over the past decade with oil majors and Aramco's rivals competing to build several projects to export gas to Europe and Asia.

The state energy firm is in talks with Tellurian to buy a stake in its 27.6mn metric tonne per annum (mtpa) Driftwood LNG plant near Lake Charles, Louisiana.

Aramco officials visited the site three times last month – including together with executives from Australia's Woodside on one of those occasions, said the sources who declined to be identified as talks are not public. Aramco is also in talks with US LNG firm NextDecade for a long-term gas purchase agreement from a proposed fifth processing unit at its $18bn Rio Grande facility.

Aramco declined to comment. Tellurian said it does not comment on market speculation. Woodside said it continuously assesses organic and inorganic growth opportunities but declined further comment. NextDecade did not immediately respond to Reuters request for comment.

Aramco is seeking to strengthen its position in the LNG market, which is set to grow by 50% by 2030, especially in the US, where LNG capacity is set to almost double over the next four years.

Tellurian has spent years and hundreds of millions of dollars on trying to finance and build the Driftwood plant.

Last fall, Tellurian warned investors that continued losses and dwindling cash reserves might not be enough within a year to cover operating and debt costs.

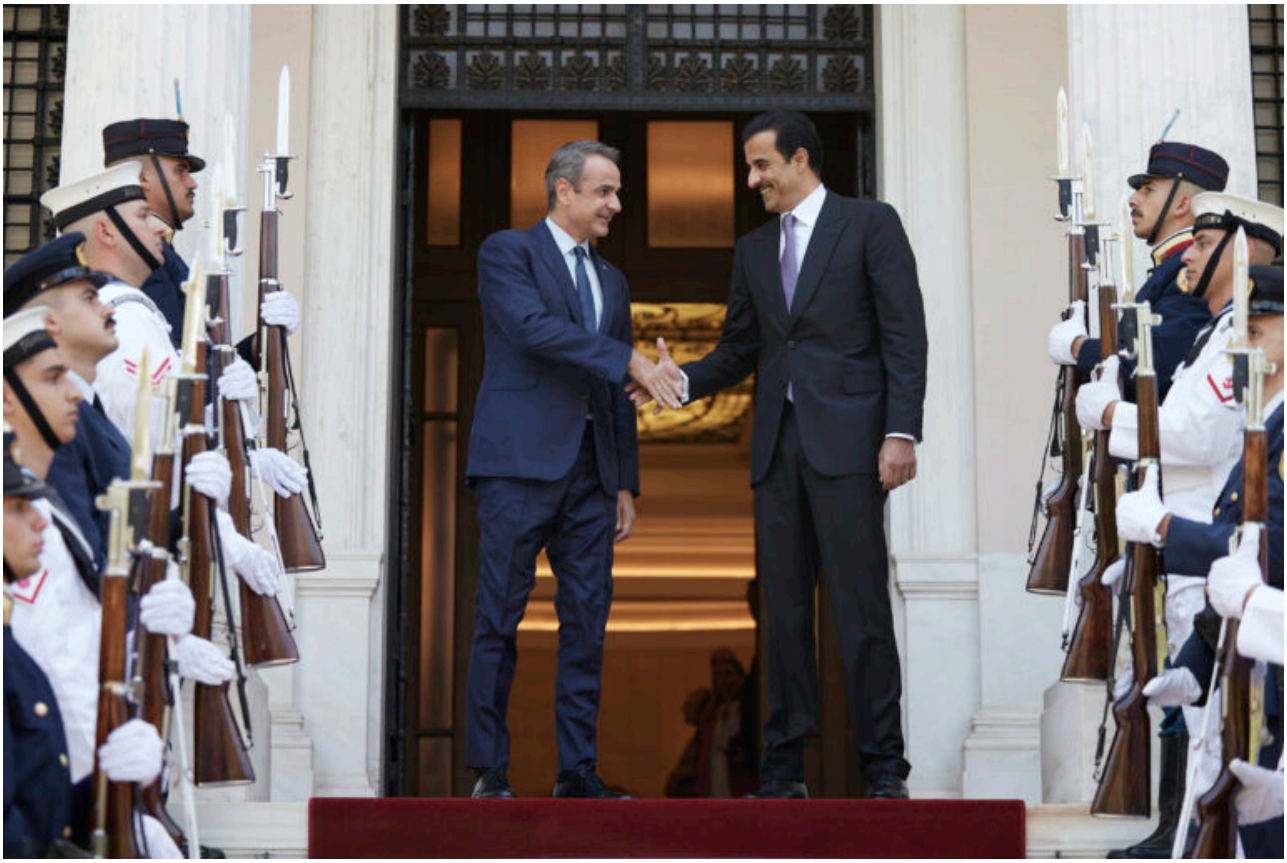
Aramco is one of the world's largest oil producers and top exporter, pumping nearly 10% of the world's crude supply.

