TAKSHASHILA INSTITUTION

Takshashila Discussion Document

An Indian Approach Towards Strategic Petroleum Reserves

Discussion Document 2020-02
V2 March 17, 2020

Anupam Manur | Rohan Seth | Narayan Ramachandran

This paper can be cited as "Anupam Manur, Rohan Seth, Narayan Ramachandran, *India's Strategic Petroleum Reserves*, Takshashila Discussion Document, 2020-02."

Executive Summary

Energy security is a strategic imperative for India, given its strong growth aspirations. As the country does not have self-sustaining oil production, it is almost entirely dependent on imports for its energy requirements. In such a scenario, having an insurance policy, such as a strategic petroleum reserve (SPR), is in India's national interest. SPR refers to holding oil inventories or stockpiles to help maintain national security during an energy crisis.

To ensure that India's SPR provides oil security and mitigates risk, we propose the following policy recommendations:

1. For mitigating costs and improving benefits, the Union Government should have formal rules and processes to ensure oil remains available in times of emergency. This requires formalising the mobilising processes of the SPR and defining the authority which can command a withdrawal of the SPR. This also involves a mobilisation plan for oil held by petroleum refineries in India.

2. Use a price benchmark for filling up the SPR. For the government owned stocks, Indian Strategic Petroleum Reserves Limited (ISPRL) can consider filling up the SPR each time the global price of crude oil falls below $45.

3. In cases where private players are holding underground reserves, the minimum levels of oil meant for emergency purposes should be well defined, and the Union government should have the first right of refusal of sale in emergencies.

4. To achieve security and mitigate risk, India must diversify its strategic petroleum reserve holdings based on geographical location (within India and elsewhere), storage location (underground and over ground), and product type (refined and crude).

5. Finally, as the world's largest democracy, India must set the standard for transparency in case of the SPR by reporting on the plan, execution, and data related to our reserves.

Introduction

Energy security is a strategic imperative for India, given its strong growth aspirations. As the country does not have self-sustaining oil production, it needs to import a significant proportion of its oil needs[1]. India consumed ~4.34 million barrels/day in 2017[2], of which nearly all of it was imported. India's oil demand is projected to surpass that of China's this year, second only to the US[3]. Given the dependence on imports for its energy requirements, India must have strategic contingency plans. Rising oil prices, tariffs and trade barriers, geopolitical dynamics and sanctions make the oil economy unpredictable. Therefore, it is important to have enough oil reserves to meet domestic demand in the event of a serious disruption to oil supply.

The structure of the oil market and the global political order do not ensure cheap and uninterrupted oil supply to the rest of the world. Presently, exports from OPEC countries represent 60% of all oil traded internationally[4]. Historical political tensions in the region translate into irregular supply and volatile prices. For instance, the drone strikes on 14th September 2019 on Saudi Arabian Aramco's facilities caused major damage in Abqaiq and Khurais, cutting Saudi oil output temporarily by 5.7 million barrels per day[5], an amount equal to around five per cent of global production. There was an immediate impact on oil prices which spiked nearly 10% on that day[6]. Luckily, the shock to the global supply chain was only temporary as Saudi Arabia released oil from its reserves and avoided a more persistent price surge.

India had to contend with the US placing oil sanctions on Iran recently[7]. While India was not dependent on Iranian oil, it was receiving the barrels at a (negotiated) price lower than the prevailing market price. Any increase in imported oil price has an implication on India's macroeconomy. An increase of $10/barrel in crude oil prices could raise the rate of inflation by ten basis points (0.1%)[8] and could, in turn, have significant spillover effects on the rest of the economy. Further, every dollar increase in the price of oil increases India's import bill by ₹10,700 crore on an annualised basis[9].

Apart from rising price levels, an increase in global crude oil price can hurt Indian economy's balance of payments. In June 2018, increase in global crude oil prices led to a current account deficit widening by $16.60 billion to a five-year high[10]. While small changes can be accommodated by normal mechanisms, a severe supply shortage and a corresponding severe price increase can eat into India's

forex reserves. Rises in oil prices can also have a negative impact on the Indian budget. A $10/barrel increase in oil prices also increases annual subsidy expenditure by the Union Government on kerosene and cooking gas by ₹18,400 crores, as of 2018[11].

