



Capital Goods in India

A Call for Action

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Foreword

A robust manufacturing sector is an essential element of the Indian growth story. It is particularly important in ensuring employment for a large and growing working age population. Manufacturing, currently at 15% of GDP, needs to grow at a rate ~2-3% higher than GDP, in order to make a significant contribution to our economy and towards employment generation. The capital goods sector is of strategic importance in enabling robust manufacturing sector growth. Recognising this, the planning commission has targeted a 5% higher growth in the capital goods sector during the 12th plan, compared to the 11th plan period.

While domestic demand has grown at a robust pace in several sectors, domestic capital goods manufacturers have not been able to catch-up with this surge, leading to an increasing dependence on imports, across market segments. Large Indian demand in the capital goods sector provides an able platform to scale up, potentially catapulting Indian players for a larger role in global markets.

While the industry, government and end users of capital goods equipment have high aspirations for the next five year plan, meeting these goals entails collective action from policy makers and industry to build competitiveness for Indian industry. We need to move towards a more collaborative approach with end users, a greater focus on formation of manufacturing clusters for improved economics, sustained efforts to bridge the technology gap between Indian and global players, supported by an enabling infrastructure for capital goods manufacturers at large.

We capture in this report some of the challenges and opportunities ahead of us in the sector today, but more importantly, we present a call for action for all of us in the industry, as well as for the policy makers. Let us all strive to act on this call for action, to ensure a vibrant capital goods sector continues to remain the manufacturing growth engine for India in the years ahead!

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Executive Summary

Indian economy is expected to grow between 8–9 per cent in the medium term. Growth of this nature can be sustained over a long period only by ensuring that the manufacturing sector also grows robustly and is competitive on a sustainable basis. Currently, the manufacturing sector accounts for ~15% of GDP. During the 12th five year plan it is targeted that manufacturing sector should grow at a rate ~2-3% higher than overall GDP growth rate in order for it to have the desired economic contribution.

Capital goods sector is of primary importance for the growth of manufacturing in India. It is a large and diverse sector with a market of ~ INR 3,12,000 Cr in 2010–11. It contributes ~12% to total manufacturing activity which translates to about 1.8% of GDP. The sector is a major employment driver, with close to 14,00,000 people employed across industries comprising capital goods. In recognition of this fact, the Planning Commission of India has set forth an ambitious growth target for the sector in the 12th five year plan, with a growth aspiration almost 5% faster over the previous plan period.

However, in recent years, production of capital goods sector has not grown fast enough to match the pace of domestic demand leading to a growing dependence on imports. Further, in a globalised world, where manufacturers are increasingly multinational, not all Indian capital goods manufacturers have been able to effectively tap the global opportunity. India's share of global capital goods exports remains much lower than several other leading countries, despite a well developed domestic capital goods sector.

Achieving higher growth going forward would need collective efforts by both policy makers and industry directed at four key areas. The first focus area is to leverage the large domestic demand effectively to drive expansion of domestic production. This would require significant coordination between the end user industry and the capital goods sector. Policy makers could also leverage domestic demand to drive rapid technology transfer and localisation to grow the local manufacturing base. The second focus area is building competitiveness in manufacturing to effectively compete against cheaper imports and cater to new global markets. This would require harmonisation of tax, duty structures and rationalisation of Free Trade Agreements (FTAs) to ensure a level playing field; ensuring factor costs are globally competitive; and drive cost efficiency through the creation of manufacturing clusters. The third focus area is bridging the technology divide that exists between Indian manufacturers and global competitors. Overcoming this challenge would require greater incentives for R&D, investments in building the technology infrastructure, as well as promoting strategic acquisitions by Indian manufacturers to plug gaps. The fourth and last focus area is expanding the global play of the Indian capital goods sector. This requires investments in export promotion and marketing infrastructure as well as promoting strong domestic companies to become global challengers.

We propose a 10 point action agenda for the capital goods sector that will enable policy makers and industry to achieve the above aspirations.

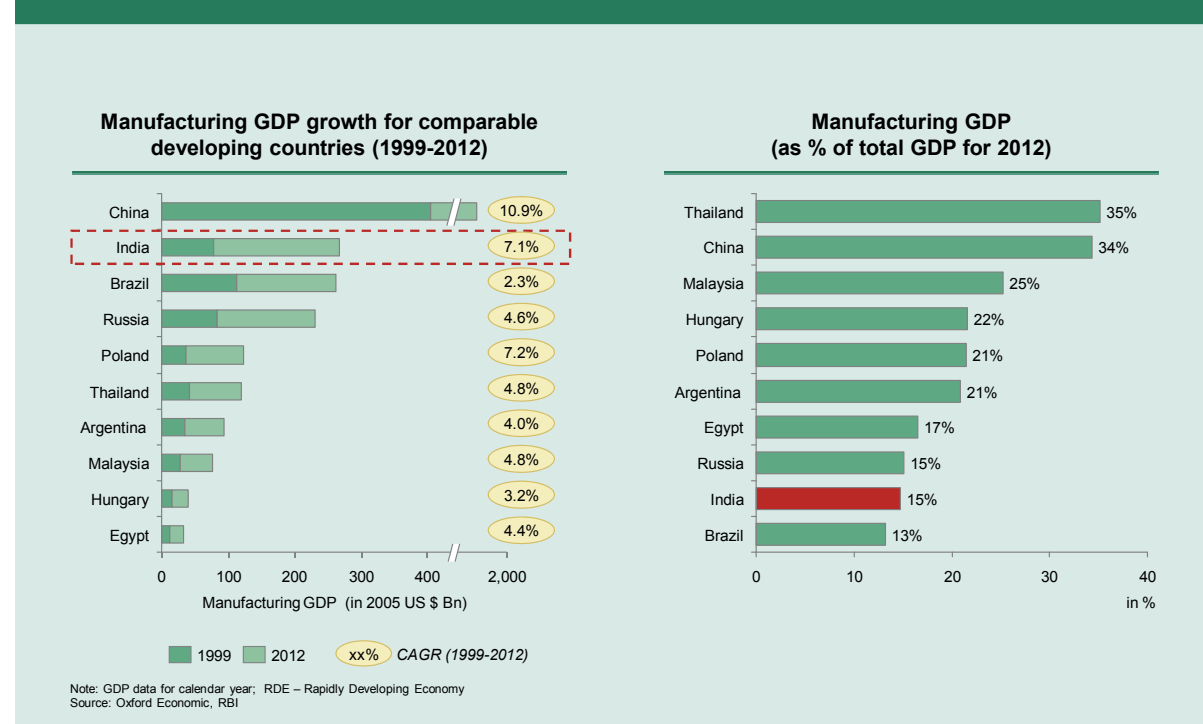
1. Leverage Indian demand to nurture and develop scale for local industry
2. Promote collaboration between end-user industry and capital goods manufacturers
3. Use domestic demand as a lever to trigger localisation and enable technology transfer
4. Create a level playing field between imports and domestically manufactured goods
5. Develop clusters for cost competitiveness, shared facilities and local supply chains
6. Invest in developing a broader pool of skilled manpower
7. Incentivise private sector investment in technology and innovation
8. Identify acquisition opportunities overseas to plug technology gaps
9. Promote exports through financial support and soft promotion policies
10. Rejuvenate, nurture and promote Indian PSU champions

1. Capital Goods – Where we are and where we want to be

1.1. Overview of capital goods sector in India

India has been one of the fastest growing economies in the world over the last decade. During this period manufacturing sector has exhibited a growth rate of ~7%, and has been a strong contributor to overall GDP growth. However GDP contribution of manufacturing at ~15% is still low when compared to other developing countries. This promises a significant upside for manufacturing in the coming decades, provided the fundamental enablers to create a vibrant manufacturing ecosystem are in place.

Exhibit 1. Indian manufacturing industry has shown robust growth, however share of GDP lower than other RDEs



Capital goods sector is of strategic importance for the Indian economy. It has a multiplier effect on overall economic growth as it facilitates faster growth for a broad base of user industries by providing critical inputs, i.e. machinery and equipment necessary for manufacturing. Therefore, the development of domestic capabilities in capital goods sector is essential to ensure self reliance, as the sector directly or indirectly influences core infrastructure development within India.

Capital goods and engineering sector comprises of plant machinery and equipment required for manufacture or production of goods, including those required for replacement, modernisation, technological upgrade and expansion of manufacturing facilities.

It is a large and diverse sector in India with a market size of INR 3,12,000 Cr in 2010–11 and a domestic production of INR 2,68,000 Cr. It contributes ~12% to total manufacturing activity which translates to about 1.8% of GDP. The sector is a major employer, with close to 14,00,000 people employed across various sub-sectors.

Capital goods can be divided into nine broad sub-sectors viz. heavy electrical equipment; engineering goods; process plant equipment; earth moving equipment; dies, moulds and tools; textile machinery; machine tools; metallurgical machinery and plastic processing machinery.

