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Operationalising ASEAN Joint Oil Stockpiling: From Policy Recommendations to Pilot Implementation

President Marcos' call to operationalise joint stockpiling and move from policy recommendations to implementation should now be translated into concrete ASEAN action. The immediate priority is not to establish a single ASEAN-wide reserve at once, but to launch practical, voluntary, public–private pilot projects that test how regional oil stockpiling could work in practice. A hybrid approach offers the most realistic pathway. It can respect national sovereignty, ease fiscal pressures, draw on existing infrastructure, mobilise private-sector capabilities, and strengthen regional resilience. It can also help translate APSA and CERM into practical preparedness arrangements. For ASEAN Member States, the stakes are high. Oil stockpiling is not simply about holding emergency barrels; it is about protecting economic growth, price stability, industrial competitiveness, trade connectivity, and public confidence during future crises. By acting now, ASEAN can demonstrate that regional energy co-operation is not only a statement of intent, but a practical instrument of resilience.

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STRATEGIC MESSAGE

ASEAN's oil security is increasingly inseparable from the resilience of its regional supply chains. With oil infrastructure and storage capacity unevenly distributed across the region, a disruption affecting one ASEAN Member State can have consequences well beyond its borders. Strengthening collective preparedness is therefore a shared economic and strategic interest. ASEAN needs to move towards an approach in which national resources, existing commercial infrastructure, and regional co-operation reinforce one another, ensuring that oil can be accessed and delivered where it is most needed during an emergency. Regional energy security is ultimately not just about holding sufficient stocks, but about ensuring that they can be mobilised effectively when a crisis occurs.

1. Regional Landscape and Strategic Need

ASEAN remains one of the world's most dynamic growth regions. Its economic model depends heavily on reliable energy, open sea lanes, efficient logistics, and affordable petroleum products. Oil accounts for about 42% of ASEAN final energy consumption in 2022 (ACE, 2024), and the region's oil use remains closely linked to urbanisation, industrialisation, transport demand, maritime trade, aviation, and manufacturing growth.

At the same time, ASEAN is increasingly exposed to external oil-market volatility. Many ASEAN Member States rely on imported crude oil and petroleum products. Maritime chokepoints such as the Strait of Hormuz, Bab el-Mandeb, the Suez Canal, and the Strait of Malacca are critical to the region's supply chains.

A disruption along any of these routes could affect physical supplies and increase freight costs, insurance premiums, procurement costs, and domestic fuel prices.

The Strait of Hormuz illustrates the scale of the risk. Around 20 million barrels per day of petroleum liquids passed through the Strait in 2024 (US EIA, 2025), equivalent to about one-fifth of global petroleum liquids consumption. A major disruption could rapidly affect Asian markets, including ASEAN, through higher crude prices, delayed cargoes, refinery constraints, and fuel-market volatility.

For ASEAN, the effects would be transmitted throughout the economy. Higher fuel prices would increase transport and logistics costs. Industry would face higher input costs. Governments could come under fiscal pressure from subsidies or emergency procurement. Households would experience inflation and reduced purchasing power. Export competitiveness could weaken. In severe cases, fuel shortages could affect essential services, food distribution, and public confidence.

ASEAN cannot eliminate these risks, but it can reduce their economic impact. Strategic oil stockpiling provides time to release emergency stocks, secure alternative cargoes, reroute shipments, stabilise markets, protect critical sectors, and co-ordinate a regional response. This is why moving from policy recommendations to practical implementation is now essential.

2. ASEAN's Oil Infrastructure Ecosystem

ASEAN has significant oil infrastructure, but it is unevenly distributed. Regional refining capacity is concentrated in a small number of countries. Indonesia, Thailand, Singapore, and Malaysia account for about 86% of ASEAN refining capacity (ERIA, 2026). The four largest holders of crude oil storage capacity – Singapore, Thailand, Indonesia, and Malaysia – account for about 79% of observed installed crude oil storage capacity (ERIA, 2026).

Singapore functions as a major refining, trading, and bunkering hub, with refining capacity well above domestic demand and extensive regional distribution links. Malaysia also has important refinery and terminal assets, including Melaka and Pengerang Deepwater Terminals. Thailand has substantial refining capacity, experience with stockholding obligations, and potential relevance for overland distribution in the Mekong subregion. Indonesia has substantial domestic demand and important refinery assets, including Balikpapan, Cilacap, Dumai, and Balongan. Viet Nam has the Nghi Son refinery and is developing its national petroleum reserve infrastructure. The Philippines has Bataan Refinery, which remains strategically important but does not fully meet domestic demand.

