# ITMF Annual Conference 2017

**Bali, Indonesia - Sept. 14 - 16, 2017**

"Technology, Trade, Climate Orientation in Disruptive Times"

| | |
|---|---|
| **Workshop – Managing Innovation Risk** | Bill Humphries, Australia |
| **Fibre Session – Cotton** | Xungai Wang, IFM, Australia<br>Arthur Spellson, ACSA, Australia<br>Jürg Reinhart, ICA, Switzerland |
| **Fiber Session – Man-made Fibers** | Steve Jenkins, PCI Fibers, Malaysia<br>Uday Gill, Indorama, Indonesia<br>Amit Gautam, Lenzing, Austria |
| **Formal Opening Session** | Jas Bedi, President, ITMF, Kenya<br>Ade Sudrajat, President, API, Indonesia |
| **1st General Session: Textile Industry in Indonesia**<br>Panel Discussion | Airlangga Hartarto, Minister of Industry<br>Oke Nurwan, Ministry of Trade<br>V. Ravi Shankar, Asia Pacific Fibers<br>Iwan S. Lukminto, Sritex<br>Anne P. Sutano, Pan Brothers |
| **2nd General Session: Textile Value Chain** | Ruizhe Sun, CNTAC, China<br>Nicole Bivens Collinson, Sandler Travis & Rosenberg, USA<br>Benjamin Duran-Servoingt, McKinsey, Japan |
| **3rd General Session: ITMF's Audit Initiative** | Karim Shafei, Gherzi, USA |
| **The Global Textile Machinery Market Situation** | Christian Schindler, Director General, ITMF |
| **4th General Session: Retail/E-Commerce** | Edwin Keh, HKRITA, Hong Kong<br>Edward Gribbin, Alvanon, USA<br>Jorge Martin, Euromonitor, UK<br>Hartmut Molzahn, 88Spares, Indonesia |
| **Keynote Address** | Prof. Jaap de Hoop Scheffer, former SG NATO, Netherlands |
| **5th General Session: Technical Textiles & Nonwovens** | Marc van Parys, University of Gent, Belgium<br>Pascal Denizart, CETI, France<br>Laurent Aucouturier, Gherzi, Switzerland |

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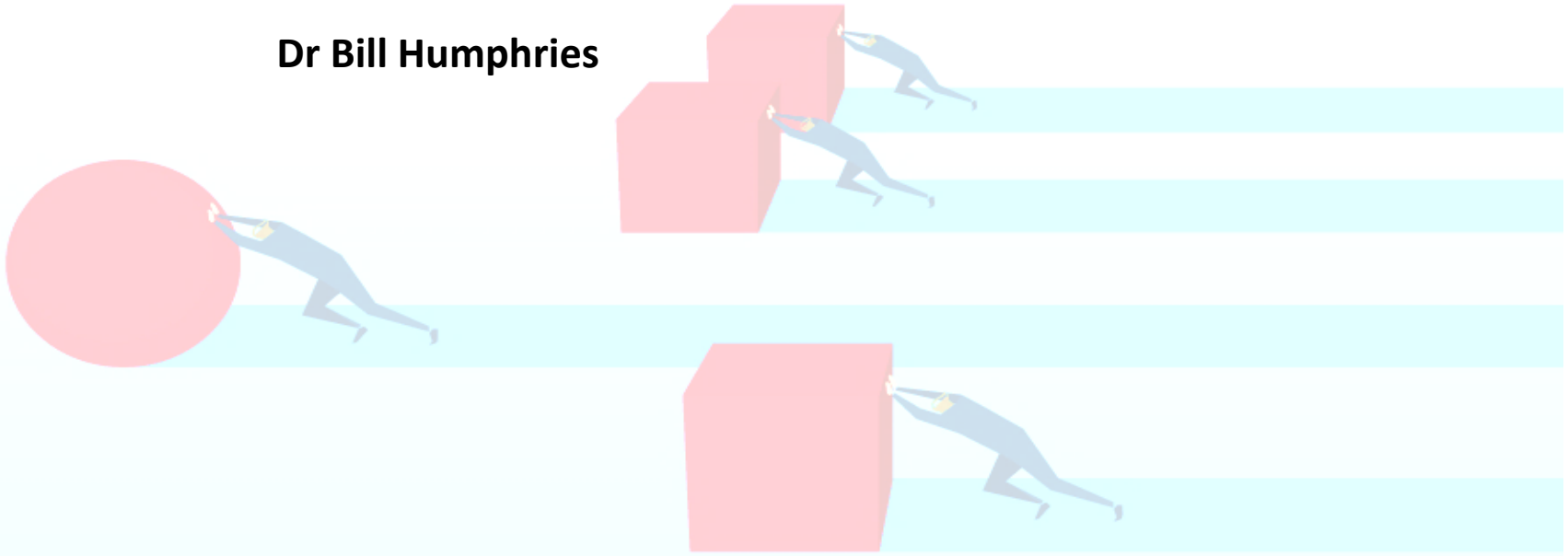
# Managing Innovation Risk

## Managing commercial and technical risks better than your competitors

**Dr Bill Humphries**



www.humphries-scientific.com

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# Definition

## Innovation

Joseph Schumpeter (Theory of Economic Development 1911)

“the development of new ideas (which he called “inventions”) into products and processes, which are then spread across the market in a process he called diffusion”

## Importance

The OECD estimates that as much as 50 per cent of economic growth in its member countries can be accounted for by innovation activity, and that this contribution will grow. Innovation has been demonstrated to drive productivity growth and the competitive advantage of businesses.

# Definition – Risk and Uncertainty

- **Risk:** A state of uncertainty where some of the possibilities involve a loss, catastrophe, or other undesirable outcome.
- **Measurement of risk:** A set of possibilities each with quantified probabilities and quantified losses. Example: "There is a 40% chance the project to develop a lighter weight ballistic protection fabric will be unsuccessful with a loss of $2 million in research costs."

# How Risky is Investing in Technology Innovation?

According to an Accenture report (2013) “despite increased business investment in innovation, only 18 percent of executives believe their company’s innovation efforts deliver a competitive advantage.”

According to the Start-up Genome Project 90% of Tech Start-ups fail in the first 3 years.

**Because of the risks involved, If investment in new technology innovation is being considered a careful assessment and management of risk should be undertaken.**

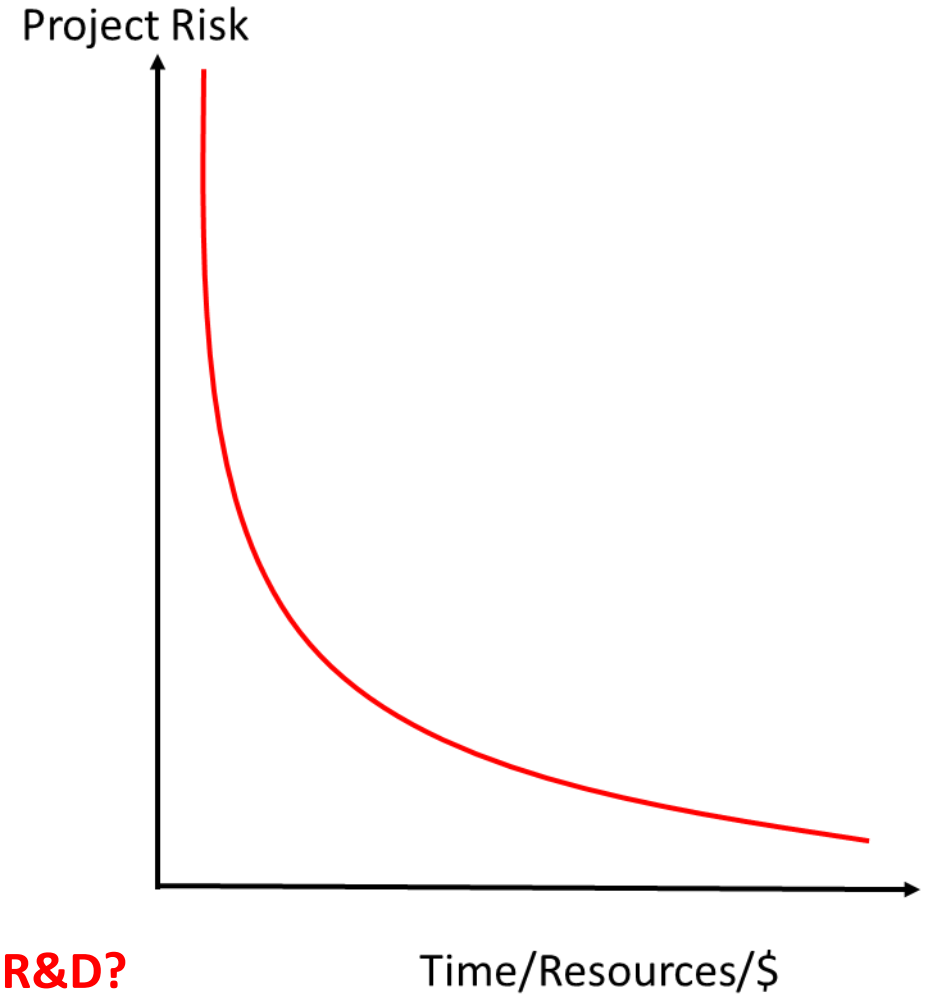
# Innovation Risk

Risk of losing R&D investment if:

Business/Commercial Risk

- There is no market for the outcomes of the research
- Another company beats you to the market with the innovation

- Technical Risk
  - Cannot overcome technical hurdles to achieve target performance, price and scale




**In a competitive market when should a firm invest in R&D?**

# Simple Case Study of R&D in a Competitive Market*

- 2 companies A and B in a market, each one has to decide on whether to invest in R&D to develop a new product
- The R&D has a fixed cost of $10m
- The project has a probability of p of resulting in a marketable product
- Profits from the innovation are
  - $24m if alone in the market
  - $10m if both companies bring the product to market

"Competitive Strategy" Taught by: Tobias Kretschmer, Professor
Institute for Strategy, Technology and Organization
Ludwig-Maximilians-Universität München (LMU) available Coursera

# Payoff for Company A

Company A engages in R&D, Company B does not

$$P*24 + (1-p)*0 - 10$$

$$= p*24 - 10$$

Both Companies engage in R&D

$$p*(1-p)*24 + p*p*10 + (1-p)*0 - 10$$

$$= p*(1-p)*24 + p^2*10$$

# Payoff Matrices for Different Risk Values

| Firm A \ Firm B | No R&D | R&D |
|---|---|---|
| No R&D | 0/0 | 0/24p-10 |
| R&D | 24p-10/0 | $24p(1-p) + 10p^2$ – $10/24(1-p) + 10p^2$ - 10 |

**P=0.25**

| Firm A \ Firm B | No R&D | R&D |
|---|---|---|
| No R&D | 0/0 | 0/-4 |
| R&D | -4/0 | -4.875/-4.875 |

**P=0.5**

| Firm A \ Firm B | No R&D | R&D |
|---|---|---|
| No R&D | 0/0 | 0/2 |
| R&D | 2/0 | -1.5/-1.5 |

**P=0.75**

| Firm A \ Firm B | No R&D | R&D |
|---|---|---|
| No R&D | 0/0 | 0/8 |
| R&D | 8/0 | 0.125/0.125 |

# Comparison of Success Rates

- High risk projects - No R&D undertaken by firms
- Medium risk projects – R&D by one firm and pre-emption of the market can lead to competitive advantage
- Low risk projects - R&D by all firms

# Reduced Risk Innovation Methodology

## Gaining Competitive Advantage

- Target some medium risk projects and try to pre-empt market
- Manage commercial and technical risks better than your competitors

# Three Step Risk Management Process

1. Opportunity Analysis
2. Risk Analysis
3. Risk Management

# Step 1: Opportunity Analysis – Define Your Business Model (Strategyzer.com)

How can you describe your Business Model?

# Define Business Model (Strategyzer.com)

| Key Partners | Key Activities | Value Propositions | Customer Relationships | Customer Segments |
|---|---|---|---|---|
| | Key Resources | | Channels | |
| Cost Structure | | Revenue Streams | | |

# Business Model Example – W L Gore*

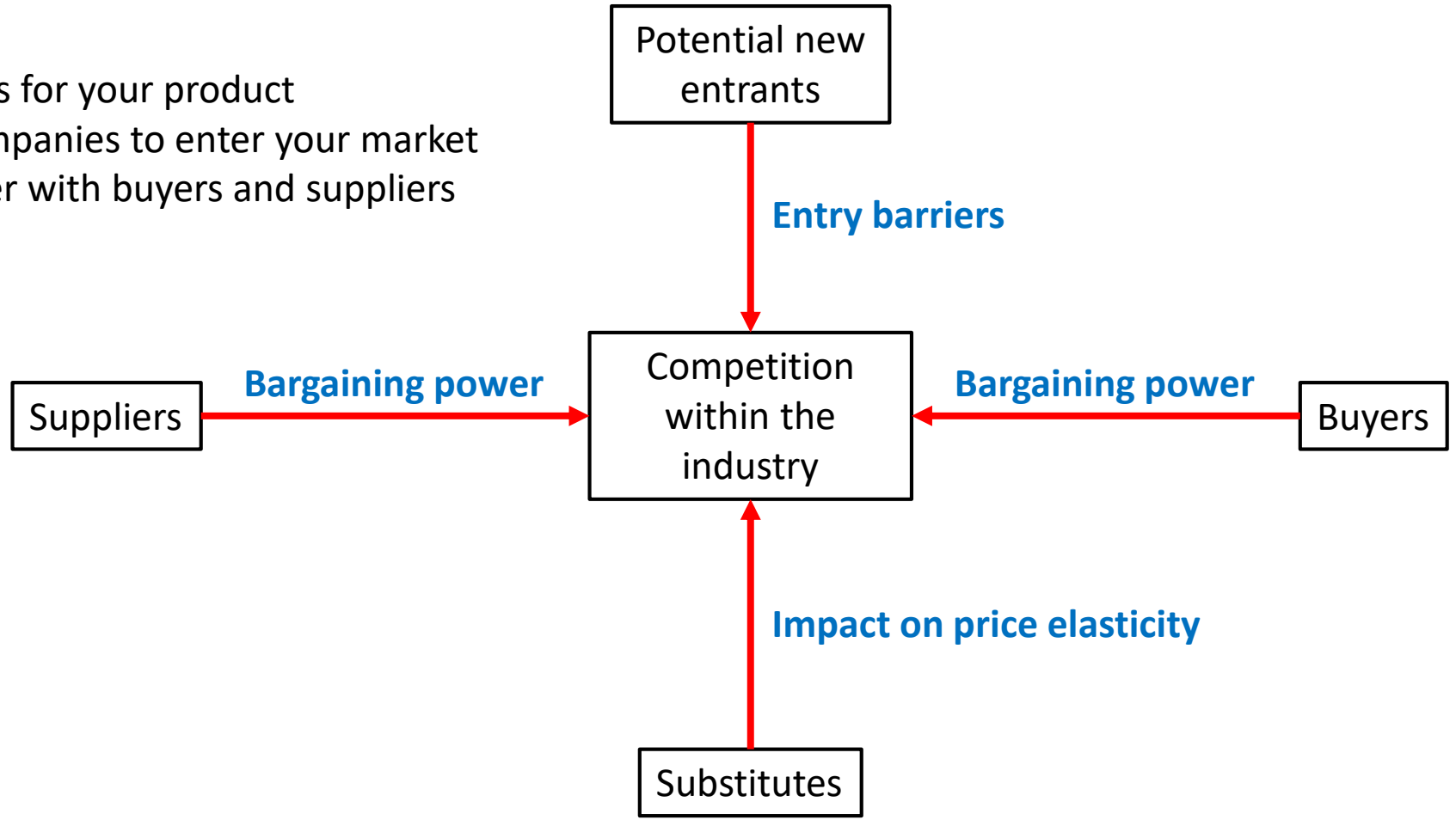
| Key Partners | Key Activities | Value Propositions | Customer Relationships | Customer Segments |
|---|---|---|---|---|
| Apparel Manufacturers<br>Military<br><br>**Filter manufacturers**<br>**Medical profession** | Design and mfg<br>R&D<br>B2C marketing (ingredient branding)<br><br>**Key Resources**<br>ePTFE<br>IP<br>Lattice structure (Associates) | Waterproof<br>Breathable<br>Durable<br><br>**Small Pores**<br>**Non-stick surface**<br>**High temperature resistance**<br>**Bio-inert** | Long term (lifetime guarantee)<br>Trust – highest performing material<br><br>**Channels**<br>Direct sales reps<br>Retailers | Apparel Manufacturer<br>Outdoor athlete<br><br>**Filtration**<br>**Medical** |
| **Cost Structure**<br>Cost of manufacturing<br>R&D/Engineering<br>Marketing B2C<br><br>**Reduce** | | **Revenue Streams**<br>Sale of laminated fabric<br>Seam sealing materials and machinery | | |

*Business Model Canvas: Gore Fabrics by Matt Terrell Youtube

# Market Attractiveness – Porter's 5 Forces

Innovation opportunity should

- Decrease chance of substitutes for your product
- Increase barriers for other companies to enter your market
- Improve your bargaining power with buyers and suppliers

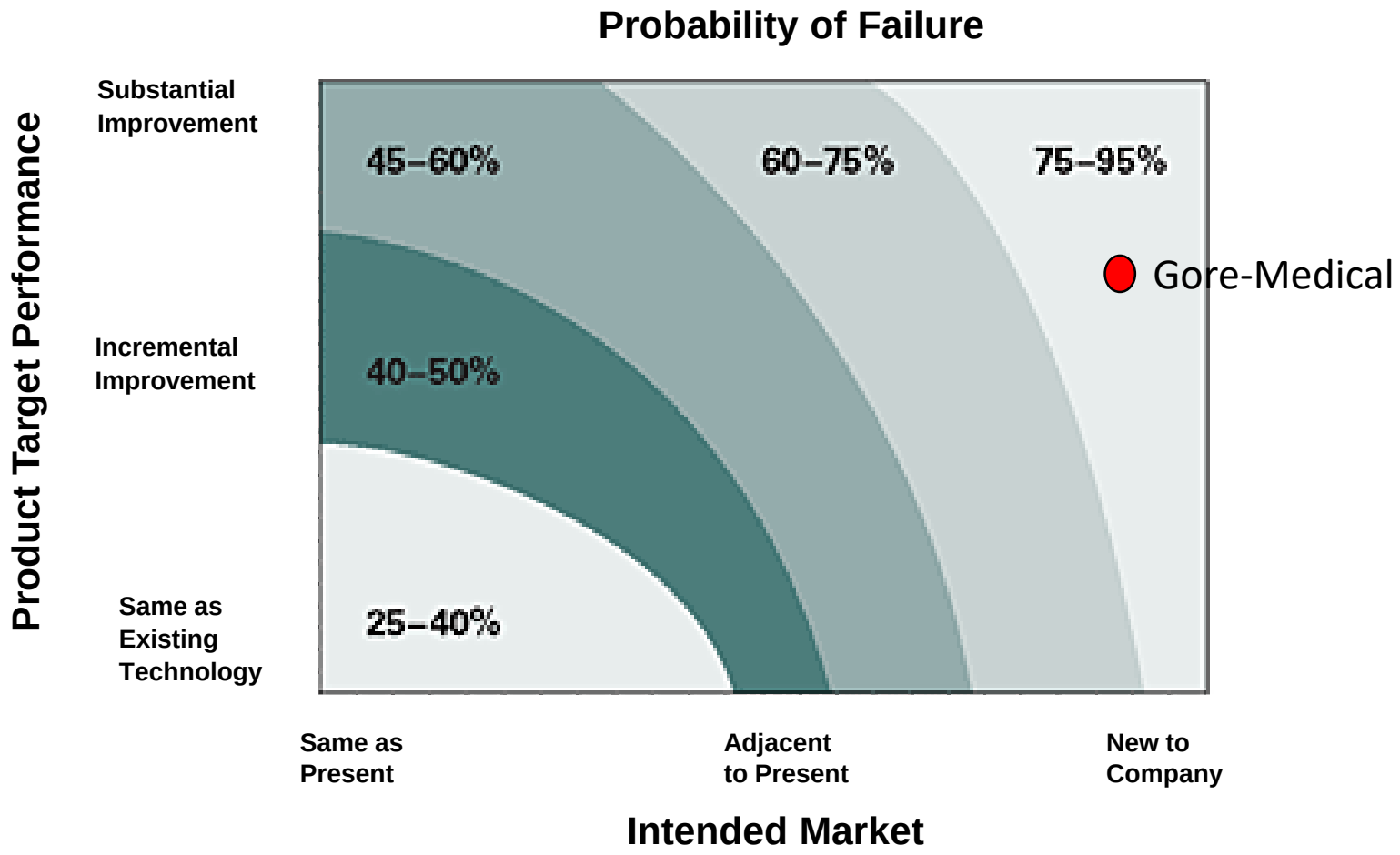


# Step 2: Risk Analysis

# Rank Projects Based on Risk and Return

Plot identified projects on a Risk vs Return chart to give an initial ranking

# Risk Calculator



# Return

**Net present value**

$$NPV = - C_0 + C_1/(1 + r) + C_2/(1 + r)^2 + C_3/(1+r)^3 \ldots\ldots C_t/(1+r)^t$$

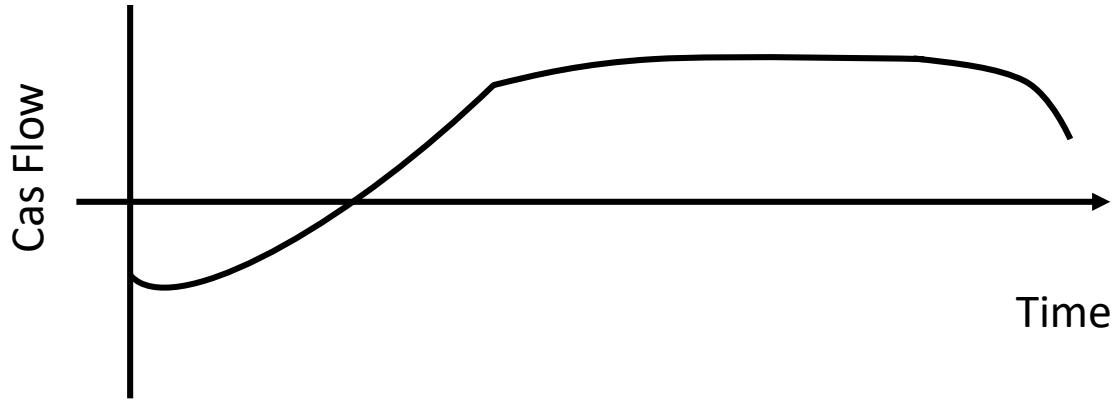
Where $C_0$ = initial investment

C = net cash flow

r = discount rate

t = time period

To calculate net cash flow need estimate of market size, margin etc. These will be estimates and it is recommended to carry out sensitivity analysis




| Sensitivity Analysis | | | |
|---|---|---|---|
| Low margin | | | |
| Market Penetration | Low | Medium | High |
| NPV | ? | ? | ? |
| Medium Margin | | | |
| Market Penetration | Low | Medium | High |
| NPV | ? | ? | ? |
| High Margin | | | |
| Market Penetration | Low | Medium | High |
| NPV | ? | ? | ? |

# VC Approach

**Required future value**

- Are potential earnings at exit high enough to provide the return to the VC to justify the initial investment? This can be calculated from:

**Require future value of investment = $(1 + IRR)^t$ x Investment**

Where IRR is required internal rate of return (often between 30 and 50%)

t = time in years (say) 5 years

VC requires value of shares when sold (total terminal value)

**Total terminal value = PER x Terminal net income ≥ Required future value of investment**

Where PER = Price of shares/net income pa - is a typical price earnings ratio in a representative industry (benchmark is 15)

# Example

- Initial investment $2m
- Required IRR = 15%
- Net income after 5 years $0.5mpa
- Representative PER for industry 15

- Required terminal value = $1.15^5$ x $2m = 2.01 x $2m = $4.02m
- Potential price for shares = 15 x 0.5m = $7.5m
- $7.5m > $4.02m therefore good investment

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- If initial investment $3m and required IRR 50%

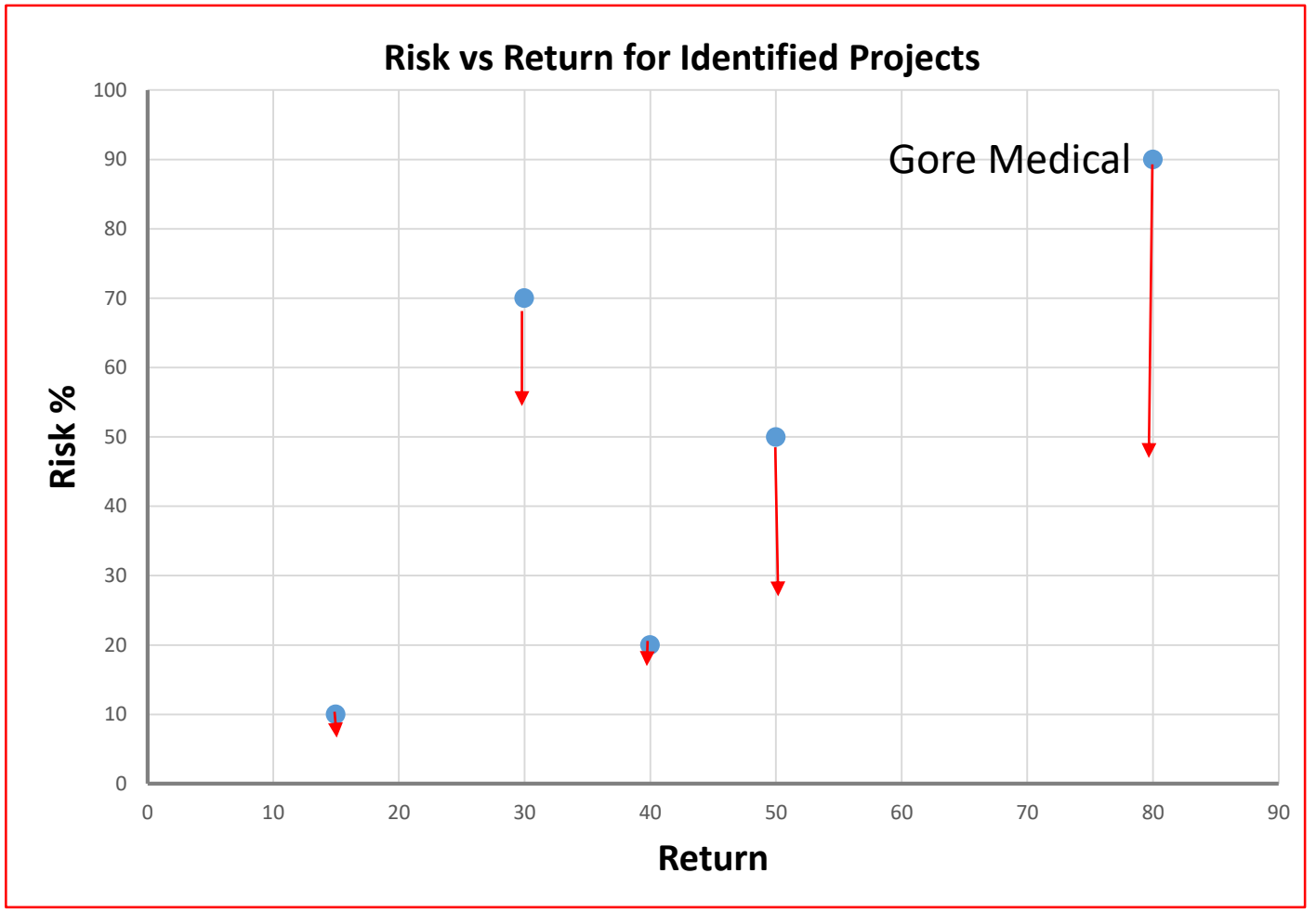
- Required terminal value = $11.14m
- Potential price for shares = $7.5m < $11.14m
- Will not achieve desired IRR

# Is There Customer Information or Scientific Literature Available that Reduces Risk

For each project analyse the scientific literature and industrial information to investigate whether published data and information can reduce the risk of undertaking the project.

Note: in a competitive market it is likely that:

- most companies will undertake low risk projects
- most companies will not undertake high risk projects
- competitive advantage can be gained by undertaking projects with medium risks that your competitors perceive as high risk



# Sourcing Information

- We are in the era of big data
- Easy-to-use tools to source information e.g.
  - Google – industry intelligence (websites, news articles, consulting reports, white papers)
  - Google Scholar – scientific papers, citations
  - Google Patent, Free Patents Online etc – patents, patent citations
- Data/information gathering and analysis becoming a source of competitive advantage
- If you have more information than your competitors this can give you a competitive market

**Talk to customers**

# Step 3: Risk Management

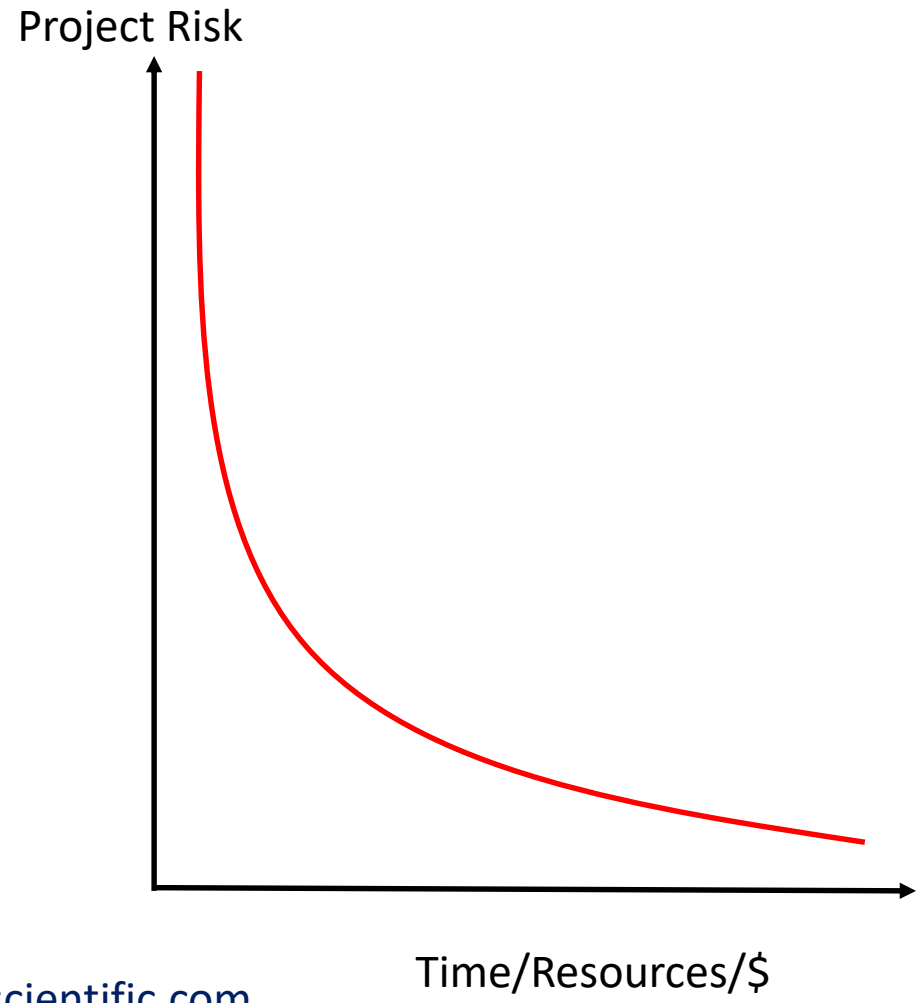
# Develop Project Plans

Develop project plans based on carrying out tasks that will reduce the most risk as early as possible within the plan.

At the start of any R&D project the risk is high & the probability of a successful outcome is low

Ideally risk should exponentially decay over time as resources spent increase.  If risk isn't reducing the project should be reviewed and redirected or terminated.

Project management needs to be continually looking for downward trends in risk over time.



# Project Planning

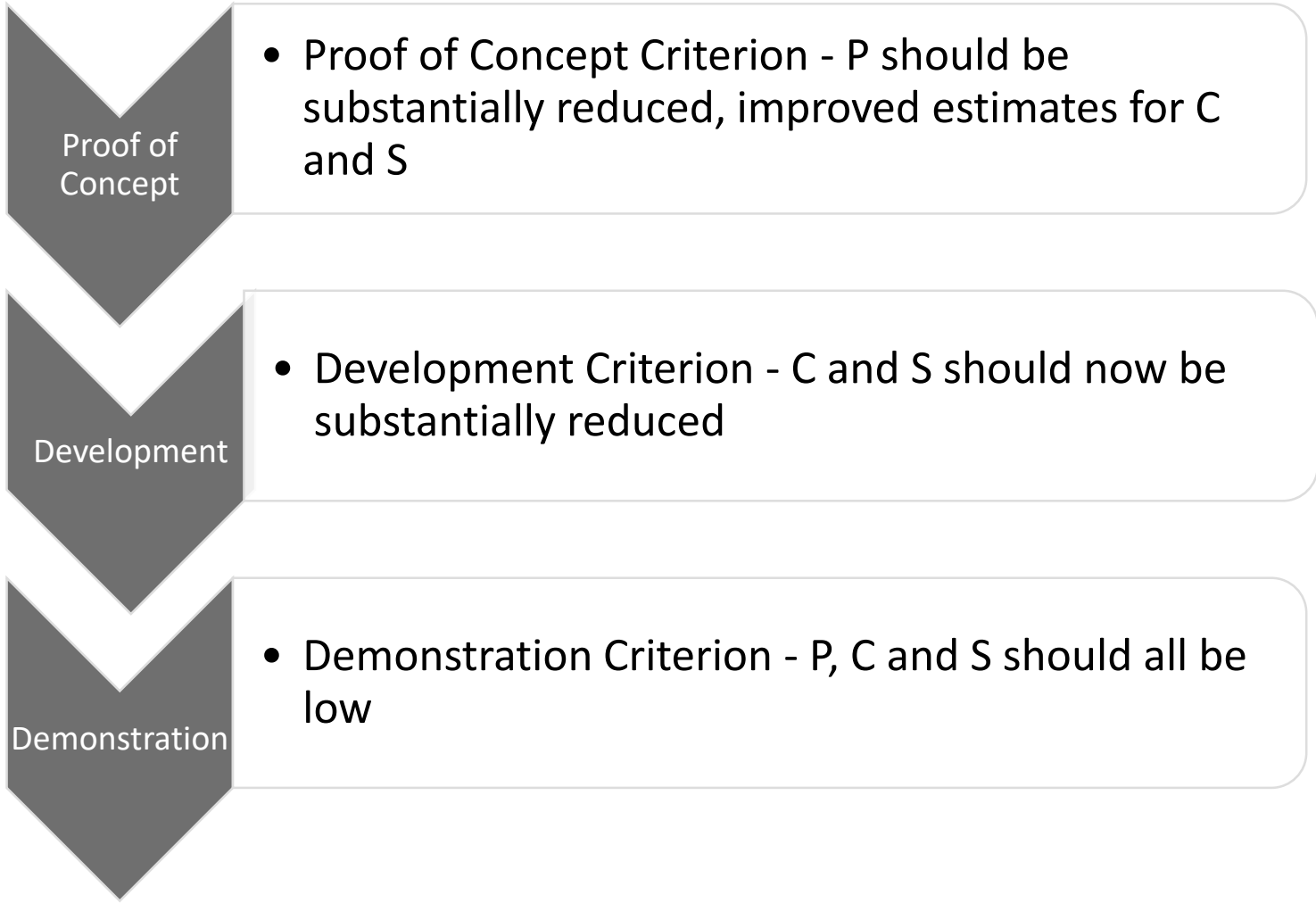
For each project there should be clear target specifications for:

- Performance
- Cost
- Scale

At the start of the project there is a risk of not achieving each of these targets

P (x%) C(y%) S(z%)

Stage gates should be set up to track the project in order to monitor if the risk has decreased for each of these measures before proceeding to the next




- Proof of Concept Criterion - P should be substantially reduced, improved estimates for C and S
- Development Criterion - C and S should now be substantially reduced
- Demonstration Criterion - P, C and S should all be low

# Project Monitoring and TRLs

Technology Readiness Levels (TRL) are a type of measurement system used to assess the maturity level of a particular technology. Each technology project is evaluated against the parameters for each technology level and is then assigned a TRL rating based on the projects progress. The higher the TRL the less is the risk of not achieving an outcome.

- TRL 1 – basic principles observed
- TRL 2 – technology concept formulated
- TRL 3 – experimental proof of concept

Discovery/ Proof of Concept

- TRL 4 – initial version of technology validated in lab environment
- TRL 5 – improved version (pre-prototype) of technology validated in industrially relevant environment

Development

- TRL 6 – pilot scale technology demonstrated in relevant industrially relevant environment
- TRL 7 –full-scale prototype demonstration in operational environment
- TRL 8 – final system complete and qualified through testing and demonstration
- TRL 9 –final system proven in operational environment (competitive manufacturing)

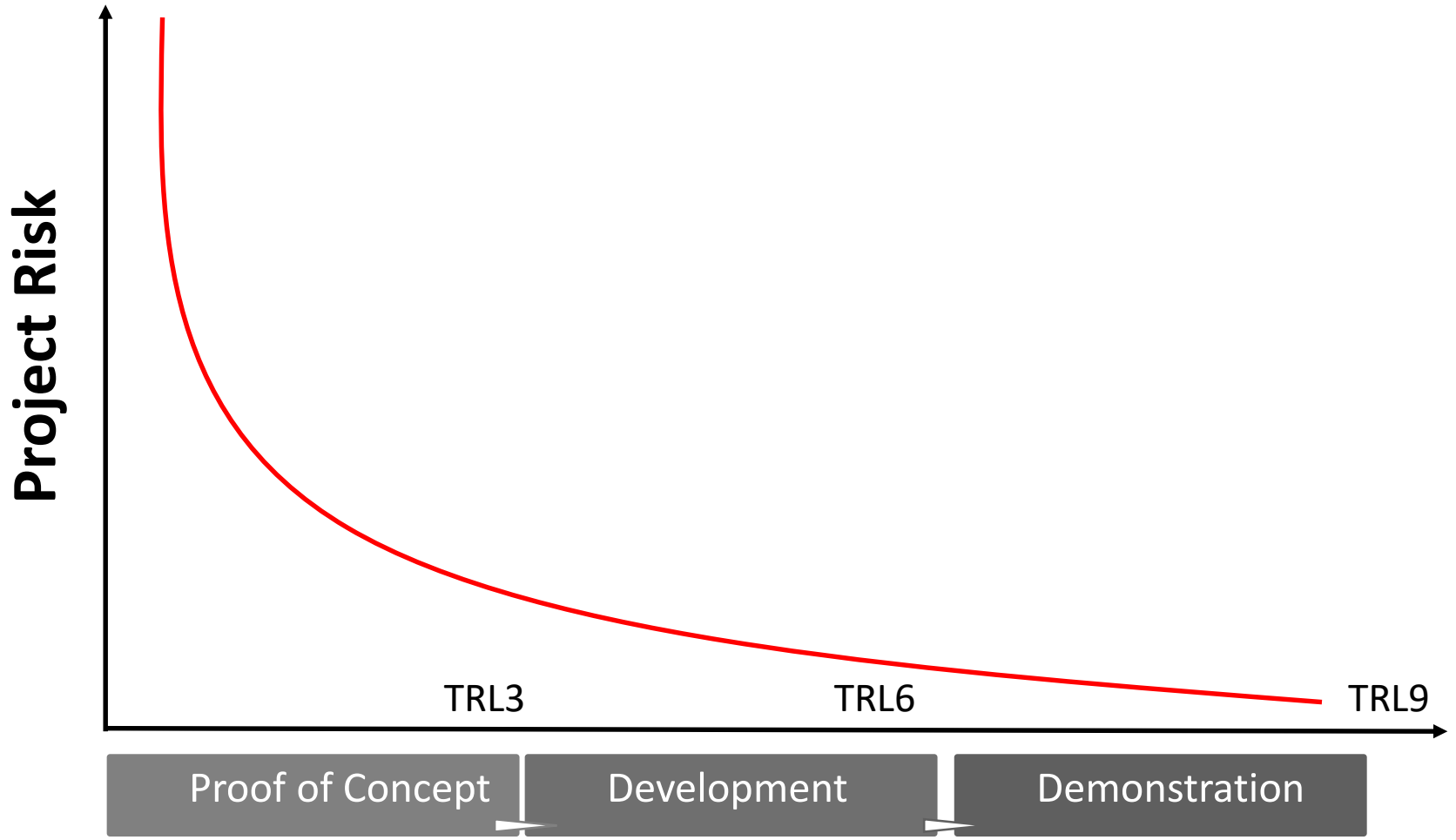
Demonstration

# Project Risk and TRLs

TRLs provide a useful means to monitor project risk.

If the project is moving up the TRL levels the risk is reducing.

If projects are not moving up the TRLs despite the expenditure of resources the project should be reviewed.



# Example Project

This project aims to develop filtration materials for first responders such as fire brigades, police, medical workers and customs agents. The focus will be protection against toxic vapours and aerosols.

This will be achieved by attaching special molecules to the fibres in the filter that can adsorb the dangerous vapours.

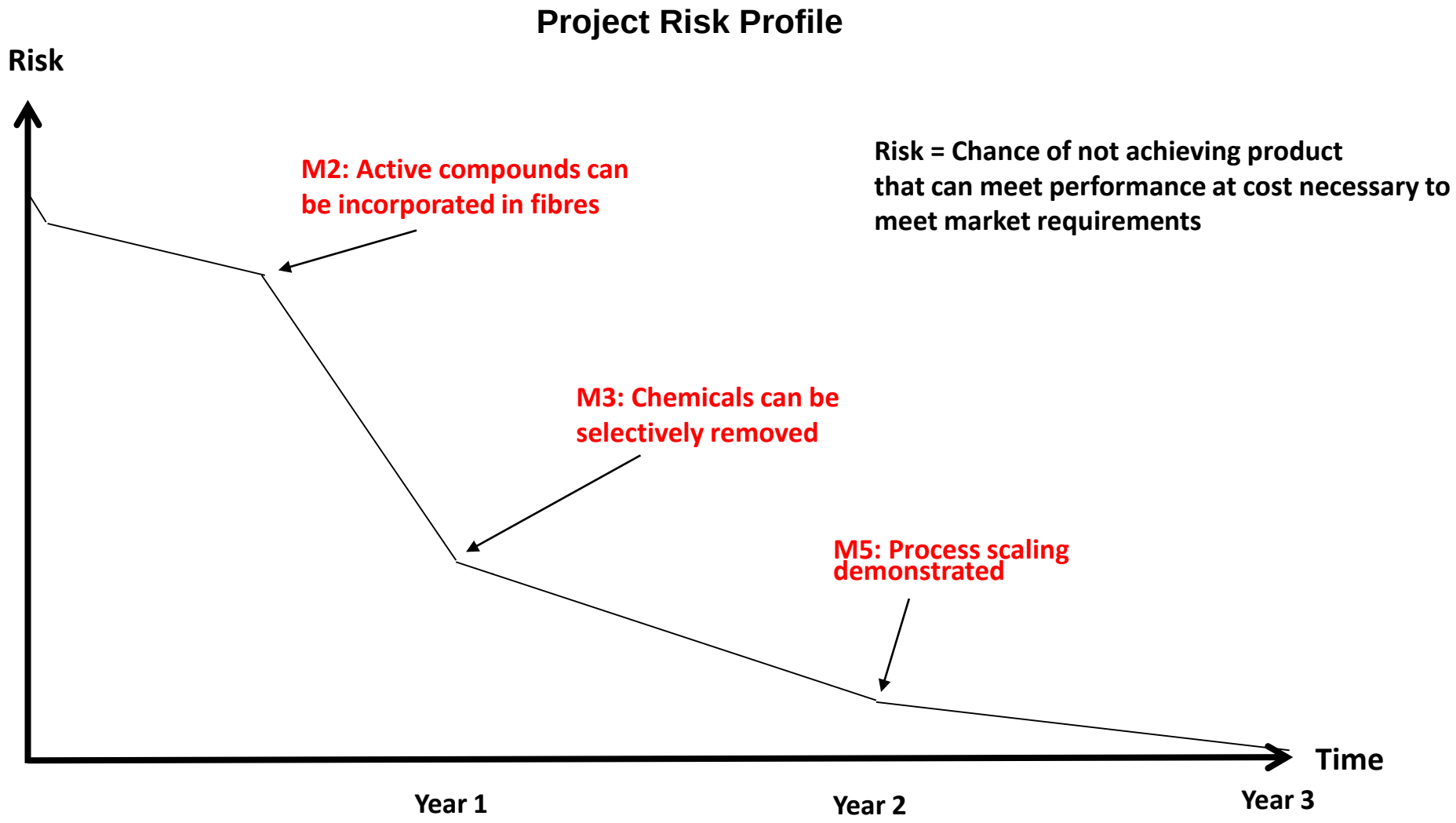
# Example Project Plan

| ***Milestone Activities*** | ***Risk Mitigation Achieved*** |
|---|---|
| ***Milestone 1 – Product specifications, materials and methodologies determined and agreed***<br>1 month | Disagreement or misunderstandings between partners avoided. |
| ***Milestone 2 – Small scale samples produced***<br>2-7 months<br>Small scale samples produced and characterised<br>Chemicals and process costs estimated | That molecules cannot be incorporated into or on to fibres<br>Process cost too high |
| ***Milestone 3 – Manufacture and Testing of generation 1 material***<br>7-12 months<br>Fabrication and testing of functionalised material (generation 1) samples from M1.<br>Further costing estimates of process<br>Client feedback on performance/cost<br>Detailed plan for next phase of project | Molecules incorporated in fibres cannot adsorb chemicals<br>Performance does not meet customer requirements |
| **TRL 3 Proof of concept** | |

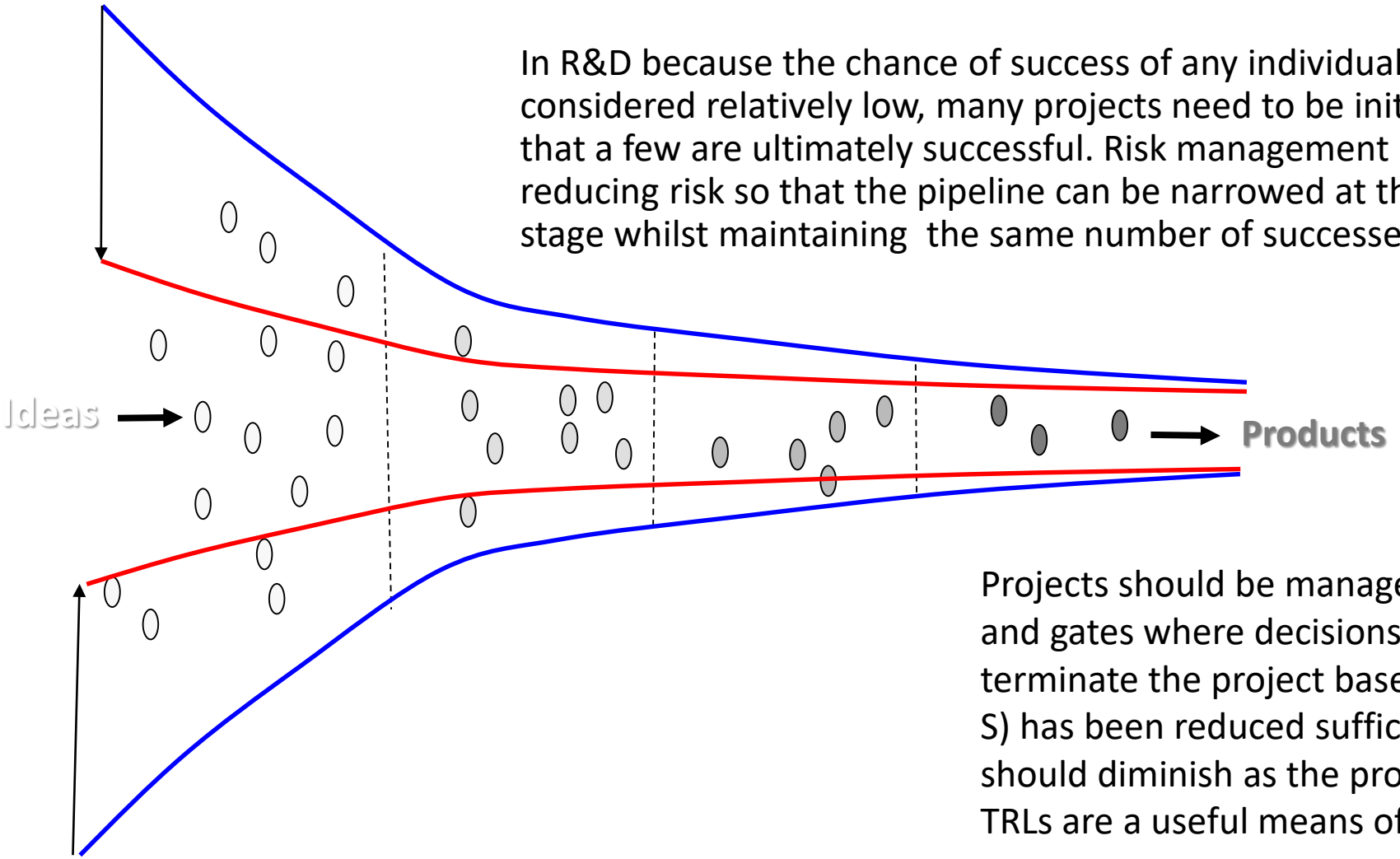
| | |
|---|---|
| ***Milestone 4 – Scale-up Activities***<br>12 – 24 months<br>Scaled-up equipment acquired<br>Fabrication of larger scale samples on appropriate substrates for product development<br>Process cost analysis completed, cost model developed<br>Application to other markets investigated<br>Business plan fully developed with future markets and supply chains identified | Process cannot be scaled, costs too high |
| ***Milestone 5 – Development & Testing of generation 2 material***<br>12 – 24 months<br>Fabrication of functionalised material (generation 2) samples tested<br>Performance of new materials against relevant contaminants tested<br>Client trials and feedback<br>Detailed plan for next phase of project | Performance of material cannot be optimised on industrial scale equipment<br>Cost on industrial scale unacceptable |
| **TRL 5 Technology validated in relevant environment** | |

| | |
|---|---|
| ***Milestone 6 – Development of full-scale processes***<br>24 -30 months<br>Testing of larger scale samples completed including customer trials<br>Industrial process design completed<br>Commercial scale production underway | Large samples cannot be produced in production environment with optimum performance to meet client needs<br>Cost/scale unacceptable |
| **TRL 9 Final system proven in operational environment** | |

# Example Project Risk Profile

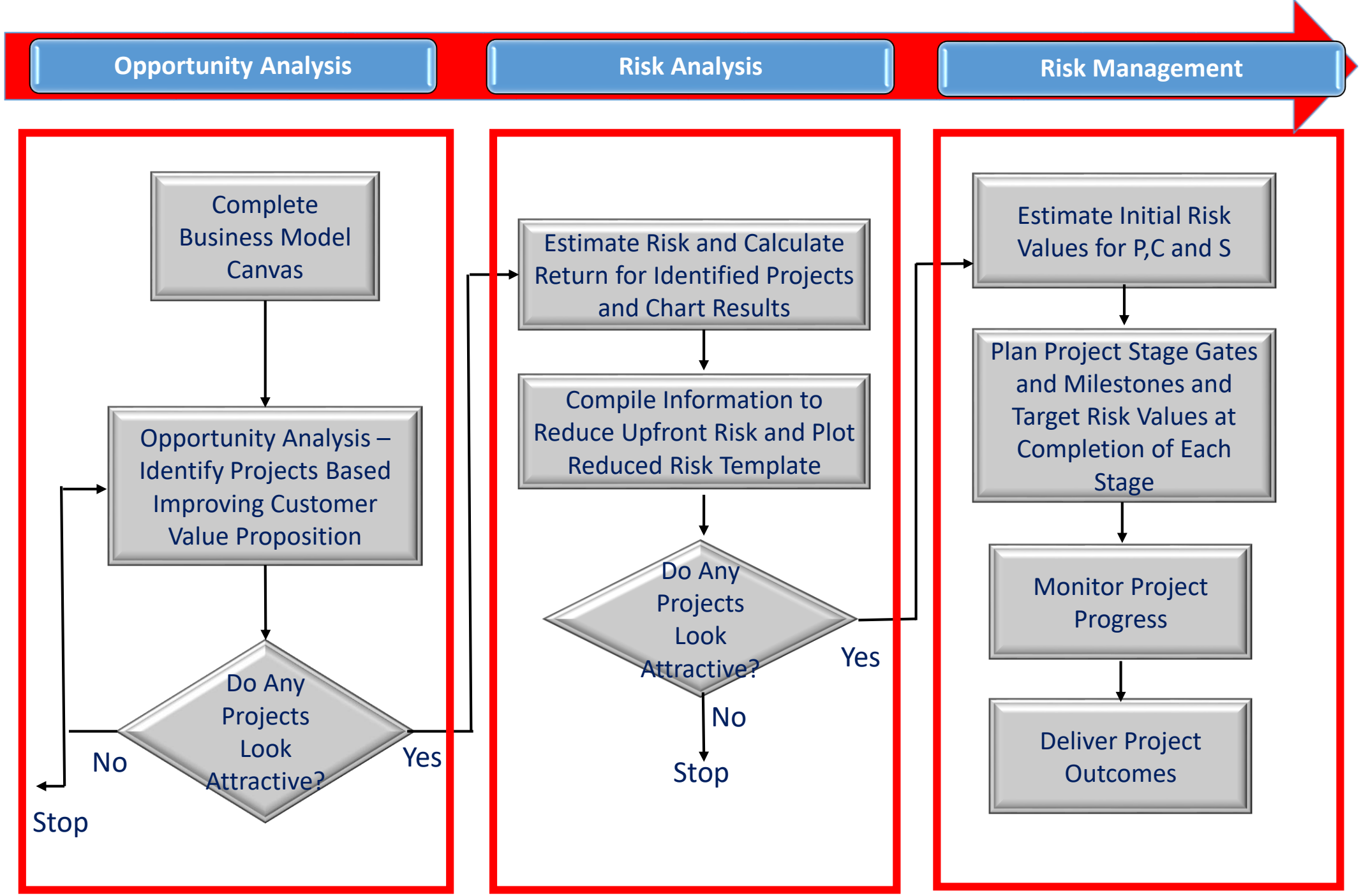


# Project Pipeline - Innovation Funnel




In R&D because the chance of success of any individual project is considered relatively low, many projects need to be initiated to ensure that a few are ultimately successful. Risk management is aimed at reducing risk so that the pipeline can be narrowed at the planning or input stage whilst maintaining  the same number of successes

Projects should be managed through a series of stages and gates where decisions are made to proceed or terminate the project based on whether risk (for P,C, and S) has been reduced sufficiently. The level of uncertainty should diminish as the projects pass through each stage. TRLs are a useful means of measuring progress


Opportunity Analysis
Risk Analysis
Risk Management
Complete Business Model Canvas
Opportunity Analysis – Identify Projects Based Improving Customer Value Proposition
Do Any Projects Look Attractive?
No
Yes
Stop
Estimate Risk and Calculate Return for Identified Projects and Chart Results
Compile Information to Reduce Upfront Risk and Plot Reduced Risk Template
Do Any Projects Look Attractive?
Yes
No
Stop
Estimate Initial Risk Values for P,C and S
Plan Project Stage Gates and Milestones and Target Risk Values at Completion of Each Stage
Monitor Project Progress
Deliver Project Outcomes

# Summary

To gain competitive advantage:

- Target some medium/high risk projects and try to pre-empt market
- Manage commercial and technical risks better than your competitors

The Innovation Risk Management process presented addresses:

- Market/business risks
- Technical risk

and helps firms pursue a prudent and disciplined investment approach that specifically addresses innovation risk management

HS Humphries Scientific

# Thank You

Contact Details

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www.humphries-scientific.com

# Fibre to Fabric Innovations in Australia

Professor Xungai Wang



ARC Research Hub for FUTURE FIBRES

IFM INSTITUTE FOR FRONTIER MATERIALS

DEAKIN UNIVERSITY

This talk gives selected examples of work conducted by Deakin University staff and PhD students, in the area of natural fibres, yarns, and fabrics.





ARC Research Hub for FUTURE FIBRES

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DEAKIN UNIVERSITY

# EXAMPLE 1: Improving Cotton Fibre Properties

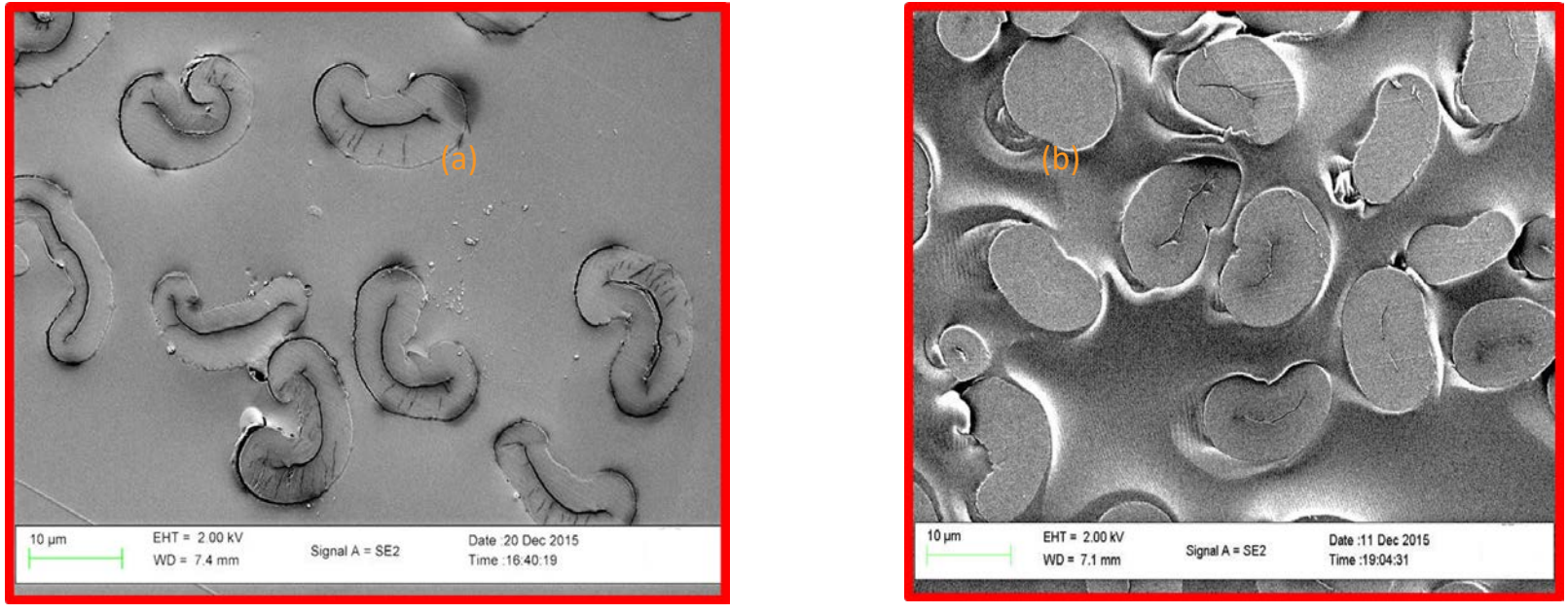
**(R Remadevi PhD project supported by CRDC)**


Australian Government

Cotton Research and Development Corporation



# Amino Acid as a Green Swelling Agent for Cotton



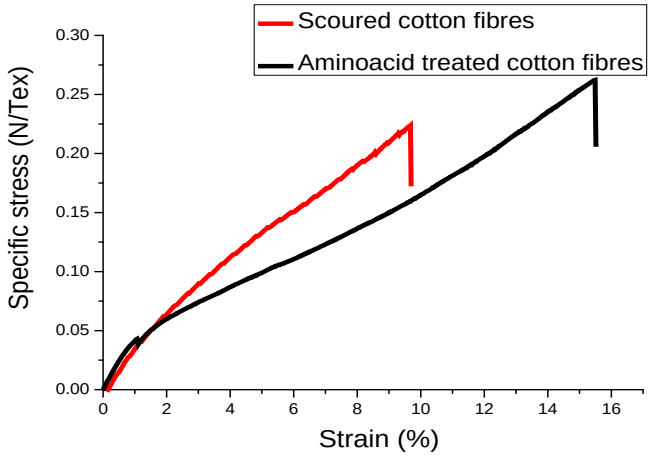

**Scanning Electron Micrographs (SEM) of (a) scoured and (b) amino acid treated cotton fibres cross sections**

Reference: Remadevi, R., Gordon, S., Wang, X. and Rajkhowa, R., 2016. ***Investigation of the swelling of cotton fibres using aqueous glycine solutions***. Textile Research Journal, p.0040517516665267

# Improvements in moisture regain and tensile properties of cotton fibres after amino acid treatment

| Samples | Linear density( Tex) by cottonscope | Load (N) ± S.D | Specific stress (N/Tex) ± S.D | Strain (%) ± S.D | Moisture regain (%) ± S.D |
|---|---|---|---|---|---|
| Scoured cotton Control | 0.198 ± 0.003 | 0.037 ± 0.010 | 0.194 ± 0.070 | 9.75 ± 2.900 | 6.63± 0.500 |
| Amino acid treated cotton | 0.210 ± 0.019 | 0.045 ± 0.010 | 0.215 ± 0.060 | 15.48 ± 4.500 | 7.68± 0.200 |

**Single fibre tensile test results (n = 200) and Moisture regain(%) of scoured and amino acid treated cotton fibres.**

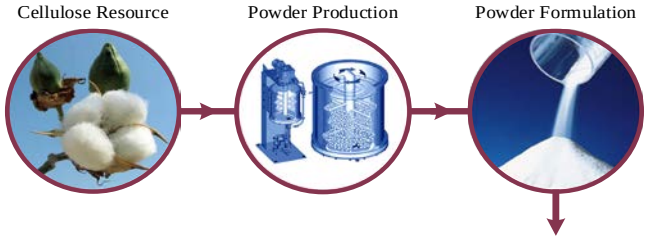


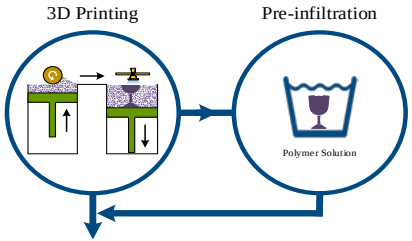

**Specific stress- strain curve of scoured and amino acid treated cotton fibres**

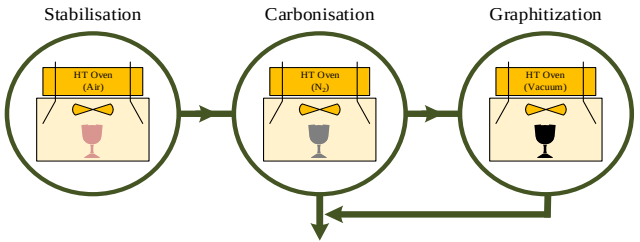
Reference: Remadevi, R., Gordon, S., Wang, X. and Rajkhowa, R., 2017. ***Tensile, physical, and microstructure properties of glycine treated cotton fibers***. Textile Research Journal, p.0040517517700196

# EXAMPLE 2: Fibre Powders and 3D Printing

**(PhD student: S Dadvar)**

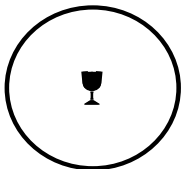



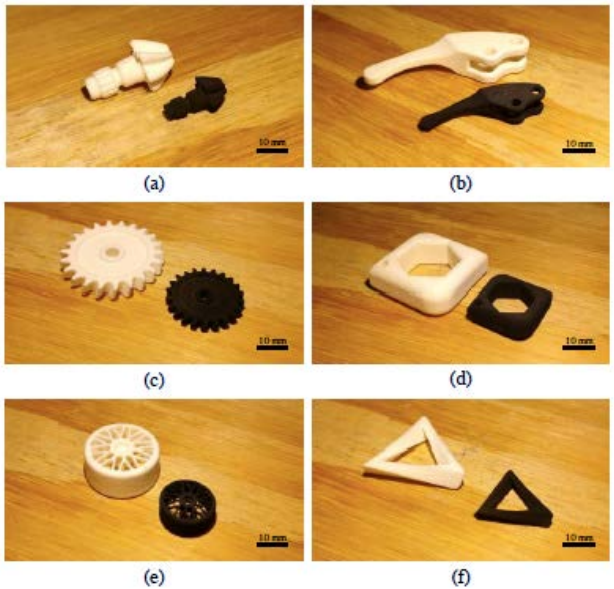





Carbon Composite Part





YouTube (https://goo.gl/DCnfxP)
YouTube (https://goo.gl/DCnfxP)

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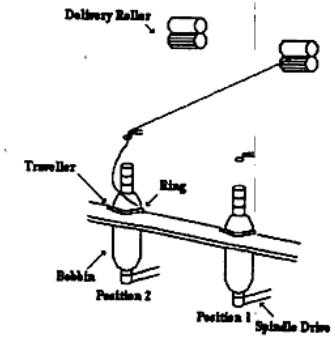
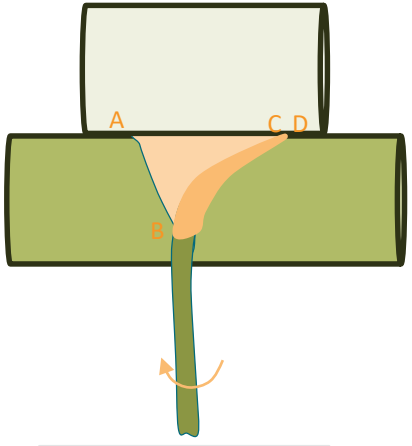
UNIVERSITY

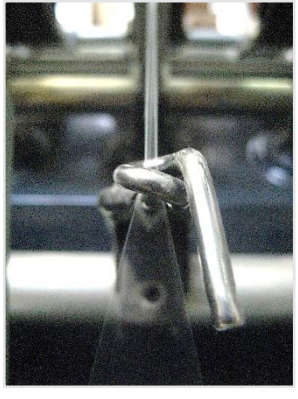
# EXAMPLE 3: Spinning Innovation – Offset Spinning

*Left offset*




*No Offset*



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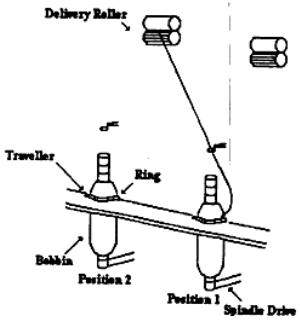


Wang XG and Chang LL, *Textile Res. J.*, **73** (4), 327-332 (2003)

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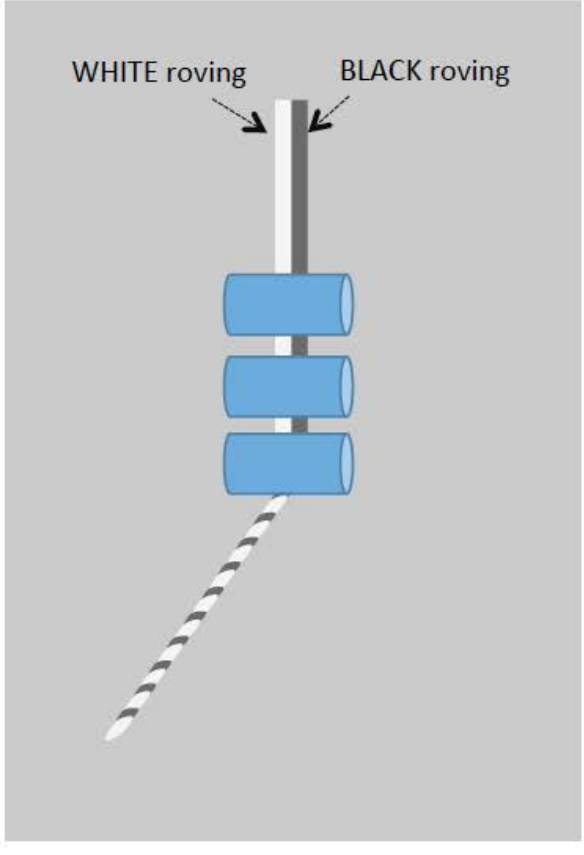


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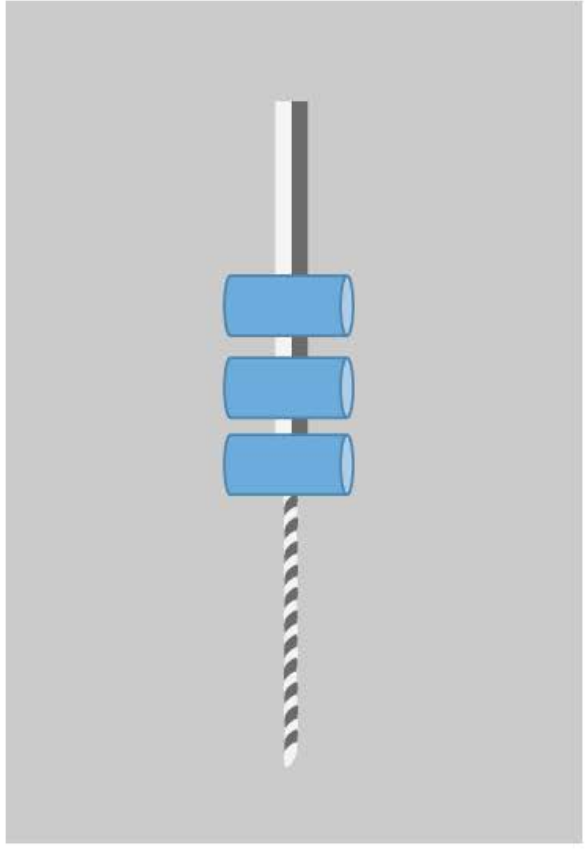

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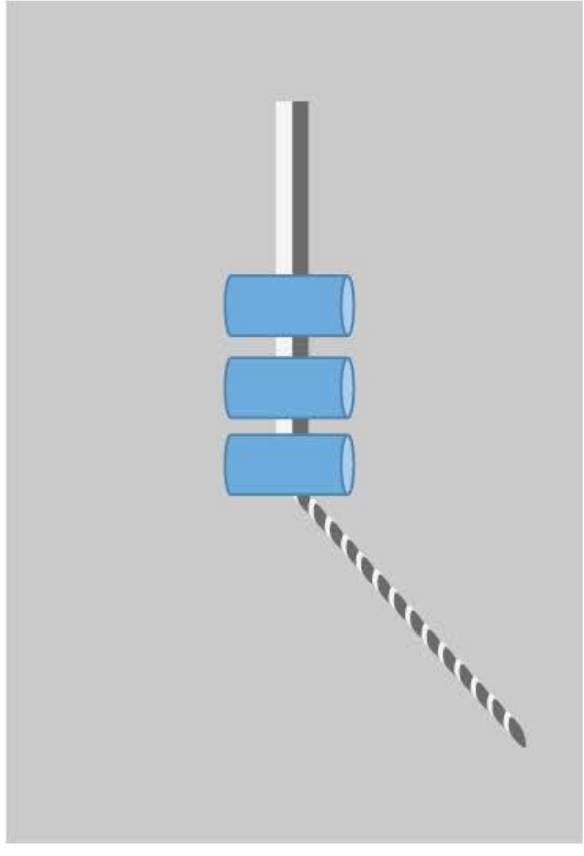
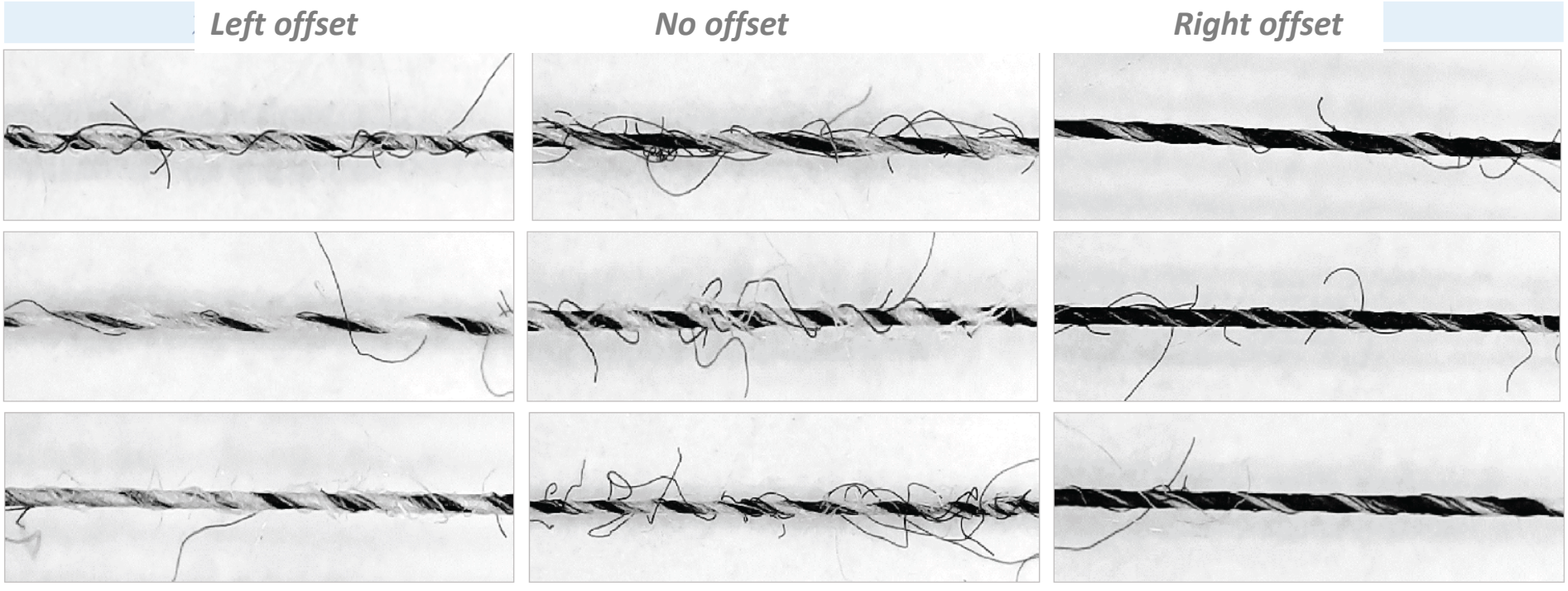





- Significant reduction in yarn hairiness
- Colour effects
- No need for machine modification
- Commercial use in some spinning mills



IFM INSTITUTE FOR FRONTIER MATERIALS

DEAKIN UNIVERSITY

# EXAMPLE 4: Improving the Safety of Motorcyle Clothing

**(Key researcher: Dr Chris Hurren)**

ARC Research Hub for FUTURE FIBRES

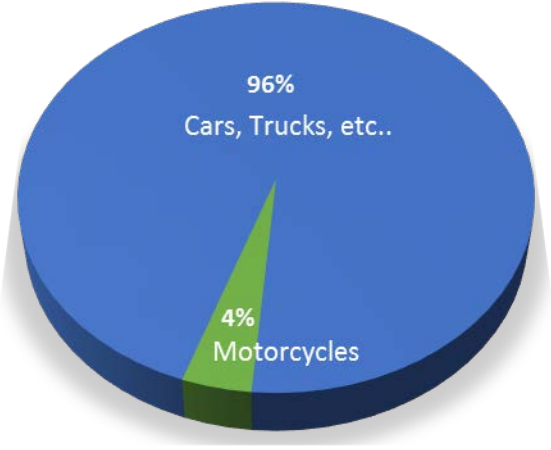
IFM INSTITUTE FOR FRONTIER MATERIALS

DEAKIN UNIVERSITY

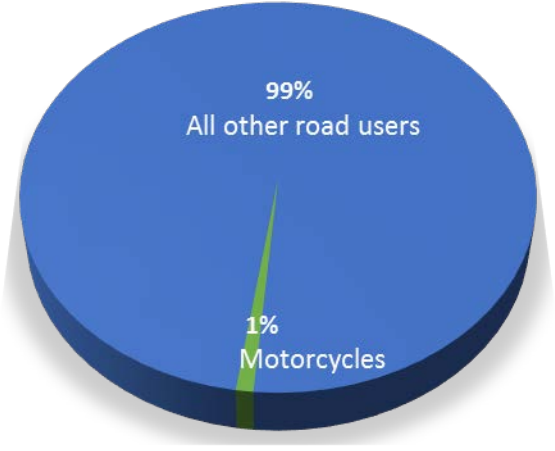
Australian Government
Australian Research Council

DRAGGIN

# Latest statistics in Australia

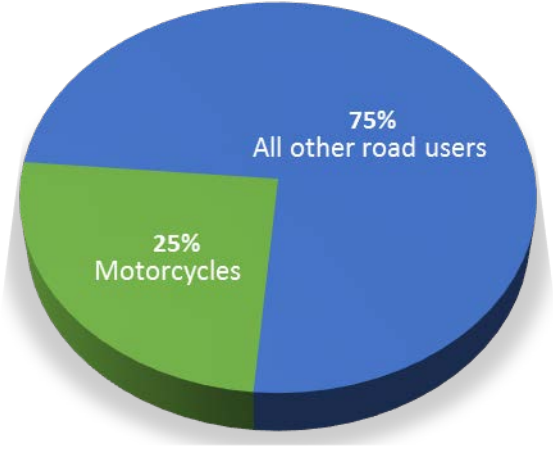



Motorcycles are 4% of all registered vehicles




Road monitoring by Monash University in Melbourne shows that motorcycles are 1% of all road users

Motorcyclists make up 25% of people injured on Australian roads




Drink drive, bloody idiot

# Objective evaluation of performance improvements (Video)

# EXAMPLE 5: Circular Denim – Denim Dyed Denim

## (One of the top 5 winners out of 2885 entries)

# Old denim – fine powder (colour pigment) – Coat/Print – New Denim

# Acknowledgements


- Australian Research Council
- CRDC
- Deakin University
- CSIRO
- H&M Foundation

# KEEPING COTTON IN HIGH DEMAND:

## An Australian Perspective

Australian Cotton Shippers Association

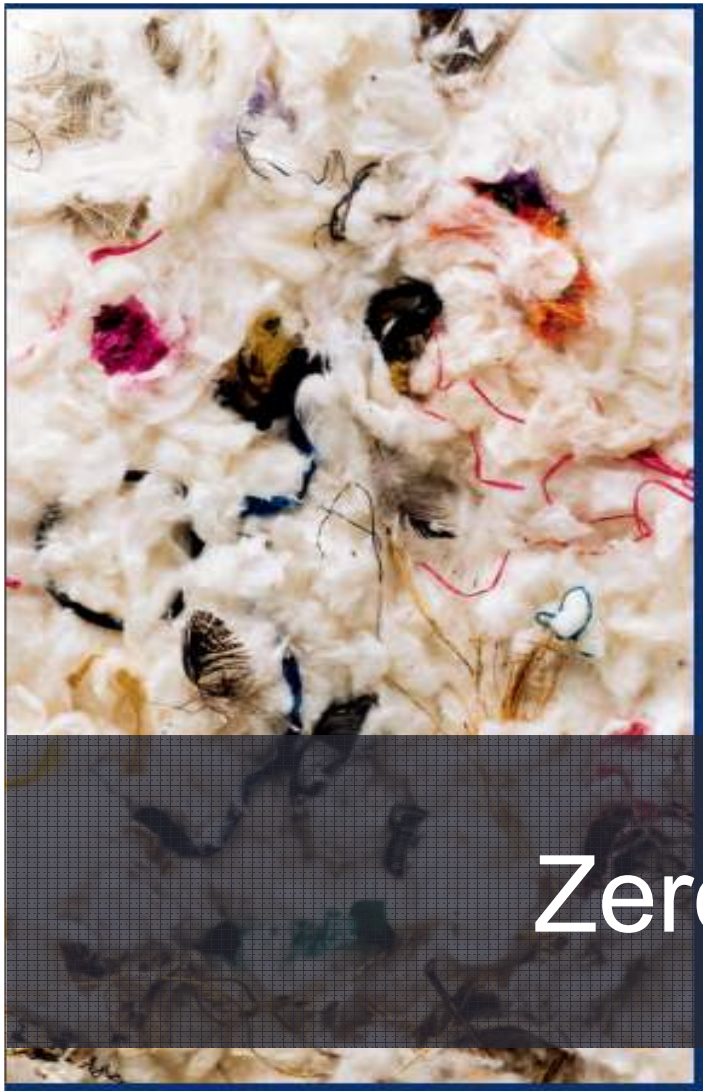
# TRADITIONAL COMPETITIVE ADVANTAGE

Australian Cotton Shippers Association


CONTINUOUS IMPROVEMENT
$20 MILLION A YEAR IN R&D
Australian Cotton
Shippers Association

# Superior & Consistent Quality


- High Spinning Efficiency
- 40 – 60 Cnt Yarns
- High Quality Yarn
- Superior Dyeability



# Cotton Contamination Surveys

2005•2007•2009•2011•2013•2016

## Zero Contamination

INTERNATIONAL TEXTILE MANUFACTURERS FEDERATION
FÉDÉRATION INTERNATIONALE DES INDUSTRIES TEXTILES
INTERNATIONALE VEREINIGUNG DER TEXTILINDUSTRIE

ITMF

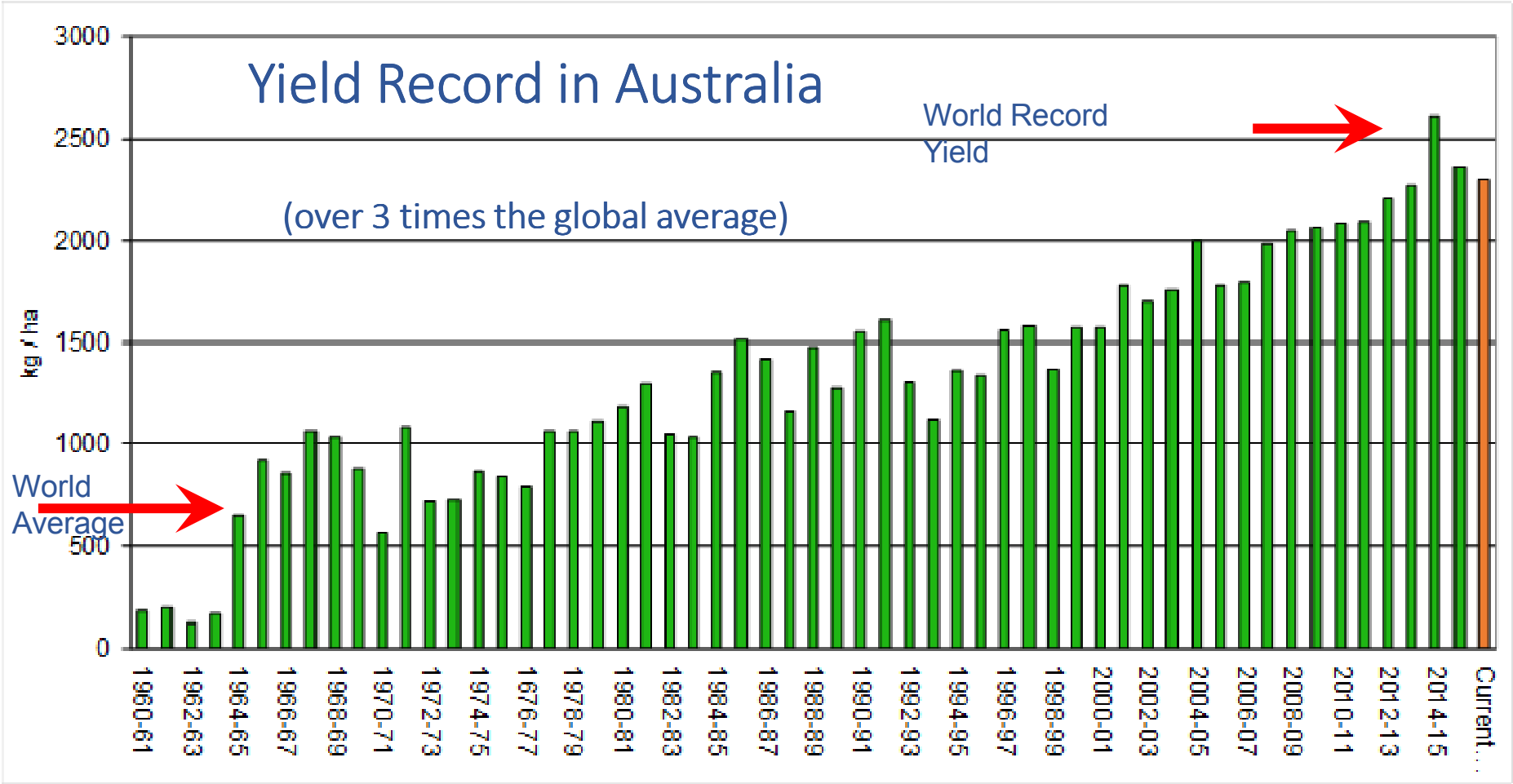
Australian Cotton Shippers Association

# World's Highest Yields

## THREE TIMES WORLD AVERAGE

Australian Cotton Shippers Association

# Australian Yields Continually Improve and lead the world




# Reliable Supply


# DEMANDS OF TODAY'S MARKET

Australian Cotton Shippers Association

# Sustainability

## 30 YEARS OF CONTINUOUS IMPROVEMENT

Australian Cotton Shippers Association

# myBMP

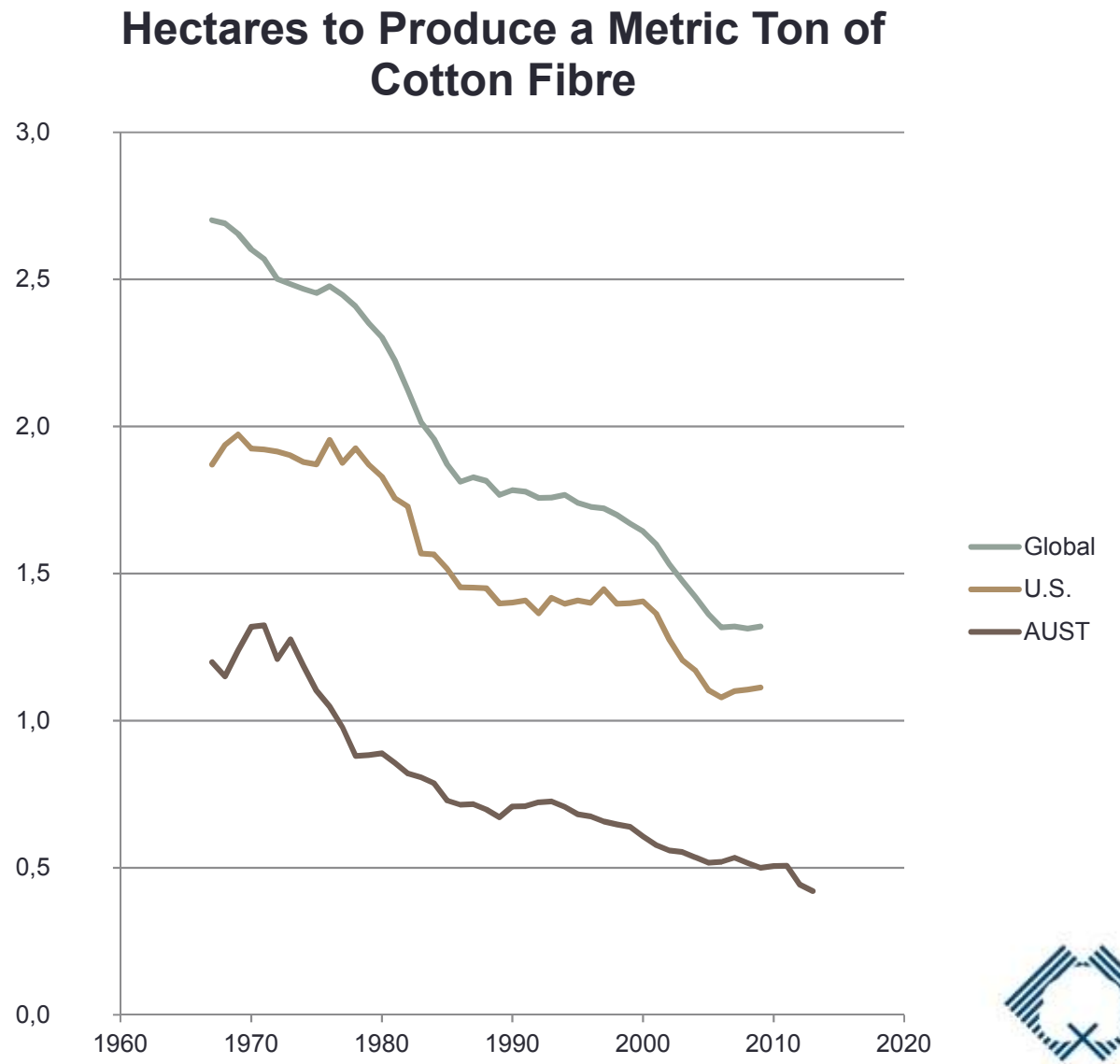
## PROGRAM TO UNDERPIN SUSTAINABILITY

Australian Cotton Shippers Association


95% Reduction in Pesticides
Australian Cotton Shippers Association


42% Increase in
Water Efficiency
Australian Cotton
Shippers Association

# 30% LESS LAND NEEDED TO PRODUCE A TONNE OF COTTON




COTTON AUSTRALIA

# 40% Native Vegetation on Farm

Australian Cotton Shippers Association

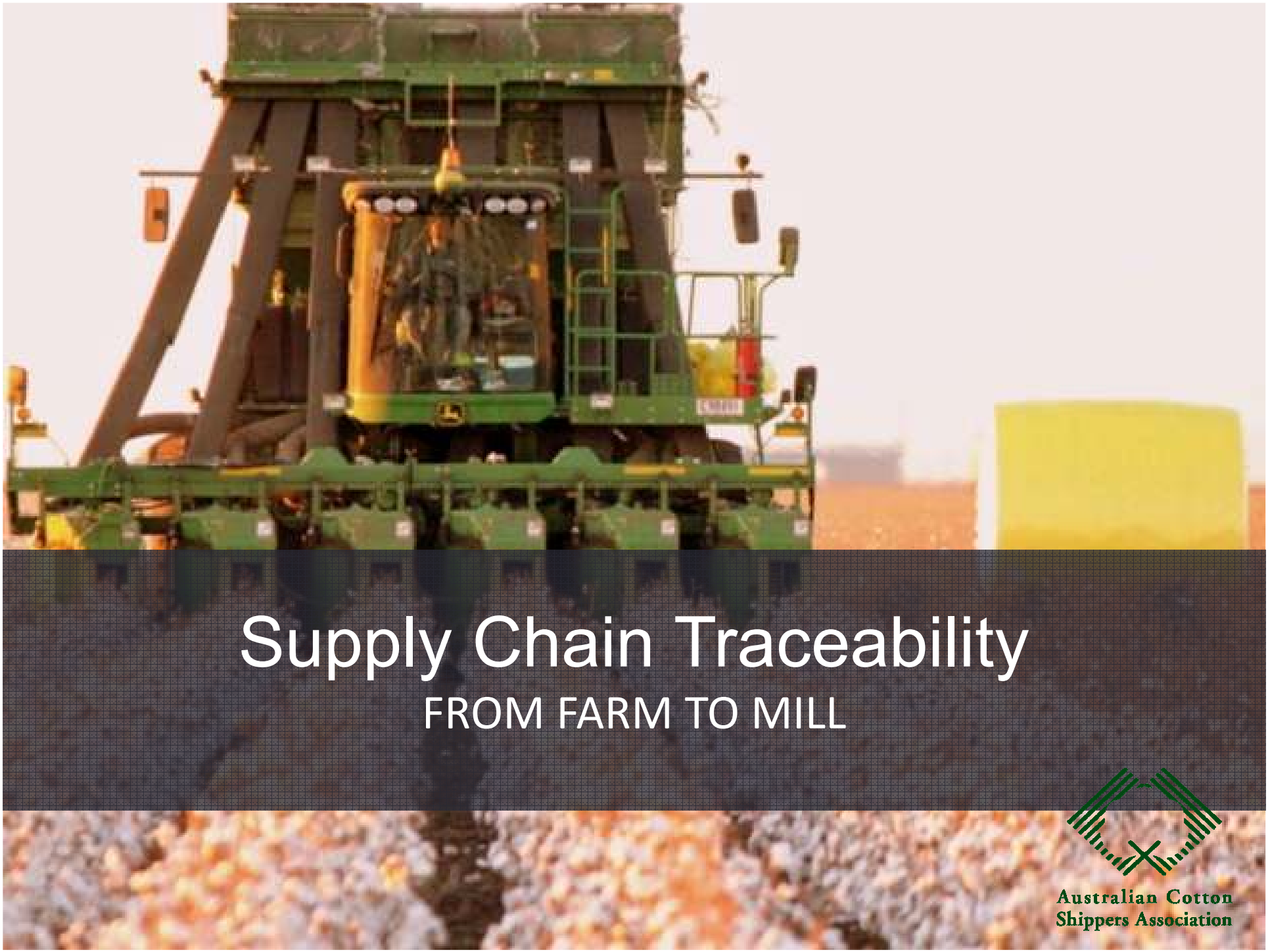

# Sustainability Reporting

## SUPPLY CHAIN TRANSPARENCY, TARGETS, INDEPENDENCE


# Rigorous Labour Standards

## WE LOOK AFTER OUR PEOPLE

Australian Cotton Shippers Association



# Supply Chain Traceability

## FROM FARM TO MILL

Australian Cotton Shippers Association

# Our Customers?

Australian Cotton
Shippers Association

# Engagement with Globally Recognised Programs, GOV'T & NGO'S

BCI Better Cotton Initiative

TextileExchange

Sustainable Apparel Coalition

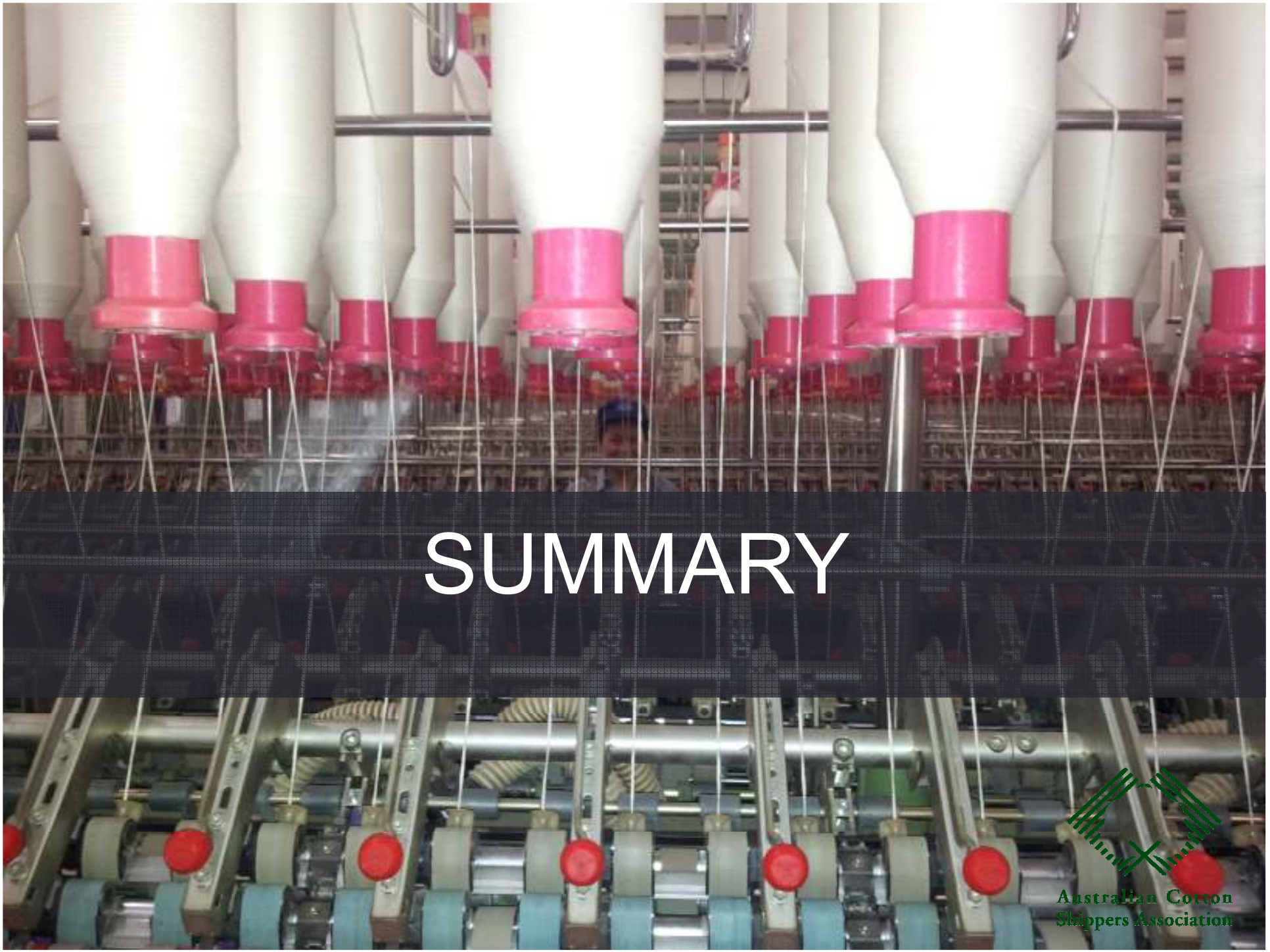
BAPTIST WORLD AID AUSTRALIA

PAN Pesticide Action Network International

ethical clothing AUSTRALIA

COTTON LEADS™

Higg Index



# SUMMARY

Australian Cotton Shippers Association


THANKS
Australian Cotton
Shippers Association


# GEOGRAPHIC LOCATION

Australian Cotton Shippers Association


CMA CGM
THIRD LARGEST EXPORTER
3% OF WORLD PRODUCTION
Australian Cotton
Shippers Association


EXCEPTIONAL QUALITY
YEAR AFTER YEAR
Australian Cotton
Shippers Association

# WE'RE PART OF THE GLOBAL COTTON STORY

200,000 Pakistani farmers to be trained this year

# CONTINUOUS IMPROVEMENT

Australian Cotton Shippers Association

REINHART COMMITTED TO COTTON SINCE 1788

# Global and local supply and demand forces

Paul Jürg Reinhart

ITMF Conference

September 2017

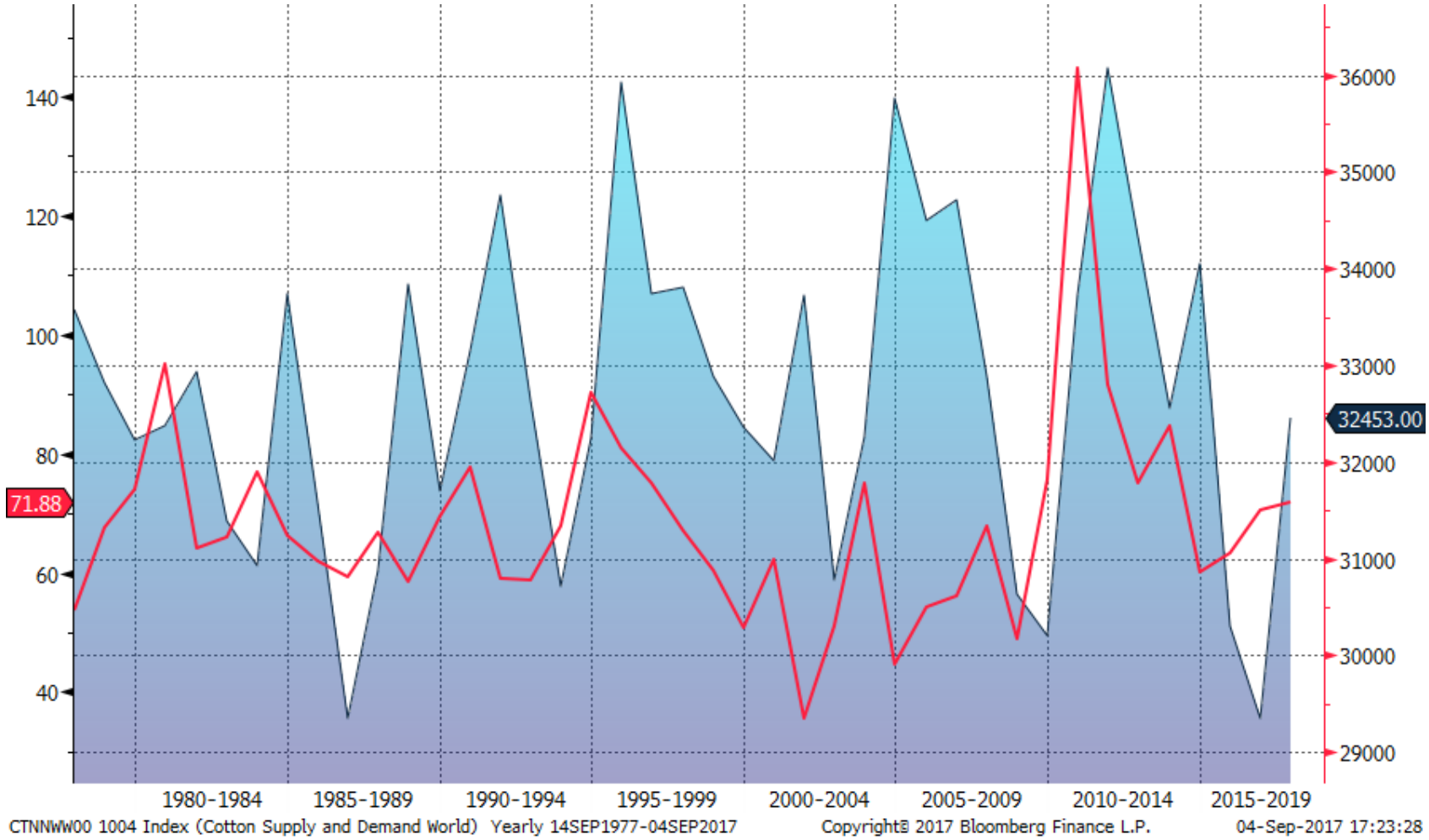
1. Supply Trends

2. Consumption Trends

3. Global S&D Balance and Stocks

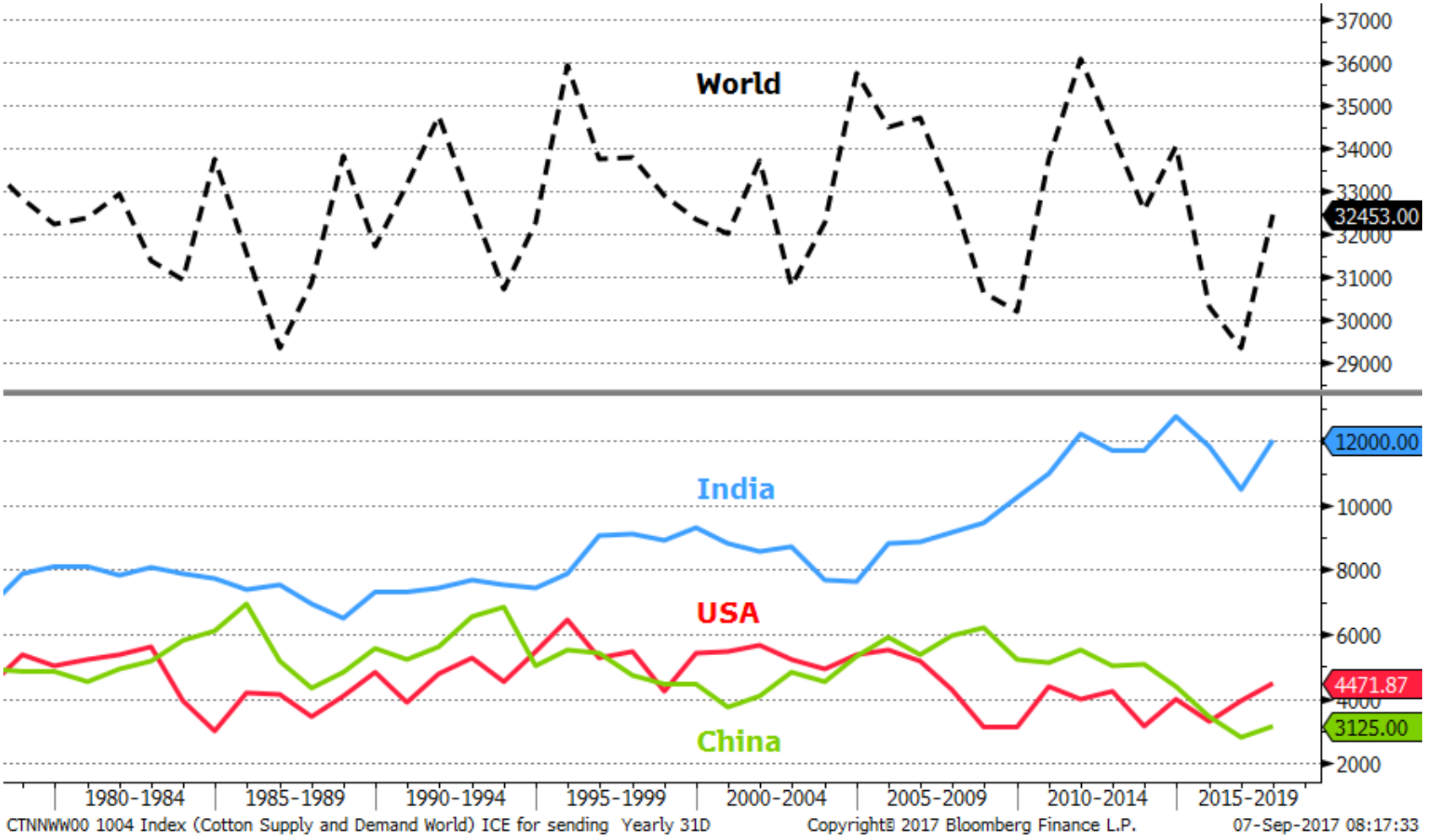
4. Outlook – China as main swing factor

# Area harvested (in ‘000 hectares) vs. Price (red)



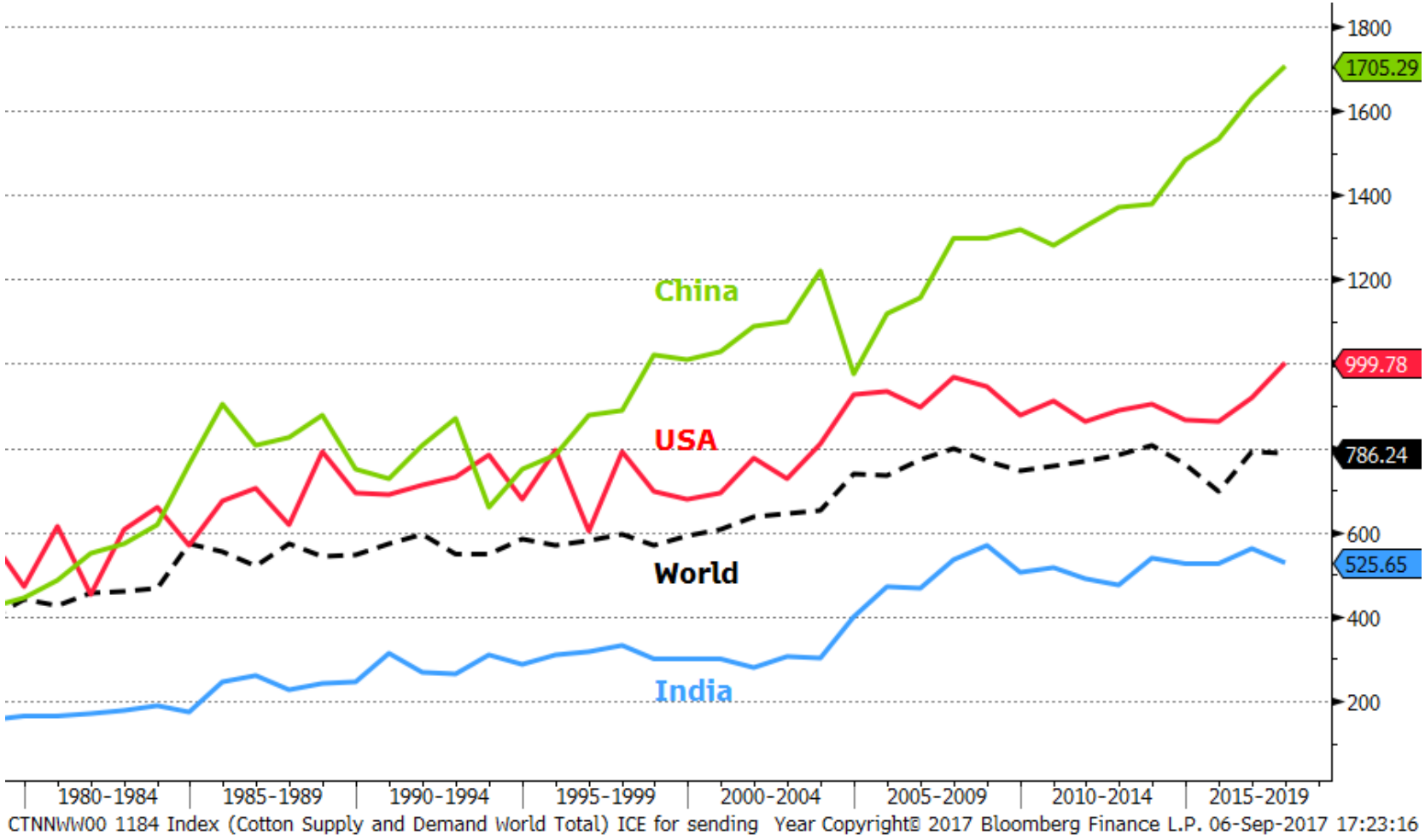

REINHART

# Area harvested, World vs. India vs. USA vs. China (in '000 hectares)



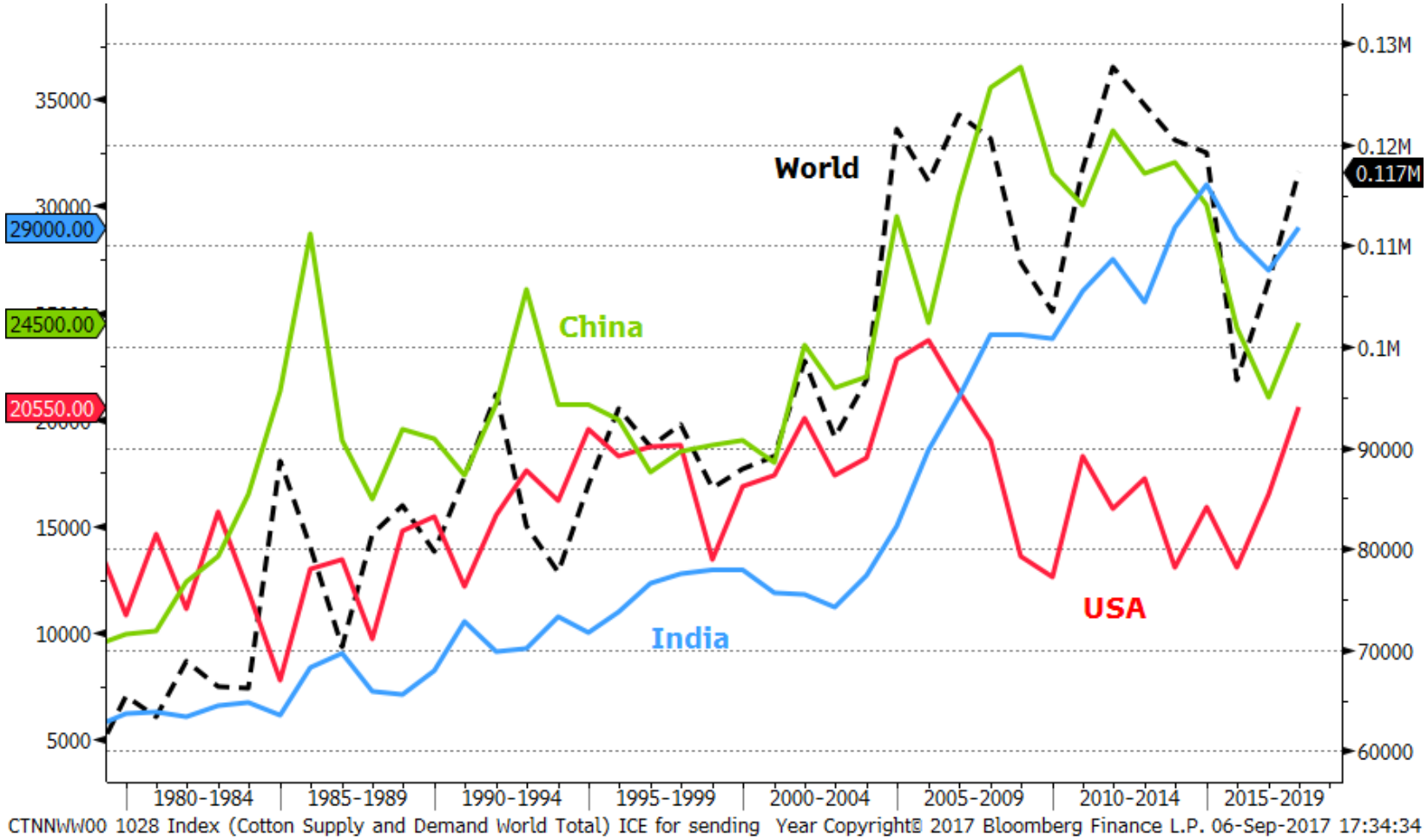

REINHART

# Yield, World vs. India vs. USA vs. China (kg/ha)



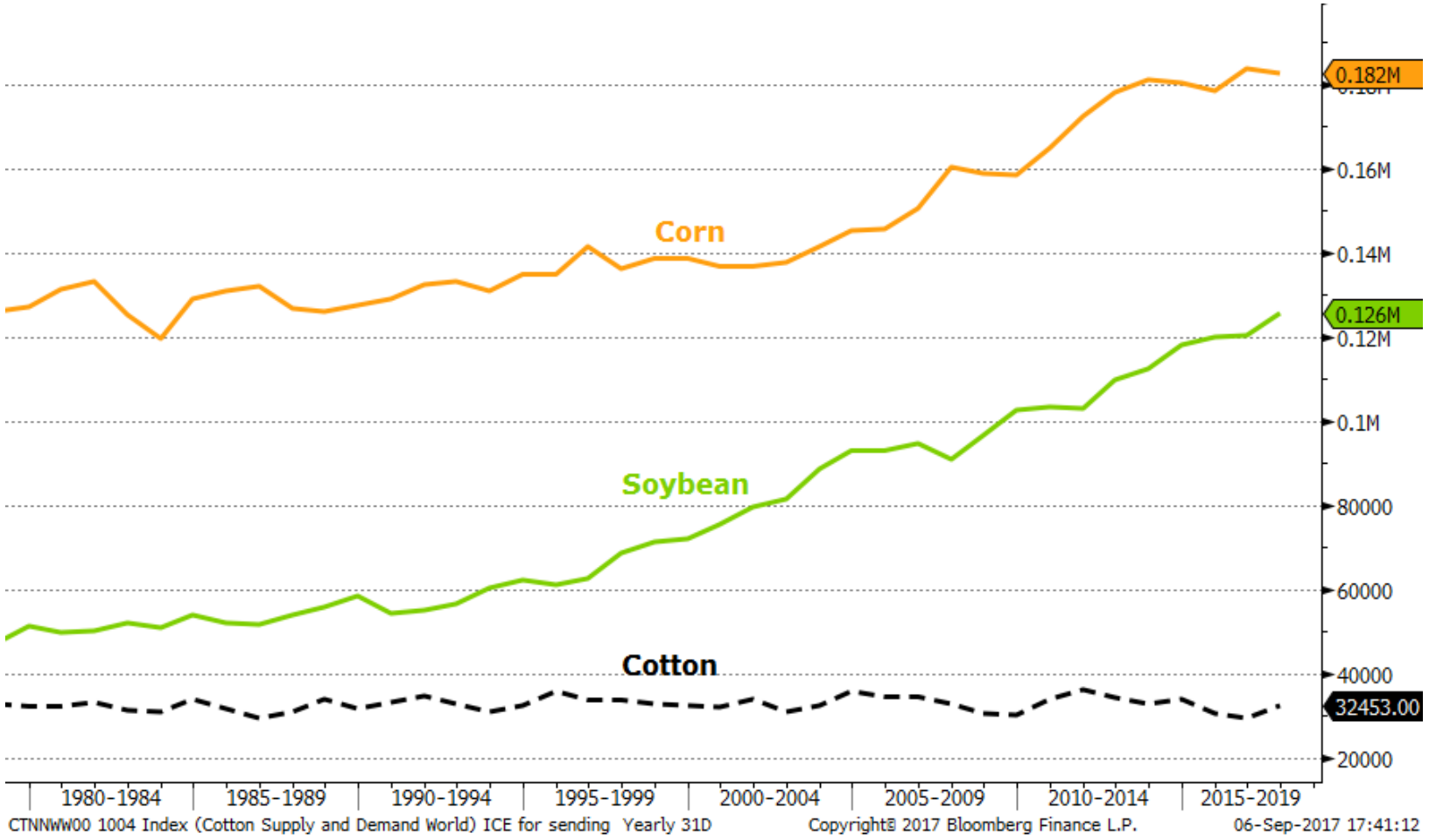

REINHART

# Production, World vs. India vs. USA vs. China (in '000 bales)




REINHART

# Area harvested, Cotton vs. Soybean vs. Corn (in ‘000 hectares)



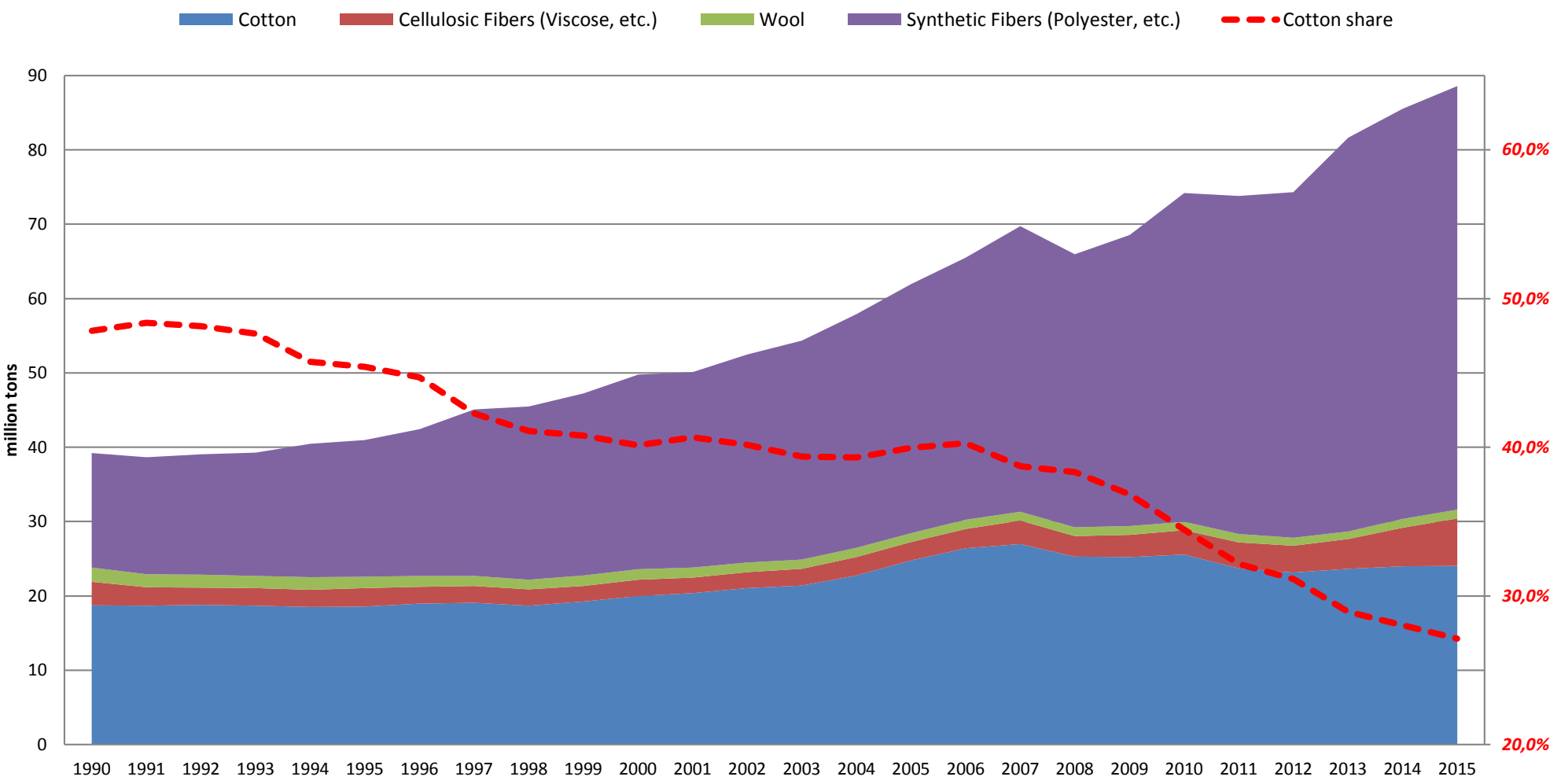

REINHART

# Production Trend - Comments

- *Area harvested – reacting to prices*
- *Development in largest production areas.*
- *Cotton competes for area with food crops!*
- *Demand for food crops will grow in the long term, along with global population and rising incomes.*
- *Therefore: Without major breakthroughs in yield, actual production cost is a strong bottom for cotton price.*

