

Opportunities for manufacturing to drive economic growth in New Brunswick

JDI round table on manufacturing competitiveness in New Brunswick

September 25, 2019



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Manufacturing can help New Brunswick face the headwinds that will challenge its economic prosperity

Building a thriving manufacturing sector requires involvement from the whole ecosystem (public agents, academia, and businesses)

New Brunswick must build two pillars to grow manufacturing and its contribution to the region

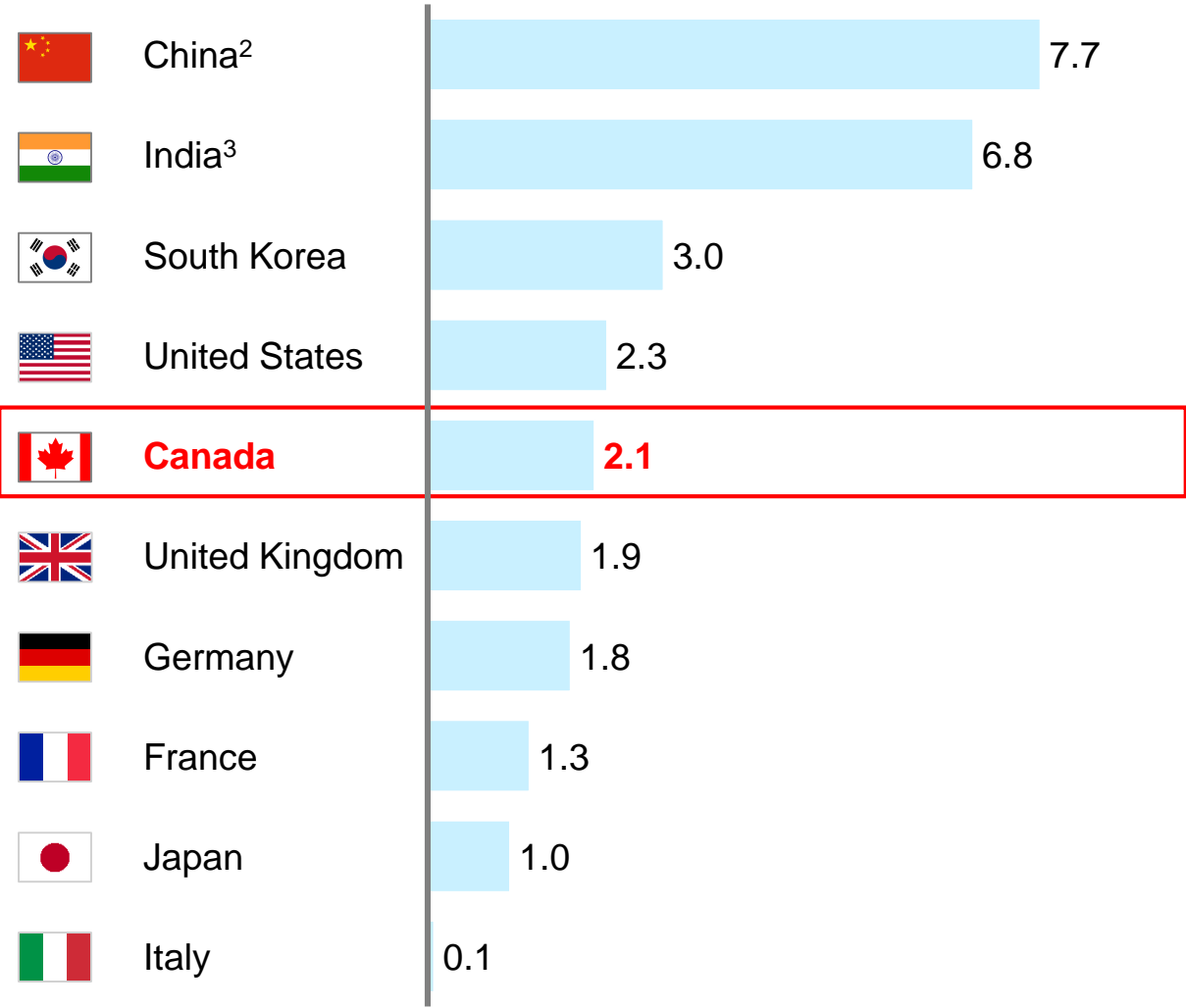
- 1) Increase manufacturing exports
- 2) Attract global foreign investment in local manufacturing

Both require productivity!

The country's economy has performed well in recent years...

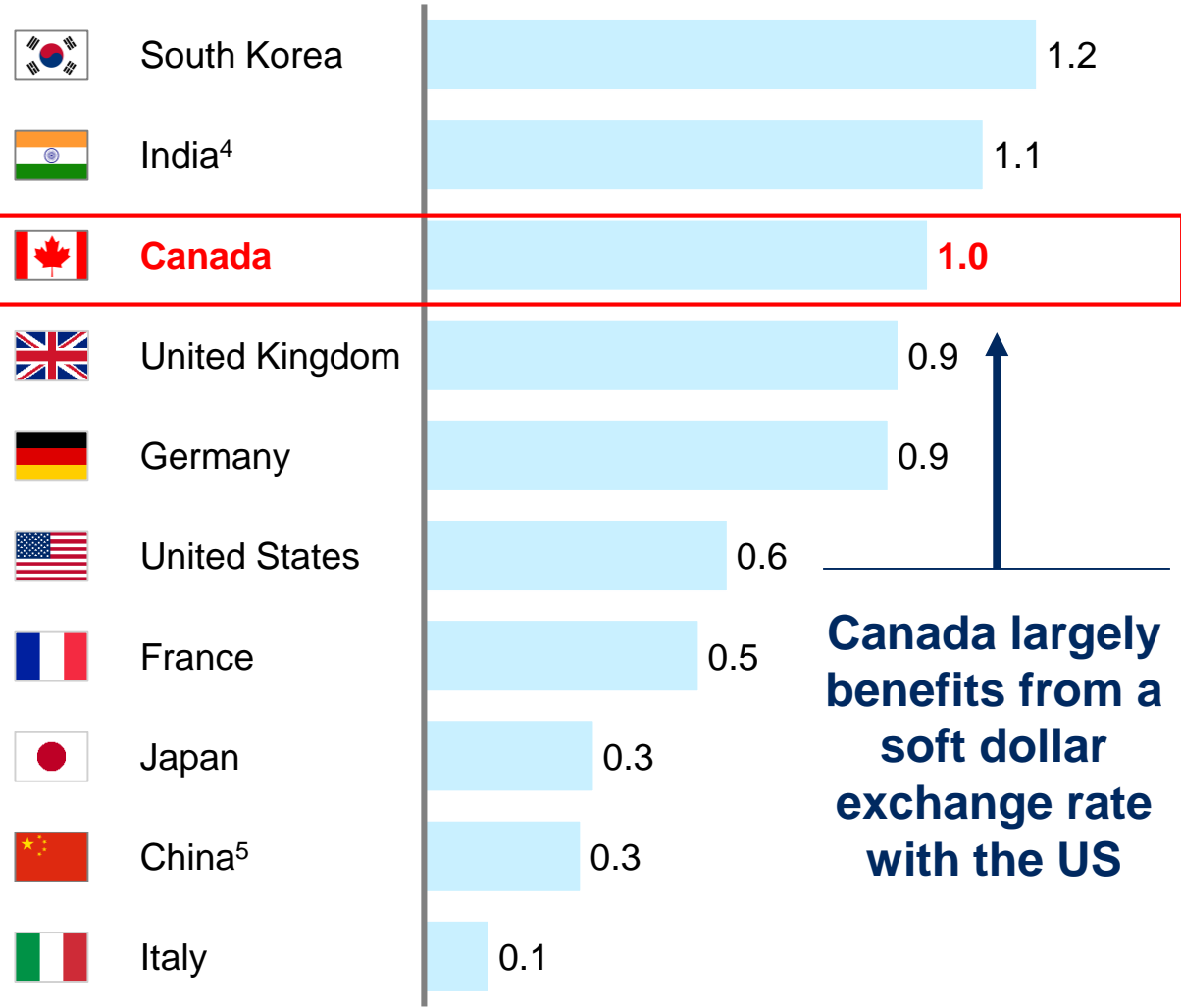
Average real annual GDP growth, 2010-2018¹

CAGR, %



Average annual employment growth, 2007-2018

CAGR, %



Canada largely benefits from a soft dollar exchange rate with the US

¹ GDP, US \$, constant prices, constant PPP, reference year 2010
SOURCE: OECD; Statistics Canada; World Bank, Statista

