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How Can Australia's Proposed Domestic Gas Reservation Scheme Be Interpreted?

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The Institute of Energy Economics, Japan

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How Can Australia's Proposed Domestic Gas Reservation Scheme Be Interpreted?

Hiroshi Hashimoto * Takafumi Yanagisawa ** Yoshimasa Mori ***

Introduction

The Australian Government announced on 7 May 2026 the proposed domestic gas reservation scheme. The idea is to require gas exporters to supply a proportion - equivalent to 20% of exports of their total production - to the Australian market. The proposed system aims to put downward pressure on gas market prices, protect industrial and household consumers from price fluctuations, and prevent supply shortages. This paper picks up the issues of interest that come to mind immediately after the announcement and provides initial considerations.

From the remarks made by the ministers at the time of the announcement of the proposed scheme, the author suspects that the proposed scheme is based on the success of the existing gas reservation policy in Western Australia. In the new proposal, there is no expression that limits the application to LNG projects in the eastern half of the country, as the ADGSM (Australian Domestic Gas Security Mechanism) has done. Instead, the new proposal apparently includes in its scope LNG export projects across Australia, including Western Australia and the Northern Territory, as well as offshore LNG projects. The official announcement does not expressly limit the scope geographically. While this supports a nationwide interpretation, it should also be noted that several media reports and policy briefings emphasise east coast supply risks, suggesting that the final design may still differentiate by region. However, for projects that are already subject to the Western Australia reservation policy, there is a concern that the calculation will be complicated if the new federal government's 20% reserve obligation system is applied after July 2027. In addition, the new proposal stipulates that export contracts entered into before the announcement on 22 December 2025 (when the Australian Government’s Gas Market Review recommended domestic gas reservation policy) will be respected, but the line between being respected and not being respected will also be an important concern.

The federal government held a consultation process for 30 days from 1 April 2026 to decide whether to activate the ADGSM in the year. The outcome is scheduled to be announced in mid-May.

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1. The geographical scope of the application of the new system - potential application to LNG projects in Western Australia

1.1 What is included in the announcement of the proposed domestic gas reservation scheme on 7 May 2026

1.1.1 The federal government (three ministers) announced in a joint statement that it will introduce:

1.1.2 Obligation for LNG exporters to supply gas equivalent to 20% of export volumes to the domestic market

1.1.3 Effective from 1 July 2027

1.1.4 Respecting export contracts entered into force before 22 December 2025

1.2 No expressions limiting the scheme's application to the Eastern LNG projects or those LNG projects subject to ADGSM are included, but the announcement just says that the proposed scheme will "require gas exporters to supply a proportion of their total production to the Australian market - equivalent to 20 per cent of exports".

1.3 Although early media reports have explained that the primary focus of the proposed scheme is on "east coast LNG exporters", no geographical specification is included in the government's official documents. Australia's largest law firm points to uncertainty regarding "how it will apply to LNG exporters at a national level (including the interaction with the existing West Australian domestic gas reservation policy)" [1]. Although the basic idea of the proposed scheme is to include "nationwide LNG" in the scope, it would be a reasonable interpretation that how to handle LNG in other regions and offshore has not yet been decided.

2. Potential adjustment with Western Australia's existing 15% domestic gas reservation policy when the proposed federal scheme applied nationwide

2.1 "Double application and computational complexity" is one of the biggest unsolved issues in the new proposal. The reason for this is that the proposed federal reservation scheme is structurally different from the existing reservation policy in Western Australia.

[1] "Australia's gas reservation scheme" By John Hedge, Rebecca Whiting - Allens, Australia 7 May 2026, https://www.allens.com.au/insights-news/insights/2026/05/australias-gas-reservation-scheme/

	Western Australia's gas reservation policy	Australia's proposed domestic gas reservation scheme
Required reservation (vs LNG exports)	15%	20%
Calculation basis	Project life basis	It may be annually and a permit basis
Management	Agreement with the state	Federal export approval
Fulfilment	Project basis	Possibly on a corporate and nationwide portfolio basis

2.2 This will lead to questions about how the reserved volumes of the same project will be counted between the two schemes, whether the 15% already reserved under Western Australia's policy will be counted towards the 20% of the proposed federal scheme, and, in turn, how it will be offset.

2.3 Possible solutions are as follows:

2.3.1 Western Australia's LNG projects should be exempt from the proposed federal scheme, and the proposed federal scheme should be effectively applied only to the eastern part of the country;

2.3.2 The 15% reserved under Western Australia's policy should be recognized as part of the 20% requirement under the proposed federal domestic reservation scheme; or

2.3.3 A company's reservation requirement should be calculated on its nationwide portfolio basis.

3. The scope of existing contracts that should be respected

3.1 While the proposed scheme stipulates that export contracts entered into before the announcement on 22 December 2025 (when a domestic gas reservation policy is recommended) will be respected, where the line between being respected and not being respected will also be an important concern.

3.2 If an existing LNG export contract contains an extension option and is actually extended, will the extended contract be treated as another existing contract and will it be exempt from the application of the proposed scheme? What will happen in the case of equity lifting (an arrangement in which the investor takes LNG production volumes in proportion to the investment)?

3.3 In the case of gas field development that backfills existing LNG projects, the author interprets that if the future supply envisaged in the gas field development is allocated to a new LNG purchase and sale contract rather than an existing contract, the new contract should be subject to the proposed domestic gas reservation scheme. In the proposed reservation scheme, the boundary line for creating domestic supply reservation

obligations is not "at the time of an FID (final investment decision) of the project" or "whether it is an existing or a new project", but on "exports" and "new (unprotected) LNG sales". Therefore, it would be reasonable at this point to argue that even backfill gas fields would be subject to a 20% domestic reserve obligation under the proposed scheme if the gas is used for new LNG contracts signed after 22 December 2025.

3.4 If LNG sales are based on long-term contracts, for example, if a long-term contract is concluded for the export and sales of 1 million tonnes of LNG per year, 200,000 tonnes per year should be marketed in the domestic market. If production is strong and it is expected that one additional cargo of LNG will be produced, efforts should be made to sell separate volumes equivalent to an additional 20% of the LNG cargo to the domestic market. However, LNG exporters who think spot sales are possible may or should take that amount into account and make efforts to increase sales to the domestic market from the beginning.

3.5 Regarding the selling price of gas for the domestic market, government officials have expressed their expectation of "downward pressure" in the latest announcement. The author interprets that either in long-term contracts or in spot sales, the selling price is basically negotiated between the parties, and officials do not regulate or set an upper limit. However, the authorities may, in practice, scrutinise pricing behaviour when assessing whether domestic supply has genuinely been made available in the LNG export licensing review.

4. Comparison with other gas-producing countries (Egypt, Algeria, and Nigeria)

4.1 Indonesia is the other gas-producing country that explicitly has a gas reserve policy to secure domestic supply, although there are differences in the system. Egypt, Algeria, and Nigeria also increase or decrease the amount of gas that can be allocated for LNG as domestic gas demand fluctuates, although they do not implement explicit domestic reserve obligations.

Country	Explicit domestic reserve obligations (%)	Notes
Indonesia	Up to 25%	Legal domestic market obligation with price regulation
Western Australia	15% (existing)	Cumulative and flexible basis
Australia's proposed scheme	20% (proposed)	It may be on an annual basis, with details to be set later
Egypt	No	Domestic supply prioritised and effectively allocated
Algeria	No	Domestic supply prioritised with Sonatrach's discretion
Nigeria	No (domestic market obligation for oil)	LNG exports decrease with infrastructure restrictions

4.2 Egypt, Algeria, and Nigeria all do not have a statutory percentage reservation system, and as a result of prioritizing domestic demand, power generation, and social stability, LNG export volumes fluctuate under a de facto allocation scheme.

5. Future steps

Regarding future steps of the proposed domestic reservation scheme, the latest announcement says, "The Government will legislate the new domestic supply obligation and commence further targeted consultation on the final design details." It is understood that the government will proceed with legislation in parliament and consult on practical details, including the industry. Japanese stakeholders will also have opportunities to seek clarification and express their opinions.

How Can Australia's Proposed Domestic Gas Reservation Scheme - draft Design Framework Be Interpreted? - #Issue 2

Hiroshi Hashimoto [*] Takafumi Yanagisawa [**] Yoshimasa Mori [***]

Introduction

The Australian Government announced on 25 May 2026 the Domestic Gas Reservation Scheme - Draft Design Framework (hereafter referred to as the "DDF" in this paper) following the release of the proposed domestic gas reservation scheme on 7 May 2026. With DDF, the government opened the consultation on the Domestic Gas Reservation Scheme.

The DDF demonstrates that the key issues identified in the authors" previous paper dated 14 May (Issue #1) - such as the nationwide scope of the scheme, its interaction with Western Australia's (WA) existing domestic gas reservation policy, and the treatment of existing contracts - have now been formally incorporated as core elements of the policy design.

While the scheme will apply nationwide and includes mechanisms for adjustment and flexibility, these adjustments are not automatically granted. Rather, they are to be determined through case-by-case assessments subject to Ministerial discretion. The following provides an overview of the key features.

1. Nationwide Application Clarified

1.1 The DDF explicitly states that: "*The Reservation Scheme will apply nationally*. . ." [1] This confirms that the scheme is intended to apply across all of Australia. At the same time, DDF also notes that: ". . . *existing regulatory arrangements, such as domestic supply obligations under state-based schemes, are recognised.*" This indicates that the new federal scheme does not simply override existing state systems. Instead, it adopts a layered approach, in which both federal and state regimes coexist, and any overlap between them is to be resolved through individual adjustment mechanisms.

1.2 The DDF envisions an Export Approval-Based Regulatory Structure. The scheme will be implemented through an export approval framework, under which LNG exporters must obtain government approval in order to export gas [2]. As a condition for approval, exporters must meet their Domestic Supply Obligation (DSO). The DSO will take effect

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[1] "The Reservation Scheme will apply nationally, with consultation with state and territory governments to ensure the policy objectives of the Reservation Scheme will be achieved and existing regulatory arrangements, such as domestic supply obligations under state-based schemes, are recognised." Page 04/24 https://storage.googleapis.com/files-au-climate/climate-au/p/prj3ce30473c51fb474d08e6/page/Domestic_Gas_Reservation_Draft_Design_Framework.pdf

[2] "The Reservation Scheme will be governed by an export approval framework for all entities intending to export LNG." Page 04/24

from 1 July 2027. Exporters must apply for export approval between 1 January and 1 July 2027[3]. The obligation will apply annually, either on a calendar-year or financial-year basis (subject to consultation)[4]. In essence, the scheme functions such that export permission is contingent on domestic supply performance.

2. Interaction with Existing State-Based Schemes (e.g. WA)

2.1 The DDF states: "*Regulated entities will be required to meet their DSO from commencement but may seek to vary their obligation to account for volumes under existing contracts or existing regulatory arrangements (such as state-based reservation schemes or other arrangements with state and territory governments).*"[5] This establishes that: Existing state-level obligations (e.g. WA's 15% reservation policy); and they can be considered in determining a project's DSO

2.2 However, this is not an automatic offset mechanism. Instead: Exporters must apply for a variation. Ministers will determine approval on a case-by-case basis.

2.3 Furthermore, the DDF clarifies: "*If regulated entities seek a variation to ensure they can meet pre-existing LNG contracts, they must demonstrate to Ministers that there is no viable alternative to meeting their DSOs without a variation. . .*"[6] This places the burden of proof on the exporter.

2.4 For projects already subject to WA's reservation policy: The WA 15% obligation is not automatically credited against the federal 20% DSO. Instead, it becomes a matter of negotiated adjustment (DSO variation). Accordingly, the relationship between the state and federal regimes is not governed by a simple formula, but rather by individualised administrative decisions. In other words, the existing 15% in-state reserve in WA will not automatically be included in the new 20% scheme but rather negotiated for individual adjustments to DSO (= measures to conditionally reduce the duty amount).

3. Treatment of Existing Contracts - Tightened Scope

3.1 The DDF clarifies the scope of contract protection: "*Extensions or variations . . . are not considered existing contracts. . .* "[7] This means that contract extensions or renewals after 22 December 2025 are not protected.

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[3] "Between 1 January 2027 and 1 July 2027, regulated entities will be required to: Apply for an export approval. . . " Page 11/24

[4] "Regulated entities' DSO would come into effect from 1 July 2027 and will apply annually on a calendar year basis, or a financial year basis, subject to consultation." Page 11/24)

[5] "Regulated entities will be required to meet their DSO from commencement but may seek to vary their obligation to account for volumes under existing contracts or existing regulatory arrangements (such as state-based reservation schemes or other arrangements with state and territory governments)." Page 04/24

[6] "If regulated entities seek a variation to ensure they can meet pre-existing LNG contracts, they must demonstrate to Ministers that there is no viable alternative to meeting their DSOs without a variation, having regard to. . ." Page 11/24

[7] "Extensions or variations to existing contracts are not considered existing contracts for the purposes of this legislation, such that the arrangements to ensure existing contracts are respected will not apply to contract extensions or variations if executed after 22 December 2025." Page 05/24

3.2 Moreover, "Volumes committed to export under new or extended contracts executed after 22 December 2025 would not be considered acceptable reasons for not meeting a DSO."[8] The protection of existing contracts may be interpreted narrower than might have been expected. Exporters cannot rely on new or extended LNG contracts to justify non-compliance.

4. Treatment of LNG Imports and Regasification

4.1 The DDF explicitly allows: "*Gas supplied via an LNG regassification facility*"[9] to count toward DSO fulfilment and clarifies that: LNG regasified for domestic use "*does not count as exports*"

4.2 Imported LNG, once regasified and supplied domestically, can be used to meet DSO obligations. This implies that future LNG import terminals are explicitly contemplated as part of compliance mechanisms. In other words, the scheme is not limited to reserving domestic resources; it represents a broader domestic supply obligation, allowing flexibility in sourcing

5. Spot Market Supply and Excess Gas Management

5.1 The framework introduces two new concepts: "*minimum liquidity requirement*" and "*release valve mechanism*".

5.2 Under the *liquidity requirement*, "*Regulated entities will be required to make uncontracted DSO volumes available to the domestic market*"[10] This implies that excess volumes cannot simply be withheld. They must be offered through short-term or spot market mechanisms.

5.3 At the same time, the release valve allows: "*Upon meeting the minimum liquidity requirements, the AER may allow volumes under the DSO that are surplus to the domestic market's demand to be exported (or 'released')*"[11] This introduces flexibility, but exported volumes remain subject to accounting and future obligations.

6. Other Key Features

6.1 The DDF stipulates "*physical supply requirement*" meaning that "*the regulated entity must physically supply gas to gas buyers in the domestic market.*"[12] This is stricter than

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[8] "Volumes committed to export under new or extended contracts executed after 22 December 2025 would not be considered acceptable reasons for not meeting a DSO." Page 12/24

[9] "Gas supplied via an LNG regassification facility," Page 16/24

[10] "Regulated entities will be required to make uncontracted DSO volumes available to the domestic market, . . ." Page 07/24

[11] "Upon meeting the minimum liquidity requirements, the AER may allow volumes under the DSO that are surplus to the domestic market's demand to be exported (or 'released')" Page 08/24

[12] "Under the reservation scheme, offers to the domestic market will not be sufficient to acquit a regulated entity's DSO. Rather, the regulated entity must physically supply gas to gas buyers in the domestic market." Page 16/24

WA's policy, which focuses on marketing obligation. The federal scheme instead will mandate actual delivery.

6.2 The DDF considers "*Third-Party Supply*" and "*Additionality*". Exporters may rely on third-party gas to meet DSO. However, such arrangements must satisfy an "additionality test" (i.e. must increase total domestic supply).[13]

6.3 The DDF considers *Enforcement* and *Penalties* as follows. Failure to comply may result in: civil penalties and suspension or revocation of export approvals. Penalties are expected to be severe (comparable to Gas Market Code penalties[14]), potentially including up to AUD 100 million or up to 30% of turnover.

Overall, the proposed scheme should not be viewed as a simple extension of Western Australia's domestic gas reservation policy to the national level. Rather, it represents a new hybrid framework combining export approval controls; mandatory domestic supply obligations; and market-based flexibility mechanisms. Accordingly, it can be characterised as an evolving regulatory system that goes beyond traditional "resource reservation" toward a broader obligation to ensure domestic gas supply.

[13] "Where a regulated entity is unable to meet its DSO from its own production, it may meet its DSO by underwriting new third-party production through investment or offtake agreements, where it can be demonstrated that this gas satisfies an additionality test." Page 07/24

[14] https://www.accc.gov.au/business/industry-codes/gas-market-code

East and West, and South too

After all, diversity is key to a stable energy supply

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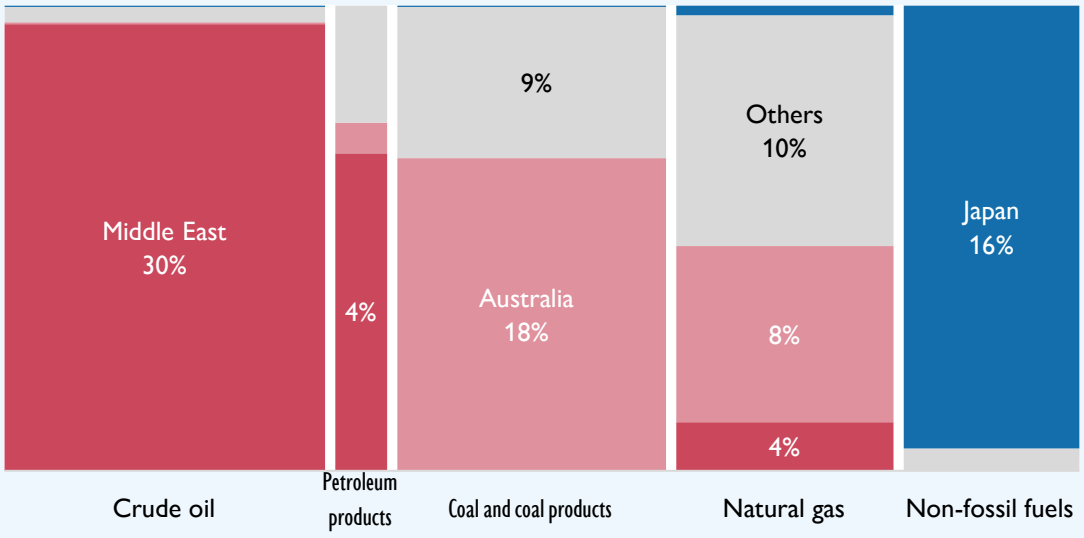
Summary

The blockade of the Strait of Hormuz has presented Japan with a major challenge. The stockpiles expanded following the oil crises of the 1970s have provided some breathing space until a full-scale response can be mounted to the sharp decline in oil supplies from the Persian Gulf. However, the lessons of the oil crisis have not been fully applied when it comes to diversifying crude oil import sources. Japan's dependence on the Middle East for crude oil imports, which stood at 78% during the first oil crisis, has now reached 93%.

Whilst the import source of liquefied petroleum gas (LPG) has rapidly shifted from the Middle East to the United States, no such structural change has occurred in naphtha, which, like LPG, relies heavily on imports. For the time being, the pattern of relying heavily on the Middle East for oil supplies is unlikely to change, and we should continue to devote our efforts to strengthening relations with the region.

However, a different picture emerges when we look at total energy consumption. Japan's dependence on the Middle East for primary energy supplies has fallen from around 60% half a century ago to 36%. This has been largely due to the substitution of oil with natural gas and coal. The contribution of non-fossil fuels has not kept pace, partly due to the stagnation in nuclear following the Great East Japan Earthquake.

Figure 1 | Breakdown of Japan's primary energy supply by country and region [FY2024]



Japan's self-sufficiency rate is recovering significantly from its decline, whilst the United States has seen growth over the past decade thanks to the shale revolution. Australia is the largest supplier, accounting for over a quarter of Japan's energy consumption. As a developed nation, Australia has a stable political system, and its sea routes to Japan do not pass through the Strait of Hormuz or the Strait of Malacca. Nevertheless, this does not mean that the situation is entirely free of risk.

Diversity is key to ensuring a stable energy supply. Whilst we must develop a balanced mix of domestic energy sources such as solar photovoltaics, wind and nuclear, it is also essential to secure flexible and strategic supplies from the West (the Middle East), the East (the United States and Canada) and the South (Australia).

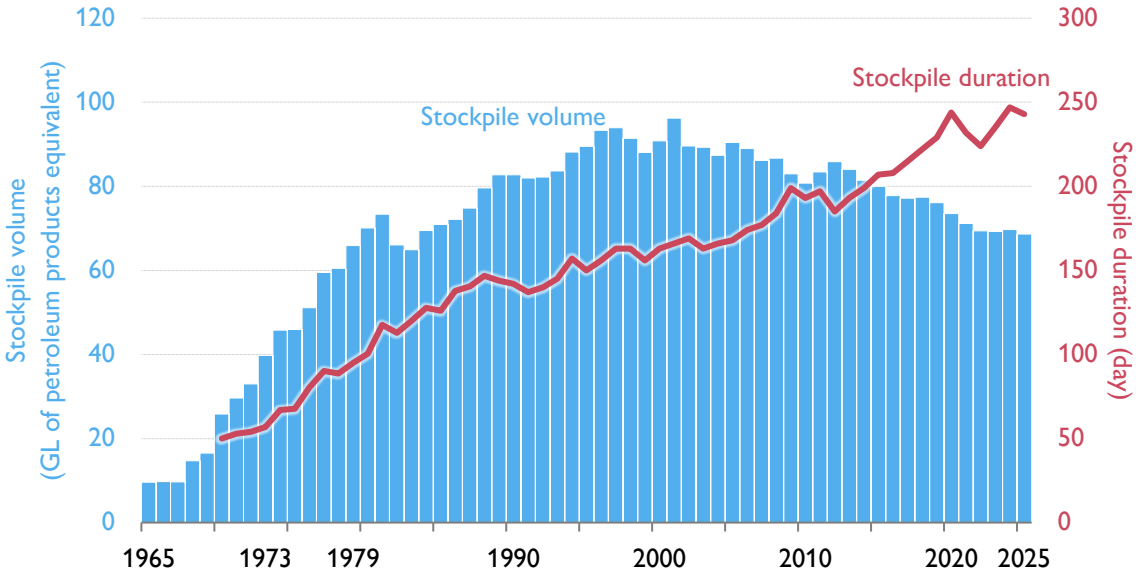
Oil supply is extremely dependent on the Middle East. This is significantly more so than during the oil crises.

Stockpiles mitigate the impact of the blockade of the Strait of Hormuz.

The blockade of the Strait of Hormuz, triggered by the US and Israeli strikes on Iran, had long been regarded as one of the major risks to the stable supply of oil, regardless of its specific cause. It, however, had not been viewed as an imminent threat. With this risk now materialising, Japan finds itself faced with a difficult challenge.

In Japan, oil stockpiles were expanded in response to the lessons learnt from the oil crises of the 1970s (Figure 1). Although their economic viability has occasionally been called into question, stockpiles stood at 243 days' worth as of the end of February 2026, just before the current release of stockpiles began. This provides a valuable window of time until a full-scale response can be mounted to the situation arising from the sharp decline in oil supplies from the Persian Gulf.

Figure 2 | Oil stockpiles

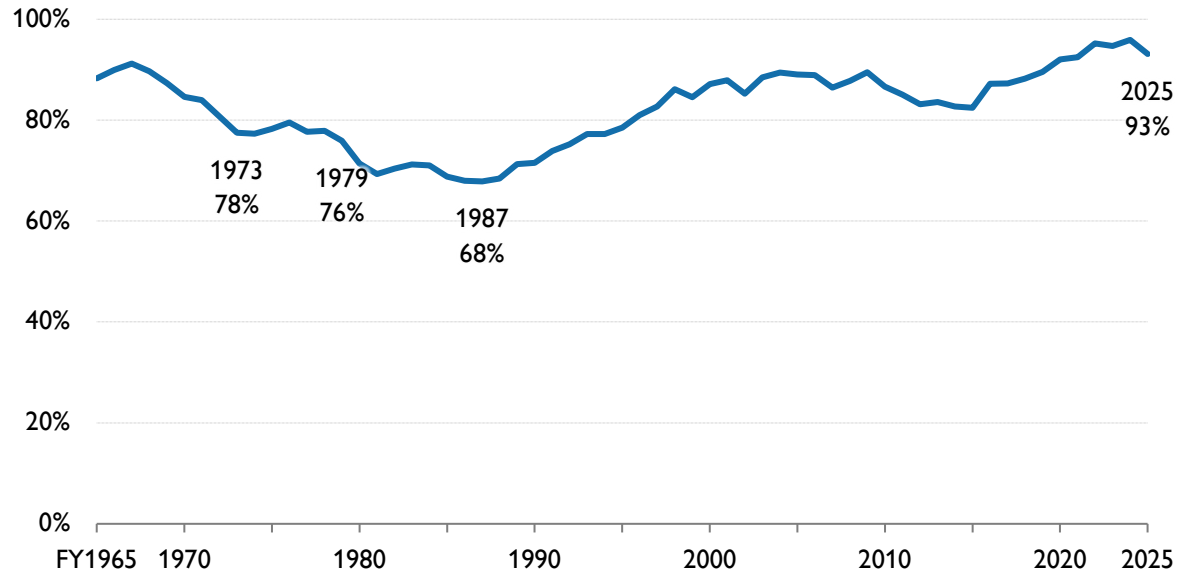


Note: Figures as at the end of the fiscal year; however, for FY2025, figures are as at the end of February 2026.
Source: The Institute of Energy Economics, Japan, 'EDMC Handbook of Japan's World Energy Economic Statistics', Ministry of Economy, Trade and Industry, 'Current Status of Petroleum Stockpiles'.

Dependence on the Middle East for crude oil imports has increased.