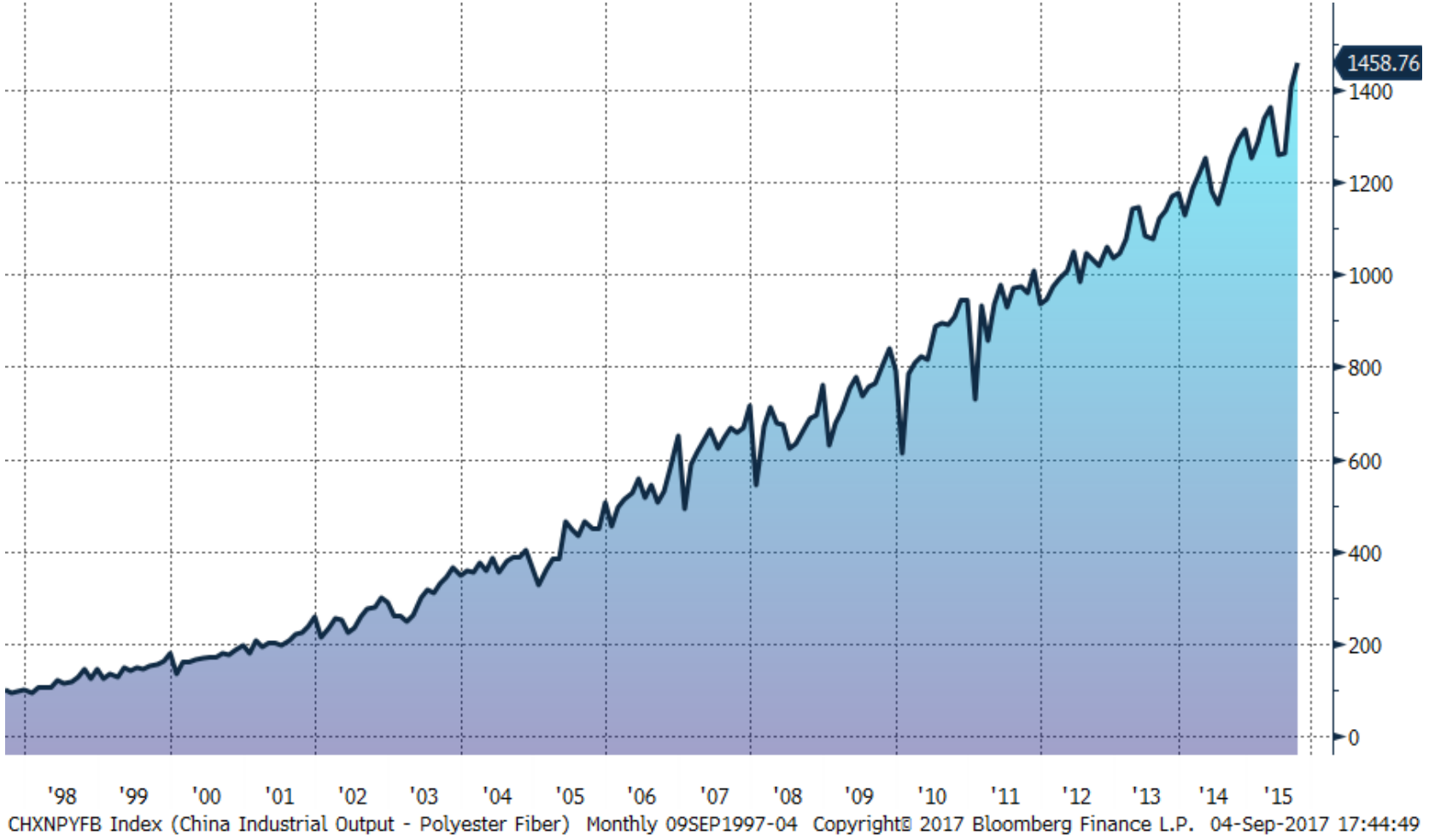
# 2. Consumption Trends

# World Fibre Consumption



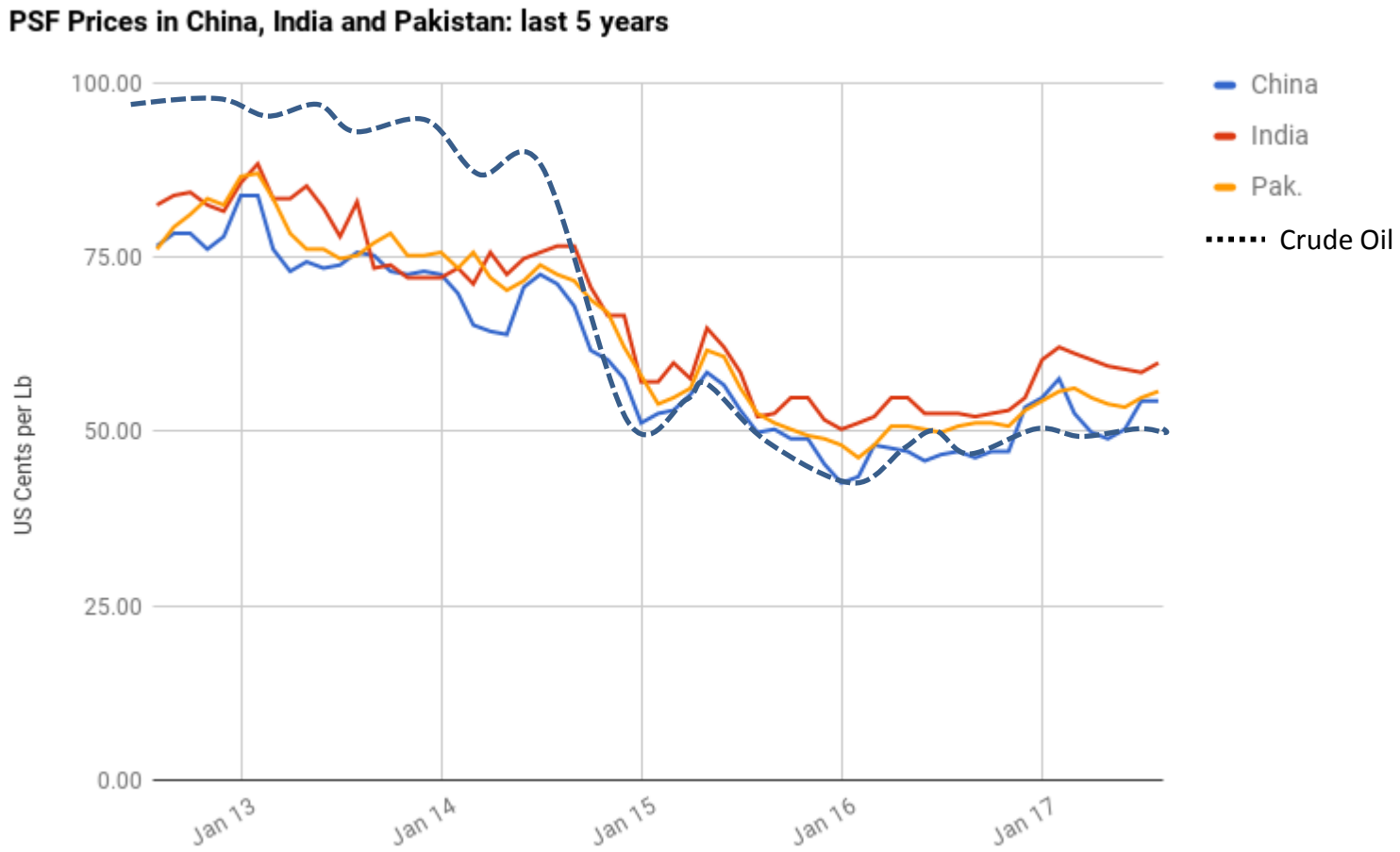

REINHART

# China Polyester Fibre Production since 1997 (indexed - %)



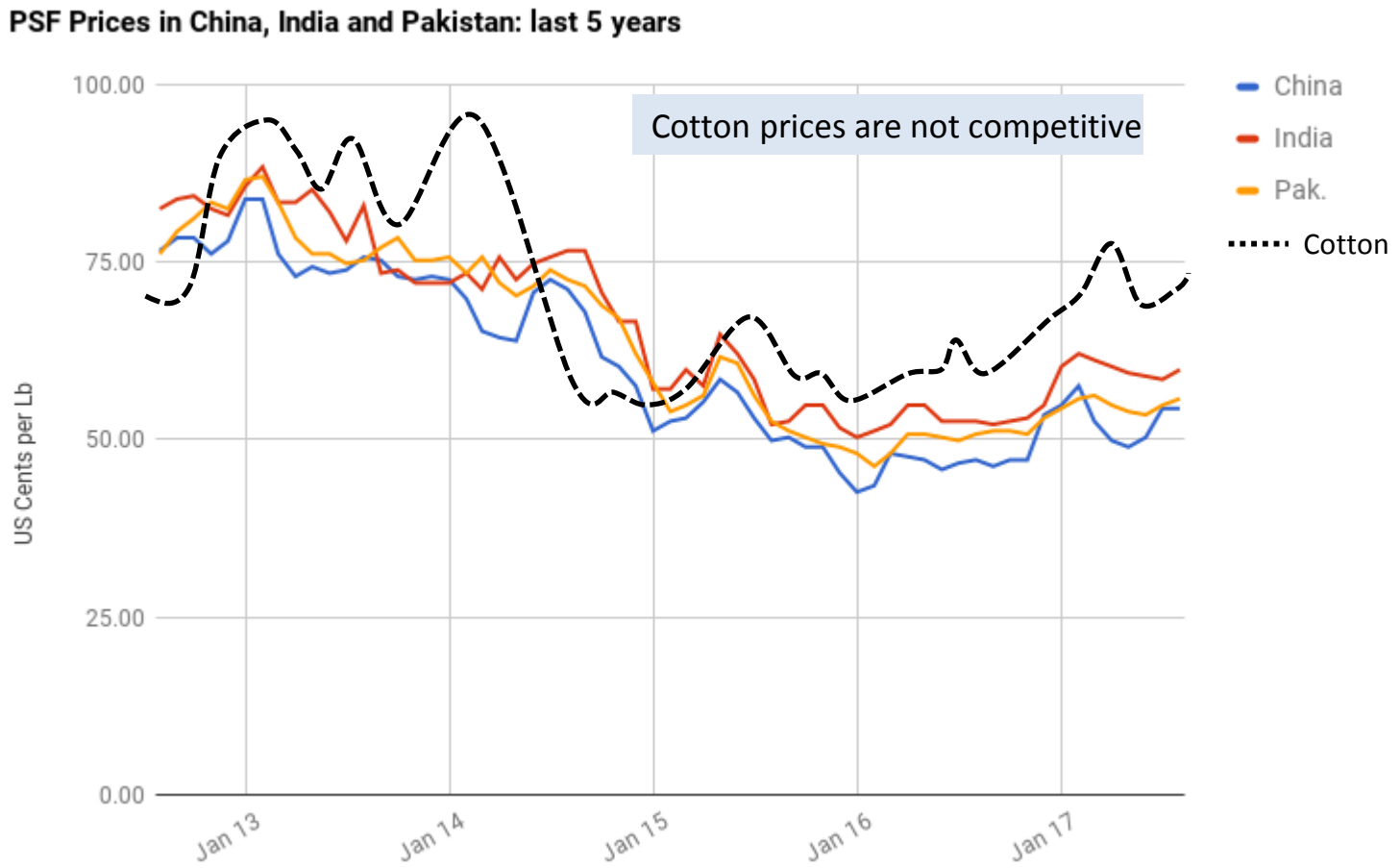

REINHART

# Polyester Staple Fiber (PSF) vs Crude Oil




REINHART

# Polyester Staple Fiber vs. Cotton



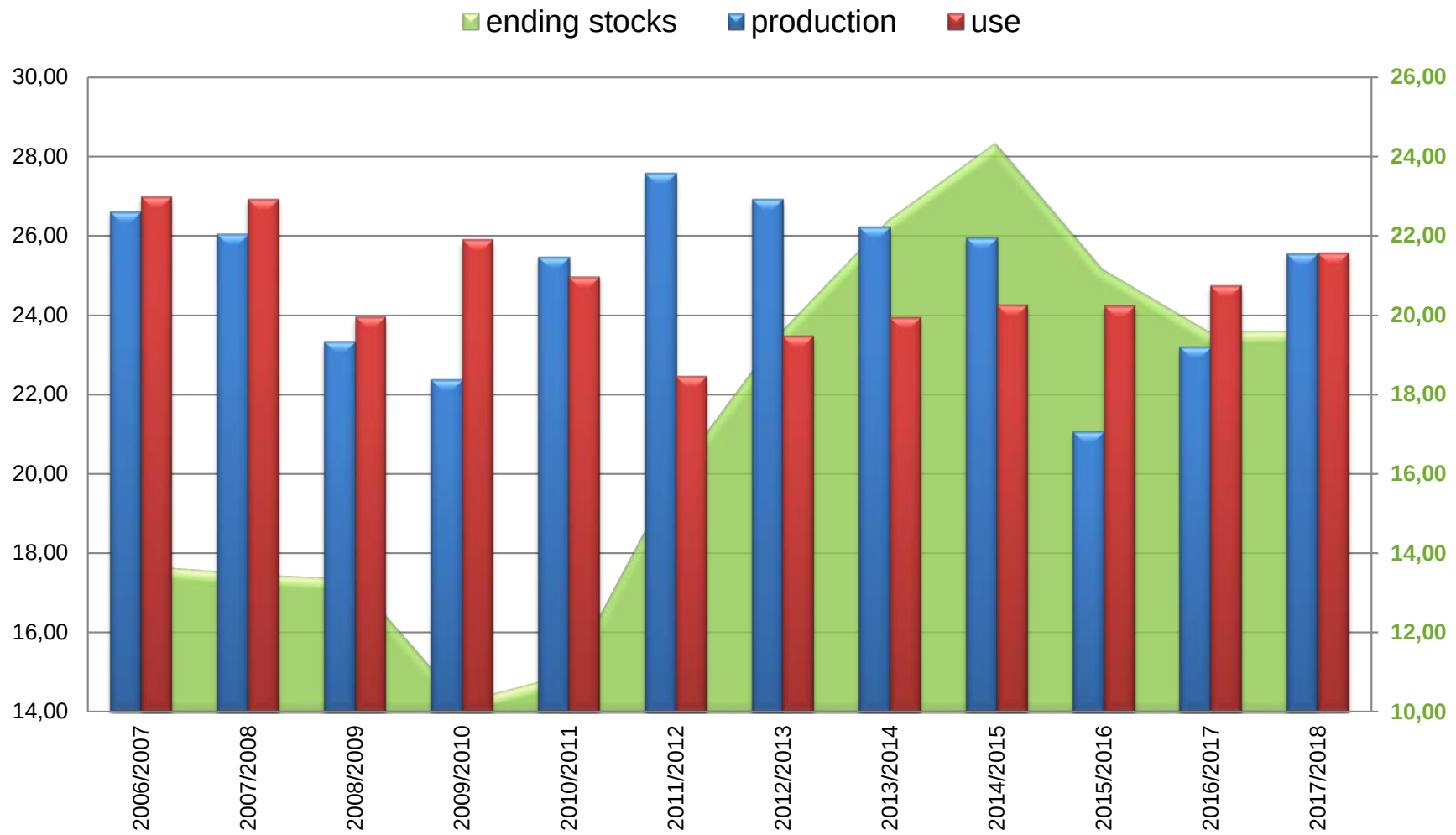

REINHART

# Consumption Trend - Comments

- Global Fibre Consumption will continue to grow.
- Growth will continue to come mainly from artificial fibres.
- Polyester prices correlate with oil prices
- Current oil prices don’t favour cotton usage
- Cotton consumption will also grow, but more slowly.

# 3. Global S/D Balance and Stocks

# World Production / Use / Ending Stocks

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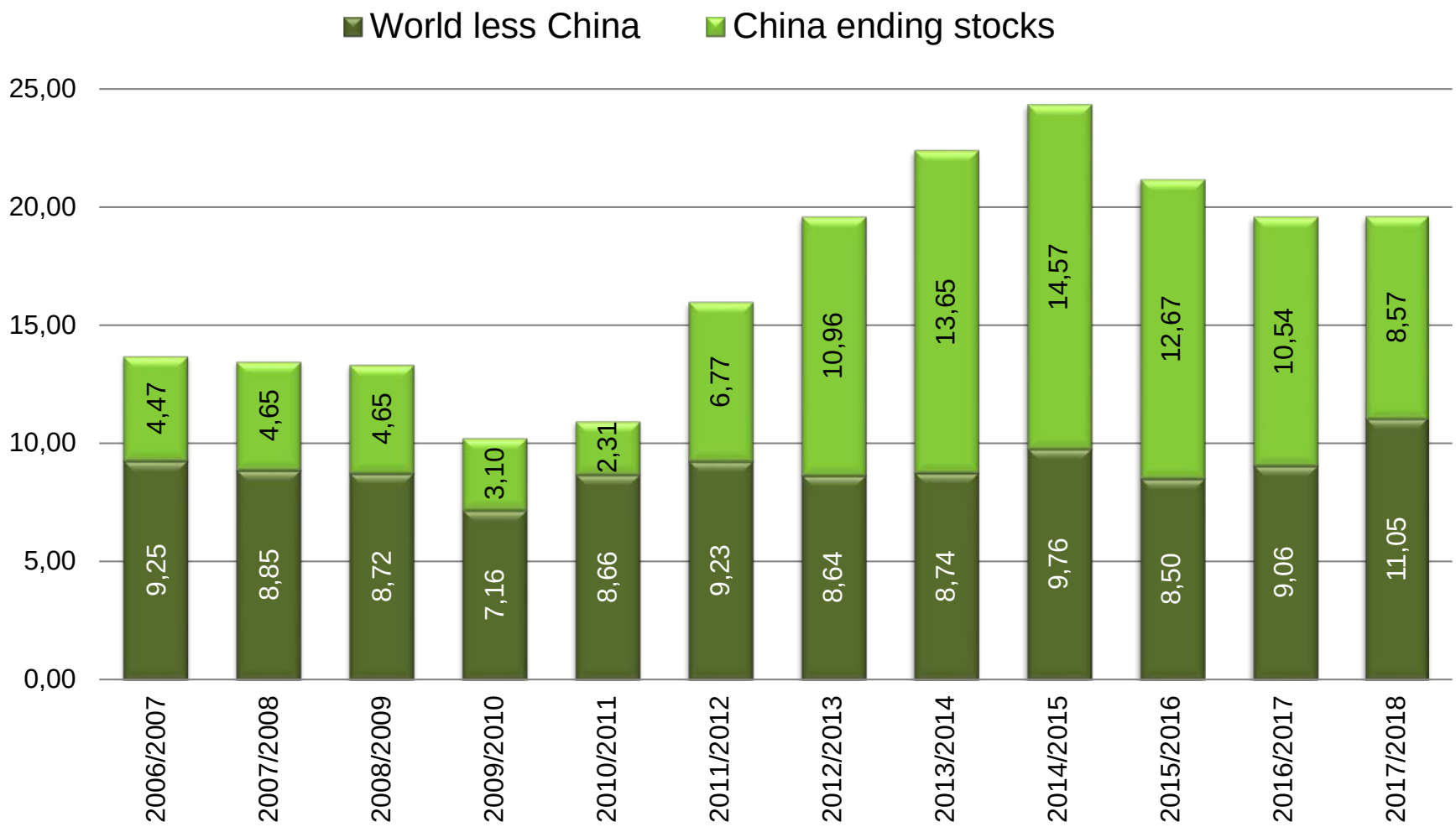
# Ending Stocks in China and Rest of the World

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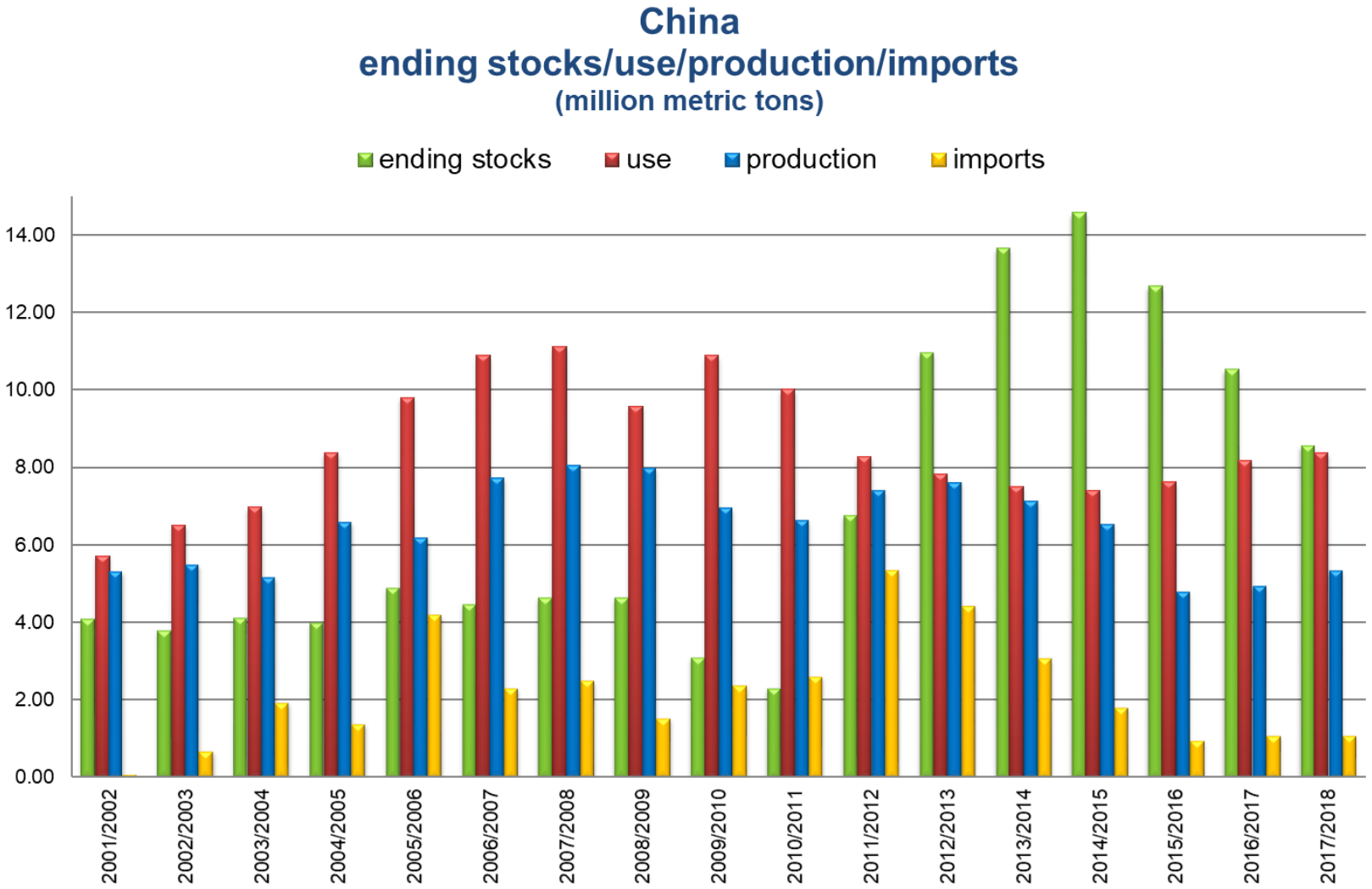
# Global S/D Balance - Comments

- Global stocks have come down but remain historically high.
- During past 4 years, global stocks have been concentrated in China; this imbalance is now being corrected.
- Chinese stocks are decreasing, while stocks outside of China grow to a record high.
- There is no shortage of cotton!

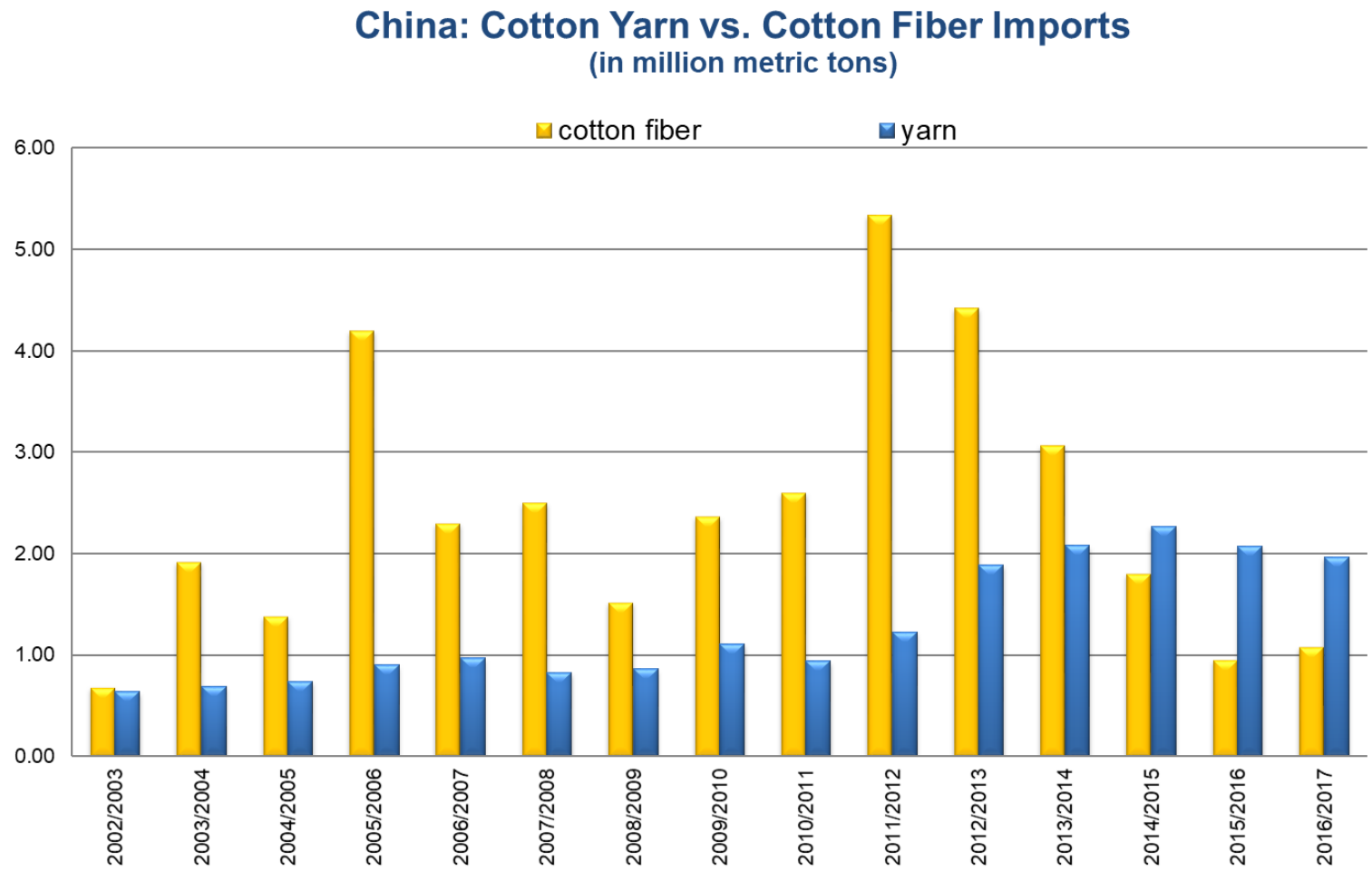
# 4. Outlook – China as main swing factor

# Chinese Supply and Demand




REINHART

# Chinese Yarn Imports

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# What to expect?

- Chinese consumption has recovered and is currently about 2.5 – 3m ts higher than domestic cotton production.
- In spite of recovering spinning business, Chinese yarn imports have not collapsed.
- The likelihood of more import buying will progressively increase during next 18 months as stocks come down.
- Increased Chinese import demand will support market prices, but not cause serious disruption in view of comfortable stocks.
- The world market is in the hands of Chinese shoppers....

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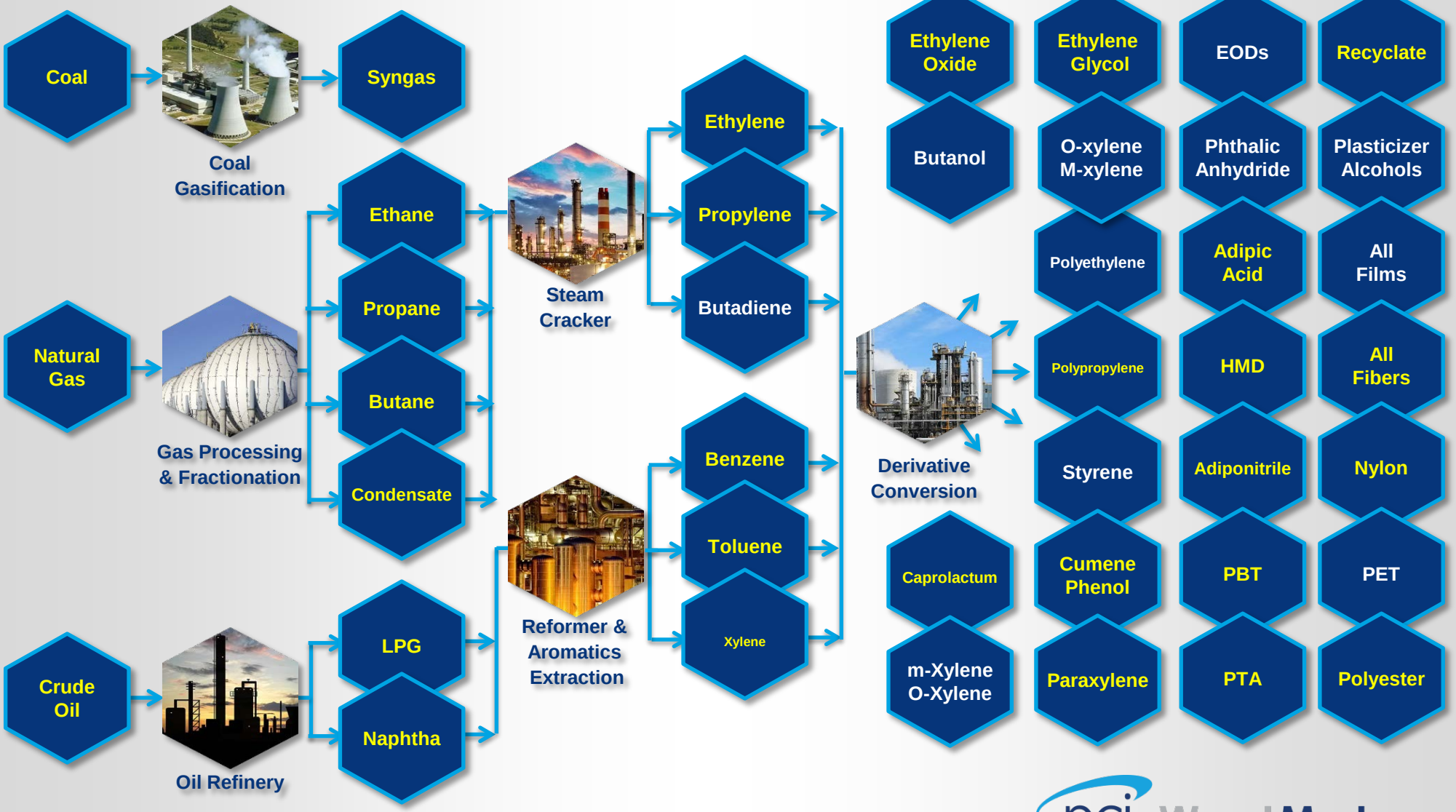
# ITMF Annual Conference

## 14-16 September 2017 – Bali, Indonesia

## Demand Creation and Sustainability
## The Role of Man-made Fibres
## 14 September 2017

# PCI Wood Mackenzie

## Bringing together best experience, methodologies, and insights across the entire energy to petrochemical value chain

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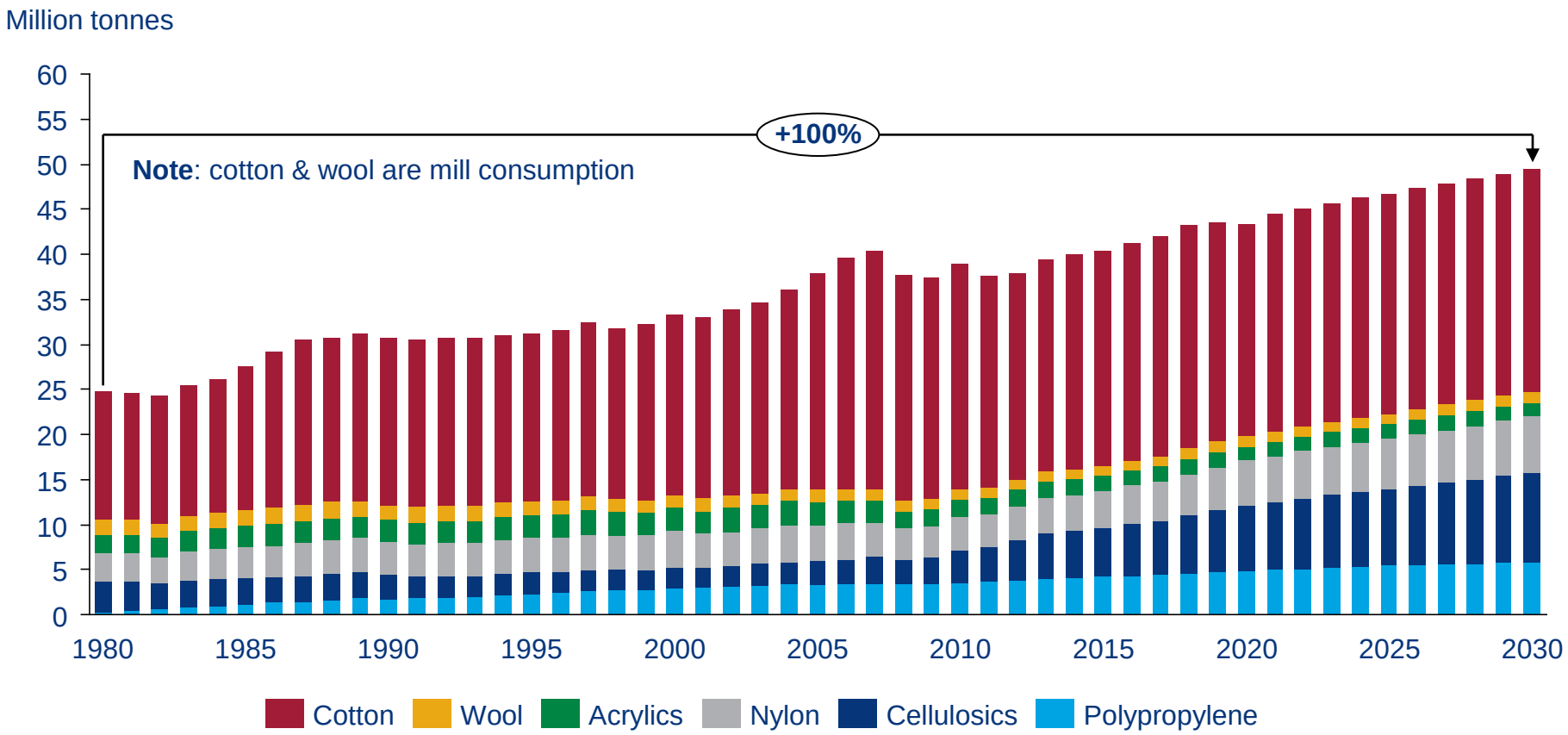
# All Fibres Global Production Growth

## All fibres demand – excluding polyester – is expected to double from 1980-2030



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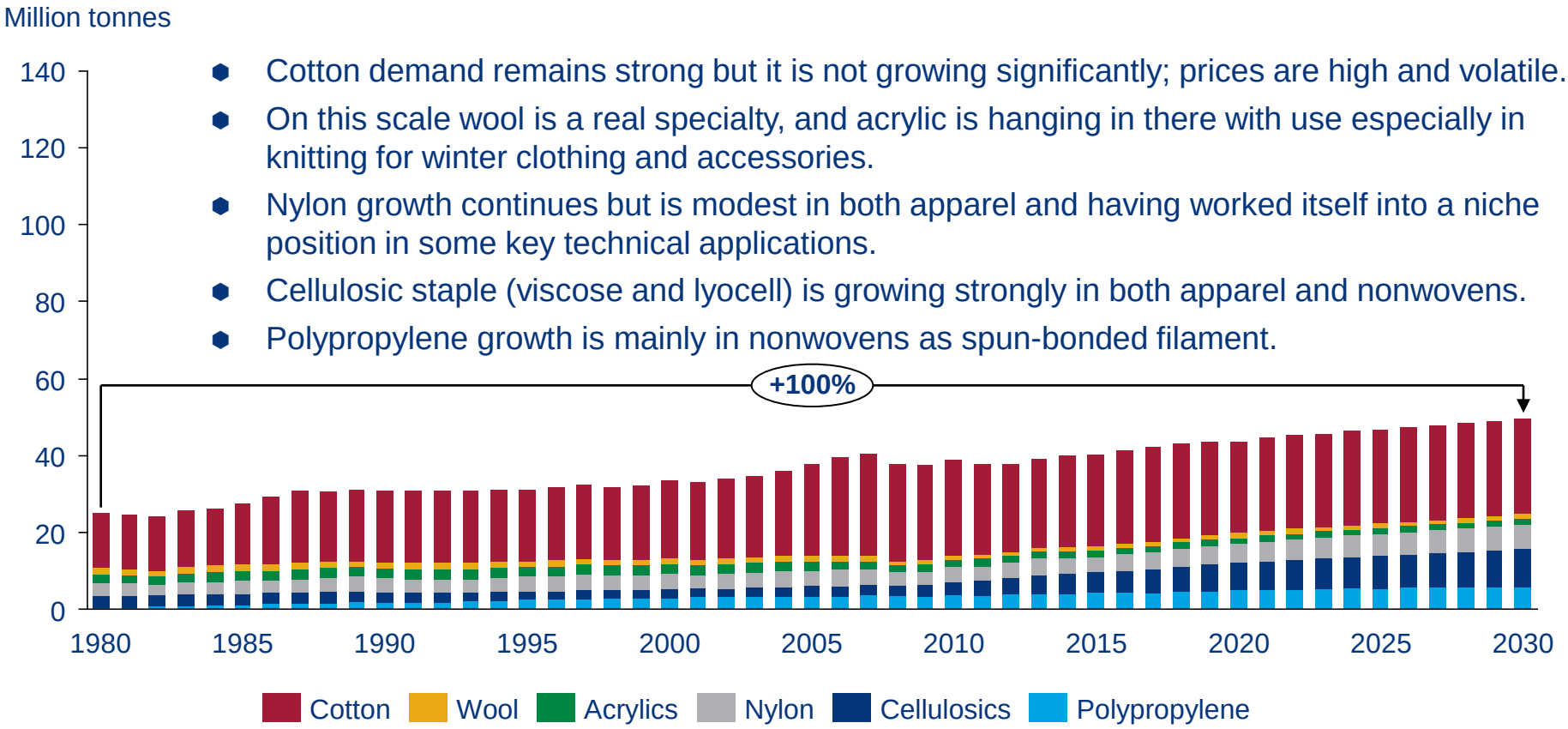
# All Fibres Global Production Growth

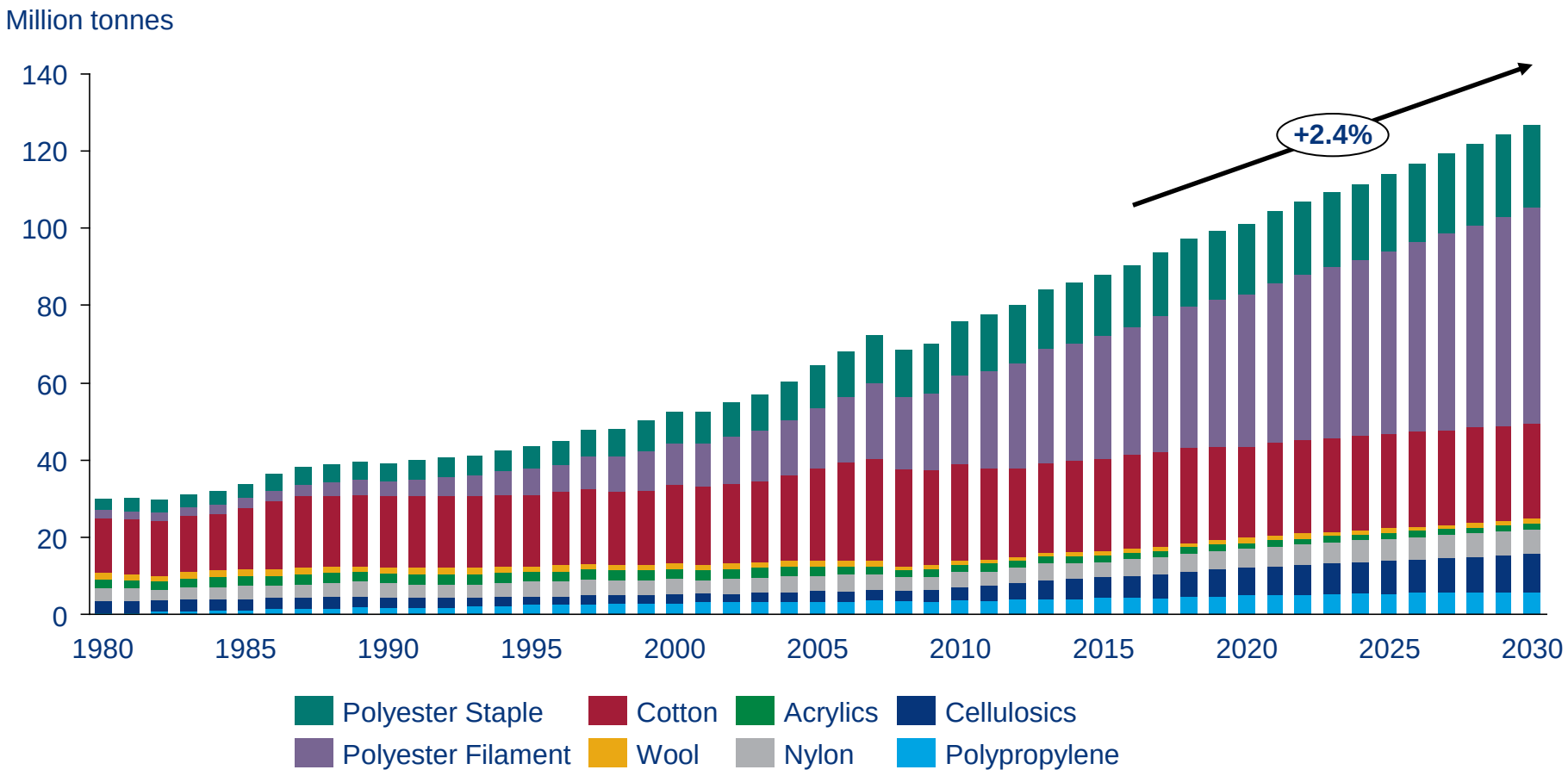
## Growth is seen in most fibre types as a more diverse fibre mix is often being used




- Cotton demand remains strong but it is not growing significantly; prices are high and volatile.
- On this scale wool is a real specialty, and acrylic is hanging in there with use especially in knitting for winter clothing and accessories.
- Nylon growth continues but is modest in both apparel and having worked itself into a niche position in some key technical applications.
- Cellulosic staple (viscose and lyocell) is growing strongly in both apparel and nonwovens.
- Polypropylene growth is mainly in nonwovens as spun-bonded filament.

# All Fibres Global Production Growth

## Polyester growth dwarfs other fibres; growing 2.4% (CAGR) overall from 2016-2030



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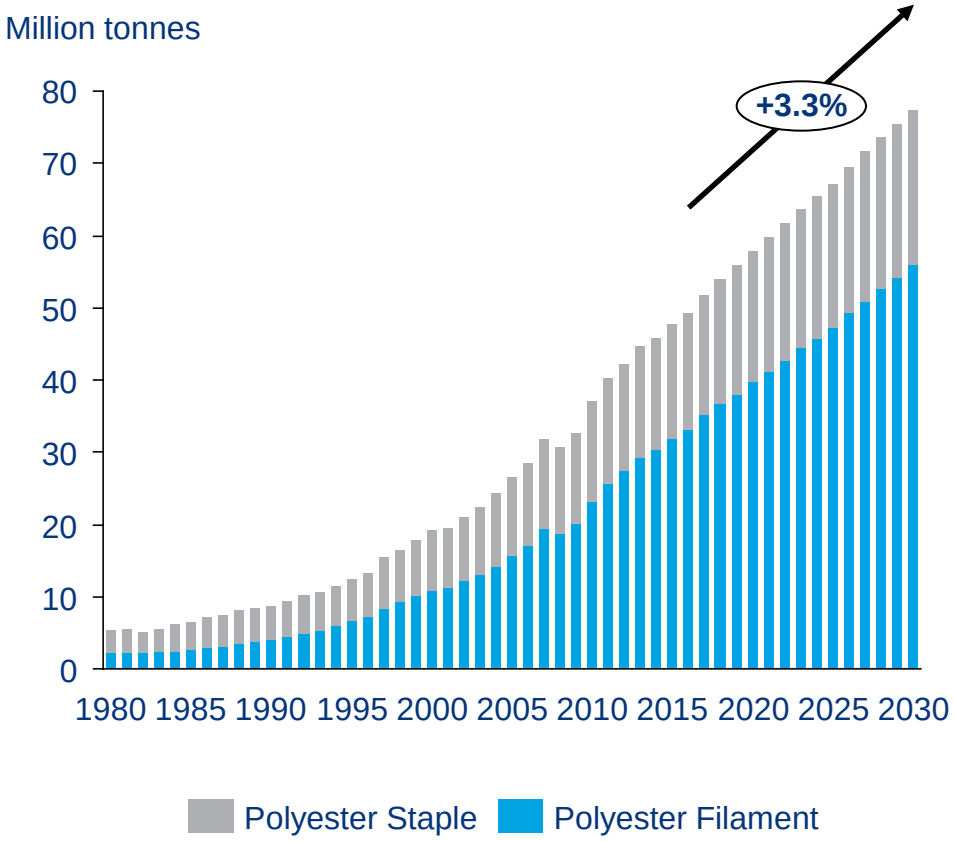
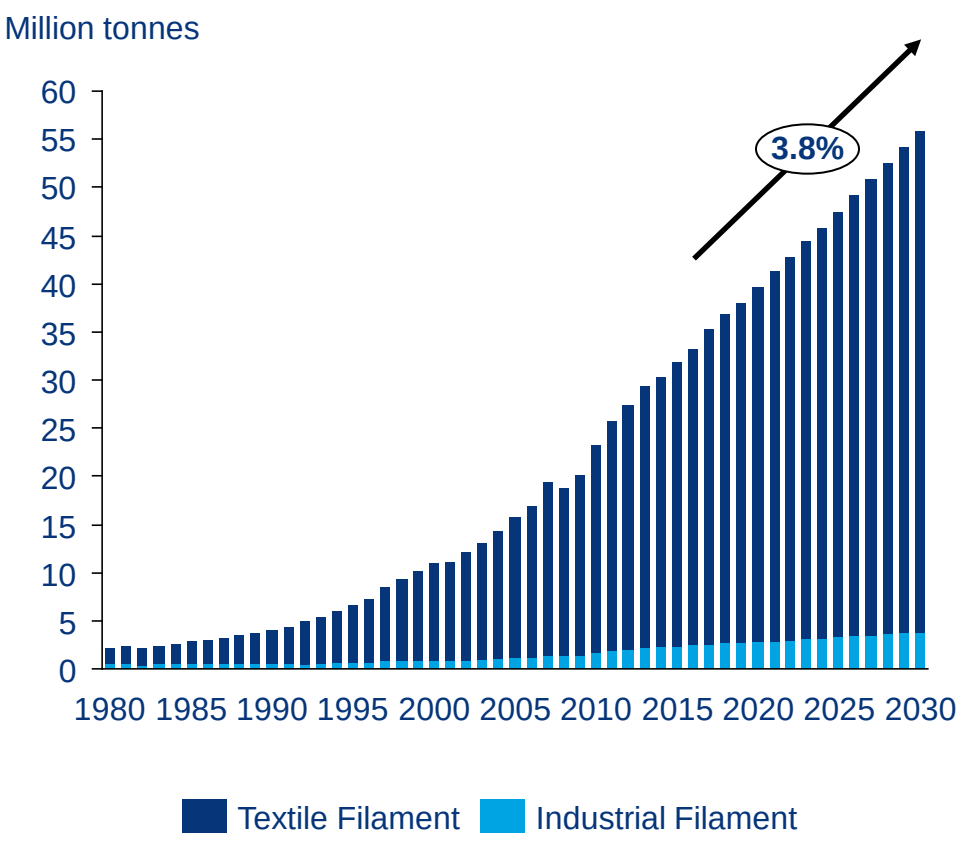
# Polyester Production by Fibre Type

## Textile filament is taking the lions share of growth rather than industrial filament or staple



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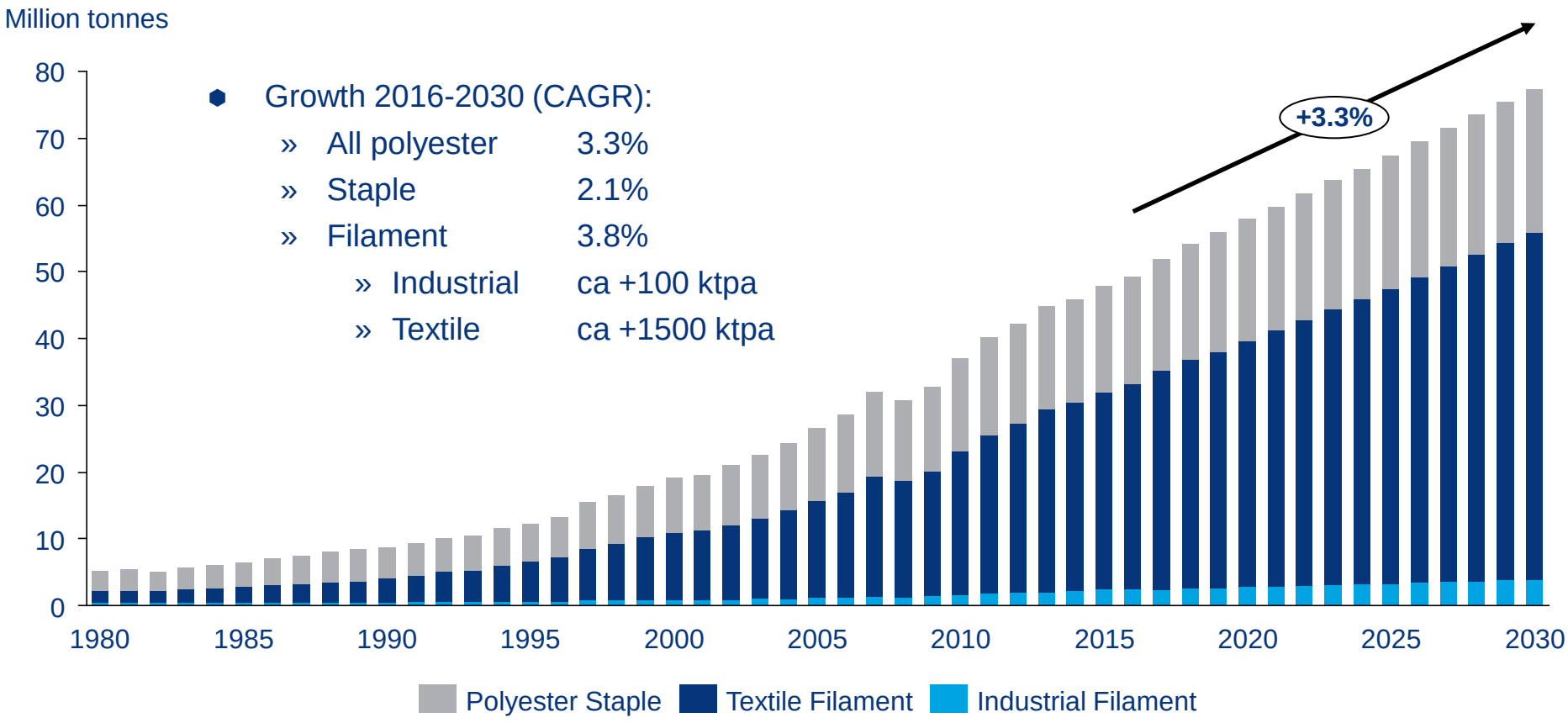
# Polyester Production by Fibre Type

## Textile filament is taking the lions share of growth rather than industrial filament or staple



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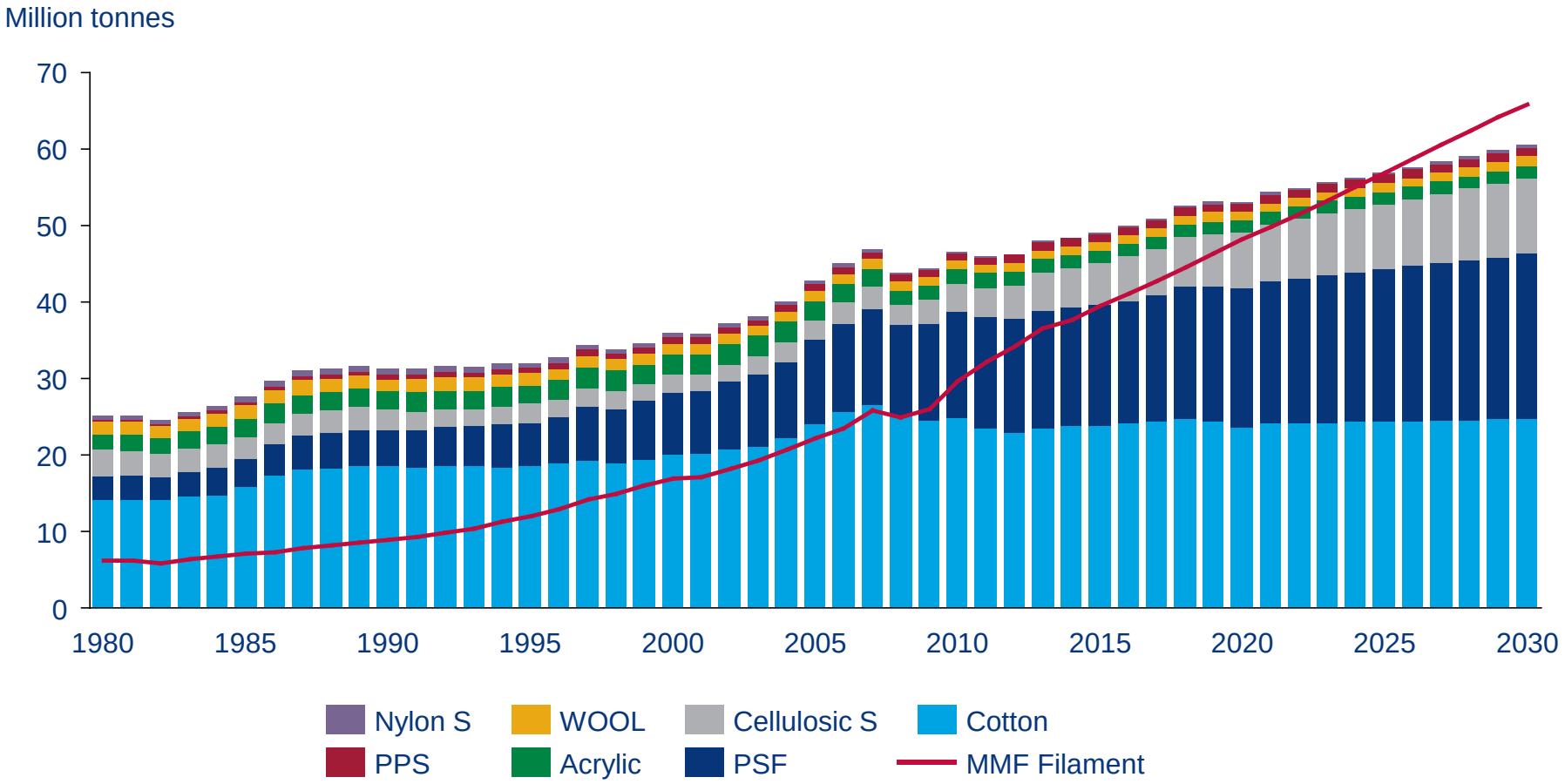
# Manmade filament is growing faster than staple fibres (MM & natural)

## MMF filament will make up more than 50% of World fibre mill consumption from 2025



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# The wide variety of fibres used in automobiles

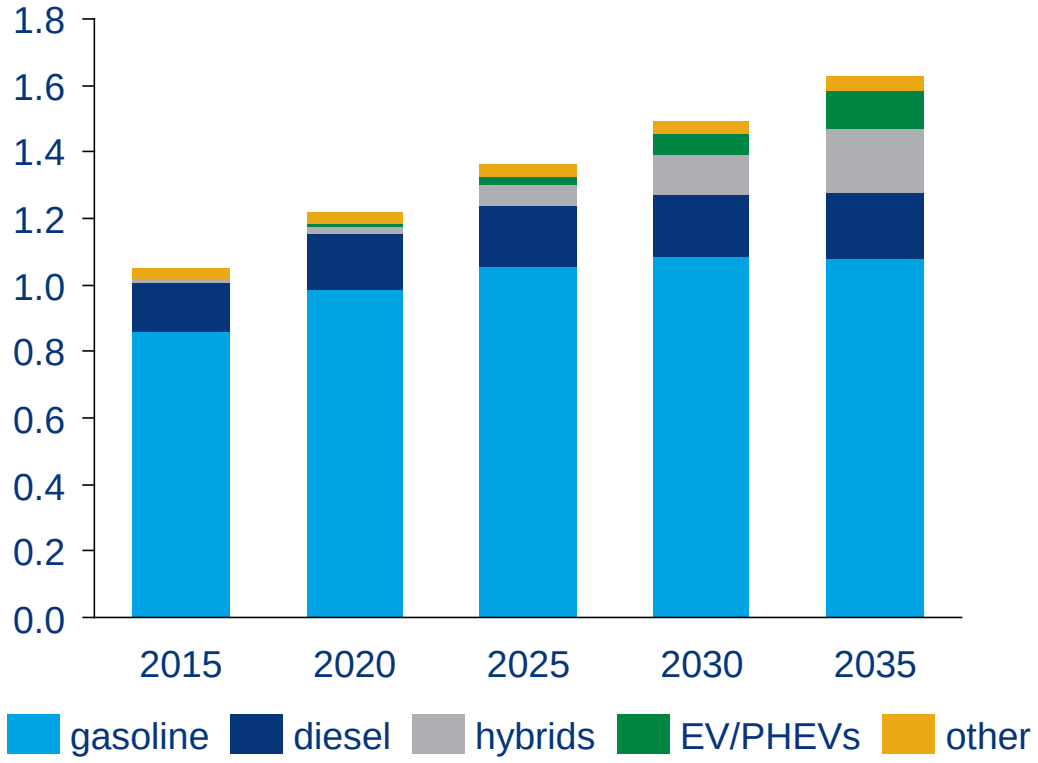
## Functional benefits define which fibres are needed in each application – not all polyester

| Function | Car part | Fibre Materials |
|---|---|---|
| Safety | Airbags | NIF, PIF |
| | Seat belts | PIF |
| Comfort | Headliner | PSF & spunbond filament |
| | Carpets | BCF (PES / PA), PSF |
| | Seats | PTF |
| | Sunroof & blinds | PTF |
| Strength and manufacturing benefits | Chassis / body | Carbon fibre, glass fibre |
| | Sewing thread | NIF, PIF |
| Energy efficiency and noise reduction | Acoustic insulation | PSF & shoddy |
| | Aerodynamic panels | PSF (incl. low melt) |
| Safety, operation at many temperatures and manufacturing benefits | Engine - MRG hoses, filters, battery | NIF, NSF, PIF rayon, aramids, glass fibre, carbon fibre |
| | Tyres | NIF (PA6 & PA66), PIF (HMLS), rayon filament, carbon fibre |

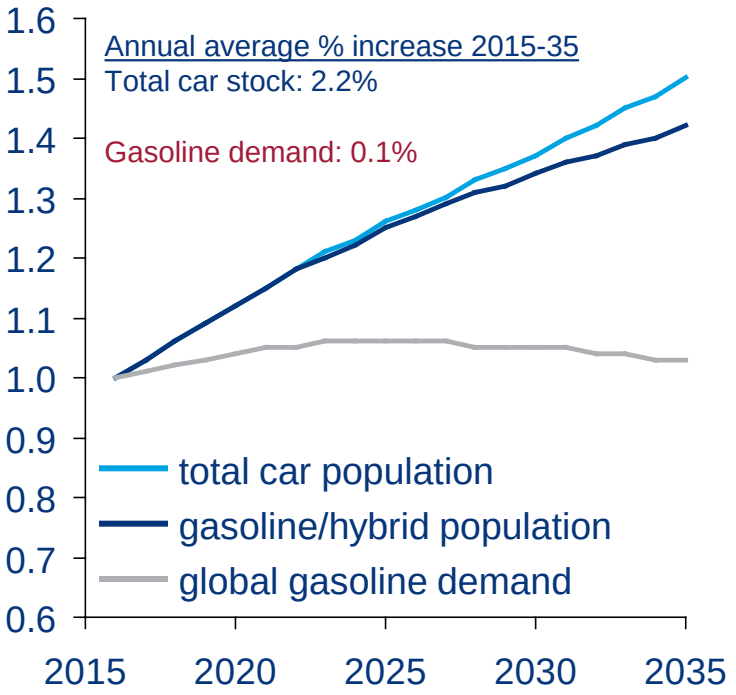
# The wide variety of fibres used in automobiles

## Growth in vehicle sales will drive growth in demand for these many fibre types

Billion units




Indexed to 2016



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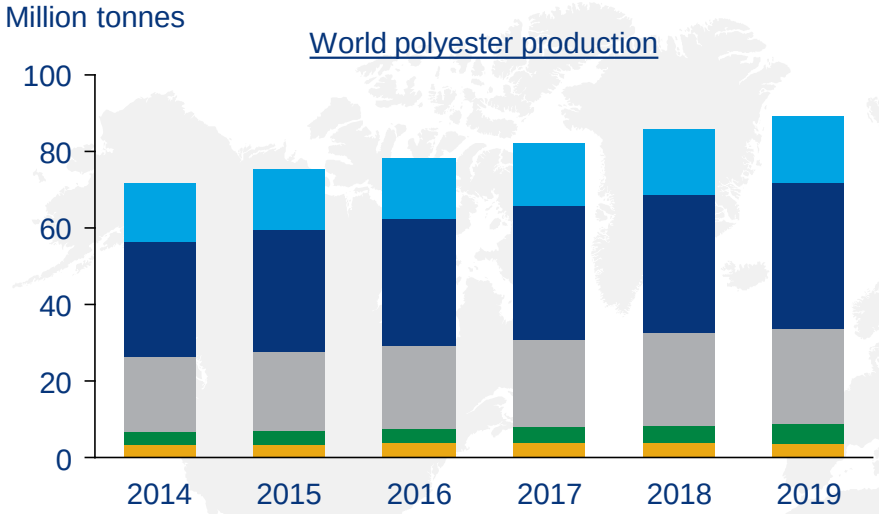
# World Polyester Growth Forecast 2016-19

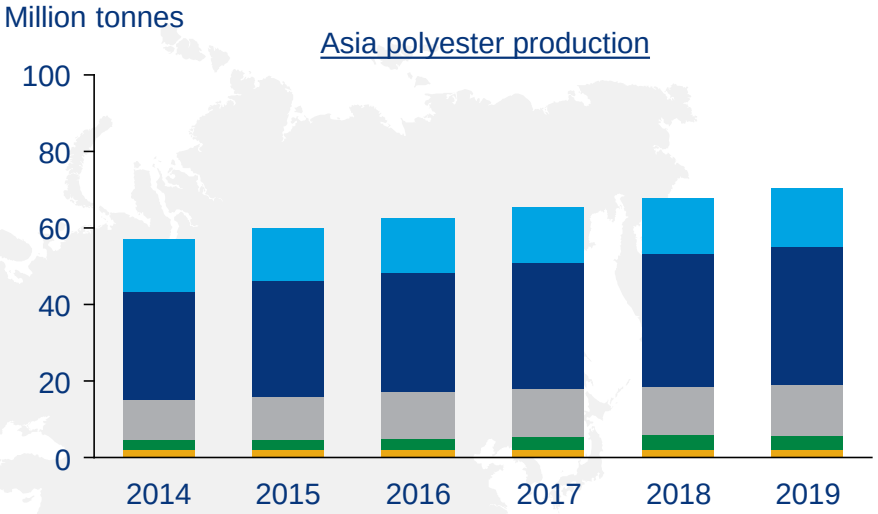
| kt | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|
| Staple | 16,144 | **16,576** | 17,260 | 17,785 |
| Filament | 33,195 | **35,275** | 36,723 | 38,038 |
| Total Fibre | 49,339 | **51,851** | 53,983 | 55,823 |
| | | | | |
| PET Resin | 21,766 | **22,460** | 23,852 | 25,191 |
| Film | 4,082 | **4,358** | 4,516 | 4,758 |
| Other Resins | 2,161 | **2,342** | 2,457 | 2,523 |
| | | | | |
| Polymer Production | 71,552 | **75,018** | 78,504 | 81,528 |
| Polymer Capacity | 89,043 | **93,417** | 100,059 | 105,187 |
| Polymer Utilisation Rate | 77.9% | **77.8%** | 76.0% | 75.1% |
| | | | | |
| Polymer Production Growth | 4.1% | **4.7%** | 4.6% | 3.9% |
| PSF | 1.8% | **2.7%** | 4.1% | 3.0% |
| PFY | 4.0% | **6.3%** | 4.1% | 3.6% |
| PET | 5.9% | **3.2%** | 6.2% | 5.6% |

Source: PCI Wood Mackenzie

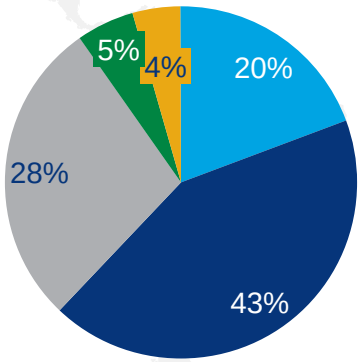
# Global and Asia Polyester Production

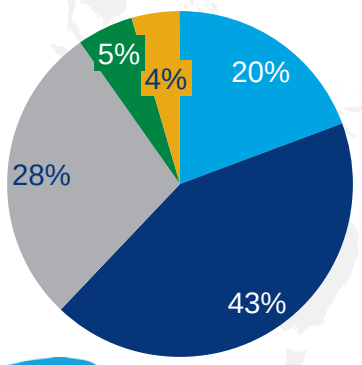
## Polyester growth remains strong as polyester fibre market development continues








Source: PCI Wood Mackenzie



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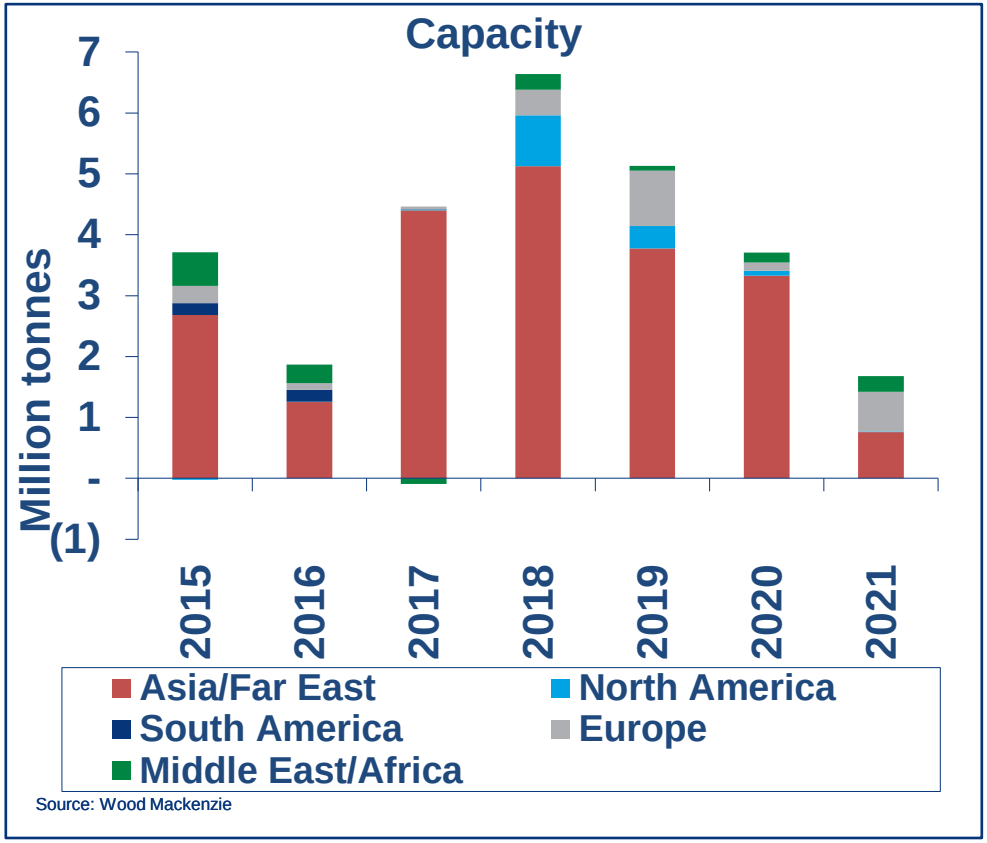
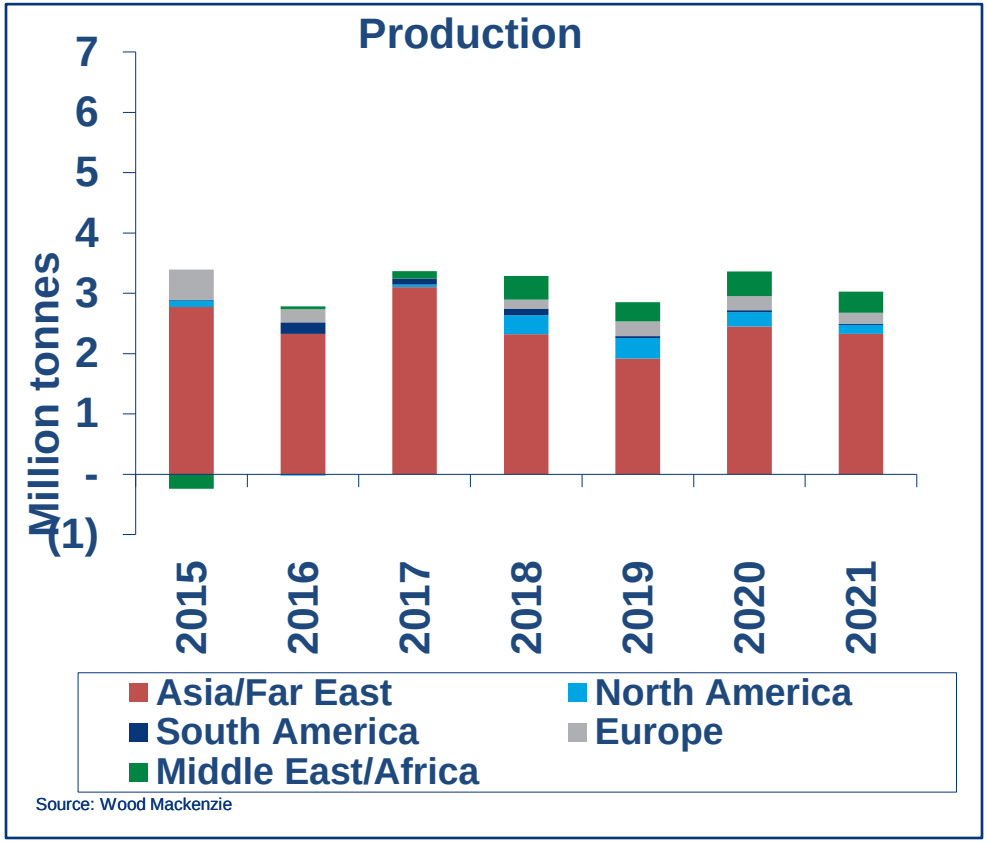
# Global polyester polymer growth



Source: Wood Mackenzie



Source: Wood Mackenzie



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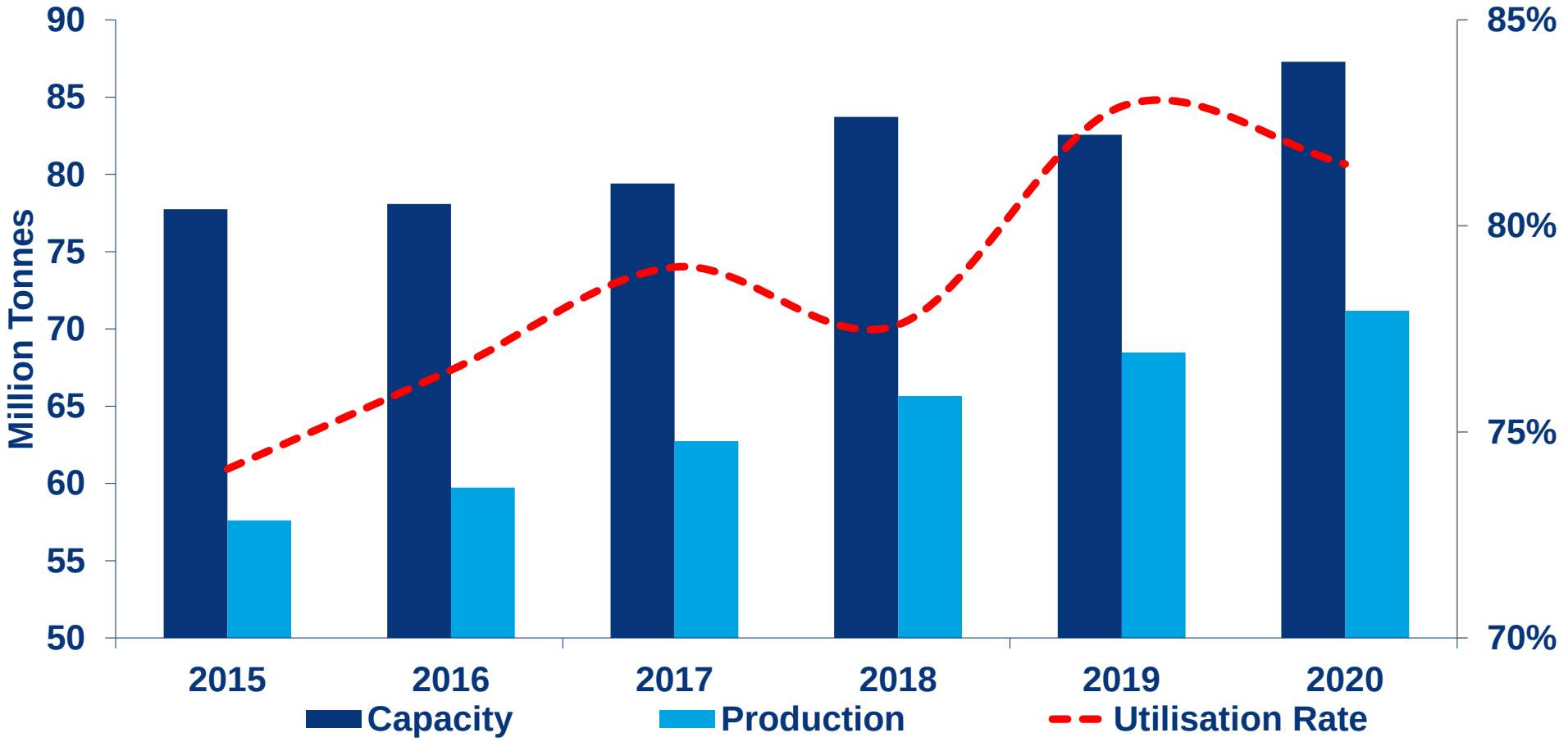
# Polyester raw materials: world PTA supply demand

## PTA markets may be recovering, investment continues and the surpluses persist




*Source: PCI Wood Mackenzie*



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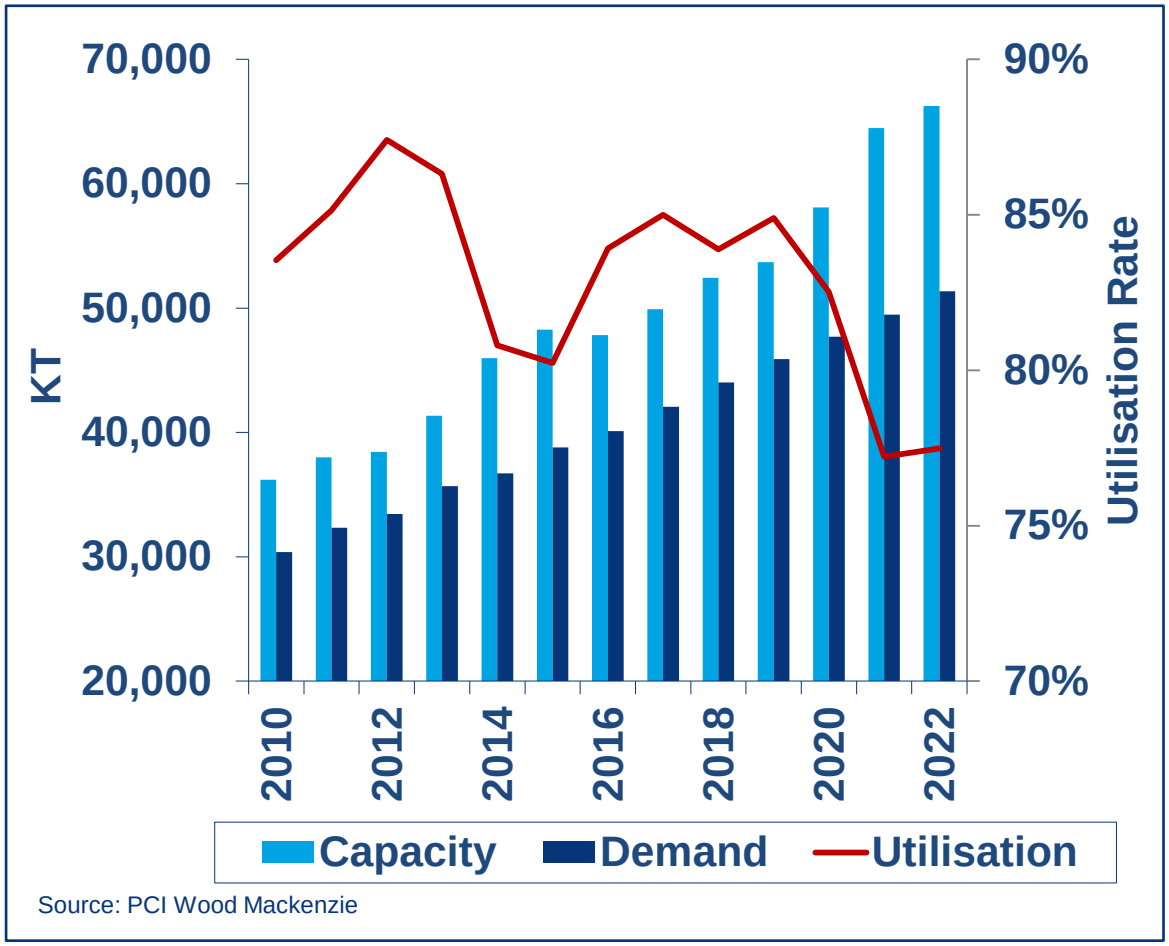
# Polyester raw materials: world paraxylene supply demand

## Capacity additions in China and Middle East set to add over 10 Mt of new supply by 2022

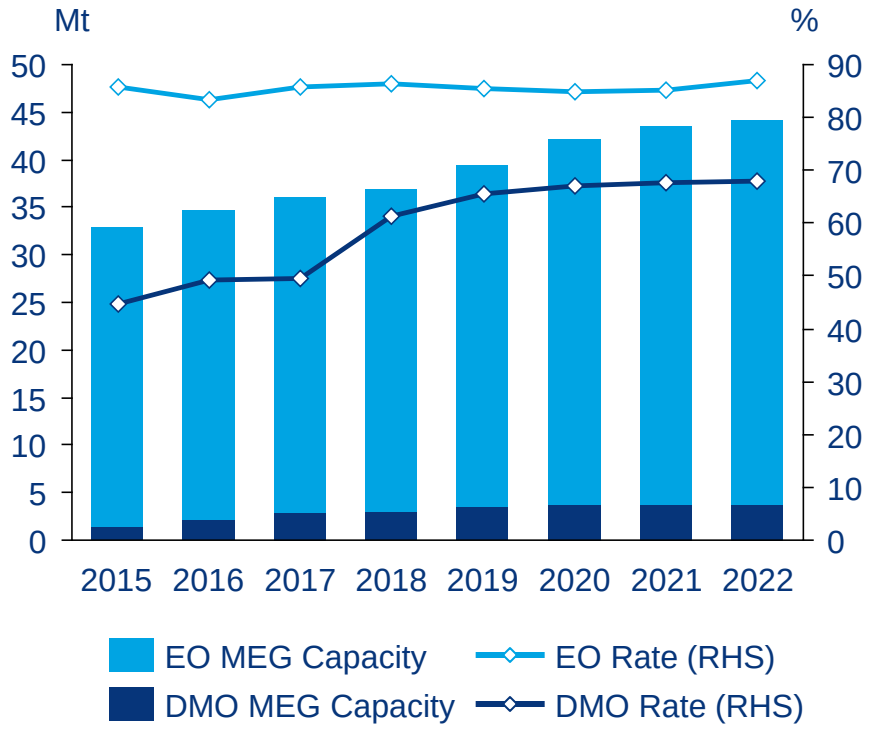



Source: PCI Wood Mackenzie

- Huge investment forecast in PX over the coming 5 years.
- Major chinese fibre and PTA producers back integrating into refining
- Peak gasoline demand in N America and Europe could see oil majors renewing interest in moving lower values surplus feedstock into the polyester sector

# Polyester raw materials: world MEG supply

MEG supply remains relatively tight. Alternative supply routes are being developed and new capacities are planned.

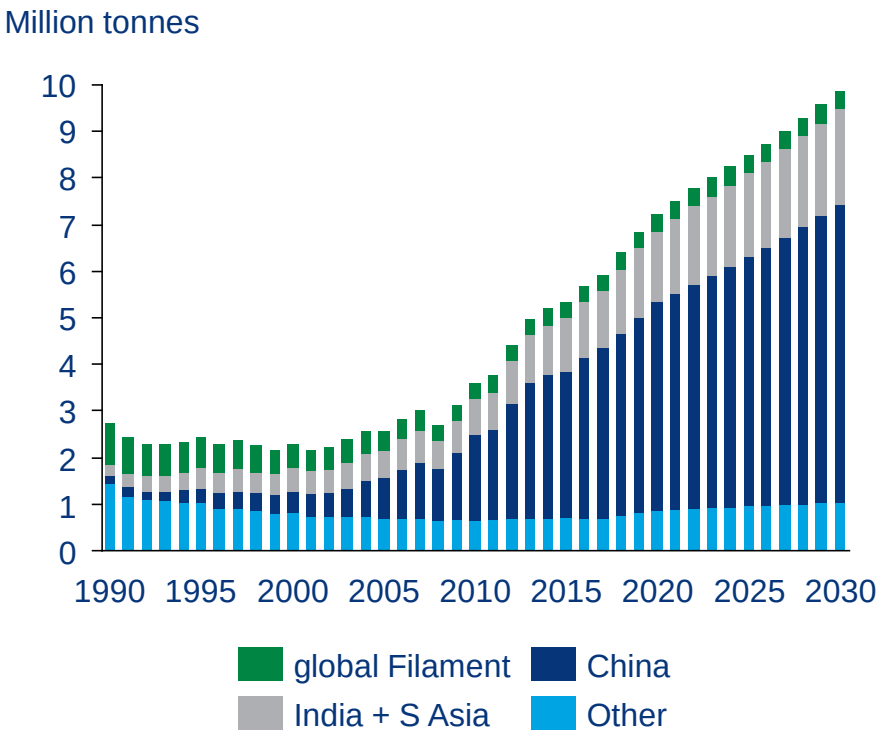


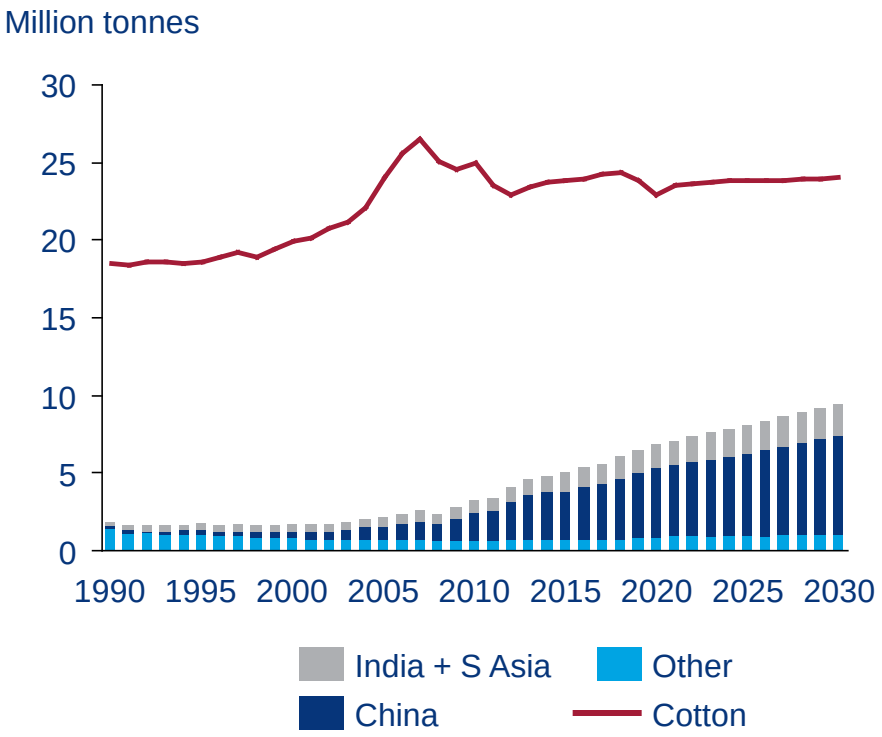

Source: PCI Wood Mackenzie

- The majority of MEG is made from ethylene oxide (EO), and EO MEG plant utilisation rates are in the high 80% range. Price spikes from EO MEG supply will disrupt pricing from time to time, but low unit consumption vs PTA means the impact on polyester pricing is moderate.
- Coal to MEG via dimethyl oxalate (DMO) may relieve supply tightness eventually, but DMO technology is still in its early days, and we have limited our forward view on capacity and production.
- India, Malaysia and Saudi Arabia are adding 1.7 Mt new supply in 2017 with US ethane-based MEG capacity and further Saudi capacity totalling 2 Mt in 2019

# Synthetic cellulosics production

## Primary growth is in viscose and lyocell staple (filament demand includes UHP tyres)

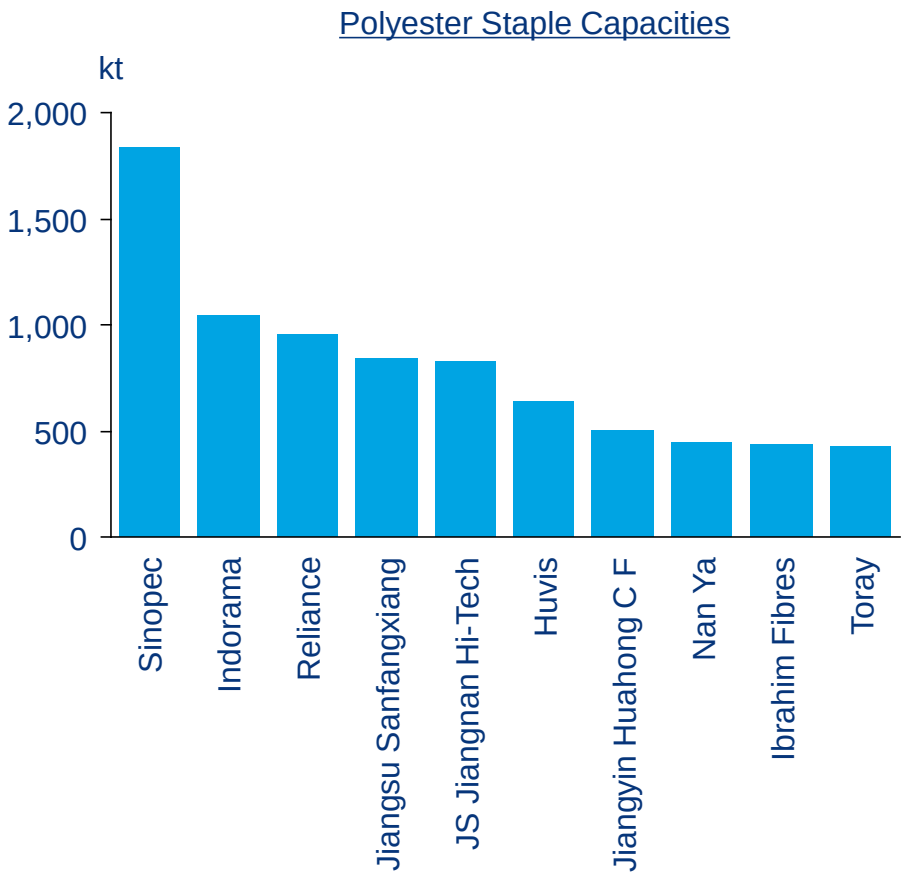


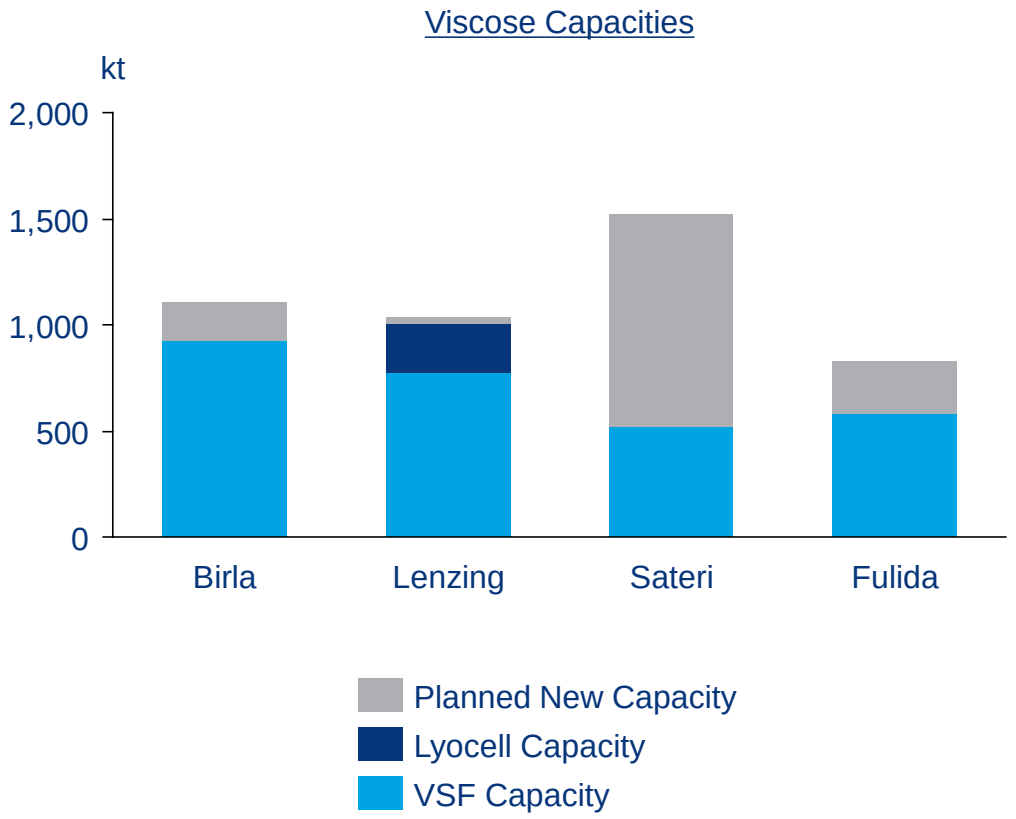




- filament demand includes UHP tyres

# Exciting prospects drive cellulosics capacity growth

Some of the key players are now as big large polyester suppliers.



# Sustainability within the Fibres Industry

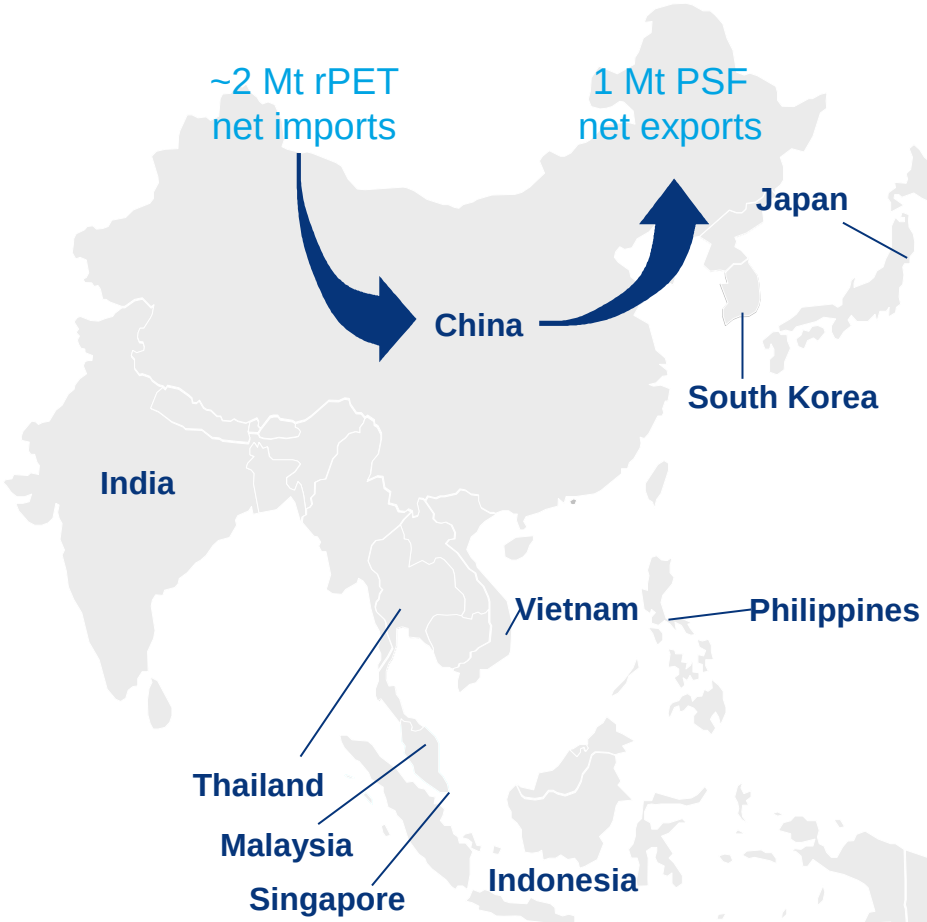
## Progress has been made and there is still a long way to go

- MMFs – an essential part of the textiles mix, but with a poor image
  - » Consume fossil resources, low biodegradability, plant emissions
  - » Micro-plastics in the environment gaining media attention
- Work on sustainable feedstocks has begun but will not meet global demand volumes any time soon.

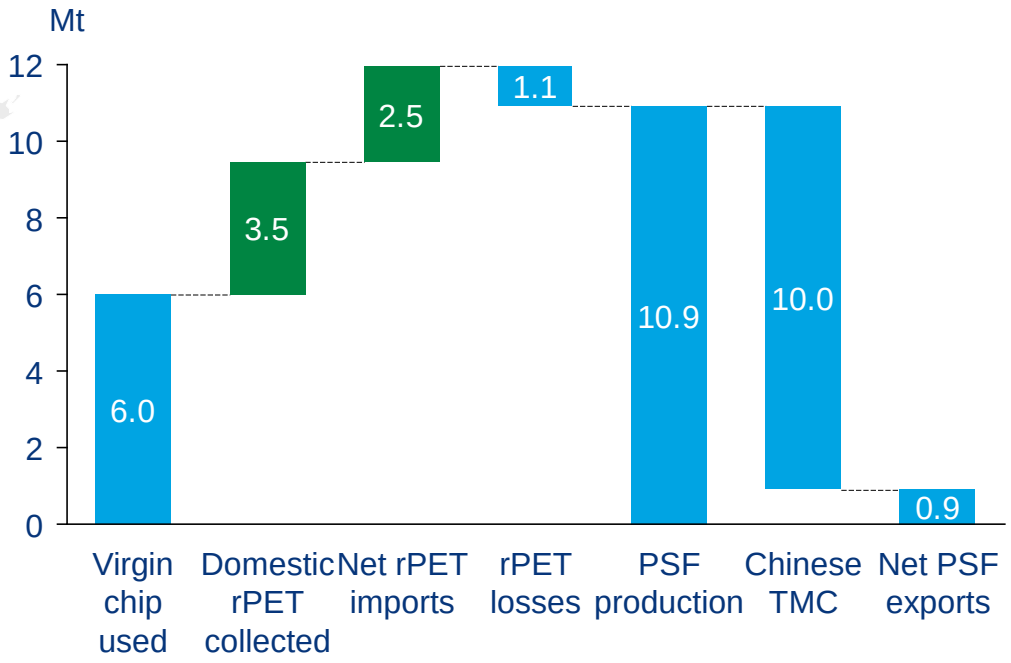
- Improved efficiencies and low emissions to make synthetic fibres
- Recycling and regeneration are well established:
  - » PET bottle resin to staple and filament
  - » Post-industrial recycling of PA into EP
  - » Post-consumer regeneration of PA6 depolymerised to CPL
- How to arrive at a “circular apparel economy”?
  - » Cotton can be recycled into viscose; collection has started
  - » Mixed fibre fabrics pose the challenge of separation.

# Recyclate established as polyester staple feedstock

## Chinese PSF consumes a large amount of domestic and imported rPET




Feedstock estimates for Chinese PSF production 2017




Source: PCI Wood Mackenzie



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# Conclusions

## Demand for MMF grows as they address many of our needs well

- The main growth will come from polyester (filament and staple), cellulosic staple and PP filament.
- We do not anticipate significant growth in cotton, wool or the synthetic fibres of nylon or acrylic.
- We expect continued growth in spandex and other specialty high performance fibres; but from a small base.
- Polyester continues to lead the growth due to its flexibility to operate in high stress industrial applications as well as in fine denier apparel, nonwovens and many other end uses.
- China production continues to dominate the world of polyester, and more investment is expected.
- Relatively low cost and stable oil pricing will keep polyester raw materials and fibres competitively priced against both natural and other MMF.
- Of all the synthetic fibres polyester has the best recycling story, particularly with the use of post consumer PET bottles into fibres.
- As for the circular textiles economy, there are some bright spots, but overall it is still a long way off.

# Disclaimer

## Strictly Private & Confidential


| | |
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| Email | contactus@woodmac.com |
| Website | www.woodmac.com |


INVESTORS IN PEOPLE | Gold

# Offshoring to Reshoring

## *A Fiber Industry Perspective*

***Uday Gill***

***CEO Fibers***

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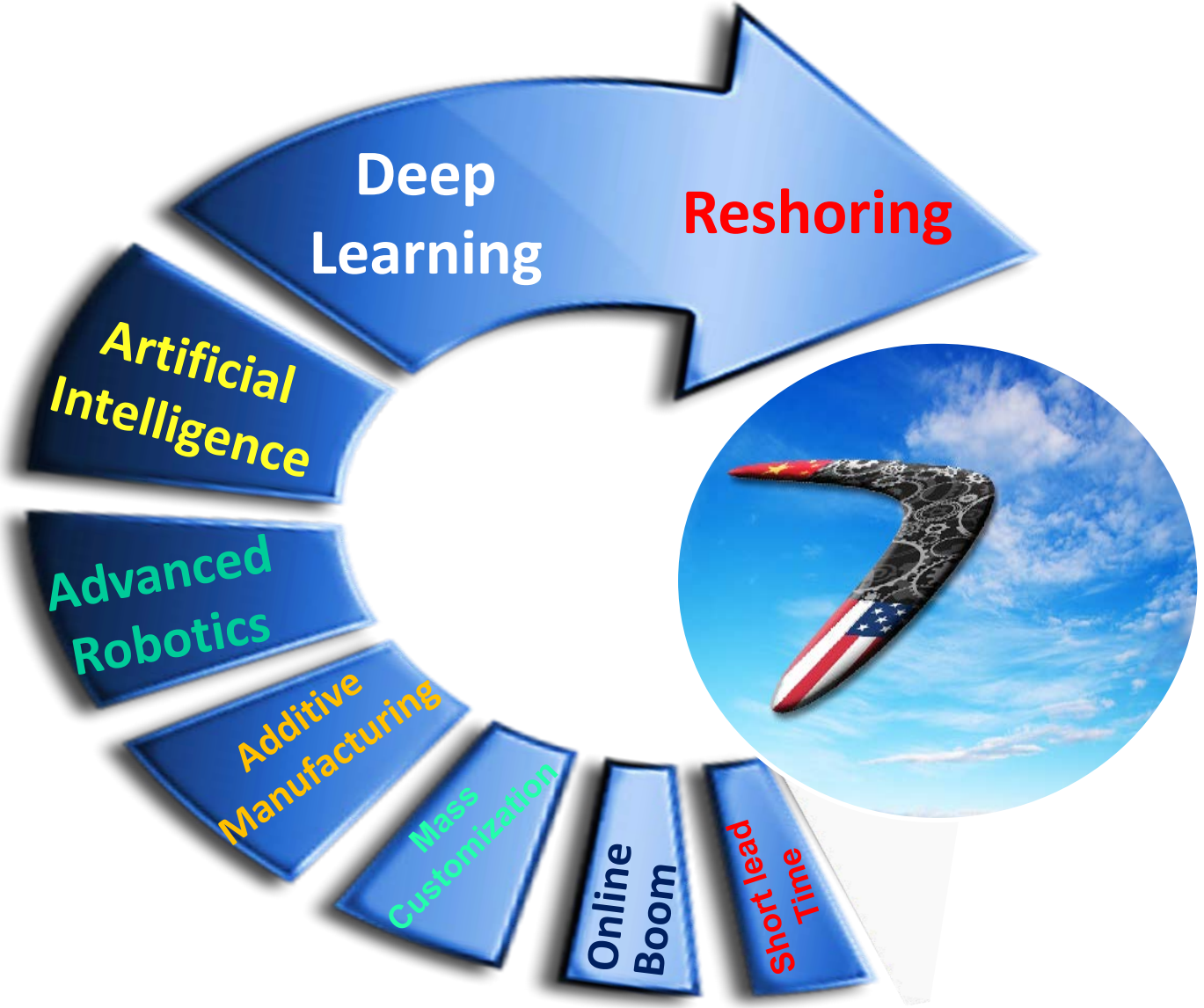
# Reshoring enablers closing supply chain gaps

## New drivers forcing global supply chain models to adjust




Offshoring that evolved due to dismantling of trade barriers,
quest for cheap labor and capacity scale up without innovation is reversing



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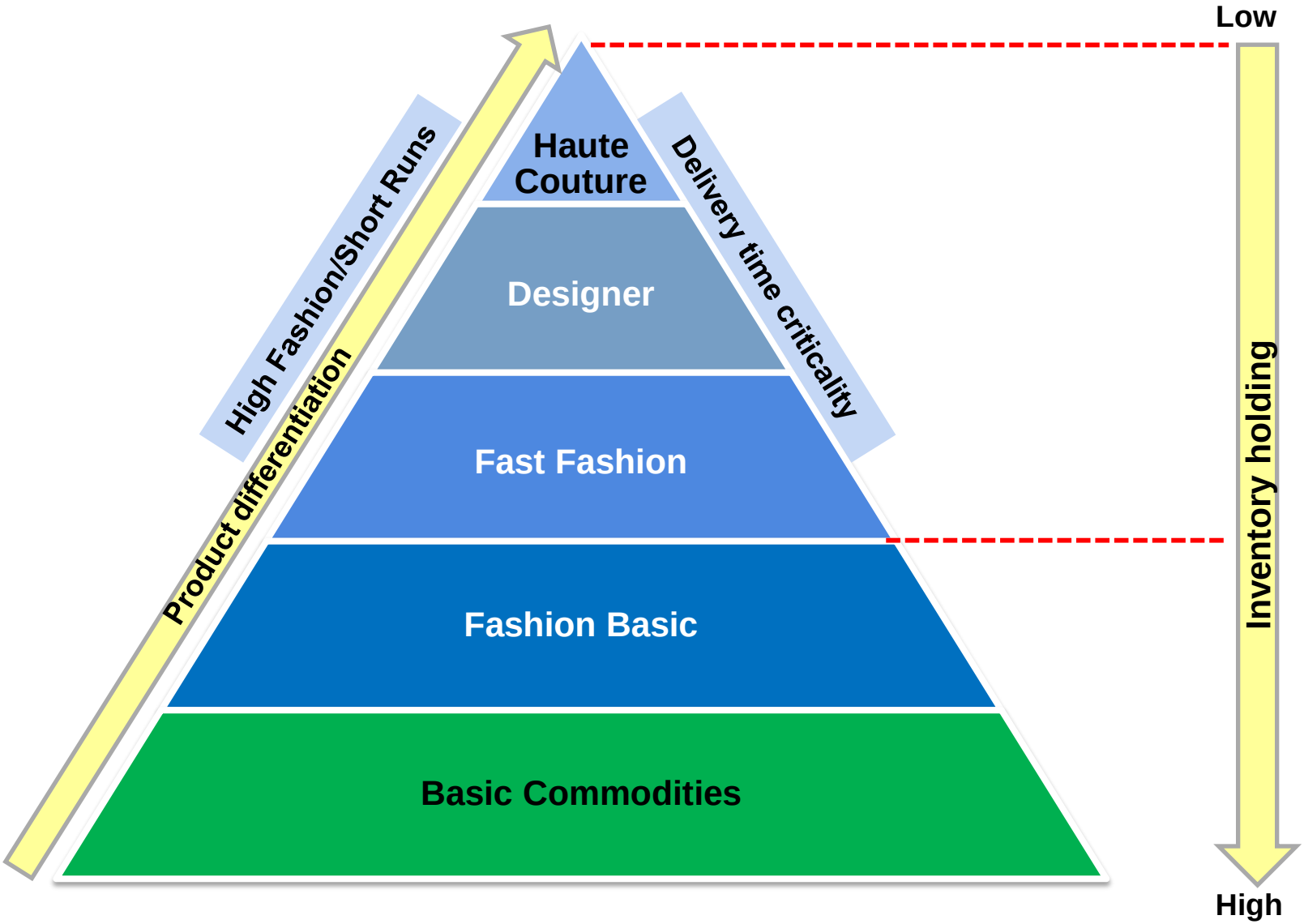
# Need for shorter lead times will drive Reshoring

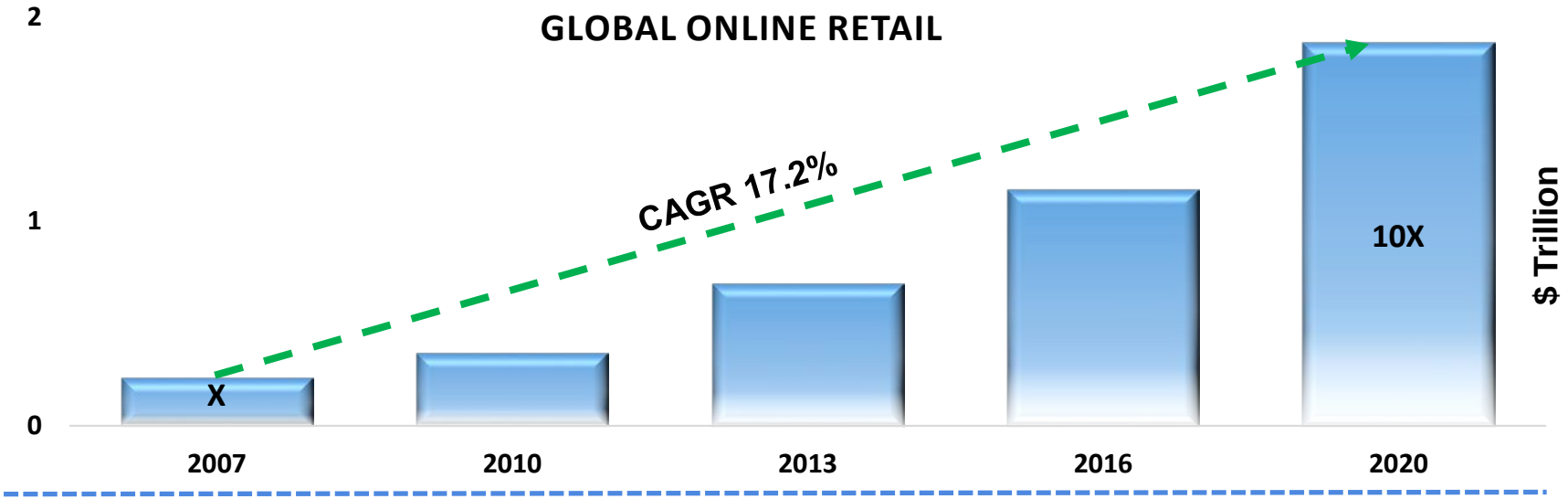
## Increasing demand for mass customization driving local manufacturing

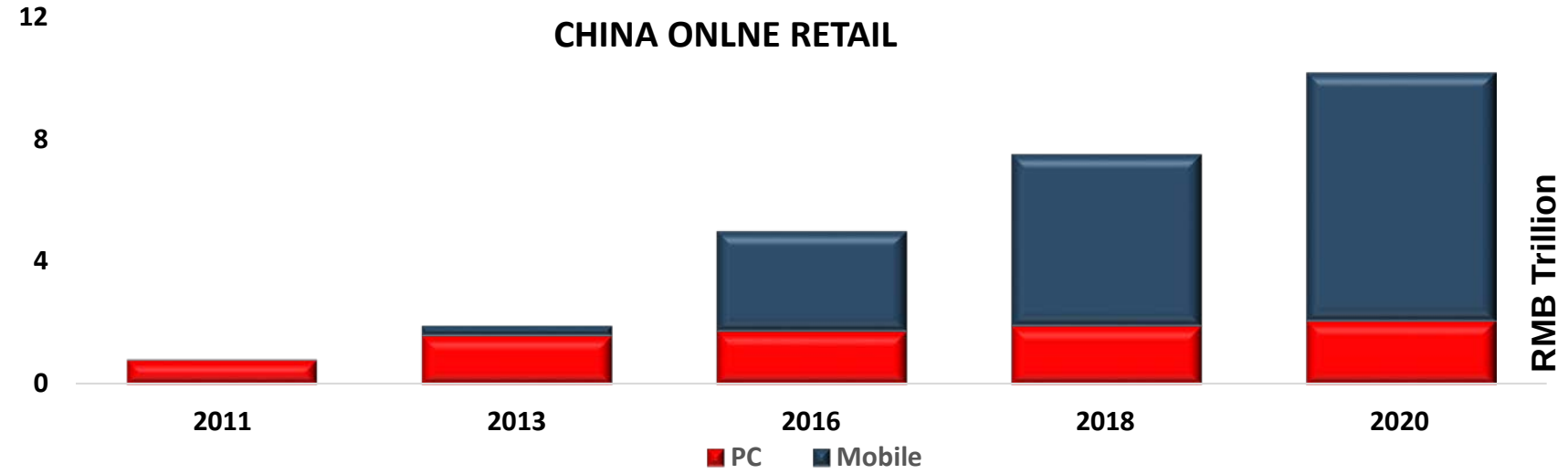



Online retail platforms demand shorter delivery time

# Smart phones leading to boom in online retail

## The “new” economy will need to supply “on demand”




Ease of transaction and instant access introducing new consumers to online

Source – Statistica, iresearch, Delloite Research Paper



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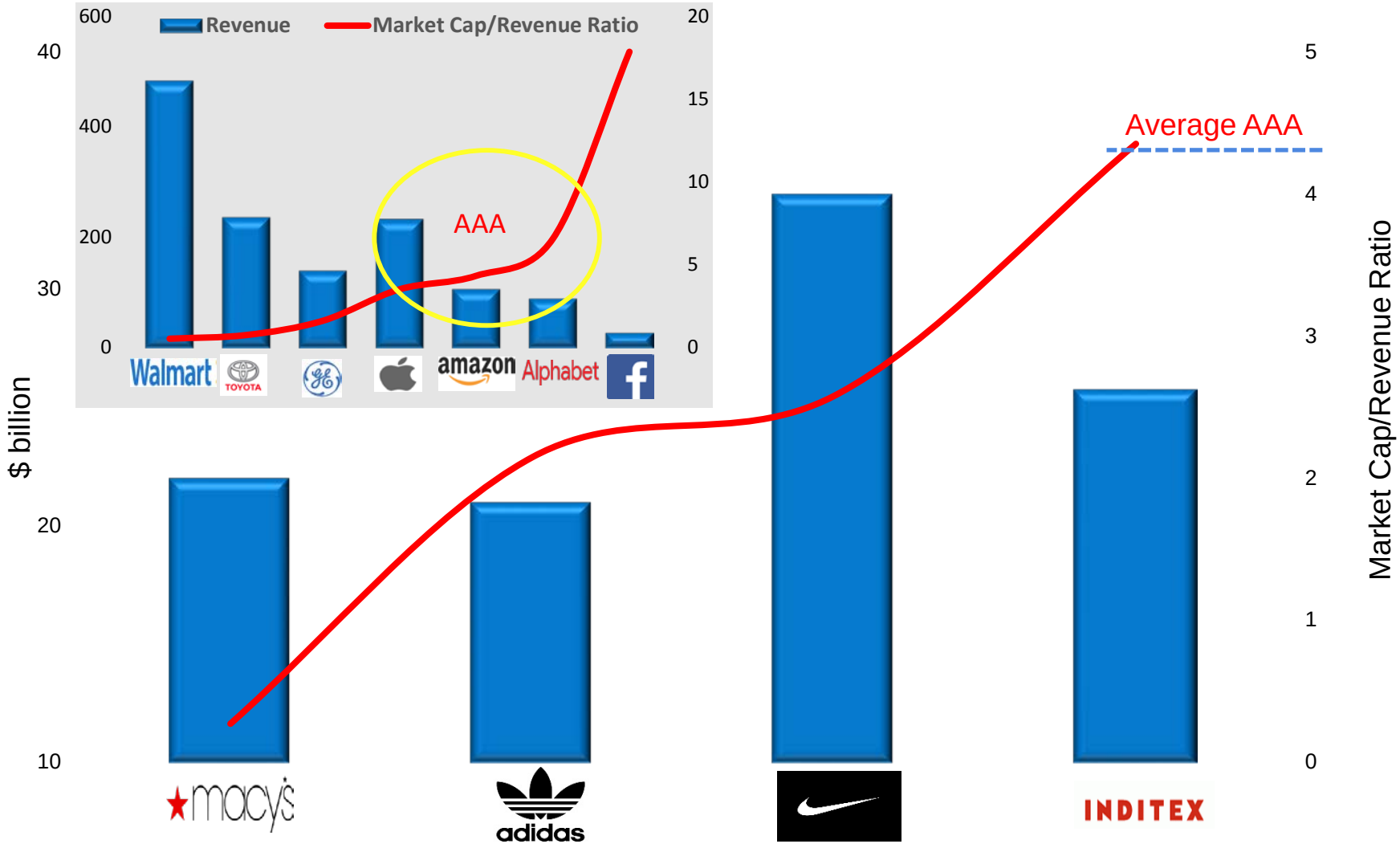
# Industry 4.0 – Role models in Textiles

## Traditional manufacturing and retailing struggling to generate value

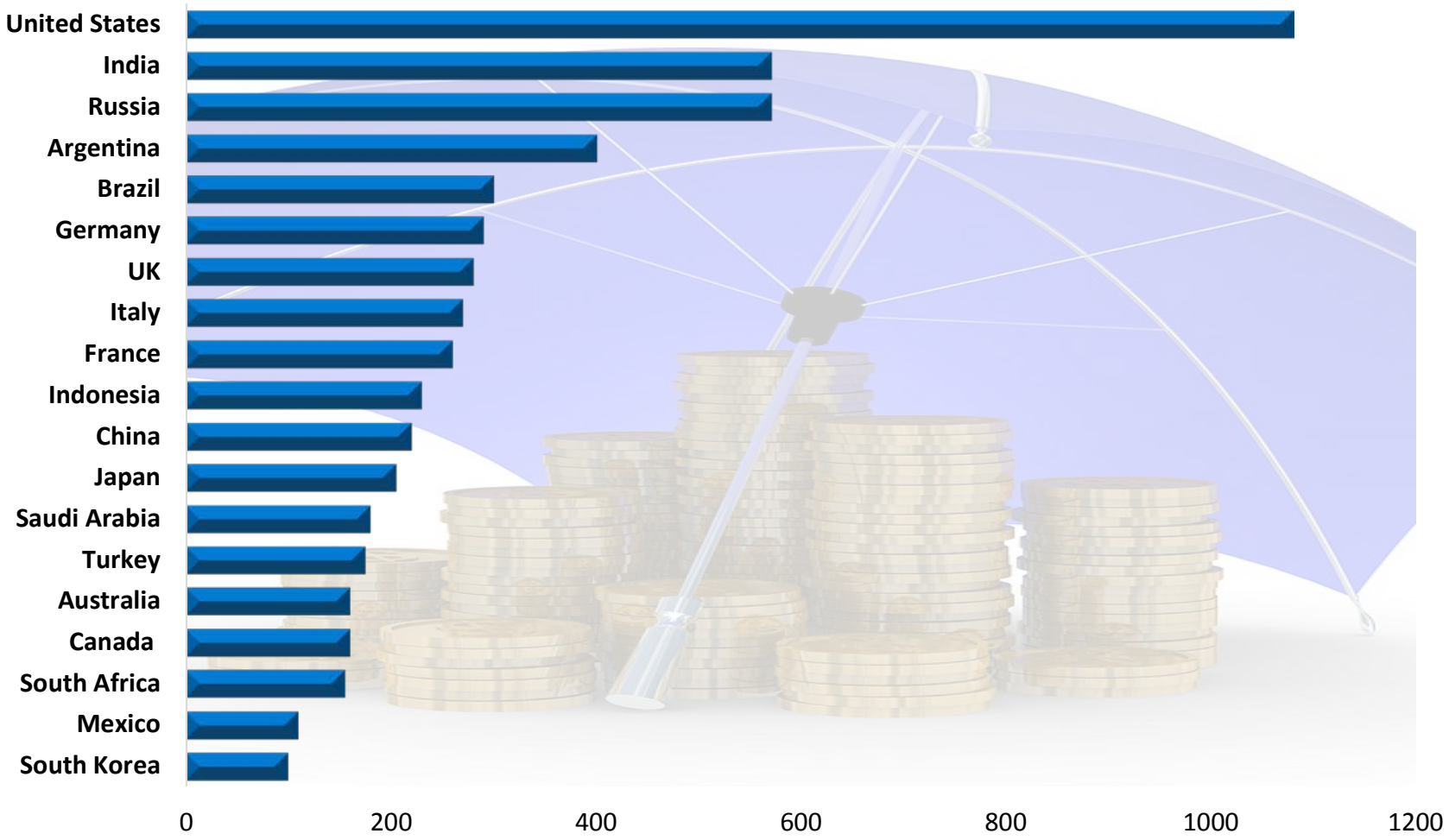



INDITEX model of proximity sourcing well adapted to the new consumer preferences

Source : Fortune Global 500 - 2016

# Trade liberalization policies facing reversal

## Measures to protect domestic markets encourage onshore manufacturing



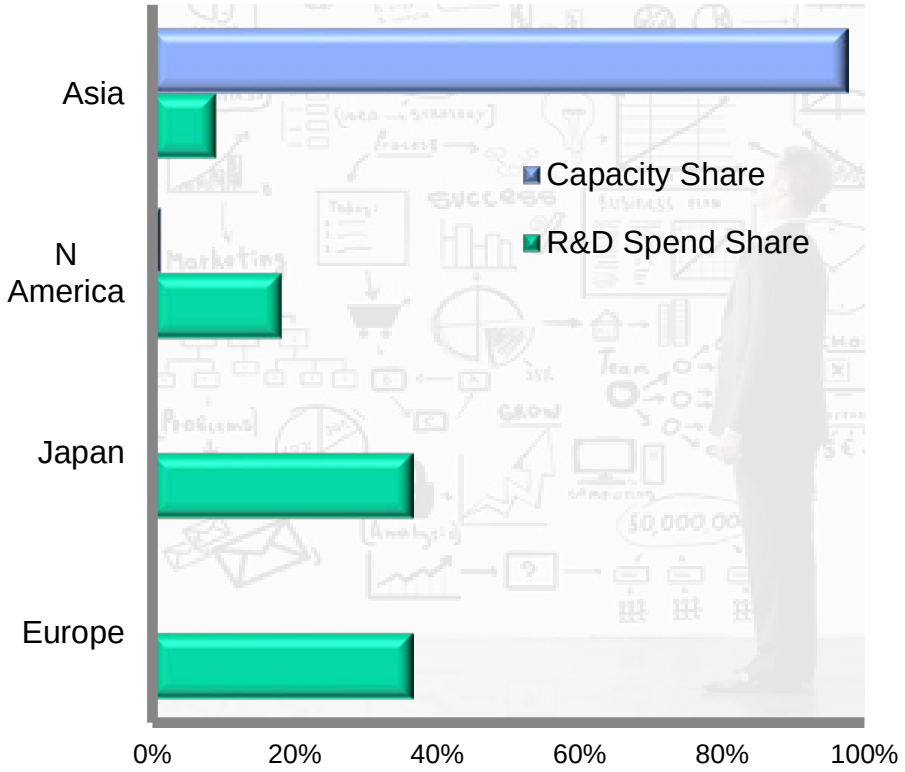

Number of discriminatory trade actions by G20 nations between 2008 to 2016

Source : CEPR

# Scale-up without innovation is unsustainable

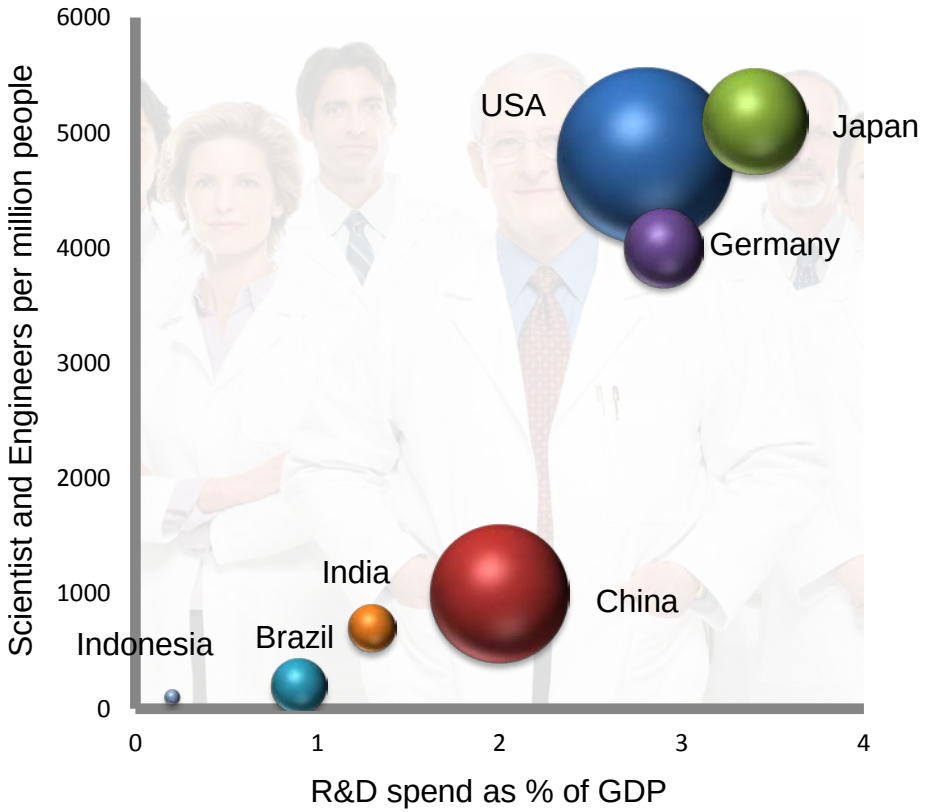
## R&D infrastructure out of sync with capacities

### R&D investment & capacity share : Chemical Industry




Note: R&D spend data for chemical companies.
Source: Cefic, CMAI, IVL analysis

### R&D infrastructure




*Note: Size of circle represent the relative amount of R&D spend*
*Source: 2014 global R&D funding forecast by Battelel*

Advanced manufacturing techniques will rebalance manufacturing capacities



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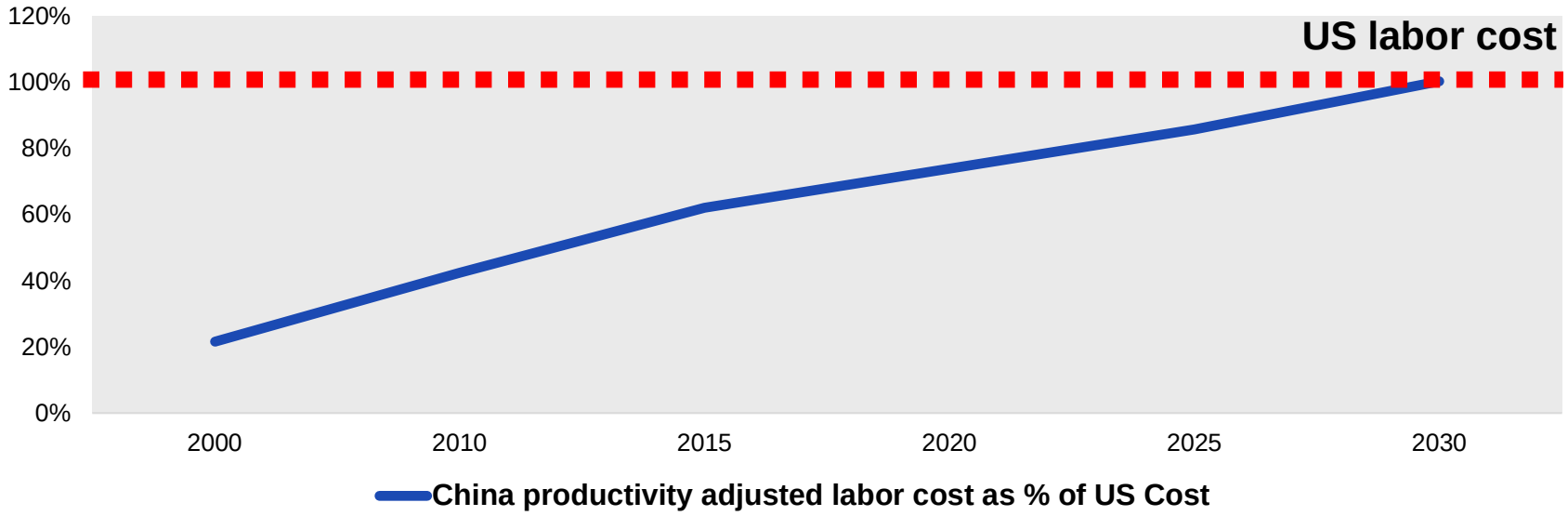
# Chinese rapid move to wage parity with US

## Higher wages will hinder Chinese low value added export model

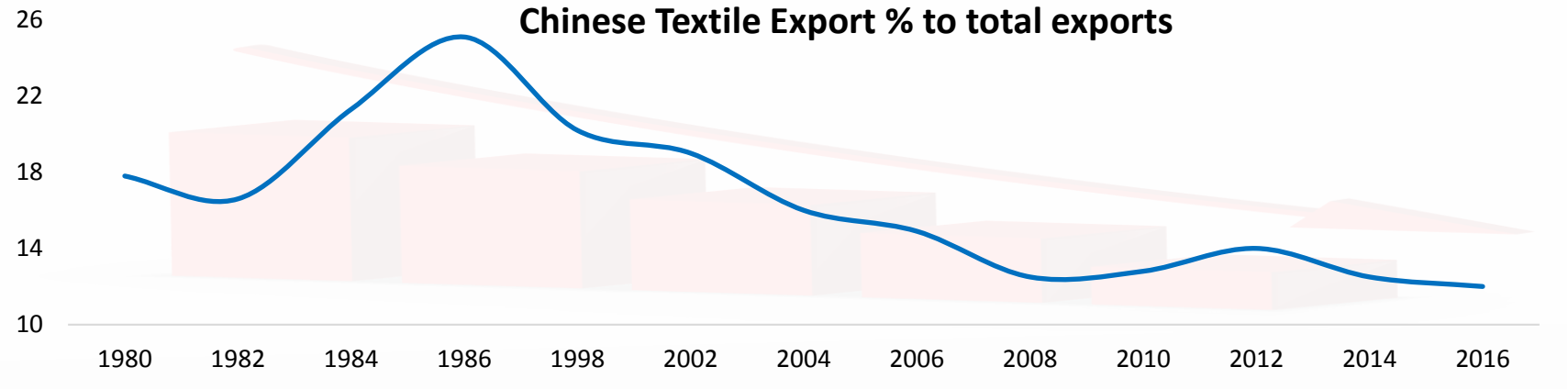



| Particulars | Unit | 2000 | 2010 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|---|---|
| China Wages | $/hr | 0.7 | 2.8 | 6.0 | 9.8 | 15.8 | 25.4 |
| US Wages | $/hr | 15.8 | 20.7 | 22.9 | 26.0 | 29.4 | 33.3 |
| China Productivity as a % of US | % | 21% | 32% | 42% | 51% | 63% | 76% |
| Productivity adjusted China wages | $/hr | 3.4 | 8.8 | 14.2 | 19.2 | 25.2 | 33.4 |
| China labor cost as % of US Cost | % | 22% | 43% | 62% | 74% | 86% | 100% |

China will rebalance its exports with increased internal consumption

# As China goes hi-tech textiles shift to rest of Asia

## Commodity textile industry moves with labor cost




**% of population living on < 3.1 $/day**

| Region | 1985 | 1995 | 2005 | 2013 | 2025 |
|---|---|---|---|---|---|
| **China** | **99** | **73** | **42** | **11** | **< 1** |
| Europe & Central Asia | 6 | 16 | 11 | 7 | < 4 |
| Latin America & Caribbean | 30 | 27 | 21 | 11 | < 5 |
| East Asia & Pacific | 87 | 69 | 43 | 16 | < 5 |
| Middle East & North Africa | 29 | 25 | 18 | 12 | < 6 |
| **South East Asia** | **81** | **76** | **70** | **50** | **28** |
| **India** | **80** | **76** | **72** | **52** | **30** |
| **Sub Sahara Africa** | **79** | **76** | **73** | **65** | **53** |

China's affluence will create opportunities for remaining textile export business to move to countries like India and South East Asia.



