



an initiative of:

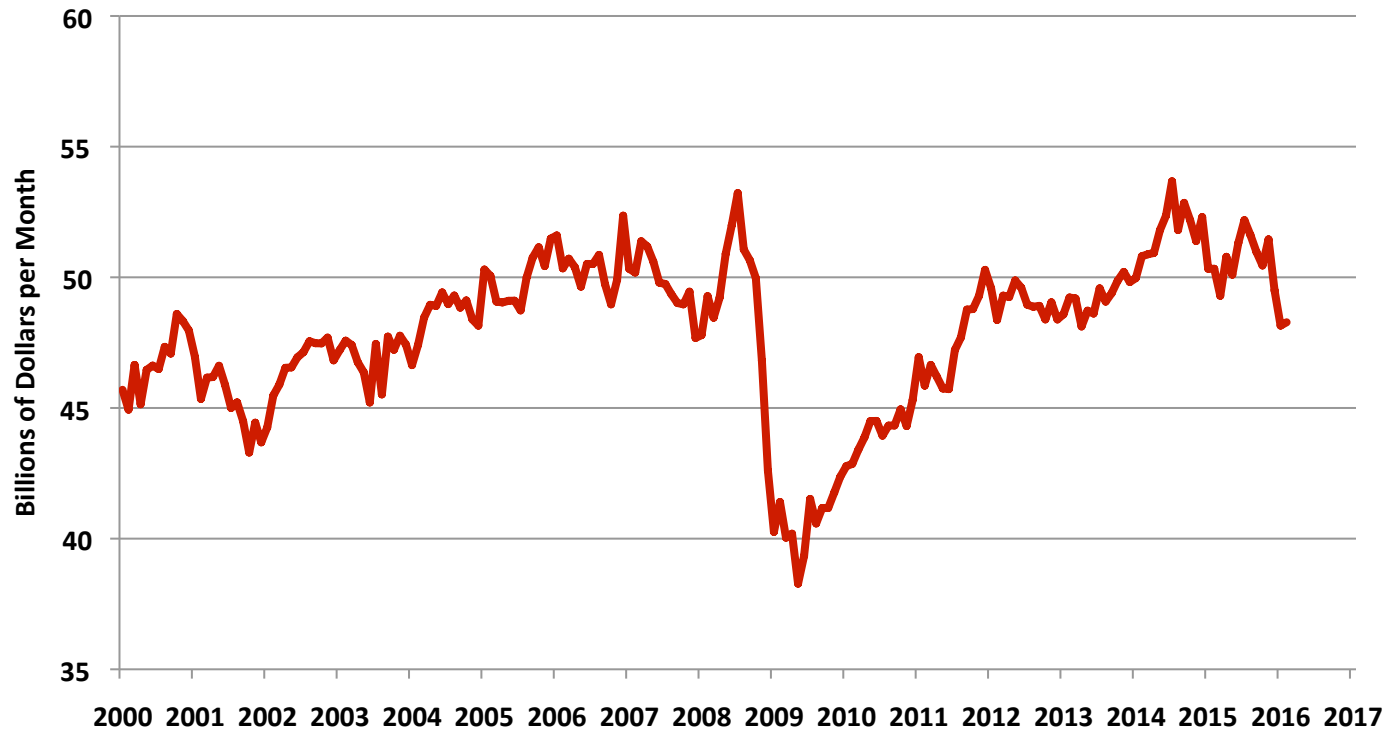


Industrie 2030: The Future of Manufacturing

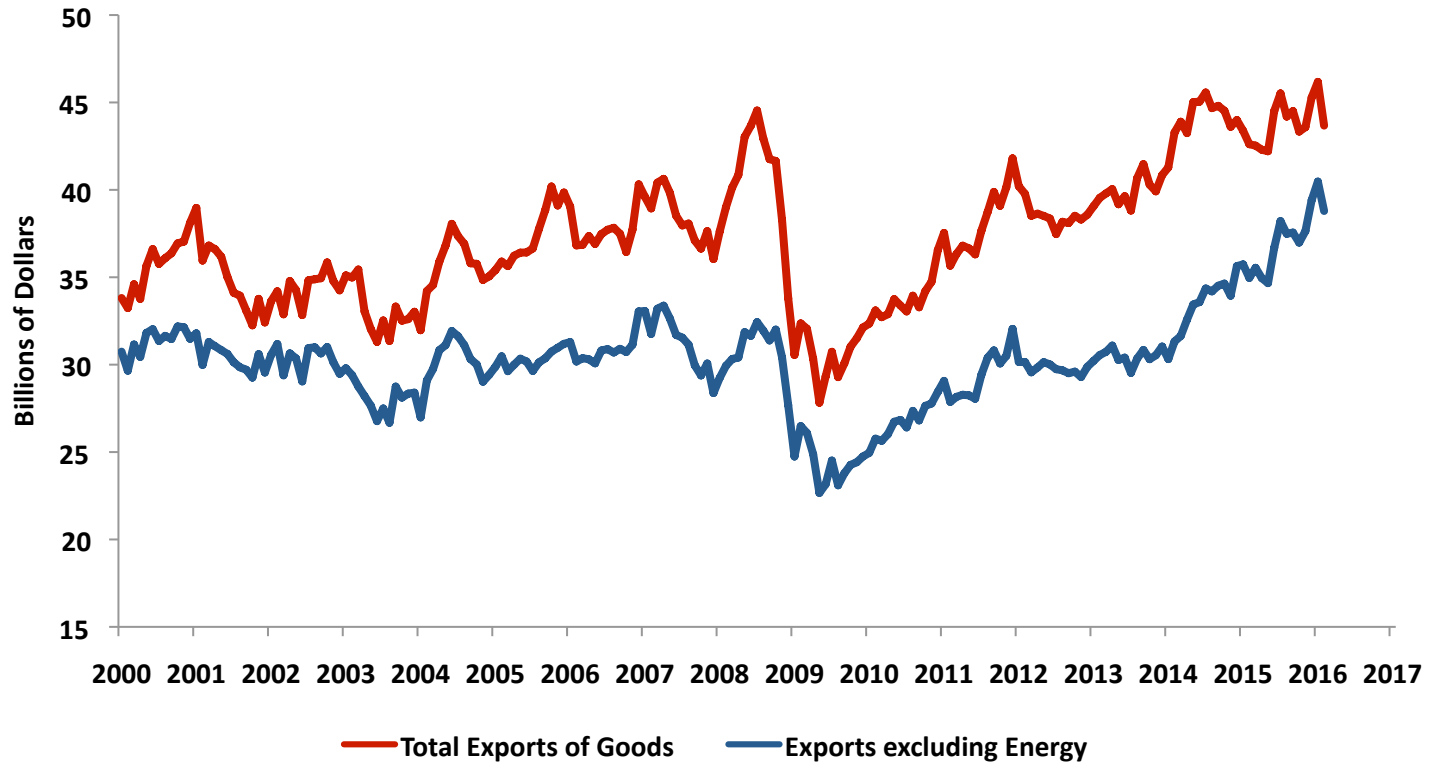
Manufacturing Matters to Canada

- A \$620 billion industry
- 11% of GDP (18% in 2004)
- 1.7 million direct employees (2.2 million in 2004)
- The largest payroll of any business sector
- Two-thirds of Canada's goods & services exports
- 80% of private sector R&D
- 85% of patents commercialized in Canada
- Every \$1 of output generates \$3.50 in total economic activity (\$3.05 in 2004)
- The business of providing customer solutions combining the production of goods, new technologies, and services

