KPMG

NATIONAL PRODUCTIVITY COUNCIL

Leveraging defence ship building to catalyse India's shipbuilding industry

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Foreword - NPC

The National Productivity Council (NPC), an autonomous body under the Ministry of Commerce and Industry, has been pioneering efforts to improve the productivity and efficiency of India's manufacturing sector since 1958. NPC has endeavoured to contribute to the socioeconomic development of the country by enhancing productivity and making Indian industry globally competitive across all sectors. One of the key objectives of NPC is to act as a catalyst in institution building and developing platforms for collaborative networking. This plays a vital role in strengthening the productivity movement and provide evidence-based policy support and advice while tracking emerging trends. In keeping with this objective, NPC, in partnership with KPMG in India, undertook an in-depth analysis of India's shipbuilding industry with an aim to identify means to strengthen it and make it globally competitive. Shipbuilding is a strategic industry given its potential for employment generation across so many disciplines/trades and for stimulating MSMEs which form a large part of the value chain. The industry also plays a significant role in boosting self-reliance in terms of both naval and commercial shipping.

Harnessing on the potential of its rich maritime history, the Indian shipbuilding industry is striving hard to realise its true capacity. While India is becoming largely self-reliant in terms of warship building, Indian shipbuilding will need a comprehensive overhaul to become an influential player in the global market. The industry's current state is largely on account of lack of commercial shipbuilding opportunities, over-dependence on defence shipbuilding coupled with issues of insufficient capability, productivity and efficiency. The industry can overcome these obstacles and gain more efficiency, productivity and become globally competitive if it is afforded opportunities to `sharpen its axe' and accrue both experience and expertise in a collective manner. It has also emerged that in addition to local defence shipbuilding demand, there is a huge potential for the Indian commercial shipping industry to create local demand. This can be used as an opportunity to progressively improve productivity to compete on a global scale. Leveraging the successful defence shipbuilding ecosystem that has already been created by the Ministry of Defence (MoD)/ Indian Navy/DPSU shipyards, to cover all shipbuilding holistically can be helpful. Further, case studies in leading shipbuilding nations, both in the West and Asia, suggest that consolidation of shipbuilding resources and efforts within a nation can enable shipyards to scale productivity while competing globally. Therefore, recommendations have been enumerated for setting up a suitably empowered national level body specifically for the purpose of framing policies that will enable productivity of the shipbuilding industry, in addition to promoting and regulating its growth. This will pave the way for the industry to become globally competitive.

Further to above, it is important to highlight that India's logistics sector is highly defragmented and the government aims is to reduce the logistics cost from the present 14 per cent of GDP to less than 10 per cent by 2022. Therefore, a key focus will be to optimise the current modal mix and facilitate a long-haul shift from road to rail, coastal shipping, inland waterways etc. Towards this objective, the commissioning of a robust commercial shipping infrastructure for inland and maritime movement of goods would be of paramount importance.

Shri Arun Kumar Jha, IES
Director General,
National Productivity Council

Foreword - KPMG

As history has often shown, the maritime influence of a nation built on a strong indigenous shipbuilding industry is a precursor as well as a catalyst for its sustained economic growth. With a 7516-km long coastline,[1] several offshore islands, a large Exclusive Economic Zone (EEZ), a sea-borne trade worth around USD750 billion and a wide range of other strategic maritime interests, India's need for a strong presence in the maritime domain both in terms of defence and commercial shipping is paramount. A vibrant shipbuilding industry is, therefore, vital to exert and sustain this maritime influence.

The shipbuilding industry has an extraordinary potential in terms of influencing trade and economy, employment generation, boosting the ancillary sector and MSMEs in its supply chain, national security and technology development. However, Inspite of these advantages, shipbuilding in India has remained well below its full potential. On the other hand, defence shipbuilding has grown exponentially over the last 60 years to achieve self-reliance. Apart from structural issues, the global downturn and low demand in commercial shipbuilding, along with a consequent overdependence on defence shipbuilding inhibits any measures taken to address other issues.

This knowledge paper highlights the current shipbuilding landscape in India and endeavours to identify and address the gaps. The paper examines the commercial shipping environment in India at a macro-level and brings out the scope for creating shipbuilding demand locally by making a conscious effort to increase the share of Indian owned Indian built ships in India's own cargo movement. Drawing from case studies and examples across many shipbuilding powerhouse nations, the benefits of consolidation of the industry in terms of efforts, capabilities and resources are highlighted. Further, the paper brings out measures including critical policy interventions in both shipping and shipbuilding that have been recommended to strengthen the industry by addressing the demand as well as the supply side.

In keeping with the nation's goal of achieving self-reliance, KPMG in India is committed to contribute towards strengthening this vital industry and help achieve self-reliance in defence as well as commercial shipbuilding.

Abhishek Verma
Partner and Lead, Aerospace and Defence
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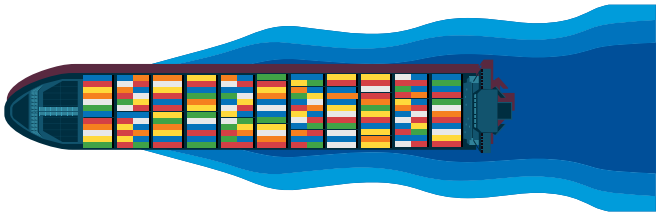


Executive Summary

The development of a mature shipbuilding industry is vital for the growth of any developing nation like India. It has a major impact on the overall economic development of the nation owing to its influence on sea trade and economy, creation of employment opportunities, enhancement of national security, fostering development of ancillary industry, besides promoting technological innovation and progress.

Maritime transport is the prime means for India's International Trade, accounting for 95 per cent of the trade volume and 68 per cent of the trade value. India's 7,516 km coastline and the need for sustaining maritime influence makes indigenous shipbuilding inherently important for national security. Increase of share in sea transport through indigenous shipping will aid in reducing foreign exchange outgo in transport and logistics and boost India's energy security.

Given the inherent labour-intensive nature of the shipbuilding industry, it can employ eight times the labour in commercial vehicle industry, five times that in civil construction and nearly thrice that of heavy engineering. The shipbuilding industry also supports the growth of ancillary sectors, since 60-65 per cent of value addition in the construction of ships comes from ancillary sectors comprising manufacturers of shipboard equipment and material. The shipbuilding industry demands multidisciplinary capability requirement and, hence, development of the industry will enable an ecosystem of technological innovation and development.

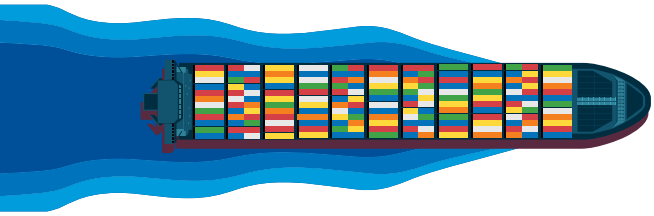
Shipbuilding in India

The Indian shipbuilding industry is anchored by around 28 shipyards (both private and public) and has capacity to build large cargo vessels up to 400,000 DWT. But the industry is performing below its true potential primarily due to a monopsonist market (a market defined by a single buyer) for defence shipbuilding and insignificant demand for commercial shipbuilding. Additionally, defence shipbuilding is dominated by DPSUs/PSUs with small opportunities for private companies that makes private shipyards financially constrained. Further, improper utilisation of assets and capacity has led to insolvency proceedings against many private shipyards. There are other challenges as well in private shipyards like production efficiency, limited availability of skilled labour, limitation of supply chain, etc. While there are many structural gaps in the industry, overdependence on defence shipbuilding and lack of orders for commercial shipbuilding is central to all other challenges.

A close analysis of the commercial shipping industry is important to understand the true demand potential for the shipbuilding industry. Some areas where opportunity exists for this industry are increasing the share of Indian-owned Indian-built ships in India's overseas sea trade, replacing the ageing coastal and overseas ships, developing a robust ship repair and maintenance sector and increasing the share of coastal and inland waterways in domestic transport.

Analysis of potential demand

The share of Indian ships, in absolute terms, in India's overall sea trade has been almost stagnant for the last two decades and accounts for only about eight per cent in 2018. This highlights the lack of orders for commercial ships. A target to achieve atleast 15 per cent share (as was in 2000) of indigenous shipping in overseas trade through indigenous shipbuilding can create a potential demand of nearly 32 million CGT in five to ten years.



Ageing overseas and coastal fleet

On examining the age profile of India's ship fleet, nearly 50 per cent of its overseas fleet is over 15 years and 56 per cent of coastal fleet is above 15 years, while the average age of the international fleet is 15.06 years. Even by conservative estimates, 50 per cent of India's existing fleet (both overseas and coastal) would require replacement next five to ten years, potentially creating a shipbuilding demand of approximately 11 million CGT.

Ship repair sector

Another demand centre for domestic shipbuilding is the ship repair and maintenance industry. Given the strategic location of India in international sea routes, this segment has huge potential for developing the shipbuilding industry. Globally, the ship repair market is expected to reach nearly USD40 billion by 2028 while India's current share is less than one per cent. A well-developed ship repair facility will attract many international voyages and could generate a demand of nearly seven million CGT (for both overseas and coastal shipping fleet) in next five to 10 years.

Waterways mode of transport

Despite several economic benefits of waterways transport as compared to other modes viz. rail, road and airways, India's share in coastal transport remains low (eight per cent) compared to other peer and developed economies. The government has acknowledged these facts and targets 12 per cent of waterways in domestic transport by 2025. If the said target is to be achieved by domestic shipbuilding, an additional demand of about 12 million CGT can be created.

Net demand potential

In total, approximately 65 million CGT of potential demand that corresponds to an opportunity of about USD 4 billion (INR 30,000 crore) can be created in next five to ten years from commercial shipbuilding only. Also, defence shipbuilding is estimated to generate 10 million CGT of additional load. The nation would accrue multiple economic benefits on account of creating this shipbuilding demand locally.

Employment generation potential

As stated earlier, shipbuilding is a labour-intensive industry and India has a natural advantage by virtue of its low-cost labour and young population. Another major economic spin-off is that about 7-8 million jobs can be generated potentially in the next five to ten years, of which about six million jobs can be created in the Tier I/II/III Suppliers in the ancillary industry.

Industry structure

The analysis of industry's structure and capability using the heuristic Porter's Five Forces model highlights that, given the monopsonist nature of defence shipbuilding, consolidation of the industry may be inevitable. Also, globally, there are several examples of such consolidation already happening in advanced shipbuilding nations including U.K., U.S., France, Italy, etc. Therefore, it would be prudent to facilitate consolidation in a systematic and regulated manner.

Recommendations

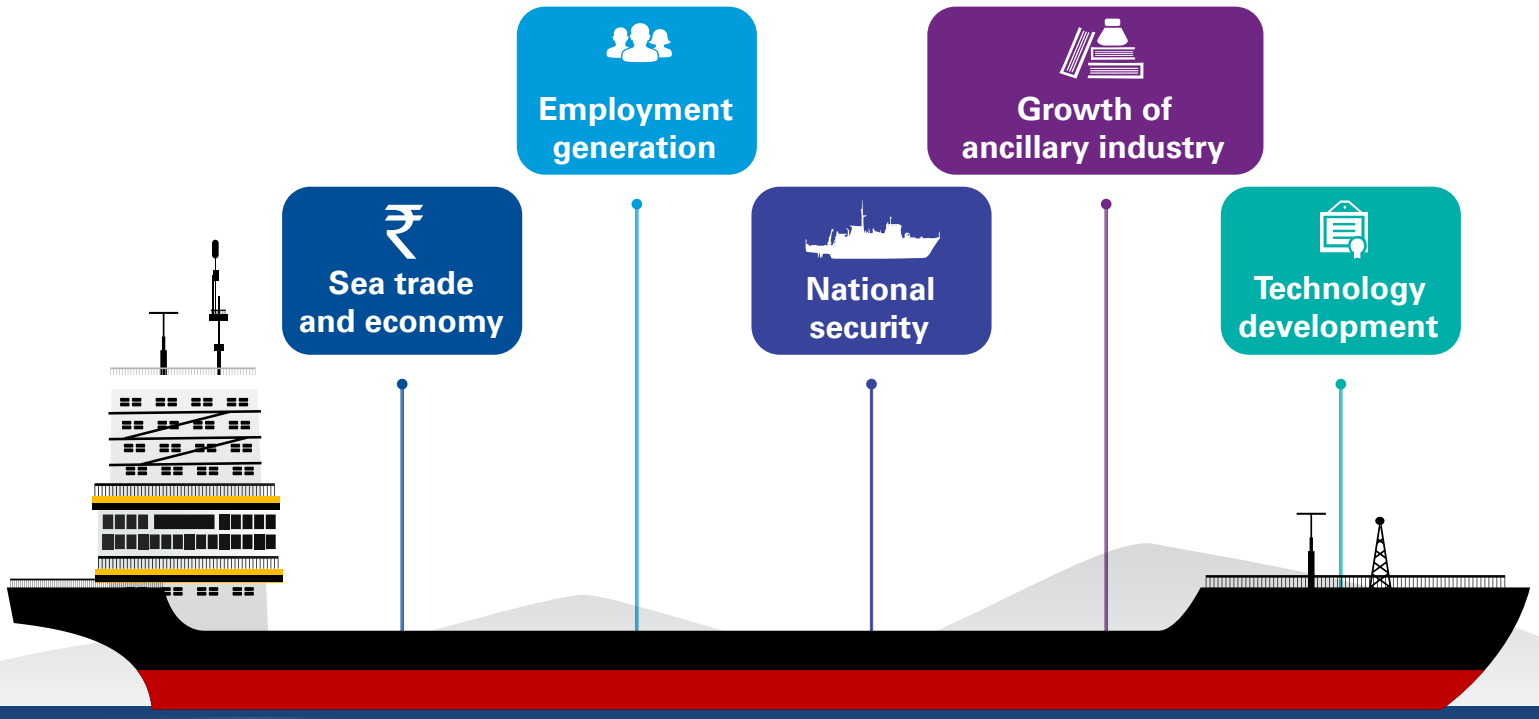
The elimination of regulatory hurdles and support from government is essential for the industry to develop. As highlighted above, consolidation of industry is unavoidable and, hence, there is a need to develop a strategy to facilitate such consolidation with core emphasis on the development of commercial shipbuilding. It is recommended to set up an empowered national level authority for strengthening India's maritime infrastructure and bringing in policy measures, on the shipping side as well as the shipbuilding side to realise the true potential of shipbuilding industry in India.

