

# INDIAN SEMICONDUCTOR FABLESS STARTUP ECOSYSTEM

## OPPORTUNITY ANALYSIS AND STRATEGIC PLAN

AN IESA - MARKETSANDMARKETS REPORT 2018

## EXECUTIVE SUMMARY

### GLOBAL SEMICONDUCTOR INDUSTRY

The worldwide semiconductor sales reached USD 339 billion in 2016, according to the figures from WSTS. According to the Semiconductor Industry Association (SIA) data, global semiconductor sales have increased at a compound annual growth rate of 9.5% over the past 20 years.

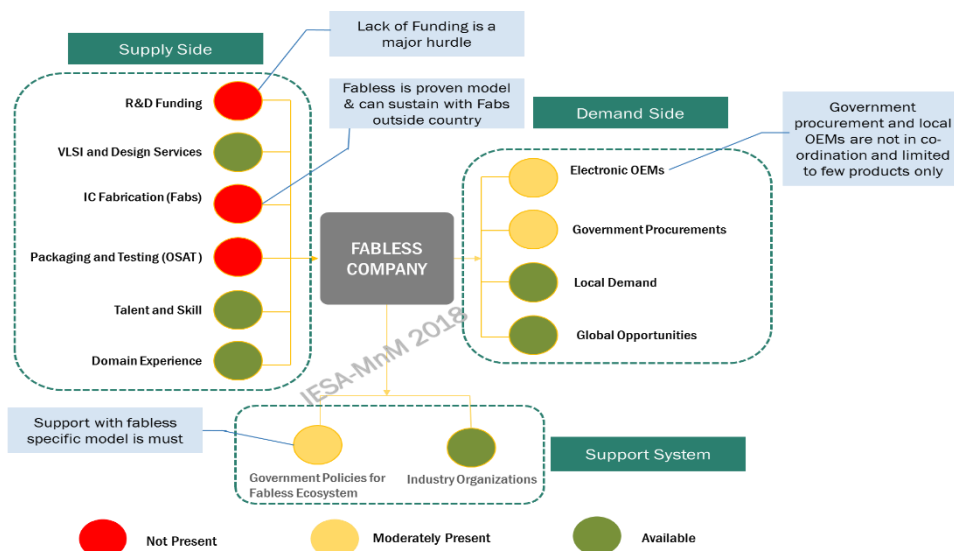
### FABLESS ECOSYSTEM

The semiconductor industry has seen a lot of changes in business models. Prior to the 1980s, the industry was fully integrated, with manufacturers owning every step of the process, from design to final product. Semiconductor companies owned and operated their silicon wafer fabrication facilities and developed their own process technologies for manufacturing chips. These companies (also known as IDMs) also carried out the assembly and testing of their chips. The late 80s and the early 90s saw the emergence of the concept of fabless and foundry business models; however, this gained prominence in the last 15 years as the capital cost of investing in new process grew multifold. Today, setting up a wafer fab for the leading edge (14 nm and below) costs ~USD 150–200 million for every 1,000 wafer starts per month (wspm). For example, a breakeven of >50 kwsmp for leading-edge manufacturing implies an investment of ~USD 7–10 billion.

### INDIAN SEMICONDUCTOR ECOSYSTEM

The Indian semiconductor design ecosystem is quite robust, with most of the major global semiconductor players having their R&D centers in India. In addition to global R&D centers, the past decade has seen quite a few Indian entrepreneurs starting their own fabless IP or SoC design houses. India is a highly attractive destination for global R&D centers owing to the availability of talent, as well as lower cost (compared with the US and Western Europe). As per our estimates, the dollar revenues for Indian fabless semiconductor companies are less than USD 50 million currently.