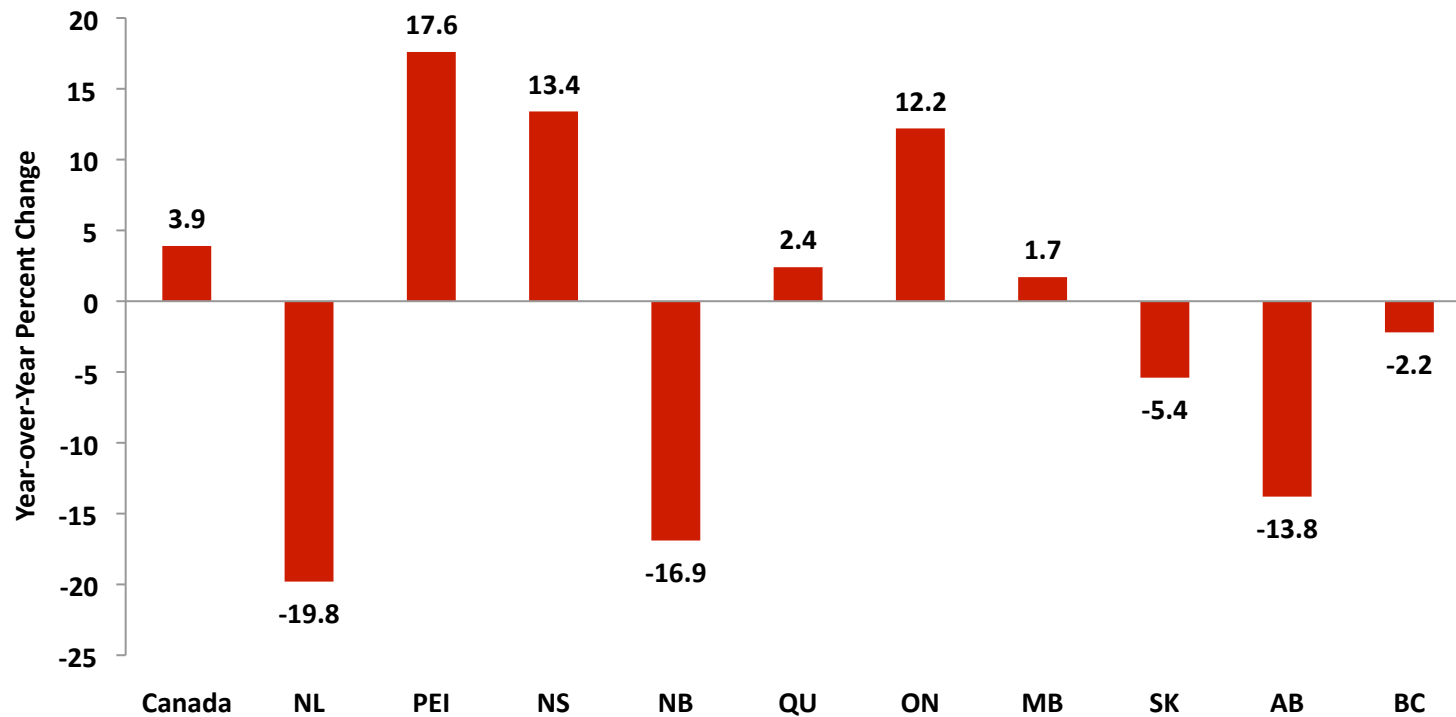
Manufacturing Sales in Canada



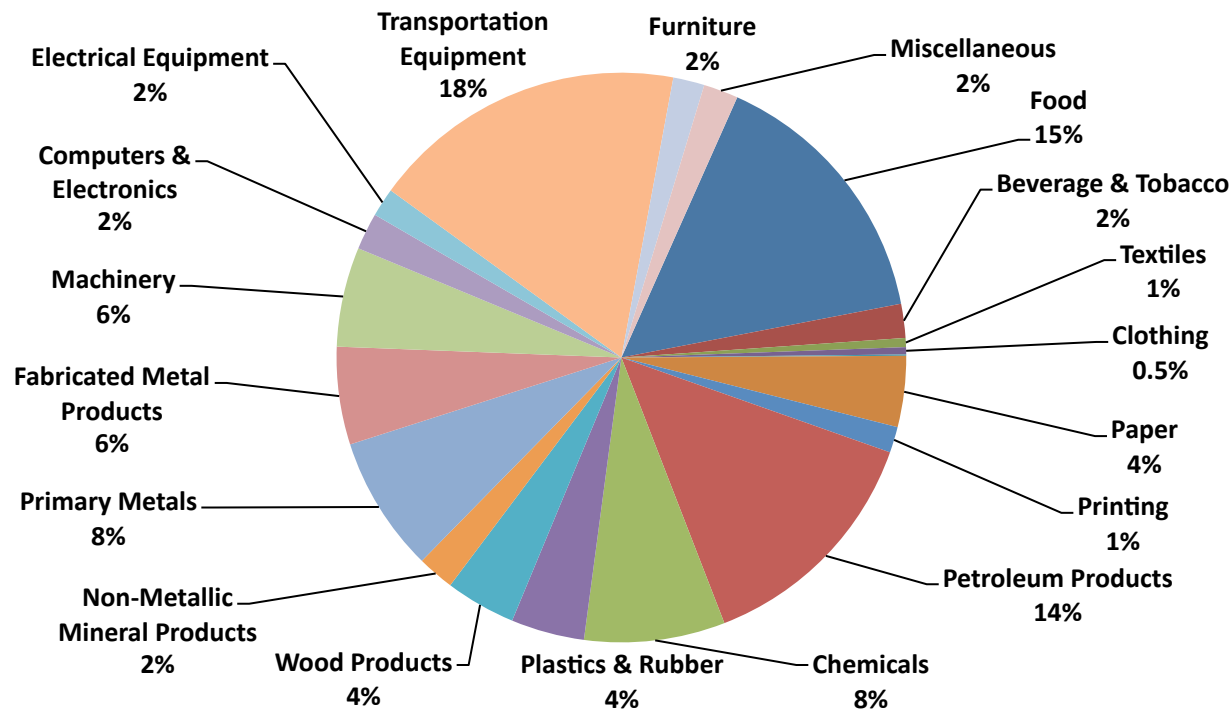