Aramco made its first LNG investment abroad when it bought a stake in US MidOcean Energy for $500mn last year.

In March, Reuters reported that Aramco was in talks to invest in Sempra Infrastructure’s Port Arthur project in Texas.

It is also competing with Shell to buy the assets of Temasek-owned LNG trading firm Pavilion Energy.

EMIR IN GREECE AND CYPRUS



Political 04.06.24
Interview by ALEXIA TASOULI
DIPLOMATIC CORRESPONDENT
POLITICAL.GR NEWSPAPER

Athens, Friday 31st of May 2024: Qatar’s Emir Sheikh Tamim Bin

Hamad AlThani paid official visits to Cyprus and Greece this week, meeting with senior officials from both countries as part of efforts to expand cooperation. International energy expert Roudi Baroudi, CEO of Dohabased independent consultancy Energy and Environment Holding, sat down to answer a few questions about the outcome and significance of the emir's mission.

Question: Overall, how successful were HH the emir's visits to Greece and Cyprus?

Answer: Both visits appear to have been very fruitful. HH the emir and his delegation held constructive talks with their counterparts in both countries, and all sides came away with clearer understandings of where the already strong relationships should go next, and how they can get there. Several important first steps were taken toward identifying likely areas for further cooperation, and now both sides have the information they need to come up with proposals for the next steps on several fronts.

Q: From your perspective, what are the main takeaways from HH the emir's trip?

A: There are several elements at play here, multiple processes unfolding according to their own timelines, but all interrelated in some ways. The first thing to consider is that both visits constitute reaffirmations of Qatar's traditional diplomatic strategy, much of which revolves around having stable and friendly relations with as many counterparts as possible. That might sound a little basic, but it's really not: many governments "pick sides" in various international disputes, which often amounts to letting other countries decide your foreign policy for you. By contrast, the Qatari model seeks instead to be on good terms with all sides in most

disputes, and the value of that approach has been on display for years: Doha has successfully used its good offices as a mediator in the past, and more recently it has done the same for ceasefire talks and other negotiations between Israel and Hamas.

This same philosophy also informs Qatar's stances in the Mediterranean, where it looks for the warmest possible relations with Greece and Cyprus while simultaneously maintaining close ties with Türkiye, with which both Athens and Nicosia have been at odds for decades. I should mention, too, that Cyprus follows a similar path, maintaining friendly relations with both Israel and Lebanon, for example.

Both Cyprus and Greece also would like to play central roles in the development and buildout of facilities aimed at carrying energy to the European mainland. This is a core part of their respective plans to grow and develop their respective economies, and the necessary investment and expertise will require strong partnerships.

Q: So how do these priorities tie in with the emir's visit?

A: In several ways, really. First, HH the emir's goodwill visit is a reconnection: the COVID pandemic threw a lot of international issues into hibernation as governments everywhere spent a lot of time looking inward for several years. By visiting now, he's demonstrating in general that he values Qatar's relationships with both Cyprus and Greece. The reengagement also bodes well for particulars, and there are several opportunities for cooperation because the parties can help one another. Both Greece and Cyprus want to be part of plans to open new channels for natural gas into Europe, whether it's Eastern Mediterranean gas or from further afield. For this they could find no better partner than Qatar, which, in addition to its own worldleading LNG industry, has also

been acquiring stakes in energy assets around the world. But both countries also want investment in other sectors, too, and once again, both the Qatar Investment Authority, the country's sovereign fund, and various private investors are on the hunt for moneymaking ventures.

Q: What does the emir's trip mean for Greece, in particular?

A: To me the time looks ripe for more cooperation. The period since 20072008 has been very difficult, but the current government under Prime Minister Kyriakos Mitsotakis has done wonders, not just to stabilize the Greek economy and restore hope to the population, but also to help Greece regain its rightful place at the European table. The country is now looking to build on this foundation by fully embracing cuttingedge sectors like digital connectivity and cleantech, but also by reinvigorating its traditional shipping expertise by becoming a major logistics center and by getting more out if its hospitality sector, too. The long recession is over, and some asset classes look very attractive to Qatari investors — and others, as well — especially given the stronger, cleaner governance and leadership on which Mitsotakis has built his reputation.