² Period of 2010-2016

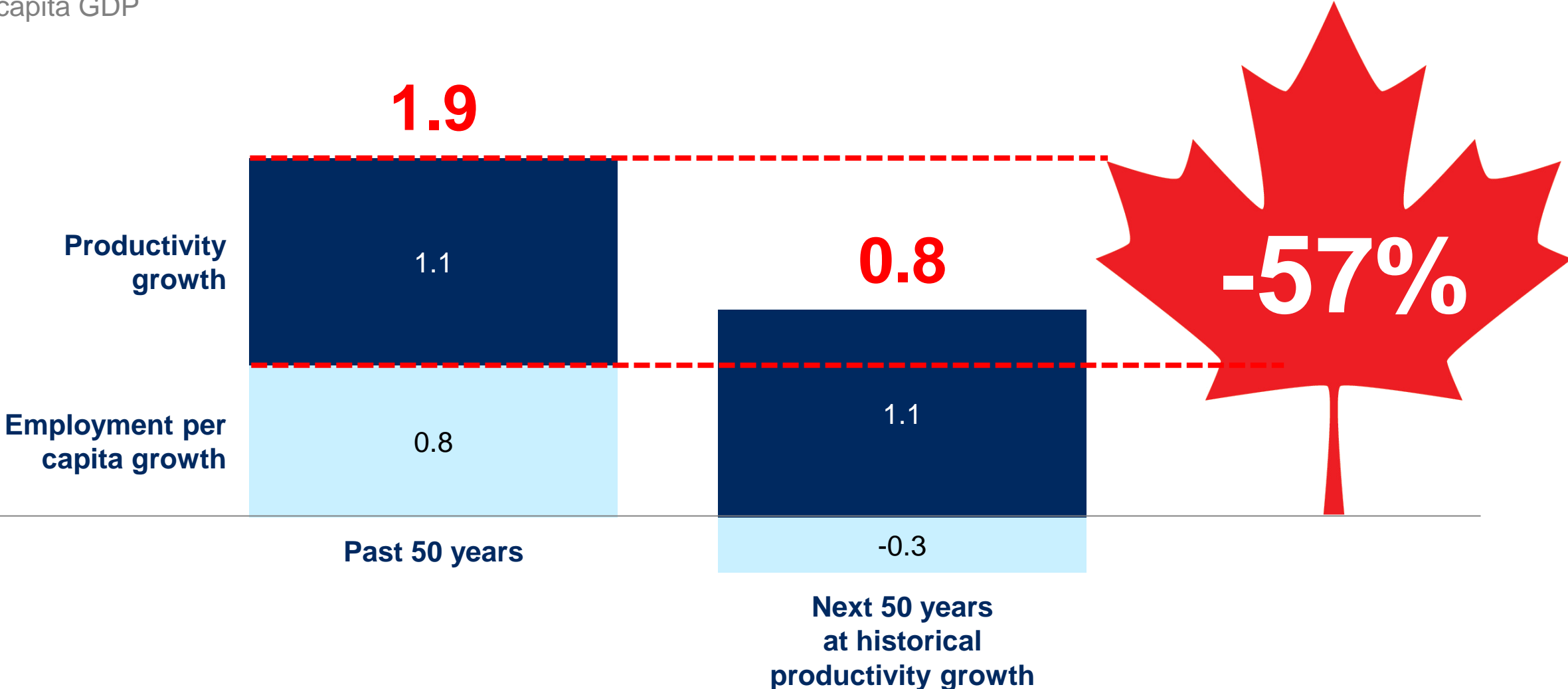
³ Period of 2010-2017

⁴ Period of 2007-2016

⁵ Period of 2007-2017

...yet, on its current path, Canada's per capita GDP growth is expected to drop by 50% in the coming years – from 1.9 to 0.8%

Per capita GDP

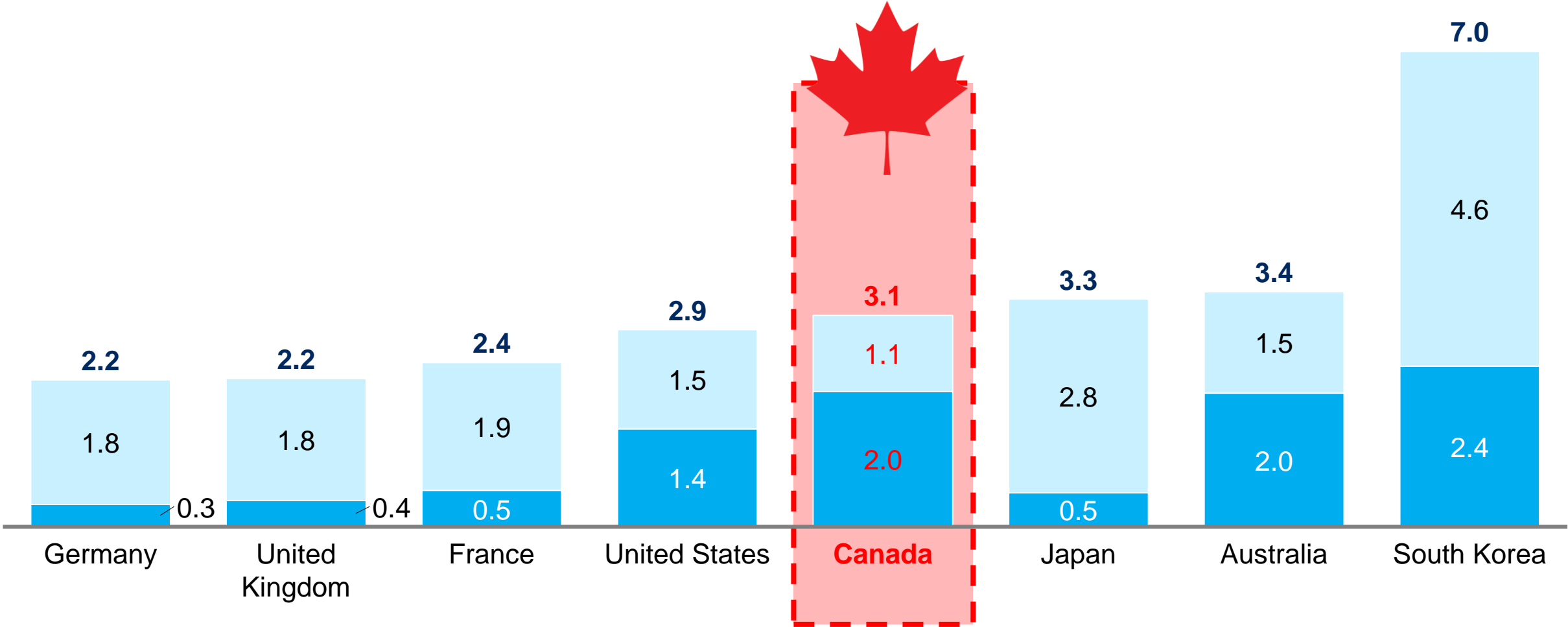


Past GDP growth in Canada was driven largely by employment growth and not increasing productivity

Contribution of employment growth and labour productivity to GDP growth

Compounded annual growth rate, 1964-2014, percent

- Productivity contribution (%)
- Employment contribution (%)



NOTE: Numbers may not sum due to rounding.

SOURCE: The Conference Board Total Economy Database; UN Population Division statistics; World Bank; International Labour Organisation; McKinsey Global Institute analysis

But the aging workforce will limit future employment growth, so the country needs to look for ways to increase productivity

Population aged 20-64 versus population aged 65+

1971 ▶ 7:1

2012 ▶ 4:1

2036 ▶ 2:1 ▶ 2:1

By 2036,
the ratio of
working age
to retired
Canadians
could be



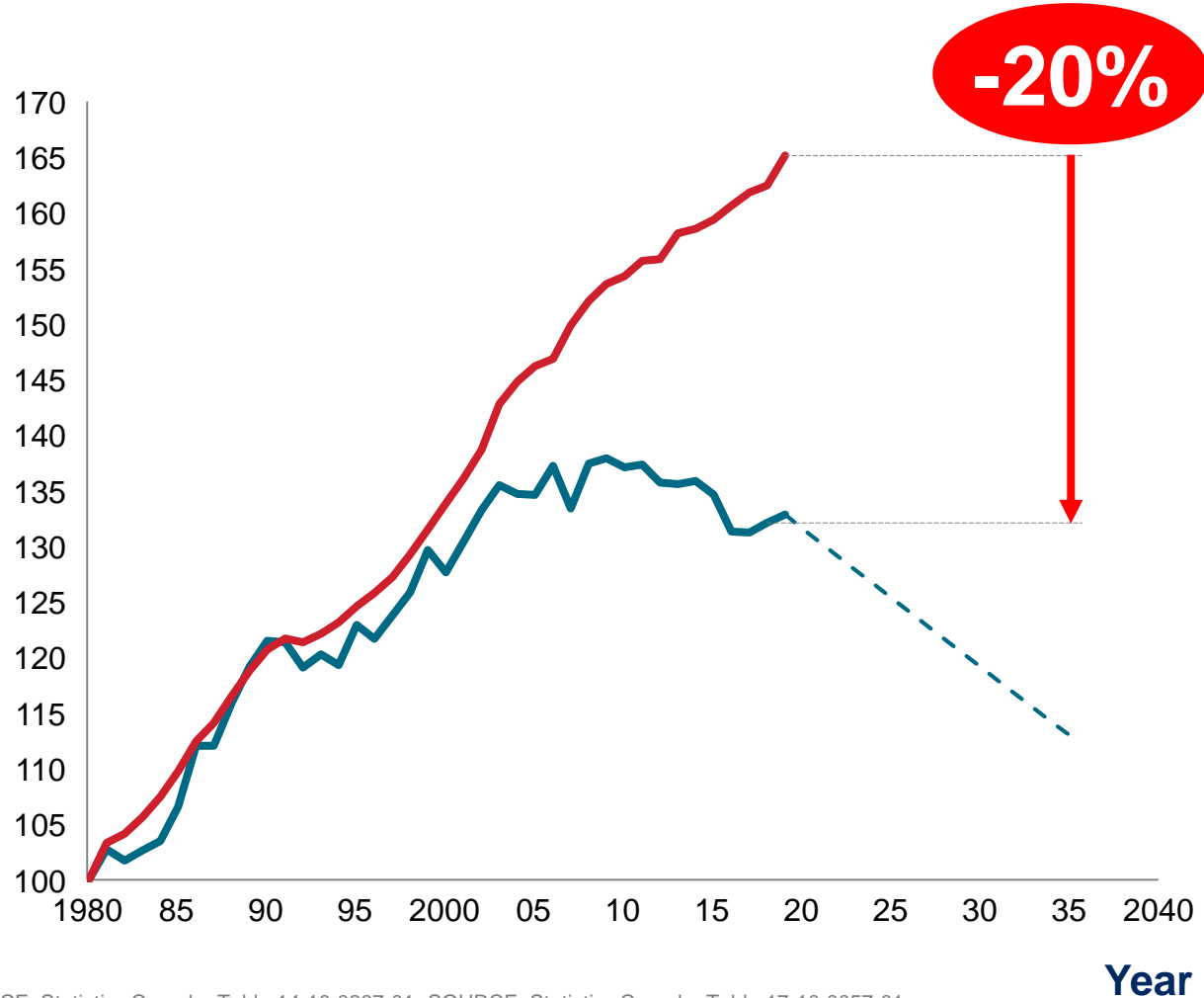
SOURCE: <https://www.statcan.gc.ca/pub/82-229-x/2009001/demo/dep-eng.htm>

The challenge is especially true for New Brunswick, whose labour force peaked in 2008...