Oil Security and Strategic Petroleum Reserves

Today, the global oil market remains vulnerable to a wide range of risk factors, including natural disasters, major technical accidents, and geopolitical tensions and yet, the economic dependence on oil has remained high. This highlights the need for strategic thinking on oil reserves, risk management, and mitigation. Initial thought on this was triggered by the oil crisis in 1973-74 when the members of the Organisation of Arab Petroleum Exporting Countries proclaimed an oil embargo targeted at nations perceived as supporting Israel during the Yom Kippur War. The US started work on its petroleum reserves in 1975 to ensure oil security. Other countries followed suit such as Israel, Australia and Germany.

Countries can maintain oil stocks in the following ways[12]:

1. Government Stocks - Owned directly by the State and financed through the budget. Held exclusively for emergency purposes.

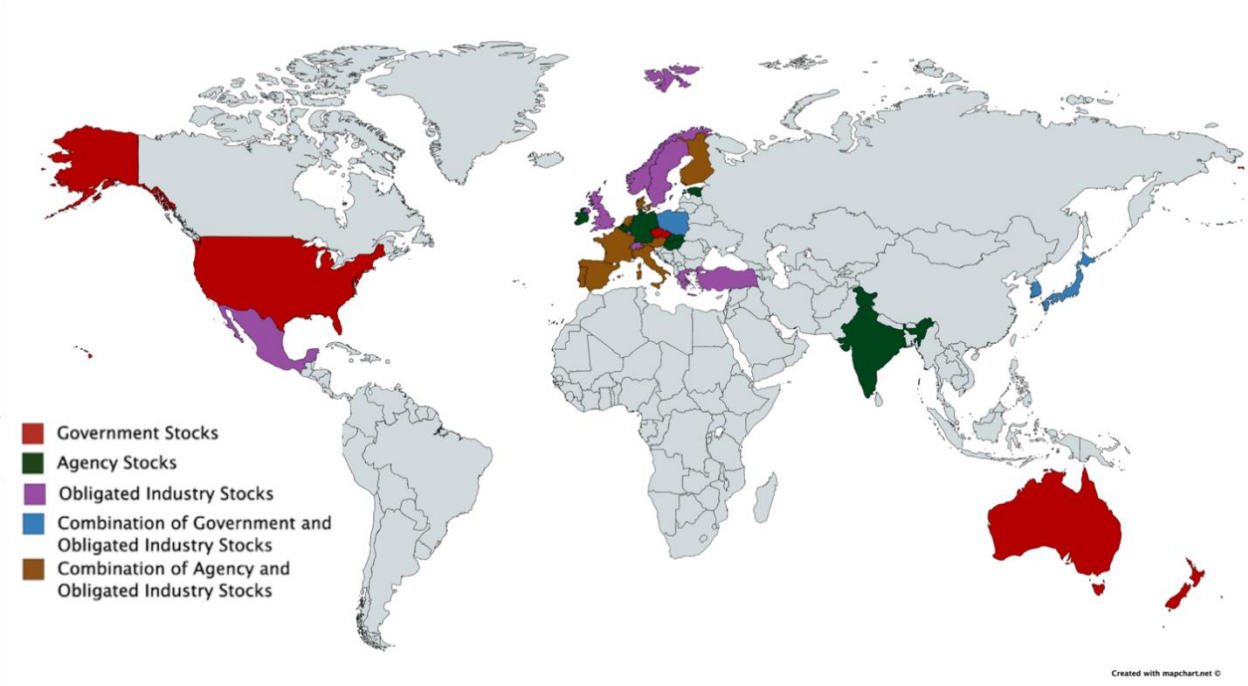
2. Agency stocks - Held by a separate agency, either on behalf of the government or industry. Countries can legislate for an agency to be responsible for building and maintaining reserves with a specific arrangement on emergency drawdowns.

3. Obligated industry stocks - Governments can mandate oil companies operating in the country to hold minimum stocks of oil for use in emergency purposes. Companies can use stocks for commercial purposes as long as they meet the mandatory minimums.

