Issue Brief

# Recurring Crisis, Deferred Transition: From Fossil Fuel Dependence to Energy Independence

How the Hormuz blockade exposed the structural limits of fossil fuel dependence in Korea and Japan — and why public finance must shift toward renewables

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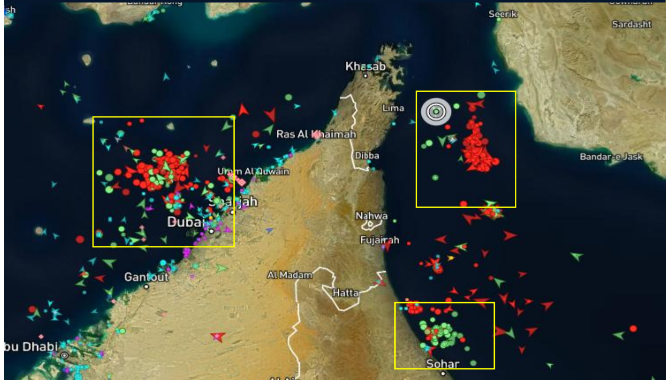
# 01 A Familiar Script: The Hormuz Blockade

Followed by QatarEnergy's force majeure* declaration, and the halt of LNG production revealed systemic risks

**Force majeure: unforeseeable circumstances that frees both parties from fulfilling a contract*

| WTI $116+ | +69% | -12.06% | ₩1,500 |
|---|---|---|---|
| International oil price (WTI Crude, Mar 9 peak) | Asia LNG benchmark (JKM $25.39, Mar 3) | KOSPI Index (Mar 4) | KRW/USD exchange rate (Mar 4) |

150+ ships are waiting ('26. 3. 8.)




## How the Strait Was Shut Systematically by Insurance

- **Insurance Collapse:** 7 of 12 major global insurers **cancelled war risk coverage** within 72 hours.
- **Traffic Plunge:** Daily transits dropped **81% (from 77 to just 4); zero LNG tankers** moved.
- More than 150 vessels are currently waiting by the area, most of them following insurance companies' guidelines to minimize insurance cost
- **Cost Explosion:** Insurance premiums spiked 8x, hitting 1% of the entire ship's value, making it nearly impossible to pass through the strait.

| 1973 | 1979 | 1990 | 2019 | 2022 | 2023 | 2026 |
|---|---|---|---|---|---|---|
| 1st Oil Shock | 2nd Oil Shock | Gulf War | Saudi Attacks | Russia-Ukraine | Red Sea Crisis | Hormuz Blockade |

*Sources: Marine Traffic, Spark Commodities, Lloyd's List, Windward, CNBC, Investing, Reuters*

# 02 How Exposed Are Korea and Japan?

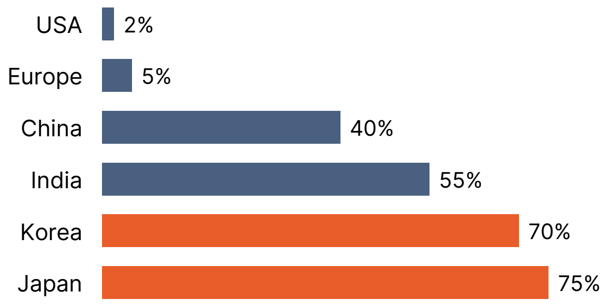
**70%**

Korea's crude oil imports
transiting the Strait of Hormuz

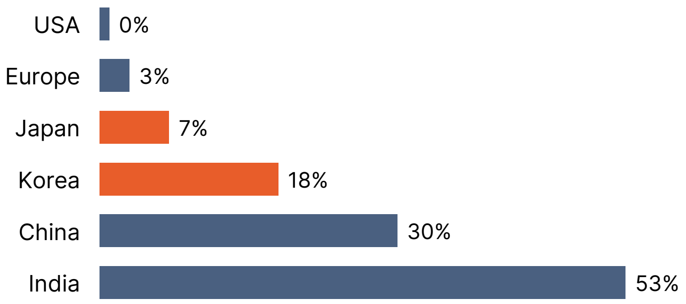
**90%+**

Japan's crude oil imports
originating in the Middle East

### Crude Oil — Hormuz Dependency (%)




### LNG — Hormuz Dependency (%)




*Sources: Kpler (Korea & Japan 5-year avg.), Bruegel (Europe), CNBC, Seatrade Maritime, CRS (2026)*