Q: What about Cyprus?

A: Another European land of opportunity. All other things being equal, if the world operated according to logic instead of politics, Cyprus would already be a major energy hub. Its location makes it the ideal base for the Eastern Med's burgeoning offshore gas industry, which also includes strategic ports, telecoms, and other support services. Many analysts see real potential in several sectors, including

ports, banking, and a host of technologies. The increased economic activity will also introduce more people to the beaches and other attractions that make the island's tourism industry so popular. Another ingredient is leadership: President Nikos Christodoulides has been in office for less than a year, but the former diplomat and foreign minister has already shown himself to be both a highly competent Head of State and a stern defender of his country's economic development & interests.

And all this is not to mention the shipping of the gas itself, for Cyprus is not just part of the European Union: it is also very much an East Mediterranean country, so it stands to reason that it should become a gateway through which some of the world's newest gas producers can sell their wares into the world's largest gas market. Whether it's a pipeline to Greece, an LNG plant to supply customers in Asia and East Africa, or both, it's a nobrainer that Cyprus is the place to start the journey. To me, this is Cyprus' destiny, and if it's further Qatari investment that makes it happen, so much the better. Remember, too, that QatarEnergy is already involved in Cyprus' gas industry, partnering with ExxonMobil to explore two offshore blocks. The Qataris know the LNG business like no one else, and their robust & steady reliability as partners is unchallenged: in 20172021, despite an illegal blockade imposed by some of their neighbors, they continued to process and ship at the highest rates to keep supplying LNG to all of their customers around the world, helping to calm world markets during a very vulnerable period.

"Baroudi, left, with Mitsotakis at the 2019 EUArab World Summit in Athens, before the latter became Greece's prime minister. According to Baroudi, Mitsotakis has done much to speed his country's recovery."

Finally, the role played by Qatar and its leaders has captured the attention of the international community due to the wise policies of the Ruler of the Gulf state. His efforts have been lauded and appreciated by East and West alike, ranging from visits of goodwill by the Emir to regional countries, to forging relations based on mutual respect and cooperation. It also has been noted that visits by the Emir tend to manifest high levels of support in mediation, bringing peace, providing materials or otherwise, as and when needed.

Crunch time for the power sector

Many of us take electricity for granted. We flip a switch and expect the light to turn on. But the capacity and resilience of power systems – generation, transmission, and distribution – are not guaranteed, and if these systems fail, it's lights out for the entire economy.

I recently participated in a meeting of the Power and Energy Society (PES), which operates under the aegis of the Institute of Electric and Electronic Engineers. The mood at the event – attended by more than 13,000 industry professionals from around the world, plus hundreds of companies exhibiting advanced equipment and systems – was upbeat and energetic.

But, despite the prevailing "can-do spirit," everyone at that meeting knew that the power sector is confronting tremendous challenges, beginning with the growing frequency of extreme weather events. Firms are now working to devise innovative ways to restore power more quickly after outages, and are

investing in infrastructure that will increase resilience to shocks. This includes efforts to minimise the risk that the system itself will cause or exacerbate a shock, such as a forest fire.

Compounding the challenge, the power sector must make progress on the green transition. That means reducing its greenhouse-gas emissions, while maintaining a stable power supply for the economy. Since renewables work differently from fossil fuels, this implies a transformation not only of power generation, but also of transmission and distribution, including storage.

Meanwhile, demand for electricity is set to surge, owing to factors like electric-vehicle adoption and the rapid growth of data centres and cloud-computing systems. The power needs of artificial-intelligence systems, in particular, are expected to grow exponentially in the coming years. According to one estimate, the AI sector will be consuming 85-135 terawatt hours per year – about as much as the Netherlands – by 2027.

To meet these challenges, all three components of the power system need to be integrated in so-called smart grids, which are managed by digital systems and, increasingly, AI. But developing smart grids is no small feat. For one thing, they require a host of devices and systems, such as residential smart meters and distributed energy resource management systems (DERMS), which are needed to manage multiple flexible and fluctuating energy sources and integrate them into power networks. And, because they are built on digital foundations, effective cybersecurity systems are essential to support stability and resilience.