The exact nature of stockholding varies from country to country, depending on their specific circumstances. Countries can either opt for a single strategy or a combination of these measures. For example:

- Government stocks: Australia, Czech Republic, New Zealand, US
- Agency stocks: Belgium, Estonia, Germany, Hungary, Ireland, Slovak Republic, India
- Combination of government and obligated industry stocks: Japan, Korea, Poland
- Obligated industry stocks: Greece, Luxembourg, Mexico, Norway, Sweden, Switzerland, Turkey, United Kingdom
- Combination of Agency and obligated industry stocks: Austria, Denmark, Finland, France, Italy, the Netherlands, Portugal, Spain

Figure 1: Showing the SPR strategies adopted by different countries



Countries can also opt to store their strategic reserves in different ways, depending on their geography and other factors. If the geography permits, many countries store oil deep underground in salt caverns, which is deemed to be one of the safest storage facilities. While the US and India have opted mainly for underground caverns, Japan and China prefer to stock oil in large overground tanks. The UK has neither and prefers to have obligated industry stocks. Finally, countries can also have their SPR stored outside of their national boundaries in other countries, provided there is a bilateral agreement between governments which guarantees access to these stocks during an emergency/crisis.

The most important multilateral global player in oil security is the International Energy Agency (IEA), which coordinates global energy security. The IEA was established in 1974 after the oil shock to work with governments and industry to shape a secure and sustainable energy future for all. In the realm of oil security, the IEA coordinates the actions of its member countries in times of emergencies.

The IEA has thirty member countries and eight associate members. To become a member of the IEA, a country must be a member of the Organisation for Economic Co-operation and Development (OECD) and be able to demonstrate that it has crude oil and/or product reserves equivalent to 90 days of the previous year's net imports, to which the government has immediate access (even if it does not own them directly) and could be used to address disruptions to global oil supply. A member country must also have in place a demand restraint programme to reduce national oil consumption by up to 10%. Further, a member country must have legislations in place to mobilise the SPR in times of emergency and contribute to IEA's collective action.

Over the past 10 years or so, IEA has opened up a new class of members called Associate Members to large energy consuming economies. Currently, the association countries are Brazil, China, India, Indonesia, Morocco, Singapore, South Africa and Thailand.

"The Agency's collective response system is designed to mitigate the negative economic impacts of sudden oil supply shortages by providing additional oil to the global market. The system focuses on alleviating short-term oil supply disruptions either by increasing supply (e.g. releasing emergency stocks) and reducing demand (e.g. implementing demand restraint measures)"[13].

In times of severe disruptions, the IEA coordinates a collective action among member countries, which includes the simultaneous release of emergency reserves into the market. Since the creation of the IEA, there have been three collective actions - in 1991 during the Gulf War; after Hurricanes Katrina and Rita damaged offshore oil rigs, pipelines and oil refineries in the Gulf of Mexico in 2005; and, in 2011 as a response to the supply disruption caused by the Libyan civil war.

Table 1: Showing the oil stocks of IEA member countries, measured in days of net oil imports (IEA 2020)

Country	**Total**	**Held by**		**Of which, held abroad**	
		Industry	Public	Industry	Public
Canada	net exporter	0	0	0	0
US	697	419	278	0	0
Japan	189	77	112	0	0
Denmark	997	672	325	2	29
France	106	28	79	0	3
Germany	124	32	92	4	4
Netherlands	431	259	172	14	81
Norway	net exporter	0	0	0	0
Turkey	95	95	0	0	0
United Kingdom	275	275	0	91	0

Notes
1. Days of net import cover is the result of emergency reserves : daily net imports.
2. Net exporters of oil are exempted from holding mandatory stocks.
3. Only a sample selection of the IEA members' stocks is shown here. The full list, updated each month, is available on the IEA website.
4. In accordance with the Agreement on an International Energy Programme (IEP), each IEA country has an obligation to hold emergency oil stocks equivalent to at least 90 days of net oil imports (though they can hold more as reserves).

The Current Scenario: India's Oil Reserves

In 2003-04, India decided to build a Strategic Petroleum Reserve (SPR) in the face of rising demand, stagnating domestic production, rising international oil prices and dependence on the unstable West Asian region for imports. The initial aim was to create reserves of 15 days' worth of oil imports. In June 2004, Indian Strategic Petroleum Reserves Limited (ISPRL), a special purpose vehicle, was founded with an equity infusion of Rs. 1 crore under Indian Oil Corporation. This was later transferred to the Oil Industry Development Board (OIDB), thus placing the SPR directly under the control of the Union Government.