In contrast, Cambodia and Timor-Leste have no domestic refineries, while Lao PDR and Myanmar have no significant operational refining capacity. These countries are more dependent on imported petroleum products and may find it difficult to develop large national strategic reserves at reasonable cost. This uneven infrastructure landscape strengthens the case for regional co-operation.

ERIA's infrastructure assessment identifies 14 areas with potential relevance for further stockpiling co-operation, subject to feasibility, commercial negotiation, and national approval.

The areas include Pulau Muara Besar in Brunei Darussalam; Balikpapan, Cilacap, Dumai, and Balongan in Indonesia; Melaka and Pengerang in Malaysia; Bataan in the Philippines; Pulau Bukom and Jurong in Singapore; Sriracha, Map Ta Phut, and Rayong in Thailand; and Nghi Son in Viet Nam.

These locations should not be treated as predetermined stockpiling sites. Rather, they provide a practical starting point for consultations with governments, national oil companies, refinery operators, storage providers, shipping companies, financiers, insurers, and dialogue partners.

Table 1. Potential Storage and Pilot Locations for Further Due Diligence

Country or hub	Potentially relevant areas	Indicative pilot role
Brunei Darussalam	Pulau Muara Besar	Export-oriented refinery and potential producer-consumer co-operation
Indonesia	Balikpapan, Cilacap, Dumai, Balongan	National reserve strengthening
Malaysia	Melaka, Pengerang	Refining, storage, and commercial terminal partnerships
Philippines	Bataan	Domestic-security anchor; access arrangements subject to national preference
Singapore	Pulau Bukom, Jurong	Trading, storage, ticketing, and logistics hub functions
Thailand	Sriracha, Map Ta Phut, Rayong	Regional product-distribution links and overland supply options
Viet Nam	Nghi Son	Strategic crude storage and domestic supply protection

Note: These sites are screening results for consultation and feasibility work, not approved stockpiling commitments.
Source: ERIA, 2026.

3. Key Data on Oil Demand, Supply, and Stockpiling

For regional planning, the study uses an ASEAN-wide oil demand baseline of 5.0 million barrels per day, covering all 11 ASEAN Member States, including Timor-Leste. Applying a 90-day coverage period to this baseline yields an indicative benchmark of approximately 450 million barrels. This is an ERIA analytical planning reference informed by international oil security practices, including the IEA's 90-day emergency stockholding framework. However, it is not a direct application of the IEA requirement, which is calculated on the basis of net oil imports, whereas the ERIA benchmark uses total oil demand. It serves as a reference for assessing ASEAN's regional oil security preparedness, not as a binding stockholding obligation for individual ASEAN Member States.

The analysis further assumes that existing refinery and commercial inventories could contribute approximately 30 days' worth of stocks to emergency preparedness, equivalent to about 150 million barrels. This is an indicative analytical assumption and does not imply that all such inventories are automatically eligible or immediately accessible during an emergency. Their actual availability would depend on national regulations, operational requirements, commercial arrangements, and emergency release mechanisms.

The model therefore distinguishes between this existing stock layer of approximately 30 days and an additional strategic reserve layer of 60 days, equivalent to about 300 million barrels. Only the incremental 60-day reserve capacity is considered for new investment in the cost–benefit analysis. Country-specific assessments and verification mechanisms would be necessary to confirm the actual availability of existing stocks and prevent double counting.

The study compares three reserve-composition scenarios:

Scenario 1 – a national-led approach – allocates 45 days to national stockpiling, 5 days to ticket stockpiling, and 10 days to joint stockpiling.

Scenario 2 – a balanced approach – allocates 35 days to national stockpiling, 5 days to ticket stockpiling, and 20 days to joint stockpiling.

Scenario 3 – a co-operative approach – allocates 25 days to national stockpiling, 5 days to ticket stockpiling, and 30 days to joint stockpiling.

The annualised unit costs are estimated at US$10.6 per barrel per year for national stockpiling, US$7.50 for ticket stockpiling, and US$4.50 for joint stockpiling. Based on these unit costs, the weighted average annualised stockholding cost declines from US$9.33 per barrel per year in Scenario 1 to US$8.31 in Scenario 2 and US$7.29 in Scenario 3.

