



Take Back Manufacturing

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Take Back Manufacturing 2019 & Beyond

The Road Map for Future Sustainability



Take Back Manufacturing
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Nigel Southway CEng, BIM. SME, Author **www.nigelsouthway.com**

55 years of Manufacturing Experience

Engineering Apprentice...British Aerospace/Electronics (1966)

BSc EEE C-Eng. in Engineering/MSc Management.... Bristol UK.

British Aerospace (Space Systems) Manufacturing Engineer (1972)

MOTOROLA Director Manufacturing Eng. / LEAN & Six Sigma Implementation (1980,s)

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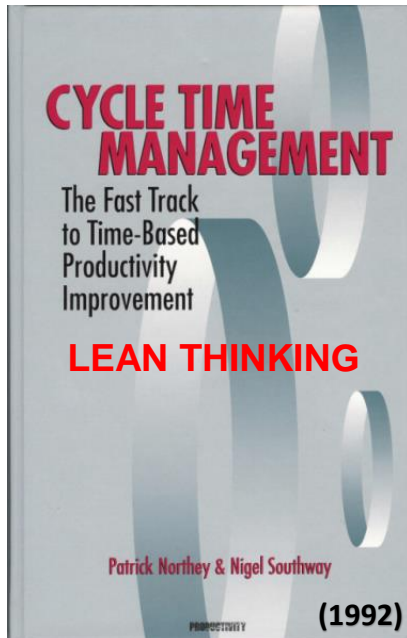
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Assisting Industry 4.0 technology companies (2017-Present)

Advocate for Take Back Manufacturing (2010 Onward)



THE CYCLE-TIME ADVANTAGE

An integrated approach delivers the greatest competitive impact, contend the authors of a new book on managing the total business cycle.

GLOBAL COMPETITIVENESS IS FORCING COMPANIES OF ALL sizes to go to ever-greater lengths to improve customer satisfaction. If they focus on cycle time as their productivity measure, they can both decrease delivery time and improve quality, obviously creating a more satisfied customer. A company's total business-cycle time is measured from the time a customer's need is identified to receipt of payment from that customer for the finished product.

The best analogy is a relay race. The time begins with the starting gun and ends when the last runner breaks the tape at the finish line. It includes all the time required to run each leg, as well as the time required to transfer the baton at the end of each leg. Total business-cycle time includes any or all of the following subcycles or loops:

The make/ship loop. The time from receipt of material, through the value-adding conversion steps, to shipment or transfer of a finished product to the distribution loop.

The distribution loop. The time from finished production to shipment to the customer from the distribution warehouse.

The supply loop. The time from release of the purchase order to receipt of the correct materials in the right quantities at the right point in the manufacturing process.

The new-product-introduction loop. The time from

identification of the need for a new product to delivery of the first unit of product to a customer.

The strategic-business-development loop. The time required to develop a new strategy, make the decision to adopt it, and then implement it.

In the last decade, it has become clear that the compartmentalization of these loops has inhibited competitiveness. All the loops must be integrated if total business-cycle time is to be reduced. In the 1980s most companies trying to make improvements focused on the make/ship loop. Prior to 1980 a long backlog of orders in this loop created a sense of complacency. This complacency rippled through the distribution and supply loops as well. As long as customers tolerated the long wait, the system worked, because it enabled the manufacturing process to "minimize product cost" by using "economical"

batch sizes. This approach increased the total cycle time, but time was not perceived as a critical issue. When customers started demanding shorter delivery times and were able to get them from competitors, a problem arose. Sales departments responded to this competition in the following ways:

✓ *They persuaded manufacturing to commit to unrealistic delivery times.* As a result, sales departments soon discovered that they were constantly having to break promises to customers; to keep customers happy, they had to become internal expeditors, which increased the tension with manufacturing.

✓ *They increased factory orders for finished goods and distribution inventory.* This increase put even more pressure on manufacturing, and the ensuing loss of trust led to second-guessing between marketing and manufacturing. In addition, the already uncertain sales forecast used to order material supplies had to be made even further in advance, since the suppliers were caught in the same time squeeze. As the forecast period was extended, the potential for error and disagreement increased.

A double problem arose for those organizations whose competitors could deliver the correct product in a measurably shorter cycle time. The lower cycle time meant that these competitors could produce at lower cost and did not

require such large inventories, which further reduced their costs. Not only were the slower companies struggling to compete, but they were faced with margin problems caused by the higher costs of inventory and waste in the structure.

The reaction of some manufacturers was to reduce their inventories. For a while the "slimming pill" worked. But as competitors with shorter cycle times continued to steal market share, it became obvious that to survive companies would have to do things differently, not just do them harder.

The next villain manufacturers focused on was the excessive time required by the manufacturing cycle. To reduce cycle time, many companies initially relied on new technology. Although technology has a role in the new cycle-time-focused approach, it is an expensive and often ineffective way to start. The reality is that as many as 90% of the existing activities are nonessential and can be eliminated. As soon as manufacturers focused on processes, they could see the waste associated with changeovers, quality defects, process control, factory layout, machine downtime, and scheduling. They soon realized they could dramatically reduce the make/ship-loop cycle time.

AS THE MANUFACTURING cycle time started to decrease, it became apparent that the cycle time for processing a customer's purchase order was greater than the time it took to manufacture the product. This was not surprising because in the traditional environment of long manufacturing cycle time there is no incentive to rush the customer-order paperwork through. It will only sit in the queue until manufacturing is ready for it. While reducing the cycle time in the make/ship loop is the logical place to start, reducing this loop's cycle time in isolation will not be enough to satisfy customer demands for better quality products, delivered more quickly. Once you reduce cycle time in the make/ship loop, the activities in the other traditional loops become the next focus for improvement.

The complexities associated with the distribution loop vary from business to business. The issue, however, is not how many hands the order goes through, but what essential role these hands play in the process and how long the process takes. For example, distributors may not be providing timely sales information because they are using the order-point method of signaling their needs. This can delay arrival of the information to the manufacturing process for several days. Some companies have taken advantage of computer networking systems to provide sales-order information on a daily basis.

Although the supply loop is a significant contributor to the total business cycle time, most companies are powerless to force suppliers to reduce their cycle times. Only large companies, such as the automotive giants, have had enough clout to

insist that their material be delivered "just-in-time." Until suppliers develop their own programs for reducing internal cycle time, the objective for most companies will be to ensure the stability of material deliveries by encouraging the supplier's efforts to improve quality.

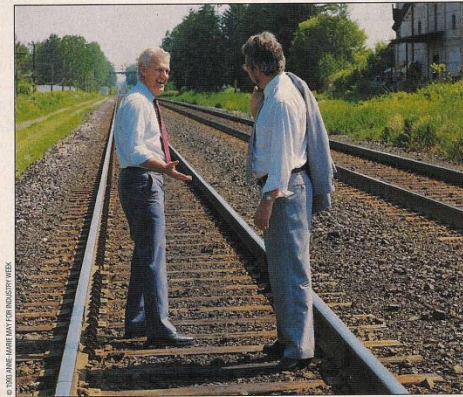
To succeed in the 1990s, many corporations will have to dramatically reduce their new-product-introduction time. As product life cycles continue to decrease, the key to success will be to integrate 1. new-product strategies; 2. new-product research; 3. product development; and 4. launch activities into one effective short-cycle capability that can respond consistently to ever-increasing market demands. To minimize the new-product-introduction cycle time requires an organization that has already minimized cycle times in the other loops and is able to integrate them with this loop.

The strategic-business-development loop is probably the most poorly managed of all loops. This is not because the people involved lack skill or intelligence, but because they do not fully understand the high financial returns to be gained from improving the loop's cycle time. Many books and articles have been written on the correct way to manage this loop. Some even hint at how to improve the cycle time. But few (if any) expose this loop as the prime mover for total business improvement. Rarely is the overall business-cycle time labeled as either an area for improvement or a parameter to be coordinated through the strategic-business-development process.

Too often, this loop is encumbered by size, politics, economics, and legal and financial inertia. The corporations that can eliminate red tape and minimize the time required to make and execute decisions will be able to survive in the 1990s. Those that cannot meet those demands will not make it into the next century. Unfortunately, many companies have not even started to reduce their total business-cycle times. The result is that not only are they denied short new-product-development and strategic-planning cycle times, but they are failing to meet rising customer expectations for shorter delivery times, higher quality, and wider product variety. The only way to keep up is to integrate the supply, make/ship, and distribution loops into one short-cycle-time manufacturing loop—and then integrate that with the new-product-development and strategic-planning loops.

A short strategic-planning loop ensures that all five loops will be integrated and embeds continuous cycle-time reduction into the corporate culture. ◀

Patrick Northey is president of Interaction Ltd., a change-management consulting firm, and was a founding partner of Cycle Time Management Inc., Mississauga, Ont. Nigel Southway is a consultant with Cycle Time Management Inc. This article was adapted from their new book, *Cycle Time Management: The Fast Track to Time-Based Productivity Improvement* (Productivity Press, Portland, Ore.)



Patrick Northey and Nigel Southway: "The corporations that can eliminate red tape and minimize the time required to make and execute decisions will be able to survive in the 1990s."

BY PATRICK NORTHEY AND NIGEL SOUTHWAY



Authors Nigel Southway (left) and Patrick Northey

From Patrick Northey & Nigel Southway, *Cycle Time Management: The Fast Track to Time-Based Productivity Improvement*, © 1990 by Productivity Press, Inc., Portland, Ore. 800-394-6808. Reprinted by permission.

Supported Clients World-Wide on LEAN THINKING & Productivity Improvement.

- Electronic assembly
- Meat processing plant..
- Metal fabrications
- HVAC Manufacturing
- Toothpaste manufacturing
- Steel mill processes
- Bank check clearing house
- US army medical Corp
- Whiskey distilling
- Dry-cell battery production
- Credit card emboss house
- Electrical products
- Custom Power-Supplies
- Computer design/manufacture
- Sheet-metal fabricators
- Plastic injection molding
- Truck Components supplier
- Construction equipment
- Oil industry equipment providers
- Aerospace equipment providers
- Soap factory
- Hydravac Truck Manufacturing
- Eyewear Manufacturing & Service
- Bubblegum and candy factory
- Food additive producer
- Data-com system provider
- Computer software developer
- Mint (Coins and Medals)
- Security equipment
- Off-road equipment
- Water pipeline manufacturer
- Exhaust System Manufacturing
- Commercial swimming pool manufacturing
- Auto dealerships
- Medical equipment Design/Manufacturer
- Oil extraction equipment manufactures
- Nano-tech Battery Manufacturing
- Automotive parts supplier
- Generic drug manufacturer
- Vaccine Development and Manufacturing
- Robotic Medical surgical devices
- Commercial Heating Equipment
- Furniture Manufacturing
- Industrial Materials Supply
- Green Battery development.
- Industry 4.0 Sensor and Data system development

NEXUS



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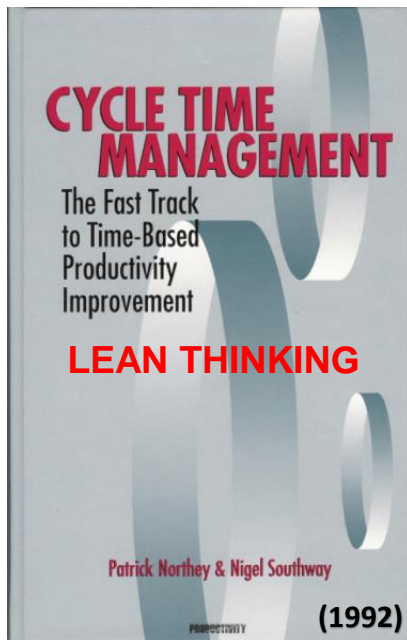
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GLOBALIZED MANUFACTURING



2004 Onward

2010/06/07 12:23



CHINA MANUFACTURING





CHINA MANUFACTURING





Metal and Plastics
+
Welded Assemblies



Mixed Volumes



Components
Subassemblies
Some final assemblies





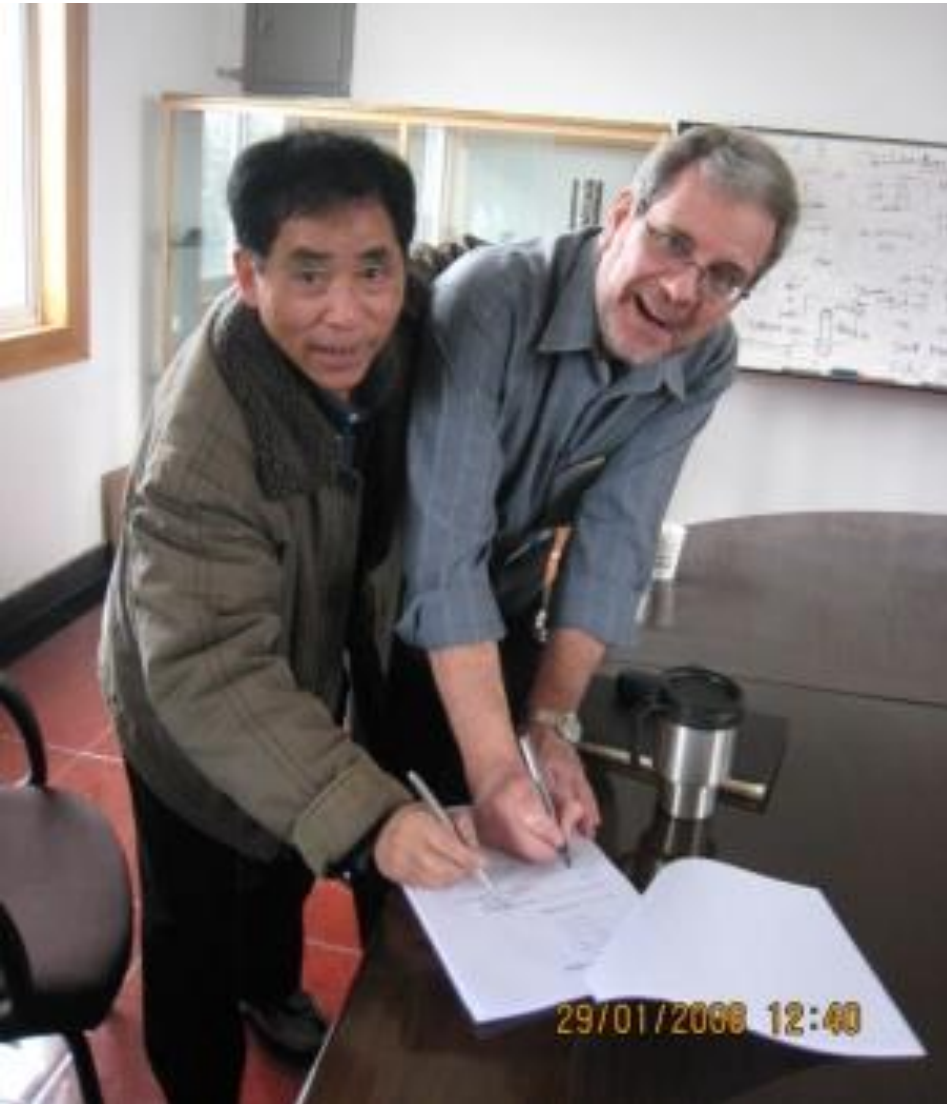
CHINA MANUFACTURING



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CHINA MANUFACTURING





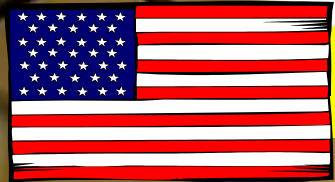
CANADA MANUFACTURING



The future of Manufacturing in Ontario's economy.



CANADA MANUFACTURING



A NORTH AMERICAN PROBLEM



The future of Manufacturing in Ontario's economy.



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TBM

**A Forum Dedicated to Restoring
our Manufacturing Sectors.**

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TBM

- 25 Technical Associations
- 3 Trade associations
- 5 Educational groups
- 6 Economic Policy makers
- 7 Media experts
- 3 Local government
- 5 Industry experts

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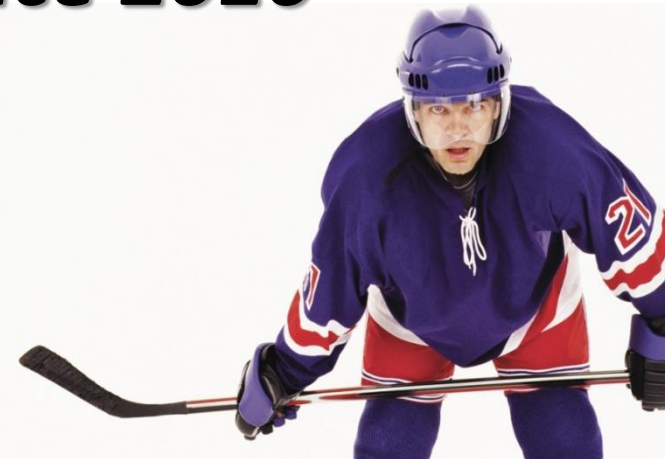
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TBM...Our Ultimate Goal

STRONG Manufacturing in North America... **AGAIN!**

*Advocating for **TBM** since 2010*





FEATURE

Reshoring Initiative: Bringing Manufacturing Back Home

*Harry Moser,
president and
founder of the
USA Reshoring
Initiative.*



Bringing good, well-paying manufacturing jobs back to North America by assisting companies to more accurately assess their total costs of offshoring, and shifting collective thinking from “offshoring is cheaper” to “local reduces the total cost of ownership,” are some of the main drivers behind the reshoring initiative that is taking the industry by storm.

Harry Moser, president and founder of the USA Reshoring Initiative, was inducted into the Industry Week Manufacturing Hall of Fame in 2010 for his work in pioneering the reshoring movement, and was awarded Quality Magazine’s Professional of the Year in 2012.



*Nigel Southway, chairman of Society of
Manufacturing Engineers' Toronto Chapter.*

CIM

Canadian Industrial Machinery®
Canada's Metalworking & Fabricating Technology Magazine

FMA A publication of the Fabricators & Manufacturers Association, Intl.®

Inside CIM this month

- Metal Cutting: Incorporating ERP Software
- Tooling: Drilling Stainless Steel
- Fabricating: Welding Thick Aluminum

November 2012

Vol. 26 No. 8



Shore up and Reshore Manufacturing Now

*To do: Educate, cooperate,
change policies, localize*

Take Back Manufacturing

www.cimindustry.com

CIM: What factors are driving manufacturers' decisions to bring production back to Canada?

Southway: It's a North American-wide realization that off shoring is getting more expensive with increased transportation expense due to oil costs, as well as labor price escalation in emerging economies. Many corporations and large consulting groups also recognize that there are many hidden costs and issues in supporting a remote supply chain. In general, local manufacturing is now considered to be no more expensive than offshore production. The landed cost tipping point in some sectors and commodities is projected to be reached by 2015. Local manufacturing also offers more stability and the ability to innovate at home more effectively. And, being closer to the customer has added inventory and flexibility advantages.

CIM: How can industry members communicate the importance and value of manufacturing to the general population?

Southway: We have had three decades of people thinking manufacturing is bad news. Manufacturing has been viewed as dirty and dangerous, risky and unstable employment, and so forth. We have a lot of work to do to change this negative image. Just talking about TBM, telling the real story, and showing what we do will help. If we look at the long term, today's 12- to 15-year-olds will lead the way. When they reach 22 years old, we will have a thriving localized manufacturing economy. It certainly won't be based on cheap oil or energy, but it will be very lean and very green. Things will be made in local manufacturing hubs or clusters. Factories will be very high-tech and their operation will demand high levels of skill and education. All this needs vision and a can-do attitude. Not having both of these is our biggest risk.



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The Road Map for Future Sustainability



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The Road Map for Future Sustainability

Caution....

This Presentation is NOT Politically Correct!!

More than ever before Do not take any information from any source as factwithout gaining a balanced view..

We live in a world full of dissention and fake news..... from all sources..

Even Science has been corrupted and divided with consensus thinking.



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History

Last 30 years

World map

Liberalized Global Free Trade??



Global Free Trade....

....Its NOT working for everyone...



Moved Off-shore.....

For low cost labor rates



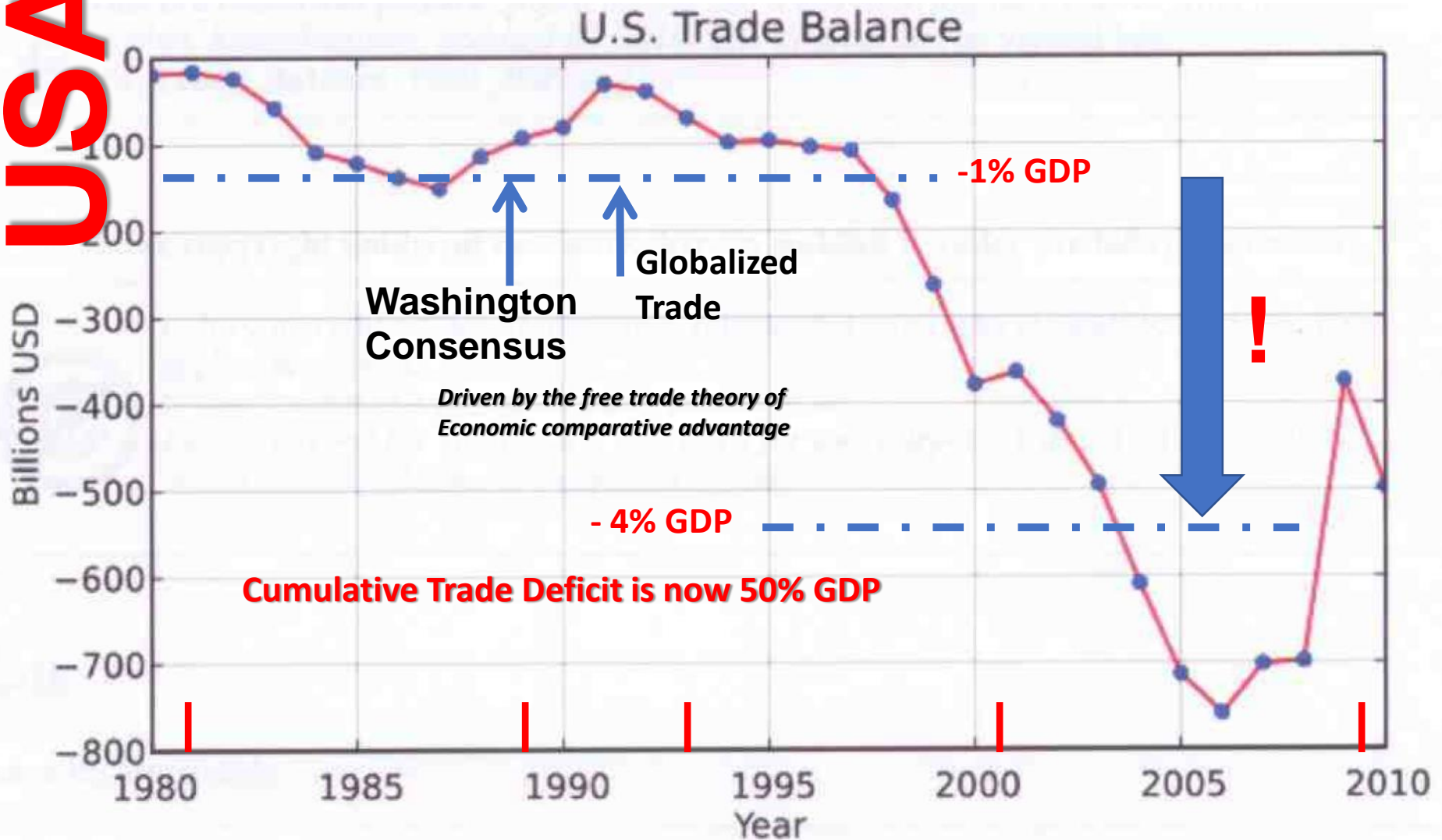
Un-controlled trade.....