The OIDB initially invested Rs. 2400 crore to start operations in the three sites that were chosen for underground oil reserves in caverns[14]. These sites were in Mangalore, Vishakhapatnam, and Padur. These three sites together accounted for 5.33 million tonnes or 39.1 million barrels of capacity. This is roughly equivalent to 9.5 to 10 days of import cover[15].

Currently, ISPRL does not release data on how much of the capacity built is being used. As of February 2020, there is no indication to suggest that the entire reserve capacity in the underground caverns is filled with oil.

According to some estimates, Visakhapatnam has near full capacity utilisation, while the other two sites are only partially filled. Estimates suggest that, of the ten days import cover capacity, the available oil in the underground reserves amounts to 4.5 to 5 days of import cover, as of November 2019.

Under phase II of the SPR plan, cabinet approved the establishment of an additional 6.5 MMT of strategic petroleum reserve which will be able to provide an extra 12 days of supply. For this, two locations - Chandikhol in Odisha and Padur in Karnataka - have been selected with an estimated investment outlay of Rs.11,000 Crores (US$ 1.6 Billion)[16].

Work on two more facilities at Bikaner in Rajasthan and Rajkot in Gujarat will be initiated soon. When complete, these would hold enough oil to meet domestic requirements for over a month.

Apart from the underground oil reserves, Indian refiners maintain 65 days of non-strategic, commercial crude storage. The exact location of the refineries, the distribution of the holdings between different refineries and the exact arrangement with the Petroleum Ministry remain opaque.

The ISPRL has often claimed that India has 87 days' worth of reserves, which is close to the IEA mandated reserves of 90 days. The breakdown of the alleged 87 days are as follows:

Phase I capacity - 10 days, Phase II capacity - 12 days, Refineries holdings - 65 days.

There are a few issues to be highlighted here. The actual availability of emergency reserves, at the end of 2019, is much lower than this. Phase II is planned capacity and realisation will take at least 10 to 15 years.

While the IEA counts crude storage by refineries as part of SPR holdings, it specifies that the holdings should be government-mandated industry stocks, which can be drawn upon at any time. In India, the arrangement between the oil refineries and the Union or State governments is not specified well, though most of the refineries that hold stock are publicly owned companies. However, to have operational clarity, the Ministry of Petroleum and Natural Gas must specify the minimum stock that refineries hold as part of the SPR and the stock they hold for commercial purposes and clarify this in a contract. The contract should also state a mobilisation plan in case of an emergency.

Though the government has recognised the need to build and maintain SPR since 2004, progress on it has been inconsistent and slow. Fifteen years after the initial plan, India has oil import cover for only five days in the underground caverns. One of the major challenges to this has been the cost. Initial phases of building reserves require investments in the range of $1.5 billion and an equivalent amount is required when further expansion is finalised[17].

Due to the high investment cost, India is carrying out Phase II of building the SPR entirely through Public-Private partnership (PPP) models. According to the press release by the Ministry of Petroleum & Natural Gas, "The Investment model seeks partnership through DBFOT (Design, Build, Finance, Operate and Transfer) and offers prospective Concessionaire the rights on the crude oil inventory as per an agreed term where the Union Government will have the first right of refusal on the inventory in times of exigencies. As a key takeaway, the Concessionaire will have access to the large Indian refining market and multiple other revenue streams."

A typical PPP model for the new SPR sites could take such a form: the government will identify the location and provide the land for construction of the new SPR holding site. For instance, the government will call for tenders from a consortium of companies that could include an oil company, a construction company and a financing company. The bidders can decide the precise equity share of the consortium. The winning bidder will win the right to trade the oil for a period of 70 years, of which the initial three to four years will be required for filling the salt caverns with oil. For the next 63 years, the companies can profit from the reserves through arbitrage opportunities - fill the oil when global prices are cheap and then release it to the market when the prices go up. This mechanism can be profitable for operating companies. It will also help in providing some degree of price

stability in the domestic market, as companies would be incentivised to release the petroleum when the global price of oil rises.

The entire mechanism will be conditional upon the companies maintaining a minimum level of oil reserves for contingency purposes, and the government will have the first right of refusal on the inventory.

