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India's Century: Sustainable and inclusive growth in Manufacturing sector

A FICCI-McKinsey multi-year forum

Manufacturing Committee Report

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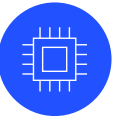




Opportunities/Tailwinds shaping the manufacturing sector

- **1** **Strong domestic demand:** due to lower per capita consumption e.g., paint consumption is 4 Kg/capita in India vs 17 Kg/capita for countries like Malaysia, past trajectory of increase in overall per capita consumption (in nominal terms) at ~8% CAGR over last 7 years i.e., ~Rs 50123 in 2014 v/s ~ Rs 85821 in 2021 etc.
- **2** **Destination for FDIs and export opportunities:**
 - **FDI relaxation across manufacturing sub-sectors** to boost economic growth e.g. 100% FDI in coal mining, contract manufacturing, and single-brand retail trading
 - **Opportunity to capture whitespace generated in trade flows** due to supply chain disruptions by Covid and emerging domination of India in sectors such as electronics, chemicals, automobiles, iron and steel etc. **become global manufacturing hub** across specific sectors e.g. Samsung has built world's largest mobile factory in India
- **3** **Workforce of the future :** **Large young and skilled workforce** and, potential for further **employment generation opportunity** e.g. currently ~58 Mn jobs provided by manufacturing sector in India
- **4** **Strategic sectors leading the way:** **Leading edge in certain sectors** such as basic metals, textiles and apparel, renewable energy, and chemical products **due to natural resource availability and low cost labour**
- **5** **Attracting capital from diverse sources**
 - Multiple capital avenues e.g. **investment push by PE/VCs** in manufacturing sector, **channelising retail household savings** (~17% of GDP) **to real sector investment**
 - **Strong policy backing** to support manufacturing industry with increase in SEZs, economic corridors, offering multiple incentives (e.g. PLI incentive scheme), tax reforms and a conducive external environment
- **6** **Push towards Sustainability** to make India leading global capital for green manufacturing and services using **decarbonization** (global market of approx. \$5 Trillion by 2025); **Pro-active participation by industry** to shift towards sustainability, RE adoption, conservation and optimum utilisation of natural resources (e.g., water)

India's century vision for manufacturing sector

Not Just Atma Nirbhar but Bharat Par Nirbhar

To (FY 2030) / To (FY 2047)

A Macro-economic indicators		B IoT and automation adoption		
Output	 <p>1200-1300/ 7500-7600 <i>(From \$ 500-550 Bn in 2022)</i></p>	Nominal GDP (\$ Bn)	 <p>50-70 <i>(From 5-6 lighthouses in 2022)</i></p>	Lighthouses in WEF (#)
	 <p>9-10% <i>(From 7-8% in 2022)</i></p>	Real GDP growth (%)	 <p>50-60%/ 70-80% <i>(From 35-40% in 2022)</i></p>	Digital adoption by MSME(%)
	 <p>60-70 <i>(From 50-60 Mn jobs in 2022)</i></p>	Job creation (Mn jobs)	C Strategic sectors Focus on rapidly scaling of (a) strategic sectors such as electronics and capital goods, chemicals, textiles and apparel, auto and auto components (including the electric vehicle ecosystem), pharmaceuticals and medical devices (<i>covering ~56% of India's GDP</i>) and (b) other upcoming sectors as aerospace and defense, low carbon technologies and semiconductor industries	
Input	 <p>700-750 <i>(3x of large firms in 2021)</i></p>	Number of large firms ² (#)		
	 <p>400-420¹ <i>(From \$120-140 Bn in 2021)</i></p>	Exports (\$ Bn)		
	 <p>10-15% <i>(From 25-30% in 2021)</i></p>	Import localization (Manufacturing as % of imports)		

1. For High-potential sectors like electronics and capital goods, chemicals, textiles and apparel, auto and auto components (including the electric vehicle ecosystem), and pharmaceuticals and medical devices
 2. Firms with revenue >-\$ 500 Mn in a year