Labour force (15-64 years) by year in New Brunswick

Index (1980 = 100)

— New Brunswick — Canada - - New Brunswick Projection



By 2020, New Brunswick's labour force will have started to shrink, leaving it far behind the rest of Canada

43% of university graduates leave New Brunswick after 2 years

96% of graduates originally from other provinces leave

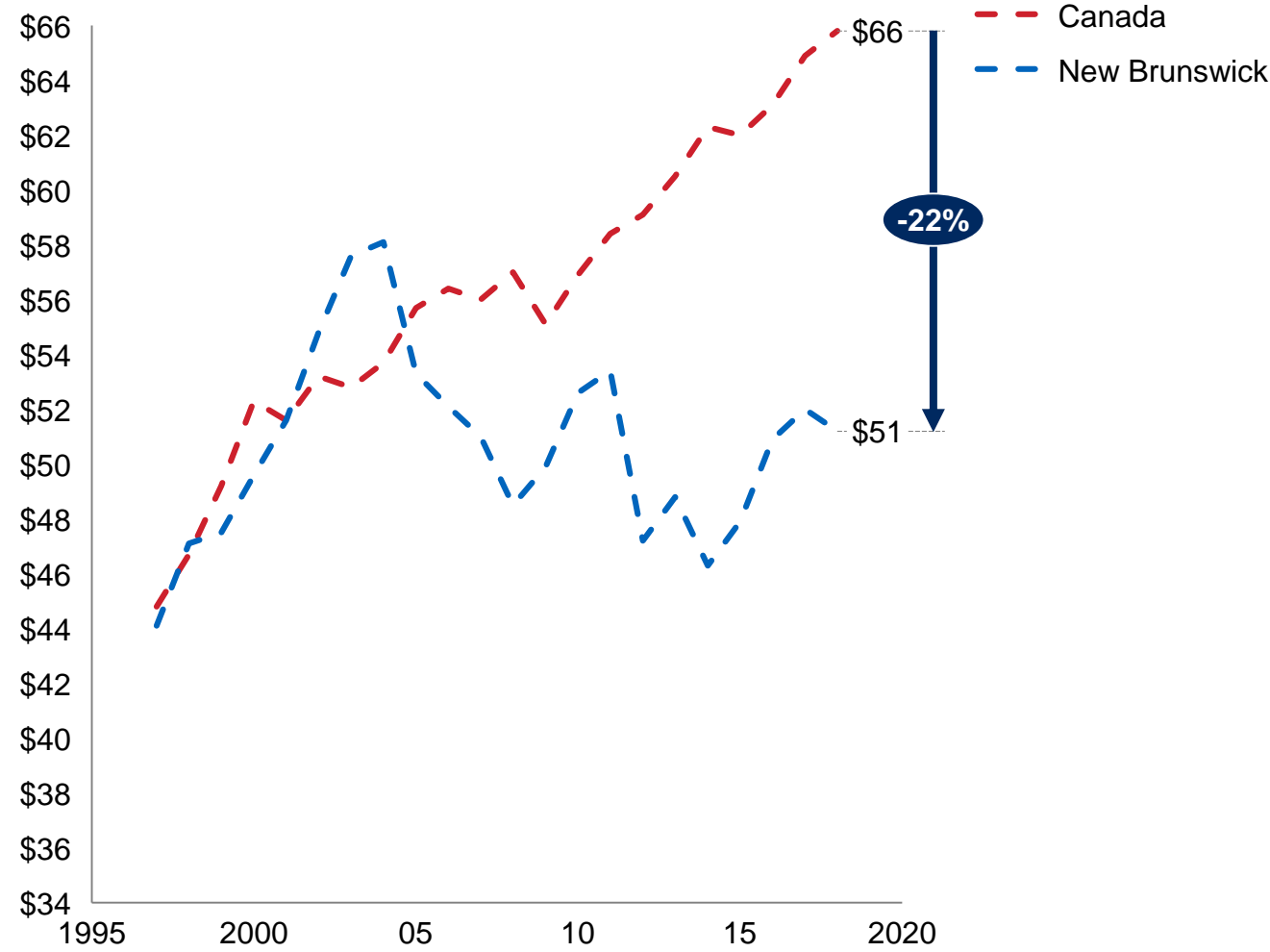
26% of graduates from New Brunswick leave

SOURCE: Statistics Canada, Table 14-10-0287-01, SOURCE: Statistics Canada, Table 17-10-0057-01

New Brunswick's manufacturing productivity has diverged and is now 22% lower than the Canadian average. New Brunswick ranks second to last among Canadian provinces

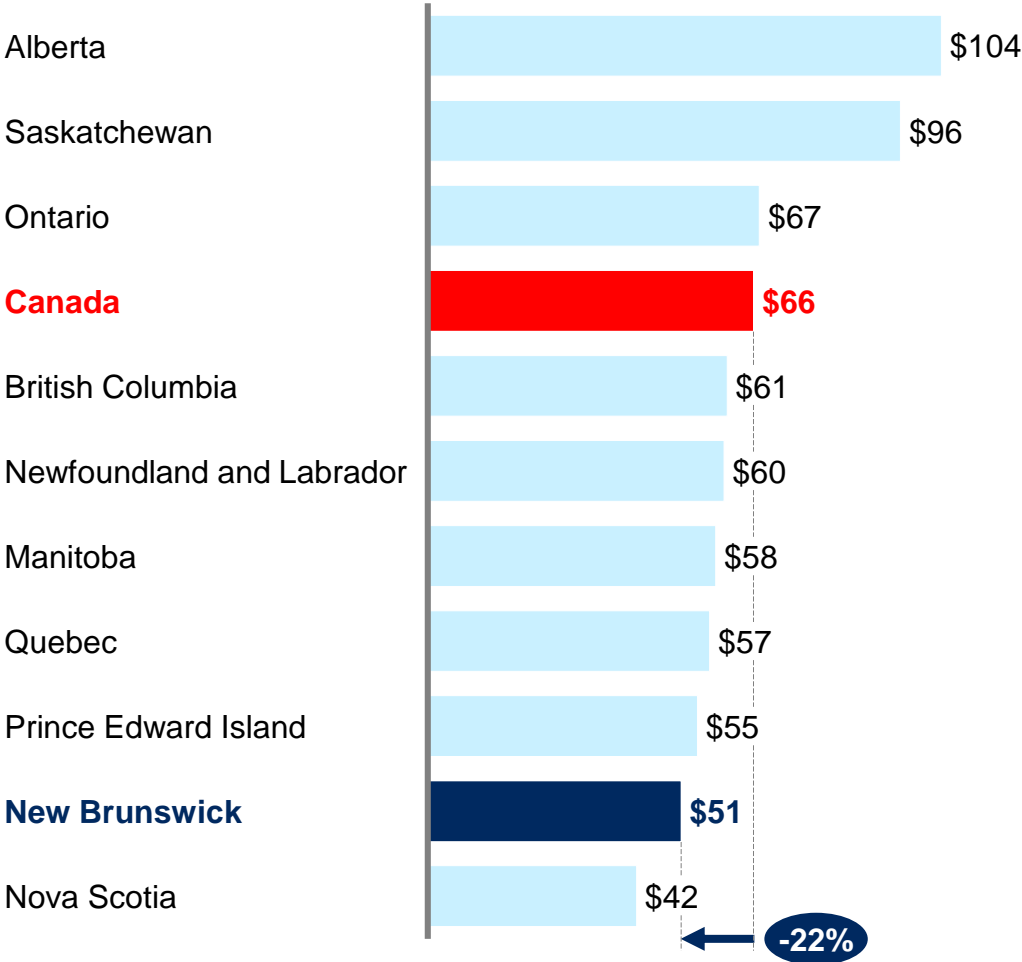
Manufacturing labour productivity, Canada and New Brunswick, 1997-18

Value added per hour worked, 2012 dollars



Manufacturing labour productivity by province, 2018

Value added per hour worked, 2012 dollars



SOURCE: Statistics Canada, Table 36-10-0480-01; Statistics Canada, Table 36-10-0480-01

Behind the widening productivity gap between companies is an unprecedented business disruption



