



The Clean Energy Economy in the Face of Maritime Chokepoint Shocks: An Analysis of China's Response to the Strait of Hormuz Crisis

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Abstract

Maritime chokepoint shocks — foremost among them disruptions to the Strait of Hormuz — have become one of the most salient risks threatening energy security and international trade. These risks take on a strategic dimension in the case of China, the world's largest oil importer, at a time when the structure of its energy system is shifting rapidly towards renewable energy and electric vehicles. This study seeks to analyse China's response to disruptions in the Strait of Hormuz and to identify the role played by the clean energy economy in mitigating the structural and economic repercussions of such shocks.

The study adopts a descriptive-analytical approach, monitoring and tracking indicators of oil consumption, renewable energy expansion, electric vehicle penetration, and strategies of supply diversification and strategic stockholding. The study concludes by assessing the extent to which the energy transition has succeeded in reducing the vulnerability of the Chinese economy to maritime shocks, and by identifying the limits of its continued dependence on the stability of oil markets and international shipping corridors.

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1. Introduction

Energy security is one of the fundamental pillars of macroeconomic stability, since the ability of contemporary economies to sustain their levels of production, consumption and growth is closely linked to continued access to energy sources at affordable prices. The risks associated with energy security are not confined to the availability of primary resources alone; they extend to other geo-economic factors, most notably the location of production centres, the degree of concentration of supply sources, the efficiency of transport infrastructure, and the level of geopolitical stability in producing regions and in the corridors through which international energy trade passes. Accordingly, any disruption affecting a strategic maritime corridor may rapidly evolve from a limited logistical problem into a comprehensive shock in energy markets, with effects extending to trade, inflation, production and economic growth.

Maritime corridors are of particular importance in this regard, given the pivotal role played by maritime transport in global oil and gas trade. The Strait of Hormuz occupies a prominent position among these corridors as a principal link between the Gulf region and international markets; consequently, any disruption to navigation through it is directly or indirectly reflected in energy availability, transport costs and price levels worldwide. The repercussions of such shocks are not limited to the states neighbouring the strait, but extend through the price mechanism, international markets, and supply, transport and insurance chains to energy-importing economies in various regions of the world. China constitutes a particularly significant case study for understanding the relationship between maritime chokepoint shocks and the energy transition: the accelerated industrial and economic growth the country has experienced in recent decades has led to a marked increase in energy demand, particularly for oil, making it heavily reliant on imports to cover a substantial part of its needs. This dependence heightens the sensitivity of the Chinese economy to the security of maritime supply routes, especially since an important share of global oil exports is shipped through a limited number of strategic maritime corridors.

At the same time, the energy structure of the Chinese economy has undergone a rapid transformation in recent years, reflected in the large-scale expansion of solar and wind power generation and in China's emergence as the world's largest market for electric vehicles, alongside the expansion of the battery industry, energy storage solutions and electric charging infrastructure. These transformations have gradually begun to reshape the nature of the relationship between the Chinese economy and oil, particularly in the transport sector, which represents one of the most important components of demand for petroleum products.

From this perspective, a central research problem arises:

To what extent has the shift towards a clean energy economy contributed to mitigating the energy-related and economic effects of the disruption of the Strait of Hormuz on the Chinese economy?

This main question gives rise to a number of subsidiary questions:

- ✓ What is the degree of exposure of the Chinese economy to energy trade linked to maritime corridors in general, and to the Strait of Hormuz in particular?
- ✓ How has the disruption of the strait been reflected in the volume of China's oil imports and in its consumption pattern?
- ✓ What mechanisms has China adopted in responding to this disruption at the level of supply, stocks and demand?
- ✓ What role have electric vehicles and the electrification of the transport sector played in reducing demand for petroleum products?
- ✓ To what extent can renewable energy and the energy transition be regarded as effective instruments for strengthening China's energy security?
- ✓ Does clean energy constitute an instrument for absorbing this particular shock, or does it contribute more fundamentally to reducing exposure to similar shocks in the future?

The study proceeds from the following main hypothesis:

The shift towards a clean energy economy has contributed to mitigating the exposure of certain sectors of the Chinese economy, particularly the transport sector, to the shock caused by the disruption of the Strait of Hormuz; nevertheless, the absorption of this shock in the short run has remained largely dependent on conventional energy security instruments, such as the diversification of supply sources, the use of strategic reserves, and the reorganisation of import routes.