By contrast, the lessons of the oil crises were not fully applied to diversifying crude oil import sources. Dependence on the Middle East for crude oil imports fell from 78% during the first oil crisis (FY1973) to 68% by FY1987 (Figure 2). However, the trend subsequently reversed, and today it stands at 93%, far exceeding the level seen during the oil crises. This makes the impact of the blockade of the Strait of Hormuz all the more severe.

Figure 3 | Dependence on the Middle East for crude oil imports



Note: Volume-based
Source: Ministry of Economy, Trade and Industry 'Resources and Energy Statistics'

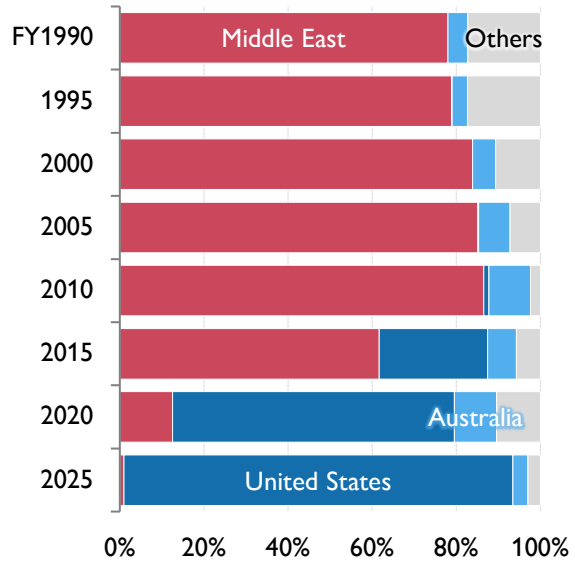
The factors behind this significant presence of Middle Eastern crude oil include: (1) the fact that Japanese refineries have traditionally been designed to process Middle Eastern medium-to-heavy crude oil, which has been considered relatively inexpensive; (2) the promotion of a policy strategy aimed at increasing the yield of high-value light petroleum products by cracking the heavy distillate fraction—which is obtained in large quantities from heavy crude oil; and (3) the fact that, despite successive wars and conflicts in the Middle East, there were no instances of a complete disruption to the supply of Middle Eastern crude oil. Furthermore, factors unrelated to Middle Eastern crude include: (4) the fact that Asian oil-producing countries, which had served as alternative import sources following the oil crises, saw their domestic oil demand increase against a backdrop of their economic growth, leading to a decline in imports from these countries; (5) the fact that imports from Russia, which had helped curb the rise in dependence on the Middle East from the mid-2000s onwards, also declined in response to changes in the international situation, such as Russia's annexation of Crimea in Ukraine in 2014[1]; (6) although imports from the United States have increased since the country fully lifted the ban on exports of domestically produced crude oil in 2015 following the shale revolution, its share in imports remains at just a few per cent due to factors such as the properties of the oil.

Whilst LPG has moved away from the Middle East, naphtha remains largely similar to crude oil. Oil as a whole remains heavily reliant on the Middle East.

There are indeed examples where a rapid shift in import sources has occurred in the case of oil (crude oil and petroleum products). As with crude oil, the Middle East once accounted for the overwhelming majority of liquefied petroleum gas (LPG) imports. However, the situation has now changed to such an extent that there are concerns about an over-reliance on the United States (Figure 3). The factors behind this include: (1) the shale revolution, which has dramatically increased the United States' spare capacity for LPG exports; (2) the expansion of the Panama Canal, which provides a tailwind for transporting LPG—which requires smaller tankers than crude oil—from the US Gulf Coast to East Asia; and (3) the fact that LPG, a refined product, is less prone to significant issues arising from variations in physical properties compared to crude oil, a primary commodity.

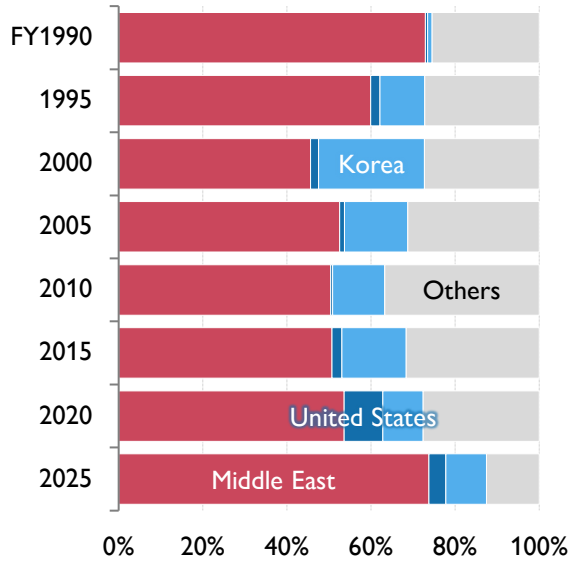
[1] There were no imports in the FY2023 and FY2024. However, 95.3 ML were imported in June 2025, and it was reported that crude oil from Sakhalin-2 was imported in May 2026.

Figure 4 | Breakdown of LPG import sources by country and region



Note: Mass-based
Source: Ministry of Finance 'Trade Statistics'

Figure 5 | Breakdown of naphtha import sources by country and region



Note: Volume-based
Source: Ministry of Finance 'Trade Statistics'

On the other hand, in the case of naphtha—a petroleum product for which Japan relies heavily on imports, much like LPG—no structural changes similar to those seen with LPG have occurred (Figure 4). Even as the United States has increased its naphtha exports, it is presumed that, from Japan's perspective, the higher cost and, possibly, the product's properties have acted as barriers. However, following the blockade of the Strait of Hormuz, naphtha imports from the United States are expected to increase, at least for the time being.

Generally speaking, changing the supplier of imported goods is considered more flexible than that of domestic goods, but this is only true provided that certain conditions are met.

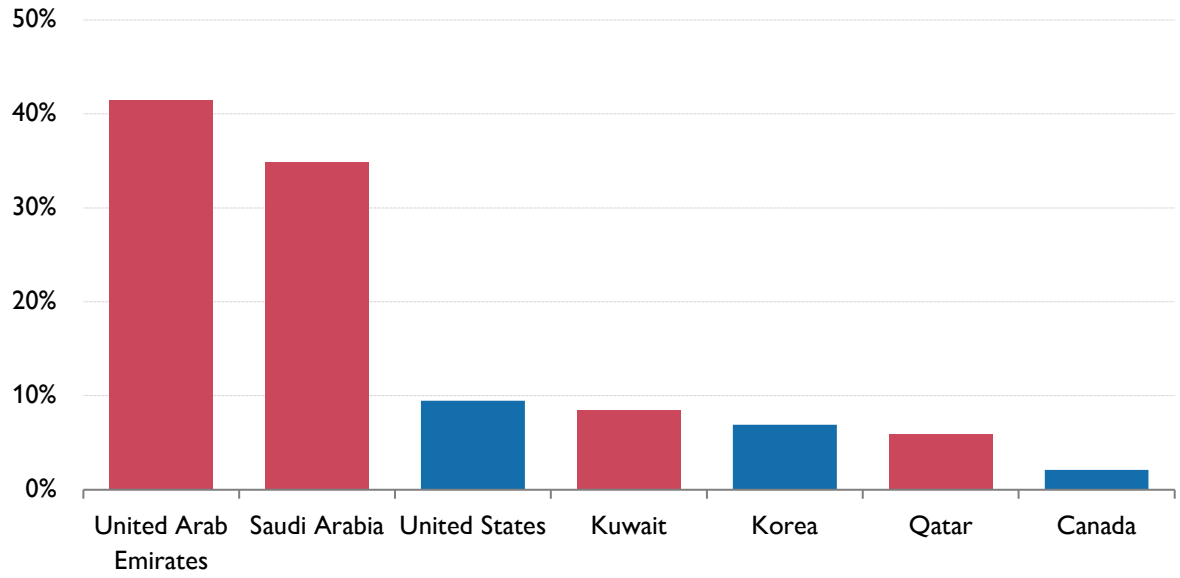
Despite the early release of crude oil stockpiles, reports suggest that certain petroleum products are becoming difficult to obtain, likely due in part to hoarding (temporary demand) driven by expectations of rising prices and supply instability. Even for types of petroleum products where supply is not an issue, soaring prices are placing a financial burden on consumers. Against this backdrop, some are calling for the replacement of oil with electricity through electric vehicles, linking this to the push for decarbonisation. However, given the reality that oil is used in an extremely wide range of contexts in modern society, as well as the current state of technology, the argument that 'if there is no oil, just use electricity' is not much different from the famous line, 'let them eat cake'. To reiterate, simply phasing out gasoline for passenger cars will not achieve the goal of moving away from oil.

We do not mean to suggest that we have no choice but to accept the current situation unconditionally; nevertheless, for the time being, the structure in which we rely on oil—and, for the most part, on the Middle East for its supply (Figure 5)—is unlikely to change easily. In this sense, even after the blockade of the Strait of Hormuz is lifted and we emerge from this crisis, we must continue to devote our efforts to strengthening relations with the Middle East. However, this must be done in a spirit of mutual benefit—for these recent events strongly urge us to reaffirm that production depends on demand, just as consumption depends on supply.

Concerns that Japan's declining oil consumption year on year is eroding its bargaining power are no longer heard as frequently as they once were. However, the underlying trend has not changed. It is essential to strengthen ties that do not rely solely on the volume or value of oil transactions—for example, in business terms, by becoming a primary supplier of goods, services and technology that the Middle East finds difficult to replace. At the same time, in order to ensure that there are other reliable oil suppliers, it is necessary to take a more proactive approach to utilising oil from

other regions. With regard to US crude oil, if the United States can demonstrate—or if Japan can identify—benefits sufficient to offset the drawbacks of its physical properties and the long transport distances and transit times involved when using large tankers (US Gulf Coast–Cape of Good Hope–Indo-Pacific–Japan, which is approximately twice the distance of the Middle East–Japan route), this would provide a tailwind.

Figure 6 | Breakdown of major import partners for primary supply of oil [FY2024]



Notes: Crude oil and petroleum products. Based on calorific value (lower calorific value).
Source: Estimated from the Ministry of Economy, Trade and Industry, 'Comprehensive Energy Statistics', 'Comprehensive Energy Statistics: Lower Calorific Value Version (IEA-compliant tables)' and 'Resources and Energy Statistics', and the Ministry of Finance 'Trade Statistics'.

Although this falls outside the scope of energy economics, we feel it is worth noting. More than two months have passed since the attacks on Iran began, and it is all too easy for public attention to focus on oil supplies and oil prices. However, we must not completely forget the feelings of sympathy for the war victims that many of us likely felt immediately after the outbreak of hostilities.

Dependence on the Middle East for overall energy has decreased.

Natural gas and coal have made a significant contribution.

On the other hand, when considering all the energy consumed in Japan, a different picture emerges from the extreme concentration on the Middle East seen in the case of oil. Japan's dependence on the Middle East for primary energy supply has fallen from around 60% half a century ago to 36% (Figure 6). The changes during this period can be decomposed into the following factors:

(1) changes in the share of fossil fuels and non-fossil fuels in total primary energy supply—the substitution of fossil fuels by non-fossil fuels such as nuclear and renewable energies,

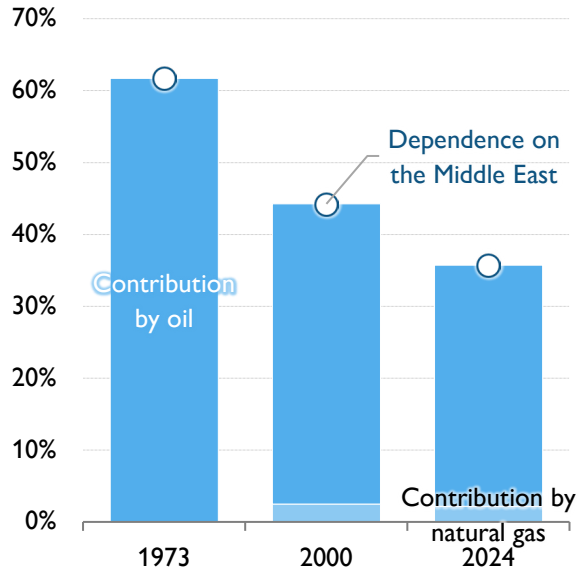
(2) changes in the share of each fossil fuel (coal, coal products, crude oil, petroleum products and natural gas) within the primary supply of fossil fuels—the substitution of oil by natural gas and coal, and

(3) changes in the degree of dependence on the Middle East for the primary supply of each fossil fuel.

Figure 7 shows the results of decomposing the changes into their respective contributions. The substitution of oil by natural gas and coal— (2) has the greatest impact on reducing dependence on the Middle East. By comparison, the contribution of the substitution of fossil fuels by non-fossil fuels— (1) amounts to only about one-third, reflecting the stagnation of nuclear following the Great East Japan Earthquake. Furthermore, as noted above, the change in Middle

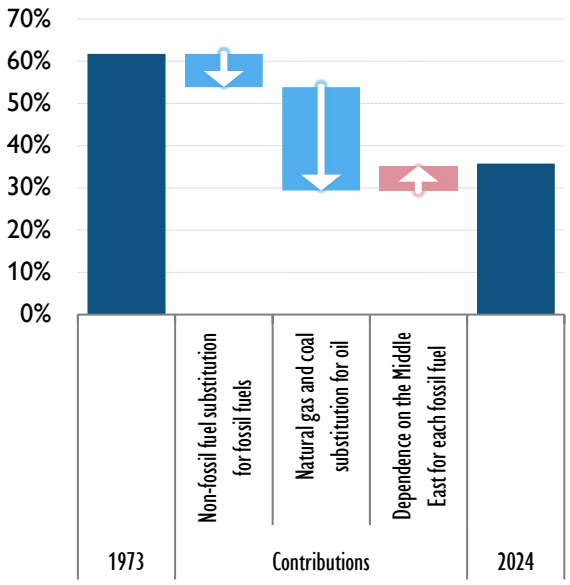
East dependency for each fossil fuel— (3) is actually pushing up Middle East dependency in primary energy supply, due to the rise in Middle East dependency for crude oil.

Figure 7 | Dependence on the Middle East for primary energy supply and contributions



Notes: Based on calorific value (lower calorific value). Figures for 1973 are for the calendar year and cover imports of coal, crude oil, naphtha, LPG and natural gas. Figures for 2020 and 2024 are for the fiscal year and cover imports of coal, coal products, crude oil, petroleum products and natural gas.
Source: Estimated from the Ministry of Economy, Trade and Industry, 'Comprehensive Energy Statistics', 'Comprehensive Energy Statistics: Lower Calorific Value Version (IEA-compliant table)' and 'Resources and Energy Statistics', and the Ministry of Finance 'Trade Statistics'.

Figure 8 | Dependence on the Middle East for primary energy supply and contributions to the changes

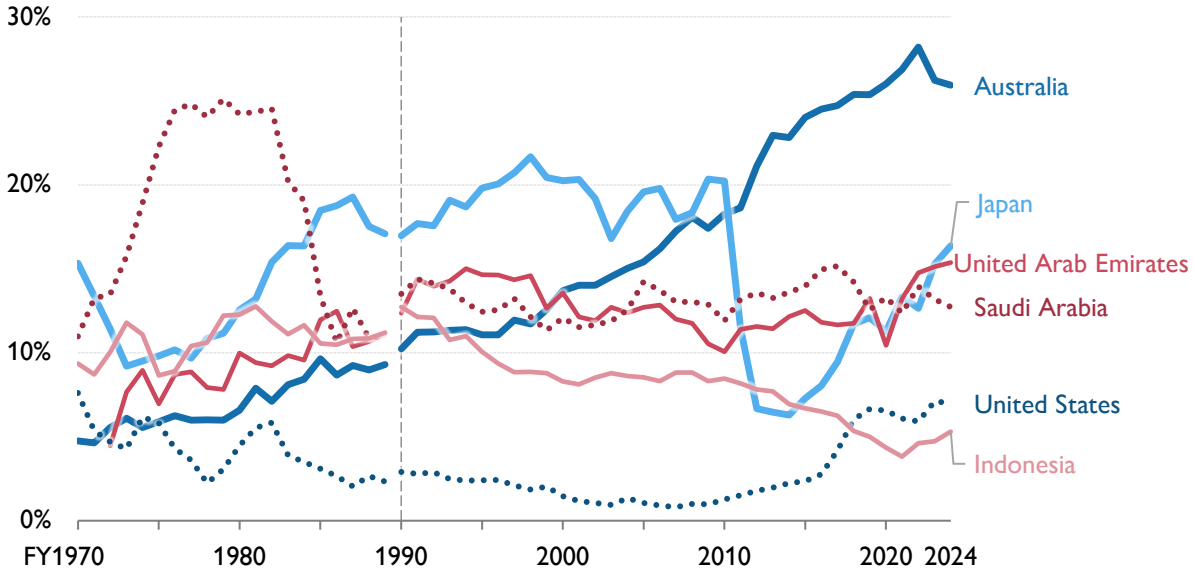


Notes: Based on calorific value (lower calorific value). Figures for 1973 are for the calendar year and cover imports of coal, crude oil, naphtha, LPG and natural gas. Figures for 2020 and 2024 are for the fiscal year and cover imports of coal, coal products, crude oil, petroleum products and natural gas.
Source: Estimated from the Ministry of Economy, Trade and Industry, 'Comprehensive Energy Statistics', 'Comprehensive Energy Statistics: Lower Calorific Value Version (IEA-compliant table)' and 'Resources and Energy Statistics', and the Ministry of Finance 'Trade Statistics'.

In the stage of primary energy supply, Japan and the United States are regaining their former roles, whilst Australia is taking the centre.

The proportion of primary energy supply that Japan produces itself—that is, its self-sufficiency rate—has fluctuated significantly (Figure 8). Having plummeted following the shutdown of nuclear power plants in the wake of the Great East Japan Earthquake in 2011, the self-sufficiency rate has recently been recovering significantly. Furthermore, as mentioned earlier, the United States, which has seen an explosive increase in oil and natural gas production and exports due to the shale revolution, has also increased its share of Japan's energy supply over the past decade. However, from a long-term perspective, both Japan and the United States are merely returning to pre-oil crisis levels.

Figure 9 | Share of major supplier countries in Japan's primary energy supply



Notes: Based on calorific value (lower calorific value). Prior to 1989, figures are for the calendar year; imports of coal, crude oil, naphtha, LPG and natural gas are covered for countries other than Japan. From 1990 onwards, figures are for the fiscal year; imports of coal, coal products, crude oil, petroleum products and natural gas are covered for countries other than Japan.
Source: Estimated from the Ministry of Economy, Trade and Industry, 'Comprehensive Energy Statistics', 'Comprehensive Energy Statistics: Lower Calorific Value Version (IEA-compliant tables)' and 'Resources and Energy Statistics', and the Ministry of Finance 'Trade Statistics'.

In contrast, Australia has almost consistently increased its role in Japan's energy supply. Since FY2011, it has been Japan's largest energy supplier by country, and its share now exceeds even that of Saudi Arabia around 1980. Australia has long been Japan's most important source of coal imports. Furthermore, having dramatically expanded its liquefied natural gas (LNG) production capacity, Down Under has also become Japan's largest supplier of natural gas. Australia's maritime supply routes to Japan do not pass through the Strait of Hormuz or the Strait of Malacca, and as a developed country, it possesses a stable political system. It could be said that Australia is an energy supplier worthy of providing over a quarter of Japan's energy consumption—far exceeding its domestic production.

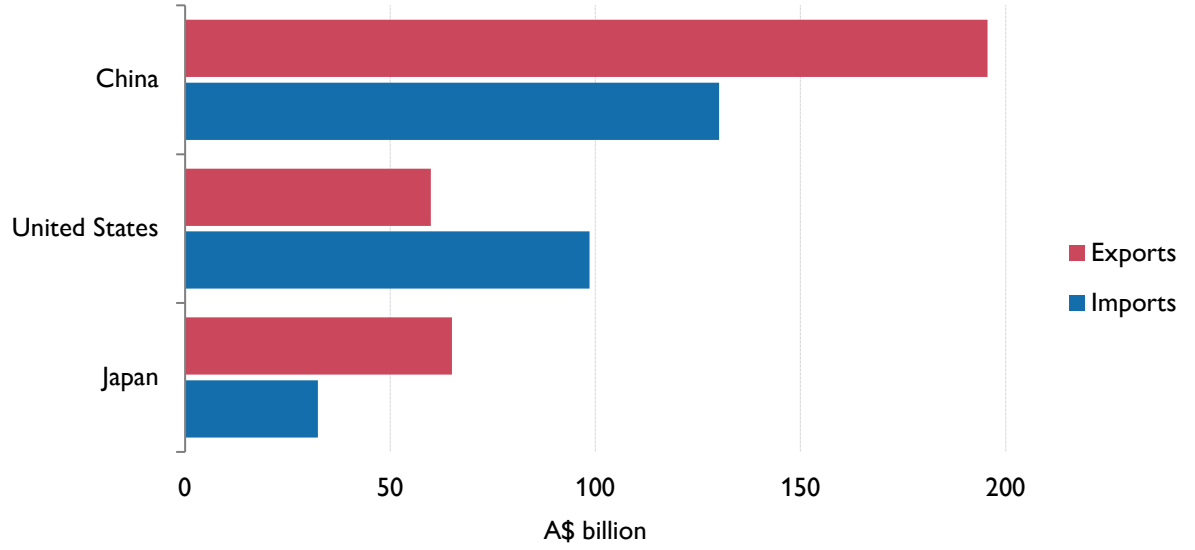
No blind spots?

However, just as there is no perfect energy source (yet), it is also difficult to find a perfect energy supplier. In Australia's case, the fact that torrential rain and flooding frequently disrupt coal production and domestic transport infrastructure is a risk factor, even though coal is easy to stockpile. Furthermore, regarding natural gas, concerns over supply shortages in densely populated areas such as the east coast from 2022 onwards have led to recurring discussions about prioritising domestic supply from the major production regions in the west and restricting exports[2]. Additionally, the fact that foreign policy, particularly towards East Asia, and climate change policy often fluctuate with changes in government can be seen as a source of concern.

Although Japan is a major trading partner for Australia, the gap between it and the leading countries is by no means insignificant (Figure 9). Such countries may exert pressure on Australia—either intentionally or as a consequence—to hinder trade with Japan, using the maintenance or expansion of trade with themselves as leverage. Whilst such a scenario would have been highly unlikely in the past, it is now a risk factor that warrants careful consideration given the shifting global landscape.

[2] In May 2026, the Australian government announced that, from July 2027 onwards, LNG export projects in the east of the country would be required to set aside 20% of their natural gas for domestic use.

Figure 10 | Australia's value of imports and exports for goods and services with the top three trading partners [2025]



Source: Australian Bureau of Statistics

Rather than simply resting on our laurels in the current Japan–Australia relationship, which is considered to be sound and free of friction, we should strive to build an even more friendly and cooperative relationship. Prime Minister Sanae Takaichi's visit to Australia during the holidays in May 2026 may well contribute to this. However, summit diplomacy alone, with its limited opportunities, is not sufficient. It is also essential to foster mutual benefit and understanding at the business and grassroots levels.

After all, diversity is key to a stable energy supply.

The current situation starkly highlights the dangers of over-reliance on energy supply. Whilst we must develop a balanced mix of domestic energy sources such as solar photovoltaics, wind and nuclear, it is essential to ensure flexible and strategic procurement from the West (the Middle East), the East (the United States and Canada, which has begun exporting LNG from its Pacific coast), and the South (Australia)[3].

[3] On the other hand, the situation regarding the North (Russia) remains difficult for the time being. The key will be whether measures can be taken that do not undermine the sanctions and deterrent effects intended by the energy embargo—its original purpose—in relation to the war in Ukraine, or whether they are sufficiently effective in mitigating the adverse effects Japan would suffer as a result of the embargo.

Why Electricity Demand Differs Across Two Statistical Sources

Tenko Cho *

1. Introduction

Chapter III of EDMC Energy Trend, published monthly by IEEJ, reviews recent trends of electricity supply and demand using statistical data. Readers may have noticed that there are two measures of electricity demand: "Total electricity demand" in Table (2) ("Electricity Demand and Self Generation") and "Electricity demand in 10 areas" in Table (4) ("Electricity Supply/Demand in 10 Areas"). Although both measure electricity demand, the values moved in opposite directions in January 2026: Total demand from Table (2) fell by 0.9% relative to January 2025, whereas demand in 10 areas from Table (4) rose by 3.0%. In this short paper, we first clarify how the two measures of electricity demand are defined and then examine why their year-over-year rates of change differ.

2. Defining the Two Measures of Electricity Demand

The "Total electricity demand" in Table (2) is drawn from the Electric Power Survey Statistics, which is compiled by the Agency for Natural Resources and Energy (ANRE) using electricity utilities' *Monthly Reports on Electricity Generation and Receipts*[1]. Hereafter, we refer to this measure as "survey demand." It consists of utilities' reported demand[2], and their specified supply and self-consumption[3]. Reported demand is further divided into extra-high voltage, high voltage, low voltage (lighting and power), last-resort supply, and remote island supply. Survey demand records electricity sales by category on the basis of utility reports. It excludes on-site consumption from self-generation for private use. [a, b]

The "Electricity demand in 10 areas" in Table (4) is compiled by the Organization for Cross-regional Coordination of Transmission Operators (OCCTO), from data published by the transmission system operators (TSOs) serving Japan's ten areas. Hereafter, we refer to this measure as "10-area demand." 10-area demand measures electricity demand connected to the TSOs' system (system demand) at the sending end[4]. It excludes demand on certain transmission and distribution networks, and on-site consumption from self-generation for private use. [c]

Table 1 summarizes the differences between the two measures.

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1 "Electricity utilities" refers to retail electricity suppliers, general transmission and distribution operators, transmission operators, distribution operators, specified transmission and distribution operators, power generation operators, and specified wholesale suppliers.

2 Demand is estimated from reports by retail electricity suppliers, general transmission and distribution operators, and specified transmission and distribution operators.