“herd behavior”

20% + Reduction in Manufacturing Intensity (2000 to 2017)



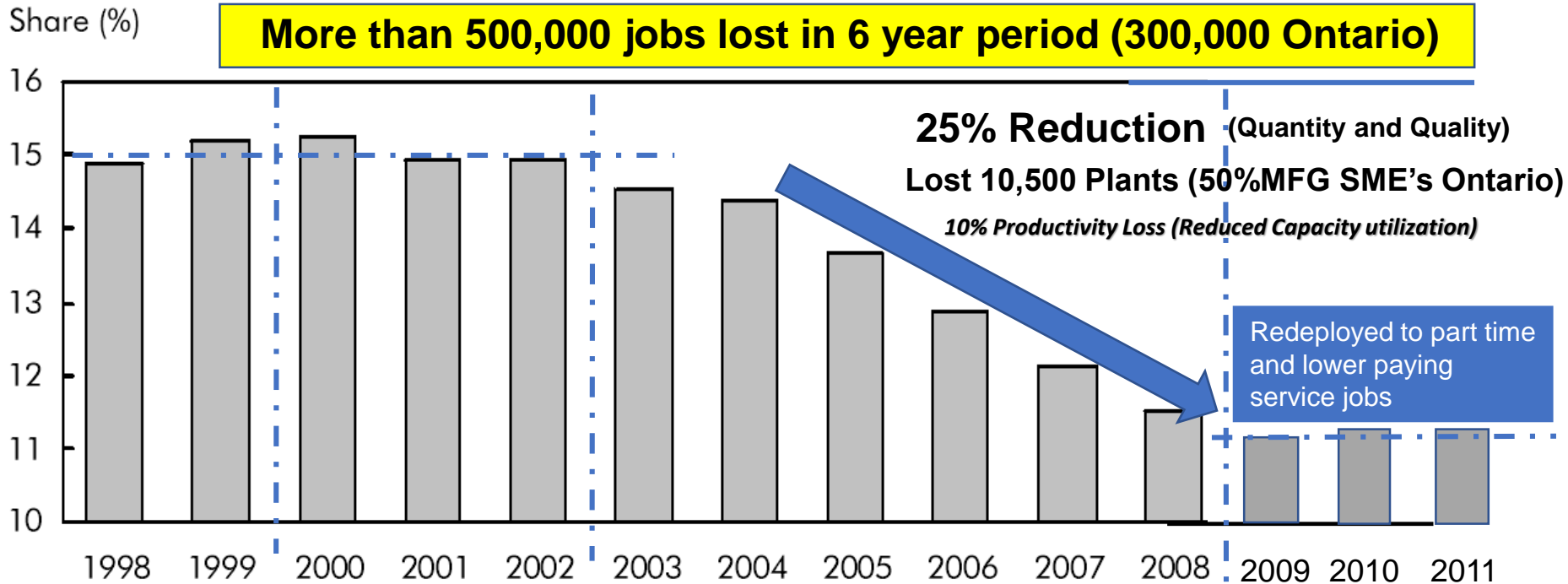
USA



Data Source: US Census Bureau Foreign Trade Division

(US GDP 2010=14000B)

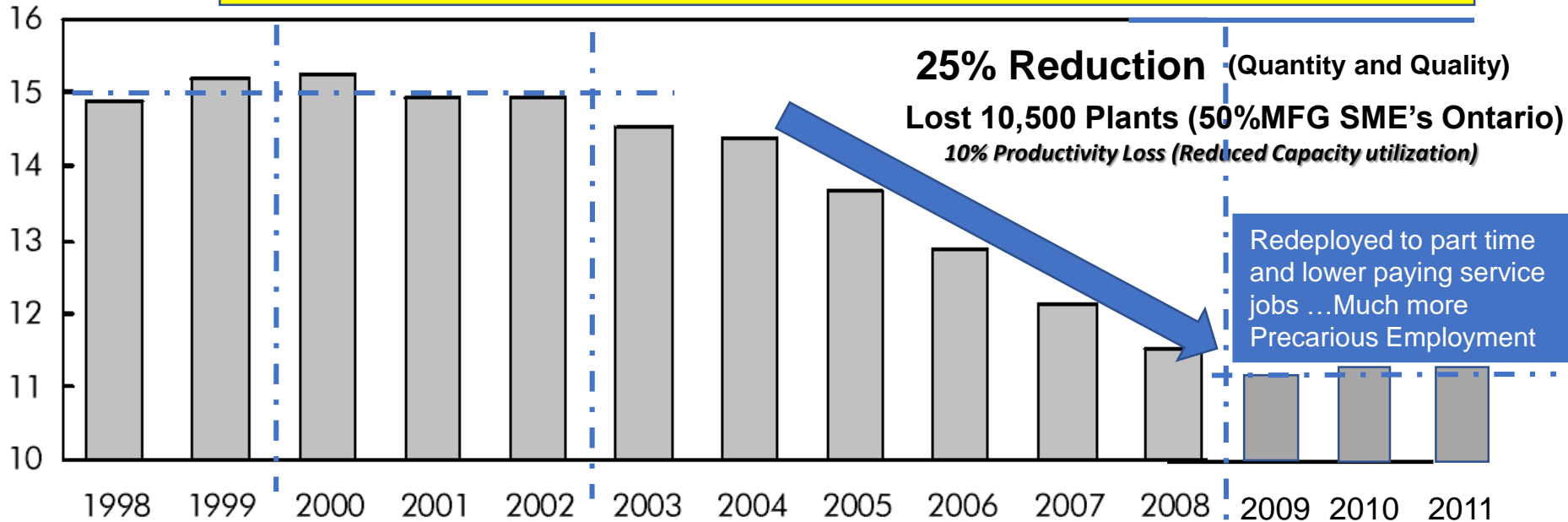
Manufacturing's share of employment has fallen sharply since the turn of the century



Manufacturing's share of employment has fallen sharply since the turn of the century

Share (%)

More than 500,000 jobs lost in 6 year period (300,000 Ontario)



Source: Statistics Canada

**Due to this....
We have a skill shortage!!!
(NOT a labor shortage)**

Youth Un & Under-Employment

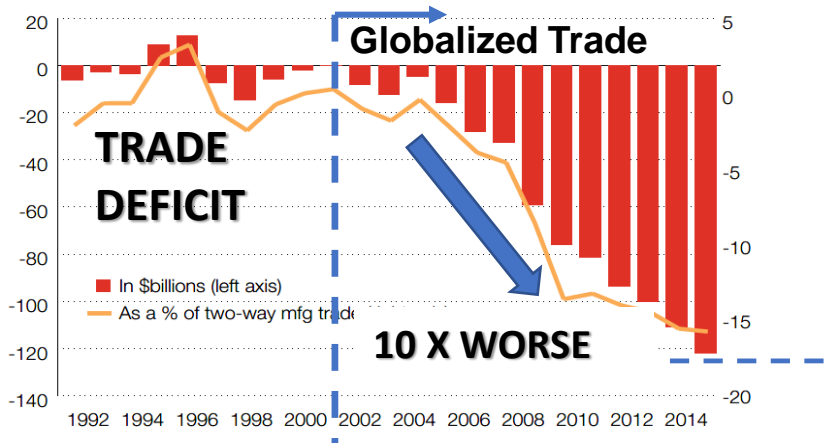
**1,000,000 Young Canadians
Now un or under employed!!**

*Youth Unemployment Rate 13%
Youth Participation Rate 51%*

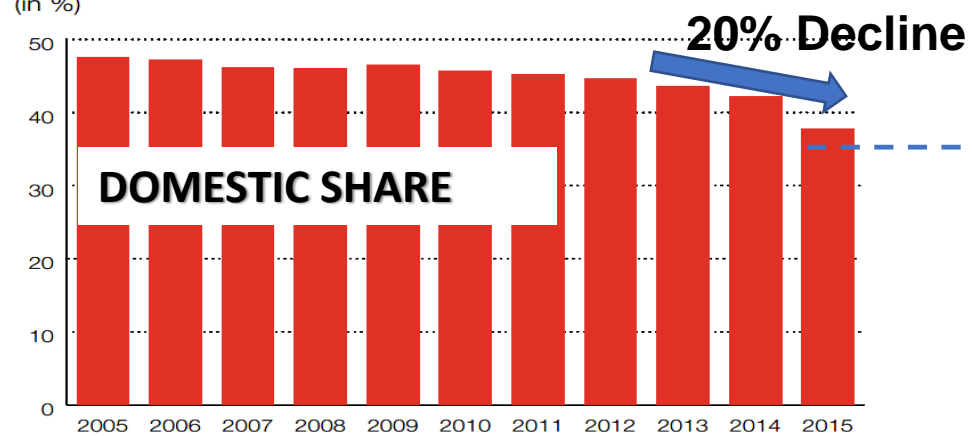


How are **WE** doing in our Manufacturing Sectors?

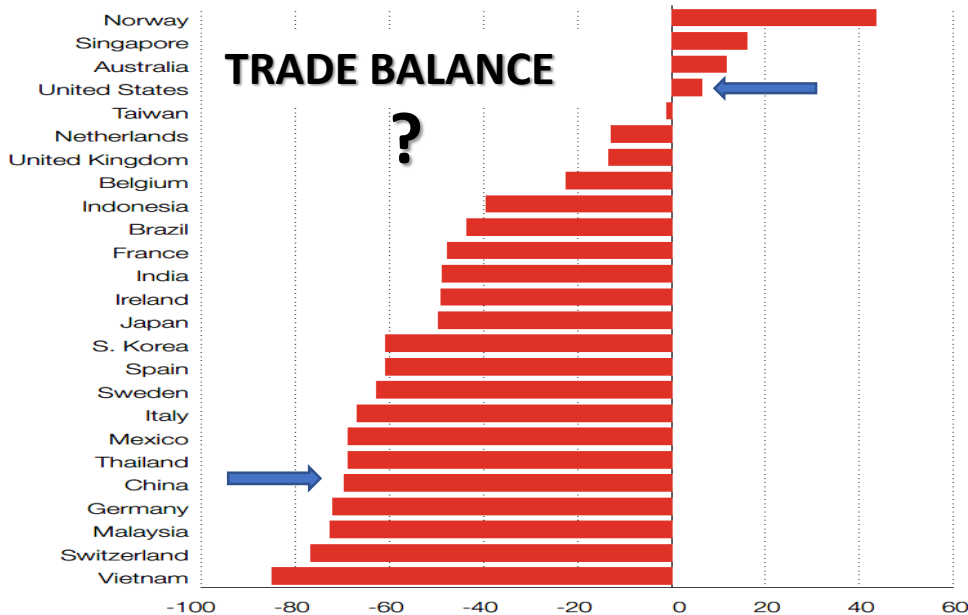
CANADA'S BALLOONING TRADE DEFICIT IN MANUFACTURING



CANADIAN MANUFACTURERS' SHARE OF THE DOMESTIC MARKET (in %)

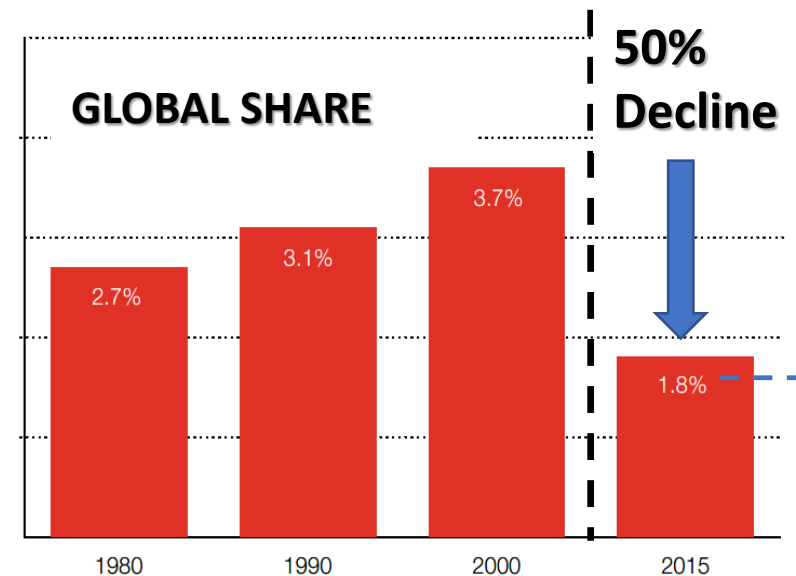


CANADA'S MANUFACTURING TRADE BALANCE BY COUNTRY (as a % of two-way trade in manufacturing)



CANADIAN MANUFACTURERS ARE LOSING GLOBAL MARKET SHARE

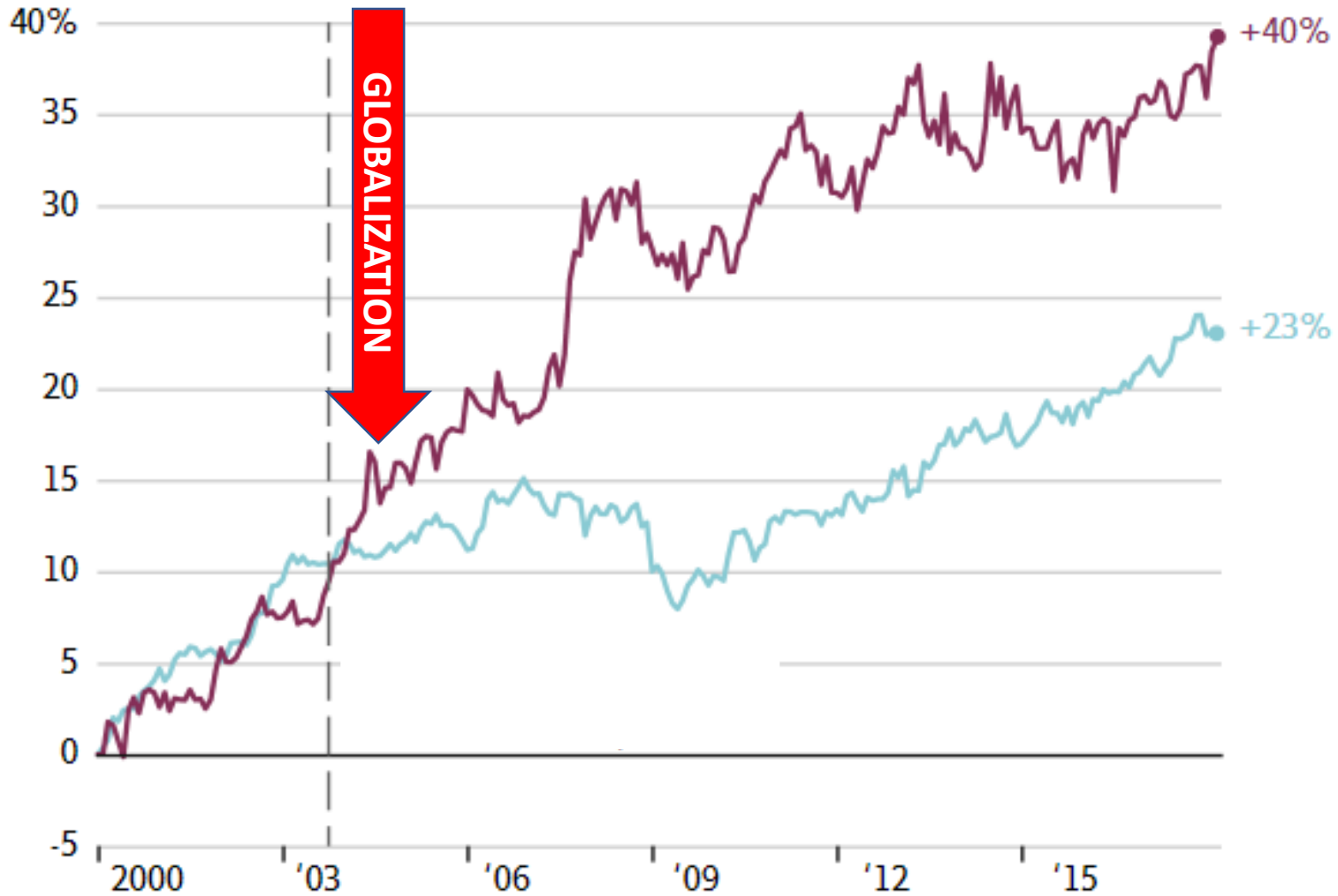
(Canada's share of global manufacturing exports, in %)



Public vs. private sector job creation in Ontario

Percentage change since January, 2000

● Public sector employees ● Private sector employees

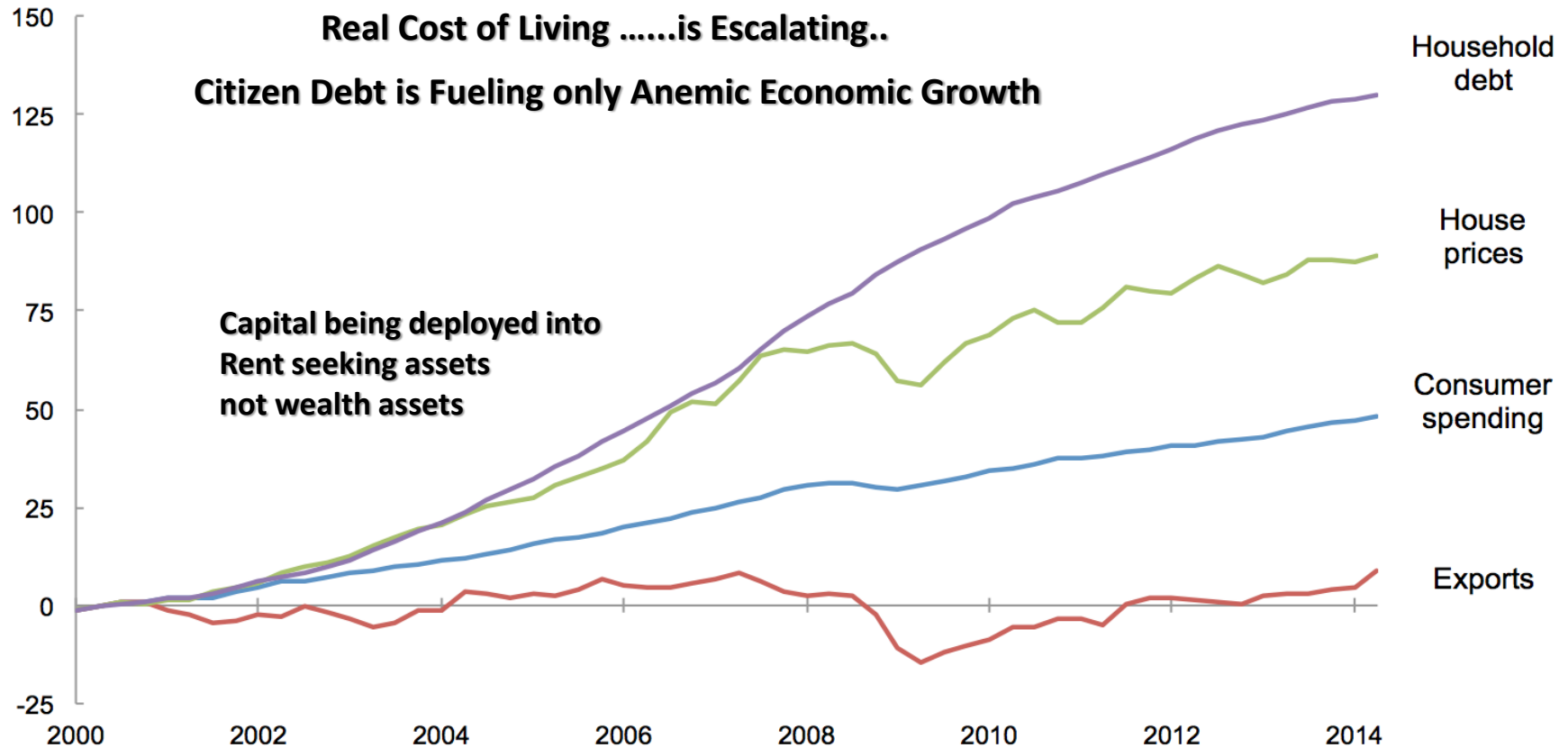


THE GLOBE AND MAIL, SOURCE: STATSCAN



Canadian Prosperity Measures show significant decline...

Cumulative real growth since 2000, selected Canadian variables, %



Household debt and house prices deflated by price index for household final consumption expenditure

Sources: FMR Co, Haver Analytics, Statistics Canada, Bank of Canada, Teranet/NB



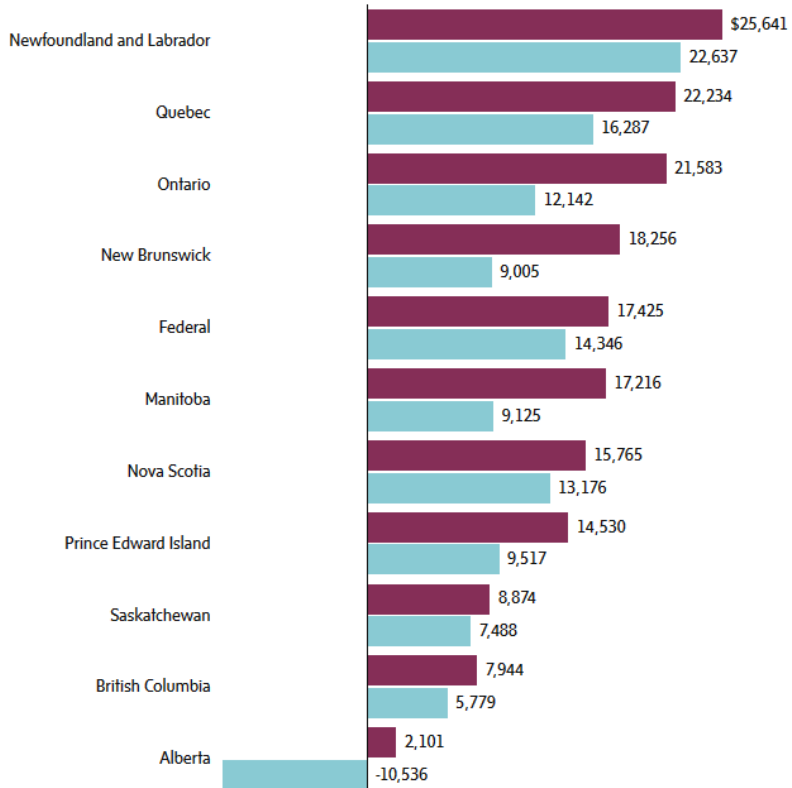


A Mature economy.....going out of Business

Government debt

Net debt per capita, provincially and federally

● 2016-17 fiscal year ● 2006-07 fiscal year

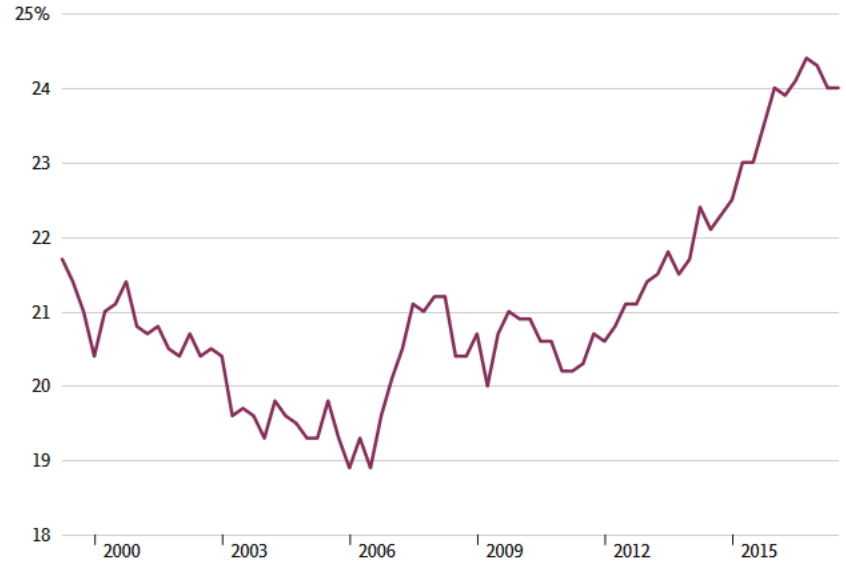


THE GLOBE AND MAIL, SOURCE: RBC ECONOMICS

DATA SHARE

Corporate debt

Debt service ratio for Canada's private non-financial sector, on quarterly basis

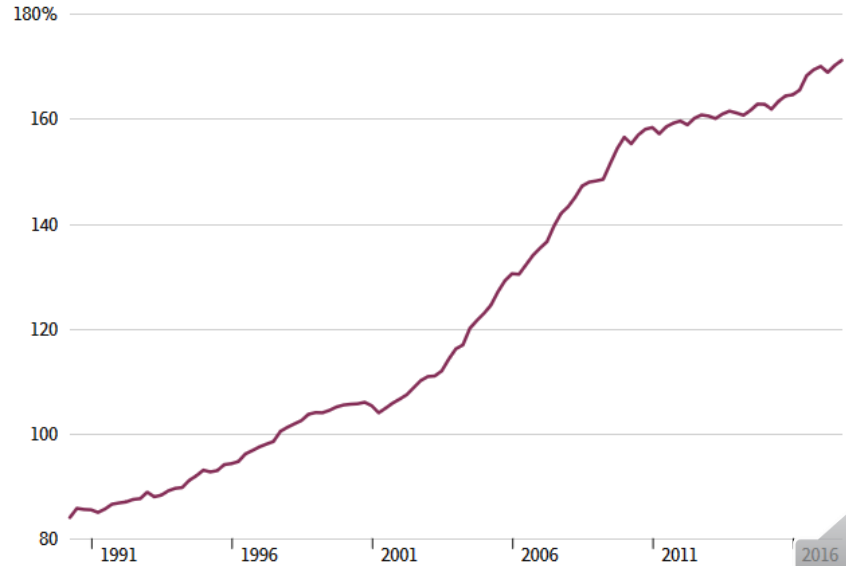


THE GLOBE AND MAIL, SOURCE: BANK FOR INTERNATIONAL SETTLEMENTS

DATA SHARE

Household debt

Credit market debt to disposable income ratio, on quarterly basis



THE GLOBE AND MAIL, SOURCE: STATSCAN

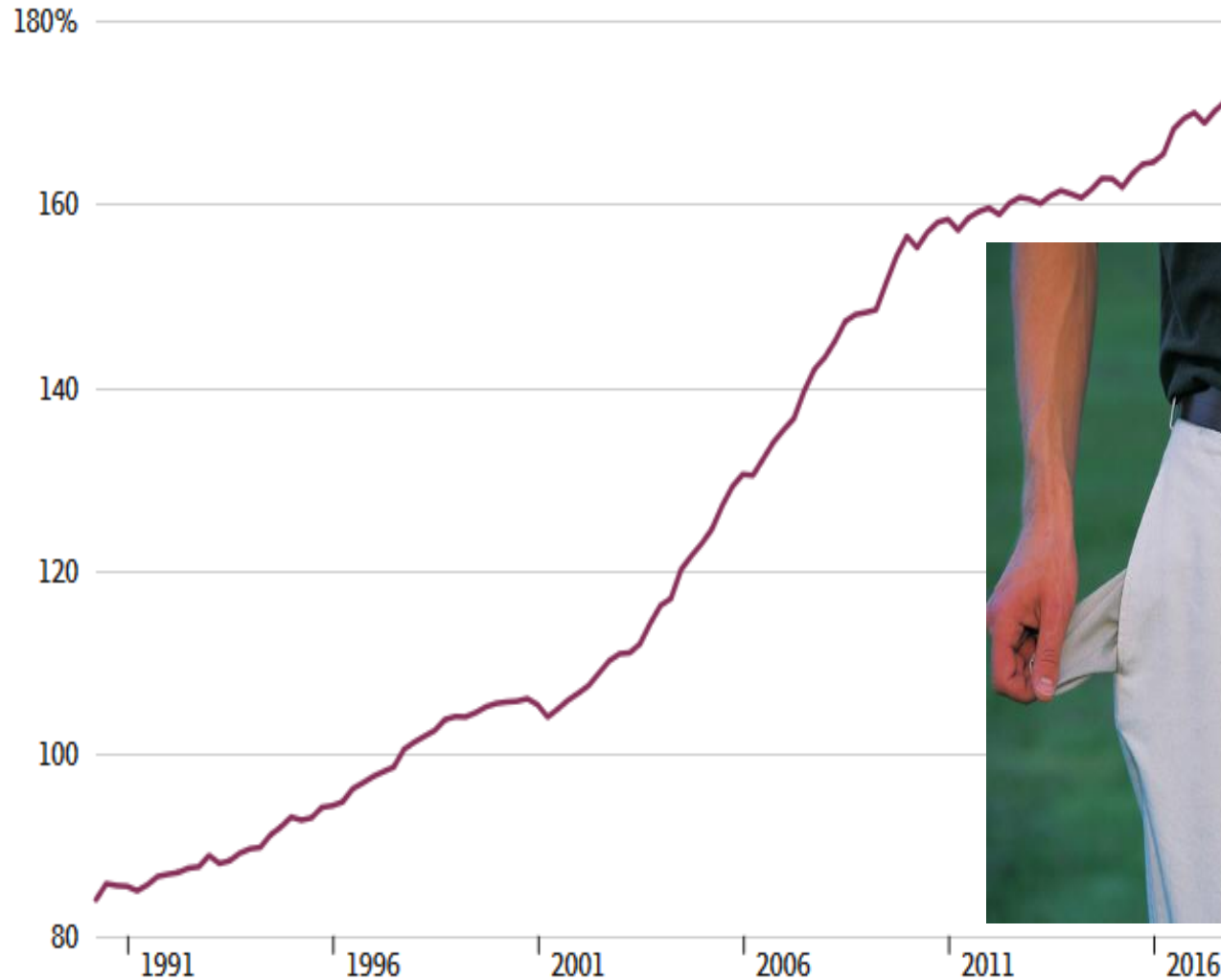
DATA SHARE

2016

Global Free Trade It's NOT working for everyone...