The study therefore does not assume that clean energy constitutes the sole or principal determinant of the Chinese response; rather, it seeks to determine its relative weight within a broader system of response mechanisms.

The study relies on the descriptive-analytical approach, tracking the evolution of indicators related to energy, trade and transport in China, and comparing the values of these indicators in the periods before and during the disruption of the Strait of Hormuz. It also employs the case study

method, focusing on China as a large energy-importing economy that is simultaneously undergoing a structural shift towards electricity and renewable energy sources. In order to analyse the Chinese response with precision, the study adopts a four-dimensional analytical framework comprising: the supply response, the stock response, the demand response, and the structural response associated with the energy transition. This framework makes it possible to avoid conflating a decline in oil imports as an indicator of falling demand with a decline resulting from supply disruption or from a change in import sources — a methodological distinction that is necessary to ensure the accurate interpretation of the results.

2. Theoretical and Conceptual Framework

2.1. Energy security and maritime chokepoint shocks

2.1.1. The theoretical concept of energy security

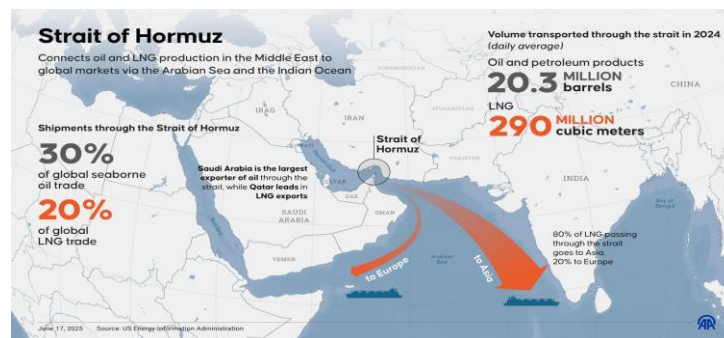
In contemporary economic literature, the concept of energy security is no longer confined to guaranteeing the availability of sufficient quantities of natural resources; it has evolved into a multidimensional concept resting on four main pillars, frequently referred to in the literature as the "Four A's": the physical availability of resources (Availability), the possibility of reaching them through open markets and corridors (Accessibility), the economic affordability of obtaining them (Affordability), and the environmental and social acceptability of their use (Acceptability). From this analytical perspective, an economy may be rich in energy resources in terms of production or reserves and yet remain exposed to fundamental energy security risks if its transport infrastructure, or its external supply routes, are highly concentrated geographically or vulnerable to geopolitical disruption (Aleh Cherp, 2014, pp. 415–421).

2.1.2. Strategic chokepoints in energy trade

The importance of this dimension is particularly evident in international oil and gas trade, since these resources do not move from producing regions to consuming regions through a network of multiple routes of comparable importance, but rather pass through a limited number of narrow waterways known in the energy literature as "chokepoints". The United States Energy Information Administration (EIA) defines these points as narrow passages linking two maritime basins, whose closure — even partial or temporary — entails the forced rerouting of oil tanker flows along longer and more costly routes, or an effective decline in the volume of supplies available in the short run. The Strait of Hormuz ranks first among these chokepoints in terms of volume, as approximately one-fifth of global daily oil consumption passes through it, which gives it a strategic weight exceeding that of any other waterway in the global energy security system. According to data from the United States Energy Information Administration, the average volume of shipments transiting

the strait in 2024 stood at around 20.3 million barrels per day of oil and petroleum products and 290 million cubic metres per day of liquefied natural gas, representing roughly 30% of total global seaborne crude oil trade and 20% of global LNG trade, while some 80% of LNG shipments transiting the strait are destined for Asian markets, compared with 20% for Europe (EIA, 2025).

Figure 1. The Strait of Hormuz, the volume of shipments passing through it (oil and LNG) and the main export destinations, 2024