92%

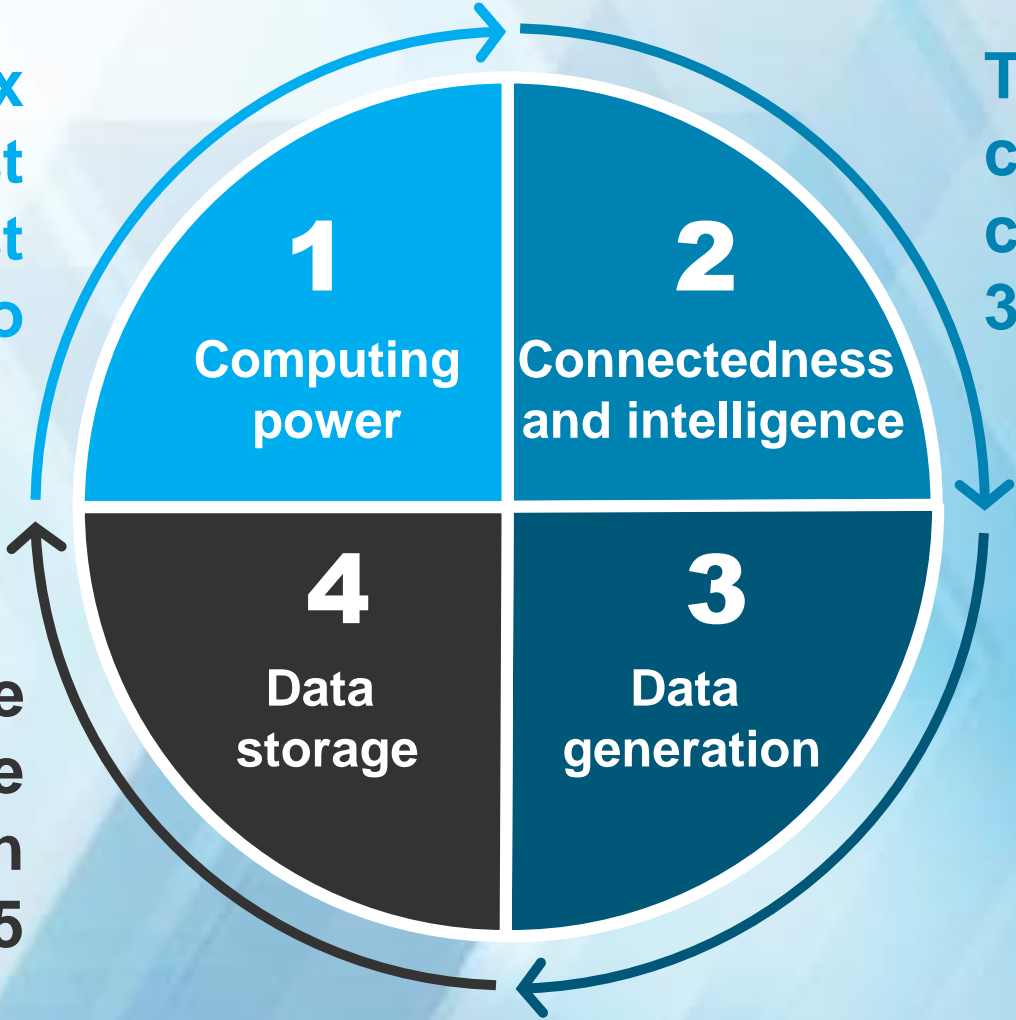
of companies believe their current business model will no longer be viable because of digitization

31%

of current revenues are at risk due to digital over the next 3 years (globally, across all sectors)

Technological change is no longer a future phenomenon - the changes have already started and are accelerating

iPhone X is 210x faster than the first iPhone released just 10 years ago



The number of connected devices could triple to 30+ billion by 2020

Storage cost per gigabyte will approach \$0 by 2025

More data has been created in the past 2 years than in the history of the human race

1 Cost was GB is \$0.033 in 2016 (Forbes)

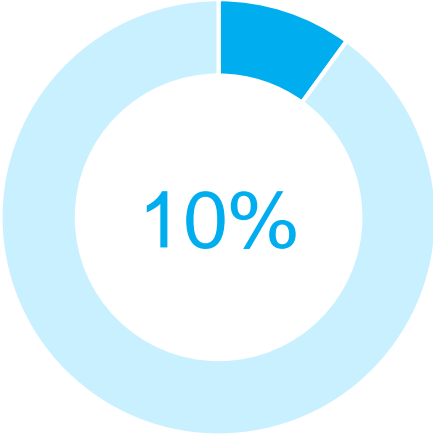
SOURCE: Gartner; IBM, Apple

This shift will require a significant reskilling of workers to ensure the gains create higher standards of living for everyone

Although jobs are not going away, they will certainly change



Of current work activities can be automated



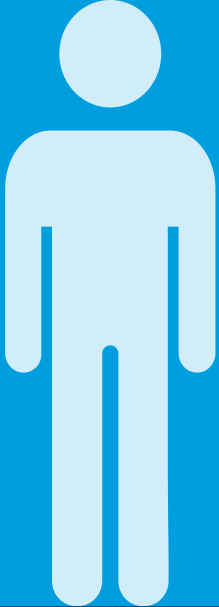
But less than 10% involve tasks that are >90% automatable



New jobs added to the global economy from catalysts such as rising incomes, new technology

By 2030,
30 to 40%

of workers in developed countries will need to be reskilled and/or change their occupations



In the next decade, more than 2 million manufacturing jobs will go unfilled in the US for lack of skills



In addition, China's pace of development has been staggering (1/2)

Shenzhen (1980)

In addition, China's pace of development has been staggering (2/2)

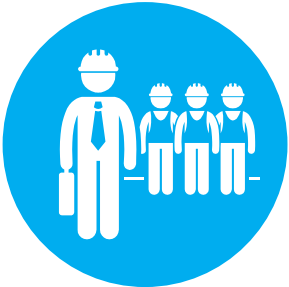


Shenzhen (2014)

However, manufacturing plays a disproportionate role in revitalizing productivity, trade, and innovation

US example

US manufacturing industries employ...



9% of the US workforce

...making outsized direct contributions to the United States economy...



12% GDP



20% net capital stock



35% productivity growth



55% patents



60% exports



70% R&D spend

...and numerous indirect contributions



Spillover effect on services



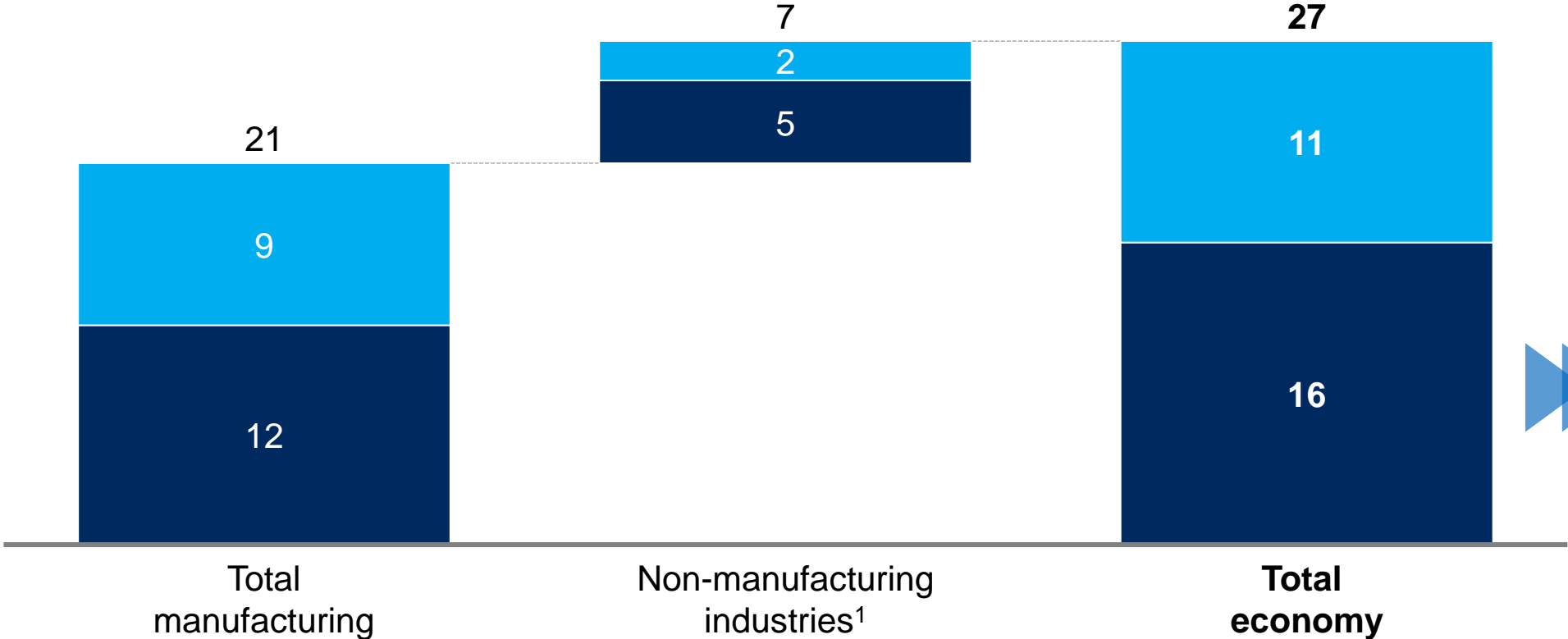
Strengthening of local economies and business ecosystems

Our analysis conducted with US data suggests that actively revitalizing manufacturing could boost value added by 20 to 30% annually over baseline trends

“2025 value-added potential in US manufacturing and indirect effect on other sectors”

Percent relative to baseline forecast

- Additional opportunity in "stretch" scenario
- Opportunity in "new normal" scenario