Merchandise Export Performance



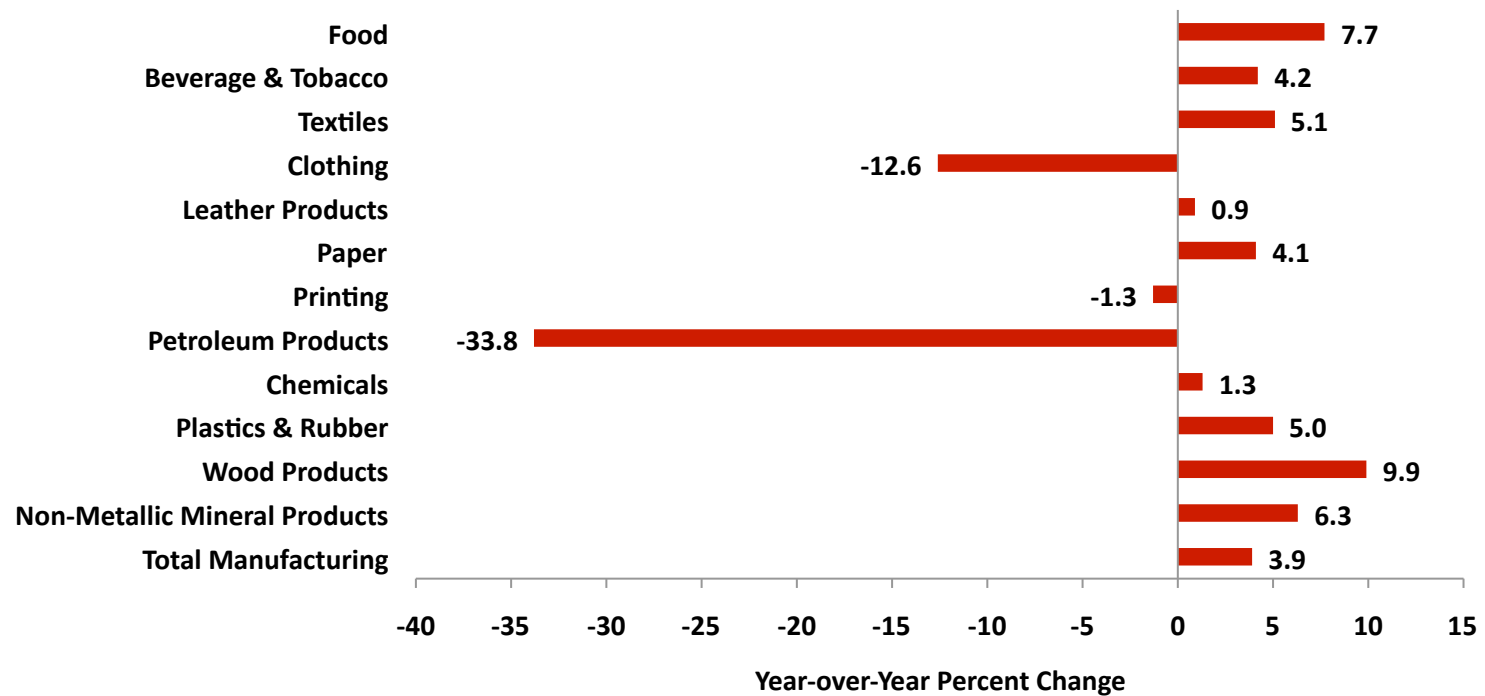
Manufacturing Sales by Province – Feb 2016