None of this will come cheap. The International Energy Agency estimates that, if the world economy is to reach net-zero emissions by 2050, annual investment in smart grids will need to double – from $300bn to $600bn – globally through 2030. This represents a significant share of the estimated $4-6tn that will be needed annually to finance the overall energy transition. But, so far, the required investment has not been forthcoming. Even in advanced economies, the smart-grid funding gap exceeds $100bn.

Meeting all these challenges will require coordinated action across what are often highly complex systems. The US is a case in point. America's roughly 3,000 electric utilities operate in various combinations of generation, transmission, and distribution, as well as playing a market-making role as intermediaries between generation and distribution. Each US state has its own regulators, and local distribution can be regulated at the municipal level. America's nuclear infrastructure is managed at the federal level, by the Department of Energy, which also funds research and, under the 2022 Inflation Reduction Act, finances investment in the power sector. And the US Environmental Protection Agency plays a major role in setting the direction and pace of the energy transition.

Other entities oversee the country's three major grid regions and the interconnections among them. For example, the not-for-profit North American Electric Reliability Corp is responsible for six regional entities that together cover all the interconnected power systems of Canada and the contiguous US, as well as a portion of Mexico.

Achieving the necessary transformation of power systems will require us to figure out how to finance the relevant investments, who will ultimately pay for them, and how a complex, technologically sophisticated, and rapidly evolving smart-grid system can be co-ordinated.

It is difficult to imagine how investment could be mobilized at the scale necessary without the financing power of national governments. This is especially true in the US, where there is no shared carbon price to level the playing field. It is thus good news that, last month, President Joe Biden's administration announced a range initiatives and investments designed to support and accelerate structural change in the power sector.

As for who should pay, the answer is complicated. In principle, investments that reduce costs or augment service quality and stability should be reflected in tariffs. The problem is that the investments that improve service quality

must be spread across multiple entities that own different assets in the grid. Highly decentralised regulatory structures would make coordinating all these tariff changes and transfers unwieldy, at best.

When it comes to investments that advance the green energy transition – including the global public good of emissions reduction – we know who should not pay: local communities. In fact, the implementation of local-level charges to finance such investments is bound to lead to inefficiencies and underinvestment. It would also be unfair: there is no good reason why consumers in areas with problematic legacy systems should pay more. If they are asked to, they are likely to resist.

A better approach would be to use an expanded federal industrial policy not only to help finance and especially to co-ordinate long-term investments in the power sector, but also to guide the development of a complex, interconnected smart-grid system. This system needs a banker and an architect working with firms, regulators, investors, researchers, and industry organisations like the PES to carry out a complex, fair, and efficient structural transformation. National governments need to be involved in filling both roles. – Project Syndicate

- *Michael Spence, a Nobel laureate in economics, is Emeritus Professor of Economics and a former dean of the Graduate School of Business at Stanford University and a co-author (with Mohamed A El-Erian, Gordon Brown, and Reid Lidow) of* Permacrisis: A Plan to Fix a Fractured World *(Simon & Schuster, 2023).*

Only public-private co-operation can accelerate decarbonisation

As countries around the world experienced record temperatures last year, UN Secretary-General Antonio Guterres declared: “We must turn a year of burning heat into a year of burning ambition.” But to move away from fossil fuels and unlock the green transition’s economic benefits, such as job creation and universal access to clean energy, industry leaders and policymakers must work together to translate the commitments made at the UN Climate Change Conference in Dubai (COP28) into actual renewable gigawatts.

COP28 marked a historic turning point in the battle against climate change. Rallying around the UAE Consensus, world leaders pledged to move away from fossil fuels, agreeing to triple renewable power capacity to at least 11,000 gigawatts

and double energy efficiency by 2030.

But ambition alone is not enough to achieve these targets and limit global warming to 1.5C. Governments must invest in mature, cost-competitive renewable technologies that can be rapidly deployed at scale. When integrated with long-duration energy storage, green hydrogen, and system optimisation, these technologies represent the most reliable and flexible way to accelerate the energy transition.

Renewables will undoubtedly shape the global energy landscape in the coming years. Both solar and wind power are expected to grow significantly, with hydropower serving as the backbone of grid flexibility. Consequently, renewables are poised to become the twenty-first century's dominant source of global electricity.