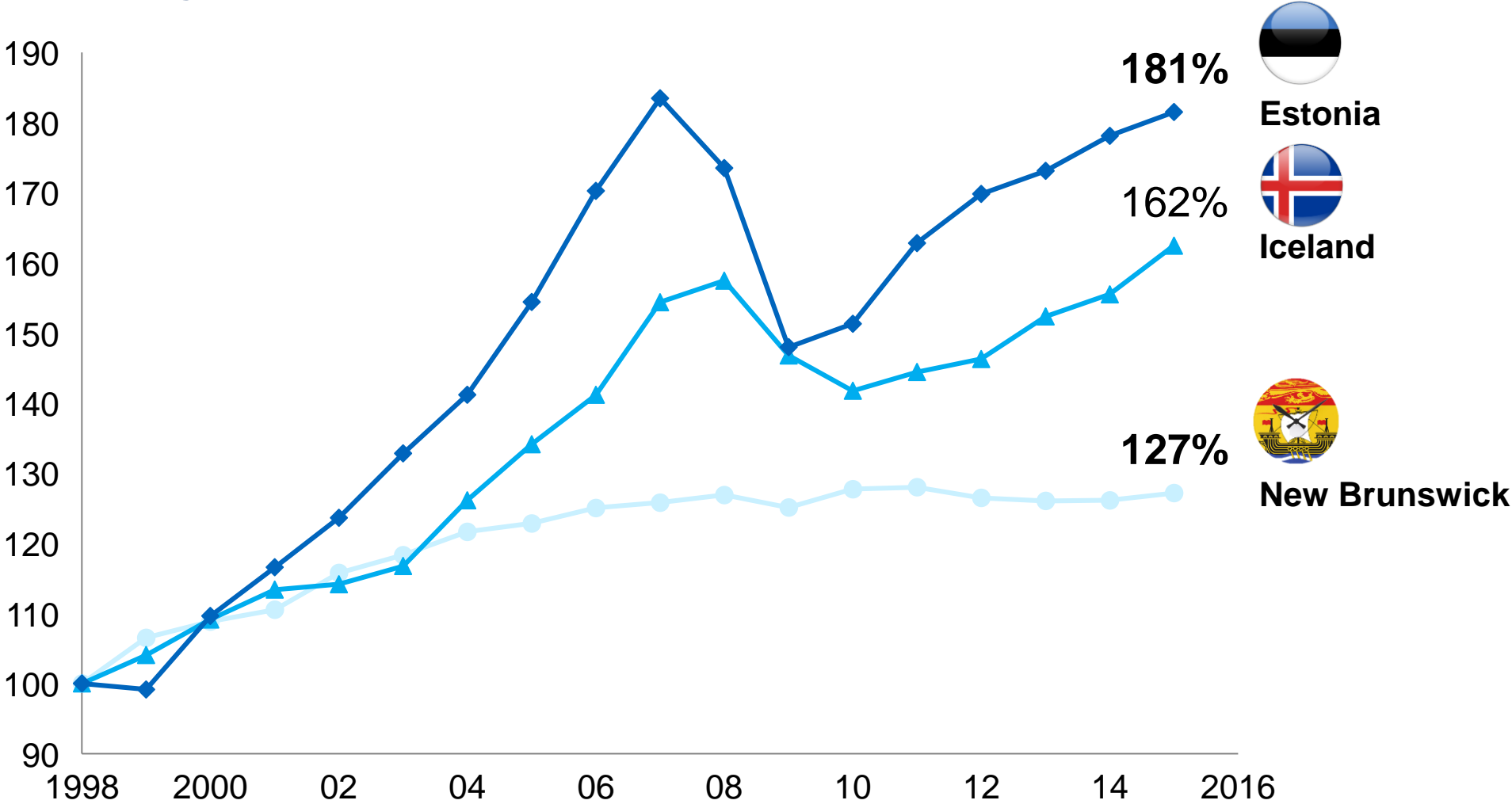


A similar lift would represent **500M-900M** in additional GDP in New Brunswick (a **2-3% increase**)

¹ Approximately 28% in professional and business services, 27% in mining and oil, 23% in wholesale, and the rest in other sectors
² Approximately 42% in professional and business services, 17% in wholesale, 15% in agriculture, 11% in transportation, and the rest in other sectors
 NOTE: Numbers may not sum due to rounding

Even small nations can achieve a lot, as illustrated by three countries with similar GDPs and populations

Comparison of GDP growth at constant dollars, 1998=100%



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- 1) Increase manufacturing exports
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Both require productivity!

New Brunswick can count on a legacy of family business champions, which can help fuel its economic growth and accelerate changes

Family businesses bring many advantages to the local economy...

Family business economic advantages

 Higher integration

 Longer-term growth perspective without shareholders

 Family-oriented regional company culture

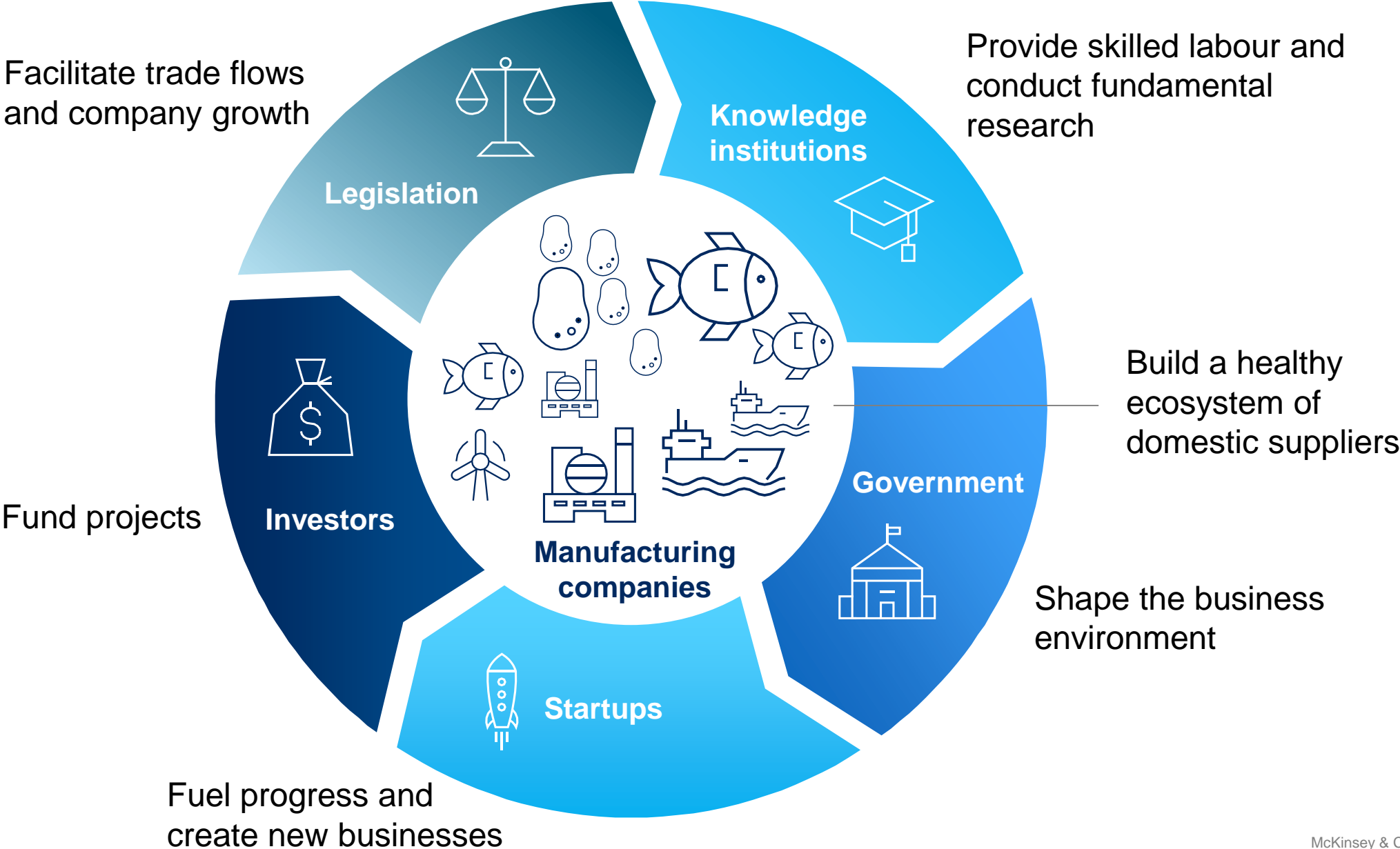
Example of NB business



New Brunswick has many family businesses, which will help support its growth



A thriving manufacturing sector requires contributions from the whole ecosystem



Beating the odds: Several examples of excellence in cross-sectoral collaboration

Digital manufacturing lighthouses

A



Reskilling: Singapore and US

B



Shaping a country's economy: Scotland

C



The impact of participating in a cluster: Norway and Ireland

D



The Netherlands' food export business

E



Attracting foreign direct investment: Ireland

F

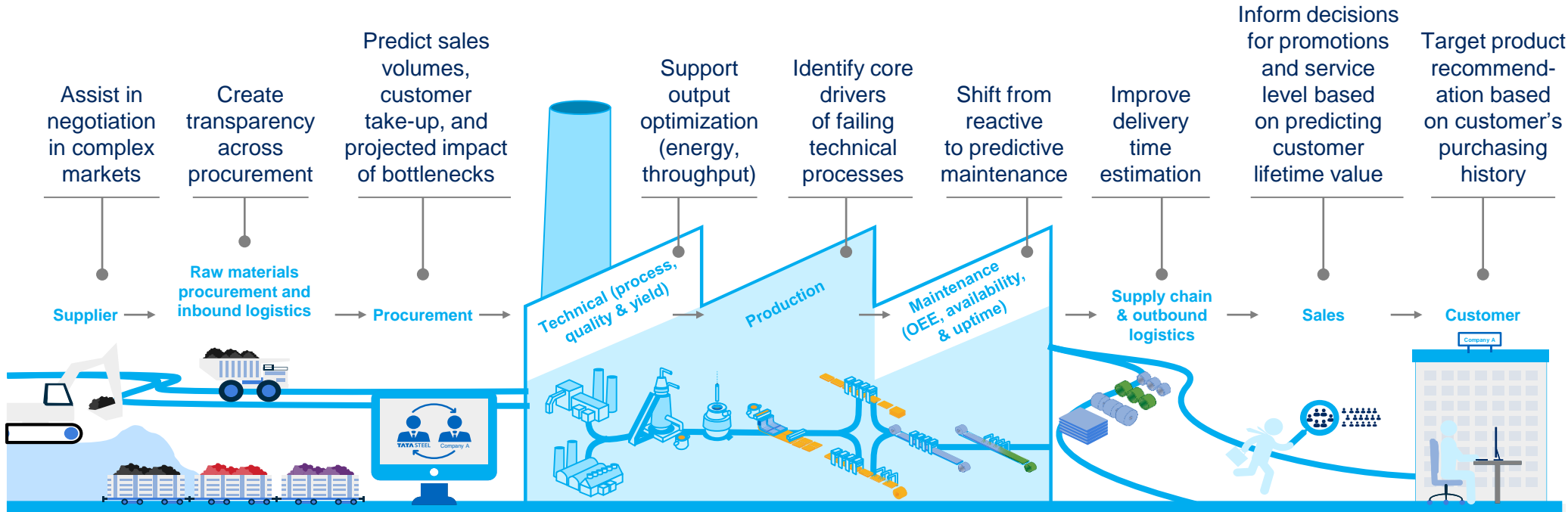


Real commitment to integration: The East African Community

G



A The AA program at a leading steel player is inspired by the vision of building the world's first digital-enabled steel plant



Strategy

Analyze public disclosures as an input to company performance forecasting



Human Resources

Leverage people analytics to support cohort-specific initiatives that optimize employee motivation, retention, and absenteeism



Finance

Predict market movements as an input into strategic forecasting



R&D

Optimize the R&D process by finding optimum ways of working

This site achieved an EBITA uplift of 15% 2 years after the start of a digital manufacturing transformation



A What have they done to achieve such impact?