Household debt

Credit market debt to disposable income ratio, on quarterly basis



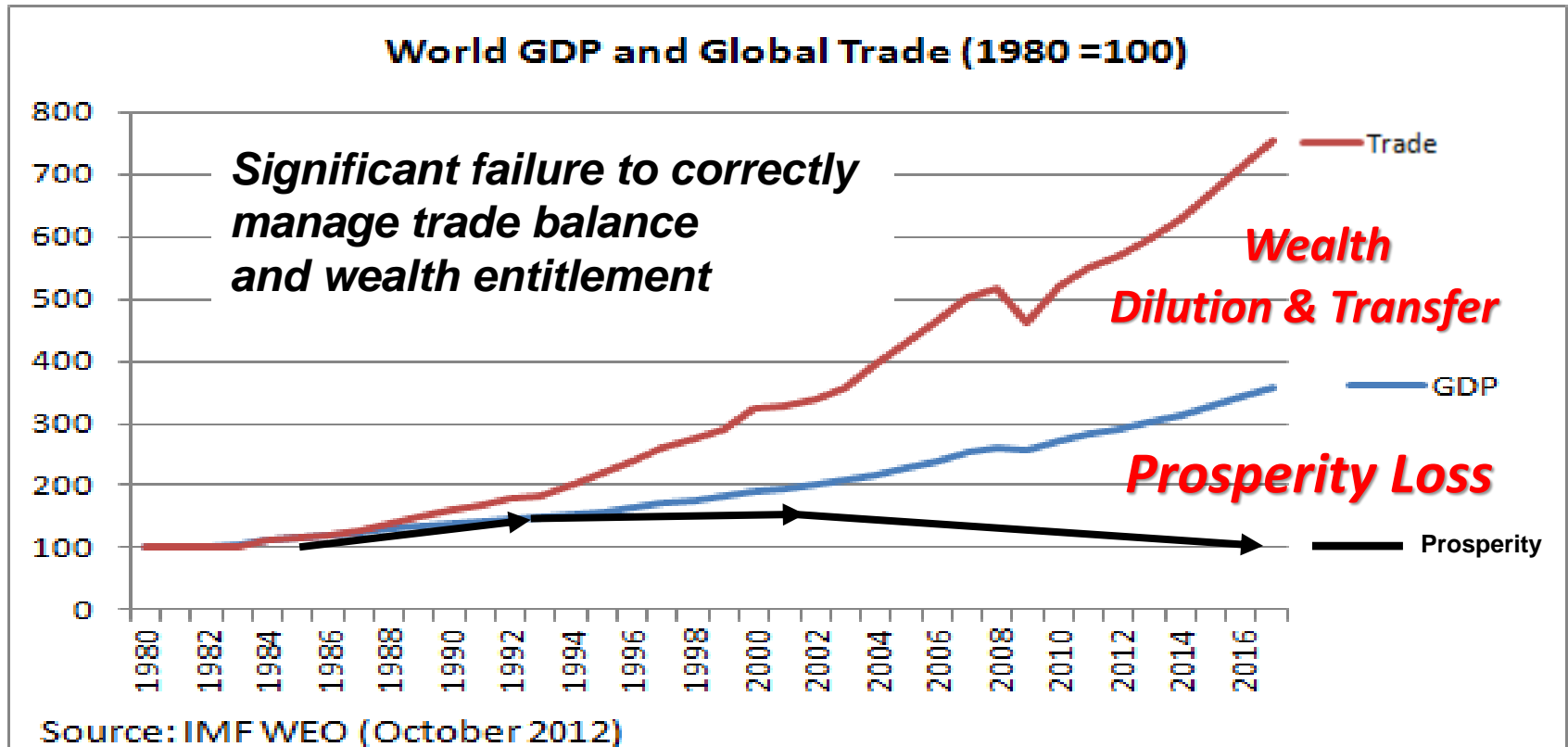
Global Free Trade It's NOT working for everyone...

Household debt

Credit market debt to disposable income ratio, on quarterly basis



Globalized Trade has outpaced Wealth Creation



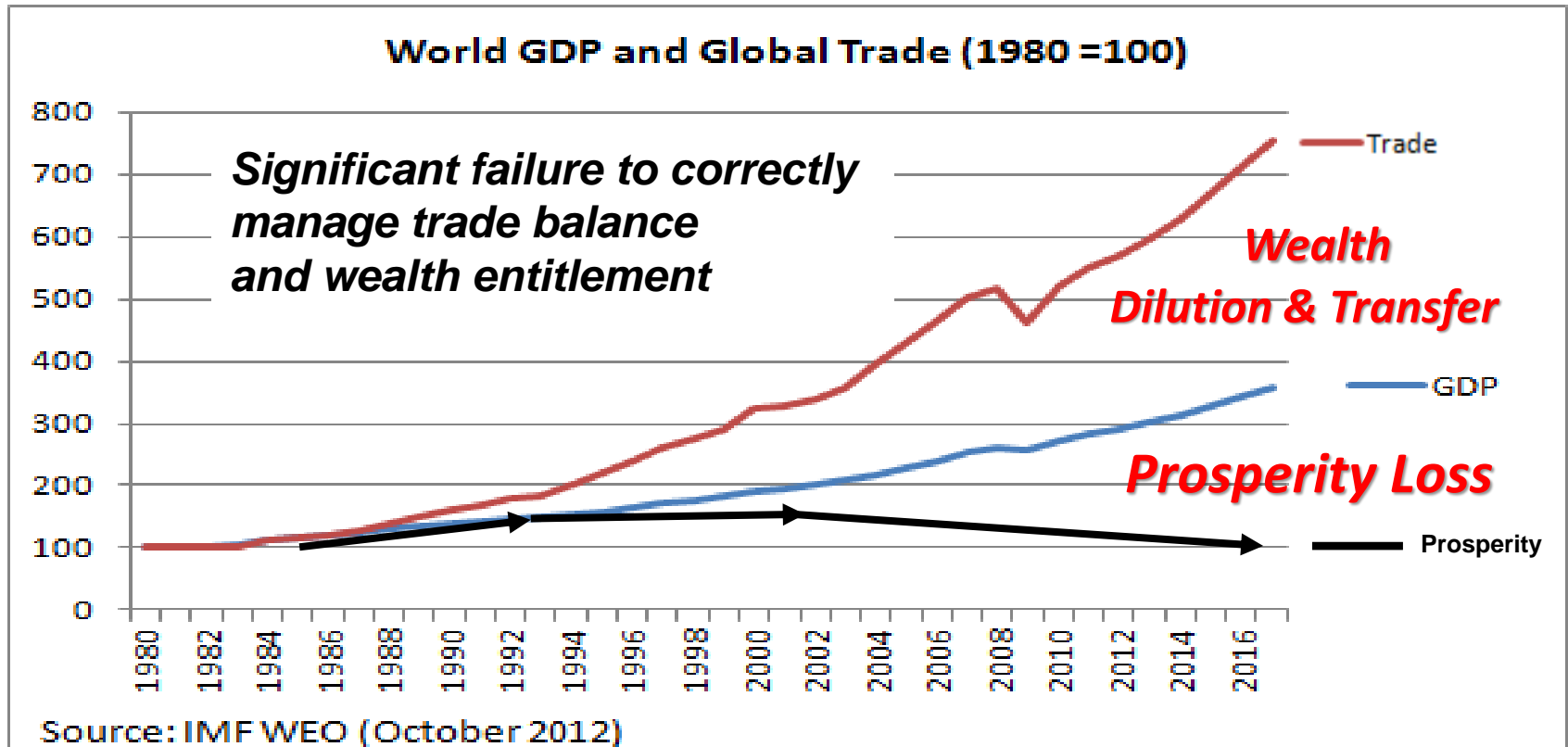
Winners

- Emerging Economies
- Bankers
- Traders
- Global Corporations
- Global Capitalists

Losers

- Mature Economies
- National governments
- Mature Economy Middle class
- Citizen level investors
- Youth early in careers
- The Planet!

Globalized Trade has outpaced Wealth Creation



Winners

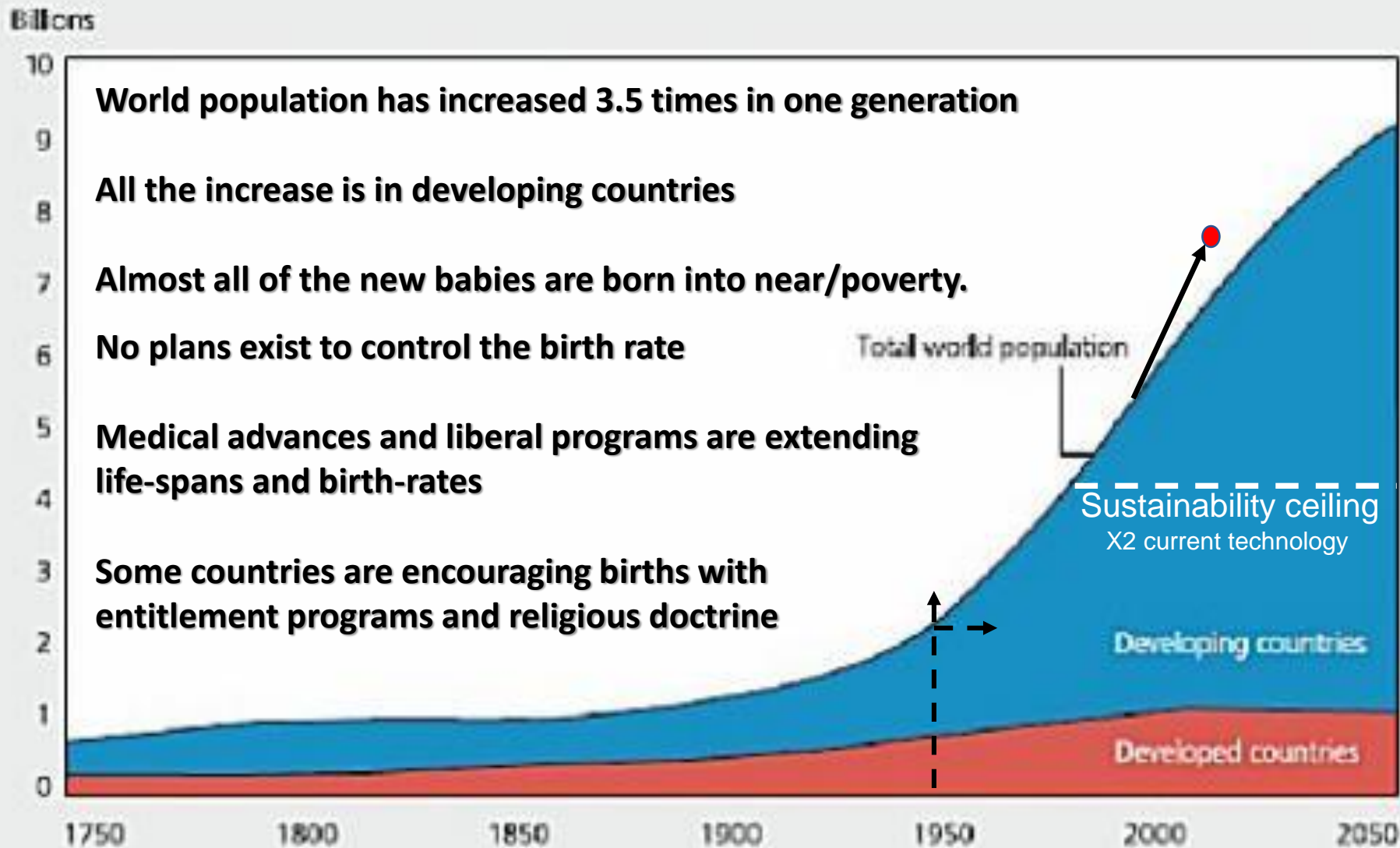
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- The Planet!

Figure 3.1

World population, 1750–2050



World population has increased 3.5 times in one generation

All the increase is in developing countries

Almost all of the new babies are born into near/poverty.

No plans exist to control the birth rate

Medical advances and liberal programs are extending life-spans and birth-rates

Some countries are encouraging births with entitlement programs and religious doctrine

Total world population

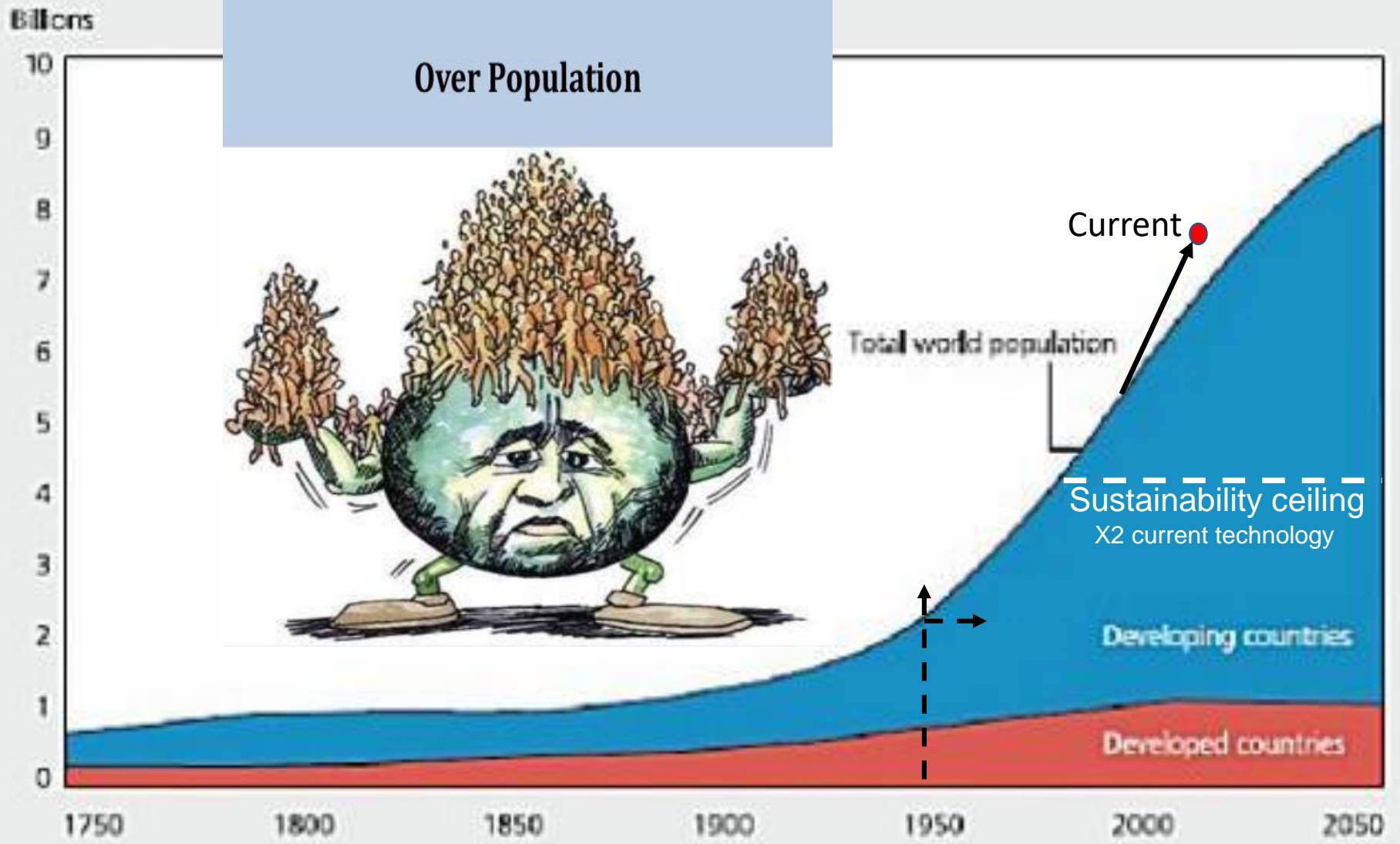
Sustainability ceiling
X2 current technology

Developing countries

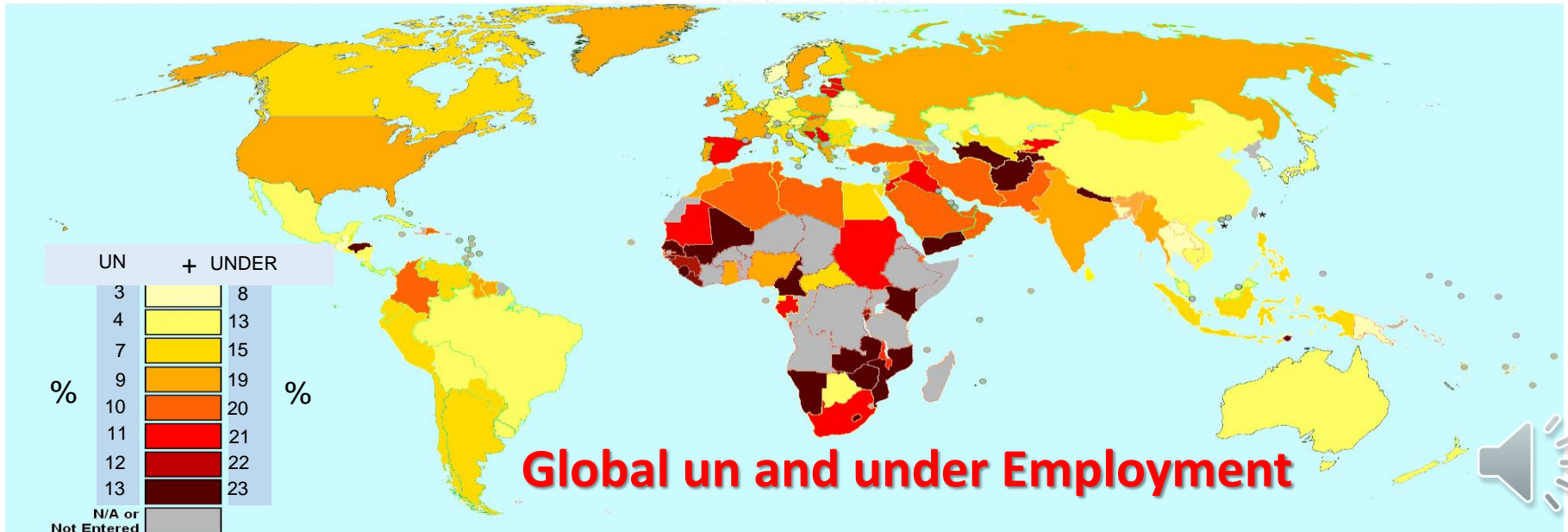
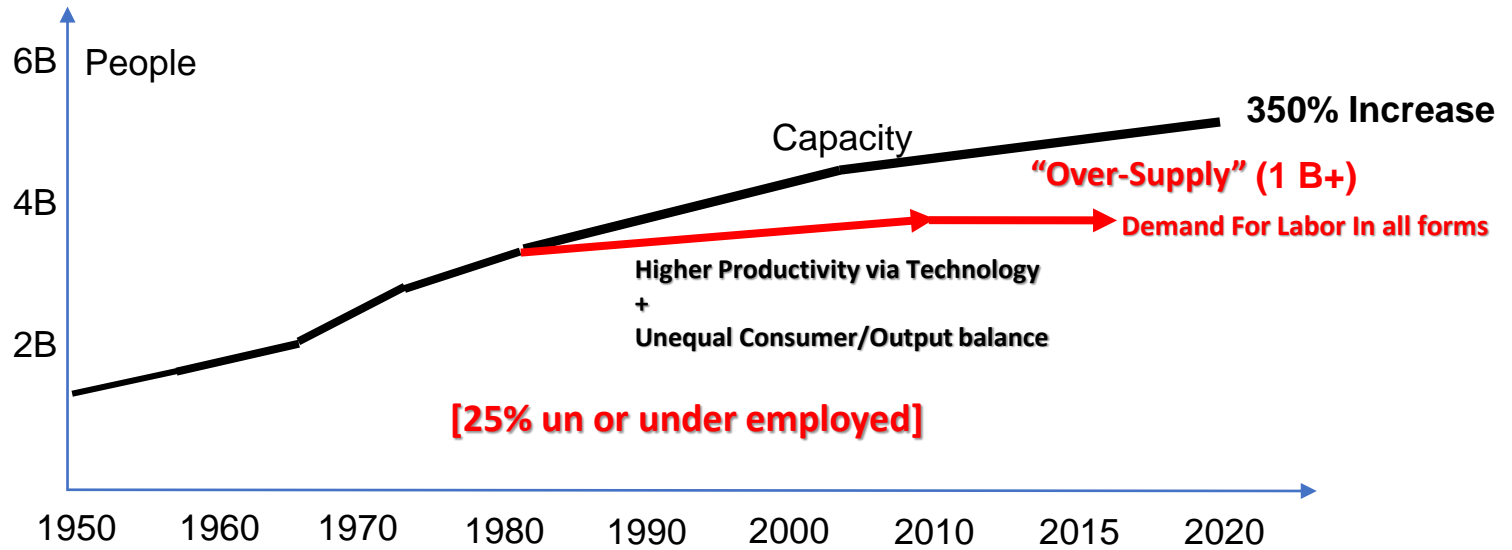
Developed countries

Figure 3.1

World population, 1750–2050

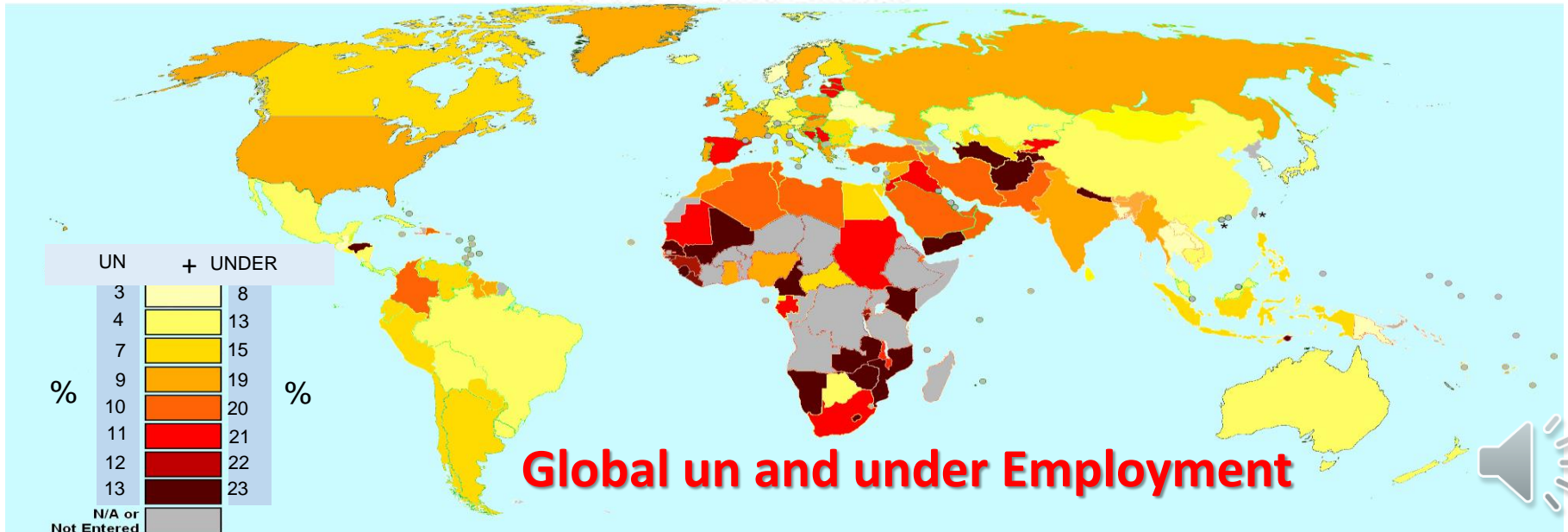
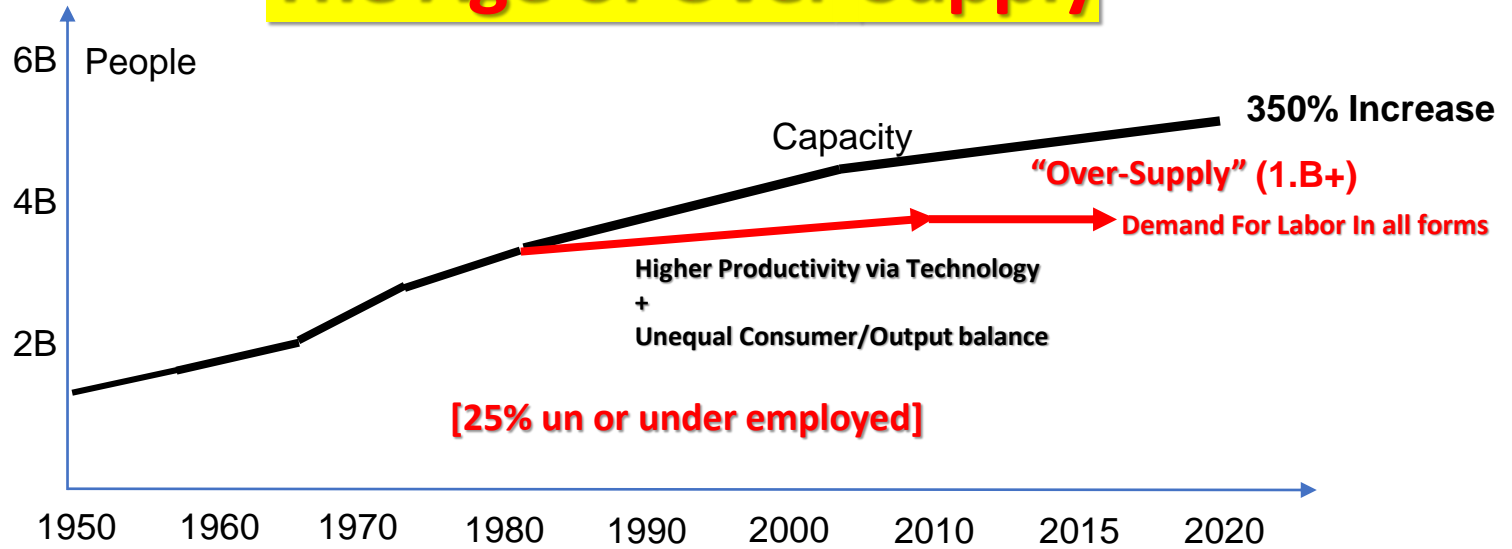


We have added 3.5 Billion to the global workforce



We have added 3.5 Billion to the global workforce

The Age of Over-Supply





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Take Back Manufacturing... 2019 and beyond.

NEXT.....