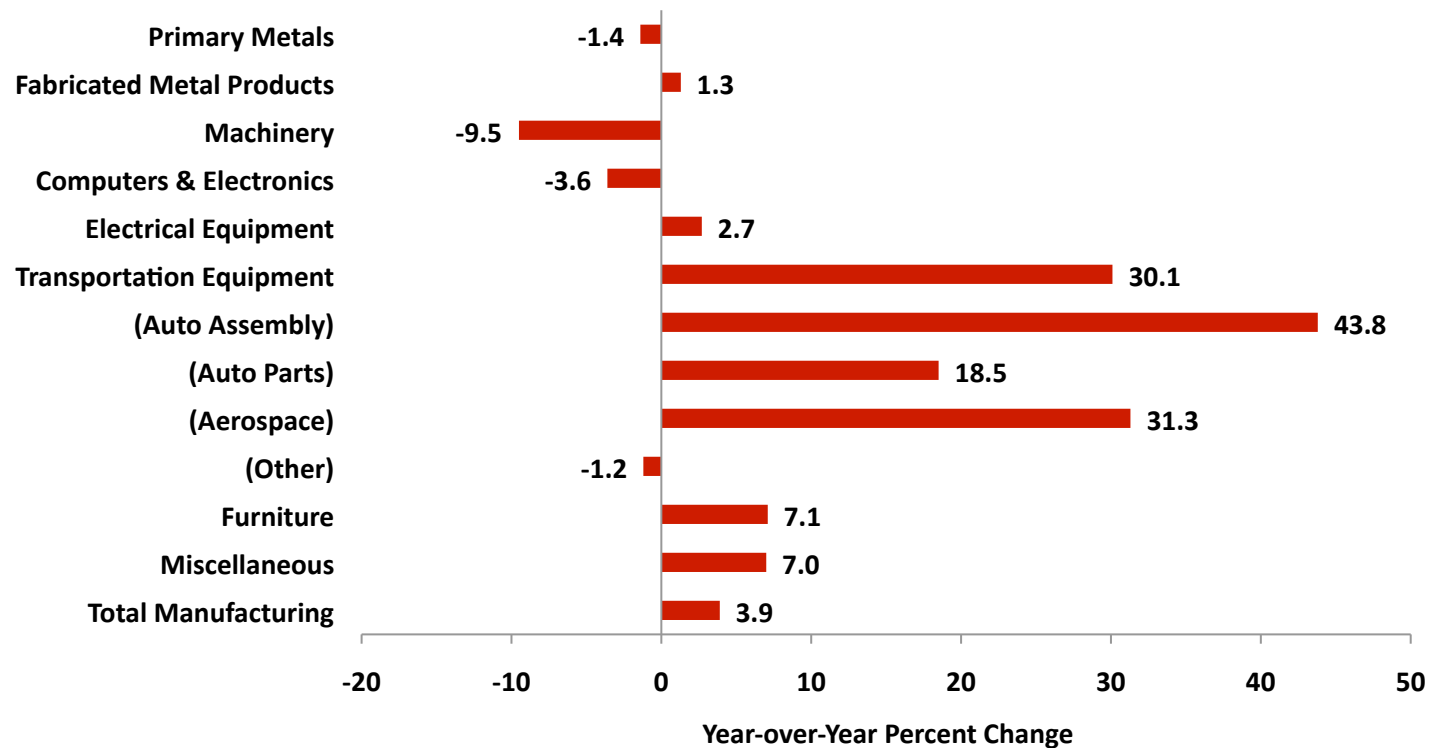
Manufacturing Sales by Sector



Manufacturing Sales by Sector – Feb 2016



Manufacturing Sales by Sector – Feb 2016



Current Economic Challenges & Opportunities

➤ Opportunities

- Recovery in US consumer demand (?)
- Competitive Canadian dollar
- Growth in specialized product markets
- Infrastructure investments