However, some challenges to be addressed along this journey

Theme	Current challenges
1 Growth trajectory	<ul style="list-style-type: none"> • Improve growth trajectory both in terms of GDP (~+2% incremental share in GDP to ~17.4% (FY'20) during last 20 years v/s Vietnam which has doubled its share of GDP) , and employment (manufacture sector share increased by just 1% v/s 5% increase for the services sector)
2 Technological advancement	<ul style="list-style-type: none"> • Limited know how for advanced manufacturing in comparison to peers e.g. electronics, semi-conductors and supply chain disruption due to covid pandemic • Need strong digital infrastructure e.g. access to mobile broadband, fibre-optic cable connections, and power-supply expansion etc. and required skillset to support growing demand of digital services (need investment up to ~ 23 Bn by 2025 as per DIPA)
3 Ease to do business index	<ul style="list-style-type: none"> • Non-uniformity across key compliances e.g. Shop Act has diff registrations across states, modes despite asking for similar details • High number of compliances e.g. 2000 compliances across 250 acts in India v/s 300-500 for other Asian countries • Highly manual and inefficient paperwork process e.g. A typical MSME factory must file for 23+ registrations and licenses, 750+ compliances, and 120+ filings per annum
4 Capital requirement	<ul style="list-style-type: none"> • Improve access to bank and government financial support in terms of tax benefits (e.g. innovation capital and budget for corporates and academia to promote R&D), low capital productivity than other countries e.g. India's capital is only about two-thirds as productive as China's (Overall, capital requirement is expected to triple – from USD 0.8 trillion in 2020 to USD 2.4 trillion in 2030)
5 Trade flows	<ul style="list-style-type: none"> • India's high potential sectors such as electronics, chemicals, textile, auto, pharma etc. (~56% of global trade) have share of exports as ~1.5 percent of the global total, whereas share of imports is ~2.3 percent
6 Number of midsize firms	<ul style="list-style-type: none"> • Limited mid size firms in India i.e. Asian countries such as China, Malaysia, Thailand, South Korea, Vietnam have 1.9x higher no. of mid size firms in comparison to India per USD trillion of GDP
7 Operational efficiencies and capabilities	<ul style="list-style-type: none"> • Improve value chain efficiency and brand equity; better productivity for large firms due to lesser number and inadequate access to technology • Capability constraints for digital first initiatives (e.g., industry 4.0) , R&D, new cutting edge technology, green materials etc.
8 Infrastructure	<ul style="list-style-type: none"> • Higher infrastructure cost, poor logistics leading to higher inventory cost, power and credit cost etc. As per McKinsey analysis, ~70% of companies have lesser ROIC than its cost of capital

Key unlocks required **Now** – fix the basics (1/3)

DRIVING STAKEHOLDER

■ Company Level

■ Industry Level

■ Policy-maker Level

Unlocks

Action Items

1 Creation of global manufacturing hubs

- Create **globally competitive manufacturing hubs** in high potential sectors¹ by govt. reforms such as free trade zones, short-term trade protection policies e.g., Mumbai–Thane–Raigad cluster could become a global manufacturing hub with proximate cluster particularly in electronics, chemicals, textiles, and pharmaceuticals etc.
- Plug and run **cluster zones³ for enabling manufacturing based on strength of states** e.g., Nagpur as world-class efficient logistics models and manufacturing particularly in electronics and aeronautics, Solapur for textiles and apparel etc.
- Leverage **existing 17+ MSME clusters** (e.g., in Aurangabad, Bhubaneshwar) for shared infrastructure and skilling purpose by providing support to seek infrastructure at competitive rates and ensure legal strengthening of IPR

2 Adopt digital led manufacturing¹

- **Reimagine manufacturing with smart technologies** (e.g., IoT based productivity improvement, Advanced Analytics based process automation (e.g., demand forecasting at a SKU/distributor level), Chatbots and RPAs based automated maintenance, 3D printing to manufacture high value spares, etc.) **to improve operational efficiency³ across key metrics (YETQM)**
- Set up foundation to drive **Industry 4.0** techniques incl. **assembly-line automation, IOT-enabled data analytics and emerging technologies such as blockchain, low-no code etc.**
 - Build a **digital ecosystem** to support deployment of **digital and analytics use cases across the value chain** e.g. DPM, AA based manpower allocation, AA based material requirement planning, **3D printing combined with new materials** etc
 - Set up **robust data and tech architecture** to roll out scalable solutions for fast-track technology adoption for MSMEs
 - Create a **dedicated digital center of excellence** to assist in upskilling people via trainings, classroom sessions etc.
- **Promote tech enabled lighthouse culture** (e.g., WEF lighthouses) **by industry forums** e.g., FICCI, ACMA by incentivization, grants, recognitions, rating advantage for the first mover companies and collaborating with government to devise policy framework
- Build **resilient and digitized supply chain by leveraging advanced analytics** to improve planning across e2e value chain and better network optimization using telemetry
- **Identify existing tech gaps** at sector level and potential source to secure technology know how e.g., component designing technology for auto components could be sourced by entering into JVs with Korea, US players etc.
- Facilitate **easy access to technology grants, capital for innovation** and faster grant of patents