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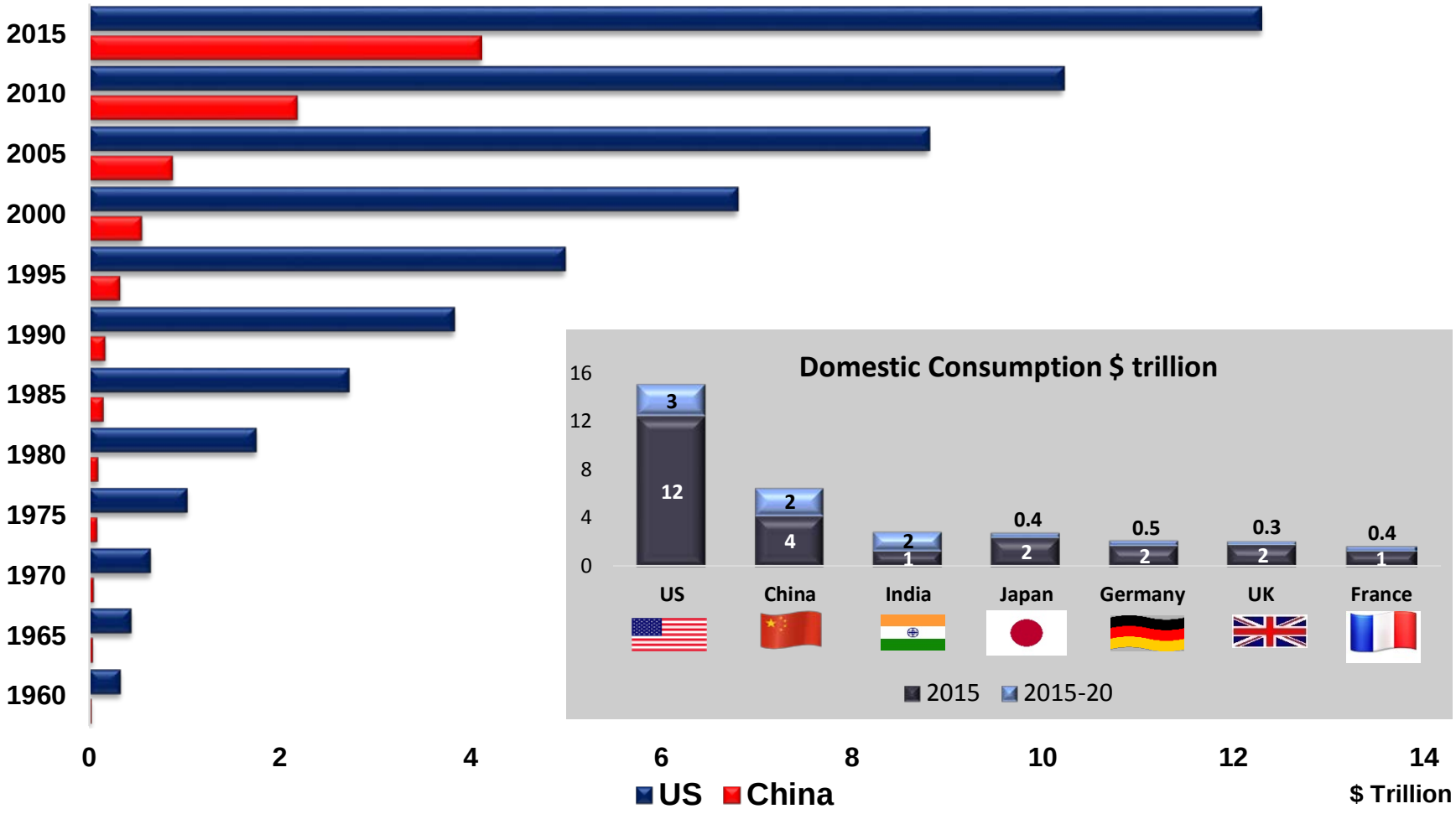
# Asia consumption growth will exceed US by 2020

## From 8% in 2000 to 34% in 2015 of total US domestic consumption

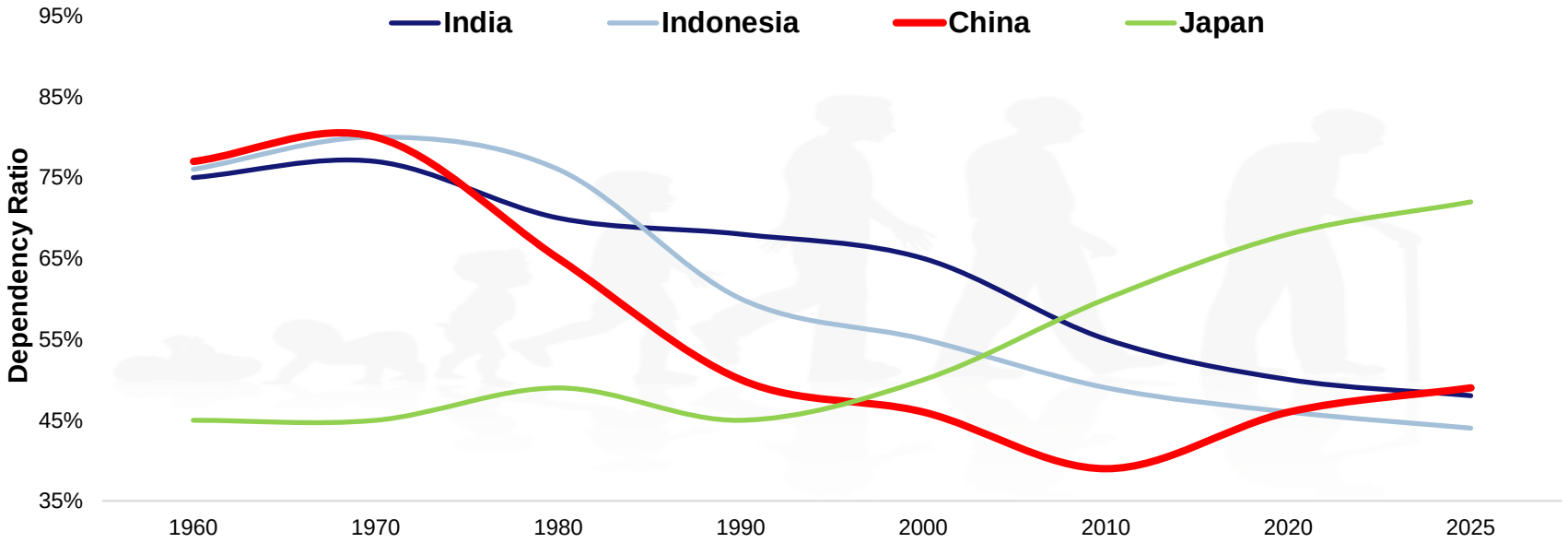
### Domestic Consumption




The closing of the wage gap will further propel the Chinese domestic consumption to reach 45% of US consumption by 2020

# Ageing population to further increase skill gap

## Countries with younger population more suitable for remaining supply chains




| Mean age country wise | 2005 | 2010 | 2016 | 2025 |
|---|---|---|---|---|
| India | 24 | 25 | 28 | 29 |
| Indonesia | 27 | 28 | 29 | 31 |
| **China** | **32** | **34** | **36** | **40** |
| USA | 36 | 37 | 37 | 40 |
| Japan | 43 | 45 | 46 | 50 |

China's ageing population will change focus to producing for domestic demand



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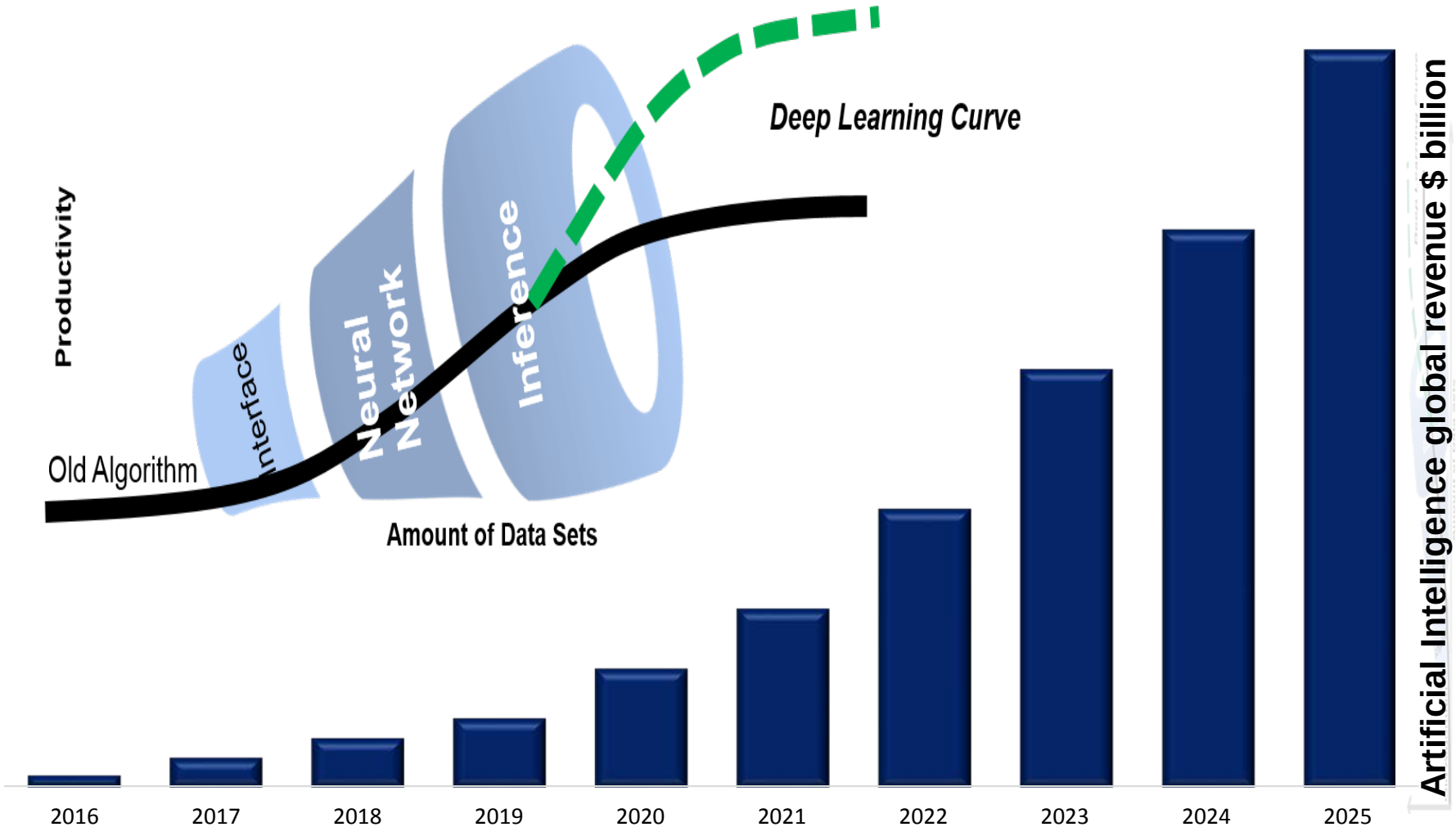
# Growth in AI will bridge skill gap

## AI to create a paradigm shift by enabling new ways to manage businesses

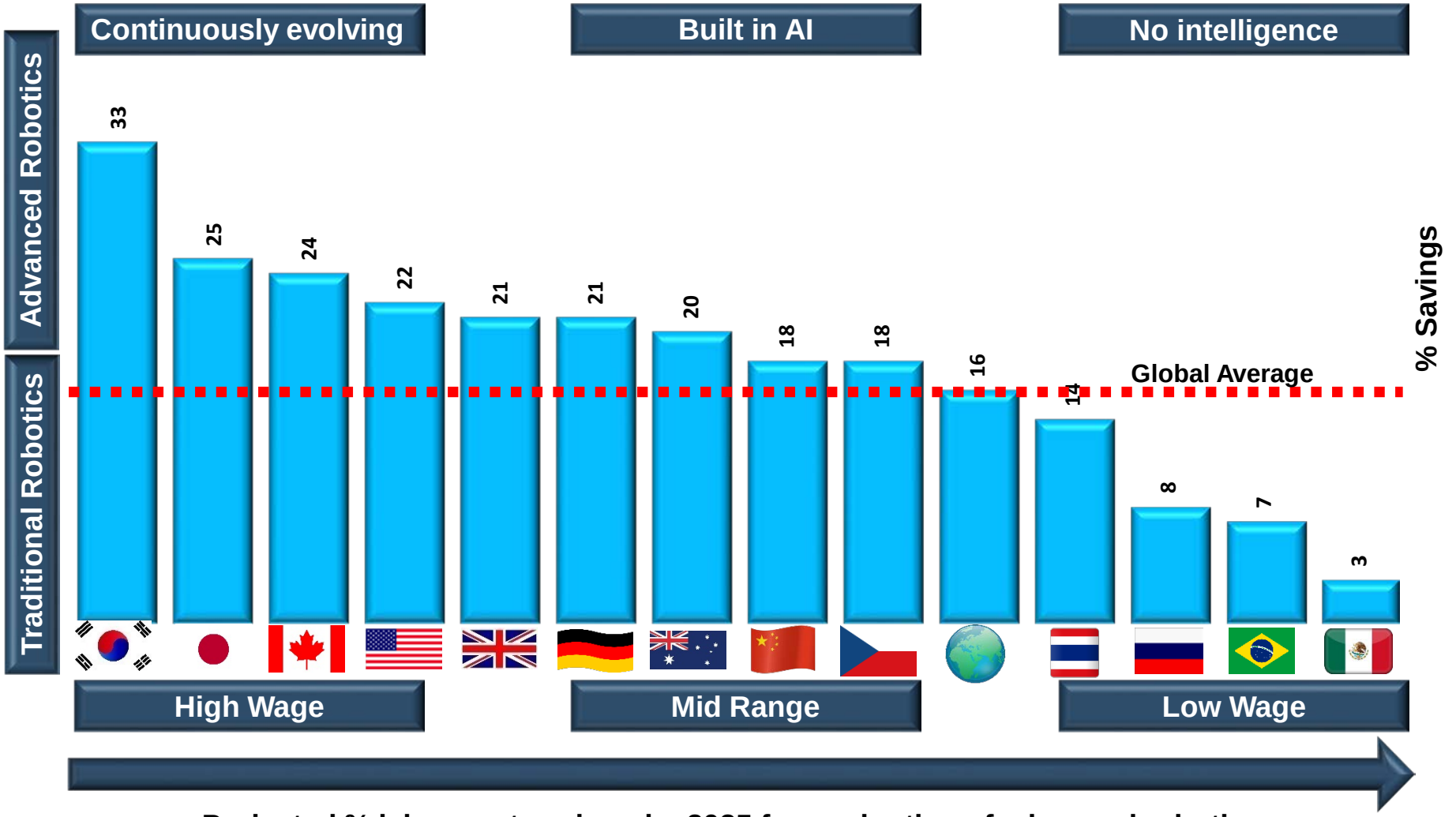



Training of machines with large datasets will create neural networks that generate inference to replace human intelligence

Source : Tractica

# Robotics to help rich economies close wage gap

## By 2025, 25% jobs automated by robotics and artificial intelligence




**Projected % labor cost savings by 2025 from adoption of advanced robotics**

Adoption of AI and Robotics will create a new competitive advantage



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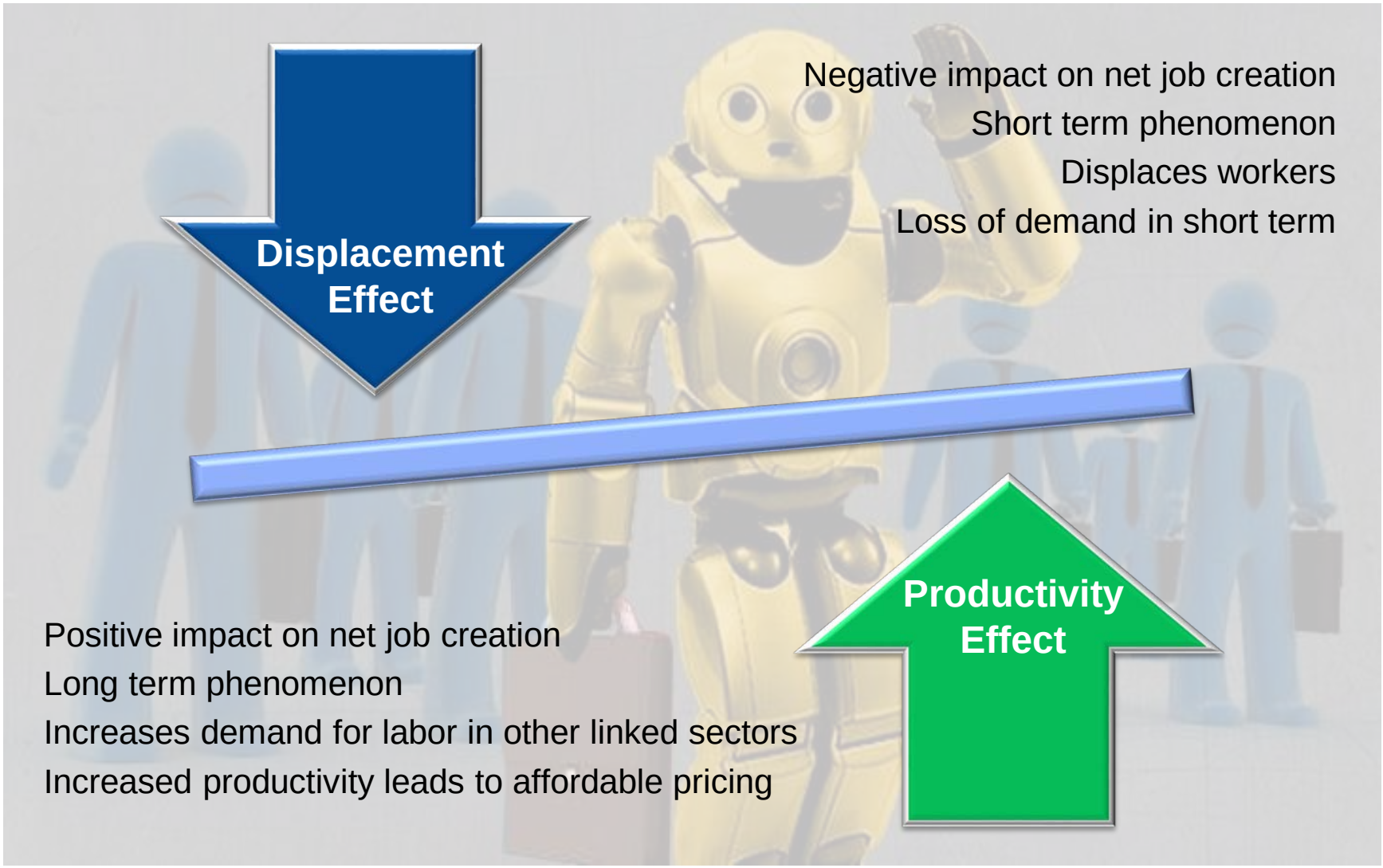
# AI and robotics will improve net demand

## Long term productivity effects offset any short term demand loss




Historically automation led disruption had always resulted in net job gain

# The process has already begun and will accelerate

## Automation and AI underpinning smart factories will allow rapid scaling

### Traditional model

**Offshore – Scale up – Rigid – Made to stock**

### Regional model

**Regional – Smaller - Specialized – Made to order**

Belarus
Bulgaria
Morocco
Tunisia
Pakistan
Bangladesh
Vietnam
Indonesia
Mexico
El Salvador
Honduras
Colombia
Ecuador
Peru

New materials
Bio-synthesis
Robotics
AI

### Emerging model

**Local – Smart - Multiproduct – Customized**

SoftWear Automation, Inc.

Sewbots

**SoftWear's fully automated Sewbots are able to replace the operator without making any modifications to the material. Has produced over 2 million home goods since 2015**

adidas

Speedfactory

**The Speedfactory at Ansbach brings business back to Germany. Production due in mid 2017 at 500k pairs. A second speedfactory is being constructed near Atlanta to cater to US market**

Proximity sourcing will encourage local and smart supply chains



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# China’s $1 trillion push for free and inclusive trade

## New Silk Road initiative is a counter measure to growing protectionism


- Beijing says it will ultimately lend as much as $8 trillion for infrastructure in 68 countries
- China’s silk road an attempt to keep markets and to cut short lead times
- This initiative can push high tech exports from China and consumption imports from the collaborative countries.



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# *Indorama Ventures Ltd*

## *World's Fiber Company*




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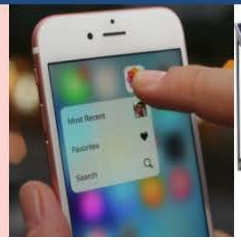


Our Vision

**“ To be a world-class chemical company making great products for society ”**

**“We commit to be a responsible industry leader leveraging on the excellence of our people, processes, and technologies to create value for our stakeholders ”**

- The **CUSTOMER** is why we exist
- Our **PEOPLE** make the difference
- We see **CHANGE** as an opportunity
- **DIVERSITY** is our strength
- We are **RESPONSIBLE**



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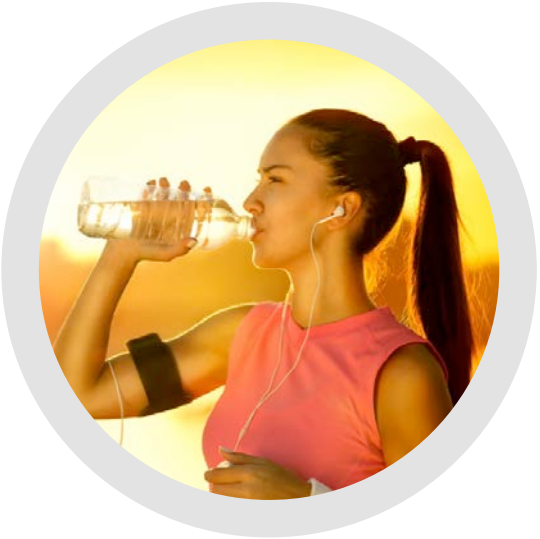
# Touching Billions of Lives

## We Are Closer Than you Think



**1 in 5**

plastic bottles
is made
from IVL polymers

**1 in 2**

premium baby diapers
is made
from IVL fibers

**1 in 4**

airbags is made
from
IVL yarns



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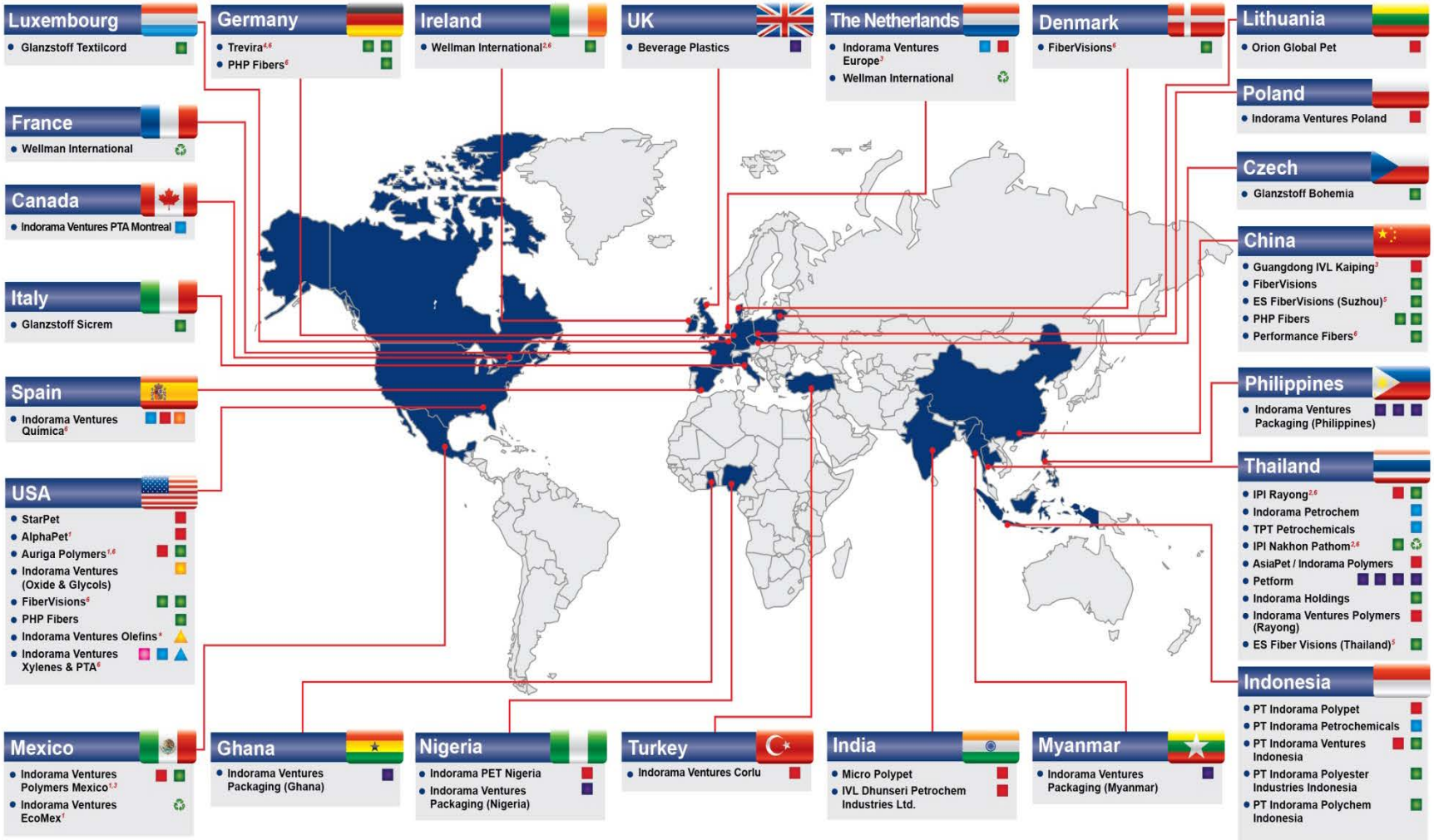
# 70 manufacturing sites, 24 countries, 4 continents




PET Fibers Ethylene Paraxylene PTA EO/EG NDC IPA Packaging Bottle Flakes

1) Recycled PET Resins
2) Recycled Fiber
3) Bio-PET
4) Biodegradable Polymers
5) Bi-co Fibers Technology
6) R&D Center

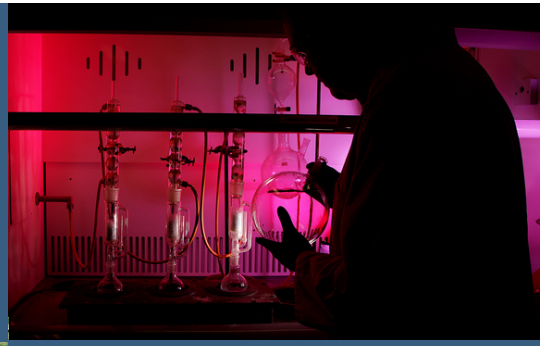
* Currently non-operational.

As of Jun 1, 2017

# Indorama Ventures, A Unique Petrochemical Play

| $7.5B | 24 | 15K | 70 | 250+ |
|---|---|---|---|---|
| Revenue | Countries | People | Sites | Patents |

**Global Leader**
#1 player in 70% of our business



**Unique Global, Local Reach**
>85% of sales within the region

**Differentiated, High Growth Portfolio**
8-10% CAGR across portfolio

**Maximizing Shareholder Value**

Note: 2014 financials are management estimates and they may or may not change materially when published

# Our Strong Focus on Sustainability

MEMBER OF
Dow Jones Sustainability Indices
In Collaboration with RobecoSAM

- A member of 2017 DJSI Emerging Markets Chemicals Industry
- Ranked among **Top Five** of all global chemical companies

ROBECOSAM Sustainability Award Bronze Class 2017

FTSE4Good

A constituent of:
- The 2017 FTSE4Good ASEAN5 Index
- The 2017 FTSE4Good Emerging Index

CDP
DRIVING SUSTAINABLE ECONOMIES

2016 Climate Change Rating - B

Bloomberg

Leading in SET Index:
2017 Bloomberg ESG Disclosure Scores

MSCI

2016 MSCI ESG Rating - B

EcoVadis

Gold Recognition:
Ranked among Top 5% of performers and most preferred suppliers

TRANSPARENCY INTERNATIONAL

#1 Thai MNC - 2016 in Transparency in Corporate Reporting

SET
The Stock Exchange of Thailand

Thailand Sustainability Investment 2016

ESG100
Environmental • Social • Governance
2016



INDORAMA VENTURES




INDORAMA VENTURES

# Navigating textile challenges and future innovations

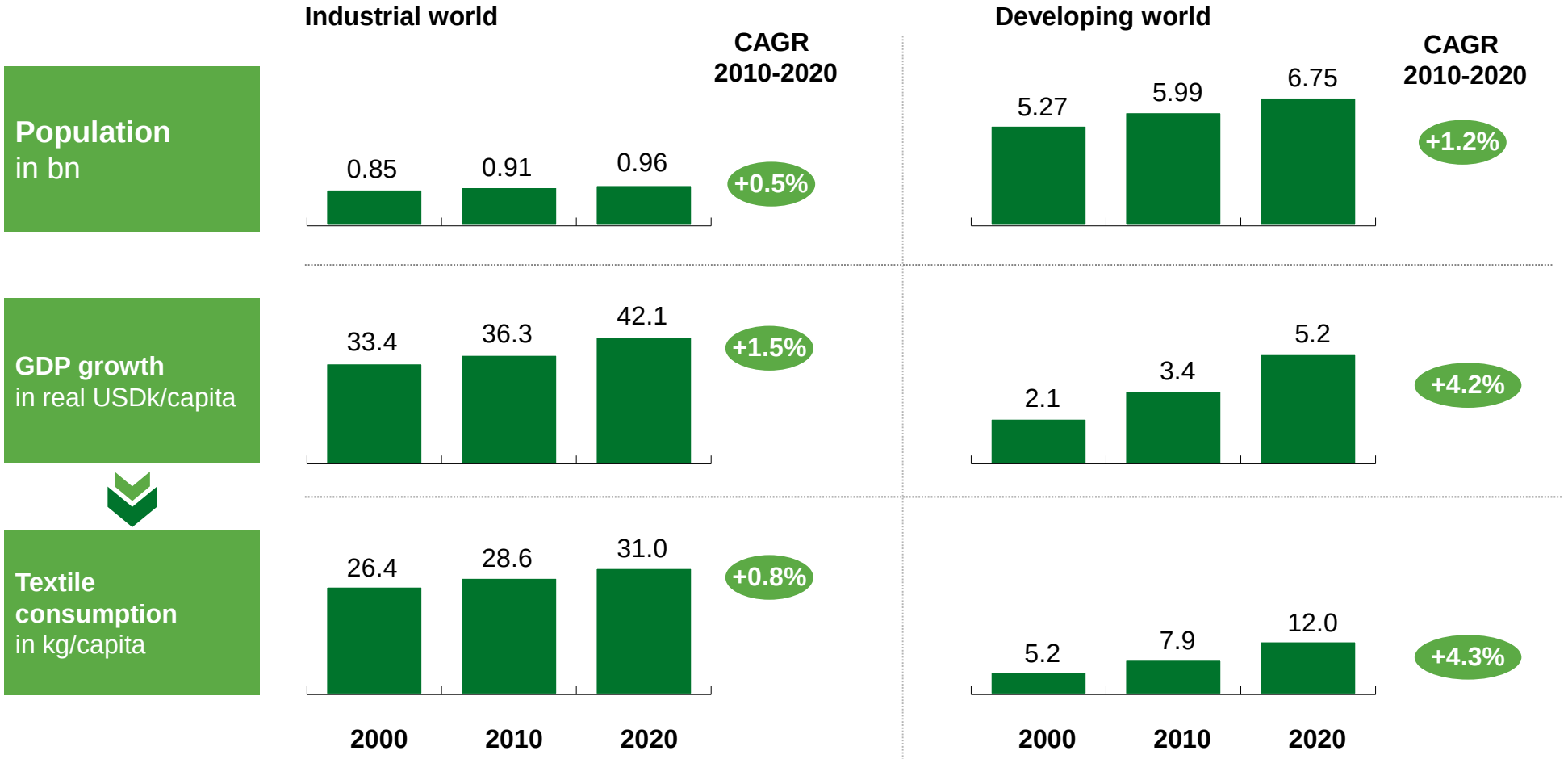
Amit Gautam
Global Vice President, Textile Business Mgmt.

LENZING

LEADING FIBER INNOVATION

# Global megatrends support long-term textile demand growth

Population growth and higher purchasing power in the emerging markets drive overall fiber growth




Source: IHS, ICAC, Lenzing data

# Ability of companies to navigate **five key challenges** in textile industry will likely become future winners

Growth thrust vs. Sustainability

Need for continuous growth vs. sustainable use of raw materials? (e.g., challenge between fast-fashion vs. authentic consumption)

Transactional vs. partnership supply model

Will TX evolve to partnership model of auto/electronics industry, or continue with ‘arms-length’ relationship with value chain suppliers?

Innovation premium vs. cost-pressure

Strong demand for functional /materials innovation but does relentless cost-focus allow for innovation premium?

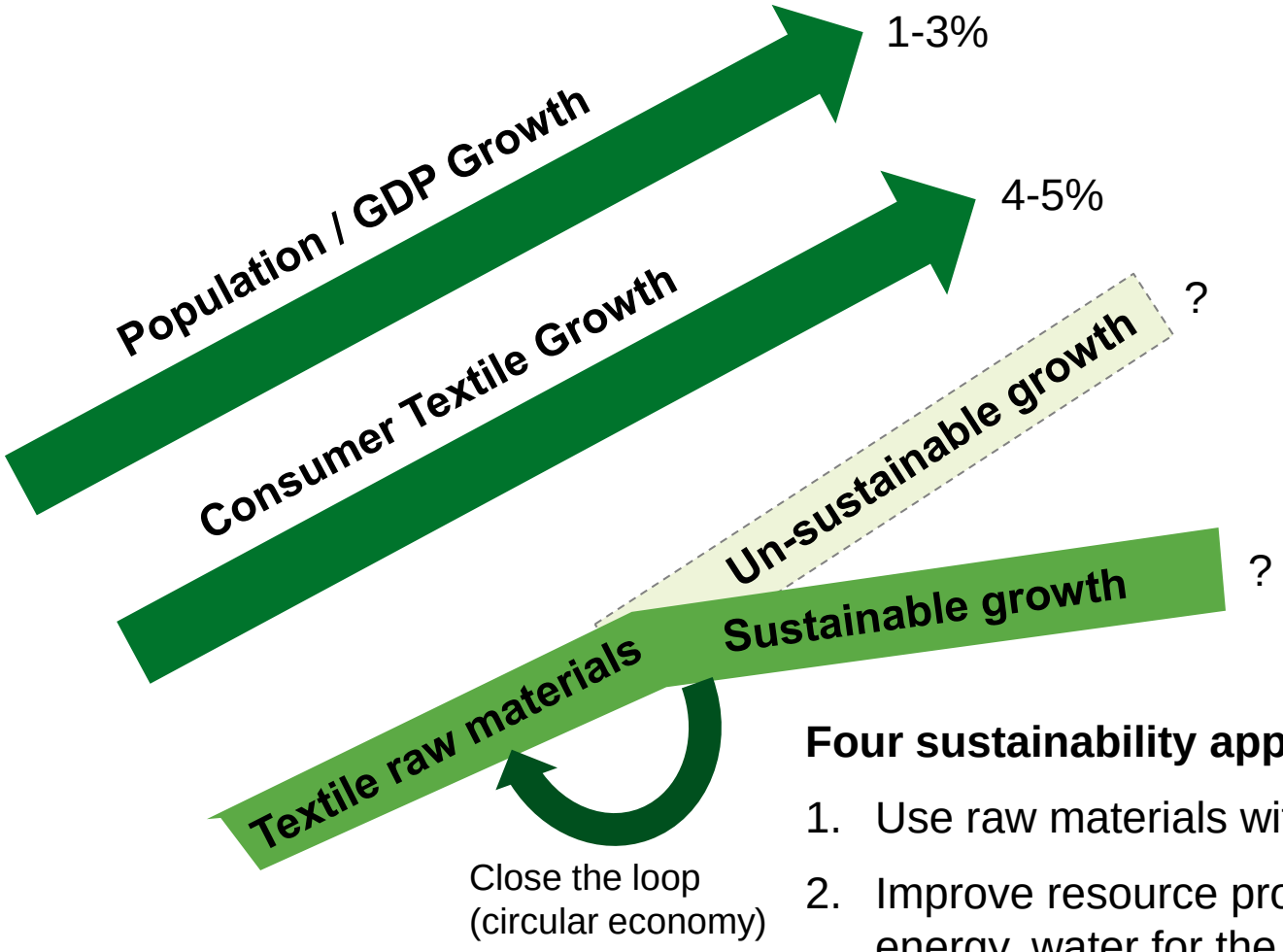
New business models (e.g., online, sharing)

What are the new emerging business models that could re-shape the future textile business?

Disruptive/game-changing textile innovations

What are some of the disruptive innovations in the textile industry?

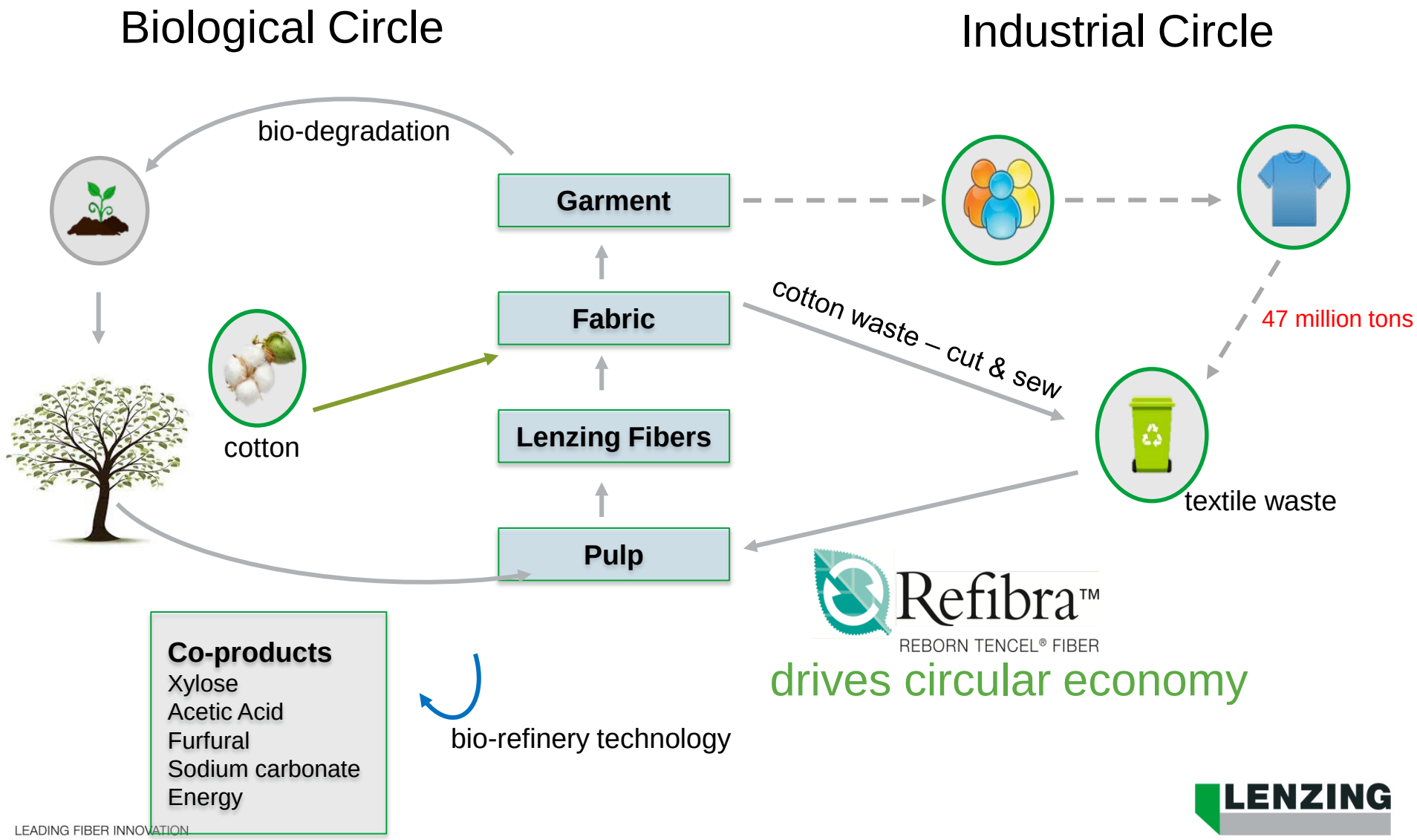
# Example 1: the growth in textile raw materials will be key sustainability challenge – four possible solutions




**Four sustainability approaches in textile**

1. Use raw materials with low eco-impact
2. Improve resource productivity (less raw material, energy, water for the same output)
3. “Close the textile loop” (re-use or recycle)
4. Change consumer behavior

# Example 2: achieving “circular economy” requires deep collaboration and transparency across the supply chain



# Example 3: proliferation of textile certification schemes need to be harmonized to bring more clarity







Responsible Care
Verantwortung hat Zukunft





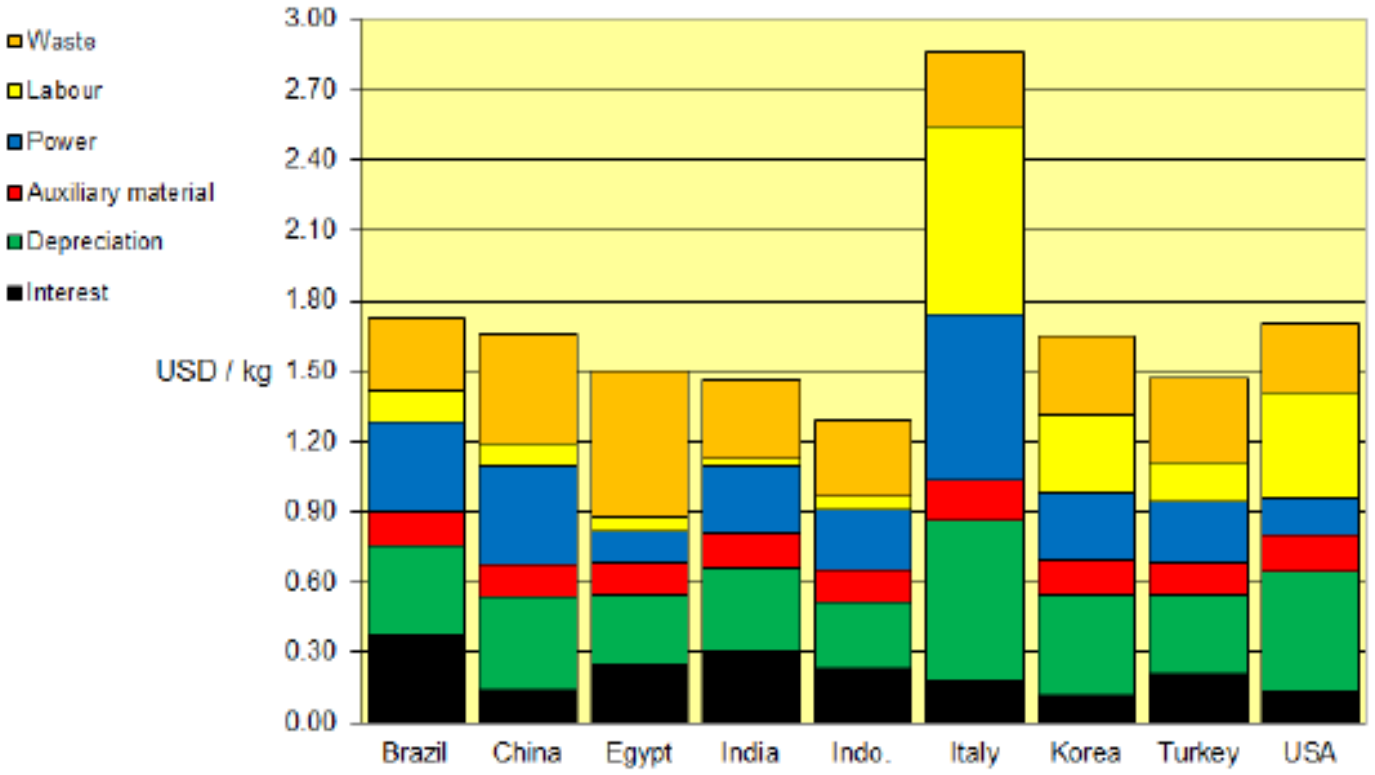





LENZING

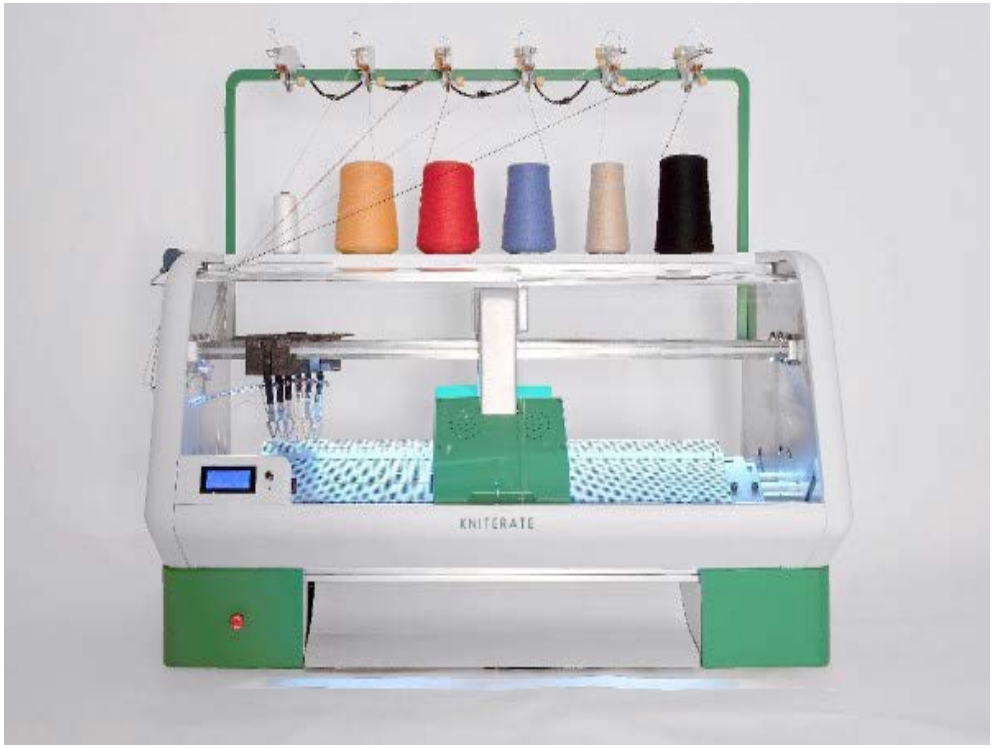
# Example 4: Textile conversion costs are narrowing across countries, creating new opportunities

**Fiber-to-Yarn spinning conversion costs (Ne 40)**




- **Retailers are** setting up in-house teams to **"nominate" suppliers for fabrics, yarns, fibers and** not just garments
- **US & Central America could see revival** of textile industry due to competitive costs, trade-barriers, & shorter lead times
- As trade further increases, retailers are increasingly conscious to protect themselves **against "counterfeiting"/fake textile products**

# Example 5: Disruptive innovations: World's first digital 3D knitting machine with ready-to-use garments




**Kniterate**


**3D digitally knitted shirt**

# Innovation will be key to future, and Lenzing has been at the forefront to solve sustainability challenges




- First textile **recycled fiber from cotton waste - Refibra™** – launched at industrial-scale
- Lenzing offers the **most sustainable viscose** with the lowest environmental impact – EcoVero™ (50% lower impact on emissions and water)
- **Spun-dyed Lenzing Modal®** to reduce downstream environmental impact, e.g.,
  - Lenzing **Modal® black** – for denim and knits
- **Micro-fibers** for even better moisture mgmt., **extra-luxury feel and softness**

# GOVERNMENT'S POLICIES AND STRATEGIES FOR INDONESIAN TEXTILE INDUSTRY

**By:**

**AIRLANGGA HARTARTO**
**MINISTER OF INDUSTRY THE REPUBLIC OF INDONESIA**

ANNUAL CONFERENCE ITMF 2017

Bali, September, 15th 2017

INTERNATIONAL TEXTILE MANUFACTURERS FEDERATION
FEDERATION INTERNATIONALE DES INDUSTRIES TEXTILES
INTERNATIONALE VEREINIGUNG DER TEXTILINDUSTRIE

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Bali, Friday the 15th of September

Formal Opening Session - Welcome address from Mr. Jas Bedi, President, ITMF, Kenya

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Honorable Director General of foreign Trade Sri Oke Nurwan,

Dear Mr. Ade Sudrajat, President of API,
Ladies and Gentleman, Dear friends,

It is a real pleasure to be here on the beautiful island of Bali and attend to the 2017 ITMF annual conference. I would like to welcome you all to this major event in the world of textile manufacturers. It already promises many good presentations and talks on topics of great importance to our industry. It is the first time that our conference is held in the wonderful country of Indonesia. I would thus like to sincerely thank the Indonesian textile association and its organizing committee for the warm welcome we received.

I think we all share a common enthusiasm about this year's conference focus: Technology, trade, climate: orientation in disruptive times. All words included in this title are of extreme importance in today's context. They are all major subjects with direct influence on our economy, our politics, our environment. It is especially interesting to think about these topics in relation to our industry's past influence on major developments in international trade and technological innovation.

It all started with cotton a couple of centuries ago. Historically, this natural fiber was one of the first globally traded commodity. The scale of its production, consumption, and exchange was greater than any other manufactured good. The demand for cotton fostered trade between Europe, the Americas, Asia, and the Asia-Pacific. Buying and selling yarns, fabric, and garments created a worldwide network of manufacturers, merchants, and consumers.

In the late 18th century, South Asia was generating about one quarter of the world textile output & Indian cotton was traded via land and sea to Indonesia, Japan, the Middle East, Africa, and Europe. At that time, India was literary clothing the world. Technological innovations however slowly changed the rules of the game and induced a geographical shift of textile epicenters. For example, the comparatively small western country of England captured an increasing share of the textile market thanks to new ways of manufacturing natural fibers. Cotton soon became one of the strong catalysts of the industrial revolution. At the same time, the global demand for natural fiber kept growing and created a fertile soil for further inventions in spinning and weaving. This eventually transformed the 18th century rural England into a manufacturing power. That part of the story is, however, only a start. Since these times, the cotton industry has further played a significant role in disrupting economic activities, social norms, and political agendas. Today, it is still an essential industry in

initiating economic development, in taking the path to modernization, or, put in other words, in creating the condition for developing countries to increase their citizens' individual welfare. In short, the textile industry has always played an important role in disrupting societies. As a journalist reminded last week, "[a]cross the Atlantic [cotton] generated the conflicts that ignited the American Civil War. It inspired the writing of Marx & Engels' The Communist Manifesto and played a pivotal role in Gandhi's fight for Indian independence.

Yet, one may ask: if innovation is a disruptive force, why are we experiencing challenges in disruptive times? While the answer to this question is very complex, one way of approaching it the recognition that innovation creates a vacuum for new sets of opportunities. Hence, making a discovery with commercial use creates room for inventing many products and applications which could not have been foreseen in previous times. Take the very first "artificial silk" patent ever granted for example. This was in 1855 in England. A Swiss chemist, Audemars, produced cellulose and patented it. While his innovation was of great importance, he failed to recognize that he could emulate a silkworm by extruding the cellulosic liquid through a small hole and this process was of no use for the textile industry at that time.

Humanity had to wait for the creation of the American Viscose Company in 1910 to produce rayon and the work of Camille and Henry Dreyfus at the same period to advance research on cellulose. It is only in 1931 that a scientist called Wallace Carothers created a "giant" molecule named "polymer". He focused on developing a specific fiber initially referred to as "66" and, there you go, nylon, the "miracle fiber", was born. After that, the world of textile extended to a whole new set of fibers; those who are completely synthesized from petrochemicals. At this point in time, things started to accelerate in the man-made fiber industry. The advent of WWII, the increasing need for cars and houses, the ever-growing consumption in the modernizing western hemisphere, as well as the ground-breaking U.S. space program were all geopolitical and economic developments which boosted the demand for polymers year after year.

What happened it that scientific research paved the way to innovation and innovation paved the way to commercial successes.

Today, the textile industry is still a major player in the worldwide economy but is has changed. It has reinvented itself for competitive reasons, it has adapted to consumption preferences, it has opened to the circular economy. Some countries begun at some point in time a transformation process which ended up in rearranging the global economy. The changes that occurred in the textile industry and set new standards for our economic activity can be captured in three points.

First, in today's world, technology is a source for competitive advantage for each component of the integrated textile value-chain.

Take fiber for a start. The production of natural fibers increasingly relies on the use of transgenic seeds which characteristics have been optimized with regards to the crops environment. The research on chemicals searches for solution to improve pest control. The evolution of irrigation systems boosts water productivity. In the man-made fibers segment, there is a constant strive to close the gap to cotton quality in terms of touch, feel, and absorption. The invention of brand new

fibers opens innumerable potential markets in different economic sectors. Technical textiles such as Smart textiles or nanotechnologies and the existence of nonwovens give rise to additional applications next to the apparel and home textiles. This segment of technical textiles is especially important in developed economies as it requires lots of interdisciplinary research and expertise. Just think of the creation of composites for the aerospace industry or the development of special textiles for the medical segment.

Of course, improving fiber characteristics is not the only domain of innovation in textile. On the topic of yarns, fabric and garments, the automatization of many production processes has been jostling routines and habits for decades. Textile machinery manufacturers have constantly improved their apparatuses in terms of quality, speed and versatility. The result is the emergence of greatly superior products and strongly improved yields. If you now add the internet of things to the equation, future developments in the industry have virtually no limit.

Once again, of course, this is not the end of the story. Retail is undergoing a metamorphosis all around the globe. The emergence of innovative E-commerce selling strategies and E-market places has revolutionized distribution channels. Research shows that apparel sales on E-commerce have surpassed any other B2C categories. This is especially true in Northern America, western Europe, and developed Asian countries. A new McKinsey report explains that China has gone from a share of 1% of worldwide transactions in the digital economy a decade ago to 40% now. Moreover, the value of China's mobile payments related to consumption by individuals was $790 billion in 2016, 11 times that of the United States.

These are novel consumption trends which are still not fully integrated in the textile value-chain. The question thus remains: what are the long-term consequences for our industry?

The second transformation which has set new standards for our industry is the global context of trade.

In 2017, the World trade organization forecasts a 2,4% increase in global trade. The WTO, however, points out that this figure is surrounded with high uncertainty. They even warn that the "unpredictable direction of the global economy in the near term and the lack of clarity about government action on monetary, fiscal and trade policies raises the risk that trade activity will be stifled".

As we all now, the years of predictable future are over. However, it is worth noting that the number of regional trade agreements has steadily grown since the beginning of the 90's. Back then, there were about 10 of them compared to 445 in 2017! Economists say that such trends show that trade has a positive impact on the global economy.

More specific for our industry, it is well known that textile and apparel trade has been the main force for economic take-off in many countries. It can be observed now in Myanmar, it was the case before in China or India. It could also be the case for other developing economies but rising concerns about some regions of the globe are to appear. In today's context, for example, the stakes are high for Africa. According to the World Economic Forum, "Africa's cotton and apparel value chain have joined

forces to integrate the global textile supply chain. Efforts to increase productivity, competitiveness, and sustainability are made in South Africa, Tanzania, or Mozambique. Investment are currently made in ginning, spinning, weaving, and garmenting. What will happen, however, if the Trump administration does not renew or extend the Africa Growth and Opportunity Act? What are the consequence for the African textile industry? Unfortunately, nothing is sure yet apart from the fact reported to Reuters on August the 8th, 2017, by Mr. Kim Elliot, a trade expert at the Washington-based Center for Global Development, that "this administration has just shown almost zero interest in Africa".

Another region of the world nevertheless focuses on a trade initiatives which can impact our industry in a great manner. I obviously talk about the "One road, one belt initiative", which aim at improving the trade route and speed between China and Europe, on land and on sea. As the guardian wrote it on May 12th, 2017: "There are plans for pipelines and a port in Pakistan, bridges in Bangladesh and railways to Russia - all with the aim of creating what China calls a "modern Silk Road" trading route that Beijing believes will kick start "a new era of globalization". Contradictory liberal and protectionist forces still shape the trade environment for textile exchanges. These trade evolutions always bring uncertainty, challenges, and the consequential opportunities along with them.

The third point I want to add is of course the environmental issue. In today's world, each industry player, from producers to consumers, is more and more conscious of the textile manufacturing global ecological footprint. Sustainability, the circular economy, the effect of climate change (which is not "fake news" by the way) are also buzz words in all industry talks. What has become increasingly clear along the years is that, we, as an industry, have the obligation to leave behind a planet where future generation can live on. What is, however, less clear is that this isn't a social and ecological issue only. It creates a set of brand new economic opportunities which prepares the future for new disruptive times. Environmentally friendly innovations are intended to increase market shares, create competitive advantages, and save on production costs.

On the production side, as explained by Dr. Blackburn from the University of Leeds, the challenges for the textile, dyeing, and finishing industries are multiple and complex. They consist of creating material that provides an equivalent function to the product it replaces, performs as well as or better than the existing product, is designed to be desirable, is available at a competitive or lower price, has a minimum environmental footprint for all the processes involved, is manufactured from renewable resources, uses only ingredients that are safe to both humans and the environment, and finally, has no negative impact on food supply or water.

On the demand side, moreover, the millennials, or the consumers of the future, are much more sensitive to environmental issues than their parents. Many initiative have been launched lately to reach these new consuming expectations. According to the 2016 Textile Exchange's "Preferred Textile Market Report", the latest initiatives in sustainable textile include circular systems, recycling textile waste, and bio-based polymer developments. These movements are supported by a growing number of certifications and labels which help ensuring sustainability claims are accurate and actions behind the claims result in real and meaningful changes. The downside of the multiplication of audit initiative is, nevertheless, the emergence of confusing and conflicting standards in addition to rising

related costs of meeting social compliance requirement. As you will learn more about this topic this afternoon during the second general session on ITMF's Audit initiative.

I will conclude by saying that the global consumption patterns are constantly changing and that per capita consumption rapidly grows in developing countries such as China and India. The per capita consumption of all fibers will further increase because China's own consumption is expected to grow from current 18kgs to 25kgs (similar to Europe) and India's consumption will raise from the current 5kgs to 15kgs. Whilst the U.S. remains the largest consumer with 39kgs per capita, the global consumption patterns will change by 2025 as follows:
- Europe and U.S. current market size (USD$665bn) is poised to grow to USD$775bn by 2025;
- China and India, whose current market size is USD$320bn and poised to grow to USD$795bn, which is bigger than E.U. and U.S. combined.

Obviously, the demand patterns will shift the supply. The world will operate in a new normal, in a local area network, whereby India will be supplied by itself, Bangladesh, Nepal & Myanmar, and on its side, China will be supplied by itself, Vietnam, Cambodia, and Laos. The EU and US markets will open to new supply chains possibly based in Africa, which enjoys a competitive advantage of duty and quota free market access. Besides shifting demand and supply patterns, the world of tomorrow will witness the greatest glocalisation movement ever experienced. It will see global brands operating in a local environment. Hence, co-opetition will become the new mantra, i.e. co-operate to compete.

Ladies and Gentleman, Dear friends,
Disruptive times are source of uncertainty. In such a context, access to relevant data and information, networking opportunities, and the existence of platforms for discussion that allow launching initiatives on relevant topics to the industry is more meaningful that ever. I think you all agree that technological innovation, ever evolving trade policies, and the challenges linked to sustainability in our industry are major topics that we must face every day. In this regards, participating to such a conference as the ITMF annual conference and being able to share on common issues on a neutral ground is of great necessity. I am very happy to see all of you, delegates and organizers, willing to exchange on these important topics here. I am convinced that it can only lead to an increased awareness of the necessities we need to tackle today to ensure a long-lasting success to our organizations in the future. It is worth pointing out the important role that plays this conference in today's context of ever changing economic conditions. Organizing such an event would, however, have not been possible without the support of our sponsors. Please let me thank our gold sponsors: 88Spares, Gemini, Saurer, and Sunrise Hong Kong; our Silver sponsors: Busana Apparel Group, EFI Reggiani, Oerlikon, Rieter, Santex Rimar, Texcoms, and Trützschle, and of course our Bronze sponsors: APAC Inti Corpora, Argo Pantes, Benninger¸Bitratex, Cargill, Danliris, Embee Plumbon Tekstil, South Pacific Viscose, Sucofindo/Surveyor Indonesia, and Swissmem.

The list of people who made that conference happen also entails our host, the Indonesian textile association and its organizing committee, who did a great job in preparing the event. I want to thank you warmly for the chance of being here these days. Finally, the work of the ITMF secretariat is of equal importance. Thank to Mr. Schindler and his colleagues, the operational role of the ITMF is

ensured.  I now let the stage to Dear Mr. Sudrajat, President of the Indonesia Textile Association, and wish the conference plain success.

Welcome Speech
Chairman of Indonesia Textile Association (API)
Opening Ceremony
ITMF Conference 2017

Honorable.

- *Minister of Finance of the Republic of Indonesia, Ibu Sri Mulyani Indrawati, or her representative*
- *Minister of Trade of the Republic of Indonesia, Bapak Enggartiarso Lukita, represented by Director General of Foreign Trade, Mr. Oke Nurwan*
- President of International Textile Manufacturer Federation (ITMF), Mr. Jas Bedi and all Member of Board and all members of ITMF
- Board of Indonesia Textile Association
- Distinguished ladies and gentlemen, Welcome to Bali, welcome to Indonesia. May the warmth of Bali gives us more spirit.

It is my great honor as Chairman of Indonesia Textile Association (API) that this year we're entrusted to host a major international conference called ITMF Conference 2017. It is a proof that Indonesia's textile and textile product industry are still being considered for its existence as well as its major rule in global market. For that reason please accept my highest gratitude for the ITMF's trust given.

Mrs. Minister and Mr. Director General,

ITMF is an international forum in the textile industry, comprising textile associations, industry supporting associations and textile companies from more than 30 countries around the world includes Indonesia. The role of ITMF is very important and strategic to promote cooperation and partnership among related parties from various countries of textile producers and supporting industries. API itself does not have an active role in ITMF membership, so I would like to thank the Indonesian textile companies who have represented Indonesia in this regard, they are PT Apac Inti Corpora, PT Texcoms, PT Bitratex, PT Embee Plumbon Tekstil and PT Indorama Synthetics

In the conference today, there were more than 280 participants from 28 countries, came from both members and non-members of ITMF. I welcome the enthusiasm of participants from Indonesia as the host country. Recorded more 80 participants are came from Indonesia, both from the textile industry, textile industry associations and supporting the textile industry. This great enthusiasm is a reflection that Indonesian textile industry businessmen still have great passion in working for the country.

Ibu Sri Mulyani and Bapak Oke, please also accept my highest gratitude for your pressence in this conference today. In the afternoon, we will have Bapak Airlangga Hartarto – the Minister of Industry – who will share the government's policy for textile industry. The presence of Indonesian government officials give us the excitement that the great enthusiasm of Indonesian textile industry is sanctioned and fully supported by the government of the Republic of Indonesia.

Distinguished ladies and gentlemen,

Textile and clothing industry plays an important and strategic role for the growth of the Indonesian economy. The important role is mainly from the acquisition of foreign exchange and the provision of employment.

Indonesia is one of very populated country in the world. With a population of over 250 million and more than 127 million of total labor force, Indonesia faces the problem of unemployment. The textile, apparel and its supporting industry is one of the answer to increase the widest possible employment opportunities.

Indonesia has a fairly complete textile industry structure, from upstream to downstream. From man-made fiber industries, either polyester, rayon or nylon; spinning industry; weaving industry; knitting industry; dyeing / printing / finishing; home textile; non woven up to garment factory are existed in Indonesia. It can be a competitive advantage for Indonesia.

# GOVERNMENT'S POLICIES AND STRATEGIES FOR INDONESIAN TEXTILE INDUSTRY

**By:**

**AIRLANGGA HARTARTO**
**MINISTER OF INDUSTRY THE REPUBLIC OF INDONESIA**

ANNUAL CONFERENCE ITMF 2017

Bali, September, 15th 2017

# CONTENTS

# I. CURRENT CONDITIONS & PROFILE OF TEXTILE INDUSTRY IN IN

## 1. LINKAGE IN TEXTILE INDUSTRY

### 1. UPSTREAM

**FIBER MAKING**
(Synthetic fibers)

**31 enterprises**

***Polyester (stapel & Filament)***

Capacity : 2.047 mil. Tones
Production : 1.135 mil. Tones

***Rayon***
Capacity : 565 mil. Tones
Production : 503,2 mil. Tones

Invest : Rp 39,98 trillion
Utilization : 54,7%
Worker : 30.869 people
Export : USD 0,47 billion
Import : USD 1,88 billion
Balance :- USD 1.40 billion

### 2. MIDSTREAM

**SPINNING**
(Sewing thread, Weaving yarn, knitting yarn)

**288 enterprises**
Capacity : 3,41 mil. Tones
Production : 2,12 mil tones
Invest : Rp 49,45 trillion
Utilization : 62,17%
Worker : 234,116 people
Export : USD 2.22 billion
Import : USD 0,65 billion
Balance : USD 1.57 billion

**WEAVING**
(Woven Fabrics)

**KNITTING**
(Knitted Fabrics)

**DYEING, PRINTING FINISHING**
(Finished Fabrics)

**1.479 enterprises (large&medium scale) & 131 thousand enterprises (micro & small industry)**
Capacity : 2,72 mil. Tones
Production : 1,32 mil. Tones
Invest : Rp 69,12 trillion
Utilization : 48,52%
Worker : 662.227 people
Export : USD 1.49 billion
Import : USD 4,78 billion
Balance : - USD 3.25 billion

### 3. DOWNSTREAM

GARMENT
(Clothing)

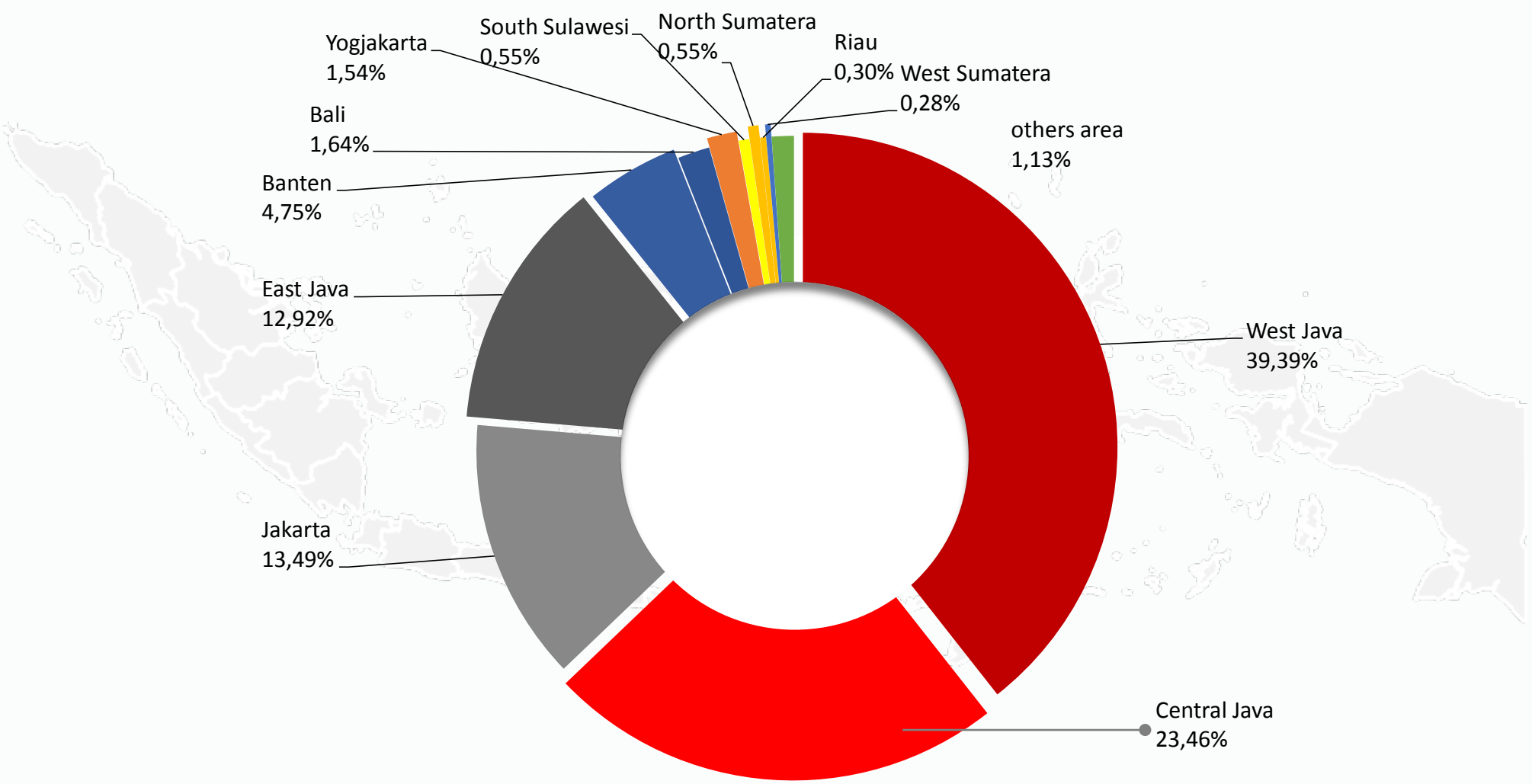
**2.830 enterprises (large & medium scale) & 407 thousand enterprises (micro & small industry)**
Capacity : 2,08 mil. Tones
Production : 1,59 mil. Tones
Invest : Rp 51,05 trillion
Utilization : 76,4%
Worker : 1.684.196 people
Export : USD 7.17 billion
Import : USD 0,41 billion
Balance : USD 6.76 billion

**OTHERS TEXTILE**
(Carpets, non woven, Bed linen etc)

**735 enterprises**
Capacity : 0,59 million Tones
Production : 0,35 million Tones
Invest : Rp 24,74 trillion
Utilization : 59,1%
Worker : 78.058 people
Export : USD 0,465 billion
Import : USD 0,468 billion
Balance : - USD 0,002 billion

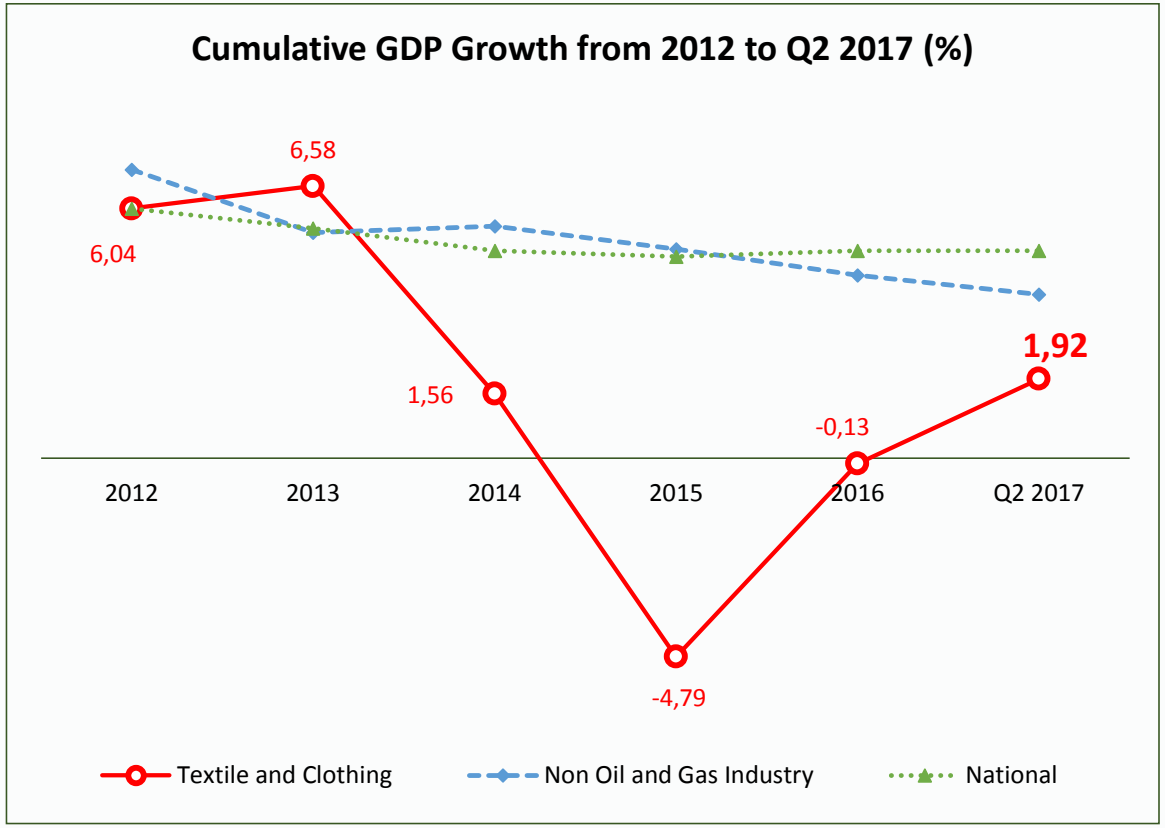
*Sources : Ministry Of Industry, BPS, API (processed)*
**) preliminary data 2016*

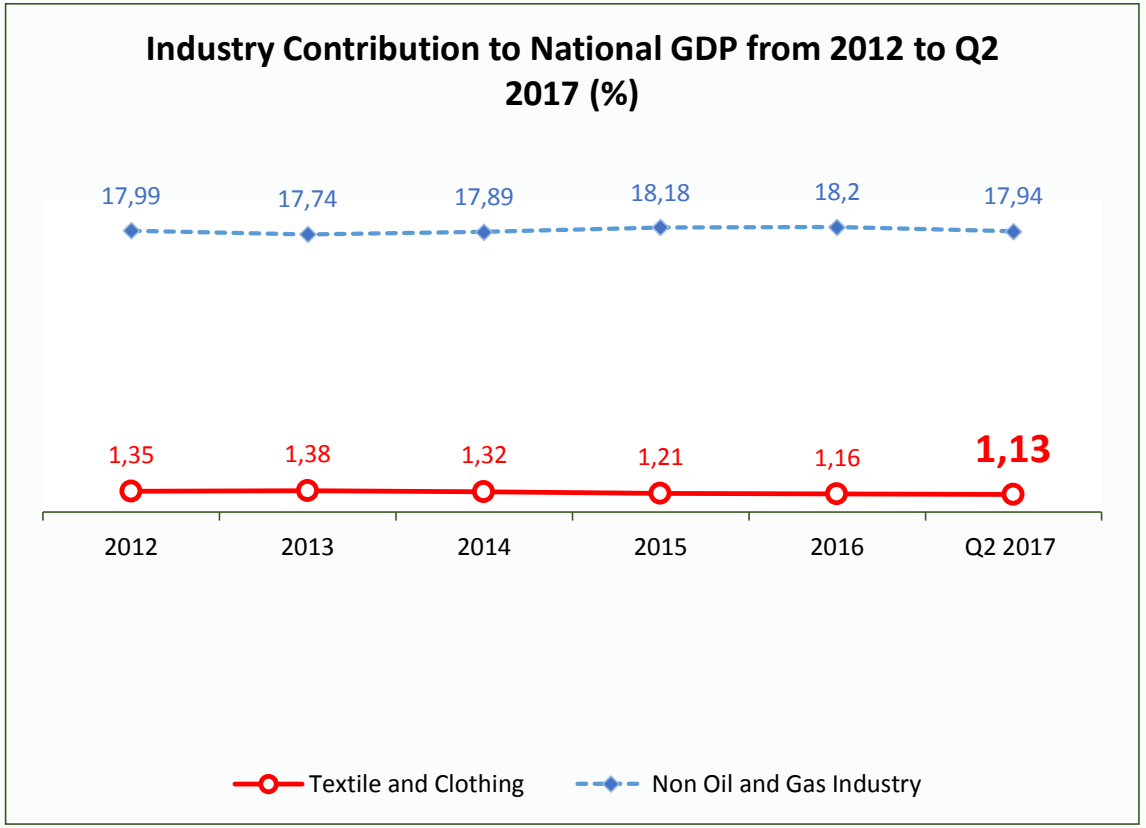
## 2. TEXTILE INDUSTRY DISTRIBUTION (LARGE & MEDIUM SCALE)




*Sources : Ministry Of Industry, BPS (processed)*

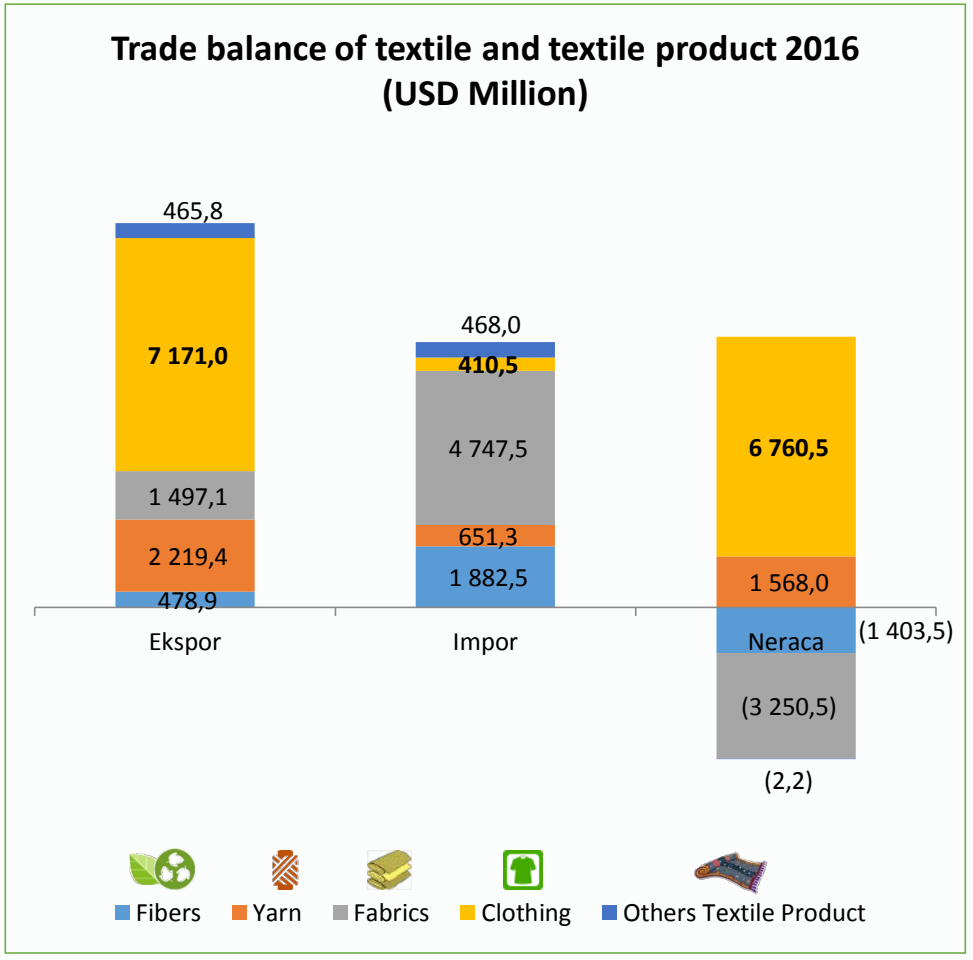
## 3. GROWTH RATE AND CONTRIBUTION TO GDP




*Sources : BPS (processed)*

# 4. BALANCE OF TRADE

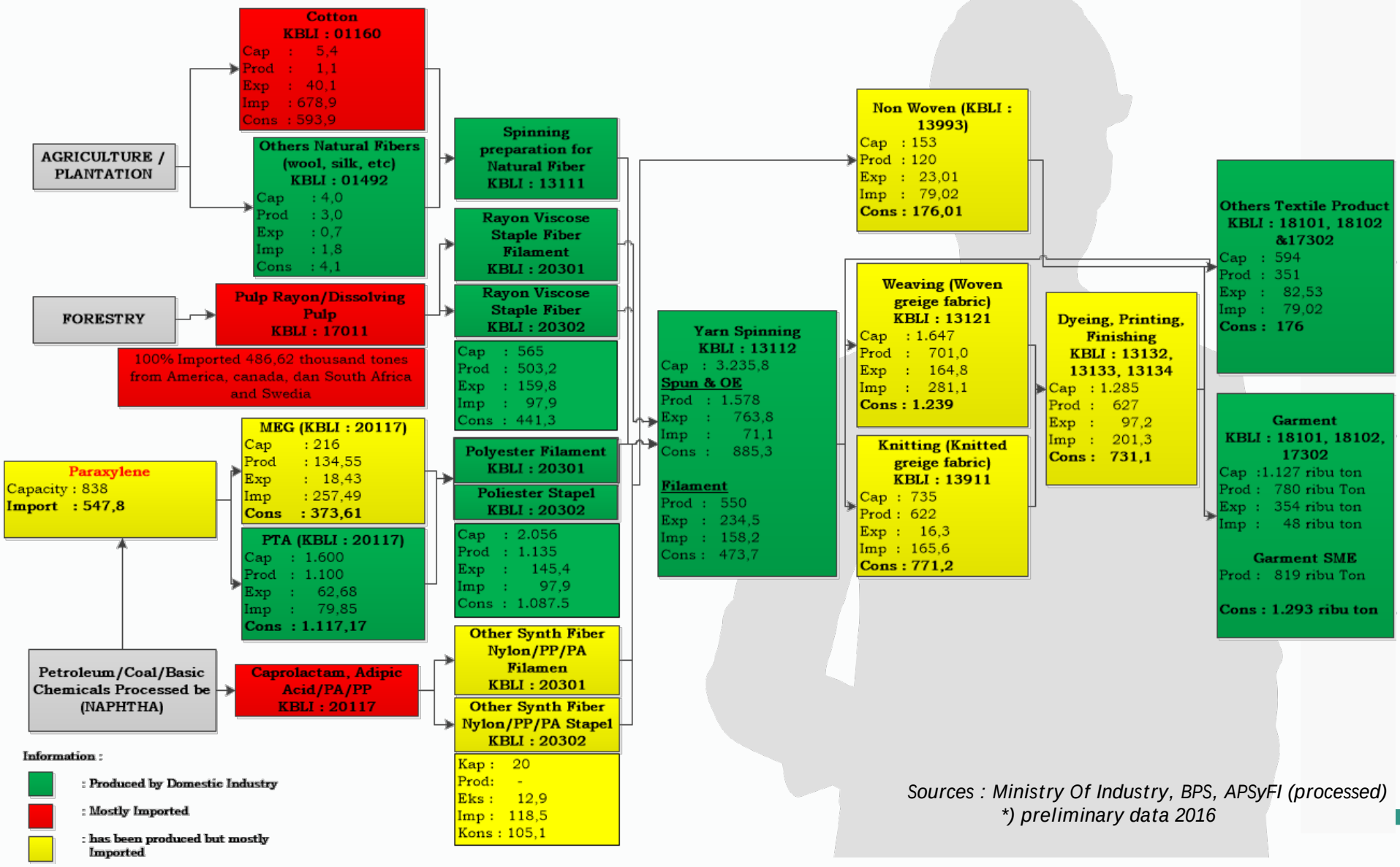

*Sources : BPS (processed)*

## 5. GLOBAL MARKET SHARE


*Source : trademap.org (processed)*

Indonesia's market share in the wolrd decreased due the competitors get preferential tariff to EU and US by 0% while Indonesia with normal tariff of 5-20%

# 5. PRODUCTION CAPABILITY OF TEXILE INDUSTRY




*Sources : Ministry Of Industry, BPS, APSyFI (processed)*
**) preliminary data 2016*

## Existing conditions (2016)

**Total Production**
6,62
Thousand Tonnes

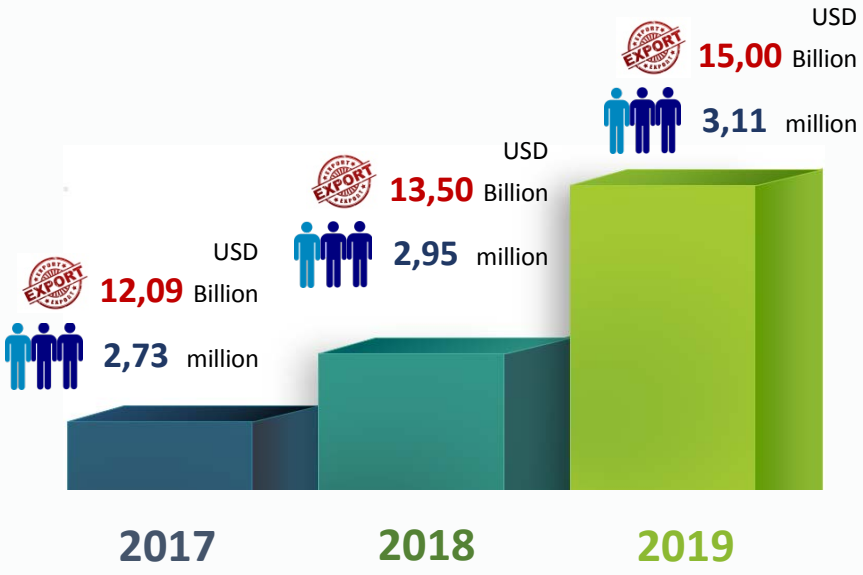
**Export**
USD
11,78
bilion

**Total Investment**
Rp
234,3
Trillion

**Worker**
2,69
Million people

# II. PROSPECT OF TEXTILE INDUSTRY

## 1. EXPORT, LABOR ABSOPRTION & INVESTMENT TARGET




**New Investment/capacity expansion to reach the target in 201**

### SPINNING
Capacity
Current : 3.412.761 tones
Target : 3.982.461 tones
Addition : 569,700 tones
Investment : Rp 12,6 Trillion
Worker : 59.779 people

### WEAVING/KNITTING/DPF
Capacity
Current : 2.723.000 tones
Target : 3.077.200 tones
Addition : 354,200 tones
Investment : Rp 18 Trillion
Worker : 116.949 people

### GARMENTS
Capacity
Current : 1.946.528 tones
Target : 2.155.328 tones
Addition : 208.800 tones
Investment : Rp 16,1 Trillion
Worker : 226.090 people

### OTHERS TEXTILE
Capacity
Current : 594.000 tones
Target : 655.800 tones
Addition : 61.800 tones
Investment : Rp 15,1 Trillion
Worker : 16.197 people

### MAN MADE FIBER
Capacity
Current : 2.997.500 tones
Target : 3.439.700 tones
Addition : 444.200 tones
Investment : Rp 29,7 Trillion
Worker : 5.246 people

**Total :**
**1.638,500** tones
Rp **81,45** Trillion
**424.261** worker

## 2. INVESTMENT OPPORTUNITY & POLICY SUPPORT

1

### New Investment/expansion opportunity

1. Investment on dissolving pulp industry with capacity of 385.000 tones to support on going viscose rayon projects (Rayon Utama Makmur, Sateri Viscose and Indo Bharat Rayon),
2. Additional Investment on MEG and Para-xylene and polyester fiber industries with capacity 92.400 tones
3. Cotton Plantation development to fulfill domestic demand with annual capacity 678.900 tones
4. Investment on stapel and filament yarn industry with capacity 569,700 tones
5. Investment on weaving and knitting industry with capacity 354, 2 thousand tons
6. Investment on garment industry with capacity 208.800 thousand tons
7. Investment on technical textile, carpet and non woven with capacity 61.800 thousand tones
8. Investments on supporting industries such as dyestuff, machinery, textile auxiliaries and garment accessories

2

### Policy/Government Support

1. Investment incentives through tax allowance and tax holiday
2. Control of customs facilities and prevention of high risk imports and illegal imports
3. Accelerated FTA with EU and bilateral agreement with UK and US (under negotiation)
4. Strengthening of Vocational training for 500.000 SMK students that link and match with textile Industry
5. Continuing Machine Restructuring Program for textile industry

# THANK YOU

ASIA PACIFIC FIBERS

Textile Industry in Indonesia - Industry Perspective

# *Indonesian Fibres Industry*

V. Ravi Shankar

President Director, Asia Pacific Fibers

International Textile Manufacturers Federation (ITMF) Annual Conference

Bali, September 2017

# AGENDA

1. Fibre Consumption – Trend & Drivers
2. Fibre Mix
3. Indonesian Fibre Industry
4. Way Forward

# AGENDA

ASIA PACIFIC FIBERS

## 1. *Global Fiber Consumption – Trends & Drivers of Growth*

- Population Driven Growth
- Higher Per-capita Consumption in Developing Countries

## 2. *Fiber Mix*

- Shrinking Share of Cotton
- Healthy Growth of Rayon
- Dominant Polyester backed by wide range of applications
- Growth of Non-woven

## 3. *Indonesian Fiber Industry*

- Growth in fiber consumption vs domestic fiber production
- Demand growth in Polyester & PET
- Growth potential from domestic consumption and import substitution

# Fiber Consumption – Trend & Drivers

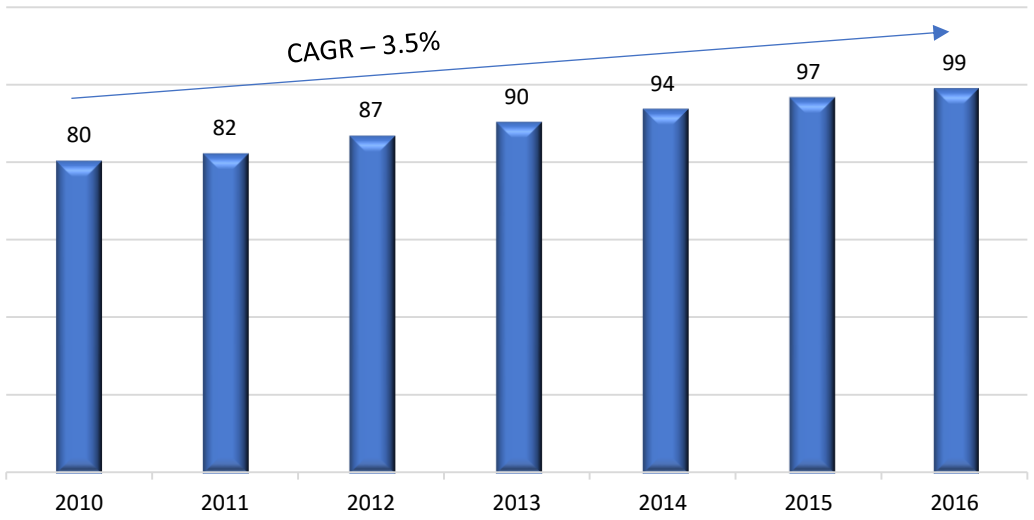
# Global Fiber Consumption

- Global Fiber Consumption grew at a steady CAGR of 3.5% p.a. over last 6 years

- Fiber Consumption growth is driven by
  - Population Growth – 1.1%
  - Consumption Growth – 2.4% growth p.a. linked to higher per-capita consumption

- Incremental Fiber Consumption in 2016 compared to 2010 :
  - 5.5 Mil MT due to population growth
  - 13.2 Mil MT growth is due to higher per-capita consumption

Global Fiber Consumption, Mil MT




Fiber Consumption Growth Drivers, Mil MT (Base - 2010)

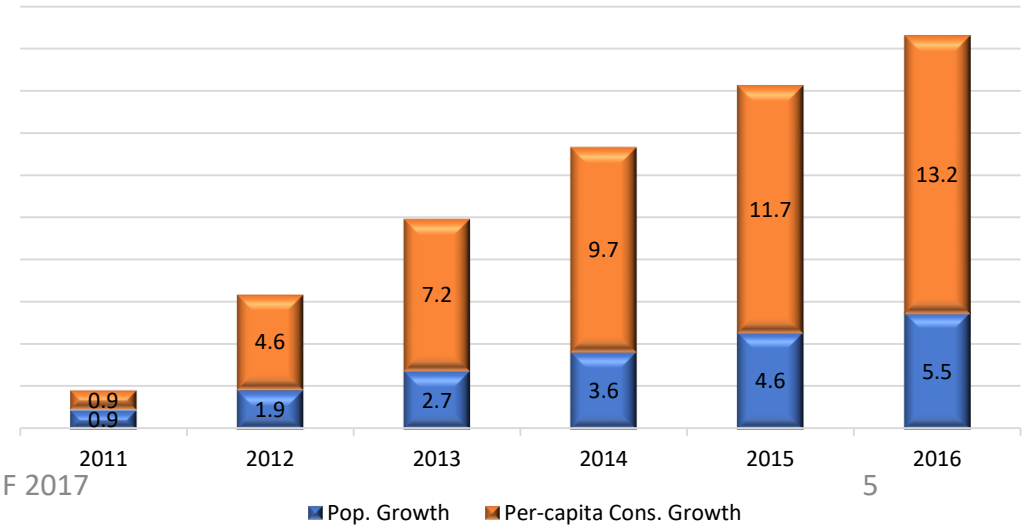
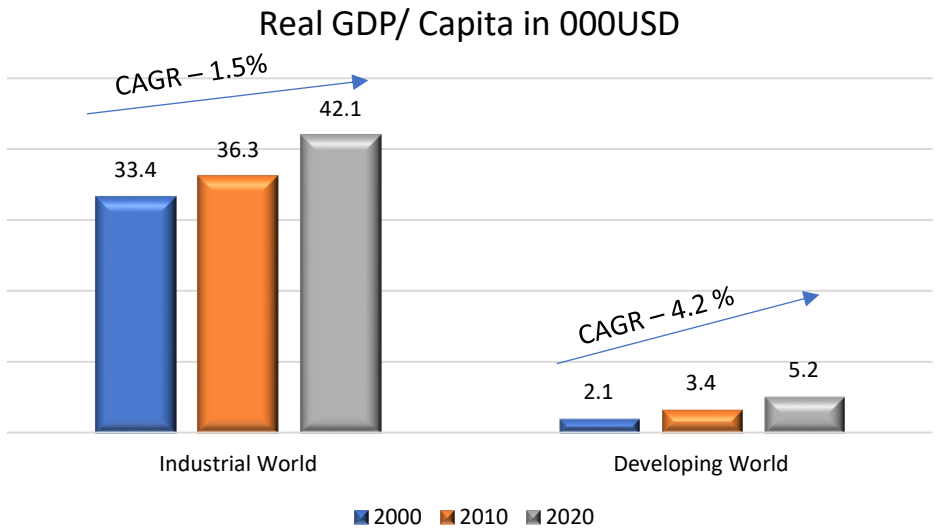



Chart 1 – Global Fiber Consumption in Mil MT – Source – The Fiber Year, Lenzing
Chart 2 – Consumption Growth Drivers – based on Midyear Population Growth Report (US Census)

# Per-capita Fiber Consumption

ASIA PACIFIC FIBERS

- GDP (Per-capita) growth in Industrial World has moderated to about 1.5% CAGR, against an almost 3 fold higher growth rate of 4.2% CAGR for Developing World
- Increase in disposable income in developing world has driven higher per-capita consumption of textiles.
- Per-capita consumption of textiles in developing countries is projected to grow at 4.3% CAGR and reach 12 kg by 2020.
- Indonesian textile consumption has grown at a CAGR of 4.5% during 2010 – 2016. Euromonitor projections show a apparel retail sale growth of 5% p.a. between 2015 – 2020.



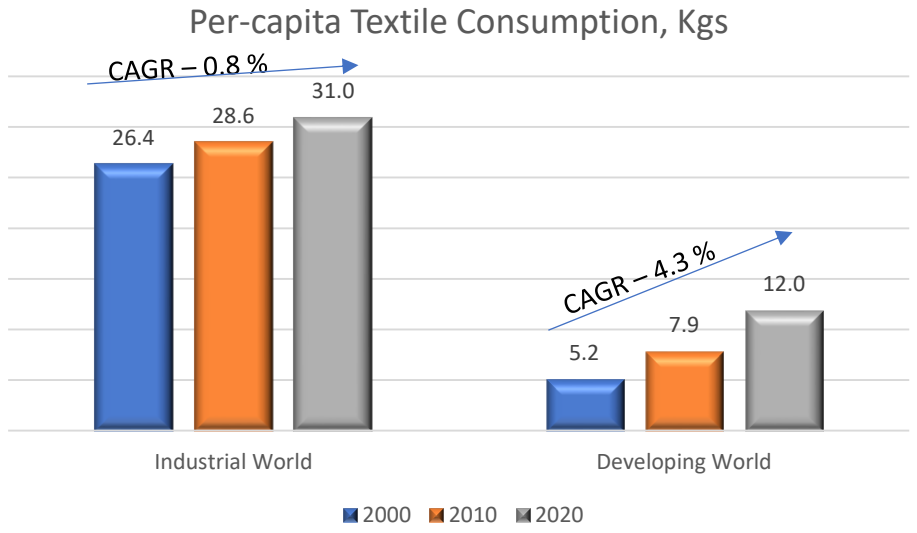
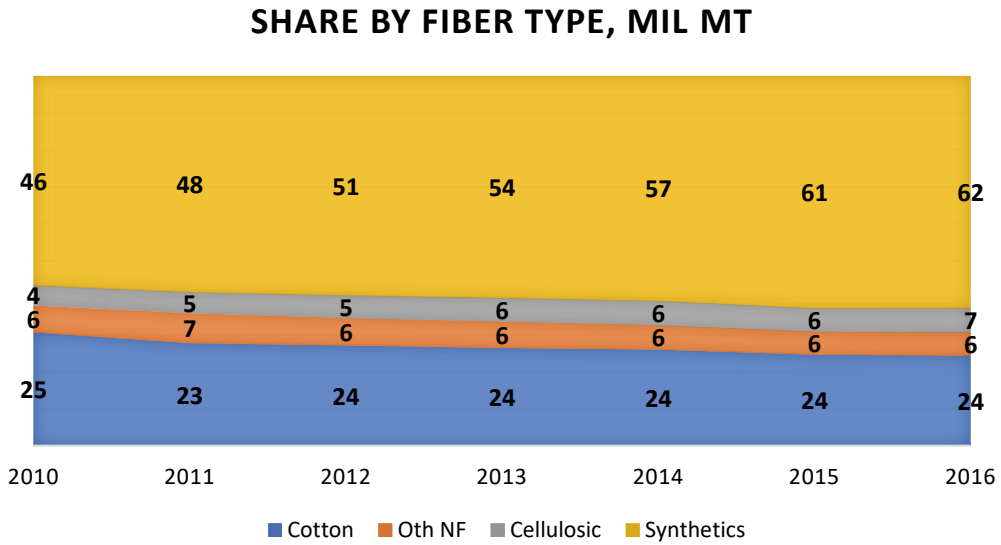




Chart 1 – Real GDP/ Capita – IHS/ ICAC, as seen in Lenzing Presentation Q2 2017
Chart 2 – Per-capita Textile Consumption – IHS/ ICAC, as seen in Lenzing Presentation Q2 2017

# Fibre Mix

# Fiber Mix – Sliding Cotton & Growing Man-Made Fibers

- Fiber consumption grew by 19 Mil MT between 2010 and 2016.
- About 17 Mil MT of this incremental growth was supplied by Synthetic Fibers, and the rest by Cellulosics (Rayon).
- Natural Fibers had a de-growth of about 1 Mil MT, mainly on account of shrinking Cotton share.
- Cellulosics grew at a CAGR % of 6.9, followed by Synthetics at 5.3%, while cotton shrank by 0.4%
- Future projections also show Synthetics driving future consumption, with Polyester as the dominant fiber.




| 2010- 16 | Cotton | Oth NF | Cellulosic | Synthetics |
|---|---|---|---|---|
| CAGR % | -0.4 | 1.2 | 6.9 | 5.3 |

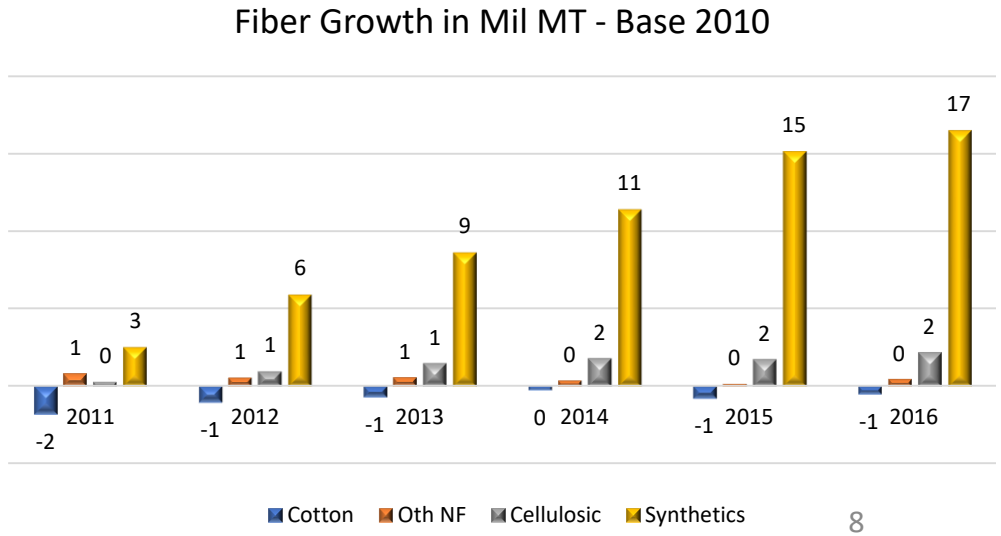
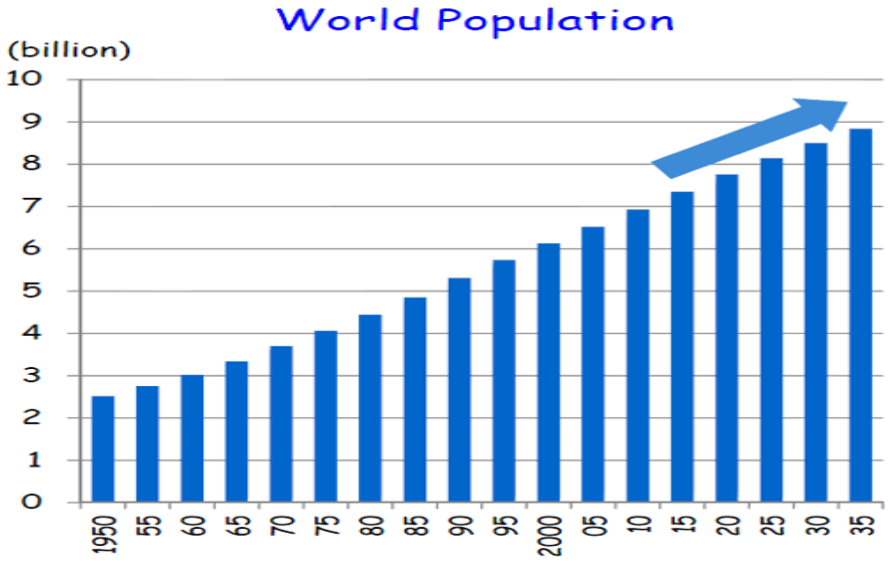
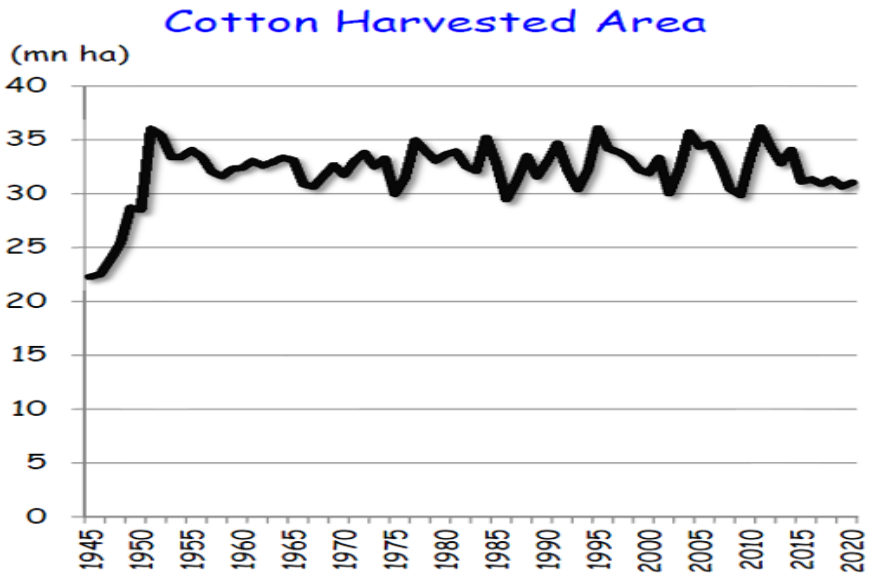



Chart 1 – Fiber Consumption by Fiber Type – The Fiber Year & Lenzing Presentation Q2 2017
Chart 2 – Fiber Growth by Type – The Fiber Year & Lenzing Presentation Q2 2017

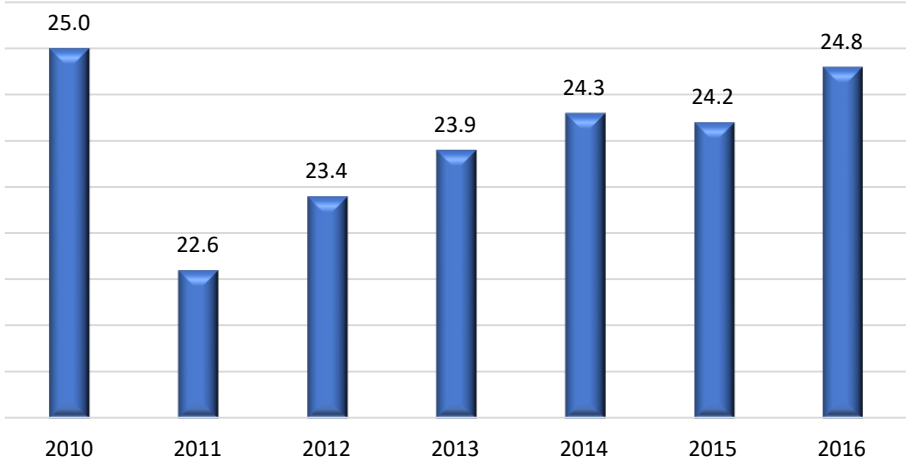
# Fiber Mix – Shrinking Share of Cotton




- Cotton share of fibers dropped from 31% in 2010 to 24% in 2016.
- With growing population, a finite supply of land, and limited supply of water, cotton acreage has become stagnant over the years and the possibility of increase is limited.
- With yields also plateauing in major producing countries, no significant increase in cotton supply expected in future.
- Indonesia imports almost all of its cotton requirement – but has a developed production chain of Rayon and Polyester fibers.