The newly sanctioned SPR facility in Mangalore is being operated under the same model. Abu Dhabi National Oil Co. is providing the facility in Mangalore with 5.86 million barrels at its own cost[18]. As an incentive for storing crude oil at its own expense, the Agreement allows ADNOC to sell part of the crude oil to Indian refineries during 'normal times'[19]. The PPP model seems to be an attractive means of engagement for the ISPRL as well as other parties. The US has also expressed interest to collaborate with India on its crude oil reserve program as part of a strategic energy partnership that covers sectors such as oil and gas, power, renewable energy, and coal[20].

Table 2: Overview of India's SPR Underground Reserves (Phase-I)

Locations	**Capacity**	**Funding**
Vishakhapatnam	9.77 million barrels	Government
Mangalore	11 million barrels	Government
Padur	18.37 million barrels	ADNOC: UAE

Apart from expanding current reserves, India is also looking at ways to use existing resources more efficiently. This is especially true for sectors that require mass consumption of crude oil. The featured example of this is India leapfrogging from Bharat IV emission norms to Bharat VI norms (skipping stage V entirely, keeping in mind the air pollution challenges). These norms go into effect from April 2020 and are the most advanced standard for emissions. Mass adoption of these norms, mandated by the Supreme Court, is also likely to increase the prices of vehicles, especially diesel vehicles and economic two-wheelers[21].

Policy Recommendations

While it is commendable that India has begun the process of building petroleum reserves, the progress has often been slow and shrouded in secrecy. In this section, we propose policy recommendations to make India's strategic petroleum reserve more transparent and accountable. Further, we elaborate on the required processes to ensure smooth functioning of private partnerships and stress on the need for an action plan to mobilise oil during times of emergency. Finally, to achieve security and mitigate risk, we propose ways to diversify India's reserve oil holdings based on geographical location, storage location, and product type.

1. Introduce transparency in the SPR Process

The procedures, protocols and facts about the Indian SPR storage require more transparency to have greater expert, public and parliamentary discourse. Strategic Petroleum Reserves should have a similar level of data and information dissemination as foreign exchange reserves data disseminated by the Reserve Bank of India. Inviting scholarship and data scrutiny strengthens the republic more than keeping it shrouded in secrecy under the excuse of national security. The following areas in SPR require greater transparency:

ISPRL should be tasked with formulating and disseminating an overall long-term plan for building and maintaining SPR. The body would also be accountable to provide annual updates on execution against that plan.

Having access to a breakdown of refineries that are counted under SPR: The majority of India's SPR (65 days out of 87) is claimed to be stored in refineries. India has a vast refinery ecosystem, and the IEA supports the practice of counting crude oil storage by refineries as part of the SPR holdings[22]. However, while the Government does claim these reserves, it does not give an overview or a breakdown of refineries which hold the reserves.

In public interest, the Ministry of Petroleum and Natural Gas should release a breakdown of what refineries are holding the reserves, whether it is held in crude or in refined form, how much of it is being held in each refinery and the number of days it is likely to take to mobilise in case of an emergency.

Having updated records of how the SPR is being maintained: The US is the benchmark for maintaining transparency around how the SPR is managed. Websites by the Department of Energy provides detailed information about their

SPR holdings, including how many people are employed and when and how exchanges and sales of SPR can take place[23]. Having a public record of when the SPR stock is being augmented, the current levels of SPR and exchanges would be an excellent first step.

2. Add to the SPR when crude oil falls below $45 per barrel

Phase-I of the SPR involves underground reserves being filled up by ISPRL and can be solely delineated as emergency stocks and prevented from being used for commercial purposes. ISPRL should consider filling up the rest of the underground caverns each time the price of Brent Crude falls below $45 per barrel. For instance, ISPRL should be looking to add to the SPR in March 2020, when global crude oil prices fell sharply as fears of a global demand slump due to the global Novel Corona virus gripped markets.

Even though the Indian basket of crude represents the weighted average of Oman and Dubai (sour) crude and Brent crude (sweet), using the price of Brent crude as a benchmark has its advantages. The market for Brent crude is more liquid and better traded, as it is used to price about two thirds of the world's internationally traded crude oil.

3. Adopt a Public-Private Partnership model for SPR

The newer Phase-II sites being built under a PPP basis can have two components – a minimum amount of SPR that is meant to be used only under emergency provisions and a second part that private companies can use to take advantage of price arbitrage.