1. High-potential sectors like electronics and capital goods, chemicals, textiles and apparel, auto and auto components (including the electric vehicle ecosystem), and pharmaceuticals and medical devices contributed to about 56 percent of global trade in 2018 2. American Society for Testing and Materials 3. About 60 percent of manufacturing-sector output could leverage predictive maintenance, smart safety management, and product design 3. Clusters focused on infrastructure, customer demand and innovation

Key unlocks required **Now** – fix the basics (2/3)

DRIVING STAKEHOLDER

■ Company Level

■ Industry Level

■ Policy-maker Level

Unlocks

Action Items

3

Facilitate ease of doing business

- Create **one stop shop** for clearances and range of taxes, set up e-governance for business at state level, scale up single e-window facility for industry queries/clarifications, **modify labor laws**, accelerate **implementation of new land reforms**; **harmonize state level compliance** requirements to avoid delays and cost
- **Digitize compliance process** by implantation of BRAP, e-signature, faster approval process, harmonize standards across the country in line with global protocols for testing and registration of new products technologies e.g., packaging norms (ASTM²)
- Focus on **paperless culture by digitizing files and records**, automate tracking and approval process, apply e-signatures etc.
- Accelerating growth of economy by PLI scheme and increasing effectiveness by encouraging component eco-system, Offering investment-linked incentives for capital-intensive and sunrise sectors (e.g., ACC Batteries, EVs, hydrogen fuel cell), targeting unexplored sectors such as white goods/industrial goods and including other segments in already announced PLI sectors such as all components under electronics (e.g., UPS, Solar invertors) , CDMO/CRAMS manufacturing in Chemicals scheme

4

Strengthen supporting infrastructure

- **Reduce logistics cost pressure** by developing cluster-based proximity approach e.g., use by-products/co-products from industry/market close to its product, increase efficiency by developing resource exchange capability with border countries
- **Improve infrastructure** (e.g., less water intensive products, facilitating rural market electrification through solar infra and linking it with e-commerce subsequently, horticulture zones and climate-controlled logistics for food processing) by extending financial support, expanding use of PPP, stable government policies, implementation of SPV concepts w/ private sector e.g., building smart manufacturing cities etc.
- **Expedite land acquisition and clearances** where land is available with state governments/PSUs and provide clearances in a strict time-bound manner

5

Capture higher trade flows (1/2)

- Build **robust manufacturing process** with quality adherence and R&D capabilities to meet international requirements for existing manufacturing sectors; promote manufacturing industry via embassy trade commissioners
- Leverage **Make in India initiative to facilitate technology tie-ups with global players** primarily for sectors such as electronics and machinery (~12% of trade deficit), auto-components and capital goods and machinery by single window clearances, simplified duty structure, incentivization etc.

Key unlocks required **Now** – fix the basics (3/3)

DRIVING STAKEHOLDER

■ Company Level

■ Industry Level

■ Policy-maker Level

Unlocks

Action Items

- | Unlocks | Action Items |
|------------------------------------|--|
| 5 Capture higher trade flows (2/2) | <ul style="list-style-type: none">Improving scale and effectiveness of EXIM bank of India by building active support to MNCs, collab with commercial banks to support large transaction sizes, tie ups and reinsurance program, extending export financing for pre-post shipment etc. |
| 6 Labour productivity | <ul style="list-style-type: none">Adopt contract-manufacturing models to increase capacity utilization (>80%) in select value chains e.g., engineering, chemicals, machine tools etc. and incentivize investments for productivity increase through smart manufacturing and energy efficiencyFocus on skilling/reskilling of employees by tie-ups with academic institutions around latest manufacturing concepts such as computer aided technologies, product design etc. |
| 7 Access to capital | <ul style="list-style-type: none">Provide financial support by offering low-cost financing solutions for long term capex projects, multiple incentives such as tax concessions, PLIs, capital subsidies, priority sector lending support, western world pension funds for MSMEs/startups etc.Provide innovation capital to support industry and academia partnership to promote R&D for high potential sectors such as electronics and semiconductors, chemicals, capital goods and machine tools, auto componentsReallocate funds earmarked for incentive towards building foundational infrastructure that enables industries to reduce their operational costs and become efficient |
| 8 Sustainability | <ul style="list-style-type: none">Facilitate cost neutrality by:<ul style="list-style-type: none">Creation of R&D fund by industry to innovate new packaging technologies and generating energy efficiency initiativesFocus on pro-government policies by offering multiple incentives or support schemes, generating rating system basis company's performance in green initiatives, investment in sunrise sectors such as semiconductor, solar etc., in order to capture share of global market for low carbon technologiesStandardize renewable energy status across states; implement taxes on carbon emission and carbon credits widely, focus on RE adoption and conservation, rejuvenation and optimum utilization of natural resources |

