

Ministry of Electronics and Information Technology Government of India





Making India Atmanirbhar in ESDM

Roadmap to achieve \$300 billion in Electronics Manufacturing by 2025-26

Report Back Session

Developing a Semiconductor and Display ecosystem in India

Venue : Gulmohar Hall , India Habitat Centre , Date : 01.12.2021





Panel

Developing a Semiconductor and Display ecosystem in India



Moderator



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Background: India's demand for electronics estimated to be 370 Billion Dollars by 2025. Domestic production is expected to grow to 200+ Billion. Domestic Growth may exceed 250+ Billion with PLI. How do we enable growth in the Indian Industry?

Design[Sanjay Gupta, NXP]

India Semiconductor Design is in Mature Teenage phase ready to Jump into adulthood. We have proven that once a challenge is thrown and the right kind of leadership is present nothing is impossible.mEvery Indian company has scaled every year in terms of capability and value addition and innovation. Lot of high end work at par with global requirements.

Todays semiconductor Industry in India has Talent war as the biggest challenge. This is critical for sustainable growth We need to have a strategy to Develop Talent. We need to produce industry ready engineers Have focused initiatives to nurture Entrepreneurs

• Displays [Akarsh Hebbar. - Vedanta]

- Display is Prevelant in all electronics. Only 4 countries dominate this space. China, Taiwan, Korea and Japan We have a huge market opportunity. India Sub continent is the largest captive market. Need to arrest imports. Display and semiconductors are strategic. We can go from 20% to 60% value add if we factor in Displays. Global market of 110 B \$ in Displays.
- LCD represents 83% of the market share. India with its smartphone market, OLED represent less numbers We have access to LCD technologies Countries like Japan, Taiwan and Korea are looking for opportunities for investment outside China. India has the pull and the market. With the new focus of the govt. atmanirbhar initiatives we will see more traction)
- In India, we have low cost and high skilled labor, we have natural resources. What we need is support from the Govt. Taiwan, China eg. have gone into govt. subsidy support. Display and Semiconductor mfg. can be the flagship for India. Will stimulate home grown Entrepreneurs if the ecosystem is built. Govt. has targeted a Billion handsets, etc.... To achieve this we need 4 to 5 display Fabs (16-20 Billion dollars of investment) to capture 50% of the market). Subsidies, import taxes, localised aspect of relief in some taxes, preferential market access.

• ATMP and OSAT [Raja Manickam - TATA OSAT]

- Most of the countries like Taiwan, Korea, China, etc. started with manufacturing and became strong in Manufacturing and using that as a platform, they developed Memory, Display technologies, Creating Products.
- In the case of India we did the opposite because of our success in the IT sector. The Engineering strength in the IT Sector flowed into the Design space as well. Most of the MNCs took advantage of the Talent in india and the Global Indian Diaspora so we became strong in Design. We designed for Other companies & Not for Indian Companies. Strategies were driven by other companies. The strength we have now is that except for manufacturing the entire ecosystem is in India now.
- With the foundation in Manufacturing, there is good chance that we will be able to see innovative. And disruptive product design. Market Size 450 500 B \$ and projection is around 700+ B \$ by 2025. Huge growth (mfg. Engineering services). India should participate in the 200 B \$ growth market .Packaging and test is a significant market. (used to be 70% wafer fab 30% post fab) Lot of innovation happening in Packaging India is in the right spot in terms of scalability because of talent Scope is very high (70 80B)
- When OSAT proposal was put together, ROI is a long term thing. Once established, it is a good business provided you think about it globally. Large companies in India are India centric. Good at operating within the framework of India Semiconductor business is global. We need to figure out how to incentivise to be global player. Korea and Taiwan had no choice as they did not have a market. So they had the vision to go global out of necessity.
- The narrative from an industry stand point Industry needs to come up with bold ideas and make investment for the long term and not just keep going to the govt. If one Morris chang made a difference, we have a lot of Morris Changs who are Indians. We should bring that talent The timing is good, Tata OSAT will make a significant investment and have strategies to get to revenue as soon as possible. It is a long term shot. Labor, Cost of labor, regulations, Govt. Support is lining up to be a global player
- Acquisitions and Mergers are part of the required strategies.