Global Cotton Production, Mil MT




Indonesian Cotton Fiber Imports, 000 MT

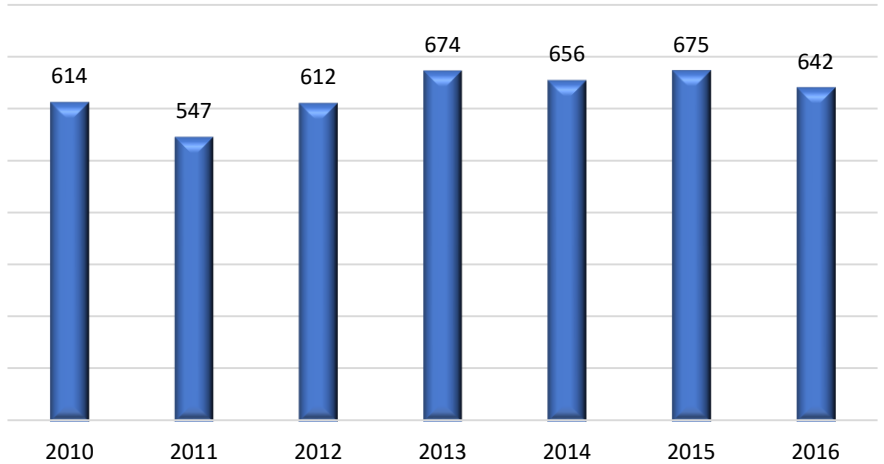
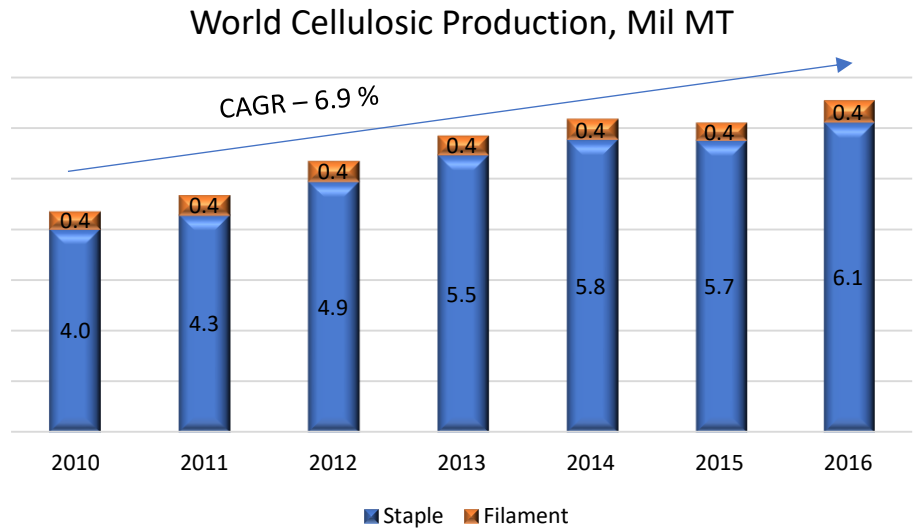



Chart 1 – World Population – UN (JCFI Presentation)
Chart 3 – Global Cotton Production – Cotton.org

Chart 2 – Cotton Harvested Area – ICAC (JCFI Presentation)
Chart 4 – Indonesian Cotton Fiber Imports – ApSyfi Database

# Fiber Mix – High Growth Rate of Rayon

- Cellulosic fibers grew at the fastest pace amongst all fibers (CAGR of 6.9%) between 2010 and 2016.
- Cellulosic Staple fibers registered the entire growth, with filament production remaining almost flat.
- Indonesia has reported a steady production of Rayon, growing at 3.3% CAGR.
- With good spinning infrastructure, domestic consumption of rayon is about 360KT against the production of 470KT. 90KT is imported and 190KT of fiber is exported.



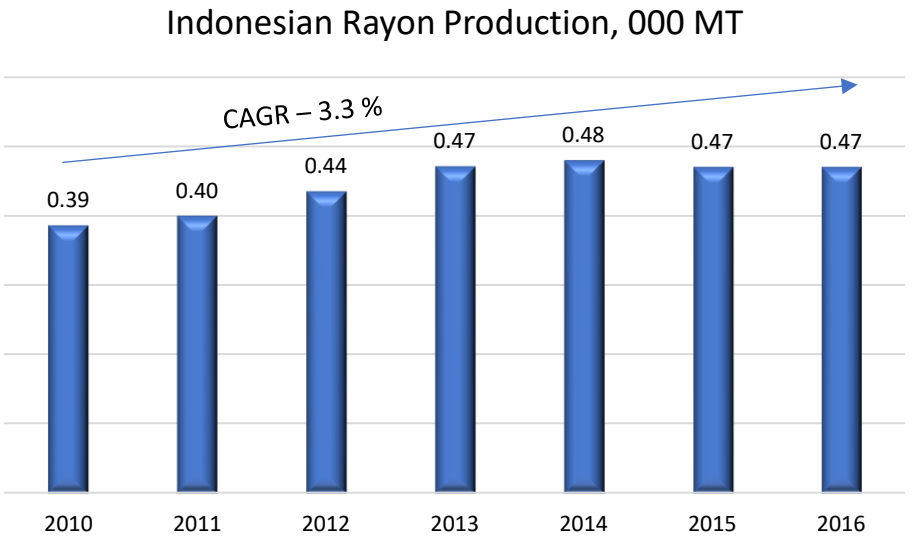
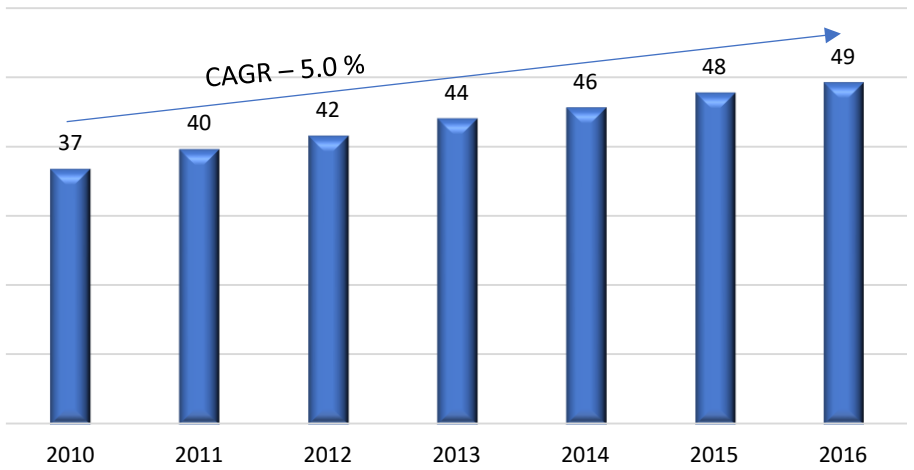




Chart 1 – World Cellulosic Production – The Fiber Year, Lenzing Q2 2017 Presentation
Chart 2 – Indonesian Rayon Production – ApSyfi Database

# Fiber Mix – Dominant Polyester

- Polyester production grew at 5.0 % CAGR between 2010 and 2016.
- Polyesters met almost 75% of the incremental fiber consumption during this period.
- Polyester growth is driven by its easy availability of raw materials, wide application range, stable and affordable pricing and durability.
- With fast expanding application, Polyester is expected to maintain its leadership position, meeting most of the incremental consumption growth.

Global Polyester Production - Mil MT



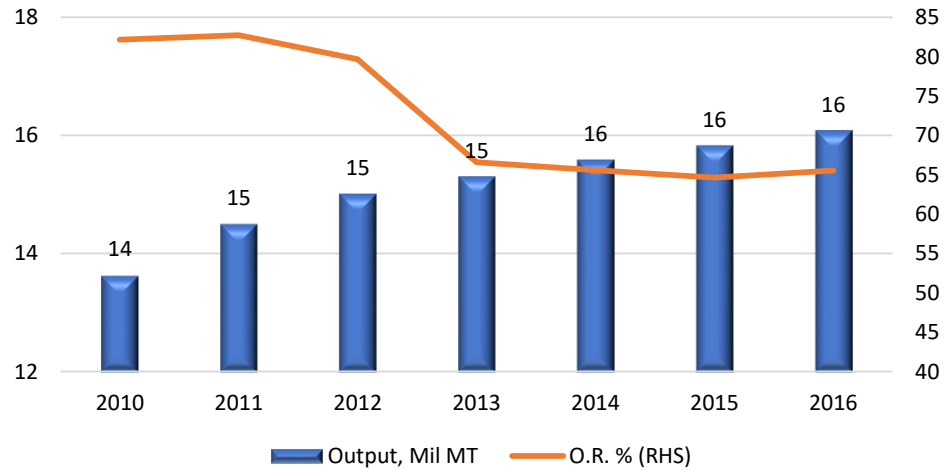

| Textile filament (POY/DTY/FDY) | Staple Blends cotton, wool, rayon | Industrial filament | BCF/other |
|---|---|---|---|
| Apparel<br>Fashion<br>Performance<br>Commodity<br>Career | Apparel<br>Fashion<br>Commodity | Automotive<br>Tyres<br>Hoses<br>Belts<br>Seat belts | Carpet<br>Residential<br>Rugs/mats |
| Household<br>Bedding<br>Upholstery<br>Drapes | Household<br>Bedding<br>Towels | Other<br>Roofing<br>Coated fabrics<br>Conveyor belts<br>Power belts<br>Geo textiles<br>Ropes<br>Nets | Nonwovens<br>Spun bond |
| Automotive<br>Upholstery<br>Headliner | Nonwovens<br>Disposables | | Monofil<br>Papermaking<br>Weedwackers |
| Other<br>Office furnishing<br>Medical<br>Luggage<br>Industrial | Fibrefill<br>Fill for pillows<br>Comforters etc<br>Carpet | | |

Chart 1 – Global Polyester Production – PCI
Chart 2 – Application of Polyesters

# Fiber Mix – Polyester Staple Fiber (PSF)

- Polyester Staple Fiber output grew at 2.8% CAGR between 2010 and 2016.
- Operating Rates sharply dropped from 80% levels in 2011/12 to 65% levels by 2015, due to huge capacity addition.
- With slowing new capacity addition, and steady demand growth of about 3%, Operating Rates have stabilised around 65%.
- PSF production is projected to grow at a CAGR of 3% to 18.1 Mil MT by 2020. Operating Rates are projected to improve marginally to about 70% by then.

Global PSF Output & Operating Rate




| CAGR % : 2010 - 2016 | CAGR% : 2016 - 2020 |
|---|---|
| 2.8 | 3.0 |

Global PSF - Projected Output & O.R.

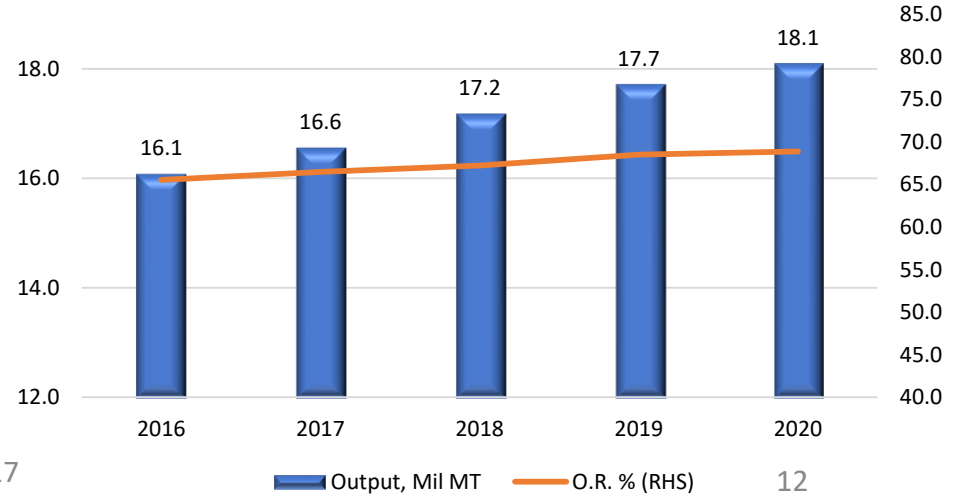
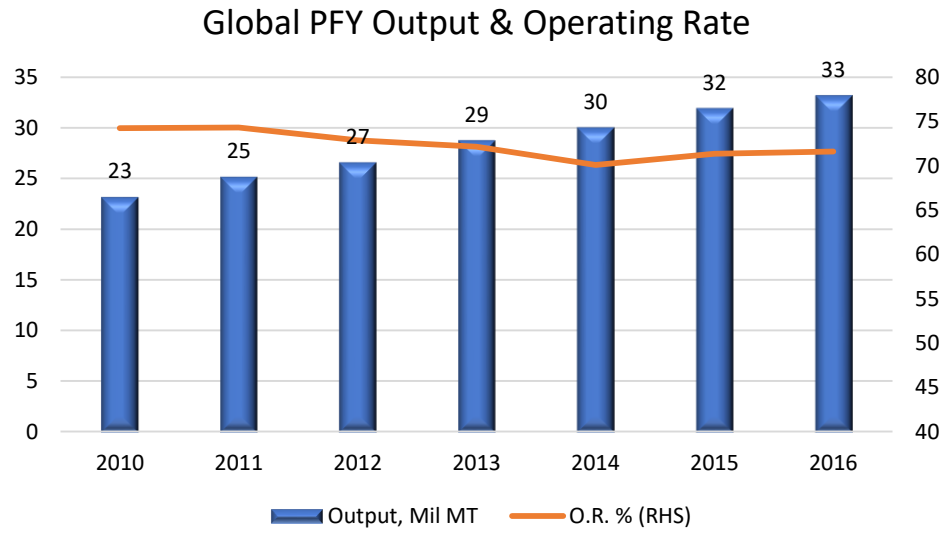



Chart 1 – World PSF Output and Operating Rate - PCI
Chart 2 – Projected PSF Output and Operating Rate - PCI

# Fiber Mix – Polyester Filament Yarn (PFY)

- Polyester Filament Yarn output grew at 6.2% CAGR between 2010 and 2016.
- Operating Rates dropped from 75% levels in 2011/12 to 70% levels by 2015, due to huge capacity addition.
- With slowing new capacity addition, and steady demand growth, Operating Rates have stabilised around 71%.
- PFY production is projected to grow at a CAGR of 4.5% to 55 Mil MT by 2020.




| CAGR % : 2010 - 2016 | CAGR% : 2016 - 2020 |
|---|---|
| 6.2 | 4.5 |

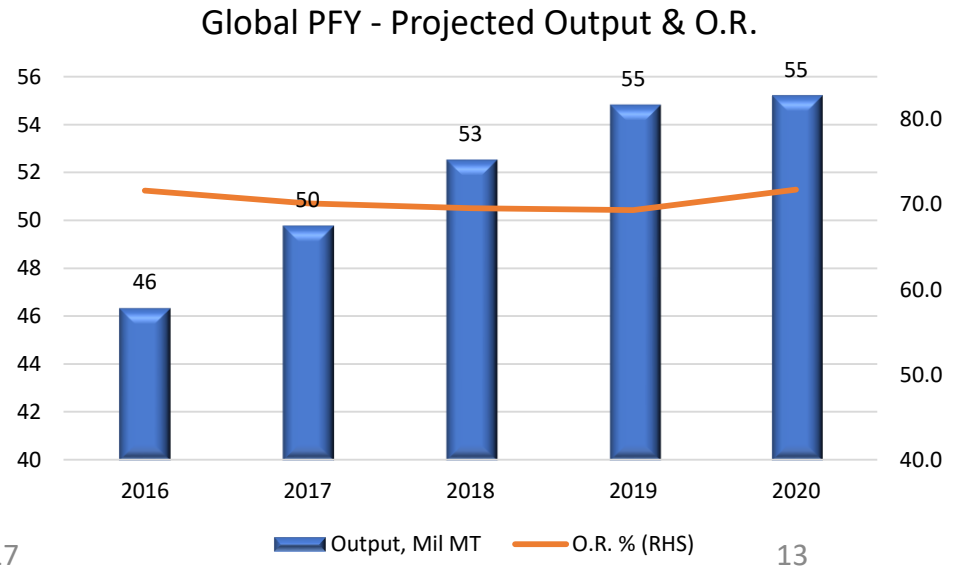



Chart 1 – World PFY Output and Operating Rate - PCI
Chart 2 – Projected PFY Output and Operating Rate - PCI

# Spun Yarn Vs Filament Yarn Production

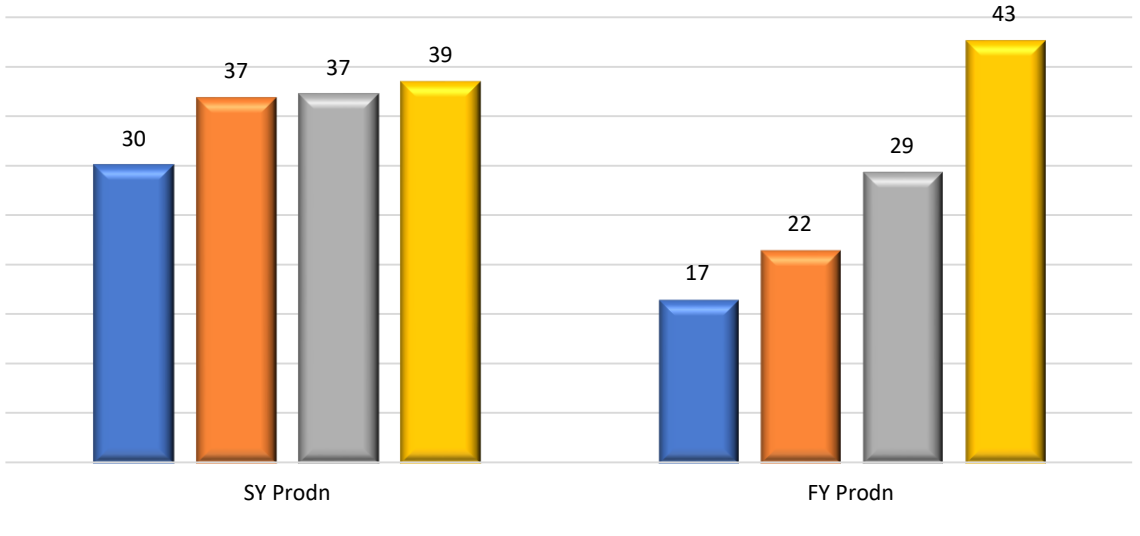
ASIA PACIFIC FIBERS

- Global Spun Yarn production grew at a very slow pace of 0.4% CAGR between 2005 and 2015, due to shrinking share of Cotton. Spun Yarn growth was driven by Cellulosics (7.3% CAGR) and then by Polyester (2.2% CAGR)

- Filament Yarn production grew at 7.1% CAGR between 2005 and 2015, driven primarily by Polyester.

- Filament Production growth was in both Textile and Industrial applications. Filament for Textiles increased from 17 Mil MT in 2005 to 37 Mil MT in 2015. Filament for Industrial/ Carpet applications increased from 4 to 6 Mil MT during the same period.

Spun Yarn & Filament Yarn Production Trend, in Mil MT




| Production Growth | Spun Yarn | Filament |
|---|---|---|
| CAGR %, 2000 - 15 | 1.7 | 6.5 |
| CAGR %, 2005 - 15 | 0.4 | 7.1 |

Filament Production by Application, Mil MT

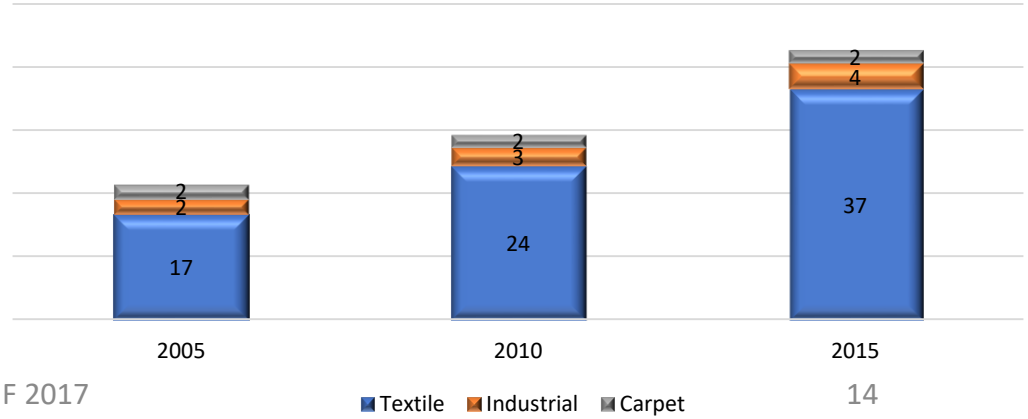
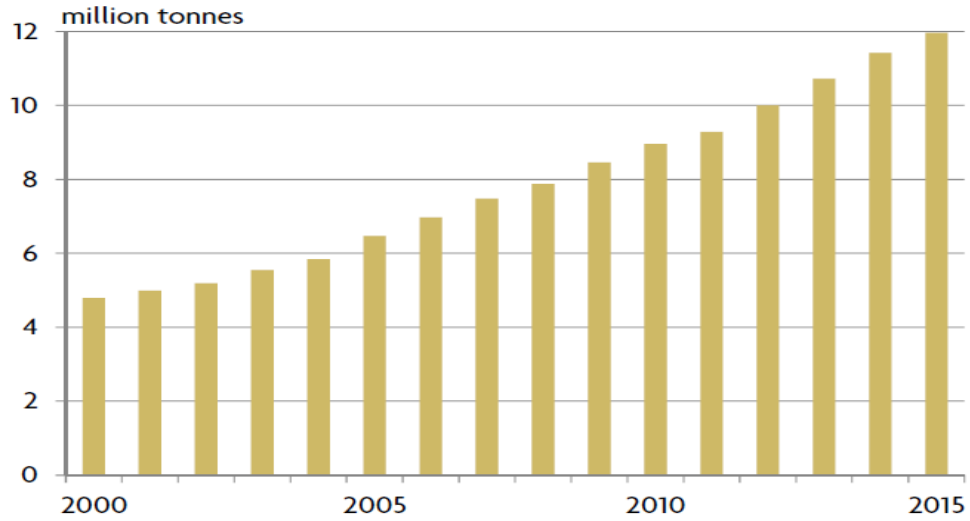



Chart 1 – World Spun Yarn and Filament Yarn Production – The Fiber Year
Chart 2 – Filament Yarn Production by Application – The Fiber Year

# Non Woven Production

- Global Nonwovens production grew at an average annual growth rate of 6.3% from 2000.
- Production in Asia showed the highest growth rate of almost 10%.
- Demand is projected to be robust, driven by multiple applications and higher demand in developing countries.
- Applications in Hygiene, Medical, Filtration, Automotive, Roofing, Building and Agriculture are the drivers of Nonwoven demand growth

**World Nonwovens and Unspun Production**




**Average Annual Growth Rate of Nonwovens and Unspun Production**

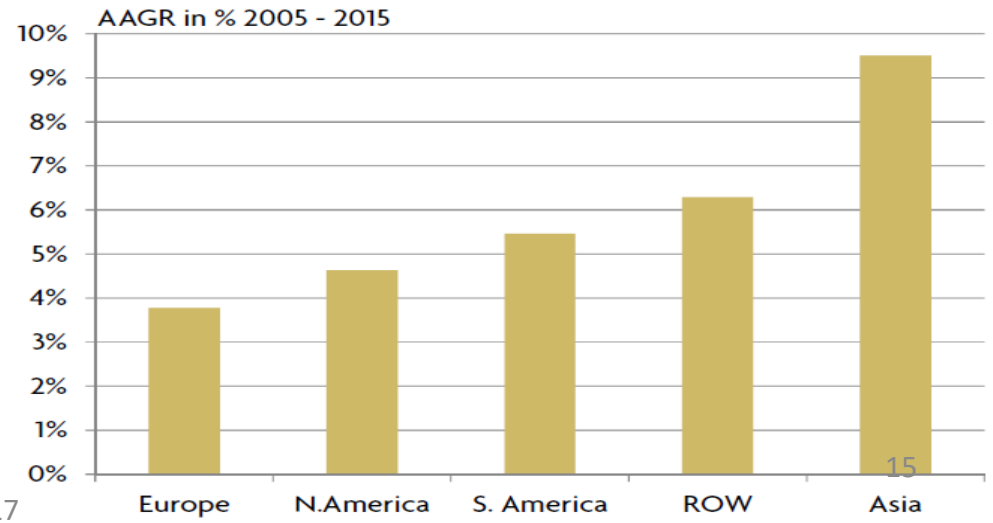
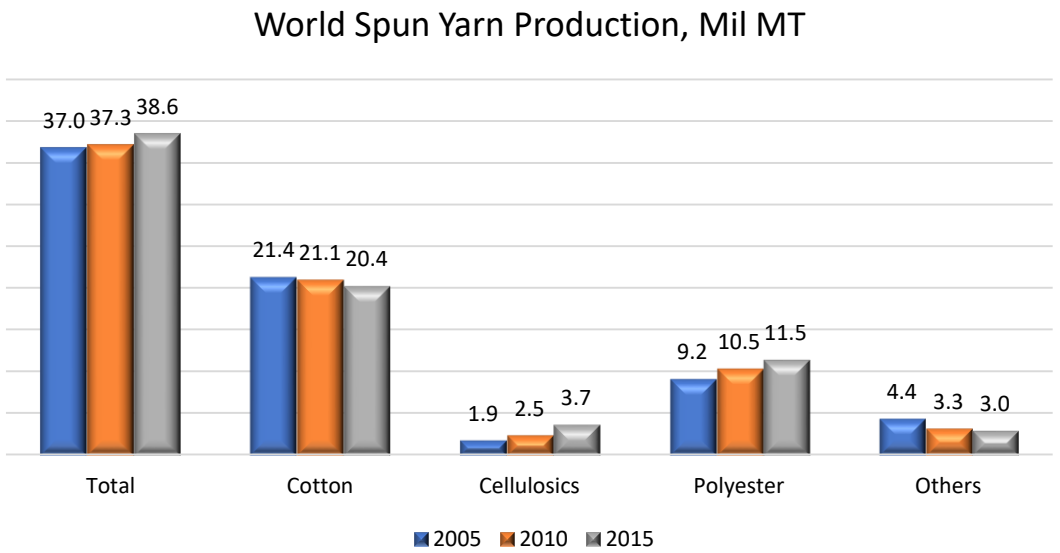



Chart 1 – World Nonwovens and Unspun Production – The Fiber Year
Chart 2 – Region wise Production Growth Rates of Nonwovens – The Fiber Year

# Spun Yarn Production

- Global Spun Yarn production grew at a very slow pace of 0.4% CAGR between 2005 and 2015, due to shrinking share of Cotton.
- Spun Yarn growth was driven by Cellulosics (7.3% CAGR) and then by Polyester (2.2% CAGR).
- Future growth in Spun Yarn will be driven by Polyester and Rayon.
- Indonesian Spun Yarn production has been steady with a CAGR of 0.8%.
- Indonesia has been a net exporter of Spun Yarn, with average exports of 750KT/ year.




| 2005 - 15 | Total | Cotton | Cellulosics | Polyester | Others |
|---|---|---|---|---|---|
| CAGR % | 0.4 | -0.5 | 7.3 | 2.2 | -3.9 |


Chart 1 – World Spun Yarn Production – The Fiber Year
Chart 2 – Indonesian Spun Yarn Production – ApSyfi database

# Indonesian Fibre Industry

# Textile Consumption- Indonesia

- Textile Consumption in Indonesia has grown at a CAGR of 4.6% between 2010 and 2016.
- As observed in all developing countries, consumption is driven more by higher per-capita consumption (3.6% CAGR) than by population growth.
- Growing middle class families, and higher GDP is projected to propel this growth further.

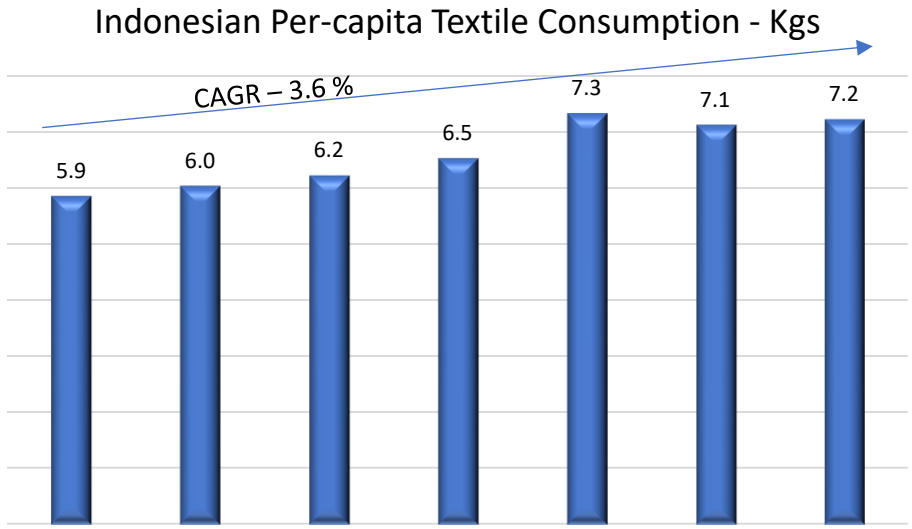
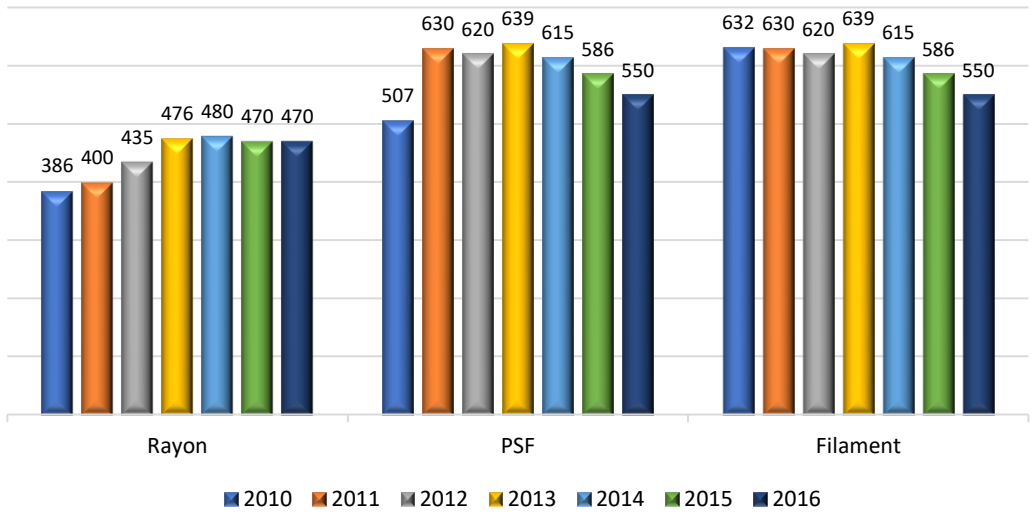




Chart 1 – Indonesian Textile Consumption – ApSyfi Database
Chart 2 – Indonesian Per-capita Textile Consumption – ApSyfi Database

# Textile Consumption vs Fiber Production- Indonesia

- While Textile consumption in Indonesia has grown at a good CAGR of 4.6%, fiber production has grown by only a small extent (CAGR of 0.5%), with a significant amount of demand growth fed by imports.
- There is virtually no production of Natural Fibers in Indonesia (current level – about 9,000 MT per year, against a total of about 1.6 Mil MT)
- Rayon production grew by 3.3%, PSF by 1.5%, while filament production went down by 2.4%.
- Tremendous potential for upstream fiber production exists in Indonesia, with increasing garment exports and growing domestic consumption.

Indonesian Fiber Production - By Type, 000 MT




| CAGR % Fiber Prod | CAGR % Text Cons. |
|---|---|
| 0.5 | 4.6 |

Indonesian Fiber Prod Vs Textile Consumption - 000 MT

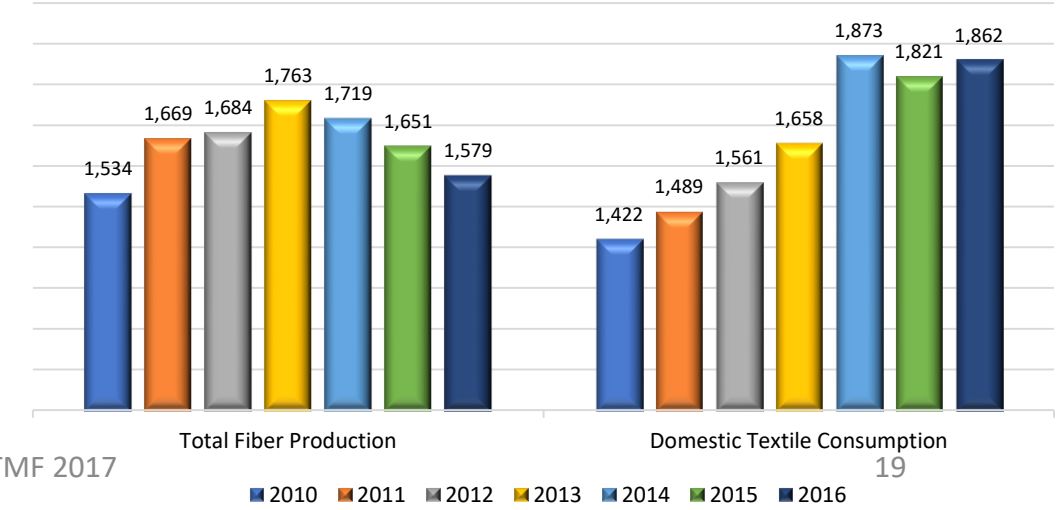
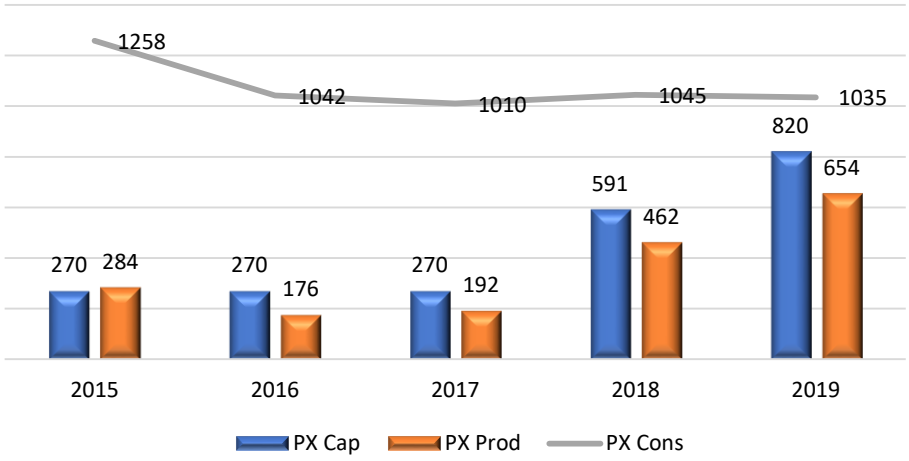



Chart 1 – Indonesian Fiber Production – ApSyfi Database
Chart 2 – Indonesian Fiber Production Vs Textile Consumption – ApSyfi Database

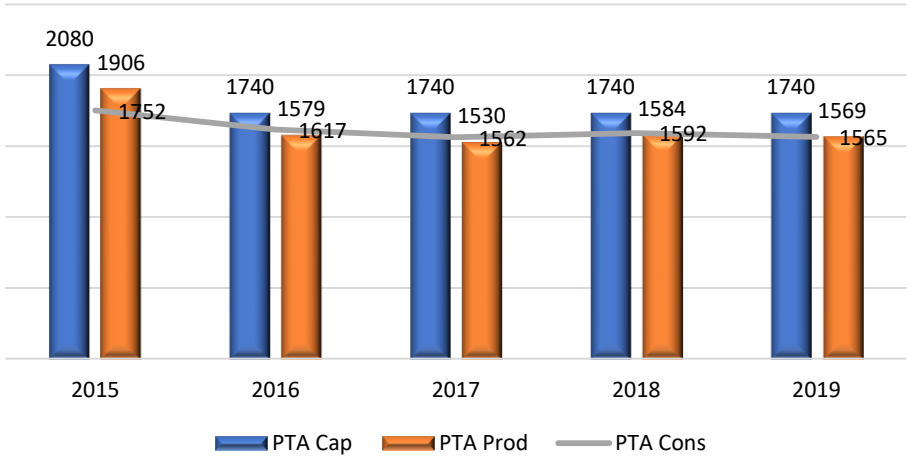
# Polyester Raw Material - Indonesia

ASIA PACIFIC FIBERS

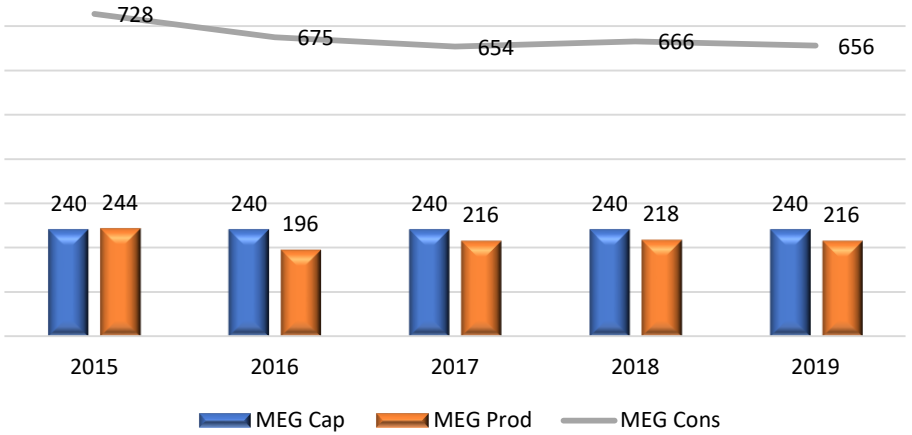
PX – Indonesia, Qty in 000MT



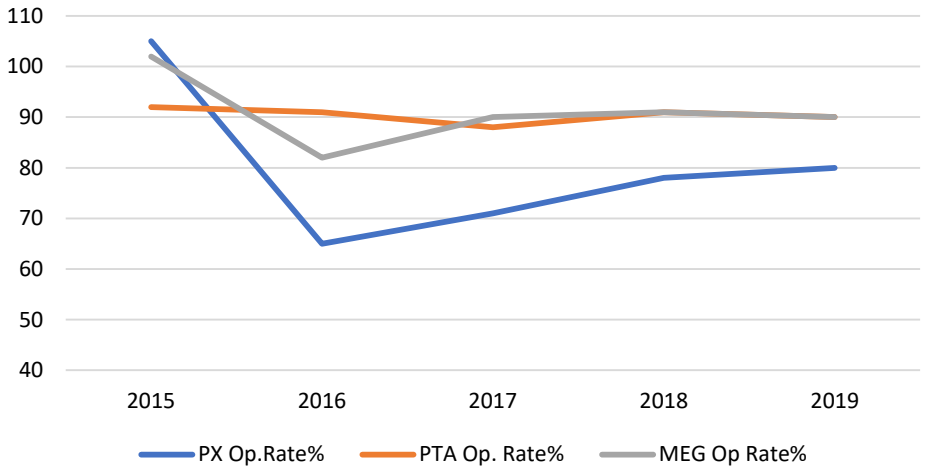

PTA – Indonesia, Qty in 000MT




MEG – Indonesia, Qty in 000MT




PX, PTA, MEG Operating Rates




- PX Requirement largely met through imports – stable consumption
- PTA production and consumption almost matching – stable Operating Rates of 90% forecast
- MEG – primarily met through imports with local capacity operating rates stable at around 90%

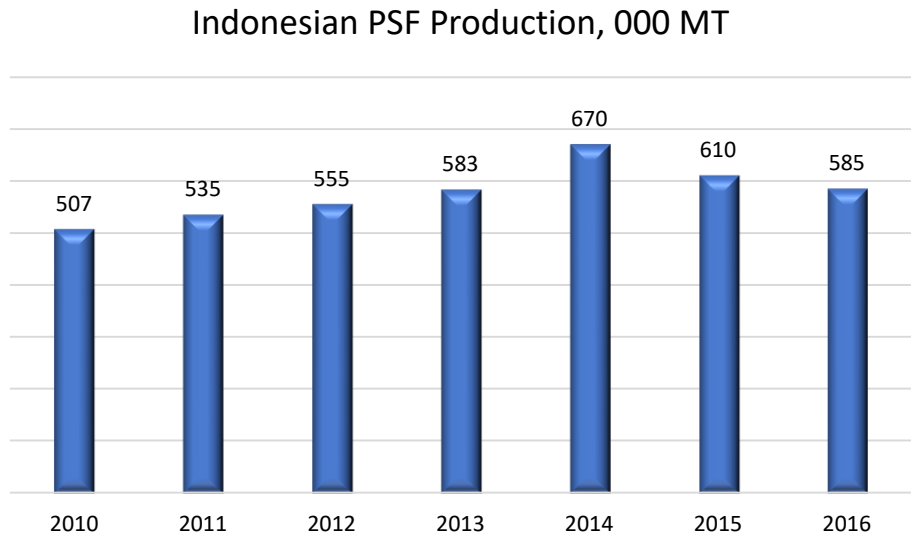
Chart 1 – Indonesian PX Position – PCI
Chart 2 – Indonesian PTA Position - PCI
Chart 3 – Indonesian MEG Position – PCI
Chart 4 – PX, PTA,MEG O.R. in Indonesia - PCI

# Polyester Production - Indonesia

- Polyester Staple Fiber output in Indonesia grew at 2.3% CAGR between 2010 and 2016. Filament output has dropped by about 2.4% during the same period.

- In spite of firm consumption growth of textiles in Indonesia, and new capacity addition in both PSF and PFY, Indonesian fiber and filament output has been under strain due to continuously increasing imports of both upstream fibers and downstream fabrics.

- With no new capacity addition till 2020, and steady improvement in consumption, opportunities exist for both PSF and PFY producers in Indonesia to ramp up the production and meet the higher demand, while cheaper imports remains a serious threat.



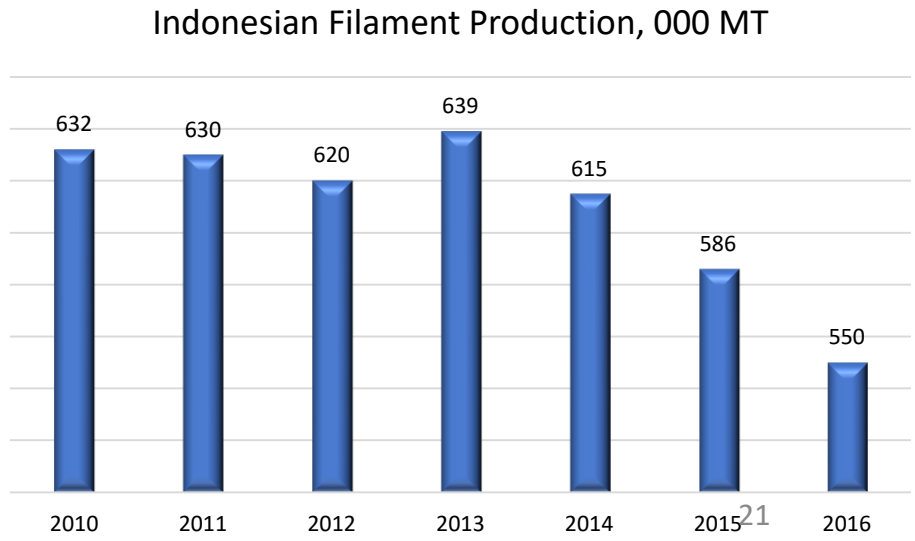
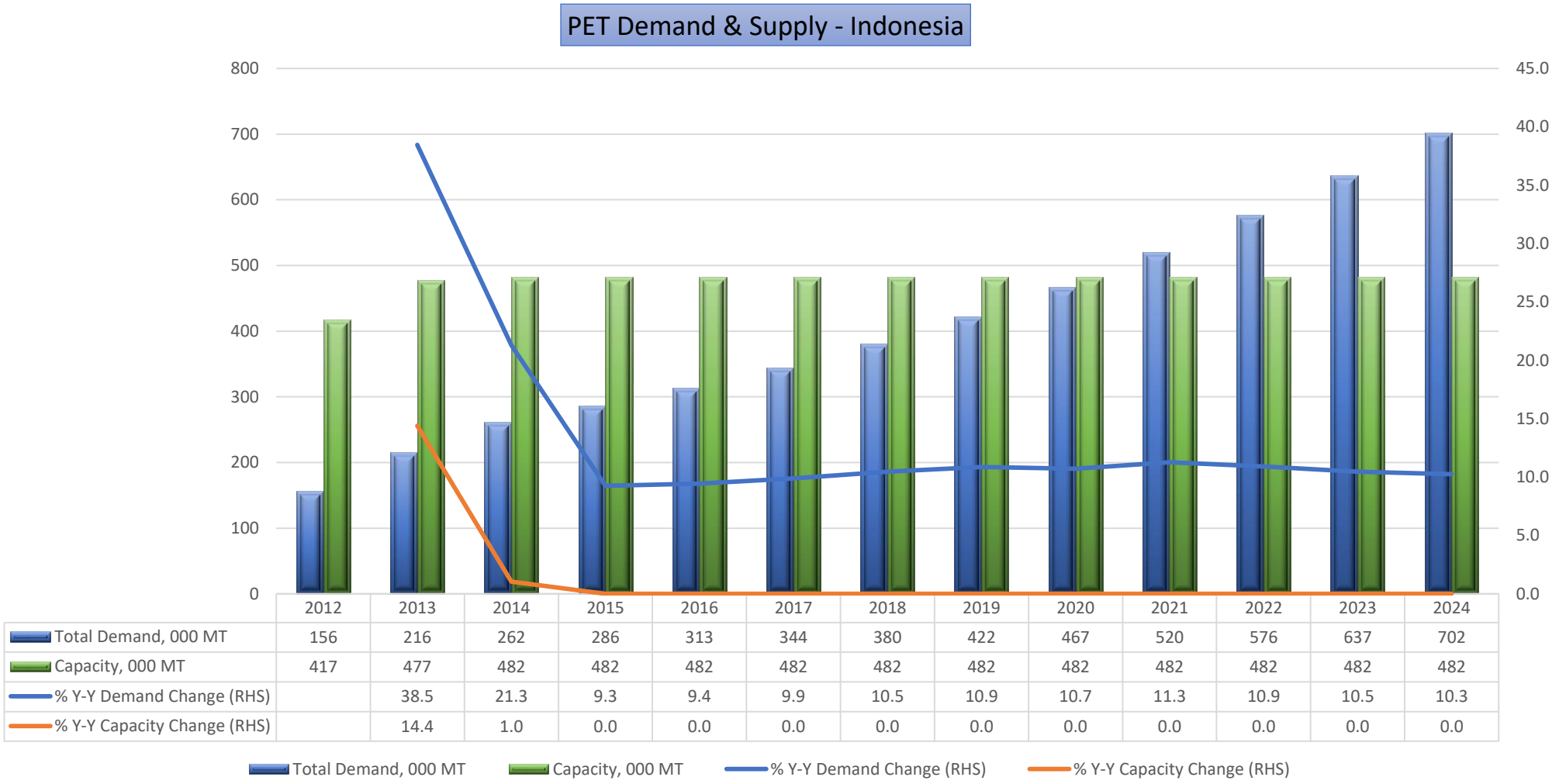




Chart 1 – Indonesian PSF Output – ApSyFi Database
Chart 2 – Indonesian PFY Output - ApSyFi Database

# PET Resin - Indonesia




| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Demand, 000 MT | 156 | 216 | 262 | 286 | 313 | 344 | 380 | 422 | 467 | 520 | 576 | 637 | 702 |
| Capacity, 000 MT | 417 | 477 | 482 | 482 | 482 | 482 | 482 | 482 | 482 | 482 | 482 | 482 | 482 |
| % Y-Y Demand Change (RHS) | | 38.5 | 21.3 | 9.3 | 9.4 | 9.9 | 10.5 | 10.9 | 10.7 | 11.3 | 10.9 | 10.5 | 10.3 |
| % Y-Y Capacity Change (RHS) | | 14.4 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

- A handsome demand growth of almost 10% per annum presents a golden opportunity for Indonesian domestic producers to ramp up capacity – currently no capacity increase planned.

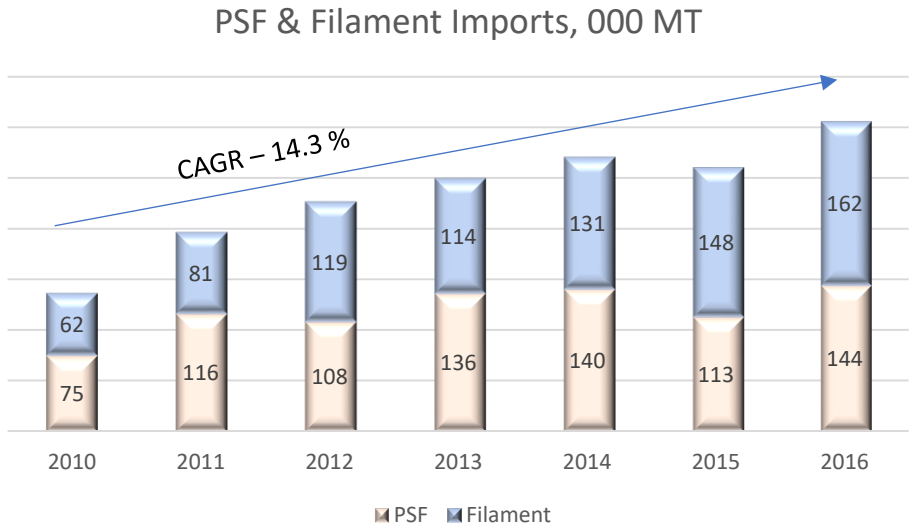
Chart 1 – Indonesian PET demand and capacity – PCI PET Packaging and Resins – Q1 2016

# Indonesian Polyesters – Growth through Import Substitution

- Import Substitution through competitive production of differentiated Fibers/ Yarns ( Imports of PSF/ Filament into Indonesia have increased at a CAGR % of 14.3 between 2010 – 2016)

- Increasing Exports through value added Fibers/Yarns (PSF/ Filament exports from Indonesia hardly grew during 2010 – 2016 – CAGR of only 1.3%)

- Providing integrated support to Garment exporters by developing appropriate fabrics and yarns/ fibers – thus bringing in benefits of higher garment exports and higher domestic consumption to the entire domestic textile chain.



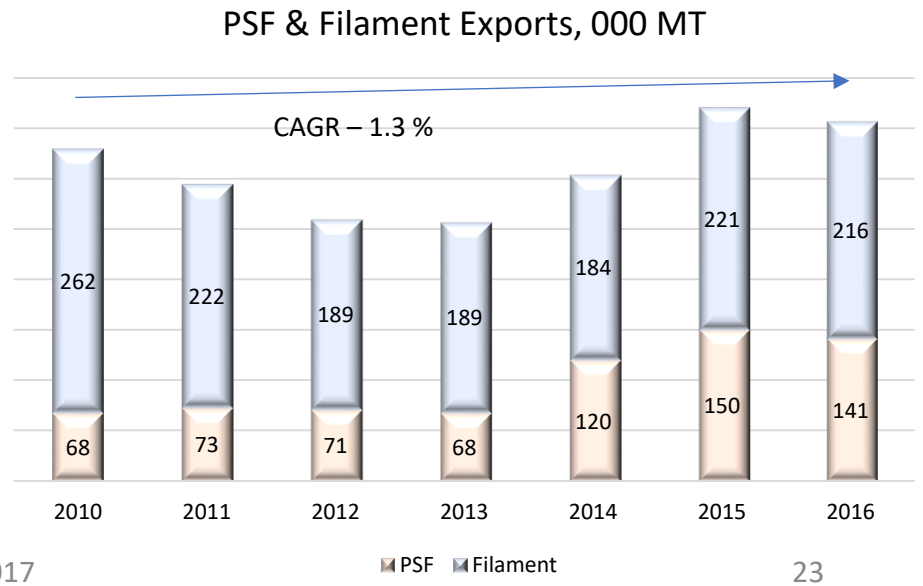
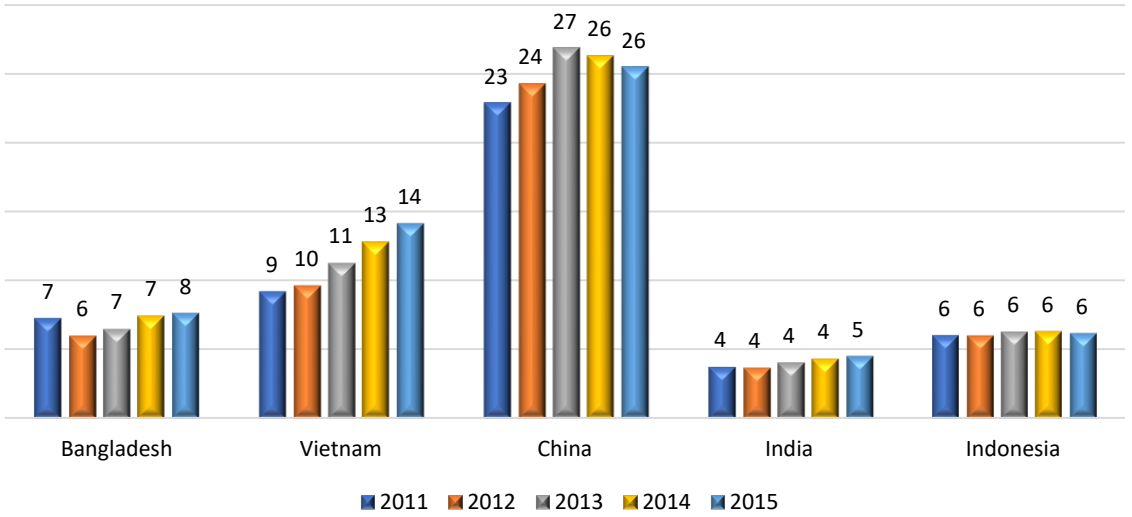




Chart 1 – Indonesian PSF/ Filament Imports – ApSyfi Database
Chart 2 – Indonesian PSF/ Filament Exports – ApSyfi Database

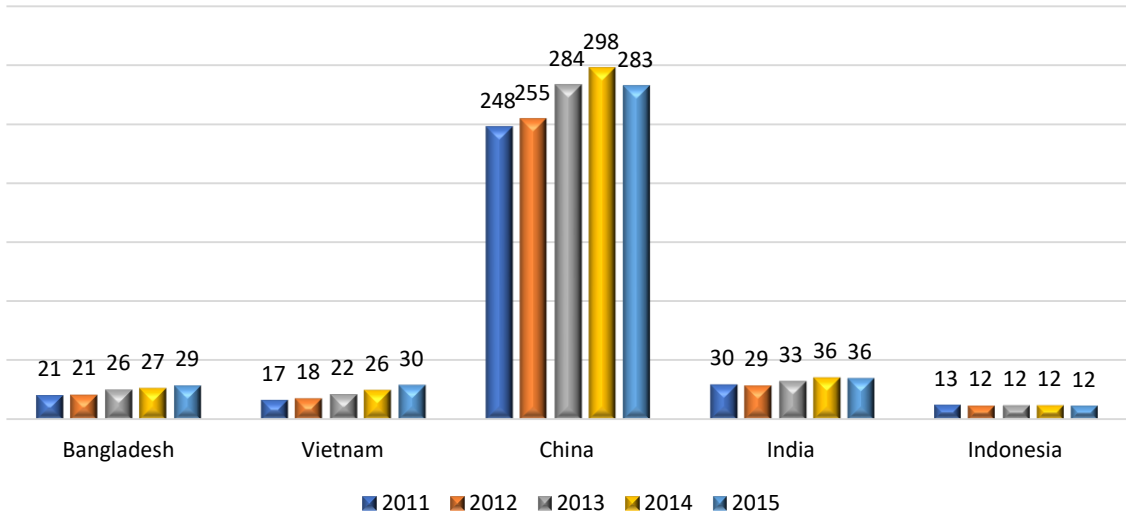
# Textiles & Clothing Trade – Opportunity for Indonesia

ASIA PACIFIC FIBERS

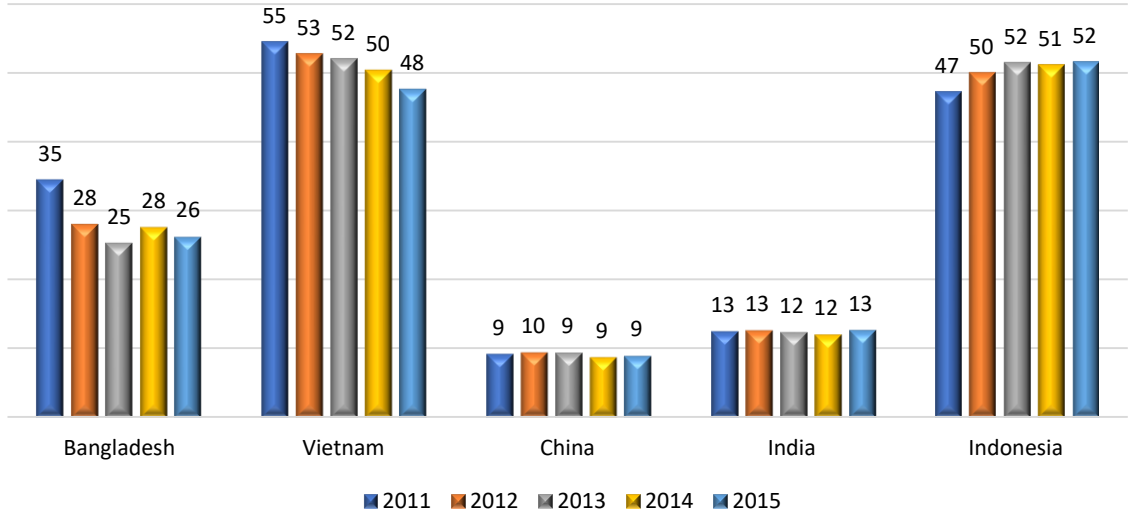
Textile & Clothing Imports - US$ Billion




Textile & Clothing Exports - US$ Billion




Textile & Clothing - Imports as % of Exports




- Indonesian exports and imports have remained at same levels over the last 5 years, as compared to Bangladesh, Vietnam and India whose exports have grown rapidly.
- Indonesian imports as a % of exports remain very high at around 52% amongst countries with integrated textile chain (China at 9% and India at 13%).
- Indonesia has tremendous scope to improve its domestic capacity on higher domestic consumption and through import substitution.

Charts 1 & 2 – Textile & Clothing Imports & Exports – WTO Online Database accessed in Aug 2017
Chart 3 – Worked out based on WTO Database

# Indonesian Upstream Textiles – Way Forward

ASIA PACIFIC FIBERS

- Indonesian domestic consumption growth in textiles is robust – at 4.6% CAGR.
- Consumption growth is not shared by domestic industry – mainly supplied through import growth.
- A Robust and Dedicated Textile Policy with a horizon of 10 years to be developed to support Indonesian Textile Industry – Upstream and Downstream, meeting consumption growth and also driving competitive export growth.
- Textile Policy to drive growth through integrated development:
  - Refinery led capacity augmentation of PTA/ MEG
  - Upstream capacity development – Fiber/ Filament/ PET Resin
  - Spun Yarn & Fabric Production Facilities
- With active policy implementation, ratio of imports on exports to be reduced from the current level of 52% to 32%.

ASIA PACIFIC FIBERS

Textile Industry in Indonesia - Industry Perspective

# *Thank you*

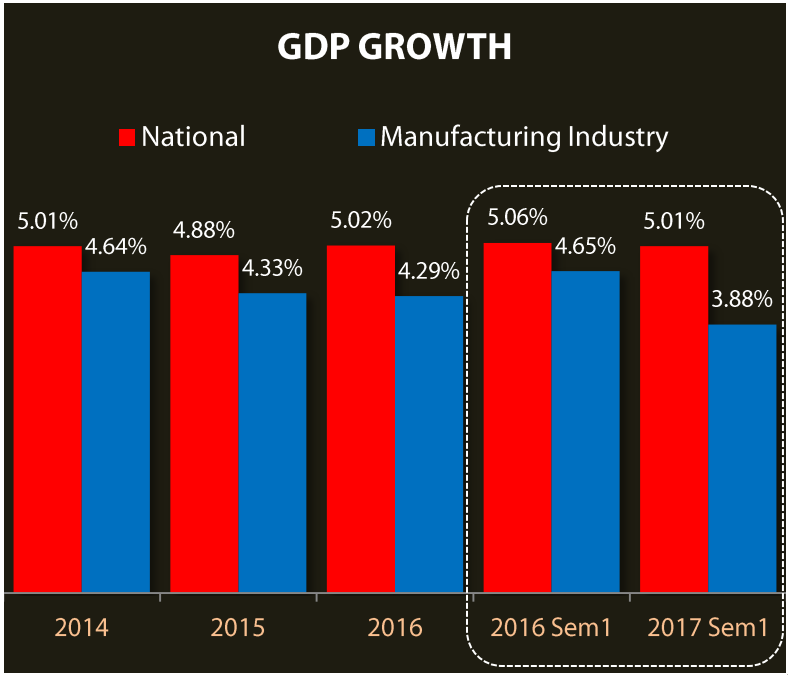
International Textile Manufacturers Federation (ITMF) Annual Conference

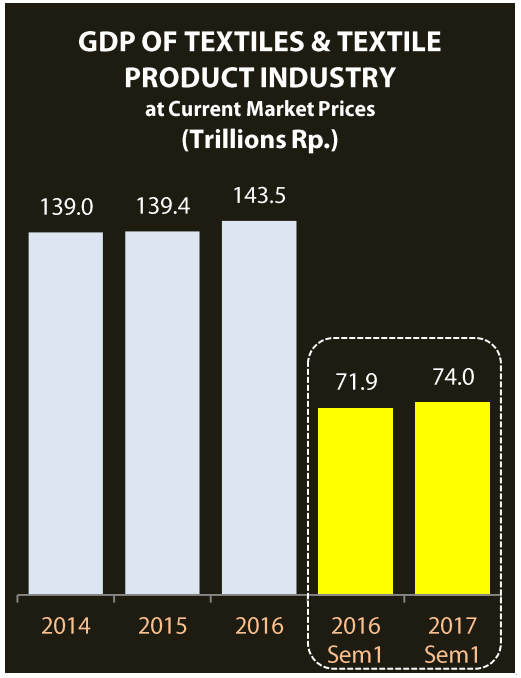
Bali, September 2017

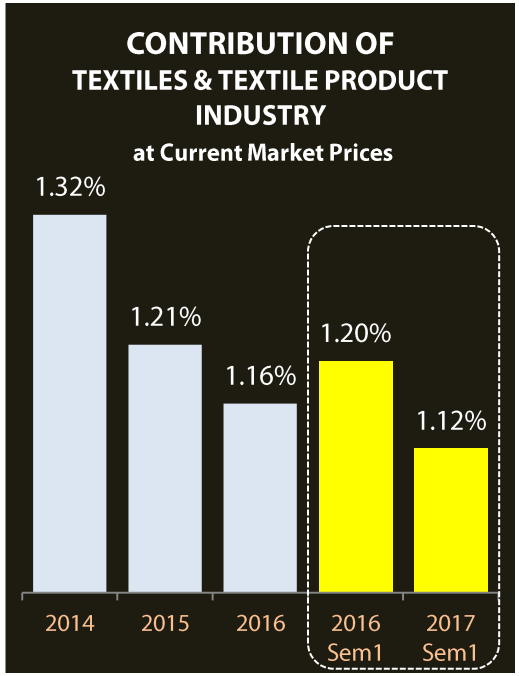
# INDONESIA SPINNING & WEAVING MANUFACTURING INDUSTRY

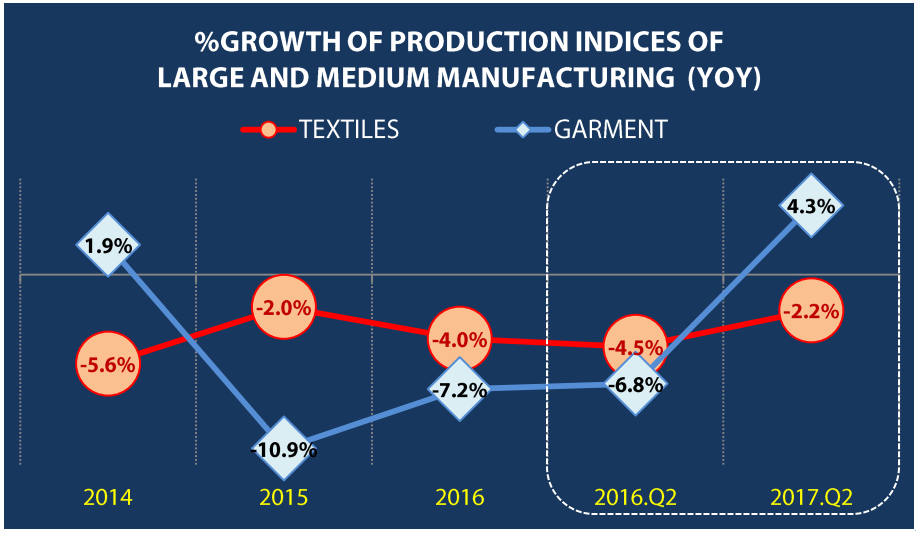
**Iwan S. Lukminto**
President Director – PT. Sri Rejeki Isman Tbk.

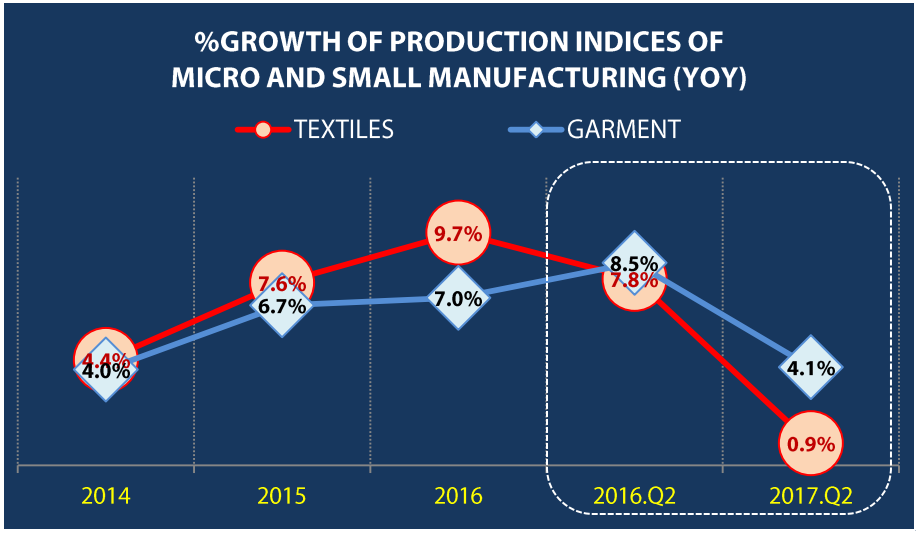
# HIGHLIGH INDONESIAN TEXTILE & TEXTILE INDUSTRY



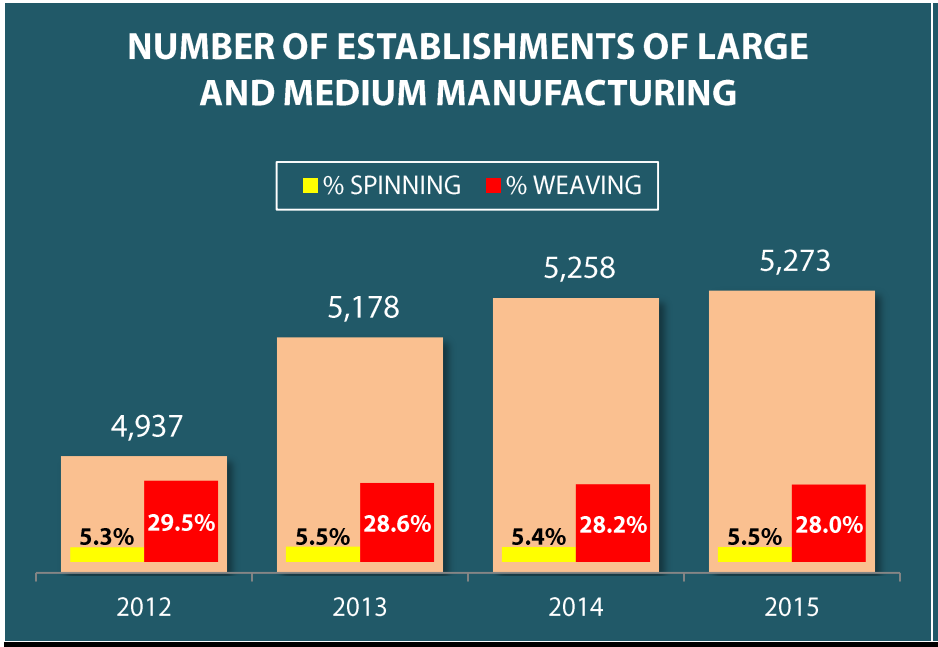



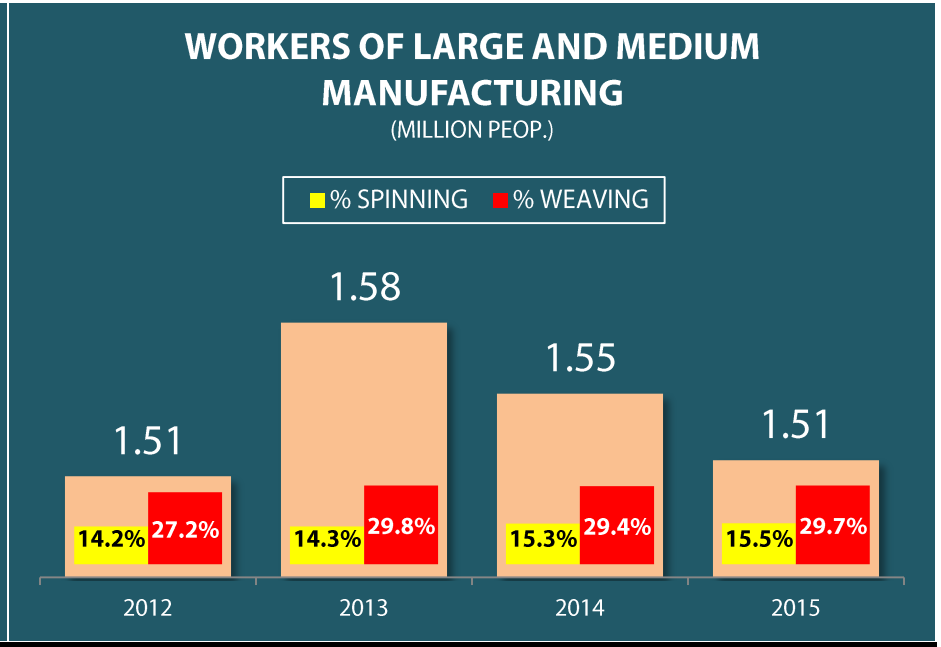



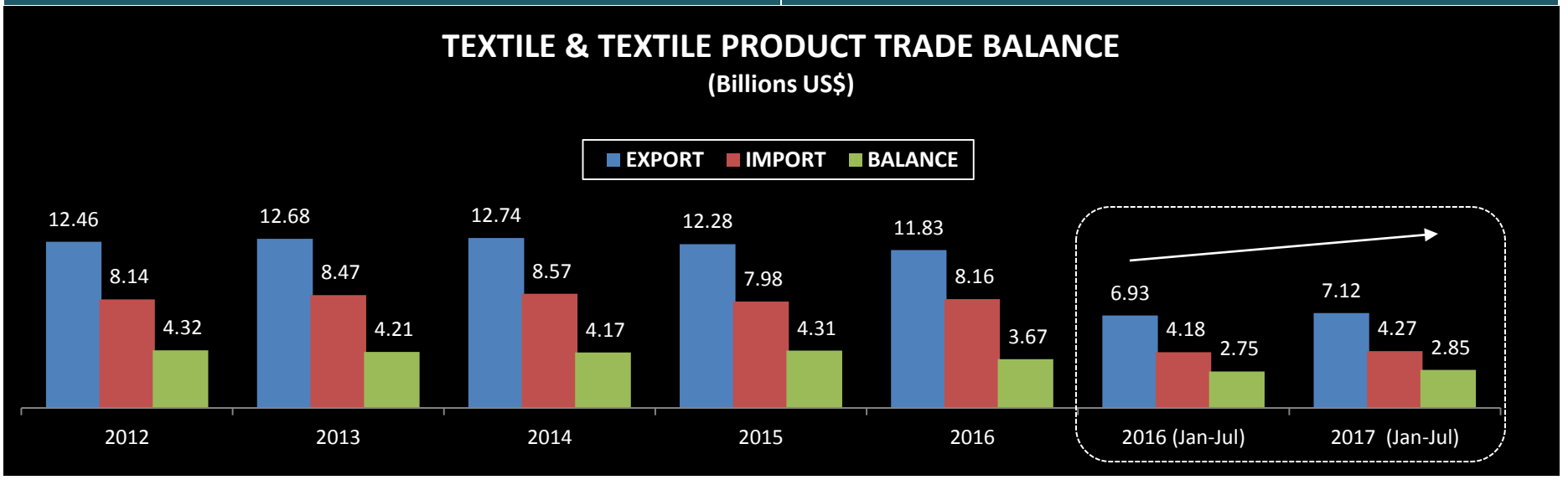




Source: BPS, MoI, BKPM, API processed

# HIGHLIGH INDONESIAN TEXTILE & TEXTILE INDUSTRY

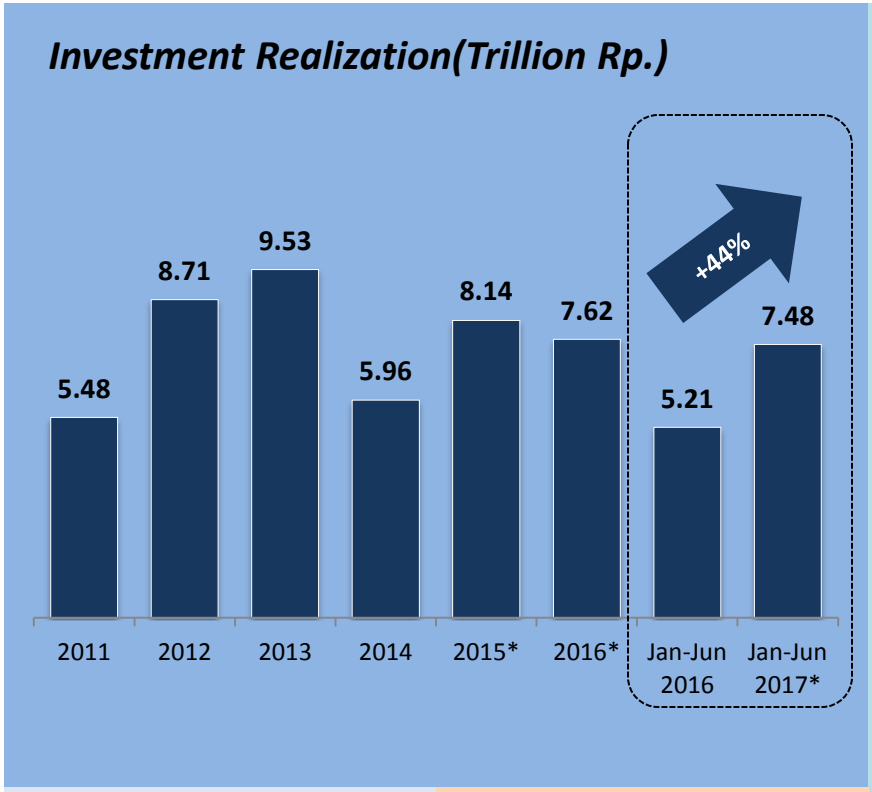


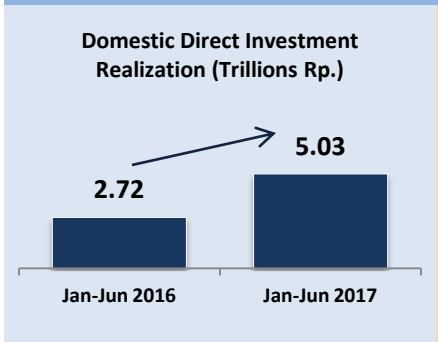



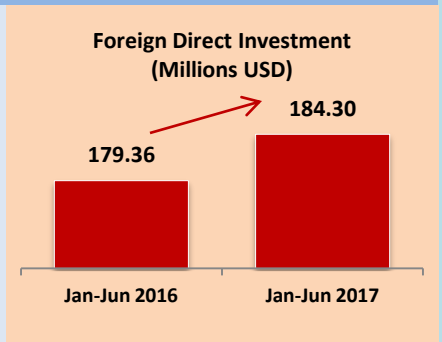



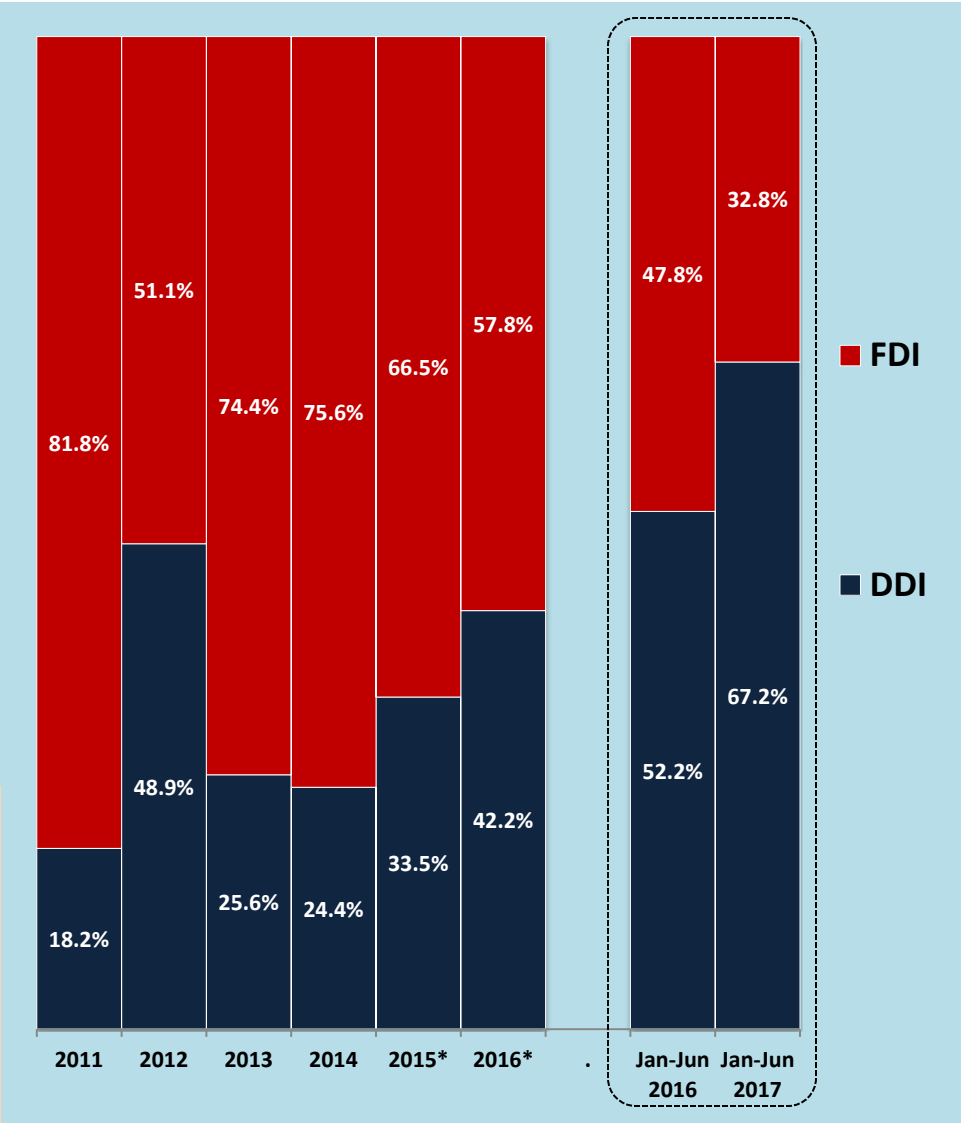

Source: BPS, MoI, BKPM, API processed

# TEXTILE & TEXTILE PRODUCT:
# INVESTMENT REALIZATION



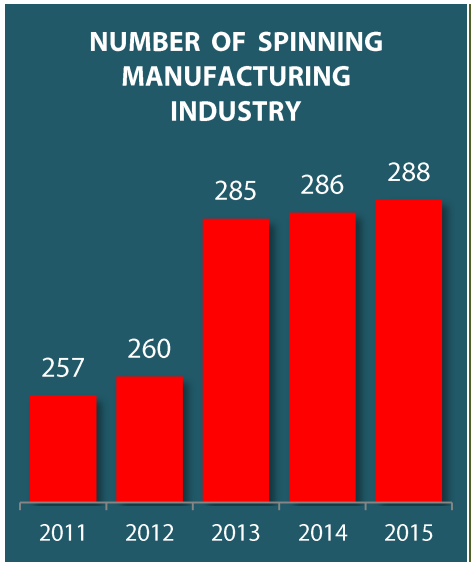



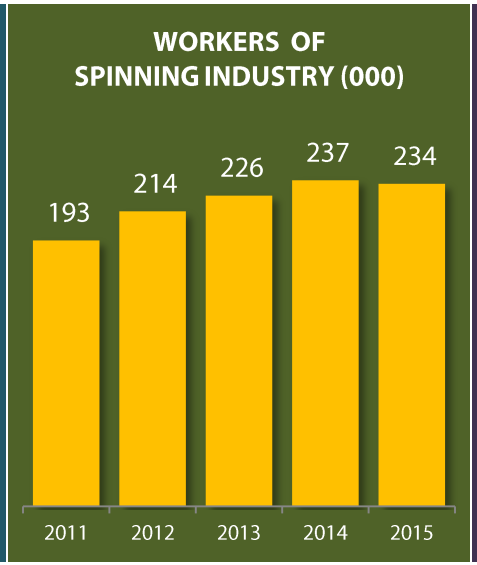



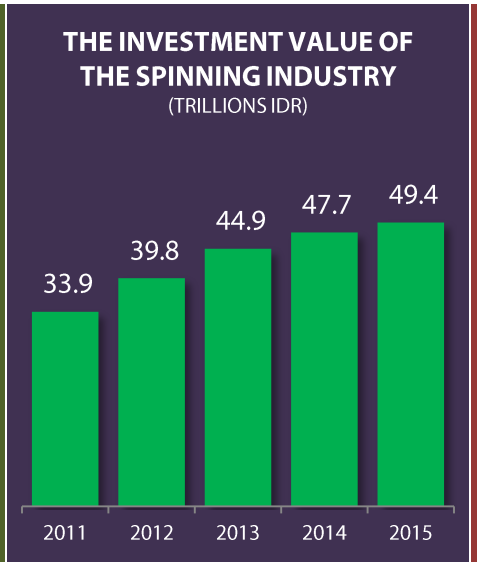

Source : BKPM *) preliminary data
Jan-Jun 2016 USD 1 = Rp. 13.900
Jan-Jun 2017 USD 1 = Rp. 13.300

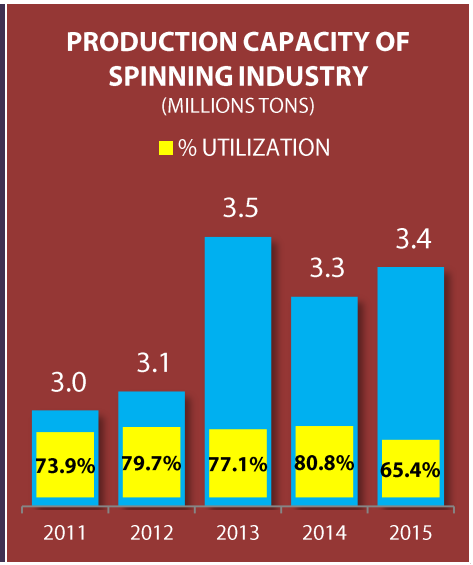
# SPINNING

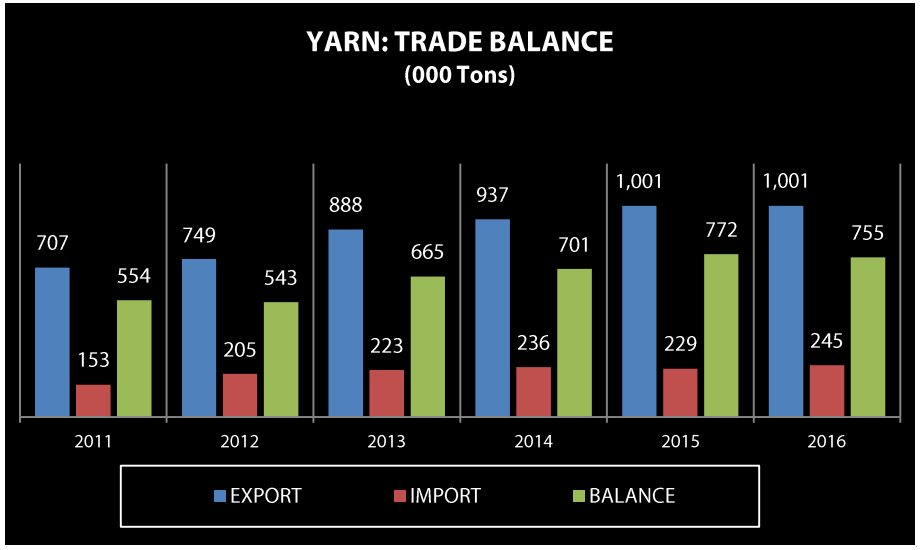
## MANUFACTURING INDUSTRY

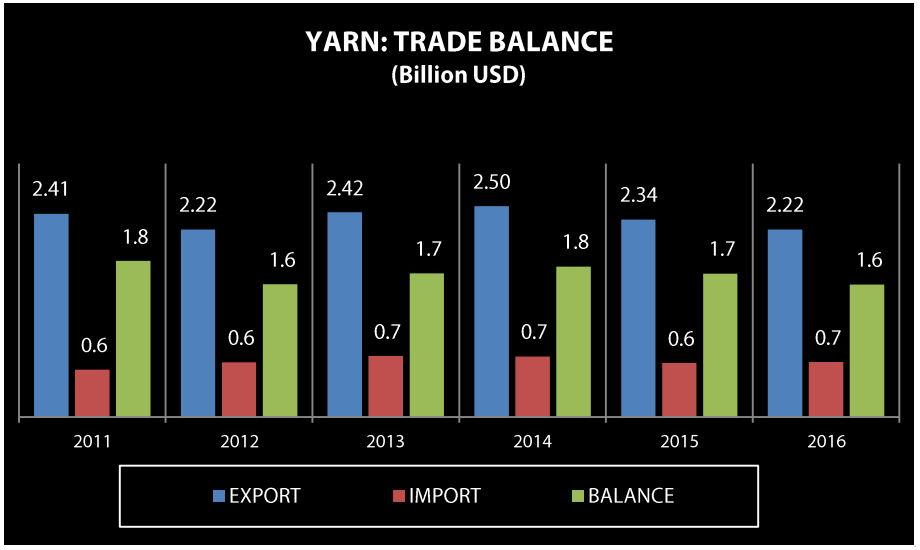


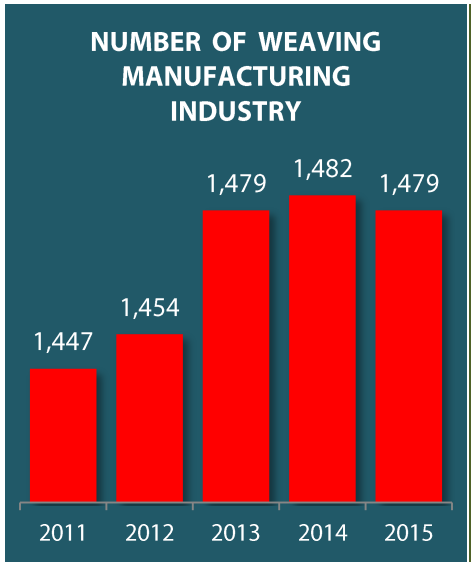



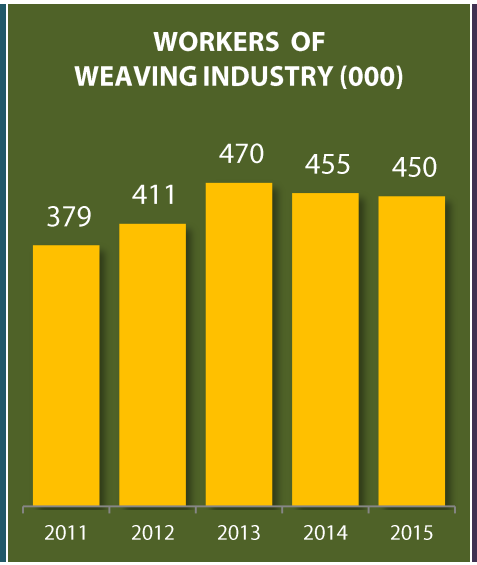



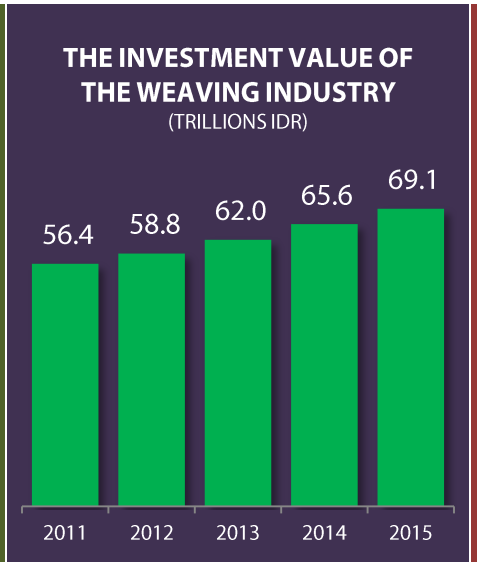

Source: BPS, MoI, BKPM, API processed

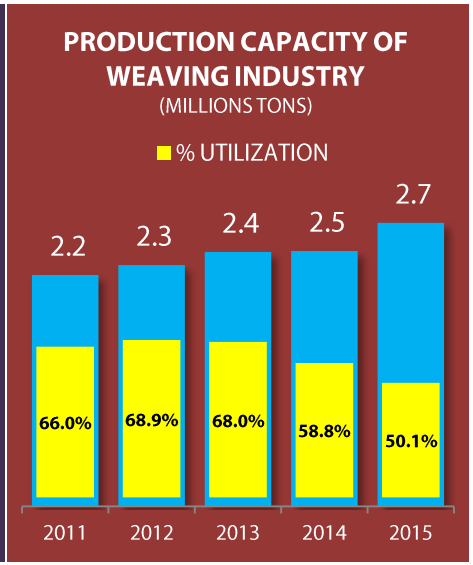
# WEAVING

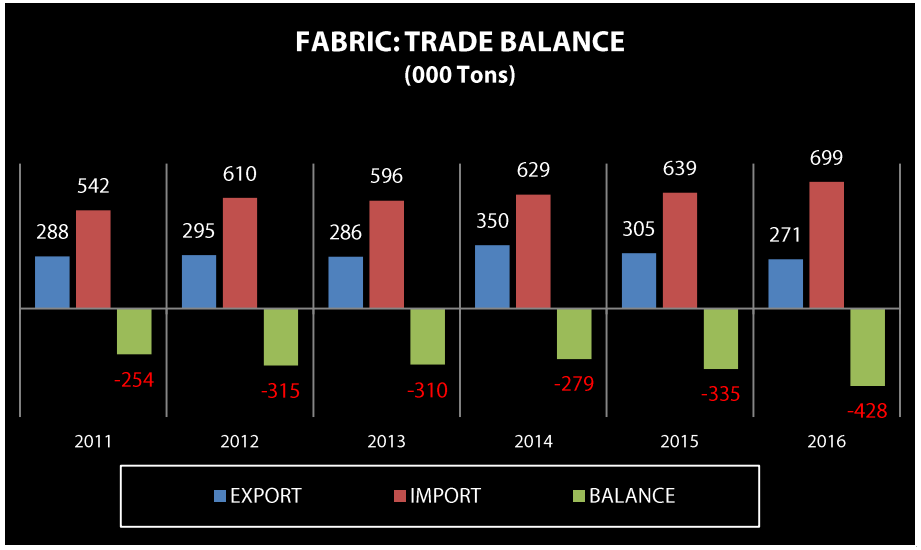
## MANUFACTURING INDUSTRY

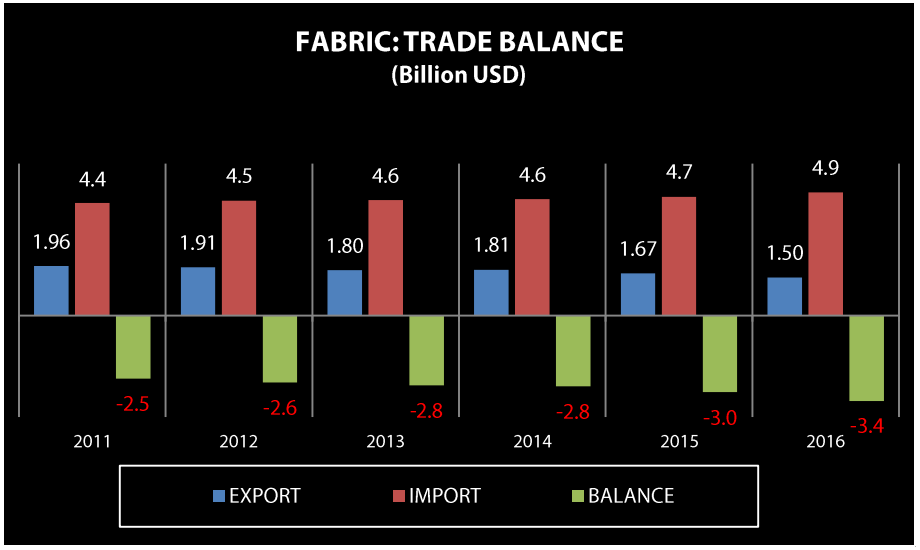


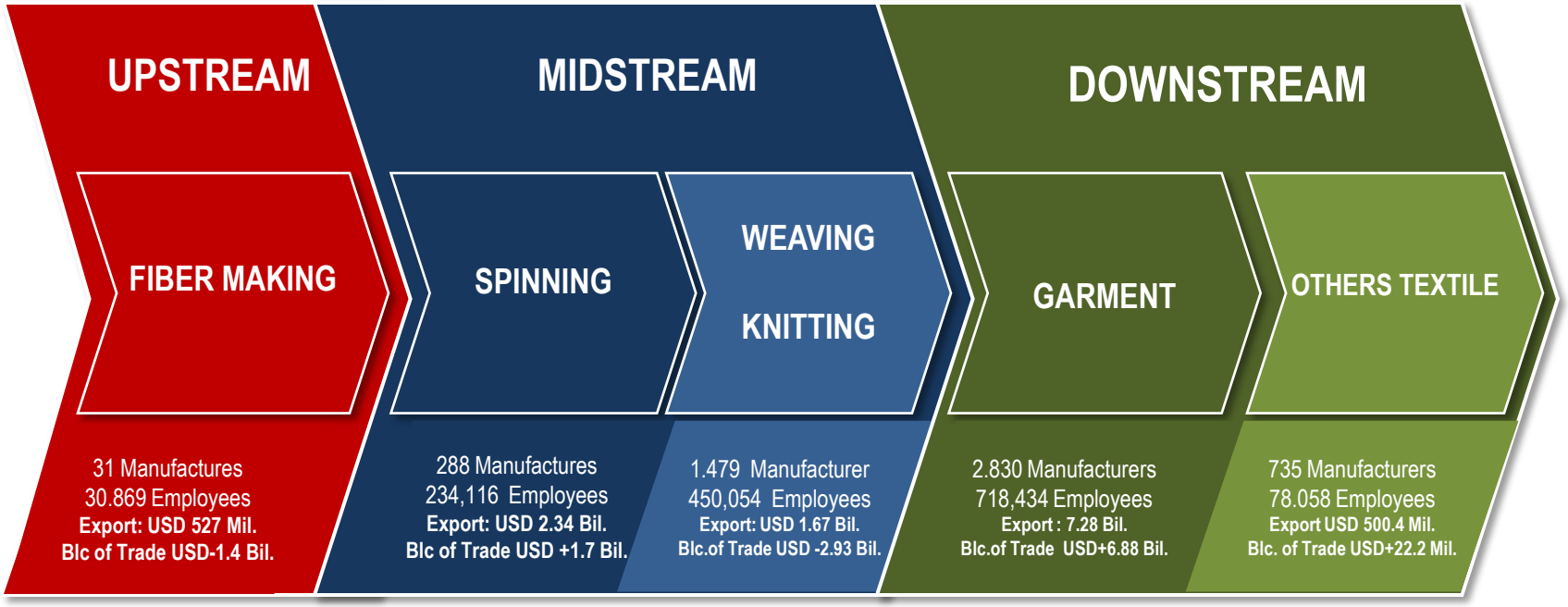




Source: BPS, MoI, BKPM, API processed

# THE INTEGRATION OF TEXTILE INDUSTRY IN INDONESIA




**Integration** → **Modernization** → **Connectivity** → **Sustainability**

It has been being practiced and enforced

It has been being executed, yet needs more efforts to reach more manufacturers

It has been being developed.
More cooperation and connection in line with better infrastructure development

- Unique advantage by offering customers with integrated solution.
- Eradication non effective regulations.
- Safe Guarding local market

**MAJOR HARMONIZATION PROCESS**

*Terima Kasih*

*Thank You*

PT Sri Rejeki Isman Tbk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http://www.sritex.co.id/

# Textile Industry in Indonesia

ANNE PATRICIA SUTANTO

VICE CEO – PT. PAN BROTHERS TBK

15 SEPTEMBER 2017

For international transport routes:

- crossroads two oceans (the Pacific and Indian Oceans),
- bridges two continents (Asia and Australia)

Abundance of Natural Resources & Work Forces (48% of total population, 3.3% in apparel industry)


Largest Archipelago: ±17.504 islands (5 main islands, 6.000 islands inhabited)

16th largest country in the world Stretching from east to west in the equator for 5.150km (± 3,200 miles)

Sea area is four times greater than land area

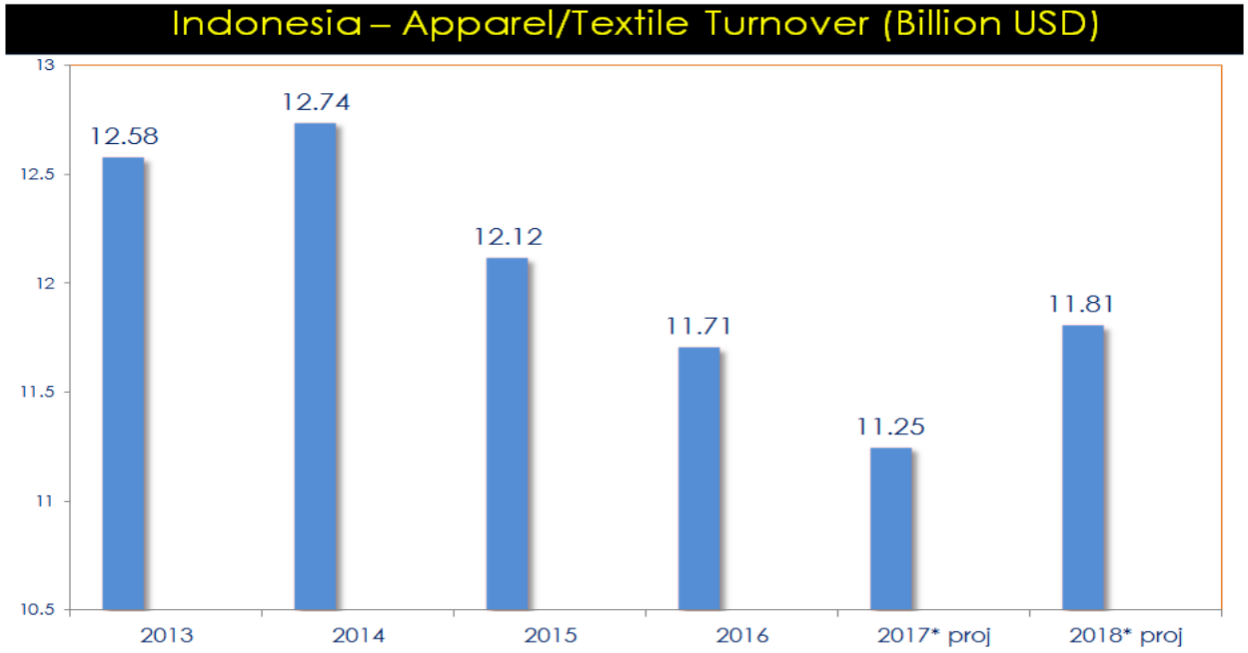
Indonesia's current population is 264,052,694

A vast, huge, diverse and polyglot nation ±700 ethnic groups with more than 1,100 languages and dialects. Bahasa Indonesia is the official language

# WHY INVEST IN INDONESIA??

# Indonesia Current Apparel Growth

| 2013 – 2016 INDONESIA GROWTH PROFILE | |
|---|---|
| Manufacturing | Average Growth 4.33% annually |
| Economic | Avarage Growth 5.13% annually |
| Textile/Apparel | Avarage Contracted 2.73% annually |




The Indonesian Textile Association (API) forecasts 2017 Indonesian textile and apparel exports are likely to decrease by 4-5%, as compared with the estimated 2016 export value. API expects the decrease in overseas demand caused by global economic downturn is unlikely to improve until 2018

# Business Contribution to Growth of Indonesia

| No | Growth Areas | 2016 | Key % |
|---|---|---|---|
| 1. | GDP Volume of Indonesia | $892 Billions | - |
| 2. | Total Exports Volume of Indonesia | $144.4 Billions | 16.2% |
| 3. | Total Textile/Apparel Exports Volume of Indonesia | $11.25 Billions | 7.8% |

# Challenges Faced in Indonesia

## VENDORS

1. Labor Conditions
2. Infrastructures (logistics, transportation)
3. Government's Trade & Economic Policies (energy cost, labor incentive, import flux)
4. Investments Climate & Environment (ease of doing business, tax incentive, allowance)
5. Talent Development (skilled labors, education)

## BRANDS

1. Free Trade Agreement (Trump's Policy, EU Bilateral Negotiations)
2. Labors Conditions
3. Government Business Rules & regulations (corruption, long-dwelling time, banking/financial support, incentive benefits)
4. Infrastructure (bandwidth, transportation)
5. Talent Management
6. Speed & Innovation, Research & Development

# Addressing the Challenges

1. Labor Conditions – increment of wages are more regulated after PP78 Year 2015
2. Infrastructures Program on-going (Paket Kebijakan Ekonomi Jilid 9 & 15) – **"Menghilangkan persyaratan perizinan angkutan barang, Standarisasi dokumen arus barang dalam negeri, Kemudahan pengadaan kapal tertentu"**

   (ex: MRT, LRT, Commuter Line, toll roads, electronic payment system for toll roads, airports and ports)
3. Government's Trade & Economic Policies (Paket Kebijakan Ekonomi Jilid 4) – **"Kebijakan kurs yang lebih murah dan meluas; Pengupahan yang adil, sederhana dan terproteksi untuk buruh"**
4. Investments Climate & Environment – one stop shopping under BKPM, KEK (Paket Kebijakan Ekonomi Jilid 6 – **"Tariff Bea Cukai masuk dengan SKA, Mempercepat Proses Waktu Perijinan"**)
5. Talent Development – vocational training school/institution would prepare both industry skill sets and management experts. Government supports the funds, export oriented curriculums and trainings materials, while Industries supports with qualified trainers, scholarships for best performers etc.

# Opportunities for Indonesia

1. Textile/apparel is among government's 10 most priority industries counted on to boost the national economic growth
2. Huge labor forces – production age, demographic bonus from 2020-2035, 15.5 millions in manufacturing, 17% of which in textile/apparel
3. Textile/apparel poses to become a social safety net due to its huge labor absorbance
4. 64.29% distribution of manufacturing businesses remain heavily in Java, 13.62% in Sumatera, 8.82% in Sulawesi, 8.34% in Bali & Nusa Tenggara, 45% in Kalimantan, 1.84% in Papua & Maluku
5. Politically & economically stable
6. Product competitiveness, locally integrated raw materials manufacturing
7. Huge product capacity

# My Forecast of Indonesia's Textile & Garment in the near future

1. As the largest populated country in ASEAN, Indonesia could be both a pillar for growth for textile and garment industry in terms of manufacturing base as well as customer base.
2. The demanding speed to market, could be really a great time for textile industry to grow in Indonesia for demand of huge supply chain as garment in Indonesia is growing and supplying more for Global Brands.
3. Indonesia Government has open the door policy and believe in Fair Competitions globally, thus, the free trade policies among countries which Indonesia is part of and would continue to be part of would be a great opportunity for Textile and Garment of Indonesia to grow 10-20 percent annually

# THANK YOU

**DISCLAIMER**

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Dr. Christian Schindler
Director General
ITMF

# «The Global Textile (Machinery) Industry in Disruptive Times”

**ITMF Annual Conference 2017**

**September 15, 2017**

**Bali / Indonesia**

# Contents

1) Situation & outlook for the global textile/apparel industry for manufacturing

2) New disruptive technologies and innovation in textile manufacturing

3) Where are currently the areas of investments in manufacturing?