**FIGURE 1** STATUS OF INDIAN FABLESS ECOSYSTEM



Source: Secondary, Company Websites, and IESA-MarketsandMarkets Analysis

### OPPORTUNITIES FOR FABLESS ECOSYSTEM IN INDIA

India is strongly focusing on semiconductor manufacturing, but it is equally important for the country to encourage the development of fabless players. It is expected that the increased demand for modern chip designs and growing demand for electronics devices would drive the need of semiconductor IP designing. The Indian semiconductor component market is expected to be worth USD 32.35 billion by 2025, growing at a CAGR of 10.1% between 2018 and 2025.

**TABLE 1** KEY OPPORTUNITIES FOR SEMICONDUCTOR COMPANIES IN INDIA

Key Trends	Key Products	Driving Factors
Smart Industrial Automation	<ul style="list-style-type: none"> <li>PLC</li> <li>DSC</li> <li>Transmitters</li> <li>Sensors</li> </ul>	<ul style="list-style-type: none"> <li>Need for mass production and connected monitoring</li> <li>Government initiatives toward pollution control</li> </ul>
Defense	<ul style="list-style-type: none"> <li>Weapons</li> <li>Munitions</li> </ul>	<ul style="list-style-type: none"> <li>Need for more efficient arms and armaments, and military weapons</li> </ul>
Rural Broadband	<ul style="list-style-type: none"> <li>Modem</li> <li>Fiber optic components</li> </ul>	<ul style="list-style-type: none"> <li>Encourage telecommunication spread in rural areas and increase literacy</li> </ul>

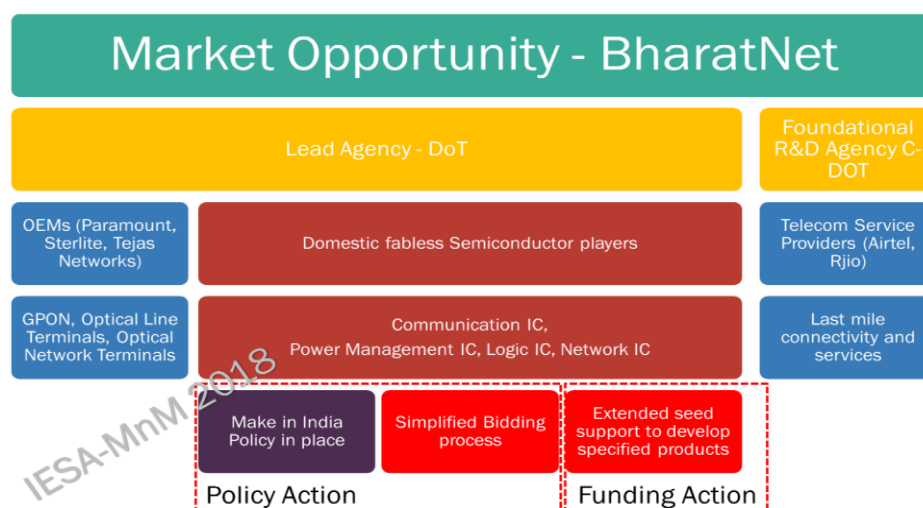
Source: IESA-MarketsandMarkets Analysis

**GOVERNMENT POLICY CREATES MARKET OPPORTUNITY**

Market discontinuities can create new opportunities for a firm and can even create innovative industries. Competitors can also create market discontinuities to achieve and sustain competitive advantage in the marketplace.

**RECOMMENDATIONS FOR STRATEGIC ACTIONS & POLICY****KEY INGREDIENTS FOR FABLESS SUCCESS**

The key elements for the success of fabless companies are market opportunity, human capital, and funding. India already has a large pool of talented and experienced professionals in semiconductor design. Government is in a position to support emergence of domestic Fabless companies through planning and policies that influence both public procurement and private consumption.