If a risk recurs, it is not temporary misfortune — it is a signal of **structural vulnerability**. Diversification of supply sources does not eliminate exposure to global price volatility. Disruptions anywhere cause price spikes everywhere as fossil fuels are traded globally. As long as dependence on imported fuels continues, volatility from external shocks is inevitable.

# 03 The Cost of Dependence

## The 2022 Precedent: Paying More for Less

| (USD mn) | LNG Spend 2021 | LNG Spend 2022 | Spending Change | Demand Change |
|---|---|---|---|---|
| **Korea** | 25,453 | 50,022 | **+96.5%** | +0.9% |
| **Japan** | 38,964 | 64,354 | **+65.2%** | -2.7% |

- Korea's LNG spending nearly doubled while demand barely changed.
- Japan's spending surged 65% even as demand fell.

### The Cost Chain: Insurance → Freight → Energy Prices → Consumers

War risk insurance cancelled → shipping rates surge (650%+) → delivered LNG/oil prices spike → electricity and gas tariffs rise → consumer and industrial burden → utility debt deepens (KEPCO: $141 billion).

## 2026 March — Evolving Impact

**Shipping Freight Surging**
- LNG carriers freight hitting $300,000/day up by **650%**
- Crude oil tankers freight hit historic high, GS Caltex pays VLCC (oil tanker): **$440,000**/day

**Marine Insurance:** war risk premiums surged **5x**

**Force Majeure trickling down**
Korea's petrochemical companies (Lotte chemical, LG Chem, Hanwha) gave potential force majeure notice, while Yeocheon NCC (No. 1 Ethylene producer in Korea) already declared force majeure

**Japan's METI** invoked emergency release of 170-day state oil reserves TEPCO warns of potential rolling blackouts.

*Sources: IEEFA, Seoul Economic Daily, Korea Herald, Caixin, Reuters, JERA, SFOC*

In 2022, KEPCO posted a ₩32.6 trillion ($24.4 billion) operating loss as fossil fuel costs surged while tariffs were frozen. Japan spent $32.2 billion (2022-2025) on electricity subsidies. The same pattern is now repeating — with currency depreciation (weak won and yen) amplifying the cost.

# 04 LNG: Bridge Fuel or Dead End?

## Alaska LNG: Leveraged as a trade tariff deal

**Taiwan** CPC singed LOI to import 6 million tons of LNG

**Japan** Jera, Tokyo Gas signed provisional purchase agreement

**South Korea** Held back due to “lack of commercial rationale”

## Gas vs. Renewables: cost comparison (LCOE)

| $/kWh | Solar PV | PV+Storage | Gas CCGT* (2025) | Gas CCGT (LNG +50%) |
|---|---|---|---|---|
| **Japan** | 70 | 104 | 89 | **121** |
| **Korea** | 120 | 152 | 88 | **115** |

**CCGT stands for Combined Cycle Gas Turbine.*
*Sources: IEEFA calculations based on Bloomberg New Energy Finance data*

## Reassessing the Bridge Fuel Case

- Lower GHG emissions than coal?

**Often worse or comparable to coal when methane leaks are included.**

- Flexible buffer during transition?

**30+ year infrastructure lifespan creates carbon lock-in; delays transition.**

- "Bridge" to clean energy?

**A bridge that has broken 3 times in 5 years.**

If LNG prices stay 50% above 2025 average,
gas power costs rise **32-27%** whereas solar costs rise ~3%.
Relying on gas is a lose-lose: greater insecurity at higher cost.