Key unlocks required **Next** (explore adjacencies) / **New** (explore frontiers)

DRIVING STAKEHOLDER

■ Company Level

■ Industry Level

■ Policy-maker Level

Unlocks

Action Items

1	Build technological advancement for MSMEs	<ul style="list-style-type: none"> Setup standard framework for digital maturity assessment of manufacturing industries by industry bodies like FICCI and assist with set up of best-in-class IT/OT infrastructure Leverage partnership between large industrial promoter groups and global OEMs to access the technology and capital to establish local manufacturing capability
2	Expand base for green manufacturing	<ul style="list-style-type: none"> Create green alternatives to existing products e.g., use Bio Based renewable sources instead of traditional Petro-based feedstock, sustainable packaging, Green Building Materials, supply for charging infrastructure Support MSMEs to become environment friendly recycling entities by creating a recycle hub of excellence; green waste management using techniques like aerobic composting and pyrolysis to make bio-fertilizer, refuse derived fuels Leverage shared infrastructure (incl. investment across companies with aim to promote circular economy) to reduce wastes and derive efficiencies, value, especially across green solutions; partner with OEMs to achieve net zero goals Leverage third party industry body to create knowledge base for green manufacturing e.g., define what makes a product qualify as “green” and create standardized process to establish consistency Support cost efficiency by offering special financing scheme/incentivizing models/subsidies for MSMEs investing in energy efficient equipment and renewable energy (motors, pumps, compressors, VFDs¹ etc), e.g. through EESL² or other agencies; incentives for adoption of select technologies such as waste heat recovery, usage of RDF³/biofuels instead of fossil fuels Encourage and incentivize sustainability-based Partnerships incl. Green Electricity, Hydrogen between various manufacturers and smart Manufacturing industries esp. in areas where digital is enabling a greener future and sustainability
3	Explore deeper access to capital	<ul style="list-style-type: none"> Evolve deep tier financing more aggressively via banking industry while lowering cost of capital to MSME space; leveraging ultimate buyer / tier 1 supplier credit profile and use transactional data analysis with GSTN to evaluate credit Provide viability-gap funding (VGF) and other incentives to support high-technology initiatives and low carbon value chains Deepen Corporate Bond market for alternate long-term source of finance e.g., and incentivize market makers for corporate bond markets (like primary dealers in Govt securities) to play role of effective intermediaries

1. Variable frequency drive 2. Energy efficiency services limited 3. Refused derive fuel

Key unlocks required **Next** (explore adjacencies) / **New** (explore frontiers)

DRIVING STAKEHOLDER

■ Company Level

■ Industry Level

■ Policy-maker Level

Unlocks

Action Items

4

Cutting edge technologies and innovation

- Explore **new age materials like technical textiles** (\$220 Bn opportunity) in application like for automotive, medical /implants, safety –heat/radiation
- Integrate **supplier eco-system to unlock end to end efficiencies** and invest in creating company wide end to end integrated decision intelligence control tower
- Leverage new business models beyond renting by incorporating technologies like **site charging infra, battery swapping, battery-as-a-service for construction/Good Movement Equipment manufacturers**; OEMs to manufacture smart IOT enabled machines for smooth data migration to cloud
- Collaborate with government and academic institutions for R&D/design innovation initiatives by setting up "**Innovation Seed Fund**" and **establishing centres of Excellence & Technology innovation centres**
- Develop "**Smart Digital Clusters**" such as "Smart Cities" to promote digital technology penetration, implementation of next gen cutting edge technology to digitize process, e2e supply chain etc. and "**industry university**" clusters to promote R&D efforts on identified themes