**The biggest LEAN Study
of all time!!.....**

GLOBALIZED



MANUFACTURING



GLOBALIZED



MANUFACTURING

GLOBALIZED



MANUFACTURING

GLOBALIZED



MANUFACTURING

GLOBALIZED



MANUFACTURING

GLOBALIZED



MANUFACTURING

GLOBALIZED



MANUFACTURING

Waste of VERY Expensive Bunker Fuel



Much Non-Value-Adding Inventory

Waste of VERY Expensive Bunker Fuel



VERY LARGE CARBON FOOTPRINT

This low grade bunker fuel is used by the worlds 90,000 cargo ships

***A single* large container ship emits pollutants equivalent to 50 million cars.**

Total container ship pollution is 6 times that of the TOTAL cars in world

2,000 times the amount of sulfur compared to diesel automobiles.

Container ships account for 90% of global trade by volume.

Our Economies will be jeopardized by this global warming enabler

INSANITY





INSANITY

We are sharing Global waste...NOT Prosperity

So.....Globalization and “Free Trade” is increasing pollution!



Third World Manufacturing Ecologically Unsustainable.



GLOBALIZED



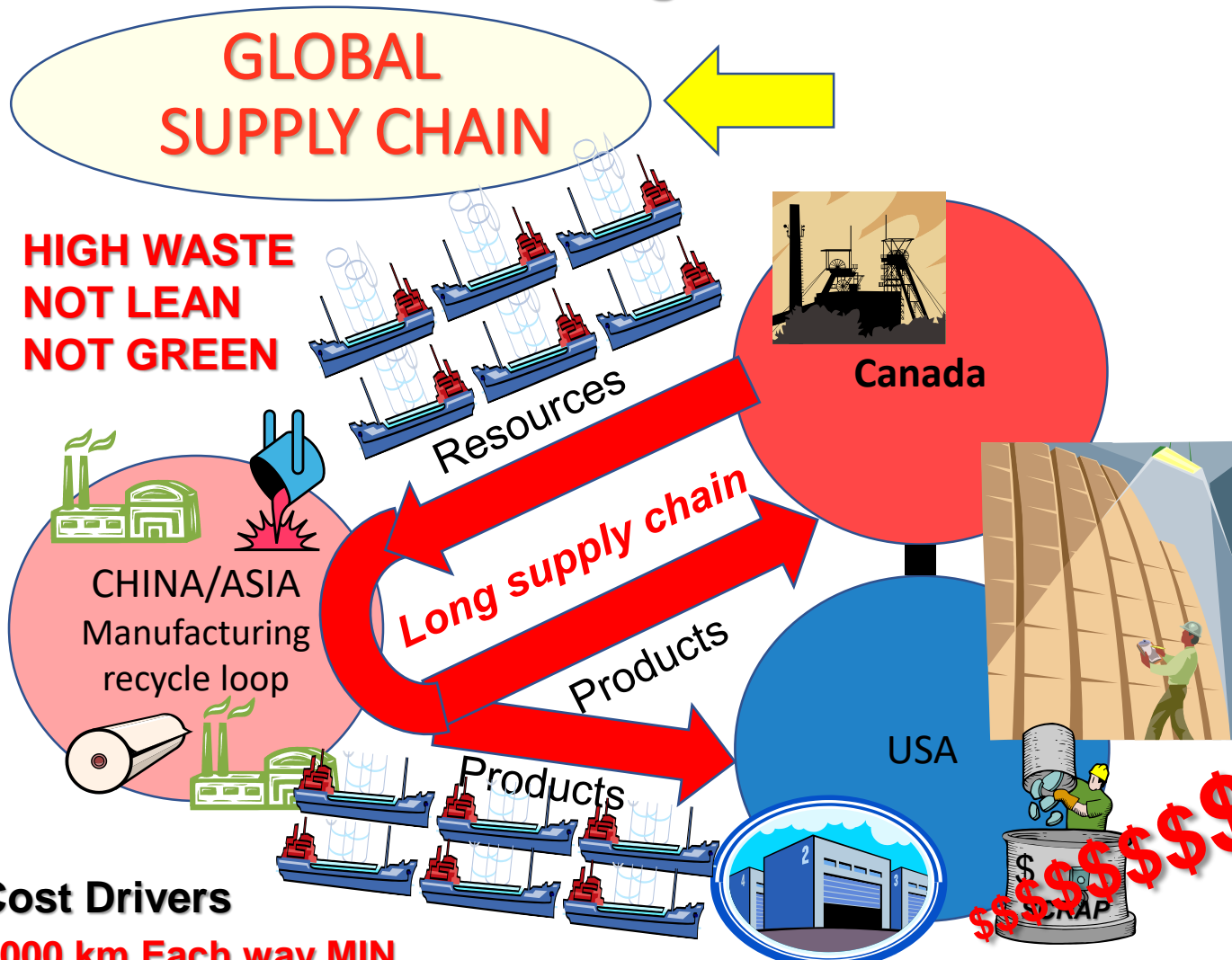
MANUFACTURING

LEAN Review of Trading Models

NOW

Process

- Dig Resources
- Ship resources
- Dock resources
- Use Resources
- Ship products
- Dock products
- Ship
- Store
- ship
- Sell



Cost Drivers

- 9000 km Each way MIN
- 6 weeks Transit Inventory MIN
- \$100/M cube to transport MIN
- Many Transactions / Handling.....
- Much Waste of Natural Resource's

When Interest rates are "normalized" we will have a "High cost of Inventory trap"

LEAN Review of Trading Models

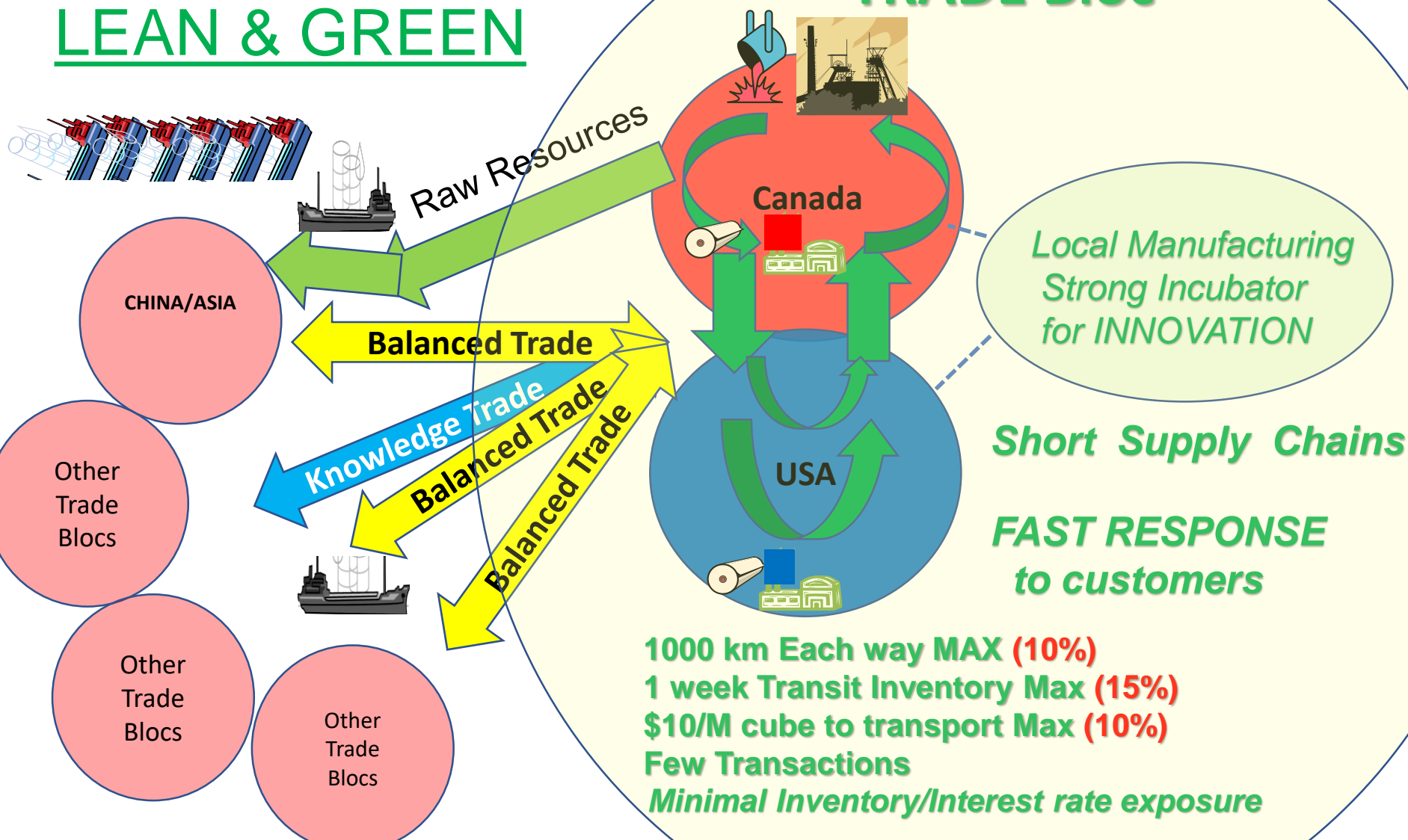
BALANCED ECONOMY

Intrinsically less wasteful

LEAN & GREEN

FUTURE

Localized TRADE Bloc



LEAN Review of Trading Models

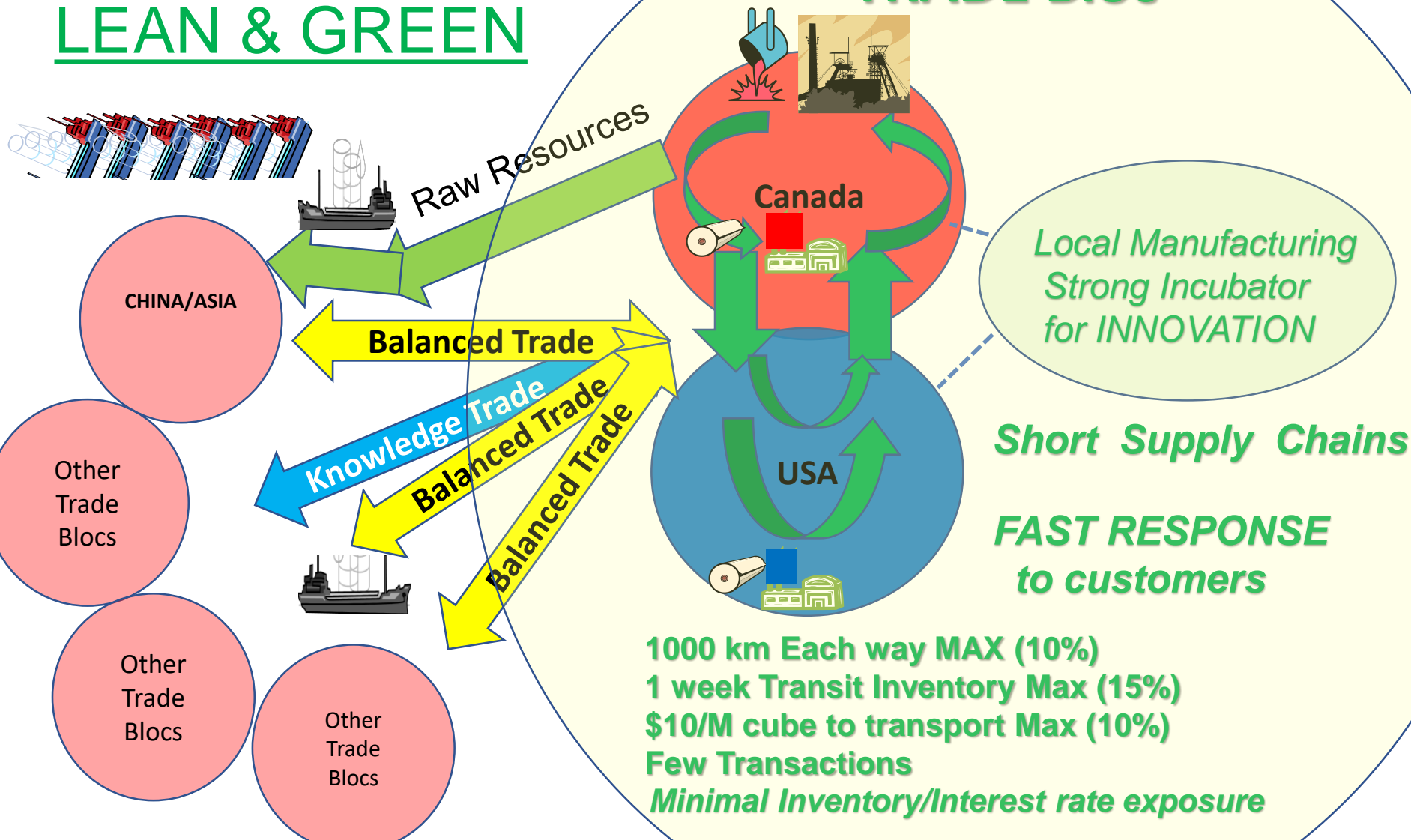
BALANCED ECONOMY

Intrinsically less wasteful

LEAN & GREEN

FUTURE

Localized TRADE Bloc



*Local Manufacturing
Strong Incubator
for INNOVATION*

Short Supply Chains

*FAST RESPONSE
to customers*

*1000 km Each way MAX (10%)
1 week Transit Inventory Max (15%)
\$10/M cube to transport Max (10%)
Few Transactions
Minimal Inventory/Interest rate exposure*

CHINA/ASIA

Other
Trade
Blocs

Other
Trade
Blocs

Other
Trade
Blocs

Balanced Trade

Knowledge Trade

Balanced Trade

Balanced Trade

Raw Resources

Canada

USA

LEAN Review of Trading Models

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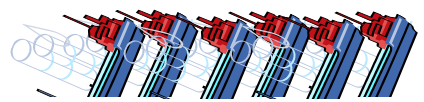
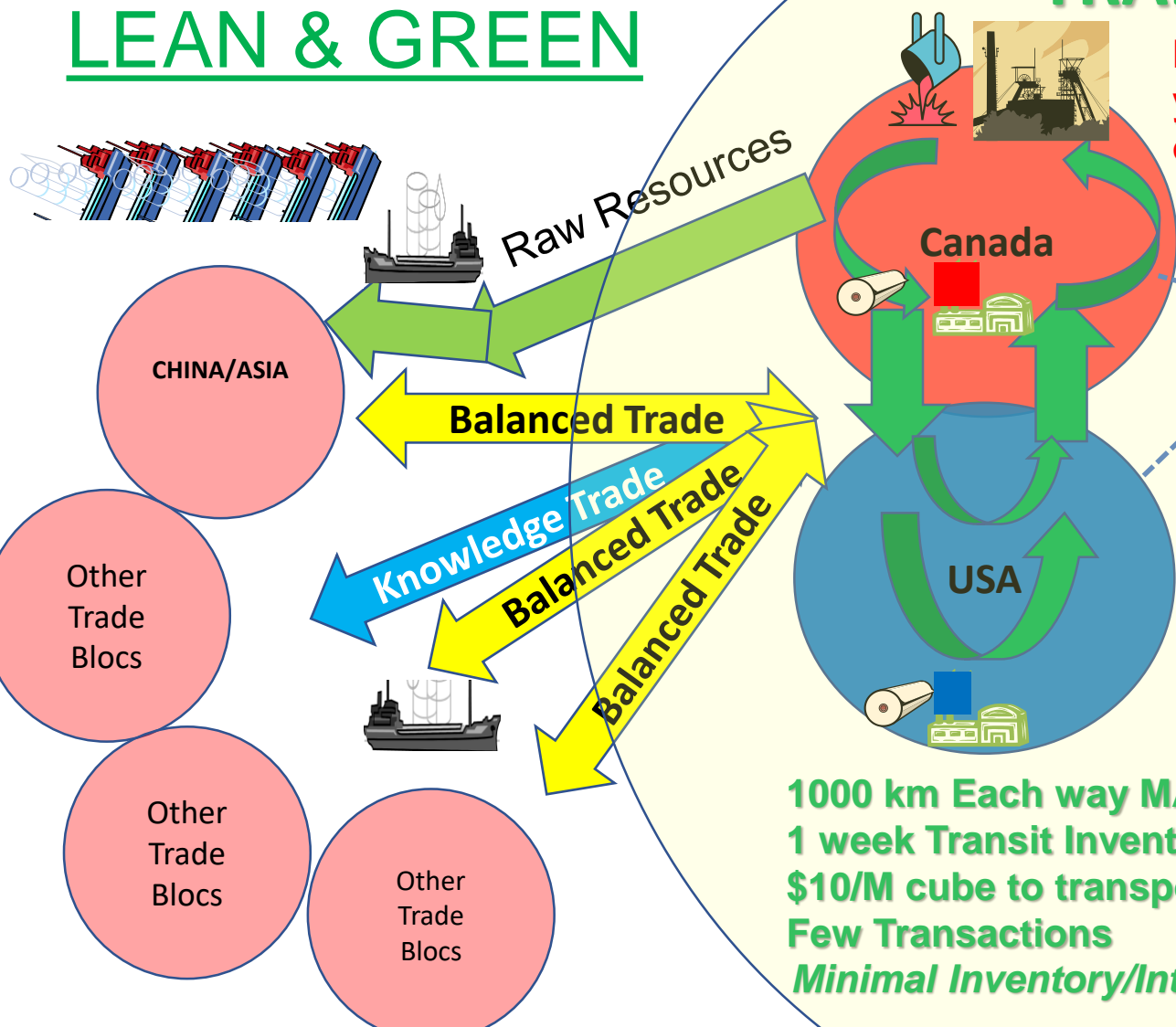
Make much more of what you Consume with more of your own resources..

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LEAN Review of Trading Models

FUTURE

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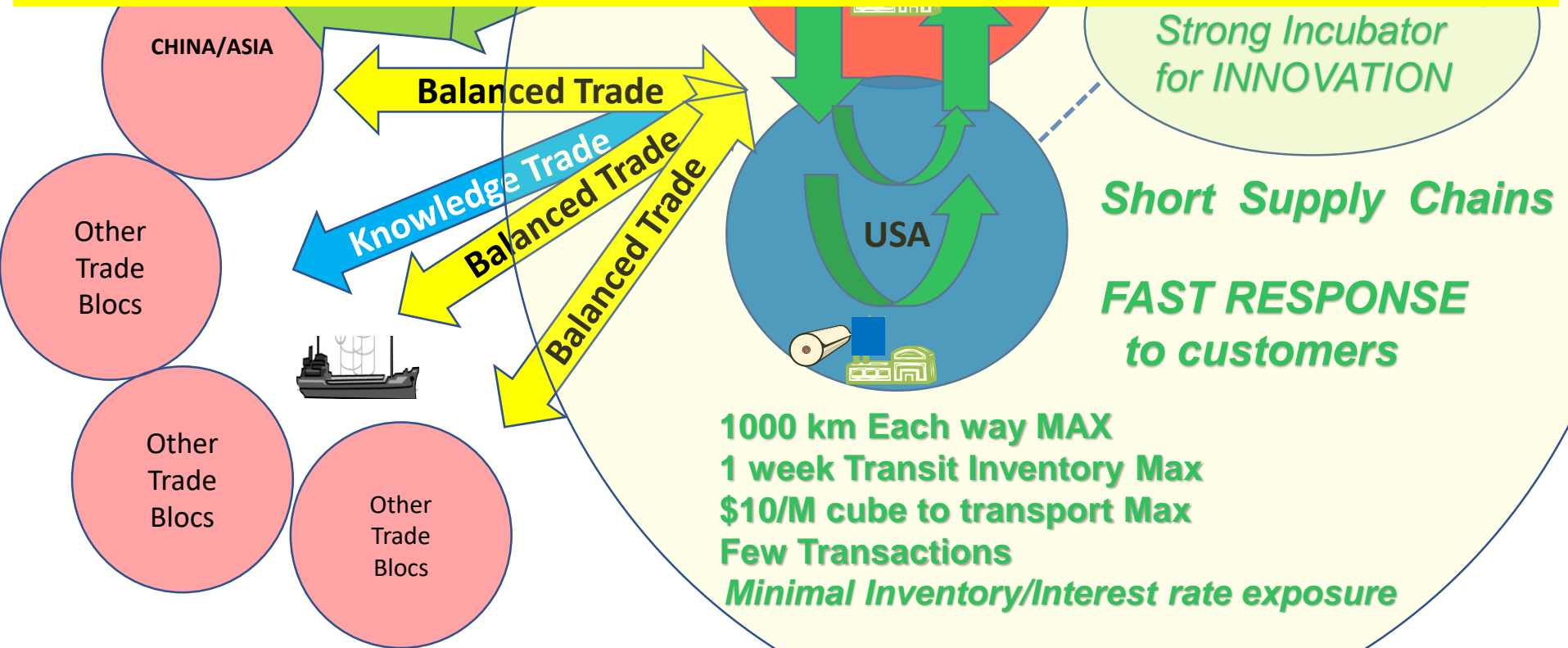
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LEAN & GREEN

Localized TRADE Bloc



**Make much more of what you Consume
with more of your own resources..**



We must remain realistic but resolved..

GLOBALIZED



MANUFACTURING

We must remain realistic but resolved..

GLOBALIZED

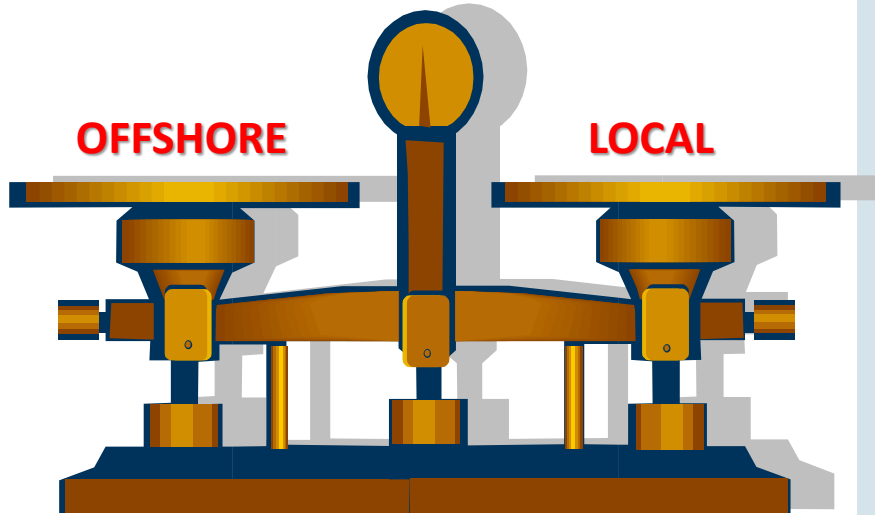


**Long Supply Chains
Are
Far Less Sustainable**

MANUFACTURING

Validated Cost Trade-off Models ... LOCAL versus Off-shore

BALANCED SOURCING



Manufacturing Outsourcing Cost Index
% of US cost



Boston Consulting Group (BCG).....

Reached *BALANCED LANDED COST PARITY* in most sectors

The **REAL** Costs to Manufacture OFF-SHORE will be projected to rise.

Due to: Exchange, tariffs, Labor wage inflation, Product Quality Cost escalation
Transportation costs, Customer location Inventory costs, Ease of doing business,
Plus...Many Other hidden drivers....

Validated Cost Trade-off Models ... LOCAL versus Off-shore

BALANCED SOURCING

OFFSHORE

100

ADVANTAGE LOCALIZED MANUFACTURING

40% + Corporations are now Reshoring to North America (NAFTA)

Manufacturing Outsourcing Cost Index
% of US cost



Boston Consulting Group (BCG).....