When energy is weaponized as trade leverage, LNG-marketed as “energy security”-becomes a liability. The dilemma is currently playing out in the Alaska LNG project. While Taiwan and Japan chose to secure supply, Korea hesitated, citing a lack of commercial rationale. True rationality isn’t about building a sturdier bridge across a failing supply chain, it is building an energy system where you no longer need to cross the river at all. **Where does public finance rank this priority?**

# 05 We Keep Paying the Price — Public Finance Imbalance

**Japan** Nearly **80%** of Japan's overseas energy finance has been concentrated in oil and gas projects.

| | | |
|---|---|---|
| **$93 Bn**<br>Public finance for overseas oil & gas projects (2013-2024) | **$24.5 Bn**<br>Public finance for overseas renewable energy — same period | **$32.2 Bn**<br>Cumulative household electricity subsidies (2022-2025) |

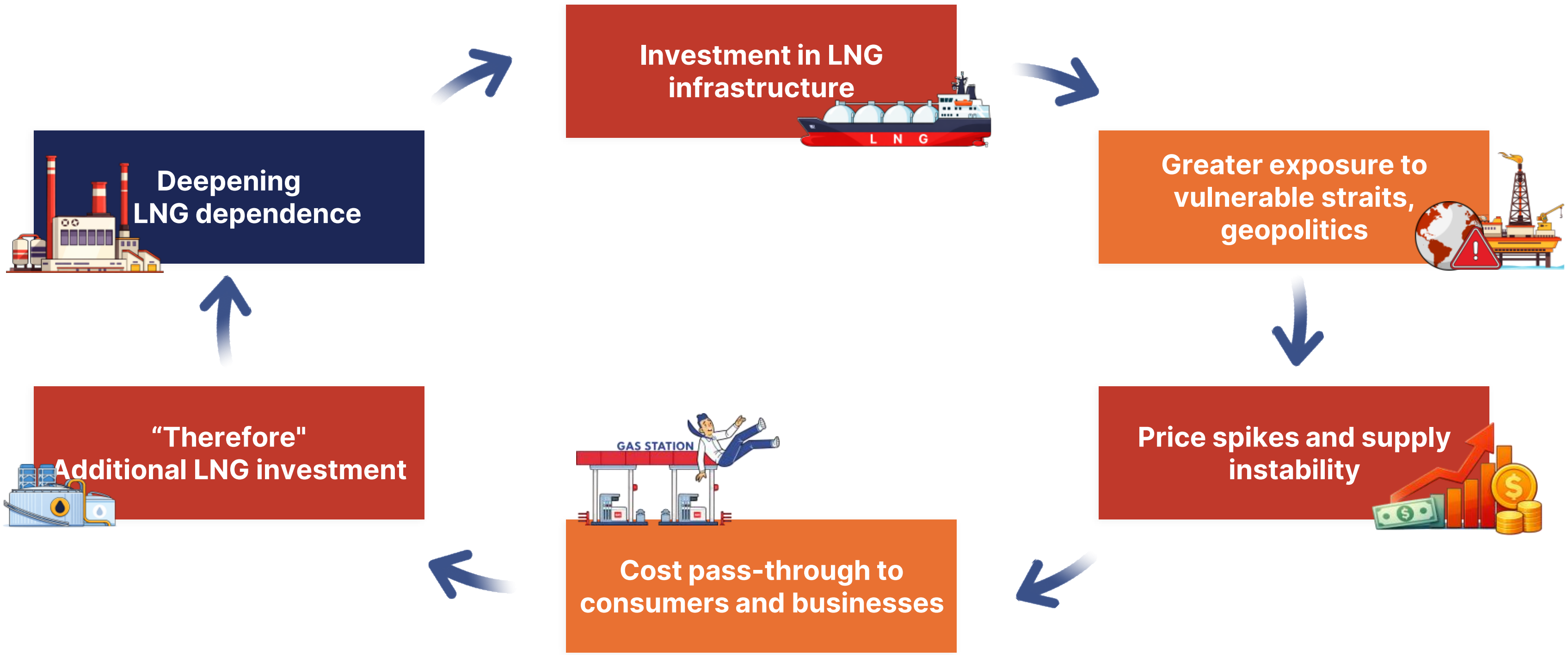
**Korea** **~60%** of Korea's public export finance in the past 5 years has been concentrated in LNG infrastructure construction.