Exhibit 2. Capital goods market has grown by 50% during 11th plan period

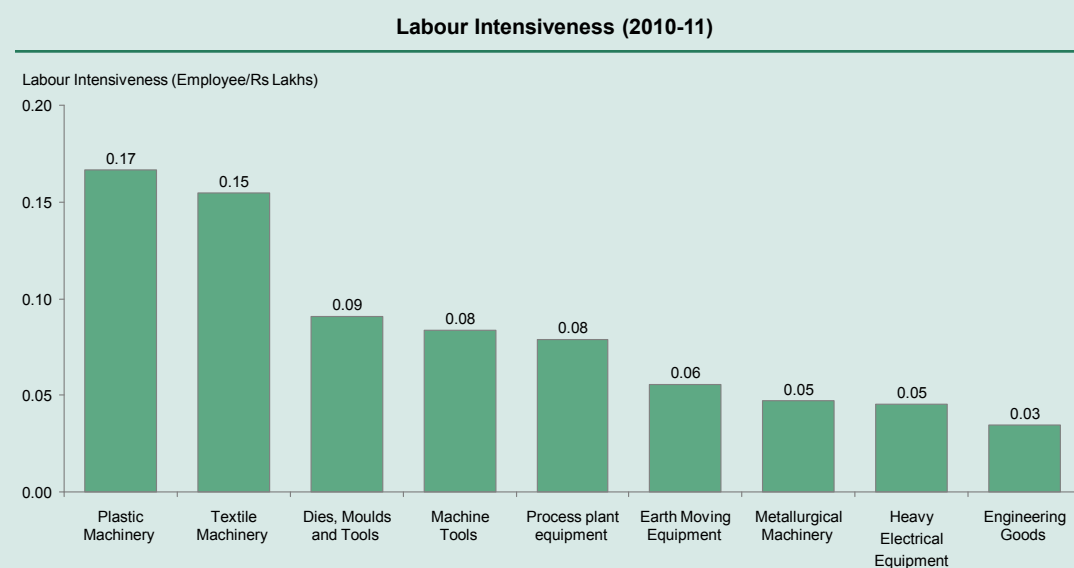
Capital Goods and Engineering Market from 2007-11 (Rs '000 Cr)

Sub-sector	2007	2011	CAGR
Heavy Electrical Equipment	68.1	121.4	16%
Engineering Goods	79.7	116.5	10%
Process plant equipment	10.5	16.3	12%
Earth Moving Equipment	9.2	14.5	12%
Dies, Moulds and Tools	8.0	13.2	13%
Textile Machinery	12.2	10.5	-4%
Machine Tools	7.2	10.2	9%
Metallurgical Machinery	2.2	5.0	23%
Plastic Machinery	1.2	3.9	34%
Total	198.3	311.5	12%

Source: Report of the Working Group on Capital Goods for the 12th Five Year Plan

Among these sub-sectors, heavy electrical equipment and engineering goods are the largest and fastest growing sub-sectors with a market size of INR 1,21,000 Cr and INR 1,16,000 Cr respectively; together they constitute ~ 75% of capital goods market in India. Labour intensity varies across the sub sectors with plastic machinery and textile machinery being the most labour intensive.

Exhibit 3. Plastic and Textile machinery are the most labour intensive sub-sectors



1.2. Performance of sector in the 11th Plan

While capital goods market in India as a whole grew at ~12% during the 11th Five Year Plan (2007-08 to 2011-12) domestic production followed closely with a growth of ~11.5%. Businesses active in the sector also performed well at the stock markets, with Capital Goods Index outperforming BSE Sensex over the last half decade (2006 to 2011).

One trend that is of concern is the increasing dependence on imports in the sector. Imports today address ~30% of domestic demand for capital goods with the proportion being significantly higher in "critical components" segment for each sub-sector. Earth moving equipment, machine tools and metallurgical machinery are sub-sectors that are particularly weak in self reliance with more than half of the demand being met by imports.

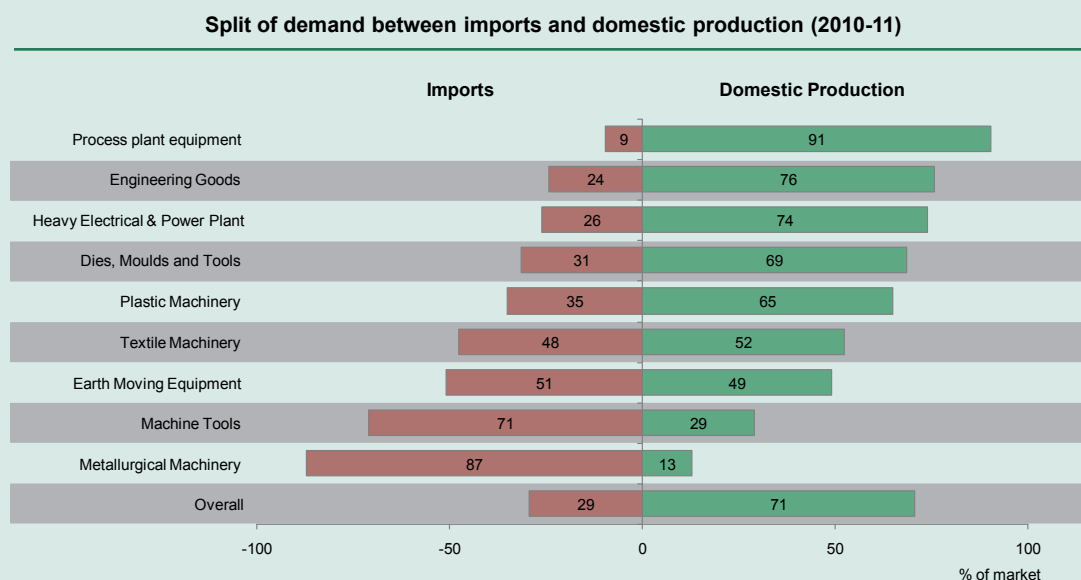
During the 11th plan period, imports grew their share in meeting the domestic demand over time. On an average imports grew faster than the market for every capital goods sub-sector, barring metallurgical machinery and dies, moulds & tools, for the period 2005-11.

In global trade, capital goods have emerged as a promising opportunity in recent years. However, Indian share in global exports is still low, ranging between 0.1% and 0.6%, across various sub-sectors. In contrast, share of global exports for China ranges between 7.7% and 16.3% depending on sub sector.

Overall, Indian exports grew at a healthy rate of ~13%. Amongst the sub-sectors, heavy electrical equipment and engineering goods drove exports, recording export revenues of INR

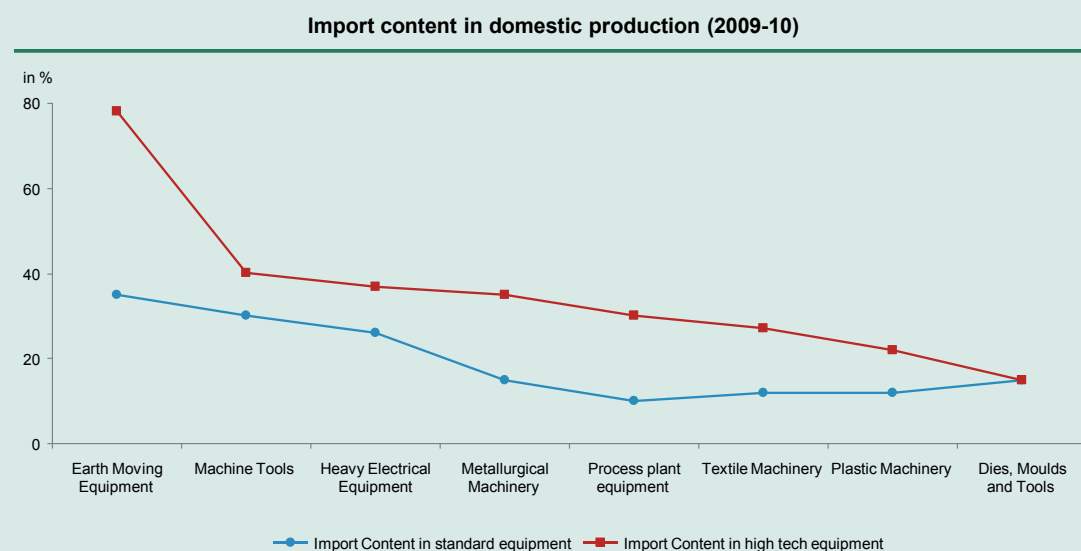
~20,000 Cr and export growth rates of ~18% per annum and ~13% per annum respectively over the last plan period.

Exhibit 4. Three sub-sectors with >50% demand met by imports



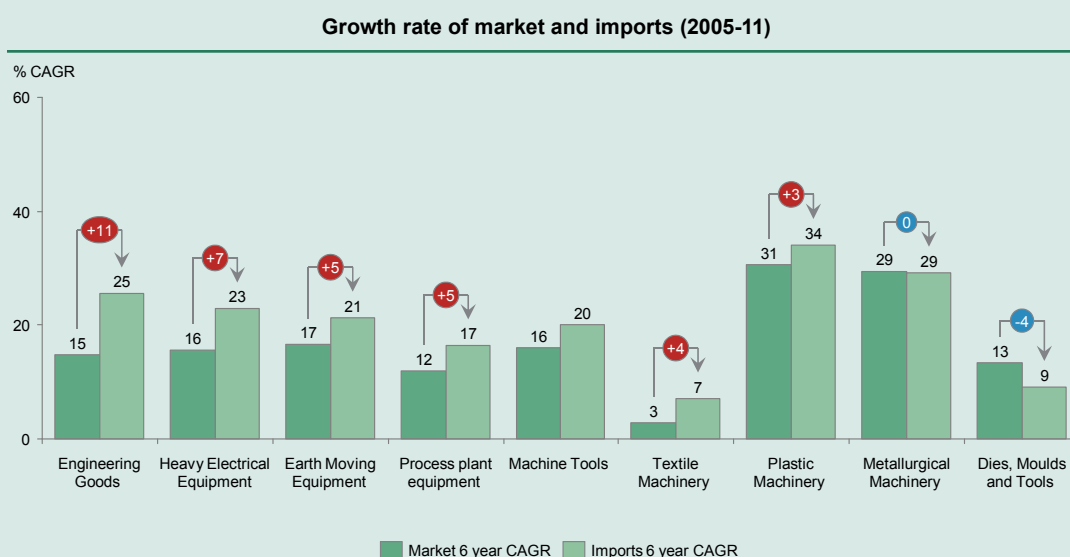
Source: Report of the Working Group on Capital Goods for the 12th Five Year Plan

Exhibit 5. Import intensity more pronounced in high-tech equipment across sub-sectors



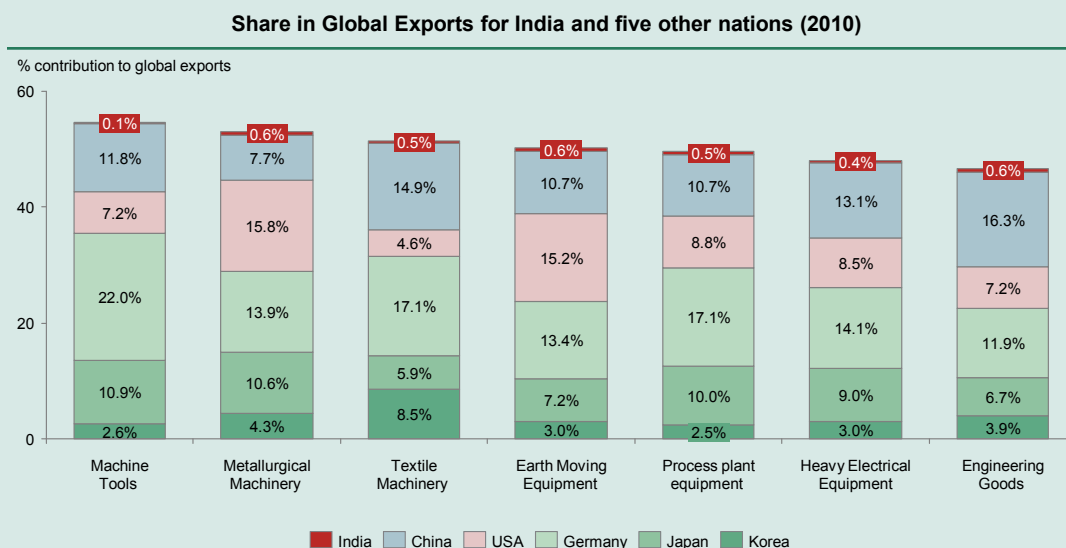
Source: Report of the Working Group on Capital Goods for the 12th Five Year Plan