3 Specified supply and self-consumption are estimated from reports by all electricity utilities.

4 A sending-end value is the electricity actually sent from generating facilities to transmission and distribution grids after deducting electricity consumption within the facilities and electricity consumption by the operators themselves.

Table 1. Comparison of "Survey demand" and "10-area demand" [a, b, c]

	Survey demand	10-area demand
Source	Monthly Reports on Electricity Generation and Receipts	Data released by TSOs
Compiled by	ANRE	OCCTO
Coverage	Utilities' reported demand + specified supply and self-consumption	System demand
Excluded	On-site consumption from self-generation for private use	Demand on certain transmission and distribution systems; on-site consumption from self-generation for private use
Measurement	Reported value	Sending-end value

3. Why the Two Measures Show Different Trends

Differences in definition help explain why the two measures differ in level and year-over-year rate of change. But why did survey demand fall while 10-area demand rose in January 2026?

An explanatory note in ANRE's summary of the Electric Power Survey Statistics identifies an important difference in reporting periods: [b]

"Electricity utilities may report figures for the period from the meter-reading date in month N−1 to the day before the meter-reading date in month N as figures for month N. Because most utilities report on a meter-reading basis, these figures do not coincide with demand in calendar month N."

10-area demand is reported for calendar month N. In contrast, for survey demand, most utilities' survey reports cover the period from their meter-reading date in month N−1 to the day before their meter-reading date in month N. Their reports therefore include part of month N−1 (from its meter-reading date through month-end) and part of month N (from the first day of the month to the day before its meter-reading date). Meter-reading dates vary by utility, and some utilities report on a calendar-month basis regardless of their meter-reading dates, as the note suggests. Even so, survey demand assigned to month N partly reflects the demand from month N−1. We assess the influence of meter-reading timing using five years of monthly data, from February 2021 through January 2026.

Let D_S^N and D_A^N denote the year-over-year rates of change in survey demand and 10-area demand, respectively, for month N. Because survey demand assigned to month N can include

demand from month N−1, we assume that D_S^N can be approximated by a weighted average of D_A^N and D_A^{N-1}, as in Equation (1). The coefficient θ is the weight assigned to the previous month. For a given θ, Equation (2) defines the fitted value $\widehat{D_S^N}$; the residual ε^N is the difference between the observed value D_S^N and the fitted value $\widehat{D_S^N}$.

$$D_S^N = (1-\theta)\cdot D_A^N + \theta \cdot D_A^{N-1} + \varepsilon^N = \widehat{D_S^N} + \varepsilon^N \tag{1}$$

$$\widehat{D_S^N} = (1-\theta)\cdot D_A^N + \theta \cdot D_A^{N-1} \tag{2}$$

Rearranging Equation (1) yields Equation (3). Equation (4) gives the residual sum of squares, and minimizing it with respect to θ yields the least-squares estimator in Equation (5). Applying this estimator to the sample gives $\theta = 0.48$.

$$D_A^N - D_S^N = \theta \cdot (D_A^N - D_A^{N-1}) - \varepsilon^N \tag{3}$$

$$\sum_N (\varepsilon^N)^2 = \sum_N [(D_A^N - D_S^N) - \theta \cdot (D_A^N - D_A^{N-1})]^2 \tag{4}$$

$$\theta = \frac{\sum_N (D_A^N - D_A^{N-1})(D_A^N - D_S^N)}{\sum_N (D_A^N - D_A^{N-1})^2} \tag{5}$$

When $\theta = 0$, Equation (2) uses only the current-month value D_A^N; when $\theta = 1$, it uses only the previous-month value D_A^{N-1}. The estimate $\theta = 0.48$ therefore assigns weights of 0.52 and 0.48 to the current and previous months, respectively. According to materials published by TSOs, meter-reading dates for low-voltage customers are distributed roughly throughout the month, whereas readings for high- and extra-high-voltage customers often take place on the first day of the month. Practices for high-voltage customers may vary, however: some operators use first-day or staggered readings depending on the circumstances [d], while some use staggered readings instead of first-day readings [e]. If a staggered reading takes place early in month N, the period reported as month N demand may contain more days from month N−1 than from month N. The reported figure can therefore diverge substantially from calendar-month demand. A reading on the first day of each month, by contrast, yields a monthly figure closer to calendar-month demand. The estimated weight should be interpreted as an overall fit to the sample, rather than as a fixed proportion for every month[5].

Using the estimated θ, we calculate a fitted value for each month and compute the root mean square error (RMSE) using Equation (6), where T denotes the number of months. A lower RMSE

5 The weight θ depends not only on the number of days from each calendar month included in the reporting period, but also on demand in those months. For a March–April pair, higher demand in March would increase the influence of the previous month; for a June–July pair, higher demand in July would increase the influence of the current month. The weight may also depend on the monthly mix of contract types: a larger low-voltage share may increase the previous month's influence because meter-reading dates for these customers are staggered.

indicates a closer fit to observed values.

$$RMSE = \sqrt{\frac{1}{T}\sum_N (\varepsilon^N)^2} \tag{6}$$

The weighted-average approximation yields an RMSE of 0.013, compared with 0.027 using the current-month value D_A^N alone and 0.028 using the previous-month value D_A^{N-1} alone. This roughly halved error is consistent with survey demand reflecting both months and indicates that a simple weighted average approximation captures part of the observed variation.

These findings highlight the importance of examining the coverage and compilation methods of statistical data and comparing them with other data to avoid misinterpretation.

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Verification of the latest cost estimate for the Alaska LNG project

- Glenfarne's reveal at the Alaska Senate Finance Committee -

Takafumi Yanagisawa *

1. Overview

On 3 June 2026, Glenfarne, the U.S. energy infrastructure company advancing the Alaska LNG project[1], revealed its latest cost estimate for the project at the Senate Finance Committee of the Alaska State Legislature. This was prompted by the Alaska legislature deliberating the tax cut proposal for the project, requesting Glenfarne to explain the latest cost estimate of the project[2].

This latest cost estimate perhaps reflects the Front-End Engineering Design (FEED) of Phase 1 (approximately 1,200 km longitudinal pipeline section) of the project, which the relevant parties say was completed in 2025. According to this estimate, the total project cost, including Phase 2 (liquefaction/export facilities with a capacity of 20 million tonnes per year, and gas treatment plant) before FEED in addition to Phase 1, is in a range between $44.5 billion to $54.5 billion, up from $38.7 billion announced in 2022 and $44 billion in 2023. A detailed breakdown is shown in Table 1.

Table 1: Changes in Cost Estimates for the Alaska LNG Project

	2022	2023	June 2026
Pipeline (Phase 1)	$12.7 billion	N/A	$13.2 - 16.9 billion
Liquefaction and Export Equipment (Phase 2)	$16.8 billion	N/A	$23.6 - 28.4 billion
GTP (Gas Treatment Plant) (Phase 2)	$9.2 billion	N/A	$7.7 - 9.2 billion
Total	$38.7 billion	$44 billion	$44.5-54.5 billion

(Source) based on information from Alaska Gasline Development Corporation and Glenfarne

Besides, it was also revealed that the cost estimate for Phase 1, which FEED has been completed, is with 15% plus accuracy, and that for Phase 2, which FEED has not yet been completed, is with 30% plus accuracy.

Based on this accuracy, the potential upside cost is calculated as shown in Table 2. Phase 1 is calculated to be 15% higher than the upper limit of the base case ($16.9 billion), which is $19.4

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[1] For the overview and background of the Alaska LNG project, please refer to the author's previous articles "Now and the Future for Alaska LNG Project " (10 October 2025, https://eneken.ieej.or.jp/data/12771.pdf) and “The progress and the future of Alaska LNG project – About the announcement of FEED completion for the pipeline portion- " (27 January 2026,https://eneken.ieej.or.jp/data/13036.pdf).

[2] Although there are still differences over the tax cut rate among Alaska's Senate, Representatives, and governor, all have been supporting the Alaska LNG project, especially the pipeline of Phase 1 since it is expected to contribute to lower gas prices in the state.

billion, and in Phase 2, the upper limit of the base case ($28.4 billion as liquefaction and export facilities, and $9.2 billion as Gas Treatment Plant) is calculated to be 30% higher, which are $36.9 billion and $12 billion, respectively. As a result, the total project cost could reach $68.3 billion.

Table 2: Estimated cost fluctuations for Alaska LNG

	Base Case	Accuracy	Highest Cost
Pipeline (Phase 1)	$13.2 - 16.9 billion	15% plus	$19.4 billion
Liquefaction and Export Equipment (Phase 2)	$23.6 - 28.4 billion	30% plus	$36.9 billion
GTP (Phase 2)	$7.7 - 9.2 billion	30% plus	$ 12 billion
Total	$44.5 - 54.5 billion		$68.3 billion

(Source) based on information from Glenfarne

Also, Glenfarne revealed that it had already agreed to supply gas to ENSTAR Natural Gas as a public-utility gas company based in Anchorage, with $16 per million BTU for up to 0.5 bcf per day, and up to $10 per day for quantities beyond that in Phase 1. Furthermore, in Phase 2, which will begin LNG exports, the maximum quantity will be set at 3 bcf, with a price of $5 per million BTU.

Meanwhile, Glenfarne has already signed preliminary agreements for feedstock gas procurement from ExxonMobil, Hilcorp, and ConocoPhillips, as major investors in Alaska's upstream oil and gas fields.

2. Future Outlook

Based on Glenfarne's latest cost estimate, the Alaska state is expected to further advance deliberation on tax cut rates applicable to the Alaska LNG project.

Regarding this project, Japan (JERA, Tokyo Gas: 1 million tonnes per year each), Taiwan (CPC: 6 million tonnes per year), Thailand (PTT: 2 million tonnes per year) and France (TotalEnergies: 2 million tonnes per year) have signed Letters of Intent (LOI) for procurement. Additionally, Korea's POSCO International has signed a Heads of Agreement (HOA) that includes procurement (1 million tonnes per year) and steel supply for pipeline construction.

For Asian LNG importers, including Japan, LNG from Alaska has the advantage of shipping days in about 10-15 days without passing through any choke point. Especially under the current Middle East crisis, making LNG imports via the Strait of Hormuz difficult, the shipping advantage of the Alaska LNG project is increasing in importance. Although with remaining uncertainty, Alaska's tax cut measures could be a desirable move from the perspective of easing project cost burden, improving its business competitiveness.

On the other hand, the estimate for the project costs remains within a broad range, and with the expected start timing as early as 2030-31 after the term of the Trump 2.0 administration, there

is a risk of policy changes from the U.S. side. Furthermore, major U.S. investors in Alaska upstream oil and gas fields still do not show a positive attitude to join the Alaska LNG project, which they had previously considered about participation[3]. Therefore, even with this latest cost estimate revealed this time, it seems that overseas companies, including Japanese firms, will continue to face high hurdles in making more binding commitments to the project.

Japan should wait for more reliable cost estimates for the project and for Alaska's tax cuts policy, while Japan should also consider the possibility of public-private partnership to involvement in the Alaska LNG project from the prospective of energy security.

[3] It is said that one of the reasons for considering this in the past was that there were no other LNG projects that could be promoted.

Community Energy in Europe's Energy Transition:

Policy Analysis and Implications for Japan

Tomoko Matsumoto *

Introduction

In its 7th Strategic Energy Plan, the Japanese government set a target to increase the share of renewable energy in power generation to approximately 40–50 % by 2040. Although renewable power generation surged after the feed-in tariff (FIT) system was introduced in 2012, disputes with local communities have also increased. Local communities have expressed concerns regarding the impact of renewable energy development on the environment, the landscape, and disaster risk management. These issues became especially serious when mega-solar power projects were planned, or when the inappropriate installation or maintenance of small-scale solar power systems was discovered, a problem stemming from previously lenient regulations. In order to support the "coexistence of renewable energy with local communities," which is essential for deploying renewable energy projects, the government has strengthened relevant policy measures. It is also necessary to develop renewable energy projects that local communities accept and comply with regulations.

Globally, many local communities participate in clean energy projects, known as community energy (in the EU, comparable forms are referred to as energy communities). To accelerate decarbonization toward carbon neutrality by 2050, the energy transition must be promoted at the regional and community levels. In this context, communities that actively participate in clean energy projects are critical to improving public acceptance of renewable energy.

In community energy models, renewable energy projects are expected to benefit local communities rather than negatively impacting them. Some European countries have a long history of utilizing community energy; for instance, co-operatives manage renewable energy projects, while residents invest in clean energy initiatives.

In contrast, Japan has no clear framework for fostering community energy, and projects categorized as community energy remain limited.[1] In 2021, the national government formulated the Regional Decarbonization Roadmap and has since supported local governments' decarbonization efforts. Although the Renewable Energy Promotion Area Scheme has encouraged the development of renewable energy projects designed to coexist with communities and deliver benefits to the local area, the designated promotion areas remain few.[2] Japan has limited

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[1] The Kanto Bureau of Economy, Trade and Industry (METI-Kanto) (2025) highlighted 14 renewable energy projects (wind, hydro, geothermal, and biomass) in the Kanto region that utilize the FIT scheme as exemplary cases of harmonizing renewable energy projects with communities, presenting them as best practices for other local governments and business operators to reference.

[2] As of March 2026, merely 79 municipalities had designated renewable energy promotion areas (Ministry of the Environment,

experience developing community-based renewable energy projects and is still exploring this area. Therefore, learning from community energy cases in other countries is meaningful for Japan as it seeks a viable pathway for renewable energy to coexist with local communities.

This study focuses on community energy in the United Kingdom and the EU, where community energy is actively fostered to accelerate the energy transition. The study examines policies and recent trends that support communities' clean energy projects and analyzes the factors driving community energy. The last section draws implications for addressing the challenge Japan faces in ensuring that local communities accept renewable energy projects.

1. Community Energy: Concepts, Benefits, and Challenges

1.1 Various Forms of Community Energy

Energy projects include not only those undertaken by energy companies but also those carried out by local citizens and communities. While private energy companies primarily pursue economic viability (profit), local citizens and communities participate in clean energy projects with broader goals such as social cohesion, environmental conservation, and climate change mitigation, alongside economic considerations. International Renewable Energy Agency (IRENA) Coalition for Action (2020) has defined community energy as the "economic and operational participation and ownership by citizens or members of a defined community—be it at the village, city or regional level—in a renewable energy project, regardless of the size and scope of the project."[3]

Community energy concepts are so diverse that comparing community energy projects in a simple, unified form can be difficult.[4] Focusing on the term "community", it is important to note that there are two distinct types: "communities of place," which consist of residents of the same or neighboring geographic areas, and "communities of interest," which consist of members who share a common goal, such as an interest in clean energy, without being bound by geography. To cover the various forms of community energy in major European countries, this paper interprets community energy broadly as clean energy projects in which communities participate and hold ownership, including renewable power generation and heat supply, energy storage, and energy conservation.

Community energy projects are managed under a variety of organizational structures. Governance structures, decision-making processes, and lines of accountability differ by legal classification (Table 1-1) (IRENA Coalition for Action, 2020; Caramizaru and Uihlein, 2020). For example, in the case of co-operatives, each member has equal voting rights and participates

n.d.).

[3] IRENA Coalition for Action defines "community energy as any combination of at least two of the following elements: (1) local stakeholders own the majority or all of a renewable energy project; (2) voting control rests with a community-based organization; (3) the majority of social and economic benefits are distributed locally" (IRENA Coalition for Action, 2020).

[4] There are several terms for energy projects that local communities participate in, not just "community energy." For example, the EU refers to local citizens and communities participating in clean energy projects as "energy communities" and further distinguishes between "renewable energy communities" and "citizen energy communities."

in decision-making; profits are reinvested in the community, and members share the benefits. In other cases, community energy initiatives include local governments, public energy companies, and private energy companies as participating members.

Various factors encourage local citizens and communities to undertake renewable energy projects. First, support measures such as FIT schemes, subsidies, and tax incentives improve economic viability, thereby facilitating the implementation of renewable energy projects. Because renewable energy projects have the potential to generate revenue for the community, community members see participation as beneficial. Second, the use of renewable energy is expected to enhance energy security. As a domestically available energy source, renewable energy helps improve energy supply stability and self-sufficiency. In off-grid areas, renewable energy deployment also enables access to clean energy. Finally, citizens concerned about environmental and climate change issues view the transition to environmentally friendly and sustainable energy as critical.

Community energy takes diverse forms, depending on available renewable energy resources and infrastructure, and the decarbonization approaches its members seek. Community energy projects previously focused primarily on renewable power generation. In recent years, however, they have expanded to include energy storage and energy conservation, and the role of energy prosumers who serve as both energy producers and consumers has become increasingly important. Beyond renewable power generation (solar, wind, small-scale hydro, and biomass), community energy projects have also encompassed the development of biomass fuel supply systems for district heating as well as efforts to decarbonize road transportation through the introduction of electric vehicles and the installation of charging infrastructure.

Table 1-1 Legal Structures for Community Energy

Co-operative	Members jointly own co-operatives to achieve common economic, social, or cultural goals based on the democratic principle of “one member, one vote.” Maximizing return on capital is not a key objective.
Non-profit organization	Members invest in the organization, but do not receive profits.
Association	Associations are private, non-profit organizations established around a common cause. Decision-making power usually stems from the association’s statutes or bylaws and rests with its members. A renewable energy association can take many forms, such as a housing association.
Community trust	Community trusts act as vehicles for broader community benefit. Investment returns are for specific local purposes and are shared with people who cannot invest.
Partnership	Partnerships are formed between individuals or legal entities to achieve a common business purpose. A partnership can take the form of a general partnership (where all partners can be held individually liable for the partnership’s debts) or a limited partnership (where partners who do not participate in management activities have limited liability for the partnership’s debts).

Corporation	Corporations are separate legal entities owned by their shareholders. Shareholders holding more shares have greater voting power and receive the profits as dividends.
Limited liability company	Members benefit from limited liability for the company's debts while profits are passed directly through to them.

Source: Compiled by the IEEJ based on Table 2, p. 19, IRENA Coalition for Action (2020)

1.2 Benefits and Challenges of Community Energy Projects

(1) Benefits of Community Energy Projects

Community energy brings environmental, social, and economic benefits (IRENA Coalition for Action, 2024). As a social benefit, community energy initiatives have the potential to improve social acceptance of renewable and clean energy technologies by fostering greater understanding and support among residents. When local citizens can participate from the project planning phase, they can engage in discussions regarding how the project will be carried out, how benefits and risks will be distributed, and how environmental considerations will be addressed. This fosters a democratic and transparent decision-making process, which is critical to building public trust in the project. For example, community energy could settle the so-called NIMBY (not in my backyard) problem. Local communities often oppose large-scale renewable energy projects, such as solar and wind farms, for two main reasons: first, the costs, such as negative impacts on the landscape and noise issues, are seen as outweighing the benefits; and second, residents are unable to participate in the planning process (Interreg Europe, 2022). Encouraging the communities surrounding the project to participate in decision-making from the planning stage will enhance transparency, while clearly articulating the benefits will improve understanding. Together, these measures can help deal with NIMBY issues.

Another social benefit is that, by actively participating in project planning and management, members come to share a sense of responsibility, strengthening solidarity and unity. Furthermore, members can gain knowledge and skills related to clean energy, which is expected to contribute to capacity building.

Community energy also delivers significant economic benefits. If community energy projects can supply affordable renewable electricity, energy costs can be lower than purchasing electricity from traditional utility providers. In some cases, community energy projects even generate revenue by selling surplus electricity. Moreover, reducing energy costs is an effective way to alleviate energy poverty.

In community energy initiatives, project revenues can be reinvested in the local community. For example, revenues can be used to expand the same project or fund other clean energy initiatives. Alternatively, they can be invested in projects that provide social benefits to the community, such as education or infrastructure development.

Community energy projects can help develop the local economy and create jobs when involving local supply chains (Verde and Rossetto, 2020). Additionally, establishing renewable

power systems with energy storage at the regional and community levels can help mitigate the impacts of fuel supply disruptions and power outages caused by natural disasters, thereby strengthening energy security.

(2) Challenges of Community Energy Projects

Although community energy has social and economic benefits, its role in the energy market remains limited, and many challenges must be addressed to achieve its widespread adoption.

First, securing financial resources is critical for sound project management. A project's high initial costs make it difficult to cover expenses solely through participants' contributions, even with government subsidies. Moreover, because community energy projects are typically small in scale, financial institutions may view them as high-risk in operation and finance, which could limit access to funding.

Second, policy support measures are necessary to secure financing and ensure project feasibility. The current energy market structure and legal framework are designed for large-scale power generation projects (IRENA Coalition for Action, 2020). Consequently, typical small-scale community energy projects are disadvantaged due to limited access to the energy market and the power grid. For example, when the renewable power purchase system shifts from a FIT scheme to a bidding system, some conditions become too stringent for small-scale projects to participate in the bidding process. As a result, small-scale community energy projects often struggle to secure buyers for their electricity, making it difficult to generate stable income.

Third, a lack of technical expertise and skilled labor hinders the launch and management of community energy projects. A community alone may not have enough personnel with the specialized knowledge and experience necessary to implement clean energy projects. Some projects failed at the planning stage because of insufficient expertise. Therefore, community energy necessitates cooperation from third-party companies or organizations for technical support.

Fourth, community energy needs to be properly understood. The benefits of active participation in community energy initiatives are not widely recognized, and information on this subject is limited. Unless policymakers understand community energy, it is unlikely to be incorporated into local or national plans and policies, and it will also be difficult to raise public awareness. Communicating knowledge, experiences, and best practices effectively is important to improve understanding not only among local communities but also among policymakers and financial institutions (IRENA Coalition for Action, 2024).

Lastly, fairness should be maintained within the local community. Careful consideration must be given to how project profits are distributed and to what extent residents are involved in project management. If energy project management is not transparent, distrust toward the project may grow. Transparency in decision-making is especially essential for gaining public trust. Furthermore, since high-income individuals with financial resources tend to participate more actively in community energy projects, widening inequality within the local community poses another challenge.

2. The United Kingdom: New Initiatives under the Local Power Plan (LPP)

2.1 Background for Promoting Community Energy Projects

(1) Establishment of Great British Energy (GBE)

To promote decarbonization, energy conservation, and energy security, the United Kingdom (UK) places importance on the role of local communities in clean energy projects.

The UK established the legal framework for reducing greenhouse gas (GHG) emissions under the Climate Change Act 2008 and, in 2019, legally committed to achieving net zero by 2050. In 2021, the UK Government announced the Net Zero Strategy, which outlined policies and plans to meet the 2050 net zero target and set a goal of fully decarbonizing the power system by 2035 (UK Government, 2021).

Following the Labour Party's victory in the 2024 general election, the UK Government further advanced its decarbonization policies and pledged to make the UK a 'clean energy superpower.' The Clean Power 2030 Action Plan, announced in December 2024, aims to generate at least 95% of electricity from clean energy sources by 2030 (UK Government, 2024). To achieve this goal, the plan sets ambitious 2030 targets for renewable power generation capacity: 45–47 GW of solar, 27–29 GW of onshore wind, and 43–50 GW of offshore wind.

In May 2025, the Government established Great British Energy (GBE), a publicly owned company dedicated to clean energy development, and positioned it at the forefront of its mission to make the UK a clean energy superpower. GBE's core objectives are as follows;

First, GBE drives "clean energy deployment across the whole of the UK, as a strategic developer, investor, and owner of clean energy projects," which includes developing new clean energy projects, derisking existing projects, investing in clean energy supply chain projects, and mobilizing private sector investments (UK Department for Energy Security and Net Zero [DESNZ], 2025a).

Second, GBE ensures "that UK taxpayers, billpayers, communities, and the current energy workforce benefit from the clean energy transition by increasing public ownership and community involvement in the development of clean energy projects, and by supporting jobs and economic growth across the UK" (UK DESNZ, 2025a). Specifically, well-paid, high-quality jobs will be created and maintained through GBE-supported projects; the long-term financial self-sustainability will be achieved, and public and community ownership of clean energy assets will be increased to enable reinvestment in support of the transition and for the wider public good; and the long-term growth of the local and community energy sector will be encouraged (UK DESNZ, 2025a).

In sum, GBE plays a critical role in promoting clean energy development at the local level. Under the "Local Power Plan" described below, GBE will provide financial support for clean energy projects developed in collaboration with local communities.

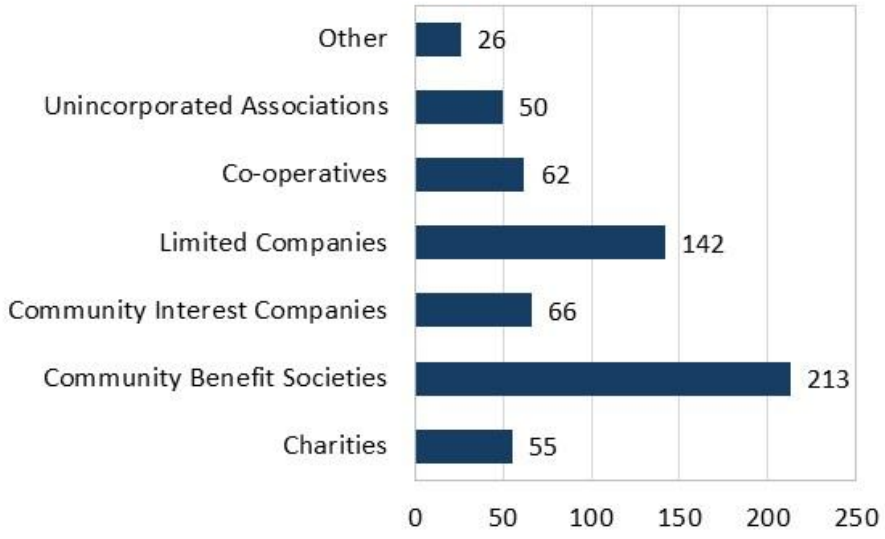
(2) Community Energy Initiatives in the UK

(a) The Current Situation of Community Energy in the UK

As of 2024, the renewable power generation capacity of community energy projects in the UK reached 411 MW (266 MW from solar, 132 MW from wind, 13 MW from hydro, and 0.25 MW from biomass), generating 575 GWh of electricity, which is equivalent to powering approximately 210,000 households annually (Community Energy England, 2025). Additionally, community energy groups, co-operatives, and local governments are planning approximately 1.9 GW of energy projects across the UK (UK DESNZ and GBE, 2026). This planned capacity is equivalent to 3% of the UK's 2025 renewable power generation capacity of 65.3GW (UK DESNZ, 2026a).