| | | | |
|---|---|---|---|
| **$127 Bn**<br>Fossil fuel public finance 11 years — world's 2nd largest | **$9.7 Bn**<br>Renewable energy finance Same period — 13x gap | **$141 Bn**<br>KEPCO debt ~60% fossil fuel generation | **$120 Bn**<br>Fuel import costs overseas 2024 alone |

*Sources: GESI (2025), SFOC, The Mainichi, KEPCO*

Yet both countries' public finance remains heavily anchored in the past, pouring over $220 billion combined into fossil fuel infrastructure-maintaining a massive investment gap with renewables while paying hundreds of billions annually in volatile energy imports and subsidies. Renewables require no fuel imports. Instead of fuel costs flowing overseas, **maintenance and operation costs circulate domestically — creating local jobs, technology, and skills.** The core of energy security is breaking the structure where money flows out.

# 06 The Dependency Loop




Treating LNG as the answer to energy security and concentrating public finance on it has created a self-reinforcing vicious cycle: dependence deepens, external risks are passed on as costs, and the pattern solidifies. **Delaying the renewable energy transition because of existing LNG infrastructure economics is a sunk cost fallacy**. Energy security that depends on war-risk insurance is not security — it is volatility.

# 06 Same money, 3x the Return

If the fossil fuel–renewable public finance gap had been redirected to solar

| KOREA · 11 YEARS | |
|---|---|
| Fossil fuel–renewable gap | **$97B** |
| IF REDIRECTED TO SOLAR → | |
| Potential capacity | ~100 GW |
| Annual LNG savings | ~$12B / yr |
| 25-year savings | **$300B** |
| **3× return on original gap** | |

| JAPAN · 11 YEARS | |
|---|---|
| Fossil fuel–renewable gap | **$68.5B** |
| IF REDIRECTED TO SOLAR → | |
| Potential capacity | ~70 GW |
| Annual LNG savings | ~$8.4B / yr |
| 25-year savings | **$200–210B** |
| **3× return on original gap** | |

*Based on IEEFA estimate of $3B in avoided LNG costs per GW of solar over 25 years (Bloomberg NEF data).*
*Solar installation cost assumed at $800M–$1B/GW. All figures are illustrative estimates. Sources: GESI (2025), The Mainichi, IEEFA.*

Public finance has been consistently deployed to deepen the exposure it then pays to manage.

07

# International Precedents — Crisis into Transition

## EU EU (REPowerEU)

### €99 Bn Saved

Post-Russia invasion to Ukraine, wind & solar replaced 70 Bn m³ gas (= Korea's annual LNG imports)

**Russian gas: 45% → 19%**
(2022–2025)

**Gas consumption −17%**
**Renewables +58%**

In 2025, renewables surpassed fossil fuels in EU generation

## TW Taiwan

### 4.4 GW

Offshore wind installed (end 2025)
Asia-Pacific #2, Global #5

### +1.8 GW in 2024

Single-year record

### 20.6 GW

2035 offshore wind target
Turned energy crisis into renewable industry opportunity

## CN China

### 434 GW

New renewables installed in 2025
Solar 315 GW + Wind 119 GW
All-time record, global #1

### 6 Years Early

Achieved 2030 target (1,200 GW) reached in 2024

### 47%

of installed generation capacity is now wind + solar (1,840 GW)
= 13x Korea's entire power capacity

*Sources: European Commission (2025), E3G & Ember (2022), GWEC, Taiwan MOEA, China NEA*

Countries that experienced crises are already moving. Korea builds **74% of the world's LNG carriers**. Japan operates one of **the world's largest commercial shipping fleets and has advanced manufacturing**. Both have the industrial capacity for transition — can these capabilities become assets for the energy transition?