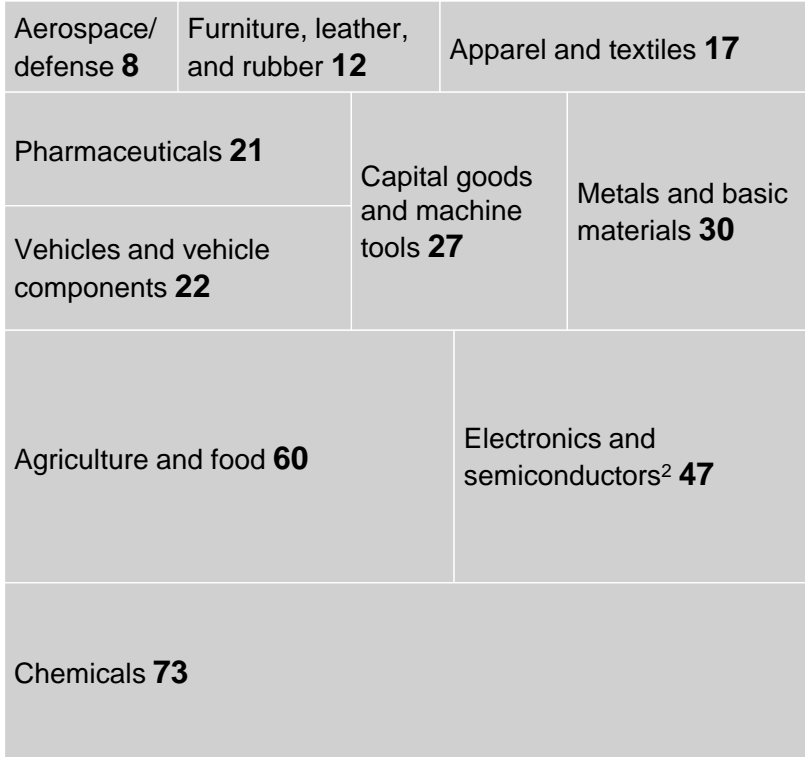
Backup

Scaling up 10-plus of India's manufacturing value chains could produce \$320 billion more in gross value added

Potential gain in India's gross value added,¹ \$ billion

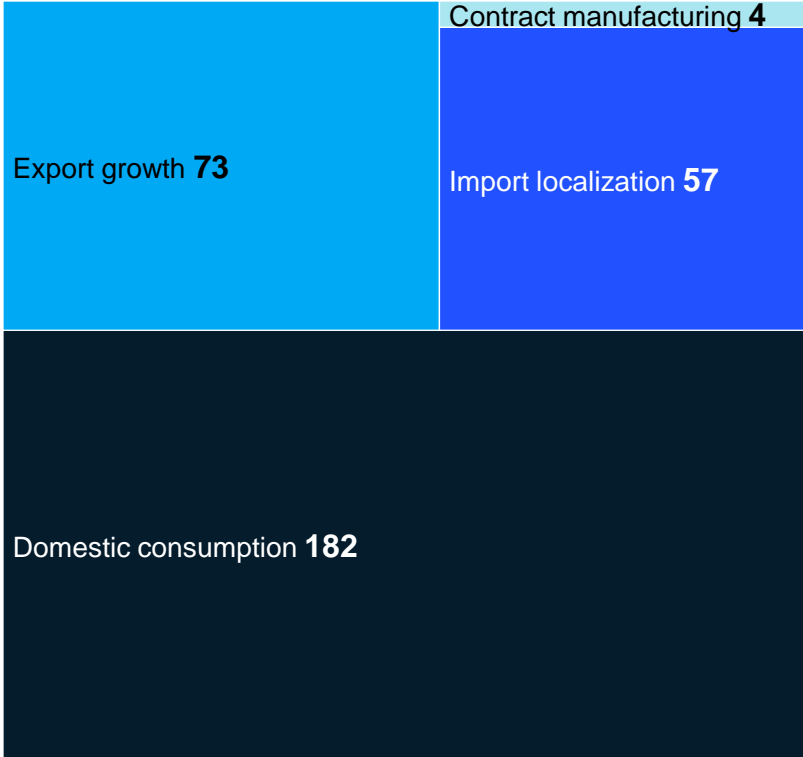
By value chain

Total 317



By growth opportunity

Total 317



Key takeaways

- ~ 80 % of incremental GVA potential resides in **six value chains**: chemical products and petrochemicals, agriculture and food processing, electronics and semiconductors, capital goods and machine tools, iron ore and steel, and automotive components and vehicles
- To realize incremental GVA potential, key value chains need to focus on **domestic sales, export growth, import localization and contract manufacturing**