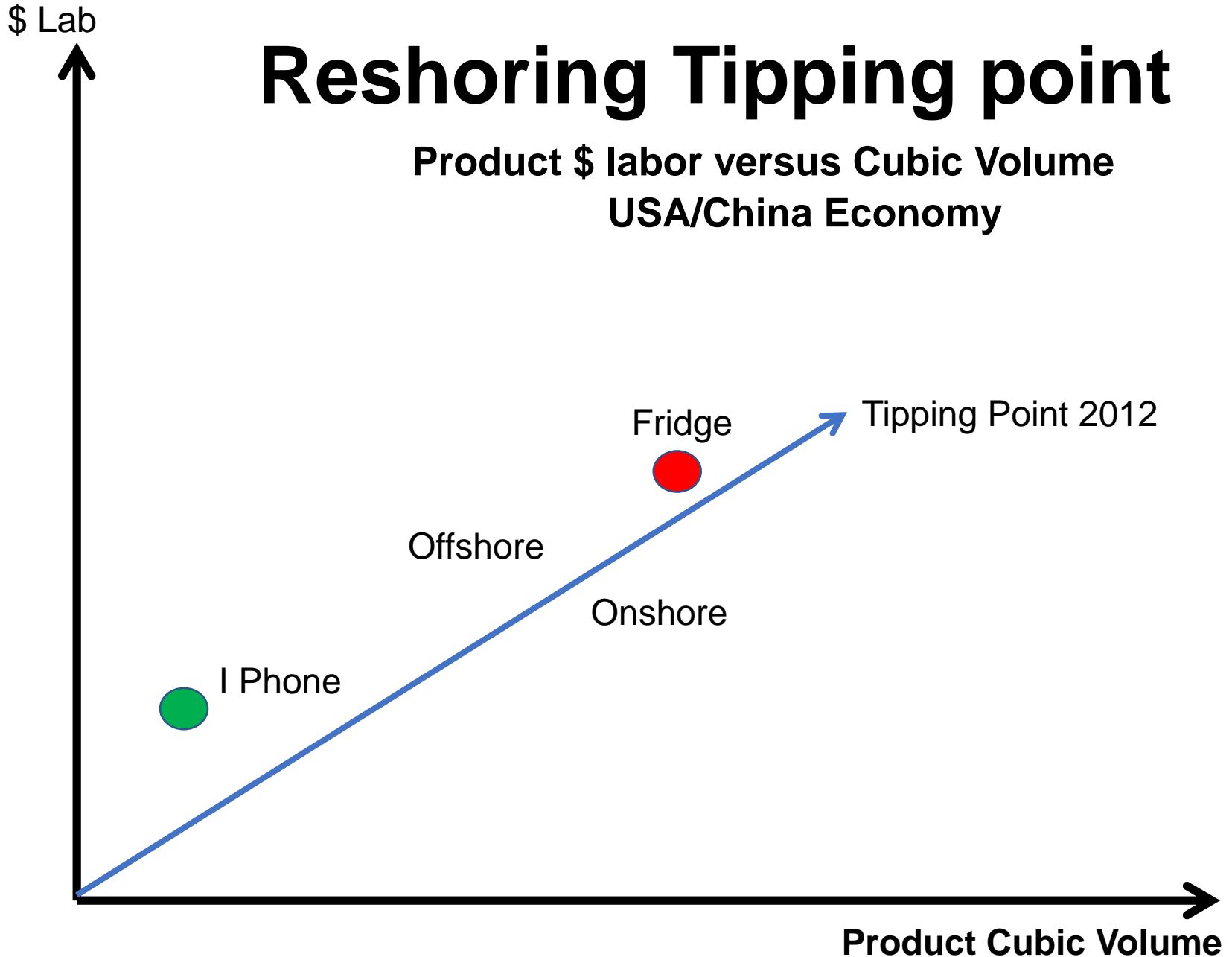
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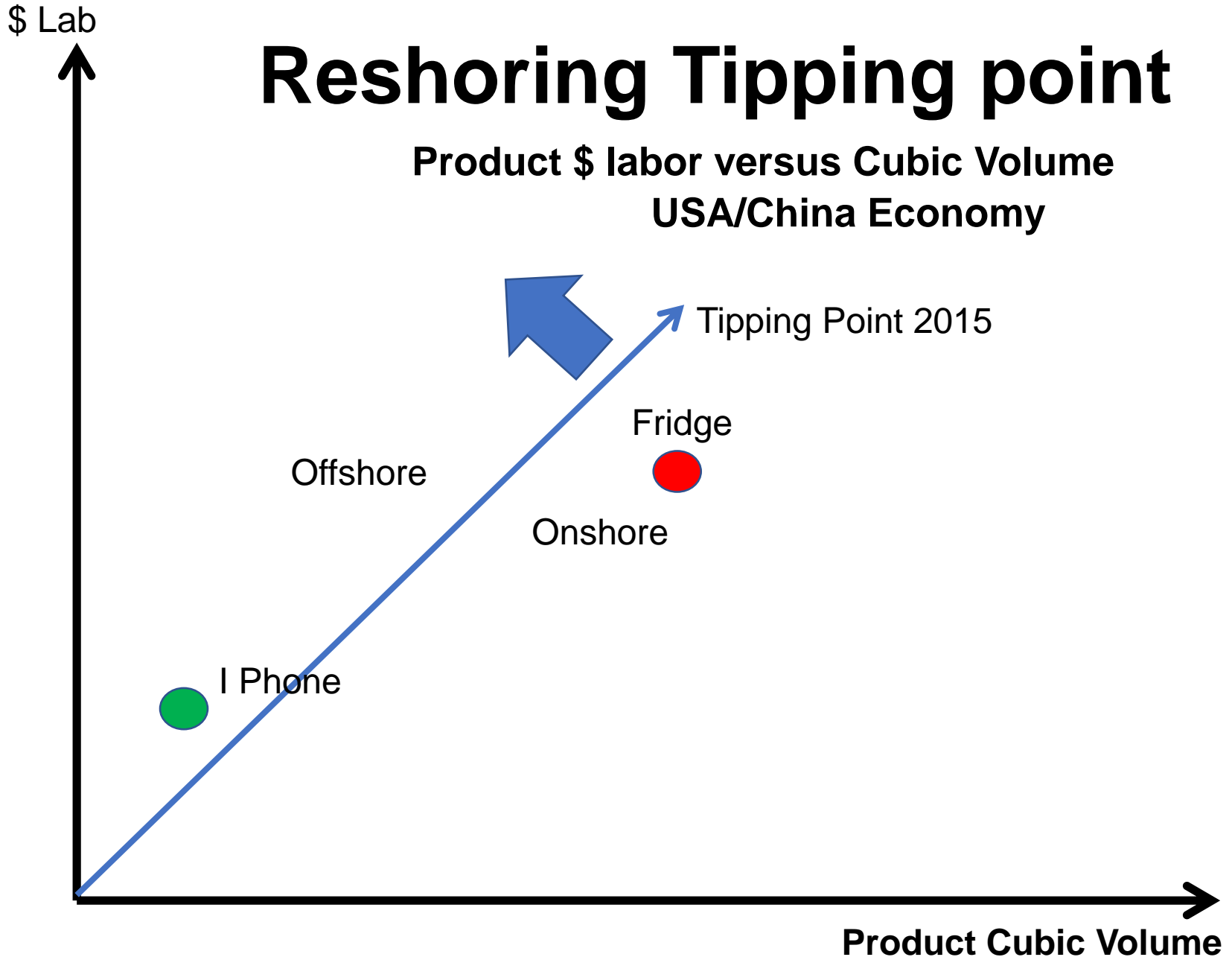
Reshoring Tipping point

Product \$ labor versus Cubic Volume
USA/China Economy



Reshoring Tipping point

Product \$ labor versus Cubic Volume
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GLOBALIZED



MANUFACTURING

We must remain realistic but resolved..

GLOBALIZED

UNSUSTAINABLE

MANUFACTURING





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The Outlook

Next 5 years

At last..... Some positive changes for TBM



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2019 & Beyond

The Road Map for Future Sustainability



**GLOBALIZED
MANUFACTURING**



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2019 & Beyond

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**GLOBALIZED
MANUFACTURING**

The Globalized Manufacturing approach with efficient Supply Chains supported by liberalized free trade agreements has been the business norm in the last three decades.



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The Road Map for Future Sustainability



**GLOBALIZED
MANUFACTURING**



**Jobs
Prosperity
Equality**



**Exploitation
Social Unrest
Health Risks
Pollution
Planet level risk**





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2019 & Beyond

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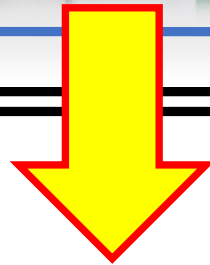
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**A Huge Political / Nationalistic
RESET**



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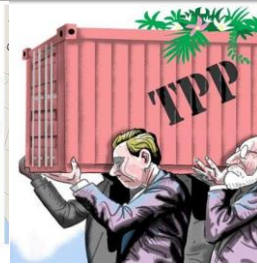


KEYSTONE XL PIPELINE

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Keystone XL will separate from the company's original Keystone Pipeline, which runs from Alberta to Nebraska.

- Keystone XL northern leg (proposed)
- Pipeline extension to Houston
- Original Keystone Pipeline
- Nebraska-Oklahoma link
- Keystone XL southern leg
- Storage tanks



Balanced Trade Matters No!.. To the Paris accord Fresh Political Will to Take Action!



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Strong Nationalistic Political will

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A Huge Political / Nationalistic RESET

Global "Free Trade" Now Discredited by Many Economists

Global Supply ChainsEcologically & Economically Unsustainable



Take Back Manufacturing

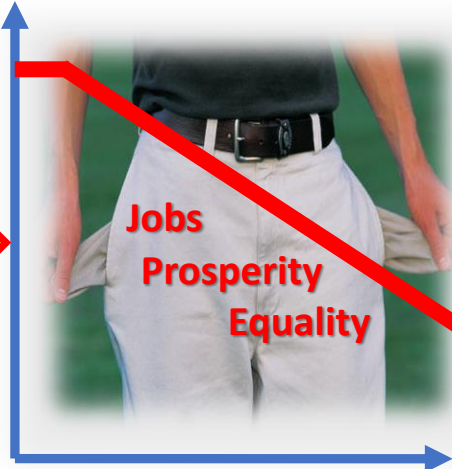
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2019 & Beyond

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A Huge Political / Nationalistic RESET

Rejecting Global Free Trade Agreements driven by the World Trade Organization

Rewriting National Focused Trade Deals...Avoid global IP Theft...Control Migration



Take Back Manufacturing

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2019 & Beyond

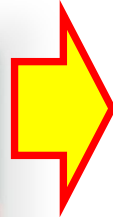
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TAKE BACK MANUFACTURING..... LEAN, **CLEAN**, SAFE & SUSTAINABLE

“Eliminate Wasteful Long Supply Chain transportation / Pollution”

*“**Make** much more of what we **Consume** with more of our own **Resources**..”*



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TAKE BACK MANUFACTURING..... LEAN, **GREEN**, SAFE & SUSTAINABLE

“LEAN & GREEN practices will rule future business strategies”

“INDUSTRY 4.0 will create an equalization of labor arbitrage”

“Manufacturing will be more LOCAL and a Strong Incubator for INNOVATION”

QUESTIONS?

Water....

A “Thirsty” Resource!!

A Car takes 39,090 gallons of water to make Plus 2,000 gallons for the Tires

Pair of Jeans takes around 1,800 gallons of water to grow enough cotton to produce just one pair.

Cotton T-Shirt... 400 gallons of water to grow the cotton required for an ordinary cotton shirt.

Single Board of Lumber takes 5.4 gallons of water to grow enough wood for one lumber board.

Barrel of Beer...(32 gallons of booze), takes 1,500 gallons of water.

To-Go Latte...takes 53 gallons to make every latte, grow coffee, sugar, plastic lid, the sleeve and the cup itself. . .

Individual Bottled Water

This irony shouldn't be lost on anyone: it takes 1.85 gallons of water to manufacture the plastic for the 500ml bottle of water.

Water.... A “Thirsty” Resource!!



Individual Bottled Water

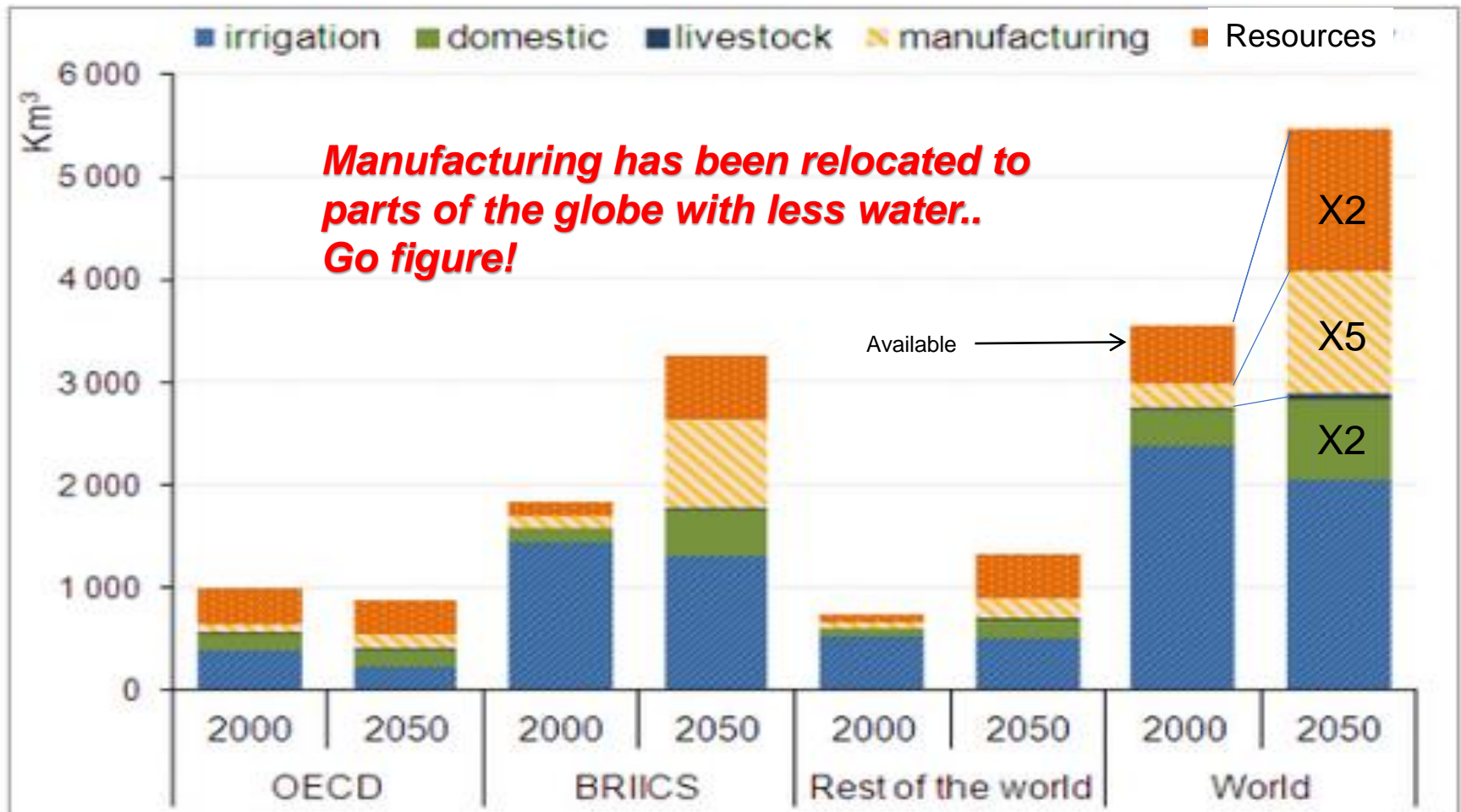
This irony shouldn't be lost on anyone:

It takes 1.85 gallons (7000ml) of water to manufacture the plastic for the 500ml bottle of water. (14:1)



Global water demand

Global water demand: Baseline scenario, 2000 and 2050



Source: OECD

The Planet Earth has a relatively new virus



The Planet Earth has a relatively new virus

- This **Destructive virus** is multiplying at an exponential rate
- Infiltrates all ecosystems and habitats
- Destroys forests and attacks all forms of life
- Increases pollution levels in rivers and oceans
- Has a negative impact on the air quality
- The virus is “mutating” to further enhance the danger

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Its called ...**Man!**

It likes to live nowand pay later!

Hopefully it will mutate into a benign state before it destroys the whole planet!

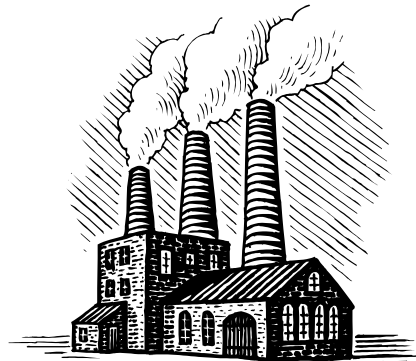
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Climate Change

The Biggest Hoax of the Century

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*We should be concerned for the increasing
Instability of our Energy Supply and its effect
on the Health of our Manufacturing Sectors*

Climate Change

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Climate Change

The Biggest Hoax of the Century

The Paris accord.....

Much wasted political arm waving at the international level on such topics

President TRUMP de-committed the USA from this agreement...

Climate Change

The Biggest Issue or Hoax of the Century

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Facts...

No Scientific Consensus Exists..... With many credible experts now saying the following...

The global climate is slightly warming .. But its.....

NOT due to human activityOR Carbon Concentration

NOT cause for alarm.... Less global ecological issues

On balance may be a good thing

Reducing our dependence on Carbon fuels will be a very slow process...

Priority must be Nuclear/Hydro/Natural Gas & Maybe Coal in some emerging nations

Solar and Wind are Non-Strategic and Impractical .

There are many opinions about climate change

“There is no convincing scientific evidence that human release of carbon dioxide will, in the foreseeable future, cause catastrophic heating of the Earth's atmosphere and disruption of the Earth's climate.”

Global Warming Petition Project – Opposed to Kyoto –
Signed by 31,000 US Scientists and Professionals.

“It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century.”

Intergovernmental Panel on Climate Change - 2014

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Politically Incorrect/Correct Statements

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Burn Coal and Save a Tree!

Stop Wind and Solar and Save our living space

Go Nuclear and Save Billions of lives!

Do Nothingand Save Humanity and the Planet!

Climate Change

The Biggest

The Paris accord.....

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CO2 is plant food and coal generates the most CO2... and more important Many 3rd world nations have plenty of coal and will burn trees if they cannot use coal!!!

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About 25% of high density areas would be consumed with Wind or Solar farms to support that population and will work only when the wind blows and only when the sun shines..... And only in the day!!

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It offers the only viable and clean source of energy in sufficient intensity.... If we replaced most of the fossil fuels with nuclear sources the health hazard costs would reduce and also save significant lives.

Politically Incorrect/Correct Statem

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The Paris accord

Much wasted

President

Politically

Burn Coal

Stop Wind

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Do Nothingand Save Humanity and the Planet!

Generating alarm and panic via a global climate emergency that does not exist, will significantly disadvantage many of the planet's population and their economies.

The planet has its own independent climate agenda ...and the scientific evidence firmly suggests that any action we can take will not significantly modify its agenda and we should focus our energy on adapting to such changes.

CO2 is not the real enemy... but pollution IS our problem.. and we must as soon as we are "Entitled" migrate to cleaner forms of energy such as nuclear.

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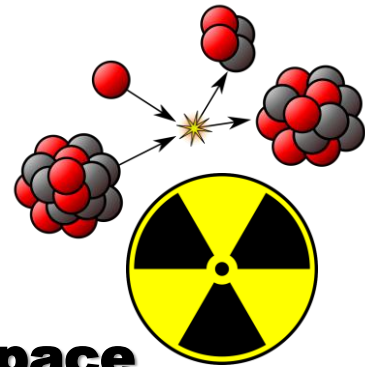


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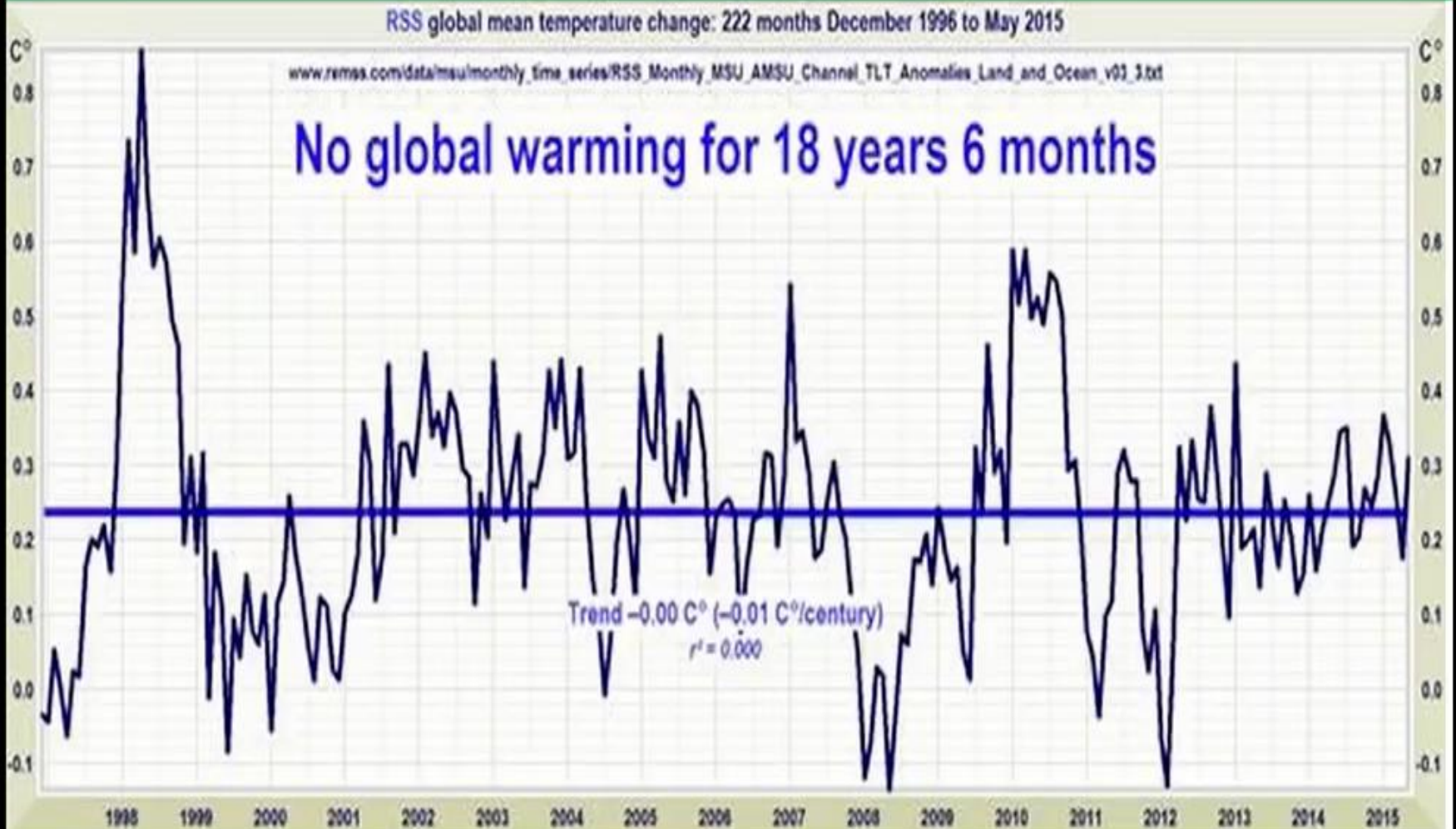
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Don't confuse Climate Change with Pollution... Its the real enemy in all forms!!

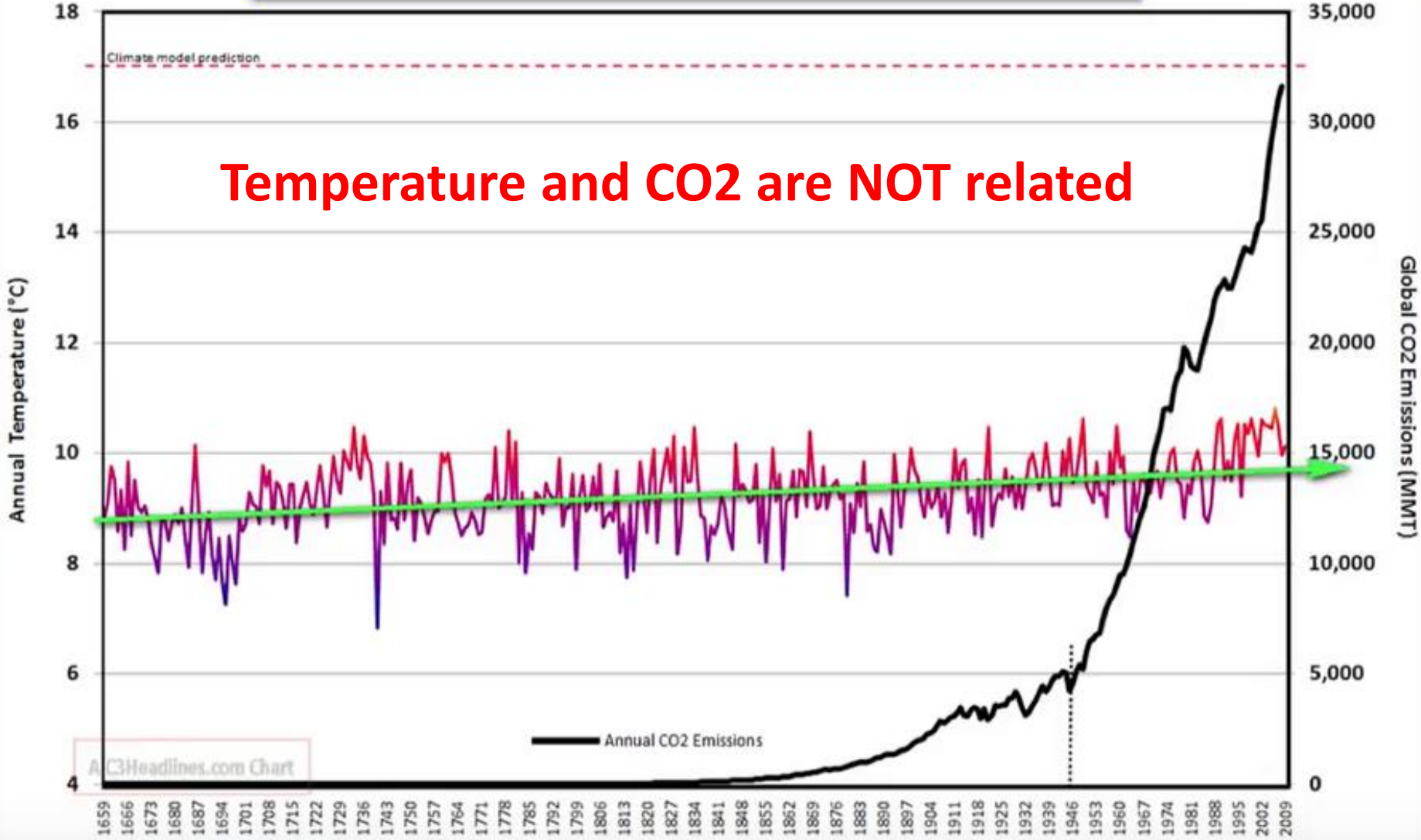
Pollution can be controlled by national standards and in the main is being met certainly in most mature economies... climate change is not ours to control... that is the agenda of the whole planet itself and humankind has no effect or power over that...

What global warming?



Central England Temperatures & Global CO2 Emissions From 1659 to 2009

Temperature and CO2 are NOT related



A C3Headlines.com Chart

Source: <http://hadobs.metoffice.com/hadcet/cetm1659on.dat>

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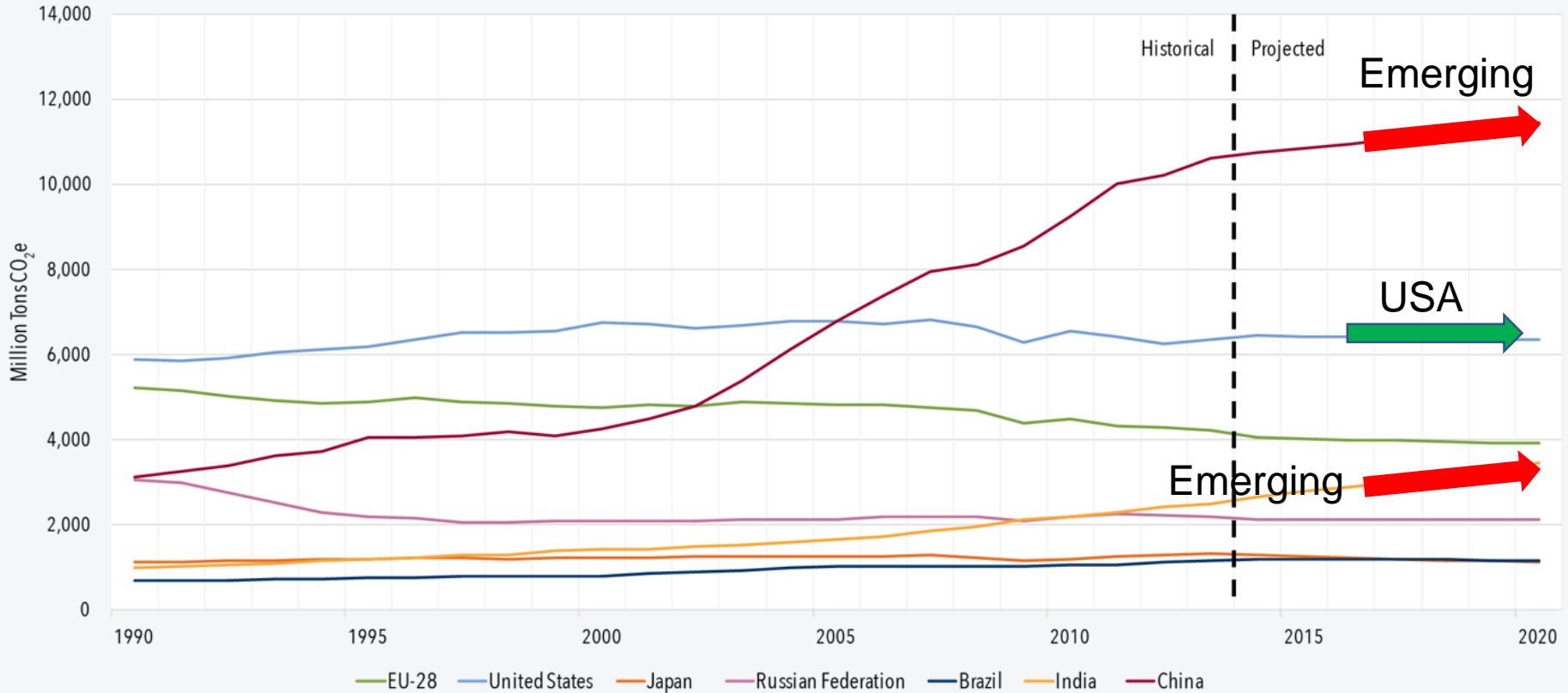
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Greenhouse Gas Emissions for Major Economies, 1990–2020



The Mature economies are flatting on population and emissions

The Emerging economies have exploding populations/consumers/emissions

The Paris accord

Climate Change

Heavy costs loaded against the mature economies

Assumed a globalized free trade manufacturing model

**Too much focus on assisting emerging economies
become global manufacturers...**

The Paris accord

Climate Change

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**Too much focus on assisting emerging economies
become global manufacturers... **Wrong Approach****

The Paris accord

Climate Change

Heavy costs loaded against the mature economies

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Wrong Approach

REDUCE

Correct Approach

Globalized Manufacturing!!!