• Semiconductor Manufacturing Supply chain [Jitendra Chaddah - Intel]

- How can we add value by sourcing materials and equipment for the global fabs and OSATS from India Some of these
 materials and components used in the Semiconductor Industry are already being used by other Industries (Paint,
 Agritech, Petrochemical). The difference is the grading of the materials is different than the ones required in the
 semiconductor Industry It is not as hard or capital intensive to bring these to semiconductor grade We should look at
 what can be sourced from India for the global ATMP and FAB's with much capital equipment Specialized Skills required
 to support the semiconductor manufacturing supply chain. To develop these skills we have to go multidisciplinary e.g.
 chemical, metallurgical electro mechanical world.
- How can we bring all the chemical players and equipment players and ask them what needs to be done to upgrade them for the Semi mfg. space. Put together an organisation that qualifies materials and equipment for both Indian and Global organisation. Eg E.U came back 6 months ago including Semiconductor materials, what material and what is required by the EU for supply. They are making a grading system for EU consumption. We can take that charter (MEITY and Govt of India)
- We need to focus on Entire ecosystem. Can we create a National Semiconductor Mission that brings all of these together (design, mfg, etc). Todays incentives are in multiple spaces. This Missions goal should be a long term 25 years. How can we change the semiconductor landscape in India.
- Min. 10% of 150 Billion dollars of semiconductor manufacturing supply chain opportunity out there for us to pick
- We need to support Fabless design startups. We need at least 4-5 SFAL's in the country. We are contributing 100 Million we can take it to 2 B (Value add). Target is to have 1000 Fabless companies

• Semiconductor Manufacturing Equipment [Krishnan Shrinivasan - LAM research]

- Semi Mfg. Equipment is one of the most multidisciplinary branches in Semi/mfg ecosystem
- Value that Equipment companies provide to customers Two largest components are IP and Material
- India has an unbeatable advantage. As semi equipment is multidisciplinary Strength of open ness and collaboration
- Political and legal systems allow multinationals to operate in India
- What we lack is the presence of a customer in India will accelerate cycles of learning within India and allow us to contribute IP
- Customer Base + Up stream supply chain will help accelerate India's contributions
- We cannot think of Mfg. in Isolation, we have to think of the entire ecosystem
- Ability of Indian ecosystem to participate in IP value creation is High. LAM CTO office funds incubation. 7 of 30 grants in 2021 went to Indian Institutions.
- We need to bring the ecosystem together and take a long term goal on a war footing

Summary

- India is at an inflection point. India has a huge opportunity to grow in diverse segments The next 3 decades belong to India. The sky is the limit.
- With increase in requirement for electronics manufacturing. This is the right time for disruption in the Supply chain which is now concentrated in other countries. This is the best time for the Indian Entrepreneur
- Creating the National Semiconductor mission should be mission. Looking at Meity to do it. It also connects well with 100 years of India's Independence. 15 Billion dollars of opportunity in the Semi material and equipment space. Small bridge required. They can be suppliers to the global semiconductor Manufacturing industry. 5 more SFAL's in the next few years.
- Govt. Should throw the challenge back to the Industry and associations that are advising the Govt.
 Google, Amazon Facebook are all getting into chips. Throw the challenge back to the Industry to create that next processor. Lot of opportunity in the market. Think global. It is different from what we are used to do. Taking lot more risks. The timing is right. As much as we are chasing the semiconductor business, the World needs india for semiconductors. The growth and scalability required to solve some big problems for like climate change. The semiconductor Industry needs India. Promote it boldly.
- We could learn from our history in the Automobile space. We can learn from the Automotive industry creating the current ecosystem,