1 Introduction

Shipbuilding industry is a vital cog in the progress wheel for any developing nation. It includes production of large vessels intended for cargo and passenger movement, military usage and offshore energy sector. The industry also includes the contribution from other sectors that supply products and services for building and maintenance of ships as well.

Going by common trends in history, growth in shipbuilding has been both a precursor and a catalyst to overall economic growth of a nation. This was witnessed in Europe and the UK in colonial era, in the U.S. in early to mid-20th century, in Japan and Korea in the second half of the 20th century, and more recently, in China in the last two-three decades. This is because shipbuilding has many inherent benefits and influences on the growth of a nation. For India, this is particularly relevant in the post COVID-19 economy, given the push towards 'Make in India' and 'Atmanirbhar Bharat' and also given the fact that shipbuilding influences many critical aspects of national growth as shown in Figure 1-1.

Fig-1-1: Shipbuilding's Influence on National Growth

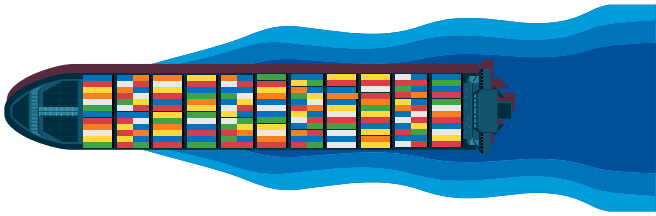


1. Increase in sea trade and economy

Maritime transport is vital for India's trade and economy. According to Ministry of Shipping (MoS), approximately 95 per cent of India's foreign trade by volume and 68 per cent by value is done through maritime transport.[2] Furthermore, for a developing country like India, a low-cost and efficient coastal transport has an important role to play for sustainable growth and development. The bulk of this trade is carried out by ships built, owned and operated by foreign countries resulting in significant foreign exchange outgo.

An indigenous shipping and shipbuilding industry will assist in reducing freight bills as well as the forex reserve outgo which will have a direct positive impact on the country's economy. During FY19, traffic at Indian ports grew by nearly six per cent and total cargo handled stood at 1,282 MT at both major and non-major ports in the country.[2] Also, major ports have improved their operational efficiency with average turnaround time improved from 107 hours in FY12 to 60 hours in FY19.

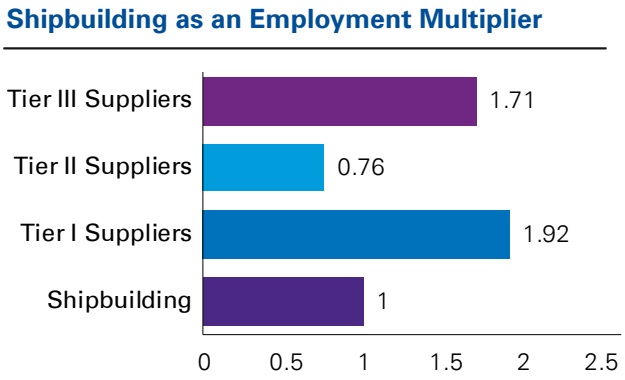
In addition, the 'Make in India' initiative aims to boost the manufacturing sector which complements India's existing strength in the service sector. This manufacturing boost, besides ensuring self-sufficiency, is also aimed at tapping the demand for manufactured goods in the export market. This provides greater volume of trade and more opportunities for carrying domestic and international cargo, which further incentivises shipbuilding to meet growing demand.

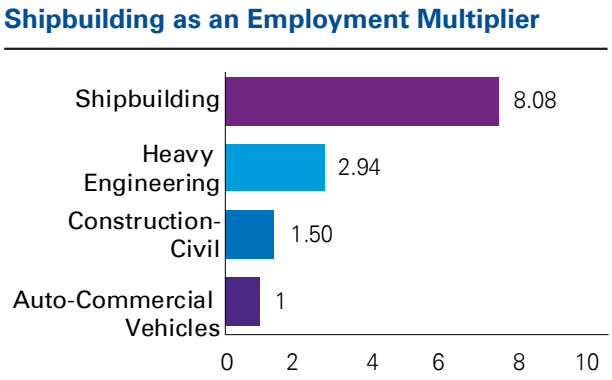


2. Employment generation

The shipbuilding industry has the potential to boost employment prospects for India's young population. Shipbuilding, by virtue of its multi- disciplinary nature and inherent intensiveness for skilled labour, provides the highest employment across the widest spectrum of disciplines. Also, per unit turnover, shipbuilding employs eight times the labour in commercial vehicle industry, five times that in civil construction and nearly thrice that of heavy engineering, as shown in Figure 1-2.

Fig-1-2: Employment Generation & Employment Multiplier Potential of Shipbuilding[3]





Given the fact that 60-65 per cent of value addition comes from ancillary industry in the supply chain, shipbuilding industry also gives impetus to other manufacturing sectors such as steel & materials, piping, cabling, insulation, engineering equipment, electronics and communication equipment, etc. The employment multiplier effect on the Tier I, Tier II and Tier III suppliers is significant as shown in Figure 1-2, particularly in the present scenario in India, which is seeking avenues to boost up large scale employment generation. In this context, the government's "Skill India" initiative is aptly positioned to fulfil these opportunities and generate employment at a large scale.

The skill requirements cover a wide range of disciplines. Blue collar skills include, specialised plate cutters & welders, fitters, machinists, electrical & electronic hardware tradesmen, forging & metal workers, machine and equipment operators, carpenters, painters etc, while the white collar skills required cover naval architects, mechanical engineers, electrical and electronic engineers, software engineers, project management professionals, material science and metallurgical engineers etc.

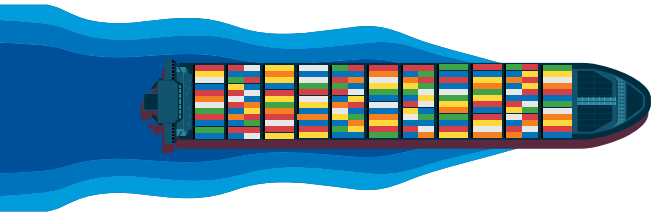
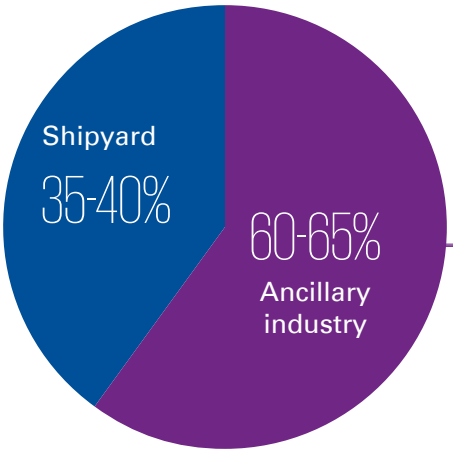


Fig-1-3: Shipbuilding value addition



3. Growth in ancillary sector

About 60-65 per cent[3] of value addition to a ship being constructed comes from manufacturers of shipboard material, equipment and systems. The shipyard, by itself only adds 35 per cent of value, by integrating these equipment/systems. Therefore, as seen in the automotive industry, shipbuilding industry creates an ecosystem of Tier I, Tier II and Tier III companies to cater to its ancillary requirements.

The shipboard equipment and material can broadly be classified into the "Float" and "Move" components, which are relevant for all ships and additionally a "Fight" component which is relevant for naval ships. The various components of the demand for goods from Ancillary manufacturers & MSMEs are highlighted below.

Shipboard equipment & material

'FLOAT' ELEMENT
(90% Indigenisation)

Hull Material & Systems

- Steel/aluminium/FRP etc.
- Deck machinery
- Insulation Material
- Corrosion protection material & systems, paints, coatings, cathodic protection systems
- Doors, hatches & access systems
- Accommodation & hygiene systems
- Material handling systems (cranes, derricks etc.)
- Boats, boat launch & recovery systems
- Safety & life saving equipment & systems.

'MOVE' ELEMENT
(50-60% Indigenisation)

Engineering & Electrical Systems

- Propulsion machinery (engines, gearboxes, propulsors)
- Power generation & distribution machinery/ systems
- Auxiliary & distributed Engineering systems, (compressors, pumps, motors,
- Machinery control systems
- Damage control & firefighting systems
- Ventilation & air-conditioning systems
- Navigation systems
- System components- pipes, valves, flanges, trunks, cables, switchgear, etc.

'FIGHT' ELEMENT
(25-30% Indigenisation)

Payload systems (weapons, sensors, aviation)

- Weapons & sensors (surface, anti air and anti submarine)
- Weapon control systems
- Combat management systems
- Aviation and aircraft handling systems
- Unmanned aerial vehicle/ drone Systems
- Remote operated vehicles
- Communication systems
- Network centric operation systems
- Decoy & ship signature management systems.

Commercial Shipbuilding

Naval Shipbuilding

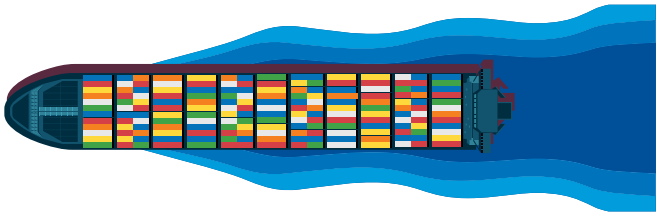
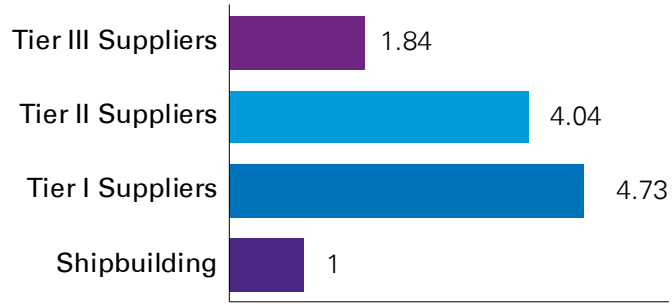


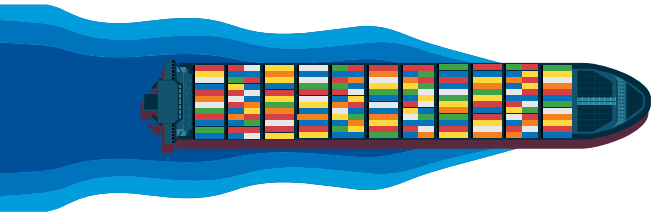
Fig 1-4: Shipbuilding as a investment multiplier



Earlier studies[3] have shown that the shipbuilding Industry can act as an investment multiplier to the related ancillary industries (**Figure 1-4** refers), wherein a unit investment in shipbuilding, can trigger productivity of more than 10 times that investment in related ancillary industry comprising Tier I, II and III suppliers.

4. Technology Development

Some of the major technological breakthroughs that have found so many applications in our daily lives with regard to material sciences, engineering, electronics, power generation and distribution systems, communication systems etc owe their genesis to technology that was originally developed for ships and shipbuilding. Given its inherent multidisciplinary nature, shipbuilding also provides an ideal environment for technology incubation and cross-functional innovation, which can trigger technological applications and advancements in several other industries.



5. National security

India has a large coastline running 7,516-kms with 1382 offshore islands and large Exclusive Economic Zone (EEZ) of 2.3 million sq. kms.[1] A sizeable amount of economic and industrial infrastructure, including nuclear power stations, is located within 200-kms of India's large coastline. India requires a strong and modern Navy to protect its varied maritime interests and shoulder additional responsibilities, particularly in the current geo-political and security situation that prevails in the Indian Ocean Region (IOR).

To ensure adequate patrolling of this large coastline and project its prowess, the Indian Navy has approximately 50 ships under various stages of construction and another 61 more planned in the pipeline.[4] The Indian Navy has persistently worked towards becoming a self-reliant "Builder's Navy, to compliment the country's vision to position India as a self-reliant power in the IOR. In keeping with these self-reliant growth through indigenous shipbuilding, the current and impending naval shipbuilding projects as shown in Table 1 and Table 2 are likely to increase shipbuilding load to unprecedented levels.