To ensure smooth functioning of a private partnership for SPR, the first step should be to decide on a minimum amount of reserves that should not be withdrawn unless in cases of severe supply-side shocks as defined by the IEA or for use in specific circumstances that are set by the Indian Parliament. The aforementioned minimum amount should be in the range of 25%-50% of the capacity of the reserve. Moreover, the Indian Government should have the first right of refusal on the sale of this component.

Since the PPP model allows private players to profit from price arbitrage, they will be naturally incentivised to fill the caverns when the price is low and sell parts of it when the price is high. The only form of government intervention required here is in defining the minimum level of holdings that cannot be used for commercial

purposes. In such a scenario, the ISPRL can move into a regulatory function that is accountable for India's overall SPR strategy.

As part of the PPP models, it is worth considering the opportunity that India could become a base for storing SPR for other countries. While allowing private companies to release oil to the domestic markets to take advantage of the price difference, they could also be allowed to ship oil to foreign countries. This could prove to be a further incentive for private players to maintain oil reserves in India and the Indian government can mandate that it will have the first right of refusal in an emergency. For instance, ADNOC could use a part of the SPR that it is building to sell oil to South-East Asian countries.

For the part of the reserves which are deemed to be used only for emergency purposes, India needs a clear set of laws on what constitutes an emergency, which agency can declare such an emergency and the process through which the SPR can be withdrawn.

For an example of defining SPR use case, India can look at the US, which has very clear guidelines on the conditions under which the SPR can be mobilised and sold. These are defined under the Energy Policy and Conservation Act of 2011 [24]. Importantly, the Act also lays out provisions for the government bodies who can authorise an SPR drawdown, namely, the President and the Secretary of Energy. Further, to establish transparency, the Act also goes on to lay provisions for when the secretary should submit reports and advance notices to Congress.

The Act states that for drawdown or sale of petroleum to be made, the President has to acknowledge a severe energy supply interruption or be obligated to the international energy program. A severe energy supply interruption can be observed on the following grounds[24]:

> An emergency situation exists and there is a significant reduction in supply which is of significant scope and duration;
>
> A severe increase in the price of petroleum products has resulted from such emergency situation;
>
> Such price increase is likely to cause a major adverse impact on the national economy.

In such cases, the Secretary of Energy and the President of the US is allowed to sell petroleum products from the withdrawn SPR to the highest bidder. The

President can also sell the withdrawn crude oil to an entity outside the US for refining and delivering the refined petroleum product to the US.

In addition to the US model, India could also consider some of the guidelines laid down by the International Energy Agency. The IEA states that, in accordance with the International Energy Programme (IEP), member countries should store 90 days' worth of oil to mitigate severe oil supply disruption. This includes natural disasters, major technical accidents, and geopolitical tensions[25].

The IEA explicitly states that SPR is not a tool for price interventions or long-term supply management. In addition, the IEA also includes as recommendations, other policy levers that can be tuned to mitigate supply-side disruptions. These include measures to restrain demand; substituting types of fuel to manage demand; surge production of spare crude oil; and relaxing fuel specifications.

In India, by design, the private players will release oil when prices rise and bring about price stability. It would be unwise for the Union government to attempt to achieve stable oil prices at all times either by releasing oil from its own stocks or influencing the private players to release stocks. Using government oil stocks to prevent price rise and drops would mute important price signals to consumers and producers. These natural price signals could help the market to correct the underlying imbalances. Further, using SPR to mitigate price volatility will create a precedent and bring about immense political pressure to manage high petrol prices by tapping on the SPR, especially during election years.

4. Formalise the Mobilisation process for SPR

India should have clearer laws and established processes regarding the following aspects:

- Which agency has the authority to mobilise SPR.
- Whether those decisions should be subject to a veto (and by whom).
- What rights the refineries may have when being subject to mandated oil mobilisation.

Given the time and expense of mobilisation of reserves, the Executive must be accountable to Parliament for such an authorisation. A legal framework for this accountability should be established by legislation.

Of the eighty-seven days of planned capacity, the majority of reserves (65 days' worth) are held by refineries. Reserves held by refineries are likely to be routinely used for commercial purposes. While it is not unusual to count these reserves as SPR, there must be more transparent laws on how these reserves are going to be mobilised during a time of crisis.