Strategy and business case

Strategy is linked to the creation of fundamental business value that is clearly articulated and communicated and has enterprise-wide validity

Augmenting the operator and democratized technology

Engaged operators develop their own apps and solutions to facilitate and automate their tasks

Big data decision making

Decisions are not hypothesis-driven but based on big data deciphered by pattern recognition – and not by humans

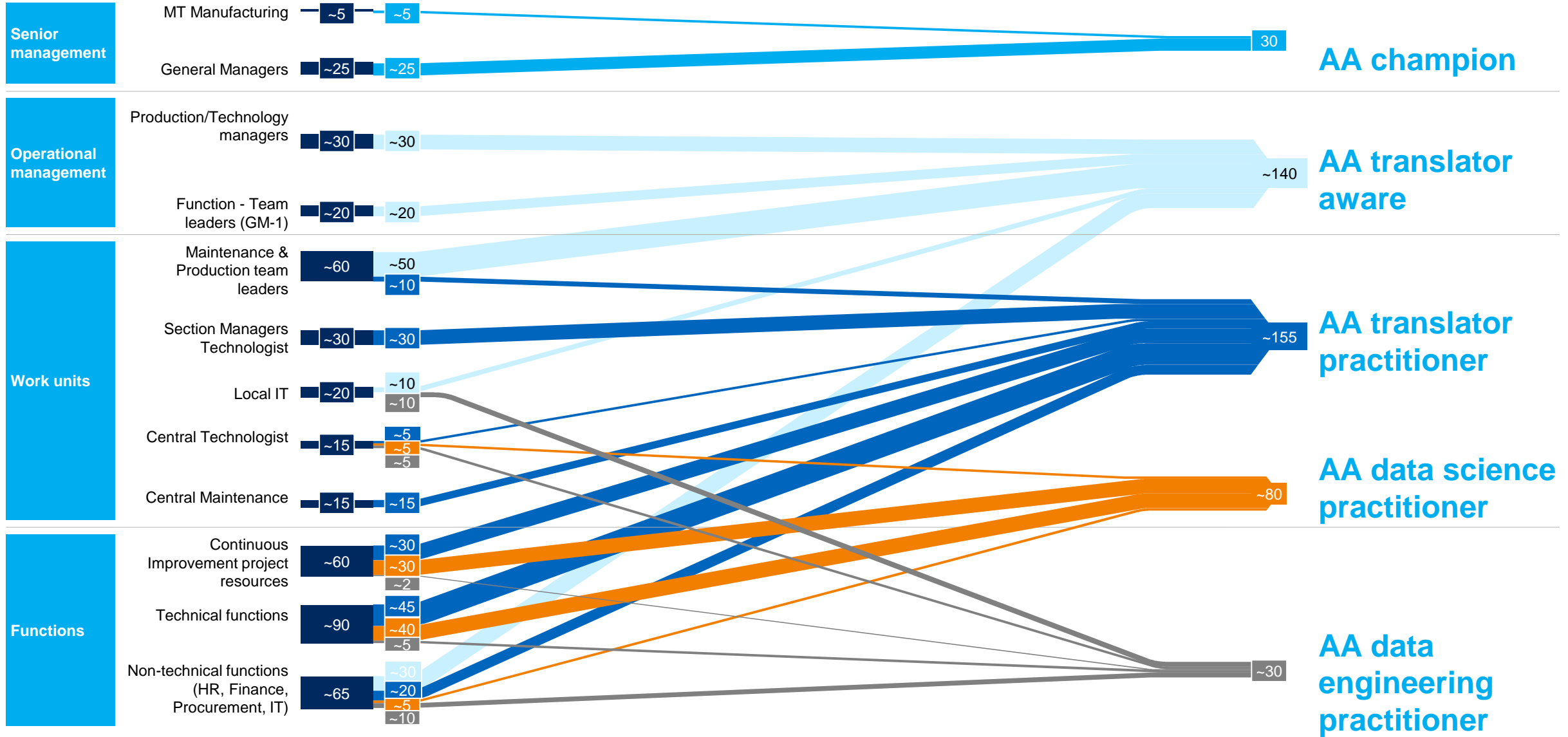
Systems change by bundling more than 15 use cases

There is no silver bullet. We found that you have to bundle 15+ use cases to achieve the impact and ROI needed

Lighthouses design and invest from the start for scale

A In total, more than 200 practitioners (7 percent of the workforce) had to be reskilled

Job



1 Only for operational management

B In the United States, AMTEC enables collaboration between the automotive industry and educational providers by developing core competencies through certified programs

- **30 community colleges** and **34 auto-related plants** in **12 US states**
- Its **mission** is to **create and sustain** an innovative, responsive, **standards-based workforce education** development system that **meets industry skill requirements**
 - Employers developed a set of **110 competencies common to all plants**
 - Core competencies are **identified through workshops with top-performing workers**
 - Community colleges deliver the content



B Singapore launched initiatives to upskill its citizens and harmonize the skills framework

Internships



Enhanced internships



65%

Courses offer experience in real work environments

Young talent program



500+

Students received funding to participate in overseas programs

Upskilling



Mid-career enhanced subsidy

90%

Subsidies

~9,000

Courses offered

69,000

Singaporeans impacted

Credit

126,000

Singaporeans registers

18,000+

Approved courses available

Skills framework



Skills Framework Guide for enterprises and Singaporeans on skills required for emerging jobs

3

Framework launched

- ✓ Early childhood care and education
- ✓ Hotel and accommodation services
- ✓ Precision engineering

7

NEW

Frameworks in the pipeline

C **Aligning behind a region's strength:**
What everybody knows about Scotland



“Driving Forward Together” –
a national strategy to focus on
golf tourism

Employs 4,400 people, generates
\$297 million in revenue, and is up
30% since 2008

Estimated impact on **GDP** is **£1 billion**

**47% of overnight visitors are golf
tourists**

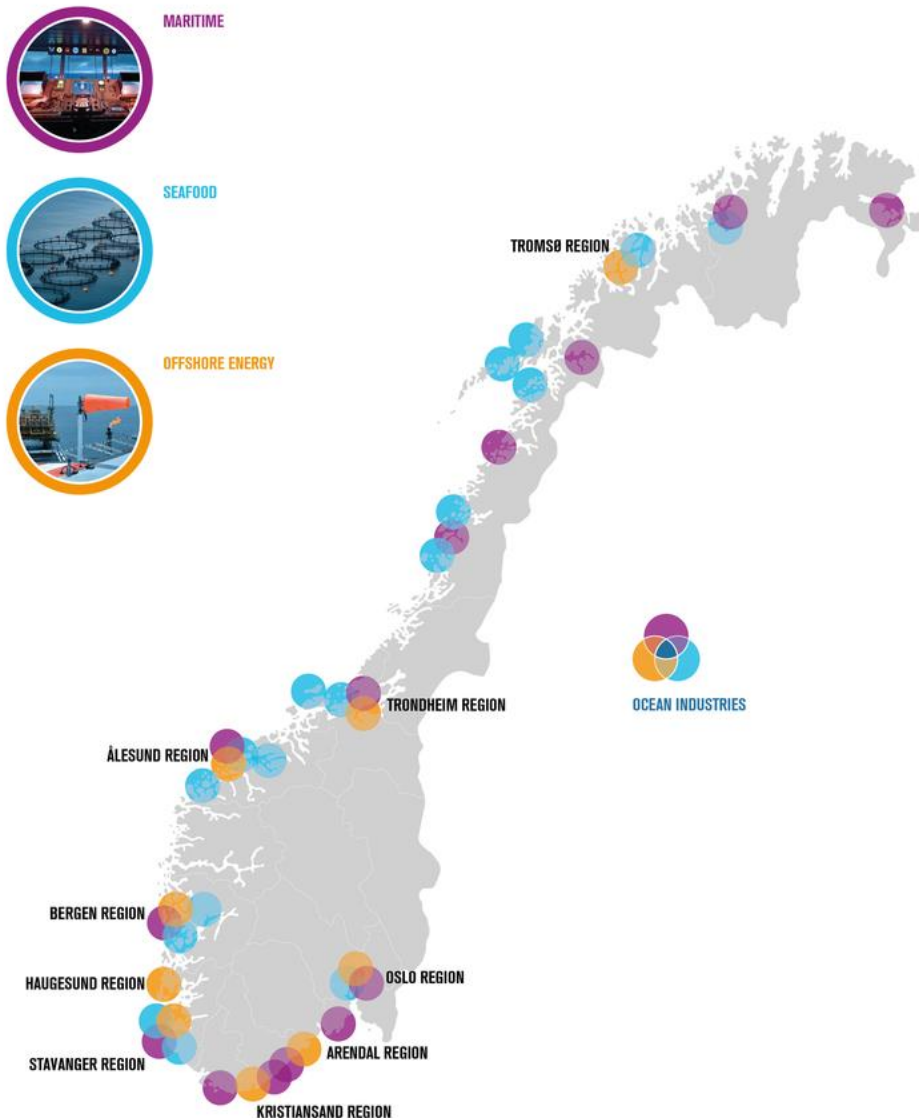
C Beyond golf, Scotland has actively invested in shaping the economy of tomorrow