Source: US Energy Information Administration, 17 June 2025

2.1.3. The concept of a maritime corridor shock

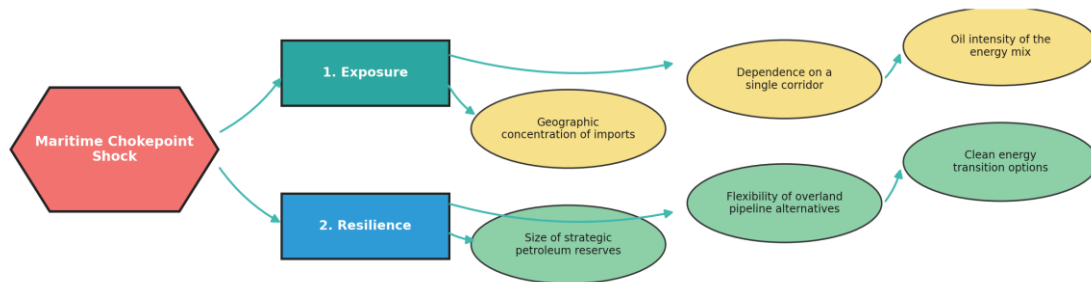
A strategic maritime chokepoint shock is defined as a sudden or protracted structural disturbance affecting energy shipping flows through vital maritime chokepoints. Such disturbances arise from multiple causes: geopolitical and military (such as direct threats to navigation or the closure of passages), technical (such as accidents and navigational breakdowns), or regulatory (such as sovereign restrictions and precautionary measures). The effects of this shock are reflected dynamically in three pivotal variables: the volume of supply flows, transit times, and total logistics costs (including maritime freight rates and war-risk insurance premiums).

The effects of this shock are transmitted to importing economies through three main transmission channels:

- ✓ The global price channel: through sharp fluctuations in the markets for crude oil and refined products.
- ✓ The external trade channel: through the structural reshaping of the trade balance and the geographical reconfiguration of supply chains.
- ✓ The logistics and supply chain channel: relating to the availability of tanker capacity, the length of alternative routes, and rising insurance costs.

The severity of the economic effects of the shock does not depend solely on the magnitude of the disturbance in the corridor itself; rather, its overall outcome is determined by the interaction between two axes: the degree of exposure and the capacity to respond and adapt (resilience / response capacity) (Rodrigue, 2020, pp. 245–250).

Figure 2. Conceptual map of the transmission channels of a maritime corridor shock between structural exposure and response resilience



Source: prepared by the author

a. Degree of exposure (structural exposure): this is directly proportional to indicators of the geographical concentration of supply sources, total dependence on transit movements through a single corridor, and the high oil intensity of the domestic consumption structure.

b. Response and adaptation capacity (resilience capacity): this is linked to the level of strategic reserves, the existence of alternative infrastructure (such as cross-border overland pipelines), and the degree of flexibility of the national energy mix.

This dual conceptual framework (exposure – response) constitutes the analytical approach adopted in this study for examining the Chinese case, in which the shift towards clean energy is treated as a mechanism with a twofold effect: it reduces structural exposure by lowering the oil intensity of the energy mix, particularly in the transport sector, and it strengthens response resilience by providing sustainable domestic alternatives that limit the severity of external shocks when they occur (Richard Smith, march 2026, pp. 1–4).

2.2. The clean energy economy and the energy transition

2.2.1. The concept of the energy transition: this refers to the long-term structural change in the energy mix used in an economy, whereby the share of fossil energy sources (oil, coal, gas) gradually declines in favour of renewable and low-carbon sources (solar, wind, hydro, nuclear), together with the associated technologies such as electric vehicles, energy storage systems and green hydrogen. International energy organisations, foremost among them the International Energy Agency (IEA) and the International Renewable Energy Agency (IRENA), agree that this transition is not confined

to its environmental dimension associated with reducing emissions, but also represents an economic response to considerations of energy security and industrial competitiveness (IRENA, 2022, pp. 25–32).

2.2.2. The concept of the clean energy economy: this is the broader economic system within which the energy transition unfolds, encompassing production, investment, manufacturing and trade activities associated with renewable energy technologies, electric vehicles, batteries, storage solutions and electric charging infrastructure, as well as the industrial value chains supporting them. In this sense, the clean energy economy is not reducible to a technical substitute for fossil fuels; it also constitutes an instrument of economic policy in which energy security objectives intersect with the goals of industrial development and positioning within emerging global value chains (Simsek, 2022).

Linking these two concepts to the "Four A's" framework of energy security presented above, it may be argued that the shift towards clean energy simultaneously affects all four of its dimensions: it strengthens Availability by diversifying the domestic resource base with renewable sources that are not dependent on imports; it raises the degree of Accessibility by reducing reliance on imports transiting a limited number of maritime corridors such as the Strait of Hormuz; it contributes to the stability of Affordability by substituting a relatively low-cost domestic energy source for oil imports subject to sharp price volatility; and it achieves environmental and social Acceptability associated with lower emissions. On this basis, the energy transition is not treated in this study as a marginal environmental variable, but as an instrument acting directly upon the infrastructure of energy security in its comprehensive economic sense.