As things stand, there is no publicly available information on the mechanism through which SPR can be mobilised. In a time of crisis, it is unclear which agency has the authority to mobilise reserves and which ministry has the final say. This potentially presents a problem of conflicting mandates which may cause redundancies in time-sensitive situations.

5. Diversify the SPR Strategy

To mitigate risk better, India's SPR portfolio should be diversified based on geographical location, storage location (underground/overground), and product type.

- Geographic Location: The SPR can be located either within India or elsewhere
- Storage Location: SPR can either be above ground in refineries and storage tanks or underground in caverns
- Product Type: SPR can be held either in crude form or refined form.

To mitigate costs and manage risks, an ideal SPR strategy would be a combination of the different types discussed here. For instance, India already has refined petroleum in refineries in India and crude oil in underground caverns in India.

India should diversify its SPR portfolio by getting into arrangements with other countries, such that it can purchase and hold oil stocks abroad. For example, consider a scenario where Abu Dhabi is contracted by India to hold a certain amount of oil as part of India's SPR stocks, which is subject to be mobilised and released based on the requirements stated by the Union Government. Similarly, India could get into an agreement with the United Arab Emirates (Fujairah, for instance) for bunkering and oil storage.

Further, India should look to operationalise, modernise, and add to the oil tanking facilities at Trincomalee in Sri Lanka. Trincomalee is a strategically located port town on the east coast of Sri Lanka and hosts 99 storage tanks from the world-

war era. Each of the 99 tanks can hold 12,250 kilolitres or around 7.7 million barrels of oil.

India should also look at getting into a strategic partnership with Oman for oil storage. Oman is currently constructing an oil storage facility in Ras Markaz, with a storage capacity of 200 million barrels of crude oil, about 70 kilometres away from DUQM refinery. Oman is reaching out to Asian economies for storing oil on their behalf. In the hypothetical case of the straits of Hormuz being blocked, the storage facility in Oman could be of strategic importance for India.

Arrangements such as those mentioned above could potentially save India the cost of building more underground reserves. However, given that they may be subject to some of the geopolitical risks that global oil supply chains are, it is only advisable to use such a tactic as part of India's overall strategy. Ideally, out of the mandated 90 days, around 10 days' worth of storage should be held abroad.

The storage abroad should be in different countries which would ideally hedge against different supply chain shocks. A diversification strategy for India could entail commissioning storage facilities in oil-producing countries such as Abu Dhabi, Oman, or UAE to the west; jointly operating storage facilities in Sri Lanka to the south and an agreement with countries known to have abundant stocks as part of their SPR, such as Japan or South Korea to the east. Further, half of the storage abroad can be crude while the other half is refined. Pursuing this could lead to meaningful cost savings and greater energy security.

Conclusion

Energy is a vital component of India's aspiration to build an inclusive and prosperous society. India is not endowed with crude oil resources, and even as it diversifies its economy away from crude oil and reduces the growth of oil demand, it would do well to secure its supply in times of emergency. This "insurance" called the SPR has a cost – in terms of capital expenditure, maintenance cost, mark-to-market impacts and mobilisation related costs. For a completely import-dependent country like India, the cost-benefit of this is in favour of the SPR. To ensure oil security and mitigate possible risks, India should implement the following policy recommendations:

1. The Union Government should have formal rules and processes set in place for ensuring that oil is available for use in times of emergency. This requires formalising the mobilisation processes of SPR and defining the authority which can command a withdrawal of the SPR. This also involves a mobilisation plan for oil held by petroleum refineries in India.

2. Use a price benchmark for filling up the SPR. For the government owned stocks, ISPRL can consider filling up the SPR each time the global price of crude oil falls below $45.

3. In cases where private players are holding underground reserves, the mandatory minimum levels of oil meant for emergency purposes should be well defined, and the Union government should have the first right of refusal of sale in emergencies.

4. Further, India must diversify its SPR holdings based on geographical location (within India and elsewhere), storage location (underground and over ground), and product type (refined and crude).

5. Finally, as the world's largest democracy, India must set the standard for transparency in the case of SPR by reporting on the plan, execution and data related to our reserves.

A transparent, prepared India in terms of energy security can set about delivering to the aspirations of its citizens.

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