CSIA-SIA Workshop on Promoting Global Semiconductor Value Chain Cooperation

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About ITIF

- One of the world’s top science and technology think tanks.
- Formulates and promotes policy solutions that accelerate innovation and boost productivity to spur growth, opportunity, and progress.
- Focuses on a host of issues at the intersection of technology innovation and public policy:
  - Innovation and trade policy
  - Innovation processes, policy, and metrics
  - Science policy related to economic growth
  - IT and economic productivity
Two Paths for China’s Manufacturing Economy

1. Indigenous innovation, development of internal value chains and manufacturing technology ecosystems.

2. Participation in global value chains (including technology absorption) for the development of advanced manufacturing technology products.
Manufacturing Policy Must Get the 4 “Ts” Right

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<th>Technology</th>
<th>Tax</th>
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<td><img src="image1.png" alt="Image of a microchip" /></td>
<td><img src="image2.png" alt="Image of a dollar sign" /></td>
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<th>Trade</th>
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<td><img src="image3.png" alt="Image of a cargo ship" /></td>
<td><img src="image4.png" alt="Image of a scientist" /></td>
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Manufacturing Technology

1. Robust investments in both basic scientific and industrially relevant applied research (R&D).

2. Platforms aligning academia, industry, and government in public-private partnerships supporting advanced manufacturing product and process innovation.

3. Bolstering the capabilities of SMEs throughout a nation’s manufacturing supply chain.
Changes in National R&D Intensity, 2000-2014

- China: 121.5%
- South Korea: 56.8%
- Russia: 42.9%
- Brazil: 27.7%
- India: 21.0%
- Japan: 13.3%
- United States: 6.9%
Anticipated Annual R&D Budgets ($ Billions at PPP), 2014-2028

Source: R&D Magazine, 2016 Global R&D Funding Forecast
Public-Private Partnerships for Adv. Manufacturing

White House Report
NNMI Framework Design
January 2013

Academia
- Universities & National Labs
- Community Colleges

Institute for Manufacturing Innovation
- Prototype lab/shops
- Research facility
- Computer lab

Shared Use Facility

Government
- Federal
- State & Local
- Economic Dev. Org.

Industry
- Large Manufacturing Companies
- Small & Medium Enterprise
- Start ups
What America’s NNMI Does

Applied Research & Demo projects for
- reducing cost/risk on commercializing new tech.
- Solving pre-competitive industrial problems

Tech Integration - Development of innovative methodologies and practices for supply chain integration

Small/Medium Enterprises
- Engagement with small and medium-sized manufacturing enterprises

Education, technical skills and Workforce development

Education and training at all levels for workforce development
Building Out America’s NNMI Network

America Makes
Additive Manufacturing
DOD – Youngstown OH

DMDII
Digital Mfg & Design Innovation
DOD – Chicago IL

LIFT
Lightweight & Modern Metals
DOD – Detroit MI

PowerAmerica
Power Electronics Manufacturing
DOE – Raleigh NC

IACMI
Adv. Composites Manufacturing
DOE – Knoxville TN

Integrated Photonics
DOD – Rochester NY

Flexible Hybrid Electronics
DOD Solicitation

Smart Manufacturing
DOE Award TBA

Revolutionary Fibers & Textiles
DOD Award TBA

Open-Topic
NIST Solicitation
Sematech

- Development and implementation of international nanoelectronics manufacturing roadmaps and standards.
- Coordinates and oversees next-generation research, development and commercialization programs in lithography, interconnects, and metrology.
Better Supporting SME Manufacturers

Australia

Canada

England

Germany

Japan

Korea

Spain

U.S.
Better Supporting SME Manufacturers

1. Technology Acceleration Programs
   - Promote technology adoption (esp. Industry 4.0)
   - Support tech transfer/commercialization
   - Audit/improve manufacturers’ mfg./operational processes

2. Next-Generation Manufacturing Technical Assistance
   - Teach innovation and NPD techniques.
   - Assist with design, energy-efficient mfg., exports.

3. Technology Acceleration Funding Mechanisms
   - Direct funding for R&D activities
   - Innovation vouchers
Trade Policy

- To lead in modern advanced manufacturing, enterprises must be able to source the most sophisticated production equipment, parts, and components from global best-of-breed vendors.

- Market access is no longer “a concession to be granted” in exchange for access to partners’ markets.

- Rather, domestic firms depend on reliable access to imports of world-class goods and services inputs in order to improve their own productivity and competitiveness.

- Leadership in semiconductor production depends on deep interaction with the integrators and end-users of ICs.
Trade Policy

50% of semiconductors consumed in China are used for exported products.
Trade Policy

- Countries not participating in ICT GVCs tend to get left behind.
Tax Policy

Leverage tax policy to incent desired enterprise behaviors. China should make even greater use of:

- R&D, including collaborative R&D tax credits.
- Capital equipment investment tax credits.
- Workforce training tax credits
China 19th in OECD for R&D Tax Credits
Mfg. Talent/Workforce

- China will need to enhance the human capital component of the equation to meet Made In China 2025 goals.
- Need to up-skill both the current and future workforce.
- Tax credits for enterprises’ investments in worker training; match apprenticeship investments.
“Make In India”: Bold Vision, But Poor Policies

Make in India launched Sept 2014

GDP growth figures mask declines in industrial production
Annual % change

Source: Haver Analytics
“Make In India”: Bold Vision, But Poor Policies

- Plan is state-heavy with command-and-control—manufacturing zones with special tax, infrastructure, funding, and regulatory settings.

- Failed to address underlying structural issues that make India a difficult place to do business – 130th Doing Business Ranking.

- Key goal was to attract MNCs, but supporting policies discriminate with local content requirements (e.g., solar & national IoT policies).

- Held back by poor political and bureaucratic coordination, buy-in, and ineffective bureaucracy.

- Why is India trying to ride exports to success when global exports are faltering?
Thank You!

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