From the standpoint of the relationship between exposure and response (resilience / response capacity) on which this study is founded, two levels of the impact of the energy transition may be distinguished:

a. A long-term structural level: this works to reduce the degree of exposure itself, by lowering the share of imported oil within the overall energy demand mix (particularly in the transport sector through its electrification).

b. A short-term complementary level: under which the energy transition is added to the set of immediate response instruments when a shock occurs, alongside conventional instruments such as the diversification of supply sources, strategic reserves and alternative pipelines.

This distinction between the structural and complementary effects is what explains the reliance on a four-dimensional analytical framework combining the supply response, the stock response and

the demand response on the one hand (short-term response instruments), and the structural response associated with the energy transition on the other (an instrument for reducing long-term structural exposure), thereby making it possible to interpret the subsequent empirical results in the light of this conceptual distinction rather than merely recording them descriptively.

2.3. Oil dependence and the importance of the Strait of Hormuz: China as a case study

2.3.1. China's position as a major energy importer

China is the world's largest importer of crude oil, with crude oil imports of approximately 11.6 million barrels per day in 2025, an increase of 5% compared with 2024. Its dependence on external crude oil imports amounts to more than 70% of domestic consumption, which makes the Chinese economy highly sensitive to any disruption in global supplies (Downs, 2026).

2.3.2. The importance of the Strait of Hormuz

The Strait of Hormuz is regarded as the principal lifeline for Chinese oil supplies from the Gulf region, as approximately 50% of China's imports pass through this strait, representing roughly one-third of total Chinese oil supplies, at a rate that reached 15 million barrels of crude oil per day in 2025. China and India together receive 44% of these flows, equivalent to 34% of global seaborne trade (IEA I. E., 2026)

2.3.3. The impact of navigation disruptions on China

Given its dependence on oil originating from the Gulf states, China is among the countries most affected by any disruption in the Strait of Hormuz. In order to mitigate these risks, however, it has developed its strategies by diversifying supply sources, building up massive strategic reserves, developing alternative overland pipelines, and expanding domestic and renewable energy.

Table 1. Evolution of China's oil dependence and oil imports (2020-2025)

Year	Imports (million barrels/day)	Import dependence ratio (%)	Share of Hormuz in imports (%)
2020	10.8	72	48
2021	10.4	71	47
2022	10.2	71	46
2023	11.3	73	46
2024	11.1	72	45
2025	11.6	73	45

Source: EIA (2026), China Customs (2026)

3. China's Transition to Clean Energy

3.1. The expansion of solar and wind power

China has witnessed an unprecedented expansion in renewable energy capacity in recent years. In 2025, it added approximately 430 GW of new solar and wind capacity, an increase of 22% compared with 2024, bringing total installed solar and wind capacity to 1.84 TW at the end of 2025, equivalent to 47.3% of China's total installed electricity capacity and exceeding, for the first time, the installed capacity of thermal power plants (China, 2026, pp. 1-1).

3.2. The share of non-fossil energy

Renewable energy exceeded 60% of China's total electricity generation capacity in 2025, with installed renewable capacity reaching more than 1,800 GW, while electricity generation from renewable sources amounted to approximately 4 trillion kilowatt-hours, surpassing total electricity consumption in the 27 member states of the European Union.

Renewable energy also covered 100% of the growth in electricity demand in China in the same year, an achievement that is the first of its kind (EMBER, 2025, pp. 1-1)

3.3. The evolution of China's energy mix

China's energy mix is undergoing a gradual shift away from coal and oil towards clean sources. While China still relies on coal for approximately 55-60% of its electricity generation, the share of renewable energy is rising steadily, with solar and wind together reaching 22% of total electricity generation in 2025. The data show that China added 315 GW of solar and 119 GW of wind capacity in 2025 alone, setting new record figures (Shaw, 2026, pp. 1-1)

3.4. Energy storage and batteries

China has invested heavily in energy storage technologies in order to support the effective integration of intermittent renewable energy into the electricity grid. It is the global leader in battery manufacturing, controlling more than 80% of global supply chain capacity across all stages, from raw materials to finished cells. Installed grid-scale battery storage capacity in China rose to more than 160 GWh by 2025/2026, a capacity that has enabled the grid to absorb an increasing share of the fluctuations in solar and wind output (Mackenzie, 2025, pp. 1-6).