Table-1-1: Naval ships under construction in India[4]

S No	Project	No of ships	Shipyard
1	Indigenous Aircraft Carrier (IAC)	1	M/s Cochin Shipyard Ltd
2	Project15B Destroyers	4	M/s Mazagon Docks Shipbuilders Ltd
3	Project 17A Frigates	7	M/s Mazagon Docks Shipbuilders Ltd (4) & M/s Garden Reach Shipbuilders & Engineers Ltd (3)
4	Follow on Project 1135.6 Frigates	2	M/s Goa Shipyard Ltd
5	Landing Craft Utilities	2	M/s Garden Reach Shipbuilders & Engineers Ltd
6	Survey Vessel	4	M/s Garden Reach Shipbuilders Ltd
7	ASW Shallow Watercraft	16	M/s Cochin Shipyard Ltd (8) &M/s Garden Reach Shipbuilders Ltd (8)
8	Naval Offshore Patrol Vessels	5	M/s Reliance Naval and Engineering Ltd*
9	Diving Support Vessels	2	M/s Hindustan Shipyard Ltd
10	Project 75 Submarines	4	M/s Mazagon Dock Shipbuilders Ltd
	Total	**47**	

* The Indian Navy has reportedly recently cancelled the Reliance Naval and Engineering Ltd's (RNEL) naval offshore patrol vessels (NPOVs) contract, owing to delay in delivery of the vessels. RNEL is currently under NCLT proceedings[5]

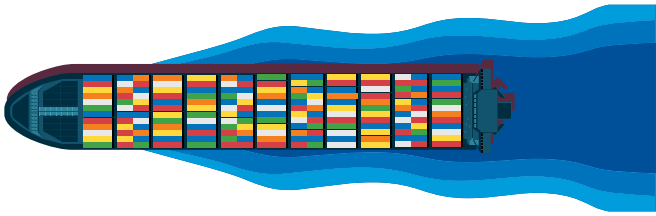


Table-1-2: Naval shipbuilding project in the pipeline[4]

S No	Project	No of ships
1	Fleet Support Ship*	5
2	Landing Platform Dock	4
3	Next Generation Missile Vessel	6
4	Survey Training Vessel	1
5	Mine Counter Measure Vessel	12
6	Multi-Purpose Vessel	4
7	Next Generation Corvettes	7
8	Next Generation Frigates	7
9	Cadet Training Ship	3
10	Next Generation Destroyers	5
11	Indigenous Aircraft Carrier 2	1
12	Project 75(I) Submarines (on Strategic Partnership Model)	6
	Total	**61**

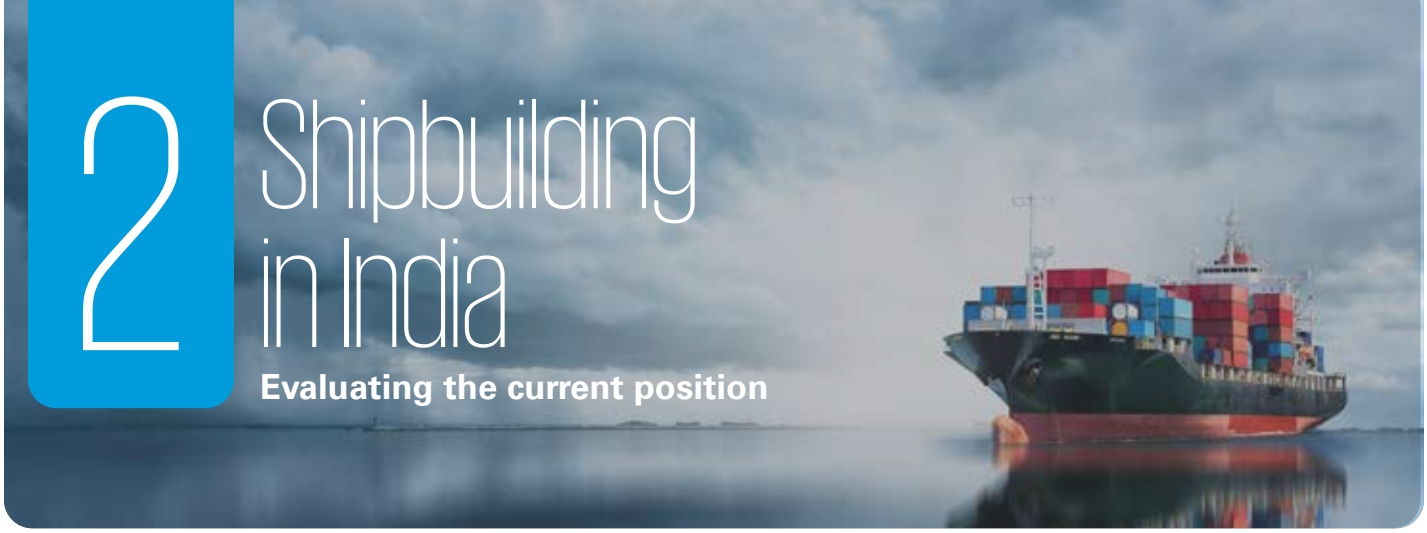
*Earmarked for construction on nomination basis by Hindustan Shipyard Ltd, Visakhapatnam

In addition to the above, there are about 40 vessels under construction for the Indian Coast guard and another 16 are planned.[3,4] These shipbuilding projects, (valued roughly at USD 40 Billion or INR 3 Lakh Crore) cumulatively amount to nearly 10 million Compensated Gross Tonnes (CGT) of shipbuilding load over the next decade.[3] This load would need to be met by the indigenous industry, both public and private, as part of India's effort of being self-reliant in meeting its national security needs. A strong and efficient indigenous shipbuilding ecosystem is therefore vital for national security.

In consonance with the initiative to boost Naval shipbuilding, it would be prudent for India to also become self-reliant in merchant shipbuilding capabilities. Indian-owned and Indian-built ships will provide India with direct control over its means of shipping and trade routes.

India's offshore oil & gas field assets contribute a significant amount of its domestic production, while the Persian Gulf and Africa are major oil & gas suppliers to India. Enabling greater control on the logistics of international trade especially in the areas of coal, oil & gas, raw materials/semi-finished goods for industry as well goods for the export market is therefore essential for national economic and energy security. It is pertinent to note that China has been systematically executing a long-term commercial fleet acquisition plan through its shipbuilding industry to enable energy and trade security.[6]

The above described aspects of influence emphasises the close link between a nation's economic development and its control over the seas, which highlight the compelling need for India to invest in the shipbuilding industry and view it is as a sunrise sector. The infrastructure and monetary investments must be preceded by investments in thinking and strategic planning. This paper aims to examine the current situation of both defence and commercial shipbuilding in India, analyse some of the key influencers through relevant data and statistics, identify gaps, study the actions taken by some countries when face deal similar scenarios and in conclusion provide recommendations that can lead to a vibrant and self-reliant shipbuilding industry.



2 Shipbuilding in India

Evaluating the current position

Indian shipbuilding industry's current position

Despite the obvious benefits as elaborated in the last chapter, the Indian shipbuilding industry finds itself in a position that is below its true potential. The industry today exists as a largely monopsonist market for defence shipbuilding with a reasonably strong domestic demand, while not making any significant headway in commercial shipbuilding, with little demand.

Defence shipbuilding is dominated by DPSUs and PSUs, with a small amount of work sharing with private shipyards. However, despite a slew of efforts from the government to encourage private participation in defence shipbuilding and efforts to stimulate the supply side, the private industry has gradually waned over the last few years.

Fig- 2-1: Current environment of Indian shipbuilding[3]

Commercial shipbuilding

The Boom

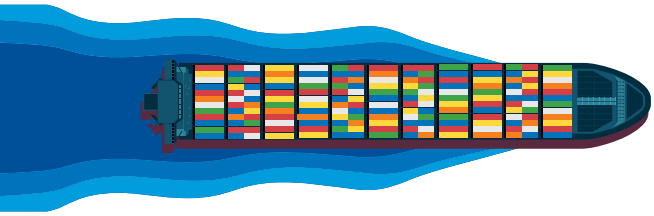
- Unprecedented growth from worldwide 2003
- Riding on stimulus of global demand
- Favourable govt. policies- subsidies upto 30 per cent. Massive infrastructure investments
- Indian Industry market share grew from 0.3 per cent to 1.2 per cent with projections of reaching 7.5 per cent by 2017.

The Bust

- Withdrawal of govt subsidy in 2007. Global recession 2008
- Relatively less competitive global market. Large scale order cancellations
- Overleveraged capital, poor cash flow. Market share 0.01 per cent by 2013
- Oil prices and freight cost plunge. Slowdown of shipping industry and consequently of commercial shipbuilding leading to overdependence on naval shipbuilding.

Naval shipbuilding

- Unprecedented growth in line with navy's expansion
- Largely restricted to DPSUs/PSUs for many years
- Govt tried to stimulate private yards by engaging them on competitive basis from FY11 onwards
- Monopsonist nature of naval shipbuilding- Aggressive bidding
- Crippled by high debts, high working capital costs. Poor cash flow
- Poor efficiency/productivity and poor project management resulting in poor performance of some shipyards in naval orders leading to virtual standstill/cancellation.
- Failed attempts at debt restructuring & liquidation proceedings against some yards in early 2019.



High demand & overdependence on naval shipbuilding

Indian shipbuilding industry current environment

Insignificant demand for commercial shipbuilding

DPSU/PSU shipyards

Strengths

- **Capability**
- **Experience**
- **Govt Support**
- **Financial Stability**
- **Lower Working Capital Costs**

Gap Areas

- **Limited Infrastructure capacity**
- **Limited efficiency/ productivity compared to international standards further constrained by supply chain limitations**

Private shipyards

Strengths

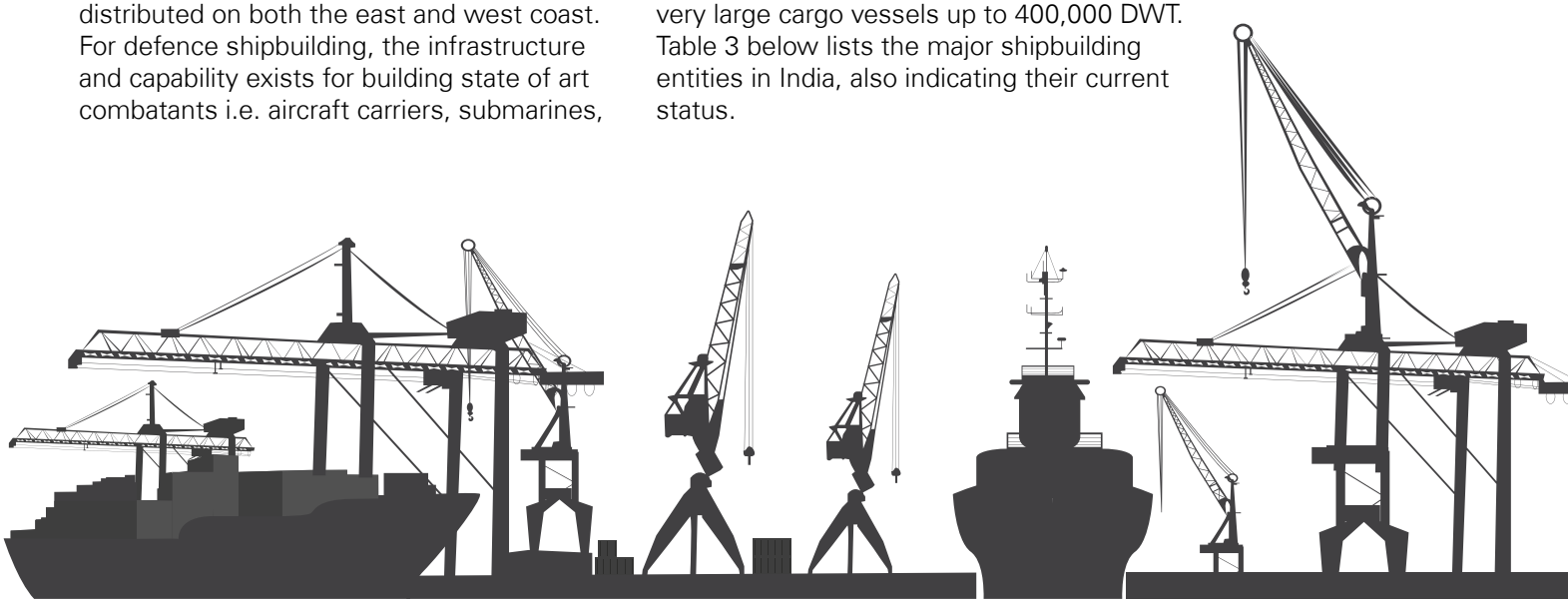
- **Available/ Underutilized Capacity**
- **Underutilized Infrastructure resources**

Gap Areas

- **Limited Capability**
- **Financial Weakness**
- **Limited productivity & Efficiency compared to International Standards further constrained by supply chain limitations**

Capacity and status of shipyards in India

India's shipbuilding industry comprises of both private and public shipyards, with about 28 shipyards and Shipbuilding assets (not including many minor boat yards) distributed on both the east and west coast. For defence shipbuilding, the infrastructure and capability exists for building state of art combatants i.e. aircraft carriers, submarines, destroyers, frigates etc., while in terms of commercial shipbuilding, capacity, capability and infrastructure exists for building vessels ranging from niche small high speed crafts to very large cargo vessels up to 400,000 DWT. Table 3 below lists the major shipbuilding entities in India, also indicating their current status.