Table 2. Core Planning Assumptions for ASEAN Oil Stockpiling

Planning item	Assumption used in ERIA analysis	Policy meaning
ASEAN oil demand base	5.0 million barrels per day	Common denominator for regional reserve planning
Effective benchmark	90 days, equal to about 450 million barrels	Analytical reference, not a uniform national obligation
Indicative existing stock layer	30 days, equal to about 150 million barrels	Refinery and commercial stocks should be verified before being counted
Additional strategic layer	60 days, equal to about 300 million barrels	Main incremental reserve volume compared across scenarios
One reserve day	5 million barrels	Allows days of coverage to be translated into barrels and annual cost

Source: ERIA, 2026.

Under these assumptions, the results suggest that ASEAN can strengthen preparedness while lowering costs by adopting a co-operative hybrid model rather than relying mainly on national stockpiles.

4. Supply Chain Implications

Oil supply disruptions are not only a matter of the availability of barrels; they can also trigger wider supply-chain shocks. ASEAN's economies are linked through refinery output, product trade, shipping routes, ports, trucking, aviation fuel, industrial zones, agriculture, and food distribution. If one country faces a fuel shortage, the effects may spread through regional logistics networks, trade flows, and production systems.

A stockpiling strategy can help reduce these risks in four ways.

First, it can provide physical access to oil or petroleum products during emergencies, reducing the need for urgent procurement in already tight markets.

Second, it can support continuity of supply for critical sectors, including transport, logistics, electricity generation where oil is still used, emergency services, ports, airports, agriculture, and food distribution.

Third, it can reduce regional competition for scarce cargoes. Without co-ordination, ASEAN Member States may bid against one another during a crisis, raising costs for all. Co-ordinated arrangements can improve bargaining power and reduce duplication.

Fourth, it can strengthen investor confidence. Industries depend on reliable energy supplies. A credible regional stockpiling mechanism signals that ASEAN is committed to resilience as well as the energy transition.

This is especially important for ASEAN's future industrial agenda, including semiconductors, electric vehicles, critical minerals processing, petrochemicals, data centres, logistics hubs, and manufacturing supply chains. Energy-security risks can affect investment decisions. A credible stockpiling approach therefore supports both energy security and industrial competitiveness.

Table 3. Comparative Cost–Benefit Results by Reserve Composition

Scenario	Reserve composition for additional 60 days	Annualised cost	Net annual benefit	B/C ratio
1 National-led	45 national / 5 ticket / 10 joint	US$2.80 billion	US$5.80 billion	3.07
2 Balanced	35 national / 5 ticket / 20 joint	US$2.49 billion	US$6.11 billion	3.45
3 Co-operative	25 national / 5 ticket / 30 joint	US$2.19 billion	US$6.41 billion	3.93

B/C = benefit–cost

Note: The annual benefit is held constant at US$8.6 billion under the reference disruption scenario. Differences in net benefit and the benefit–cost ratio reflect the lower cost of a more co-operative reserve composition.

Source: ERIA, 2026.

5. The Cost–Benefit Case for Action

The economic case for ASEAN oil stockpiling is strong under the reference disruption scenario. The model estimates avoided economic losses using ASEAN GDP of US$4.3 trillion, an assumed GDP shock of 0.4% reflecting a growth downgrade of about 0.4 percentage points (ADB, 2026), and a mitigation effect of 50%. The assumed shock implies an economic loss of US$17.2 billion in the affected year, half of which is assumed to be avoided. This produces an estimated annual benefit of US$8.6 billion, equivalent to US$28.67 per barrel per year across the additional 300 million barrels of strategic reserves. This estimate is conditional on the reference disruption occurring, and it does not assume recurring disruptions or assign an annual probability to their occurrence.

Compared with this estimated benefit, the annualised costs are significantly lower across all three scenarios. The national-led approach has an annualised cost of US$9.33 per barrel per year, producing a net economic value of US$19.34 per barrel per year. The balanced approach has a cost of US$8.31 and a net value of US$20.36. The co-operative approach has the lowest cost, at US$7.29, and the highest net value, at US$21.38.

The co-operative approach therefore reduces annualised stockholding costs by about 21.9% compared with the national-led approach and increases net economic value by around 11%.