Additional sector specific additional unlocks for manufacturing (1/2)

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Sectors	Additional unlocks
Electronics	<ul style="list-style-type: none"> • Focus by MSMEs on R&D/design innovation initiatives by setting up "Innovation Seed Fund" and establishing Centres of Excellence & Technology innovation centres • Prioritize development of component base by increasing local manufacturing and reducing imports under Make in India initiative • Announce phased manufacturing programs for easy-to-manufacture products such as LEDs, Televisions, etc. • Expand scope of PLI and SPECS schemes for electronics to include more product categories beyond mobile-phones • Design a credit guarantee scheme for access to finances especially for plant & machinery and enhancing working capital
Food processing	<ul style="list-style-type: none"> • Focus on growing domestic Fruits & Vegetables value chain by establishing export competitive products and optimizing cost for value added spices • Focus on dairy value chain by establishing top dairy chain clusters, providing adequate incentives to farmers, cold chain infrastructure (e.g. climate controlled warehouse and logistics) • Strengthen market linkages to connect farmers to processors through strengthening of e-NAMs, FPOs and aggregation centres • Extend Priority Sector Lending support to enhance demand and support improved production/ processing facilities; and extend the Mega Food Park scheme to any large integrated food processing facility that manufactures multiple food products under one roof
Capital goods	<ul style="list-style-type: none"> • Partner with high-tech firms or focus on technology acquisition from overseas to enhance access to advance technology • Set up R&D centres through partnerships with industry and leading academic institutions/labs and support MSMEs by setting up "Innovation Seed Fund" and establishing Centres of Excellence & Technology innovation centres and ensure legal strengthening of IPRs • Expedite investment into infrastructure, pulling forward projects from NIP1 expected to come up with high degree of certainty with mechanical electrical content e.g. power plants, renewable projects, transmission and distribution, pipelines, metro, railways etc.

Not exhaustive

Additional sector specific additional unlocks for manufacturing (2/2)

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■ Company Level

■ Industry Level

■ Policy-maker Level

Not exhaustive

Sectors

Additional unlocks

Electric vehicles (EV)

- Set up **skill development infrastructure**, especially for technical research and to impart manufacturing and operations skill sets; and mechanics and maintenance ecosystem set-ups
- Provide **transitioning capital by creating infrastructure** (e.g., fast charging, H2 refuelling), transitioning ICE to BEV and providing Gigafactory investments
- Provide **fiscal and regulatory support** for incentivising sales by localisation of component manufacturing, hydrogen generation policy, vehicle scrappage incentives on adoption of EV, and continued taxation and subsidy benefits
- **Drive faster execution of DFCs** (Dedicated Freight Corridor) and **RRTs** (Rail Rapid Transit) to take goods/passenger traffic away from roads to electrified railways

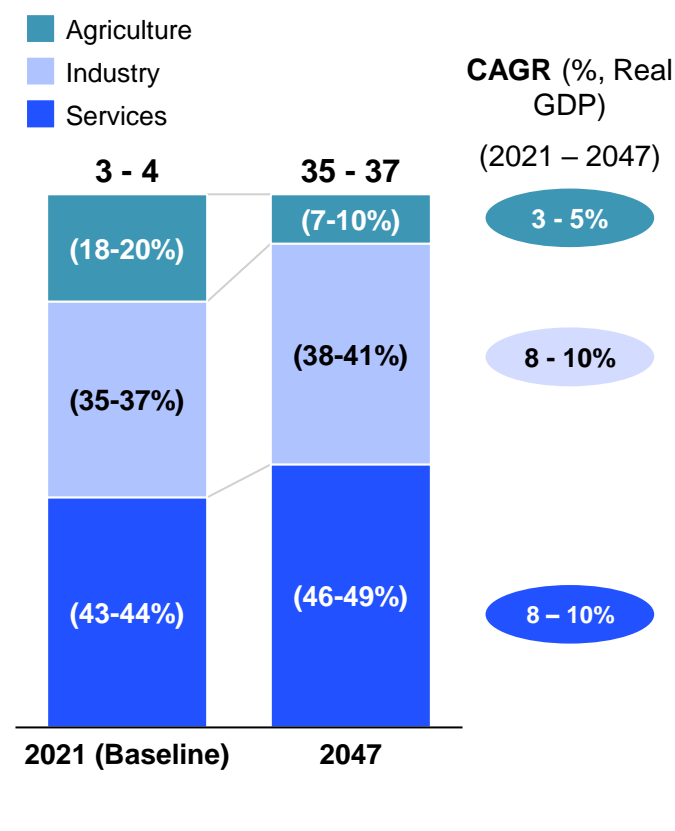
Industry & services to grow at ~2x relative to agri. as India ascends to global leadership in multiple domains e.g., Green mfg., Tech services, SaaS, etc