Force everyone to consume more of what they make and make more of what they consumein a sustainable manner.

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<https://www.youtube.com/watch?v=UFHX526NPbE>

<https://www.youtube.com/watch?v=TjlmFr4FMvI>



Take Back Manufacturing

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Man-made climate change....The myth and media hysteria.

The Man-made climate emergency myth is the biggest Hoax of the Century with science being subjugated by over liberalized political will and media hysteria at a level not seen before.

The media hysteria has reached a point that reasonable fact based debate on the subject is impossible due to the almost religious fanaticism from "the believers" that man-made climate change is an Armageddon that requires a colossal level of immediate global action. Our governments are being railroaded into policies that will cripple the progress and sustainability of our modern civilization.

We lack Scientific Consensus.....

Many politically motivated study groups have said.....

"It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century". They believe that future climate change will cause higher temperatures, Lower temperatures, more snow and blizzards, Drought, fire, and floods, Rising sea levels, Disappearing glaciers, loss of sea ice at the poles, Species extinction, more and stronger storms, more storm damage, more volcanic eruptions, dying forests, death of coral reefs and shellfish, shutting down the Gulf Stream, fatal heat waves, more heat-related illness and disease, crop failure and food shortages, Millions of climate change refugees, Increased cancer, cardiovascular disease, mental illness, and respiratory disease, and some say a devastating effect on the quality of French

QUESTIONS?

So what's next?

A glimmer of hope!



So what's next?

A new critical mass of Awareness/Dialogue/Debate

A glimmer of hope!

To force action taking



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Fresh Political Will

THE GAME CHANGERS!



Balanced Trade Matters

No!.. To the Paris accord

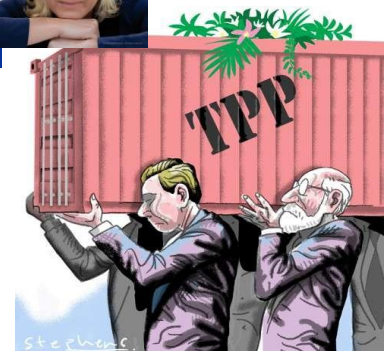
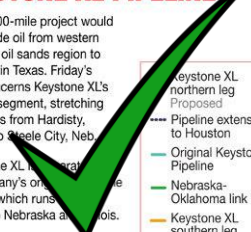


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- Original Keystone Pipeline
- Nebraska-Oklahoma link
- Keystone XL southern leg
- Storage tanks



The Institutions of Global Multilateralism are in question!

THE NEW WORLD ORDER??

World Trade Organization?
liberalized Global Free Trade?

United Nations?

World Banking System?
Free-Flow of Capital?



The Institutions of Global Multilateralism are in question!



Reset in political leadership

A Move away from global free trade agreements driven by the out-of-date World Trade Organization

*Toward a redefined national trade bloc model, with a strong focus on more **Balanced Trade** and far greater controls on capital transfers and borders.*

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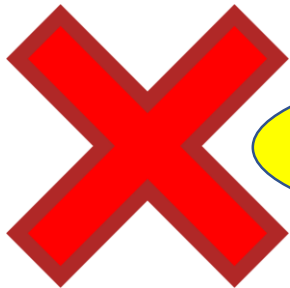
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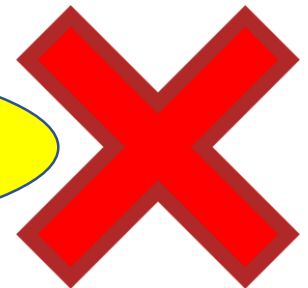
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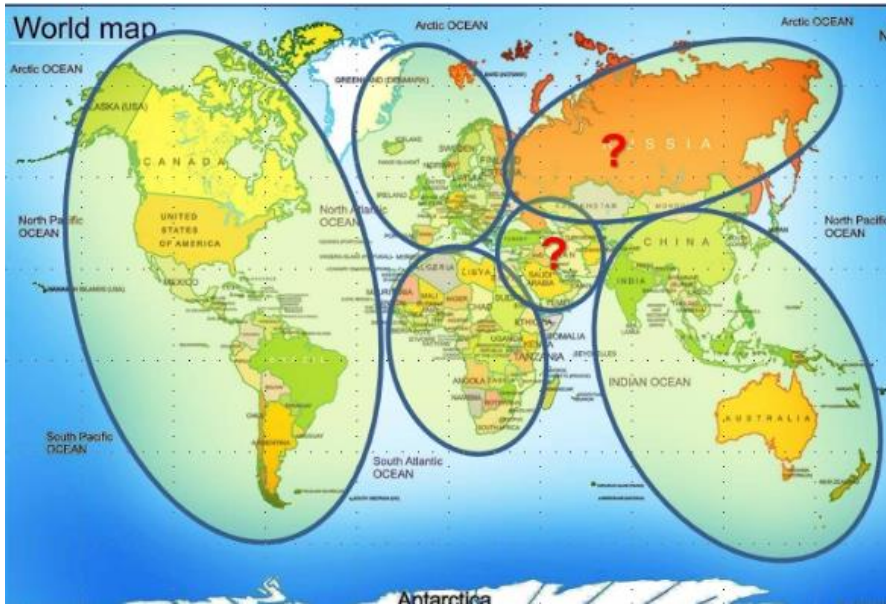


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This is absolute nonsense, each nation must have the right to choose with who and how it trades, and its real goal is its own sustainability.

The Future....Regionalized Trade Blocs



Reset in political leadership

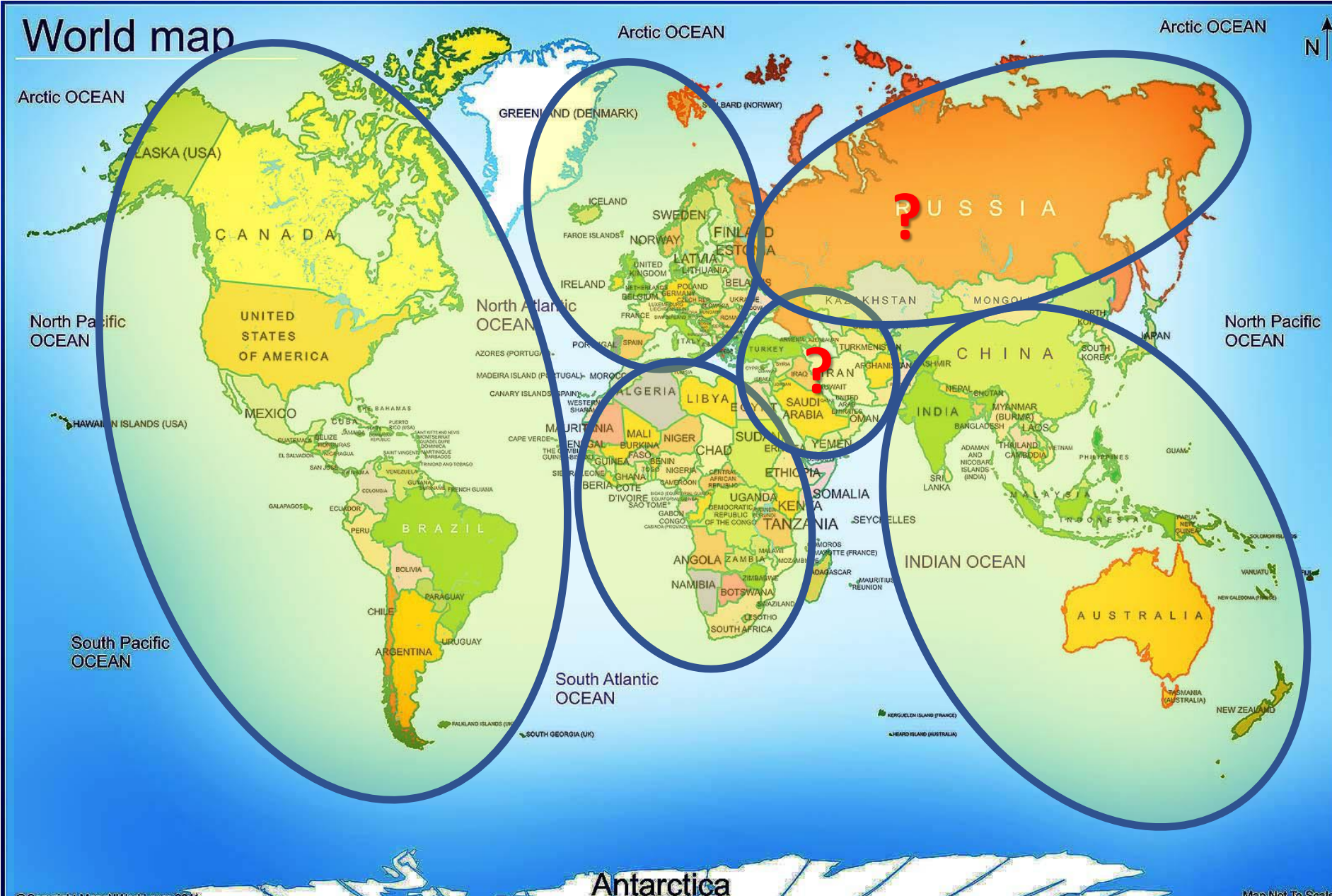
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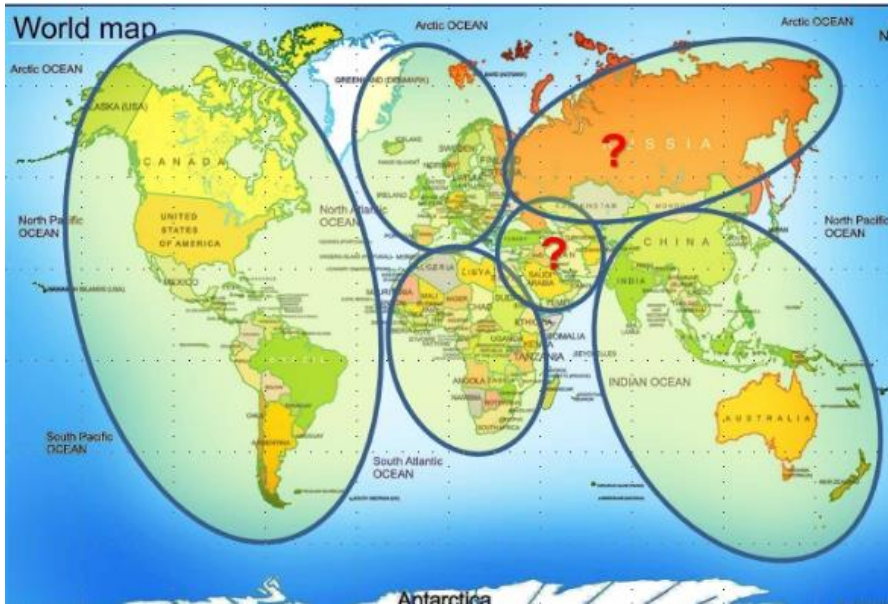
The Solution...

Generate far more sustainable economies organized into localized trade blocs.

The Future...Regionalized Trade Blocs



The Future....Regionalized Trade Blocs

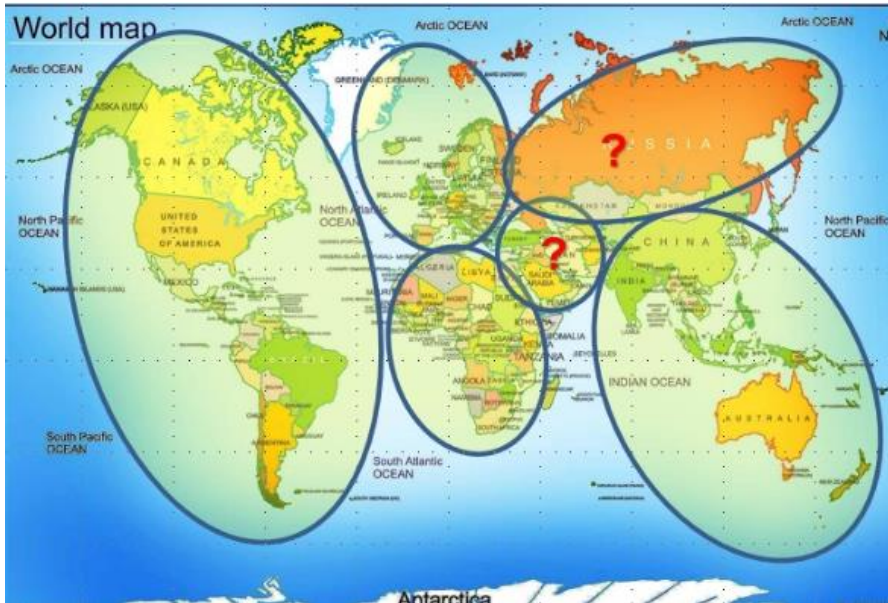


The Solution...

Generate far more sustainable national economies organized into localized trade blocs.

- Where practical, a suppression of imports to avoid unfair labor arbitrage**
- Encourage consumers to make/grow/mine much more of what they consume.**
- Force much more closed loop local trade driven by economic sustainability rather than unplanned global growth, wealth transfer and inequality..**
- Modify current globalized manufacturing supply chains for improved global sustainability.**

The Future....Regionalized Trade Blocs



The Solution...

Generate far more sustainable national economies organized into localized trade blocs.

Strict controls on trade, human migration and if necessary, population levels....

Balanced Trade between Trade Blocs will take place only if necessary

IP trade will exist.... but more controlled by franchise or license.

This does not imply global isolation ,,,,,,, But a LEAN vision of sustainability.

Trump's very valid point...

True Free Trade has always been a fallacy

CHINA... maintains strict controls on imports and all forms of foreign investment.

INDIAand many other emerging economies are doing the same....

India Curbs Power of Amazon and Walmart to Sell Products Online



Prime Minister Narendra Modi's administration has turned protectionist. Protesters demonstrated in New Delhi this year when the American retailer Walmart bought a majority stake in the Indian e-commerce retailer Flipkart. Saumya Khandelwal/Reuters

The Indian government dealt a surprise blow on Wednesday to the e-commerce ambitions of Amazon and Walmart, effectively barring the American companies from selling products supplied by affiliated companies on their Indian shopping sites and from offering their customers special discounts or exclusive products.

If strictly interpreted, the new policies could force significant changes in the India strategies of the retail giants. Amazon might have to stop competing with independent sellers and end its offerings of [proprietary products](#) like its Echo smart speakers in India, its top emerging market.

The New York Times

Source NY Times Digest 27 December 2018



Prediction on Global Trade

From a global “free for all” ...toward ...local trade blocs managed by nation states.

Global Multilateralism & Global Free Trade will be discredited.....

(Originally driven by peace treaties, and the rather purist economic thinking of comparative advantage)

Creates unwelcome labor arbitrage.

Significant National Wealth Transfer.

Adding to Uncontrolled Global Pollution

NEW Global Trade Rules

National Prosperity & Sustainability will always come first!....

Global Trade is NOT a god given right.... (Some multilateralists would disagree)

Every Nation must have the right to limit external trade!

Global (Trade) will only be undertaken if it is a benefit to a nation or local trade bloc.



Take Back Manufacturing
WWW.SME-TBM.ORG

Take Back Manufacturing... 2019 and beyond.

Significant changes underway....

The Future Drivers.....

- ✓ **Strong nationalistic political will moving away from multilateral globalism**
 - ✓ **Global Supply Chains proven to be Ecologically & Economically Unsustainable**
 - ✓ **LEAN & GREEN practices will rule business strategies**
- INDUSTRY 4.0 will create an equalization of labor arbitrage.**

The Outcome.....

Localized trade blocs....

With self-sustaining and Integrated economies of ...

Resources (as much as practical)

Manufacturing

Services



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INDUSTRY 4.0

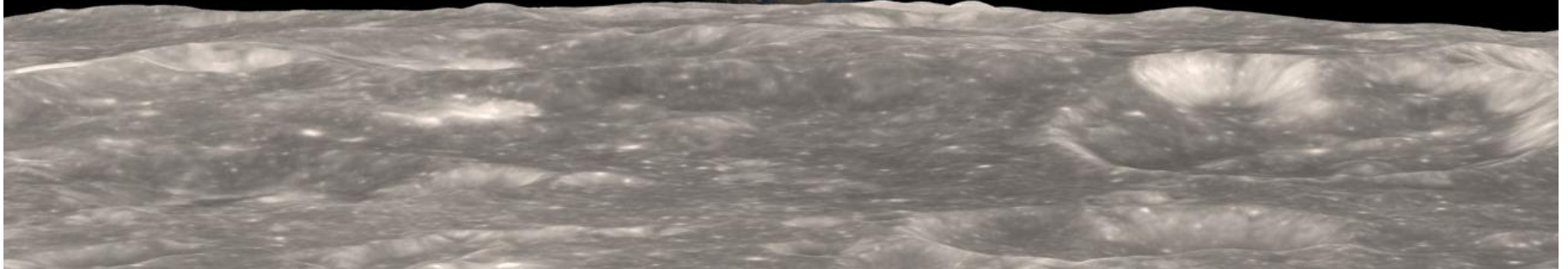
Age of Technological Disruption

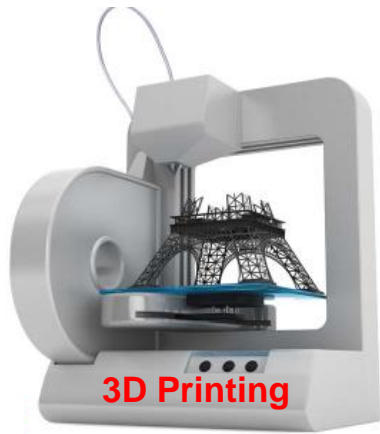
LEAN & GREEN ...& *AUTOMATED*

The New Management Buzz Word “Disruption”



“Disruptive Innovation”





3D Printing



ADVANCED
MANUFACTURING

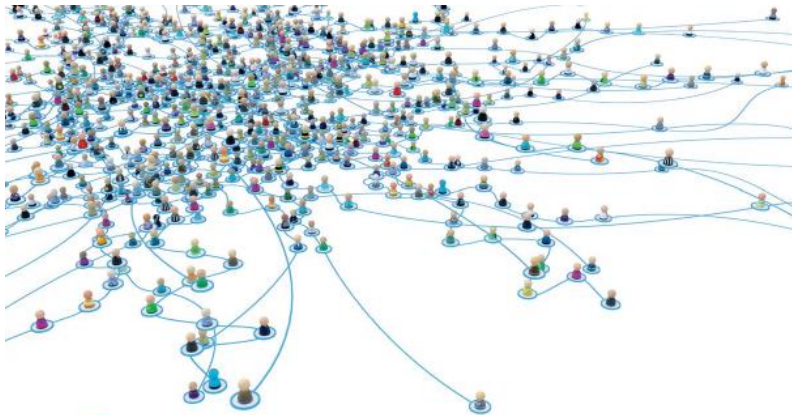


ADVANCED
ROBOTICS



ARTIFICIAL
INTELLIGENCE

The 5 Advanced Technologies Driving Disruptive Innovation



NETWORKS



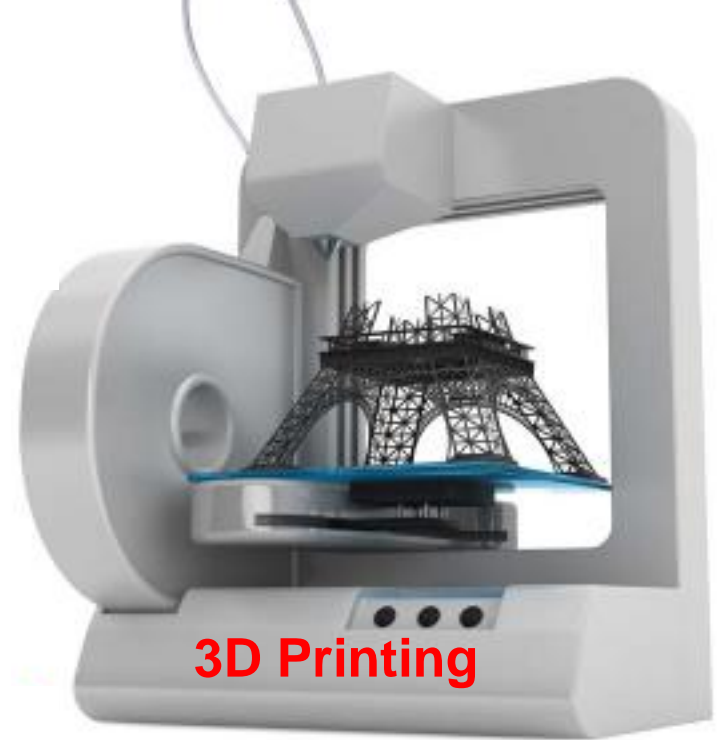
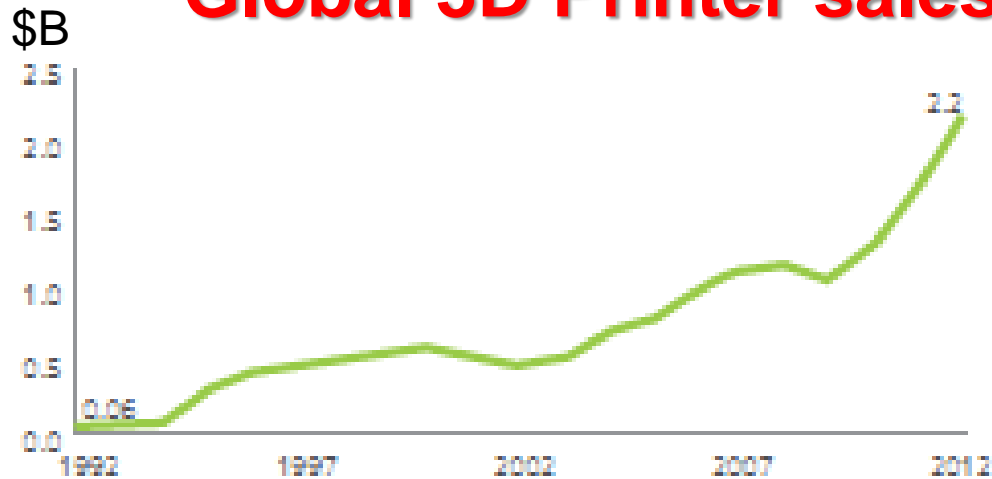
COLLABORATIVE
CONNECTED PLATFORMS

Moving us toward another (4th) Industrial Revolution



ADVANCED MANUFACTURING

Global 3D Printer sales



Plastics

Metal (Tooling solutions)

Composites

Food

Bones

Organs

?

Disruptive technologies such as Additive 3D printing in both Plastic and Metal can provide many industries with both Rapid prototyping and hi performance tooling strategies to re-life traditional industries and breed new industries.