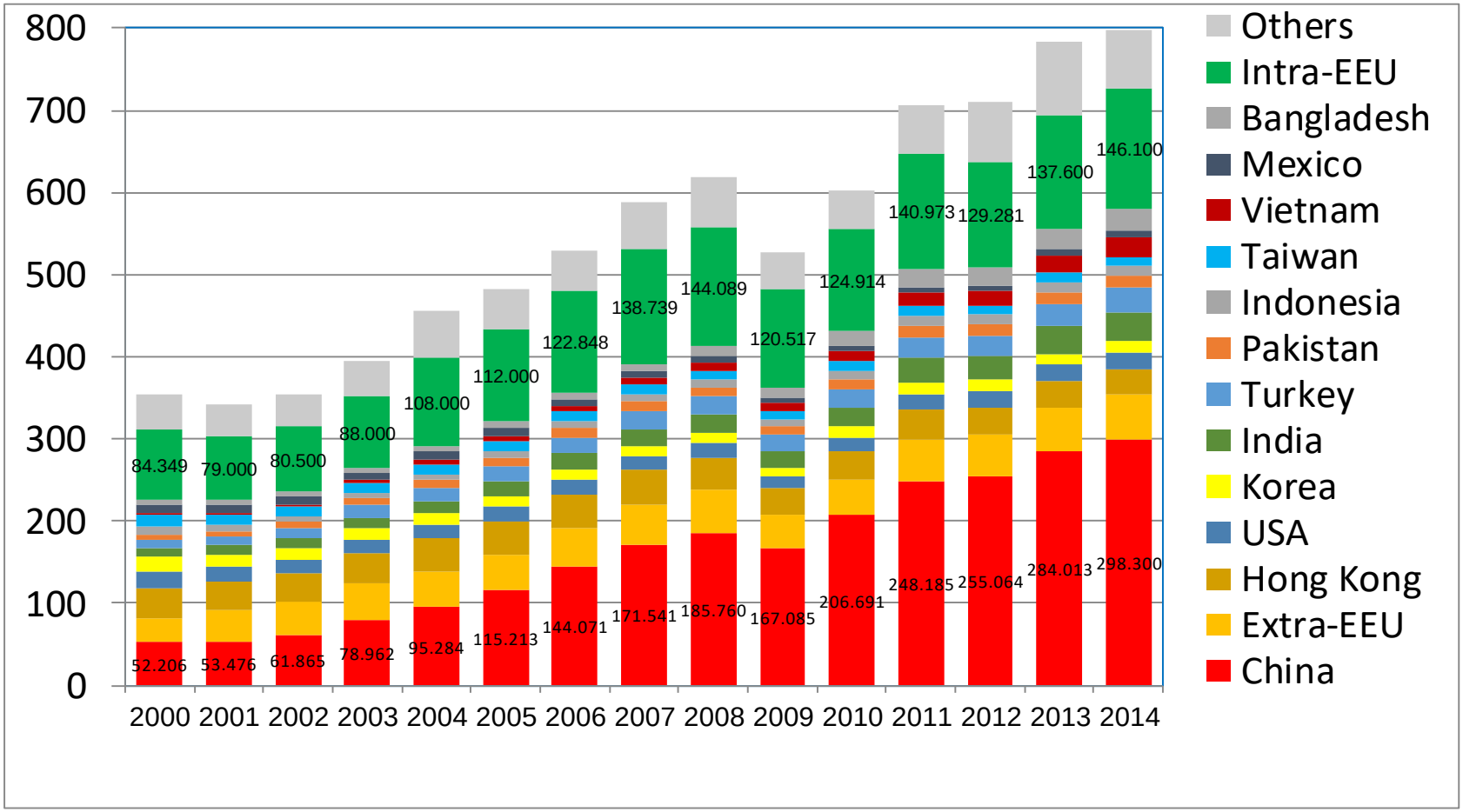
4) Implications for the global textile industry

# Contents

# Textiles & Clothing Exports 2000 – 2014

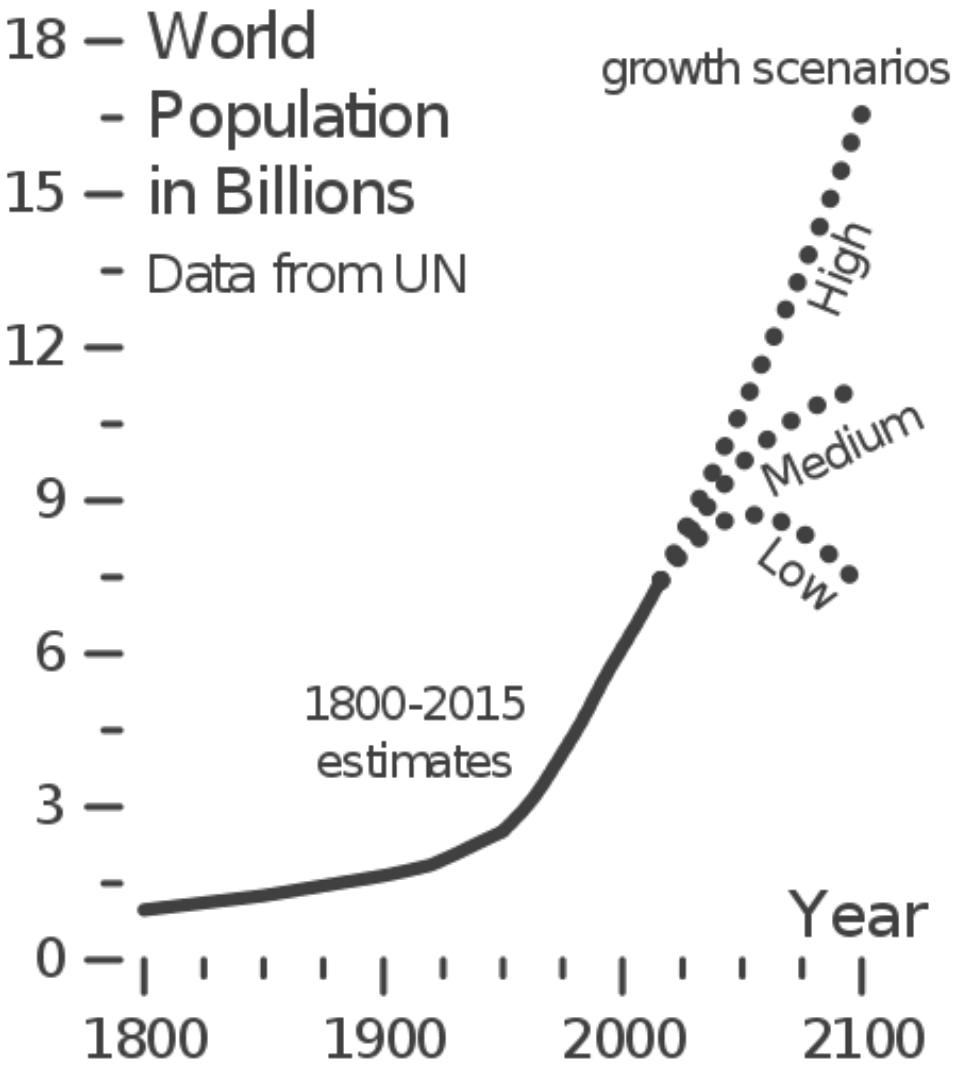
- top exporters -

Billion USD

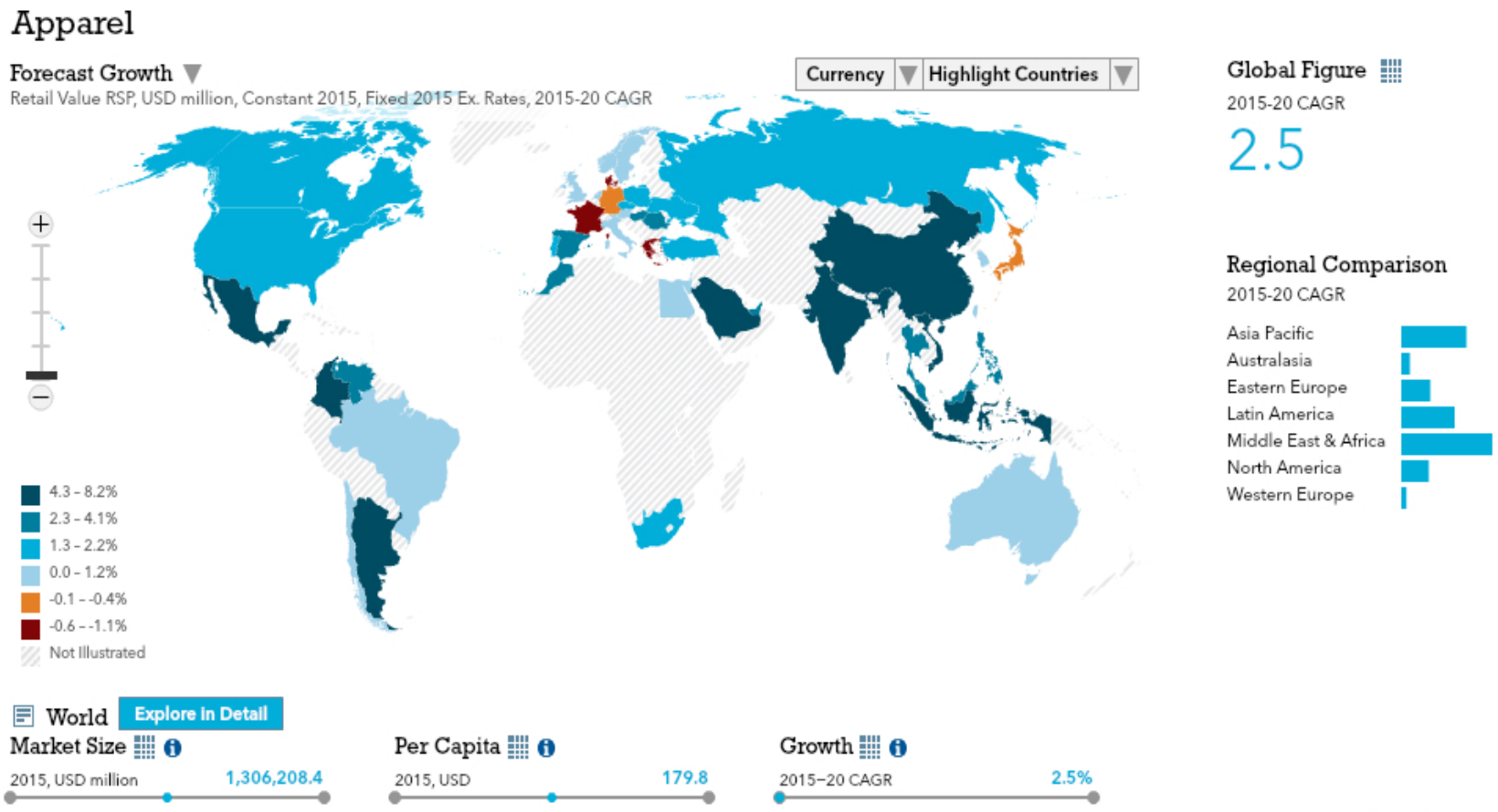



Quelle: World Trade Organization, International Trade Statistics

# World Population (in bn)



# Apparel sales will grow strongest in Asia and the Middle East

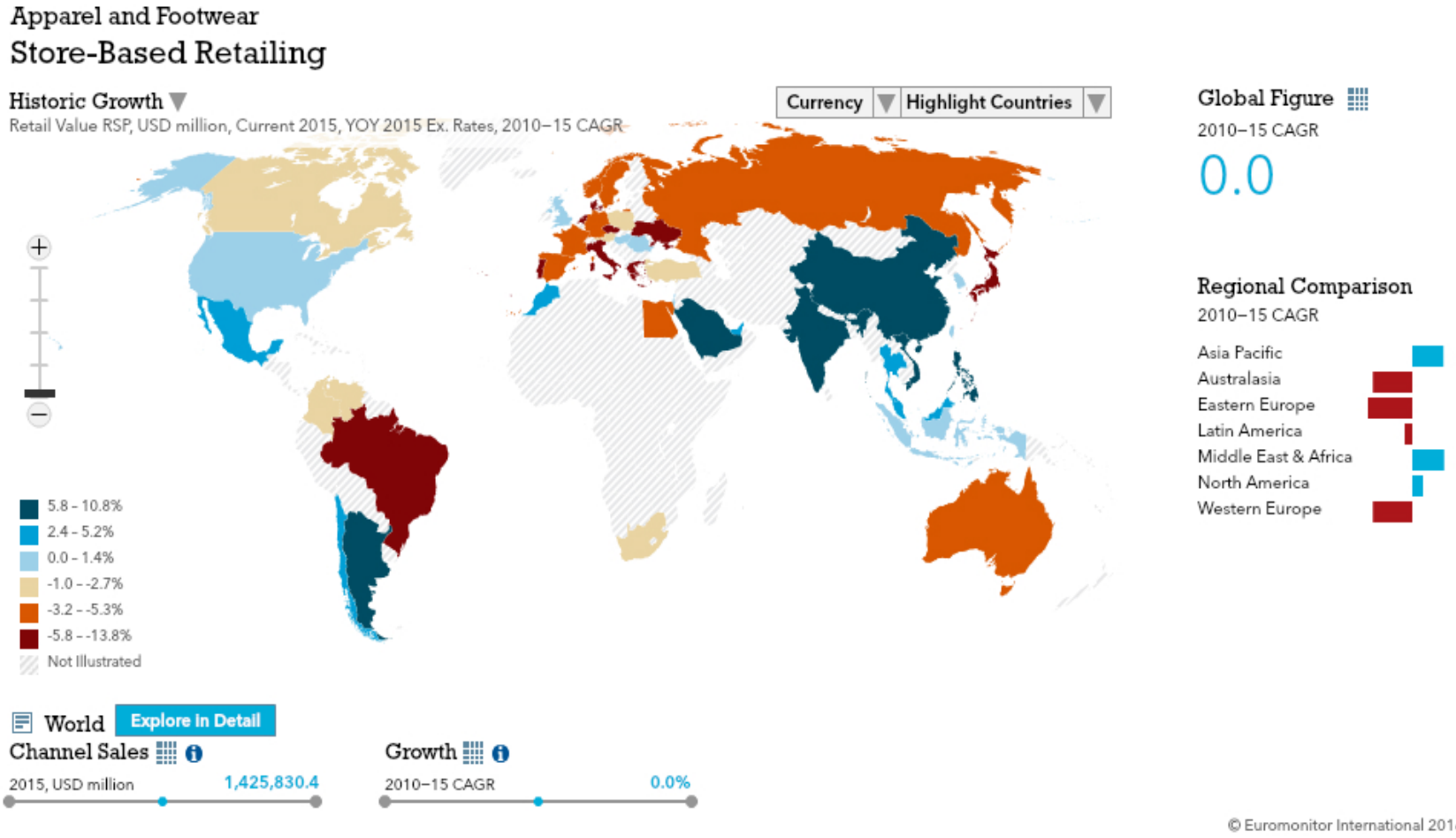


# Apparel Market Size of Selected Countries 2015 to 2020

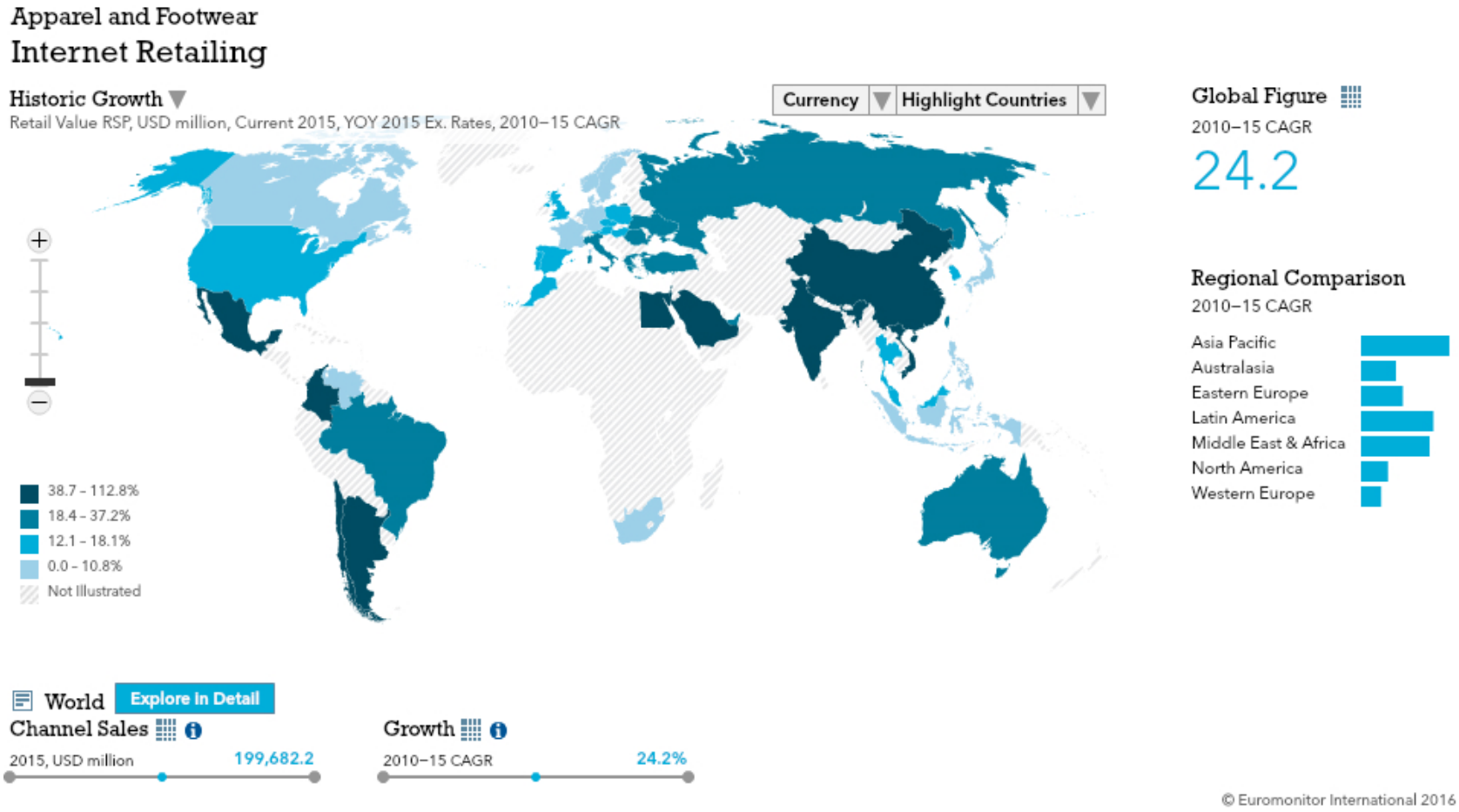
| Region | Retail value in USD bn, constant 2015 prices, fixed exchange rate | | Mean annual growth rate 2015 to 2020 (%) |
|---|---|---|---|
| | 2015 | 2020 | |
| China | 276 | 341 | 4.3 |
| India | 50 | 70 | 7.2 |
| Indonesia | 8 | 10 | 5 |
| Vietnam | 2 | 3 | 5 |
| **Subtotal (C+I+I+V)** | **336** | **424** | **4.8** |
| Egypt | 2.5 | 2.6 | 1 |
| Morocco | 1.3 | 1.4 | 2.3 |
| Nigeria | 3.9 | 4.7 | 3.6 |
| South Africa | 8.9 | 9.6 | 1.6 |
| **Subtotal (E+M+N+SA)** | **16.5** | **18.3** | **2.1** |
| USA | 267 | 289 | 1.6 |
| EU | 299 | 303 | 0.3 |
| **USA and EU combined** | **566** | **592** | **0.9** |
| **World** | **1'306** | **1'475** | **2.5** |

Source: Euromonitor

# Store-based retailing remained flat while …



# … internet retailing grew strongly since 2010.



# Contents

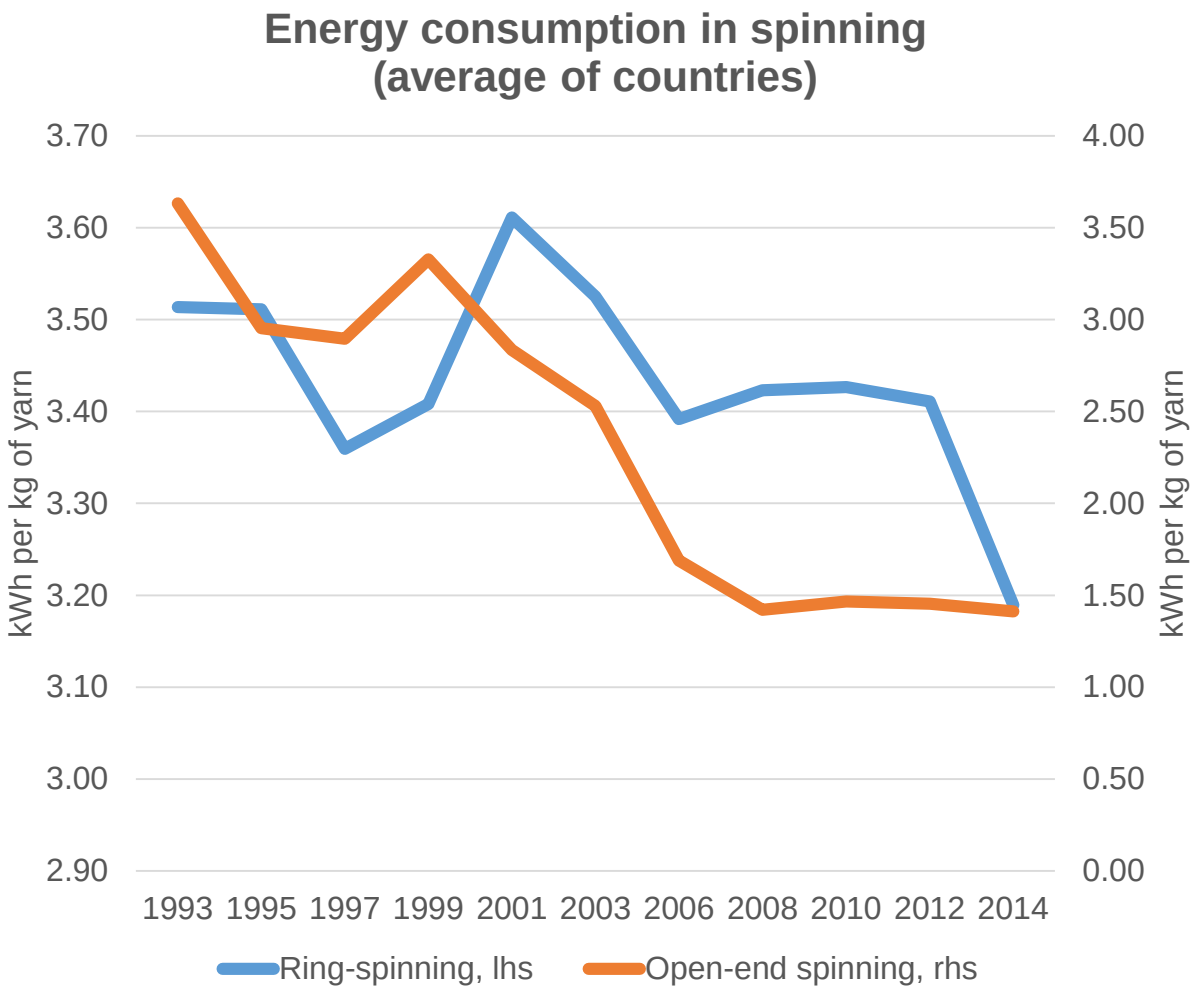
# Competitiveness of the textile and apparel industry

- Textile and apparel manufacturing in constant search for higher productivity:
  - Faster
  - Less labour-intensive
  - Less energy-intensive
  - Less water-intensive

**This results in high demand for ever more automated and ever more energy- and water-efficient textile machines**

- Necessities for the industry:
  - Increase of R&D activities
  - Networking with suppliers and customers to develop new products (e.g. technical textiles or functional textiles) and processes (e.g. digitization of the textile value chain)
  - Monitoring of market for technological innovations
  - Monitoring of market trends

# Energy efficiency has improved constantly



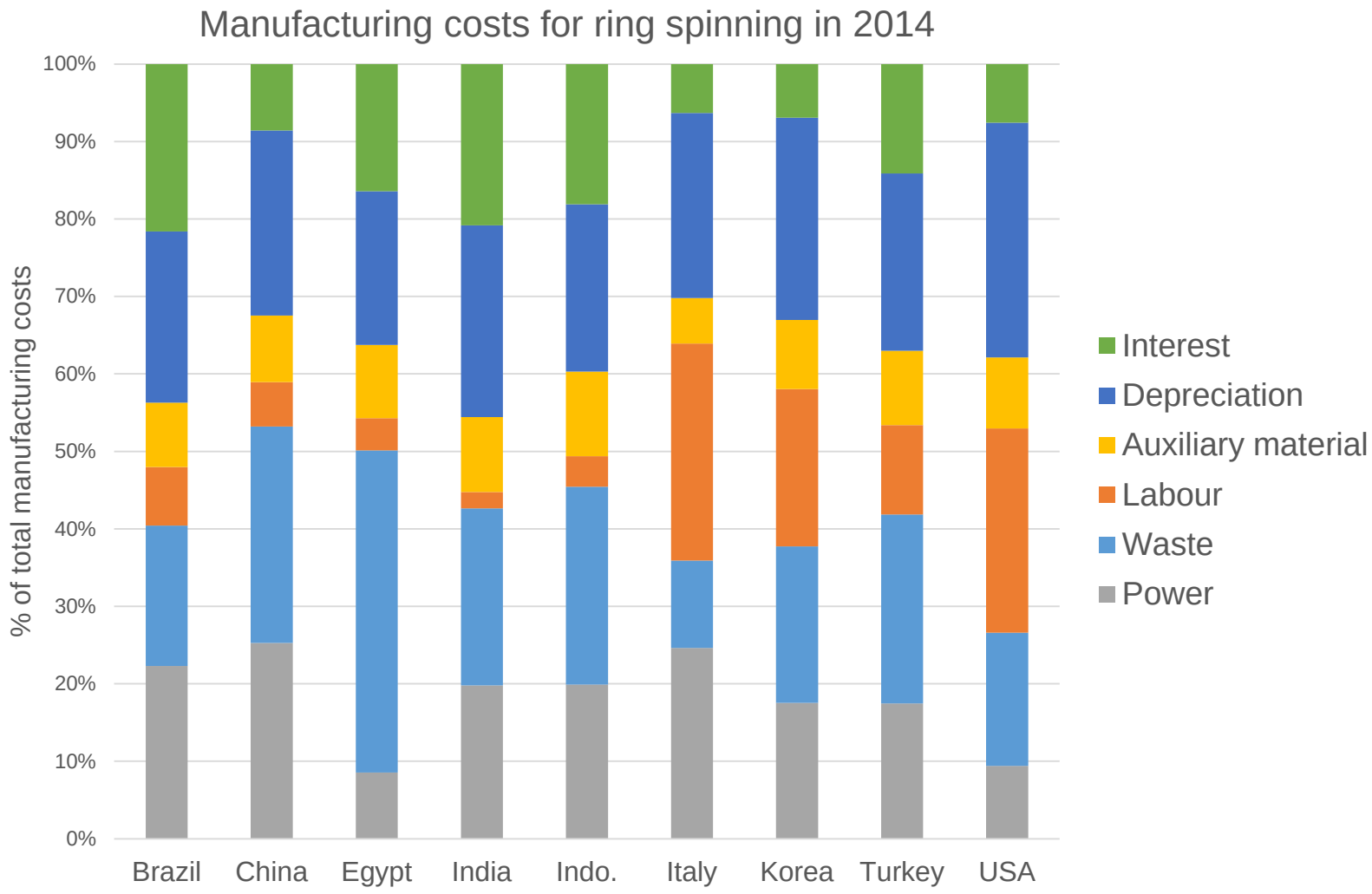

Over the last two decades the energy consumption of **ring-spinning** machines on average of Brazil, India, Italy, Korea and the USA – these countries continuously took part in IPCC since 1993 - **fell by over 9%** from 3.5 to 3.2 kilowatt hour (kWh) per kilogram (kg) of yarn.

The energy efficiency of **rotor spinning** machines improved even more, whereby consumption dropped from 3.6 to 1.4kWh per kg, a **drop of 61%** .

Energy costs in ITMF's survey include the costs relating to the actual power consumption of the machines, the illumination and the air conditioning.

Source: ITMF

# Power Costs: A Relevant Cost Factor




Source: ITMF

# New disruptive technologies & processes

- Digital printing & finishing
- Internet

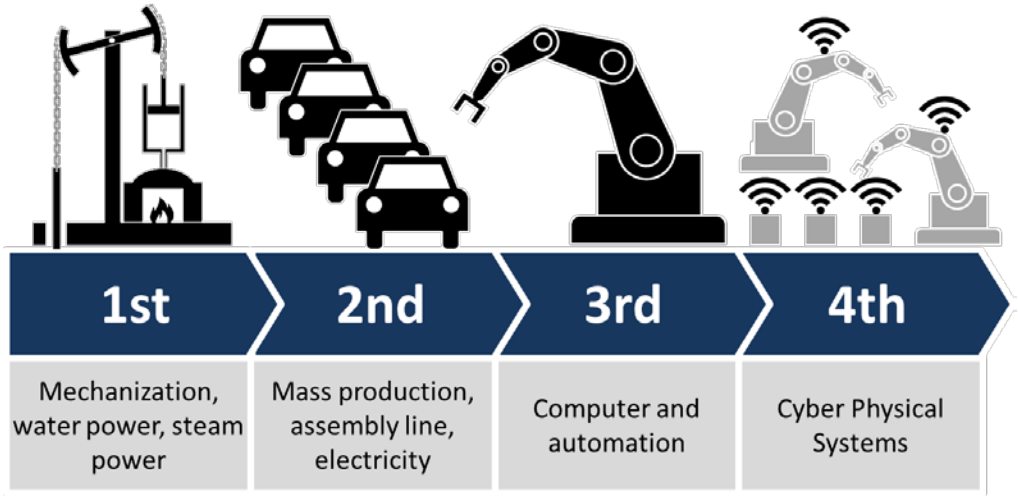
## 1) Mass Customization !!!

*"… use of flexible computer-aided manufacturing systems to produce custom output. Those systems combine the low unit costs of mass production processes with the flexibility of individual customization*." (Wikipedia)

"*Producing goods and services to meet individual customer's needs with near mass production efficiency*." (Tseng, M.M.; Jiao, J. (2001)

# New disruptive technologies & processes (continued)

- Internet of Things (IoT)
- Big data




## 2) Industry 4.0 !!!

*"The fourth industrial revolution, is the current trend of automation and data exchange in manufacturing technologies. It includes cyber-physical systems, the Internet of Things and cloud computing. …*

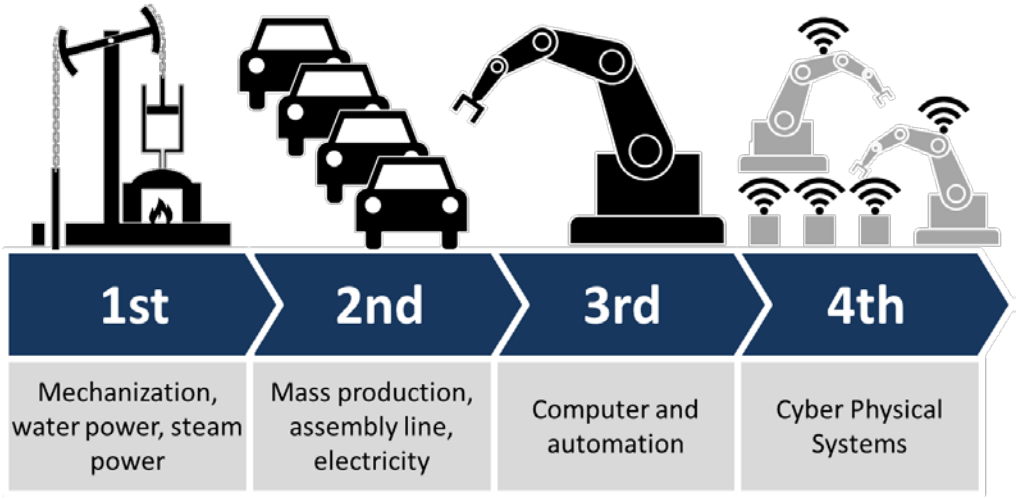
*The basic principle of Industry 4.0 is that by connecting machines, work pieces and systems, businesses are creating intelligent networks along the entire value chain that can control each other autonomously.*

*Some examples for Industry 4.0 are machines which can predict failures and trigger maintenance processes autonomously or self-organized logistics which react to unexpected changes in production.*"

(Wikipedia)

# New disruptive technologies & processes (continued)

- Internet of things
- Big data




## 2) Industry 4.0 !!!

*The fact that **costs** for sensors, communications, data storage and data analytics have dropped significantly in the past, have made it possible to record and process data about physical systems.*

*According to Gartner there were 2.4 billion connected devices. By 2020 this number will reach 7.6 billion.*

*"Data analytics and machine connectivity are the way to get to the next level of productivity."*

*Mr. Bill Ruh (Chief Digital Officer, General Electric)*

## New disruptive technologies & processes (continued)

*"We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten."*

Bill Gates

# New disruptive technologies & processes (continued)

- Increase of Population
- Higher Energy Demand
- Higher Fiber Demand
- Climate Warming

## 3) <u>Sustainability</u> !!!

*Global population will increase to around 10 billion people.*

*Energy consumption will increase by more than 50% by 2040.*

*More fibres will be needed (up to around 115 million tons by 2030).*

*Fast Fashion intensifies demand for fibres.*

- *Circular Economy*
- *Recycling*
- *Bio-based Textiles*

# New disruptive technologies & processes (continued)

- New Infrastructure Projects
- New Markets
- New Consumers

## 4) Infrastructure Projects

1) **One Road, One Belt Initiative**
2) **Panama Canal**
3) **Suez Canal**

*Improving existing infrastructure.*
*Developing and building new infrastructure.*
*Creating more regional economic integration.*

# Contents

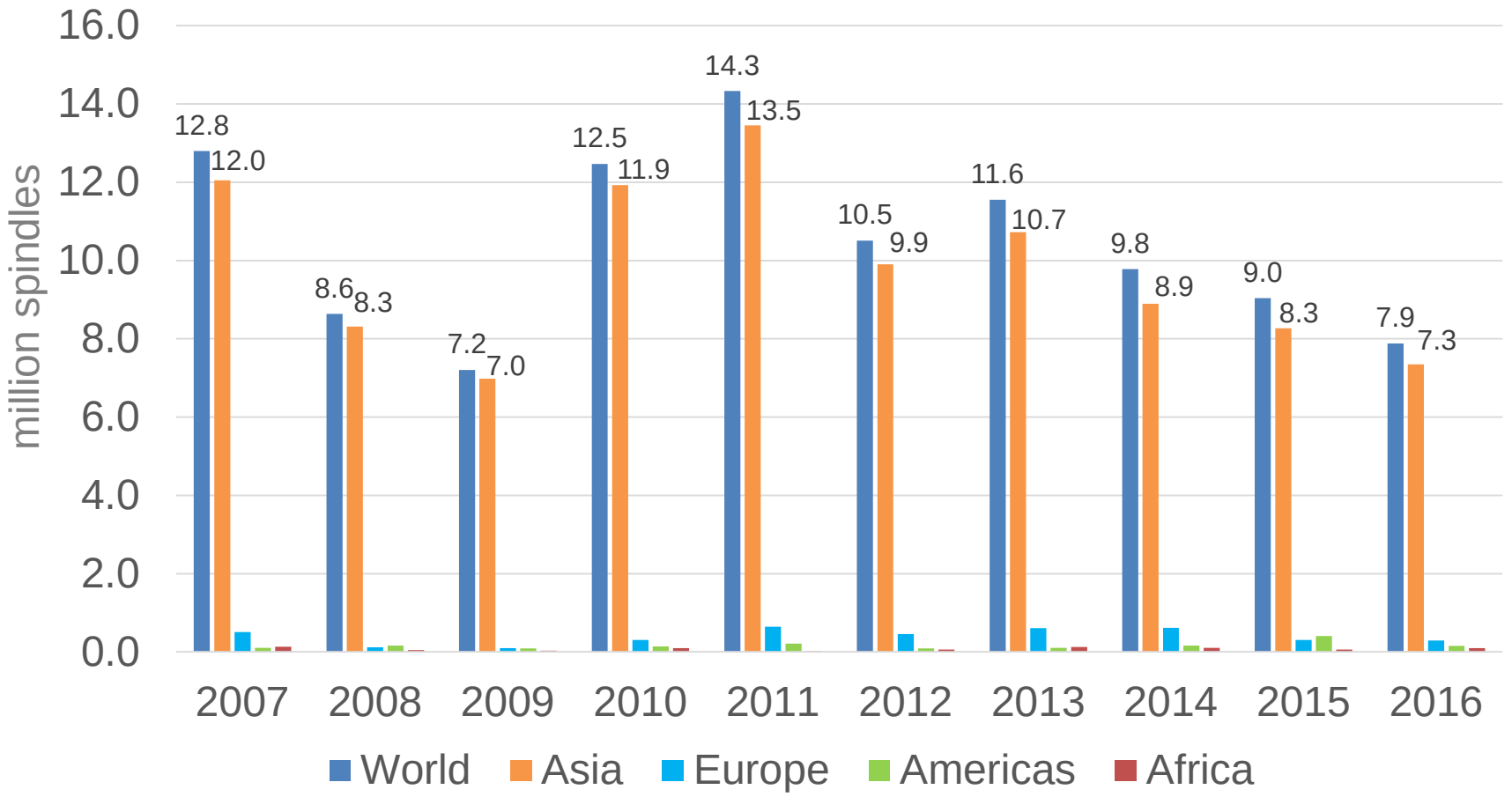
# Global Shipments of New Textile Machinery (2007-2016)

- Spinning Machines
- Texturing Machines
- Weaving Machines
- Circular Knitting Machines
- Flat Knitting Machines
- Finishing Machines

# 1. Shipped Short-staple Spindles

(2007– 2016, World & Regions)

- 12%

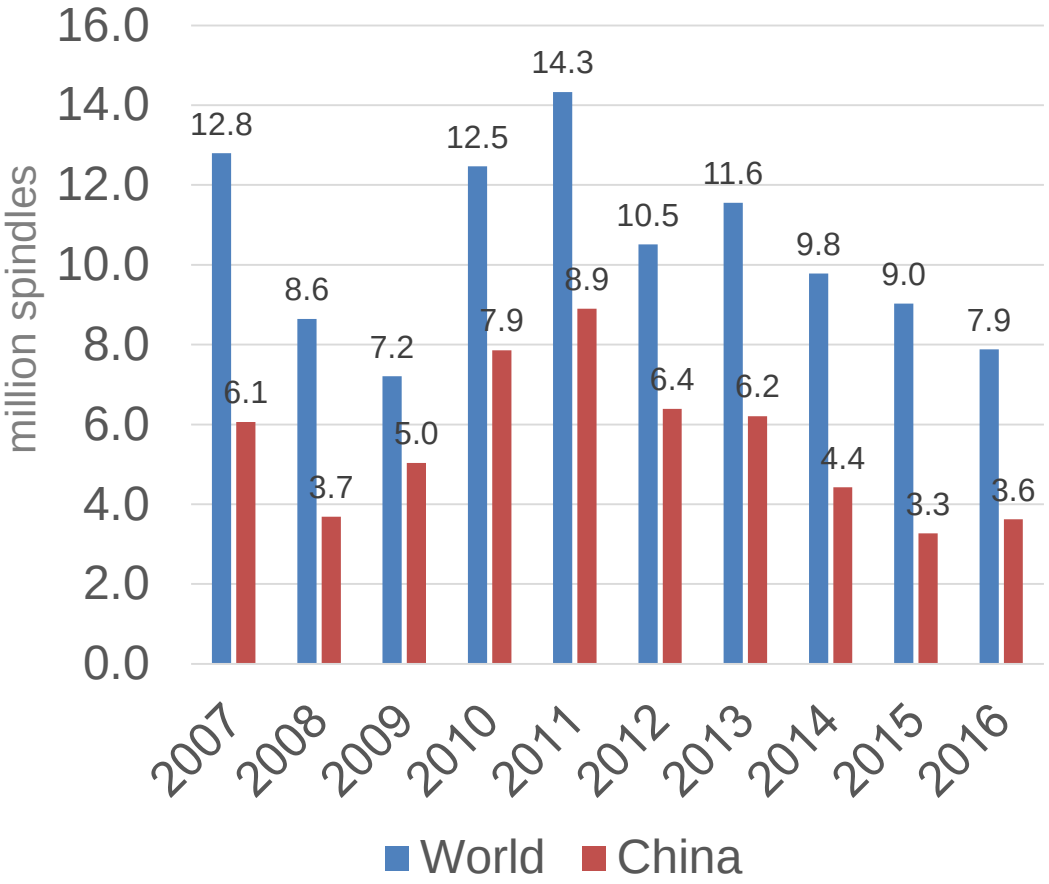


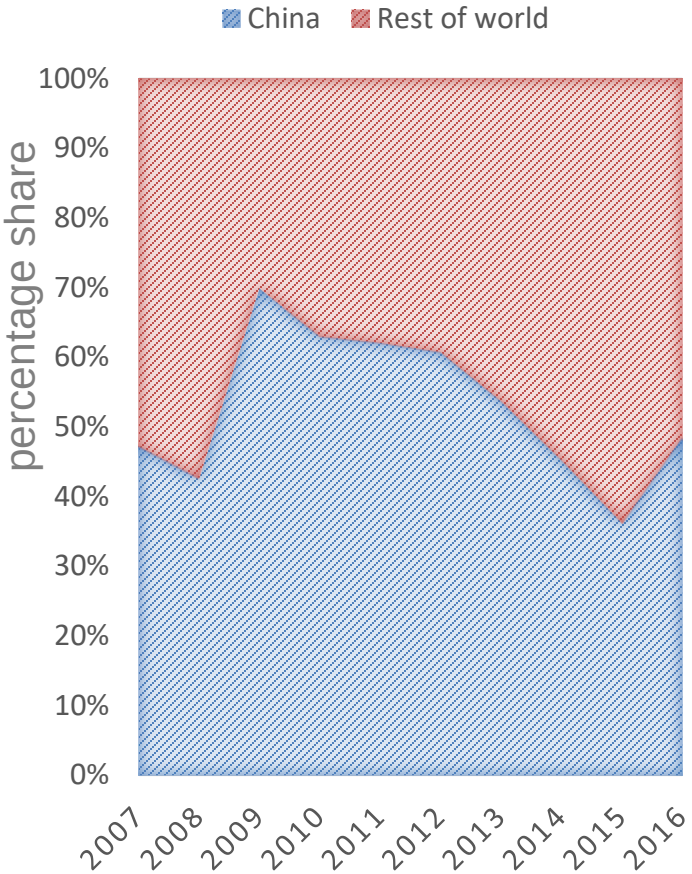
# 1. Shipped Short-staple Spindles

(2007–2016, China‘s Share)

**Chinese Investments**

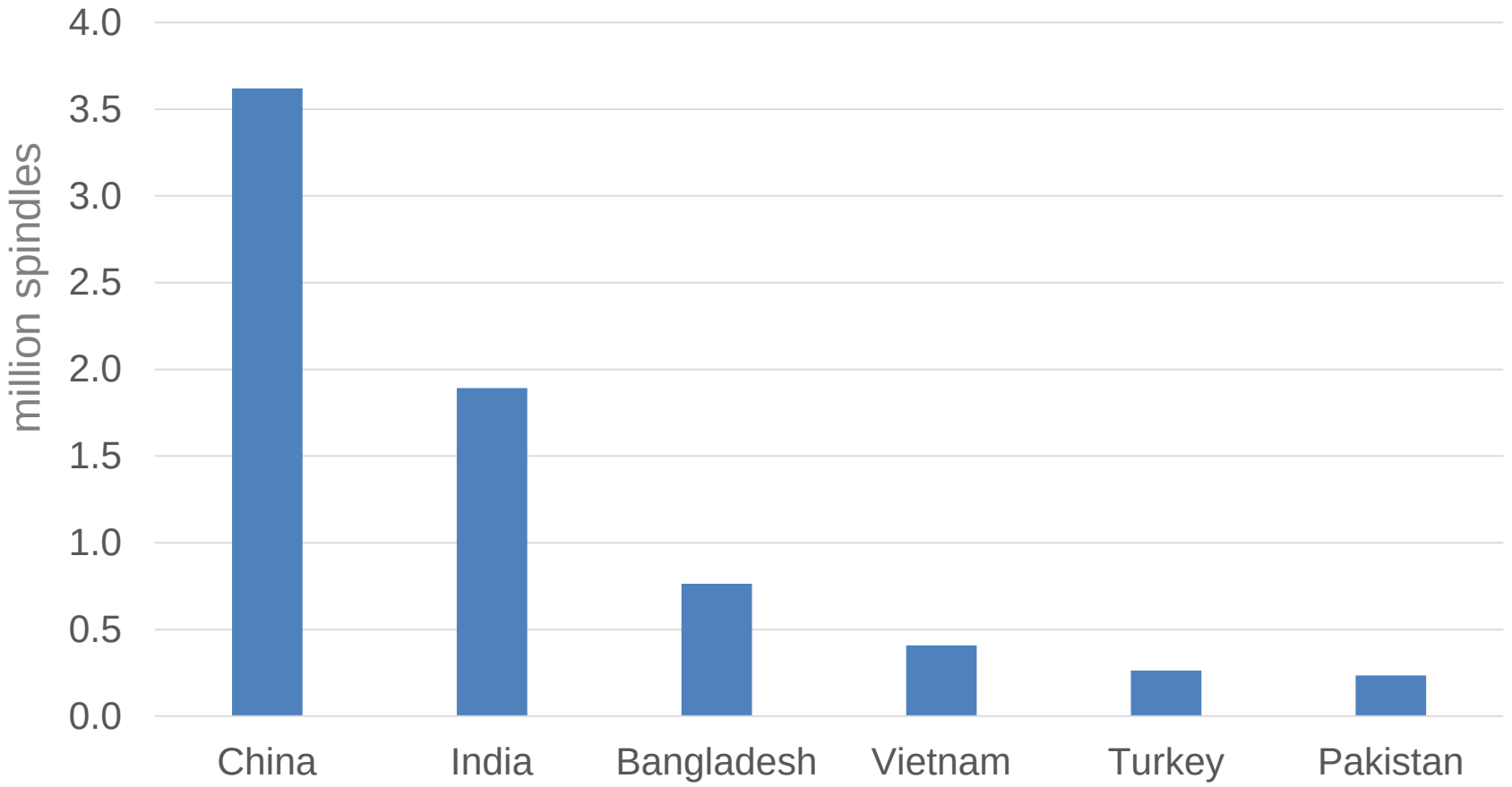
**+9%**



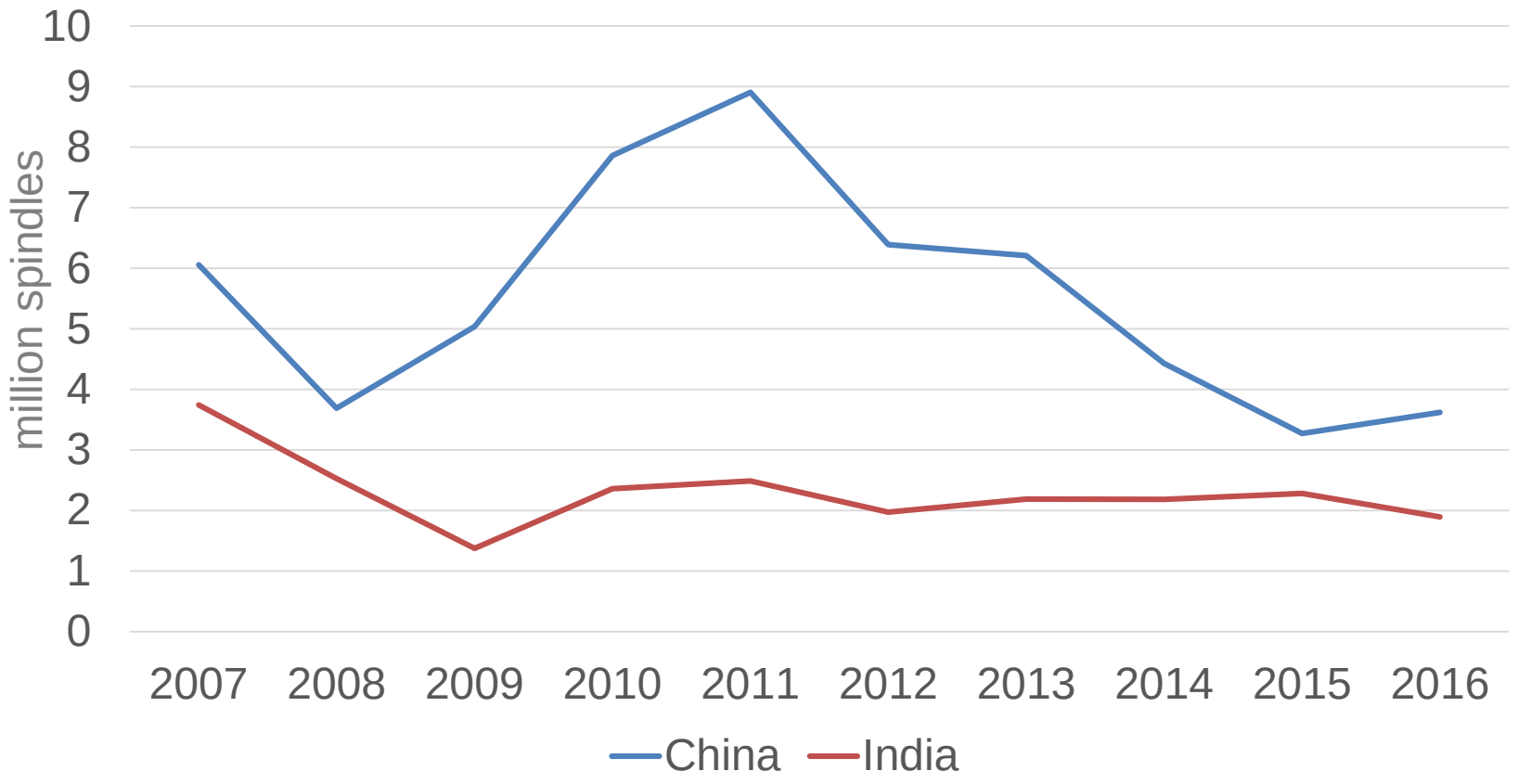
# 1. Shipments of Short-staple Spindles

(2016, 6 Biggest Investors)



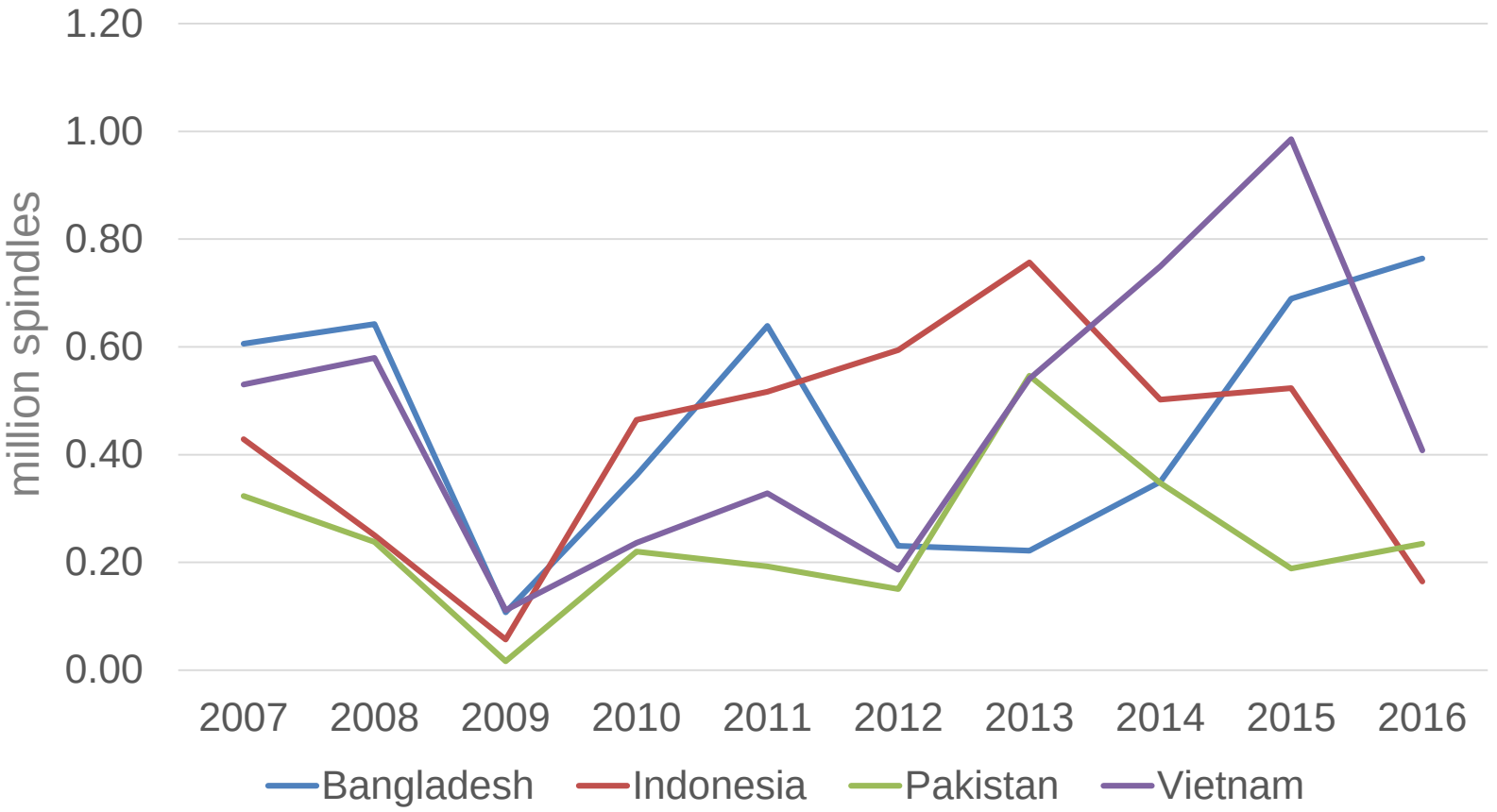
# 1. Shipments of Short-staple Spindles

(2007 – 2016 - China &India)

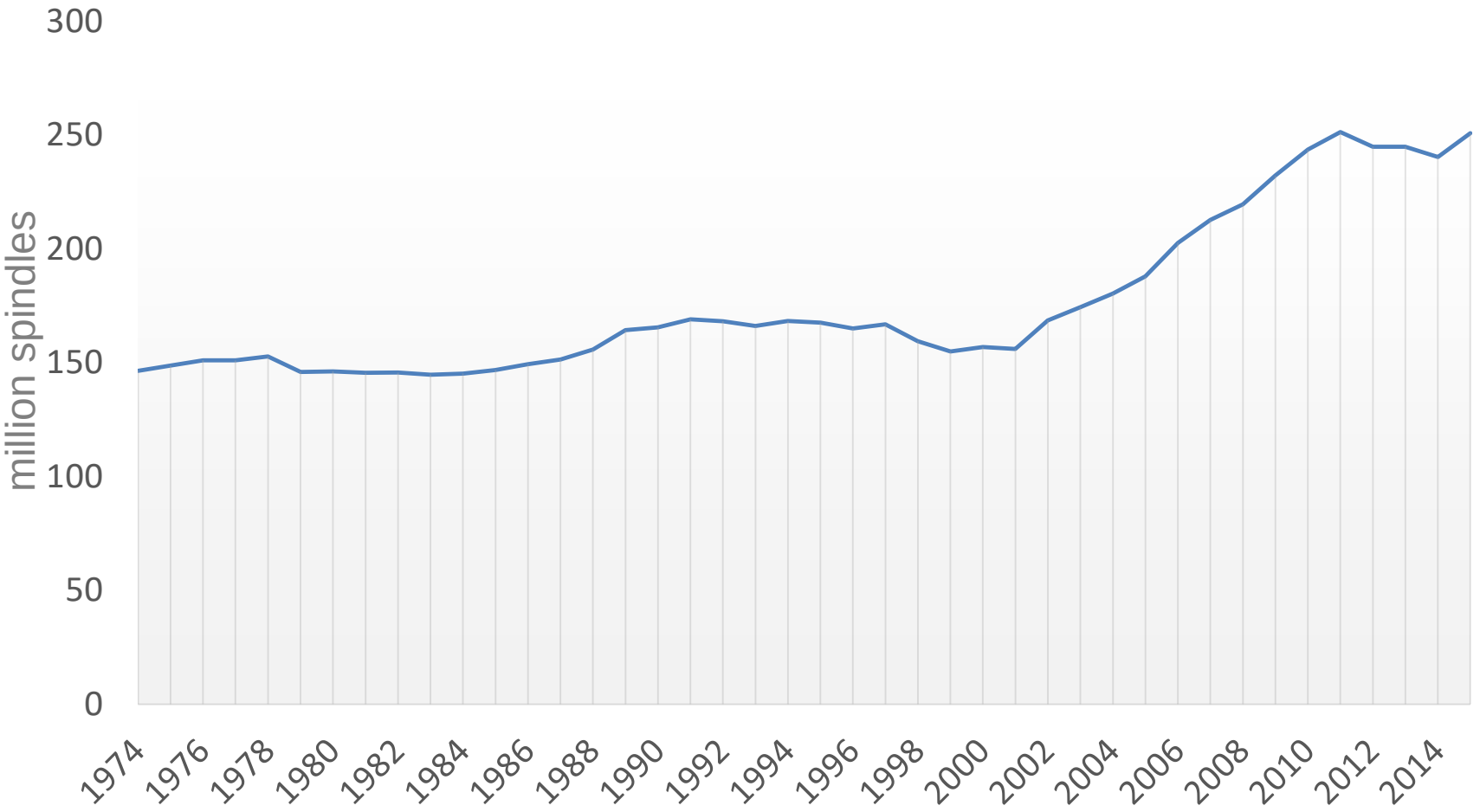


# 1. Shipments of Short-staple Spindles 2007

(2016 - Bangladesh, Indonesia, Pakistan, Vietnam)

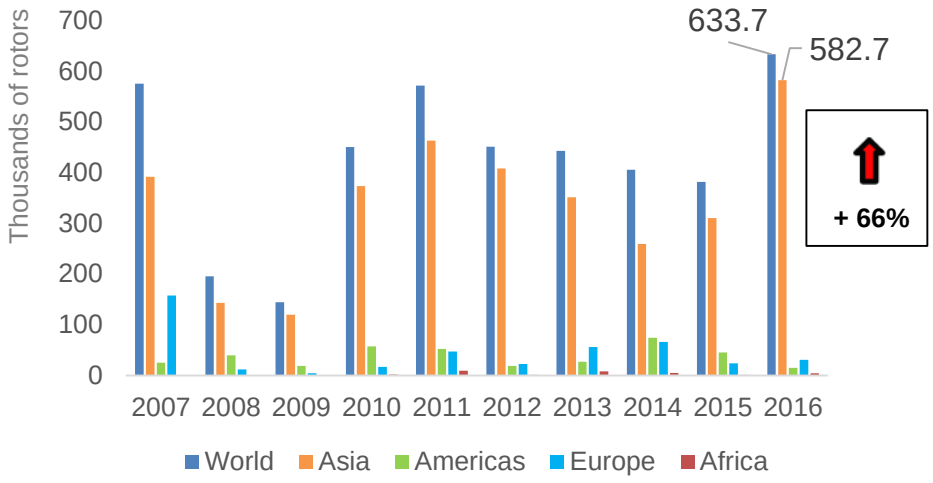


# 1. Installed Short-staple Capacity (1974 – 2015)

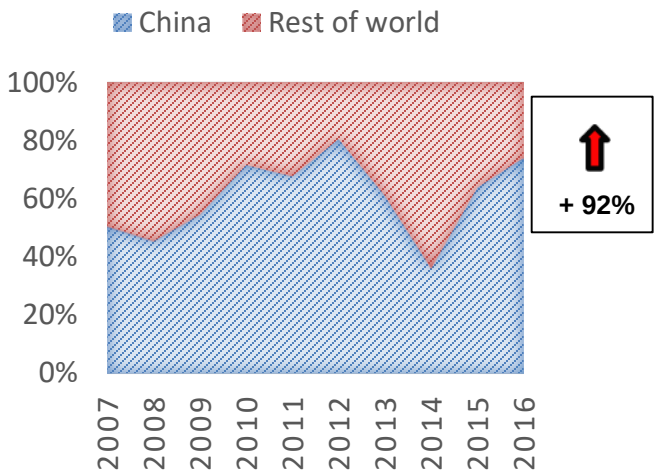


# 2. Shipped Open-end Rotors

## Evolution in the world & regions

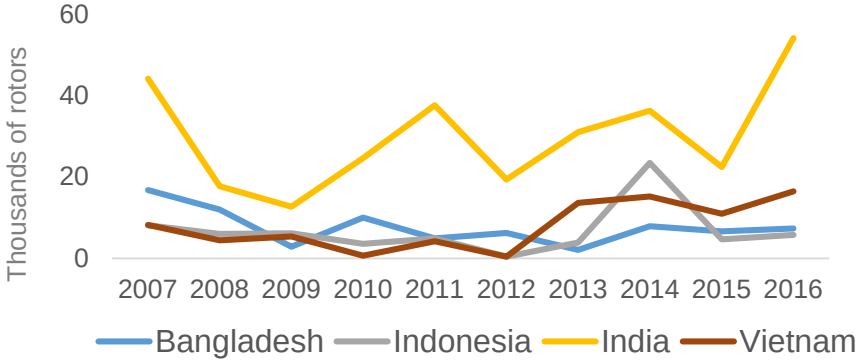



## China's share

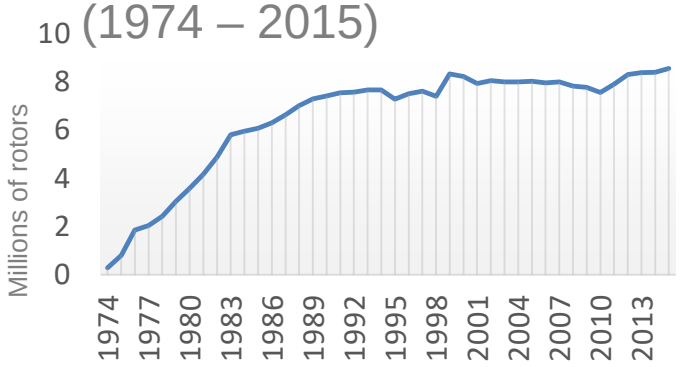



5 Biggest Investors 2016 : China, India, Turkey, Vietnam, Pakistan

## Evolution in selected countires

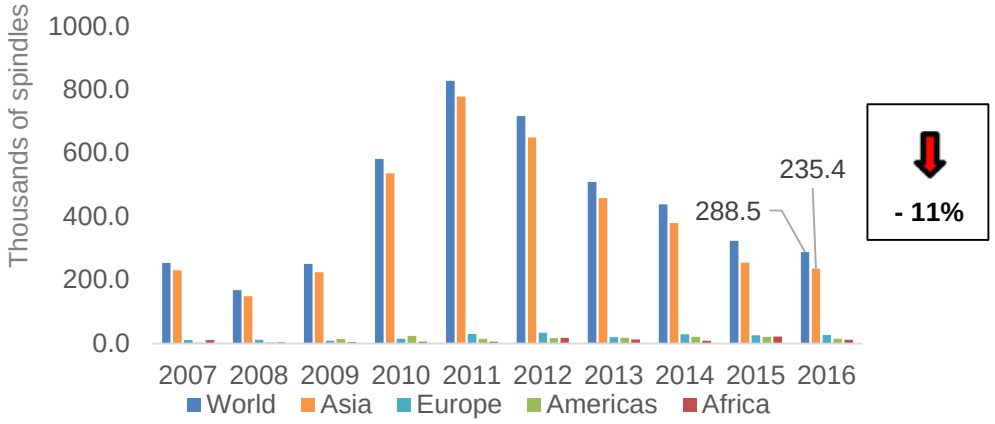



## Installed OE-Rotors Capacity (1974 – 2015)

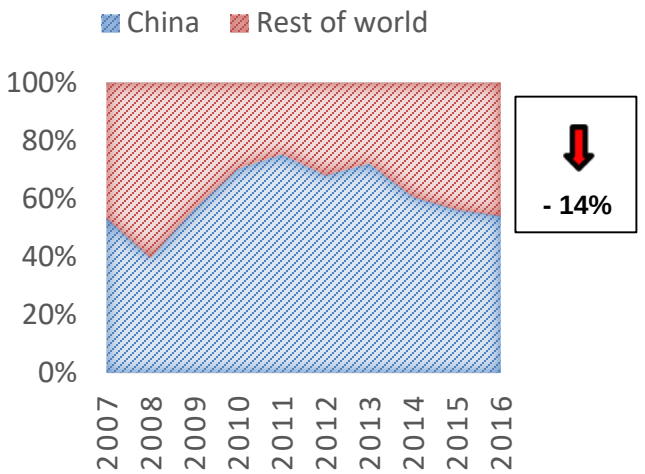


# 3. Shipped Texturing Spindles

## Evolution in the world & regions

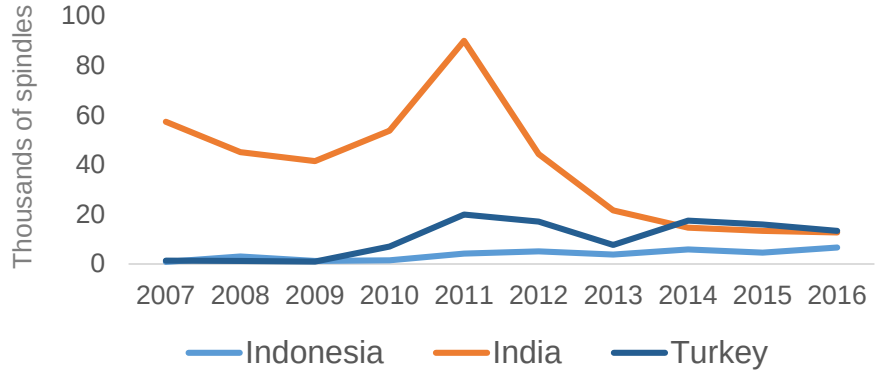



## China's share



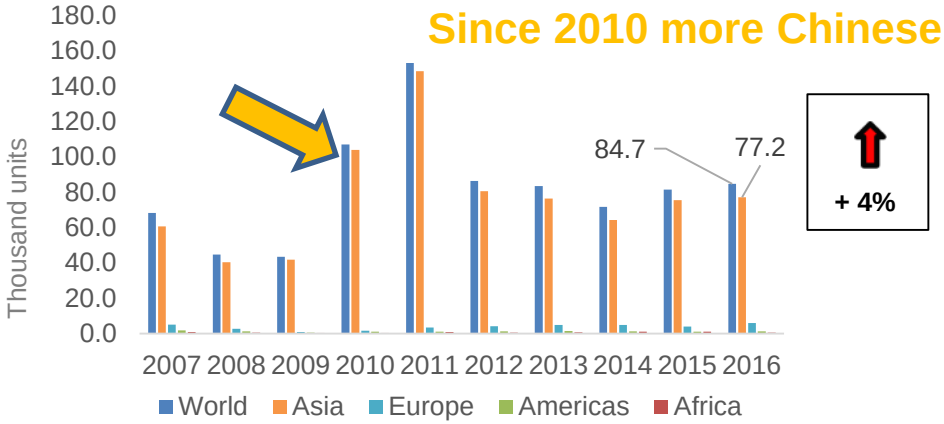

5 Biggest Investors 2016 : China, Japan, Turkey, Chines Tapei, India

## Evolution in selected countires

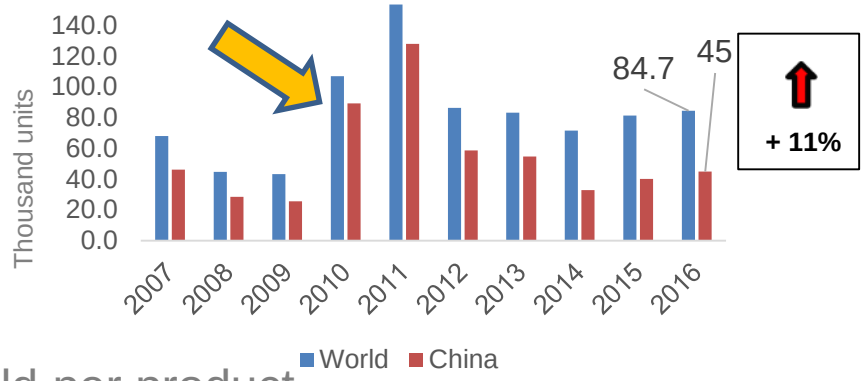


# 4. Shipped Shuttel-less looms

## Evolution in the world & regions



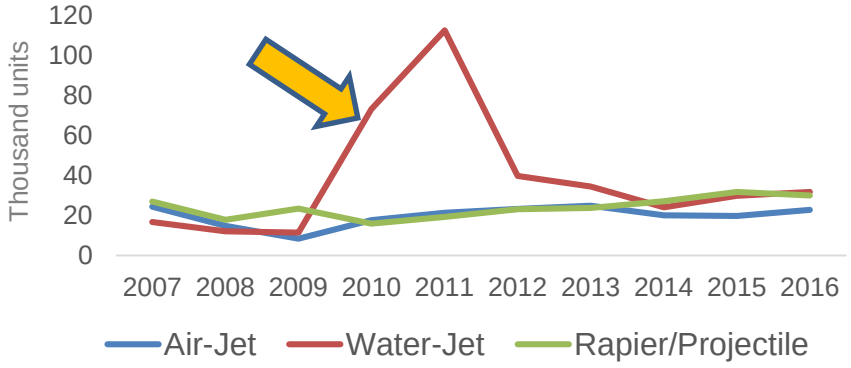

## China's share



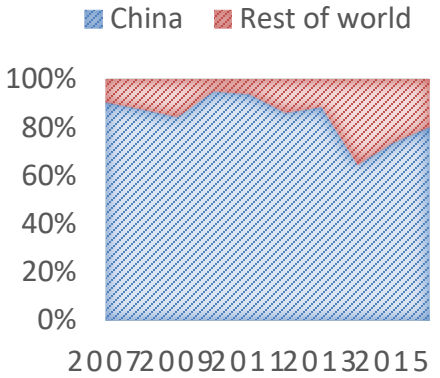

## Evolution in the world per product

5 Biggest Investors 2016 : China, India,, Bangladesh, Turkey, Pakistan

## Evolution in the world per product

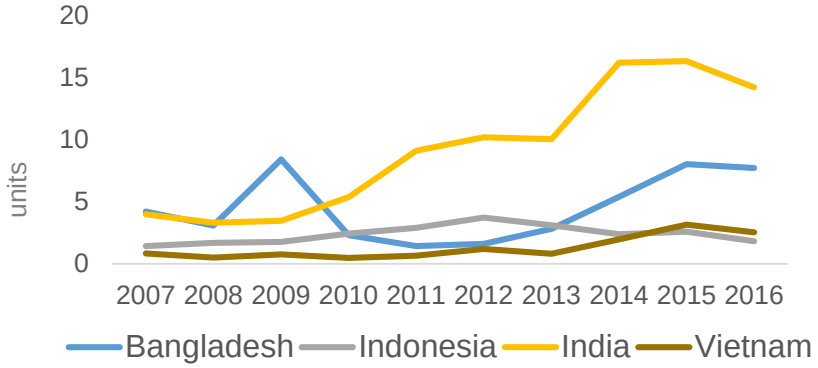


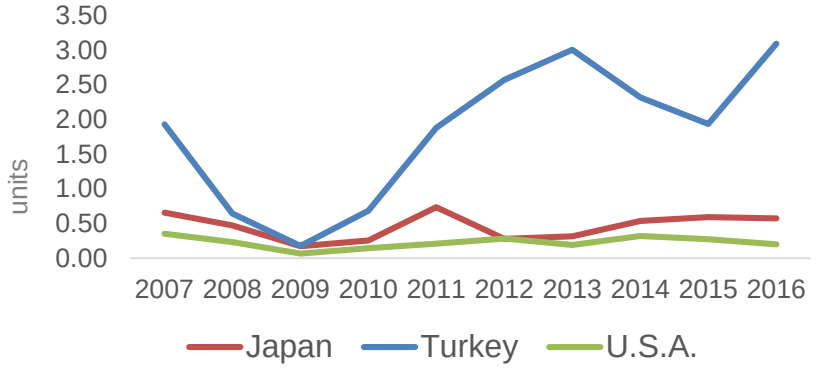

## China's share in Water-Jet looms



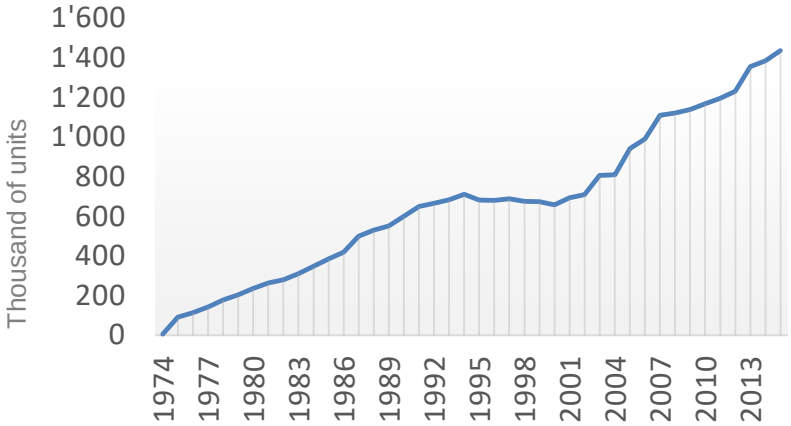
# 4. Shipped Shuttle-less looms

## Evolution in selected countries



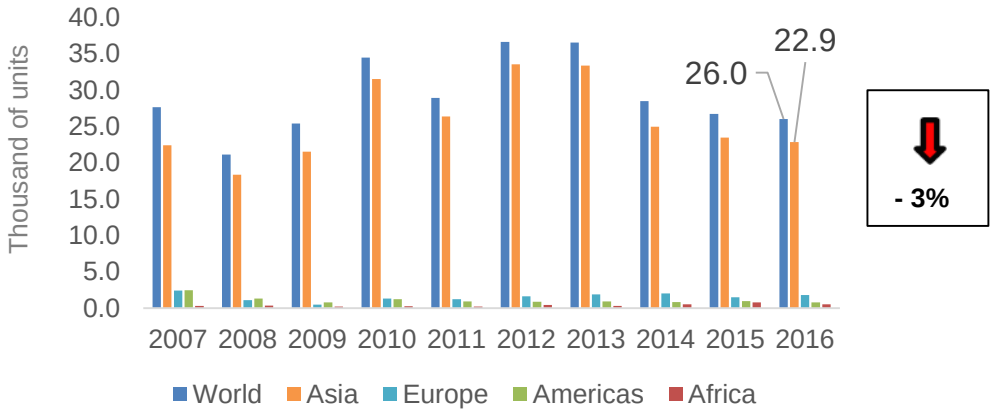




## Installed Shuttle-less looms Capacity



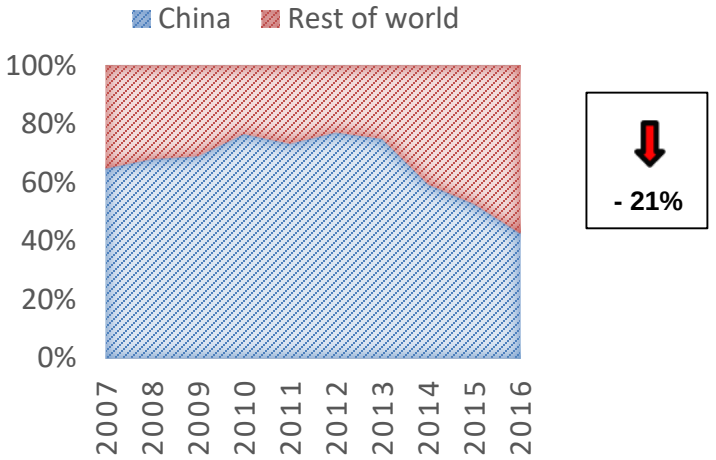
# 5. Shipped Circular Kniting Machines

## Evolution in the world & regions




- 3%

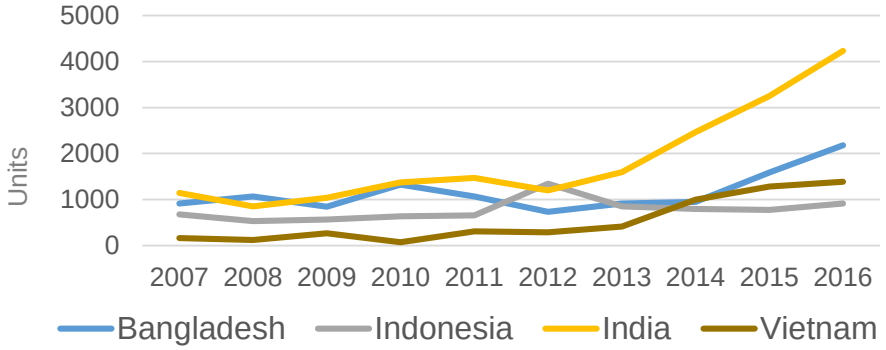
## China's share




- 21%

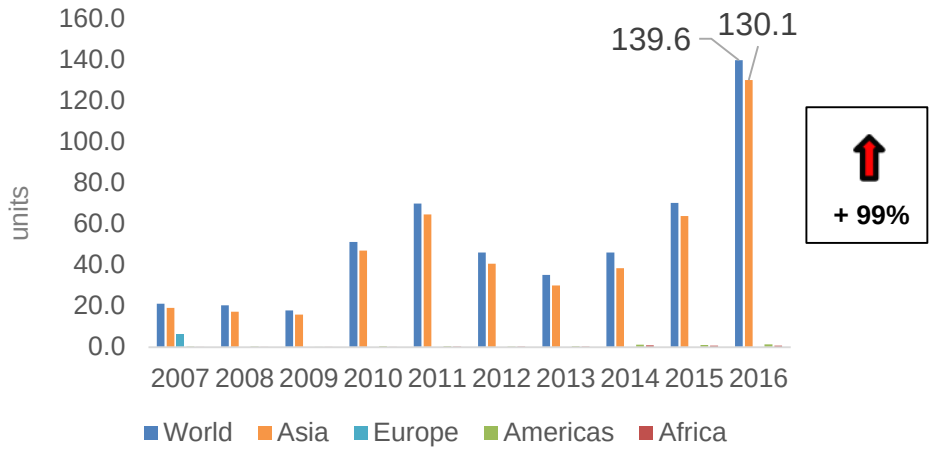
5 Biggest Investors 2016 : China, India, Bangladesh, Vietnam, Turkey

## Evolution in selected countires

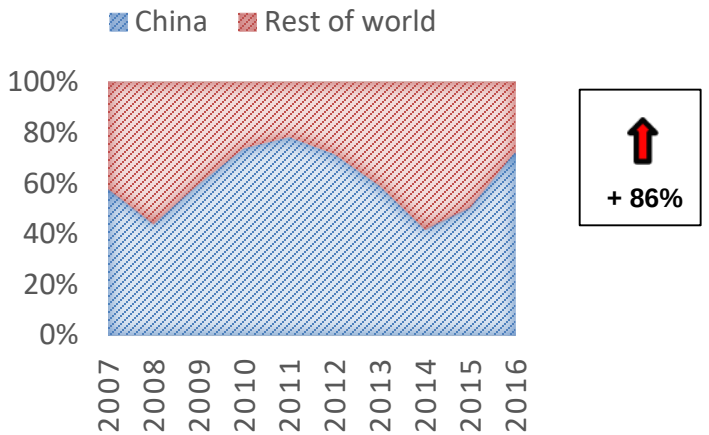


# 6. Shipped electr. Flat Knitting Machines

## Evolution in the world & regions

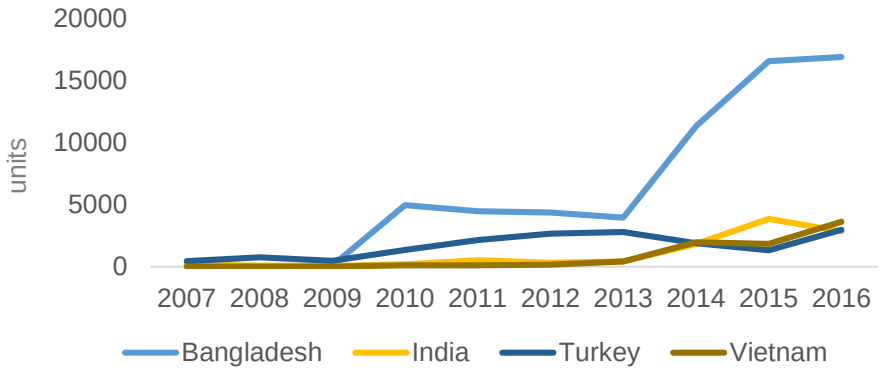



## China's share

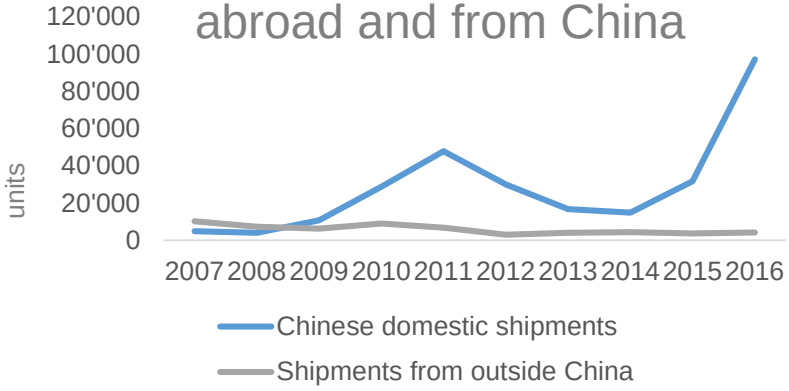



5 Biggest Investors 2016 : China, Bangladesh, Vietnam, Turkey, India

## Evolution in selected countires

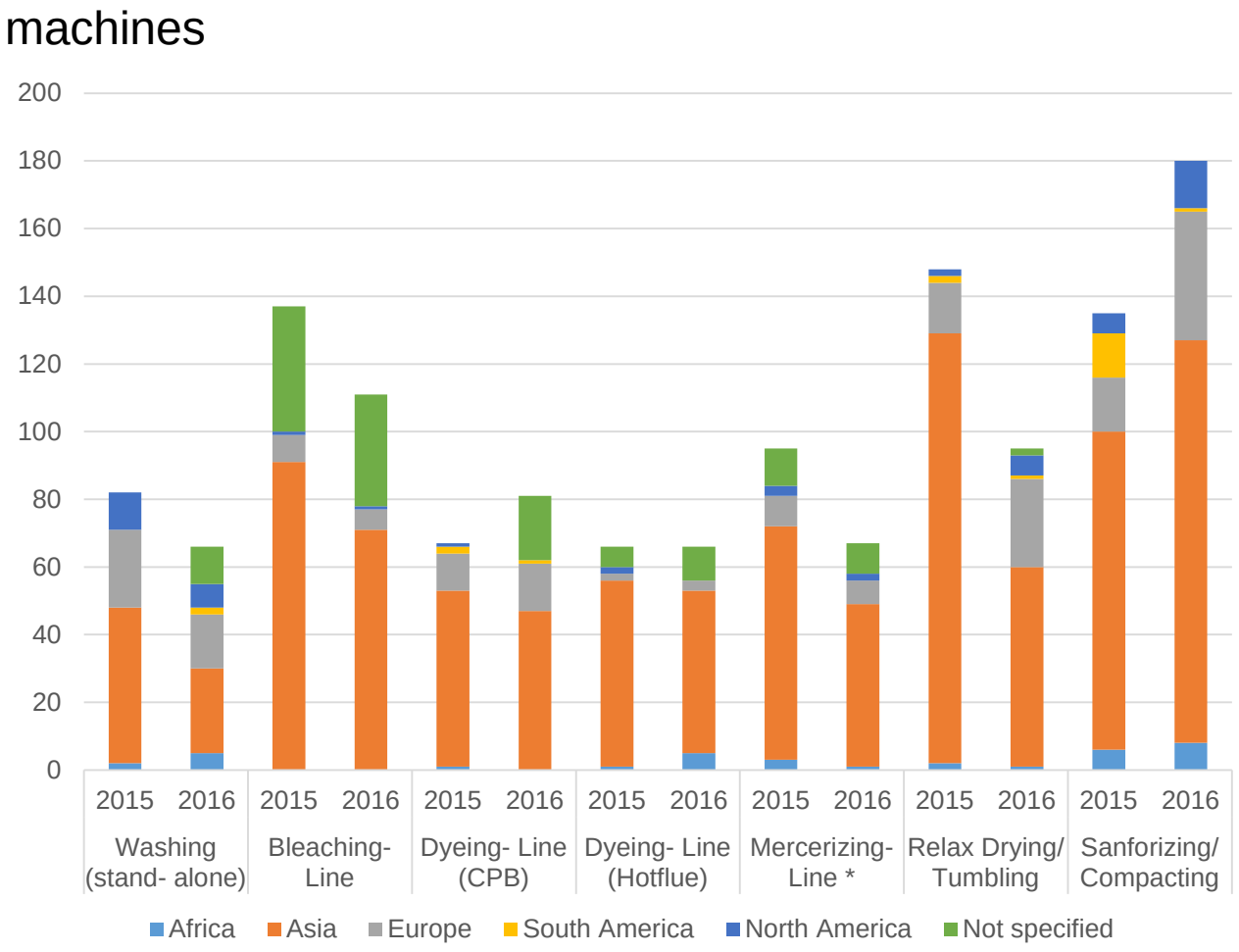


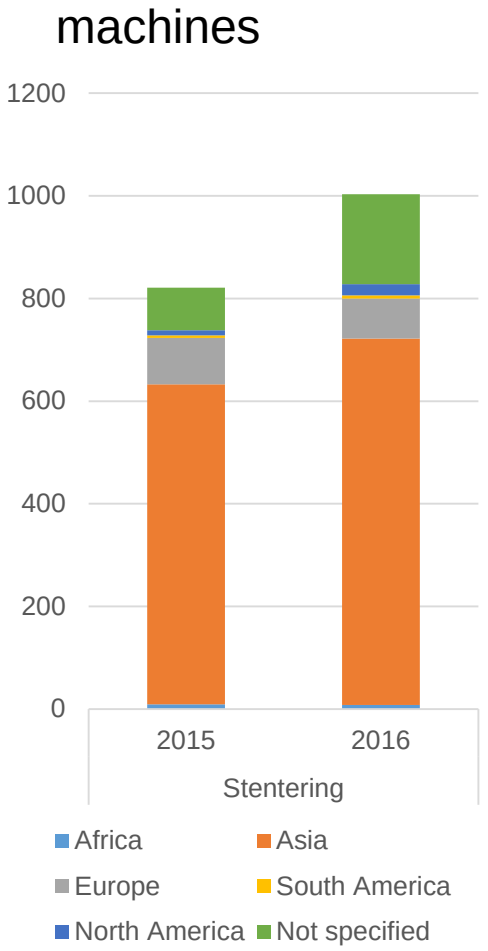

## Shipments to China from abroad and from China



# 7. Shipments of Finishing Machinery

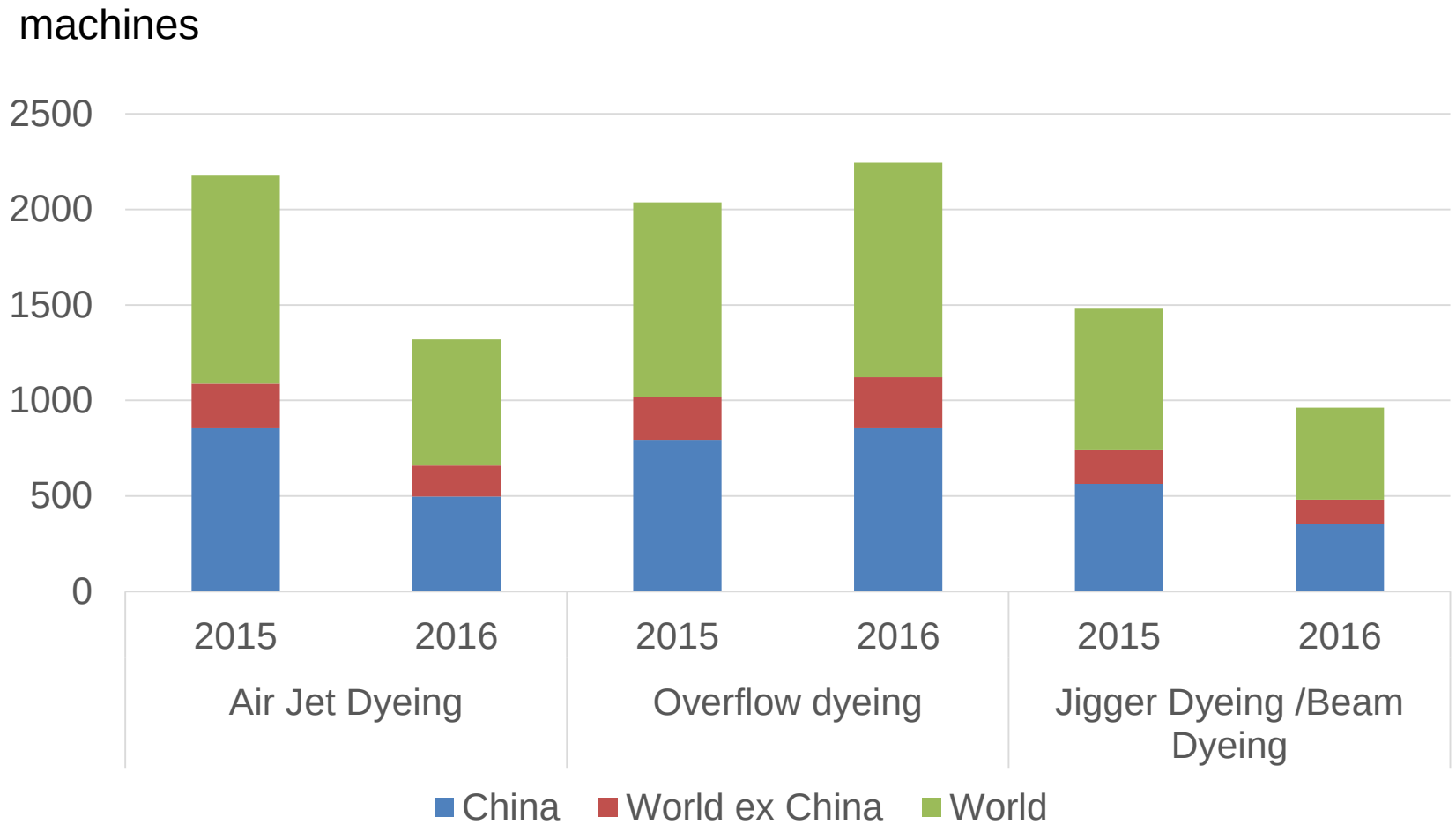
(2016, Fabrics (Woven & Knits) Continuous)



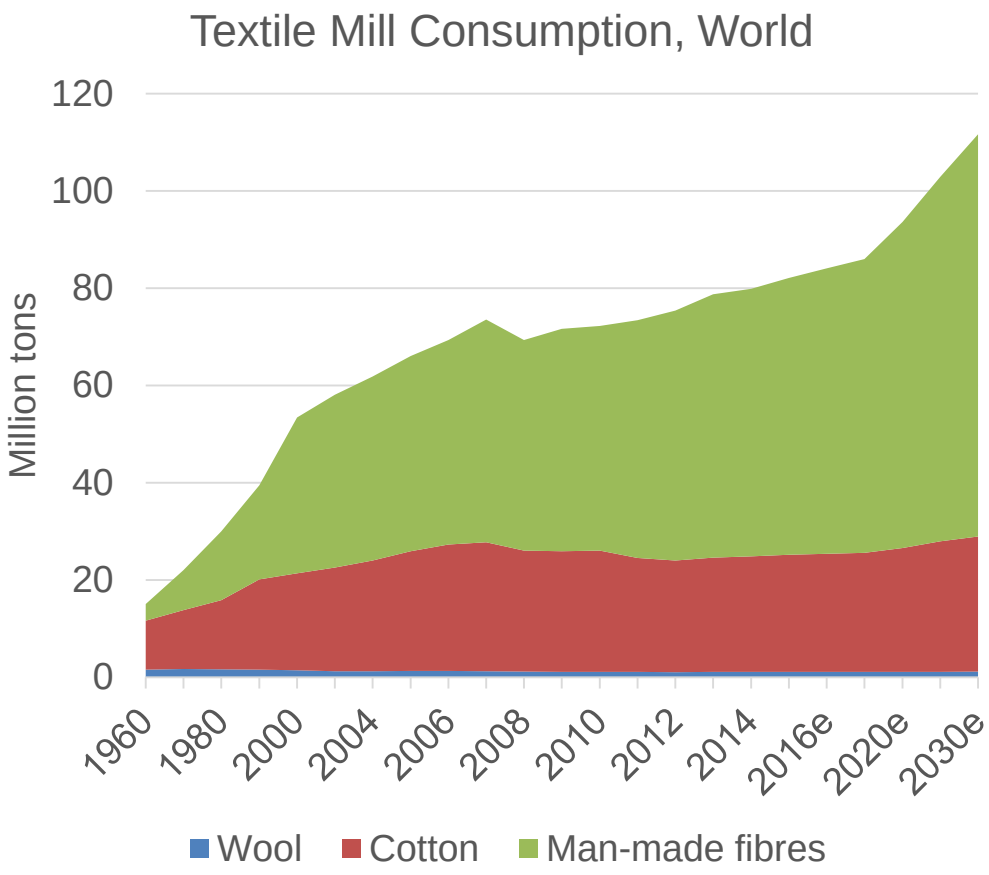
# 7. Shipments of Finishing Machinery

(2016, Fabrics (Wovens & Knits) Discontinuous)



# Contents

# Textile Mill Consumption




- Advent of synthetic fibres
  - Wearing comfort improves
  - Functional clothing
  - Technical textiles
  - Easy to control quality and quantity
- Cotton consumption stagnated in recent years due to both volatile and relative high cotton prices since 2010.
- While on paper there are huge cotton stocks, in reality most of the cotton is not freely available (China).

Source: PCI Fibres (2015)

# Fiber Production - World (in million tons)

| | 2015 | 2020 ** | %-change |
|---|---|---|---|
| Cotton * | 24.055 | 25.467 | 5.9 |
| Wool * | 1.131 | 1.147 | 4.3 |
| Acrylic | 1.705 | 1.701 | -1.8 |
| Nylon (filament) | 3.955 | 4.3 | 10.4 |
| Nylon (staple) | 0.144 | 0.149 | 2.1 |
| Polypropylene (staple) | 0.797 | 0.787 | -2.0 |
| Polypropylene (filament) | 2.735 | 2.844 | 3.7 |
| Polyester (staple) | 15.868 | 17.262 | 11.3 |
| Polyester (filament) | 32.162 | 40.064 | 32.2 |
| Cellulosic (staple) | 4.935 | 5.736 | 20.3 |
| Cellulosic (filament) | 0.39 | 0.421 | 9.1 |
| **Total MMF** | **62.691** | **73.264** | **21.5** |
| **Total Fibre Production** | **87.877** | **99.878** | **17.3** |

* Consumption figures

** Forecast

Source: PCI Fibres (2015)

## World Man-made Fibre Production by Country/Region (million tons)

| | 2015 | 2020 * | %-change |
|---|---|---|---|
| China | 40.000 | 48.097 | 20.24 |
| Western Europe | 2.295 | 2.232 | -2.75 |
| Eastern Europe | 0.602 | 0.654 | 8.64 |
| Turkey | 1.241 | 1.392 | 12.17 |
| Africa/Middle East | 0.702 | 0.782 | 11.40 |
| Chinese Taipei | 1.965 | 1.700 | -13.49 |
| North America | 2.836 | 3.091 | 8.99 |
| India | 5.259 | 6.775 | 28.83 |
| Japan | 0.681 | 0.641 | -5.87 |
| South Asia | 4.600 | 5.322 | 15.70 |
| S. Korea | 1.698 | 1.552 | -8.60 |
| Australasia | 0.035 | 0.038 | 8.57 |
| **Total Fibre Production** | **61.914** | **72.276** | **16.74** |

* Forecast

Source: PCI Fibres (2015)

# World Polyester Production by Country (million tons)

| | 2015 | | 2020 * | | %-change | |
|---|---|---|---|---|---|---|
| | Polyester (staple) | Polyester (textile filament) | Polyester (staple) | Polyester (textile filament) | Polyester (staple) | Polyester (filament) |
| China | 9.600 | 22.000 | 10.270 | 28.150 | 6.98 | 27.95 |
| India | 1.375 | 3.275 | 1.700 | 4.180 | 23.64 | 27.63 |
| USA | 0.657 | 0.181 | 0.700 | 0.188 | 6.54 | 3.87 |
| Turkey | 0.245 | 0.196 | 0.261 | 0.206 | 6.53 | 5.10 |
| Chinese Taipei | 0.525 | 0.820 | 0.495 | 0.645 | -5.71 | -21.34 |
| South Korea | 0.660 | 0.585 | 0.655 | 0.470 | -0.76 | -19.66 |
| Indonesia | 0.715 | 0.795 | 0.790 | 0.940 | 10.49 | 18.24 |
| Thailand | 0.315 | 0.355 | 0.340 | 0.374 | 7.94 | 5.35 |
| Malaysia | 0.106 | 0.255 | 0.107 | 0.255 | 0.94 | 0.00 |
| Vietnam | 0.165 | 0.090 | 0.225 | 0.145 | 36.36 | 61.11 |
| Bangladesh | 0.062 | 0.062 | 0.073 | 0.064 | 17.74 | 3.23 |
| Others | 1.443 | 0.352 | 1.646 | 0.588 | 14.07 | 67.05 |
| **Total** | **15.868** | **28.966** | **17.262** | **36.205** | **8.78** | **24.99** |

* Forecast

Source: PCI Fibres (2015)

# Economic catch-up in Asia continues

## Growing global GDP, current prices (billion USD)

| Year | World | USA | China | India | Middle East & North Africa | Sub-Saharan Africa |
|---|---|---|---|---|---|---|
| 2015 | 73'600 | 18'037 | 11'182 | 2'073 | 2'843 | 1'504 |
| 2021 | 98'632 | 22'767 | 18'033 | 3'650 | 3'975 | 1'855 |
| **Growth %** | **34.0** | **26.2** | **61.3** | **76.1** | **39.8** | **23.3** |

## GDP per capita, current prices (USD)

| Year | World | USA | China | India | Middle East & North Africa | Sub-Saharan Africa |
|---|---|---|---|---|---|---|
| 2015 | 10'014 | 56'084 | 8'141 | 1'600 | 6'704 | 1'563 |
| 2021 | 12'713 | 67'940 | 12'857 | 2'611 | 8'478 | 1'651 |
| **Growth %** | **27.0** | **21.1** | **57.9** | **63.2** | **26.5** | **5.6** |

Sources: IMF, UN

- Global GDP is expected to increase by over 31% from 2015 to 2021
- Economic growth in emerging and developing countries will be strong
- Asian retail markets for textile and apparel become more and more important
- Customer preferences in Asian countries change towards Western-style. On the other hand, Asian-style will influence textile industry

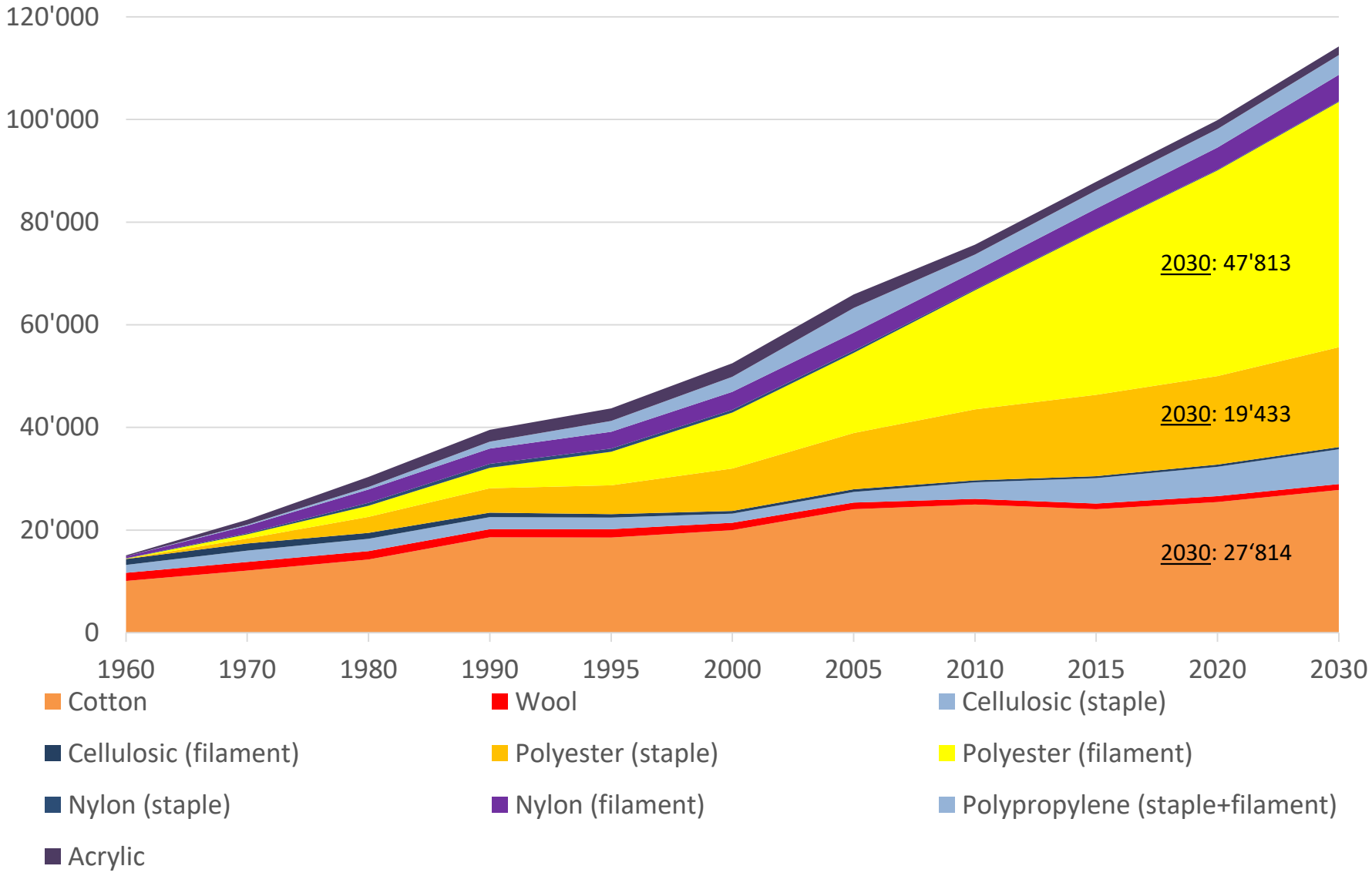
# Strong increase in fibres consumption in China and India

Higher per capita fibre consumption (kg per capita)

| Year | World | West Europe | Turkey | North America | China | India | Africa / Middle East |
|---|---|---|---|---|---|---|---|
| **2016** | 11.5 | 23 | 11.5 | 39.8 | 15.5 | 5.4 | 5.0 |
| **2020** | 12.2 | 24.2 | 13.4 | 40.4 | 18.3 | 5.9 | 5.7 |
| **2030** | 13.4 | 24.5 | 16.2 | 40.0 | 20.1 | 7.9 | 6.9 |

Source: PCI-Fibres (2015)

# Global Textile Mill Consumption (in ‘000 tons)



# Summary

- Growing Global Textile & Apparel Market
- E-Commerce share is on the rise
- New technologies allow mass customized production
- Internet of Things (IoT) offers new potential to increase productivity
- Sustainability is a trend and an integral part of business (CSR)
- Infrastructure Projects (OR,OB-Initiative) – Creating new opportunities
- Textile production concentrated in Asia (especially in China)
- Certain shift of textile production to other Asian countries
- Production in other regions (Africa, Americas, Europe) has more potential due to
  - Technologies (digital and 3-D printing, automation)
  - Fashion trends (fast fashion)
  - Reduced cost differentials
  - Sustainability (traceability, circular economy)

- Global fiber consumption is on the rise (GDP and population)
- Man-made fibers (mmf) are benefiting most
- Within mmf, polyester filaments are growing strongly
- Wool has become a «luxury» fibre
- Is cotton is becoming a «luxury» fiber as well?

# THANK YOU
# FOR YOUR ATTENTION!

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# Standard Audit Initiative

by


## Audit Fatigue: Challenges and Opportunities

**ITMF Annual Conference 2017**
Bali - Indonesia

Presented by

**Karim Shafei**

GHERZI

September 2017

GHERZI

## Social compliance requirements are becoming a major burden to textile manufacturers..

- **Confusing and conflicting standards**
- **Gaps in coverage**
- **Costs**
- **Disruption to production**
- **Lengthy process**

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## Conflicting standards: example from working hours and days off..

| | # of hours | Overtime | Hours exceptions | Days off | Days-off exceptions |
|---|---|---|---|---|---|
| **Walmart** | 48 | 12 | None | 1 / 7 | Could be 1 / 14 |
| **Sears** | 48 | 12 | 72 in peak season | 1 / 7 | Could be exchanged |
| **JC Penny** | Local Laws | Local Laws | None | Local Laws | None |
| **IKEA** | 48 | 12 | None | 1 / 7 | None |
| **Macy's** | 48 | 12 | 72 in peak season 14 / day max | Yes | - |

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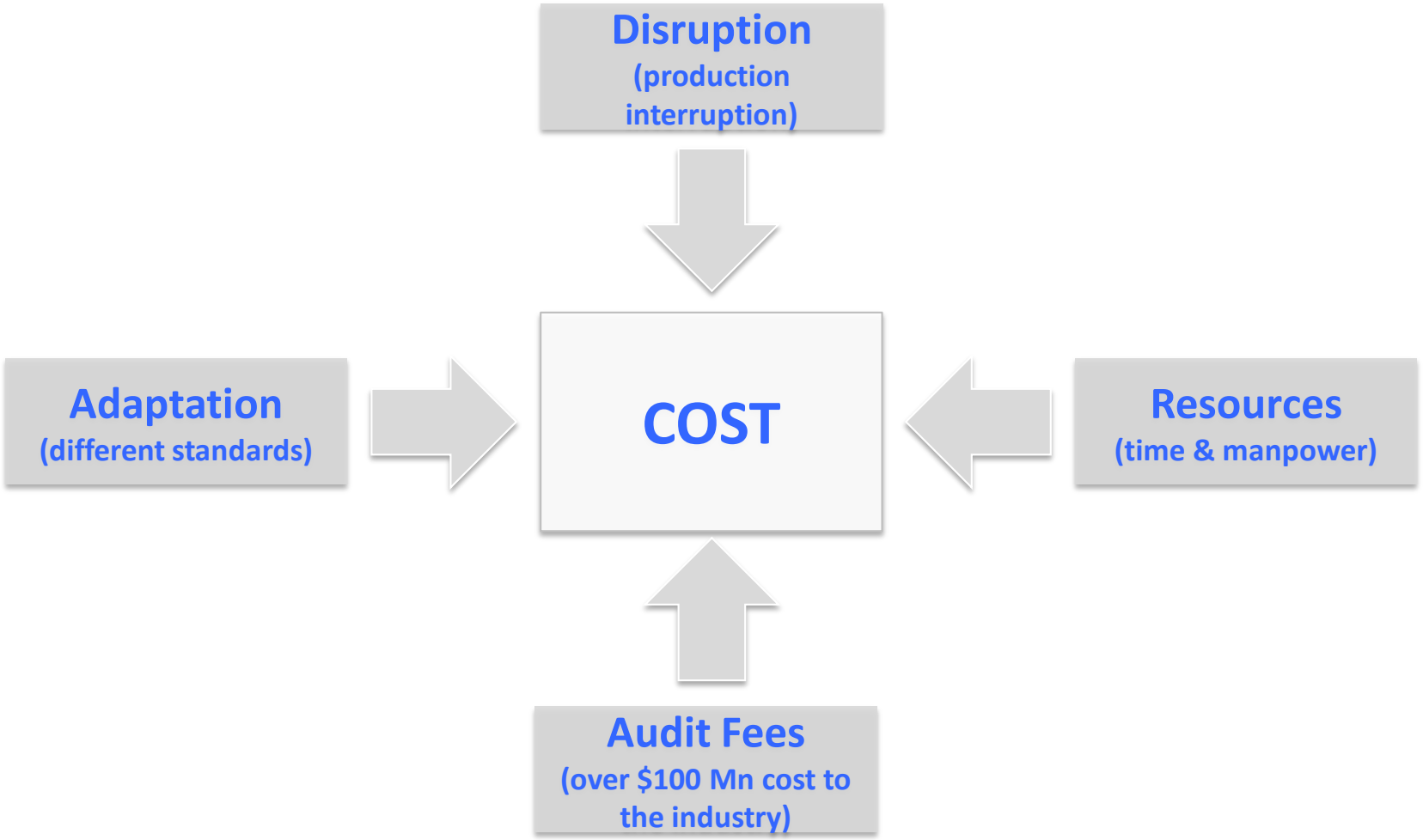
## Gaps in coverage: example from toilet policy

| | Toilets : workers | Cleaning | Ventilation | Privacy |
|---|---|---|---|---|
| Walmart | - | - | - | - |
| Sears | 1:25 – 1:40 | Cleaning schedule | Yes | Yes |
| Macy's | 1:30 | Yes | Yes | Yes |
| JC Penny | - | Yes | - | - |
| Next | At least 1 male & 1 female / 2 floors | Yes | - | Yes |

Elaborate Policy  Basic Policy  No Policy

## Current practices are resulting in additional costs to manufacturers..



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## In 2014 the ITMF HTP committee launched the “Standard Audit Label” Initiative to unify social compliance requirements from major retailers..

| | |
|---|---|
| 1 | SEARS |
| 2 | WALMART |
| 3 | CARREFOUR |
| 4 | JC PENNEY |
| 5 | AUCHAN |
| 6 | BBC |
| 7 | NEXT |
| 8 | PRIMARK |
| 9 | Target |
| 10 | Khol’s |

| | |
|---|---|
| 11 | IKEA |
| 12 | Otto |
| 13 | Tesco |
| 14 | Kmart |
| 15 | Macy's |
| 16 | CHF |
| 17 | Li & Fung |
| 18 | Lowe’s |
| 19 | Home Depot |
| 20 | PIER – 1 |

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**The outcome is a unified "Code Of Conduct" that covers the most stringent list of social compliance requirements, covering the 7 key topics..**

| | |
|---|---|
| 1 | General |
| 2 | Health & Safety |
| 3 | Employment |
| 4 | Environment |
| 5 | Security |
| 6 | Corruption & Business ethics |
| 7 | Required Documents |

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# The ITMF "Code Of Conduct" covers all social compliance requirements..

**1. Introduction**

**2. Health & Safety**

- Ventilation
- Drinking Water
- Toilet facilities
- Lighting
- Temperature
- Ergonomic conditions
- Housekeeping and Hygiene
- Equipment Safety
- Protective Equipment
    i. Foot Protection
    ii. Head Protection
    iii. Eye and Face Protection
    iv. Ear Protection
    v. Hand Protection
    vi. Body Protection
    vii. Respiratory Protection
- Hazardous material
    i. Hazardous material definition
    ii. Keeping a log of hazardous material
    iii. Handling of hazardous material
    iv. Storage of hazardous material
    v. Labeling hazardous material
- First aid
- Aisles, exits and stairwells
    i. Aisles and Stairwells
    ii. Exits
- Electrical safety
- Emergency evacuation
- Dormitories / Living facilities / Canteen
    i. General Requirements
    ii. Security
    iii. Facilities
    iv. Material and Chemical safety
    v. Electrical Safety
    vi. Smoking
    vii. First aid and emergency response
    viii. Evacuation and Evacuation training
    ix. Fire safety
        - Dormitory and Canteen fixtures and equipment
        - Travel distance
        - Fire safety inspection
    x. Dormitory sanitation
    xi. Canteen sanitation
- Permits and building designs
- Smoking
- Alcohol and drugs
- Child care / Crèche
- Fire safety Committee
- Fire safety inspection
- Fire safety training

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# The ITMF "Code Of Conduct" covers all social compliance requirements..

**3. Employment**

- Hiring
  - i. Forced Labor
  - ii. Contract Labor
  - iii. Child Labor
- Labor treatment
  - i. Harassment or abuse
  - ii. Non-discrimination
  - iii. Freedom of association and collective bargaining
  - iv. Wages and benefits (labor laws)
  - v. Work hours and overtime
  - vi. Breaks
  - vii. Rest days and holidays
  - viii. Employment contracts
  - ix. Worker discipline
  - x. Pregnancy and maternity
  - xi. Accident Insurance

**4. Environment**

- General waste management
- Waste storage
- Waste transport and disposal
- Wastewater and effluents management
- Air emission management
- Water management
- Energy consumption and Greenhouse Gas management
- Land use and biodiversity
- Environmental management system
- Hazardous substances management and pollution prevention
- Noise pollution
- Nuisance
- Ground contamination
- Continuous improvement
- Recycling of waste

**5. Security**

**6. Corruption and business ethics**

- Gifts and entertainment
- Anti-corruption
- Limits on supplier action
- Origination of material
- Financial integrity
- Competition and anti-trust practices

**7. Documentation**

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# And an audit tool was developed to measure the degree of compliance of participating members..

| 1. General requirements | Answer | Score | Notes | Verification: Docs | Interviw | Observe | Inspect |
|---|---|---|---|---|---|---|---|
| Does the member have a written procedure for everyone of the standards | Y | 1 | | x | | | |
| Is there a responsible person for the implementation and documentation of standards and procedures? | Y | 1 | | x | | | |
| Does the compliance system of the member include the following: | | | | | | | |
| Assigned personnel to | | | | x | | | |
| Line management acc | | | | x | | | |
| Disciplinary actions for | | | | x | | | |
| A process for the iden | | | | x | | | |
| A policy for continuou | | | | x | | | |
| Does the member keep records of incidents whe | | | | | | | |
| Does the member review regularly the standard | | | | | | | |
| Does the member have all the procedures writte | | | | | | | |
| Does the member provide training for workers v | | | | | | | |
| Does such a training include the following: | | | | | | | |
| Induction training? Do | | | | | | | |
| Work sch | | | | | | | |
| Minimum | | | | | | | |
| Wage cal | | | | | | | |
| Work day | | | | | | | |
| Entitled leave? | | | | | | | |
| Workplace rules? | | | | | | | |
| Dormitory and canteen rules (if applicable)? | | | | | | | |
| Disciplinary procedure and grievance procedure? | | | | | | | |
| Environmental health and safety awareness? Does it include: | | | | | | | |
| Evacuation procedures? | | | | | | | |
| Fire prevention? | | | | | | | |
| Accident reporting? | | | | | | | |
| Electrical safety? | | | | | | | |
| Asbestos, chemical handling and waste management (when applica | | | | | | | |
| Job specific training? | | | | | | | |
| Does the member keep training records? Do they include: | | | | | | | |
| Training date? | | | | | | | |
| Training content? | N | 0 | | x | | | |
| Trainers? | N | 0 | | x | | | |
| Attendees? | Y | 1 | | x | | | |
| Are key procedures communicated in writing? Are such key procedures: | Y | 1 | | x | | | |
| Communicated using signage on walls? | Y | 1 | | | | x | |
| Communicated in manuals? | Y | 1 | | x | | | |
| Written in a simple language using clear, legible fonts? | Y | 1 | | x | | | |
| Total Score for this section | | 23 | | | | | |
| Maximum Score for this section | | 37 | | | | | |
| Score percentage | | 62% | | | | | |

| 1. General requirements | |
|---|---|
| | Does the member have a written procedure for everyone of the standards? |
| | Does the compliance syst |
| | Assigned person compliance? |
| | Line manageme |
| | Disciplinary acti |

| | Chapter | Score | Maximum Score | Percentage |
|---|---|---|---|---|
| 1 | General | 28 | 36 | 78% |
| 2 | Health & Safety | 323 | 333 | 97% |
| 3 | Employment | 76 | 150 | 51% |
| 4 | Environment | 31 | 79 | 40% |
| 5 | Security | 18 | 18 | 100% |
| 6 | Corruption & Business ethics | 9 | 9 | 100% |
| 7 | Required Documents | 8 | 60 | 13% |
| **Total Score** | | **475** | **685** | **69%** |

## 3 auditing companies were selected to perform the audits and 8 ITMF members took a self imposed audit

| Auditor | India | Pakistan |
|---|---|---|
| Bureau Veritas | x | x |
| SGS | x | x |
| Intertek | x | x |

1. Welspun
2. Feroze1888
3. Lucky
4. Yunus
5. Gul Ahmed
6. Century
7. Trident
8. Textrade

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## Several meetings were organized with retailers and organizations to build support for the initiative..

### BRANDS

JCPenney

TARGET

IKEA

Walmart

LI & FUNG

### ORGANIZATIONS

SCAN Supplier Compliance Audit Network

GAFTI

Sustainable Apparel Coalition

NRF®

NATIONAL RETAIL FEDERATION®

## Feedback although positive has also shown several challenges..

| | | |
|---|---|---|
| 1 | Retailers are aware of “audit fatigue” | + |
| 2 | They are happy to cooperate | + |
| 3 | Biggest issue: agree with other retailers on methodology | - |
| 4 | Second biggest issue: cross-industry standardization | - |
| 5 | Every retailer is part of one or several initiatives / takes time | - |

## Recently Walmart switched to using 3rd party audits and other retailers seem to be following suit..

| Retailer | Status |
|---|---|
| **Target** | - Target currently reevaluating their social compliance<br>- Not clear on next steps yet but might follow Walmart steps |
| **Walmart** | - Rolling out their social compliance to 3rd parties (8 organizations including WRAP and BSCI)<br>- Could evaluate our initiative if we have a program |
| **IKEA** | - Interest in standardizing social compliance but don't know how yet |
| **JC Penny** | - Recognize audit fatigue do not have a plan yet for next steps (information from 2016) |
| **Li & Fung** | - Founding members of GAFTI and hosting it in their premises for now |

## Recently Walmart switched to using 3rd party audits and other retailers seem to be following suit..

- **Walmart shifted to 3rd party audits for social compliance**
- **They scrutinized 8 social compliance programs across different industries**:
  - Best Aquaculture Practices (BAP)
  - Business Social Compliance Initiative (BSCI)
  - Electronic Industry Citizenship Coalition (EICC)
  - International Labor Organization – Better Work
  - International Council of Toy Industry CARE
  - Sedex Members Ethical Trade Audits (SMETA)
  - Social Accountability International (SA 8000)
  - Worldwide Responsible Accredited Production (WRAP)
- **Suppliers can select any one of the above 8 programs**
- **Walmart will continue to carefully review the audits and ensure that companies are compliant through those 3rd party audits**

## ITMF to leverage its network of tens of thousands of manufacturers to create a unified voice for the industry..

| | |
|---|---|
| **Mission** | ITMF to become the entity representing manufacturers in various initiatives |
| **Offering** | Unified voice for the industry<br>Industry insight into the development of social compliance<br>The infrastructure already developed |
| **Strategy** | Leverage ITMF network<br>Create platform for communication<br>Consolidate the industry |
| **Scope** | Join forces with existing initiatives and give them weight<br>Consolidate industry players<br>Engage buyers to adopt existing initiatives |
| **Time Frame** | 3 years |

## In order to have an active role in the representation of the industry, the ITMF will work on 3 distinct axis:

1. **Partnership with social compliance initiatives**
2. **Join forces with other industry bodies**
3. **Bring retailers on board**

## Identify and scrutinize various initiatives to strike a partnership and secure a voice for the ITMF..

| | | | | | |
|---|---|---|---|---|---|
| 1 | Business Social Compliance Initiative (BSCI) | 16 | ABNT (Associacao Brasileira de Normas Tecnicas) Ecolabel | 31 | Fair Trade USA |
| 2 | Global Organic Textile Standard | 17 | Fair for Life | 32 | BRC Global Standards - Consumer Products |
| 3 | Worldwide Responsible Accredited Production (WRAP) | 18 | Good Weave | 33 | OFDC Organic Certification Standards |
| 4 | Fair Trade | 19 | Singapore Green Labelling Scheme | 34 | EcoVadis |
| 5 | OEKO Tex | 20 | Soil Association Organic Standards | 35 | Climate, Community & Biodiversity Standards (CCB) Standards |
| 6 | Ethical Trading Initiative | 21 | Thai Green Label | 36 | FLA Workplace Code of Conduct |
| 7 | Bluesign ag | 22 | China Environmental Labeling | 37 | Global Reporting Initiative (GRI) |
| 8 | Disha Common Code of Conduct | 23 | Cotton made in Africa | 38 | LIFE Certification |
| 9 | Fair Wear Foundation (FWF) | 24 | International Labour Standards | 39 | OECD Guidelines for Multinational Enterprises |
| 10 | Naturland | 25 | China Social Compliance for Textile and Apparel Industry CSC9000T | 40 | Sedex Members Ethical Trade Audit - SMETA |
| 11 | Better Cotton Initiative (BCI) | 26 | Ekolabel Indonesia | 41 | Social Accountability International - SA8000 |
| 12 | Step by Oeko Tex | 27 | TerraChoice | 42 | UN Global Compact |
| 13 | Workplace Conditions Assessment (WCA) | 28 | Hong Kong Green Label Scheme - HKGLS | 43 | Verified Carbon Standard - VCS |
| 14 | EU Ecolabel | 29 | Singapore Green Labelling Scheme (SGLS) | 44 | WFTO Guarantee System |
| 15 | Naturland | 30 | Workplace Conditions Assessment (WCA) | 45 | Alliance for Water Stewardship |

## Identify other industry organizations and consolidate industry voice possibly through creating a steering committee

### Ongoing discussions with:

- International Apparel Federation

### Examples of other organizations:

- **Industrial organizations**

(such as: National Council of Textile Organizations, EURATEX, American Sewing Guild, European Textile Services Association, etc.)

- **Trade and retail organizations**

(such as: National Retail Federation, American Footwear and Apparel Association, European Fashion Council, etc.)

- **Fiber organizations**

(Cotton USA, ICAC, Woolmark, etc.)

## There are multiple reasons why retailers would join the initiative..

### 1. Increase efficiency
Opportunity to reduce cost, time and effort

### 2. Consolidate know-how
Make available best practices from several platforms

### 3. Expand supplier base faster
Easier to bring new manufacturers on board

### 4. Visibility into the entire value chain
A unified code of conduct will facilitate auditing earlier stages of the process

### 5. Support a universal industry standard
Opportunity to communicate with consumers

## The initiative will bring a number of benefits to ITMF members..

### 1. Gain access to several organizations
Information / updates / influence decision making

### 2. Belong to a large-scale platform
Recognized by customers / NGO's / Governments

### 3. Participate in decision making
Influence future developments in the sector

### 4. Level playing field
Especially with regards to digital retailers

### 5. Save costs
Avoid multiple audits

## The initiative will position the ITMF as a platform for communication and playing a pivotal role in shaping the future of the textile industry..

### 1. Expand corporate membership
Show benefits to members

### 2. Potential source of additional funding
By partaking in audit fees

### 3. Expand ITMF role / influence
By taking an active role in the development of the industry

## A taskforce headed by a steering committee will be structured to manage the initiative:

### 1. Define strategic direction
Manage the developments of the initiative and take strategic decisions

### 2. Provide support
Provide contacts to buyers, organizations and other stakeholders

### 3. Act as ambassadors
Help recruiting support to the initiative

### 4. Represent the initiative in various forums
Act as industry representatives in various relevant forums

## Some factors can affect the success of the project.. However, market conditions are favourable and there are no risks to the ITMF..

### 1. Buyers do not join
They continue to use their own methodology

### 2. Inability to consolidate the industry
ITMF is not able to bring together various organizations or support from members

### 3. No active role in decision making
ITMF does not secure a voice (seat) in the targeted organizations

### 4. Too many initiatives
Inability to select winning initiatives

## The initiative is expected to take 3 years to reach full maturity..

### Year 1

- Partnership with existing initiatives
- Build consensus in the industry
- Approach select retailers

### Year 2

- Expand the initiative to other retailers and organizations
- Expand ITMF membership

### Year 3

- Expand initiative beyond social compliance

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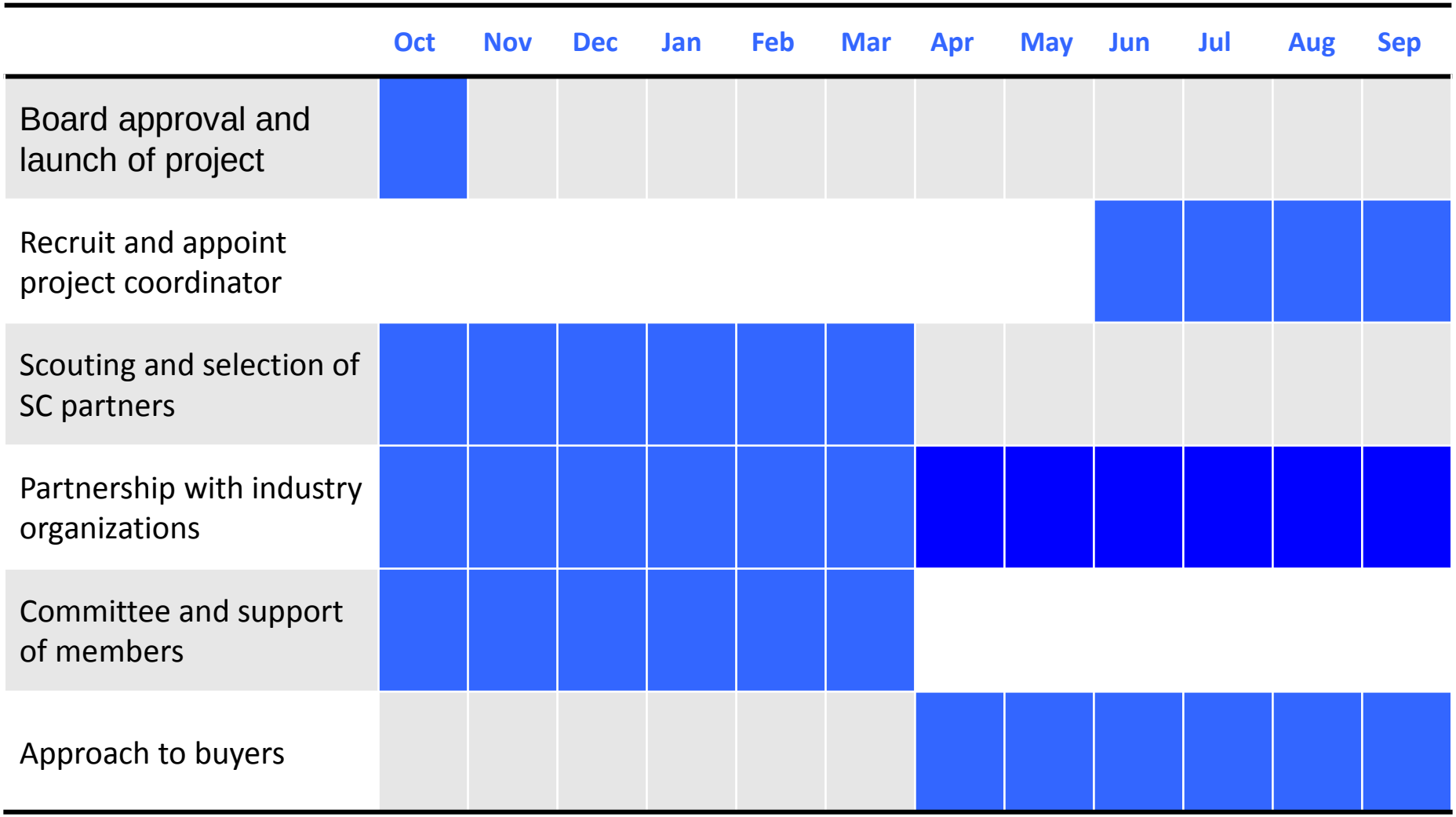
## The first year will mark the launch of the project setting the framework for following steps..