The policy conclusion is not that ASEAN should abandon national stockpiles. National reserves remain essential because governments need to retain sovereign control during emergencies. However, relying too heavily on national stockpiling could be fiscally burdensome and inefficient, especially for countries with limited infrastructure. A hybrid model offers a better balance: national control where necessary, regional co-operation where efficient, and private-sector participation where commercially realistic.

6. Potential Storage Locations and Pilot Opportunities

ASEAN should begin with a small number of voluntary pilot projects involving interested and ready member states. These pilots should test practical operational questions: Where is the stock located? Who owns it? Who has access rights? How quickly can it be released? Can it be delivered across borders? How is it priced and replenished? How can stock data be verified without compromising commercial confidentiality?

Potential host or hub roles could be explored in countries with established refinery, storage, port, and distribution capacity, including Singapore, Malaysia, Thailand, Indonesia, Viet Nam, Brunei, and the Philippines, depending on the structure of each arrangement. For example, Singapore has strong commercial and distribution capabilities, although any pilot would require close private-sector engagement. Malaysia's Pengerang ecosystem may offer hub potential. Thailand's refining system and institutional readiness may support regional distribution, including to the Mekong subregion. Indonesia may offer selective hosting opportunities in Dumai and Balongan while strengthening its own product security. Viet Nam and the Philippines may have a strong interest in early-access arrangements because of their reliance on imported crude oil or petroleum products.

Pilot projects should not be presented as completed reserves. They should be framed as implementation pilots to test commercial, legal, technical, financial, and logistical feasibility. This distinction is important for credibility.

7. Recommended Policy Direction

ASEAN should consider a voluntary hybrid approach to oil stockpiling co-operation, guided by the following priorities.

First, launch pilot projects through public–private partnerships. Governments should define the public objective, emergency-access principles, regulatory treatment, and sovereign release authority. Private-sector actors should help design feasible storage, financing, rotation, shipping, insurance, and delivery arrangements.

Second, prioritise joint stockpiling and ticketing arrangements where they reduce costs and improve access. Joint stockpiling with producer countries or commercial partners can reduce upfront inventory costs, while ticketing can provide contractual access without requiring each country to build full domestic infrastructure.

Third, develop legal and contractual templates covering emergency access, ownership, custody, stock rotation, release rights, pricing, replenishment, customs, taxation, liability, confidentiality, and dispute resolution.

Fourth, establish secure stock-data and monitoring systems. ASEAN does not need to publish sensitive stock data, but participating authorities must be able to verify that stocks exist, are not double-counted, and can be delivered.

Fifth, align the initiative with APSA and CERM. The renewed APSA, once in force, will provide the regional framework for petroleum-security co-operation, with CERM setting out the co-ordinated emergency-response measures. The proposed oil stockpiling pilots could complement this framework and help establish practical arrangements for regional preparedness and response.

Sixth, mobilise financing beyond public budgets. Options could include public–private partnerships, shared participant financing, ticketing fees, producer-owned stocks, development finance, export credit, guarantees, credit enhancement, and reserve-service contracts.

Seventh, strengthen co-operation with oil-producing countries and dialogue partners. Producer–consumer stockpiling arrangements can benefit both sides: ASEAN gains access to emergency supplies, while producers strengthen their market presence close to major demand centres.

Conclusion

ASEAN's growing exposure to oil supply disruptions underscores the need to strengthen regional energy security and economic resilience. ERIA's analysis demonstrates that a voluntary hybrid stockpiling approach, combining national reserves, ticketing, and joint stockpiling, can improve emergency preparedness while reducing costs through regional co-operation and the use of existing infrastructure. This approach preserves national sovereignty while enabling greater private-sector participation to enhance financial and operational efficiency.

The immediate priority is to move from policy recommendations to practical implementation. ASEAN should initiate a small number of voluntary public–private pilot projects involving interested and ready ASEAN Member States. These pilots should test the technical, commercial, financial, legal, and operational feasibility of different stockpiling arrangements, particularly with regard to emergency access, stock release, cross-border delivery, and verification. The lessons learned can inform future expansion and support the objectives of APSA and CERM.

By adopting a gradual, flexible, and implementation-oriented approach, ASEAN can translate regional co-operation into tangible energy security benefits, strengthen supply chain resilience, and better protect economic growth and industrial competitiveness against future oil supply disruptions.

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Sentral Senayan II, 5th, 6th, 15th floors
Jalan Asia Afrika No. 8
Senayan, Central Jakarta 10270, Indonesia
Tel: (62-21) 57974460
E-mail: contactus@eria.org