3.5. Clean energy investment

China invests massively in clean energy, accounting for more than 60% of global growth in renewable energy capacity. China aims to reach peak carbon emissions before 2030 and carbon

neutrality before 2060, which requires this momentum in green investment to be sustained (IEA, 2021)

Table 2. Indicators of China's clean energy expansion (2020-2025)

Indicator	2020	2022	2024	2025
Installed solar capacity (GW)	253	393	885	1,200
Installed wind capacity (GW)	281	365	521	640
Total solar + wind (GW)	534	758	1,406	1,840
Share of solar + wind in installed capacity (%)	24.0	31.0	42.0	47.3
Share of renewables in installed capacity (%)	43.0	48.0	55.0	60.0
Renewable electricity generation (trillion kWh)	2.2	2.7	3.5	4.0
Share of renewables in electricity generation (%)	13.0	16.0	20.0	22.0

Source: NEA (2026), IEA (2026), IRENA (2026)

3.6. The limits of the transition to clean energy

Despite the high growth rates shown in the table above, an objective reading of the impact of the energy transition on China's energy security requires attention to a number of constraints that prevent it from being regarded as a complete substitute for fossil energy sources in the foreseeable future. Although the share of renewable energy in installed electricity capacity reached around 60% in 2025, coal still provides the largest share of electricity actually generated (and not merely of installed capacity), since actual generation differs from nominal installed capacity owing to the natural intermittency of solar and wind sources. Thus, although the installed capacity of wind and solar reached 47.3%, the effective capacity factor did not exceed approximately 22-24% for solar and 30-32% for wind, compared with a capacity factor of around 60% for coal-fired plants, which explains why coal continues to provide the largest share of generation despite the decline in its share of installed capacity (Qi Qin & Christine Shearer, 2025, pp. 1-3).

Moreover, the energy transition is concentrated mainly in the electricity and road transport sectors, while oil and gas remain difficult to dispense with in other sectors such as petrochemicals, aviation, maritime shipping and steel — sectors for which commercially mature, large-scale clean alternatives are not yet available. In addition, the expansion of renewable energy comes up against the limited storage (battery) capacity required to address the intermittency of solar and wind output, and against the dependence of the supply chains for the primary minerals used in manufacturing solar panels and batteries (such as lithium, cobalt and copper) on external imports, which may in turn carry geopolitical and supply chain risks similar to those China faces in the oil market (Rabley, 2025).

Accordingly, the energy transition, despite its genuine contribution to mitigating structural exposure to maritime chokepoint shocks, does not constitute in the short and medium run a

comprehensive substitute for conventional energy security instruments; rather, it operates in parallel with them within a multi-instrument response system — a point that will be clarified by the results of the fourth axis when testing the resilience of the Chinese economy to the Strait of Hormuz shock.

4. Electric Vehicles in China as an Energy Security Instrument

4.1. The evolution of electric vehicle sales in China

China is the world's largest market for electric vehicles, with approximately 44 million electric vehicles on the road in 2025, a figure roughly equivalent to the combined total of electric vehicles in the rest of the world. Electric vehicle sales in China exceeded 60% of total vehicle sales in the first half of 2026.

4.2. The impact of electric vehicles on fuel consumption

The rapid spread of electric vehicles in China has led to a tangible reduction in petroleum fuel consumption in the road transport sector. According to the International Energy Agency, electric vehicles displaced around one million barrels per day of oil demand in China during 2025, representing a decline of approximately 15% relative to the level of demand that would have been reached had road transport vehicles remained entirely dependent on internal combustion engines. The Agency notes that this effect is likely to increase, as the volume of oil displaced by electric vehicles in China is expected to rise to around 2.7 million barrels per day by 2030 under current policies.

These figures reflect a structural shift in the relationship between economic growth and fuel consumption: an increase in the number of vehicles and in the volume of mobility no longer necessarily leads to a parallel increase in demand for petrol and diesel. The impact of electric vehicles also extends beyond the direct reduction of fuel consumption to affect oil imports, refinery utilisation rates, the composition of demand for petroleum products, and investment in energy infrastructure. The net effect on emissions, however, depends on the electricity mix used to charge the vehicles, as well as on the carbon footprint associated with the production of batteries and the minerals required for them.