Exhibit 6. Imports gaining market share over domestic manufacturers across most sub-sectors



Source: Report of the Working Group on Capital Goods for the 12th Five Year Plan; TMMA; IMTMA; DHI

Exhibit 7. Share of Indian manufacturers in global exports is low across capital goods sub-sectors

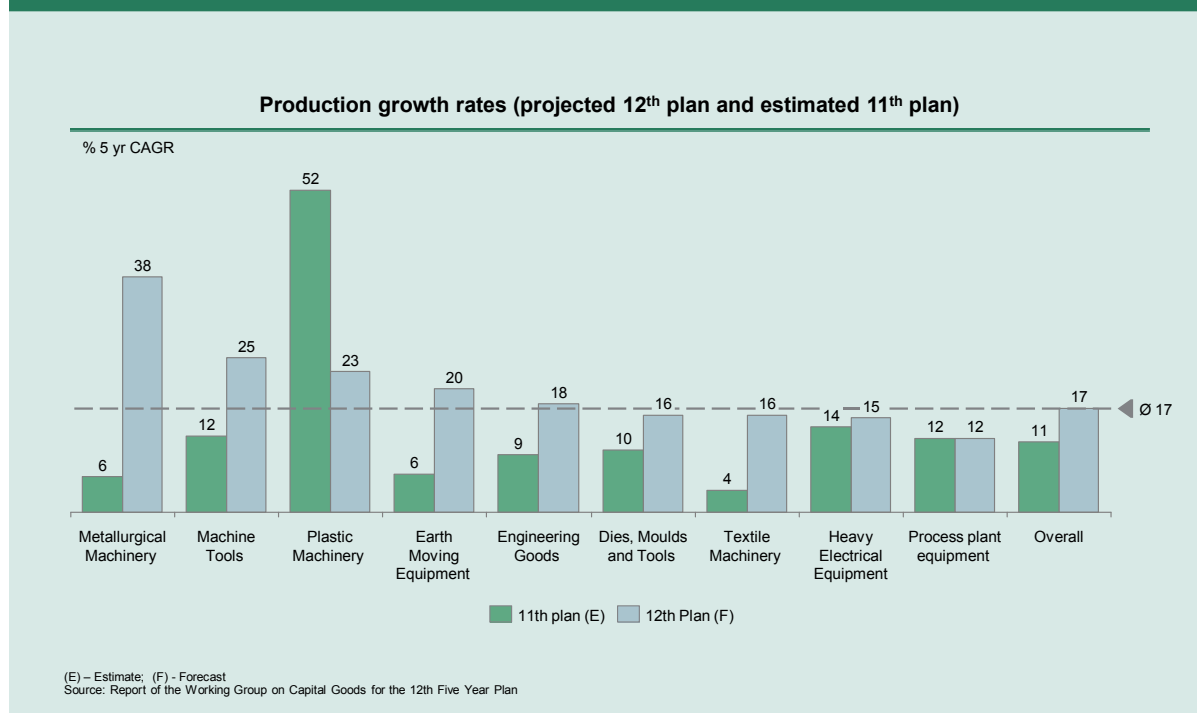


Note: All analysis is done for selected products in the sub-sector
Source: UN Comtrade

1.3. Four key themes to drive future growth

The growth aspiration set by Planning Commission for the 12th Five Year Plan (2012-13 to 2016-17) requires a significant step-up in performance. On average, the sector needs to grow 5% higher than the previous plan period in production terms, to achieve 12th plan targets i.e. a growth of 17%. As this aspiration seeks to build upon robust growth during the previous plan period, it represents an ambitious goal.

Exhibit 8. Sub-sector production needs to grow, on average, at a rate 5% higher during the 12th plan over the 11th plan



We have outlined four key themes that government and industry need to focus on to drive the next level of growth in capital goods:

1. Leveraging Indian end user demand to drive localisation and manufacturing scale
2. Harmonisation of tax, duty structures, FTAs and building domestic factor cost competitiveness
3. Bridging the technology gap and increasing the depth of capabilities of domestic capital goods manufacturers
4. Focus on globalisation and building "Indian Champions" to tap into global markets

2. Indian demand – A powerful growth engine

2.1. Strong growth projections in 12th plan for capital goods

The 12th five year plan has set a high growth target for Indian manufacturing industry as a whole and capital goods sector in particular. The 12th plan has targeted an average GDP growth of ~9% and expects the share of manufacturing to increase. This translates in to a growth of 11-13% per annum for the manufacturing sector. Capital goods sector is projected to grow to a market size of INR 7,71,000 Cr at a growth rate of ~16-18% annually by the end of the 12th plan. Planning Commission also expects capital goods sector to generate 13,30,000 additional jobs by the end of the same period. This additional job creation goal is almost equivalent to the size of the current workforce employed in the sector.

Growth in capital goods is supported by a large number of big ticket projects that are expected to be commissioned in the 12th plan, requiring a significant expansion of the sector. For instance the Planning Commission has set a target of adding ~70-80,000 MW of power generation capacity which will drive a strong demand for heavy electrical equipment. The domestic production of coal, which is expected to continue to be a major source of power in coming years and a critical raw material for the iron and steel industry, is expected to touch ~750 million tons by 2017; this will in turn drive the demand for earth moving equipment sub-sector during the 12th plan. Likewise, the prospects for other capital goods sub-sectors are equally bright as the Indian growth story at plays out.

The 12th plan period represents a significant opportunity, as well as a challenge for both government and industry in fulfilling the increasing needs of end user industries.

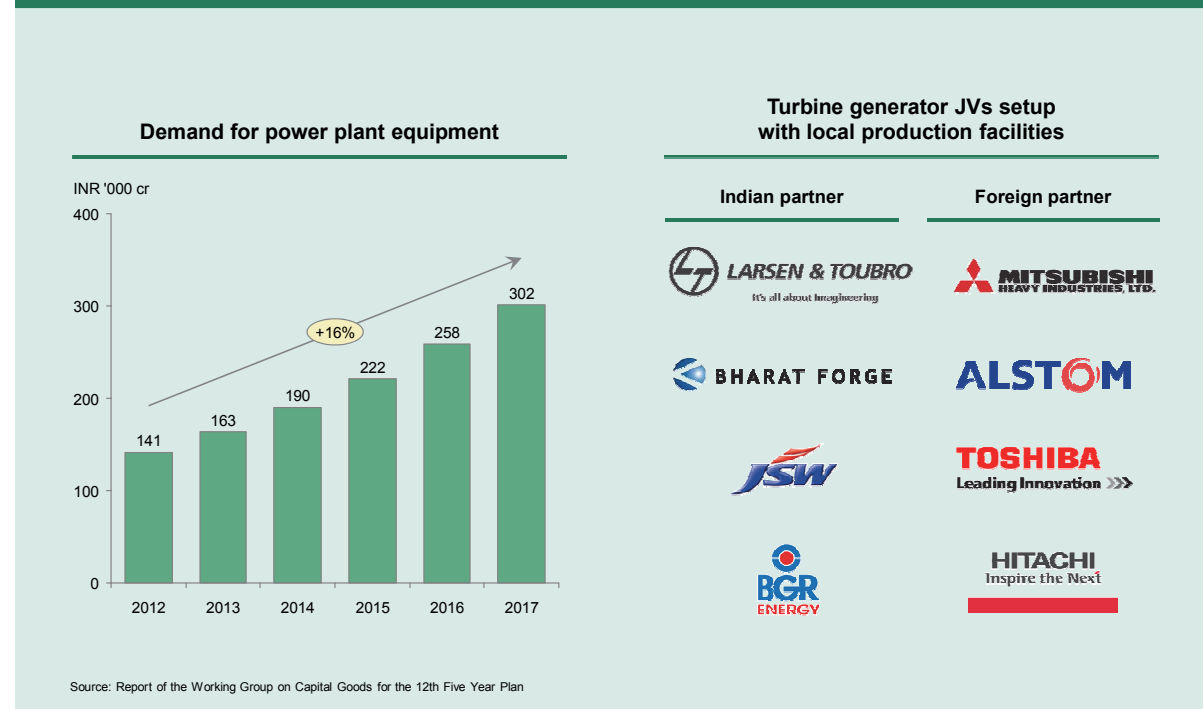
2.2. Collaborate with end user industry to drive growth

Large domestic demand can help build a strong capital goods sector. However it would require significant collaboration between capital goods and end user industries to fully leverage this demand to the sector's advantage. Significant demand for capital goods originates in India, for example, in coal mining alone, average annual investment of ~ INR 10,000 Cr will be expected during the 12th plan, with Coal India driving bulk of the spend. Similarly, India is also projected as one of the fastest growing markets for power equipment over the next decade which would translate to a heavy electrical equipment demand of INR 300,000 Cr by 2017.

A good case in point of collaboration driving local growth is that of the power equipment industry. Close end-user and manufacturing industry collaboration has helped ensure significant investments in domestic power equipment manufacturing capacity build-up. The process started with Ministry of Power aggregating demand and thereafter using it for promoting localisation of supercritical technology, allowing only players with domestic manufacturing facilities to participate in a tender for bulk orders, of National and State utilities. This resulted in multiple JVs, such as those between L&T and Mitsubishi; Bharat

Forge and Alstom amongst others to cater to the demand. Similar efforts replicated in other sub-sectors can potentially unleash significant investments and rapid growth of the capital goods sector in India.