**FIGURE 2** GOVERNMENT POLICY INCENTIVES AND SEED FUNDING TO PROMOTE FABLESS STARTUPS (EXAMPLE: BHARATNET)

Source: IESA-Markets and Markets Analysis

**NEED FOR GOVERNMENT SUPPORT**

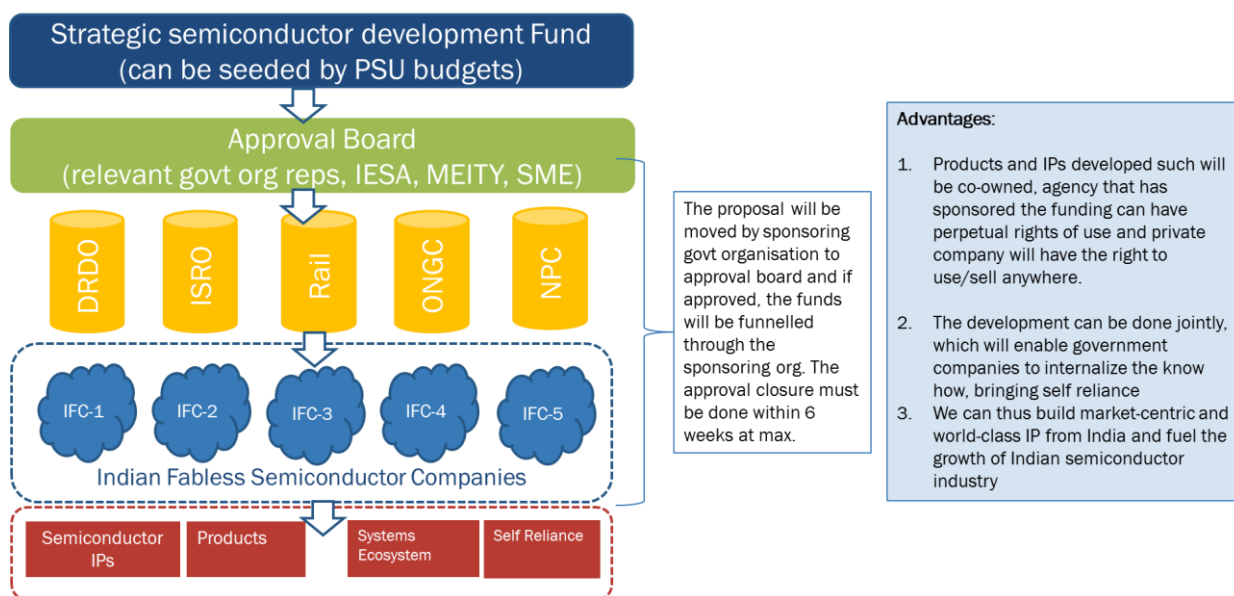
To shift the market momentum in semiconductor industry from a service based model to growing and high value creation product-based model, the nascent Fabless ecosystem needs support from the government. The figure

below shows that R&D Funding, formation of Fabless Incubation centres and subsidies for prototyping of ICs can be effectively used by Government to promote domestic Fabless companies.

## STRATEGIC ACTIONS

- Market-linked & strategic **product R&D** funding model through PSU.

**FIGURE 3** CUSTOMER AS INVESTOR FRAMEWORK



Source: IESA-MarketsandMarkets Analysis

- National security & defence procurements
- Incubation centers for fabless ecosystem
- Use government initiated market transitions to promote domestic fabless companies
- Empowered entity to drive fabless policy
- Promoting partnership between OEMs and local fabless players

## POLICY RECOMMENDATIONS TO PROMOTE FABLESS COMPANIES

- Special provisions in EDF
- Special provisions in M-SIPS
- Cluster-based development– a proven model
- Fabless-specific international trade policies
- Facilitation of market access for local fabless companies

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IESA is the premier trade body representing the Indian Electronic System Design and Manufacturing ESDM industry and has represented it since 2005. It has over 300 members - both domestic and multinational enterprises. IESA is committed towards building global awareness for the Indian ESDM industry and supporting its growth through focused initiatives in developing the ecosystem. This is through publishing credible data, networking events and alliances with other international associations IESA works closely with the Government as a knowledge partner on the sector, both at the center and at the state level.

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Published by: India Electronics & Semiconductor Association, Bangalore

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