But as a joint report released by the International Renewable Energy Agency (IRENA) and the Global Renewables Alliance (GRA) ahead of COP28 noted, tripling renewable capacity will require cooperation between the private and public sectors. Partnerships should focus on initiatives that deliver immediate results, such as mobilising low-cost financing, accelerating permitting processes, clearing grid connection backlogs, reforming government auction mechanisms for renewable-energy projects, and diversifying global supply chains. A strong commitment to inclusivity and the active participation of developing economies must be at the heart of these efforts. IRENA and GRA are demonstrating this commitment by collaborating on the annual reports commissioned by the COP28 Presidency to monitor progress toward the global tripling target and facilitate the energy transition.

We must, however, move faster, especially if we aim to ensure that progress is equitably distributed around the world. While renewable power capacity rose by 473 gigawatts in 2023, the economic benefits of the energy transition did not reach every country. Remarkably, 83% of these increases were concentrated in China, the European Union, and the US, leaving many countries in the Global South behind.

In fact, the shift to renewables is alarmingly slow in many

parts of the world. Opportunities to address development and access challenges in Sub-Saharan Africa, where more than 500mn people still lack access to electricity, are being squandered. This sluggish transition can be attributed largely to the lack of affordable financing, adequate planning, and the policy and market frameworks needed to support the adoption of renewable energy. Tellingly, public fossil-fuel subsidies reached $1.3tn in 2022 – roughly the annual investment needed to triple renewable capacity by 2030.

A critical first step toward fostering greater public-private co-operation in pursuit of COP28's ambitious targets is to reform the global financial architecture. Africa, for example, accounts for 17% of the world's population but has received less than 2% of global investments in renewable energy over the past two decades, underscoring the need to reduce capital costs and attract private investors. Developing industrial clusters and initiating grant programs could also help foster environments conducive to innovation and private-public partnerships.

Recent commitments by world leaders offer glimmers of hope. African leaders at the September 2023 Africa Climate Summit in Nairobi, for example, pledged to increase the continent's renewable capacity to at least 300 gigawatts by 2030. This effort aims to reduce energy poverty and boost the global supply of cost-effective clean energy suitable for industrial use.

Kenyan President William Ruto, a key advocate of the Nairobi agreement, established the Accelerated Partnership for Renewables in Africa, an African-led international alliance of governments and stakeholders that aims to accelerate renewable-energy deployment, increase access, promote green industrialisation, and strengthen economic and societal resilience.

Governments and business leaders should harness the current political momentum to foster co-operation between policymakers and private investors. As governments develop appropriate policy and market frameworks to facilitate the transition to

renewables, the private sector – historically responsible for 86% of global investments in renewable energy – is poised to lead the charge. Together, we can achieve a clean, secure, and just energy future. But to realise this vision, we must act fast. – Project Syndicate

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The Psychologist Who Convinced Economists that to Err Is Human

Daniel Kahneman, who passed away in March at the age of 90, received the Nobel Prize in Economics despite having never taken an economics course. Nevertheless, his scholarship reshaped and upended the discipline's fundamental assumptions, laying the groundwork for the emergence of behavioral

economics.

CAMBRIDGE – The recent passing of psychologist and Nobel laureate Daniel Kahneman is an apt moment to reflect on his invaluable contribution to the field of behavioral economics. While Alexander Pope's famous assertion that "to err is human" dates back to 1711, it was the pioneering work of Kahneman and his late co-author and friend Amos Tversky in the 1970s and early 1980s that finally persuaded economists to recognize that people often make mistakes.

When I received a fellowship at Stanford University's Center for Advanced Study in the Behavioral Sciences (CASBS) four years ago, it was this fundamental breakthrough that motivated me to choose the office – or "study" (to use CASBS terminology) – that Kahneman occupied during his year at the Center in 1977-78. It seemed like the ideal setting to explore Kahneman's three major economic contributions, which challenged economic theory's apocryphal "rational actor" by introducing an element of psychological realism into the discipline.

Kahneman's first major contribution was his and Tversky's groundbreaking 1974 study on judgment and uncertainty, which introduced the idea that "biases" and "heuristics," or rules of thumb, influence our decision-making. Instead of thoroughly analyzing each decision, they found, people tend to rely on mental shortcuts. For example, we may rely on stereotypes (known as the "representativeness heuristic"), be overly influenced by recent experiences (the "availability heuristic"), or use the first piece of information we receive as a reference point (the "anchor effect").

Second, Kahneman and Tversky's work on "prospect theory," which they published in 1979, critiqued expected utility theory as a model of decision-making under risk. Drawing on the "certainty effect," Kahneman and Tversky argued that humans are psychologically more affected by losses than gains.