WWW.Additivemet.com



Advanced Manufacturing Technology process machinery and “SMART” Sensor Technology is included in this loose term “Advanced Robotics”

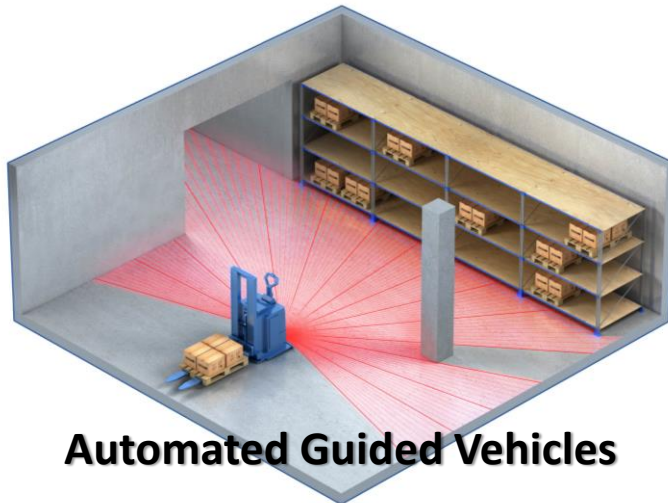
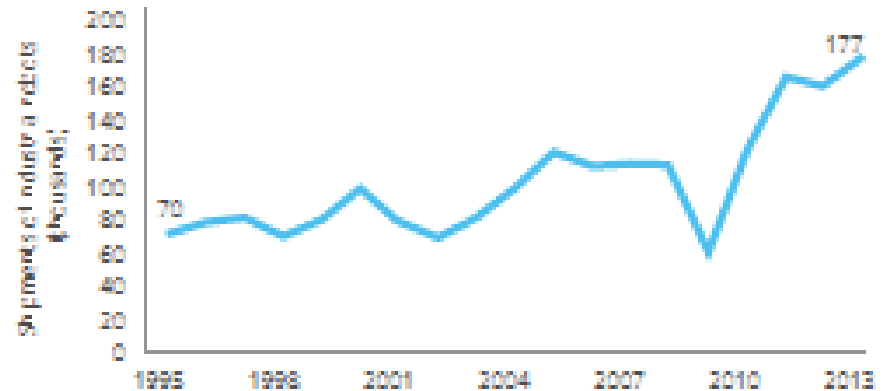


ADVANCED ROBOTICS

Robots started to change the industrialized world more than a half century ago. Since then, they've transformed how businesses manufacture goods large and small, and replaced the need for human labour in a vast range of applications, from fulfilling warehouse orders to maintaining nuclear reactors.¹⁵

“Some distraction due to Low Cost Country labor utilization”

Estimated worldwide annual shipments of industrial robots from 1995 to 2013¹⁶



Automated Guided Vehicles

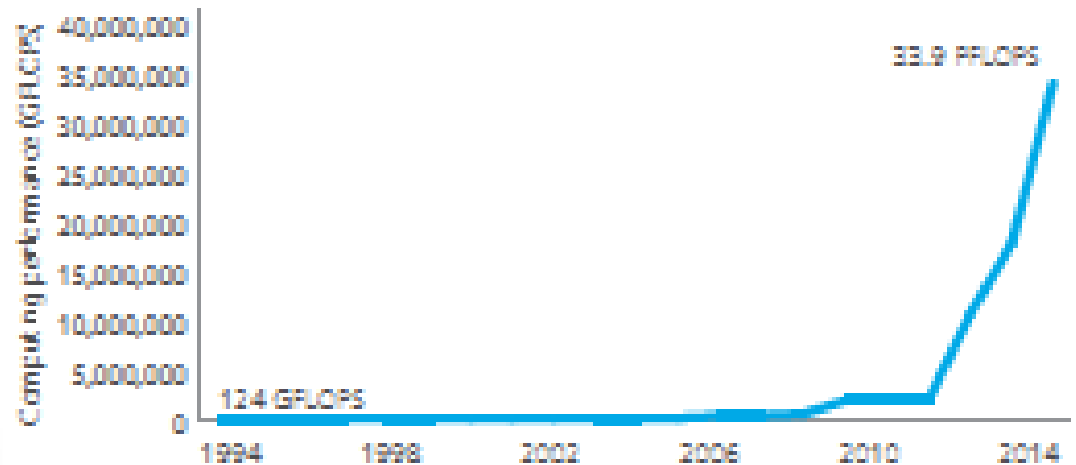


ARTIFICIAL INTELLIGENCE

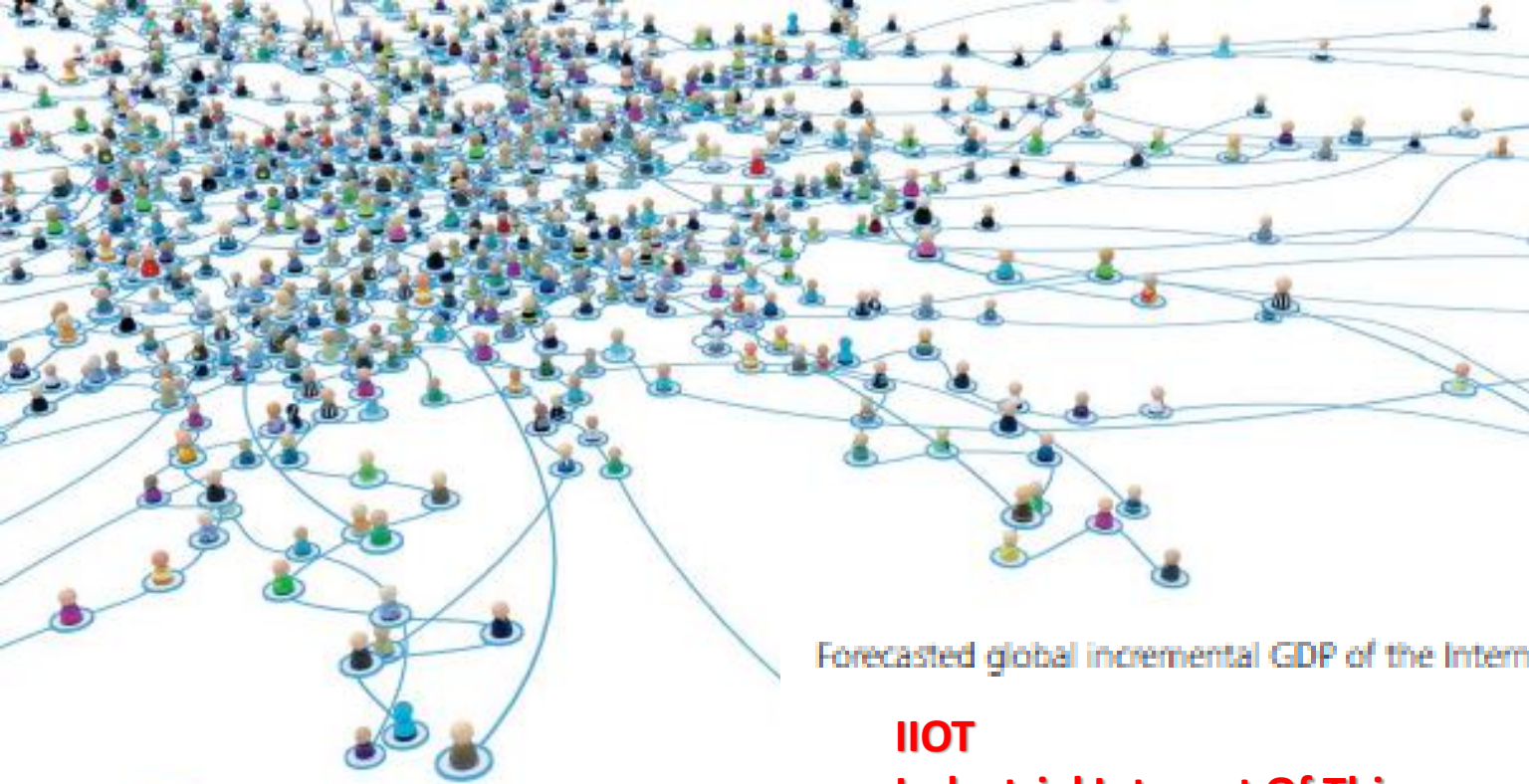
Big Data



Computing power of the most powerful supercomputer⁴¹

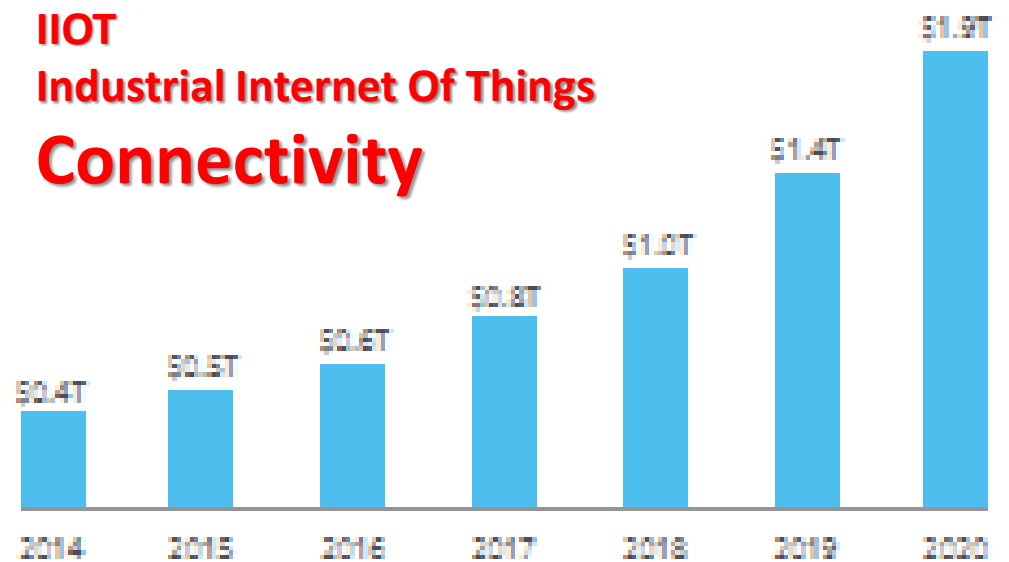


Thanks to 20 years of dramatic improvements in computer processing power (measured in floating-point operations per second, or FLOPS), machines process much more information far faster than ever before



Forecasted global incremental GDP of the Internet of Things⁴²

IIoT
Industrial Internet Of Things
Connectivity



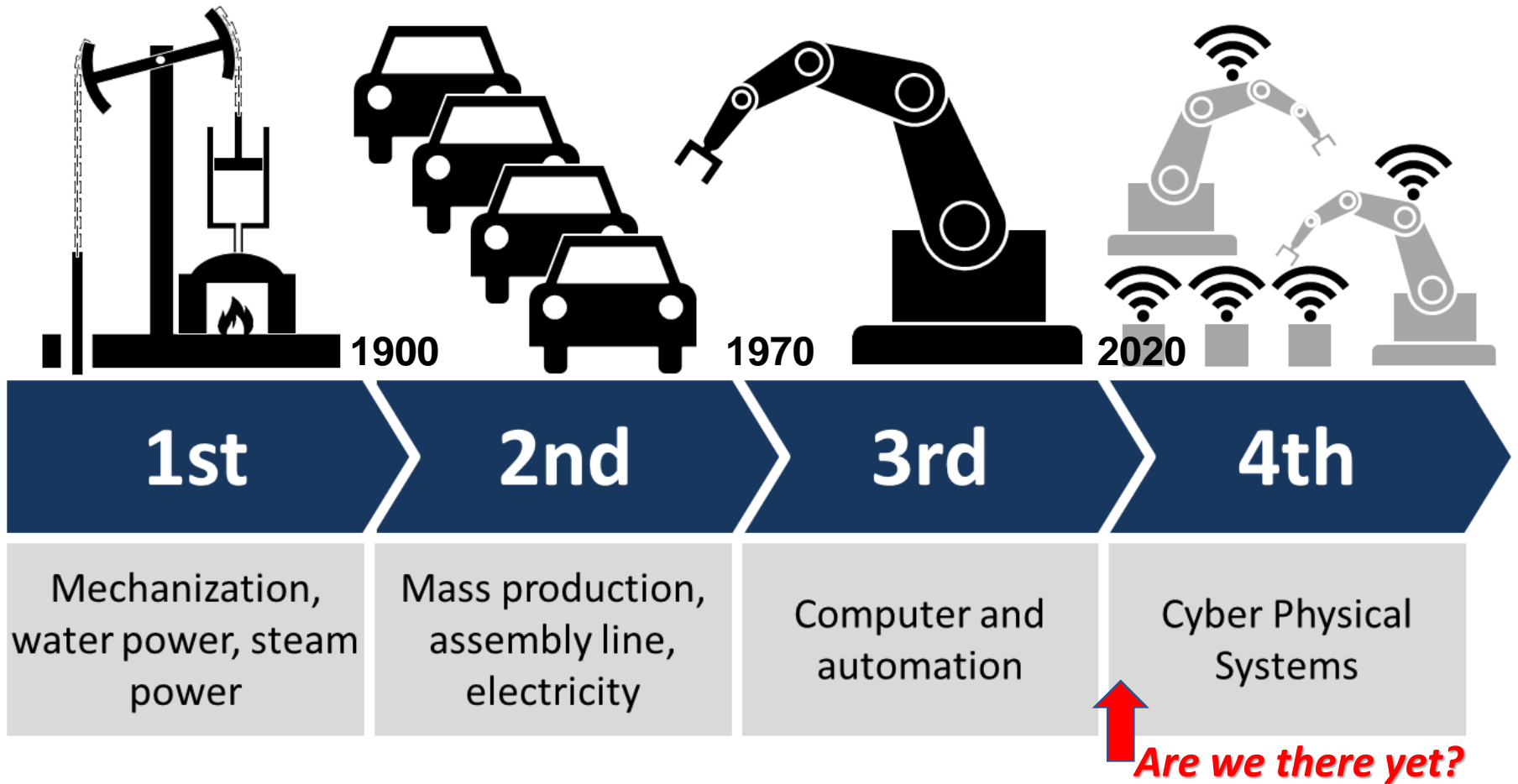


COLLABORATIVE CONNECTED PLATFORMS

The Internet has revolutionized how we communicate and interact with each other. Today, we take for granted our ability to connect with people and participate in activities thousands of kilometers away. Increased connectivity and Internet capacity have made crowdsourcing, crowdfunding and cloud computing possible, giving people and organizations alike access to skills, knowledge, funds and resources in ways that were never before possible.⁵⁹

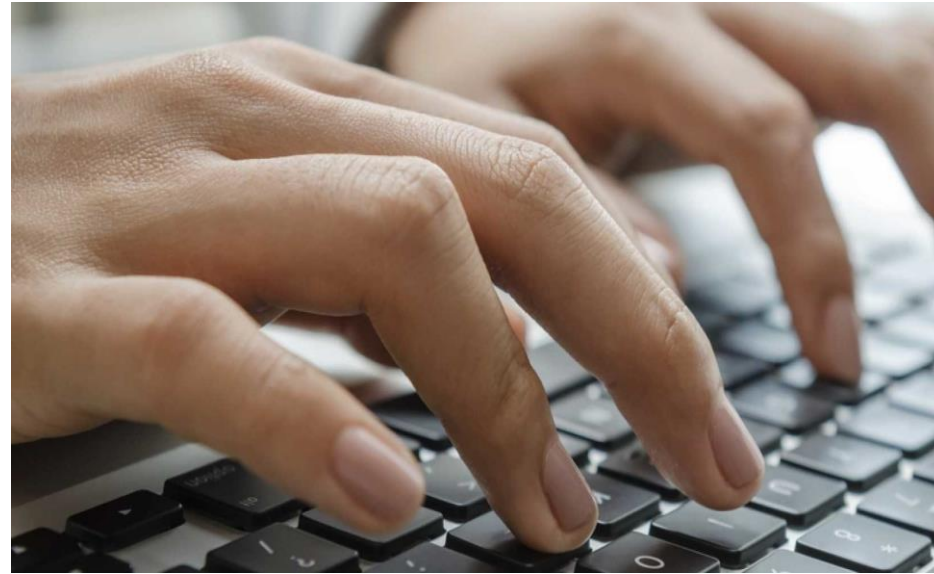
**Globalization
of Ideas....
NOT
materials!**

Industry 4.0...The Next Industrial Revolution/Opportunity



Pre Cyber Physical

Manual Effort (High cost) Errors (Inaccurate data) Not real-time (Outdated)



Cyber Physical Quiz

A



B



C



D

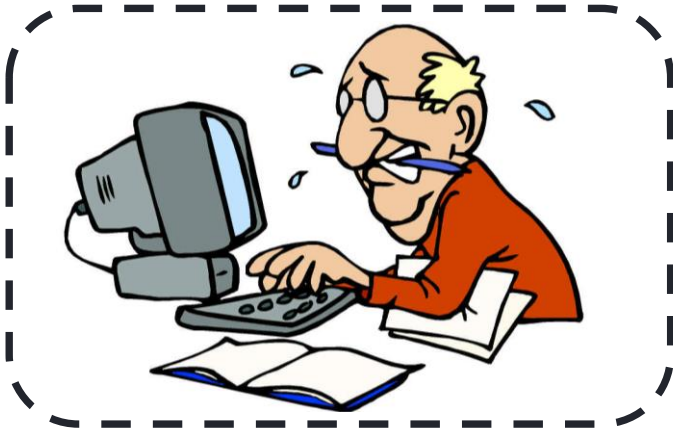


Cyber-Physical Systems...

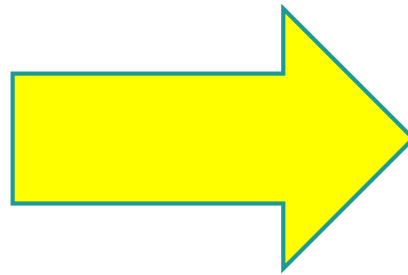
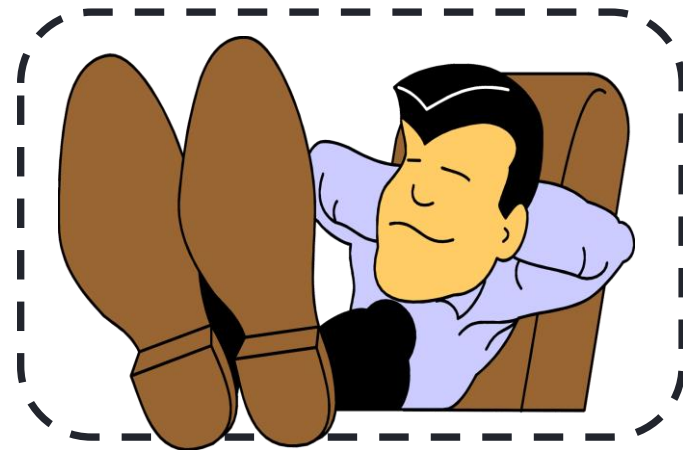
[Cyber-Physical: Connecting computers to processes without human intervention]

“Computers working for us NOT us for the computer”

BEFORE



AFTER



Processes



~~Human Intervention~~



Computers



Processes



Computers

SMART Cyber Physical Connectivity using WPSN®



Manufacturing



Logistics



Mining



Aerospace



Health care



Agriculture



Nuclear



Freight



Construction

Will be deployed across most business sectors.

SMART Cyber Physical Connectivity using WPSN®



Manufacturing



Logistics



Mining



Aerospace



Health care



Agriculture



Nuclear



Freight



Construction

Will be deployed across most business sectors.

Asset Management



Inventory Management



Transaction Elimination



Process Control



Global Positioning



Advanced Sensor Integration



Safety Systems



Will solve many operating issues and eliminate significant waste

SMART Cyber Physical Connectivity using WPSN®



Manufacturing



Logistics



Mining



Aerospace



Health care



Agriculture



Nuclear



Freight



Construction

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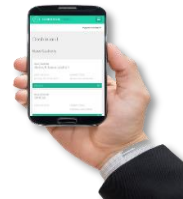
Transaction Free



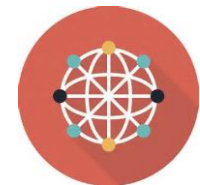
LEAN



Visual



Smart



Connected

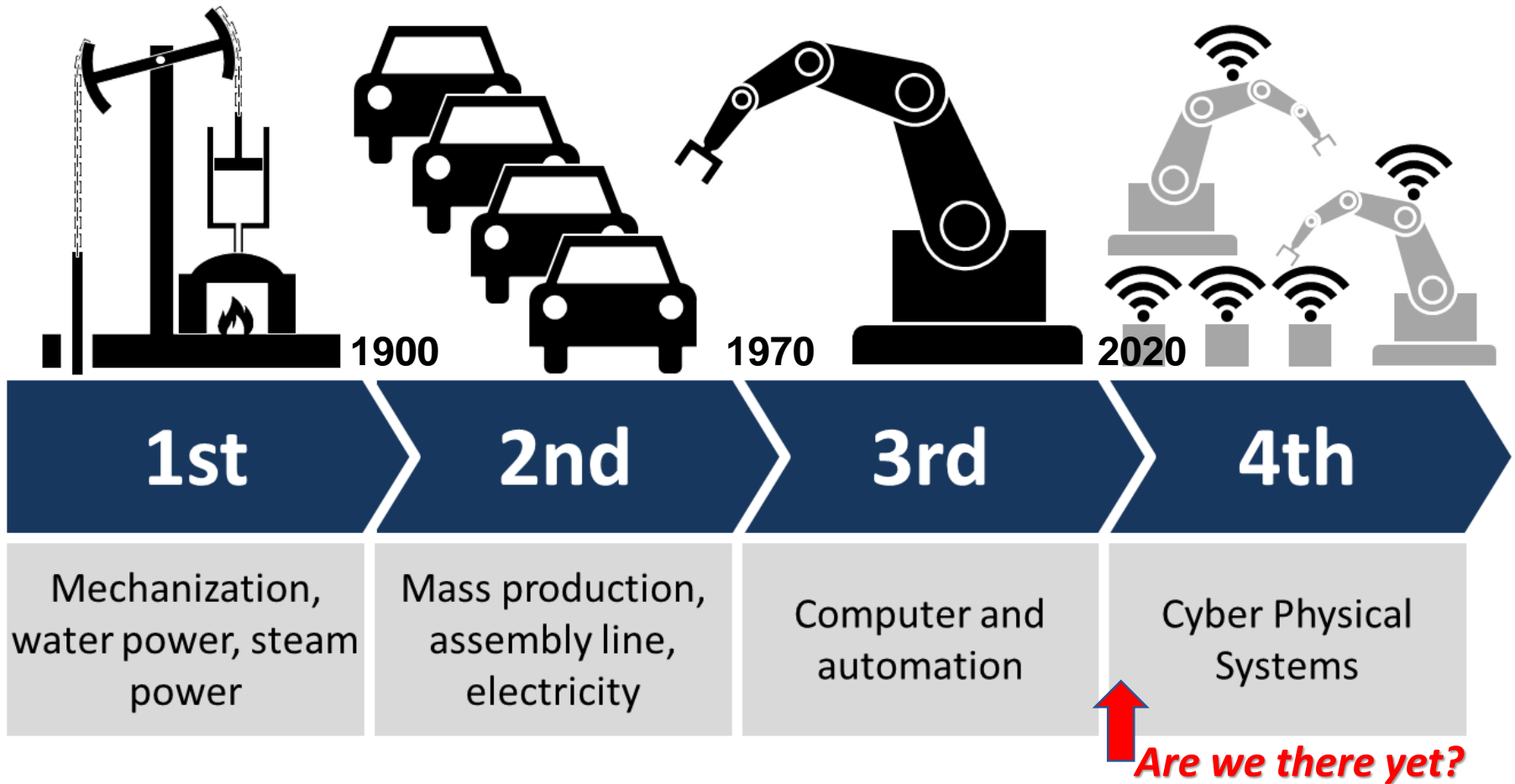
Confidential

Will Move us toward INDUSTRY 4.0 and the Business of the FUTURE

Now...we can connect processes to computers without human intervention?



Industry 4.0...The Next Industrial Revolution/Opportunity



***This Disruption Can level the Manufacturing playing field.....
..... between Low Cost Labor and Developed Countries***



Take Back Manufacturing
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Take Back Manufacturing... 2019 and beyond.

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Manufacturing

Services

QUESTIONS?



Take Back Manufacturing 2019

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**How Can Canada
Take Back Manufacturing?**



Take Back Manufacturing 2019

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*It's now certain that the USA will Reshore
significant parts of It's Manufacturing base...*

How Can Canada Take Back Manufacturing?



Take Back Manufacturing 2019

WWW.SME-TBM.ORG

It's now certain that the USA will Reshore significant parts of It's Manufacturing base...

How Can Canada Take Back Manufacturing?

Unless we in Canada do something significantly different, it is very doubtful this journey will be shared by Canada.

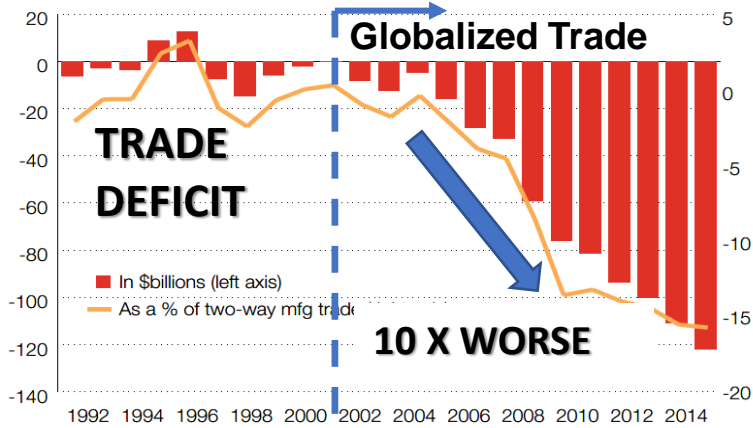


How are WE doing?

