

## **Public-Private Roundtables – Tuesday, May 28, 2019**

*Smart Manufacturing for a Sustainable Energy Future*  
Co-Chairs: Canada and United States

### **Brief Overview:**

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This session will address the potential for harnessing the latest advancements in intelligent manufacturing processes including artificial intelligence (AI), robotics, internet of things, big data and high-performance computing, with a view to maximize the viability and environmental sustainability of clean energy manufacturing.

### **Narrative:**

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Industry is transitioning from manufacturing processes based on computerization and automation to advanced digitally interlinked systems of production. Advanced robotics and artificial intelligence are making our production processes more efficient, flexible and reliable; while big data and high-performance computing are enabling manufactures to better manage logistical challenges, and develop more complex production processes and supplier networks.

This next generation of manufacturing, created through the deployment of advanced digital technologies, can play a pivotal role in the creation and enhancement of clean energy products and process technologies including:

- improving solar cell efficiency,
- converting carbon dioxide to value added products,
- generating hydrogen economically
- improving energy efficiency, and
- increasing the overall demand for products manufactured from earth abundant, sustainable raw materials.

With broad support for clean energy technology solutions, there is an opportunity for private and public sectors to collaboratively and strategically deploy these advanced technologies to meet the challenge of rising global energy demand. By working together, industry and governments can reduce the environmental impact of manufacturing; and enable more efficient and low cost storage and production of energy such as wind turbines, solar cells, zero-emissions vehicles, and electric and thermal storage batteries.

## Session Structure:

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The discussion will focus on the transformation of manufacturing toward a more energy efficient production of clean energy materials, products and systems. It will look at key challenges to the adoption of these digitally enhanced, robotic technologies including:

- labour market disruption,
- technology aversion,
- skills and expertise development, and
- investments in capital that might strand existing assets.

The discussion will key in specifically on startups and SMEs as their production flexibility and less-established supply chains provide them with unique opportunities to take advantage of advanced manufacturing technologies.

This discussion seeks to identify broad, and stakeholder-specific opportunities for implementation of Industry 4.0 technologies in sustainable manufacturing for energy. The focus will be on examples and experiences from the stakeholders at the table. Considerations include:

- Assessing the hard and soft costs of implementing the latest advancements intelligent manufacturing processes
- Identifying the most promising approaches to adoption and the scale-up of next-generation manufacturing technologies, with consideration of the unique experiences of new entrants and SMEs
- Taking stock of existing resources across various sectors to support underlying technologies
- Reviewing the impact of new materials in an energy-sensitive manufacturing ecosystem
- Identifying the new value-chains needed for widespread platform technology deployment
- Discussing the role of the public and private sectors and how they can accelerate innovation through collaboration.

## Desired Outcomes:

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- To challenge MI members and the private sector to share best practices and explore collaborative opportunities to foster the adoption of smart manufacturing, specifically in regards to energy intensive products and processes. Participants should take into account the following aspects:
  - Insights on how artificial intelligence, robotics, internet of things, big data and high-performance computing will create smart manufacturing
  - Understand of the potential impact smart manufacturing could have in improving energy efficiency
  - Ways public- and private-sector can work together to foster smart manufacturing

- Determine MI's potential to address the cross-sectoral opportunities and challenges discussed in this session. The MI clean energy materials Innovation Challenge utilizes a smart manufacturing platform to accelerate the discovery of new clean energy materials, and has broad applications for the smart manufacturing of clean energy - from new inputs to optimized implementation of these platforms in manufacturing.

### **Guiding Questions:**

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1. What are the barriers and practical opportunities for public-private collaboration to harness the latest advancements in intelligent manufacturing processes in the upstream clean energy value chain?
2. How will the value chains change with the adoption of a digitalized manufacturing system? Where are the gaps?
3. What are the impacts and concerns associated with increased digitization of manufacturing? Where are we vulnerable?