# Standard Audit Initiative

by


## Audit Fatigue: Challenges and Opportunities

**ITMF Annual Conference 2017**
Bali - Indonesia

Presented by

**Karim Shafei**

GHERZI

September 2017

# An Overview of China's Textile Industry: Innovation and Development

# 中国纺织工业的创新与发展

**Sun Ruizhe**

**China National Textile and Apparel Council**

**孙瑞哲**

**中国纺织工业联合会**

**2017-09-15**

# World Textiles & Clothing Trade
# 全球纺织品服装贸易格局

## Top 10 exporters of textiles 世界纺织品出口前10名的国家和地区

| 排名 | 2016 | | | 2015 | | |
|---|---|---|---|---|---|---|
| | Country/Region 国家/地区 | Exports（US$ bil）出口额（十亿美元） | Share in Global Total 世界占比 | Country/Region 国家/地区 | Exports（US$ bil）出口额（十亿美元） | share in Global Total 世界占比 |
| 1 | China 中国 | 106 | 37.20% | China 中国 | 109 | 37.4% |
| 2 | EU (28) 欧盟 | 65 | 23% | EU (28) 欧盟 | 64 | 22.1% |
| 3 | India 印度 | 16 | 5.7% | India 印度 | 17 | 5.9% |
| 4 | United States 美国 | 13 | 4.6% | United States 美国 | 14 | 4.8% |
| 5 | Turkey 土耳其 | 11 | 3.8% | Turkey 土耳其 | 11 | 3.8% |
| 6 | Korea, Rep韩国 | 10 | 3.5% | Korea, Rep韩国 | 11 | 3.7% |
| 7 | Pakistan 巴基斯坦 | 9 | 3.2% | Chinese Taipei 中国台湾 | 10 | 3.3% |
| 8 | Chinese Taipei 中国台湾 | 9 | 3.1% | Hong Kong, China 中国香港 | 9 | 3.0% |
| 9 | Hong Kong, China 中国香港 | 8 | 2.8% | Pakistan 巴基斯坦 | 8 | 2.9% |
| 10 | Viet Nam 越南 | 7 | 2.4% | Viet Nam 越南 | 6 | 2.1% |

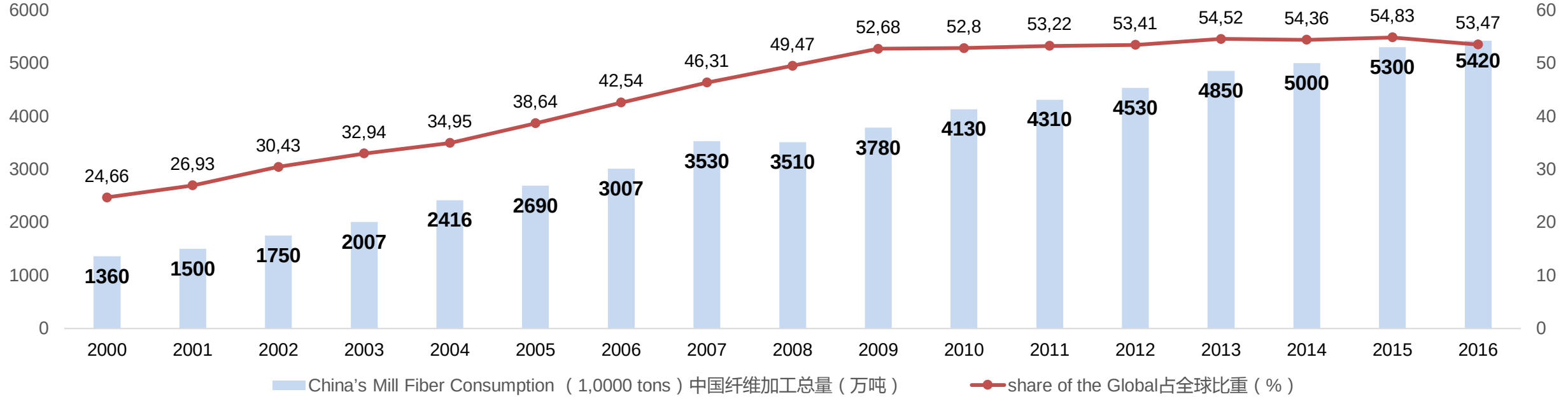
## Top 10 exporters of clothing 世界服装出口前10名的国家和地区

| 排名 | 2016 | | | 2015 | | |
|---|---|---|---|---|---|---|
| | Country/Region 国家/地区 | Exports（US$ bil）出口额（十亿美元） | Share in Global Total 世界占比 | Country/Region 国家/地区 | Exports（US$ bil）出口额（十亿美元） | Share in Global Total 世界占比 |
| 1 | China 中国 | 161 | 36.4% | China 中国 | 175 | 39.3% |
| 2 | EU (28) 欧盟 | 117 | 26.4% | EU (28) 欧盟 | 112 | 25.2% |
| 3 | Bangladesh 孟加拉 | 28 | 6.4% | Bangladesh 孟加拉 | 26 | 5.9% |
| 4 | Viet Nam 越南 | 25 | 5.5% | Viet Nam 越南 | 22 | 4.8% |
| 5 | India 印度 | 18 | 4.0% | Hong Kong, China 中国香港 | 18 | 4.1% |
| 6 | Hong Kong, China 中国香港 | 16 | 3.6% | India 印度 | 18 | 4.1% |
| 7 | Turkey 土耳其 | 15 | 3.4% | Turkey 土耳其 | 15 | 3.4% |
| 8 | Indonesia 印尼 | 7 | 1.7% | Indonesia 印尼 | 7 | 1.5% |
| 9 | Cambodia 柬埔寨 | 6 | 1.4% | Cambodia 柬埔寨 | 6 | 1.4% |
| 10 | United States 美国 | 6 | 1.3% | United States 美国 | 6 | 1.4% |

Sources：WTO　数据来源：WTO

# China’s Textile Industry in the World
# 中国纺织工业在全球的地位

**Mill fiber consumption of China’s textile industry and its share in world total, 2000--2016**
**2000-2016年中国纺织工业纤维加工总量及其全球占比**



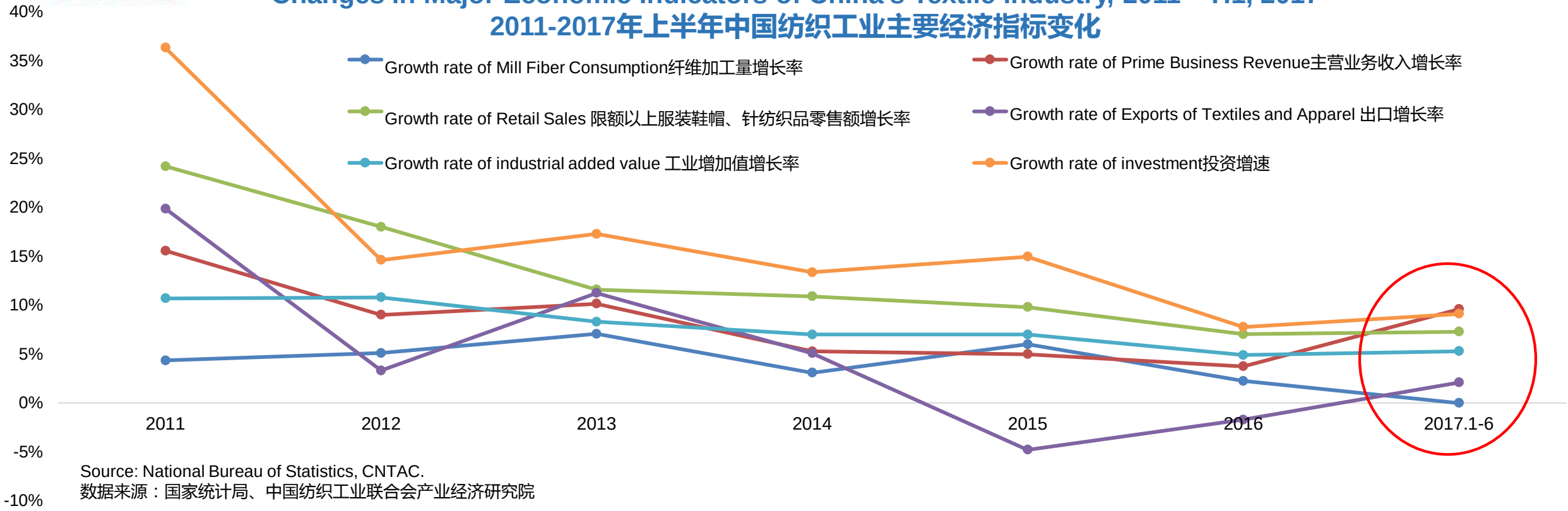

Source: “Fiber Year”, CNTAC
数据来源：纤维年报、中国纺织工业联合会产业经济研究院

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015年 | 2016 |
|---|---|---|---|---|---|---|---|
| **China’s exports of textiles and garment (US$ 100mil)**<br>**中国纺织品服装出口额（亿美元）** | **2120.01** | **2541.23** | 2625.63 | **2920.75** | 3069.58 | **2911.48** | **2701.2** |
| **Share in global total**<br>**占全球纺织品服装出口额比重** | 34.3% | 35.2% | 36.0% | 37.1% | 37.4% | 38.0% | —— |

Source: CNTAC, “Statistical Yearbook of Textile Industry
数据来源：中国纺织工业联合会产业经济研究院、纺织工业统计年报

# China's Textile Industry Sees Moderate but Steady Growth
# 中国纺织工业的现状：稳中向好

## Changes in Major Economic Indicators of China's Textile Industry, 2011 – H1, 2017
## 2011-2017年上半年中国纺织工业主要经济指标变化

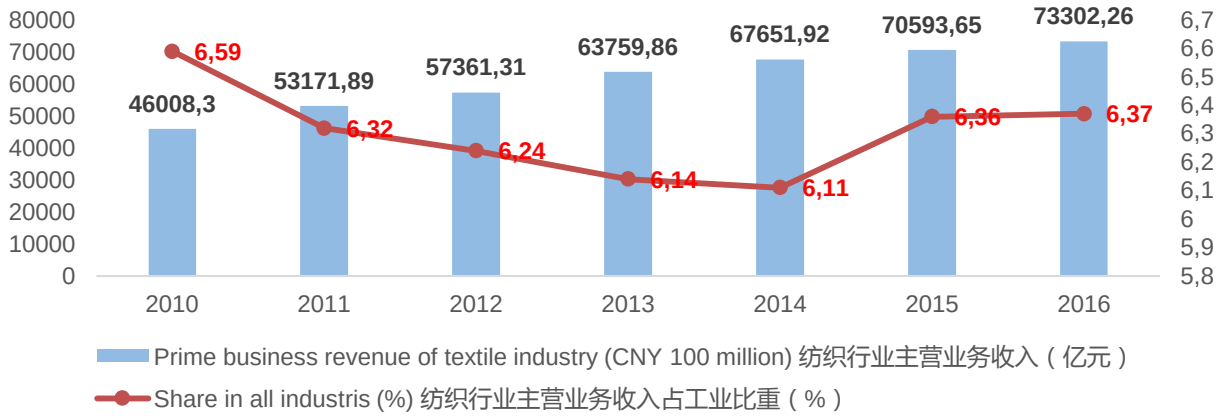



Source: National Bureau of Statistics, CNTAC.
数据来源：国家统计局、中国纺织工业联合会产业经济研究院

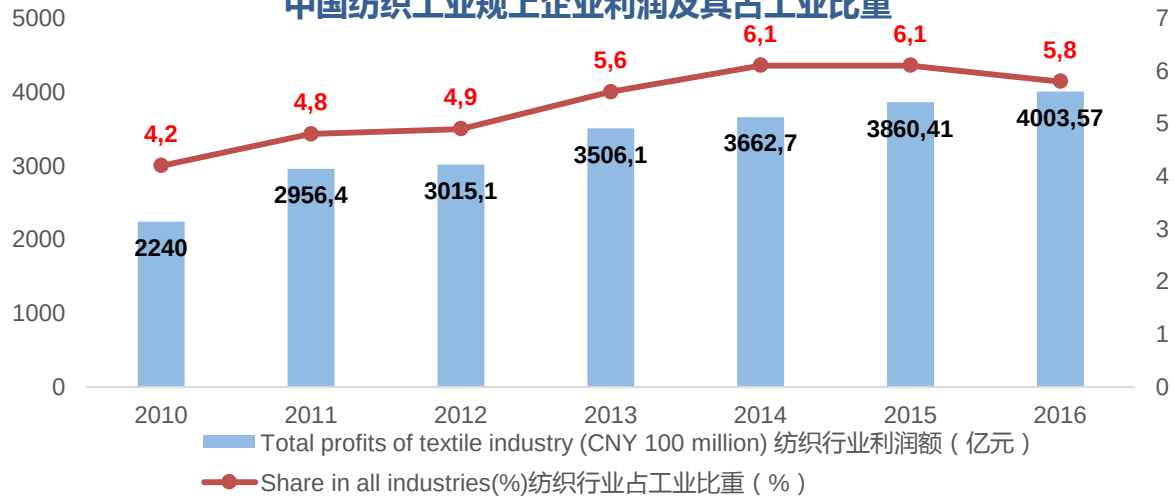
- **Moderate but steady growth:** In first half of 2017, industrial value added of major enterprises above designated size saw 5.3-percent year-on-year growth; in January-July, prime business revenue rose 9.1% year-on-year to near CNY 4.32 trillion; total profits increased by 11.93% to CNY 222.29 billion.
  **稳中向好：2017年1-6月行业规上企业工业增加值增长5.3%；1-7月，主营业务收入43193.8亿元，增长9.1%；利润总额2222.9亿元，增长11.93%。**
- **Warmer market: In the first six months of 2017, China's exports of textiles and apparel totaled US$ 124.05 billion, up 2.1% year-on-year; the retail sales of apparel, head & foot wear and knitwear by major retailers grew 7.3% year-on-year to CNY 717.17 billion.**
  **市场回暖：2017年1-6月中国累计出口纺织品服装1240.5亿美元，增长2.1%；全国限额以上服装鞋帽针纺织品零售额7171.7亿元，增长7.3%。**
- **Quality and performance ahead of other indicators:** In January-June of 2017, the sales margins of major textile enterprises stood at 5.1%.
  **质效领跑：2017年1-6月，规模以上纺织企业销售利润率为5.1%。**

# Textile Industry is One of the Main Contributors to National Economy
# 纺织工业是中国经济的重要力量

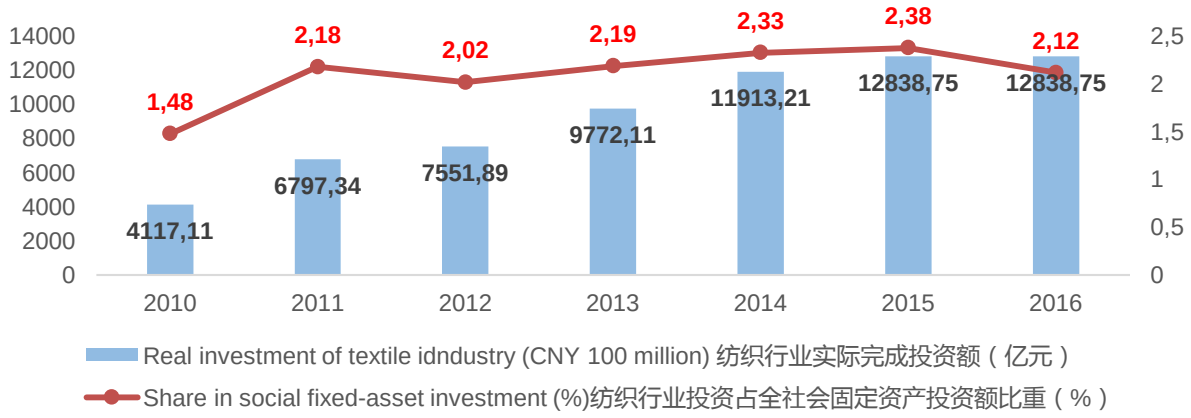
## Prime business revenue above the designated scale of China's textile industry and its share in all industries
## 中国纺织工业规上企业主营业务收入及其占工业比重



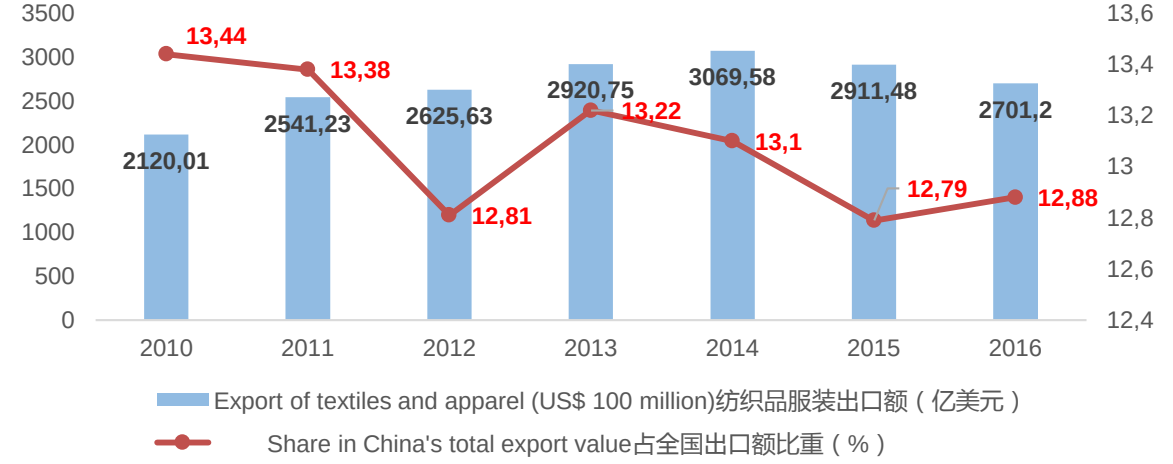

## Total profits above the designated scale of China's textile industry and its share in all industries
## 中国纺织工业规上企业利润及其占工业比重




## Investment above the designated scale of China's textile industry and its share in the whole Country
## 中国纺织工业规上企业投资额及其占社会投资额比重




## T&A Export and its share in China's total export
## 中国纺织品服装出口额及其占全国出口额比重




Source： National Bureau of Statistics, CNTAC, "Statistical Yearbook of Textile Industry.
数据来源：国家统计局、中国纺织工业联合会产业经济研究院、纺织工业统计年报

# Productive Force of China's Textile Industry Undergoing Full-scale Upgrading
# 中国纺织工业的生产力系统正经历全面升级

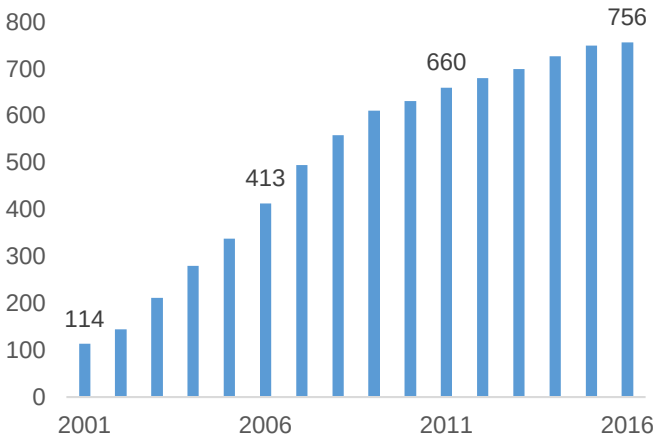
## Labor (Qualified) 劳动者(优质化)

As work-tasks of textile industry become more complicated, the labor competitive advantage is shifting from quantity-intensive to quality-intensive. The rising labor cost in China is accompanied with quality improvement.

**随着行业工作复杂程度提升，劳动力竞争优势正从数量向质量迁移。中国劳动力成本上升的背后是劳动力质量的提升。**

**Graduates of Chinese Colleges, 2001-2016 (10,000 person)**

**2001-2016中国普通高等学校毕业生数（万人）**




## Production tools (Intelligentized) 生产工具（智能化）

IoT technology，sensors，intelligent manufacturing technology
物联网技术、传感器、智能制造技术

in-store technology，AI，IoT technology and social media
店内定位技术，人工智能技术，物联网技术，社交媒体

### Design设计

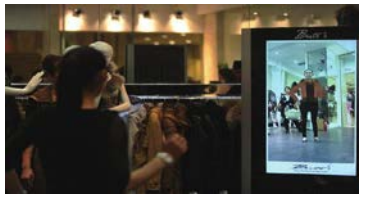
Digital design software，virtual sampling，predictive analytics and 3D printing
设计软件、虚拟采样、预测分析与3D打印

### Manufacturing制造

### Distribution 配送

Robots，autonomous vehicles，RFID，NFC
机器人技术、自动车辆、RFID技术、NFC技术

### Sales营销



## Object of labor (Diversified) 劳动对象（多元化）

**Scope:** The object of labor is extending from atoms to bits, and data has become important resources.
**范围**：劳动对象从原子延伸至比特，数据成为重要资源。

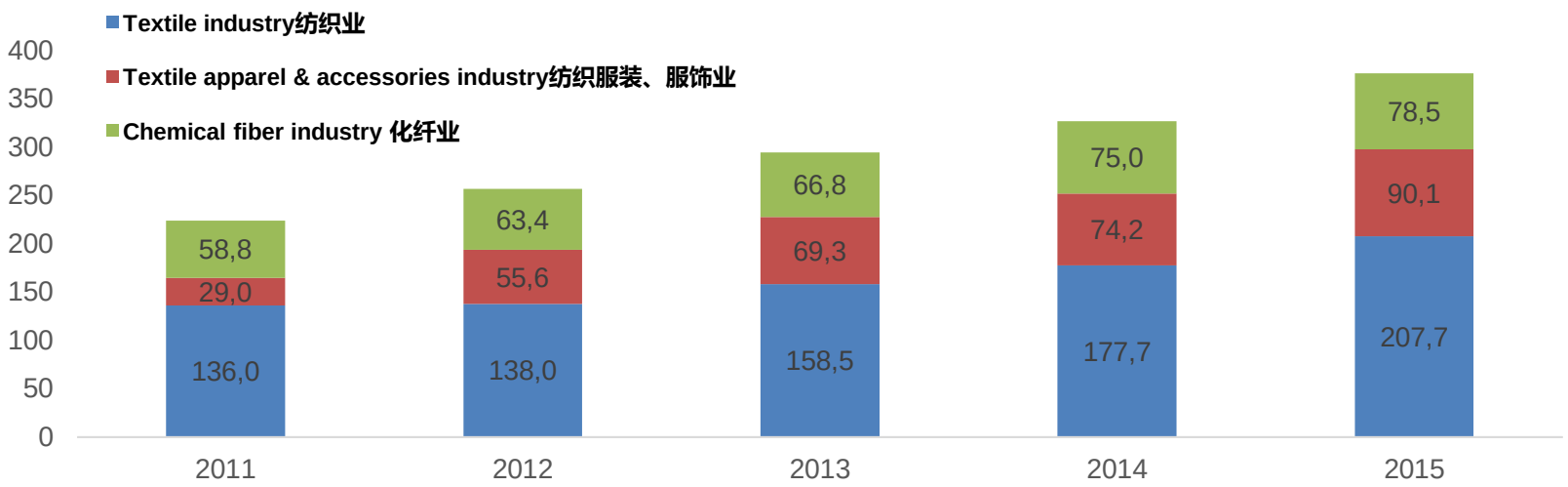
**Value:** The value content of materials is increasing thanks to continuous improvement in performance, function, price/performance ratio, availability, economy and environment-friendliness.
**价值**：材料价值含量不断提升，性能、功能、性价比、可获得性、经济性、环保性持续改善。

**Variety:** Chemical fibers cover high proportion of materials. Materials are being constantly diversified with bottlenecks at fibers and processes being broken one after another.
**品类**：化纤所占比重加大，材料不断突破原有纤维与工艺的束缚，品类持续丰富

# Innovation-driven Becomes Industry-wide Consensus
# 创新发展成为行业共识

- **Textile patent filing maintains fast growth. From 2008 to 2015, there were 142,237 patent filings, in which, annual filings of innovation patent increased from 5,786 to 16,004, at a compound annual growth rate of 11.48%.**
  **纺织专利申请保持快速成长。2008—2015年累计申请量达到142237件，发明专利历年申请量由5786件增至16004件，年均复合增长率18.48%。**
- **In 2015, major textile and apparel enterprises above designated size earned CNY 650 billion from selling new products and the investment in R&D obtained 21.4 times gain. In 2011-2015, major textile enterprises' investment in new product R&D grew 21% and their sales revenue of new products increased by 42%. The return on R&D input of textile industry is higher than the average of all industries.2015年，**
  **纺织服装规上企业新产品的销售收入近6500亿元，研发投入回报率为21.4倍。“十二五”期间，行业规上企业新产品开发投入增长２１％，新产品销售收入增长４２％。行业研发投入回报率高于工业平均水平。**

**Expenditure on R&D of Textile Enterprises above Designated Size(CNY 100 million)**
**纺织行业规上企业R&D经费内部支出（亿元）**




Source: China Statistical Yearbook on Science and Technology (2016) 来源：中国科技统计年鉴2016

- **All-personnel labor productivity** of 32s pure cotton yarn rose from 56,000tons/person-year in 2000 to 270,000tons/person-year in 2015.
  生产纯棉32支纱的劳动生产率2000年为5.6 吨/人年，2015年达到27 吨/人年。
- Labors per 10,000 cotton spindles reduced from 250 labors/10,000 spindles in 2000 to 60 labors/10,000 spindles in 2015.
  **棉纺万锭用工人数**2000年为250人/万锭，到2015年平均用人整体水平降到60人/万锭。
- **Share of cotton shuttle-less looms** increased from about 7.69% in 2000 to 68.64% in 2015.
  **棉纺无梭织机占比**2000年约为7.69%，2015年达到68.64%。
- **Share in total fiber consumption of technical textiles sector** increased from 12.78% in 2000 to **26.75% in 2016**.
  **产业用纺织品纤维加工量占比**从2000年的12.78%，上升到**2016年的26.75%**。

# Great Potential for Collaborative Innovation Thanks to the Complete Industrial System
# 依托规模化、体系化优势，行业协同创新潜力巨大

## China's Textile Industrial System (Prime Business Revenue in 2016) 中国纺织工业体系（2016年主营业务收入）

单位：10亿元（Unit：CNY billion）

| Raw material stage 原料环节 | Processing stage 加工环节 | End-use stage 终端环节 |
|---|---|---|
| Chemical fiber sector 化学纤维行业 (766.28) | Wool sector 棉纺行业（2256.27）<br>Wool sector 毛纺行业 (234.58)<br>Bast fiber sector 麻纺行业 (59.97)<br>Silk sector 丝绸行业 (127.39) | Apparel sector 服装行业（2360.51） |
| | Printing & dyeing sector 印染行业 (393.72) | Home-textiles sector 家用纺织品行业 (272.08) |
| Natural fiber sector 天然纤维行业 | Filament weaving sector 长丝织造行业 (130.15) | Technical textiles sector 产业用纺织品行业 (308.19) |
| | Knitting sector针织行业(754.52) | |

Textile machinery sector 纺织机械行业（115.85）

- Information service 信息服务
- Financial service 金融服务
- Testing & certification service 检测认证服务
- R&D system 研发体系
- Incubator system 孵化体系
- Industrial desige service 工业设计服务

数据来源：中国纺织机械协会
Source: China Textile Machinery Association

# The “Blue Ocean Strategy” for China’s Textile industry
# 新格局下中国纺织工业创新发展的“蓝海”

- **The inclusive development pattern: joint development, sharing achievements.**

  **—— To satisfy multi-level demand through diversified innovation**

  **普惠发展的格局：共同发展，共享成果**

  **——多层次需求带来多元化创新的“蓝海”**

- **The green development pattern : green hills and clear waters are invaluable assets.**

  **——To achieve sustainable development by sustainable innovation.**

  **绿色发展的格局：“绿水青山，金山银山”**

  **——可持续发展带来可持续创新的“蓝海”**

- **The open development pattern: quality imports & exports, mutual benefits and win-win result.**

  **—— To develop an open economy with collaborative innovation.**

  **开放发展的格局：优进优出，互利共赢**

  **——开放式经济带来协同化创新的“蓝海”**

# To Satisfy Multi-level Demand through Diversified Innovation
# 多层次需求带来多元化创新的“蓝海”

**The gap between different regions, between urban and rural areas, between different industries and between different generations has prompted consumption stratification and demand differentiation. To share the achievements of textile industry among a larger crowd of people, it is necessary to diversify innovation to satisfy different demands, play emphasis not only on cost and efficiency, but also on experience and service, so as to enhance the extensiveness and adaptability of innovation.**

**区域差距、城乡差距、产业差距、代际差距加深了消费分层、需求异化。要使更广泛的人群分享行业发展成果，需要进行多元化创新满足多层次需求，既要关注成本与效率，也要注重体验与服务，提升创新的广泛性与适用性。**

**More than 70 million poverty-stricken population in rural areas**
**7000多万农村贫困人口**

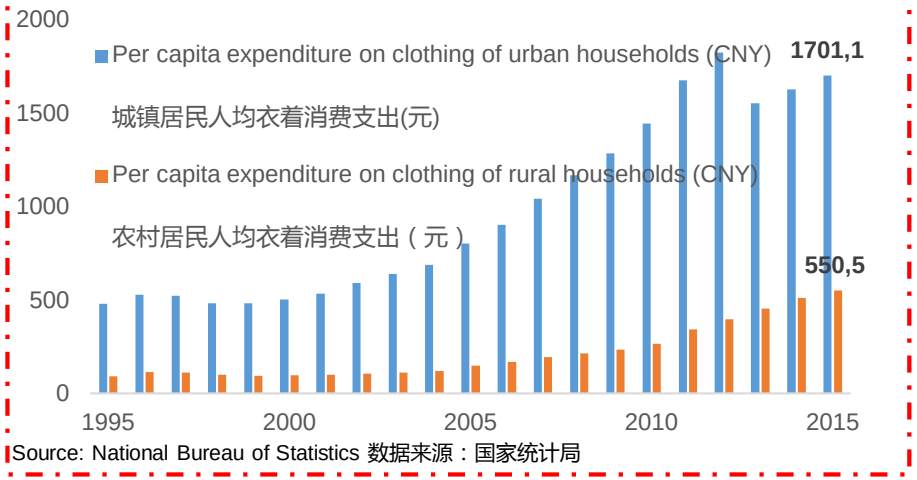
Subsistence consumption生存消费
Keeping warm and covering the body保暖遮羞

Living consumption 生活消费
Quality products at affordable price物美价廉

Quality consumption 品质消费
Excellent quality品质卓越

Experience consumption 体验消费
Diversified experiences 体验丰富

**Progress in urbanization 新型城镇化推进**



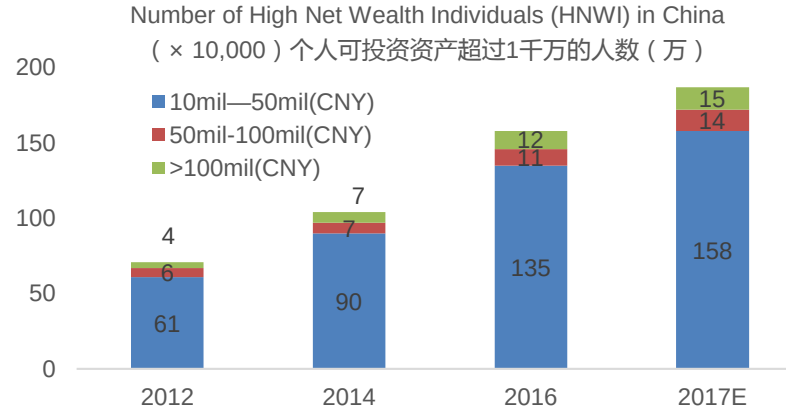

Source: National Bureau of Statistics 数据来源：国家统计局

**Growth of resident income 居民收入增长**

| Unit (CNY) 单位（元） | 2014 | 2015 | 2016 |
|---|---|---|---|
| Per capita dispensable income of residents 全国居民人均可支配收入 | 20167.1 | 21966.2 | 23821.0 |
| Per capita expenditure on clothing of residents 全国居民人均衣着消费支出 | 1099.3 | 1164.1 | 1203.0 |

Source: National Bureau of Statistics. 数据来源：国家统计局

**Growth of resident income 居民收入增长**




Source: “2017 China Private Wealth Report” jointly published by China Merchants Bank and Bain & Company数据来源：《2017中国私人财富报告》招商银行、贝恩公司

# To Achieve Sustainable Development by Sustainable Innovation
# 可持续发展带来可持续创新的“蓝海”

**China is a staunch advocate and facilitator of global inclusive development and climate governance. The construction of ecological civilization has become a national strategy. The textile industry has huge potential for developing sustainable innovation.**

**中国是全球包容性发展与气候治理的坚定维护者和推动者。**生态文明建设上升为国家战略。纺织行业可持续创新具有巨大发展空间。

**The technological system for realizing low-carbon, green and circular development**
**实现低碳发展、绿色发展、循环发展的技术系统**


**The economic system for keeping a balance between internal economy and external economy, between short-term gains and long-term value**
**平衡内部经济与外部经济、短期收益与长远价值的经济系统**

## Potential for recycling of resources
## 资源循环的空间

- According to “The Fiber Year 2017”, people dispose of some 140 billion pieces of clothing every year.
  《2017纤维年报》显示，人们每年抛弃1400亿件衣物。
- Materials that are easy to process, recycle and dispose; re-generable, reusable and degradable products; waste textiles recycling and reutilization system; waste textiles recycling and high-value utilization technologies.
  易加工、易回收、易处理的材料；可再生、可重用、可降解的产品；废旧纺织品回收再利用体系

## Potential for upgrading of production capacity
## 产能升级的空间

- Under policy pressure, while eliminating outdated production capacity, it is necessary for textile industry to optimize capacity structure via introducing advanced adaptable technology and equipment
  淘汰落后产能，优化产能结构。
- From raw materials to finished products, from R&D to marketing, green development penetrates into each stage of product lifecycle and industry chain.
  绿色发展涉及产品全生命周期和产业链各个环节

## Potential for market premium
## 市场溢价的空间

Related study shows that more than 70% of Chinese consumers have certain awareness of sustainable consumption, and about 50% are willing to pay no more than 10% premium for sustainable products.
有研究显示，中国超过七成的消费者已具备一定程度的可持续消费意识。约一半消费者愿意为可持续产品支付不超过 10%的溢价。

## Potential for sharing economy
## 共享经济的空间

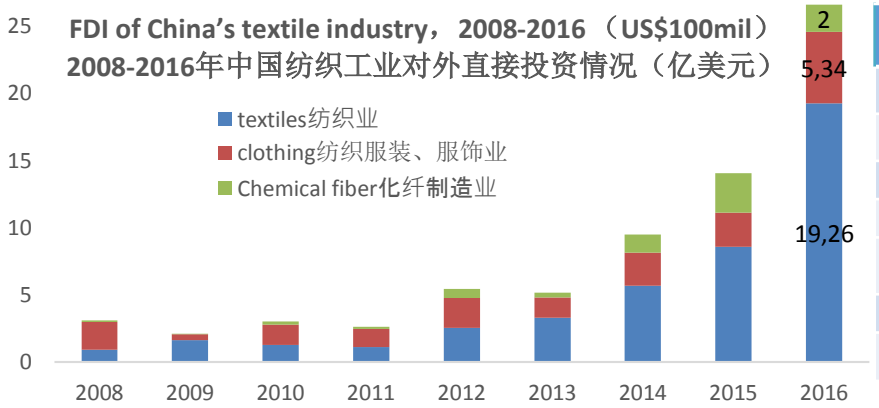
Capacity sharing：Tao factories (factories registered on tgc.1688.com) can sell their idle time for processing tailor-made products. By June 2017, the platform has gathered together about 15,000 factories.
产能共享：淘工厂截至2017年6月已汇集了15000家左右的纺织工厂
Product sharing：《2017 Fashion Resale Market and Trend Report》 shows that apparel resale has become a US$18 billion industry. The market size is expected to reach US$33 bil. in 2021.
服装转售已成为180亿美元的产业。到2021年市场规模有望达到330亿美元。

# To Develop an Open Economy with Collaborative Innovation
# 开放式经济带来协同化创新的“蓝海”

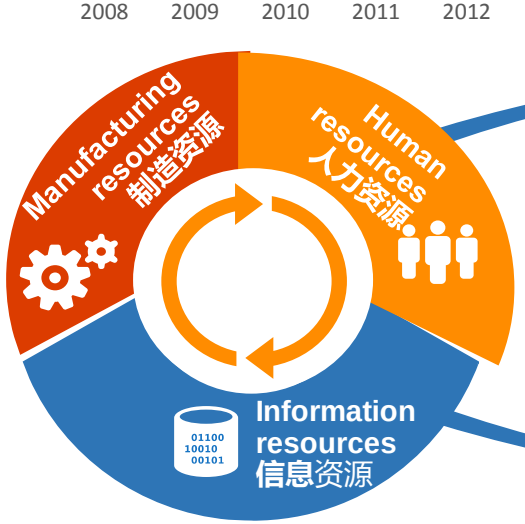
The further implementation of the “Belt & Road” Initiative, the formation of a flying-geese model of “1+3+7” free-trade zones, and the signing of more bilateral FTAs will open wider space for the development of China’s textile industry, and promote the complementation of resource endowments and synergy of innovation capabilities.

“一带一路”倡议的推进、“1+3+7”自贸区雁阵的形成、双边多边自由贸易协定的签署，将拓展中国纺织工业的发展空间，促进资源禀赋的互补与创新能力的协同。

**In 2016, the foreign direct investment (FDI) of China’s textile industry hit a record high. It rose 89.3% year-on-year to US$ 2.66 billion. Since 2008, it has been growing at an annual average of 30.88%. 2016年中国纺织工业对外直接投资创历史新高，同比增长89.3%，达26.6亿美元。2008年以来，年均增速达30.88%。**




| M&As of China’s Textile and Apparel Industry on Global Brands in 2016　2016年中国纺织服装行业国际品牌并购概况 | |
|---|---|
| Shandong Ruyi Group山东如意集团 | Acquisition: French fashion group SMCP 收购：法国时装集团SMCP |
| Trands Group 大杨创世集团 | Investment: INDOCHINO (a Canadian brand for custom men’s suits) 投资：INDOCHINO（加拿大男装定制创业公司） |
| Belle 百丽公司 | Investment: Replay (Italian Jeans brand) 投资：Replay（意大利牛仔品牌） |
| Shenzhen Ellassay 深圳歌力思 | Acquisition: Tangli International 收购：唐利国际 |
| Baoxiniao Group 报喜鸟集团 | Investment: Elite – the No. 1 school uniform brand of the ROK 投资：韩国第一校服品牌：elite |
| Shanghaitex Group 上海纺织集团 | Acquisition: Luen Thai Holdings 收购：联泰控股 |
| Shanghai VGRASS 上海维格娜丝 | Acquisition: Teenie Weenie brand and associated properties and businesses收购：Teenie Weenie品牌及该品牌相关的资产和业务 |




**Globalization 全球化**

**Informatization 信息化**

**Marketization 市场化**

**Global production and innovation system**
**全球化生产与创新体系**
**Multi-national companies 跨国公司**

**Regional production and innovation system**
**区域化生产与创新体系**
**Industrial clusters 产业集群**

**Supply chain production and innovation system**
**供应链生产与创新体系**
**Branded enterprises 品牌企业**

**Internet-based production and innovation system**
**网络化生产与创新体系**
**Online platforms 网络平台**

# What Kind of World Does Textile Industry Settle in?
# 纺织工业正处于一个怎样的世界？

- **Virtual & Reality: The world is composed of not only atoms but also bits & bytes**

  **虚与实：世界是原子的也是比特的**

  **The relationship between intelligent manufacturing and labor**

  **智能与人工的关系**

- **Flat & zigzag: The world is both flat and zigzag**

  **平与折：世界是平坦的也是波折的**

  **The judgement for competition and cooperation**

  **竞争与合作的关系**

- **Similarity & disparity: The world has both common places and differences**

  **同与异：世界是趋同的也是多元的**

  **The coordination among standard and personalization**

  **标准与个性的关系**

# Establish “New Position” of China’s Textile Industry
# 树立中国纺织工业的“新定位”

## Cognition restart 认知重启：

An innovation-driven sci-tech industry
创新驱动的科技产业

A responsible green industry
责任导向的绿色产业


A culture-inspired fashion industry
文化引领的时尚产业

## Value reconstruction价值重构：

**New materials 新材料**
- Fiber development 纤维开发
- Material application 材料应用

**New tools 新工具**
- Intelligent manufacturing 智能制造
- Social responsibility 社会责任

**New connotations 新内涵**
- Cultural confidence 文化自信
- Cultural empowerment 文化赋能

# New Materials: Fiber Development + Material Application
# 新材料：纤维开发 + 材料应用

**Developing material technology towards high-performance, differential, scale production, low-cost and eco-friendly**
**以高性能、差别化、规模化、低成本、绿色化为方向，发展材料技术**

- Multi-component copolymerization technology 多元共聚技术
- Poly-blending and modification technology 共混改性技术
- Fiber forming technology 纤维成型技术
- Surface engineering technology 表面构筑技术
- Nano-technology 纳米技术
- Intelligent technology 智能技术

## Fiber technology 纤维技术

### Nano-fibers纳米纤维：

- carbon nanotube reinforced fiber 碳纳米材料增强纤维
- industrial production of flexible ceramic nanofibers 柔性陶瓷纳米纤维产业化技术；

### High-performance fibers高性能纤维：

- high-modulus carbon fiber; 高模量碳纤维技术
- high-output, low-cost production of polyimide fiber；高强度、低成本聚酰亚胺纤维制备

### Natural and regenerated fibers天然与循环再生纤维：

- molecule design and directional transformation of silk fiber 蚕丝纤维的分子设计与定向改造；
- technologies for processing recycled and regenerated fibers 循环再生纤维技术

### Bio-based fibers生物基纤维：

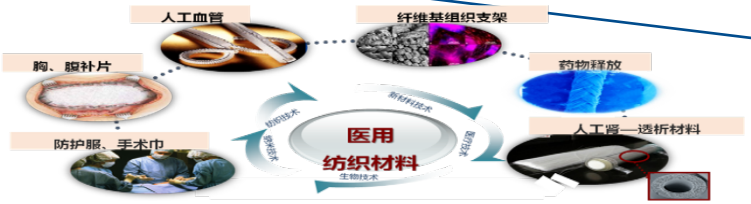
- high-efficient synthesis and preparation of bio-based raw materials生物基原料高效合成制备技术；
- industrial-scale production of marine bio-based fibers 海洋生物基纤维产业化技术

**Ever-enlarging application fields不断丰富材料的应用领域**

**“New clothing”**
**“新服装”**

**“Integrated home furnishing”**
**“大家居”**

**Technical textiles**
**产业用**



# New Tools: Intelligent Manufacturing + Social Responsibility
# 新工具：智能制造 + 社会责任

## Production tool: intelligent manufacturing 生产工具：智能制造

(Mobile) Internet, big data, cloud computing, Internet of Things（移动）互联网、大数据、云计算、物联网

**Intelligent Products** 智能化产品

**Intelligent Operation** 智能化运营

**Intelligent Equipment** 智能化设备

**Intelligent Products 智能产品**
service provider提供服务 demands capturer捕获需求 platform Linker 链接平台

| Design设计 | R&D研发 | Sourcing采购 | Production生产 | Marketing营销 |
|---|---|---|---|---|

Supply Chain Management（SCM）供应链管理

Customer Relationship Managment（CRM）客户关系管理

Product Lifecycle Management（PLM）产品生命周期管理

Enterprise Resource Planning（ERP）企业资源管理

Flexible Manufacture System（FMS）柔性制造系统

Manufacturing Execution System（MES）制造执行系统

Advanced Planning and Scheduling（APS）自动排期系统

**Intelligent equipment智能装备:**
Fiber production equipment, textile-purpose basic parts production equipment, intelligent spinning and weaving machinery' digital and intelligent printing & dyeing machinery
纤维材料装备、纺织专用基础件生产设备、智能化纺纱和织造设备、数字化、智能化印染设备

**Intelligent production line智能生产线:**
Intelligent filament production line, intelligent spinning line, intelligent printing & dyeing line, intelligent nonwoven fabric production line; intelligent knitting line, intelligent apparel and home-textiles production lines
智能化长丝生产线、智能化纺纱生产线、智能化印染生产线、智能化非织造布生产线、智能化针织生产线、智能化服装家纺生产线；

## Management tool: social responsibility 管理工具：社会责任

**Responsible for market 市场责任**

**Responsible for environment 环境责任**

**Responsible for people 人本责任**

Management System 管理体系

Disclosure Mechanism 披露机制

- **Responsibility transparency 责任透明化**
- **Responsibility capitalization 责任资产化**

# New Connotations: Cultural Confidence + Cultural Empowerment
# 新内涵：文化自信+文化赋能

Build the industry's cultural confidence, increase added value of products and have a say in fashion
树立产业文化自信，提升**产品附加值与时尚话语权**


- **Promote profound integration of textile technique and cultural creativity, make greater efforts to developing new products, diversify product variety and constantly increase the cultural value, aesthetic value and market value of products.**
  **促进纺织工艺与文化创意的深度融合**
- **Based on lifestyle, forecast fashion trends from color, fiber, fabric to end products and strengthen fashion promotion and brand cultivation.**
  **研究发布流行趋势**
- **Explore and investigate cultural elements in textile and apparel field, and inherit and protect textile-related intangible cultural heritage during application.**
  **在应用中实现纺织类非物质文化遗产的传承与保护**

# *Thanks!*

谢　谢！

SANDLER, TRAVIS & ROSENBERG, P.A.
Customs & International Trade Law

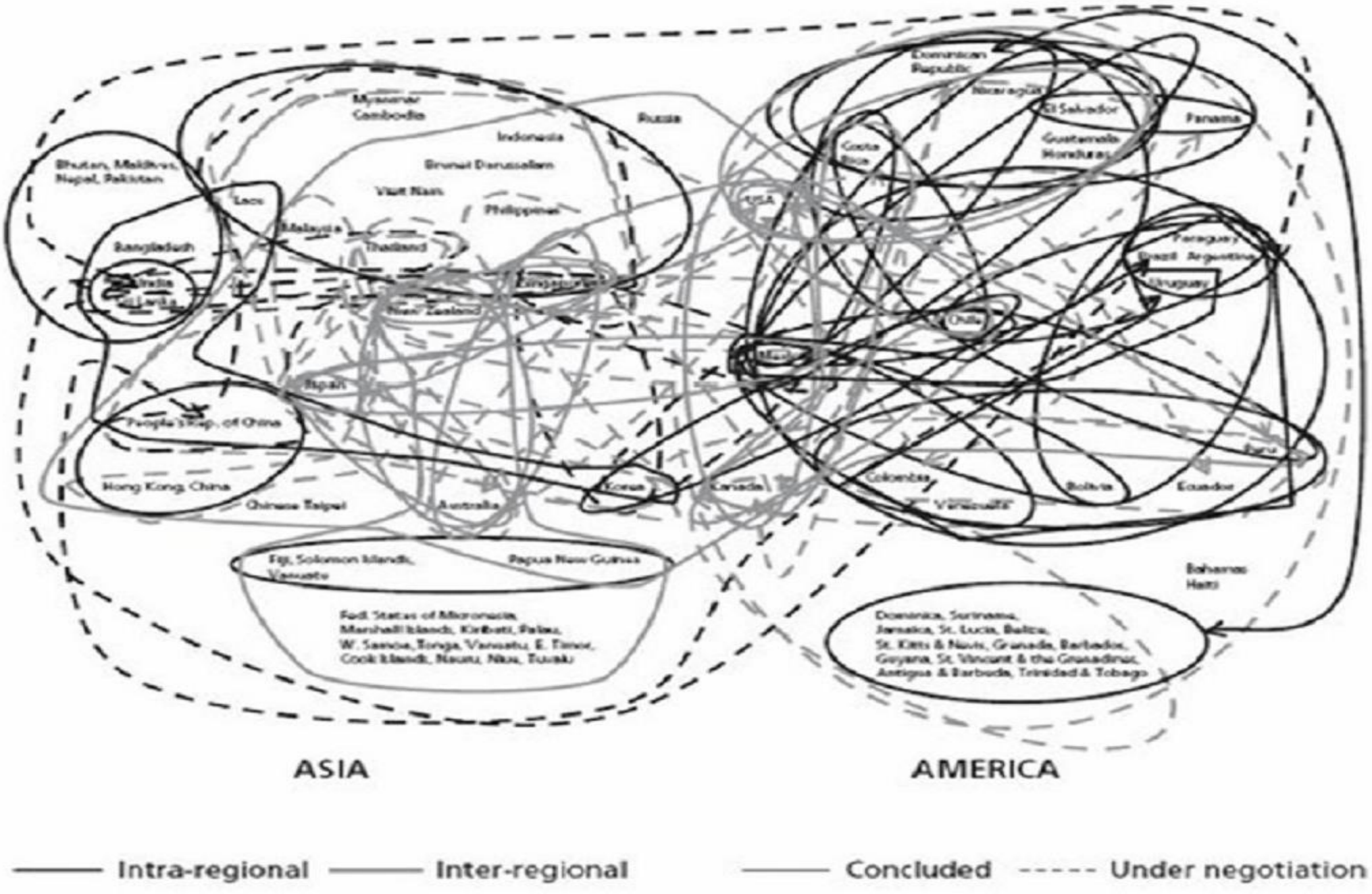
Sandler & Travis
Global Trade Compliance Management

# Textile & Trade Policy in the Trump Era: It's Impact on the Global Textile Markets

September 15, 2017

ITMF
INTERNATIONAL TEXTILE MANUFACTURERS FEDERATION

Annual Meeting



# November 8, 2017

# Greater Domestic Protection and Trade Renegotiation

- Renegotiate NAFTA
- Withdraw from TPP
- Label China as currency manipulator
  - impose tariffs
- Build a wall on Southern Border
  - impose tariffs
- Rip up FTAs
- Withdraw from WTO
- Impose a hiring freeze on Federal Agencies
- Rescind Executive Orders
- Negotiate mostly on a bilateral basis

**Donald J. Trump**

@realDonaldTrump

Follow

The United States made some of the worst Trade Deals in world history.Why should we continue these deals with countries that do not help us?

7:14 AM - 5 Jul 2017

# Trump: Renegotiate/Withdraw NAFTA/KORUS/WTO

- All FTAs have an exit clause  which generally requires a six month prior notification, and notification to Congress
- President cannot raise tariffs above MFN rates under FTA withdrawal, but could do so under other laws
- Additional duties may be imposed following consultations (not acquiescence) with Congress

# ADMINISTRATION'S TEXTILE AND APPAREL SPECIFIC NAFTA OBJECTIVES

- General objective is same as 2015 Trade Promotion Authority Act: "Maintain *existing duty free access to* NAFTA country markets for U.S. textile and apparel products and seek to improve competitive opportunities for exports of U.S. textile and apparel exports **while addressing U.S. import sensitivities**."

# ADMINISTRATION'S RULES OF ORIGIN NAFTA OBJECTIVES

- Update and strengthen the rules of origin, as necessary, to ensure that the benefits of NAFTA go to products genuinely made in the United States and North America
- Ensure the rules of origin incentivize the sourcing of goods and materials from the United States and North America
- Establish origin procedures that streamline the certification and verification of rules of origin and that promote strong enforcement, **including with respect to textiles**
- Promote cooperation with NAFTA countries to ensure that goods that meet the rules of origin receive NAFTA benefits, prevent duty evasion, and combat customs offenses

# Trump: Trade Negotiations - NAFTA

- Two Rounds of Negotiations held (Washington DC, Mexico City)
- Next Round Ottawa September 23-27

# Trump: Trade Negotiations - KORUS

- Meeting of Joint Committee on August 22
- USTR Lighthizer joined by video conference; Chief of Staff :& AUSTR for Japan and Korea were in person
- Reports not positive on reaction to US remarks and process
- Not clear on process nor timing of talks
- Threats to withdraw from KORUS

# President May Impose New Tariffs Under -

- **Trading with the Enemy Act of 1917, Sec 5(b)(1)(B)**
  - "Time of War"
  - Virtually all trade powers vested to President
- **Tariff Act of 1930, Sec 338**
  - "Country discriminates against US Commerce"
  - Additional duties up to 50% of the product's value
- **Trade Expansion Act of 1962, Sec 232(b)**
  - "Adverse impact on national security"
  - Tariffs or Quotas as needed

# President May Impose New Tariffs Under -

- **Trade Act of 1974, Sec 122**
  - "Balance of payments deficit"
  - Increase tariffs to 15%, or quantitative restrictions, or both, for 150 days
- **Trade Act of 1974, Sec 301**
  - "Foreign country carries out discriminatory practices against US"
  - Potential Tariff and Quotas
- **International Emergency Economic Powers Act of 1977**
  - "National emergency"
  - Virtually all trade powers vested to President

# Action Under Section 232

## Requesting Section 232 Report on Steel Imports into the US

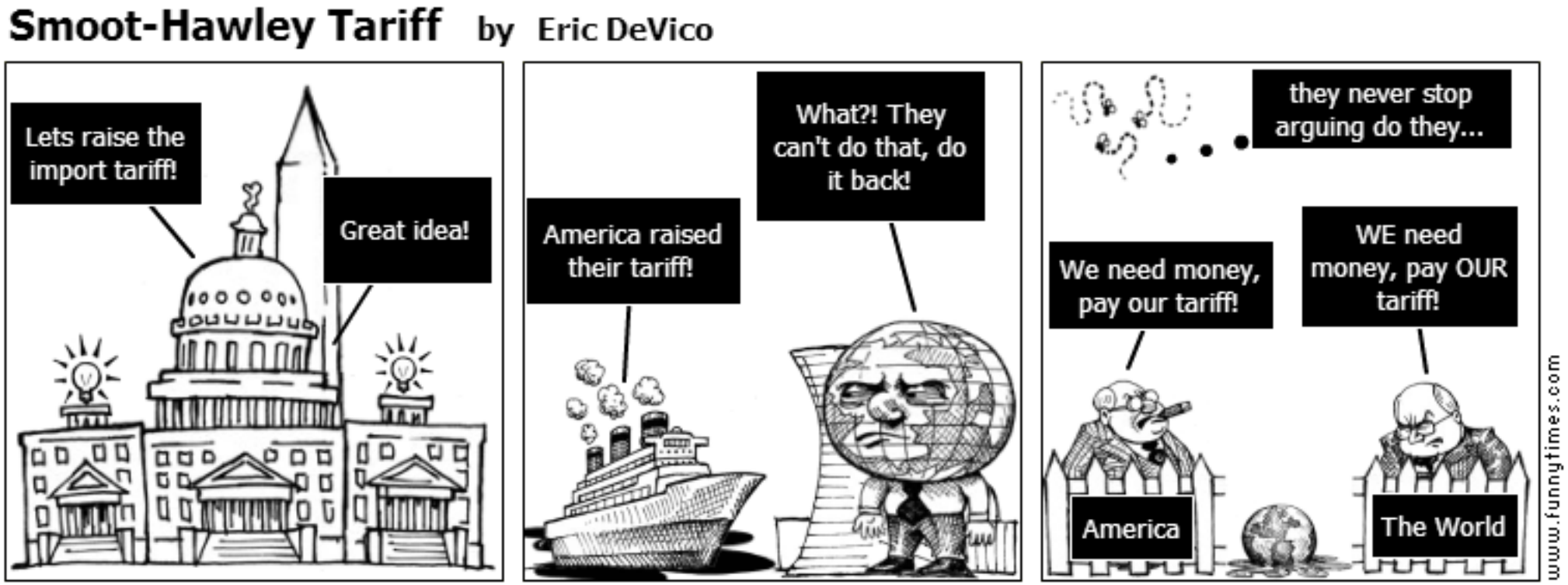
- No action taken contrary to reports recommendations were made
- Possible sign industry not confident action will be taken given filing of AD/CVD cases on stainless steel flanges from China and India and on steel pipe from Germany in August

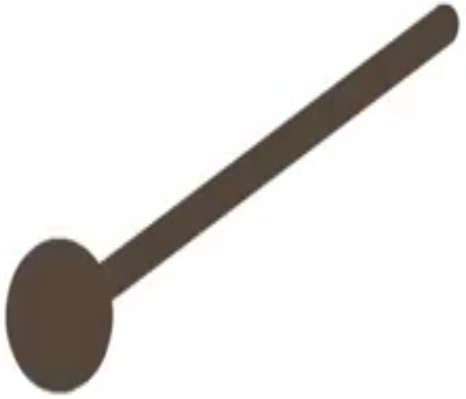
## Requesting Section 232 Report on Aluminum Imports into the US

- Still delayed no report yet

# Action Under Section 301

- August 14, 2017 President Memo to USTR to Determine whether China is being unreasonable or discriminatory and has taking or taking actions that may be harming American intellectual property rights, innovation, or technology development.
- August 18, 2017 Investigation Initiated by USTR/Notified China
- September 28, 2017 – Written comments & request to appear at hearing
- October 10, 2017 – Public hearing
- October 20, 2017 – Post hearing briefs due
- August 17, 2018 – Decision due (could take longer)





Globalism

Protectionism

# Questions?


## Nicole Bivens Collinson

**President,**
**International Trade & Government Relations**
**Sandler, Travis & Rosenberg, P.A.**

**Phone: 202.730.4956**
**Email: NBC@strtrade.com**

McKinsey&Company

# The apparel sourcing caravan's next stop: Digitization

**Benjamin Durand-Servoingt**

ITMF Conference Presentation | September 2017

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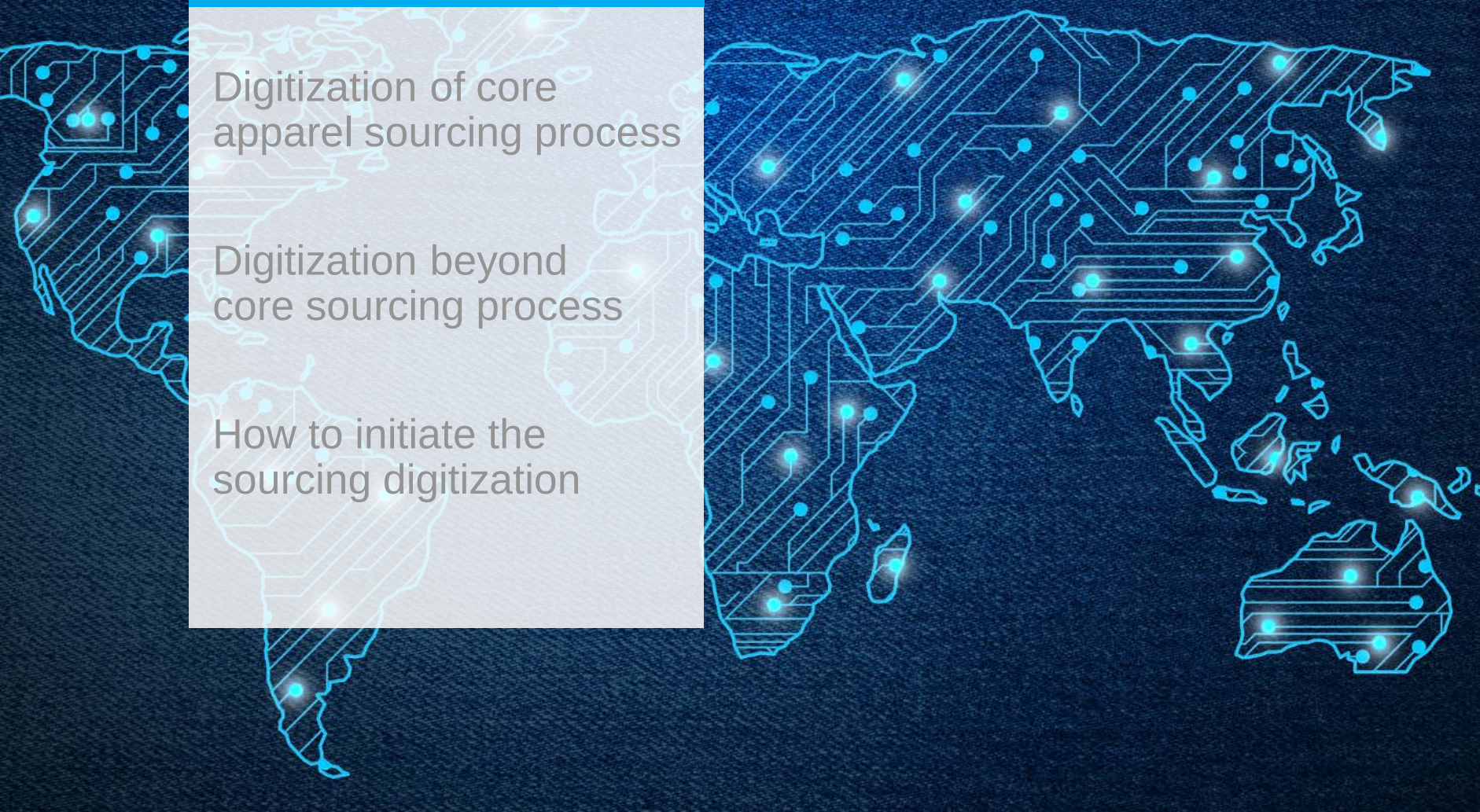
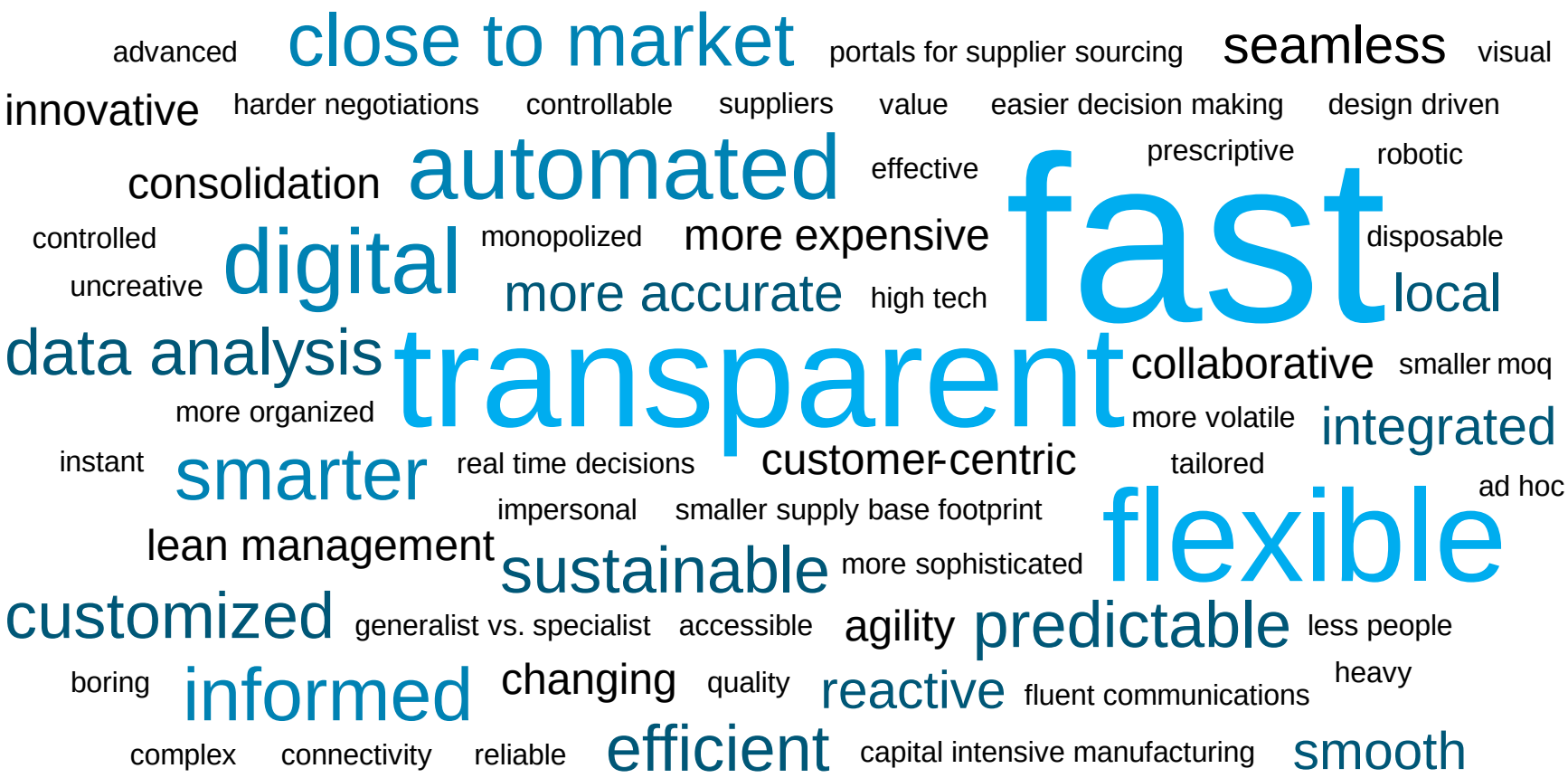


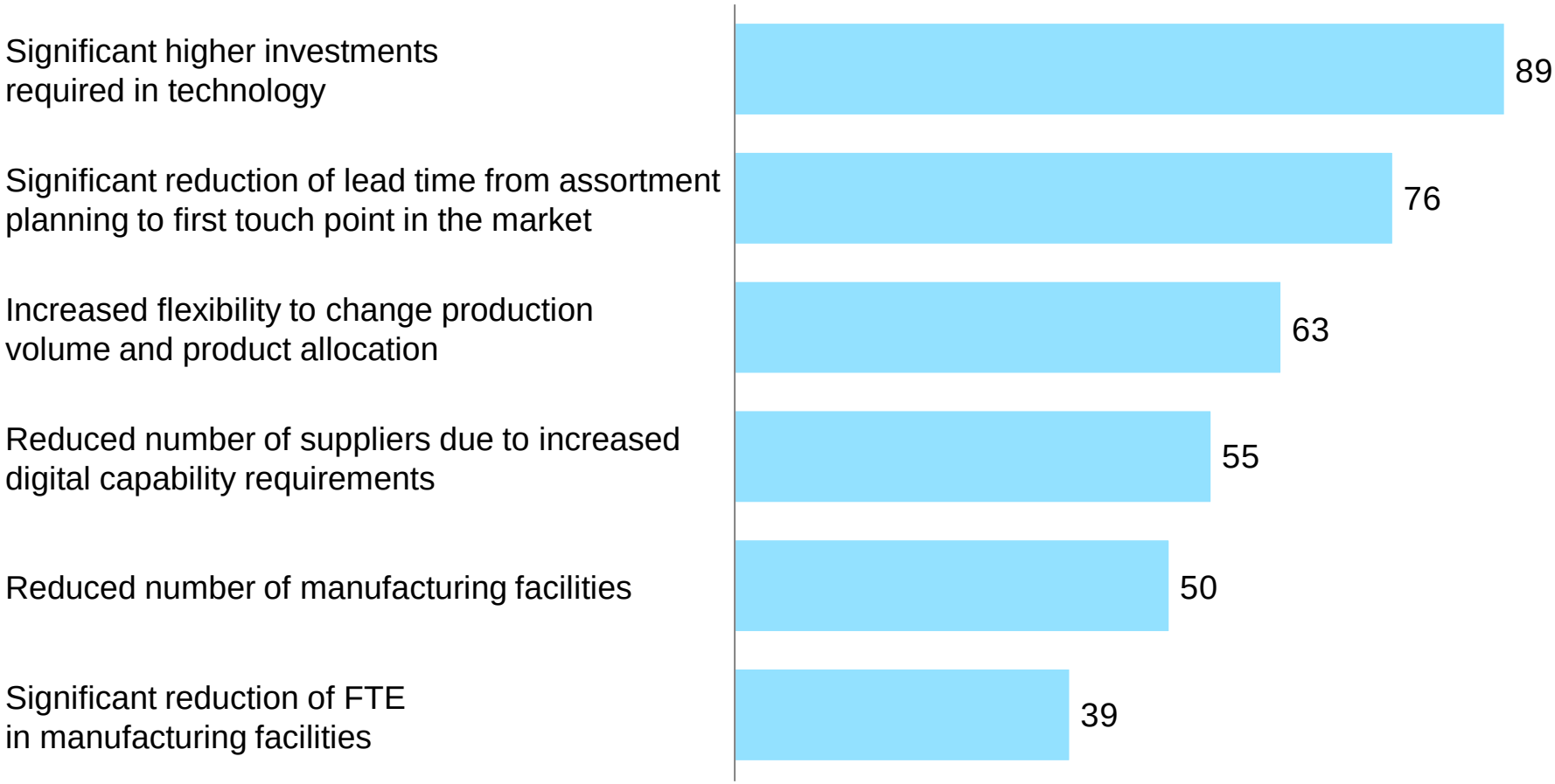
# Looking to the future, the top-of-mind issues for sourcing executives are speed, transparency, and flexibility

"Which adjectives describe, how daily life in apparel sourcing in the year 2030 will be compared to today?"
Percentage of respondents, n = 63



# According to sourcing executives, speed and flexibility will be driven by digitization and automation

"What will be the impact of digitization on the structural elements of the apparel sourcing industry by 2030?"
Percentage of respondents, n = 63

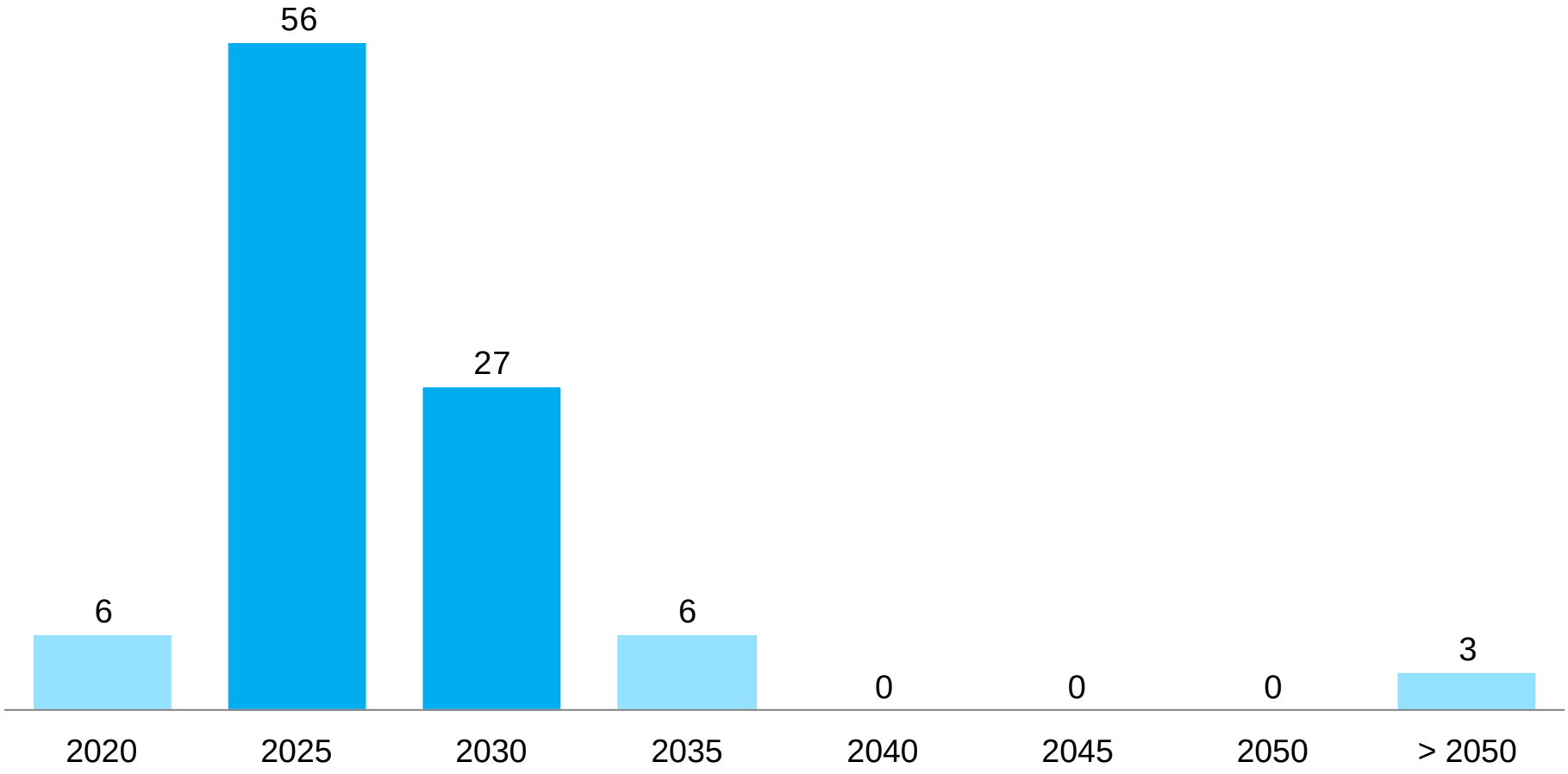



SOURCE: McKinsey Apparel CPO Survey 2017

# As a result he majority of respondents believe that sourcing decisions changes from cost considerations to automation within the next 10 years

"By when will automation in manufacturing reach a significant enough level and becomes the major driver for sourcing decisions instead of labor cost?"

Percent of respondents, n = 63




SOURCE: McKinsey Apparel CPO Survey 2017

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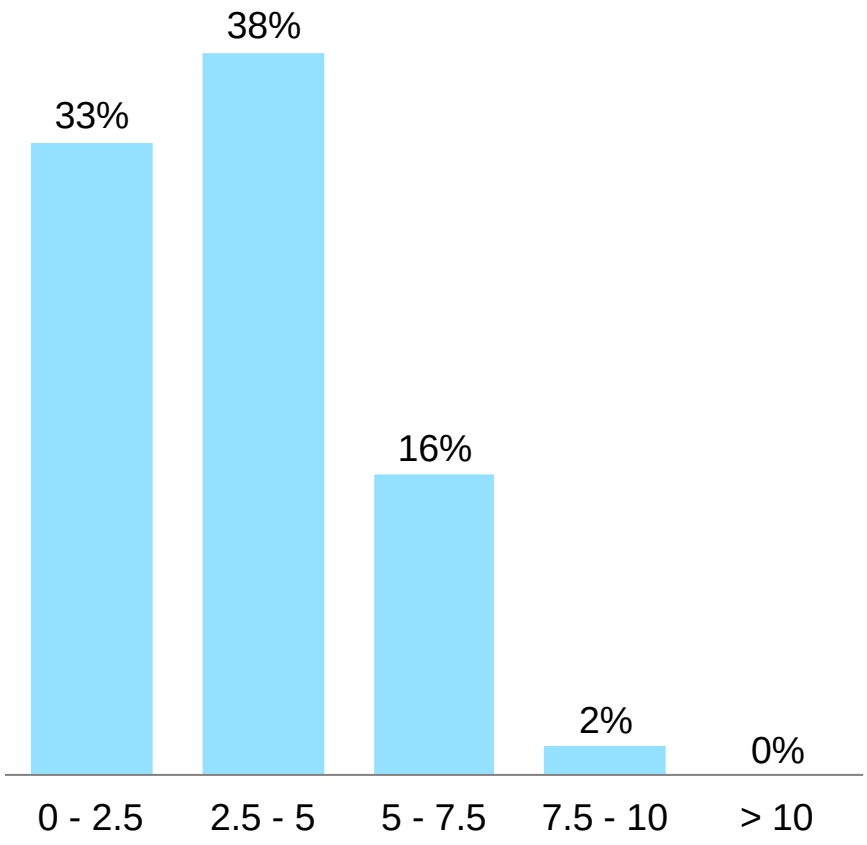
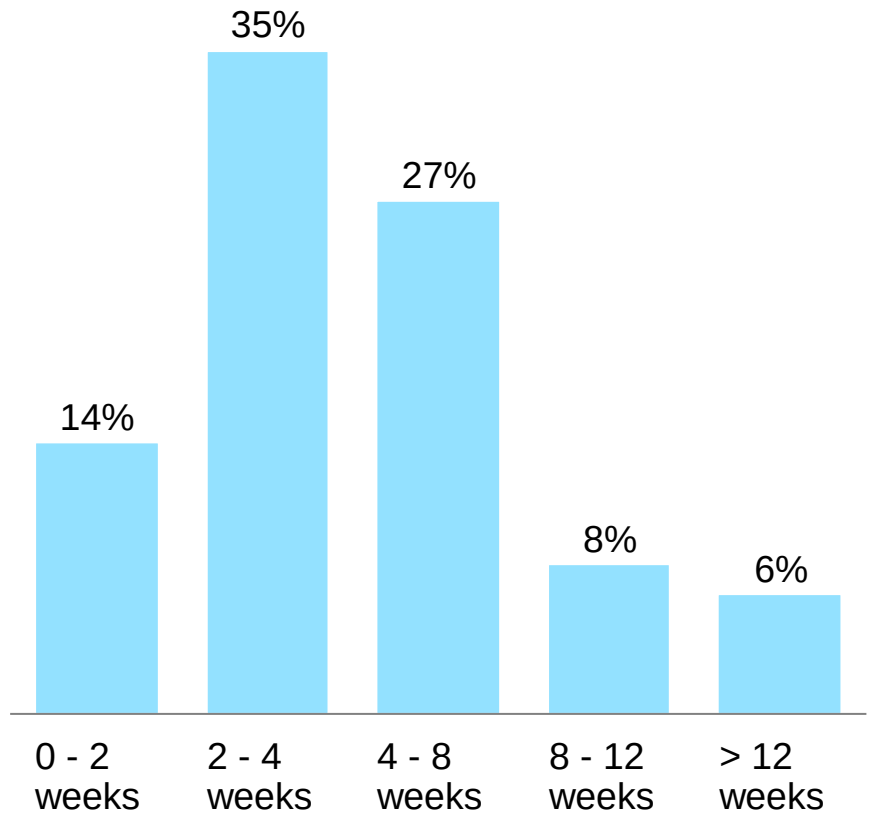
# Executives are targeting to reduce FOB price up to 5% and lead-time by 2-8 weeks through digitized apparel sourcing

"What is the aspired impact of your digitization of sourcing investments regarding …"
Percent of respondents, n = 63

… cost reduction (percent of FOB price)




… lead time reduction

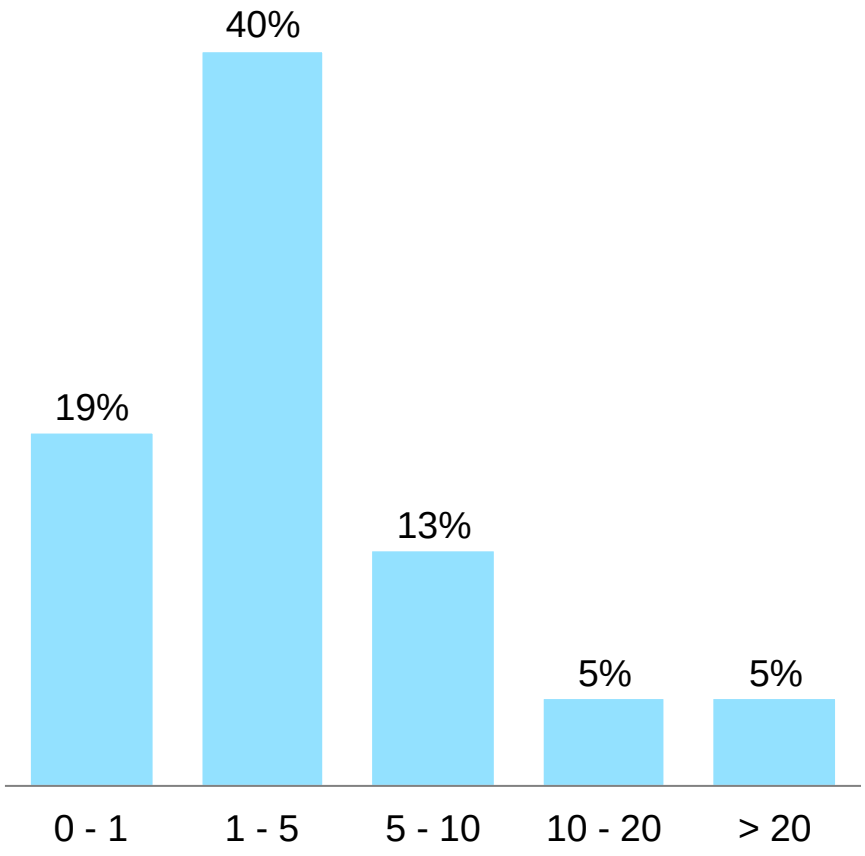



SOURCE: McKinsey Apparel CPO Survey 2017

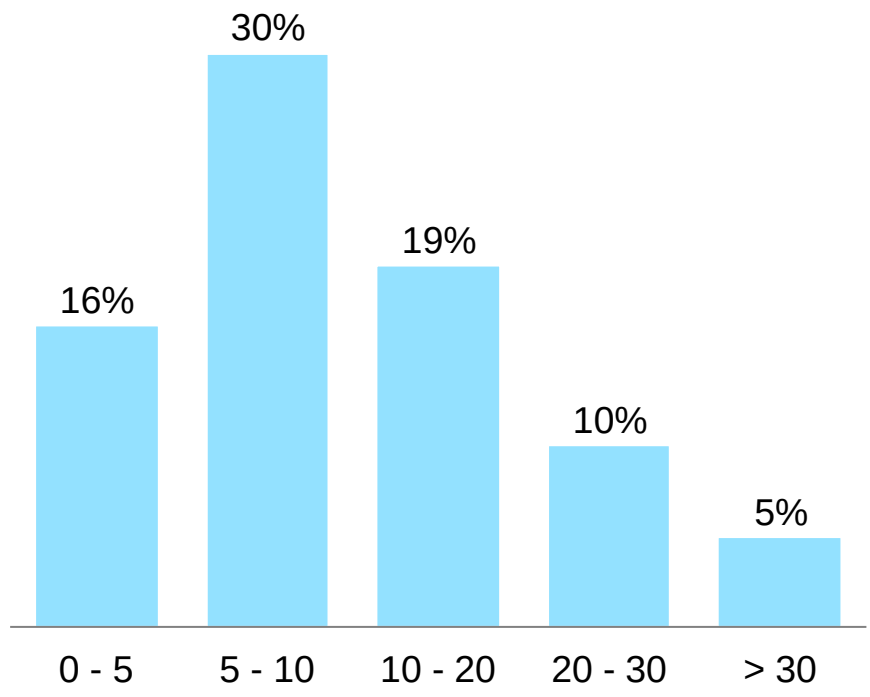
# … while at the same time, achieving higher on-time delivery and planning accuracy

"What is the aspired impact of your digitization of sourcing investments regarding …"
Percent of respondents, n = 63

## … on-time in-full delivery (pp)




## … demand planning accuracy (pp)

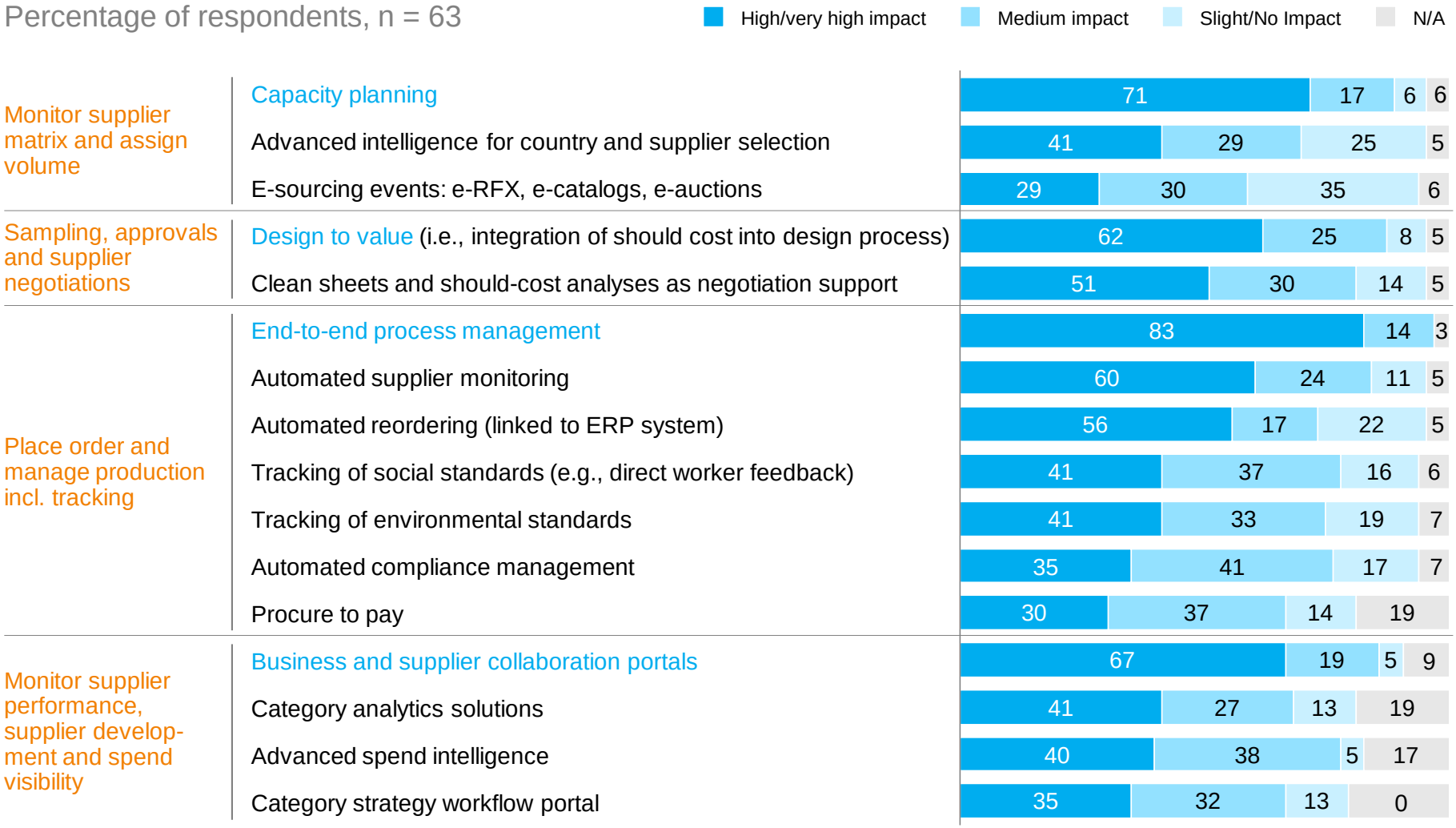



SOURCE: McKinsey Apparel CPO Survey 2017

# Digitization is expected to have the greatest impact on end-to-end process management, design-to-value, and capacity planning …

"Over the next 5 years, what level of impact will the following digitization opportunities have on apparel sourcing?"

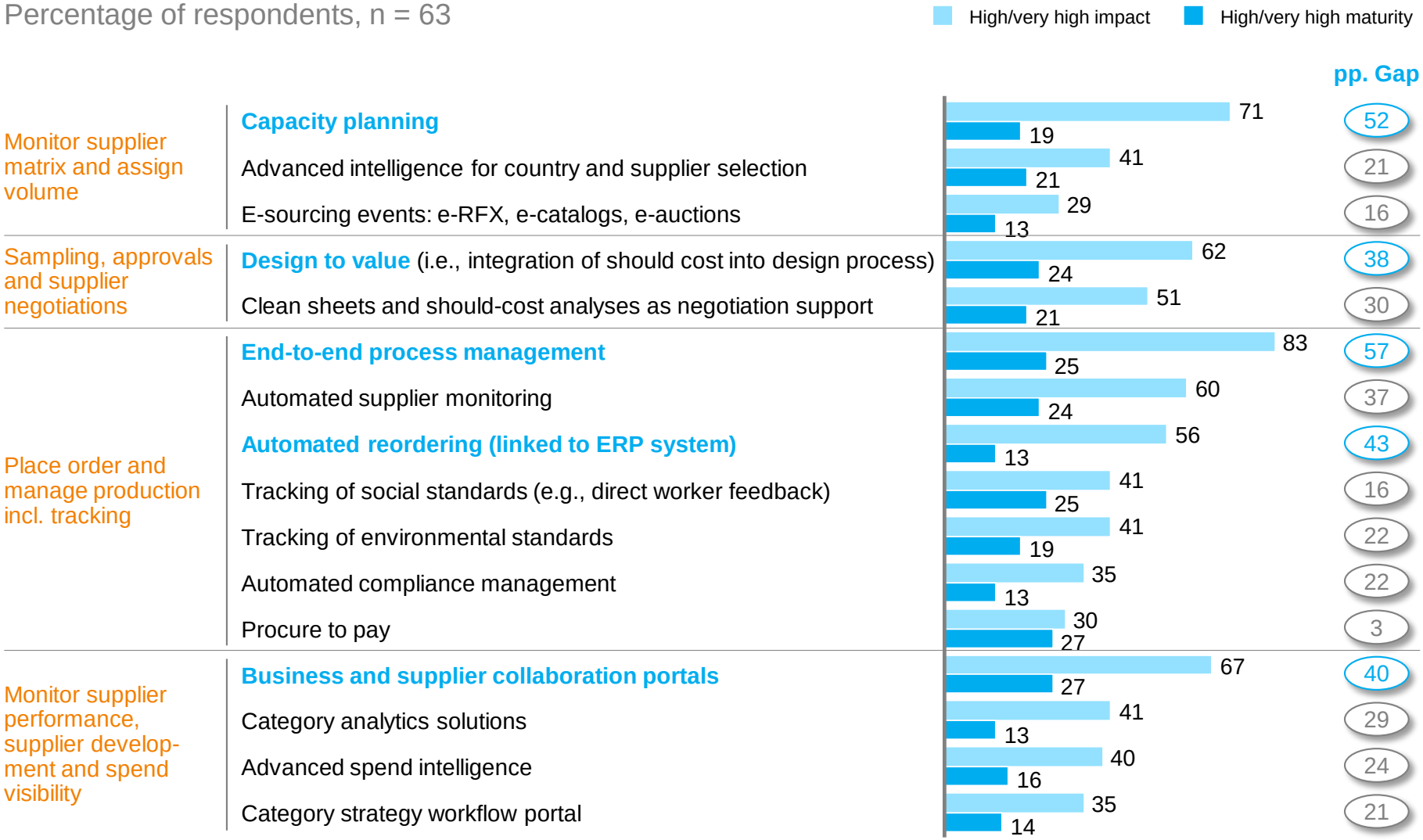
Percentage of respondents, n = 63




SOURCE: McKinsey Apparel CPO Survey 2017

# … while at the same time, these are also the areas with the largest gaps to achieve the future impact

Gap between current maturity and expected impact in next 5 years
Percentage of respondents, n = 63

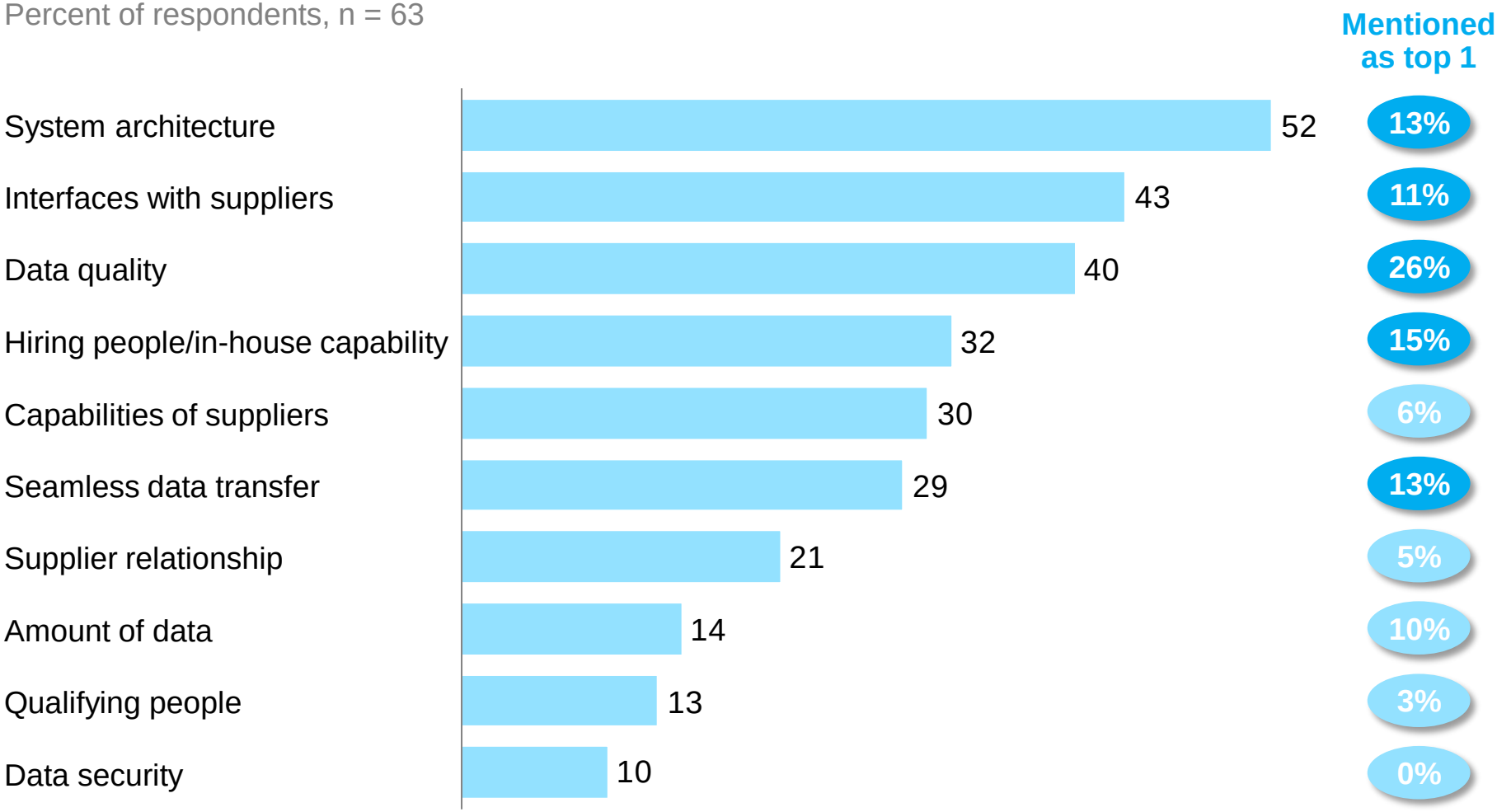



SOURCE: McKinsey Apparel CPO Survey 2017

# On both the technical side and the people side, there are significant barriers to digitization of apparel sourcing

"What are the top 3 challenges your organization faces in achieving the full/aspired impact of investments in digitization of apparel sourcing?

Percent of respondents, n = 63




SOURCE: McKinsey Apparel CPO Survey 2017

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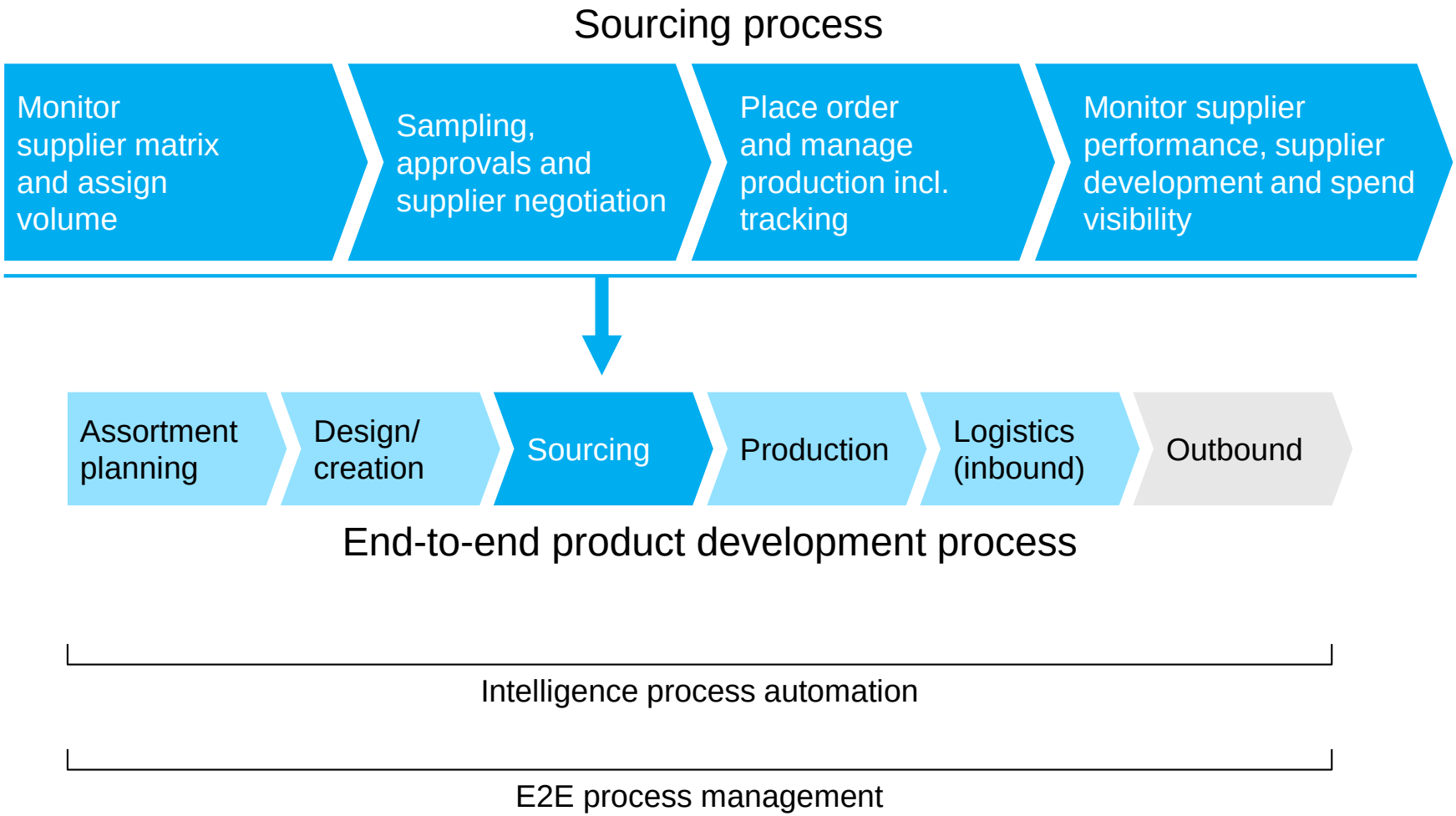
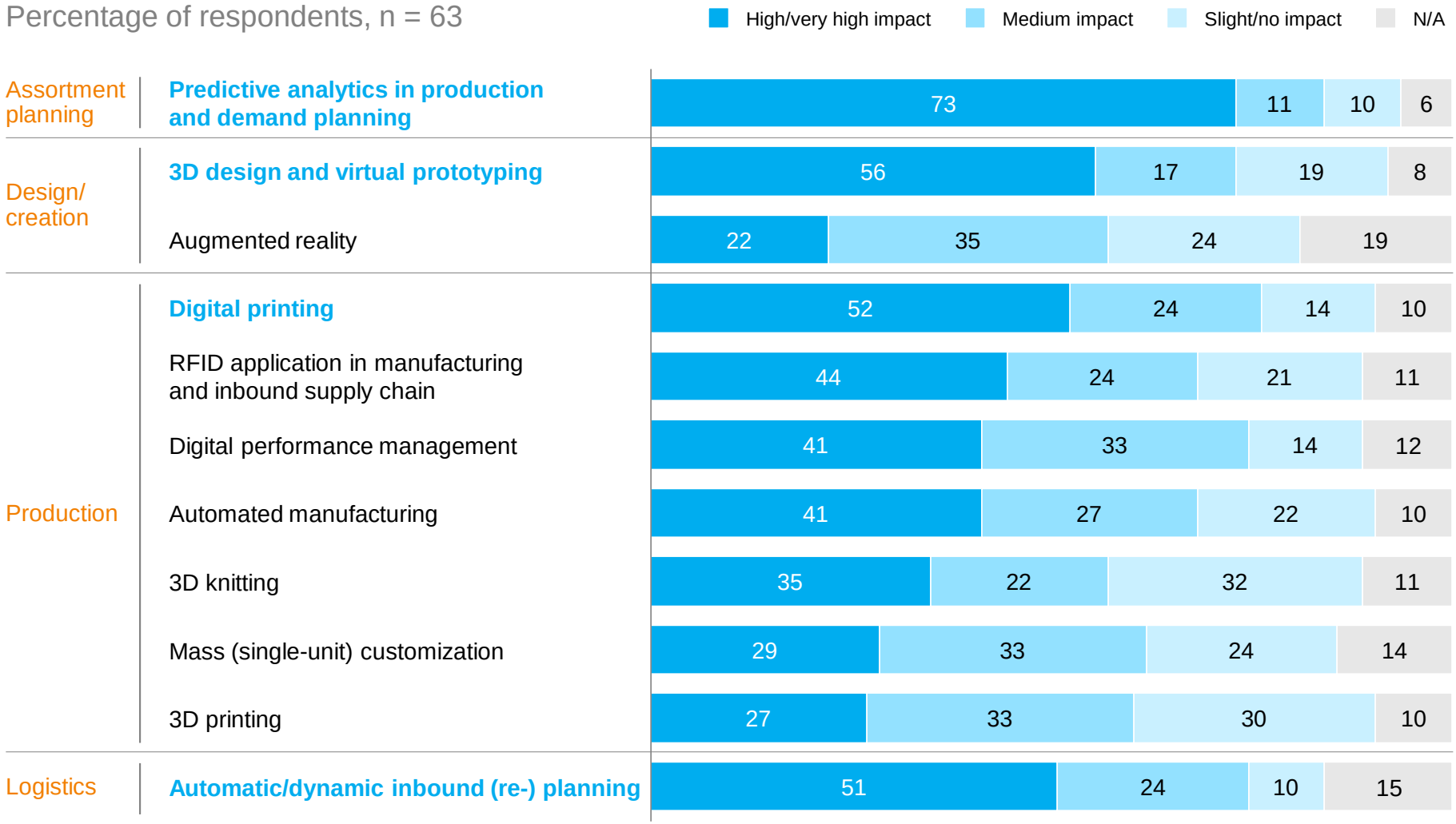
# Digitization of apparel sourcing goes beyond core sourcing processes and impacts the full end-to-end product development process



# Sourcing executives identified predictive analytics as the area where digitization could have the highest impact

"Over the next 5 years, what level of impact will the following digitization opportunities interfacing with apparel sourcing will have?"

Percentage of respondents, n = 63

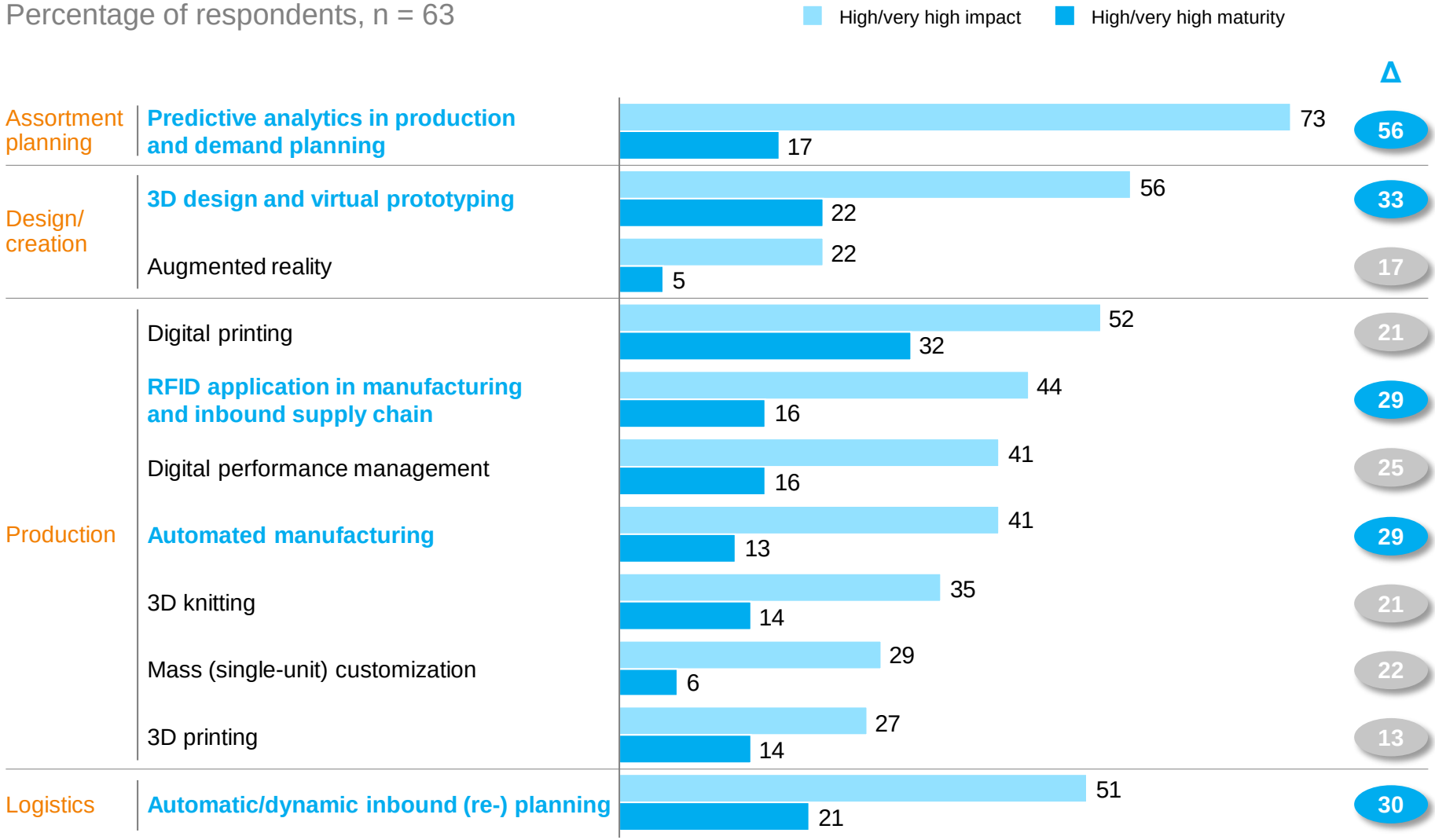



SOURCE: McKinsey Apparel CPO Survey 2017

# Bridging the large gap in analytics should be one of the core focus area for sourcing organizations

Gap between expected impact in next 5 years and current maturity

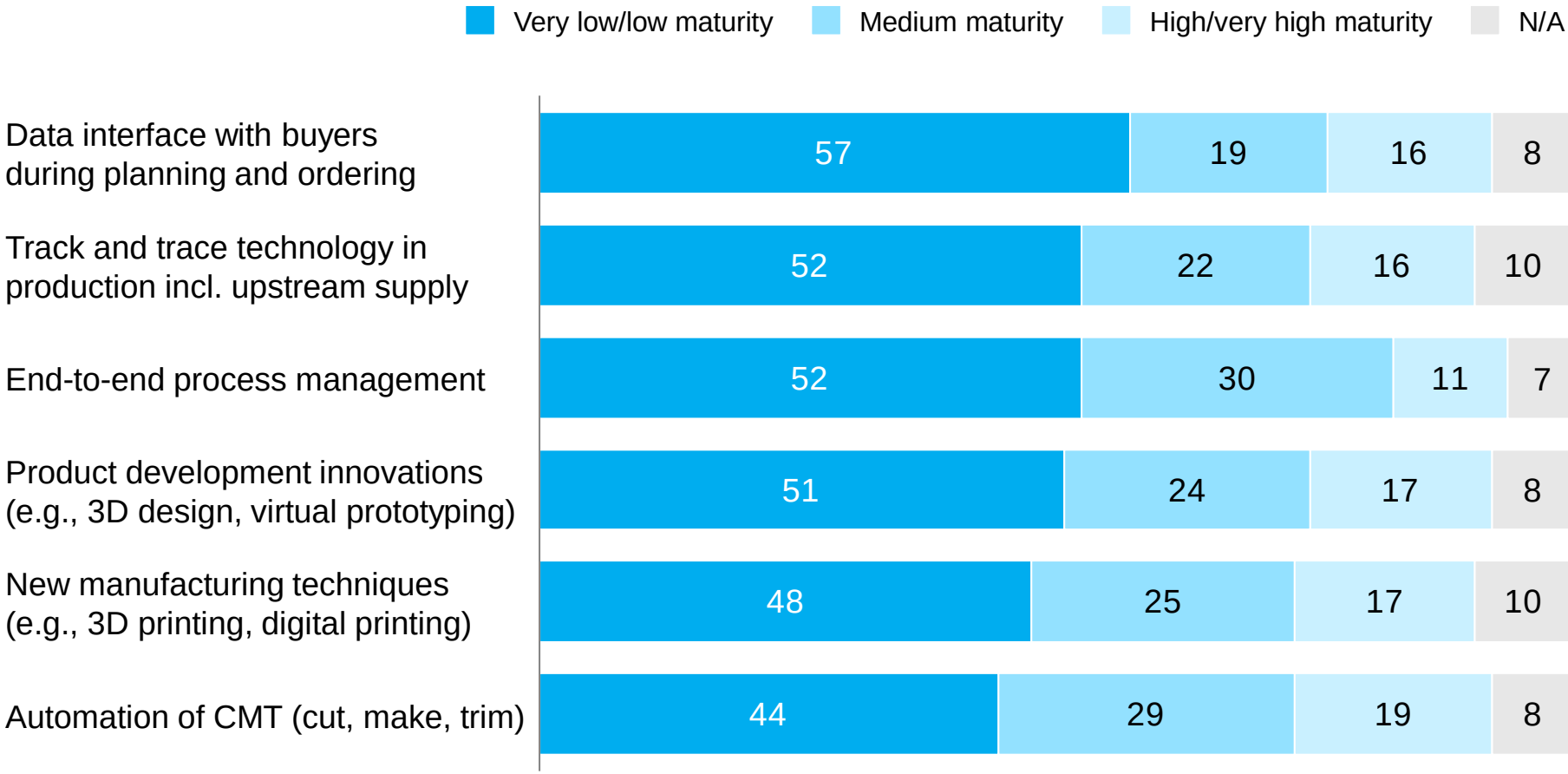
Percentage of respondents, n = 63




SOURCE: McKinsey Apparel CPO Survey 2017

# Sourcing executives rate their suppliers' current digitization maturity as low—although they see CMT automation as slightly more mature

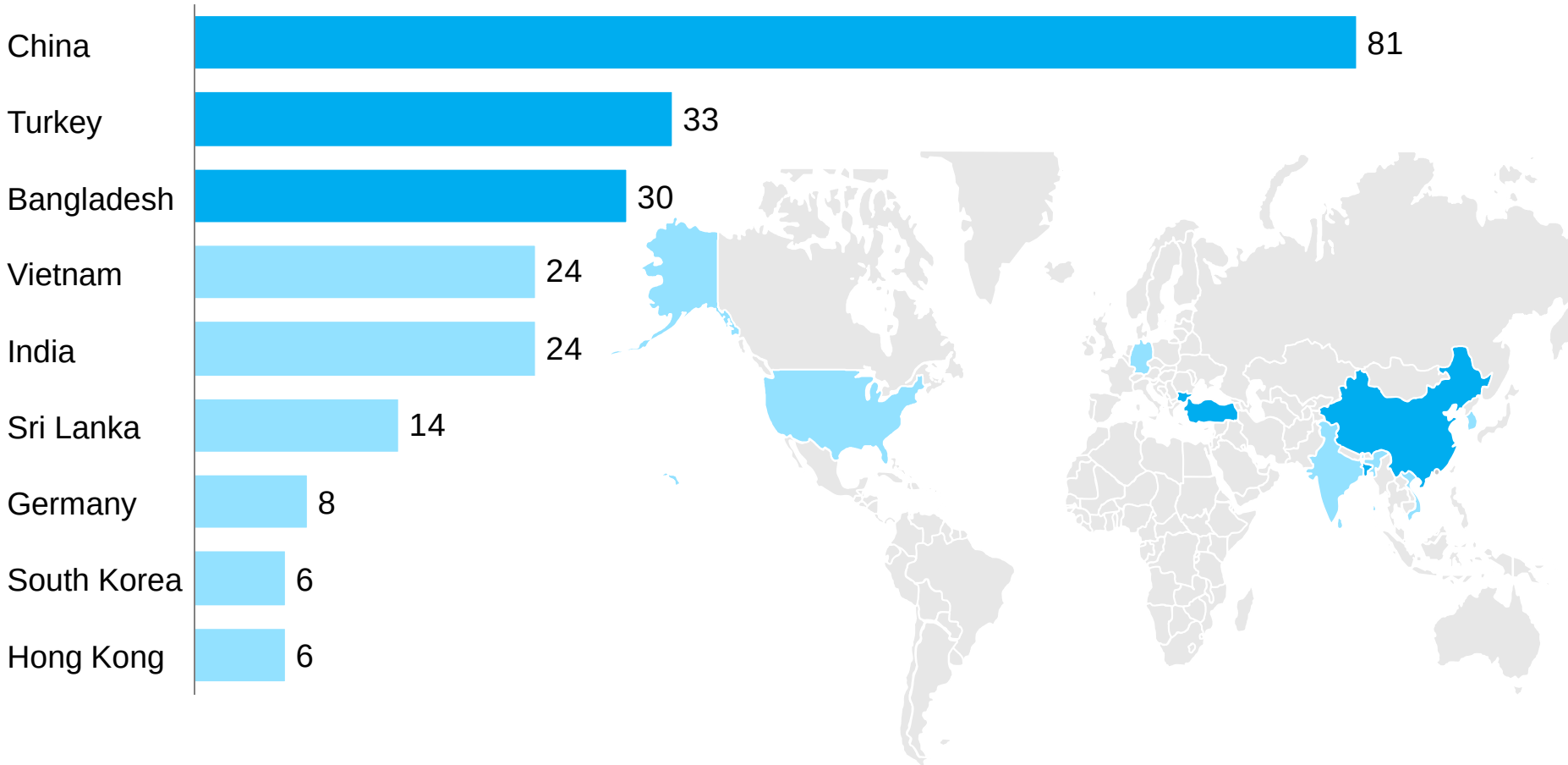
"How do you rate the digitization maturity of your suppliers?"
Percentage of respondents, n = 63




SOURCE: McKinsey Apparel CPO Survey 2017

# China is the clear leader in digitization of sourcing in the eyes of sourcing executives

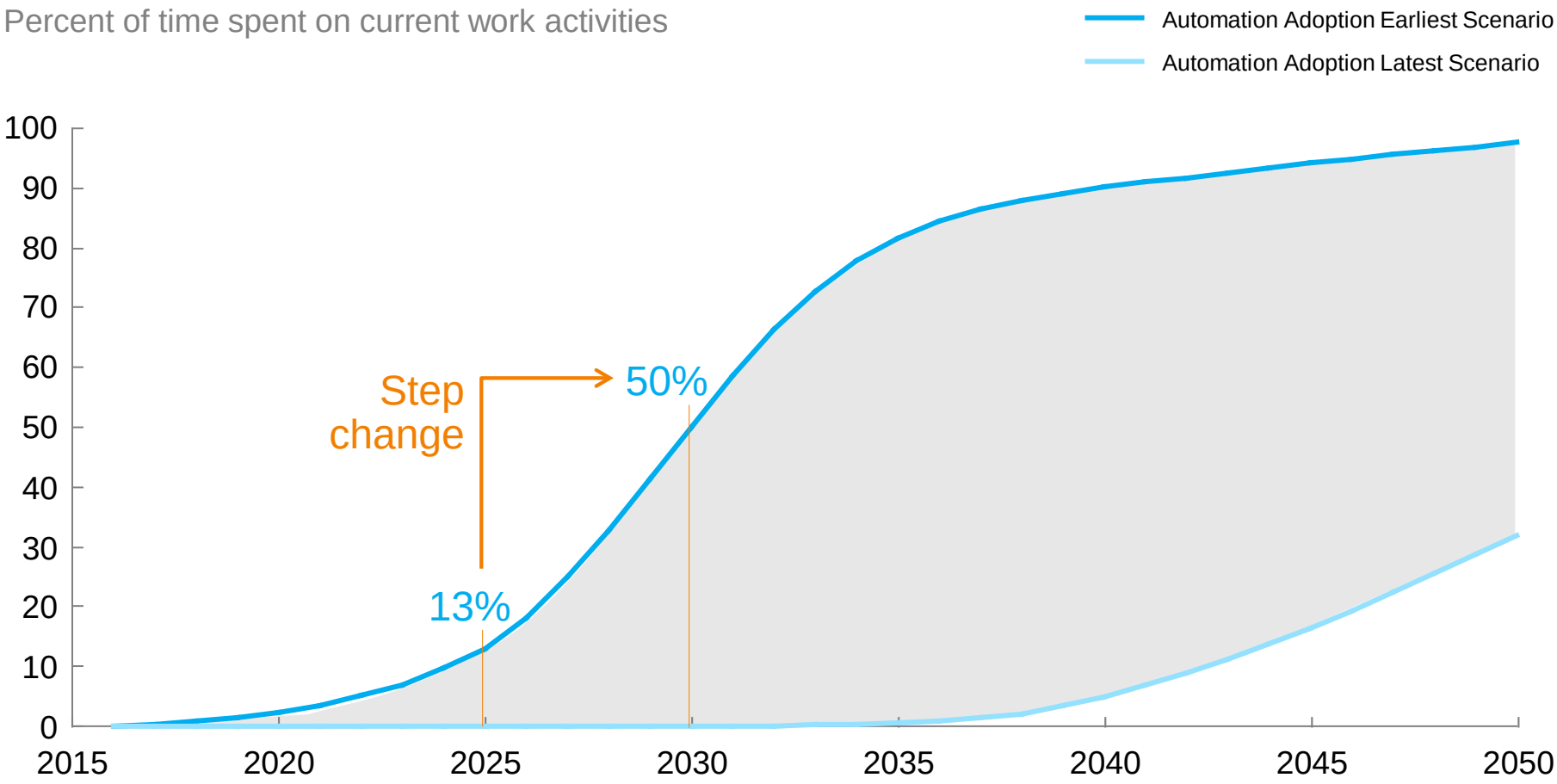
"Which 3 countries do you see as the best performers in terms of the sourcing digitization maturity today?"
Percent of respondents who ranked the respective countries within top 3, n = 63




SOURCE: McKinsey Apparel CPO Survey 2017

# Automation of garment manufacturing in China could achieve an adoption rate of up to 50% by 2030

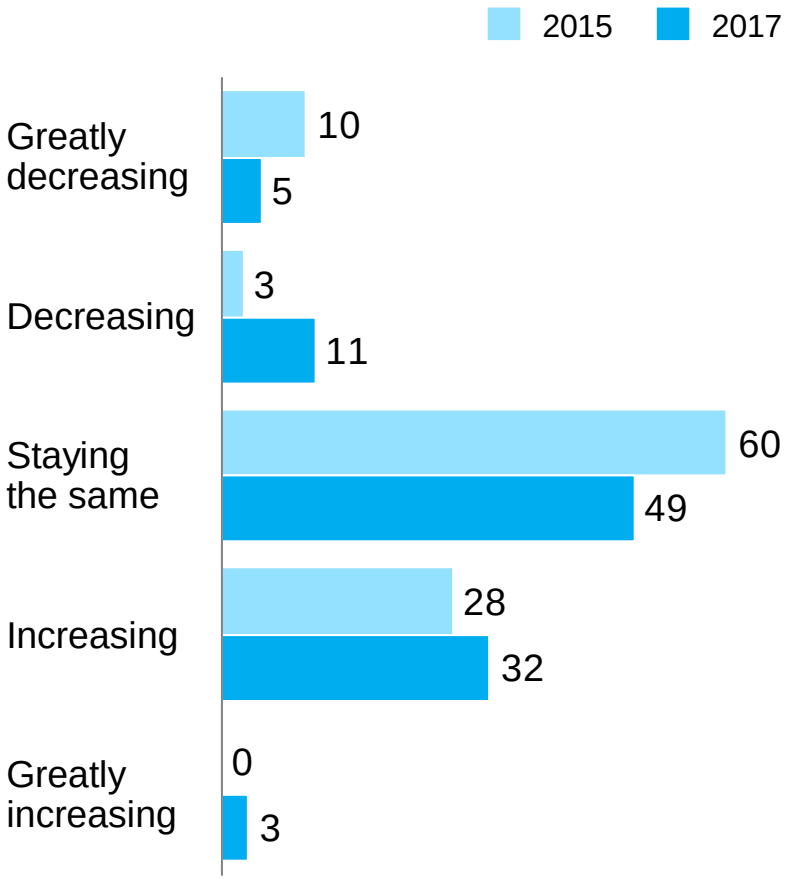
Percent of time spent on current work activities




SOURCE: Expert Interviews, BLS; O*Net; FDI Benchmarks, Oxford Economics United Nations Population Division; McKinsey Global Institute analysis "Future that works"

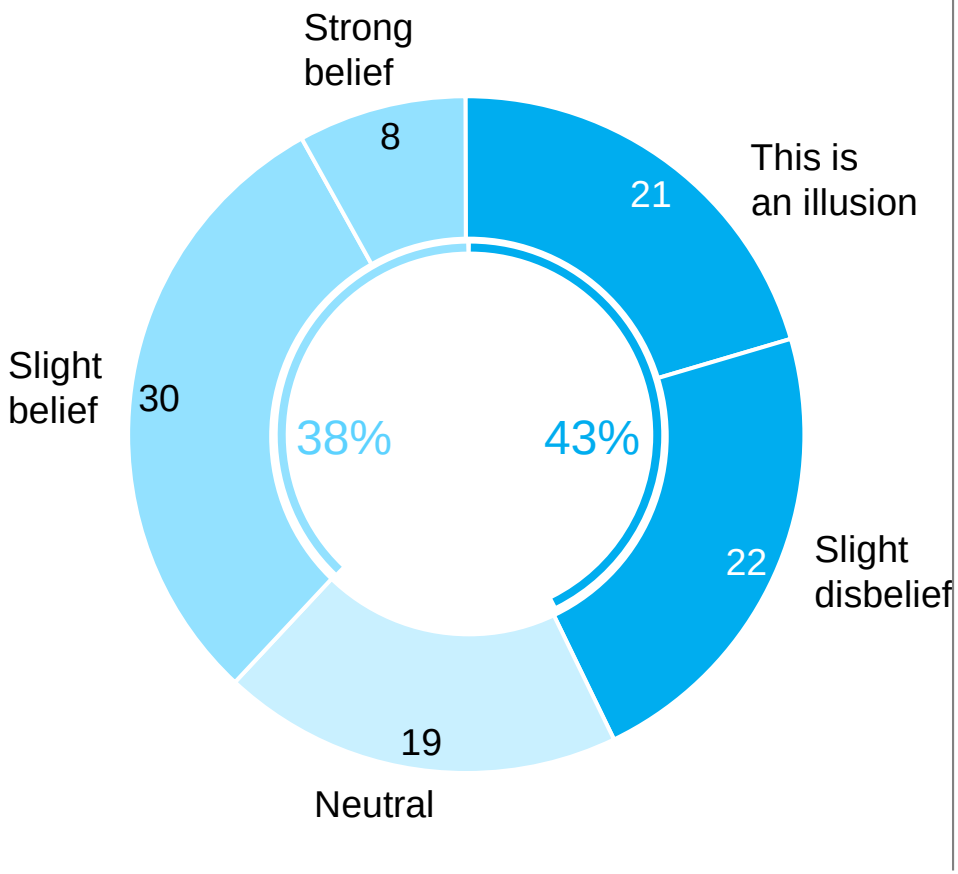
# Respondents remain skeptical about automation's potential to drive re-shoring

Trend of engaging in re-shoring in own company




"Given the trend towards automation, to what extent do you believe manufacturing will return to the US/Europe within the next 5 years?"