Exhibit 9. Coordination between end users industry and capital goods manufacturers can help address domestic demand locally



2.3. Leverage domestic demand for localisation and technology transfer

China has been extremely successful in building a world class manufacturing sector. Chinese value addition in manufacturing has shown a dramatic rise in the last decade, and is now approaching that of USA. Acquisition of technology and building self sufficiency in capital goods has played a major role in this rise. This has been accomplished through proactive policies, prominent amongst them being a strong procurement policy favouring goods produced within the country.

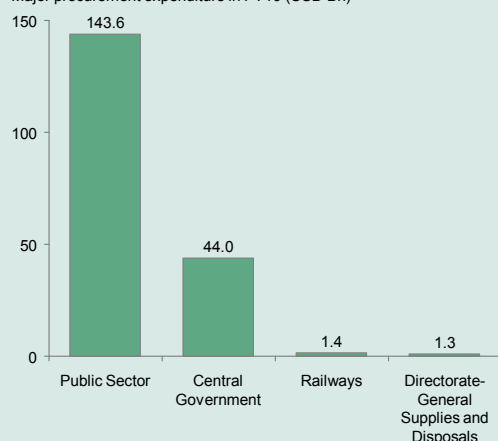
China's public procurement policies clearly lay down a preference for domestic goods with extensive controls over purchase of imported products (requiring several approvals and special procedures). The Chinese government's procurement law clearly spells out that the government shall procure goods, construction and services goods from outside only in the event that *"the goods, construction or services needed are not available within the territory of the People's Republic of China or, though available, cannot be acquired on reasonable commercial terms"* or *"where the items to be procured are for use abroad"*. There is also a clearly stated preference for domestic innovation. Such policies have led to localisation of several capital goods products. Foreign players eager to capture the Chinese market setup production facilities in China through JVs to locally manufacture the goods. At the same time manufacturers were also encouraged to think of ways in which they can acquire technology

to compete against cutting edge products from foreign players. This prompted greater investment in R&D and improved practices to ensure rapid adoption of new technology made available through JVs. Where JVs did not work, global acquisitions to plug gaps in their technology portfolio were also aggressively pursued.

Exhibit 10. Public procurement a lever to promote domestic industry

Public procurement accounts for ~16% of Indian GDP

Major procurement expenditure in FY10 (USD Bn)



Note: Indian GDP is taken as USD 1.2trillion for FY10 in real terms

Source: Public Procurement Report - Policy and Practice within the EU and India, Planning Commission Technology and Depth report, EIU database

Public procurement can be leveraged for domestic value addition

Public procurement can take place in 2 ways:

- Direct purchase of government from industry
- Indirect value addition through provision of a scarce resource under government influence

"Development Contracts" for risk sharing partnership to develop technology with domestic manufacturers

- Readjust "Earlier supply" conditions in tender documents
- Made in India (manufactured and IP in India) and Made for India (manufactured in India with at least 40% local content) products could qualify for such preferential purchases

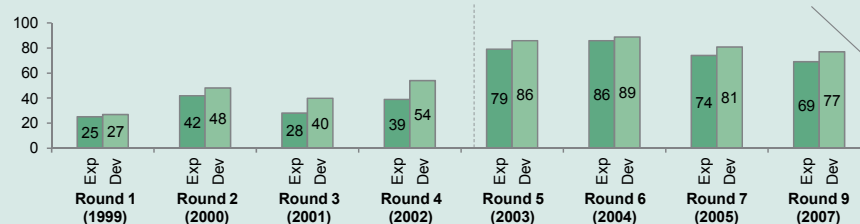
Special provisions in contracts to promote indigenous products, e.g.

- Indigenous innovation products may enjoy additional boost in technical and price evaluation
- Share of purchase by all Government departments can be mandated from local manufacturers

Exhibit 11. Petrobras took extraordinary steps to increase local content requirements

Local content required by successive Brazil ANP licensing round

% of local content



2003 – Lula elected "Everything which can be done in Brazil should be done in Brazil"

Petrobras has to pay severe penalties to the Brazilian Petroleum Agency if they do not comply with the minimum local content requirements

Staged, long-term contracts offer necessary time and commitment to build capacity in-country

Oct 09 – "Nowadays, we have to import almost 100% of the drilling packages for our platforms. **What we are trying to accomplish is to require the local content step by step**...drilling packages on first two drill ships require a Brazilian content of at least 20%, rising to 40% for the third and fourth units... "At the end of the seventh unit, we will have the conditions set to start requiring a minimum 50% of local content for drilling package equipment," he said.

Exceptional investments and commitments made in order to stimulate local industry

"Petrobras may rent the former Ishibras shipyard in Rio de Janeiro ... lease the shipyard at a cost of USD 2.34 million per month for 20 yrs...**the site will need about USD 80 million in investments to bring it up to current shipyard standards**. Petrobras would likely turnaround and sublet to a company that would build platform/ships, rather than operate shipyard"

Commits USD 11.5B in credit lines for potential suppliers

Source: Press search

3. Competitiveness – Driving efficiencies to win

3.1. High factor costs erode competitiveness

Domestic manufacturers often have to bear higher cost structures compared to peers in other competing countries. Reasons range from higher factors costs in power, taxation and lending rates to inefficiencies in manufacturing processes such as dispersed supply chains, lack of standardisation and duplication of facilities. Labour costs are competitive in relation to other Rapidly Developing Economies (RDEs) however the productivity itself has not grown at comparable rates over recent years. China's real manufacturing labour productivity has grown at a ~12.5% CAGR while India has been able to manage only a 7% CAGR over good part of the last decade.

Evaluating other cost heads in manufacturing, one finds that on several factor cost heads while reported costs are low, there are hidden costs which render manufacturing in India disadvantageous. For example, though power costs are almost comparable to other RDEs unreliability of power supply forces Indian manufacturers to use more expensive sources of backup power like generator sets. Similarly, land rates appear to be competitive but after accounting for delays in land acquisitions and dispute settlements, effective land acquisition costs become higher.

Exhibit 12. Asian RDEs better than India on several factor cost heads

Factor cost heads	Units	India	China	Thailand	Malaysia	Indonesia
Land costs¹ (industrial) (2011)	US \$/sq-mt	37	71-87	119	20-25	164-191
Power costs² (2011)	US \$/kWh	0.11 - 0.13	0.13	0.14	0.09	0.08
VAT rate³ (2011)	%	12.5 (~25-30) ⁴	17	7	5 - 25 (sales tax) + 6 (service tax)	10
Lending rate⁵ (2012)	%	12-14.5	6.56	7.32	6.53	12.0
Minimum wage⁶ (2011)	US \$/month	120	199	204	150 - 344	167
Manufacturing productivity of labour⁷(2006)	\$/worker	20,477	26,645	13,871	19,592	21,136

Note: All factor costs are taken at the current market prices for the years mentioned. Factor costs like land costs, labour costs and power costs vary widely across regions within large countries.
1.Data from comparative survey of investment related costs by Japanese External Trade Organization (JETRO). Rates taken are capital values for land in industrial zones in and around key cities. For India – New Delhi; China – Beijing, for Malaysia – Kuala Lumpur, for Thailand – Bangkok, for Indonesia – Jakarta. 2.Power costs are industrial power costs taken from JETRO report for capital cities.
3.Data from JETRO report. VAT rates applicable across the country uniformly; tax rates may not be completely comparable across different countries due to differences in tax structure. 4.Total indirect tax incidence on sales price in India can be as high as 25-30% including entry taxes, cesses etc. 5. For China data from EIU for Apr 2012, other data from ISI Securities - for India (Retail loan rates in Oct 2012), Thailand (Prime Rate – mim loan rate for Apr 2012), Malaysia (Base Lending Rate for Commercial Banks, Apr 2012), Indonesia (Lending rate for Q1 2012). 6. Data from JETRO, data for India is for a skilled worker, rate for Thailand is daily rate converted into 30day monthly rate, for Malaysia rate is for a store staff to general worker. 7.Data taken from EIU market indicators and forecasts.
Source: JETRO 22nd Survey of Investment Related Costs in Asia and Oceania (FY 2011 Survey), April 2012;

However, products manufactured within India purchased by Indian users, despite the higher initial costs outlined above, are often cheaper to own over the lifecycle of the product due to proximity to Original Equipment Manufacturers (OEMs), speed of service and faster access

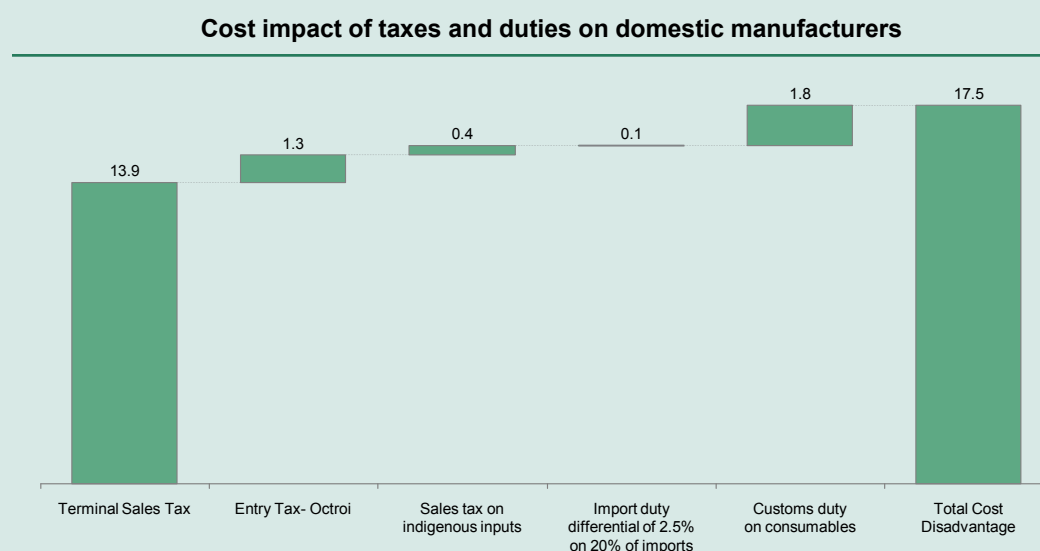
to spares. The advantage offered by proximity and lower costs of transportation can be compelling. The industry needs to proactively highlight this "overall cost advantage" to end customers. For instance, it is easier and much faster to service power equipment manufactured locally in India rather than imported (for example, Chinese) power equipment for which no local support is available. Increasingly, Indian manufacturers must position themselves as partners in business for their end users, assuring desired performance throughout the lifecycle of their product.