Community energy in the UK is diverse, with 614 organizations engaged in energy projects as of 2024 (Community Energy England, 2025). In terms of organizational structure, Community Benefit Societies were the most common, accounting for nearly one-third of the total; these are organizations that serve the broader interests of the community (Figure 2-1).[5]

Figure 2-1 Community Energy Organizations as of 2024



Note: Community Interest Companies are limited companies that operate to benefit the community.

Source: Compiled by the IEEJ based on p. 4, Community Energy England (2025)

(b) Policy Measures

Two developments explain the driving factors behind community energy deployment in the UK: the liberalization and privatization of energy infrastructure and supply, and the rapid advancement of renewable energy technology. Together, these shifts created opportunities for

[5] Community Benefit Societies are classified as a type of co-operative. Under the Co-operative and Community Benefit Societies Act 2014, co-operative members were required to participate directly in the business. However, because most community energy groups sold electricity to the national grid rather than supplying it to members, they did not meet this requirement and were therefore required to register as Community Benefit Societies instead. Consequently, this organizational structure became common among community energy projects (Braunholtz-Speight et al., 2018).

small-scale energy providers to enter the market (Braunholtz-Speight et al., 2018). Community energy initiatives in the UK began in 1997, when Baywind Energy Co-operative, the first UK co-operative to own wind turbines, raised GBP 2 million to fund its project (Baywind Energy Co-operative, n.d.).

In the 2000s, policies supporting local and community-based renewable energy projects were implemented. In 2002, the UK Government introduced the Renewables Obligation program to expand renewable energy deployment. In particular, the FIT scheme, introduced in 2010 for small-scale renewable energy facilities (less than 50 kW), significantly boosted installed community-owned renewable energy capacity (Verde and Rossetto, 2020). Furthermore, the UK Government provided subsidies, such as the Rural Community Energy Fund, to promote community investment in renewable energy

In 2014, the Community Energy Strategy was formulated to promote the community's active role in energy systems (UK Department of Energy and Climate Change, 2014). This strategy outlined government policy directions to support community participation in renewable energy generation and heat supply, energy saving, energy demand management, and collective purchasing and switching. The strategy also sought to create an enabling environment for community energy projects through measures such as strengthening partnerships with local authorities and businesses and building community capability.

However, support measures for renewable energy scaled back in 2015 after the dissolution of the coalition government between the Conservative Party and the environmentally focused Liberal Democrats (2010–2015), a change that also affected community energy projects. The new government, led solely by the Conservative Party, reduced the applicability of the FIT scheme and shifted its focus to support measures such as the Renewables Obligations scheme and the Contracts for Difference scheme, which were better suited to large-scale renewable energy projects (Braunholtz-Speight et al., 2018; Verde and Rossetto, 2020). Subsequently, community energy growth decelerated.

(c) Organizational Support

In the UK, specialized organizations that help establish and manage community energy projects have also contributed to their widespread deployment (Braunholtz-Speight et al., 2018). These include Community Energy Scotland (established in 2007), Community Energy Wales (established in 2012), and Community Energy England (established in 2014), all of which are committed to sharing knowledge and information and building networks among community energy groups.

Another organizational support factor is that experienced groups provide services to facilitate the development of community energy projects. For example, founded by Baywind Energy Co-operative, Energy4All is a family of co-operatives dedicated to helping communities develop renewable energy projects, with more than 30 co-operatives as members. Energy4All helps communities raise the funding they need, access high-quality project managers, and improve

overall project management. Once a new co-operative is built and operational, it too supports other community energy projects through the Energy4All membership network (Energy4All, n.d.).

(d) Initiatives in England, Scotland, and Wales

The UK Government has set an ambitious target of 8 GW of local and community-owned energy projects by 2030 (UK DESNZ, 2025b). The Scottish Government has set a target of 2 GW of community energy projects by 2030, while the Welsh Government aims to achieve at least 1.5 GW of locally owned renewable power generation capacity by 2035. To achieve these goals, each government has supported local authorities and communities for decarbonization projects.

① England

In England, under the Local Net Zero Hubs program, five Net Zero Hubs—the North East and Yorkshire Local Net Zero Hub, the North West Local Net Zero Hub, the Midlands Local Net Zero Hub, the South West Local Net Zero Hub, and the South East Local Net Zero Hub—support local authorities and communities by developing and promoting net zero projects, attracting commercial investment, and sharing information and knowledge with residents (UK DESNZ, 2026b). In addition, GBE launched a GBP 5 million Community Fund, which is allocated to community clean energy projects through each Net Zero Hub.

② Scotland

The Scottish Government has actively promoted local and community ownership of renewable energy projects[6]. Renewable energy accounted for 97% of Scotland's electricity demand in 2020, and clean energy co-operatives and locally owned generation facilities generated nearly 10% of that supply (Hockenos, 2022).

The Scottish Government's key support program, the Community and Renewable Energy Scheme (CARES), provides funding and expert advice to facilitate community ownership of renewable energy projects (Scottish Government, n.d.). Under the Good Practice Principles, the Scottish Government also encourages renewable energy developers to consider shared ownership—"any structure which involves a community group as financial partner over the lifetime of a renewable energy project" (Scottish Government, 2019).[7]

Furthermore, a pilot scheme is underway to give community groups priority in leasing one of 10 publicly owned Forestry and Land Scotland sites with wind farms for repowering projects (Scottish Government, 2025). This scheme aims to provide local communities with opportunities to benefit from wind repowering projects.[8]

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[6] The Scottish Government defines community energy as renewable power generation carried out only by not-for-profit local groups (Verde and Rossetto, 2020).

[7] The Scottish Government aimed to have at least half of newly consented renewable energy projects under shared ownership arrangements by 2020 (Scottish Government, 2019).

[8] For this pilot scheme, Forestry and Land Scotland gives communities advance notification of upcoming lease opportunities to

③ Wales

Since 2018, the Welsh Government has supported the public sector and community groups in accelerating the energy transition through the Energy Service program (Welsh Government, n.d.). It provides grants and technical, commercial, and procurement advice for energy projects, such as renewable energy, low-carbon heat, energy conservation, zero-emission vehicles, and electric vehicle charging infrastructure.

2.2 Local Power Plan (LPP)

With the 2024 change in government, community energy has gained momentum again. In February 2026, the UK Government announced the Local Power Plan (LPP). Under the LPP, the government will accelerate local clean energy development through GBE by investing GBP 1 billion—the largest-ever public investment in community energy projects. The LPP outlines a vision in which "every community in the UK will have the opportunity to own a local energy project" by 2030 (UK DESNZ and GBE, 2026).

The LPP highlights the importance of local governments and communities retaining ownership of clean energy projects. With ownership, they can control their own energy and reap its benefits. In addition to creating local jobs and strengthening energy security, clean energy projects owned by local governments and communities are expected to reduce energy costs, allowing the savings to be reinvested in the local community for other priorities (UK DESNZ and GBE, 2026).

The LPP is designed not only for local governments and community energy groups, but also for members of the public interested in exploring community energy, as well as other public sector organizations that could benefit from renewable energy. The program aims to support over 1,000 community energy projects and expand shared ownership. The LPP covers clean energy technologies such as wind, solar, hydroelectric (including wave and tidal energy), bioenergy, and electricity storage (UK DESNZ and GBE, 2026).

The LPP lays out four support measures to overcome barriers and market failures that prevent project development. First, direct funding ensures access to finance, improves projects' economic viability, and mobilizes private capital. Second, GBE provides a team of experts to help communities plan and develop projects and build their capacity. Third, GBE presents a long-term plan to attract more investment in local and community energy by developing revenue-generating business models. Fourth, revised policies and regulations will foster community energy projects. Specifically, mandating shared ownership in community energy projects and ensuring communities have fair access to the energy market and the grid are issues for consideration (UK DESNZ and GBE, 2026).[9]

In addition, the UK Government proposed a potential mandatory scheme that would require

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have sufficient time for preparation. Meanwhile, community groups receive dedicated guidance for repowering projects, including support with financing, evaluation and governance, as well as targeted support through CARES (Scottish Government, 2025).

[9] As of 2024, 25 organizations were involved in shared ownership energy projects, and another 70 organizations were planning such projects (Community Energy England, 2025).

developers of low-carbon energy infrastructure to provide community benefit funds. In May 2025, the Government released a working paper to seek opinions on the scheme's design (UK DESNZ, 2025b).

While community benefit funds have been provided on a voluntary basis, their management has varied across clean energy technologies and regions. Making such funds mandatory through regulation is expected to ensure a fair and uniform approach to sharing the social and economic benefits derived from community energy projects. The technologies under consideration for the scheme's scope include low-carbon power generation with a minimum threshold capacity of 5 MW—such as onshore and offshore wind, solar, tidal stream, hydro, nuclear, electricity generation with CCUS (carbon capture, utilization, and storage), and hydrogen to power—as well as battery energy storage systems and long-duration energy storage. Developers using these technologies would be required to establish community benefit funds tailored to local conditions in collaboration with residents.[10] A mandatory scheme is expected to take effect by the end of 2027 at the earliest.

The working paper also examines how best to facilitate shared ownership of renewable energy generation infrastructure. Under shared ownership models, a community group has an opportunity to invest in a commercially owned renewable energy project, with the community's share of the project considered community-owned. Through this partial ownership, communities become directly involved in the project, which can deepen their understanding of project management, while allowing them to benefit from the project's revenue and social advantages. However, shared ownership carries risks, as it requires communities to bear a significant portion of the project's costs and provide the necessary personnel and technical expertise.

How the UK's new initiatives affect local governments and communities, and whether they lead to an increase in community energy projects, may offer useful lessons for other countries.

3. EU: Energy Community Development

3.1 EU's Energy Community Policy

(1) Regulatory Framework for Energy Community

In the Renewable Energy Directive amended in 2023 (RED III), the EU set a legally binding target for renewable energy to account for at least 42.5% of the energy mix by 2030, with an aspiration to reach 45%. To promote renewable energy adoption, the EU has encouraged power purchase agreements (PPAs), the streamlining of permitting processes, the establishment of renewables acceleration areas, and the development of renewable energy communities (European Commission, n.d.-a).

In the EU, energy communities are "legal entities that empower citizens, small businesses and local authorities to produce, manage, share and consume their own energy" (European Court of

[10] Low-carbon energy infrastructure with capacities below 5MW are encouraged to provide community benefits voluntarily (UK DESNZ, 2025b).

Auditors, 2026).[11] Citizen-driven energy communities enhance public acceptance of renewable energy projects and mobilize private investment in the clean energy transition (European Commission, n.d.-b). Energy communities are expected to restructure the energy system by enabling citizens to drive the energy transition at the local level and directly reap benefits such as energy efficiency, lower energy costs, and more local green jobs. The REPowerEU Plan, announced in 2022, set a political objective of establishing one energy community in every municipality with a population of more than 10,000 by 2025.[12] The Affordable Energy Action Plan also positions energy communities as a means of accessing affordable renewable energy and emphasizes the need to strengthen them.

With the Clean Energy Package adopted in 2019, the EU introduced the concept of energy communities into legislation. Energy communities are defined in two separate directives of the package (Caramizaru and Uihlein, 2020). The first is the revised Renewable Energy Directive (EU) 2018/2001 (RED II), which established a framework for renewable energy communities covering renewable energy specifically. The second is the revised Internal Electricity Market Directive (EU) 2019/944 (IEMD), which introduced citizen energy communities in the energy system, including all types of electricity.

Renewable energy communities and citizen energy communities have similar concepts, but their definitions are partially different. RED II Article 2 (16) and IEMD Article 2 (11) define these legal entities, respectively. Both definitions share the following common elements: participation is open and voluntary; members or shareholders—such as natural persons, local authorities, and small and medium-sized enterprises—exercise effective control; and the primary purpose is to provide environmental, economic, or social benefits to the community, rather than financial profits. However, the two concepts differ in the following points. In renewable energy communities, the community's autonomy is maintained, and the renewable energy projects are effectively controlled by shareholders or members located in the proximity of the projects. In contrast, citizen energy communities must engage in activities such as generation, distribution, supply, consumption, aggregation, energy storage, energy efficiency services, or electric vehicle charging services.

EU Member States are required to transpose the directives into national legislation. Only a few Member States have explicitly incorporated the definitions of renewable energy communities and/or citizen energy communities into their national laws (REScoop.eu, n.d.). Even in countries that have incorporated these definitions into domestic regulations, they have different perspectives on which organizational structures are regarded as energy communities (Koltunov et al., 2023).

[11] The term "energy community" is used throughout this chapter.
[12] As of January 2025, the EU had achieved only 27% of this target (European Court of Auditors, 2026).

(2) Citizens Energy Package

In March 2026, the European Commission published the Citizens Energy Package to deliver affordable energy and empower citizens to actively participate in the clean energy transition. As part of this package, a Communication set out actions to "lower energy bills for households, protect and empower consumers, tackle energy poverty, and implement the existing EU laws effectively" (European Commission, n.d.-c). This Communication highlights the important role of energy communities in empowering consumers.

According to this Communication, more than 8,000 energy communities are active in Europe, and vast untapped potential remains, particularly in rural areas, for utilizing renewable energy sources such as biogas and biomethane (European Commission, 2026a). The goal is to increase renewable energy capacity in energy communities by up to tenfold by 2030, through encouraging investments in communities that develop renewable energy. In terms of economic benefits, households that generate and consume their own solar power are estimated to save EUR 260–550 per year, while energy communities that utilize wind and solar power are projected to generate annual revenue of EUR 440–930. To achieve the goal, the European Commission will:

- provide guidance to Member States on how to unleash the potential of energy communities and energy self-consumption by Q1 2026;
- adopt an implementing regulation on data interoperability to ensure that energy sharing is easy to use and fully automated by 2027; and
- issue a series of practical, step-by-step guides on how to set up and manage community energy projects by 2026–2027.

On April 30, 2026, the European Commission presented a package of recommendations to protect citizens and support the shift toward a more inclusive, resilient, and sustainable energy system (European Commission, n.d.-d). One recommendation includes practical guidance for Member States to facilitate the deployment of energy communities and maximize the potential of self-consumption (European Commission, 2026b).[13] This document provides a comprehensive framework for promoting the adoption and use of renewable energy led by citizens and local communities, in order to accelerate the EU's energy transition. It also outlines measures that Member States should take to help energy communities overcome challenges, including difficulties in mobilizing finance at the early stage of project development, navigating complex administrative procedures, and securing investment in infrastructure. An ambitious target is to develop a national strategy for energy communities and self-consumption, including an assessment of their potential contribution to EU energy objectives by 2030 and 2040 (European Commission, 2026b).

[13] This document requires Member States to clearly differentiate between the two concepts of renewable energy communities and citizen energy communities. However, the European Court of Auditors (2026) found that the legal definitions of these two energy communities at the EU level are not clear.

3.2 Energy Community Initiatives of EU Member States

While the EU has made energy communities a priority, Member States have adopted them to different extents. There is a disparity between countries that have established energy co-operatives and those that have not. Energy communities are particularly prevalent in higher-income Northern and Western European countries, where community ownership of energy projects has a long-standing tradition (Caramizaru and Uihlein, 2020).

This section reviews the background of energy community development and the latest policies in Germany and the Netherlands, two leading countries in this field. It also analyzes policy developments in Italy, as the country has seen an increase in energy communities in recent years, although it was a latecomer.

(1) Germany

Germany has the largest number of energy communities in Europe, with approximately 1,700 communities as of 2016. Co-operatives, which mainly focus on solar power generation, account for more than half (55%) of energy communities, followed by limited liability companies (37%) (Eriksson Berggren et al., 2023). Most energy communities are engaged in renewable power generation, such as solar and wind, and district heat supply using biomass.

In Germany, co-operatives are well-established organizations that have long supplied electricity, particularly in rural areas, which laid the foundation for energy community development (Eriksson Berggren et al., 2023). In addition, *Energiewende*—Germany's politically driven initiative to transition away from nuclear power and toward a low-carbon energy system—has also helped boost renewable energy use (Verde and Rossetto, 2020).

The number of energy communities focusing on renewable energy has increased since 1995 (Eriksson Berggren et al., 2023). The Renewable Energy Sources Act (*Erneuerbare-Energien-Gesetz*, EEG), introduced in 2000, included the FIT scheme and prioritized renewable electricity for grid connection, both of which spurred investment in renewable energy. The 2006 Amendments to the Co-operative Law also encouraged the establishment of energy co-operatives (IRENA Coalition for Action, 2020; Eriksson Berggren et al., 2023).[14] New energy communities, especially those focusing on solar power, increased substantially between 2006 and 2013. However, lower FIT rates and a shift to an auction system slowed their growth. From 2013, wind projects in the form of limited liability companies increased because of changes in the EEG, and limited liability companies replaced co-operatives as the predominant legal structure of energy communities. Recently, insufficient digital infrastructure has posed a technical constraint to energy communities (Eriksson Berggren et al., 2023).

Regarding the two EU directives, Germany has partially transposed the provisions on

[14] The minimum number of members required to establish a co-operative was reduced from seven to three, and regulations were relaxed to allow co-operatives with 20 or fewer members not to have auditors and multiple directors in their articles of incorporation (Tabuchi, 2014). However, the EEG 2021 stipulates that an energy community must have at least 10 natural persons as members (European Commission, n.d.-e).

renewable energy communities and citizen energy communities into national laws (Deutsche Energie-Agentur [dena], 2024). However, the absence of specific regulations on energy sharing has hindered the development of energy communities in Germany (Eriksson Berggren et al., 2023).[15] In November 2025, the German parliament (*Bundestag*) passed an amendment to the Energy Industry Act (EnWG), which introduced a new energy sharing regulation in Section 42c (Taylor Wessing, 2025). The EEG has allowed tenant electricity models, in which electricity "generated in, on, or at a residential building" is "supplied directly to the tenants or homeowners and owners without using the public grid" (dena, 2024). Under the amendment, end users can form energy communities and jointly develop renewable energy systems from June 2026. Generated electricity can be shared with other consumers in the same balancing area via the public grid, with a phased expansion to neighboring grid areas by 2028 (Taylor Wessing, 2025). Although challenges such as the administrative burden on energy communities and grid connection costs remain, this legislative amendment enables more flexible use of renewable energy and opens new possibilities for energy communities.

(2) The Netherlands

The Netherlands has encouraged the development of energy communities to reduce CO_2 emissions and expand the use of renewable energy (Tarpani et al., 2022). The number of energy co-operatives has increased substantially from 27 in 2010 to 696 in 2025 (HIER, 2025). They engage in solar and wind power generation, energy saving, heat supply, and projects that combine these activities. As of 2025, their total operating capacity reached 439.6 MW for solar and 335.9 MW for wind (HIER, 2025).

Policy measures that facilitate the establishment of energy communities have driven a robust increase in their numbers. First, a tax reduction scheme known as the Postal Code Rose Regulation (PCRR) was introduced in the Environmental Tax Act in 2014 (Diestelmeier and Swens, 2021). The scheme was geographically restricted: members of co-operatives or homeowners' associations living within a particular postal code area were eligible for tax reductions on energy produced within a collective renewable energy project in the same postal code area. In April 2021, the PCRR was replaced by a new subsidy scheme for co-operative energy production (*Subsidieregeling Coöperatieve Energieopwekking*) (Diestelmeier and Swens, 2021). This new measure provides subsidies based on the amount of renewable power generated to help co-operatives recover their investments in generation facilities.

Second, the Dutch Experimentation Decree was implemented between 2015 and 2018 as an experimental regulation on decentralized renewable power generation (Diestelmeier and Swens, 2021). This decree aimed to increase the generation, distribution, or supply of decentralized renewable electricity and provided exemptions from specific articles of the 1998 Electricity Act.

[15] Energy sharing refers to "the coordinated consumption of electricity generated jointly in close proximity using the public grid" (dena, 2024).

Specifically, projects approved under this decree were exempt from the requirement that only designated distribution system operators manage an electricity system and were allowed to set network tariffs without prior approval by the regulatory authority (Diestelmeier and Swens, 2021).

Third, a revolving development fund is available to energy co-operatives to cover the start-up costs of wind and solar projects. Energy co-operatives can apply for interest-free loans ranging from EUR 10,000 to EUR 300,000, depending on the project development stage, and covering up to 80% of development costs for wind and solar projects. European Court of Auditors (2026) found this fund effective in derisking projects at an early stage.

Furthermore, in the Netherlands, systematically established organizational structures supporting energy communities have also contributed to their widespread adoption. The Ministry of Economic Affairs and Climate Policy and the Netherlands Enterprise Agency are the government bodies responsible for policy development and implementation, respectively (Eriksson Berggren et al., 2023). In addition, Energie Samen and HIER play a crucial role in supporting energy communities. Energie Samen shares knowledge, experience, and capital, provides training courses, and stimulates and coordinates innovation within the co-operative energy sector. It also advocates for ensuring “the voice of the energy communities is heard in policy, legislation and regulations” (Energie Samen, n.d.). HIER publishes data and a report on the development of citizen energy initiatives (HIER, 2025).

The Energy Act, which consolidates the Electricity Act and the Gas Act, came into force on January 1, 2026. For the first time, this Act recognizes energy communities as legal entities and establishes them as official market players in the energy market (European Energy Communities Facility, 2025). The Energy Act mandates priority grid access for renewable energy producers and introduces mechanisms to enhance consumer protection. The country has also focused on decentralized energy systems and introduced a framework to support local and community-based energy projects, thereby facilitating local energy production and citizen participation (Law and More, 2025). The new Act envisions citizens as energy prosumers. If it works effectively, the number of energy communities is likely to increase further.

In the Netherlands, grid congestion that delays connecting renewable energy projects is one obstacle to energy community deployment (European Court of Auditors, 2026). In addition to prioritizing renewable energy for grid connection, the new legal framework facilitates the balancing of electricity supply and demand within energy communities, which is expected to alleviate grid congestion.

However, the energy community concepts in the Netherlands are not aligned with the EU directives. While the EU directives define renewable energy communities and citizen energy communities separately, the Energy Act adopts a single definition covering both (European Court of Auditors, 2026).

(3) Italy

Italy once lacked sufficient policy support for energy communities and lagged behind other EU

Member States in deploying them. In recent years, however, the country has developed a regulatory framework to encourage energy communities, and the framework's effects have begun to emerge.

In Italy, energy community initiatives have gained momentum since the country transposed the energy community provisions of both EU directives—RED II and IEMD—into national legislation. First, in 2019, Legislative Decree 162/2019 specified two possible energy community schemes: collective self-consumption and renewable energy communities (Tarpani et al., 2022). Subsequently, in 2021, Legislative Decree 199/2021 and Legislative Decree 210/2021 incorporated the energy community provisions in RED II and IEMD, respectively (Zhu et al., 2025). Before these regulatory developments, only 77 energy communities existed, but their number rose to 119 in 2022 and further increased to 421 as of June 2025 (Koltunov et al., 2023; European Court of Auditors, 2026). Previously, most energy communities were energy co-operatives, especially in rural areas. Transposing the EU directives into national regulations has enabled new players to join the market as energy communities, including local governments, small and medium-sized enterprises, NGOs, research institutions, and social housing associations (Koltunov et al., 2023).

Incentive schemes have also contributed to the growth of energy communities. Legislative Decree 199/2021 set a premium tariff on shared energy—EUR 110/MWh for renewable energy communities and EUR 100/MWh for self-consumption—applied to the net amount of shared electricity, calculated as the difference between electricity supplied to the grid and electricity received from the grid (Tarpani et al., 2022). In addition, Ministerial Decree 414/2023 introduced capital grants covering up to 40% of eligible costs for collective self-consumption and renewable energy communities in municipalities with fewer than 5,000 inhabitants, aiming to develop 2 GW of renewable energy capacity (Ministero dell'Ambiente e della Sicurezza Energetica, 2024).[16] Ministerial Decree 414/2023 also sets the maximum premium tariff for shared energy, depending on the power plant capacity.[17] Through these two incentive measures (the capital grants and the premium tariff), the country aims to develop 5 GW of renewable energy capacity by the end of December 2027.

Furthermore, expanded eligibility criteria for support schemes have contributed to the adoption of energy communities. Legislative Decree 199/2021 raised the capacity limit for renewable energy systems eligible for grid connections from 200 kW to 1 MW (Tarpani et al., 2022). In 2025, Italy also raised the population threshold for municipalities eligible for capital grants from 5,000 to 50,000 inhabitants (European Court of Auditors, 2026).

While Italy has seen robust growth in energy communities, complex administrative procedures and financial burden pose barriers for municipalities with limited resources and capacity (Zhu et

[16] These grants are funded by Italy's National Recovery and Resilience Plan (Piano Nazionale di Ripresa e Resilienza, PNRR), which allocates EUR 2.2 billion for this purpose.

[17] The premium tariff is stipulated in Annex 1: EUR 100/MWh for installations with a capacity above 600 kW, EUR 110/MWh for installations between 200 kW and 600 kW, and EUR 120/MWh for installations below 200 kW.

al., 2025). Furthermore, energy communities are concentrated in the northern regions, reflecting regional disparities. Therefore, further efforts are needed to promote their nationwide adoption. Additionally, because many energy communities currently rely on solar power, establishing a framework that enables the use of wind and biomass could also help expand energy communities.