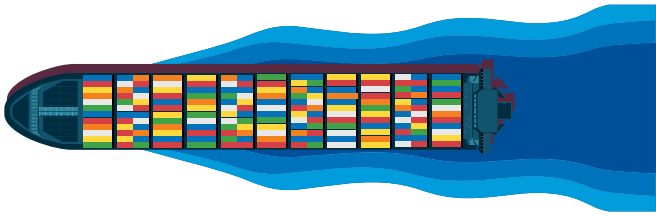
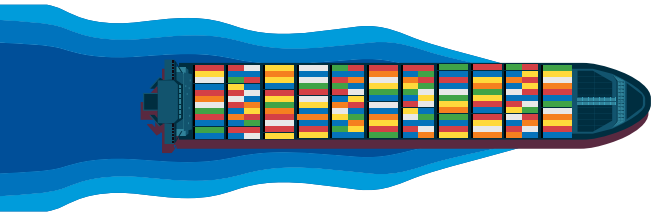
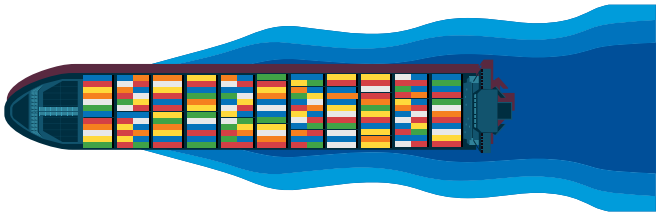


Table 2-1: Capacity and status of Indian shipyards[3]

S No	Name	Infrastructure capacity	Typical product line	Status
Public Sector Entities - MoD				
1	Mazagon Docks Shipbuilders Ltd, Mumbai	Large and medium sized frontline naval ships	Destroyers, Frigates, Submarines	Active
2	Garden Reach Shipbuilders & Engineers Ltd, Kolkata	Large and medium sized frontline naval ships	Frigates, Corvettes, OPVs, FACs, LCUs, Shallow Water Anti-Submarine Crafts etc	Active
3	Goa Shipyard Ltd	Medium size naval ships and auxiliaries	Frigates/Corvettes, Missile, vessels, OPVs etc	Active
4	Hindustan Shipyard Ltd	Large and medium sized warships & naval auxiliaries	Large Fleet Support Ships, Diving Support Vessels, Large cargo carriers, Submarine overhauls	Active
Public Sector Entities - MoS				
5	Cochin Shipyard Ltd	Large and medium sized ships	Aircraft Carrier, Large Cargo ships/Tankers, Coastal Anti-Submarine Crafts	Active
6	Hooghly Dock & Port Engineers Ltd, Kolkata	Small vessels	Tugs, Boats, Barges & other small crafts	Originally PSU. Post financial strain, asset acquired by Cochin Shipyard
Public Sector Entities – State government				
7	Shalimar Works, Kolkata	Small vessels	Passenger ferries, tugs, boats, barges & other small crafts	Active
8	Alcock Ashdown Ltd, Bhavnagar	Small vessels	Small survey vessels, tugs, boats, barges & other small crafts	Shutdown by Gujarat Government. Cochin Shipyard reportedly eying takeover of assets
Private Sector Entities				
12	Dempo Shipbuilding & Engineering, Goa	Medium and small crafts	Passenger ferries, dredgers, coastal/inland ore carriers, barges etc	Active

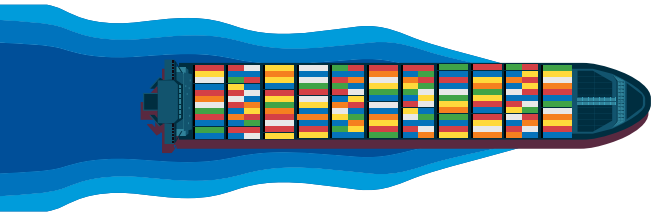


S No	Name	Infrastructure capacity	Typical product line	Status
10	Reliance Naval & Engineering Ltd, Pipavav	Large and medium sized ships	Large cargo vessels, OPVs, auxiliary vessels etc	Inactive. NCLT insolvency proceedings underway
11	Bharati Shipyard	Medium sized ships	Medium sized cargo vessels, OPVs, tugs, barges etc	Inactive. NCLT insolvency proceedings underway
12	ABG Shipyard, Bhavnagar	Large and medium sized ships	Large cargo vessels, OPVs, offshore supply vessels	Inactive. NCLT insolvency proceedings underway
13	Chowgule Shipyard. Goa	Medium and small crafts	Medium sized coastal cargo vessels, fishing trawlers, ferry crafts, tugs, barges etc	Active
14	Tebma Shipyard, Malpe & Chennai	Medium and small crafts	Offshore support vessels, tugs, dredgers, floating cranes	Being taken over by Cochin Shipyard Ltd post NCLT insolvency proceedings
15	L&T Shipbuilding	Large and medium sized ships	Large cargo vessels, OPVs, floating docks, interceptor boats, capacity & capability for submarines, Landing Platform Dock	Active, merged with parent company L&T
16	Modest Infrastructure, Bhavnagar	Medium and small crafts	Coastal cargo carriers, offshore supply vessels, barges etc	Majority stake acquired by Dempo
17	Shoft Shipyard Ltd, Bharuch	Medium and small crafts	Offshore supply vessels, torpedo recovery vessel, coastal cargo carriers, mini bulk carriers, tugs, barges etc	Active
18	Dempo Shipbuilding & Engineering, Goa	Medium and small crafts	Passenger ferries, dredgers, coastal/inland ore carriers, barges etc	Active
19	Sembmarine, Kakinada	Medium and small crafts	Offshore supply vessels, repair and conversion of medium sized vessel	Inactive NCLT insolvency proceedings underway
20	Mandovi Dry Docks, Goa	Medium and small crafts	Coastal/inland cargo carriers, dredgers, fishing vessels, offshore supply vessels, etc	Active



S No	Name	Infrastructure capacity	Typical product line	Status
21	Waterways Shipyard Pvt Ltd, Goa	Small crafts	Inland/coastal crafts, barges, etc	Active
22	Vijai Marine Services, Goa	Small crafts	Coastal cargo vessels, tugs, trawlers, barges etc	Active
23	AC Roy, Kolkata	Small crafts	Inland crafts, passenger ferries, tugs, barges etc	Active
24	Titagarh Shipyard, Kolkata	Small crafts	Costal research vessels, river cruise ferries, tugs, inland transport vessels, barges	Active, operating under Parent Company Titagarh Wagons
25	Synergy Shipbuilders, Goa	Small crafts	Offshore support/ towing vessels, crew boats, tugs, barges etc	Active
26	Western India Shipyards, Goa	Repair of medium and small vessels	Repair/overhaul of OPVS, Tugs, Boats etc	Inactive Subsidiary of ABG, under NCLT Insolvency proceedings
27	West Coast Shipyard, Goa	Small vessels	Fishing trawlers, ferry boats, tugs, dredgers etc	Active
28	Marine Frontiers, Mumbai	Small aluminium boats and crafts	Harbour defence and patrol boats, workboats, ferries, landing crafts, marina systems, helidecks for offshore rigs etc	Active

As can be seen from the above table, some shipyards have been constrained financially, leading to the assets being rendered inactive and insolvency proceedings have been initiated against them. However, it would be pertinent to note that the related infrastructure assets are still available and in many cases these assets are being acquired and consolidated by other active shipyards.



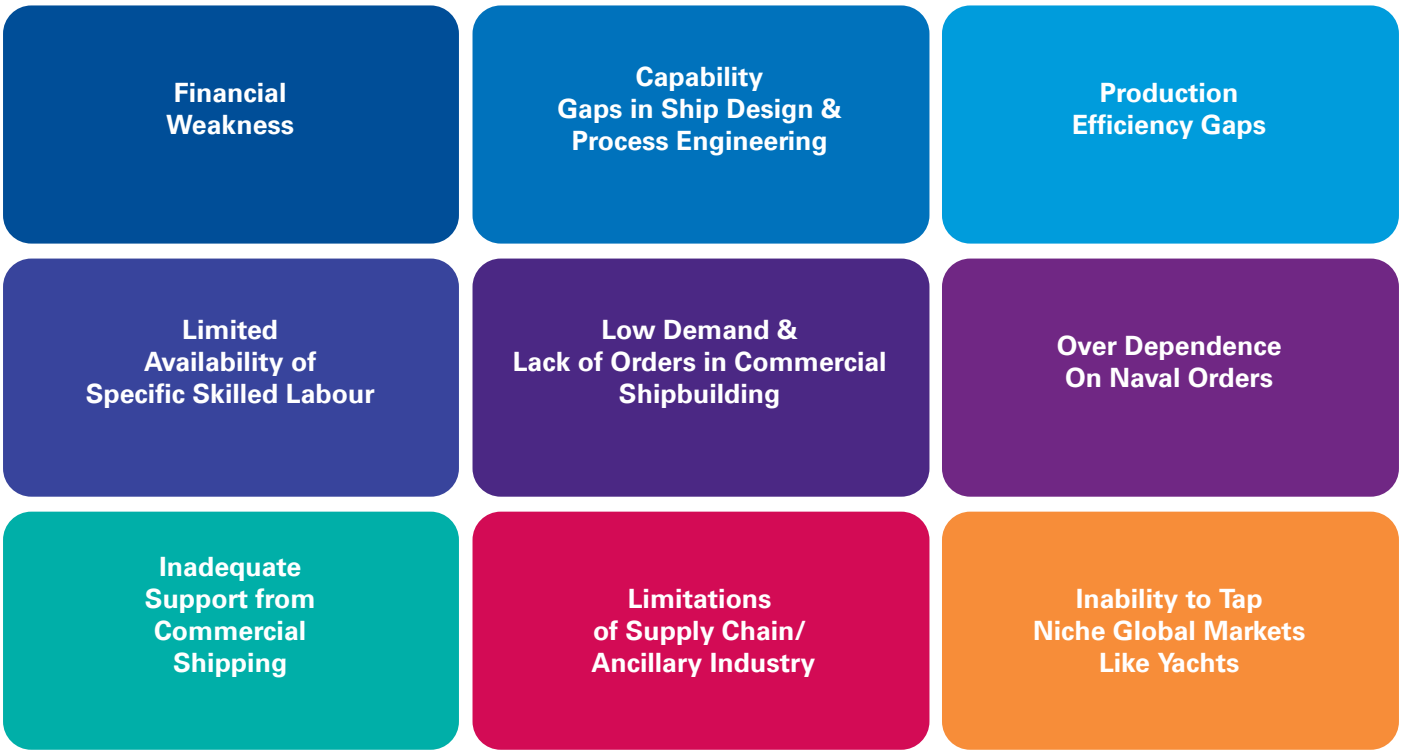
Challenges and gap areas in the private industry

The current position of the shipbuilding industry and the status of many private shipyards can be attributed to several gap areas and challenges that have plagued the sector. The major challenges and gap areas can be summarised as shown in Figure 2-2. The government, for its part has attempted to address some of these challenges, with some measures on the supply side, i.e. reviving subsidy up to 20 per cent since December 2015 and by according infrastructure status to shipbuilding industry, thereby making shipyards eligible for long-term low interest funding.[7,8]

However, there are other structural and capability issues that would need to be addressed in a comprehensive and consolidated manner. Some of the major capability gaps in the industry relate to ship design and process engineering, lower production efficiency, limited availability of specific skilled labour, limited output of supply chain, etc.

One gap area is the skewed distribution of capability, particularly for defence shipbuilding, wherein the DPSUs dominate. This is attributable to India's conscious effort to invest in indigenous warship design and shipbuilding capabilities in 1950s. The Indian Navy took control of this endeavour, by setting up and nurturing its in-house warship design, overseeing, quality control and trial organisations and nurturing its own Shipbuilding ecosystem in conjunction with the DPSU shipyards. The DPSU shipyards have also built up their capability, expertise and experience through years of focus on defence shipbuilding, based on the Navy's long-term perspective plans for fleet acquisitions. In contrast, there is no equivalent eco-system or a long-term perspective plan for India's commercial fleet. It therefore emerges that using the strength of India's defence shipbuilding capabilities to create and nurture a similar eco system for commercial shipbuilding can benefit the entire industry and the nation significantly.

Fig- 2-2: Challenges & gap areas in Indian private shipbuilding industry



Low demand in commercial shipbuilding from the shipping Industry

While there are many structural challenges to the industry, the low demand and lack of orders for commercial shipbuilding is central to all the current challenges, as it creates a vicious cycle and indirectly inhibits any scope of strengthening other structural issues and gap areas.

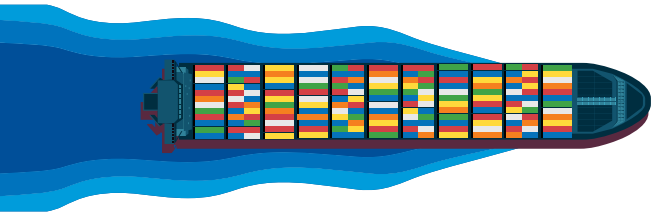
This also results in overdependence on defence shipbuilding, for which the capabilities/skillsets are not evenly distributed or easily available. The lack of demand from the international market in the immediate future is understandable given the cyclic nature of shipbuilding demand and the ongoing low demand scenario globally. However, the lack of local demand from India's commercial shipping industry is an area that merits a more detailed examination and analysis to identify means to address the same.

3 Analysis of potential demand and related aspects

To understand the demand scenario in commercial shipbuilding, it is important to examine India's commercial shipping industry, which has the potential to create demand. Indian commercial shipping fleet comprises overseas shipping fleet and vessels for coastal/inland waterways. By examining the present status of each of these segments and identifying potential for their respective growth, the consequent potential for each of these segments to create demand for India's shipbuilding industry would be analysed.

A. India's overseas commercial fleet – shipbuilding demand potential

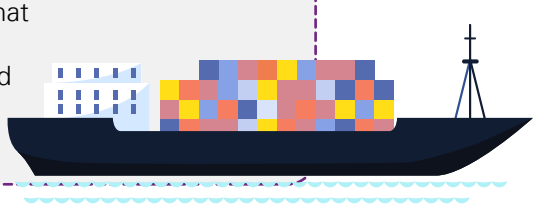
During FY19, traffic at Indian ports grew by nearly six per cent and total cargo handled stood at 1,282 MT at both major and non-major ports in the country.[2] Therefore, by sheer volume of cargo, India's overseas trade and the fleet of ships required for it are an important focus area for analysis. The present scenario with regards to India's overseas fleet is, therefore, examined to understand gap areas if any, with a view to understanding its potential for creating shipbuilding demand.