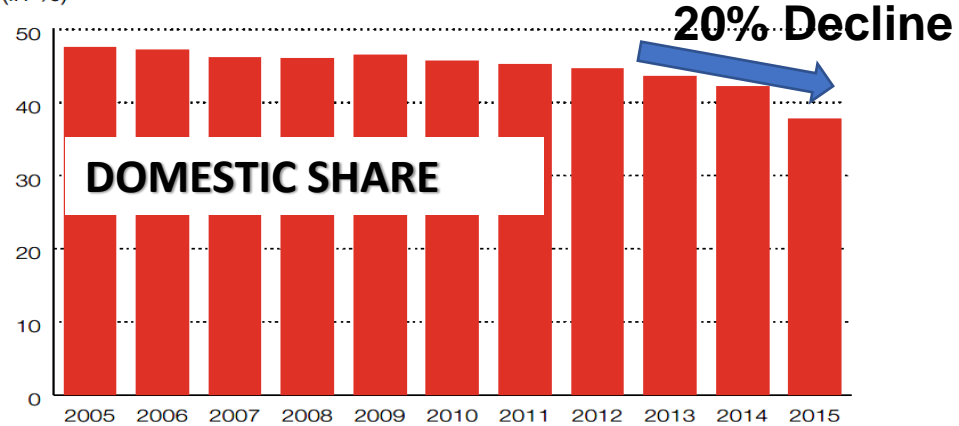
MANUFACTURING



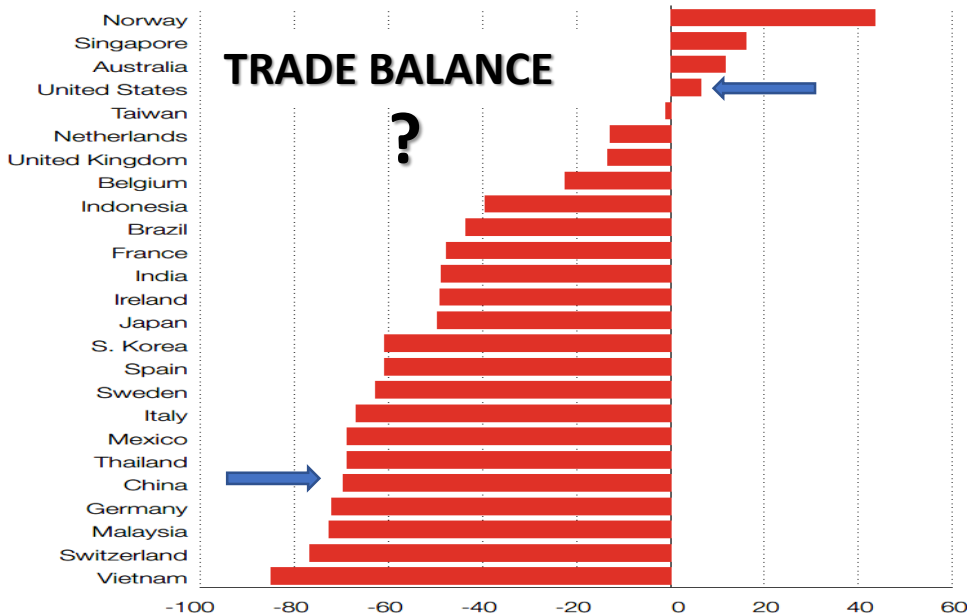
CANADA'S BALLOONING TRADE DEFICIT IN MANUFACTURING



CANADIAN MANUFACTURERS' SHARE OF THE DOMESTIC MARKET (in %)

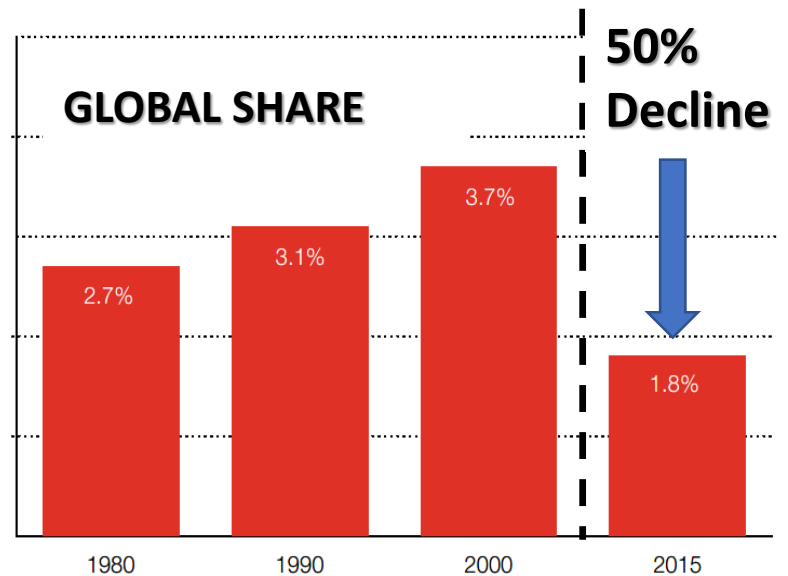


CANADA'S MANUFACTURING TRADE BALANCE BY COUNTRY (as a % of two-way trade in manufacturing)



CANADIAN MANUFACTURERS ARE LOSING GLOBAL MARKET SHARE

(Canada's share of global manufacturing exports, in %)



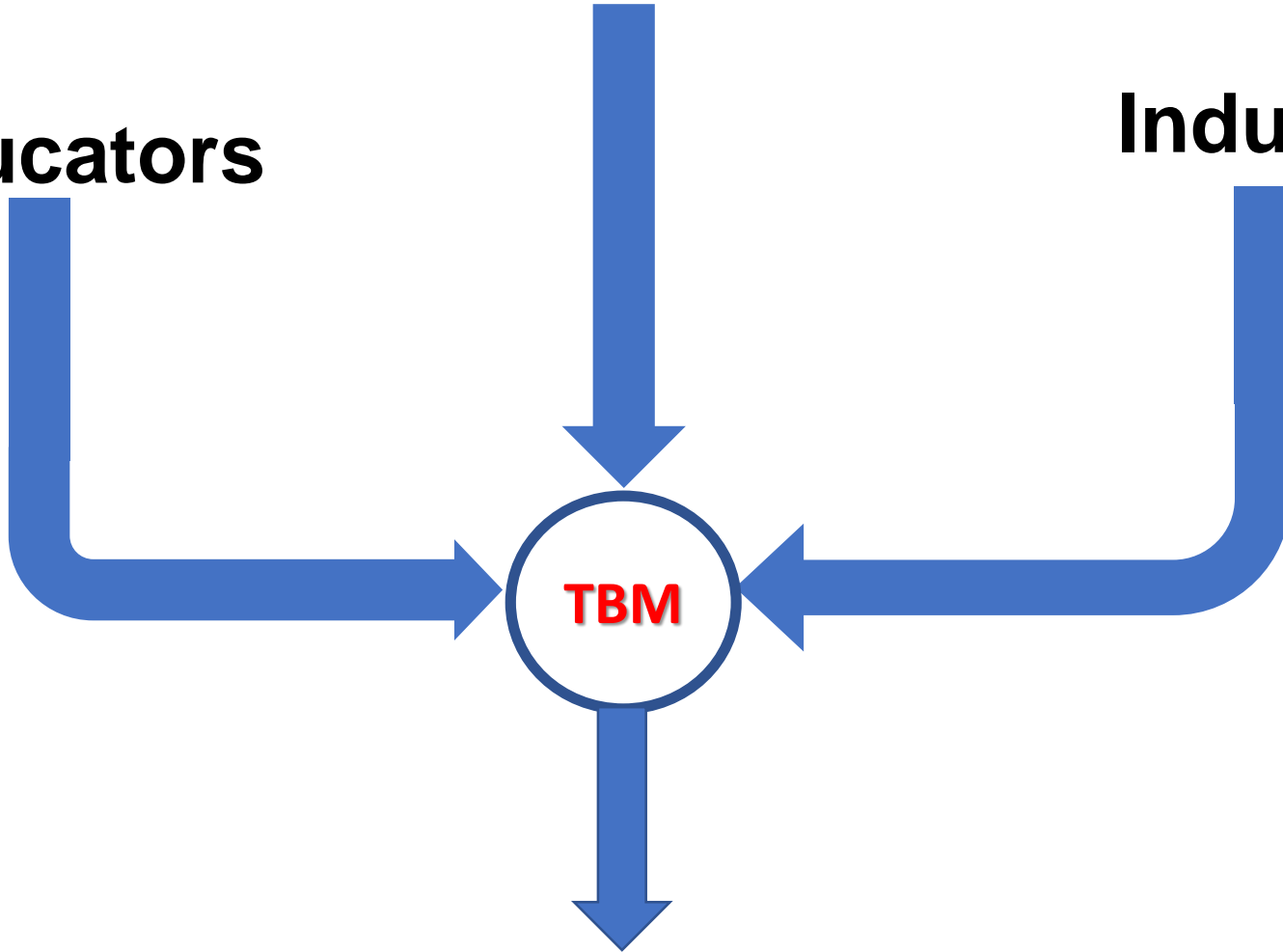


- The 3 Parallel Imperatives

Government

Educators

Industry



**Manufacturing
Prosperity for all.**

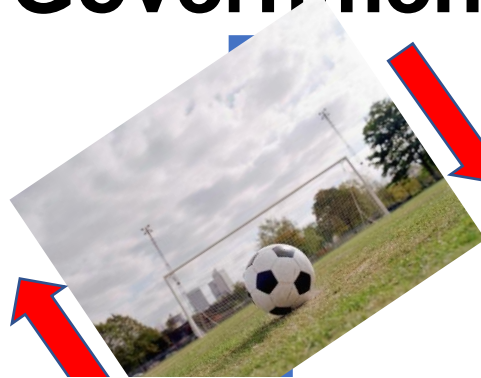


- The 3 Parallel Imperatives

Government

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Industry



IMPROVE INDUSTRIAL POLICY



**Manufacturing
Prosperity for all.**

Our Biggest Threat.....

Unresponsive National Governments



Avoid the fixation with multilateral solutions
Focus on the local economy!
Start looking at the national interest
Put our Citizens first!!!!



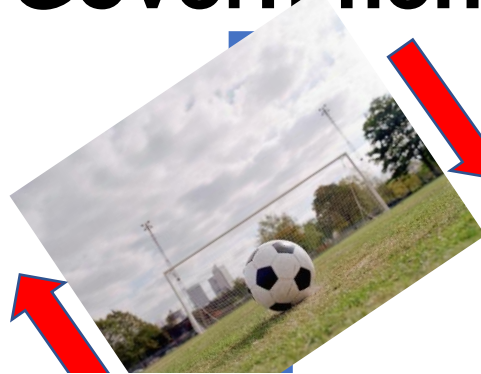


- The 3 Parallel Imperatives

Government

Educators

Industry



IMPROVE INDUSTRIAL POLICY!

Hold a Policy Blitz process!!

- Provide MORE support for Manufacturing
- Focused Industrialization POLICY and PLANS
- **Avoid duplicated policy and support organizations**

In Ontario alone we have 18 different policy groups feeding off the public trough Issuing independent reports without integrated review and closure. Put them all in one room!.. Come out with one plan!

**Manufacturing
Prosperity for all.**

Suggested New Industrial policy for Canada

“Make much more of what we consume, using much more of our own resources.”

Understand that the USA is our natural “trading bloc” partner ... avoid global multilateral deals

Focus on national resources and have more value added with effective government investments.

Continue to support/legislate/Reshore traditional industries via new technologies....

Any ecological legislation MUST support the economy.

No carbon tax.... Global Warming is NOT man made.... Focus on pollution reduction only.

Reduce energy costs and focus on sustainable strategies with nuclear power as the prime source.

Ensure government investments are industry and associated infra-structure centered

Mitigate foreign investments via a national industrial investment focus

Install a formal Integrated Industrial learning system to support the above.

Learn from lost decade (2005-15) ... Resource driven Dutch disease escalated the \$Loonie\$



Take Back Manufacturing

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- The 3 Parallel Imperatives

Government

Industry

Educators



IMPROVE Balance

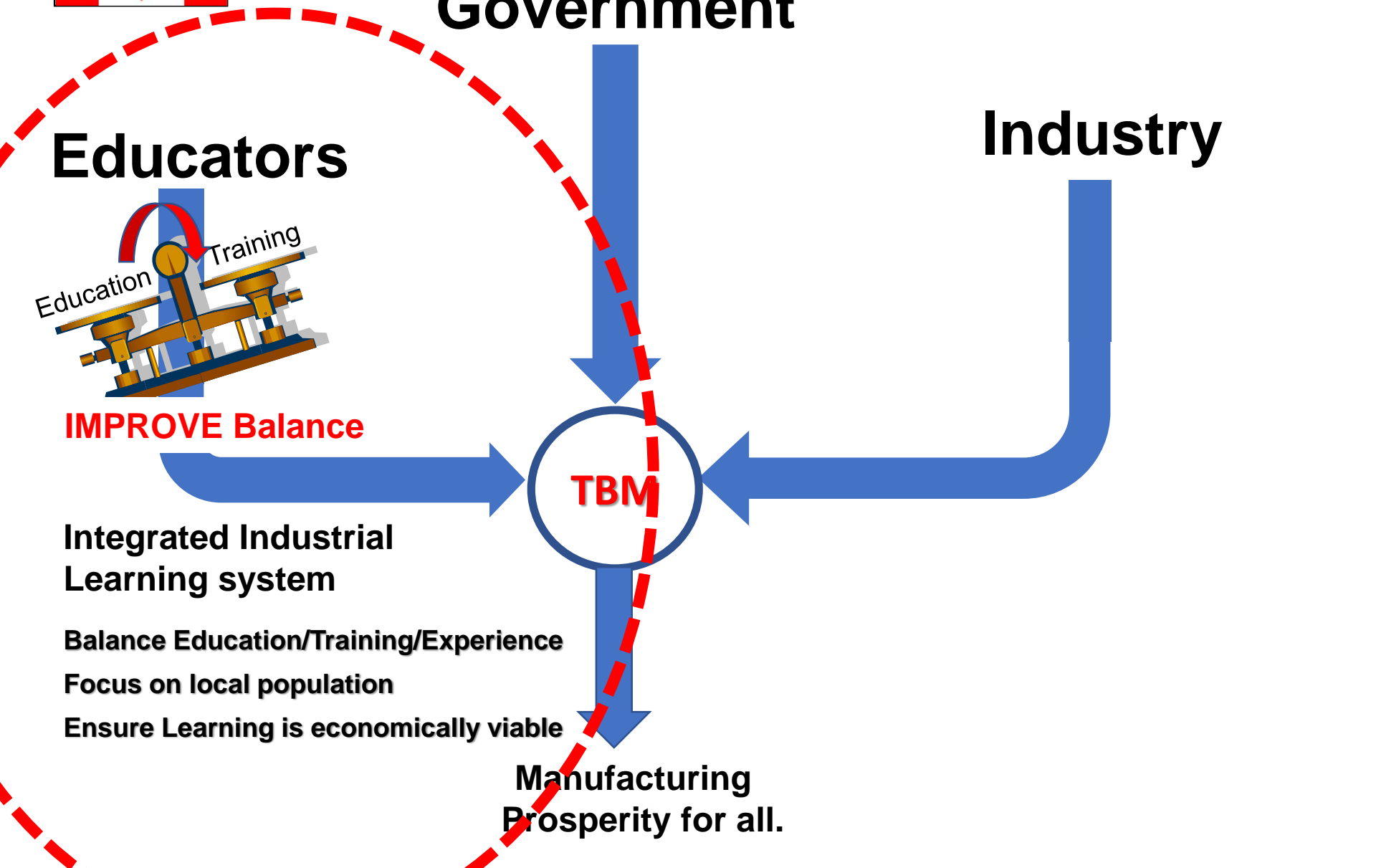
Integrated Industrial Learning system

Balance Education/Training/Experience

Focus on local population

Ensure Learning is economically viable

Manufacturing Prosperity for all.

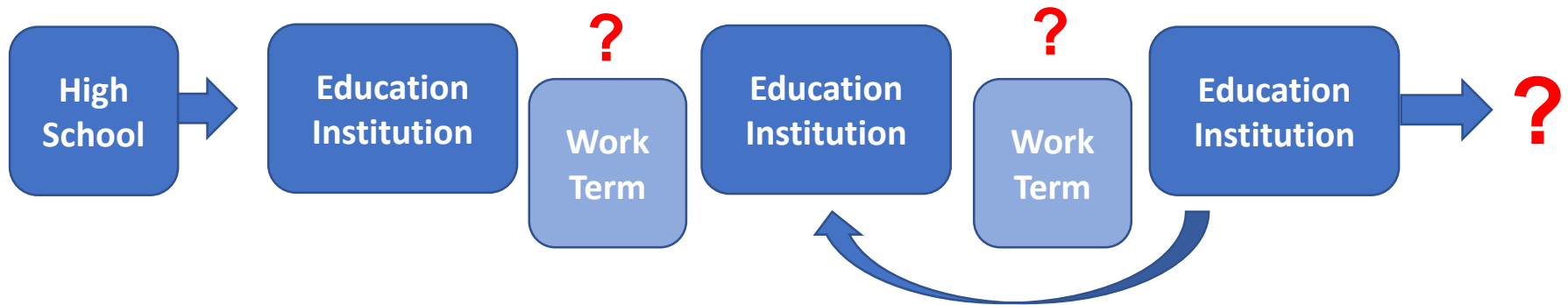


Integrated Industrial Learning System



Take Back Manufacturing (TBM)
Will demand the availability Of a future manufacturing workforce that Is well-educated, well-trained with industry experience.

Current Environment



Our Current International score.....

14 out of 18 in Literacy
19 out of 21 in Numeracy
14 out of 18 in Problem Solving

Only 20% are STEM students
(Science, Technology, Engineering and Math)

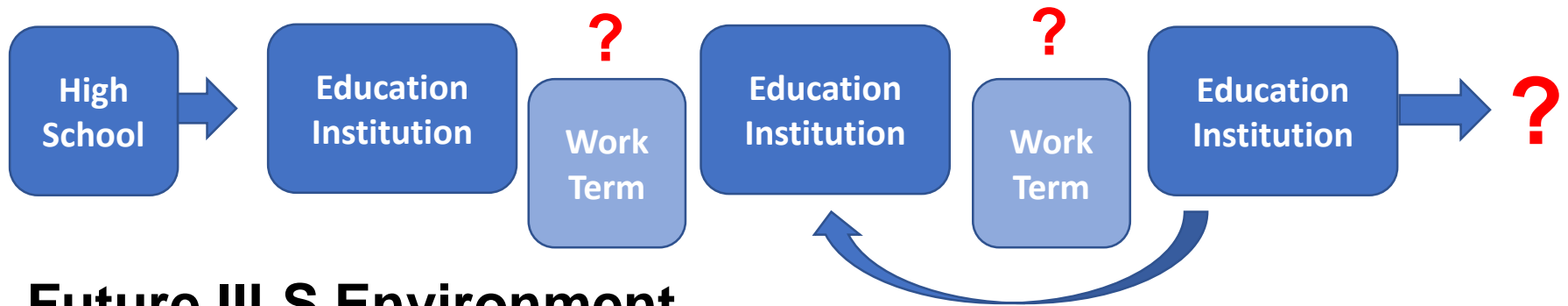
C- A failing Grade!!!!

Integrated Industrial Learning System

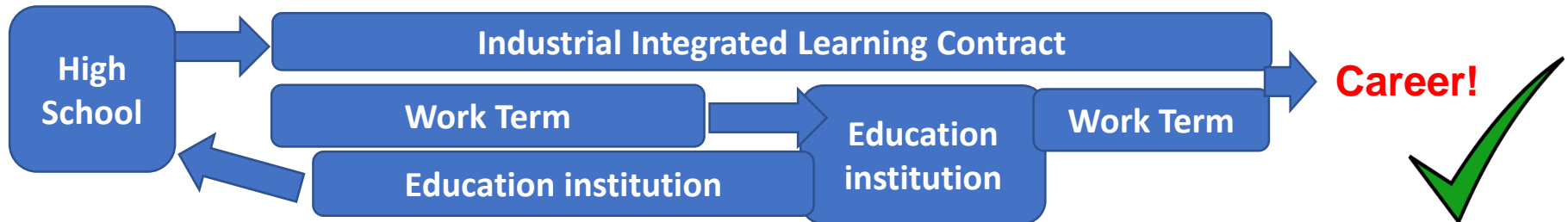


*Take Back Manufacturing (TBM)
Will demand the availability Of a future manufacturing
workforce that Is well-educated, well-trained with
industry experience.*

Current Environment



Future IILS Environment



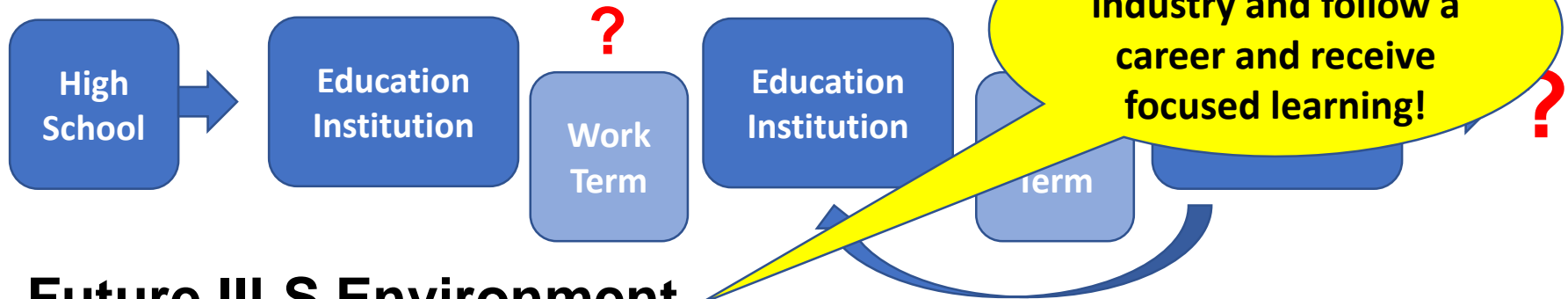
Integrated Industrial Learning System



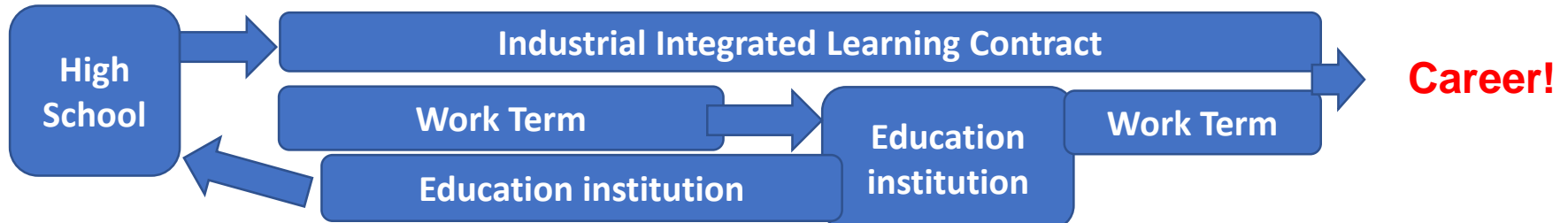
*Take Back Manufacturing (TBM)
Will demand the availability
workforce that is well-
industry experience.*

Provide education
and hope they get a job?

Current Environment



Future IILS Environment



Remove educational and association silos

Manufacturing has an IMAGE problem!!

Most manufacturing-based businesses are beyond dispirited....

Our Politicians/Government/Educators/Population have little understanding of business and manufacturing...**We must EDUCATE them!!**

Manufacturing is deemed:

Dark, Dirty, Dangerous, Deafening and Difficult....

..... And Smelly!

***And....
Highly unstable as a career!***



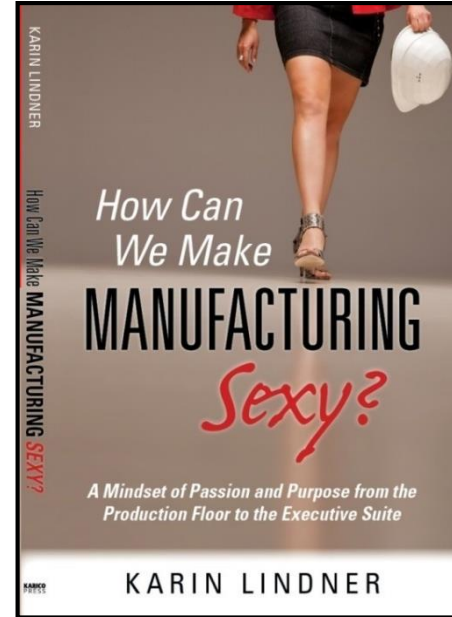


TBM


Change

The **Image** of Manufacturing

Let's Make
Manufacturing
SEXY!



EXCITE the NEXT GENERATION





- The 3 Parallel Imperatives

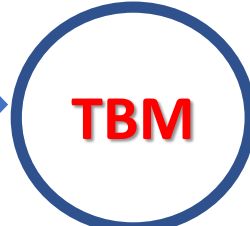
Government

Educators

Industry



IMPROVE & Mobilize



Supply Chain Strategy

+

Productivity Improvements

+

Local Community Engagement

**Manufacturing
Prosperity for all.**

Industry Game-plan Checklist

Supply Chain Strategy... *Reduce intrinsic waste*

Run a Balanced Sourcing model...Include all cost factors ...

Rethink Sourcing plans within NAFTA ... **RUN THE NUMBERS!!!** US/Canada + Mexico?

Develop shorter supply chains where possible (NAFTA + Global)

Productivity Improvements... *In all aspects of the business*

Industrial Learning system ... Develop/retain/stabilize/mobilize workforce.

Re-invent business wide LEAN Thinking/Continuous Improvement Culture

Need an Evolution Plan for INDUSTRY 4.0.... “Integration and connectivity.

New process technology/capital reinvestment... **DISRUPTIVE technologies**

Apply INDUSTRY 4.0 to traditional sectors to Innovate New products

Local Community Engagement *Work on the image*

Re-engineer the “Image” of manufacturing value for every-one!!

Make the rebuilding of small to large manufacturing facilities “easy and red tape free”.

Plan to minimize exposure to high energy, infrastructure logistics and transportation costs

Look at “manufacturing friendly” local taxes, Tariffs, Grants, savings and subsidies.

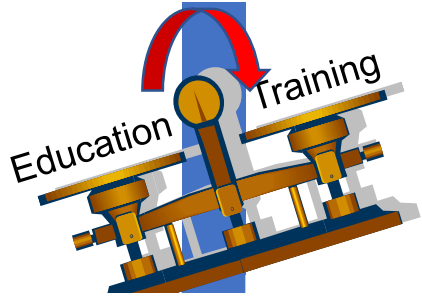
Ensure local legislations (Safety/Human Resources/Environmental) are “business friendly”.

Encourage Import avoidance as well as export enhancement in fiscal rewards!!!

TBM - The 3 Parallel Imperatives

Government

Educators



IMPROVE Balance

Integrated Industrial Learning system

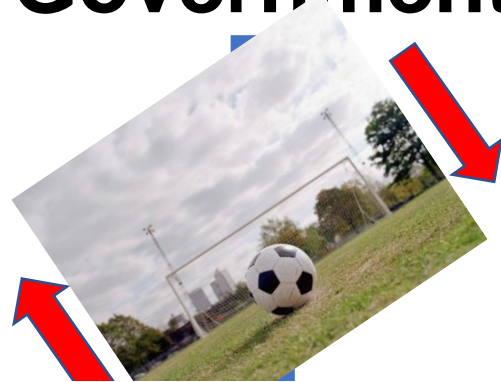
Balance Education / Training / Experience

Focus on local population

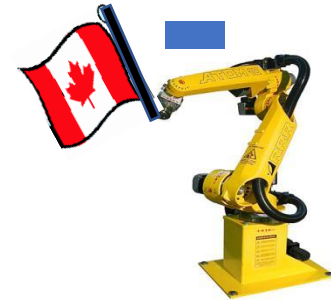
Ensure Learning is economically viable

IMPROVE INDUSTRIAL POLICY

Hold a Policy Blitz process!!



Industry



IMPROVE & Mobilize

Supply Chain Strategy

+

LEAN Productivity Improvements

+

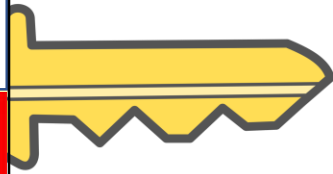
INDUSTRY 4.0 Execution

+

Local Community Engagement

TBM

North-American Manufacturing Prosperity for all.



KEY Things to Remember

- **Our Manufacturing sectors are losing ground on all fronts to the global free market.**
- **Manufacturing Globalization is reversible, and Globalization has been and gone before..**
- **Global trade has been a very inefficient generator of real wealth.**
- **North America has the ability to become self sustaining...**
- **Manufacturing provides the strongest economic multiplier effect for prosperity.....**
- **We only need 10% increase in price/cost of luxury goods to reshore/gain back prosperity.**
- **Sustainability not Economic growth will be the real driver of economic prosperity**
- **Our most treasured right must be our national citizenship, and the protection of personal worth, prosperity, and the stability of social order.**

QUESTIONS?

For more about our advocacy go to www.sme-tbm.org

Read our article.... **Take Back Manufacturing 2019.**

Nigel Southway

Advocate

Take Back Manufacturing.

*Nigel Southway is an independent business consultant and the Author of CYCLE TIME MANAGMENT
...Fast Track to Time Based Productivity Improvement A LEAN Thinking Textbook.*

*He consults and educates worldwide on Business Productivity Improvement LEAN Business Improvement
Initiatives, Joint Ventures, New Product Introduction Systems, Global Technology Transfer projects,
Advanced Manufacturing Engineering and Global Sustainability.*

*He is past chair of the Society of Manufacturing Engineers and the leading advocate for the Take Back
Manufacturing Forum and the North American Reshoring initiative in Canada.*

www.nigelsouthway.com

Reading list

- TBM Positional Papers
- Global Economic Trade Books...

EXTRA INFORMATION