3.2. Unequal playing field due to current duty structure and FTAs

Existing tax structures, duties, FTAs and regulations have created an unequal playing field between domestically manufactured goods and imported goods, imposing higher costs on domestic manufacturers. The current system of taxes leads to distortions to the detriment of domestic manufacturers. While the difference varies across states, the overall tax and duty structure can cause a 17% cost disadvantage for domestic manufacturers.

FTAs in certain cases are also creating an undue advantage for global competitors seeking to tap into Indian demand. If corresponding measures for creating a level playing field are not adopted, such as, for example, lower duties for raw materials costs domestic manufacturers will remain disadvantaged. A case in point is duty reductions in plastic machinery equipment such as injection moulding machines where FTAs with ASEAN and South Korea are applicable. Not only are manufacturers in these countries benefitting, but exports from other countries such as China are also routed through FTA countries to secure greater advantage over local manufacturers.

Exhibit 13. Cost disadvantage to domestic players due to adverse tax and duty structure



Source: CII Report on Capital Goods industry, Planning Commission Working Group for Capital Goods, DHI

In the current duty structure for intermediate and finished goods, there are anomalies which at places make components costlier for domestic manufacturers raising their product costs. At the same time import duty on finished goods is lower thereby creating an advantage for imports over domestic products. Several such cases exist in various sectors, and there is need for a review of the overall value chain for harmonisation.

Exhibit 14. Imports becoming advantaged due to tax structure

	TN	AP	Mah	Guj	J&K	All Other
VAT %	12.5%	14.5%	12.5%	15%	13%	5%
Octroi %			2.5%			
ED %	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%
Basic	1	1	1	1	1	1
Total local tax impact	1.24	1.26	1.28	1.27	1.25	1.16
Imported Basic	1	1	1	1	1	1
Customs duty	24%	24%	24%	24%	24%	24%
CENVAT refund	(10.3%)	(10.3%)	(10.3%)	(10.3%)	(10.3%)	(10.3%)
Net Duty impact	1.14	1.14	1.14	1.14	1.14	1.14
Imports cheaper by	10.4%	12.6%	15.1%	13.2%	11.5%	2.1%

Adverse impact on competitiveness of domestic industry

Source: CII Report on Capital Goods industry, Planning Commission Working Group for Capital Goods, DHI

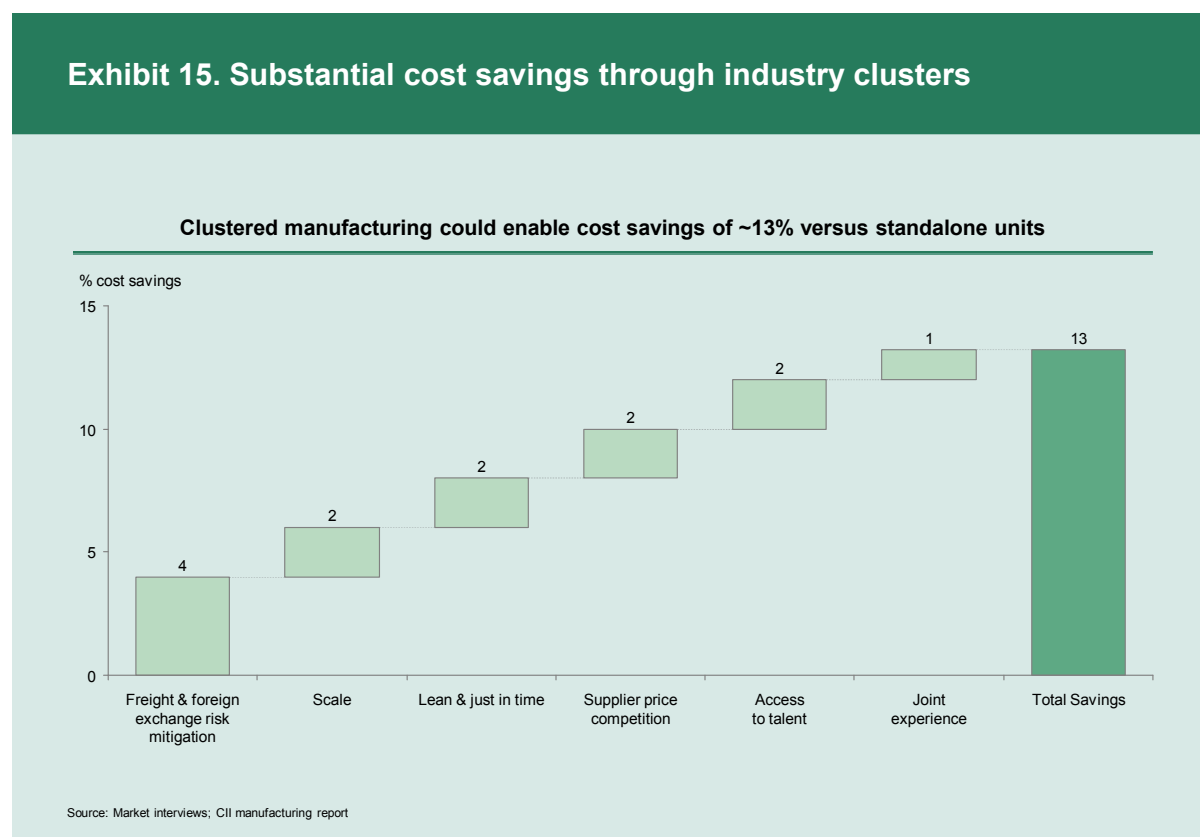
In several sectors the import of second hand machinery is also quite high – as high as 45% (machine tools) and 75% (textile machinery) of production. Policy needs to be shaped to limit import of second hand equipment to provide impetus to local manufacturing.

3.3. Industrial clusters: a possible solution to foster cost efficiencies

Industrial clusters have been proven to have several advantages in promoting the growth of a particular sector or industry. The co-location of several production facilities increases supply chain responsiveness because of manufacturing consolidation near suppliers; time to market comes down as companies become more effective at leveraging vendors within cluster; proximity of suppliers lowers logistics cost; clusters also typically offer better skilled and more concentrated labour pools and hence lower efforts for recruiting talent. Duplication of facilities also raises the overall cost of manufacturing. For instance currently there are only a limited number of Common Facility Centres, which can offer heavy and high precision machining services to users on a chargeable basis and are equipped with advanced testing equipments. As a result a lot of players have to invest independently in testing and machining facilities, raising overall manufacturing costs.

A good example of how cluster development can strengthen an entire sector is the development of the Hard Disk Drive (HDD) cluster in Thailand. These clusters span the entire value chain and success is driven through close collaboration between stakeholders. Leading firms in Thailand came together to form an association for driving development of the cluster. The government made HDD a priority industry and provided incentives and tax exemptions for companies for investing in R&D centres, which further accelerated technological advancements. Universities and companies jointly invested in laboratories and R&D centres. Between 2001 and 2005, Thai HDD value add rose from 30% to 45%, while the number of Thai HDD supporting industries grew by 20%. Thailand's share of the global production of hard disk drives increased from 10% to 33% making Thailand the world's largest HDD exporter.

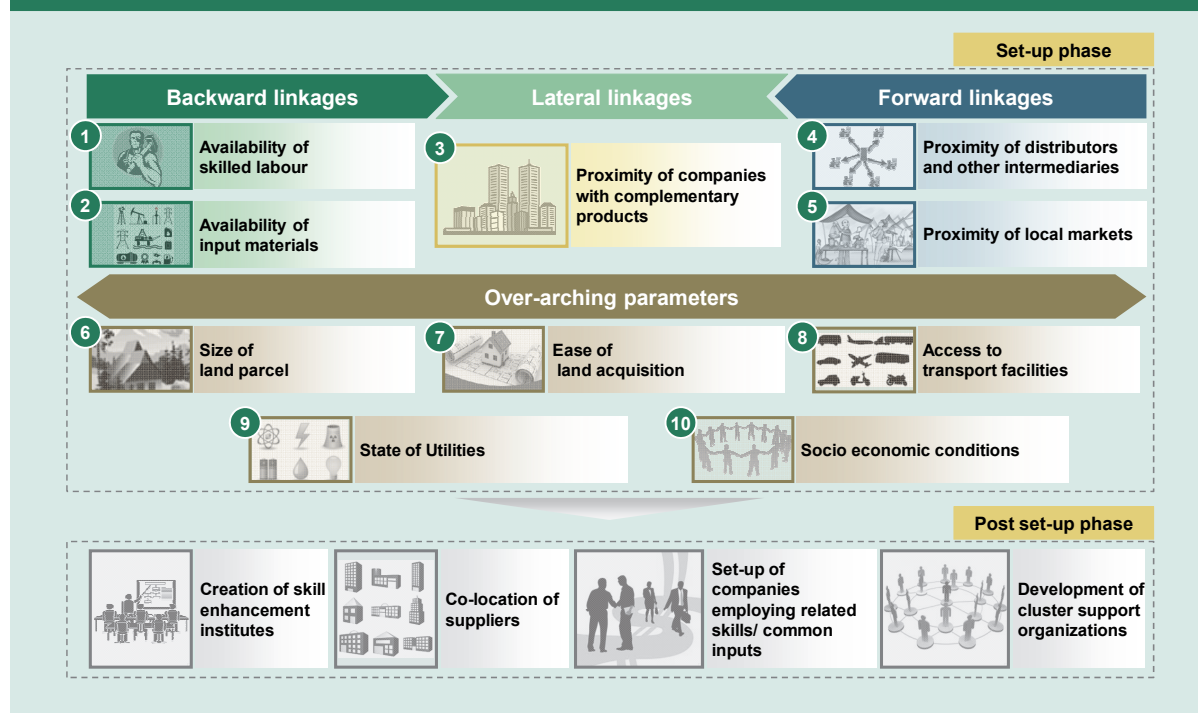
Exhibit 15. Substantial cost savings through industry clusters



As a result of their positive impact on all the above mentioned factors, clusters have led to cost savings to the tune of 13% on average relative to an isolated production plant.