1. Share of Indian ships in India's overseas sea trade

An examination of India's overseas sea trade in the last two decades reveal that the Indian commercial shipping companies have largely preferred foreign controlled freight. As a result, Indian flagged/controlled vessels account for a mere eight per cent of the USD30 billion Indian export and import freight market dropping significantly from the 15 per cent share in 2000. While foreign share has been constantly increasing commensurate with increase in India's sea borne trade, Indian share in absolute terms has almost remained stagnant as can be seen in Figure 3-1. A much smaller fraction of this eight per cent accounts for the ships built in India, highlighting the lack of orders in commercial shipbuilding.

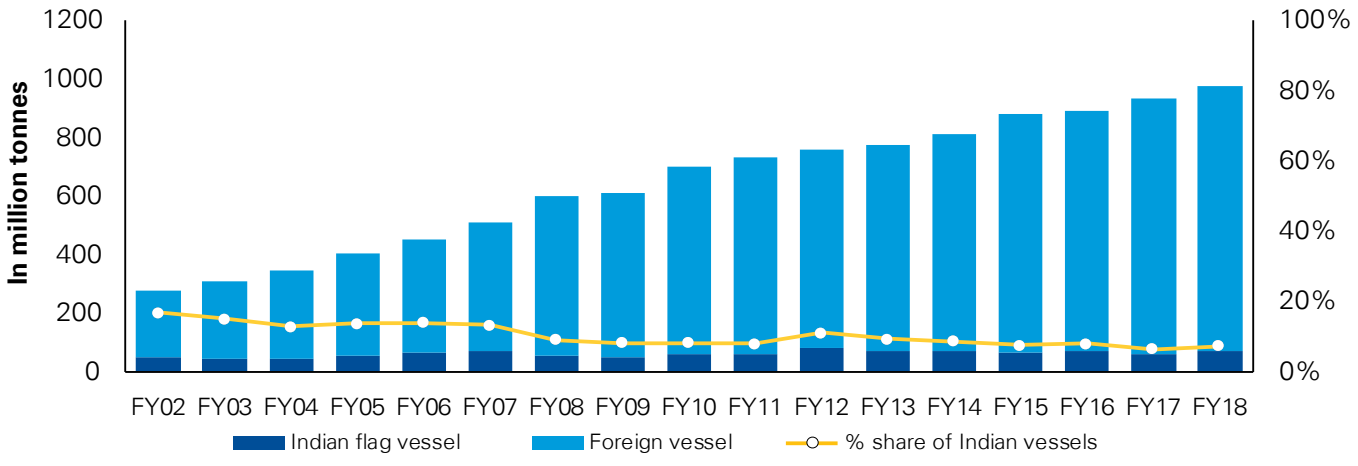
From economy, trade and energy security point of view as well as from a shipbuilding perspective, it would be prudent to reduce the dependence on foreign controlled/foreign built ships for India's sea trade requirements. A policy driven realistic target in the next five to ten years would be to achieve at least 15 per cent share of indigenous fleet in India's overseas trade. This would entail an additional requirement of new ships and in effect tripling the overall cargo carrying capacity of India's merchant fleet in the next five to ten years. With suitable policy interventions from the government, if this increase in fleet size is mandated to be achieved by building the entire new additional fleet only from Indian shipyards, then it is estimated that potentially, a shipbuilding load demand of about 32 million CGT[3] can be created on the Indian shipbuilding industry.

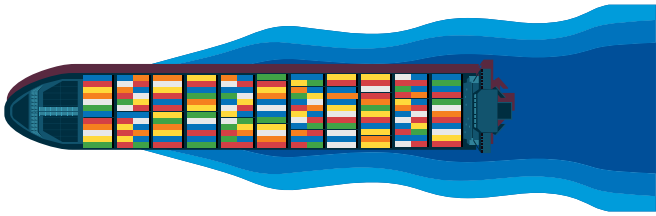


15%

Share of Indigenous fleet in overseas trade should be targeted and can be achieved in the next five to ten years.

Fig 3-1: Share of Indian Vessels in India's Overseas Cargo Movement[9]





2. India's ageing overseas fleet

Besides the fact that India's indigenous fleet accounts for only eight per cent of its overseas sea trade, another critical issue that emerges is the fact that India's overseas fleet is also ageing rapidly. A look at the age profile of the overseas fleet (Figure 3-2) reveals that over 50 per cent of the fleet (both by number and by gross tonnage) is over 15 years old and nearly 35 per cent is over 20 years, while the average age of the international fleet is only 15.06 years.[2]

From the above, it is clear that even by a conservative estimate, at least 50 per cent of India's existing overseas fleet would require replacement in the next five to 10 years. If, as a policy-driven decision, the replacement of this ageing part of the fleet is also mandated to be met by the Indian shipbuilding industry, then a potential load demand of about eight million CGT can be created, solely based on replacement of vessels beyond a certain age.

50%

of India's existing overseas fleet would require replacement in next five to ten years

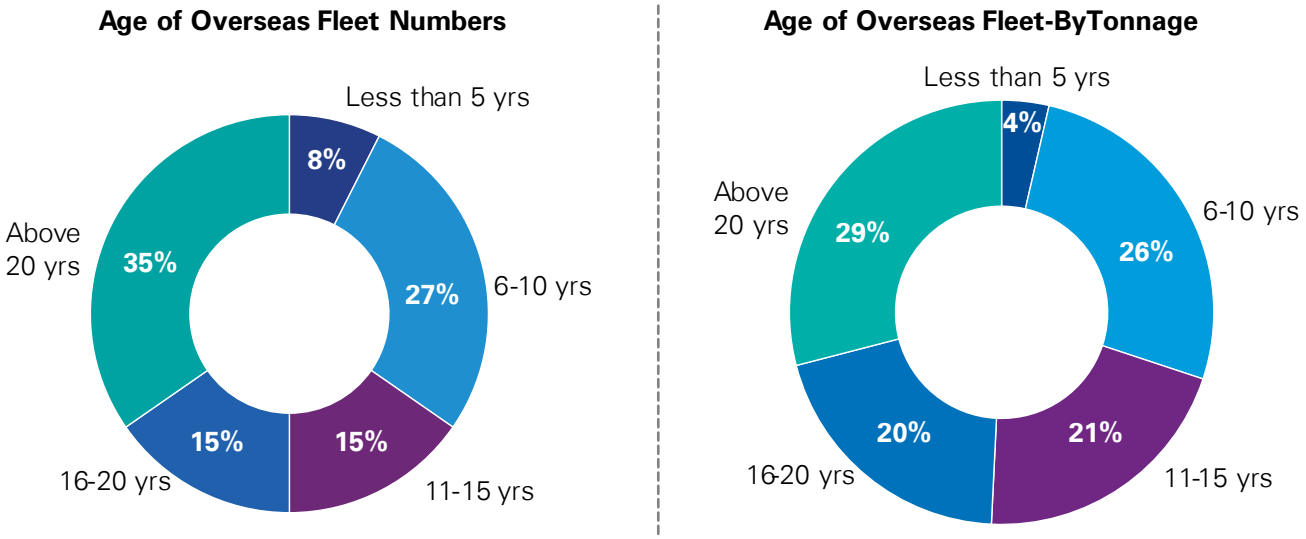
3. Repair and maintenance of India's overseas fleet.

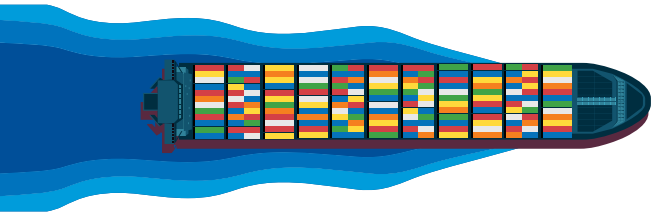
India has an advantageous strategic location in global sea trade, which can be leveraged for ship repair activities for international ships. The ship repair segment is an important segment that could unlock huge untapped potential of both ancillary industry and shipyards. The global ship repair market in 2018 was approximately USD 19 billion and is expected to reach USD 40 billion by 2028. Presently, India's share in global ship repair market is less than one per cent and it would be pertinent to note that India's own overseas fleet owners tend to seek out facilities/yards overseas. If a policy driven approach mandates repair and maintenance of India's overseas fleet exclusively at India's shipyards, then it is estimated that this could potentially generate a load equivalent to 4.8 million CGT in the next five to 10 years.

USD 40 billion

global ship repair market by 2028

Fig 3-2: Age profile of India's overseas merchant shipping fleet[3,9]



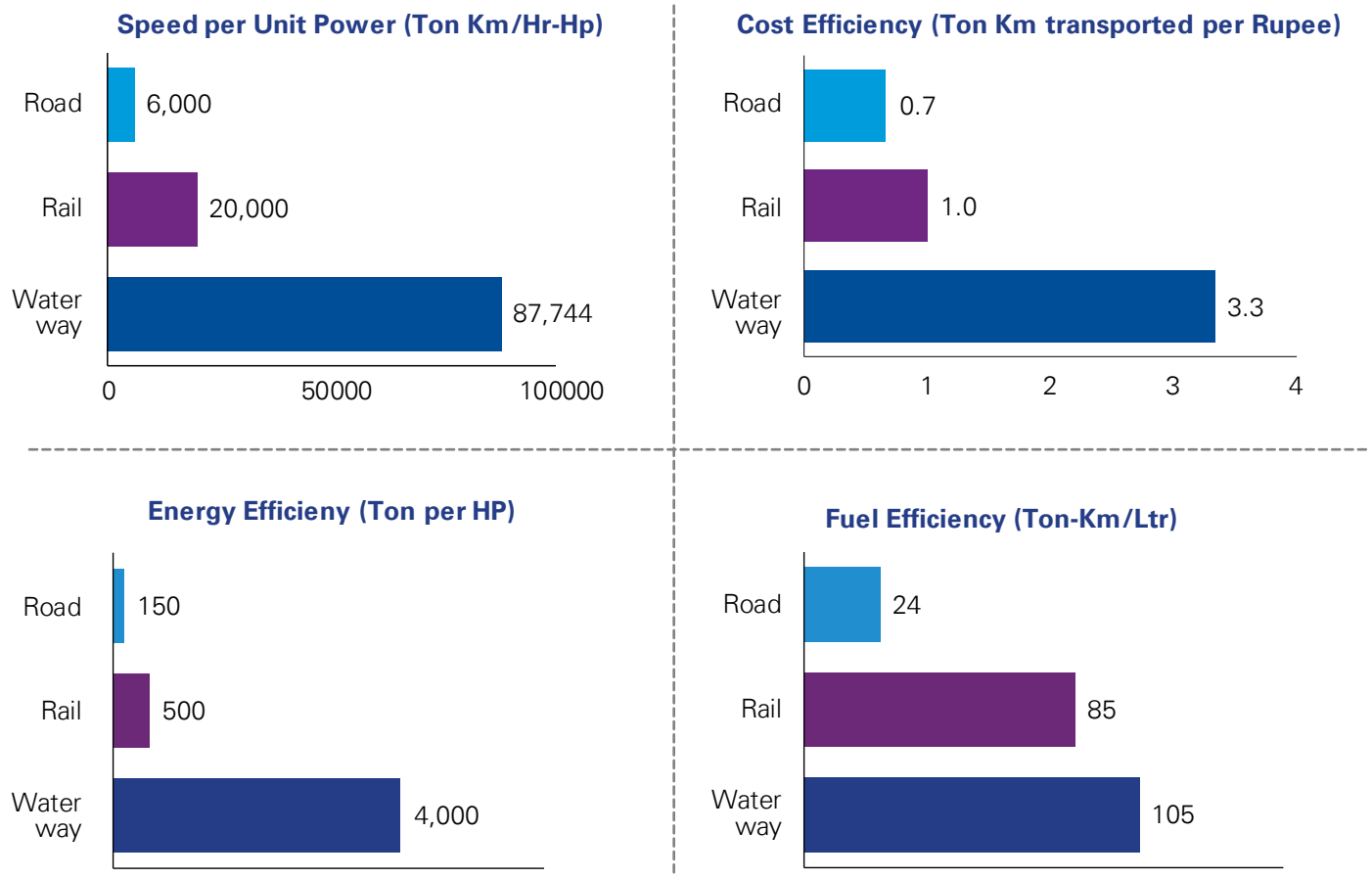


B. India's coastal & inland shipping – Shipbuilding demand potential

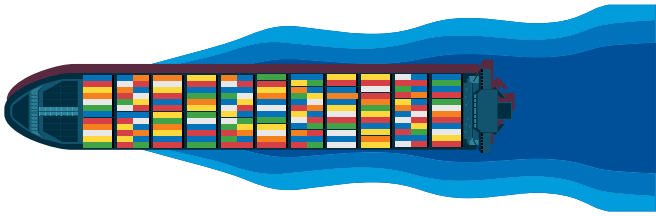
Much like India's overseas fleets, the coastal and inland waterway fleet are also an important focus area. Various studies sponsored by the MoS have revealed that waterways (both coastal and inland) are one of the most energy efficient, fuel efficient, environment friendly and cost-effective form of cargo transportations.

If the first and last mile connectivity issues are resolved, then the economic and efficiency benefits of coastal and inland waterways can be leveraged significantly, besides aiding in reducing the strain on India's road and rail infrastructure. However, despite these obvious advantages in terms of energy efficiency, the share of waterways in India's domestic cargo movement is only eight per cent, which is low compared to peer economies.

Fig 3-3: Comparison of Efficiencies- Road, rail and waterway cargo transportation[10]



Note: Cost efficiency shown does not Include 1st and last mile connectivity costs which tend to be higher for waterways.



1. India's ageing overseas fleet

The Government has taken cognisance of the cost efficiency and Sagarmala programme targets an increase in the share of waterways to about 12 per cent by 2025.[11] In FY19, coastal shipping accounted for about 120 million tons per annum (MTPA) of cargo transportation and the GoI has targeted an increase to about 230 MTPA by 2025.