➤ Challenges

- Currency volatility
- Oil & commodity price collapse = loss of demand in oil sands and mining developments
- Financial turbulence
- Slower growth in China and other “emerging markets”
- Low/no growth in other major economies
- Slow growth at home – high risk for consumers /housing market
- Higher mandatory overheads (tax, user fees, regulatory compliance costs)
- Regulatory obstacles – federal, provincial, inter-governmental, border, international

Long Term Trends

- More demanding customers looking for immediate, customized, reliable, competitively priced solutions and expecting interaction with products that can serve a variety of interests
- More demanding stakeholders – governments, investors, public
- More intense competition – in both mass produced and specialized/innovative product lines
- Aging population and skills shortages
- Social challenges = new business opportunities
 - Health care, climate, environment, food, water, energy, security, social development
- Accelerating pace of technological change

A Revolution in Manufacturing Technologies

- Digital revolution – Computing power growing exponentially, costs of technology are falling
- Industry 4.0 – Integration of cyber-physical systems
- Advanced visualization, modeling, and artificial intelligence
- Reconfigurable, and integrated automation, sensors, robots, lasers, & visual systems enabling product/process monitoring & control, data collection both vertically (from shop floor to top floor) and horizontally (across the value chain)
- Internet of Things – “Internet of Value” – Real-time connection of products, processes, systems, customers, suppliers, networks of value
- Big data & quantum computing – Data analysis enabling rapid decisions and new applications & services
- Additive manufacturing/3-D Printing – Rapid prototyping and mass customization of complex parts
- Micromachining – Nano-machines, Bio-machines
- New materials – Lightweight, bio-nano-based, new alloys, printable electronics & smart materials
- New energy technologies – Generation, storage, propulsion, renewables

The Future of Manufacturing

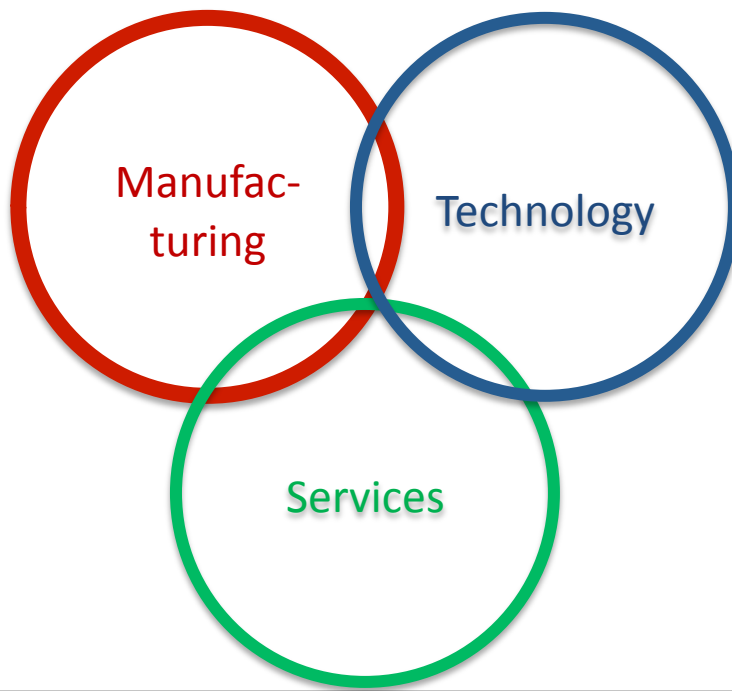
- Customers will interact directly with products and design processes.
- Products will be designed, tested, and engineered for production in cyberspace, using three-dimensional software, virtual and augmented reality
- Instructions will be sent to smart machines and automated factories to make the products.
- Software will optimize production processes and information flows across value chains – improving quality, reducing waste, increasing operating efficiencies, and speeding time to market for mass-customized products.
- Products and processes will be information platforms allowing for life cycle maintenance, monitoring, control, data analysis, and new applications
- More money will be made from services, data analytics, and apps than from products & production processes.