In order to realize the benefits from clusters, it is imperative to think through the structural advantages that need to be built-in before the creation of cluster and investment in infrastructure. These must consider backward (resource availability oriented), lateral (collaboration oriented) and forward (market oriented) looking factors. In addition, infrastructure must be created to reinforce the above linkages. A set of long term enablers focussed on skill development, mechanisms for coordination and proactively inviting manufacturers in line with cluster objectives must be put in place.

Exhibit 16. Ten key parameters to assess for industry clusters during set-up and four to assess post set-up phase



The compelling cost advantage provided by clusters has been the driving forces behind the recent National Manufacturing Policy, which envisages the establishment of National Investment and Manufacturing Zones (NIMZs). Seven such zones have been planned across the country. These zones, each having an area greater than 5,000 hectares, would be developed as integrated industrial townships with state of the art infrastructure and planned usage of land. The NIMZs would subsume current SEZs and would develop as large industrial clusters with several industries collocated. It is expected that these clusters would drive reduction in overall manufacturing costs through sharing of facilities, reduced cost of logistics and greater availability of cheap labour.

4. Technology & R&D – Building the next generation of products today

4.1. Globalisation requires being at the forefront of innovation

Developed markets continue to be at the forefront of innovation and new technology. As they migrate towards greater automation to offset labour and factor costs, this phenomenon becomes even more relevant for the capital goods sector. Greater automation is driving the development of the next generation of industrial machinery. While such technical innovation is absorbed first by the developed world, it is adopted by the developing world as well. In order to become a global force, Indian capital goods sector needs to understand these changes and also evolve to serve user industries with the next generation of products.

For instance, a sector where technical innovation and automation is becoming ever more important in mature markets is mining equipment. "Next generation mining" is transforming operations that were once manual, local and silo-ed into those that are automated, remotely operated and integrated. Increasingly, a step change in productivity is being delivered through integration of equipment with information technology. The usage of "autonomous" haulage or unmanned vehicles for earth moving is a step in that direction. These earth movers are equipped with GPS, CCTV cameras, inertial guidance systems and leverage dispatch route planning and guidance software for functioning. Several global mining players are already migrating towards such advanced means of autonomous haulage.

Planning and investing in developing the "next generation" products is a critical task for Indian industry and we must act now to shorten the prevailing technology gap between domestic manufacturers and foreign players.

4.2. Indian manufacturing lags foreign peers in technology and innovation

Today, the products offered by indigenous manufacturers are not always cutting edge; often there exists a large technology gap between domestic and foreign manufacturers of capital goods leaving user industries with little recourse other than importing goods for several equipment categories. As demands of user industries evolve over time and the demand for next generation of products increases this technology gap can be crippling for the sector.

The technology gaps prevailing in the sector are symptoms of an overall lack of technological depth in the manufacturing sector. India's value addition in manufacturing is estimated to be ~USD 228 Billion which is only ~13% of what happens in US (USD 1,771 Billion) and China (USD 1,756 Billion) and ~20% that of Japan as well (USD 1,063 Billion). Increasing the proportion of value addition would require greater innovation within the country and a faster rate of technology transfer, in many cases both need to be done.

Exhibit 17. Total R&D spend in India lower than global benchmarks

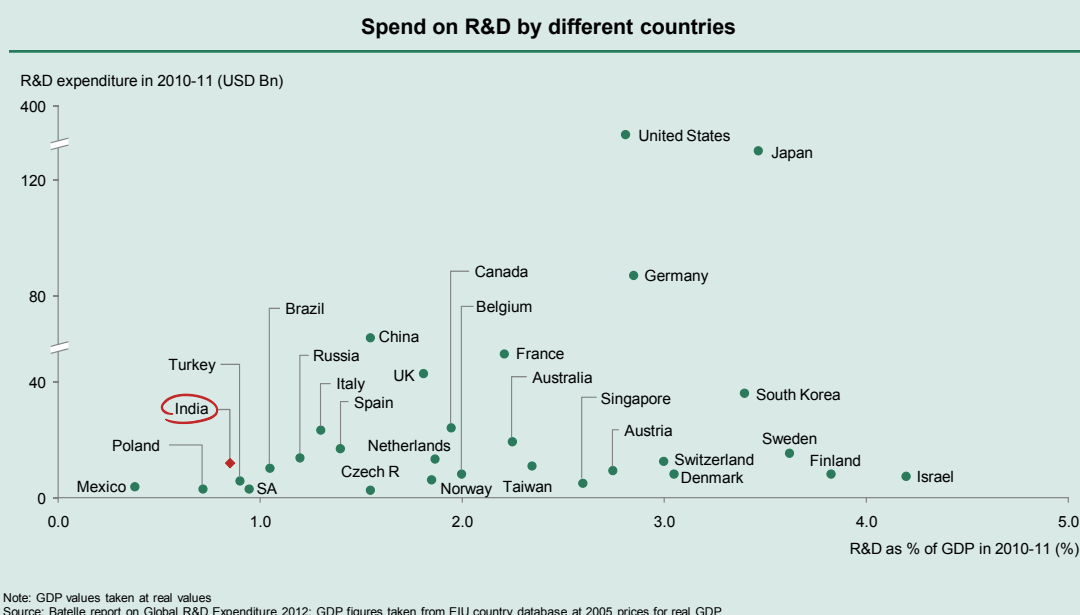
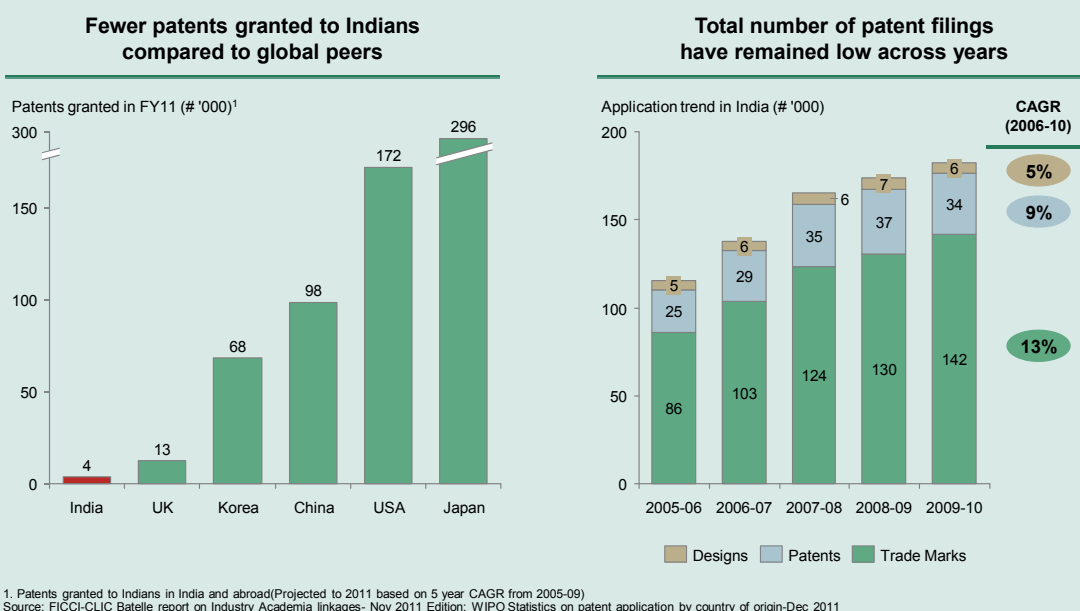


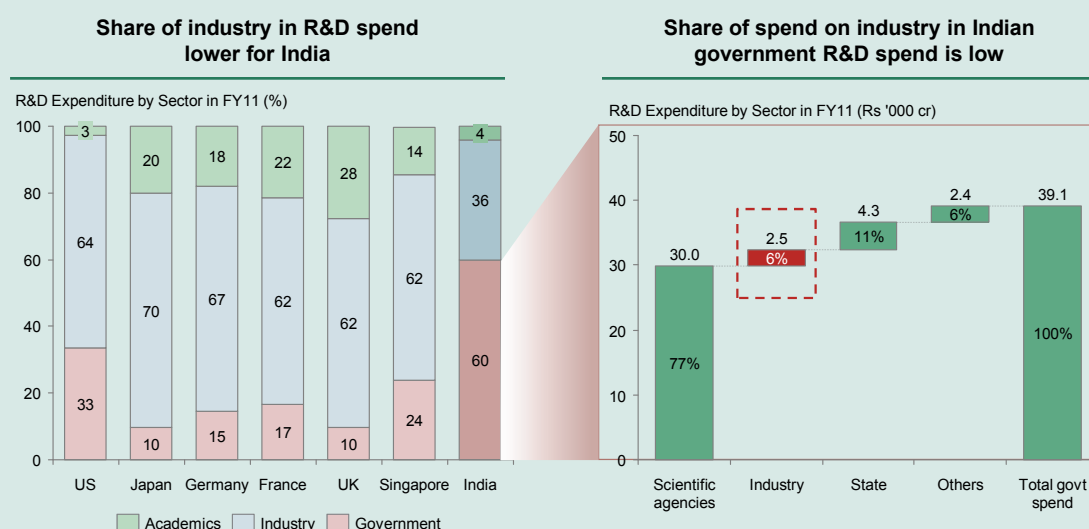
Exhibit 18. Indians hold fewer patents compared to global peers



The current levels of investment in R&D infrastructure within the country are actually far below global benchmarks. R&D spends as a proportion of GDP at ~0.9%, is much below other countries that have succeeded in promoting R&D (Israel at ~4.2%, Japan at ~3.5%, US

at ~ 2.8%, Singapore at ~2.6%). Further, within current R&D spends the share of industry spending is less than 50%, whereas the exact opposite is observed globally (Japan at ~70%, Germany at ~67%, USA ~64%). Moreover, the proportion of government R&D spends that goes towards industry is a meagre 6%. As of result of lower investments in R&D, India has far fewer R&D professionals per capita and holds far fewer patents than China, USA or Japan (number of patents in force in the countries being 0.8 million, 1.4 million and 1.2 million respectively in 2008 while in India it was only ~0.03 million patents).