From the perspective of international trade, this shift may lead to a redistribution of global energy demand, whereby the importance of oil imports in China's transport sector declines while the importance of trade in batteries, semiconductors, critical minerals and electrical equipment increases. Economic value is thus gradually shifting from the conventional fuel chain towards new value chains centred on batteries, software, electronics and charging infrastructure (IEA I. E., 2026)

4.3. The electrification of public transport and commercial vehicles

The electrification of the transport sector in China has not been confined to private cars, but has extended to public transport and commercial vehicles, including buses, trucks and delivery vehicles. Urban and industrial policies, together with falling battery costs and the development of charging infrastructure, have contributed to expanding the use of electric buses in major cities, including Shanghai and Beijing, turning public transport into one of the most important fields of application for electric vehicles (World Bank, 2021).

China is the world leader in sales of electric commercial vehicles. According to the International Energy Agency, sales of electric trucks in China exceeded 400,000 units in 2025, representing more than 90% of global electric truck sales in that year. Electric trucks have also come to account for about one-quarter of new trucks sold in the Chinese market, while China holds the world's largest fleet of electric trucks.

In the bus segment, China has retained the largest share of global electric bus sales, despite the gradual decline in its relative share as other markets have expanded. China's share stood at around 60% of global electric bus sales in 2025, after approaching 100% in 2018, which reflects the wider diffusion of this mode of transport in other regions, while Chinese superiority continues in terms of volume, manufacturing and operational experience.

The significance of these developments goes beyond reducing petrol and diesel consumption: the electrification of public transport and commercial vehicles reshapes the value chains associated with transport and energy. Economic value is gradually shifting from internal combustion engines and fuel systems towards batteries, electric motors, software, fleet management systems and charging infrastructure. Electric commercial vehicles may also contribute to lowering operating costs, particularly for buses and trucks operating over long distances or along regular urban routes (IEA I. E., 2026).

4.4. The electric vehicle as an energy security instrument

The Chinese electric vehicle may be regarded as an energy security instrument rather than merely a low-carbon, environmentally friendly means of transport, for the following reasons:

- ✓ Reducing demand for imported oil: every electric vehicle that replaces a petrol- or diesel-powered vehicle reduces demand for imported oil and therefore reduces exposure to maritime supply shocks.
- ✓ Diversifying energy sources: electric vehicles use electricity that can be generated from a variety of domestic sources (coal, solar, wind, nuclear), which reduces dependence on imported oil.

- ✓ Resilience to shocks: in the event of a disruption to oil supplies, the Chinese electricity system can continue to operate thanks to domestic coal stocks and growing renewable energy capacity.
- ✓ Cumulative effect: with the number of electric vehicles reaching 44 million in 2025, the aggregate impact on oil demand has become large enough to make a strategic difference to energy security.

Table 3. Indicators of electric vehicle diffusion in China and displaced oil demand (2020-2025)

Indicator	2020	2022	2024	2025
Electric vehicle fleet (million vehicles)	4.9	13.9	30.0	44.0
Electric vehicle sales (% of total sales)	5.4	25.6	45.0	55.0
Displaced oil demand (million barrels/day)	0.2	0.5	0.8	1.0
Electric buses (thousand units)	600	800	950	1,000

Source: IEA 2026, Global EV Outlook 2026; NEA 2026

5. The Strait of Hormuz Shock and the Test of China's Resilience

5.1. The shock scenario

Assuming a partial disruption or temporary interruption of oil flows through the Strait of Hormuz as a result of geopolitical tensions or attacks on oil tankers, the figure below illustrates the general path through which this shock is transmitted to the Chinese economy, while the table that follows sets out these transmission channels specifically, together with the corresponding response instruments.

Figure 3. The shock scenario



Source: prepared by the author

China holds the world's largest strategic oil reserve, with reserves reaching approximately 1.5 billion barrels at the end of 2025, covering around 180 days of net imports and exceeding the International Energy Agency standard of 90 days.

Forty per cent of China's imports pass through the Strait of Hormuz. China diversifies its oil sources, importing from Russia via pipelines and maritime routes, from Africa and Latin America,

in addition to the Gulf states. China has developed these pipelines with Russia and Central Asia, providing alternative routes for oil and gas supplies away from maritime corridors exposed to risk. It is here that the energy transition plays a role as an instrument of crisis management, since growing renewable energy generation capacity means that part of energy demand can be met domestically without recourse to imported oil (CSIS, 2026) .