The perceived loss from misplacing a $20 note, for example, would outweigh the perceived gain from finding a $20 note on the sidewalk, leading to “loss aversion.”

This insight is also at the core of the “framing effect.” The theory, developed while Kahneman was a fellow at CASBS and Tversky was a visiting professor at Stanford, posits that the way information is presented – whether as a loss or a gain – significantly influences the decision-making process, even when what is framed as a loss or gain has the same value.

Lastly, there is Kahneman’s popular masterpiece, the bestselling *Thinking, Fast and Slow*. Published in 2011 and offering a lifetime’s worth of insights, the book introduced the general public to two stylized modes of human decision-making: the “quick,” instinctive, emotional mode that Kahneman called System 1, and the “slower,” deliberative, or logical mode, which he called System 2. Humans, he showed, are prone to abandoning logic in favor of emotional impulses.

Kahneman received the Nobel Prize in Economics in 2002, despite, as he jokingly remarked, having never taken a single economics course. Nevertheless, his scholarship laid the groundwork for an entirely new field of economic research – and it had all begun in Study 6.

In particular, Kahneman’s work had a profound impact on University of Chicago economist Richard Thaler, who went on to become a Nobel laureate himself. As an assistant professor, Thaler managed to “finagle” a visiting appointment at the National Bureau of Economic Research, whose offices were located down the hill from CASBS, enabling him to connect with Kahneman and Tversky.

In 1998, Thaler co-authored a seminal paper with Cass Sunstein and Christine Jolls, introducing the concept of “bounds” on reason, willpower, and self-interest, and highlighting human limitations that rational-actor models had overlooked. By the

time he received the Nobel Prize in 2017, Thaler had systematically documented “anomalies” in human behavior that conventional economics struggled to explain and conducted highly influential research (with Sunstein) on “choice architectures,” popularizing the idea that subtle design changes (“nudges”) can influence human behavior.

But as I gazed at the sweeping views of Palo Alto and the San Francisco Peninsula from the office window at CASBS, the birthplace of behavioral economics, I could not help but wonder whether Kahneman, despite his famously gentle nature, had perhaps been too critical of human decision-making. Are all deviations from “pure” economic logic necessarily “irrational”? Is our inability to align with the idealized model of economic analysis, coupled with our inevitable — albeit predictable — irrationality, really an inherent weakness? And is our tendency to rely on emotions rather than reason a fatal flaw, and if so, could our susceptibility to instinct ultimately lead to our downfall?

I wish I could ask Kahneman these questions. During my time there in 2020-21, Kahneman, affectionately known as “Danny” to all, was not just what CASBS called a “ghost” of the “study” — a former occupant who had been a major influence on my work — but also, happily, a vibrant, living legend who had enthusiastically invited me to discuss these very issues in person. Looking back, I regret my “planning fallacy” in not taking him up on his offer to deepen our conversation sooner — a sentiment shared by both my System 1 and System 2 modes. If “to err is human,” Danny taught me a poignant final lesson in human error.

QatarEnergy to acquire two new exploration blocks offshore Egypt

QatarEnergy has signed a farm-in agreement with ExxonMobil to acquire a 40% participating interest in two exploration blocks offshore Egypt.

Under the terms of the agreement, which is subject to customary approvals by the government of Egypt, QatarEnergy will acquire a 40% working interest in each of the “Cairo” and

“Masry” Offshore Concession Agreements, while ExxonMobil (the Operator) will retain the remaining 60% working interest.

Commenting on the signing of this agreement, HE Minister of State for Energy Affairs, the President and CEO of QatarEnergy Eng. Saad bin Sherida Al Kaabi said: “I am pleased with our entry into the Cairo and Masry offshore exploration blocks as they expand QatarEnergys presence in the Arab Republic of Egypt and extend our ambitious exploration program in-country.”

“We look forward to working with our valued long-term strategic partner ExxonMobil, as well as with the Egyptian Natural Gas Holding Company (EGAS) and the Egyptian Ministry of Petroleum and Mineral Resources, in this promising and prospective region. I would like to take this opportunity to thank the Egyptian authorities and our partners for their valuable support and cooperation,” His Excellency added.

The Cairo and Masry offshore exploration blocks were awarded to ExxonMobil in January 2023, and cover an area of approximately 11,400 square kilometers in water depths of 2,000 to 3,000 meters.