# 08 The 74% Paradox — Shipbuilding & Shipping Limits

## Stranded Asset Risk Warning

- UCL Energy Institute: Korea is the country most exposed to stranded asset risk in shipping finance
- KEXIM portfolio: >50% concentrated in fossil fuel carriers — disproportionately midstream (LNG shipping)
- The gap between LNG carrier orders and actual long-term demand is widening
- Japan's shipping fleet (NYK, MOL, K Line) and trading houses are deeply invested in LNG carrier operations and long-term charters

## Strategic Shift: Volume → Technology

- LNG carriers depend on foreign core tech (GTT) — orders don't build domestic ecosystem value
- Korean yards already commercializing WTIVs, HLVs, ammonia-fueled ships with proprietary design
- Japanese yards (Kawasaki, Mitsui E&S) developing hydrogen carriers and alt-fuel systems
- **Right policy finance signals can accelerate transition and global market leadership**

### Global Offshore Wind: The Investment Opportunity

2030 target: 500 GW (from 75 GW in 2023) — 6x growth needed

Annual additions needed: ~61 GW vs. recent average ~10 GW

**$21–26 Bn**

in specialized vessels alone needed immediately

*Sources: UCL Bartlett Energy Institute (2025), GWEC (2024), Clarksons, Kuehne Climate Center (2025)*

High market share does not guarantee sustainable profits or future competitiveness. The exit strategy for Korea's shipbuilding and Japan's maritime industries lies in a qualitative shift toward offshore wind vessels and alternative fuel propulsion systems — sectors where they can lead on proprietary technology.

# 09 Energy Security = Energy Mix

| Current: LNG = "Energy Security" | → | Transition: Diversified, Self-Sufficient |
|---|---|---|
| × 100% import dependent | | ✓ Renewables: domestically produced |
| × Immediately exposed to strait blockades | | ✓ Generation continues during blockades |
| × Vulnerable to tariff & diplomatic pressure | | ✓ Not affected by tariffs or wars |
| × Price surges passed to consumers | | ✓ Supply chain diversification: underway |
| × Depends on war-risk insurance to function | | ✓ No war-risk premium needed |

> " The idea that you can cost-effectively decarbonise your economies by relying on a commodity that, in the space of 5 years, is subject to two illegal wars that send prices stratospheric just doesn't make any sense."
> — Seb Kennedy, Energy Flux (Eco-Business, March 2026)

To transform the fossil fuel-dependent economic structure that is vulnerable to geopolitical conflict, **it is time to redirect public finance toward renewables.**

# Policy Recommendations

## 01 Mandatory Energy Portfolio Risk Assessment & Disclosure

Public export finance institutions (KEXIM, K-SURE for Korea; JBIC, NEXI for Japan) should conduct systematic risk assessments including geopolitical supply route risks, insurance volatility, and stranded asset exposure — with mandatory legislative reporting.

## 02 Review Public Finance for New LNG Infrastructure

Reassess the economic rationale and stranded asset risks of continued public financing for LNG carriers, terminals, and upstream investments. Apply stress tests reflecting scenarios like the current crisis.

## 03 Expand Finance for Renewables & Clean Maritime Vessels

Redirect public finance portfolios toward offshore wind installation vessels, alternative fuel carriers, and renewable energy infrastructure. Both countries' shipbuilding and maritime industries can lead this transition.

## 04 Energy Independence Roadmap

Move beyond import diversification to structural energy mix transformation — prioritizing domestic renewable energy deployment to reduce fundamental dependence on imported fossil fuels.

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## How the Hormuz blockade exposed the structural limits of fossil fuel dependence and the need for public finance to shift toward renewables

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