New Business Strategies are Required

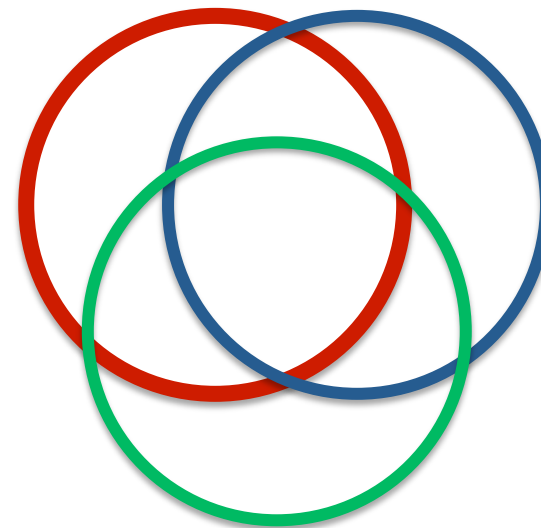
- Manufacturers will still need to be fast, flexible, efficient, compliant, & reliable
- They will be producing more customized, complex products requiring greater precision and accuracy
- Convergence of manufacturing, technology, service business models
- Focus on customized solutions, not products
- Value creation from services and data analytics
- Responsibility for end-to-end product life cycles
- Collaborative business models across international value chains to reduce risk and develop new opportunities
- Financing will depend on cash flow & rapid payback – less on asset-based lending

Increasing Convergence

From this ...



To this



An Integrated Value Network

It's up to Manufacturers to Compete and Grow

- Dynamic business planning
- Competitive value proposition
- International perspective
- Business development – grow customer base
- Customer solutions – product, technology, service
- Lean – understand processes, standardize work, reduce waste, continuous improvement of processes and flow (materials, product, information, work)
- Manage innovation – source, improve, create
- Smart & continuous technology adoption & improvement
- People – motivation, skills development, team based problem solving
- Collaboration – reduce risk & create new business opportunities
- Cash flow & financial sustainability – key to attracting finance & investments
- Importance of personal relationships

New Policies are Required to Support Manufacturing

- Make manufacturing a priority
- Business growth & new investment
- Fiscal policies that facilitate rapid technological change
- Investments that enhance commercialization
 - Procurement, technology demonstration, & risk reduction
- Data security & global IP regimes – who can commercialize the data?
- Open markets (products, services, investment, people)
- Seem-less → Seamless borders
- Education & skills for Industry 4.0 workforce
- Access to reliable, cost competitive infrastructure (transportation, energy, innovation, IT & Telecom, standards)
- Future oriented, Lean regulation
- Supportive financing

Industry 2030

- An industry led initiative to double manufacturing and exporting output in Canada over the next 15 years
- Developing and implementing a strategy aimed at:
 - Enabling Canadian companies to become world leaders in the development, application, and commercialization of advanced manufacturing technologies
 - Leveraging the strengths of Canadian industry
 - Identifying and reducing the obstacles that stand in the way
 - Celebrating the success of manufacturers from coast to coast
- Through on-line surveys and face-to-face discussions with manufacturers across Canada
- Culminating in a National Manufacturing Summit in October 2016



an initiative of:
 CME

**Double
Manufacturing & Exporting
Output in Canada**

Manufactured Right Here Promotion Campaign

**Retain &
Attract
Investment
& Expand
Capacity**

**Manufacture
More New
Products/
Technologies
in Canada**

**Accelerate
Adoption of
New
Technologies**

**Sell More
to
Customers
around the
World**

Develop Skilled Advanced Manufacturing Workforce

Ensure Infrastructure and Policy Environment Required for Success

MANUFACTURINGOURFUTURE

Get Involved – Shape your Future

- Participate in industry roundtables
- Host a roundtable at your facility
- Complete our 2030 survey in June
- Promote to your suppliers, business partners, peers
- Sponsor regional and national activities
- Promote *Manufactured Right Here*
 - Show the flag in your communications & on your products
 - Support and promote Canadian products throughout your supply chain



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Contact:

Marie.Morden@cme-mec.ca

613 355-8819

www.Industrie2030.ca

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