4. Implications for Coexistence of Renewable Energy with Communities in Japan

Japan also has projects comparable to community energy. Examples include local power producers and suppliers funded and managed by citizens, local businesses, and municipalities, as well as projects in areas selected by the Ministry of the Environment as Decarbonization Leading Regions.[18] However, these projects are not categorized specifically as community energy, and public awareness remains low. Drawing on policy implications from European initiatives, this section identifies the key factors necessary for widespread adoption of community energy in Japan so that renewable energy projects can coexist with local communities.

First, community energy initiatives need support measures. Because small-scale community energy projects have limited access to financing to cover high upfront costs, subsidies and tax incentives for capital investment can be effective measures. Where feasible, a subsidy program focused specifically on community energy, such as the one in the UK, would provide support directly to communities. Although community energy grew in Europe since the FIT scheme took effect, its deployment slowed after the scheme ended and an auction system was introduced. Because Japan has also shifted to an auction system for purchasing renewable energy, the environment for community energy has become more challenging. While maximizing profit is not the primary objective of community energy projects, revenue from selling electricity is crucial to a project's viability. Therefore, policy measures that ensure a stable revenue stream are needed to sustain community energy projects.

In addition to financial support, knowledge-sharing measures such as practical guidance on establishing and operating community energy projects can also be useful, as recommended in the EU's Citizens Energy Package. Such assistance could help promote understanding of community energy and facilitate the sharing of reliable information nationwide.

The UK's LPP encourages local governments and communities to retain ownership of clean energy projects. While shared ownership is expected to enhance social acceptance among local communities, building trust between project developers and communities and reaching consensus may require considerable time (Hogan, 2024). Policies that support both project developers and communities may therefore be necessary to facilitate shared ownership. If shared ownership becomes mandatory, the UK's policy implementation and outcome could provide a useful

[18] For example, in the small-scale hydropower project of the regional collaborative model in Takayama City, Gifu Prefecture, consensus is sought among residents of the neighborhood association where the facility is planned to be built. This consensus-building is facilitated by presenting, in advance, ways for local participation and contribution, such as operation and maintenance and joint investment. The project will reinvest a portion of its revenue in local community development initiatives (Ministry of the Environment, n.d.).

precedent for Japan.

Second, establishing a legal framework for community energy lays the foundation for project development. The EU's two definitions of energy communities may have confused stakeholders, which potentially delays project development. To address this, a clear definition of community energy is fundamental for its widespread adoption. Clarifying what constitutes community energy is also important because this definition will serve as the basis for determining eligibility for government support. Furthermore, regulations are needed when community energy is integrated into the electricity system, including procedures and permissible generation capacity for grid connection.

The Netherlands has enacted the Energy Act, which envisions community energy and citizens as prosumers playing an active role in the energy system. Although the Act has only recently come into effect, its implementation could offer valuable lessons on how community energy can function within the energy system and contribute to decarbonization.

Third, designating a specific administrative body to oversee community energy could work effectively. For example, GBE, a publicly owned company, was established to support community energy in the UK, and the Netherlands Enterprise Agency is responsible for implementing community energy policy in the Netherlands. In Japan, however, multiple ministries and agencies work on programs that support renewable energy projects similar to community energy.[19] Community energy stakeholders may face difficulties such as procedural complexity and administrative costs because of the fragmented administrative nature. A single agency responsible for community energy could provide efficient support and management focused specifically on community energy. If such an agency offered a one-stop service, it would clarify the contact point for community energy stakeholders and facilitate data provision and information sharing.

Fourth, establishing an organization dedicated to supporting community energy could be useful in encouraging community energy projects. In the UK, Community Energy England operates in England, and similar organizations also exist in Scotland and Wales. In the Netherlands, Energie Samen supports community energy projects and acts as an intermediary between the government and communities. Such organizations, which are close to communities and provide hands-on support, can help address the limited resources and expertise of community energy initiatives. They also importantly support information sharing and capacity building to improve understanding of community energy.

Fifth, deploying new technologies is vital for managing community energy projects efficiently. For example, digital technologies can be used to optimize energy system operations. Furthermore,

[19] Under its Commendation for Community-based Renewable Energy Projects, the Ministry of Economy, Trade and Industry (METI) awards the Community Coexistence Mark to outstanding projects that work to expand renewable energy coexisting with local communities (Agency for Natural Resources and Energy, METI, n.d.). In addition, seven government bodies—the Cabinet Office, the Ministry of Internal Affairs and Communications, the Ministry of Education, Culture, Sports, Science and Technology, the Ministry of Agriculture, Forestry and Fisheries, METI, the Ministry of Land, Infrastructure, Transport and Tourism, and the Ministry of the Environment—provide many support measures and frameworks, including financial assistance, to assist decarbonization efforts at the local level (Ministry of the Environment, n.d.).

integrating energy storage, such as battery energy storage systems, with variable renewable energy sources (wind and solar) enables a stable power supply and backup power during outages caused by natural disasters, thereby enhancing community resilience.

Community energy can enhance public acceptance of renewable energy. To accelerate decarbonization, community energy offers a business model that can help renewable energy coexist with local communities. However, because community energy projects are primarily small in scale, they often face financial and technical hurdles. Although Japan has introduced support measures for projects comparable to community energy, these measures tend to be fragmented, making it difficult to gauge their effectiveness. It is time to reconsider the policy approach to community energy. In this context, community energy initiatives that foster local production and consumption of renewable energy would be an effective measure.

Conclusion

Community energy has become increasingly important in Europe for accelerating the energy transition, reducing energy costs, and strengthening energy security. Both the UK and the EU are actively pursuing policies to encourage its development. In the UK, the Labour government, which came to power in 2024, has stepped up efforts to promote community energy. One of GBE's primary missions is to support local governments and communities in participating in clean energy projects. Under the LPP, GBE will work in partnership with local governments and communities to facilitate the development of clean energy projects.

The EU, which is accelerating the adoption of renewable energy in part to address geopolitical risks, also positions the deployment of renewable energy communities as one of the key measures in its energy transition. The EU has established legal definitions for renewable energy communities and citizen energy communities in its directives and has proposed policy measures to promote their expansion. Member States have also created a favorable investment environment for community energy by formulating regulations and offering incentives.

These European community energy initiatives will demonstrate the effects of these policy measures. To accelerate the energy transition, it is critical not only to pursue large-scale renewable energy projects but also to develop small-scale projects involving local communities. Community energy can improve social acceptance and serve to ensure that renewable energy projects coexist with local communities.

Japan needs to better understand the role of community energy in facilitating coexistence between renewable energy and local communities and tailor community energy to local conditions. Such an approach could encourage renewable energy deployment. Ultimately, community energy will help Japan to achieve its goal of establishing renewable energy as a major power source.

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Analysis of LNG Supply-Demand Dynamics and Outlook Following the 2026 Iran War and the Closure of the Strait of Hormuz

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Executive Summary

This report presents a scenario-based assessment of the potential impact on the global LNG supply-demand balance of reduced LNG supply capacity in Qatar and the UAE resulting from damage to energy infrastructure around the Strait of Hormuz and disruptions to shipping through the Strait.

The current war and disruptions in the Strait are unlikely to be fully resolved in the short term. Even if the ceasefire and the lifting of the blockade remain in place, reduced supply capacity and higher prices would persist for several months or longer.

The analysis suggests that global LNG supply capacity may fall short of projected demand in 2026 and 2027 on an annual basis. Before the 2026 Iran war, the author estimated that global LNG supply capacity would exceed demand in two distinct waves, peaking in the late 2020s and again in the early 2030s. The war is now expected to significantly reduce the first peak, leaving only the early 2030s peak. Although market adjustments are likely to prevent a substantial supply-demand imbalance, the two previously projected peaks are expected to converge into the later peak, effectively delaying the LNG market's growth trajectory by several years.

Given the multiple large-scale shocks in the global LNG supply-demand balance during 2022–26, together with the possibility of repeated attacks on LNG infrastructure and disruptions through strategic chokepoints, LNG procurement strategies are likely to evolve with a greater emphasis on energy security.

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1. Introduction

This report presents a scenario-based assessment of the potential impact on the global LNG supply-demand balance of reduced LNG supply capacity in Qatar and the United Arab Emirates (UAE) resulting from damage to energy infrastructure around the Strait of Hormuz and disruptions to shipping through the Strait. It also examines the long-term implications for LNG market participants and the evolution of global LNG supply and demand.

2. Background

(1) LNG Supply Capacity Outlook Prior to the 2026 Iran War

QatarEnergy, Qatar's state-run company, plans to expand its LNG liquefaction capacity from the current 77 million tonnes per annum (Mtpa) across 14 existing liquefaction trains to 142 Mtpa by the end of 2030 through the phased start-up of the North Field expansion projects[1]. ADNOC, the national oil company of Abu Dhabi, UAE, plans to increase its capacity from 6 Mtpa to 15.6 Mtpa by 1H 2029 through the start-up of the Ruwais LNG project[2] (see Table 1).

Table 1. LNG Capacity Expansion Plans in Qatar and the UAE

Qatar	Capacity (Mtpa)	Expected Start-up
QatarEnergy LNG N(1)-N(4) (Trains 1－7)	47	In operation
QatarEnergy LNG S(1)-S(3) (Trains 1－7)	30	In operation
North Field East (NFE) (Trains 1－4)	32	2H 2026–27
North Field South (NFS) (Trains 1－2)	16	2028
North Field West (NFW) (Trains 1－2)	16	2030 (pre-FID)
UAE	**Capacity (Mtpa)**	**Expected Start-up**
ADNOC LNG (Trains 1－3)	6	In operation
Ruwais LNG (Trains 1－2)	9.6	2H 2028–1H 29

Note: Liquefaction capacity represents nominal capacity. Actual production may vary.

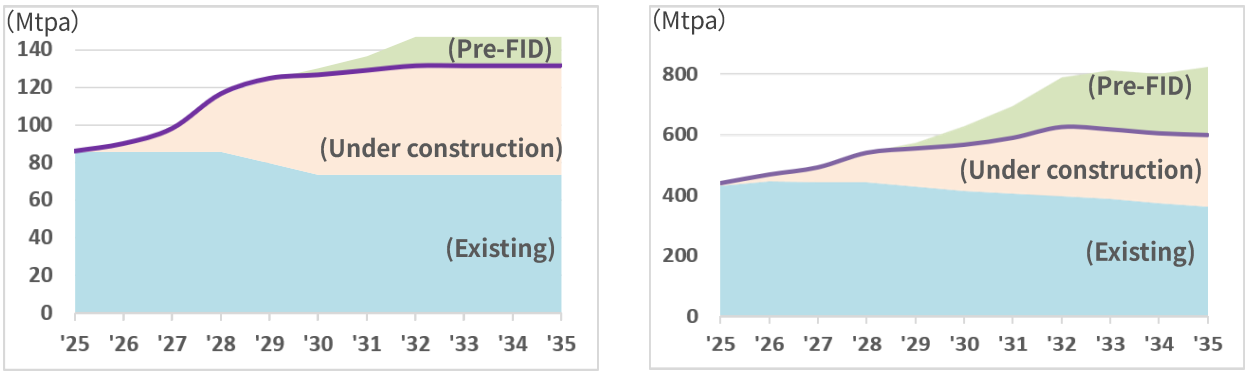
Source: Author's compilation based on publicly available information.

In addition to the projects above, numerous new projects and expansions of existing projects are progressing worldwide, including in the United States. As a result, global LNG supply capacity is projected to rapidly increase from approximately 440 Mtpa today to more than 600 Mtpa during the late 2020s to early 2030s, based on LNG supply from existing facilities and projects that have reached final investment decision (FID) (see Figure 1).

[1] QatarEnergy, "LNG: a cleaner source of energy", <https://www.qatarenergy.qa/en/WhoWeAre/Pages/WhatIsLNG.aspx>.
[2] ADNOC Gas, "ADNOC Gas to Acquire 60% Stake in Ruwais LNG from ADNOC at Cost in H2 2028", 11 Nov 2024, <https://adnocgas.ae/en/news-and-media/press-releases/2024/adnoc-gas-stake-in-ruwias-lng>.

Figure 1. LNG Supply Capacity Outlook: Qatar + UAE and the World

(Qatar + UAE) **(World)**



Note: Solid lines represent liquefaction capacity from existing facilities and projects under construction.

Source: Author's compilation based on publicly available information. The pace of capacity additions and declines is based on the author's assumptions.

(2) Damage to LNG Production Facilities and Suspension of Exports

On 28 February 2026, the Islamic Revolutionary Guard Corps (IRGC) announced that it would not permit vessels to transit the Strait of Hormuz. Subsequent military actions resulted in a substantial disruption to maritime traffic through the Strait. In March, oil and gas production facilities in Qatar were attacked. Around the same period, facilities in the UAE, notably the Habshan gas processing facility, which supplies the domestic market and accounts for approximately 60% of ADNOC's total gas processing capacity, were affected by security-related incidents, resulting in reduced operational capacity. LNG exports from both countries via the Strait (approximately 80 Mtpa) were halted, resulting in the sudden removal of around 20% of global LNG trade (over 400 Mtpa) from the market[3].

QatarEnergy has stated that repairs to two damaged liquefaction trains (12.8 Mtpa in total) are expected to take 3–5 years. It has also indicated that the North Field East (NFE) expansion project, scheduled for phased start-up from 2H2026, could face delays of months, if not a year or more[4]. ADNOC has reported that around 60% of its Habshan processing capacity has been restored as of May 2026, with restoration targeted to reach 80% by the end of 2026 and full capacity to be restored in 2027[5]. The facility's operational status is likely to affect ADNOC's LNG export volumes.

[3] IEA, "Strait of Hormuz Factsheet", Feb 2026, <https://www.iea.org/about/oil-security-and-emergency-response/strait-of-hormuz?ftag=YHF4eb9d17>.
[4] Reuters, "Exclusive: Qatar's energy boss says he had warned of dangers of provoking Iran", 20 Mar 2026, <https://www.reuters.com/business/energy/qatars-energy-boss-says-he-had-warned-dangers-provoking-iran-2026-03-20/>.
[5] ADNOC Gas, "ADNOC Gas Reports Resilient Q1 Net Income of $1.1 Billion", 12 May 2026, <https://adnocgas.ae/en/news-and-media/press-releases/2026/q1-2026-results>.

3. LNG Supply Capacity Outlook under Current Conditions

(1) Duration of the Impact

① The current war and disruptions in the Strait are unlikely to be resolved in the short term

Both Iran and the United States hold non-negotiable positions. While the United States seeks substantial restrictions on Iran's nuclear program, Iran prioritizes preserving its nuclear capabilities, securing sanctions relief, and ensuring the survival of the current regime. Significant obstacles therefore remain to reaching a comprehensive agreement.

Israel views Iran's nuclear program and support for regional proxy groups as threats to the survival of the state and the safety of its population. Israel is therefore expected to be reluctant to support a ceasefire agreement between the United States and Iran, as an early resolution that allows Iran to maintain its current regime would be unlikely to address Israel's fundamental security concerns.

② Even if the ceasefire and the reopening of the Strait remain in place, reduced supply capacity and higher prices would likely persist for several months or longer

Qatar's statement that the repair period for LNG production facilities will take 3–5 years is largely attributed to long lead times of 2–4 years for the delivery of large-frame gas turbines essential to core facilities[6]. Even in the absence of damage, restoring the normal operation of the full chain of facilities from gas field drilling to LNG loading requires several weeks. In addition, facilities currently under construction for future start-up face multiple factors causing delays, including the securing of workers and the revision of various contracts.

Regarding the recovery of maritime transportation, the shipping industry expects that restoring normal operations will take at least 3–4 months, with full recovery requiring considerably longer. More than 1,550 vessels[7] of various types currently stranded in the Strait of Hormuz will need to return to normal operations in stages (including bunkering and replenishment). The condition of vessels, equipment, and personnel must be assessed and necessary maintenance carried out. Insurance will also need to be revised, and vessel deployment and crew assignments readjusted. If naval mines have been laid, minesweeping operations and safety inspections will be required before normal navigation can resume.

However, recovery periods for both facility operations and maritime transportation could be shortened through advance preparation and early restoration efforts (Qatar has an advantage in this regard, as it operates its own LNG carrier fleet).

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[6] RystadEnergy, "The cost of war: Gulf energy infrastructure left facing a $25 billion repair bill", 15 Apr 2026, <https://www.rystadenergy.com/news/middle-east-conflict-rebuild-energy-cost>.

[7] CSIS, "The Strait of Hormuz in 8 Charts", 22 Apr 2026, <https://www.csis.org/analysis/strait-hormuz-8-charts>.

(2) Changes in the LNG Supply Capacity Outlook

Based on the foregoing analysis, and assuming that the normalization of LNG supply and transportation capacity will take time even after the Strait of Hormuz is reopened, the impacts are estimated under three scenarios: Scenario 1, in which recovery proceeds smoothly; Scenario 2, in which recovery is prolonged; and Scenario 3, in which damage worsens further.

The assumed durations of facility restoration and project delays in Qatar are based on QatarEnergy's statement described above, which indicates that repairs to damaged facilities could take 3–5 years and project delays could last for several months, if not a year or more[8]. Scenario 1 assumes the shorter end of these ranges, while Scenario 2 assumes the longer end. Scenario 3 further illustrates a case in which the war continues, assuming more extensive damage to Qatar's LNG facilities than at present (approximately 17% of production capacity) and a reopening of the Strait of Hormuz approximately 3 years after the onset of the blockade.

Scenario 1 (Faster Recovery)

Strait of Hormuz reopened in June 2026; damaged facilities restored after 3 years; expansion projects delayed by 6 months.

Scenario 2 (Slower Recovery)

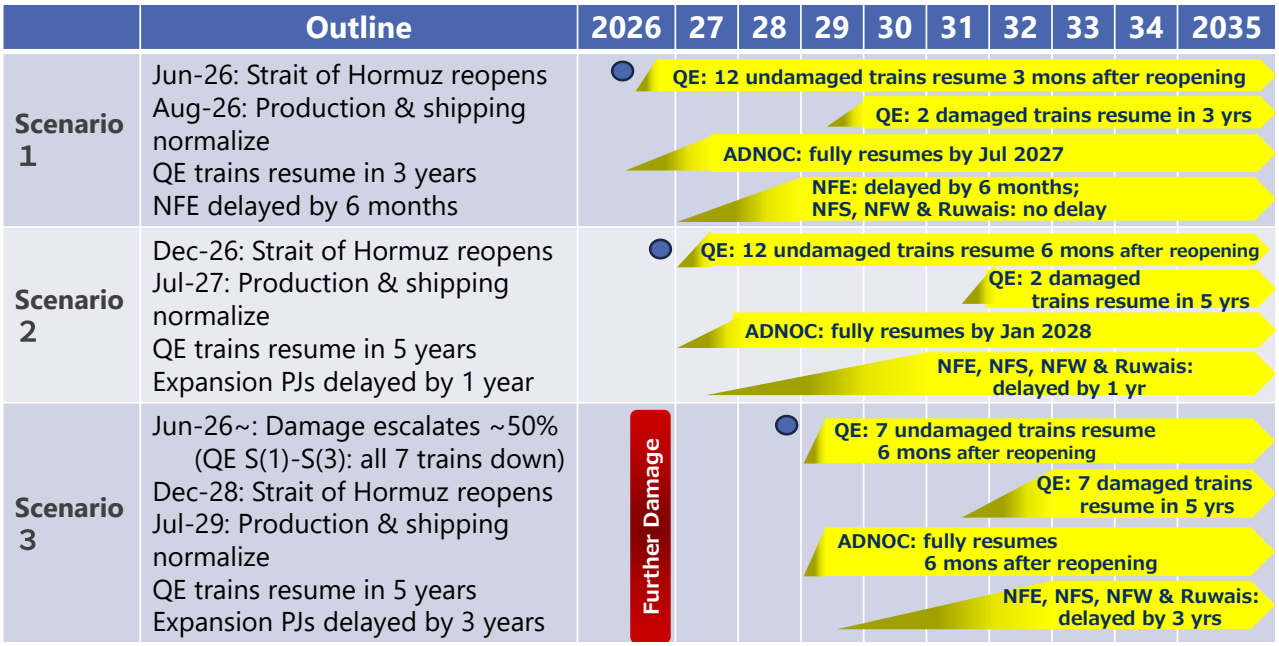
Strait of Hormuz reopened in December 2026; damaged facilities restored after 5 years; expansion projects delayed by 1 year.

Scenario 3 (Further Damage)

LNG export capacity reduced to approximately 50% (following damage to two of the seven liquefaction trains at QatarEnergy LNG S(1)-S(3) in March, the remaining five trains are assumed to shut down); Strait of Hormuz reopened in December 2028; damaged facilities restored after 5 years; expansion projects delayed by 3 years.

[8] Reuters, “Exclusive: Qatar's energy boss says he had warned of dangers of provoking Iran”, 20 Mar 2026, <https://www.reuters.com/business/energy/qatars-energy-boss-says-he-had-warned-dangers-provoking-iran-2026-03-20/>.

Figure 2. LNG Supply Capacity Recovery Scenario

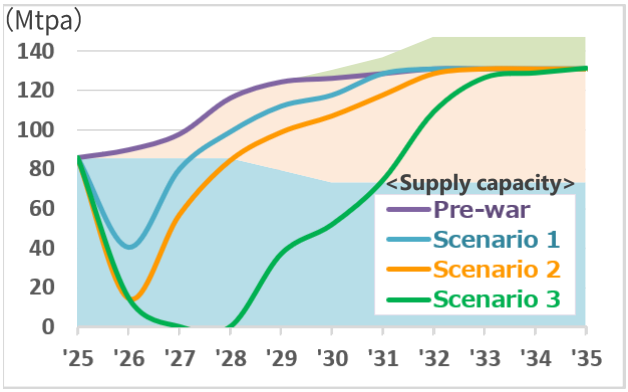


Note: For simplicity, logistics are assumed to recover at the same pace as production facilities.

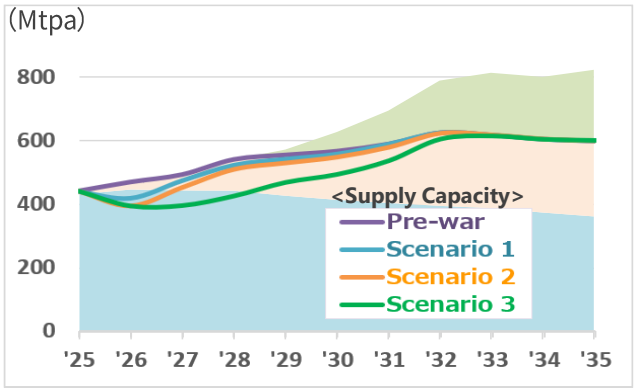
The results of the analysis indicate that even under Scenario 1, where normalization is expected to occur earlier, global LNG supply capacity will remain below initial assumptions for the next 2–3 years. Naturally, the longer the recovery is delayed, the longer the period of reduced supply capacity will last, and the larger the magnitude of the shortfall will become (see Figure 3).

Figure 3. Changes in the LNG Supply Capacity Outlook

(Qatar + UAE)



(World)



Note: Solid lines represent liquefaction capacity from existing facilities and projects under construction.

Source: Author's calculation. The pace of capacity additions and declines is based on the author's assumptions.

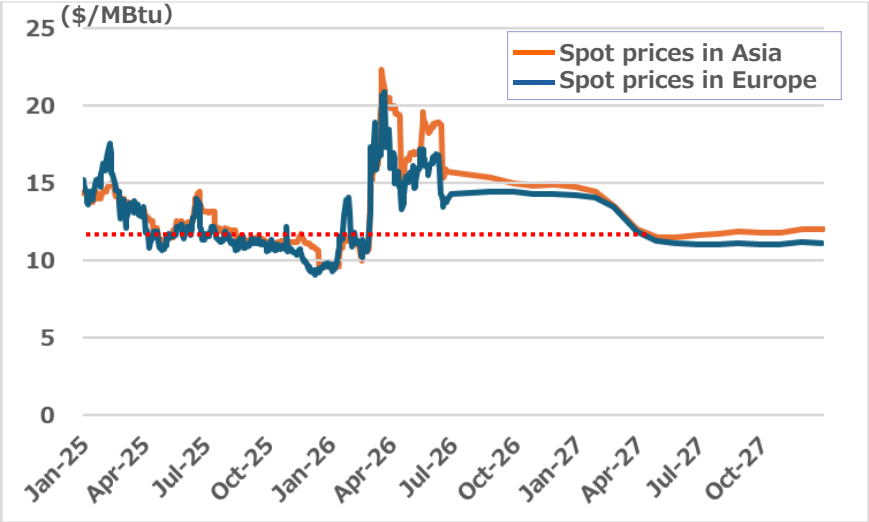
4. LNG Demand Volume Outlook

(1) LNG Price Outlook

Spot LNG prices temporarily exceeded $20 per million British thermal units (MBtu) but fluctuated around $18/MBtu in Asia and $16/MBtu in Europe during May 2026. Prices have been driven by changing expectations regarding the timing and likelihood of the reopening of the Strait of Hormuz and are expected to remain volatile going forward.

The LNG futures curve suggests that prices are unlikely to return to their pre-war level of about $12/MMBtu until around March 2027 (approximately nine months later), implying that the market expects relatively elevated LNG prices to persist until then (see Figure 4; prices as of June 23, 2026).

Figure 4. LNG Spot Price and Futures Curve



Source: Author's compilation based on exchange data.

(2) LNG Demand Outlook and Changes in the Supply-Demand Balance

Higher prices reduce demand. LNG imports have already declined, particularly in Asian countries that rely heavily on Qatari LNG (see Table 2).

Table 2. Changes in LNG Import Volumes by Region

	April 2026 LNG Imports (YoY)	2022 Annual LNG Imports (YoY)
China	3.55 Mt (▲22.9%)	63.3 Mt (▲20.1%)
India	1.44 Mt (▲29.6%)	19.9 Mt (▲17.2%)
Japan	4.27 Mt (▲20.6%)	72.2 Mt (▲2.9%)
EU	9.96 Mt (▲7.5%)	*

* Increase due to the switch from pipeline gas (Russia-to-Europe) to LNG.