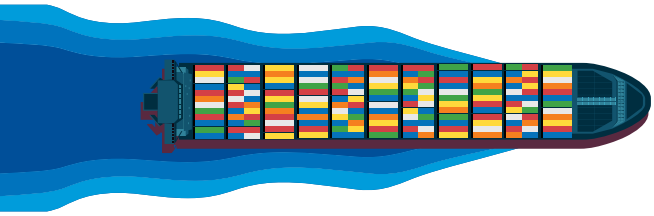
Further, Inland Waterways Authority of India (IWAI) has declared 106 rivers across the country as national waterways for cargo movement in 2016. To achieve this target and sustain this growth, it is estimated that India's existing coastal and inland waterway fleet would need to be tripled in the next five to 10 years. If it is mandated by policy that this increase in size of coastal/inland waterway fleet would be achieved by indigenous shipbuilding, this would potentially create a shipbuilding load demand of about 12.75 million CGT.

Table 3-1: Global scenario of modal split in transport[12]

India	60%	31%	8%	1%
U.S.	37%	48%	14%	1%
China	30%	23%	46%	1%
Europe	10%	46%	43%	1%

12%

share of waterways in mode of domestic cargo transport is targeted by 2025 by the Sagarmala program



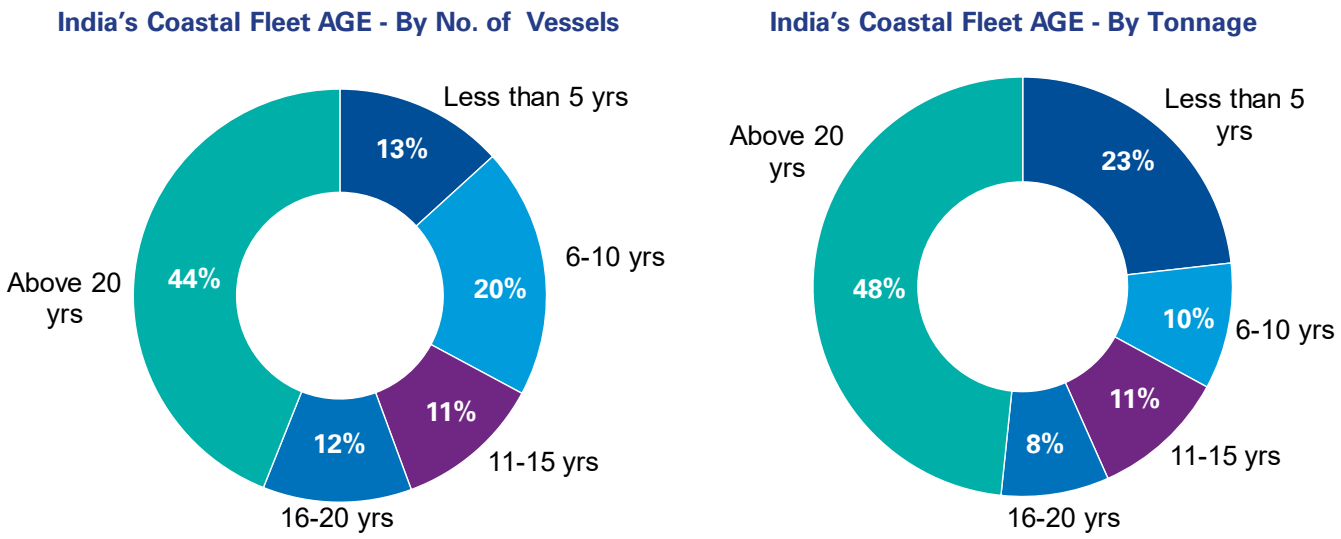
2. India's ageing coastal fleet

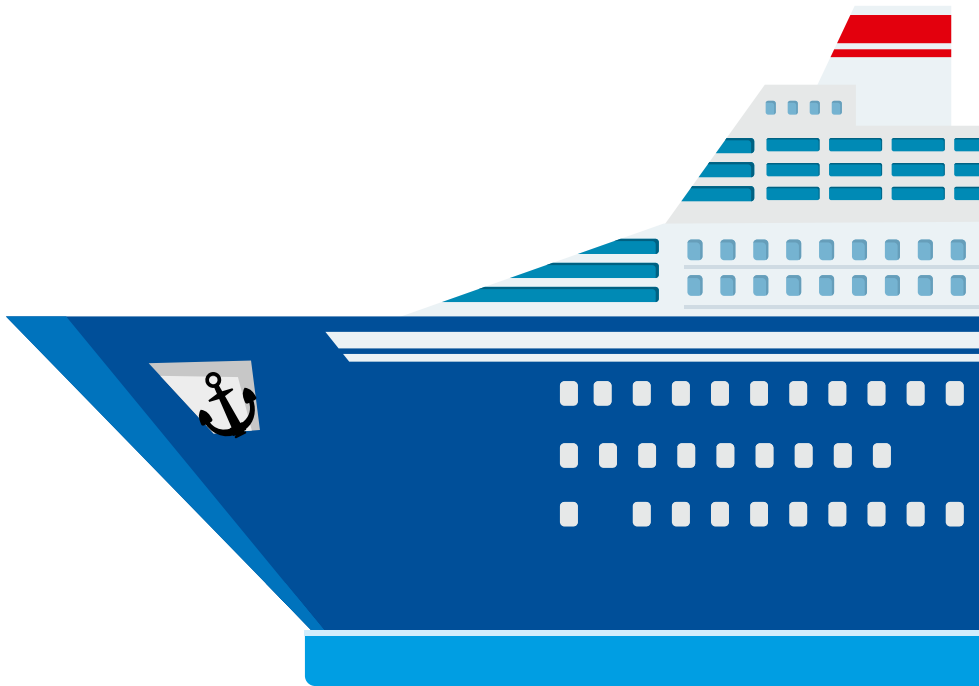
As in the case of the overseas fleet, the coastal fleet is also ageing rapidly wherein about 56 per cent of the existing fleet is above 15 years old and over 44 per cent of the fleet is above 20 years old as shown in Figure 3-4. Even by a conservative estimate, at least 50 per cent of the existing coastal fleet would need to be replaced in the next five to 10 years. If, as a matter of policy, it is mandated that the replacement of this ageing part of the coastal fleet would be achieved by indigenous shipbuilding, then this would potentially create a demand of over three million CGT over the next five to 10 years, while repair and maintenance requirements for the coastal fleet can additionally generate a shipbuilding demand of about two million CGT.

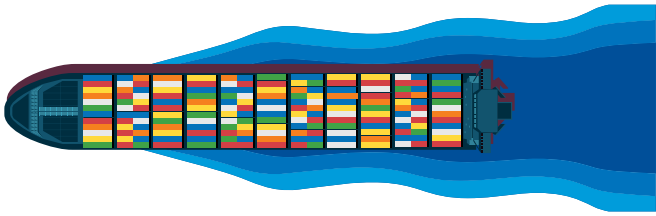
50%

of India's existing coastal fleet would require replacement in next five to ten years

Fig 3-4: India's Coastal Shipping Fleet Age Profile[9]



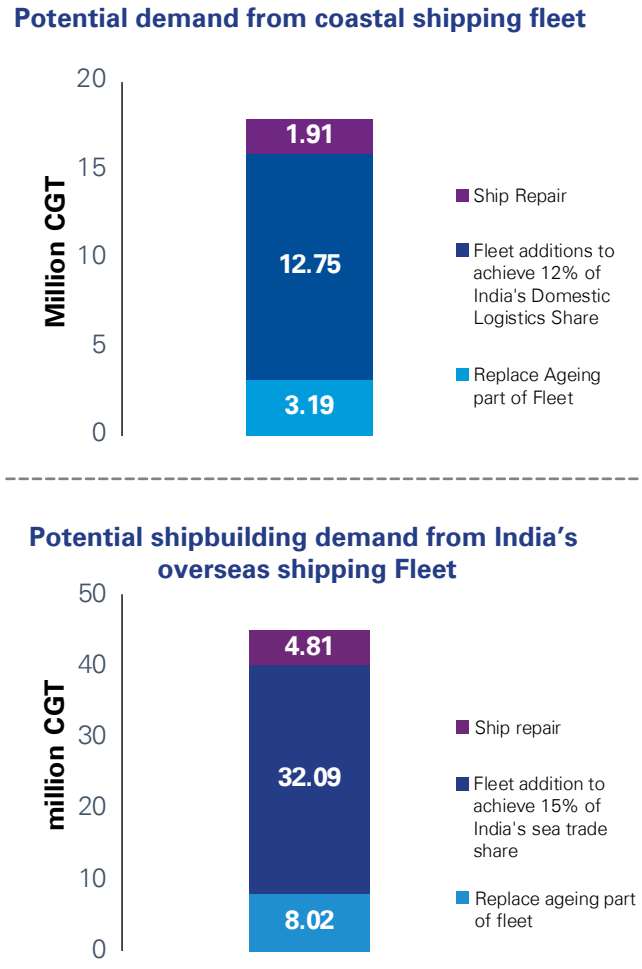


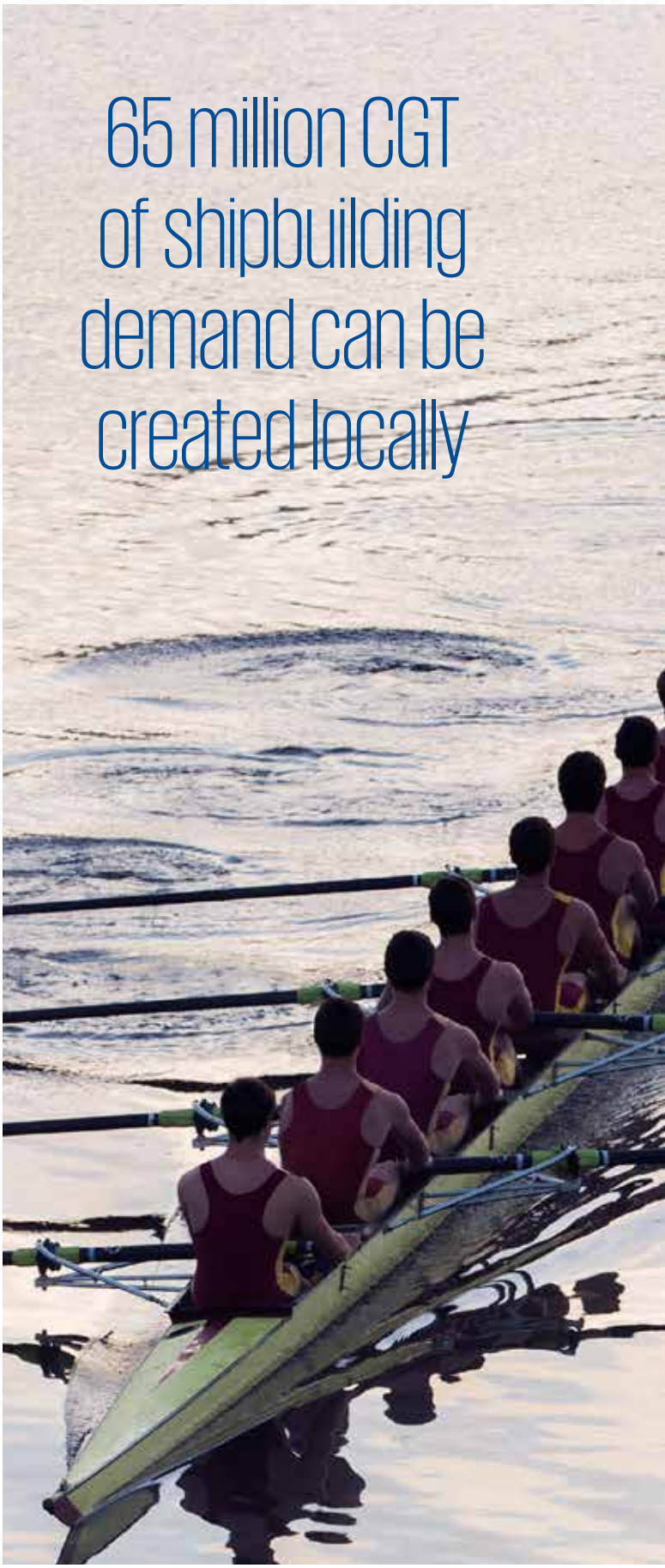


C. Net local Demand potential for commercial shipbuilding in India

Summarising the analysis with regard to demand that can potentially be created by India's shipping needs (both overseas fleet and coastal/inland fleet), it emerges that, a net commercial shipbuilding load demand of about 45 million CGT from India's overseas fleet requirement and about 20 million CGT from India's coastal/inland fleet requirements. Thus, without any need to depend on foreign orders, about 65 million CGT of shipbuilding demand can potentially be created locally, by evolving policies and addressing local factors which are entirely under India's control.

Fig 3-5: Net Potential Shipbuilding Demand from India's Overseas and Coastal Fleet requirement[3]

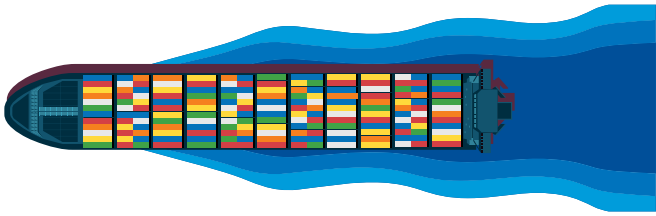




D. Economic spin offs from creating local shipbuilding demand

This net potential commercial shipbuilding load of about 65 million CGT roughly corresponds to a business opportunity of about USD 4 Billion (INR 30,000 Crore). The defence shipbuilding market is estimated to generate about 10 million CGT of shipbuilding load. However, in terms of business value, defence shipbuilding, on account of being far more technology intensive with regards to weapons, sensors and specialised military grade equipment, is estimated to present a business opportunity of about USD40 billion (INR 3 Lakh Crore) over the next decade or so.