Percent of respondents, n = 63




SOURCE: McKinsey Apparel CPO Survey 2017

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# Sourcing executives should start today to build the 5 required foundations to digitize apparel sourcing

# Sourcing executives should start today to build the 5 required foundations to digitize apparel sourcing

## Talent and mindset

**Acquire and develop savvy talent** internally and externally

- **Overcome silos** along the end-to-end process from design to delivery
- Bring **new people** in, with **Tech/Analytics background and business acumen**
- **Increase risk appetite and the external orientation**

# Sourcing executives should start today to build the 5 required foundations to digitize apparel sourcing

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## External collaboration and engagement models

**Build alliances and strategic partnerships**

- **Connect and partner with strategic suppliers** to build up a competitive ecosystem
- **Experiment new collaboration models** with suppliers, start-ups and fashion schools

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## Digital infrastructure

**Design target infrastructure and roadmap** to allow faster, more and sustainable impact

- **Prioritize areas to invest in** based on solid business cases
- **Do not wait for the all-encompassing solution**
- **Leverage internal talent and external communities**

# Sourcing executives should start today to build the 5 required foundations to digitize apparel sourcing

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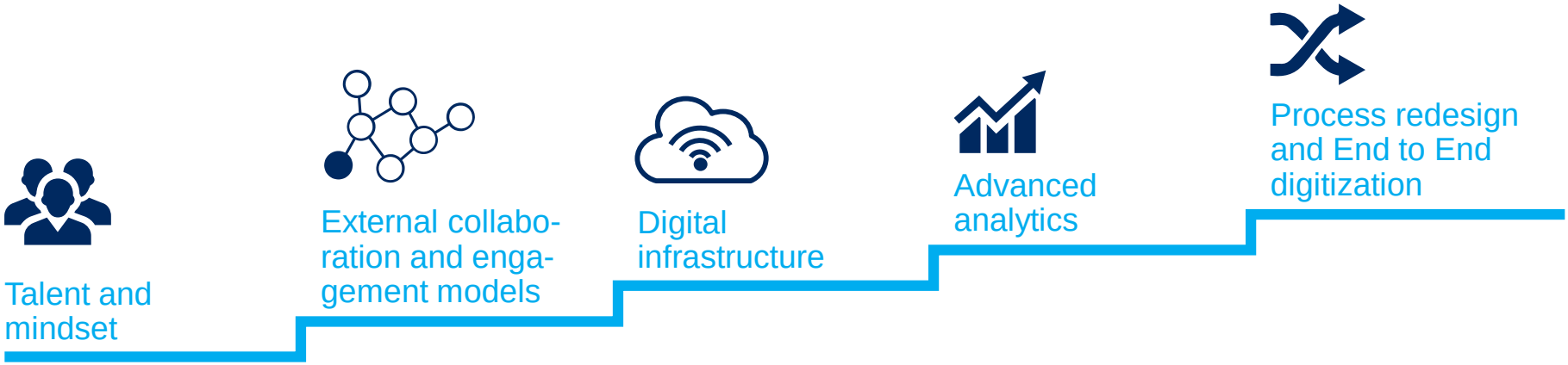
## Advanced analytics

**Step-up the use of big data and analytics**

- **Define value drivers and use cases**
- **Build relevant point solutions**
- **Create success cases** and embed into the broader roadmap
- **Enhance overall analytics posture**

# Sourcing executives should start today to build the 5 required foundations to digitize apparel sourcing



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- **Enhance overall analytics posture**

## Process redesign and End to End digitization

**Shift to a demand focused model**

- **Optimize end-to-end process efficiency and SC flexibility**
- **Identify high value cases for digitization** and develop a roadmap
- **Identify available solutions/partners**
- **Test, partner and scale fast**


THANK YOU!

# HKRITA

香港紡織及成衣研發中心

The Hong Kong Research Institute of Textiles and Apparel

ITMF Sept 2017

# Fashion Industry 4.0

“Court Ladies Preparing Newly Woven Silk” Museum of Fine Arts Boston in the United States. A copy rendered by Emperor Huizong (1082-1135).

# 2006-2016

# It doesn't work anymore…

**BRICK & MORTAR RETAILER MARKET VALUE (2006* VS. TODAY)**

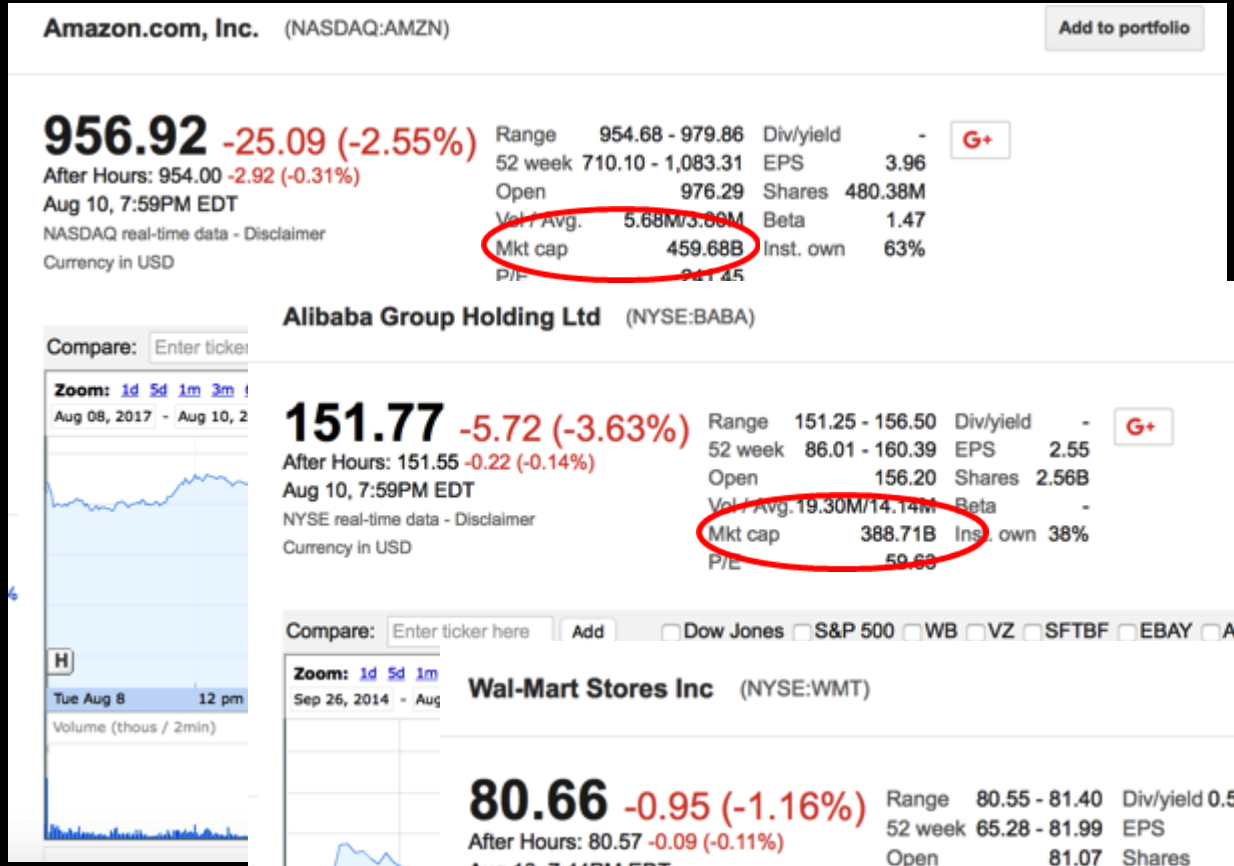
| Item | Market Value 2006 | Market Value Today | % Change |
|---|---|---|---|
| BEST BUY | $28.4B | $14.5B | (49%) |
| JCPenney | $18.1B | $3.0B | (83%) |
| KOHL'S | $24.2B | $9.9B | (59%) |
| macy's | $24.2B | $13.0B | (46%) |
| NORDSTROM | $12.4B | $9.8B | (21%) |
| sears | $27.8B | $1.3B | (95%) |
| TARGET | $51.3B | $43.8B | (15%) |
| Walmart | $214.0B | $219.3B | 2% |
| amazon | $17.5B | $351.8B | 1,910% |

*Source: Yahoo Finance*
**Peak Market Value 2006*

# Mid-August 2017


Source: Google Finance

# Mid-August 2017




Source: Google Finance

# Walmart preparing to make 1,000 job cuts


Payless SHOESOURCE

Stressed retailers like J. Crew and Neiman Marcus are doing something unusual to manage deb

By Ciara Linnane
Published: June 3, 2017 4:44 p.m. ET

obs at its headquarters and regional personnel th
t sai
revea
ce, a
asing

## Abercrombie & Fitch Co. (ANF) Considerable Downside Risk Should Sales Not Materialize As Planned

Source: Just-Style.com

# The Limited Is Closing All Its

## Macy's to slash 10,000 jobs amid poor holiday sales

By Beth Wright | 5 January 2017 Font size Email Print

US retail giant Macy's has slashed its full-year profit outlook and says it plans to cut more than 10,000 jobs through store closures and moves to streamline its management team.

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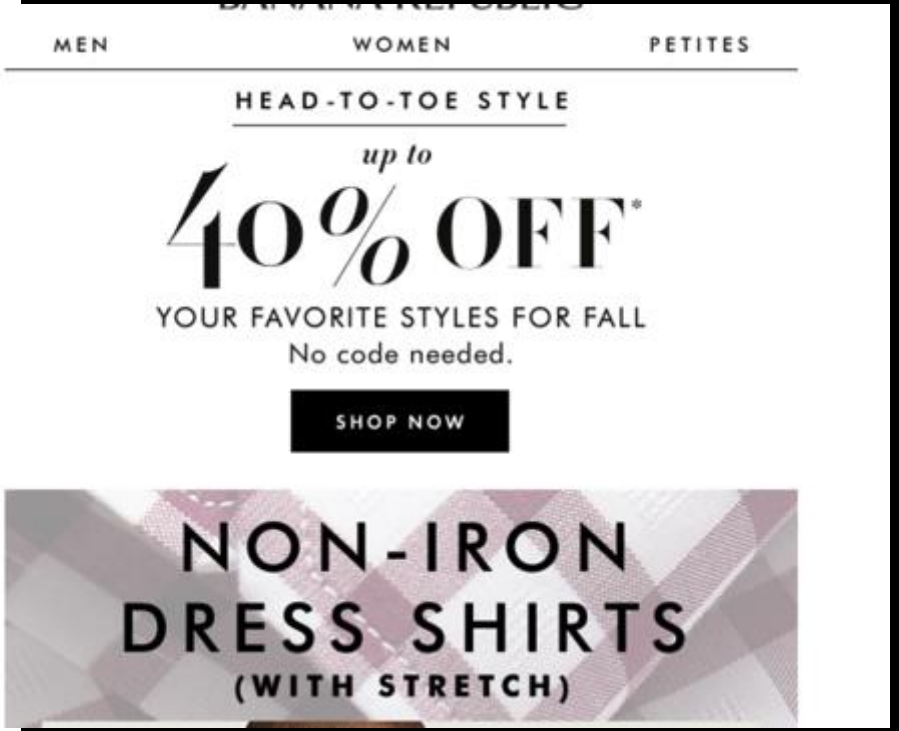
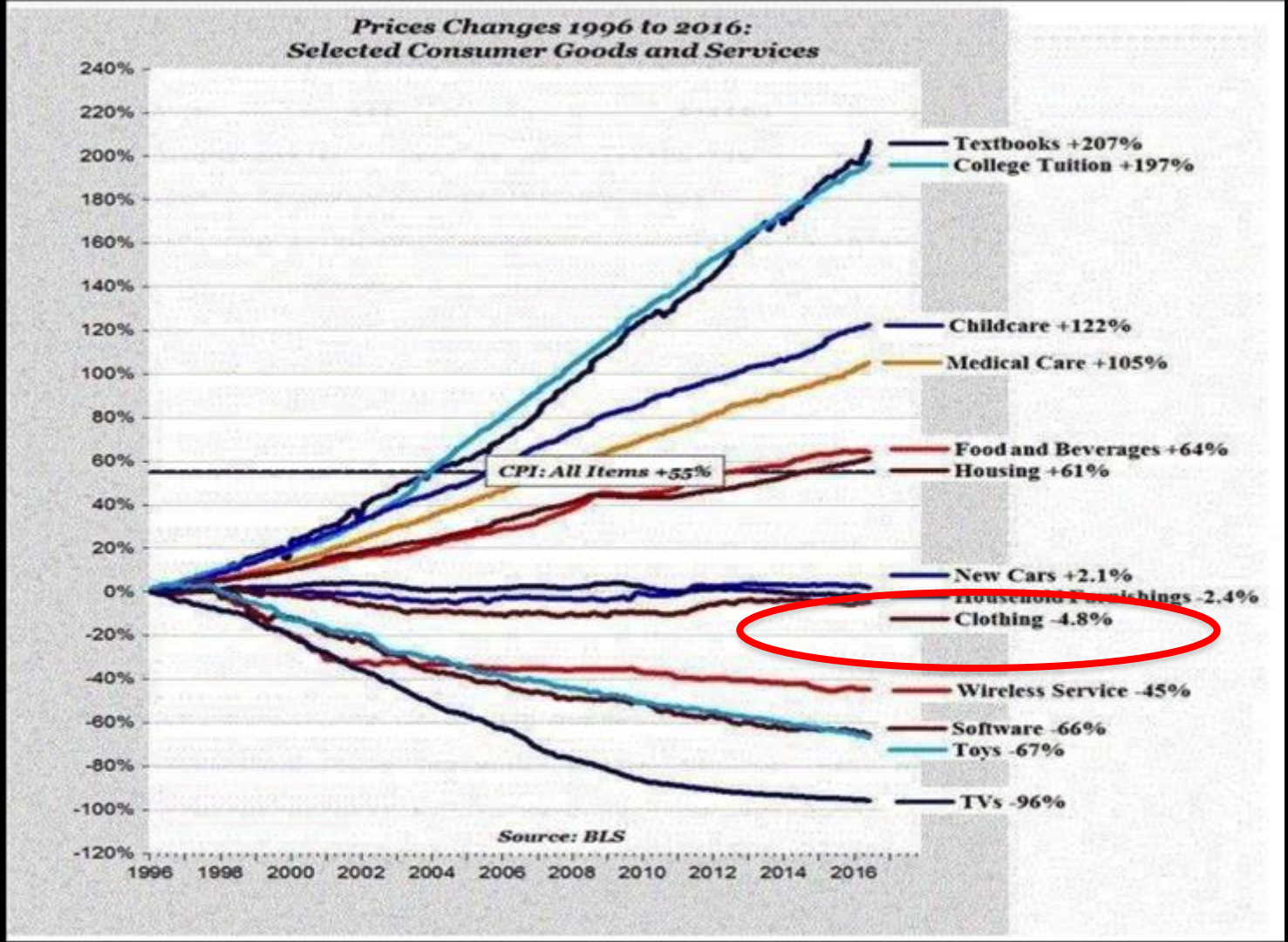
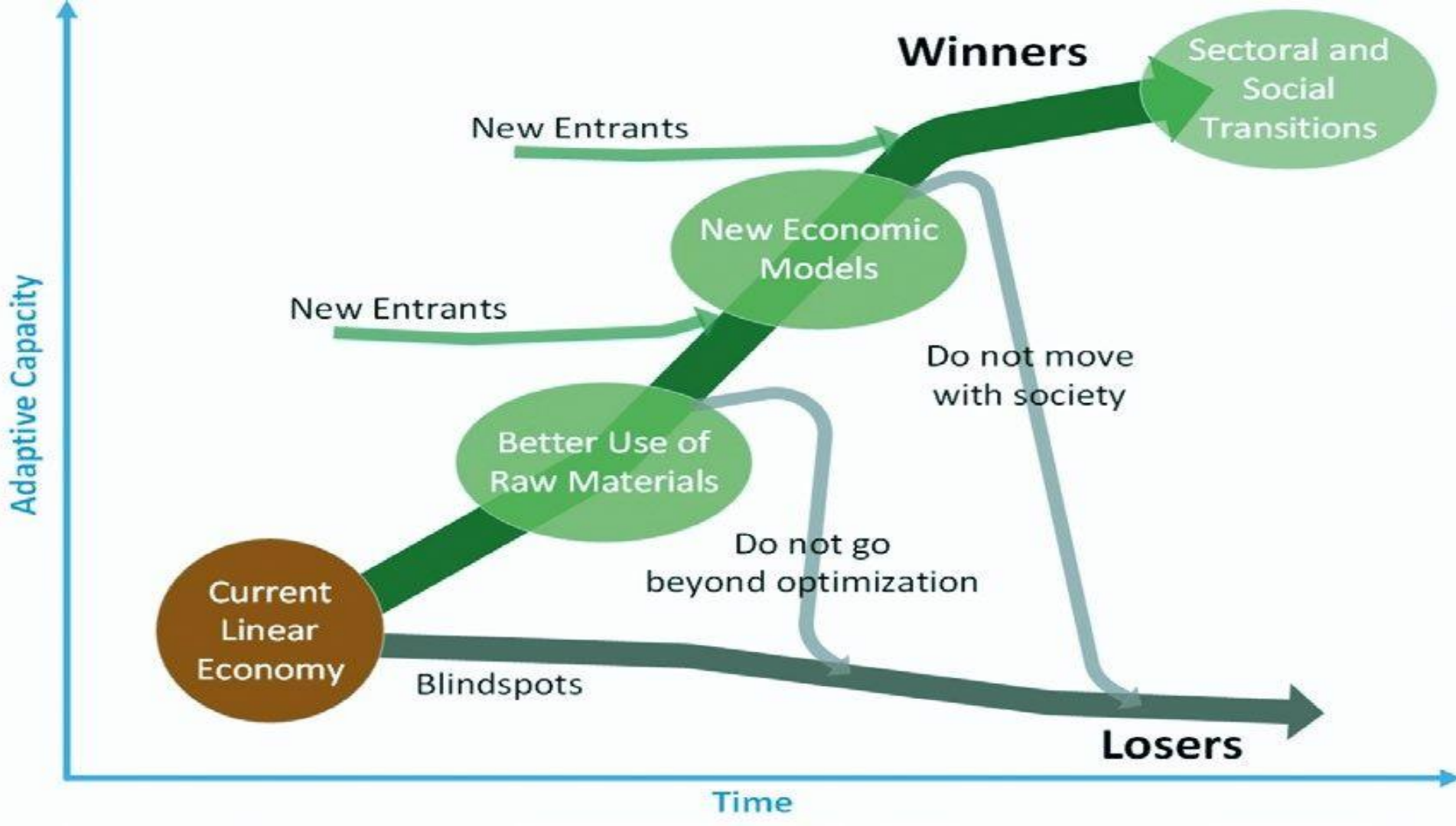
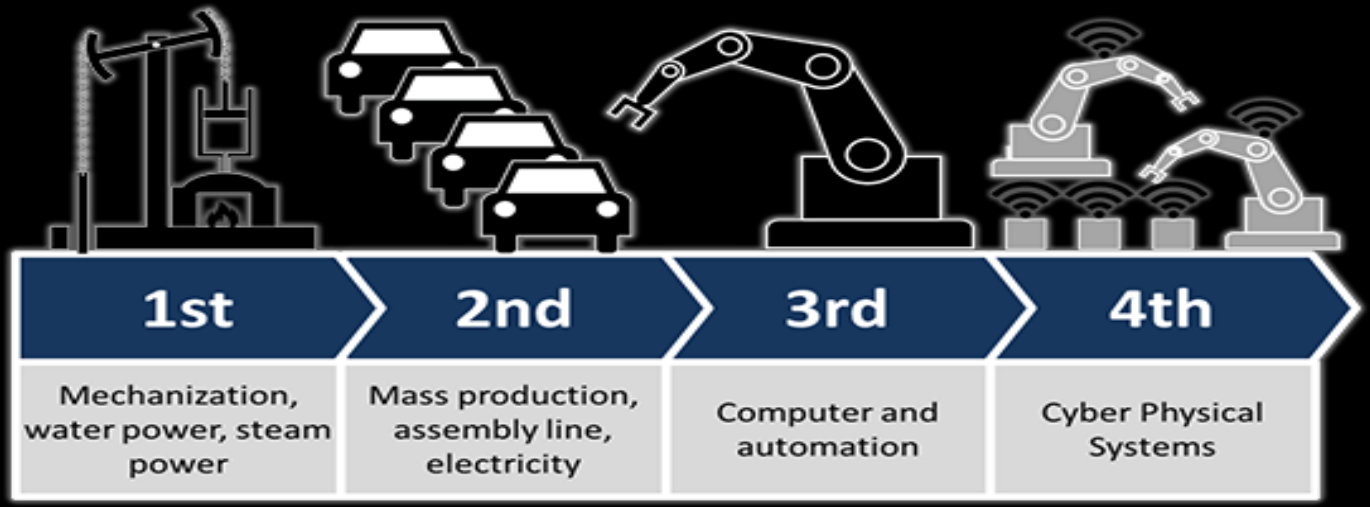
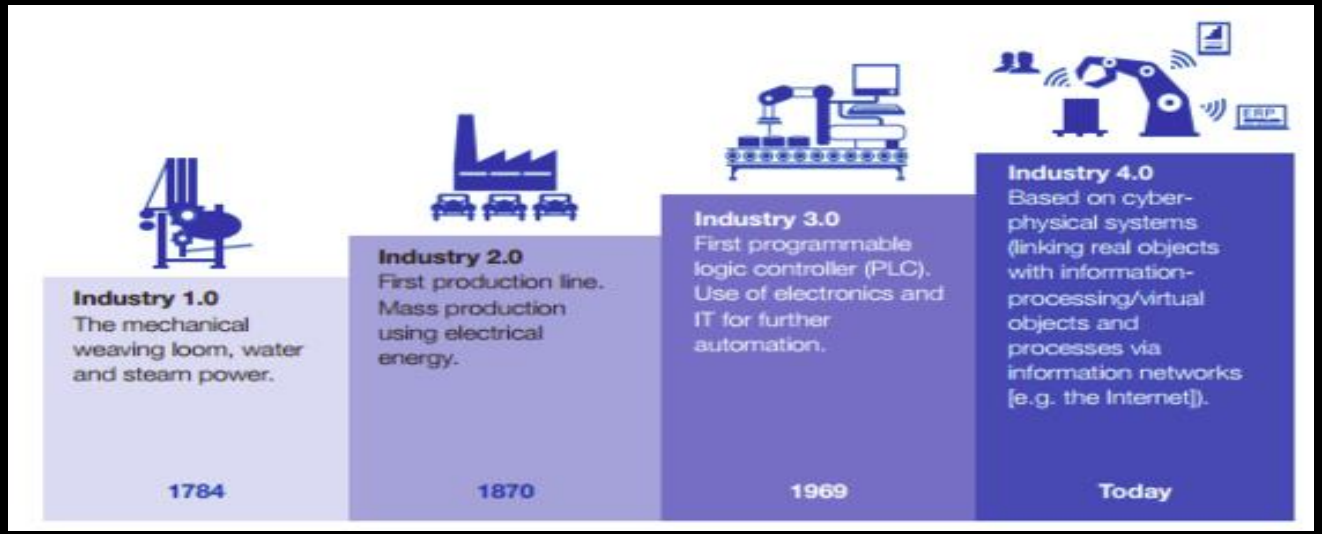
60% OFF$


MEN
WOMEN
PETITES
HEAD-TO-TOE STYLE
up to
40% OFF*
YOUR FAVORITE STYLES FOR FALL
No code needed.
SHOP NOW
NON-IRON
DRESS SHIRTS
(WITH STRETCH)


Prices Changes 1996 to 2016:
Selected Consumer Goods and Services
240%
220%
200%
180%
160%
140%
120%
100%
80%
60%
40%
20%
0%
-20%
-40%
-60%
-80%
-100%
-120%
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
Textbooks +207%
College Tuition +197%
Childcare +122%
Medical Care +105%
Food and Beverages +64%
Housing +61%
CPI: All Items +55%
New Cars +2.1%
Clothing -4.8%
Wireless Service -45%
Software -66%
Toys -67%
TVs -96%
Source: BLS


Winners
Sectoral and Social Transitions
New Entrants
New Economic Models
New Entrants
Do not move with society
Better Use of Raw Materials
Do not go beyond optimization
Current Linear Economy
Blindspots
Losers
Adaptive Capacity
Time


1st
Mechanization, water power, steam power
2nd
Mass production, assembly line, electricity
3rd
Computer and automation
4th
Cyber Physical Systems


Industry 1.0
The mechanical weaving loom, water and steam power.
1784
Industry 2.0
First production line. Mass production using electrical energy.
1870
Industry 3.0
First programmable logic controller (PLC). Use of electronics and IT for further automation.
1969
Industry 4.0
Based on cyber-physical systems (linking real objects with information-processing/virtual objects and processes via information networks [e.g. the Internet]).
Today

HKRITA

# On Demand Manufacturing Systems

# Apparel as Intelligent Systems

# Green, Infinitely Recyclable Materials

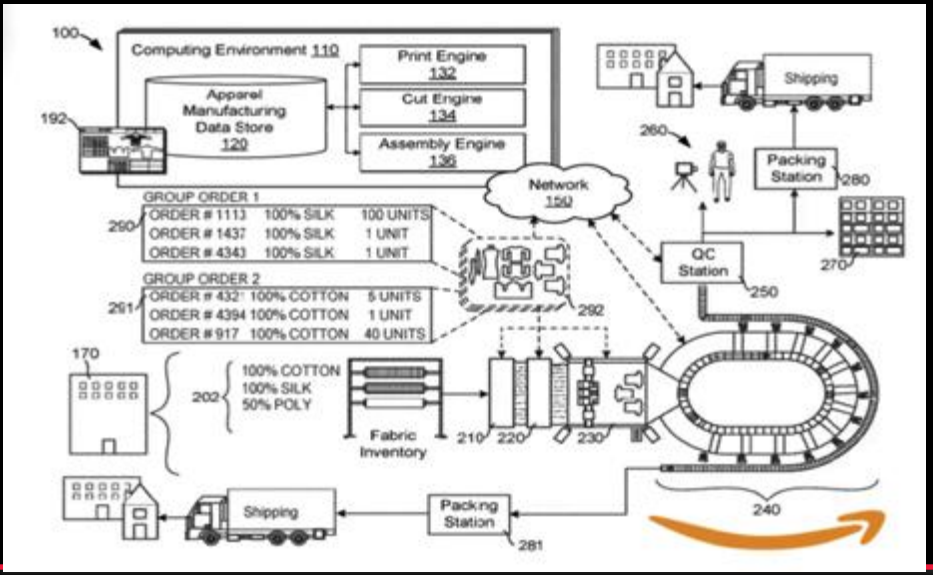
# “What will sell 90 days from now?”

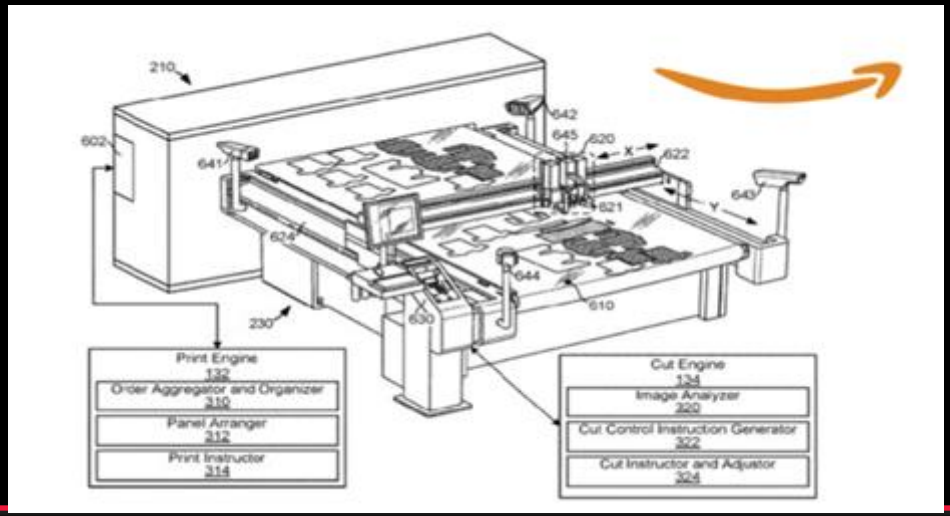
C2B

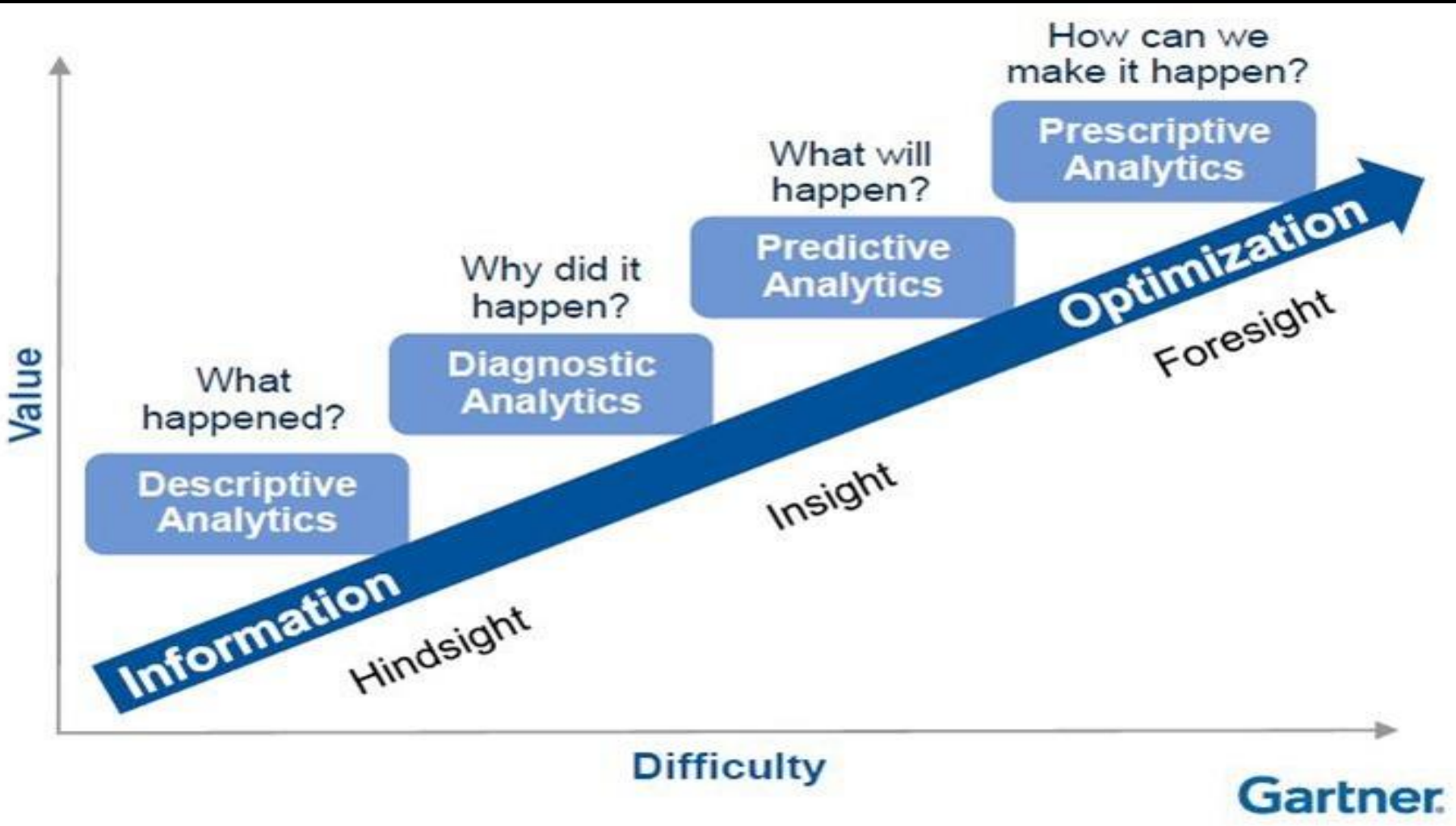
# Amazon Prepares for On-Demand Fashion Production With Patent

## On-demand is coming to apparel manufacturing, if Amazon has its way.

By Kali Hays on April 18, 2017



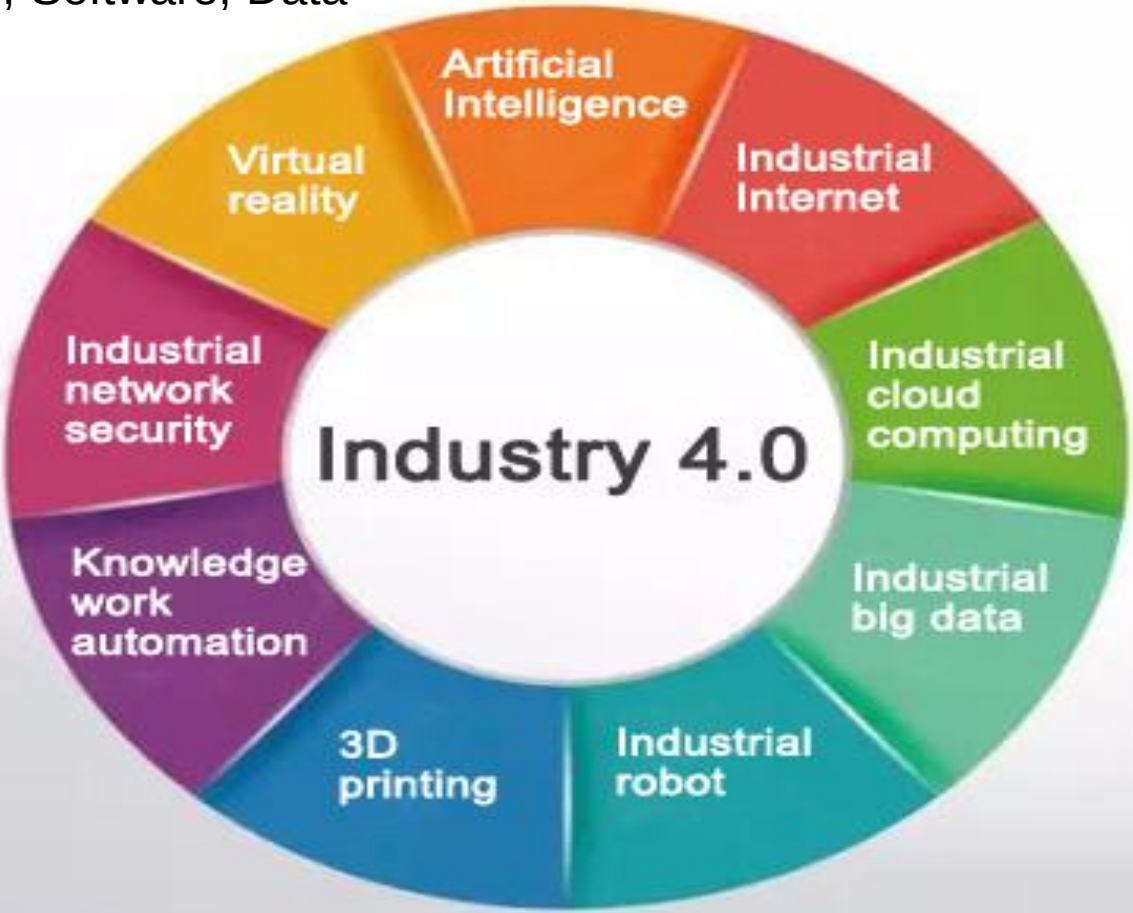



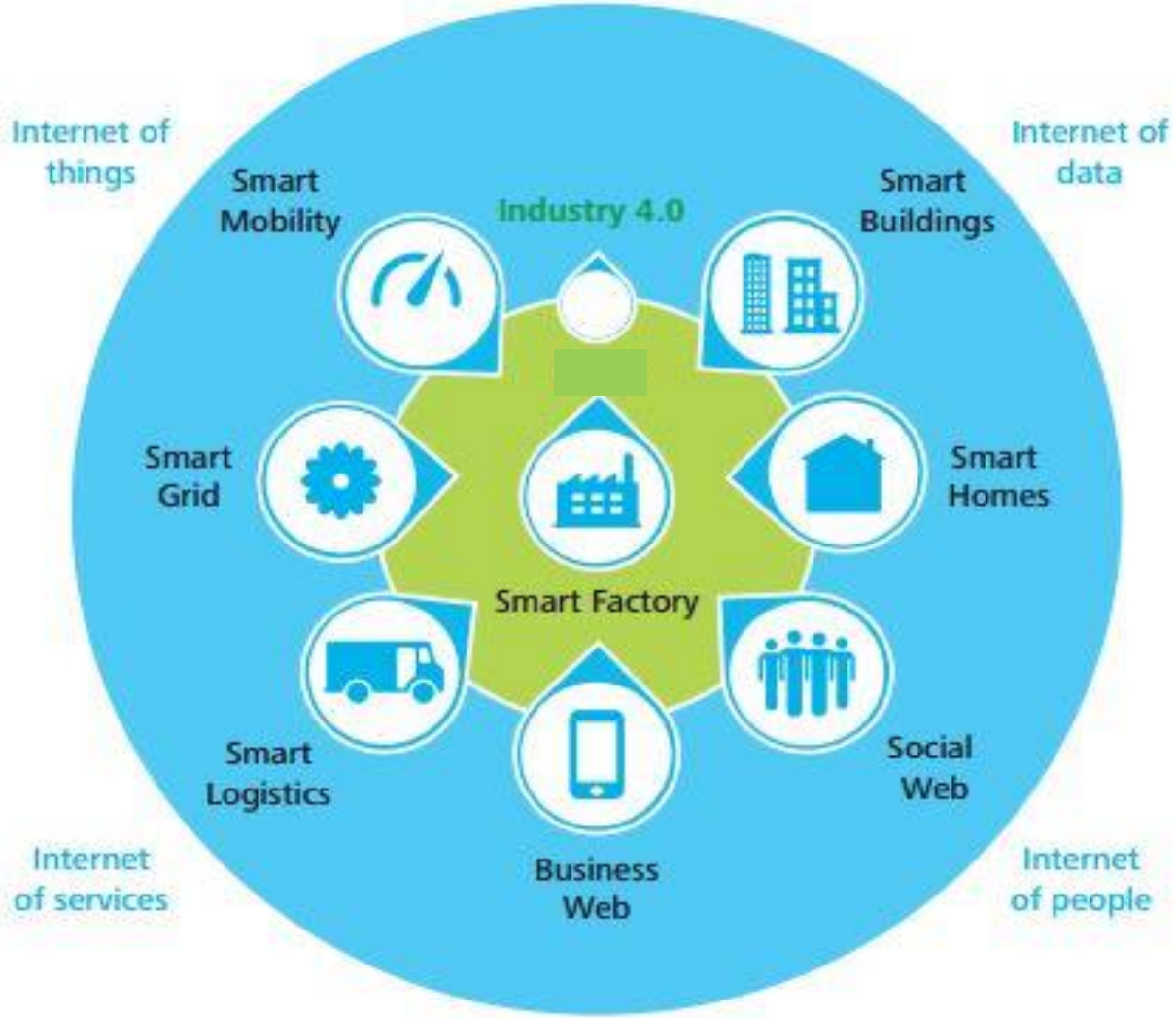

How can we make it happen?
Prescriptive Analytics
What will happen?
Predictive Analytics
Why did it happen?
Diagnostic Analytics
What happened?
Descriptive Analytics
Optimization
Foresight
Insight
Hindsight
Information
Value
Difficulty
Gartner

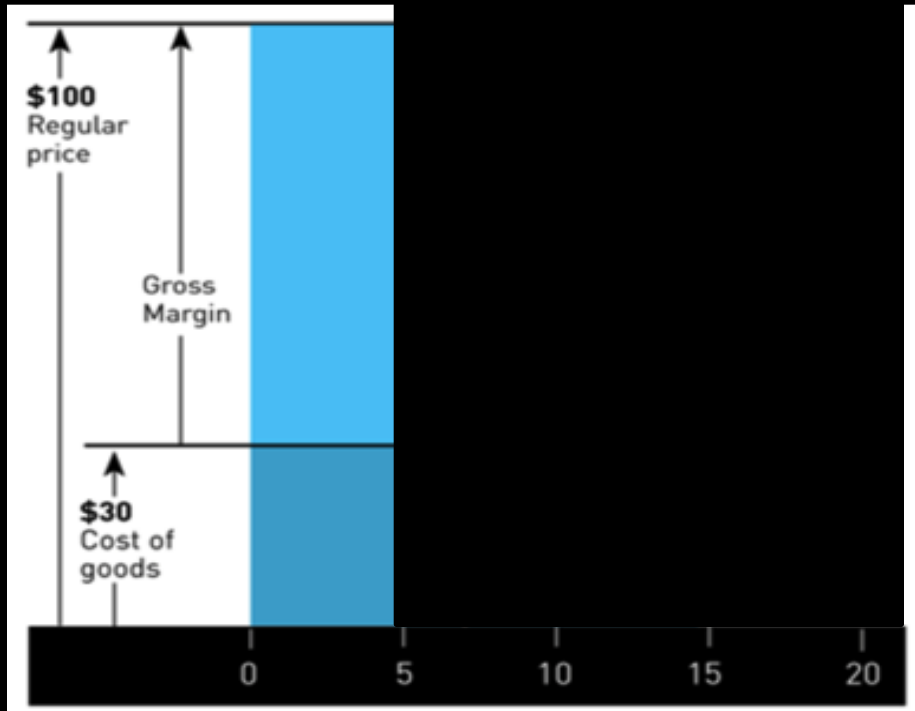

Google
NOW HIRING!
No need to apply,
we already have all
your information.

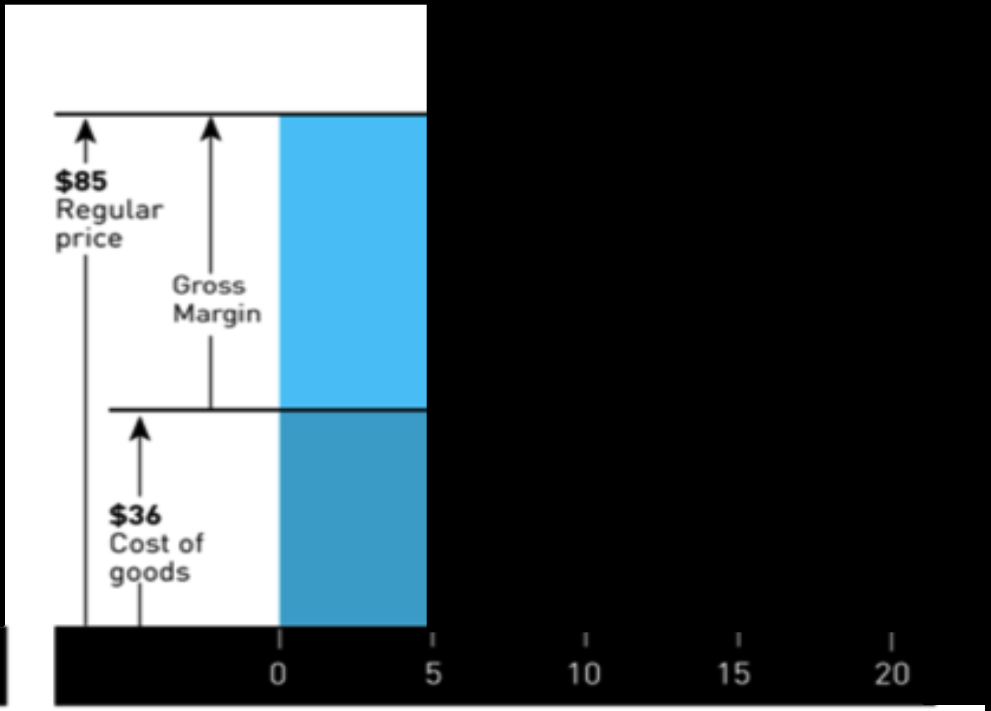
Convergence of Hardware, Software, Data

Nine technical backbone industry 4.0




Internet of things
Internet of data
Smart Mobility
Industry 4.0
Smart Buildings
Smart Grid
Smart Homes
Smart Factory
Smart Logistics
Social Web
Business Web
Internet of services
Internet of people

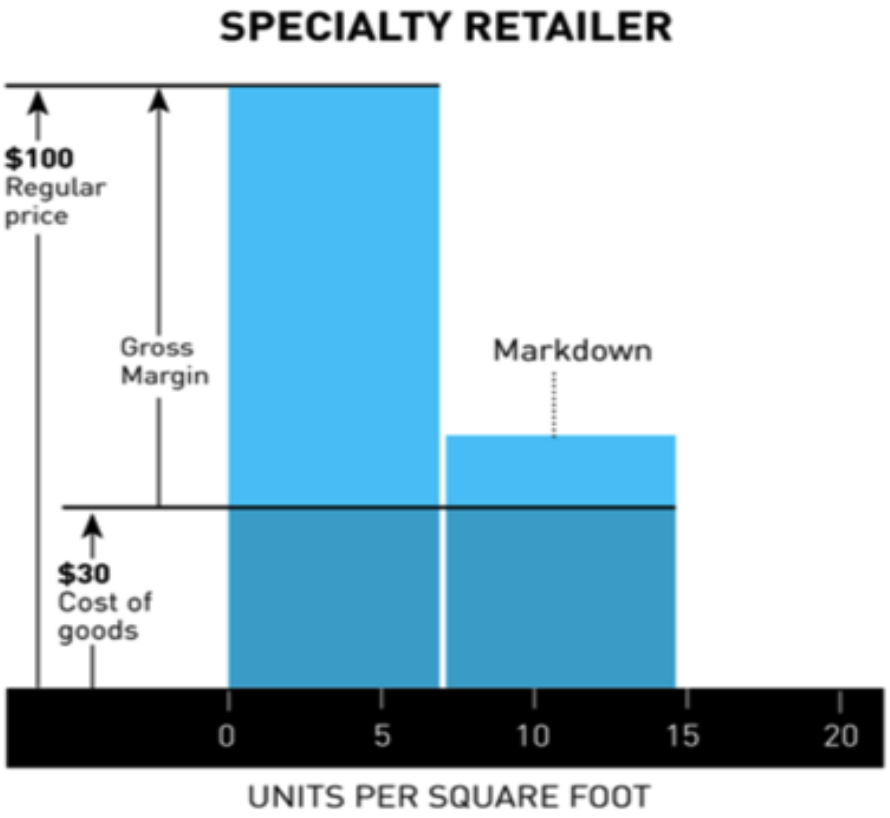


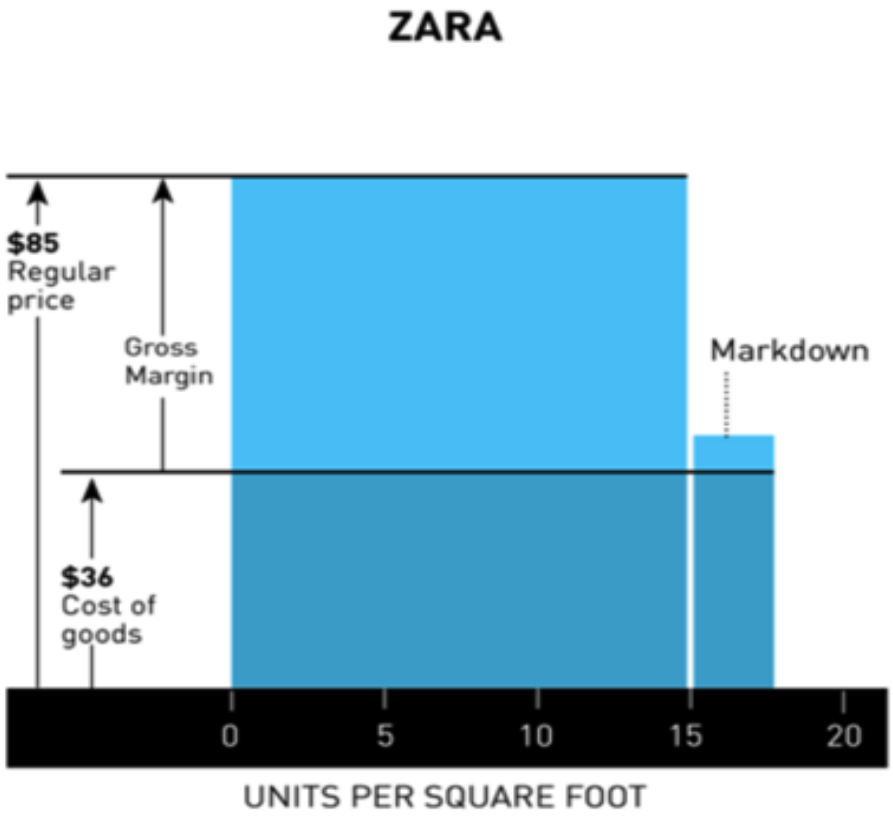




**Source:** Company financials and Booz Allen Hamilton

## Exhibit 2: **Zara's Competitive Economics**

Compared to an unnamed but real specialty retailer, Zara (a fashion retailer owned by the Inditex Group) has lower prices and higher production costs. Its advantages: gross margins (light blue areas) that are 55 percent greater and sales of approximately 20 percent more units per square foot.




**Source:** Company financials and Booz Allen Hamilton

CES Consumer Technology Association

> REGISTER & PLAN | SHOW FLOOR | > EVENTS & EXPE

> WHY CES?

EXHIBIT OR SPONSOR

WHAT TO SEE AT TECH EAST

WHAT TO SEE AT TECH WEST

WHAT TO SEE AT TECH SOUTH

MARKETPLACES

- 3D Printing
- Accessibility
- Augmented Reality
- Baby Tech
- Beauty Tech
- Cyber & Personal

# Wearables

HOME | SHOW FLOOR | MARKETPLACES | Wearables

The Wearables Marketplace featured everything from high-tech fashion and smart jewelry to wearables that track your mood, activity and


News Reviews Smartwatches Fitness trackers Running VR Smart Home Forum Sign In

HOT WEARABLES APPLE WATCH SERIES 2 APPLE HOMEPOD FORERUNNER 935 FENIX 5S FITBIT ALTA HR WATCHOS 4

CONSUMER ELECTRONICS SHOW FEATURE

# The best wearable tech at CES 2017

CES 2017: The hottest connected self tech on show in Vegas this week

PC REVIEWS BEST PICKS HOW-TO NEWS TIPS BUSINESS

#iOS11 #E32017 #XboxOneX #AppleCar #FathersDayGifts

Reviews | Consumer Electronics | Wearables

# The Most Intriguing Wearabl Devices at CES 2017

*of CES 2017, we still saw a bunch that mad*

10 Comments

Men'sHealth SIX-PACK ABS FITNESS SEX STYLE SUBSCRIBE

GUY WISDOM | TECH

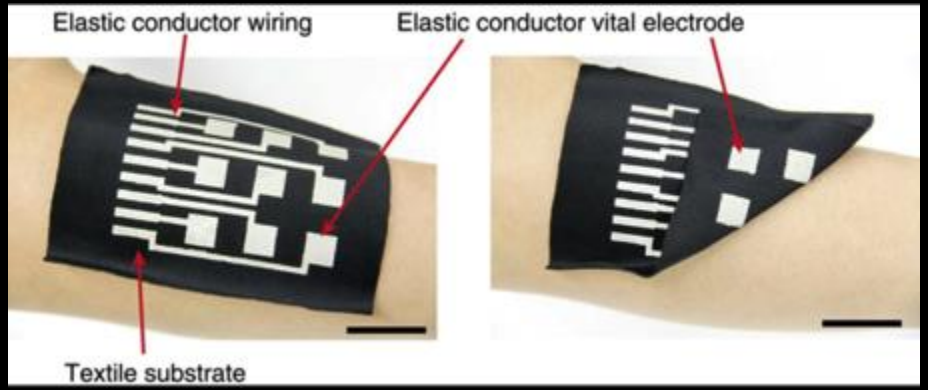
# The Best Wearable Fitness Tech We Saw At CES 2017

# Samsung's smart clothes are wearables you'd actually wear

2.8k
SHARES

Share on Facebook | Share on Twitter | +

WHAT'S THIS?


Elastic conductor wiring
Elastic conductor vital electrode
Textile substrate


US OPEN
US OPEN


FWD
THE POLO TECH SHIRT
[120 BPM]
ALGORITHMIC BIO-METRIC DATA ANALYSIS
COMPREHENSIVE BREATHING & HEART RATE TRACKING
ACCELEROMETER & GYROSCOPE FOR DIRECTIONAL DATA
LIVE STREAMING TO iPHONE OR iPAD

OCTOBER 14, 2015

# NIKE'S MANUFACTURING REVOLUTION ACCELERATED BY NEW PARTNERSHIP WITH FLEX

NIKE, Inc. announced today a partnership with Flex (Nasdaq: FLEX), a world-class global manufacturer, to accelerate NIKE's vision to bring advanced innovation to its manufacturing supply chain. Working together, NIKE and Flex will deliver footwear innovation that enables product to reach consumers more quickly, with customized solutions and increased performance innovation.

NIKE has been actively developing new technologies to enhance its manufacturing business model for the past few years with investments in automation, modernization, sustainability and innovative new methods of manufacturing such as Flyknit. The partnership with Flex advances

# THE BEZOS EMPIRE

## amazon

- Alexa
- KIVA Systems
- audible
- twitch
- IMDb
- twilio
- WHOLE FOODS
- ELEMENTAL
- Songza
- Zappos
- goodreads
- Livingsocial

## BEZOS EXPEDITIONS

- workday.
- rethink robotics.
- Lookout
- generalfusion
- Basecamp
- GRAIL
- stackoverflow
- DOMO
- BUSINESS INSIDER
- JUNO THERAPEUTICS
- Remitly

Acquisitions Investments

## BLUE ORIGIN

## The Washington Post

Nash Holdings LLC

# amazon | KEY ACQUISITIONS IN BILLIONS

● CASH ● STOCK U UNDISCLOSED

| | | |
|---|---|---|
| 2017 | Whole Foods | $13.70 ● |
| 2009 | Zappos | $1.20 ● |
| 2014 | Twitch | $0.97 ● |
| 2012 | Kiva Systems | $0.78 ● |
| 2017 | Souq.com | $0.65 U |
| 2010 | Quidsi | $0.55 ● ● |
| 2015 | Elemental Tech | $0.50 ● |
| 2015 | Annapurna Labs | $0.37 U |
| 2008 | Audible | $0.30 ● |
| 1999 | Alexa | $0.25 ● |
| 2013 | Goodreads | $0.15 U |
| 2010 | Woot | $0.11 ● |
| 1999 | Accept.com | $0.10 U |
| 1998 | IMDB | $0.06 ● ● |

WHOLE FOODS MARKET

At $13.7B in cash, Whole Foods is Amazon's boldest acquisition yet. The move signals Amazon's ambition, which is to become a transcendent brand that touches many aspects of daily life.

amazonrobotics

Kiva Systems became Amazon Robotics, a subsidiary that manufactures mobile robotic fulfillment systems for Amazon's array of warehouses.

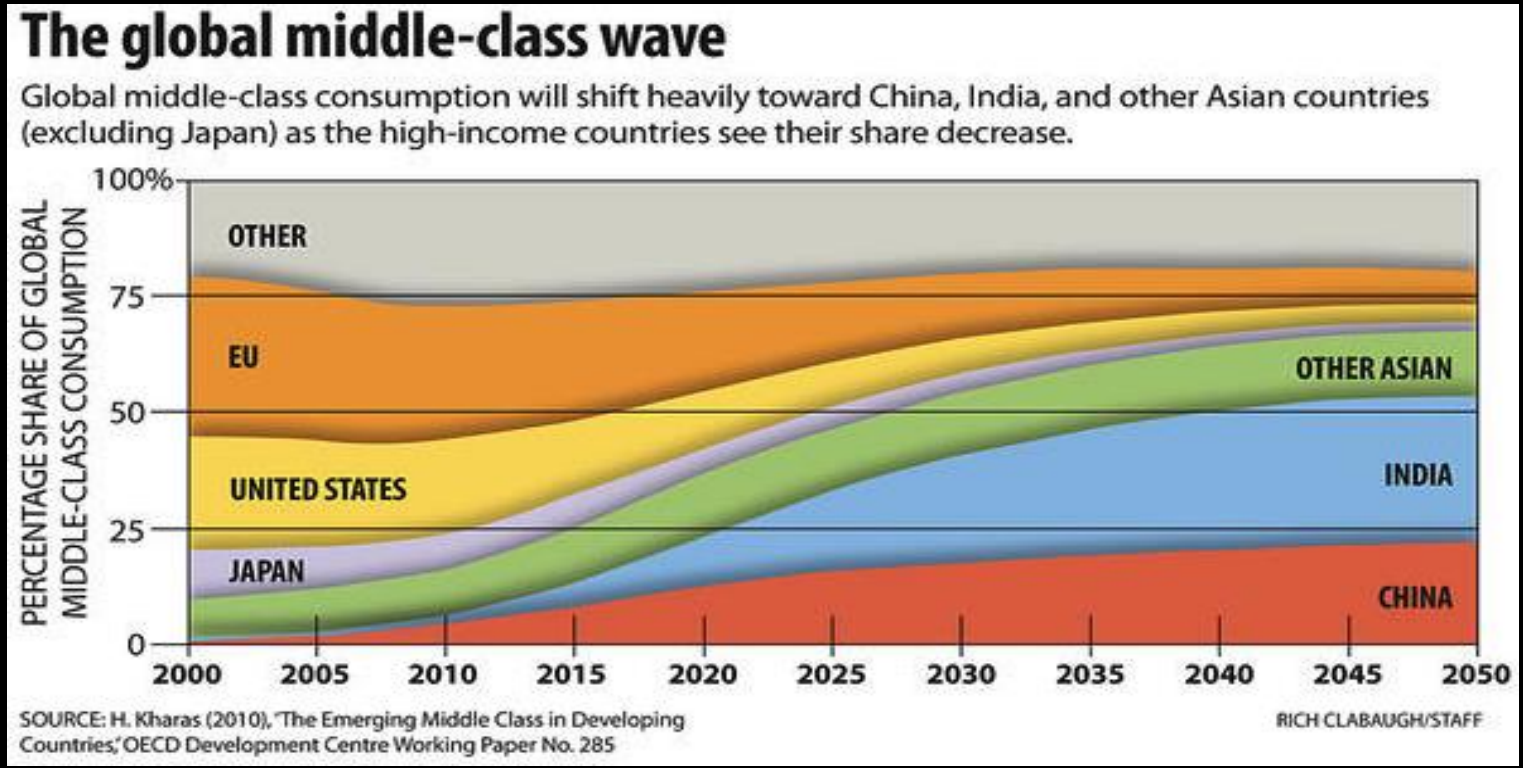
# NASH HOLDINGS LLC | KEY ACQUISITIONS IN BILLIONS

| | | |
|---|---|---|
| 2013 | Washington Post | $0.25 |

The Washington Post

In 2013, Bezos locked up one of the world's most trusted publishers for $250 million, and has big plans to redefine the company through the use of technology.

Reengineering the Global Supply Chain for the 21st Century




The new Global urban consumer


12
1
2
3
4
5
6
7
8
9
10
11
±0


StarTAC
MOTOROLA


10:09
Tuesday, Sep 9

# HOW DO WE SEE THE FUTURE…

# The Manufacturer of the future…

Founded 2003, 1st car 2008
Market cap US$62B

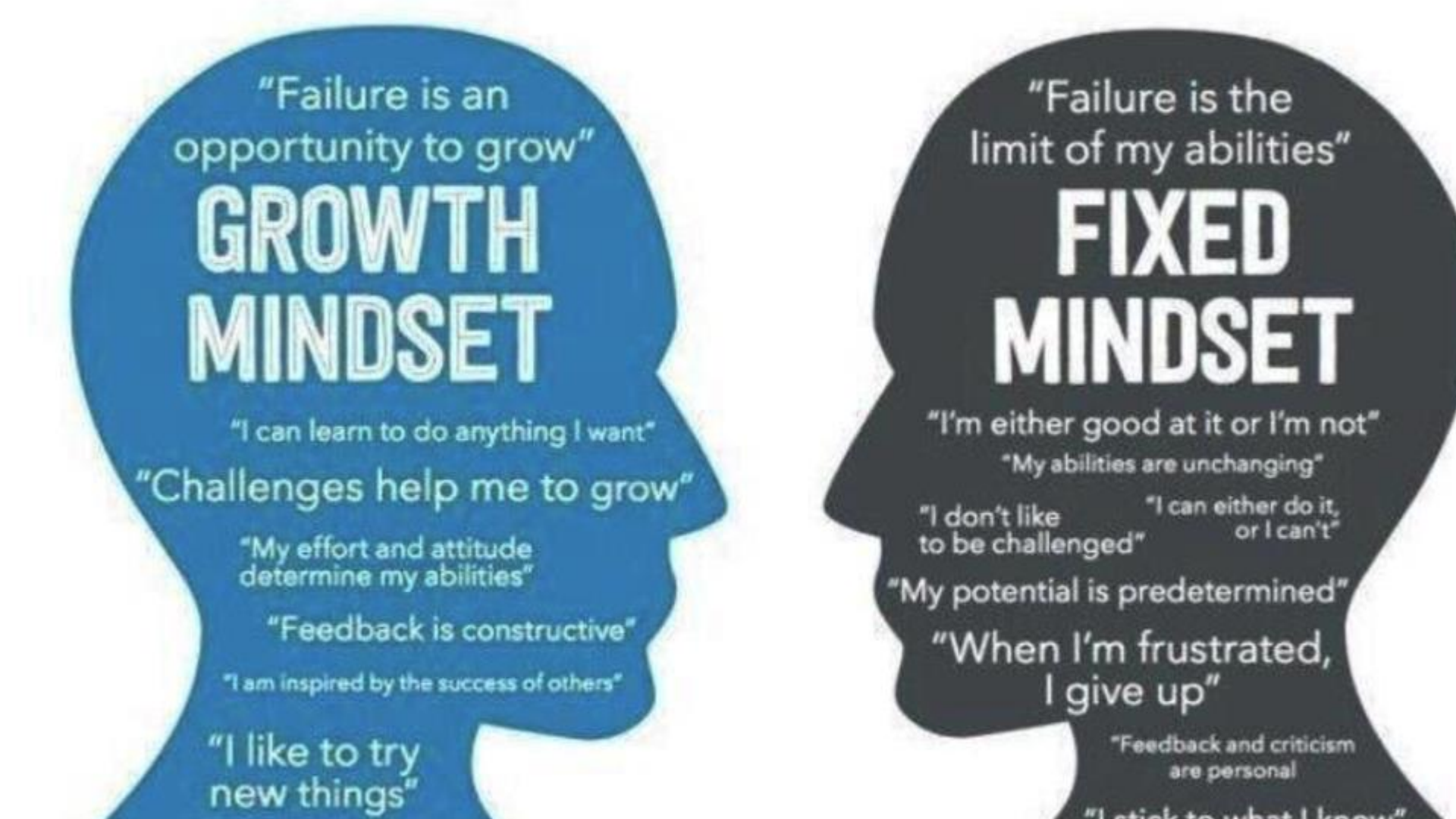
Founded 1916
Market Cap US$54B

# The future feels… 未来令人…

Exciting
兴奋

Challenging
挑战

Frightening
恐惧


"Failure is an opportunity to grow"
GROWTH MINDSET
"I can learn to do anything I want"
"Challenges help me to grow"
"My effort and attitude determine my abilities"
"Feedback is constructive"
"I am inspired by the success of others"
"I like to try new things"
"Failure is the limit of my abilities"
FIXED MINDSET
"I'm either good at it or I'm not"
"My abilities are unchanging"
"I don't like to be challenged"
"I can either do it, or I can't"
"My potential is predetermined"
"When I'm frustrated, I give up"
"Feedback and criticism are personal"

## It is about changing the culture

**Optimist**

The glass is half full!

**Pessimist**

The glass is half empty!

**Lean Thinker**

Why is this glass twice as big as it should be?

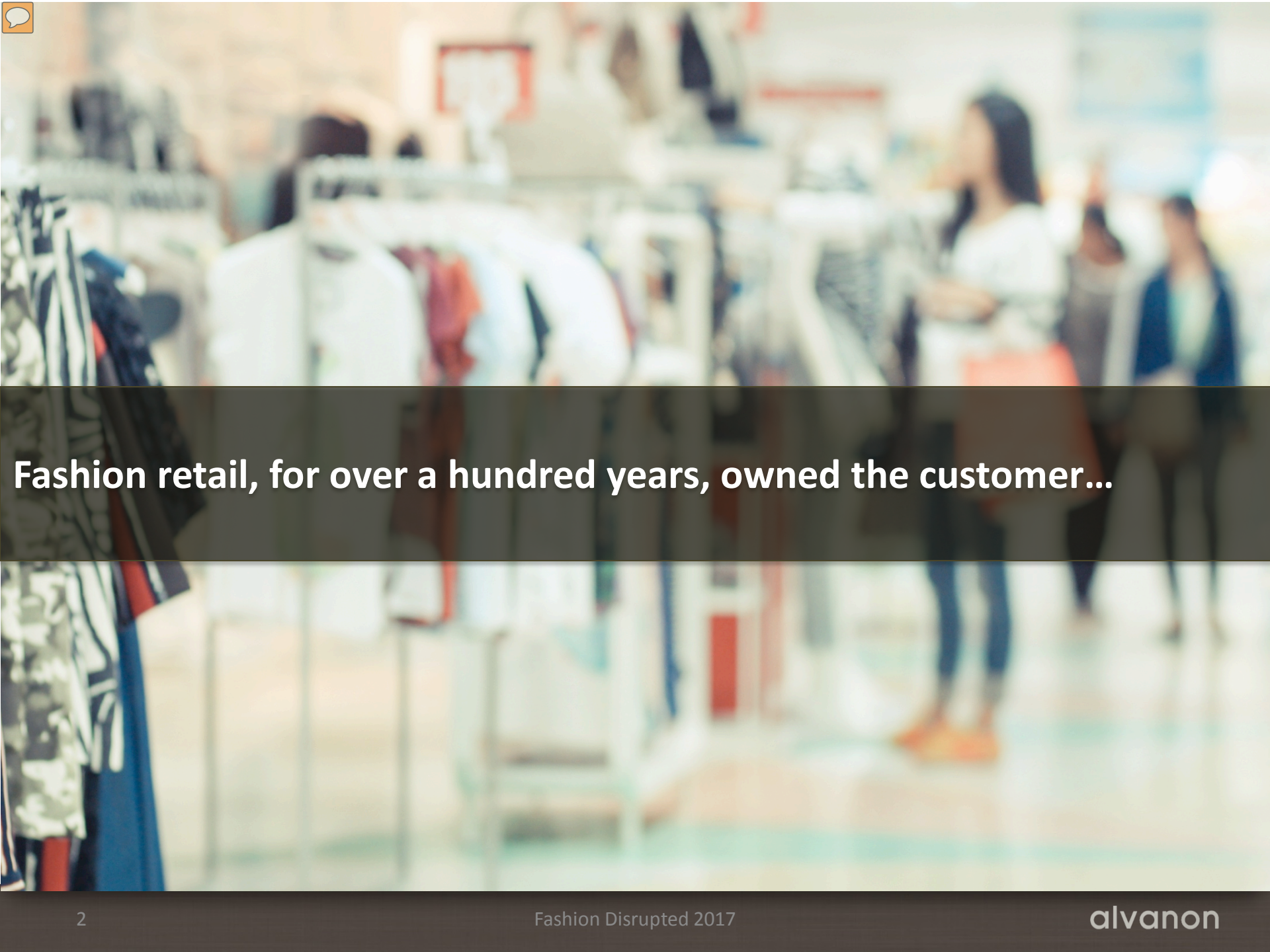
edwinkeh@hkrita.com

香港紡織及成衣研發中心

The Hong Kong Research Institute of Textiles and Apparel

# Fashion Disrupted

***How Technology, Innovation, Consumers & Politics are changing the future of fashion***

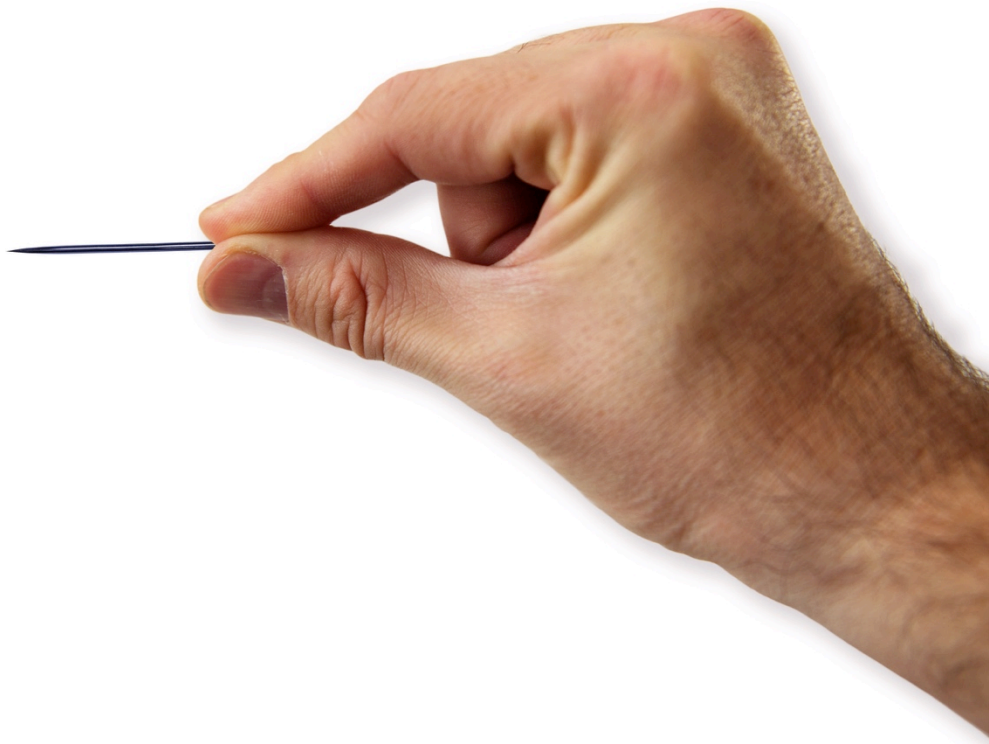


## Fashion retail, for over a hundred years, owned the customer…

# Not anymore…

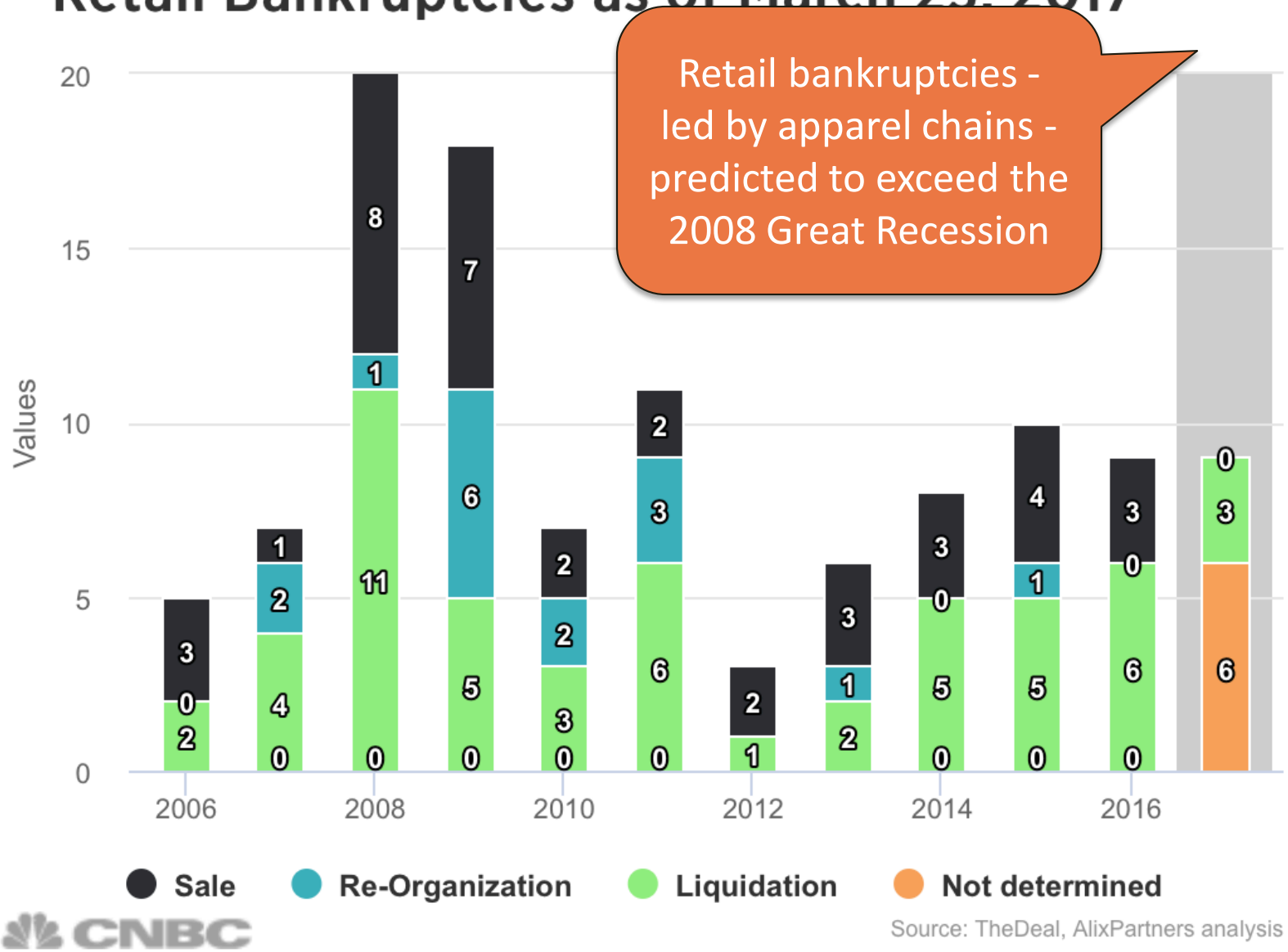
In 2007, the iPhone was introduced and (unrelated) the world slipped into the largest financial crisis in 80 years.

Most retailers waited for “things to get back to normal”.

**But, ”normal” is not coming back...**

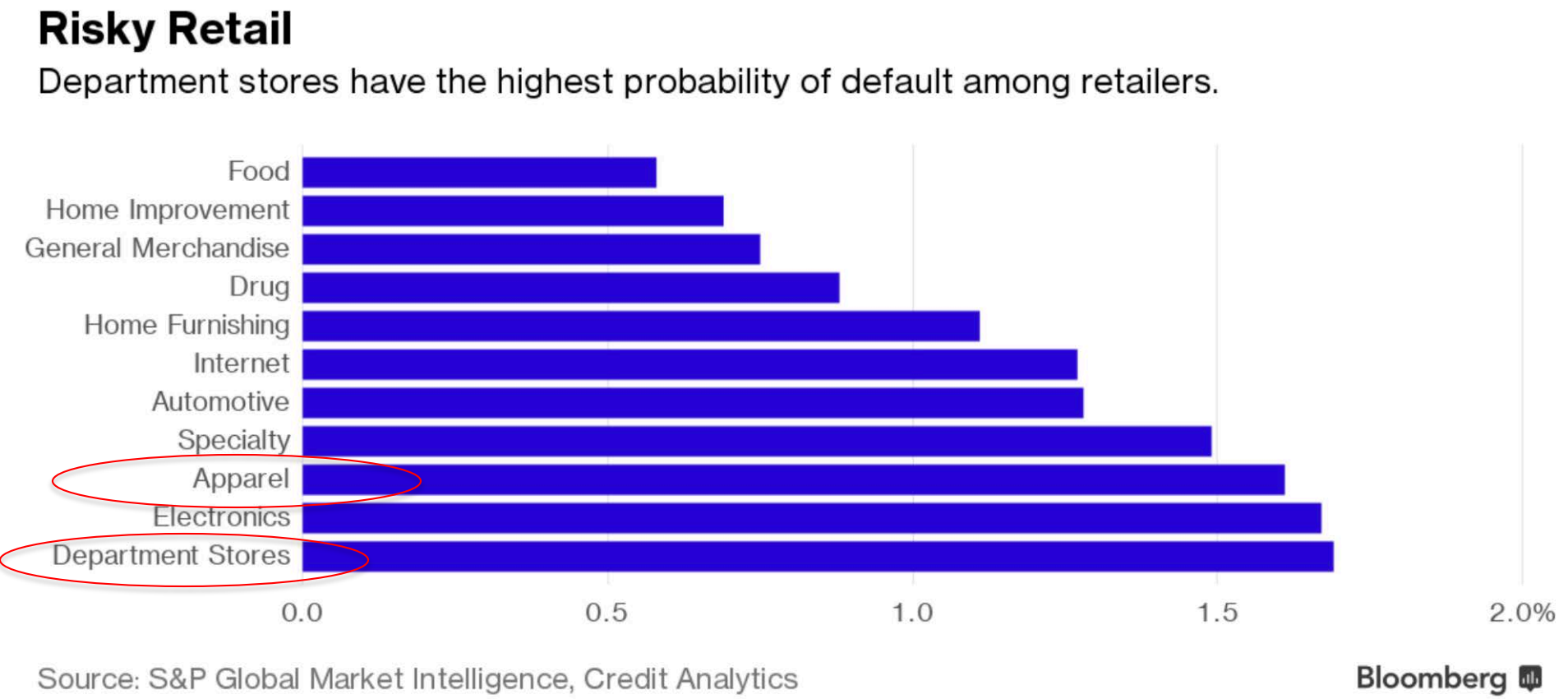
# Retail Bankruptcies as of March 23, 2017




CNBC

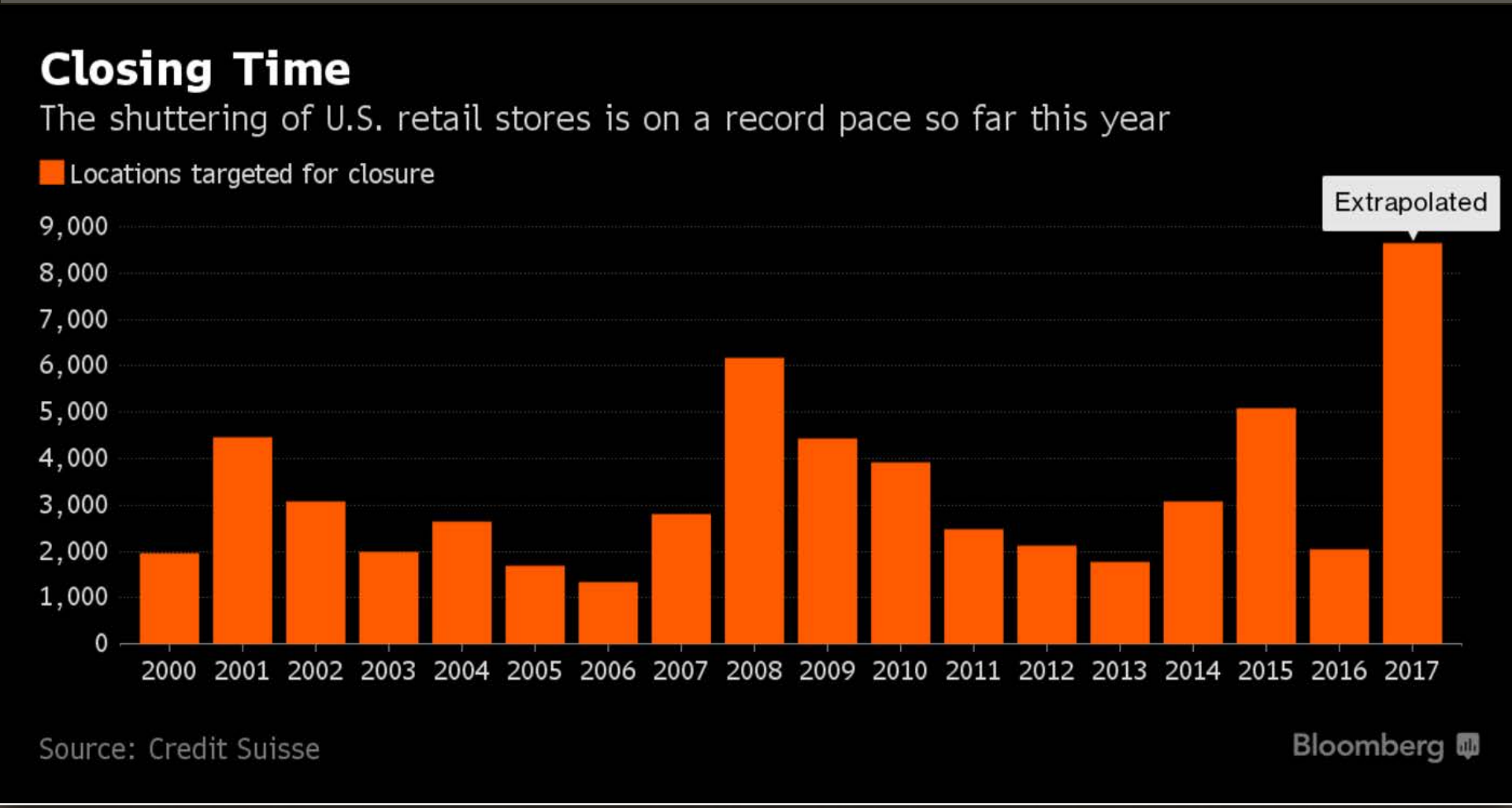
Source: TheDeal, AlixPartners analysis

# If you sell --- or make --- apparel or textiles, prepare to be disrupted…



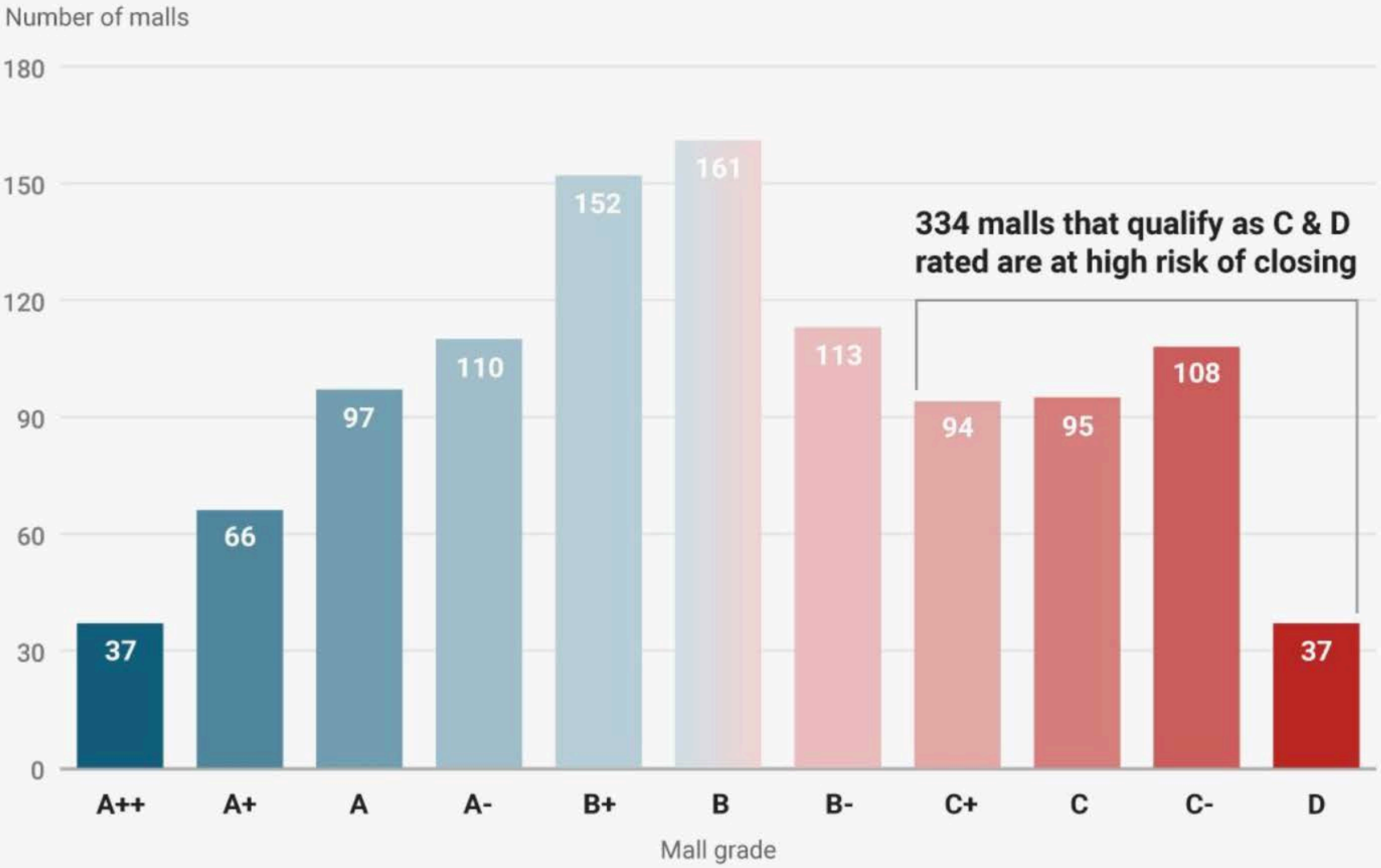
# We have too many stores, too many malls, and too little control or visibility of inventories

# Bloomberg projects over 8,600 retail store closings in 2017



# Declining mall traffic?…in many malls, *what traffic*?

# MALLS ACROSS AMERICA ARE AT RISK OF CLOSING




**SOURCE:** Green Street Advisors

BUSINESS INSIDER

# *RETAIL STOCKS IN RETREAT*

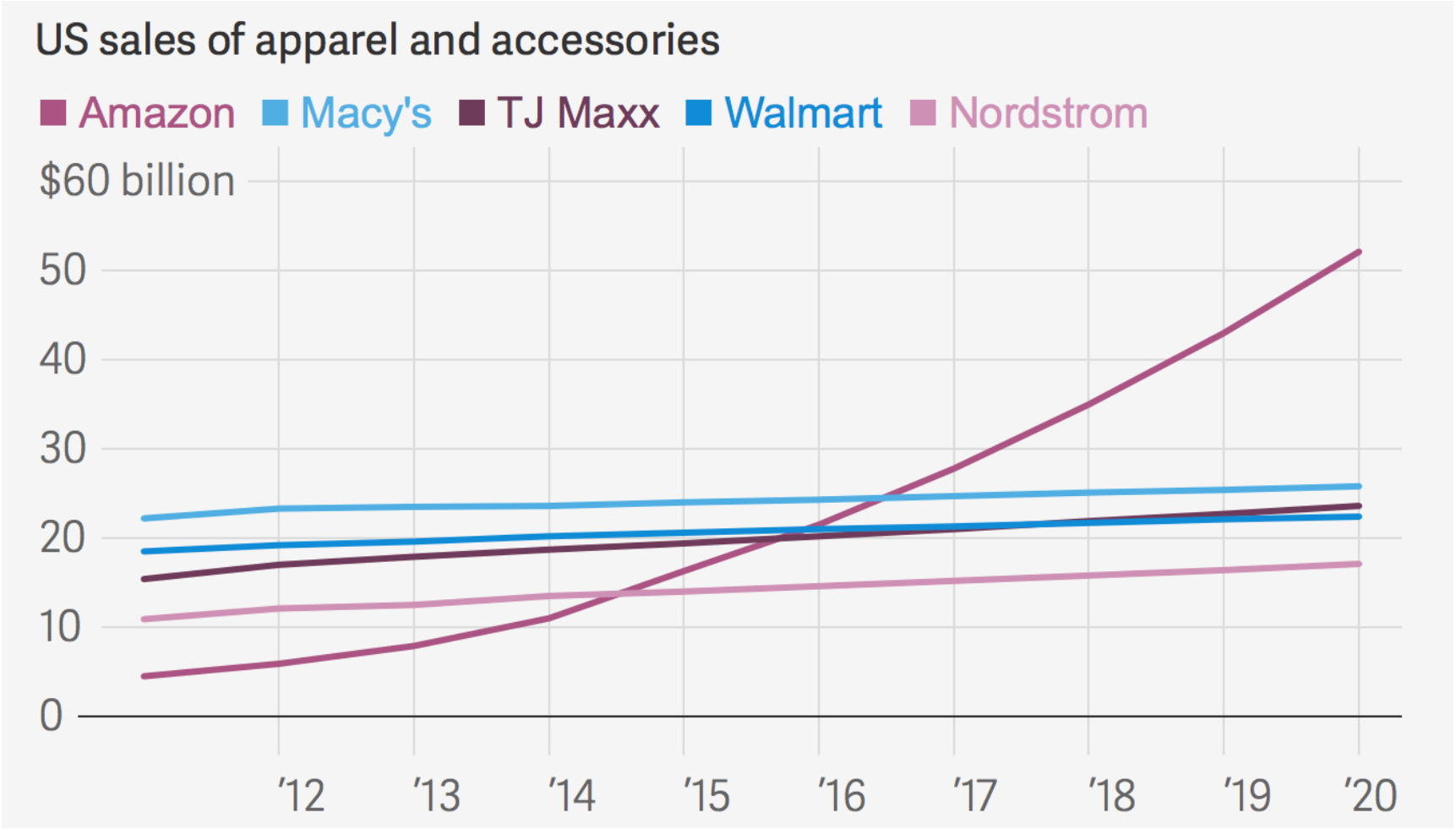
***WWD August 22, 2017***

S&P 500 YTD gains:
+24.14%

S&P Apparel/retail subset:
-17%

# Threat or opportunity? …..*either way significant disruption*

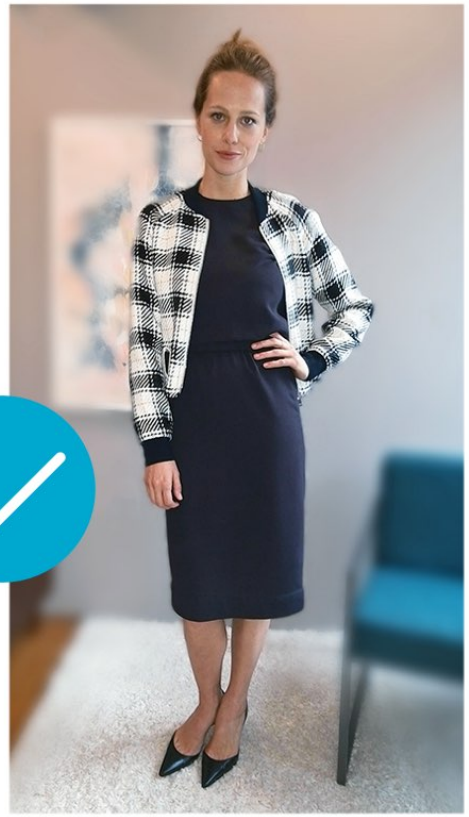
# Amazon is now the largest US apparel retailer




Source: Cowen & Co.

echo look


Machine learning and AI will let Amazon know exactly what to sell us.



64%

36%


And enough power and money to lose millions building share.

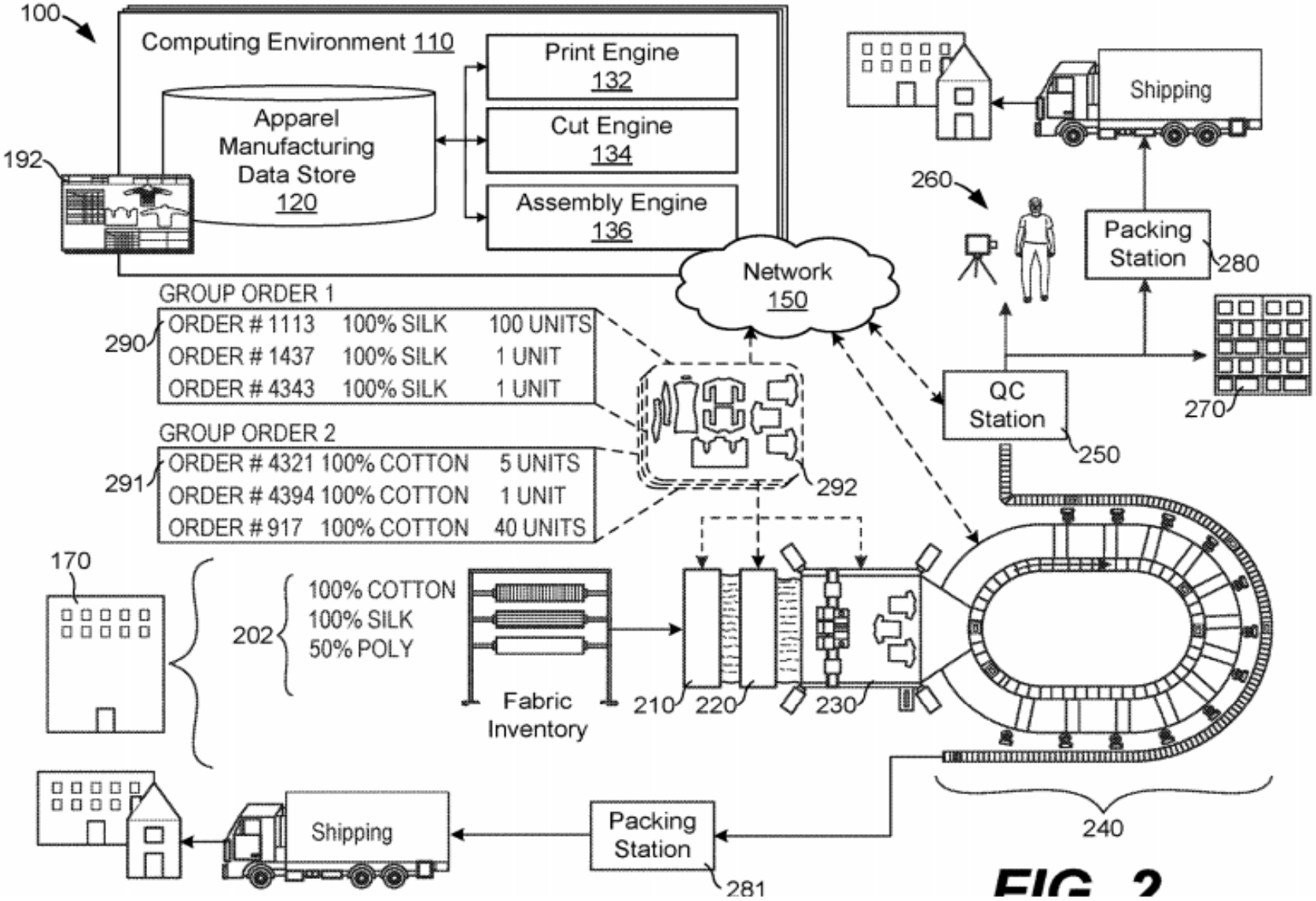



FIG. 2

*Two of the inventors named in the patent are Aaron Barnet and Nancy Liang, co-founders of the 3-D printing startup Mixee Labs, who went to work at Amazon in 2015.*


# Newness & scarcity: Zara delivers up to 20 new collections in up to 40 new deliveries per year

# What's really threatening retail is not Amazon or Zara…

It's

- Sameness
- Indecisiveness and risk-aversion
- Over-promotion and discounting
- Over-storing for the sake of short-term growth
- Lack of personalized service

# The takeaway: TRANSFORM OR DIE


Besides newly empowered consumers, we have an increasingly unpredictable, volatile global political climate

# We don’t know what we don’t know yet…

- Trade policy by executive order?
- Renegotiation of NAFTA?
- Tax reform?
- TPP without us?
- Brexit/TTIP?
- Raw material & labor costs?
- Regulatory uncertainty?

# The takeaway: GET POLITICALLY ACTIVE


**The largest generation in history, now representing almost half of all retail spending…**

# The real sustainability conundrum….

Less than 4 percent of every dollar is now spent on buying apparel, half of what it was 10 years ago

According to a Fung and First Insights study, on average today, consumers are willing to pay only 76% of full price (MSRP).

**THE 'GOOD' NEWS?**

**We are well into the age of data and advanced analytics…**

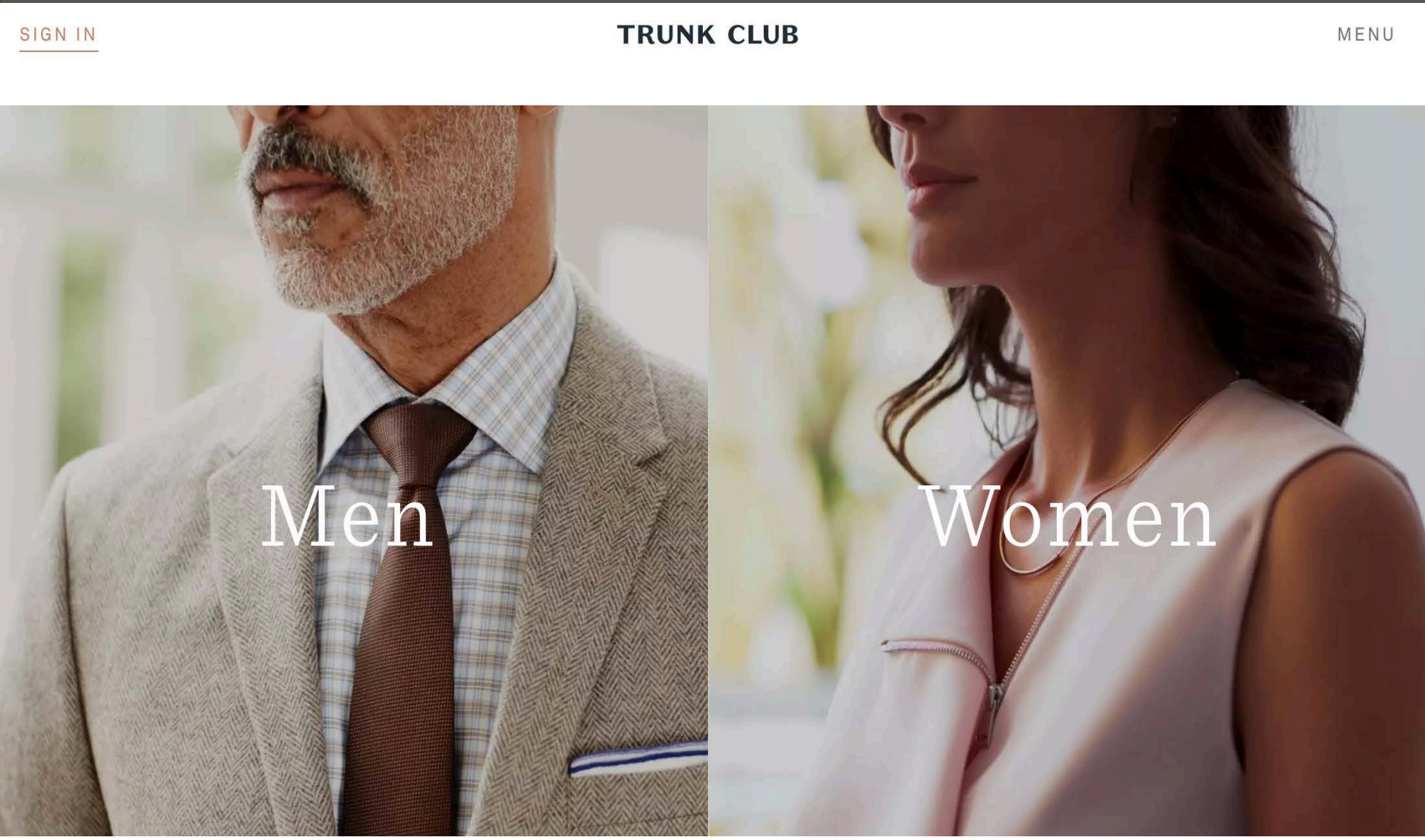
- ***Descriptive analytics***
- ***Predictive analytics***
- ***Prescriptive analytics***



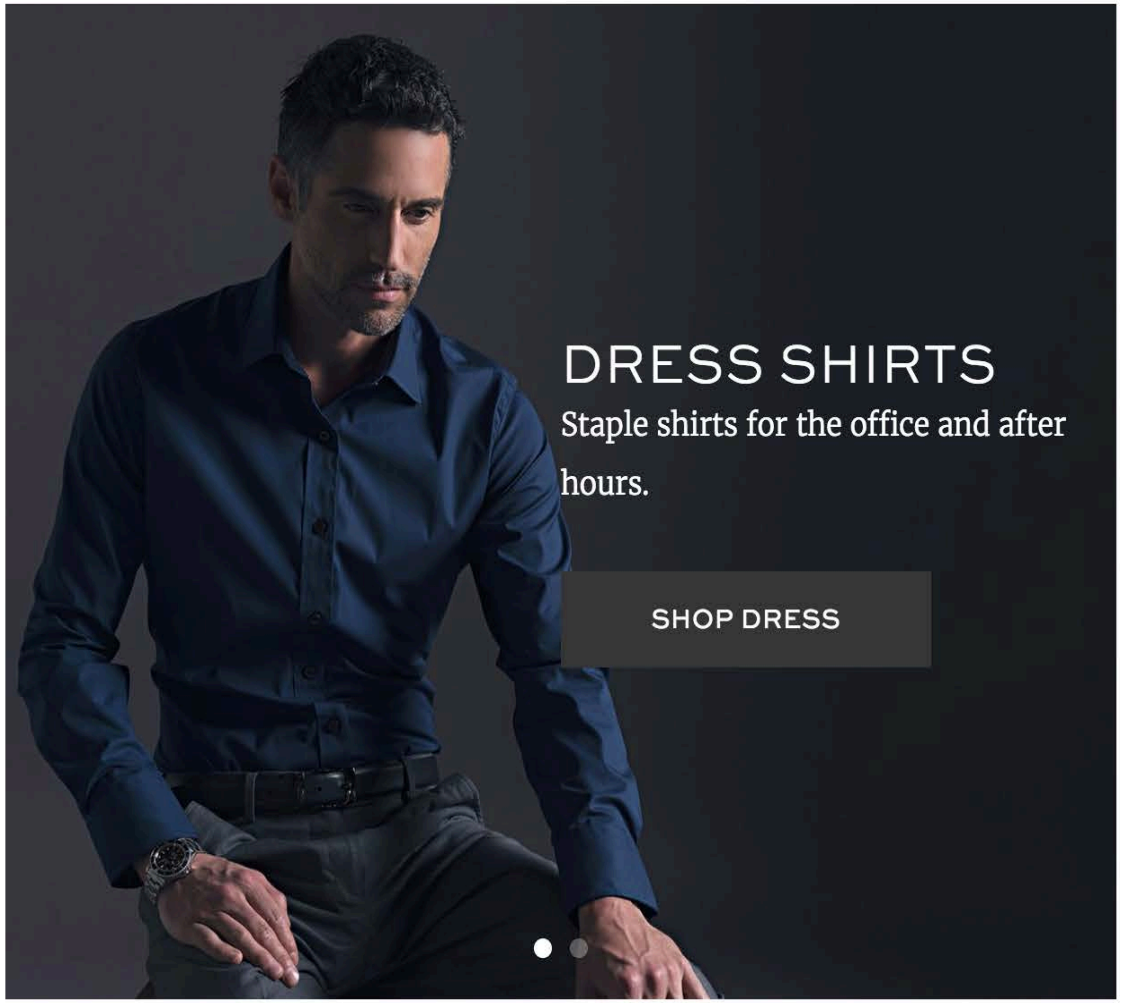
**They know more about us than we do….**

The new winners will leverage data, innovation and technology to continuously engage customers

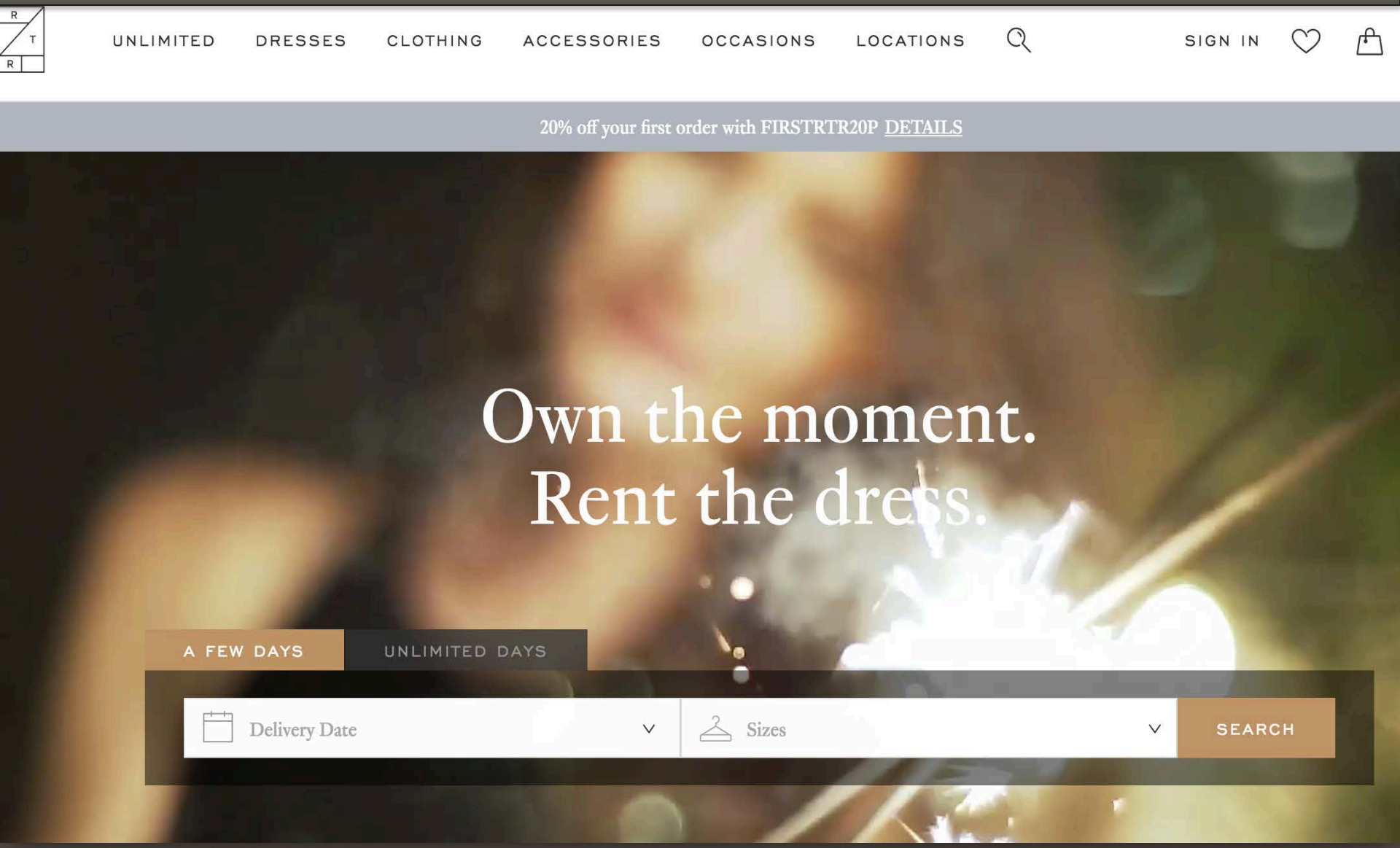
# Intimate personalization…combined with ‘subscription retail’

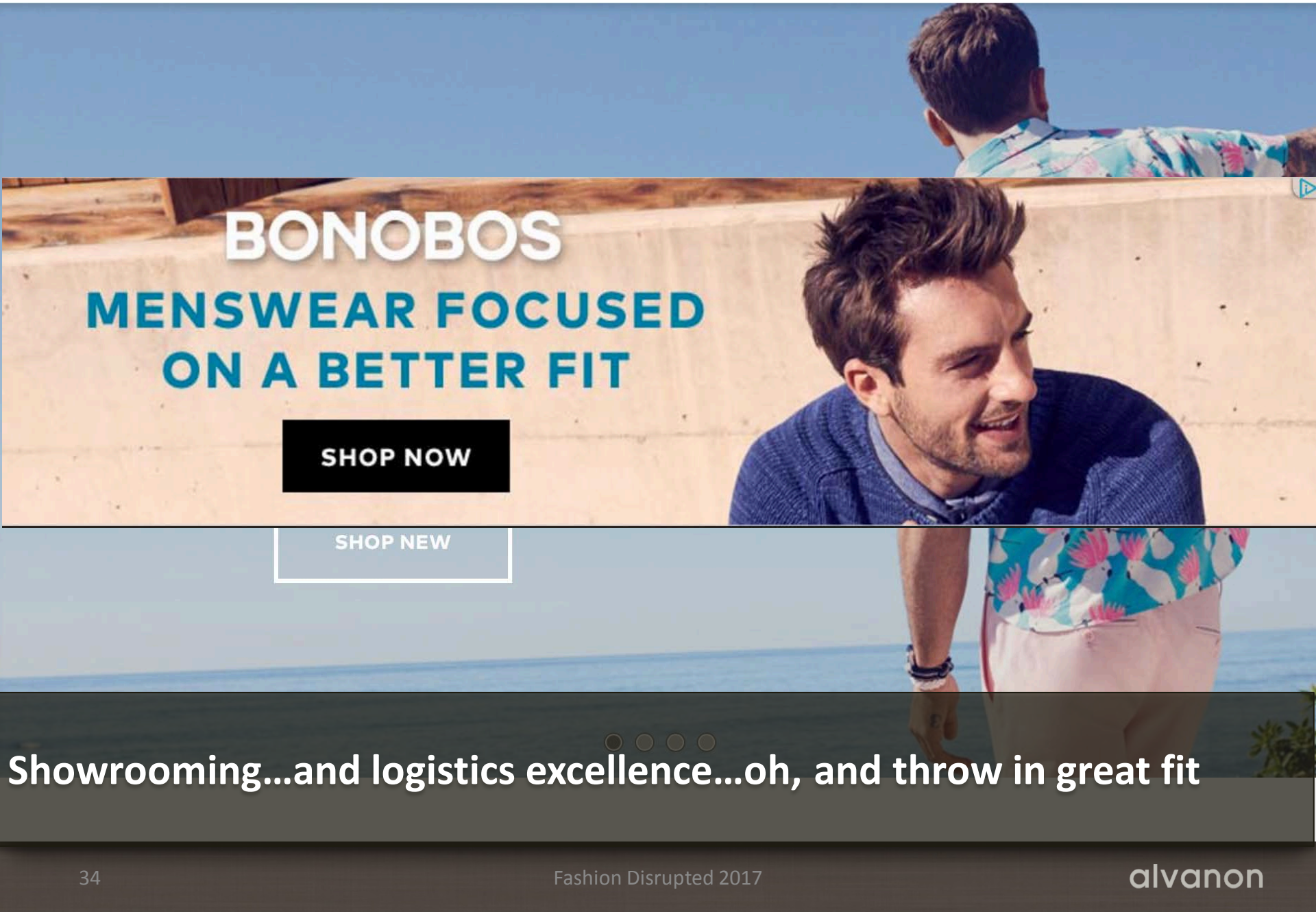


# Customization…perfect fit…& speed!



# Rent instead if buy…sustainable? Fashionable? Or, both?



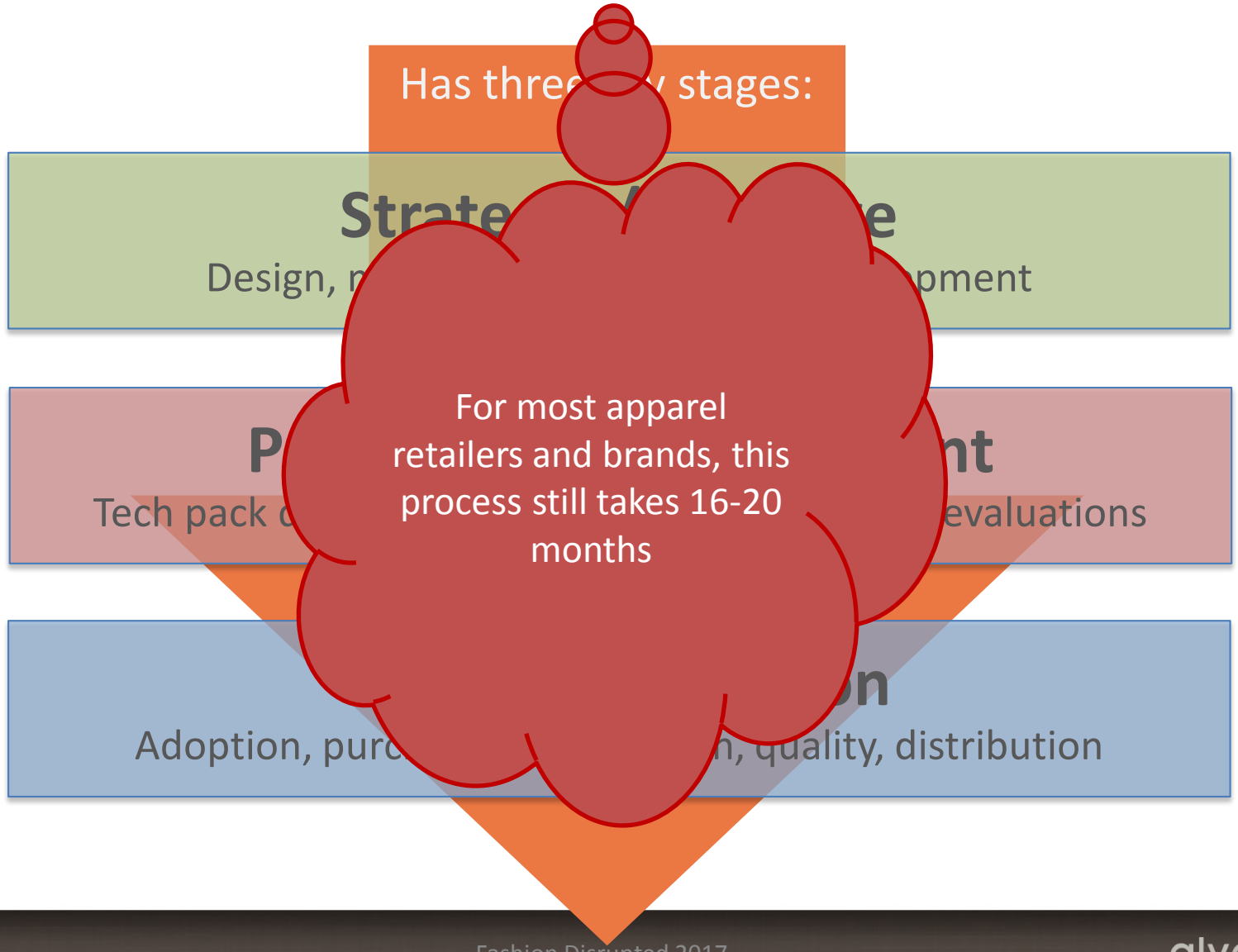



**Showrooming…and logistics excellence…oh, and throw in great fit**

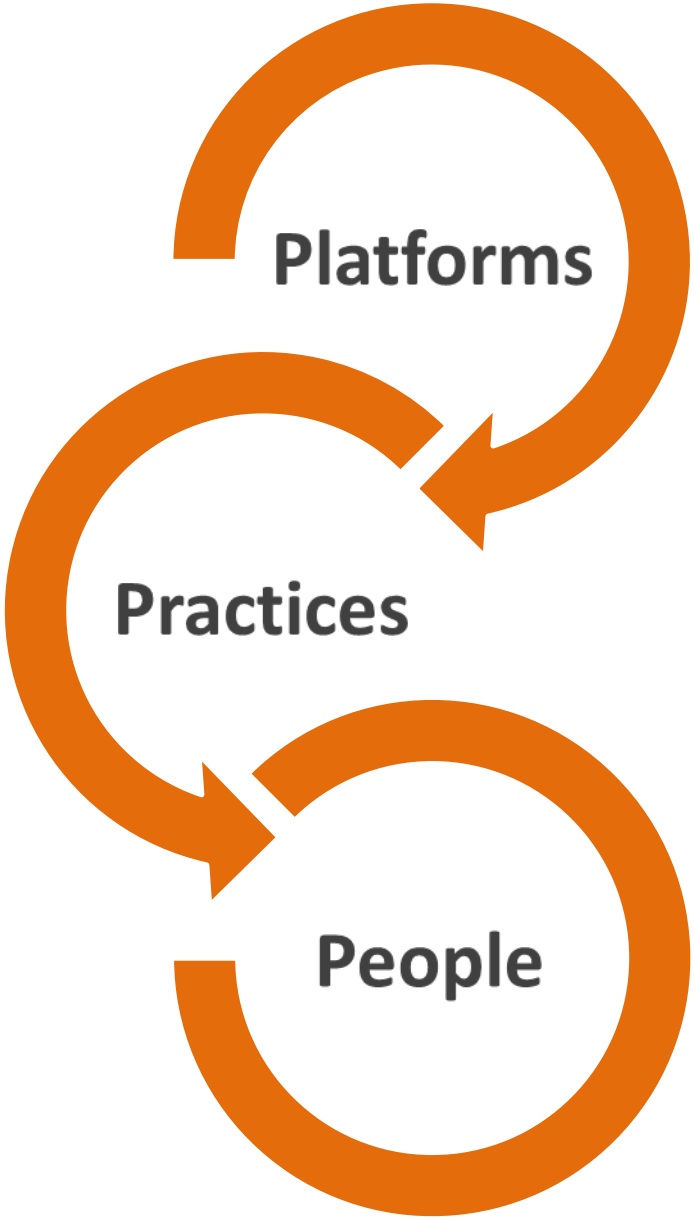
# The takeaway: ANTICIPATE, PREDICT, CUSTOMIZE

**Start by blowing up the traditional product development process!**

# A typical product development process…



In re-thinking the product development process…you should focus on three major areas:



# Embrace 3D in Design, Planning, Development, and Selling


3D is already transforming how truly innovative brands design, develop, buy and sell product and is radically improving:

> Accuracy

> Consistency

> Speed

# Virtual prototyping and line planning are cutting the time from design to delivery from months to days

BROWZWEAR

optitex
software that fits

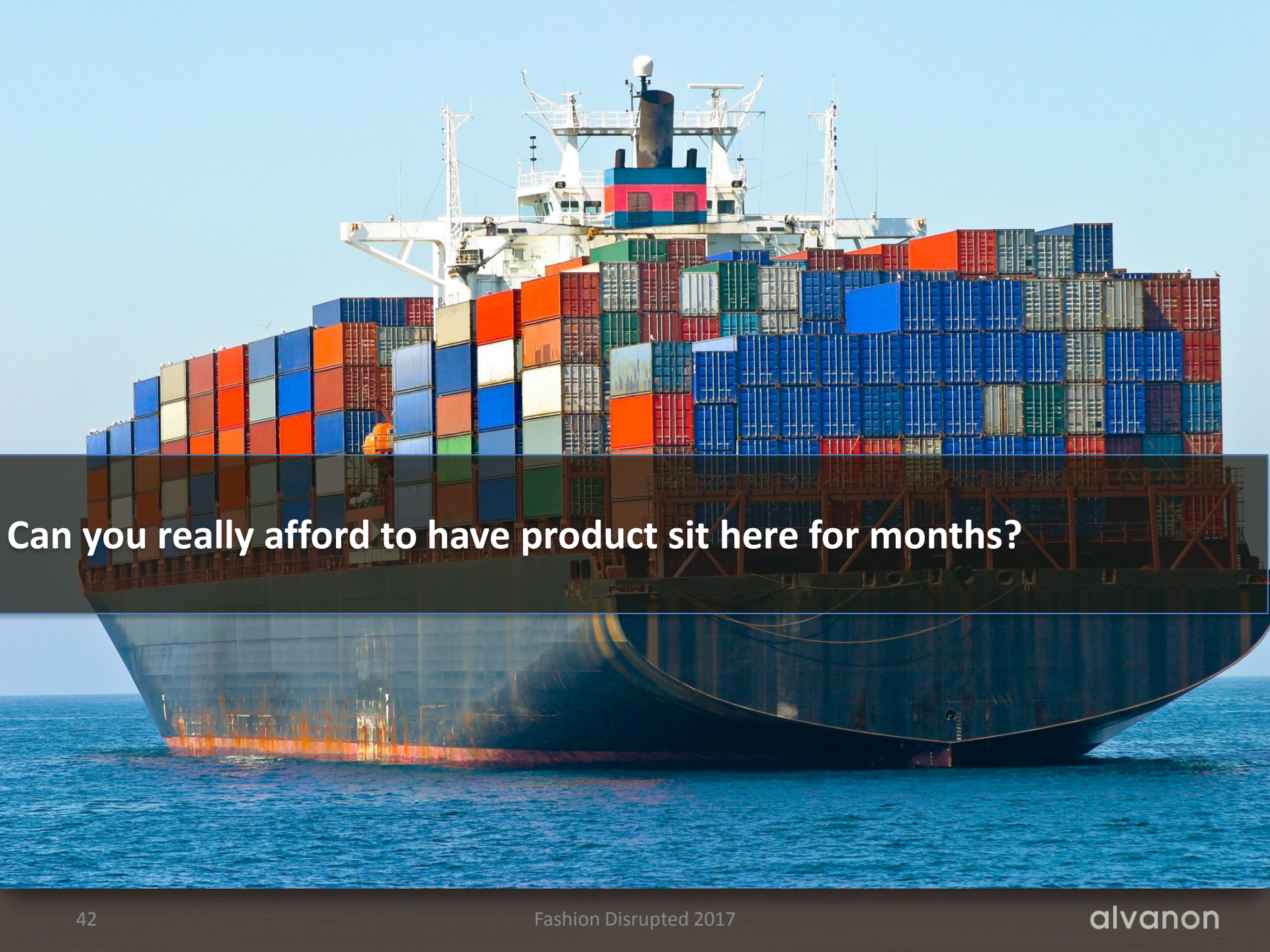
CLO 3D

GERBER
TECHNOLOGY

Lectra

assyst


Supply chains must be shortened…


Can you really afford to have product sit here for months?