Source: Author's compilation based on publicly available data.

Although the price spikes and month-on-month declines in LNG demand observed in April 2026 may not persist, higher spot LNG and crude oil prices are typically reflected in contract LNG import prices after approximately 1–3 months and subsequently in city gas tariffs in the following quarter. As a result, the impact on LNG demand is likely to persist even after spot prices decline.

This report estimates that the reduction in LNG demand under Scenarios 1–3 by simplified assumptions below:

- LNG import demand declines by a fixed percentage during the period from the closure of the Strait of Hormuz until the normalization of LNG supply.
- LNG import demand returns to the Reference Scenario once LNG supply normalizes.

The LNG import projection is based on the Reference Scenario of the *IEEJ Outlook 2026* (published in October 2025). The scenario assumes the continuation of current policy and technology trends.

Table 3. Assumptions for LNG Demand Reduction

	Demand Reduction Period	China	South Asia (India and others)	Japan, Korea and Taiwan	Europe
Scenario 1	Apr-26 – Sep-26	▲20%	▲20%	▲10%	▲2%
Scenario 2	Apr-26 – Jun-27	▲20%	▲20%	▲10%	▲2%
Scenario 3	Apr-26 – Jun-29	▲20%	▲20%	▲10%	▲2%

Item	Assumption
LNG Import Outlook	Based on the Reference Scenario of the *IEEJ Outlook 2026* , which assumes the continuation of current policy and technology trends.
Seasonality of LNG Imports	Not considered. Monthly LNG import volumes are assumed to be constant throughout the year.
Secondary Effects	Not considered. Potential long-term effects, such as sustained energy conservation, fuel switching, and slower economic growth due to higher crude oil and LNG prices, are excluded. LNG demand is assumed to return to the Reference Scenario trajectory once the period of demand reduction ends.

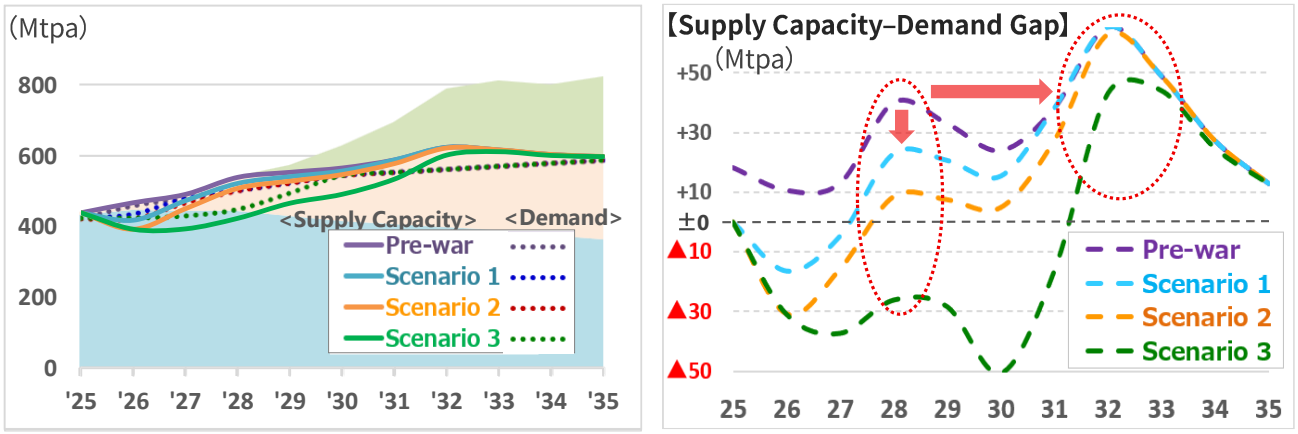
Assumptions regarding reductions in LNG imports are primarily based on the year-on-year changes observed in April 2026.

For Asia, the assumed reductions are moderated to reflect market adaptation, while also taking into account the changes in LNG imports during the previous supply crisis in 2022. For Bangladesh and Pakistan in South Asia, the same import reduction as assumed for India is applied, given their high dependence on Qatari LNG.

For Europe, although LNG imports in April 2026 declined by 7.5% year on year, the assumed reduction is moderated to 2%, reflecting the region's relatively low dependence on LNG imports

via the Strait of Hormuz (approximately 7%, compared with about 27% for Asia)[9] and the expectation that most of the initial shortfall will be offset by alternative supplies, including U.S. LNG.

Figure 5. Global LNG Supply-Demand Balance Outlook



Note: ① Solid lines represent liquefaction capacity from existing facilities and projects under construction.

② Dotted lines represent demand (volume).

③ Dashed lines represent gaps between liquefaction capacity and demand (= ① − ②).

Source: Author's calculation.

Based on the estimates above, global LNG supply capacity may be insufficient to meet projected demand in 2026–27 on an annual basis (see Figure 5).

It should be noted that these are simplified estimates of global LNG import volumes and do not represent the LNG shortfall of any individual country. Supply shortages and higher prices trigger both increased production and demand reduction, ultimately bringing supply and demand back into balance (for example, in 2026, increased LNG exports from the United States partially offset reduced exports from Qatar and the UAE).

Over the medium to long term, the surplus of LNG supply capacity over demand is expected to fluctuate. Before the 2026 Iran war, the author estimated that global LNG supply capacity would exceed demand in two distinct waves, peaking in the late 2020s and again in the early 2030s. The war is now expected to significantly reduce the first peak, leaving only the early 2030s peak (see Figure 5).

It should also be noted that an excess of LNG supply capacity over demand does not necessarily result in oversupply, as producers may restrain output. Likewise, lower prices discourage production while stimulating demand, ultimately restoring market balance.

[9] IEA, “Strait of Hormuz Factsheet”, Feb 2026, <https://www.iea.org/about/oil-security-and-emergency-response/strait-of-hormuz?ftag=YHF4eb9d17>.

The key points here are as follows:

- When LNG supply capacity and demand are not in balance, substantial shortages or surpluses do not necessarily materialize.
- The recent changes may slow the expansion pace of both supply and demand, potentially delaying the growth trajectory of the global LNG market by several years.

(3) Developments in Medium- to Long-Term LNG Procurement Strategies

LNG prices and supply-demand balances are constantly affected by geopolitical developments, disruptions at LNG production facilities, project start-up delays, weather events such as heatwaves and cold spells, and other factors. In particular, two major shocks to the global LNG supply-demand balance, each leading to a shortfall of approximately 20%, occurred within just four years: the 2022 Ukraine crisis and the 2026 Iran war and Strait of Hormuz closure.

On 17 June, the United States and Iran reached a provisional ceasefire agreement, and maritime transit through the Strait of Hormuz has partially resumed. However, negotiations on the detailed terms of the ceasefire remain unresolved, and attacks on neighboring countries and disruptions to shipping through the Strait could still recur. Even if a ceasefire is reached, there is no guarantee against their recurrence in the future. The risk of repeated disruptions from potential attacks on LNG infrastructure and transit through strategic chokepoints would continue to be factored into market expectations.

Against this backdrop, changes in LNG procurement strategies among global market participants are expected, reflecting growing concerns over energy security. Several examples are presented below:

- Supply Source Diversification:

Increasing procurement from supply sources with limited chokepoint exposure (e.g., LNG supplies from the North American Pacific Coast to Asia) and expansion of domestic production (e.g., China and India).

- Supply Redundancy:

Maintaining resilient procurement portfolios through long-term contracts and alternative supply sources, even at higher cost.

- Securing Alternative Fuels:

Maintenance and securing of fuels and power generation options that enable long-term, low-cost incremental procurement, stable supply, and stockpiling (e.g., coal and nuclear power), as well as consideration of renewable energy (including combinations with battery storage).

(4) Differentiation Factors for New LNG Projects

For LNG export projects currently at the pre-FID stage, global LNG supply capacity is expected to significantly exceed demand in the 2030s and beyond, resulting in many new projects coming online simultaneously and competing with one another.

Under such circumstances, it is considered desirable for projects to possess differentiation factors, including cost competitiveness, supply security, environmental advantages, and policy support.

Future Energy Landscape - Global Energy Agenda –

China has begun laying the groundwork in various areas from the perspective of energy security

Takahiko Tagami *

How can China's recent efforts on energy and climate change be interpreted within the framework and perspective of energy security? What are the current and future impacts of these efforts?

Of China's total energy supply, coal accounts for 58%, oil 20%, natural gas 10%, renewable energy 9%, and nuclear power 3% (2024, EI Statistics). Focusing on imports as a percentage of total energy supply, imported oil accounts for 18% (9% imported from the Middle East), imported coal 7%, and imported natural gas 4% (2% imported via pipeline and 1% imported from the Middle East). From the perspective of energy security, it is important to reduce these imports, especially those of oil.

Regarding oil, the development of domestic resources is progressing. At a press conference on March 23, Sinopec announced that it had extracted 1 million tons of oil from the Jiyang Trough in the Bohai Bay Basin in 2025 and will expand the scale of shale oil development in the Bohai Bay Basin in the future. There are also predictions that China's shale oil production will increase to 16 million tons by 2035. However, the figure of 16 million tons is still minuscule compared to the 620 million tons of oil imports in 2025 (National Bureau of Statistics, Annual Statistical Bulletin).

Regarding coal-to-liquid (CTL) and coal-to-gas (CTG) processes, which replace oil and natural gas, the amount of coal consumed as an intermediate has surged. In 2023, the most recent year for which statistics are available, 38 million tons of coal were input into CTL and 50 million tons in CTG (National Bureau of Statistics, Coal Balance Table). Concerns have also been raised about the sharp increase in CO2 emissions from these processes. Therefore, on December 17, 2025, the National Development and Reform Commission and other bodies published the "Target Levels and Standard Levels for Key Areas of Clean and High-Efficiency Coal Utilization," and included CTL and CTG in this scope to improve utilization efficiency. It remains to be seen whether CTL and CTG will continue to increase in the future.

Regarding coal, some reports suggested a shift from imports to domestic production, citing a decrease of 50 million tons from 540 million tons to 490 million tons between 2024 and 2025, while domestic production increased by 70 million tons from 4.78 billion tons to 4.85 billion tons (National Bureau of Statistics, Annual Statistical Bulletin). However, coal imports are in a period of adjustment after a sharp increase from 290 million tons in 2022, when China suffered an energy shortages, to 470 million tons in 2023, and domestic production has also continued to increase by an average of 70 million tons per year since 2023, making it difficult to see this as a shift from imports to domestic

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production.

Regarding renewable energy, which is a domestic energy source, the 15th Five-Year Plan Outline, approved on March 12, includes the construction of a new energy infrastructure/system consisting of clean energy bases such as wind and solar power in the "deserts, Gobi Desert, and wastelands" of the "Three Norths" (Northwest, North China, and Northeast), and large-scale hydroelectric power plants in the Southwest, as well as transmission lines that will carry the generated electricity across provinces and autonomous regions to the East. Furthermore, regarding the transportation sector, where petroleum is the main source of consumption, the plan states that, focusing on transportation routes where cargo volume is concentrated, multiple zero-carbon transportation corridor demonstration roads will be built by constructing facilities for charging and battery exchange, as well as hydrogen, ammonia and alcohol refueling.

However, currently, renewable energy sources face challenges such as fluctuations in output and an increase in the rate of electricity wasted (the proportion of electricity generated that is not utilized due to insufficient transmission capacity, etc.) or a decline in the utilization rate of generated electricity. From April 2025 to March 2026, the year-on-year monthly increase in generated electricity was 55.5% for solar power in July and 28.4% for wind power in August, while it decreased by 12.5% in March (National Bureau of Statistics, Monthly Data). In December, when overall electricity generation (electricity demand) increased by only 1.5%, solar power increased by 33.7% and wind power increased by 13.1%. From 2023 to 2025, the utilization rate of generated power decreased from 98.0% to 94.8% for solar power and from 97.3% to 94.3% for wind power. Solar power fell below 90% in the Tibet Autonomous Region, Qinghai Province, Xinjiang Uyghur Autonomous Region, and Gansu Province, while wind power fell below 90% in the Tibet Autonomous Region (Center for Power Industry Planning/Research and Monitoring/Early Warning, National Status on Grid Interconnection and Consumption of New Energy). In January-February 2026, the utilization rate of generated power was 90.8% for solar power and 91.5% for wind power, with slightly less than 10% being wasted.

One way to address these output fluctuations is through the production and utilization of green hydrogen using renewable energy. According to a press conference held by the National Energy Administration on April 27, by the end of March 2026, the renewable hydrogen production capacity that is in operation in China exceeded 250,000 tons per year, more than double the capacity at the end of 2024, with over 900,000 tons per year under construction. In Jilin Province, Inner Mongolia Autonomous Region, and Xinjiang Uyghur Autonomous Region, eight projects with a capacity of over 10,000 tons each are in operation. In Xinjiang Uyghur Autonomous Region, Inner Mongolia Autonomous Region, and Jilin Province, several projects with a capacity of over 50,000 tons each have started construction. In February, the first green ammonia was supplied to Lotte Fine Chemical of the Republic of Korea from a project in Chifeng City, Inner Mongolia Autonomous Region, operated by Envision Energy. Furthermore, in terms of utilization, on March 16, the Ministry of Industry and Information Technology, the Ministry of Finance, and the National Development and

Reform Commission issued a "Notice on the Implementation of Comprehensive Hydrogen Energy Application Pilot Projects" with the aim of reducing costs through large-scale applications in various situations. Cities will implement pilot projects in eligible application scenes, such as fuel cell vehicles, green ammonia and methanol, substitution of chemical raw materials with hydrogen, hydrogen steelmaking, and hydrogen-mixed combustion.

Recent efforts by China regarding energy and climate change reveal that it is carefully laying the groundwork in various areas from the perspective of energy security, but the impact is currently limited. However, in the future, the trends in CTL and CTG, and hydrogen will be worth watching. Regarding hydrogen, China's actions are particularly noteworthy while other countries are holding back. Its strategy, which looks not only at expanding domestic use but also at exports, is attracting attention.

The Current Middle East Crisis and the Global LNG Supply-Demand Outlook

Takafumi Yanagisawa *

The attacks by the U.S. and Israel on Iran on February 28, subsequent Iranian attacks on neighboring Gulf countries, and the continuing blockade of the Strait of Hormuz have significantly impacted the global LNG market. Specifically, LNG exports from Qatar (with an annual LNG production capacity of about 78 million tonnes) and the UAE (with an annual LNG production capacity of about 6 million tonnes), accounting for about 20% of global LNG trade (about 400 million tonnes annually), have become difficult. Meanwhile, Oman (with an annual LNG production capacity of about 11 million tonnes), continues to export LNG constantly since the country has LNG shipment ports facing the Arabian Sea, outside the Strait of Hormuz, facing the Arabian Sea.

After this crisis, and by May 15, a total of four LNG tankers from Qatar and the UAE had passed through the Strait of Hormuz (the two from Qatar to Pakistan, the one from the UAE to China, and the one from the UAE to Japan). In addition, it is reported that the other eleven LNG tankers out of the twelve remaining in the Gulf have likely turned off their location signals, aiming to pass through the Strait. However, it remains uncertain whether these changes will lead to the recovery of LNG production in Qatar and the UAE, by taking consideration that these LNG cargoes have been stranded in the Gulf, and have not been produced newly after the crisis.

In this paper, based on these current situations, I will examine the LNG supply and demand outlook for the latter half of 2026 in two scenarios: 'if the blockade of the Strait of Hormuz continues' and 'if the blockade is lifted,' and I will also consider the implications for the mid- to long-term outlook toward 2030.

Scenario 1: “If the blockage of the Strait of Hormuz will continue”

In this case, since there are currently no detour routes other than the Strait of Hormuz for Qatar and the UAE to export LNG[1], about 20% of global LNG exports will continue to stagnate. Although LNG supply is expected to expand, especially from the U.S., from the latter half of 2026, it will not cover all supplies from Qatar and the UAE, and global LNG supply in 2026 may decrease by 30 to 40 million tonnes compared to the previous year[2]. On the demand side, Europe

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[1] Qatar has the Dolphin Pipeline (with an annual capacity of about 14 million tonnes) supplying its gas to Oman via the UAE, while LNG export volume is restricted within Oman's existing liquefaction capacity.

[2] For example, Plaquemines, with a combined annual LNG production capacity of 27 million tonnes for Phase 1 and Phase 2, are expected to increase its export from the current level of 17 million tonnes in 2025. Corpus Christi Stage 3 with annual LNG production capacity of 10 million tonnes is also expected to start export in 2026. Furthermore, Golden Pass with annual production capacity of 15.6 million tonnes, started its shipment in March 2026 and is expected to increase its export.

is expected to increase gas inventories for winter through the latter half of 2026, and Asia, including Japan, is also expected to see rising cooling demand toward summer and heating demand toward winter.

Therefore, even if supply from the U.S. will increase, there will remain uncertainty regarding whether LNG supply and demand will be less tight, and whether spot LNG prices for Asia will fall from the current level around $17/MBTU[3].

Furthermore, the LNG expansion project in Qatar, which was initially planned to begin and increase production gradually from the latter half of 2026, will be delayed due to related equipment delivery constraints caused by the blockade and the recovery of damage to existing facilities[4]. As a result, the basic scenario before the crisis that the expansion of supply from Qatar and the U.S. will lower LNG prices, stimulating demand mainly in Asia, and will expand the global LNG market size from the current annual 400 million tonnes to about annual 650 million tonnes by 2030, will become difficult to realize.

Scenario 2: “If the blockade of the Strait of Hormuz will be lifted"

In this case, LNG production and export from Qatar and the UAE is expected to be recovered gradually, while it should also be noted that Qatar has announced that it lost 17% of its existing production capacity due to an attack from Iran in March and that recovery would take up to five years. Additionally, this would be the first time for these two countries to restart LNG facilities that had been completely shut down, so it could take several months for such restart. Therefore, it will take considerable time for LNG exports from these two countries to return to pre-crisis levels.

Additionally, even in this scenario 2, the Qatar expansion project will be inevitably delayed to some extent, because Qatar should put priority on restoring the damaged existing facilities.

Furthermore, since the blockade of the Strait of Hormuz has become a reality now, even if the blockade is lifted, the LNG market will continue to consider the risk of recurrence, so spot LNG prices are unlikely to stabilize back to the pre-crisis level (around $/11/MBTU) for a while.

Other factors that could impact both scenarios above include whether the EU will halt LNG imports from Russia within 2026 as originally planned, even as Qatar’s expansion project is likely to be delayed under the current situation[5]. On the supply side, it is also important to watch how

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Assuming LNG exports from Qatar and the UAE in 2026 will be difficult over the ten months during March and December, a simple calculation shows about 70 million tonnes among the annual 84 million tonnes capacity will be lost from the global LNG market.

[3] Before the recent Middle East crisis, spot LNG prices for Asia were around $11/MBTU.

[4] The initial plan was to expand Qatar's annual LNG export capacity from the current 78 million tonnes to 142 million tonnes by 2030.

[5] EU has been expecting to increase LNG procurement from the Qatar expansion project as the main alternative for LNG from Russia (about 15 million tonnes imported in 2025), and the long-term procurement contracts to Europe have already been signed, totaling an annual 10 million tonnes. Other alternatives include pipeline gas imports from Romania's Neptune project, which is scheduled to start operations in 2027 with an annual capacity of about 5 million tonnes, and increased LNG imports from the U.S.

the "Domestic Gas Reservation Scheme," which Australia government has just announced and plans to introduce in July 2027, will be legislated[6].

Regarding the above EU policy, the EU could increase LNG imports from outside Russia, and regarding the above Australian policy, Australia could constrain its LNG exports, both of which could further tighten the global LNG market, bringing a higher LNG price.

Such LNG price hikes could lead to insufficient LNG procurement, especially in financially vulnerable South Asian countries, leading to power outages and a shift back to coal. In fact, Pakistan, which imports over 90% of its LNG procurement via the Strait of Hormuz, has been facing a severe gas shortage since the current Middle East crisis, and had to introduce power cuts in April. As I mentioned at the beginning, two shipments from Qatar have just arrived in Pakistan in May, so the short-term gas shortage appears to have eased, but in any case, Pakistan's power situation will continue to largely depend on the situation in the Strait of Hormuz.

In conclusion, I hope that the efforts to stabilize the global LNG market will be realized through a more strengthened close dialogue between LNG exporters and importers.

[6] The scheme aims to require the volume equivalent with 20 % of LNG exports to be supplied to Australian domestic market. For more details, please refer to the link below, IEEJ Research Paper titled "How Can Australia's Proposed Domestic Gas Reservation Scheme Be Interpreted?" published on May 14, 2026, by Hiroshi Hashimoto, Takafumi Yanagisawa, and Yoshimasa Mori. https://eneken.ieej.or.jp/data/13255.pdf

Future Energy Landscape - Global Energy Agenda –

Why Iraq's Alternative Oil Export Routes Do Not Function

Akiko Yoshioka *

Since late February 2026, the Strait of Hormuz has effectively been closed. Iraq is one of the countries most severely affected by this situation. The bulk of Iraq's oil exports had depended on crude produced in the southern oil fields and exported via the Gulf. As a result of the closure of the strait, Iraq's oil exports fell to 330,000 b/d in April 2026, roughly one-tenth of the pre-closure level.

Can Iraq offset this decline by using alternative export routes that bypass the Strait of Hormuz? The short answer is no. The alternative routes that can be used in the short term are extremely limited, while medium- to long-term plans to build or rehabilitate pipelines face constraints related to security, finance, and political relations with transit countries.

The first alternative export route is the pipeline to Turkey. However, the northern pipeline controlled by the Iraqi government has been out of operation since 2014 due to terrorist attacks and is still under repair. At present, the only export pipeline that can function is the Kurdistan pipeline, built in 2014 by the Kurdistan Regional Government, which runs from Kirkuk through the Kurdistan Region to the Turkish border.

Even so, exports through this pipeline remained at only around 200,000 b/d as of early May 2026. This is far below the pipeline's capacity. One reason is that Iraq cannot transport sufficient volumes of crude from the large southern oil fields to the north. The strategic pipeline linking southern and northern Iraq has deteriorated, and as of mid-2024, its transport capacity was estimated at only around 250,000–300,000 b/d. Since 2024, the Iraqi government has been planning the construction of a new trunk pipeline linking the south and north of the country, and it was reported in May 2026 that construction had begun. However, with the sharp decline in oil exports directly hitting Iraq's public finances and financial constraints intensifying, the future progress of this project remains uncertain.

Apart from the route to Turkey, Iraq has in the past had pipelines running toward Jordan, Syria, and Saudi Arabia. None of these, however, currently functions as an alternative route capable of replacing exports via the Strait of Hormuz.

The first is the route toward Jordan. For a little more than a decade, from 1934, there was a Mediterranean-bound pipeline running from Iraq through Jordan to the port of Haifa in British Mandate Palestine. This former Haifa route, however, ceased operations when Israel was established in 1948. The Iraqi section of the pipeline later lost its function as oil transport infrastructure, with parts reportedly repurposed by local residents for water supply.

In the early 2010s, a new Basra Aqaba pipeline project, separate from the old Haifa route, gained momentum between the Iraqi and Jordanian governments. In 2012, SNC-Lavalin conducted a feasibility study, and in 2013, the governments of Iraq and Jordan signed an agreement to build the

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pipeline. The project envisaged a 1,680-kilometer pipeline from Basra to Aqaba via Haditha, with a planned capacity of 1 million b/d of oil and 258 million cubic feet per day of natural gas, at an estimated cost of $18 billion. A tender was scheduled for 2014, but the project subsequently stalled due to deteriorating security conditions and fiscal constraints.

The obstacles to the project were not limited to practical constraints such as security and financing. Some Iraqi members of parliament argued that, because of Aqaba's geographical proximity to Israel, Iraqi crude could indirectly reach Israel. This became one of the political obstacles to the project's realization. As a result, the Basra Aqaba pipeline remains no more than a plan. As a short-term measure, Iraq is merely considering renewing a trucking contract for around 15,000 b/d of Kirkuk crude to Jordan, which expired in December 2025.

The second is the pipeline to Syria. This pipeline was built in 1952 and had a capacity of 300,000 b/d. However, its pumping facilities were destroyed during the 2003 Iraq War, and the line has remained out of operation since then. After the collapse of the Assad regime in late 2024, Iraq and Syria began discussions on rehabilitating the pipeline. In April 2025, an Iraqi delegation visited Syria to assess its technical and economic feasibility. In August of the same year, Iraqi Oil Minister Hayan Abdul-Ghani and Syrian Energy Minister Mohammed al-Bashir met in Baghdad and agreed to examine the possibility of restarting the line.

Nevertheless, the existing pipeline is severely degraded, and parts of the line and pumping facilities inside Syria remain damaged. At this stage, the two sides are still assessing whether to repair the existing line or build a new one. As a practical measure, since April 2026, Iraq has been trucking fuel oil and around 50,000 b/d of Basra crude to the port of Baniyas for export. However, the volumes are extremely limited and cannot compensate for the sharp decline in southern exports.

The third route is the pipeline toward Saudi Arabia. This route ran from Basra through the Saudi border to the area south of Yanbu on the Red Sea coast. It was built in 1988 during the Iran-Iraq War to export Iraqi crude while bypassing the Strait of Hormuz. At the time, its capacity was 1.6 million b/d. However, it ceased operations after the Gulf crisis in August 1990. In 2001, the Saudi government seized the pipeline inside Saudi territory as part of compensation for the Gulf War and converted it into a natural gas pipeline for power plants. Although Iraq has shown interest in reopening this route, there are currently no concrete discussions between Iraq and Saudi Arabia on doing so. This route, therefore, is not in a condition that could be restored in the short term through simple repairs.