Industry	Scotland government initiative	Impact on Scotland
Digital	<ul style="list-style-type: none"> Launched funding for community digital inclusion projects Made £8.5 million available for a program to tackle digital skills across Scotland 	<p>+150,000 jobs</p> <p>in digital technology roles over the next 5 years</p>
Business services	<ul style="list-style-type: none"> 2019-2020 it proposed a £300 million R&D investment and £255 million in growth funding for companies 	<p>+4,425 jobs</p> <p>through investments in 139 projects</p>
Food and drink	<ul style="list-style-type: none"> Invested around £5 million in food education projects between 2010 and 2017 	<p>£14 billion</p> <p>Generated each year by industry</p>
International trade	<ul style="list-style-type: none"> Launched “A Trading Nation” plan to help grow Scottish exports, to focus £40 million of export support already delivered, and to add an additional £20 million over the next 3 years 	<p>+35%</p> <p>2010-2017 increase in exports</p>
Manufacturing	<ul style="list-style-type: none"> Committed to raising productivity through increased investment and innovation. Invested £1.5 million over 2 years to pursue a range of enhanced opportunities for young people in STEM 	<p>180,000 jobs</p> <p>in industry across the country</p>
Science and research	<ul style="list-style-type: none"> Funding opportunities for science engagement Investing in university research to maintain its strong international reputation 	<p>2nd worldwide</p> <p>For number of world-class universities by head¹</p>
Tourism and events	<ul style="list-style-type: none"> Sponsoring the national tourism organization, which has a budget of more than £45 million a year Working with public, private, and third-sector partners to deliver an industry-led tourism strategy – Tourism Scotland 2020 	<p>9% of jobs</p> <p>generated by the country’s tourism²</p>

¹ 2016-2017; ² In 2015

SOURCE: Scotland Government Website <https://www.gov.scot/>

D Firms participating in the Norwegian Innovation Clusters experience an 8 percent average increase in value added over the first 3 years



There are 14 Norwegian Centers of Expertise – of those, relevant examples for New Brunswick include Aquaculture, Aquatech, Seafood Innovation, and Maritime CleanTech

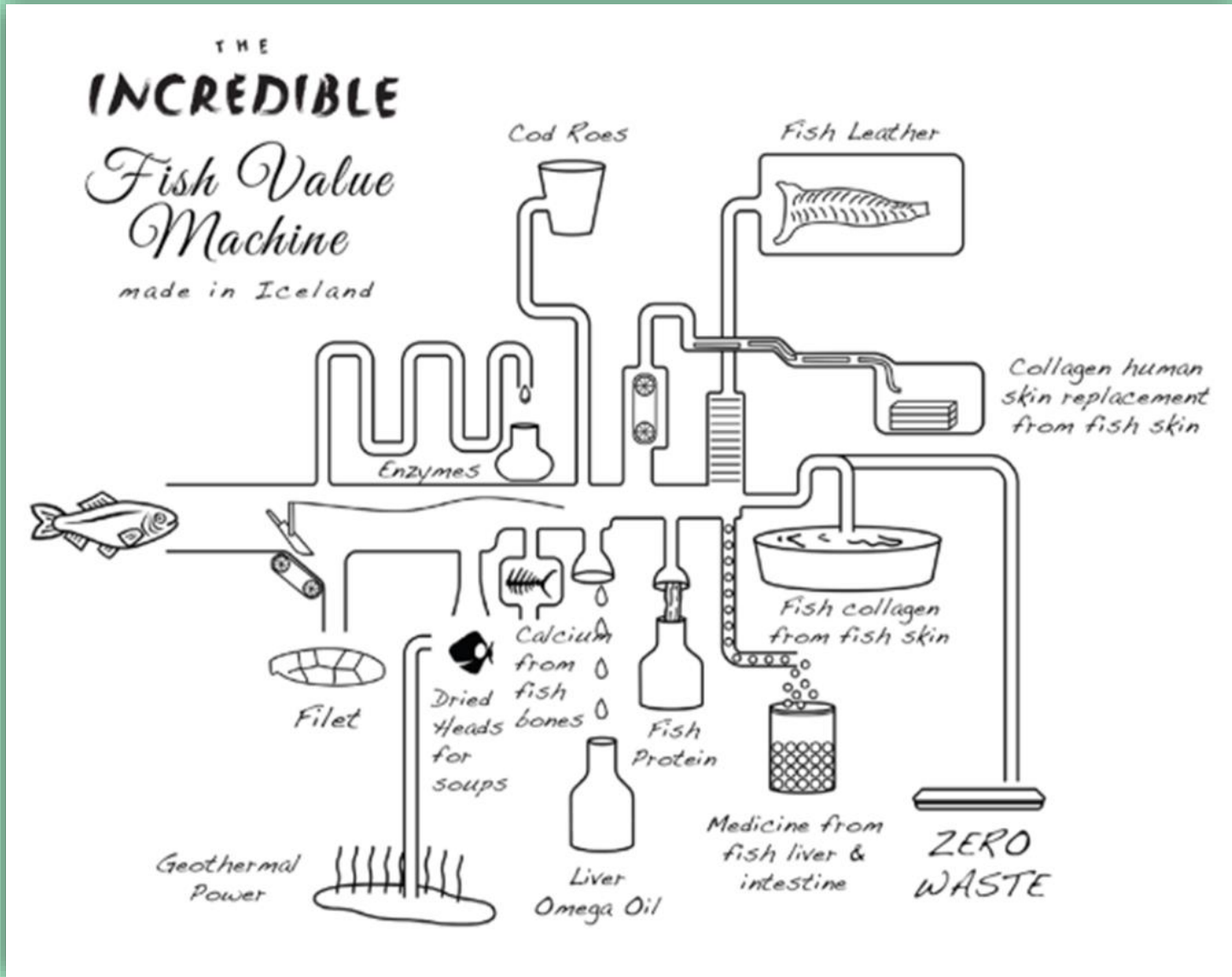
Studies have shown that, in the first 3 years, companies participating in clusters experience

+7% in direct employment

+12% in sales revenues

+8% in value added

D Iceland's Green Marine Technology cluster promotes the development of quality and ecofriendly technologies



GREEN MARINE TECHNOLOGY

E Holland globally ranks the third largest agfood exporter because of its strong commitment to productivity and its growth mindset

The government worked with companies in the sector to

- Develop intensive agriculture facilities, like **greenhouses**
- Organize well-integrated **supply chains** and transportation infrastructure
- Ensure a **high level of investment** in agricultural research and development
- **Educate** the agricultural workforce
- Accelerate innovation by **fostering connections** among businesses, universities, research institutions, and government agencies through agfood hubs like FoodValley

As a result, the country has achieved the highest growth rate in both exports and total factor productivity over the past 50 years



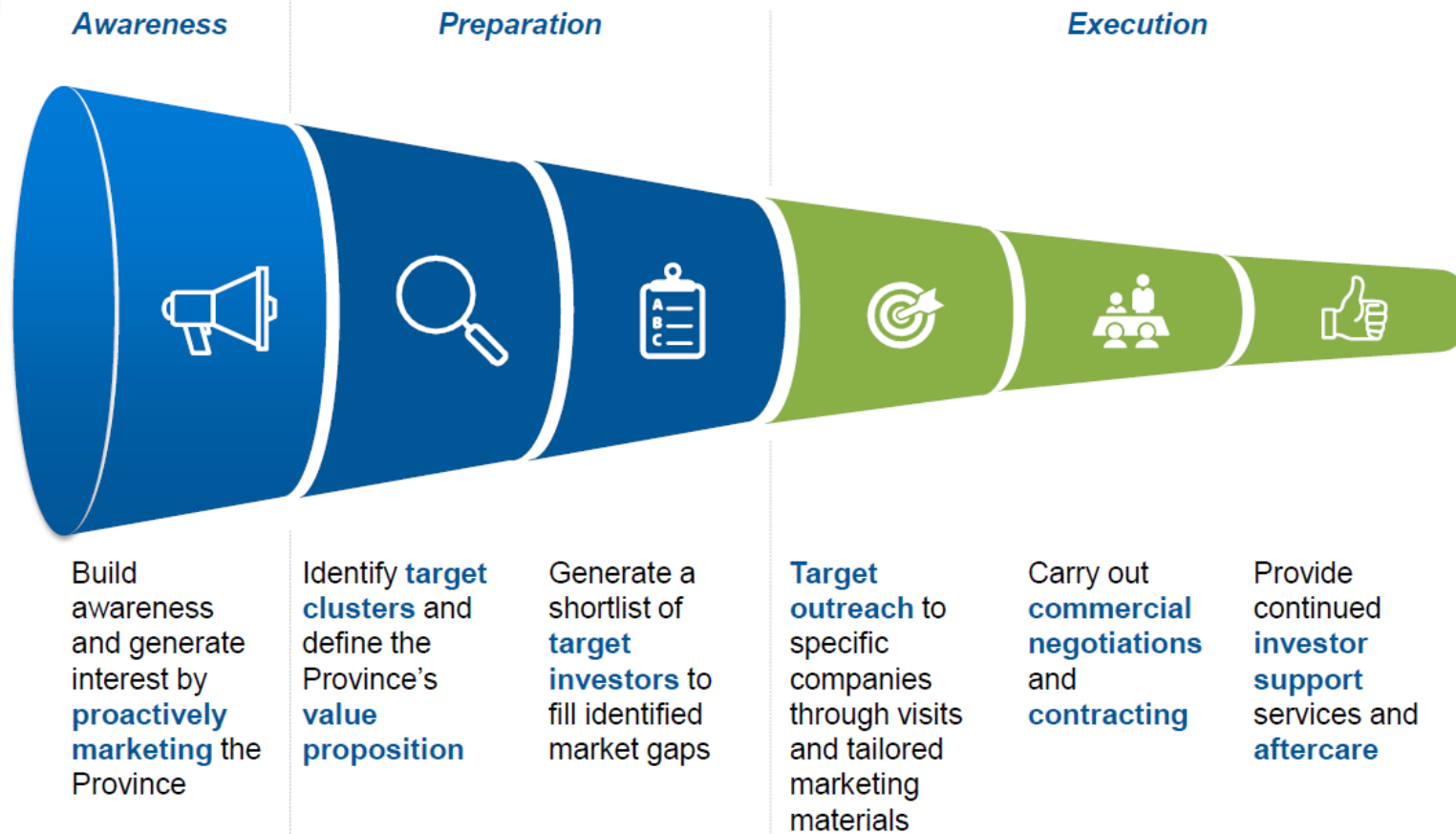
12 of the world's 40 largest food-and-beverage companies have a major production site or R&D facility there