Exhibit 19. R&D spending in India is government led with little focus on industry R&D



Source: Batelle report on Global R&D Expenditure 2012, Eurostat by European Commission- Report on R&D expenditure, Statistical Bureau of Japan Website, National Science Foundation website, Dept of Statistics- Singapore website; GDP values from EIU database; DST report on R&D Expenditure in 2005-06

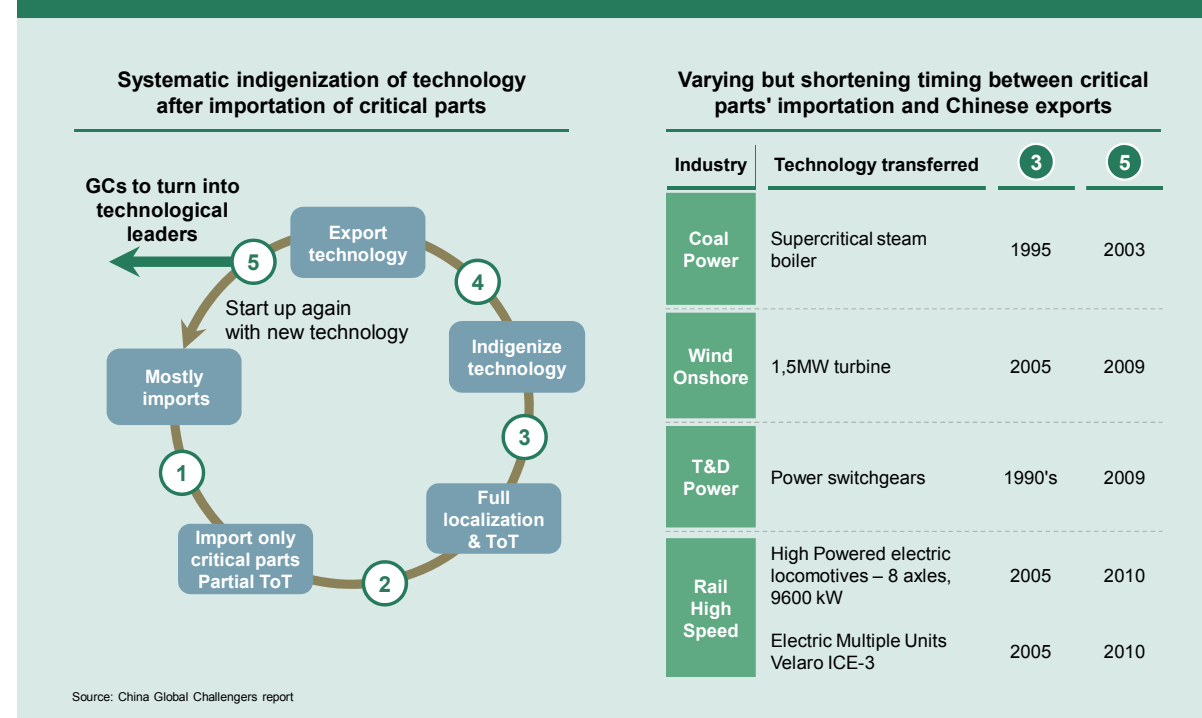
A key driver of innovation is the institutional and legal support provided by the government to innovators. Currently the incentives in place are not attractive enough to encourage innovation. There are multiple reasons for this. Firstly the patent granting process is quite lengthy and bureaucratic, taking almost twice the amount of time than in the US (6–8 years vs. 3–4 years). The existing patent registration infrastructure is also strained, both in terms of quantity and quality of resources which leads to long lead times in granting patents. Secondly there is a lack of adequate incentives for innovators. There are for example, no instituted rewards for successful commercialisation of innovation in India. Other countries have recognized that rewarding commercialisation can be a significant motivator for innovation; for instance in China, employers are supposed to pay employee innovators 2% of annual profits from exploitation of the invention patent and 0.2% of annual profits from exploitation of a design patent.

4.3. Technology gap can be bridged through strategic partnership and acquisitions

Strategic takeovers to acquire critical technology are another means to bridge the technology gap. Capital goods manufacturers from Korea have been particularly aggressive in adopting this approach. Some have obtained access to the triad of BTG or Boiler-Turbine-Generator technologies entirely through strategic acquisitions enabling them to enter the class of GE, Siemens and Alstom as companies capable of providing end to end solutions for fossil fuel based power plants.

China on the other hand has followed a systematic approach of driving technology transfer through local partnerships. The pace of technology transfer has increased over the years across capital goods industries. As a result, the time period between when China imports certain critical goods and then actually starts exporting after technology transfer, has gradually shortened over the years.

Exhibit 20. After localization in China, all industries saw systematic transfer of technology

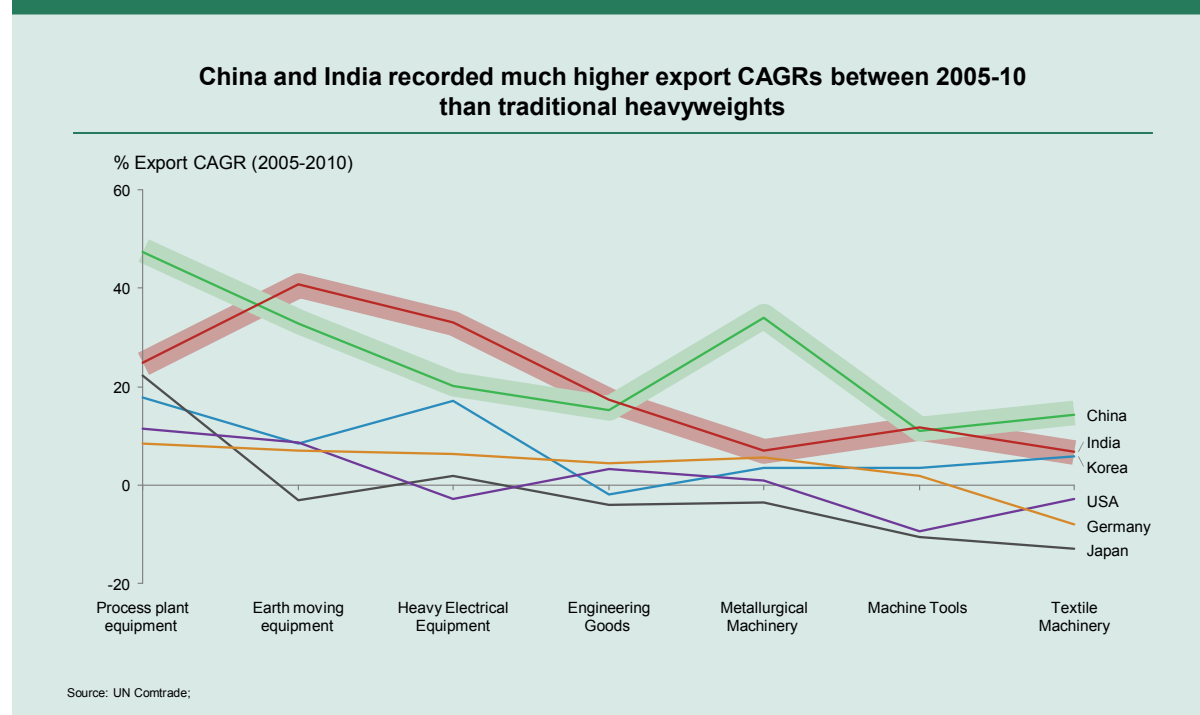


5. Globalisation – Indian champions in a global village

5.1. Share of exports from RDEs on the rise

In recent times exports from RDEs have shown an increasing trend over more mature markets. Exports have been on the rise not just to the developed markets but intra-trade between RDEs has increased significantly and now forms a significant share of international trade.

Exhibit 21. Export share shifting from developed to developing countries



In India, players in the heavy electrical and process plant equipment segments in particular have been successful in tapping the opportunity engendered by the needs of the developing world. Africa, Central Asia and the Middle East, where the needs of rapid industrialisation are driving imports, have emerged as clear target markets.

However notwithstanding the high growth rates in exports, the actual export volumes from India are quite low as compared to China with our share of global exports at less than 1%.

Industry players need to do more to build on this starting position. A more comprehensive approach towards targeting these new emerging markets is required based on an understanding of the local ecosystem, customer requirements for becoming a credible player in the global market. The competitive environment remains challenging and focusing on these areas is vital for success.

Capital goods manufacturers across RDEs are increasingly leveraging overseas opportunities to drive their expansion. Operating in emerging markets in a high growth environment, they have scaled up, upgraded their technologies and today are becoming a force to reckon with in more mature markets as well. Many of them are transforming into global challengers assuming the reach and scale of established Western multinationals.

As a case in point, power equipment manufacturers from China are amongst the largest in the world today. One of the largest manufacturers is projecting close to 25% of their overall revenues from exports, driven by efforts to grow their EPC business overseas. The company foresees that as one of their most profitable business segments in the near future with projections of ~30% margins. These manufacturers have been able to grow this business by tapping opportunities in high demand developing countries in Africa, Middle East and South East Asia.

Another example is that of a leading manufacturer of electric cables and transformers from the Middle East. Traditionally it has supplied Africa and the Middle East with electrical cables which form 75% of its revenue base, however recently other segments like transformers and turnkey projects have witnessed the fastest growth driven by demand in underpenetrated markets in Africa. It has also embarked on an aggressive globalisation agenda through acquisitions in Europe to acquire technology and venture into new segments.