As shown above, Iraq has several alternative pipeline projects and existing pieces of infrastructure that could, in theory, bypass the Strait of Hormuz. In practice, however, the routes that can actually be used in the short term are limited, and they cannot replace the export volumes lost as a result of the effective closure of the Strait of Hormuz. For the time being, Iraq will have no choice but to rely on measures such as accelerating repair work on domestic pipelines, expanding exports through the Turkey-bound pipeline, including by increasing production from within the Kurdistan Region, and increasing truck transport to the Mediterranean. None of these measures, however, can match the scale of exports via the Strait of Hormuz.

This problem illustrates the vulnerability of energy transport infrastructure. The operation of

pipelines that cross multiple countries is heavily shaped by political relations with transit states and neighboring countries that serve as export outlets. Moreover, even once a pipeline has been built, sustaining its operation requires domestic security, fiscal capacity, and maintenance capability. In analyzing energy security, it is therefore necessary to look not only at technical and economic conditions such as transport capacity and construction costs, but also at the political conditions required to keep infrastructure functioning over time.

Future Energy Landscape - Global Energy Agenda –

AI-Driven Surging Electricity Demand:

Emerging Opportunities for Burden Sharing in the U.S.–Japan Alliance

Shoichi Itoh [*, **]

Overview

The development of AI is profoundly shaping the future of human society. It is a source of both hope and anxiety. The spread of AI is not only set to increasingly impact daily economic and social activities, but it has also become a matter of national security. The United States currently hosts approximately 40 percent of the world's AI-related data centers. However, as the competition between the United States and China intensifies, securing cutting-edge AI technology and maintaining a technological advantage over China has also become an inevitable national defense challenge.

U.S. energy policy under the Trump administration has been formulated in a way that is inextricably linked to national security issues. The accelerated proliferation of AI is causing a rapid increase in electricity demand. This makes ensuring the necessary power supply a matter of paramount national security that goes beyond an energy issue. Meanwhile, curbing the surge in electricity prices, particularly for households, against the backdrop of a tightening supply and demand, is becoming one of major issues for both Democrats and Republicans in winning the support of voters.

The Trump administration gutted the Inflation Reduction Act (IRA), introduced by the Biden administration to promote decarbonization, and has supported maximizing the use of fossil fuels. However, many states have already started to adopt renewable energy sources. This includes "red states," where the Republican Party has a strong base of support, as well as "swing states," where Republican and Democratic support are balanced. Meanwhile, electricity prices are also rising sharply in "blue states," including the New England region in the Northeast, where the Democratic Party has a strong base of support.

Sooner or later—and particularly after the current administration's term ends—given the growing bipartisan concern over how to address soaring electricity prices, U.S. energy policy is likely to take a new direction that goes beyond the traditional debates focused on climate change measures and the merits of fossil fuels. For the United States, the renovation and modernization of its electric power infrastructure—which has remained largely untouched for many years—has become a critical issue that extends beyond energy concerns to impact national security as well. Japan could find significant investment opportunities in strengthening the resilience of the U.S. energy system, which would also serve as a form of burden-sharing in the context of the U.S.-Japan alliance.

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[**] This text expresses the author's personal opinions, and does not in any regard represent the views held by any organizations with which the author is affiliated.

Electricity Demand Driven by AI

Electricity demand in the United States is surging against the backdrop of the expansion of data centers, which are necessary for the widespread adoption of AI and result in an increase in energy consumption. Although demand reached a record high in 2025 for the second consecutive year, the U.S. Energy Information Administration's (EIA) Short-Term Energy Outlook (STEO, June 2026) projects that demand will reach 4,271 billion kilowatt-hours (kWh) in 2026 (a 1.8% increase from the previous year) and 4,397 billion kWh in 2027 (a 2.9% increase). The surge in residential electricity rates, which rose 3% and 5%, respectively, in 2024 and 2025, is becoming increasingly severe. Rates are projected to rise 5.4% and 2.1%, respectively, in 2026 and 2027.

Grid Strategies forecasts that U.S. electricity demand will grow at an annual rate of 5.7% starting in 2026. Peak demand is expected to increase by 166 GW compared to 2025 levels in 2030. Data center consumption is expected to account for approximately 55% of that increase.

According to the EIA's Annual Energy Outlook 2026, U.S. electricity demand grew at an annual rate of 2.1% between 2020 and 2025, after remaining largely flat for 15 years. However, it is expected to gradually increase at a rate of 0.9% to 1.6% through 2050. Furthermore, under the "High Electricity Demand Scenario" (which assumes an exponential increase in the number of AI servers installed by 2025), data center server electricity consumption alone is projected to reach 818 billion kWh by 2050, over 16 times the 2020 level.

As of March 2026, electricity prices in the United States rose by 5.8% year-over-year in the commercial sector, while prices in the residential sector rose by 10.2%—a rate far higher than that of the commercial sector. Amid rising electricity rates driven by the rapid dissemination of AI, major U.S. tech companies are implementing various measures—such as covering the costs of new power infrastructure construction and bearing the burden of electricity rates—in response to a request from the Trump Administration.

Key Electricity Policies Under the Trump Administration

In April 2025, the executive order "Strengthening the Reliability and Security of the United States Electric Grid" was signed. It emphasized that ensuring the reliability of the electric grid is critical to national and economic security. The order also directed the streamlining of procedures under which the Department of Energy (DOE) may order power generators to increase their electricity supply in the event of a power shortage pursuant to Section 202(c) of the Federal Power Act. The executive order issued in July of that year, "Accelerating Federal Permitting of Data Center Infrastructure," directed the Department of Commerce to provide financial support, including loans, grants, and tax incentives, for data centers requiring new capacity of more than 100 megawatts (MW), infrastructure projects related to data center energy needs, and data centers (including related infrastructure) designated by the Secretaries of Defense, the Interior, Commerce, or State. That same month, the White House released Winning the AI Race: America's AI Action Plan, which emphasizes the need to develop a comprehensive strategy to strengthen and expand the power grid, as well as stabilize and maximize the use of the existing grid, in order to secure the electricity essential for maintaining and

strengthening the United States' international leadership in AI development.

In May 2025, the Trump administration announced a series of executive orders that aim to streamline the review and approval processes for constructing nuclear power plants. The orders also seek to significantly strengthen support for building 10 new large-scale reactors by 2030, as well as for developing and deploying next-generation reactors, including small modular reactors (SMRs). The orders set a target of expanding installed capacity to 400 GW by 2050, which is four times the 2004 level. In April 2026, President Trump authorized the Secretary of Energy, under the Defense Production Act of 1950, to implement policies and financial measures aimed at expanding the infrastructure used to transport, process, and store natural gas, as well as strengthening the electricity supply chain, including power lines and substation facilities.

Regarding coal-fired power generation, the DOE ordered power plants originally scheduled to close in 2025 to remain operational, adding up to more than 17 GW. In February 2006, the DOE announced that it would provide $175 million for the renovation and modernization of six coal-fired power plants, and $500 million for those of 13 plants—pursuant to a presidential order issued under the Defense Production Act— in June of the same year.

Key Initiatives Among Hyperscalers[1]

Major tech companies are scrambling to secure new sources of electricity. Google has sourced all of the electricity it consumes from renewable energy since 2017, but it is now under pressure to diversify its power sources. In February 2026, the company signed contracts to purchase 1.9 GW from Xcel in Minnesota and over 1.5 GW from AES in Texas (both for 20 years; both sources are solar and wind power). Meanwhile, in October 2025, Google announced that it would purchase 400 MW of electricity from a gas-fired power plant equipped with CCS (carbon capture and storage) at the Broadwing Project in Illinois—the company's first purchase of this kind. Google is reportedly considering getting involved in gas-fired power projects that do not incorporate carbon capture and storage (CCS). The company plans to procure nuclear power from NextEra Energy's nuclear power plant in Iowa, the only one in the state planned for restart, as well as from Kairos Power's planned SMR project in Tennessee.

In September 2024, Microsoft signed a contract with Constellation Energy to restart Unit 1 of the Three Mile Island Nuclear Power Plant (in Pennsylvania)—which had been offline since 2019—and to purchase its entire power output (835 MW) for 20 years. Like Google, Microsoft has had a target of achieving 24/7 CFE (Carbon-Free Electricity, 24 hours a day, 365 days a year) by 2030 as a key part of its corporate strategy; however, faced with a rapid surge in electricity demand, it is reportedly considering the possibility of postponing or withdrawing the original target. In June 2026, the company signed a contract with Chevron to procure natural gas-fired power (approximately 2.67 GW) for a data center it is building in Texas.

In June 2025, Meta signed a 20-year contract with Constellation Energy to purchase over 1.1 GW

[1] We do not address the distinction between the strict definitions of "hyperscalers" and "major tech companies" because it does not affect the argument here.

of electricity from the Clinton Clean Energy Center nuclear power plant in Illinois, beginning in 2027. In January 2026, Meta announced that it had secured up to 6.6 GW of electricity by 2035 through several agreements. These include an agreement to purchase electricity from the sodium-cooled fast reactor that TerraPower is planning to build in Wyoming, support for an SMR that Oklo Inc. is developing, and power purchase agreements with these advanced reactors. Meta also signed agreements to purchase electricity from Vistra's existing nuclear power plants in Ohio and Pennsylvania.

In October 2024, Amazon Web Services, Inc. (AWS) signed agreements to collaborate with Energy Northwest in Washington and with Dominion Energy and X-energy in Virginia on SMR construction projects. In April 2025, the company also entered into a contract with Talen Energy to purchase carbon-free electricity (1.92 GW through 2042), based on the assumption that the Susquehanna Nuclear Power Plant (in Pennsylvania) will expand its capacity and potentially introduce SMRs.

Current Status and Challenges by Power Source

Nuclear power enjoys bipartisan support, even if Democrats and Republicans have different reasons.[2] However, the lead time from planning the construction of a new nuclear power plant to commencing commercial operation is lengthy. Even regarding SMRs, which are attracting increasing attention, opinions vary on the timing of commercial operation and widespread adoption. The current reality is that it will take time for a clear timeline to emerge.

Regarding gas-fired power generation, the Global Gas Energy Monitor reports that installed capacity reached approximately 252 GW by 2025 (more than three times the previous year's level), as U.S. domestic natural gas production continues to reach record highs. If all currently planned power plants are constructed, that capacity is expected to grow by approximately 50%. However, shortages in gas turbine production are becoming increasingly severe in response to growing demand for gas-fired power plant, not only in the United States but also worldwide. Some studies suggest that, depending on the scale of future growth in global LNG demand, U.S. domestic gas prices may rise, which could reduce the economic competitiveness of gas-fired power.

Given that the Trump Administration proactively supports coal-fired power generation, there have been a series of decommissioning plan postponements and cancellations as emergency measures to meet increased electricity demand caused by extreme weather events, such as summer heat waves and winter cold snaps. In 2025, only four power plants were decommissioned, totaling 2.6 GW—the fewest since 2010. The DOE announced its support for constructing new coal-fired power plants in West Virginia and Alaska and for modernizing existing ones. However, the general consensus that coal's role in power generation will gradually decline remains largely unchanged. Nevertheless, if electricity demand becomes even more strained in the future, or if plans to expand nuclear or gas-fired power generation encounter obstacles, it cannot be ruled out entirely that the importance of coal-fired electricity as a baseload power source will be reconsidered, even more seriously than it is now.

[2] Generally speaking, the major difference of supporting nuclear generation between the Democratic and Republican parties is that the former emphasizes the importance of decarbonized power sources as a measure to combat climate change.

Despite facing headwinds under the Trump administration, prioritizing fossil fuels, power generation from renewables is projected to increase down the road. According to an EIA report, the installed capacity of wind and solar power increased by 4% and 23%, respectively, in 2025 compared to the previous year. It is projected to grow by an additional 7% and 21%, respectively, in 2026 and 2027. As of March 2026, the "red states" of Texas, Iowa, Oklahoma, and Kansas held the top four spots for wind power generation (MWh). California, a "blue state," held the top spot for solar power. "Red states" took the second and third spots (Texas and Florida, respectively), while "swing states" from the 2024 presidential election took the fourth through seventh spots (Arizona, Nevada, North Carolina, and Georgia, respectively). In other words, the Republican camp could also face political consequences if it blindly continues to reject renewable energy despite rising electricity prices.

Yet, this energy source is also shrouded in uncertainties. In recent years the Production Tax Credit (PTC) and the Investment Tax Credit (ITC) reduced the installation costs of wind and solar power facilities. With the passage of the "One Big Beautiful Act" in July 2025, which effectively nullified the IRA passed under the Biden Administration, these tax credits will be phased out. However, the future of tax incentives for renewable energy under the next administration and beyond remains unpredictable. Besides, although the United States is pursuing a national strategy to reduce its dependence on China for critical minerals needed for the manufacture of wind turbines, solar panels, and other products, it remains unclear when it will be able to secure sufficient alternative sources to keep pace with the rapid expansion of renewable energy.

The Worsening Power Infrastructure Crisis

The cost of renovating and upgrading power infrastructure in the United States—including transmission and distribution networks and substation facilities—has accounted for a much larger share of rising electricity prices than power generation itself. According to a Rhodium Group survey, this is primarily due to increased procurement prices of the materials needed to build this infrastructure, such as wires, cables, and transformers. As of 2024, these prices were 50–152% higher than in 2019, far exceeding the 29% increase in the Consumer Price Index (CPI) over the same period.

In the United States, renovating and modernizing the aging power infrastructure is an urgent priority and unavoidable in order to meet the surge in electricity demand. Most of the power grid was built between 40 and 70 years ago, and approximately 70% of transformers have been in service for over 25 years.

In July 2025, the DOE released a report, "Evaluating the Reliability and Security of the United States Electric Grid," which warns that construction of power generation and transmission facilities is not keeping up with the rapid surge in electricity demand: If appropriate measures—such as accelerating construction or revising the operational plans for power plants originally scheduled for decommissioning—are not taken, the risk of power outages could increase up to 100-fold by 2030. Furthermore, only 19 GW of the 154 GW of power generation capacity nearing completion is capable of stable, 24-hour operation. If the decommissioning of aging nuclear power plants (totaling 104 GW by 2030) proceeds as planned, the stability of the power grid could be threatened by severe power

shortages. In other words, even if renewable energy increases its share of the power mix, a power system that is harmoniously integrated with nuclear, natural gas, and coal-fired power generation is still necessary.

The New Phase of U.S. Energy Policy and Its Implications for Strengthening Japan–U.S. Cooperation

The following factors are key to assessing investment risk in formulating a business strategy:

1) In the short term, whether the Democrats will regain a majority in both houses of Congress in the November 2026 midterm elections.
2) In the medium term, whether the post-Trump administration, which will take office in January 2029, will be Republican or Democratic.
3) The extent to which the Trump Administration's fossil-fuel-focused policies will remain sustainable is unclear, given the outcomes of 1) and 2). Specifically, if the Democrats regain power, how far might the pendulum of energy policy swing in the opposite direction? To what extent could a decarbonization agenda be revived?

Concerns about the tight balance between electricity supply and demand are growing, driven by the rapid proliferation and development of AI. It can be said that resolving this bottleneck hinges not on choosing energy sources, but on rebuilding the electricity infrastructure. In short, it would be difficult to resolve policy differences between Republicans and Democrats if the issue were limited to prioritizing decarbonization in power generation. However, it would be easier to find common ground when it comes to strengthening the power infrastructure to stabilize the rapidly increasing energy supply—an urgent and unavoidable challenge for both Democrats and Republicans. This is precisely the kind of issue that should be a key pillar in identifying investment opportunities and formulating a long-term business strategy for the energy sector in the United States.

Enhancing the resilience of electricity infrastructure is not only essential for the United States to maintain its leading position in AI technology, but it is also of critical importance from the perspectives of Japan's economic security and national security. Therefore, this should be approached as a priority area for public–private cooperation that goes beyond mere business opportunities. Japan's significant involvement in and support for AI development in the United States can be seen as a way of implementing burden-sharing as an ally and will likely become even more important down the road.

Future Energy Landscape - Global Energy Agenda –

Rapid Growth in Grid Connection Applications and Regulatory Reform

― Challenges and Responses in Japan and the United States Regarding Grid-Scale Battery Storage and Data Centers? ―

Kenichi Onishi *

In Japan, applications for grid connection have been increasing rapidly, driven by the expanding deployment of renewable energy generation and grid-scale battery energy storage systems (BESS). In particular, from FY2023 through the second half of FY2025, both grid connection studies and connection applications for battery storage projects increased substantially, resulting in a significant accumulation of projects at the grid connection study stage.

Specifically, as of January 2023, virtually no grid-scale battery storage systems had been connected to the grid. Projects under grid connection study totaled 8.787 GW, while projects with submitted connection applications amounted to approximately 0.668 GW[1]. By December 2025, however, although the capacity of grid-connected battery storage systems had increased to only approximately 0.64 GW, projects under grid connection study had surged to approximately 172 GW, and projects with submitted connection applications had reached approximately 30 GW[2]. These figures indicate that only a limited proportion of projects proceed from the grid connection study stage to actual grid connection.

This discrepancy suggests that some projects may be securing grid connection capacity at the planning stage without having a realistic prospect of implementation. Applications for grid-scale battery energy storage systems (BESS) are particularly likely to increase rapidly because such projects typically have relatively short construction periods, require comparatively little land, and may be able to avoid the need for upstream transmission network reinforcement through non-firm grid connections. As a result, grid capacity has increasingly been occupied by projects with limited feasibility.

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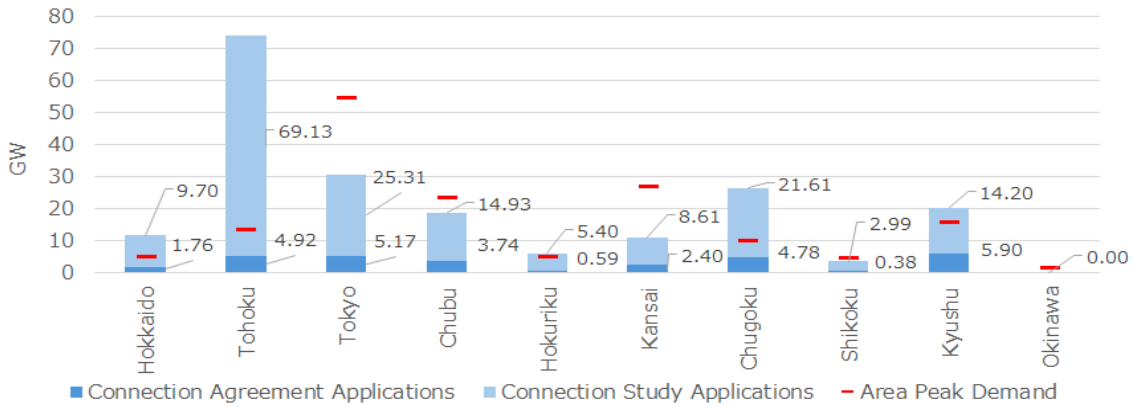
[1] Agency for Natural Resources and Energy. (2023, February 28). *On the connection and utilization of grid-scale battery energy storage systems*. Retrieved June 27, 2026, from https://www.meti.go.jp/shingikai/enecho/shoene_shinene/shin_energy/keito_wg/pdf/044_02_00.pdf

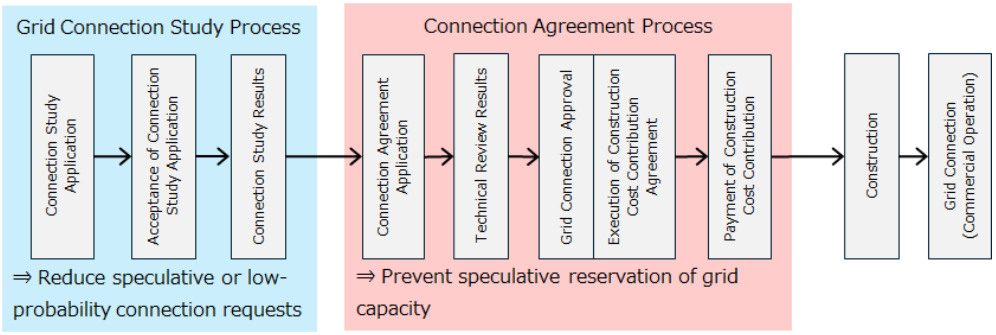
[2] Agency for Natural Resources and Energy. (2026, March 27). *Measures to accelerate grid interconnection for grid-scale battery energy storage systems and other power generation facilities*. Retrieved June 27, 2026, from https://www.meti.go.jp/shingikai/enecho/denryoku_gas/saisei_kano/smart_power_grid_wg/pdf/009_01_00.pdf



Source: Prepared by The Institute of Energy Economics, Japan (IEEJ) based on data from the Agency for Natural Resources and Energy (ANRE).

Figure 1. Status of Grid Connection Study Requests and Connection Applications for Grid-Scale Battery Energy Storage Systems (BESS) in Japan (as of the end of December 2025)

To address this issue, the Japanese government is moving toward introducing measures in both the grid connection study process and the connection application process. Measures in the grid connection study process include: (1) requiring applicants to submit documentation demonstrating information related to the proposed project site; (2) imposing an upper limit on the number of grid connection study requests that can be submitted by a single developer; and (3) improving operational procedures so that the results of the grid connection study are provided promptly once it becomes evident that construction costs or other conditions do not meet the applicant's requirements. Measures in the connection application process include: (4) requiring applicants to demonstrate legal rights to use the proposed project site; and (5) increasing the security deposit required upon submission of a connection application and setting a minimum amount for the initial installment payment of construction costs[3].



Source: Prepared by The Institute of Energy Economics, Japan (IEEJ) based on data from the Agency for Natural Resources and Energy (ANRE).

Figure 2. Grid Connection Process in Japan

[3] Agency for Natural Resources and Energy. (2026, June 3). *Future renewable energy policy toward making renewable energy the primary power source*. Retrieved June 27, 2026, from https://www.meti.go.jp/shingikai/enecho/denryoku_gas/saiene_shuryoku/pdf/001_03_00.pdf

On the demand side, the growth of large-scale electricity demand, including data centers, has also emerged as a new challenge. As of 2023, approximately 90% of data centers in Japan, measured by floor area, were concentrated in the Kanto and Kansai regions, indicating a pronounced regional concentration of demand[4]. In particular, in the Inzai and Shiroi areas of Chiba Prefecture, there were approximately 40 large-scale demand projects awaiting grid connection, with a total requested capacity of around 2,500 MW. The grid reinforcement costs required to accommodate these projects are estimated to exceed JPY 200 billion, while the customers seeking grid connection would bear only around JPY 10 billion of these costs[5].

Such concentration may lead to delays in electricity supply and inefficient investment in grid infrastructure. Large-scale electricity consumers typically do not reach their maximum demand immediately after commencing operations; rather, their electricity demand generally increases gradually over several years. As a result, discrepancies arise between contracted capacity and actual demand, leading to the reservation of unused grid capacity and inefficient utilization of the grid resulting from subsequent changes to project plans. To address these issues, the Japanese government is considering measures such as guiding project siting through the expansion of the Welcome Zone Map and enabling earlier grid connection, subject to electricity receiving restrictions.

Table 1. Distribution of Data Centers in Japan (2023)

Region	Floor Area (m^2)	Share	Number of Buildings	Share
Hokkaido	17,290	1%	16	3%
Tohoku	25,590	2%	40	8%
Kanto	1,070,450	64%	194	38%
Chubu	69,150	4%	78	15%
Kansai	411,550	24%	84	16%
Chugoku/Shikoku	37,920	2%	49	10%
Kyushu/Okinawa	47,960	3%	49	10%
Total	1,679,910	100%	510	100%

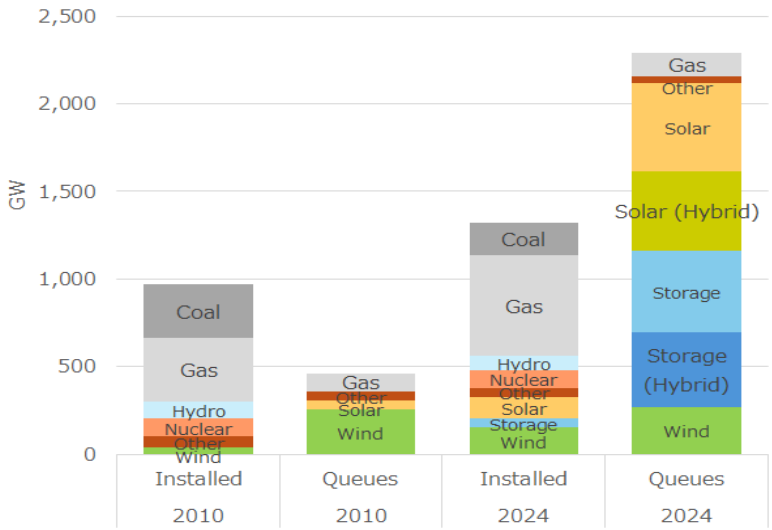
Source: Prepared by The Institute of Energy Economics, Japan (IEEJ) based on data from the Agency for Natural Resources and Energy (ANRE).

Similar challenges have also emerged in the United States. The total capacity of power generation and other facilities awaiting grid interconnection studies has reached approximately 2,290 GW, nearly twice the existing installed generation capacity of 1,322 GW. Furthermore, of the projects that applied for grid interconnection between 2000 and 2019, only 13% had commenced commercial operation

[4] Ministry of Economy, Trade and Industry. (2024, May 30). *Expert meeting on the development of digital infrastructure, including data centers*. Retrieved June 27, 2026, from https://www.meti.go.jp/policy/mono_info_service/joho/conference/digital_infrastructure/0007/004_jimukyokusiryou.pdf

[5] Agency for Natural Resources and Energy. (2025, October 15). *Toward the next generation of Japan's electricity network*. Retrieved June 27, 2026, from https://www.meti.go.jp/shingikai/enecho/denryoku_gas/jisedai_kiban/system_design_wg/pdf/005_05_00.pdf

by the end of 2024, while 77% had been withdrawn[6]. These figures indicate that only a limited proportion of interconnection requests ultimately proceed to project completion.



Source: Prepared by The Institute of Energy Economics, Japan (IEEJ) based on Rand, J., et al. (2025), Queued Up: 2025 Edition: Characteristics of Power Plants Seeking Transmission Interconnection as of the End of 2024.