When combined, this presents a substantial opportunity for the industry. Further, considering that 60-65 per cent of value addition comes from the ancillary industry i.e. Tier I, Tier II and Tier III suppliers, many of whom are MSMEs, this translates to a demand of about USD27-30 billion on the supply chain. If the dependence on foreign sources for shipboard equipment is progressively reduced, particularly in the 'move' and 'fight' components, this also provides extensive long-term business opportunities for indigenous manufacturers and MSMEs, thereby benefiting the nation economically.

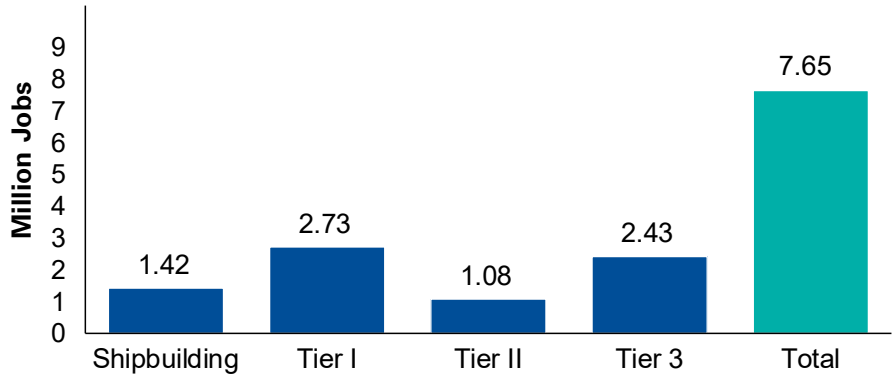


E. Employment generation potential

The Indian shipbuilding industry's productivity roughly translates to about 25 to 30 man-days per CGT i.e. (200-250 manhours per CGT) presently. However, by bringing in process improvements, the efficiency can be improved to about 20 man-days per CGT. Therefore, for the net estimated shipbuilding load of about 75 million CGT (considering both commercial and defence shipbuilding,) this translates to about 1.5 billion man-days of workload in the next five to 10 years, implying creation of about 1.42 million jobs directly in shipbuilding.

Considering the multiplier effect on the Tier I, II and III suppliers as elaborated in Chapter 1, this can lead to a creation of about 7.65 million jobs in the five to ten years, as shown in Figure 3-6.

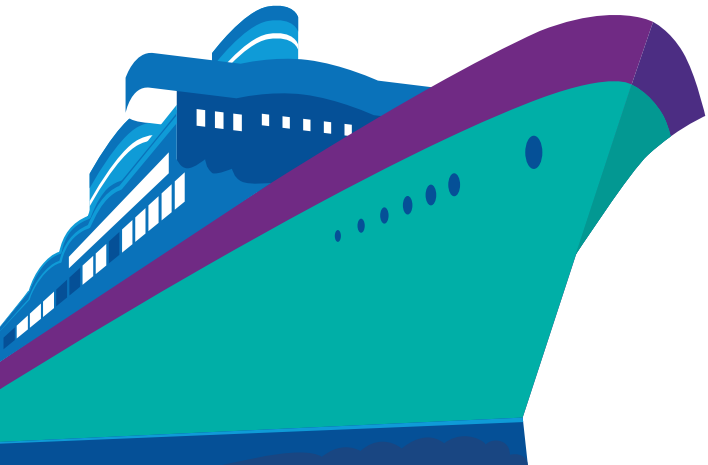
Fig 3-6: Net job creation potential of shipbuilding in next five-10 Years[3]



7-8 million

jobs can be created in next five to 10 years

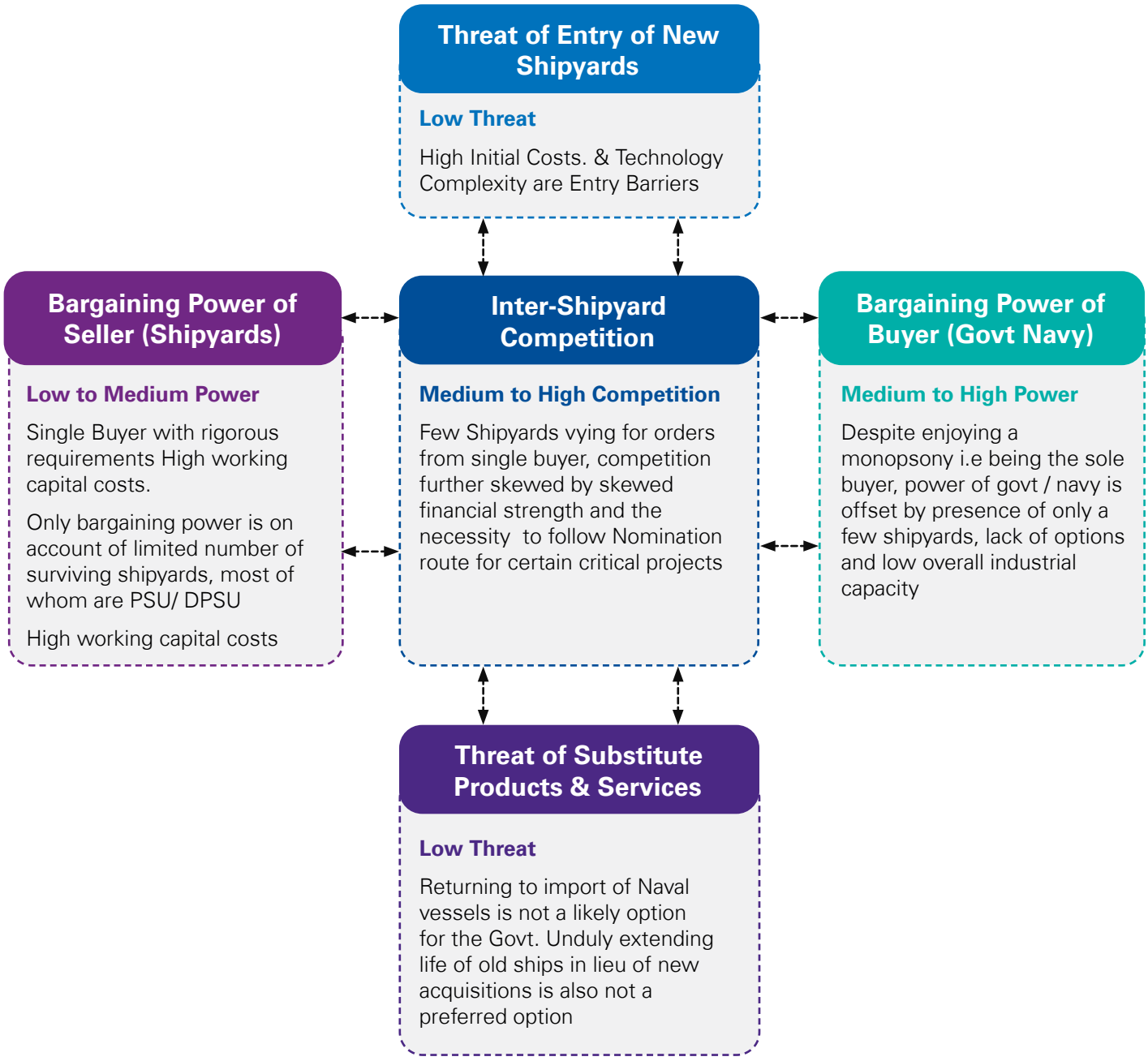
Given the large difference between the estimated business value projections of defence shipbuilding and commercial shipbuilding, there may be a temptation for many stakeholders to disregard commercial shipbuilding and focus only on defence shipbuilding. It is imperative that the nation and the stakeholders avoid falling into this trap once again. As explained earlier, a large part of the business value in defence shipbuilding comes from weapons, sensors and specialised military grade equipment. The value addition scope and consequently the business value/scope for the rest of stakeholders is relatively much lesser. It is also important to view this local demand creation for commercial shipbuilding as an opportunity to not only enhance self-reliance by boosting the entire value chain, but also to 'sharpen the axe' and help in long term capability build up. When global demand for commercial shipbuilding picks up again in the next 10 years in line with the cycle, the Indian industry would have gained vital capabilities and a competitive edge to claim a larger share of the global demand. It is, therefore, important to understand that the two segments are complimentary to each other and the wheels need to be kept turning on both segments to strengthen the industry as a whole.

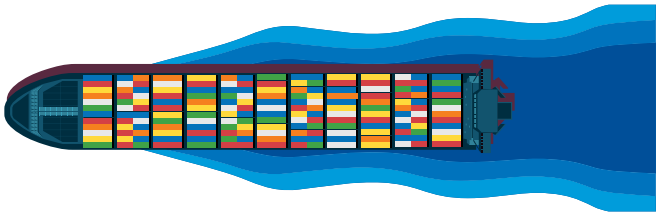


F. Analysing preparedness of the industry & evolving optimal strategy

With the potential shipbuilding load in the pipeline, the next logical step is to analyse the preparedness of the industry to meet this load and evolve the right strategy to ensure the same is achieved. Taking cognizance of the Indian shipbuilding industry's current environment, it is analysed using the Porter's five forces model as shown in Figure 3-7. In the analysis, the bargaining power of the single buyer (GoI/Navy) is compared to the bargaining power of the seller (shipyards), while assessing the threat from new-entrants and substitutes. The following illustration summarises the analysis and the conclusions drawn are elaborated subsequently.

Fig 3-7: Industry structure analysis using Porter's five forces model[3]





Over dependence on defence shipbuilding and the non-existence of any meaningful commercial orders renders the market monopsonist. Therefore, the bargaining power on the buying side outweighs the selling side, which limits the scope of balanced competition. Additionally, despite attempts to encourage competitive defence shipbuilding with involvement of many private players, scope of any new entry to the competitive scenario is very limited given the distributed and disproportionate presence, further discouraged by the fact that many existing players have already been driven to severe financial constraints. The demand for naval vessels is inelastic and specific, rendering no opportunity for any substitutes. The possible substitute options of importing warships or unduly extending the service life of existing platforms is not a tangible option. Further, despite the high bargaining power, there are very limited choices (with required capability) available to the buyer. In such an unbalanced scenario, the monopsonist market pushes the industry towards consolidation.

Similar monopsonist scenarios for defence shipbuilding have resulted in other advanced nations, as a consequence of waning commercial shipbuilding and several shipyards being forced to compete in defence shipbuilding. An analysis of these similar resultant monopsonist markets in other advanced nations also reveals that the monopsony pushes the industry automatically towards consolidation.

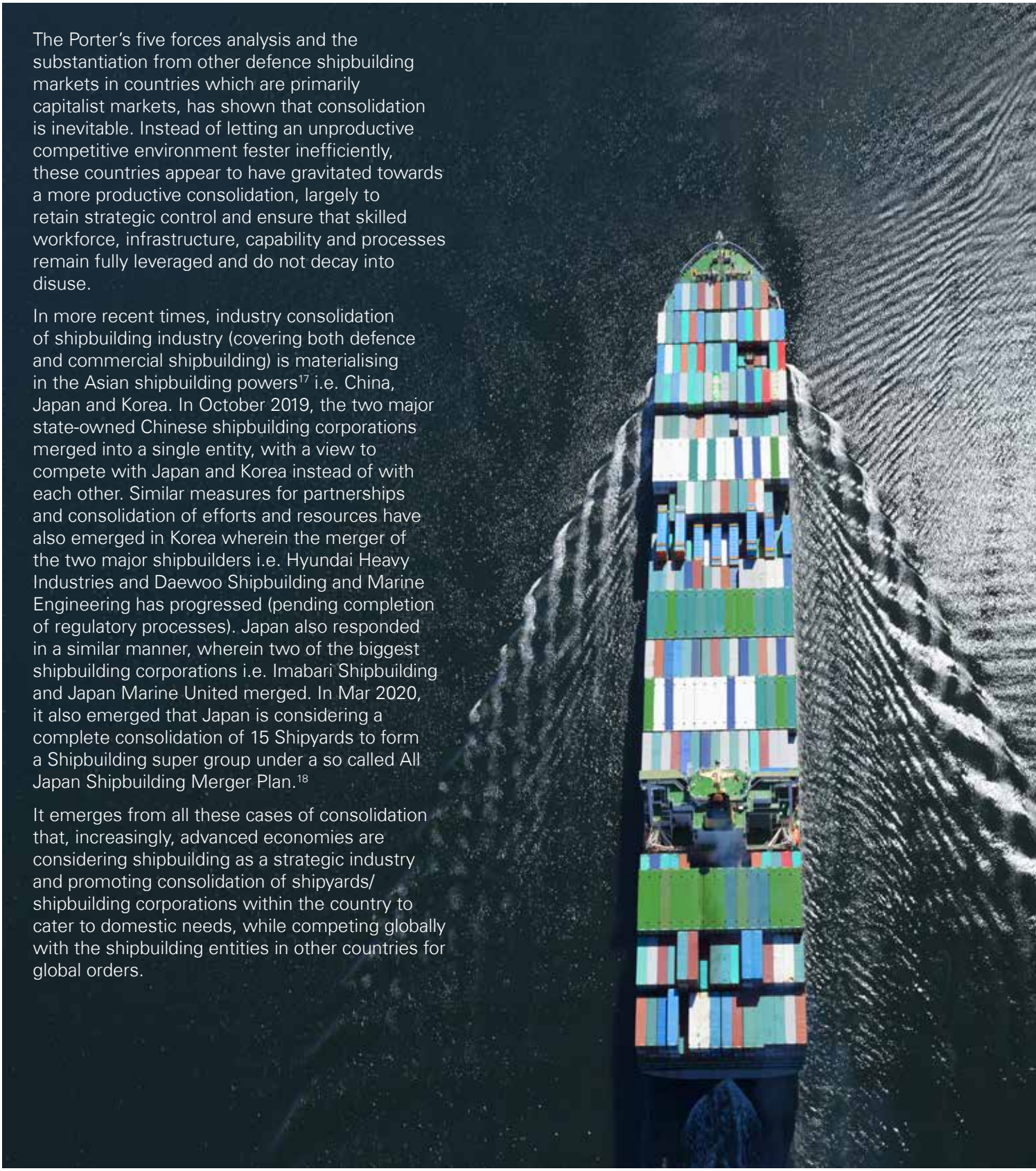
Table 3-2: Monopsony and consolidation in defence shipbuilding in Western nations