5.2. Credit lines and soft promotion can successfully stimulate exports

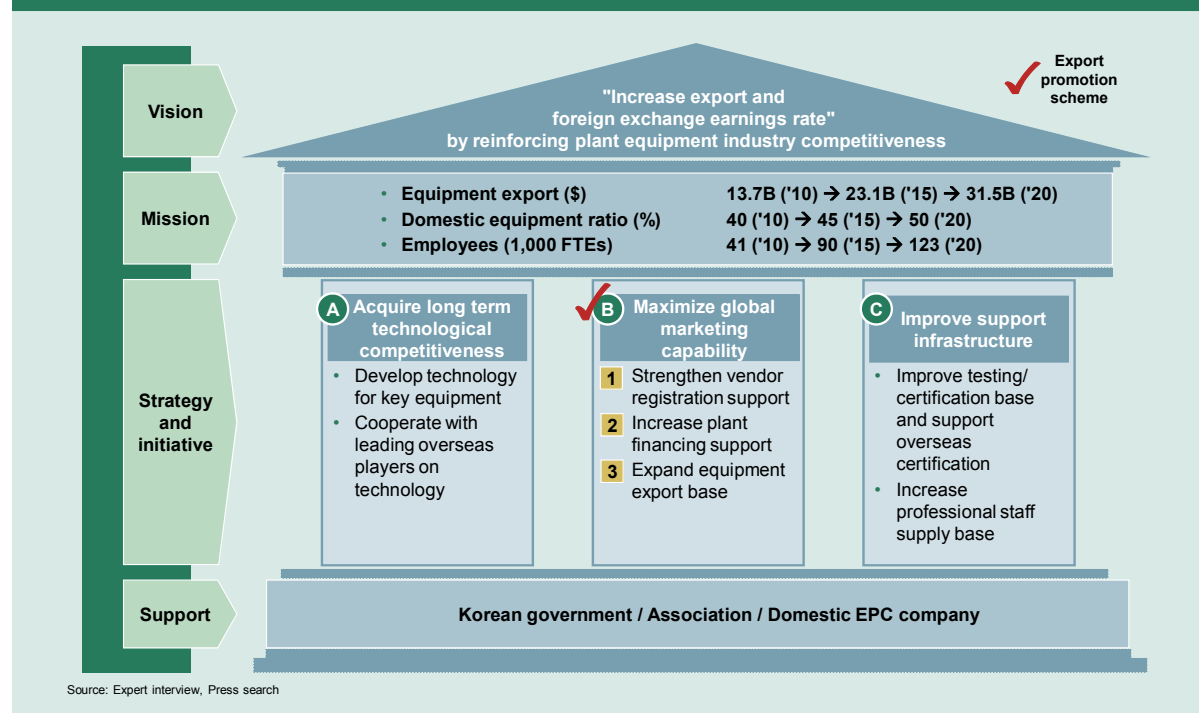
Indian exports currently receive lesser amount of support from the government as do exports in other countries. The cumulative volume of medium and long term export credit for the period 2006–2010 was ~INR 200,000 Cr, a fifth of that of China.

The Indian capital goods sector can learn from the experience of countries that have successfully used a combination of financing and soft promotion to drive exports. A particularly successful example is that of South Korea. The country's share in global exports ranges from 2.5% (process and plant equipment) to 8.5% (textile machinery) across various sub categories of capital goods.

Korea's success in capital goods exports can be attributed to an active policy pursued by the government for promotion of exports, which encompasses both soft promotion and financial assistance to exporters.

An example of Korea's export promotion strategy at work is the support for vendor registration in the process and plant equipment industry. It does this by opening project support centres overseas - for instance the "India Plant/Machinery Support Centre" was opened in June 2006 in New Delhi.

Exhibit 22. Korean government developed a plant equipment industry "2020 Vision and Mission" to drive globalisation



These centres create a friendly environment for local vendor registrations by supporting the administrative process for the same; hosting information sessions and providing consulting. They also carry out market intelligence activities to track key customer procurement practices in overseas markets.

Government financial institutions also support exports through various initiatives, key amongst them being extended support for export financing, widened coverage of equipment export insurance, subsidy on interest rates or commission fees for export loans and extended network loans.

5.3. Focus on building "global" champions out of strong domestic PSUs

China, is a very good example of how consistent and systematic government support can help build strong domestic players that eventually evolve to compete globally. The Chinese government has followed a systematic policy for building strong domestic players over the past two decades. Since 1985, policy has evolved through four distinct phases from setting the foundation of various industries in the country (1985–95) to improving domestic capabilities by focusing on import substitution (1996–02) to nurturing leaders in various sectors by cultivating capabilities to innovate (2003–08) to now competing effectively on the global stage by supporting international expansion of strong players.

The government during this period has focused on 5 policy areas to strengthen domestic players:

- Driving domestic demand through huge investments
- Deploying a proactive industrial policy of nurturing national champions by channelizing demand and funding
- Driving access to critical technology through laws requiring the formation of JVs and lax IP law
- Maintaining lower cost / delivery time positions through lower factor costs and huge domestic demand (bringing economies of scale)
- Developing a coordinated exports strategy supporting exports through financing and extensive soft promotion

As a consequence of its policies China's domestic capital goods manufacturers are in the global top 5 in a number of categories (for instance Photovoltaic, Thermal (coal based) power, Wireless telecom and Rail rolling stock).

Exhibit 23. Chinese players emerging as Top 5 players across industries

Photovoltaics ¹		Thermal (Coal) Power ²		Wireless Telecom ³		Rail Rolling Stock ⁴	
2005	2009	2005	2009	2005	2009	2005	2009
 Sharp	 First Solar	 SEC	 SEC	 Ericsson	 Ericsson	 BBD	 BBD
 Kyocera	 Sun Tech	 HPEC	 DEC	 Nokia	 NSN	 Alstom	 CSR
 Sanyo	 Yingli	 Alstom	 HPEC	 Nortel	 Huawei	 Siemens	 CNR
 Mitsubishi	 Trina	 DEC	 BHEL	 Siemens	 Alcatel-Lucent	 GE	 Alstom
 BP Solar	 CSI Canadian	 BHEL	 Alstom	 Lucent	 ZTE	 Ansaldo	 Siemens

1. EUPD Output 2. Capacity Addition 3. Wireless Revenues 4. Sales of Rolling Stock
Source: China's Global Challengers

6. Ten point agenda for action

Achieving the aims of the 12th plan and taking the capital goods sector to the next level requires concrete action steps from both the government and industry

- 1. Leverage Indian demand to nurture and develop scale for local industry** – India represents one of the fastest growing markets in the world. Local demand provides a unique opportunity for capital goods manufacturers to scale up. This fact needs to form the basis for developing a long term growth strategy for Indian capital goods sector. The government needs to ensure an environment that promotes local manufacturers and ensures they are able to compete on a level playing field. Indeed, we need to learn from examples of other countries such as China and Korea, where this has been the basis for creating global giants. Where feasible, public procurement should have preference for local manufacturers.
- 2. Promote collaboration between end-user industry and capital goods manufacturers** – The tremendous opportunity provided by demand in India needs to be catalysed through close collaboration between government and PSUs; and between government and the private sector at the industry level. The need of the hour is for end users and capital goods manufacturers to engage in building joint strategies and shared road-maps that lead to a win-win for both. Close public-private collaboration is required to ensure opportunities across the complete production value chain get captured. It will enable both end-users and domestic manufacturers to de-risk their operations and at the same time improve economics through scale effects.
- 3. Use domestic demand as a lever to trigger localisation and enable technology transfer** – Demand consolidation and bulk orders have proven to be an excellent means to trigger FDI and technology transfer. This will create opportunities for Indian manufacturers to enter JVs for transfer of technology. At the same time, it will provide an impetus for manufacturers to explore acquisitions to secure newer technologies. It would also be a means to incentivize/mandate foreign players to increase value addition to local manufacturing in India. This would be critical to expand the capability and depth of Indian capital goods manufacturers. There are several success stories both outside and within India that illustrate the power of this approach (as was the case with bulk orders for power plant equipment in India).
- 4. Create a level playing field between imports and domestically manufactured goods** – Insights from the 11th plan indicate that imports have grown much faster than local production. This has been driven by several factors such as import of second hand machinery, skewed tax and duty structures and easy access provided to Indian market through existing FTAs. There is an urgent need to revisit each of these factors in a manner that rationally addresses the needs of both end user industries and

domestic manufacturers. Duty structures should be such that they do not provide any undue advantage to imports. Where feasible, detrimental FTAs should be renegotiated with partner countries. In any case, before any future trade agreement is negotiated, it is prudent to set in place processes that ensure inputs of domestic capital goods manufacturers are adequately captured and considered before they get finalized.

- 5. Develop clusters for cost competitiveness, shared facilities and local supply chains** – Industry cluster formation has been one of the levers successfully applied by several countries to improve competitiveness. There is an urgent need for replicating the model in India as well. As NIMZs and other industry clusters develop, it is essential to set them up in a way so as to deliver structural advantages on a long term basis to domestic capital goods manufacturers. Core infrastructure for supporting operations, common facility centres, common product development centres as well as means to enable easier market access should be established as part of the effort.
- 6. Invest in developing a broader pool of skilled manpower** – Focussed efforts are required for increasing the pool of skilled manpower in India. The availability of skilled manpower needs to be improved by increasing the intake of vocational training courses. Specialized and highly trained staff is required to promote greater efficiencies, innovation and technological development in Indian capital goods sector. Increased competencies in trained staff can be achieved by introducing sector specific courses designed in close collaboration with industry. Both academic institutions and industry need to be brought closer in order to better understand respective requirements. Not only students, but also industry professionals will benefit through increased business and academia exchange and a tighter connect.
- 7. Incentivize private sector investment in technology and innovation** – Indian investment in R&D remains low and largely government driven. Proactive policies are required that incentivise industry efforts to invest in innovation and develop new products. This needs to be supported through financial incentives, as well as through better institutional support for securing patents. On the demand side, end users need to openly embrace and support new indigenously developed technologies, and even partner in the process through joint development efforts. This will reduce the risk associated with investments in R&D for both capital goods manufacturers and end users.
- 8. Identify acquisition opportunities overseas to plug technology gaps** – Considering the prevailing global economic environment of depressed financial markets and equity valuations, Indian capital goods manufacturers need to proactively scan the horizon for strategic acquisitions. Rapid technological advancement through the acquisition route will help compete against imports by offering a superior value proposition to end users. Acquisition of critical technologies will also enable more appropriate product portfolios that would facilitate entry into global markets.

- 9. Promote exports through financial support and soft promotion policies** – The share of domestic manufacturers in global export market is very small. In order to promote exports, the government needs to support exporters through appropriate incentives and financial enablers such as extending line-of-credit for exports with favourable conditions. At the same time support for soft promotions overseas must also be provided to facilitate the entry of local manufacturers into global markets. This is essential for building a market and brand for Indian capital goods. Further, there is a need to leverage policy options such as future trade agreements to ensure the advantage is in favour of Indian manufacturers as they seek entry into global markets.
- 10. Rejuvenate, nurture and promote Indian PSU champions** – Indian PSUs represent years of cumulative knowledge and know-how. Several PSUs while not doing well today, have deep capabilities and infrastructure. They can potentially become champions through improved scale of operations, technology up-gradation, and strategic entry into new markets. PSUs that are already strong and vibrant in India must be supported to become global champions through focused efforts on export led growth. It is time to unlock the huge potential of Indian PSUs in the capital goods space.

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Note to the Reader

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