Figure 3. Status of Power Plant Grid Interconnection Requests in the United States, by Generation Technology (2010 and 2024)

As a result, the large volume of interconnection requests, combined with the submission of many projects with limited feasibility, has created a substantial backlog in the interconnection queue. Consequently, evaluating necessary transmission network reinforcements and conducting interconnection studies have become increasingly time-consuming. In the United States, the median time required to complete the grid interconnection process now exceeds four years, making prolonged delays and growing uncertainty serious challenges.

To address these issues, the Federal Energy Regulatory Commission (FERC), through Order No. 2023, has introduced reforms including the adoption of cluster studies that evaluate multiple interconnection requests simultaneously, strengthened financial security and withdrawal penalties, and enhanced information disclosure requirements[7].

In addition, the rapid expansion of large electricity demand from data centers and other facilities has raised concerns about accelerating electricity demand growth and declining grid reliability. In response, the United States is considering measures for large electricity demand projects of 20 MW or greater, including an integrated assessment of load and associated generation resources, the introduction of financial security requirements, and requiring large demand customers to bear the full

[6] Rand, J., et al. (2025, December 15). *Queued up: 2025 edition: Characteristics of power plants seeking transmission interconnection as of the end of 2024*. Lawrence Berkeley National Laboratory. Retrieved June 27, 2026, from https://eta-publications.lbl.gov/sites/default/files/2025-12/queued_up_2025_edition_12.15.2025.pdf

[7] Federal Energy Regulatory Commission. (2023, July 28). Order No. 2023: *Improvements to generator interconnection procedures and agreements* (Docket No. RM22-14-000). Retrieved June 27, 2026, from https://www.ferc.gov/media/order-no-2023

cost of necessary grid reinforcements[8].

As discussed above, both Japan and the United States face common challenges of rapidly increasing grid connection applications and prolonged interconnection review processes, driven by the rapid deployment of grid-scale battery energy storage systems (BESS) and data centers. Underlying these challenges are structural issues, including the reservation of grid capacity by projects with limited feasibility and discrepancies between planned and actual demand and supply.

Going forward, it will be important to enhance the credibility of grid connection applications by revising financial security requirements and withdrawal rules, while making more efficient use of limited grid capacity through measures such as guiding project siting toward areas with available grid capacity and promoting more flexible use of the transmission network. Furthermore, as grid connection demand is expected to continue increasing with the expansion of data centers, accelerating grid development in parallel with regulatory reform will be essential to achieving both a reliable electricity supply and decarbonization.

[8] U.S. Department of Energy. (2025, October 23). *Secretary of Energy's direction that the Federal Energy Regulatory Commission initiate rulemaking procedures and proposal regarding the interconnection of large loads pursuant to the Secretary's authority under Section 403 of the Department of Energy Organization Act*. Retrieved June 27, 2026, from https://www.energy.gov/sites/default/files/2025-10/403%20Large%20Loads%20Letter.pdf

Future Energy Landscape - Global Energy Agenda –

Electrification and the SDGs: Ensuring No One Is Left Behind

Tomoko Murakami *

On June 23, 2026, during the Global Energy Transition and Electrification Summit—held as part of London Climate Week—a coalition comprising business associations, think tanks, and civil society organizations from various countries launched "Electrify Now," an international initiative aimed at accelerating electrification through renewable energy[1]. Led by the Global Renewables Alliance and supported by governments including the European Commission, the UK, and the co-hosts of COP31 (Turkey and Australia), this initiative involves over 40 organizations worldwide. Its goal is to raise the share of electricity in global final energy consumption from approximately 21% in 2023 to 35% by 2035. The movement urges nations to:

* Translate the collective global ambition into action via national and sub-national action plans, policies and electro-technology deployment.
* Match increasing electricity demand with continued investment in renewable energy, modernised and expanded electricity grids, and energy storage.
* Advance international cooperation by exchanging experience through bilateral and multilateral meetings, leveraging coalitions of ambition around the energy transition and deploying technical assistance to support electrification planning capacity.
* Mobilise investment and financing at scale by using public finance to crowd in private capital, while ensuring international finance institutions systematically integrate electrification into energy, climate, crisis response, and capacity-building support.

The Global Renewables Alliance—which proposed this initiative—is an industry group established by the Global Wind Energy Council, Global Solar Council, Green Hydrogen Organisation, International Geothermal Association, International Hydropower Association, and Long Duration Energy Storage Council. It was formed based on the goal set at COP28 in 2023 to triple global renewable energy capacity by 2030. The Coalition plays a role in uniting voices across diverse sectors—including various forms of renewable energy, energy storage, and power grids—to advocate for policy recommendations.

The "Electrify Now" official website[2] introduces the practical steps for electrification on its homepage using large, simple illustrations and concise, clear messages; a 38-page presentation further

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[1] Global Renewables Alliance, Global coalition launches ‘Electrify Now’ movement to accelerate action to meet 35% electrification target, 2026-6-23, <https://globalrenewablesalliance.org/news/global-renewables-alliance-joins-global-movement-to-electrify-now/>.

[2] Electrify Now, “Go Electric!”, <https://electrifynow.net/>.

explains the benefits of electrification for consumers. Advocating for a shift to "Electrify Everything," the campaign highlights that electrification not only reduces CO2 emissions but also saves money on household expenses. While seemingly targeted at households in North America and Europe—regions with high heating demands—the material illustrates, for instance, that replacing a gas water heater with a heat pump water heater can cut annual costs from $330 to $100, effectively reducing the expense to about one-third.

The presentation argues that electrification is the more economical choice not only for household heating but also in the transportation sector. Comparing Hyundai's gasoline-powered Kona with its electric counterpart, the Kona EV, it notes that for an identical $10 in operating costs, the gasoline vehicle covers 66 miles, whereas the EV travels 354 miles. While it is unlikely that every EV from every manufacturer outperforms its gasoline-powered counterpart in terms of cost-efficiency per mile, the presentation is skillfully crafted to create precisely that impression.

Such "hyperbole" may well be acceptable—provided it is not outright false—as a pragmatic tactic for introducing unfamiliar innovative technologies or new products to the market. However, I would rather like to focus on certain challenges associated with this initiative—issues that cannot simply be overlooked.

One issue arises when we consider the fundamental principle of the Sustainable Development Goals (SDGs) —"leave no one behind"—a concept that has become widely known since the goals were adopted by the UN in 2015.

It goes without saying that the closure of the Strait of Hormuz and the political instability in the Gulf Coast region threaten global energy security, making the shift away from fossil fuel dependence increasingly critical. There is also no doubt that promoting electrification aligns with SDG 7: "Affordable and Clean Energy."

However, the SDGs framework does not condone pursuing one specific goal at the expense of others. While the SDGs are often equated primarily with environmental issues, "climate action" is merely one of the 17 goals (Goal 13). We must also consider whether a collective push for electrification —such as switching from gasoline vehicles to EVs or replacing water heating systems with heat pumps powered by renewable energy—might have negative impacts on other SDGs or risk leavng certain people behind.

The "Electrify Now!" presentation cites examples of residential heat pump water heaters with a 10-year warranty, but these generally cost over $1,000—a price point that hardly makes them easily accessible to everyone; the same likely applies to EVs. In other words, low-income households unable to afford heat pump water heaters or EVs—items that fall into the category of "luxury appliances" rather than daily necessities—risk being "left behind" by electrification campaigns. Furthermore, there may be a divide between countries that can accept the integration costs associated with the rise of variable renewable energy (VRE) sources, such as solar and wind power, and those that cannot.

The presentation does not, however, address what must be done to ensure that this initiative truly "leaves no one behind."

The second challenge concerns the uneven distribution of critical minerals—essential raw materials for most renewable energy equipment—and the associated technologies. While critical minerals now serve as materials not only for renewable energy equipment but also for a wide range of general-purpose products, it is a well-known fact that both the producing nations and the countries possessing facilities to process them into value-added intermediate or final products are limited.

The 2026 edition of the IEA's "Global Critical Minerals Outlook"[3] draws policy implications—including impacts on security—alongside the latest trends in markets, investment, and technology covered in previous reports. For instance, regarding rare-earth magnets—widely used in renewable energy equipment—recycling (or "secondary supply") from discarded units will become increasingly important as early-generation EVs and wind power facilities reach the end of their service lives and waste volumes rise. Since renewable energy equipment is set to become widespread across virtually all nations, expanding secondary supply technologies and the necessary infrastructure is a crucial task directly linked to SDG Goal 9: "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation."

However, waste recycling technologies are more advanced and complex than raw material processing; consequently, a handful of technologically capable nations will likely retain the lead, at least for the foreseeable future. This report does not go so far as to propose solutions for the "imbalance in secondary supply technologies" in the context of the SDGs.

On June 12, the United Nations released a report titled "Critical minerals are reshaping global trade as demand surges."[4] The report highlights the importance for developing nations—which produce these mineral resources—to generate added value. This can be achieved through technology transfer and skills development covering processing, refining, and even the manufacture of components close to the final product stage—activities that constitute the "critical path" of critical mineral supply chains. Such an approach aligns with SDG Goal 10 ("Reduced Inequalities —promoting equal opportunity and narrowing gaps through appropriate policies and actions) and SDG Goal 9 ("Industry, Innovation and Infrastructure"— sustainable industrialization), while also adhering to the fundamental principle of "leaving no one behind."

Of course, the renewable energy coalition advocating for "Electrify Now" is not without a perspective that aligns with the core principles of the SDGs. A survey of corporate executives across 18 countries[5], released prior to the launch of the "Electrify Now" initiative, notes that promoting electrification contributes to economic development and improved quality of life for any nation, and

[3] IEA, Global Critical Minerals Outlook 2026, 2026-7-16, <https://www.iea.org/reports/global-critical-minerals-outlook-2026>.
[4] UN Trade & development, Critical minerals are reshaping global trade as demand surges, 2026-6-12, <https://unctad.org/news/critical-minerals-are-reshaping-global-trade-demand-surges>.
[5] Global Renewables Alliance, New polling shows overwhelming global business support for clean electrification amid fossil fuel volatility, 2026-6-15, <https://globalrenewablesalliance.org/news/new-polling-shows-overwhelming-global-business-support-for-clean-electrification-amid-fossil-fuel-volatility/>.

that government policy support is desirable. We must take our thinking a step further and seriously consider whether there are any aspects that could negatively impact other SDG goals, or whether any individuals or nations might be left behind; if such risks arise, we must determine how to adjust our course. Furthermore, we must consider whether Japan itself risks being "left behind," particularly in areas such as rare-earth recycling. The "Electrify Now" movement offers an opportunity to reflect on these issues.

453rd Forum on Research Works on 31 July 2026

U.S. - Iran Relations and Prospects for the Middle Eastern Order

<Summary> ◆

Sachi Sakanashi *

Background and Course of the Iran War

1. The Iran War, which began on February 28, 2026, with an invasion by the United States and Israel, was fundamentally a conflict over Israel's position in the Middle Eastern regional order. While Israel normalized diplomatic relations with the United Arab Emirates (UAE), Bahrain, and other Arab states under the Abraham Accords signed in August 2020, the Iran-led "Axis of Resistance" continued to oppose Israel's attempts to sideline the Palestinian issue.

2. Following the October 7 attacks on Israel that triggered the Gaza war, Israel sought to eliminate not only Hamas but also other "resistance forces," including Hezbollah in Lebanon and the Houthis in Yemen. Israel subsequently turned its focus to Iran, the leader of the Axis of Resistance, launching a 12-day war against the country in June 2025 and ultimately launching a joint invasion with the United States in late February 2026.

3. Facing an existential threat to the Islamic Republic as a result of the invasion, Iran closed the Strait of Hormuz. Unable to reopen the strait by force, the United States entered into negotiations with Tehran. On June 17, the United States and Iran signed a memorandum of understanding (MoU) aimed at bringing an end to the war.

Diverging Views over the Management of the Strait of Hormuz

4. Article 5 of the 14-point memorandum of understanding contained provisions regarding the management of the Strait of Hormuz. Divergent interpretations of this clause between Washington and Tehran precipitated a renewed exchange of strikes. Iran insists on retaining a defined role in the strait's oversight, whereas the Trump administration rejects any such involvement, demanding a return to the status quo ante that preceded the invasion.

5. However, viewing the survival of the Islamic Republic as continuously threatened, Tehran is unlikely to cede control over the waterway. Iran is reportedly exploring a framework modeled after the Strait of Malacca, under which littoral and user states jointly establish a fund to finance the management and operation of the strait. Oman, situated along the southern coast

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of the Strait of Hormuz, has also engaged in discussions with Iran regarding a multilateral management framework.

6. Meanwhile, the Red Sea route—relied upon by Saudi Arabia as an alternative conduit for crude oil exports—faces heightened security risks following a "blockade declaration" by Yemen's Houthis. While the group's ultimate intentions remain opaque, the disruption constrains President Trump's ability to rely solely on kinetic military options, especially as the administration seeks to curb spikes in global oil prices ahead of the November midterm elections.

Iran's Internal Dynamics and Strategic Posture

7. Within the Islamic Republic, factional divisions between hardliners advocating an uncompromising stance and pragmatists favoring negotiation appear to be widening. Nevertheless, the preservation of the political system remains the paramount objective across all factions. From this perspective, civilian authorities and the military apparatus—most notably the Islamic Revolutionary Guard Corps (IRGC)—can be seen as dividing labor in pursuit of this shared imperative.

8. Even so, the IRGC harbors deep-seated distrust of the United States, convinced that Washington's ultimate aim is regime change. Following the resumption of U.S. strikes, the IRGC has sought to deter further action through high-risk, escalatory retaliation. These operations have included targeting commercial shipping operating within U.S.-designated transit corridors as well as U.S. military installations in Jordan.

Prospects for the U.S.–Iran Confrontation

9. Regional states increasingly regard coexistence with the Islamic Republic as an unavoidable reality, given its survival against extensive U.S. and Israeli military campaigns. The Trump administration, by contrast, remains committed to compelling Iranian capitulation through maximum pressure. Absent a strategic shift in Washington, armed confrontations are likely to recur.

10. Even if Washington and Tehran reach a comprehensive settlement, the underlying conflict between Iran and Israel will persist. Prime Minister Netanyahu, whose political survival is closely tied to the conflict, continues to pursue a decisive, crippling blow against the Islamic Republic while seeking to keep U.S. military power anchored to the confrontation.

11. Against this volatile backdrop, Japan must balance its energy security imperatives by actively exploring diplomatic avenues to enhance regional stability while accelerating efforts to diversify its energy supply chains.

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Japan and Global Oil and LNG Supply and Demand Trends

— Impact of the Middle East Crisis and Future Outlook —

<Summary> ◆

Takafumi Yanagisawa*

1. Due to the U.S.-Israel attacks on Iran, and Iranian attacks on neighboring countries and the blockade of the Strait of Hormuz, being followed by the U.S. maritime blockade against Iran, exports of oil and LNG, which account for 20% of global trade respectively, have significantly stagnated. Even after the ceasefire agreement in June between the U.S. and Iran, the strait has been re-blocked, and the situation remains uncertain.

Impact of the Middle East crisis on the oil market and future outlook

2. In 2025, 15 million barrels per day (b/d) of crude oil were exported via the Strait of Hormuz. After the current Middle East crisis, the main export routes were the port of Yanbu (about 5 million b/d) on the Red Sea via Saudi Arabia's East-West Pipeline (with a capacity of 7 million b/d) and the UAE's port of Fujairah (about 1.8 million b/d). Exports from Iran also dropped significantly after the U.S. maritime blockade starting from May 2026.

3. On the other hand, considering the stagnant export volume caused by the blockade of the Strait of Hormuz, the rise in crude oil prices seems to be "restrained." This is likely influenced by factors such as the pre-crisis oil market "supply surplus," the rapid drawdown of global oil stocks after the Middle East crisis, China's suppression of crude oil imports, and continued exports via bypass routes from Saudi Arabia and the UAE.

4. If the blockade of the Strait of Hormuz continues, Gulf countries may strengthen their bypass routes through the strait, but it may take several years for a sufficient increase. Therefore, oil prices are unlikely to go down stably at pre-crisis levels (Brent: $73/bbl). Furthermore, the UAE's exit from OPEC is expected to weaken its market influence, and price fluctuations are likely to continue in a manner highly swayed by the situation.

5. In addition, following the statement of a possible blockade and actual attack around the Babu el-Mandeb Strait by Yemen's Houthis in mid-July, Saudi Arabia's bypass export route via the

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strait has become uncertain. The remaining option, the Suez Canal, is difficult to navigate with fully loaded Very Large Tankers (VLCCs), and if the situation worsens, there is the possibility that crude oil prices could remain above $100/bbl. On the other hand, if China, which has been enhancing its role as a swing importer through EV shifts and so on, continues to adjust crude oil imports, it is also possible that rising crude oil prices could be restrained.

6. After the Middle East crisis, Japan has pursued alternative procurement not passing through the Strait of Hormuz, mainly in the Middle East and the United States, in addition to releasing its oil stocks in March and April, with a replacement rate expected to be 100% for July procurement. However, efforts to diversify procurement over the medium to long term will also continue to be required.

Impact of the Middle East crisis on the LNG market and future outlook

7. The blockade of the Strait of Hormuz has made LNG exports from Qatar (about 78 million tonnes per year) and the UAE (about 6 million tonnes per year) difficult. Furthermore, Qatar announced that due to an attack from Iran in March, it lost 17% of its existing production capacity (equivalent to 12.8 million tonnes per year), and its recovery could take up to five years. The LNG expansion project in Qatar, scheduled to begin production sequentially from the latter half of 2026, is also expected to be delayed.

8. Spot prices for Asia rose from pre-crisis levels ($11/Mbtu), briefly surpassing $20/Mbtu following the damage to Qatar's LNG facility in March. Even after the “ceasefire agreement” in June between the U.S. and Iran, the price remained in the high 10/Mbtu range due to uncertain circumstances, and after the resumption of attacks in mid-July, which is also the summer demand period, it has risen again to around $20/Mbtu.

9. If the blockade of the Strait of Hormuz continues, there are currently no effective bypass routes for LNG exports from Qatar and the UAE, and LNG supply from both countries could decrease by more than 60 million tonnes in 2026. Even if the blockade is lifted, both countries have completely halted LNG production facilities, and full resumption is expected to take several months.

10. In the medium to long term, if the blockade of the Strait of Hormuz continues, Qatar and the UAE's new projects (64 million tonnes per year and 9.6 million tonnes per year, respectively) will be delayed, and the previous IEEJ outlook that “LNG price will be lowered following supply increase toward around 2030, stimulating LNG demand increase in Asia, and the LNG market will expand from the current 400 million tonnes per year to 650 million tonnes per year” will become difficult to be realized. As a result, the importance of LNG projects on the west coast of North America will increase, especially for Asia.

11. Japan, with a relatively lower dependence on the Strait of Hormuz for its LNG imports, has managed to secure enough LNG via alternative sources, and import prices have also not risen significantly at this point due to factors such as crude oil linkage (applying a three-month average lag) based on long-term contracts. However, if crude oil prices continue to rise, it will also affect Japan’s LNG import prices.

12. In addition to the Middle East situation, factors that could affect the LNG market after 2027 include the way forward of the Australian government's proposed "domestic gas reservation scheme " announced in May, and that of the EU's policy to halt imports of Russian LNG within 2026 and pipeline gas by autumn 2027.

453rd Forum on Research Works on 31 July 2026

Trends in Economic Security: Focusing on Rare Earths

<Summary> ◆

Yoshikazu Kobayashi *

1. As the energy transition progresses, demand for clean energy technologies is expanding, while a new challenge is emerging: the supply of these technologies is becoming increasingly concentrated in a limited number of countries. In particular, critical minerals essential for clean energy technologies are highly dependent on China, especially for refining and processing. Such concentration of supply sources poses a major economic security challenge, as it could affect not only the stable supply of energy but also the Japanese economy as a whole.

2. Since the rare earth crisis in 2010, Japan has pursued various measures, including securing alternative sources of supply and developing technologies to reduce the use of rare earths and promote recycling. Japan also prevailed in a WTO dispute brought jointly with the United States and the EU. As a result, Japan's dependence on specific countries has declined to some extent, while progress has also been made in developing alternative sources of supply. However, dependence on China remains high for some critical minerals, and there are signs that this dependence may be increasing again in recent years, partly reflecting growing domestic demand.

3. Several factors explain why these efforts have not yet produced sufficient results. These include the high cost competitiveness, supply flexibility, and the concentration of refining capacity in China, the technical and economic difficulties associated with recycling, and strategic export policies pursued by China.

4. Going forward, Japan needs to continue promoting the development of alternative supply chains, while also pursuing the development of technologies that reduce the use of critical minerals and of substitute materials, as well as further promoting recycling. Stockpiling should also be gradually expanded in light of supply and demand trends. In the longer term, the introduction of private-sector stockpiles, which could offer greater flexibility and responsiveness, may also warrant consideration.

5. Although these measures entail additional costs, the macroeconomic losses that could result

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from disruptions in the supply of critical minerals such as rare earths could be extremely significant. From the perspective of economic security, it is therefore important to consider how the necessary costs should be shared between the public and private sectors.

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Lessons from the Strait of Hormuz Crisis

<Summary> ◆

Ichiro Kutani *

Response to an unprecedented crisis

1. The blockade of the Strait of Hormuz caused the world to lose approximately 20 percent of its oil and LNG trade. Since much of the exports from the Persian Gulf were destined for Asia, Asia was particularly hard hit. Although a ceasefire agreement was reached between the United States and Iran on June 17, the ceasefire effectively collapsed in mid-July, and the situation remains uncertain.

2. Due to the blockade of the Strait, the spare capacity of crude oil production held by Saudi Arabia and the UAE—which had previously served as a stabilizer in the oil market—is not functioning. Furthermore, oil-producing countries outside the Persian Gulf require lead time to ramp up production in earnest. While the reduction in import volumes resulting from the drawdown of reserves in various countries has significantly helped curb price increases, it is important to note that this decline in reserves has reduced resilience to potential future shocks.

3. On the other hand, it became clear that there were significant differences in the crisis response capabilities of Asian nations. The impact was particularly severe in countries with low purchasing power, those experiencing rapid growth in energy demand, those highly dependent on imports, and those with insufficient inventories. In these countries, measures were implemented that required people to make sacrifices in their daily lives, such as restrictions on oil supplies and reductions in the number of workdays.

4. In Japan, the fact that the country maintained sufficient domestic oil reserves and refining capacity helped mitigate the impact of the supply disruption. On the other hand, despite its high dependence on imports and on the Middle East, insufficient naphtha stockpiles resulted in shortages of certain petrochemical products.

5. The electricity sector offers flexibility in energy choices not found in other sectors. Thanks to efforts undertaken since the oil crisis in the 1970s, Japan has significantly reduced its dependence on oil for the power generation and has achieved a relatively balanced power generation mix. The availability of options such as renewable energy, nuclear power, and coal-

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fired power—which does not rely on energy sources transiting the Strait of Hormuz—proved effective in addressing the LNG shortage.

What will happen in the world?

6. Taking into comprehensive consideration factors such as the suitability of domestic refineries for processing crude oil, the amount of reserves, transportation distances, and the limited availability of alternative supply sources, the oil-producing nations of the Persian Gulf are the optimal crude oil suppliers for Japan. Therefore, if Japan were to make renewed efforts to reduce its dependence on the Strait of Hormuz, it would inevitably lead to an overall increase in costs due to higher transportation costs and additional costs incurred by refineries to adapt to the new circumstances.

7. Globally, there is a possibility that efforts to reevaluate the energy mix—with "enhanced security" as the key theme—will gain momentum. These efforts can be categorized into 1) fossil fuel security, 2) reducing reliance on the Strait of Hormuz, and 3) moving away from oil. However, since these measures do not necessarily align with economic rationality, they may drive up energy costs.

8. More precisely, 1) regarding fossil fuel security, measures include those directly related to strengthening the stability of oil supply—such as the development of oil reserves—as well as those aimed at maintaining alternative energy sources, such as the continued use of coal-fired power. 2) Regarding reducing dependence on the Strait of Hormuz, measures include developing fossil fuel resources outside the Persian Gulf, expanding the capacity to bypass the Strait of Hormuz, and, depending on the country, a potential return to Russian sources. 3) Regarding the shift away from oil, examples include the electrification of automobiles, the accelerated adoption of renewable energy, and growing interest in nuclear power generation.

9. In Japan as well, the risk remains that the Strait of Hormuz could be blockaded again in the future, and measures addressing both supply and demand must be taken based on this assumption. In doing so, it is essential to aim for enhanced supply stability while maintaining the competitiveness of the domestic refining sector. This is because if domestic refining becomes less economically viable than importing petroleum products, it will become difficult or costly to maintain refineries in Japan. Therefore, it is also necessary to consider ways to strengthen the competitiveness of the domestic refining sector.

10. On the other hand, the continuation of conflict between the United States and Iran could lead to new crises, and it will be necessary to review countermeasures in light of the new lessons. For example, while the expansion of the capacity of the bypass pipeline around the Strait of Hormuz is expected to mitigate navigation risks in the Strait of Hormuz, if the Bab el-Mandeb Strait were to be blockaded in the future, the effectiveness of this risk mitigation would be

reduced.

11. Essentially, a transition to a structure that does not rely on fossil fuel imports is necessary. Specifically, improving energy efficiency and expanding the use of domestically produced energy (such as renewable energy and nuclear power) are essential. However, since the energy transition will take time, we must not overlook fossil fuel security during the transition period. Ensuring a stable supply of fossil fuels—the importance of which has been reaffirmed—and the systematic maintenance of fossil fuel infrastructure going forward remain critical.

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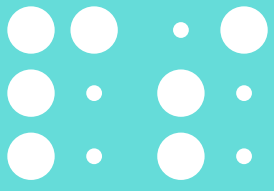

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