 **UK**	M/s BAE has consolidated into one company after a series of mergers and acquisitions of several shipyards/companies in the last two decades. UK Ministry of Defence (MoD) has a long-term agreement with M/s BAE for all defence shaipbuilding requirements. Similarly, M/S BABCOCK – has consolidated into one company that enjoys ship repair monopoly in UK.[13]
 **USA**	Several erstwhile shipyards have closed down and surviving yards have consolidated between two major companies, with major shipbuilding/ submarine building load divided between them. The US Government keeps both production lines active by distributing work consciously. M/s General Dynamics M/s Huntingdon Ingalls (Formerly Northrop Grumann) Also, there are two new entrants which are foreign companies establishing their facilities in US for ships which are less complex i.e. M/s Austal, Australia and M/s Marinette Marine, Italy.[14]
 **France**	NAVAL Group (formerly M/s DCNS) enjoys a monopoly in French Defence Shipbuilding. The French Govt holds a majority stake (62.4 per cent) in this company.[15]
 **Italy**	M/s Fincantieri enjoys a monopoly in Italian defence shipbuilding. CDP Industria SpA, a holding company controlled by the Italian govt (Ministry of Economy and Finance) is its majority share holder and holds 71.6 per cent of the Company's share capital.[16]

The Porter's five forces analysis and the substantiation from other defence shipbuilding markets in countries which are primarily capitalist markets, has shown that consolidation is inevitable. Instead of letting an unproductive competitive environment fester inefficiently, these countries appear to have gravitated towards a more productive consolidation, largely to retain strategic control and ensure that skilled workforce, infrastructure, capability and processes remain fully leveraged and do not decay into disuse.

In more recent times, industry consolidation of shipbuilding industry (covering both defence and commercial shipbuilding) is materialising in the Asian shipbuilding powers[17] i.e. China, Japan and Korea. In October 2019, the two major state-owned Chinese shipbuilding corporations merged into a single entity, with a view to compete with Japan and Korea instead of with each other. Similar measures for partnerships and consolidation of efforts and resources have also emerged in Korea wherein the merger of the two major shipbuilders i.e. Hyundai Heavy Industries and Daewoo Shipbuilding and Marine Engineering has progressed (pending completion of regulatory processes). Japan also responded in a similar manner, wherein two of the biggest shipbuilding corporations i.e. Imabari Shipbuilding and Japan Marine United merged. In Mar 2020, it also emerged that Japan is considering a complete consolidation of 15 Shipyards to form a Shipbuilding super group under a so called All Japan Shipbuilding Merger Plan.[18]

It emerges from all these cases of consolidation that, increasingly, advanced economies are considering shipbuilding as a strategic industry and promoting consolidation of shipyards/ shipbuilding corporations within the country to cater to domestic needs, while competing globally with the shipbuilding entities in other countries for global orders.



Indian DPSU/PSU shipyards, though operating as independent business entities, effectively function as a consolidated shipbuilding resource owing to common government control, with major defence shipbuilding load largely distributed between them. The signs of thinning of the competitive base with winding down of many entities and subsequent consolidation by the remaining entities is already evident in India. It may therefore be prudent to facilitate this consolidation to balance the buyer monopsony, while also regulating it to avoid any scope for monopolistic pricing. In any case, even though there may be concerns of monopolistic pricing , it should be borne in mind that since about 60-65 per cent of value addition comes from a largely free market shipbuilding ancillary industry outside the shipyards, competitive price discovery for at least 65 per cent of a ship's value can be ensured.

A viable strategy would therefore be to adopt an organised and regulated consolidation of the industry, in terms of efforts, skills and capacities, by distributing and collectively meeting the demand using all available resources optimally. In fact, it may be prudent to try and replicate the extremely successful model that the Indian Navy, along with DPSU shipyards, has institutionalised for defence shipbuilding. The Indian navy's systematic approach for achieving self-reliance is evolved around a sound plan by way of its Maritime Capability Perspective Plan for ship and submarine acquisitions, over a 15-year horizon. This plan is then systematically executed by the Navy's Controllerate of Warship Production and Acquisition, with its inhouse design directorates/ production directorates and warship overseeing teams stationed in various shipyards, ably supported by a host of quality assurance establishments and Navy's own trial agencies.

It may therefore be prudent to establish an empowered body to ensure consolidation of efforts and prudent distribution of load, besides regulating and strengthening the industry. This empowered body can aid the industry's growth in a systematic manner, through all the stages of planning and executing projects to meet India's shipping and consequent shipbuilding needs holistically.

4 Conclusion and recommendations

This broad macro level study and analysis clearly highlights the potential of the shipbuilding industry to contribute significantly towards boosting local industry/ MSMEs, generating employment and aid economic growth, besides strengthening India's maritime presence and ensuring energy and national security. There are structural and capability related issues that hamper the growth of shipbuilding, and the lack of orders in commercial shipbuilding with resultant overdependence on defence shipbuilding is central to all the other issues. In addition to measures on the supply side such as subsidy and long-term financing at low interest rates, it is important to evolve policies to address the demand side.

It therefore emerges that the commercial shipping industry also needs a national focus, both for its own growth and as a potential source of demand for shipbuilding. Shipping and shipbuilding are fundamentally interlinked, with the Indian naval fleet, India's merchant marine fleet and the shipyards forming key components of India's maritime infrastructure. This strategically important maritime infrastructure would need to be addressed as a whole.

In a defence shipbuilding dominated monopsonist scenario, consolidation is inevitable. It may therefore be prudent to embrace and facilitate some form of consolidation of the shipbuilding industry in a regulated, systematic manner. It would be in the nation's interest to consider setting up an empowered authority to facilitate this consolidation, address the structural issues on both the demand side and supply side, and evolve a mechanism for judicious distribution of load to ensure optimal utilisation of resources. From the analysis, it emerges that the strategy that would need to be adopted over the next 10 year horizon (Figure 4-1) should focus on creating demand for commercial shipbuilding locally to leverage the economic benefits of the same and also use this as an opportunity to strengthen long term capability of the industry as a whole.

Fig 4-1: Road map & strategy for shipbuilding industry for the next 10 years

Flow chart highlighting road map & strategy for shipbuilding industry for the next 10 years

1. Create Local/Domestic Demand for Commercial Shipbuilding
2. Consolidate & Strengthen Shipbuilding Resources required for both Defence and Commercial Shipbuilding
3. Judiciously distribute shipbuilding load to ensure optimal utilisation of resources and timely delivery of arequired ships, both naval as well as commercial
4. Use the local demand also as an opportunity to build up long term capability in the next 10 years to become competent internationally
5. With established capabilities, systematically target export market for defence and commercial shipbuilding and increase India's Share in global market

This macro level analysis should be followed by a more systematic "deeper dive" study of the shipbuilding industry to examine the details and issues of the industry's structure, functioning, the role of various stakeholders on both the demand side and the supply side. This would be an essential precursor to the setting up of an empowered authority that has been recommended.

Recommendations

1 Setting up an empowered authority for strengthening India's maritime infrastructure

Shipbuilding industry's link to India's commercial shipping and the need to address the two interlinked industries holistically as India's "maritime infrastructure", is obvious. Setting up an empowered national level authority for holistically strengthening and regulating India's maritime infrastructure, is recommended, with active participation of the MoD, MoS and other stakeholders. Some of the key roles, focus areas and measures recommended for this national authority are enumerated below.

2 Policy measures on the shipping side to stimulate shipbuilding demand

Akin to Indian Navy's maritime capability perspective plan for its fleet, the authority should evolve medium term and long-term plans for India's sea trade capabilities, with specific plans for new acquisitions for capacity enhancement and timely replacement of ageing ships. Complimentary policy measures such as capping service life of commercial ships can also be considered to avoid fait accompli situations involving an overaged fleet, with a consequent need for undue life extensions which come with several associated risks.

As a starting point, policy measures need to be examined and implemented to strengthen India's commercial fleet with a significant increase in size of both the overseas fleet and the coastal fleet, (roughly amounting to tripling of the fleet capacity) in the next five to 10 years. Policy measures should focus on incentivising cargo movement on Indian owned Indian built ships and also mandating construction of such ships at Indian shipyards. These policy measures are vital to increasing India's share in its own sea trade, enhancing energy and economic security and improving transport efficiencies, besides creating vital demand for indigenous shipbuilding.

Role of authority for strengthening the supply side

1. The authority should take concrete steps for establishing shipbuilding and commercial shipping as a strategic sector. A key role of the authority would be to evolve a business model/structure for consolidating shipbuilding resources, efforts and act as an authority for evaluating and distributing shipbuilding work judiciously to ensure optimal utilization of all available resources. The authority should identify specific measures to facilitate holistic long-term build-up of capability, distributed across all entities in the industry.
2. Another important role would be to set up avenues for low interest funding of shipyards and associated industries to aid in the efforts of consolidation, enhancing shipbuilding Infrastructure and for facilitating easy availability of working capital. It would be prudent for the authority to consider adapting/replicating the ecosystem created for defence shipbuilding by the Indian Navy and the DPSU shipyards, to cover all shipbuilding. In this regard, it would be fruitful to actively involve the Indian Navy, particularly its shipbuilding set up with a vast array of professionals, to assist in establishing the authority and aid in its functioning.
3. The authority should co-ordinate with the Ministry of Skill Development and Entrepreneurship (MSDE) for evolving medium term and long-term skill development initiatives to widen base of the specific skilled manpower i.e. both blue collar and white collar required for shipbuilding. In this regard, it would again be prudent to tap/replicate the eco system that exists in the Indian Navy and DPSU shipyards for skill development and sustenance i.e. training partners, apprentice schools etc.
4. In order to optimise the resources, the authority should consider evolving standard product lines, common designs and related build strategy for construction to ensure quick, assembly-line-like production of ships with maximum use of modular multi location construction techniques to improve production efficiency.
5. The authority should institutionalise a mechanism for carrying out vendor identification, indigenisation of shipboard equipment, commonality identification for defence & commercial shipboard equipment and evolving efficient supply chain.
6. Attracting and promoting investment both for shipbuilding and Indian owned commercial shipping should be facilitated by the authority through international tieups/ partnerships for technology/ process upgradation etc. for enhancing capability to build.
7. Building up capacity & capability of the Indian industry should be a key focus area of the authority, by using the domestic demand to improve international competitiveness of industry. This would be crucial when the international commercial shipbuilding cycle demand picks up again in the next 10 years.
8. The authority should evolve long term strategies for increasing India's global shipbuilding market share considerably and act as a centralised business development unit for Indian shipbuilding industry for export of both defence as well as commercial ships.

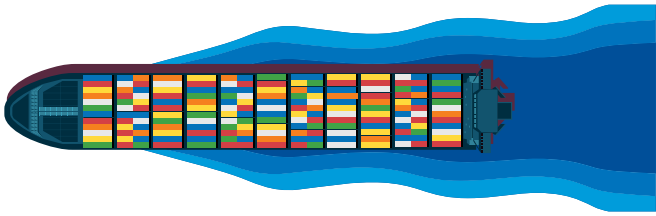
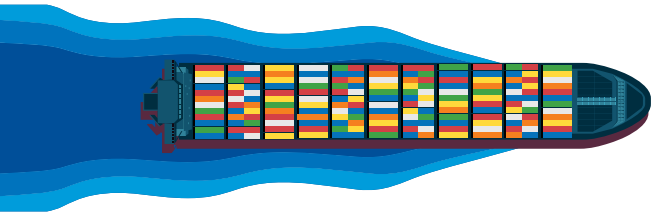


Table of abbreviations

ASW	Anti-Submarine Warfare
CGT	Compensated Gross Tonnage
DPSU	Defence Public Sector Undertaking
DWT	Dead Weight Tonnage
EEZ	Exclusive Economic Zone
FAC	Fast Attack Craft
FRP	Fibre Reinforced Plastic
IAC	Indigenous Aircraft Carrier
IOR	Indian Ocean Region
IWAI	Inland Waterways Authority of India
LCU	Landing Craft Utility
MoD	Ministry of Defence
MoS	Ministry of Shipping
MSDE	Ministry of Skill Development and Entrepreneurship
MTPA	Million Tonnes Per Annum
NCLT	National Company Law Tribunal
OPV	Offshore Patrol Vehicle
PSU	Public Sector Undertakin



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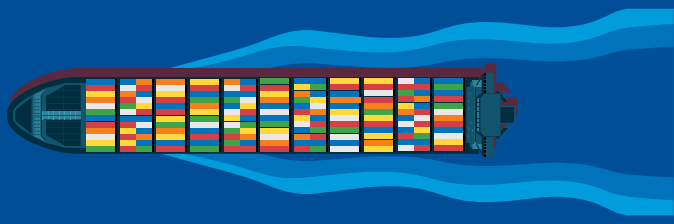

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