5.2. Channels through which the Strait of Hormuz shock affects the Chinese economy and possible responses

Table 4. Channels through which the Strait of Hormuz shock affects the Chinese economy and possible responses

Channel	Transmission mechanism	Possible response
Crude oil supply	Disruption of tanker traffic through the strait reduces supplies coming from the Gulf	Diversifying import sources and activating alternative long-term contracts; raising the utilisation rate of overland pipeline capacity (e.g. ESPO with Russia, Kazakhstan pipelines) above 90% of design capacity
Liquefied natural gas	Higher freight and insurance premiums on gas tankers raise import costs	Greater reliance on overland pipelines instead of maritime shipping
Domestic energy prices	Higher import costs are partially passed through to fuel and electricity prices	Temporary government support and partial absorption of the shock through state-owned energy companies
Strategic reserves	Drawdown of the strategic reserve to cover the short-term supply gap	Accelerating the refilling of stocks after the crisis and expanding storage capacity
Transport sector	Higher fuel costs put pressure on road, air and maritime transport	Accelerating the adoption of electric vehicles and electric public transport
Energy-intensive industry	Higher energy input costs raise production costs	Rationalising industrial consumption and improving energy efficiency in factories
Aggregate demand and inflation	Transmission of the energy price shock to production and transport costs in general	Partially accommodative monetary and fiscal policies to absorb the inflationary impact
Balance of payments	A higher energy import bill puts pressure on the currency and foreign reserves	Settling part of oil payments in yuan with partners such as Russia and Iran
Long-term structural transformation	The shock reveals the fragility of dependence on a single maritime corridor	Accelerating renewable energy plans in order to reduce dependence on imported fossil energy

Source: IEA 2026

The table above shows that the channels through which the Strait of Hormuz shock is transmitted to the Chinese economy are divided between channels whose severity is directly mitigated by the shift towards clean energy — foremost among them the transport sector and long-term structural transformation — and other channels for which the response still depends primarily on conventional energy security instruments, such as the diversification of supply sources, strategic

reserves and the balance of payments. This differentiation is consistent with the main hypothesis of the study, since it confirms that clean energy has contributed to mitigating the exposure of certain sectors to the shock without constituting a complete substitute for conventional response instruments in the short run — a point that will be elaborated in the discussion of the results.

6. Analysis of Crisis Absorption Mechanisms and the Strategic Trade-off

The analytical reading of the nature of the resilience displayed by the Chinese economy in the face of the 2026 disruption rests on the intersection between the evidence on the actual response and the theoretical frameworks of energy security. The quantitative evidence reveals a qualitative shift in the structure of absorption: structural exposure remains in place, with China's dependence on oil imports exceeding 70%, around half of which passes through the Strait of Hormuz. In confronting the short-term shock, conventional instruments served as the first safety valve, through the activation of strategic reserves covering some 180 days of net imports, alongside the diversification of overland supply routes via Russia and Central Asia.

The novel variable in this equation, however, lay in the entry of the energy transition as a structural absorption instrument that reduces structural exposure through the "electrification of demand". This was clearly apparent in the road transport sector: the expansion of the electric vehicle fleet (amounting to 44 million vehicles) displaced approximately one million barrels per day of oil demand. This finding goes beyond the simplistic view that places clean energy and conventional instruments in competition, suggesting instead a complementary and synergistic relationship: conventional instruments provide the immediate response when the shock occurs, while energy transition instruments reduce the magnitude of the shock borne by the economy in the first place.

Table 5. Comparison between the conventional oil market and critical mineral supply chains

Basis of comparison	Conventional oil market	Critical mineral supply chains
Nature of the chokepoint	Maritime and geographical corridors such as the Strait of Hormuz	Geographical concentration in extraction and mining centres
Level of concentration	Moderate to relatively high	Very high (exceeding 4,000 points for lithium)
Resilience of the response to shocks	High (strategic stockholding and alternative pipelines)	Low (limited stocks and difficulty of substitution)
China's position in the chain	Net importer of the raw material	Dominant in manufacturing and refining, and an importer of the raw material

Source: Prepared by the author based on data from IEA (2026)

Sectoral analysis reveals the heterogeneity of this effect: while electrification has made tangible progress in road transport, it has remained almost absent from the hard-to-abate sectors, such as mining, maritime shipping, aviation and the petrochemical industries. Furthermore, the fact that the share of solar and wind has reached 47% of installed capacity (and renewable energy in general more than 60%) does not imply immediate emancipation from fossil fuels, since the actual structure of operational electricity generation still relies for its main share on coal in order to manage the intermittency of supply.