Share of agriculture as % of GDP to decline as sector grows at 3-5% annually, as key manufacturing & services sectors grow at 7-12%

Preliminary Analysis

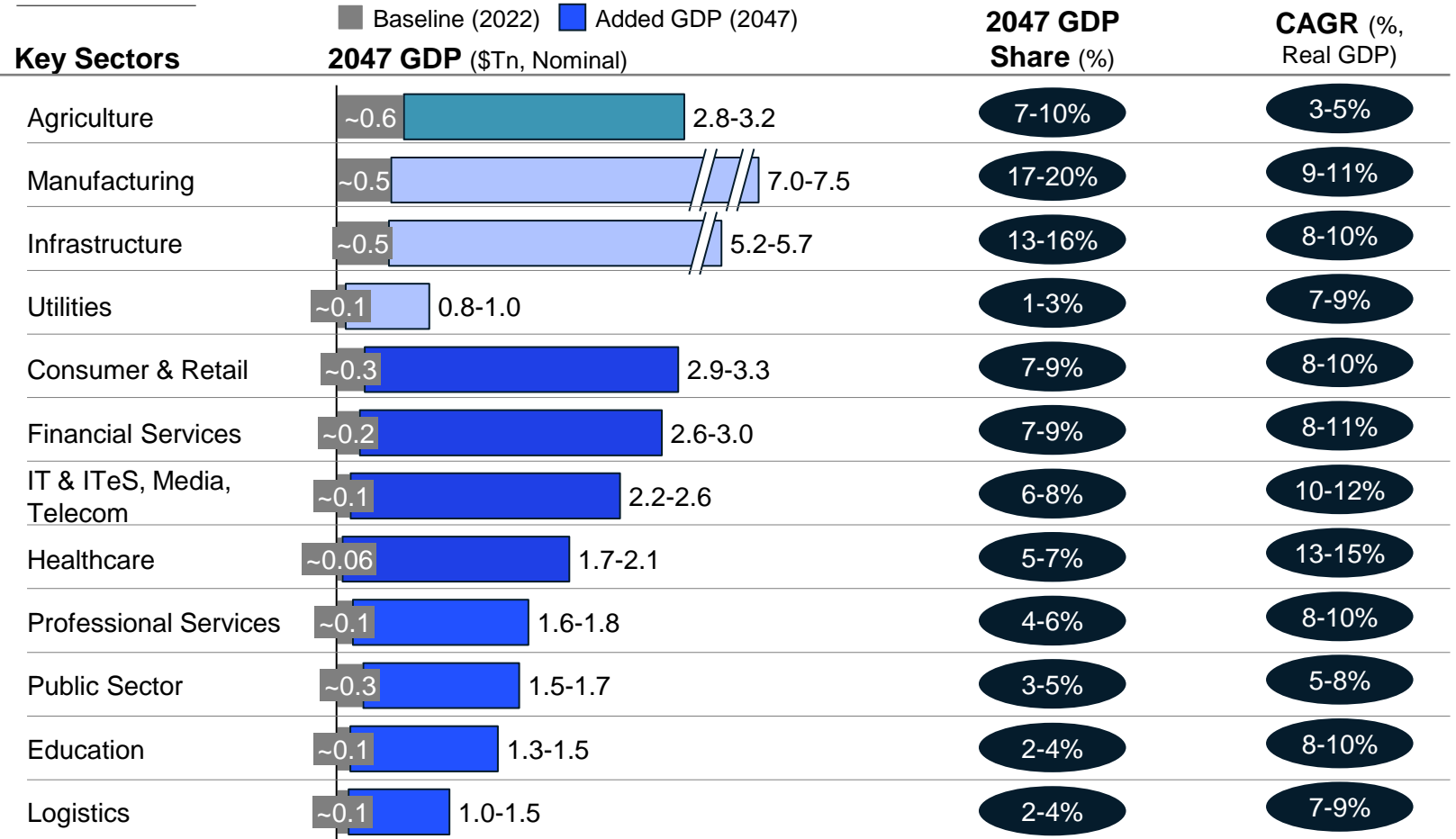
Breakdown of GDP Contribution

(\$Tn, % of Total)¹



Non-exhaustive

Key Sectors



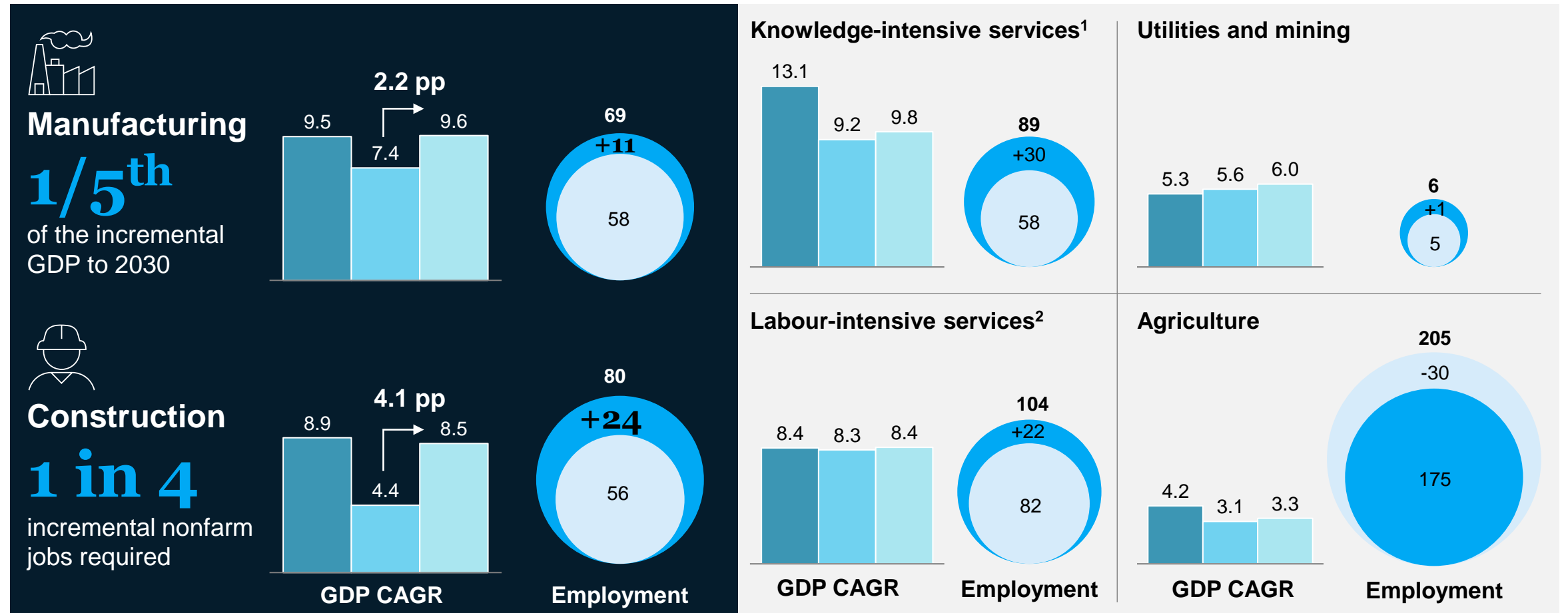
Methodology: Sectoral growth rates projected basis employment & productivity growth rates during historic high-growth periods in India & peer economies (e.g., Korea, China etc.)

- Recent (last 10-15 years) periods considered for tech-intensive sectors (e.g., IT & ITeS)
- Investments in healthcare & education likely to see non-linear returns by 2047 – aspiration for GDP contribution calculated by benchmarking against investment – GDP contribution ratios of global best-in-class peers
- Current sectoral GDP figures from MOSPI, IHS scaled to 2021/22 GDP (\$3.15 Tn); growth rates applied to scaled 2021/22 GDP figures and 2047 figures scaled to overall ~35-37 Tn aspiration

Growth: 90 mn non-farm jobs need to be created by 2030, 30% of which will be provided by manufacturing and construction

While knowledge and labor-intensive services maintain their historical momentum

■ FY06–12 GDP CAGR (%) ■ FY13–19 GDP CAGR (%) ■ FY23–30 GDP CAGR (%) ● FY20 employment (mn) ● FY30 employment (mn)



1. Includes communication and broadcasting, IT/BPM, financial services, education, healthcare and other professional services.

2. Includes trade, transportation and storage, hotels and restaurants sectors.