F IDA Ireland is involved in all steps of the investment cycle to attract strategic foreign investment



Invest in Ireland

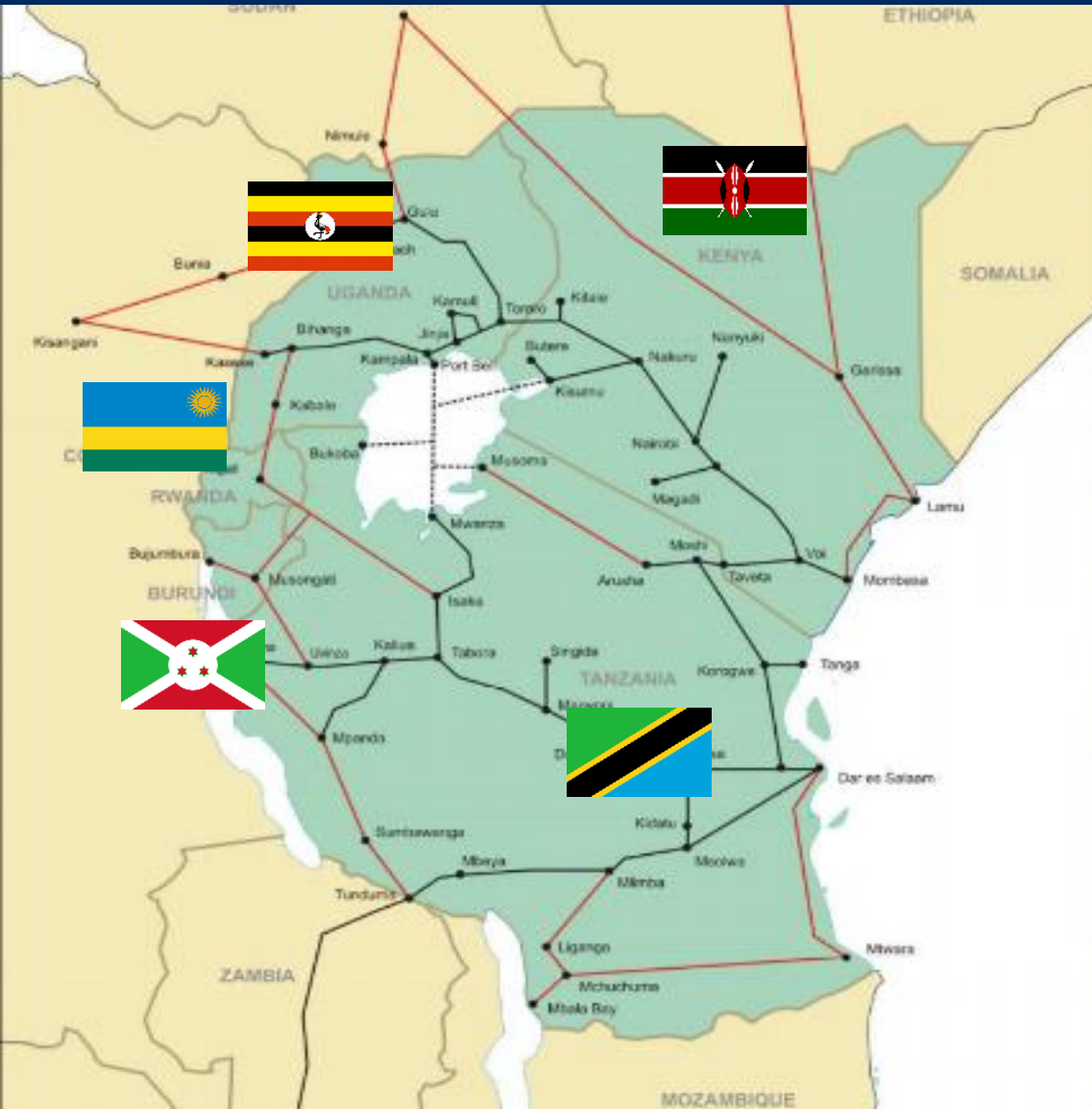
#WhyIreland
2019



In the first half of 2018, Ireland welcomed **75 new companies** and approved **64 investment projects** from existing companies that chose to expand their services

This approach has led Ireland to be named the **best country for high-value FDI** for **6 consecutive years**

G Several countries are grouping to create integrated networks



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Both require productivity!

New Brunswick has two options to grow the manufacturing sector's footprint and contribution to the region

Attract global foreign investment in local manufacturing

Increase manufacturing exports





**Increasing manufacturing exports
requires making the sector much
more productive**

Local champions

Encourage local suppliers in the supply chain **to go global with you** and become exporters. Continue building a strong and **modern backbone** by committing to a performance culture (i.e., Lean) and Industry 4.0 at scale

SME

Diversify your leadership teams – **bring people from outside** to challenge old ways of doing things. Think globally early – **don't assume there is too much risk**

Academia

Incentivize professors to **commercialize their IP into exciting business areas** but also to invest in topics where there is demand to begin with. Develop **attractive co-op programs** in line with local employers' needs as a means of training and retaining international students in the region's workforce

Government

Harmonize tax and wages regulations, eliminate trade barriers across Atlantic provinces – exports have to start here. Invest to fund growth for **a few targeted high-potential companies**, even if it is less politically popular



Attract global players to invest in local manufacturing plants

Local champions

Consider the region your **first priority for investment**

Government

Engage in a **massive reskilling** of the workforce. Provide **real incentives** for foreign R&D investments. **Attract students** and keep them local

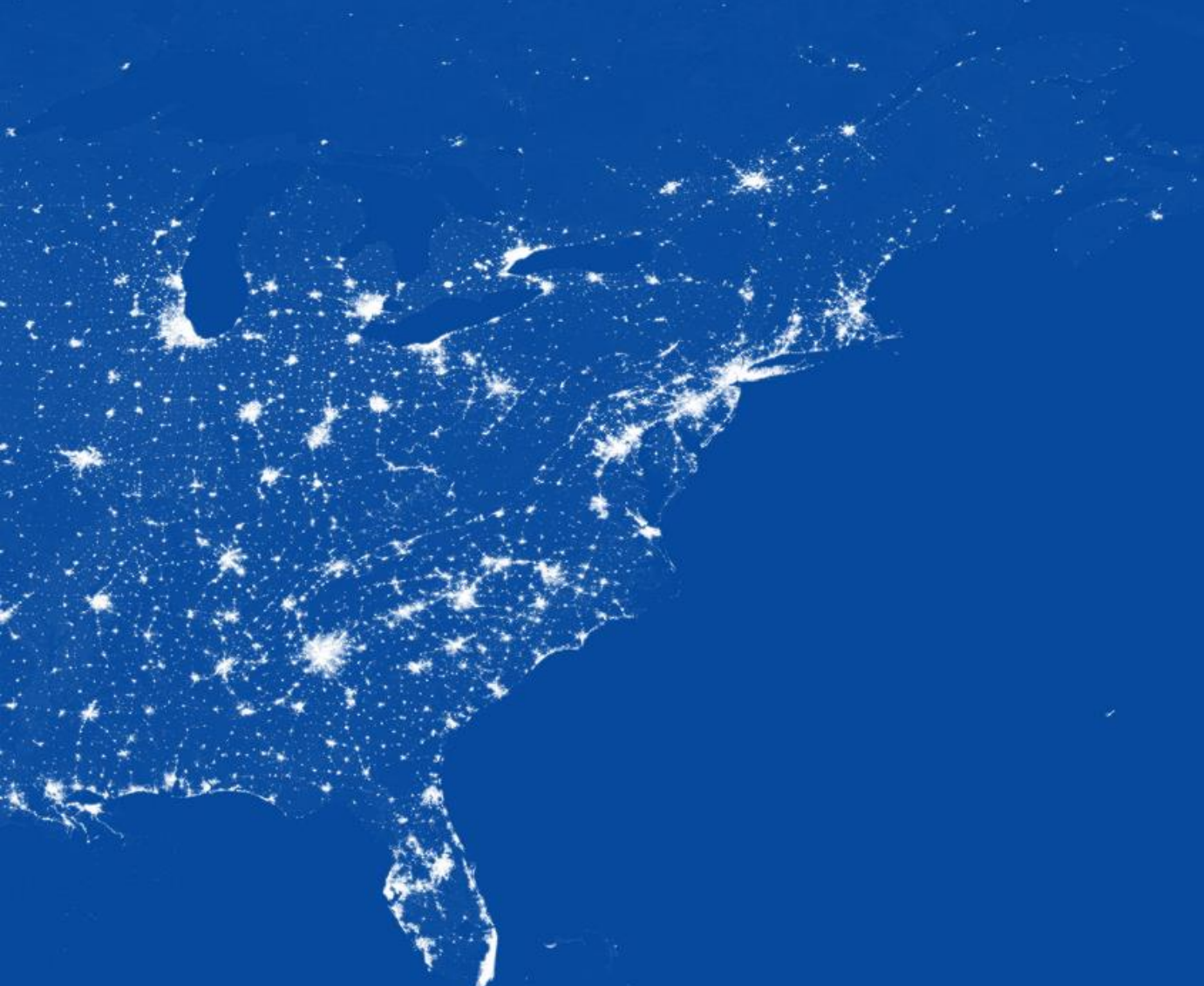
SME

Build around your **local champions**. Pick targeted industries in line with the regions' natural strengths (i.e., ocean technology)

Academia

Steer young Canadians **toward jobs that pay in alignment with industry needs**

Our advice to New Brunswick's manufacturing ecosystem



Think Big

Think Maritimes

Think Global