These findings are reflected in the formulation of what may be termed the "strategic trade-off": expanding renewable energy and battery capacity transfers part of the geopolitical risk from the conventional oil market to critical mineral supply chains (such as lithium, cobalt, nickel and rare earth elements). Quantitative indicators reveal the intensity of this concentration at the extraction stage: the Herfindahl-Hirschman Index (HHI) for the concentration of China's imports of raw lithium reaches levels exceeding 4,000 points, with dependence of more than 65% on only two countries (Australia and Chile).

The strategic trade-off is embodied in the fact that, by reducing its dependence on oil imports from the Arabian Gulf through threatened maritime corridors, China is redistributing its geopolitical risks towards industrial supply chains that are more complex and less mature in terms of the instruments available to address them. Although it occupies a dominant position in the refining, processing and final manufacturing stages of these minerals, this does not exempt it from the risks of disruption at the primary extraction stages, which lie outside its national borders and are subject to mounting geopolitical and export restrictions. This confirms that the shift towards a green economy does not confer absolute emancipation from energy dependence, but rather reshapes it into a new pattern, moving from the risks of the "single maritime corridor" to those of the "extended supply chain".

7. Conclusion

This study has analysed the response of the Chinese economy to the disruption of the Strait of Hormuz in 2026, as a real-world test of the extent to which the shift towards a clean energy economy contributes to mitigating China's exposure to maritime chokepoint shocks. The study adopted the descriptive-analytical approach and the case study method, drawing on a four-dimensional analytical framework that distinguishes between the supply response, the stock response and the demand response on the one hand, and the structural response associated with the energy transition on the other. The study tracked indicators of oil dependence, renewable energy expansion and electric vehicle diffusion, and then examined the interaction of these elements as a whole in confronting the Strait of Hormuz shock, without any prior assumption that clean energy has rendered China fully immune to this type of shock.

First: Results

✓ The Chinese economy remains highly exposed to Strait of Hormuz shocks, given its reliance on oil imports for more than 70% of domestic consumption and the passage of around half of these imports through the strait.

- ✓ In absorbing the short-term shock, China relied principally on conventional energy security instruments: massive strategic reserves covering around 180 days of net imports, the diversification of supply sources through Russia, Central Asia, Africa and Latin America, and alternative overland pipelines.
- ✓ The shift towards clean energy made a real, albeit partial, contribution to reducing the structural exposure of the Chinese economy, particularly in the road transport sector, where an electric vehicle fleet of 44 million vehicles displaced around one million barrels per day of oil demand.
- ✓ The share of solar and wind power reached around 47% of installed electricity capacity in China, and renewable energy as a whole exceeded 60% of this capacity; nevertheless, coal still provides the largest share of electricity actually generated, which limits the immediate impact of this expansion.
- ✓ The energy transition remains unable to cover sectors that are heavily dependent on oil and gas, such as petrochemicals, aviation, maritime shipping and heavy industry. Moreover, the expansion of renewable energy is itself contingent on imports of strategic minerals such as lithium and cobalt, which reproduces a form of external dependence.
- ✓ The main hypothesis of the study is partially confirmed: clean energy has mitigated the exposure of certain sectors, foremost among them transport, but it has not replaced conventional energy security instruments in absorbing the short-term shock; rather, it has operated in complementarity with them.

Second: Recommendations

- ✓ Continuing to accelerate the electrification of road transport (private cars, buses and trucks) as the sector most responsive to energy transition instruments in reducing dependence on imported oil.
- ✓ Expanding investment in energy storage technologies in order to address the intermittency of solar and wind output, thereby raising the effective share of renewable energy in electricity generation and not only in installed capacity.
- ✓ Diversifying the supply chains of critical minerals (such as lithium, cobalt and copper) used in the manufacture of batteries and solar panels, in order to avoid substituting a new geopolitical dependence for oil dependence.

- ✓ Maintaining strategic reserves at high levels and expanding storage capacity, alongside strengthening alternative overland supply routes, as instruments that remain indispensable in the short and medium run.
- ✓ Seeking clean alternatives for sectors that are currently difficult to electrify, such as aviation, maritime shipping and the petrochemical industries, through investment in biofuels and green hydrogen.
- ✓ Directing future research towards the quantitative measurement of the elasticity of Chinese oil demand with respect to price shocks, and comparing China's response with that of other major importers such as India and the European Union.

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