# Combining speed, customization and localization...*adidas Speedfactory*

# and Under Armour's 'Lighthouse'


# What about the future?

alvanon

# Thank you.

**Ed Gribbin**
ed.gribbin@alvanon.com

**FIT IS OUR FOUNDATION**

www.alvanon.com

EUROMONITOR INTERNATIONAL

# SHOPPING FOR FASHION: A GLOBAL OVERVIEW

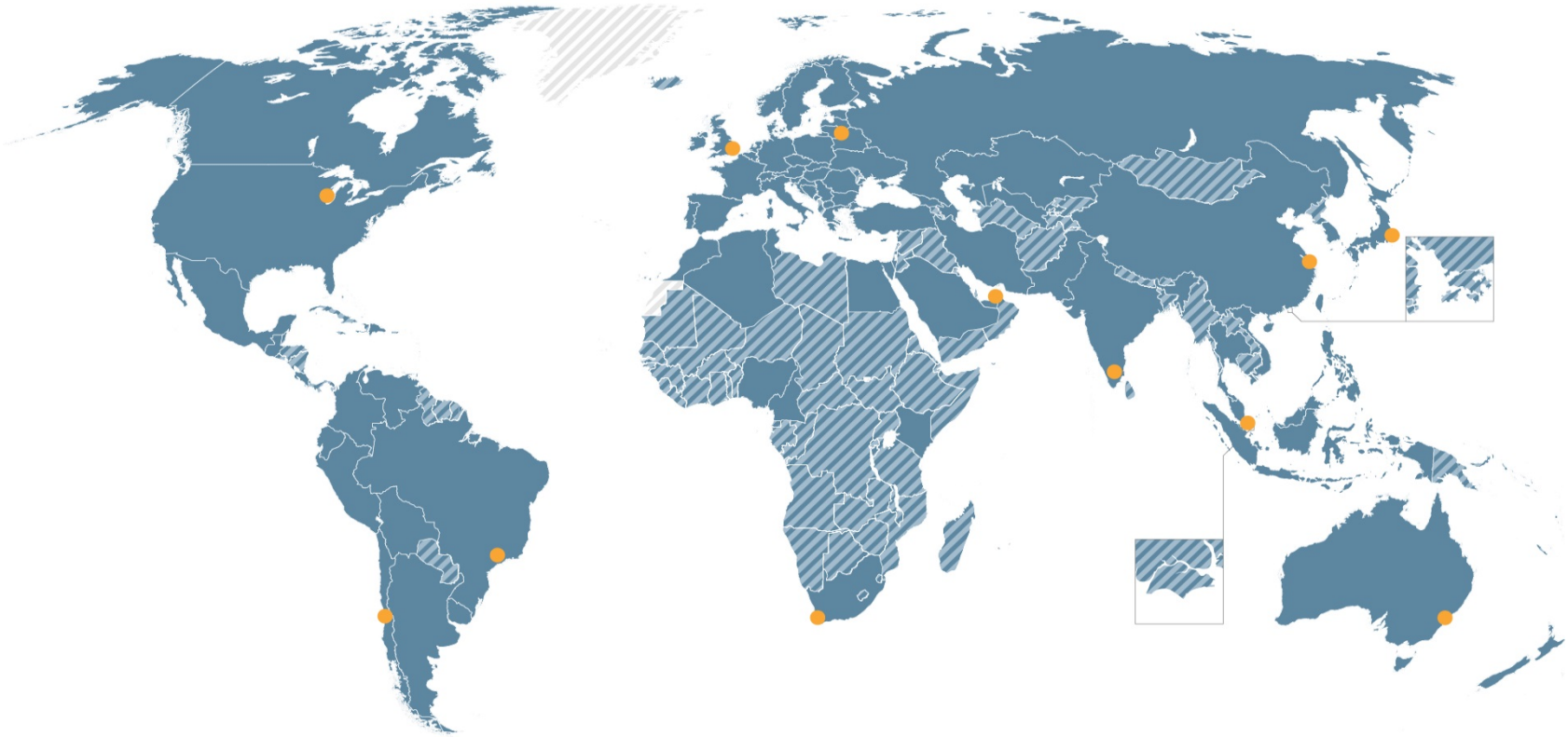
## ITMF ANNUAL CONFERENCE 2017

3RD GENERAL SESSION: RETAIL / E-COMMERCE

BALI, INDONESIA, SEPTEMBER 2017

ITMF

# Euromonitor International



**12 OFFICE LOCATIONS**
London, Chicago, Singapore, Shanghai, Vilnius, Santiago, Dubai, Cape Town, Tokyo, Sydney, Bangalore, and São Paulo

**80 COUNTRIES**
in-depth analysis on consumer goods and service industries

**+ 210 COUNTRIES**
demographic, macro- and socio-economic data on consumers and economies



EUROMONITOR INTERNATIONAL

EUROMONITOR INTERNATIONAL

# Apparel Global Distribution

## Digitalisation & Physical Reinvention

## A Peak into the Future

## Implications for Textile Manufacturers


# 85%

Of global sales take place via store-based retailing

# 10

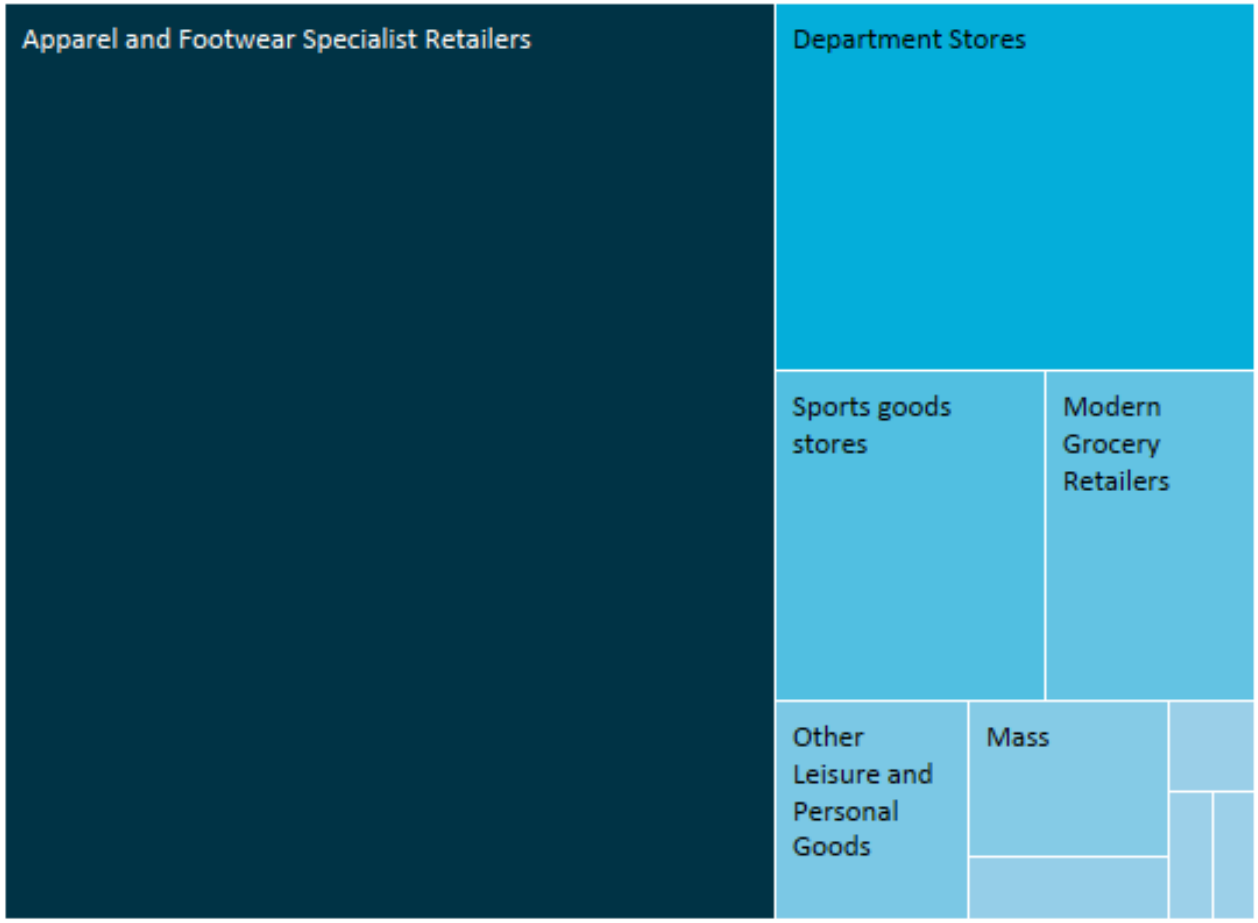
Percentage points less than in 2002

# Half

Of Internet Retailing sales are originated in Asia Pacific in 2016

# Specialists dominate store-based landscape…

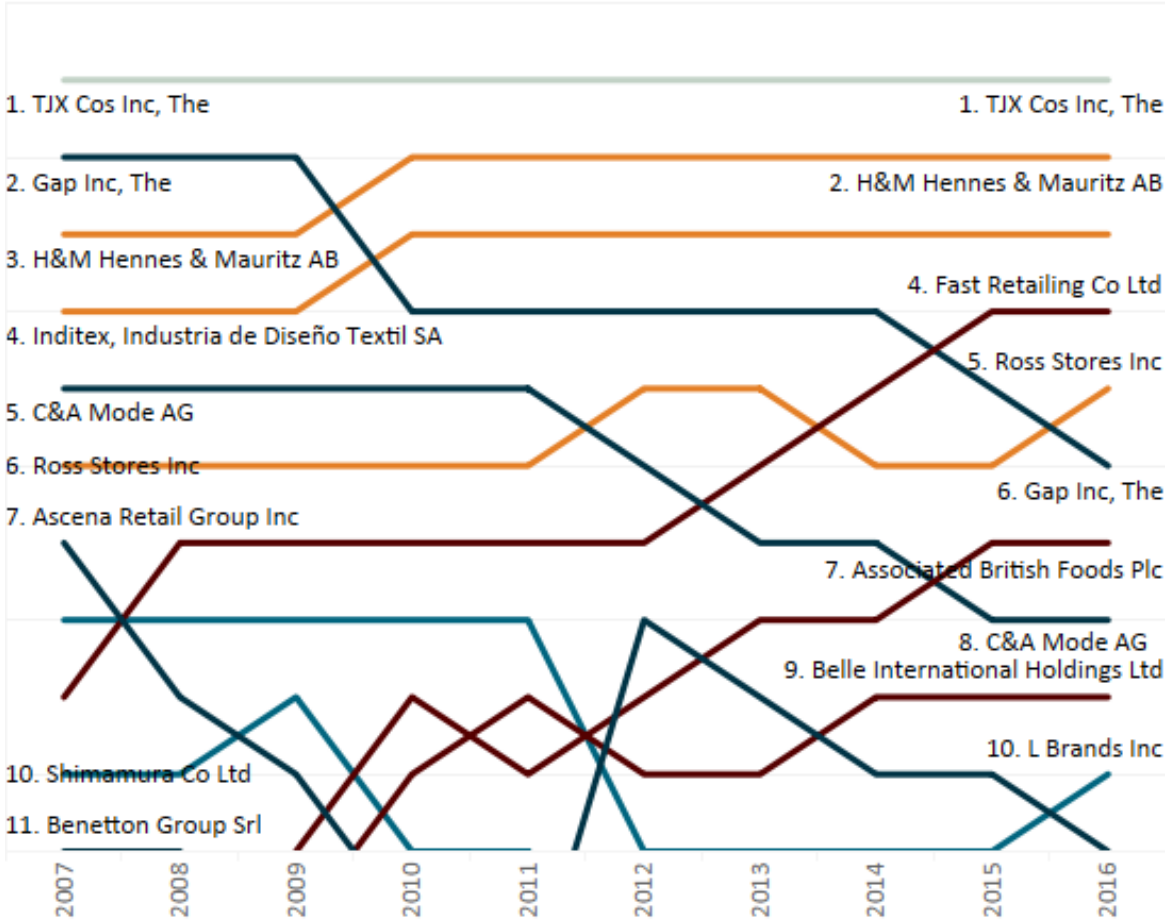
Apparel and Footwear by Store-Based Retailing 2016




Proportion of store-based retailing

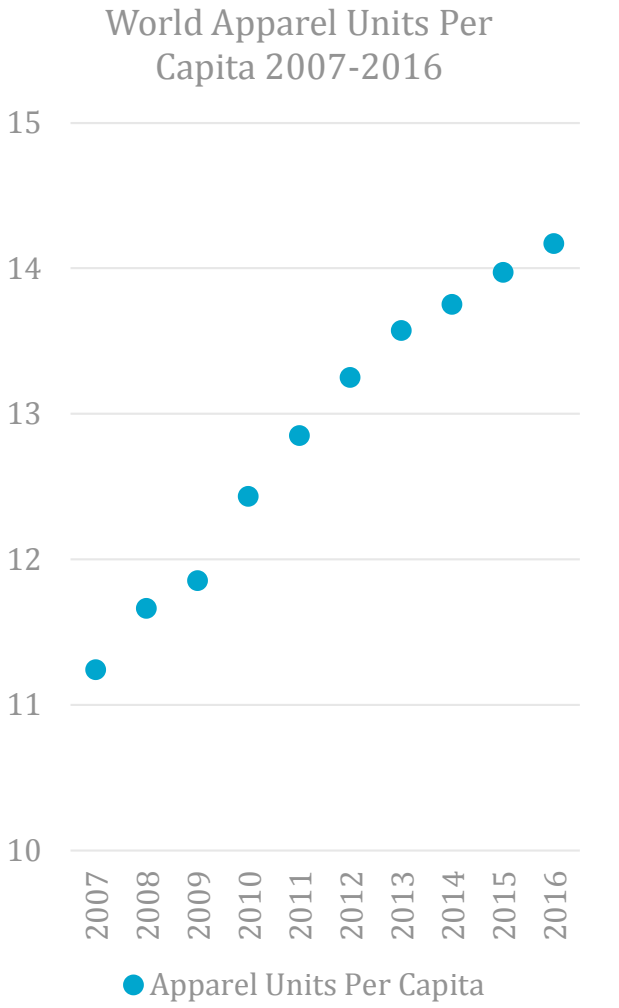
# Volume-based businesses lead the way

Global Apparel and Footwear Specialist Retailers Top Companies 2007-2016

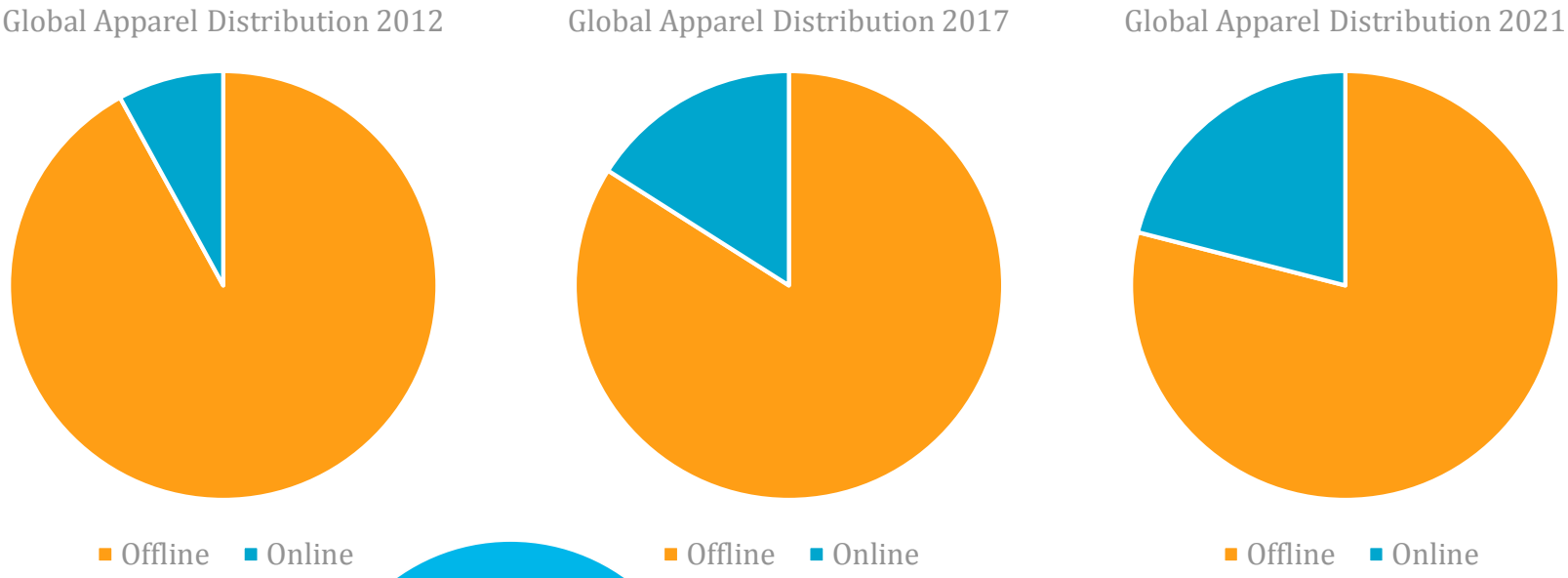



Source: Euromonitor International Ltd, Retailing 2017ed

# So what?: Lower prices and higher volumes

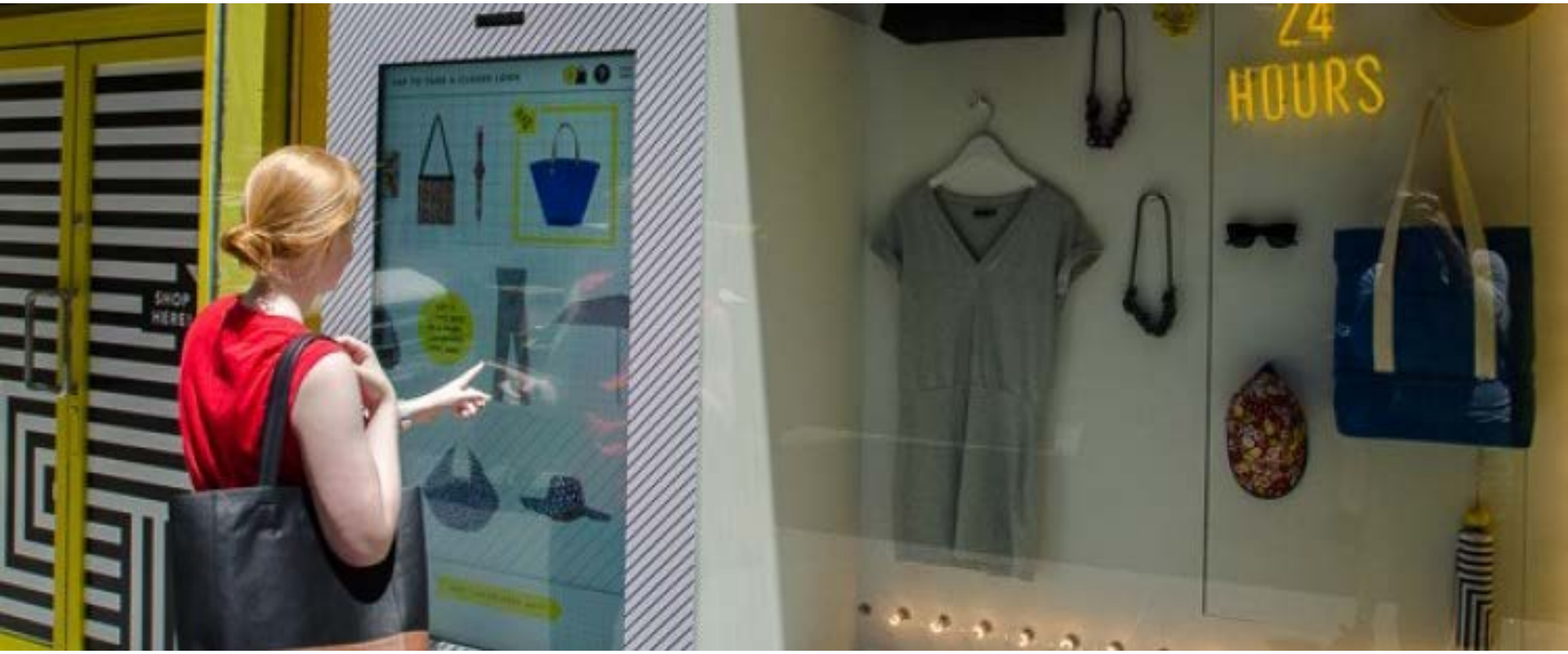



# Increasing Digitalisation…




# Pushes for Physical Reinvention

# A step beyond omnichannel



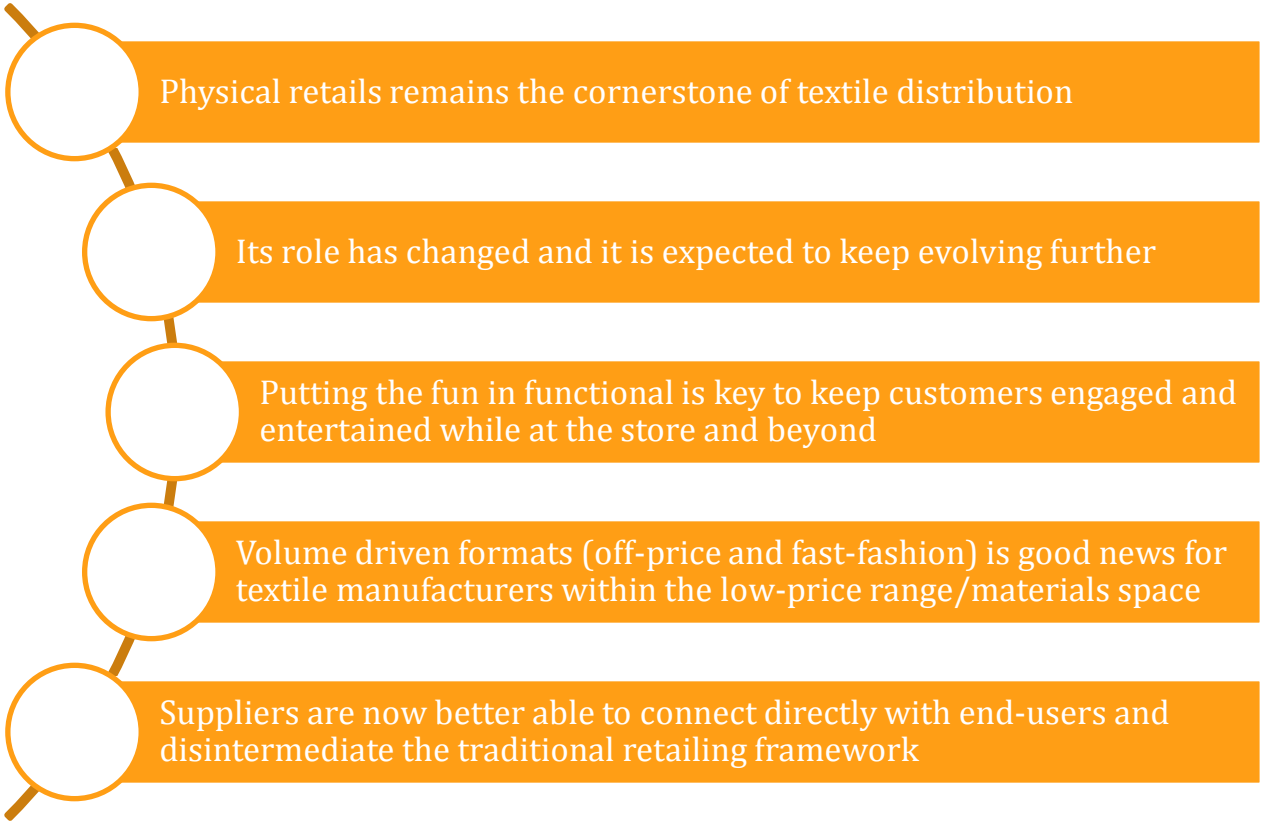

**Integration** **Experience** **Branding**

# **Integration:** Farfetch concept store

# **Experience:** House of Vans

# **Branding:** Adidas HomeCourt

# Implications and key takeaways



EUROMONITOR INTERNATIONAL

# THANK YOU FOR LISTENING

Jorge Martin | Head of Research

Jorge.Martin@euromonitor.com

Euromonitor International Ltd.

# How to develop the digital market

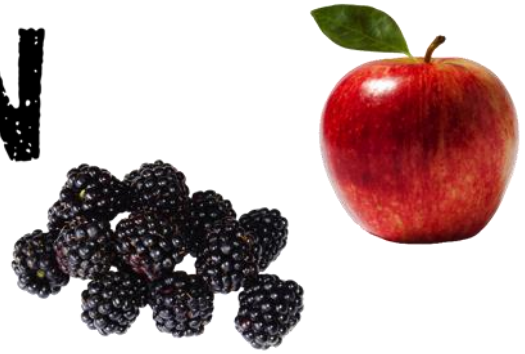
**Hartmut Molzahn – CEO / Co-Founder 88Spares Pte. Ltd.**

ITMF Annual Meeting Bali
16.09.2017

www.88spares.com

LIFE WAS MUCH EASIER WHEN AND WERE JUST

LIFE WAS MUCH EASIER WHEN AND WERE JUST FRUITS

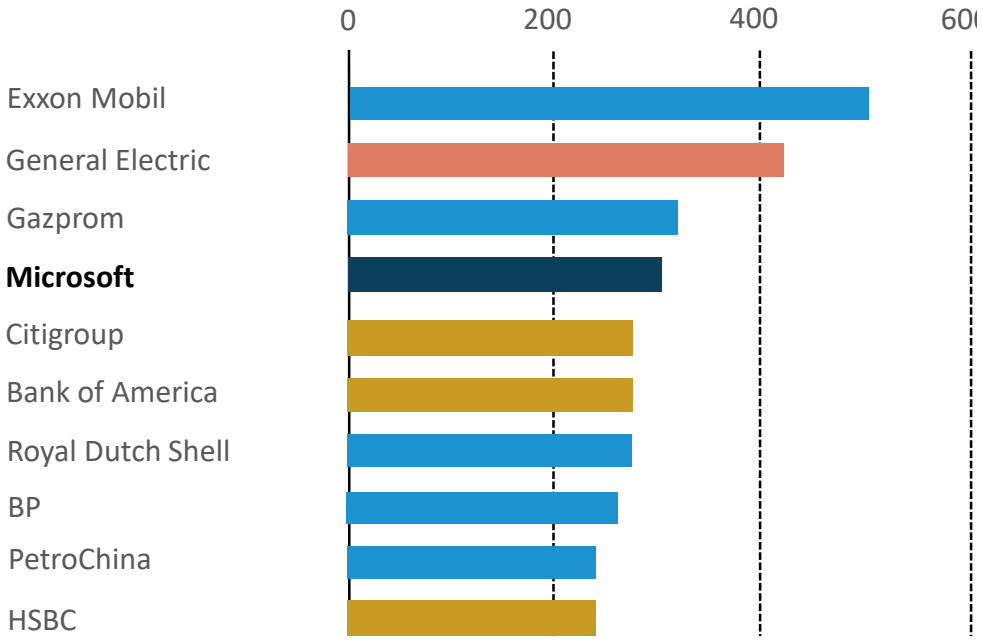


# A virtually new world

World, largest listed companies by market capitalization, $bn

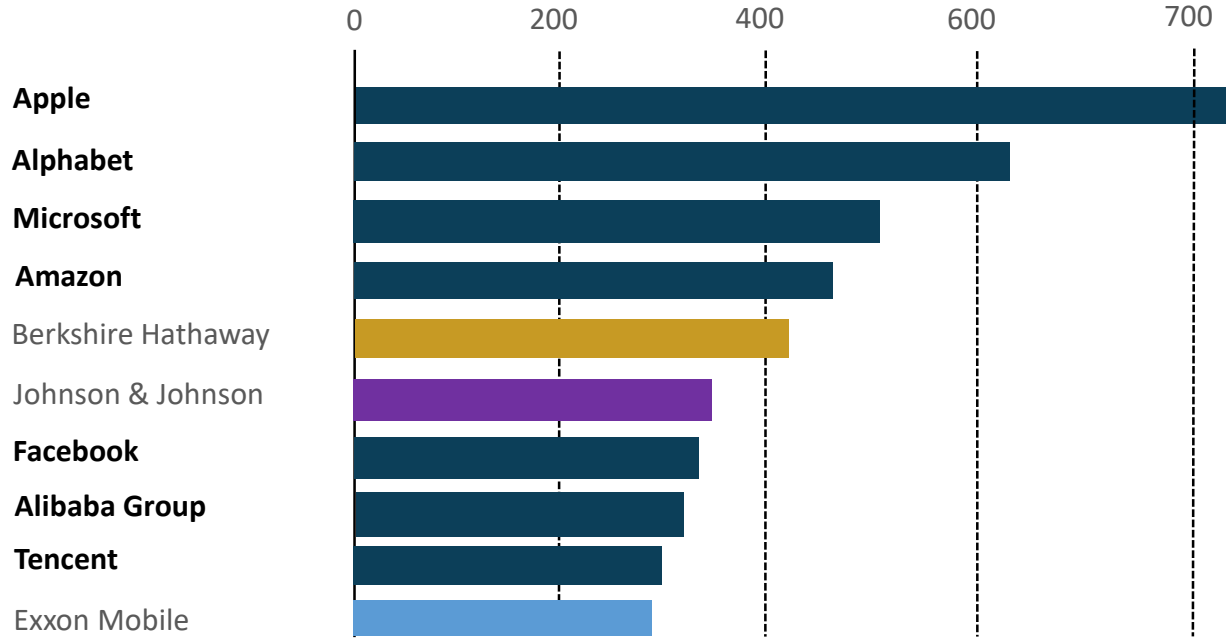
Sector: Energy Financials Health Care Industrials IT Telecoms

**End 2006**




Source: The Economist

**2017**




Source: Bloomberg

# How the world is changing

## The world's largest bookseller today …

amazon.com

## The largest marketing & advisement companies today…

## The music landscape

SONY MUSIC

BMG BERTELSMANN

Content provider for

Spotify

gaana

Baidu 百度

2017

Lost over 300 bln USD

2012

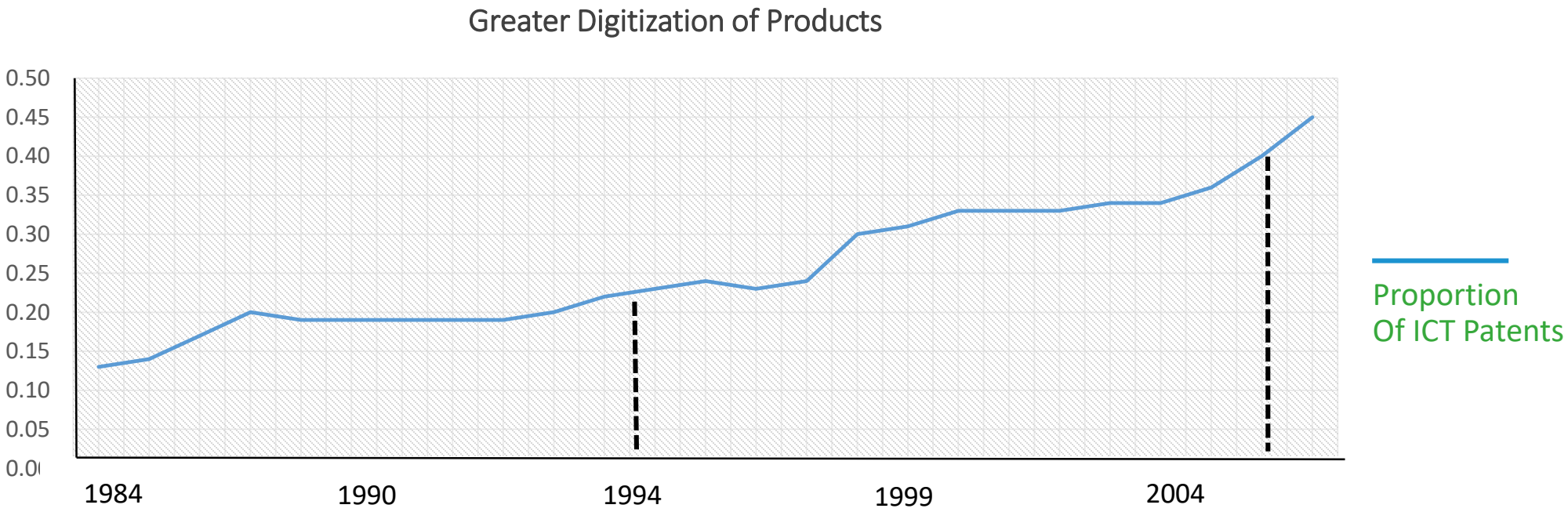
WhatsApp

skype

OLD TELECOM

# Not only services but also products and RD becomes more digital

**Products of diverse firms across a wide array of industries are being digitized**




**Example: Automotive Industry**

- Software guides you (Navigation)
- Software helps parking, supports security systems and runs your engine
- In the future software will be your driver

“We believe that every industrial company will become a software company.”

Jeffrey Immelt - Chairman of GE

# How the internet disrupted Industries

2002

2017

**What happened during the last 15 years**

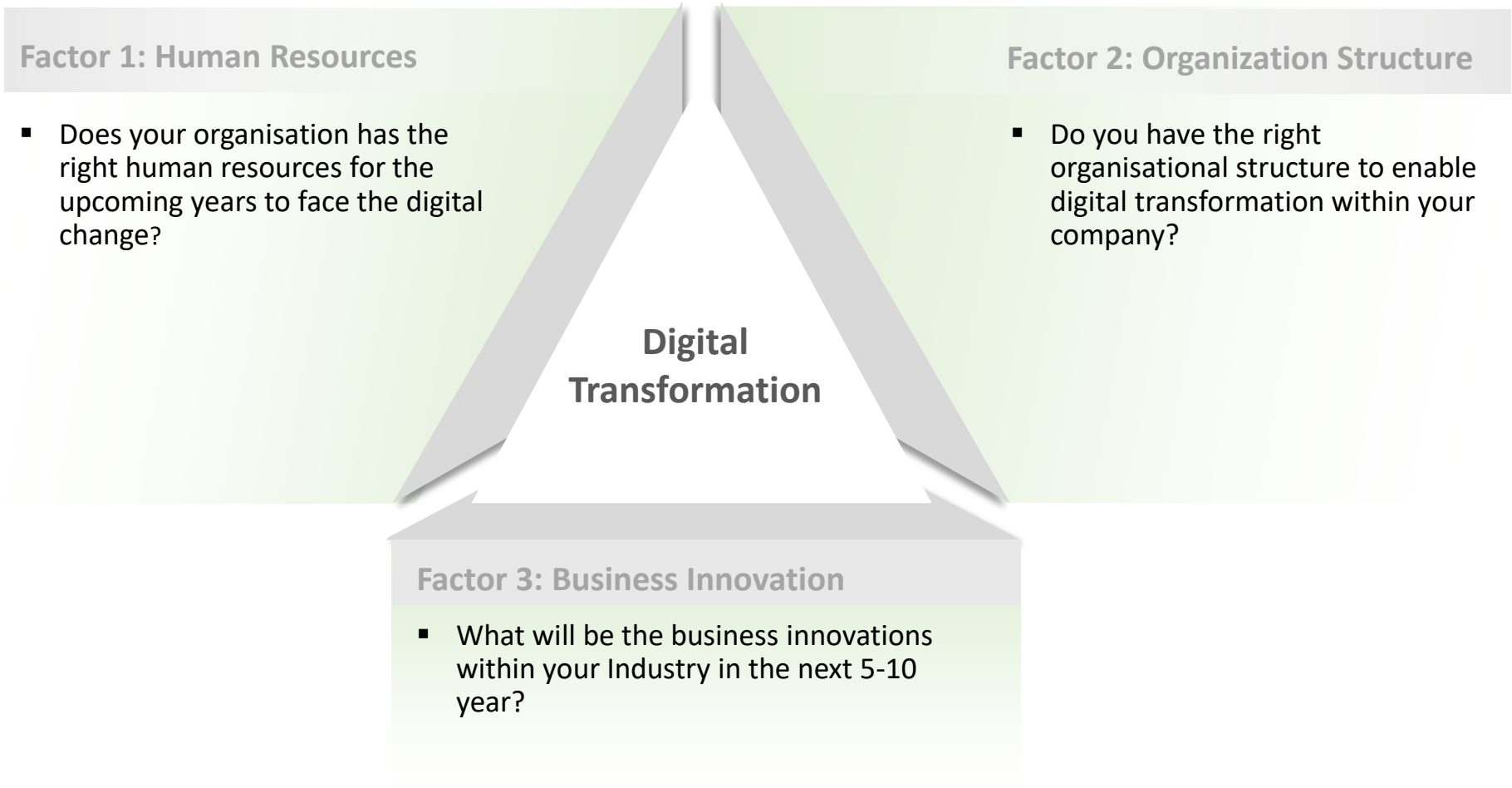
- **Travel agencies** – The world biggest “travel agency” is **booking.com**
- **Retail** -The worlds most valuable retailer is **Amazon**
- **Advertisement Market –** The biggest advertisement companies are **Google** and **Facebook**
- **Transportation –** The worlds biggest Taxi company is **Uber**
- **Hotel -** The worlds largest accommodation provider is **Airbnb**
- **Banking -** The worlds fastest growing banks are online ones like **SocietyOne**

And do you think it will stop here? Industry 4.0 is just starting….

# How to get your copmpany ready for the digital market

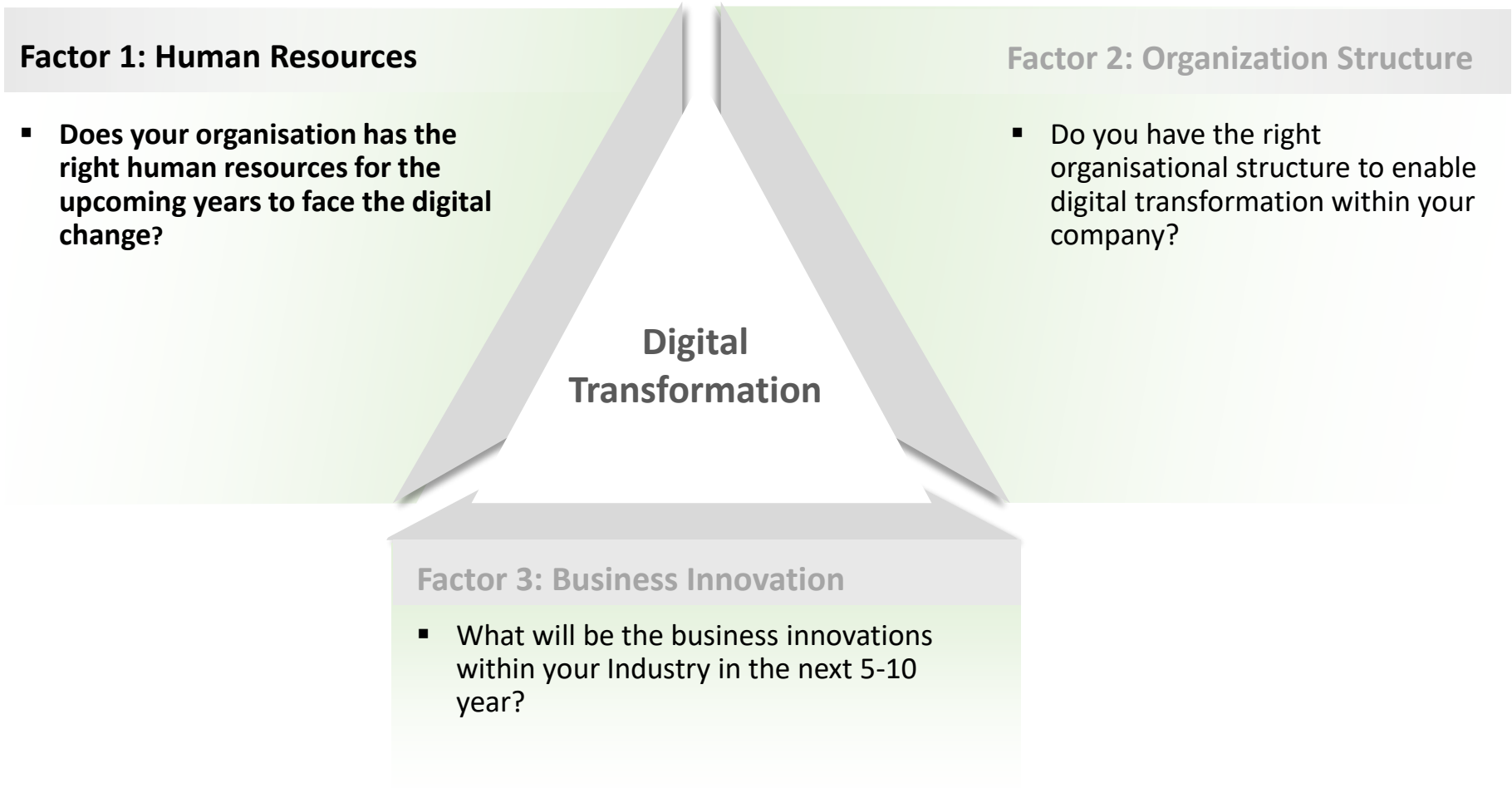
# The Triangle of Digital Transformation

Factors which need to be considered to get your organization ready for the digital market



# The Triangle of Digital Transformation

Factors which need to be considered to get your organization ready for the digital market



# Will digital trends disrupt your industry and do you have the right people for this challenge?

**Lets see how other companies answered these questions:**

"Almost 90% of managers and executives surveyed anticipate that their industries will be disrupted by digital trends to a 'great or moderate' extent.

Only 44% think they are adequately prepared for the disruptions to come."

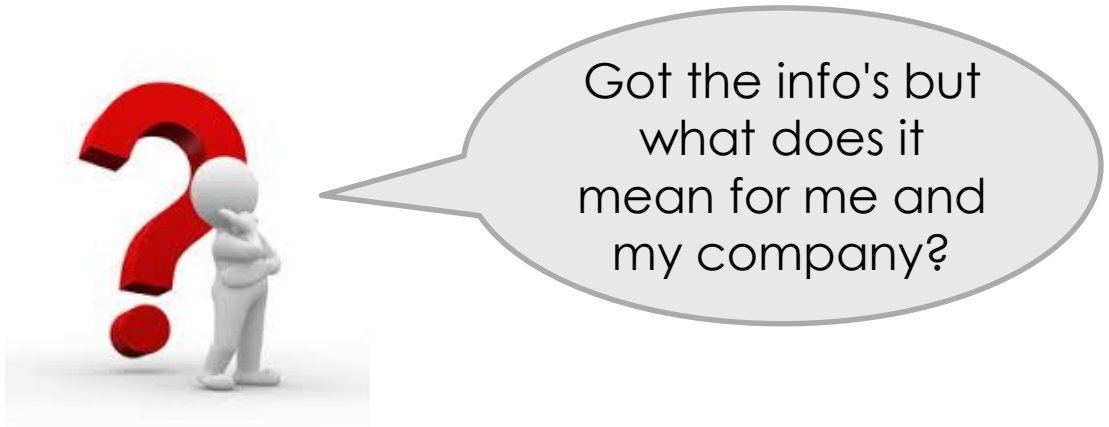
"70% of the respondents said their organization needs a new or different talent base to compete in the digital economy."

- MIT SMR / Deloitte Global Business Executive Study and Research Project, 2016

"Ninety-one percent of the surveyed are in no doubt that they have a role to play in their organization's digital transformation.

However, 59 percent added that their IT organization is unprepared For the digital business of the next two years.

- Gartner, 2016



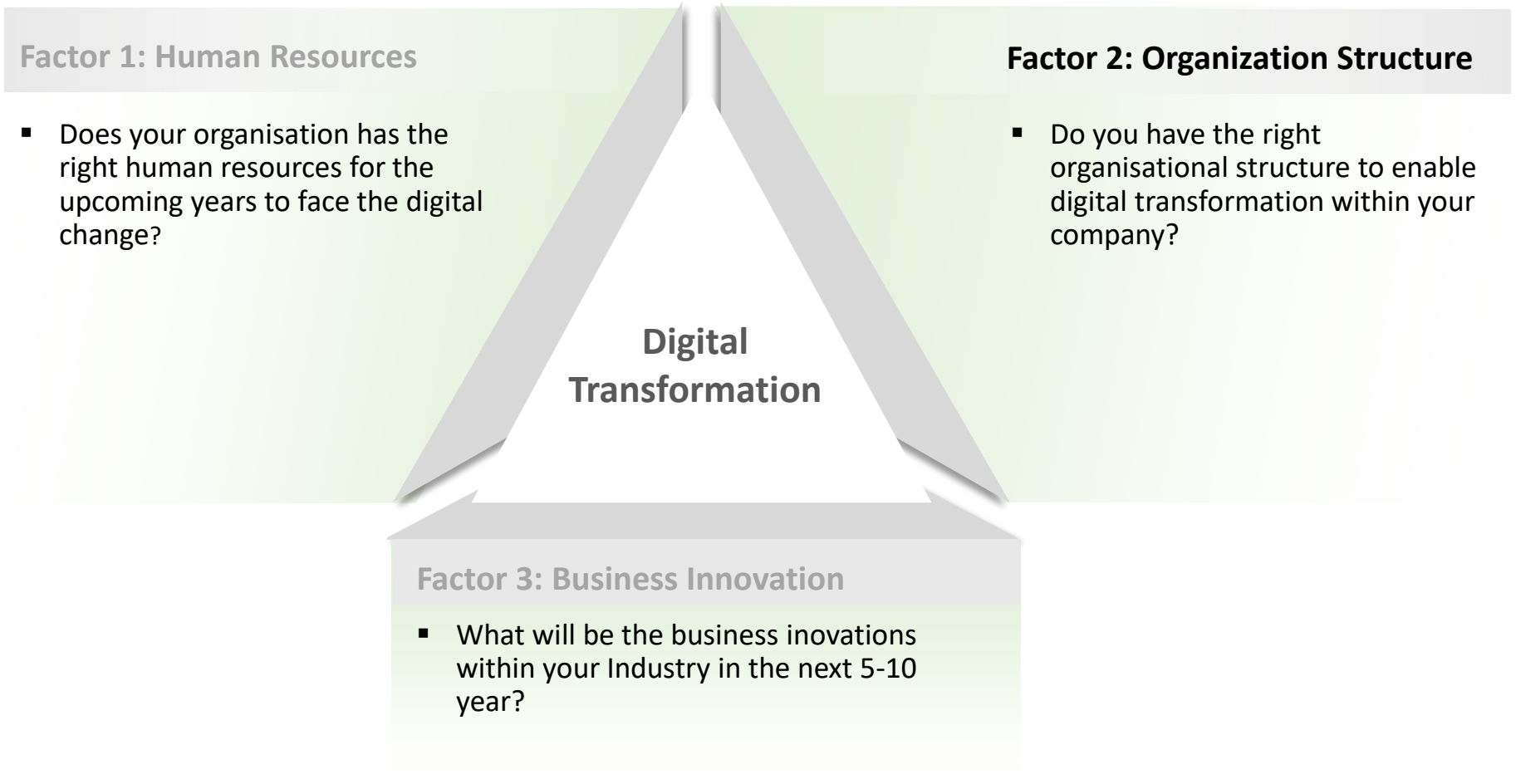

Well, the result showed that:

You don’t need a technologist to lead the company but you need:

- Somebody in the C-Level has to be responsible for the digital transformation program and has to push this topic
- A CEO / CIO / CDO who has is a forward thinker, has a change oriented mind set and a transformative vision
- If you don’t have the right people yet, get new talents with the required skill set to join your company

# The Triangle of Digital Transformation

Factors which need to be considered to get your organization ready for the digital market



# Organization Structure

**Function and role of the IT has to change**

## IN THE PAST

1. Support function
2. Technology a separate function
3. Automation
4. Cost center

## MOVING FORWARD

1. Strategic partner
2. Integrate technology into business strategy
3. Information and innovation
4. Competitive asset

# Establish a company culture which supports Corporate Entrepreneurship

**How do you enable employees to be entrepreneurial?**

1. Cultivate their entrepreneurial mindset, motivations, and behaviors
2. Enable them to see entrepreneurial opportunities in the industries and markets
3. Allocate recourses, Innovation doesn't come for free
4. Provide encouragement and support from the senior leadership of the company
5. Offer reassurance that even if the ideas fail, the individual will not be unduly penalized

# Corporate Entrepreneurship in Action

## Examples of Corporate Entrepreneurship

- Google allows 20% time for personal projects.
- The Facebook “Like buttuon” and the Facebook chat was first prototyped in one of Facebook’s regular hack-a-thons.
- Shutterstock hosts an annual hack-a-thon over the span of 24-hours.
- W.L. Gore gives employees 10% of their work day to develop new ideas and work on personal projects.
- Lockhead created Skunk Works in 1943 as an autonomous organization with a small, focused team.

Give your employees time. If you squeeze them like lemons you might get lemon juice, but no innovations!

Don’t forget to create the create a formal structure for corporate Entrepreneurship and communicate it

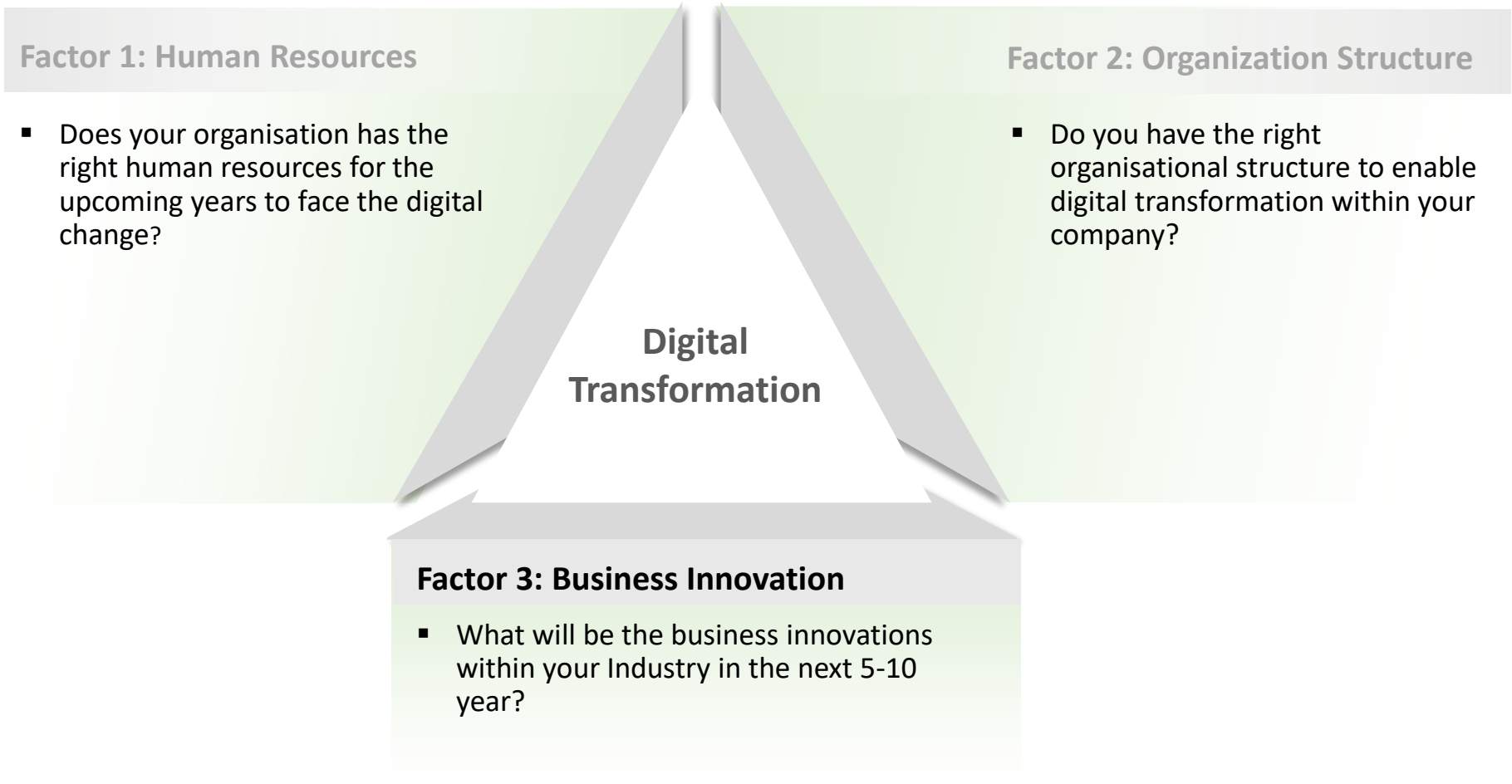
## Why stay?

- Corporate entrepreneurs tend to be mavericks whose philosophies and ideas are at odds with those of the organization
- Many may quit to form their own businesses, and take their ideas and innovative spirit with them

Design a career path for corporate Entrepreneurs!

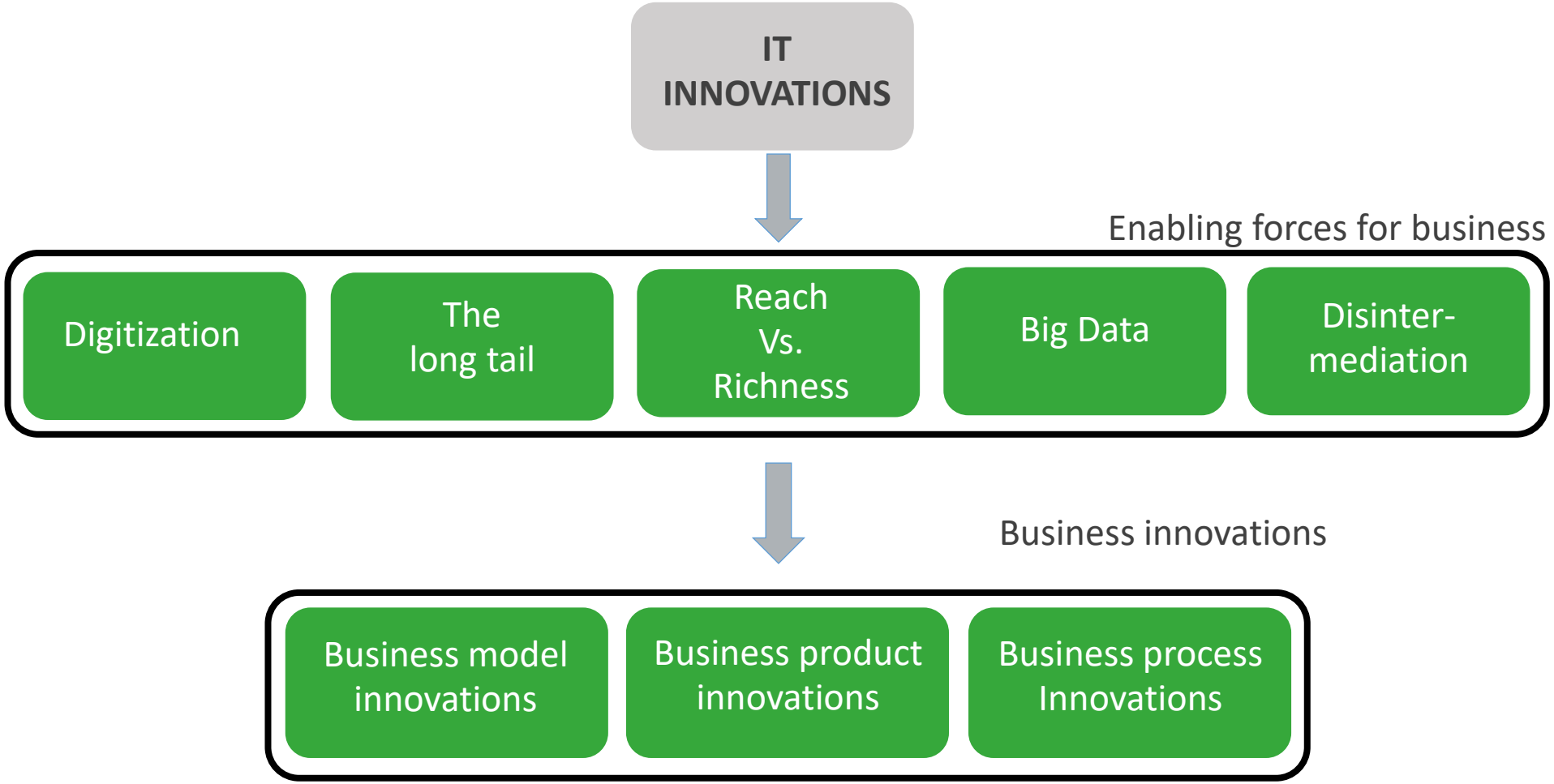
# The Triangle of Digital Transformation

Factors which need to be considered to get your organization ready for the digital market



# Business Innovation

**Driver and enabling forces of digital innovations**



# Contact

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**+ Hartmut Molzahn**

**CEO / Co-Founder**

- Cell: +62 8111 752 321
- Landline: +65 6221 2440
- E-Mail: hartmut.molzahn@88spares.com

# THE METAMORPHOSIS OF TEXTILES FOR AN ENVIRONMENTALLY SUSTAINABLE FUTURE

CETI
CENTRE
EUROPÉEN
DES TEXTILES INNOVANTS

# CENTRE EUROPEEN des TEXTILES INNOVANTS

## Lille, France

**CETI** takes part in making textile innovation a major, sustainable & competitive advantage in the market.

CETI CENTRE EUROPÉEN DES TEXTILES INNOVANTS

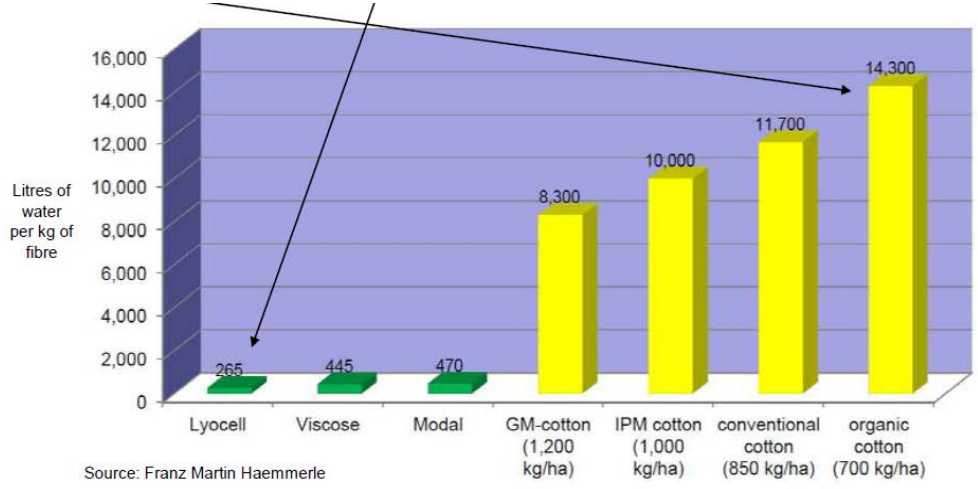
# FIBERS and sustainability

**Fibers evaluation regarding respect of the Environment**

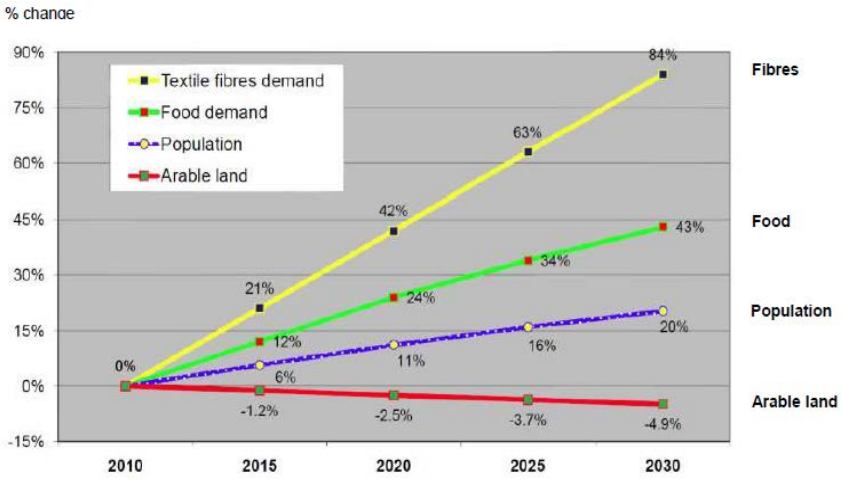
Solutions to increase sustainability : Bio-based polymers and friendly environmental fibers

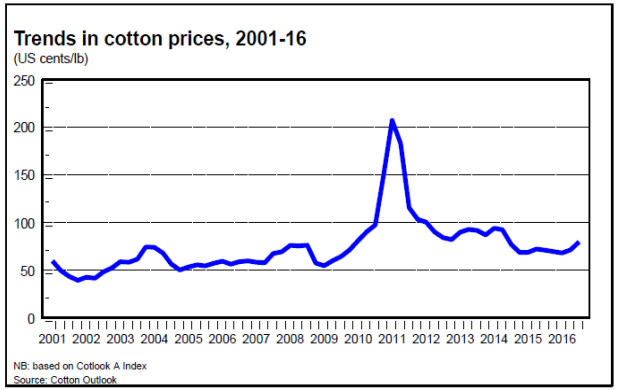
CETI CENTRE EUROPÉEN DES TEXTILES INNOVANTS

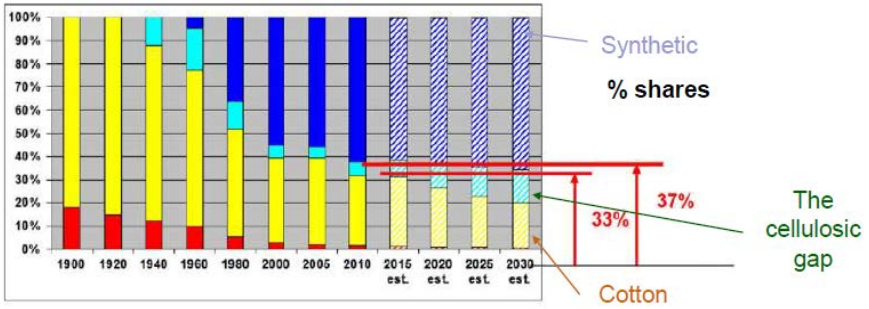
# KEY FIGURES




Source: Franz Martin Haemmerle



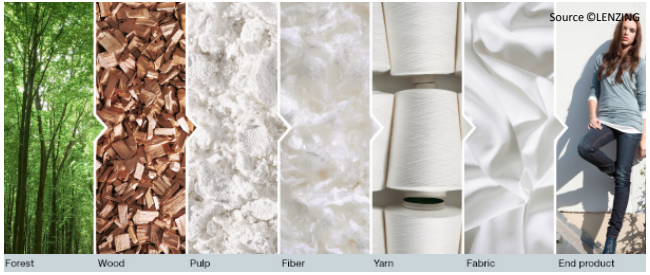

Sources: Textile intelligence

CETI CENTRE EUROPÉEN DES TEXTILES INNOVANTS

# A TO DO LIST AND NOT A WISH LIST

- Improving the sustainability of cotton textiles
- Improving the sustainability of man- made fibers
    - Man-made cellulosic fibers
    - Synthetics
- Looking at friendly environmental fibers (like flax)
- Re-engineering the textile processes, labelling
- Upcycling initiatives






CETI CENTRE EUROPÉEN DES TEXTILES INNOVANTS

# ECO-DESIGN & Collaborative Design

**How to reduce the impact of your products and develop them with your value chain**

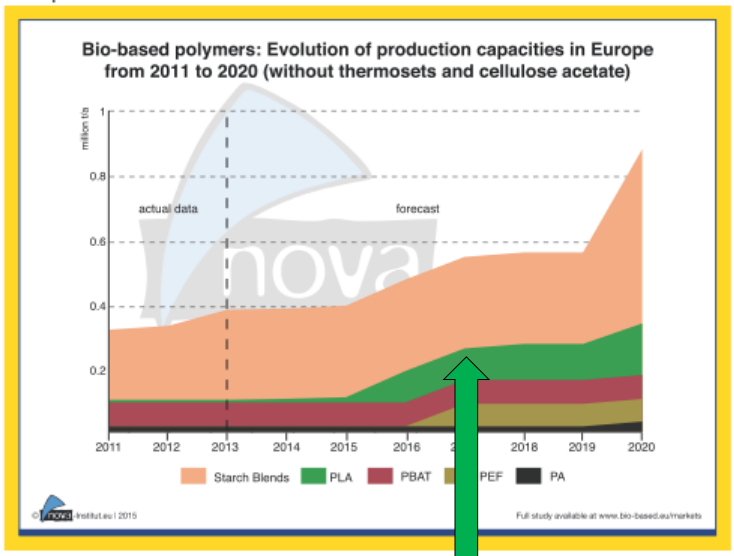
Eco-design business case: The eco-design of a bio-based, biodegradable WIPE using a "*Business design*" process.

# ONE BUSINESS CASE

The eco-design of a bio-based, biodegradable WIPE using a "*business design*" process.

# SURVEY: PLA PRODUCTION & COST


In Europe :




PLA

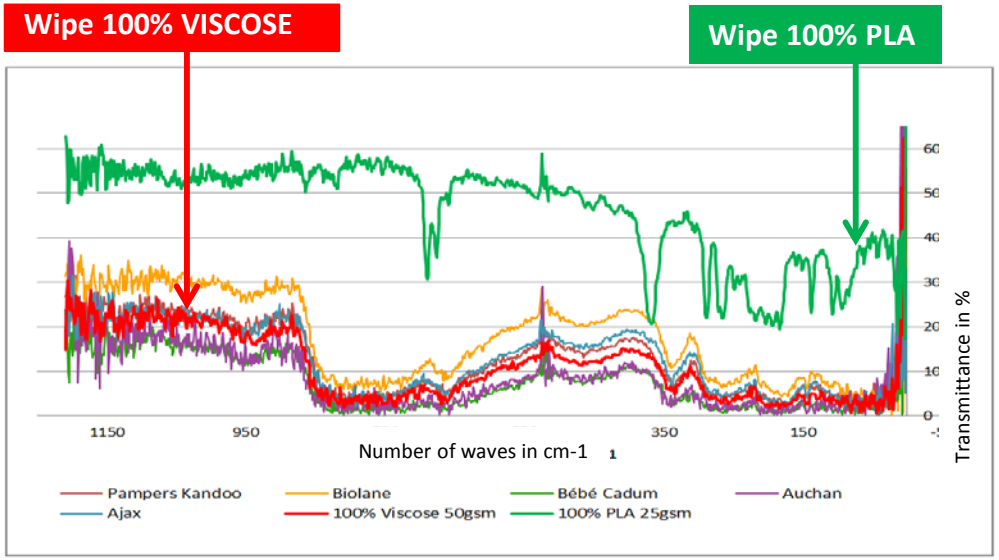
Produced by numerous companies worldwide, with NatureWorks as market leader, PLA is the most well established new bio-based polymer.

**PLA market is still expected to grow further, with a projected fourfold growth between 2013 and 2020.**

PLA can already be found at near-comparable prices to fossil-based polymers.

# WIPES BENCHMARKING ON THE FRENCH MARKET

Identification of raw materials in of 4 wipes brands : Pampers, Kandoo, Biolane, Bébé Cadum, AUCHAN



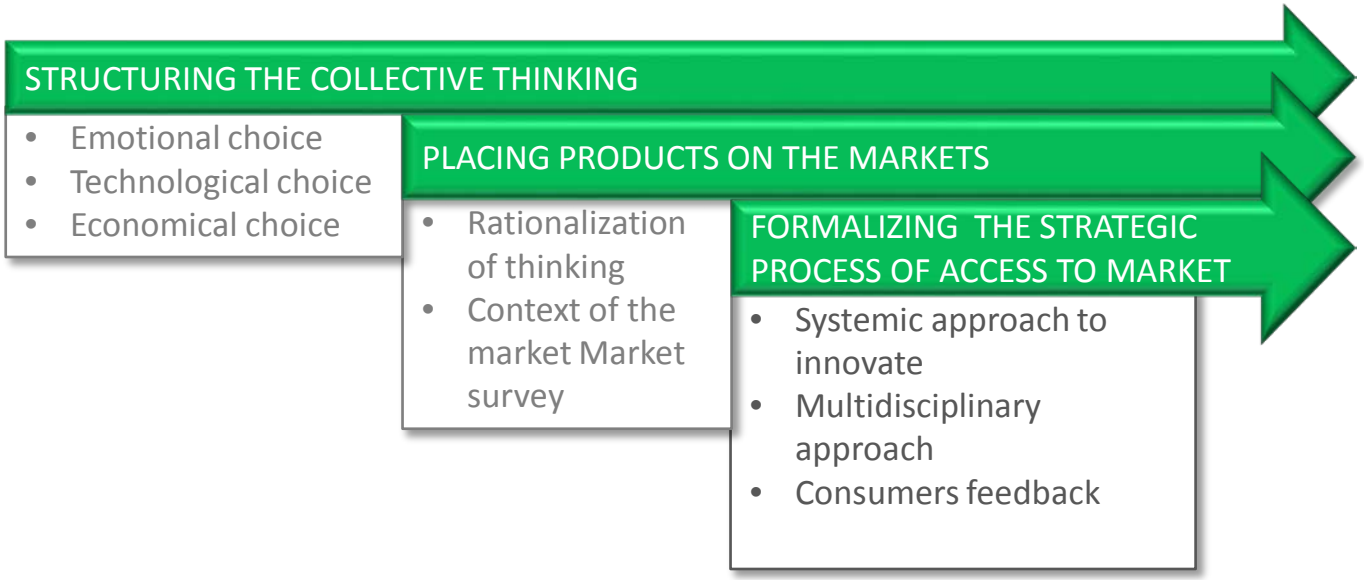

Infrared tests made by HEI/ISEN/ISA November 2014 : Spectrum of wipes currently in the market

Infrared Analysis: No wipes using 100% PLA are available on the French market actually

# INTEGRATE THE HABITS OF FINAL USERS IN THE CENTRE OF THE REFLEXION

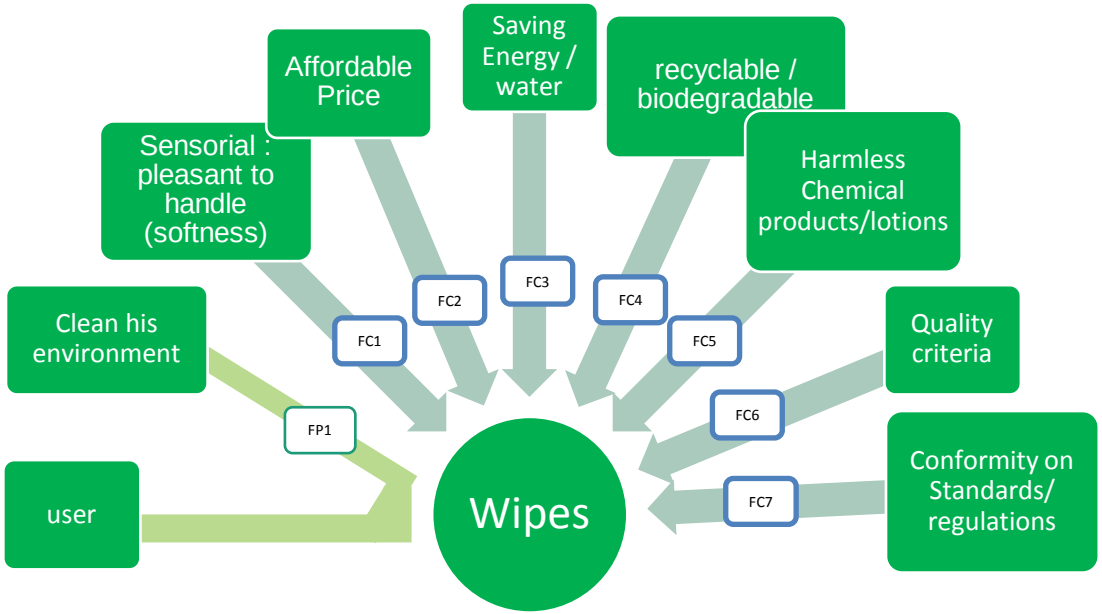
Access to a business design methodology through a software based on 5 keys values

# WORKING AS A TEAM



CETI CENTRE EUROPÉEN DES TEXTILES INNOVANTS

# (USES/NEEDS)




- FP1 : allows the user to clean his environment
- FC1 : is pleasant to handle (softness)
- FC2 : is FC3 : consumes little energy and water when manufactured and used
- FC4 : is recyclable / biodegradable
- FC5 : is healthy and without danger for the user
- FC6 : has qualitative criteria that validates the product and facilitates its use
- FC7 : respects environmental and security standards

CETI CENTRE EUROPÉEN DES TEXTILES INNOVANTS

# PROTOTYPING OF A BIODEGRADABLE, BIO-BASED WIPE

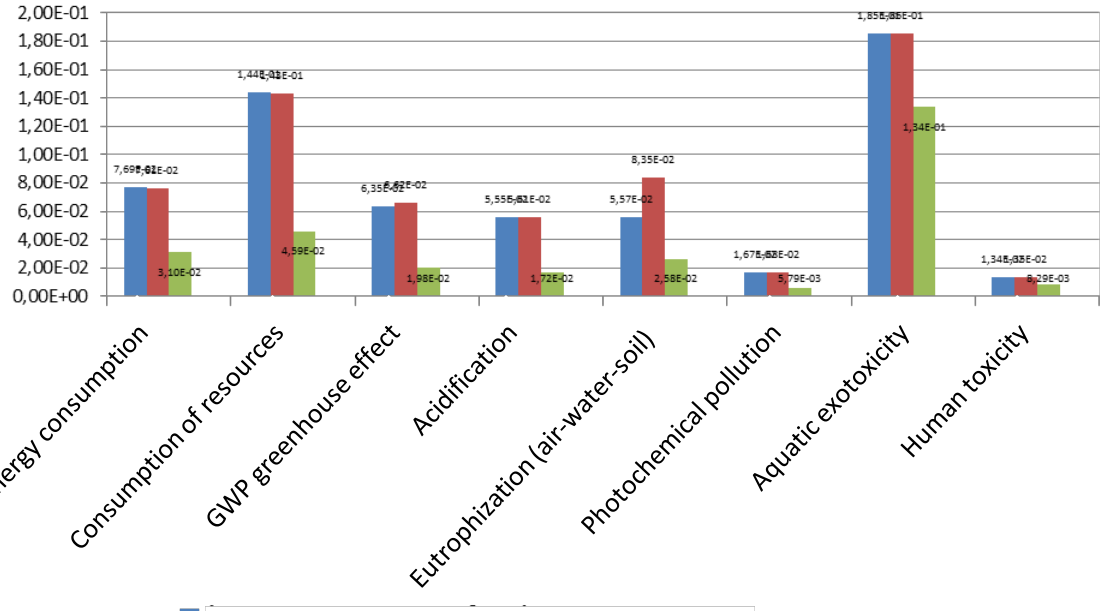
- **PROCESS 1** : Nonwoven Drylaid process with 1Xhydro entanglement for web consolidation
- **PROCESS 2** : Nonwoven Drylaid process with 2Xhydro entanglement for web consolidation

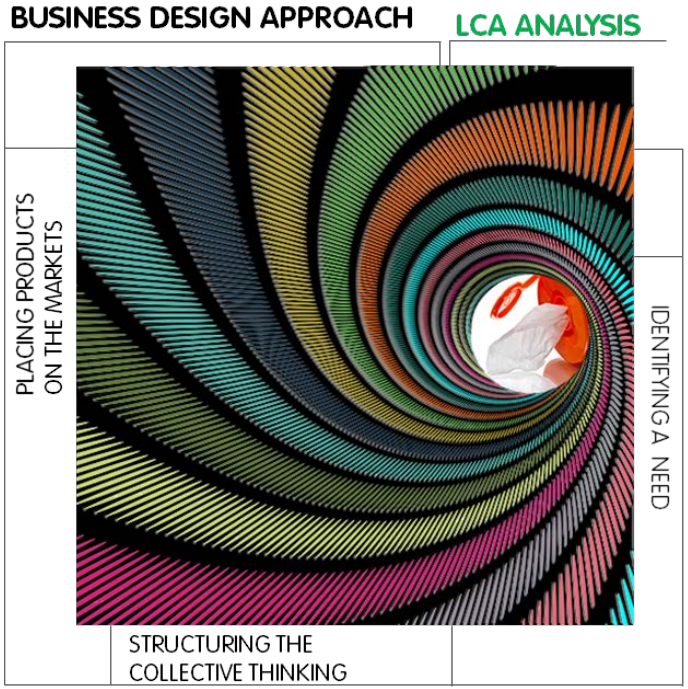
| Trial | Composition | Process | g/m² | MD Resistance N/5cm | MD Elongation % | CD Resistance N/5cm | CD Elongation % | Permeability 196 Pa l/m²/s | Thickness 0.5 kPas (mm) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | V 100% | 1 | 50 | 35 | 42 | 18 | 112 | 3846 | 1.25 |
| 2 | V/PP 70/30 | 1 | 48 | 30 | 70 | 13 | 148 | 4204 | 1.05 |
| 3 | V/PLA 70/30 | 1 | 48 | 31 | 45 | 13 | 130 | 4486 | 1.49 |
| 4 | V 100% | 2 | 61 | 108 | 15 | 37 | 84 | 2180 | 0.52 |
| 5 | V/PP 70/30 | 2 | 65 | 88 | 24 | 36 | 115 | 2354 | 0.65 |
| 6 | V/PLA 70/30 | 2 | 63 | 94 | 23 | 42 | 78 | 2588 | 0.6 |

Compositions made of **100% biodegradable materials (PLA base)** have **characteristics** similar, if not **better**, to those made with petro-chemicals **(PP base)**

# MIXING BUSINESS DESIGN AND VIRTUOUS PROCESS: THE KEY FOR SUSTAINABLE TEXTILE

Point(s) – in the CO2 equivalent one a day of an average European



CETI CENTRE EUROPÉEN DES TEXTILES INNOVANTS

# CIRCULAR ECONOMY in the textile industry/ Sustainable Fashion

## Big brands and their sustainable strategies

Key points about Sustainable Fashion

# KEY POINTS ABOUT SUSTAINABLE FASHION

## NEW MARKETS & NEW IDEAS

Diversity - Creativity

Use of **bio-sourced materials**

**Lightening** of textile structures

**Recyclability & UPCycling**

# ADIDAS AND “THE SPORT INFINITY INITIATIVE”

Creating new fibers from recycled raw materials in football sporting goods, a research project « Sport Infinity »realized in the context of the H2020 European Commission.


# DECATHLON AND THE “REWIND INITIATIVE”

DECATHLON
SPORT FOR ALL - ALL FOR SPORT


Identify a new business model adapted to commercialize textile made from post-consumer recycled cotton for woven or knitted products.

Structuring a local textile chain: collecting, sorting, dismantling raw material preparation and article production from recycled fibers. This sustainable project is a model that is economically viable and therefore can also be reproduced elsewhere.

# THE DECATHLON/TDV INITIATIVE

Conception of a pilot Recycling/Upcycling technological platform at CETI for the R&D (sorting/fraying/Carding/open-end spinning) and industrial transfer of the fraying equipment at TDV Industries

Expansion of textile deposit ;  sorting and demantling selected products; transformation into yarn (higher added value), maximise percentage of recycled fibres in article composition, reduce environmental impact.

# SNCF AND THE “POLYCOTTON + INITIATIVE”

## A French green deal : a new polyester / cotton recycling solution for professional clothing and workwear


*De gauche à droite : Laurence MONNOYER-SMITH – Commissaire générale au développement durable, Sophie-Noëlle NEMO – Directrice de la Délégation à la Transition Energétique La Poste, Richard PAPIN – Président Innortex/Moncorgé, Christian DUBOST – Directeur du Développement Durable SNCF, Antoinette GUHL – Adjointe à la Maire de Paris en charge de l'Economie sociale et solidaire, de l'Innovation sociale et de l'Economie circulaire, Hervé CLERBOUT – Directeur Sympatex, Hélène DE LA MOUREYRE – Fondatrice de bilum, Emmanuel MACRON – Ministre de l'Économie, de l'Industrie et du Numérique, Nathalie BOYER – Déléguée générale d'ORÉE, Michel LOPEZ – Vice-Président « Clubs Métiers Recyclage » d'ORÉE.*

CETI CENTRE EUROPÉEN DES TEXTILES INNOVANTS

# SNCF AND THE “POLYCOTTON + INITIATIVE”

Placing on the market a new polyester / cotton recycling solution for professional clothing

**OBJECTIVES:**

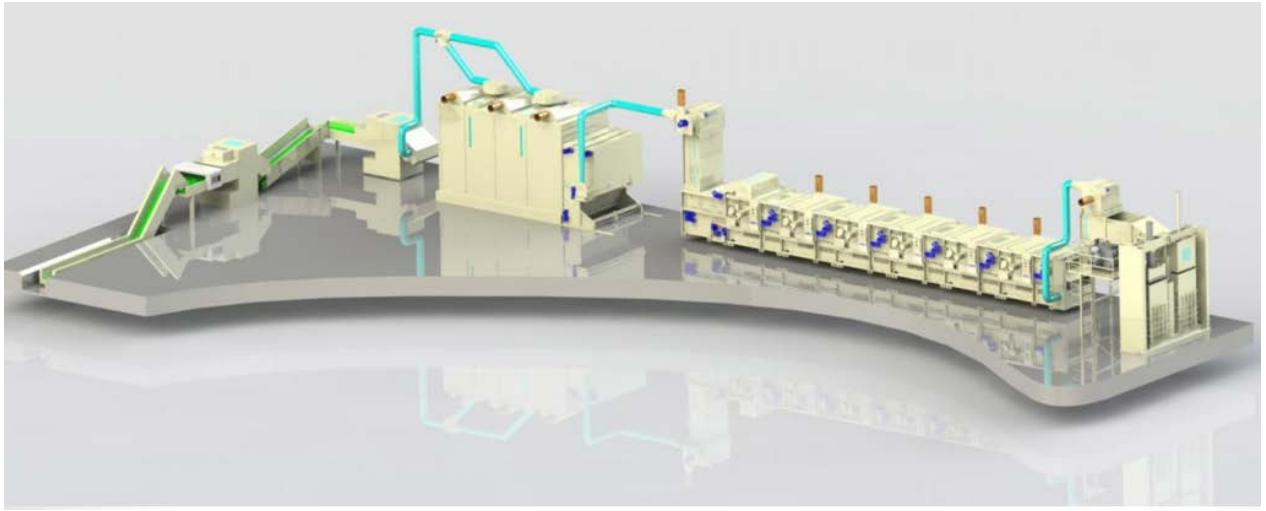
- Control the flow of the deposits (pools of materials) to be recycled by fine sorting according to materials and colors assisted by an automated device allowing its industrialization
- Automatically eliminate non-textile hard contaminants using a Jumbo Picker shredder placed at the entrance of *the fraying line*
- Develop and improve fraying and spinning equipment to optimize the quality and cost of fabrics or knits made from recycled polyester / cotton fibers

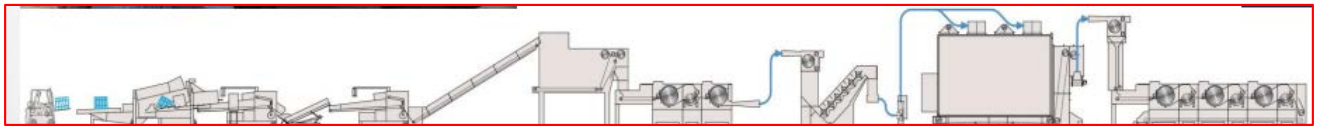
Fraying

Opening fibre

Open-end spinning => recycled yarn

# A UNIQUE UPCYCLING PILOTE LINE AT CETI IN 2018





Automatic sorting

Baling Press

Fraying

Cutting

Loading & blending fibers

Opening fibre

Carding

Open-end spinning

# CETI –UNIQUE PILOTE LINE IN THE WORLD

**IDEA** | **PROTOTYPE**

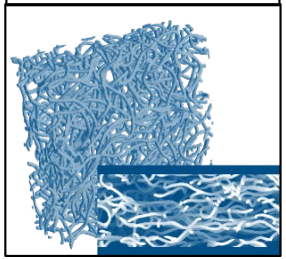
## Digital Maker

**BUSINESS DESIGN**

**INTERNET OF THINGS**
Space


**3D VIRTUALIZATION**
Fashion

**3D VIRTUALIZATION**
Materials

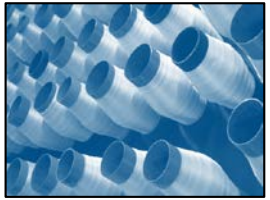


## Textile Pilot facilities

**COMPOUNDING**
Pilot line

**MELT-SPINNING**
Pilot line

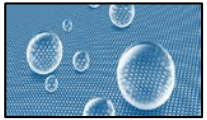
**RING SPINNING**
Pilot line



**NONWOVENS**
Spunlaid & Drylaid Pilot line

**WEAVING**
Pilot line

**COATING**
Pilot line



## Upcycling pilote line

**IDENTIFYING & SORTING** Pilot line

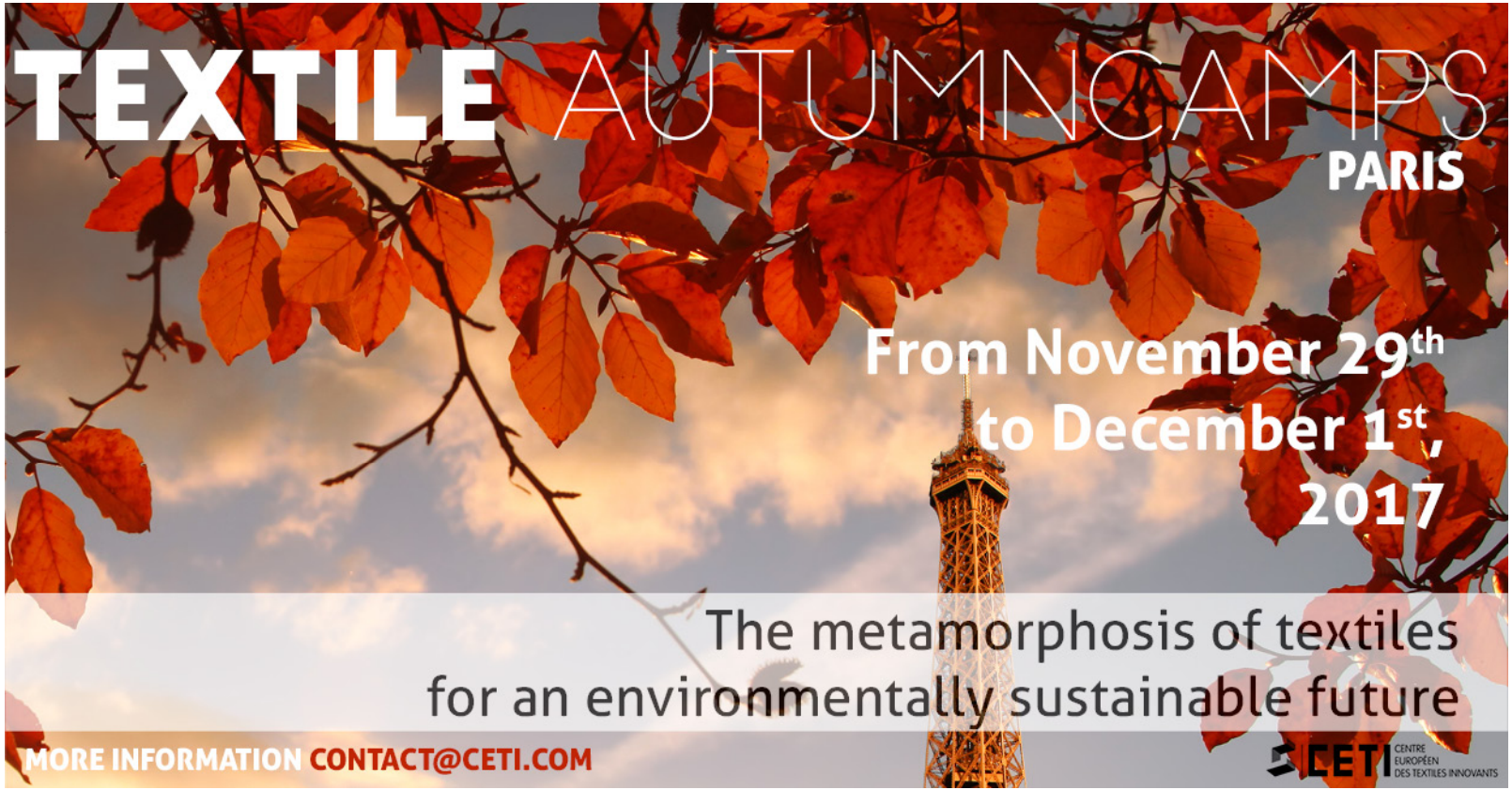
**DISMANTLING** Pilot line

**FRAYING** Pilot line

**OPEN-END SPINNING** Pilot line

CETI CENTRE EUROPÉEN DES TEXTILES INNOVANTS

# Training course




# Digital Technologies For the Factory of the Future

Prof. Dr. em. Marc Van Parys

ITMF-Congress 2017 Bali - Indonesia


Global warming of earth
WE HAVE ONLY ONE EARTH
WAR AGAINST POLLUTION
Scarcity of natural of Resources


Re-inventing our textile industrie
is a ... MUST FOR the
Factory of the
Future
Out with the old
In with the new !


Who seeks shall find, who investigates shall expercience


Good Choice
Bad Choice

# DISRUPTIVE TEHNOLOGIES

## Digital Technologies

# FACTS

> 1.5 billion $m^2$

Number of printers > 36.000

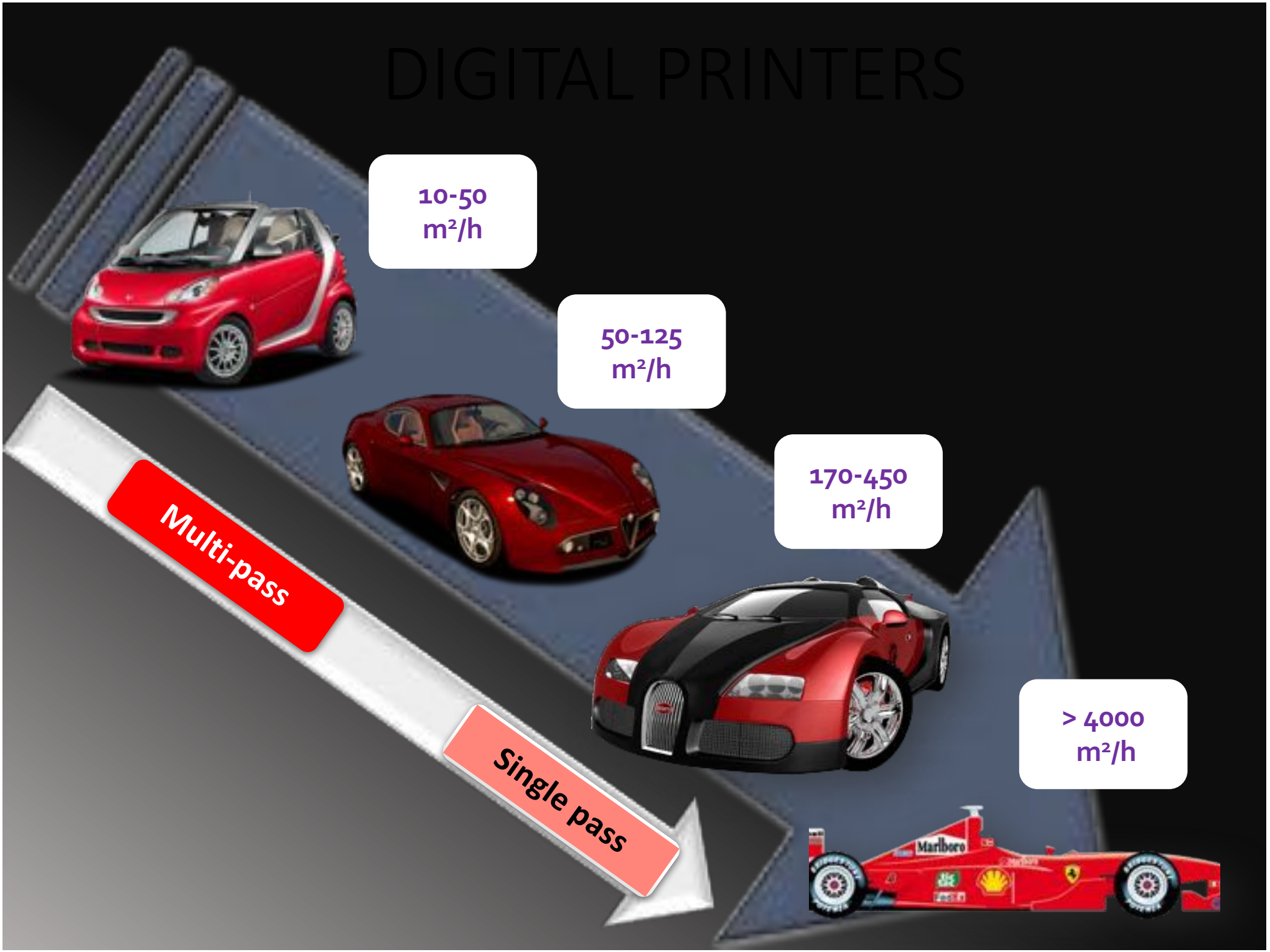
CAGR: > 4%

Source: WTIN - Dystar

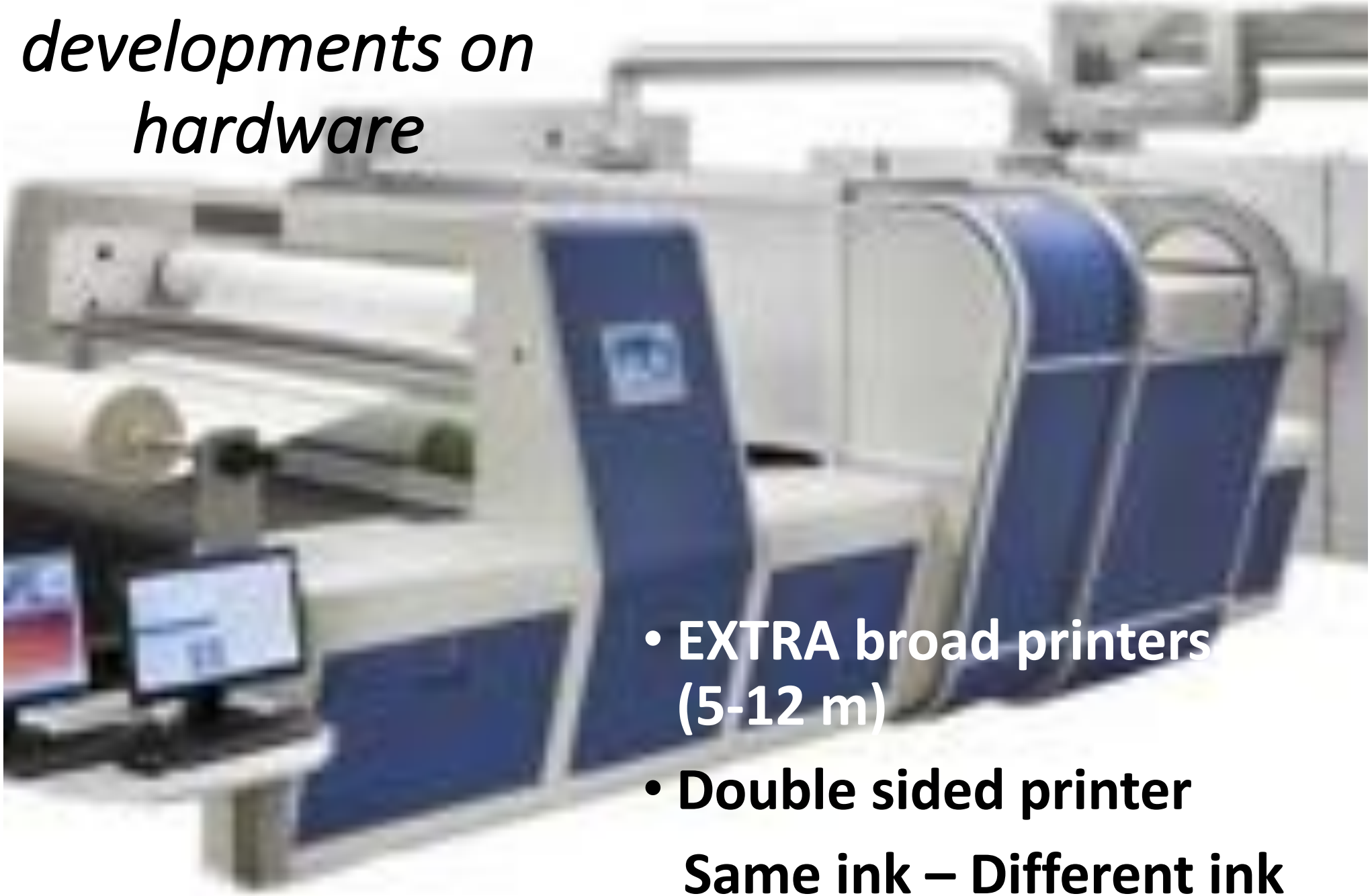
# Investments in Digital Technologies - TOP 6 countries


Source: WTIN

# DIGITAL PRINTERS



# *More developments on hardware*

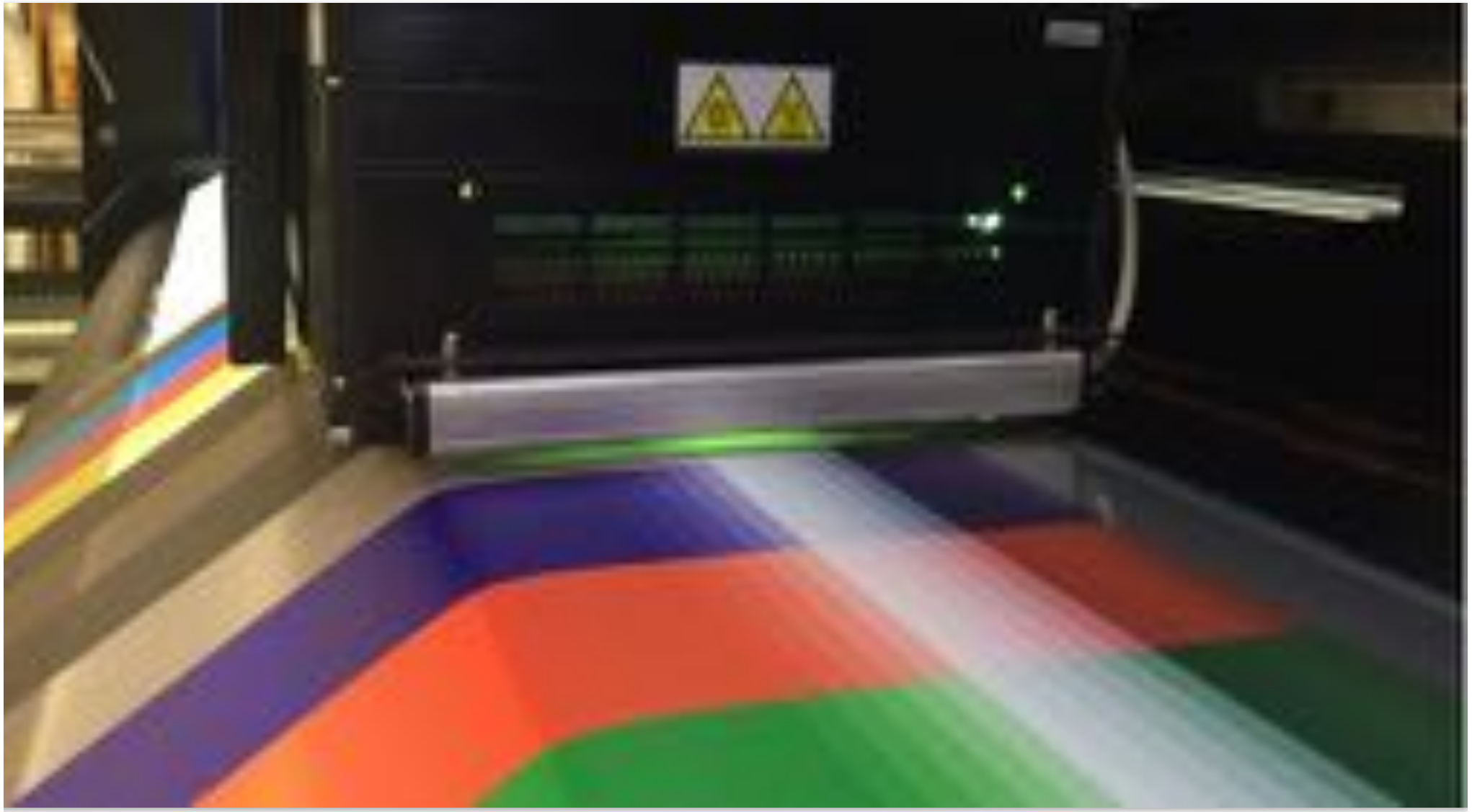


- **EXTRA broad printers (5-12 m)**
- **Double sided printer**

  **Same ink – Different ink**

# DP-printer 12 m width

# Double-sided Printers




Double-side Printer

# BENEFITS

1. Creative

2. Technical

3. Future proof

# Digital Printing Benefits

# BENEFITS

Min. set-up costs

Minimum waste

Personalisation

Mass Customization

# NEW Business Models

| Fashion says | Style says |
| --- | --- |
| *"me too"* | *"only me"* (Geraldine Stutz) |

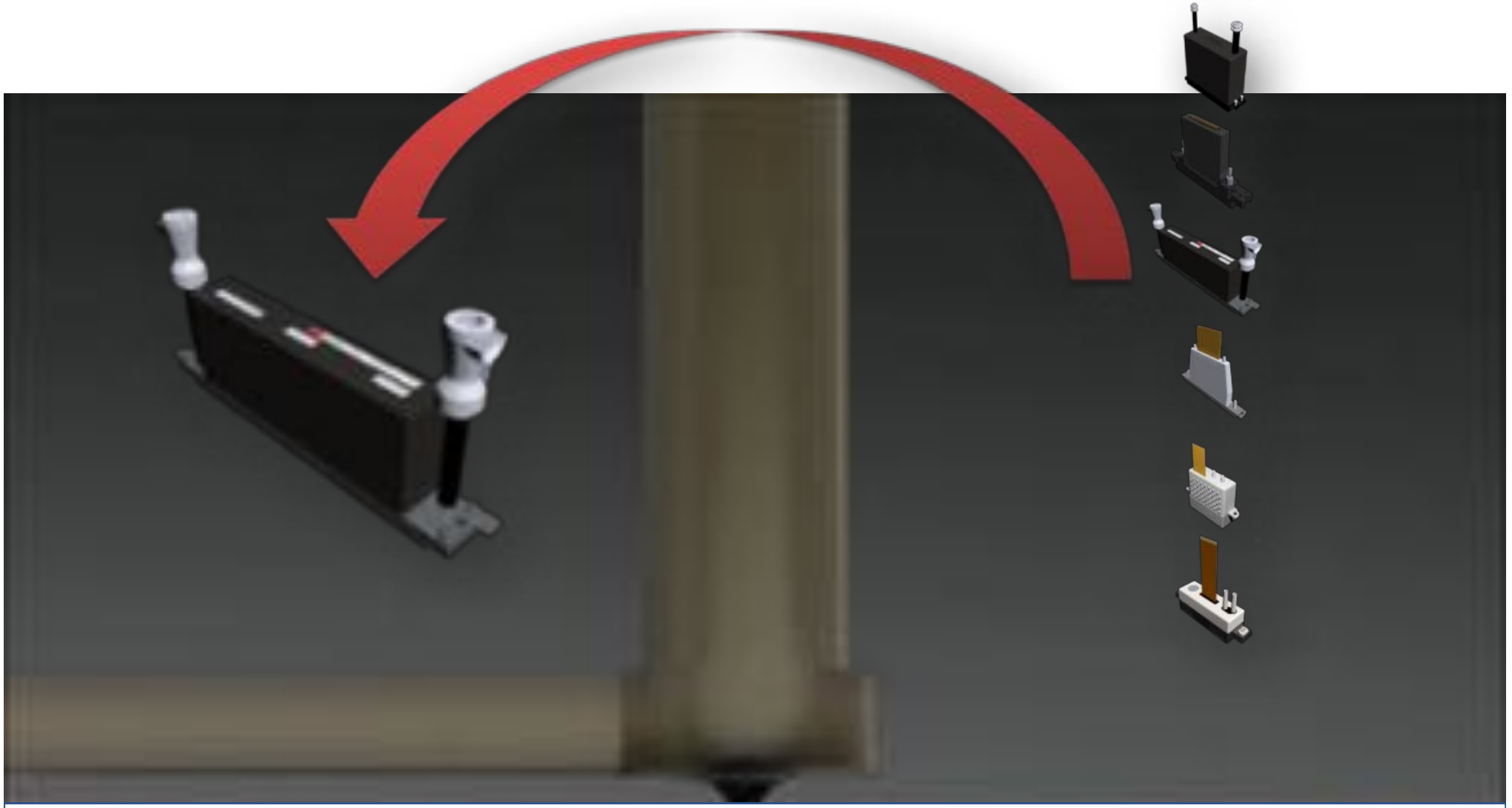
DIGITAL TECHNOLOGIES fullfil the need for personal expression

Kornit

# Testimonal
# Screen versus Digital printing

**Water consumption**

| | | |
|---|---|---|
| Rotary 6 colour printer 50 – 60 liter water/lm | | |
| Digital for fashion designs 14-20 liter water/lm | Saving of 60-70% | |
| Suspose all linear meters printed change from rotary to digital | Saving of 760 billion liters of water | |
| | Equals 300.000 olympic swimming pools | |



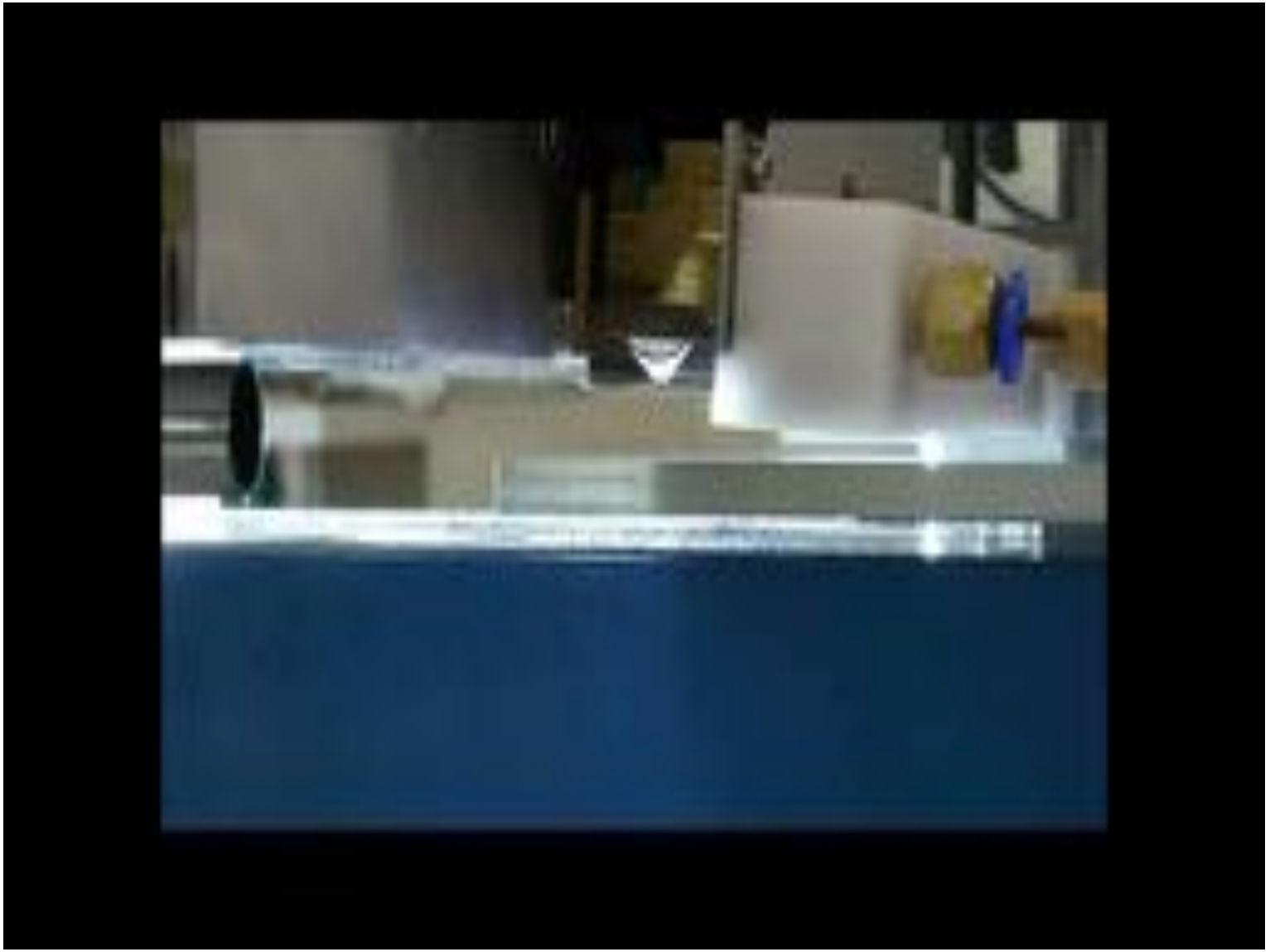
# Development of new Printheads:

## Variable droplets/higher volumes


MORE POTENTIAL FOR JETTING VISCOUS DISPERSIONS WITHOUT CLOGGING THE NOZZLES

New Piëzo-based print head

*drop volumes from pico litres up to  100 micro litres per second*



# Digital Finishing/Coating

# Are you following Trends?

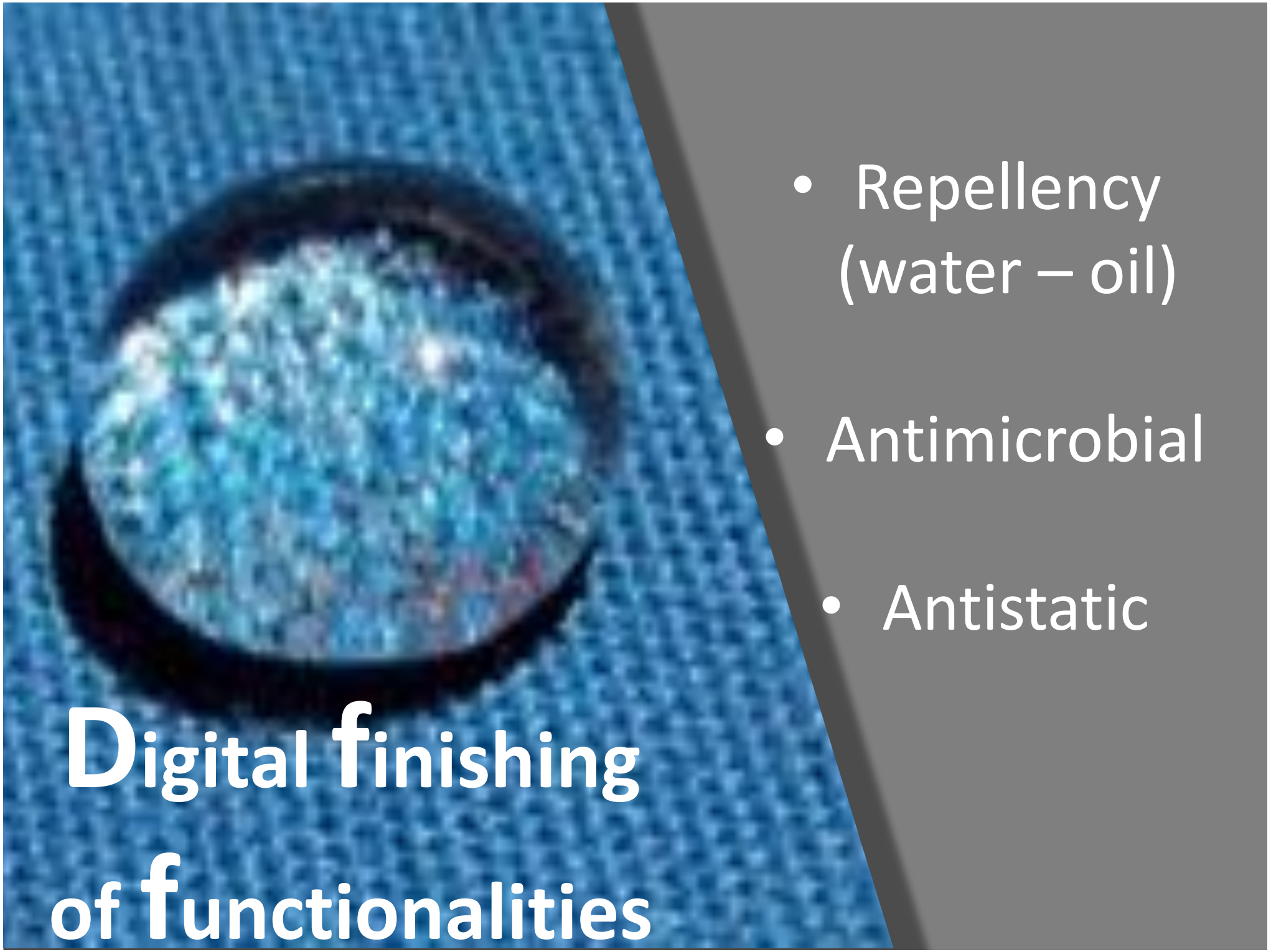
# Better being a TRENDSETTER !


KEYWORDS ARE:
CREATIVITY
SMARTNESS
FUNCTIONALITY


Ceativity
COLOUR = PROFILING


Ceativity
COLOUR = INSPIRATION


Creating illusions


Digital finishing
of functionalities
• Repellency (water – oil)
• Antimicrobial
• Antistatic

# Digital Finishing/Coating

- Uniform application
- **Local or selective patterning**

- Deposition on ONE side
- Deposition on BOTH sides

  - SAME product
  - DIFFERENT product


# Local Functional Deposition

# Smart Textile

***Smartness***

- *Responsive*
- *Interactive - Communicative Textiles*


Some ideas for you ?


COLOUR = COMMUNICATION

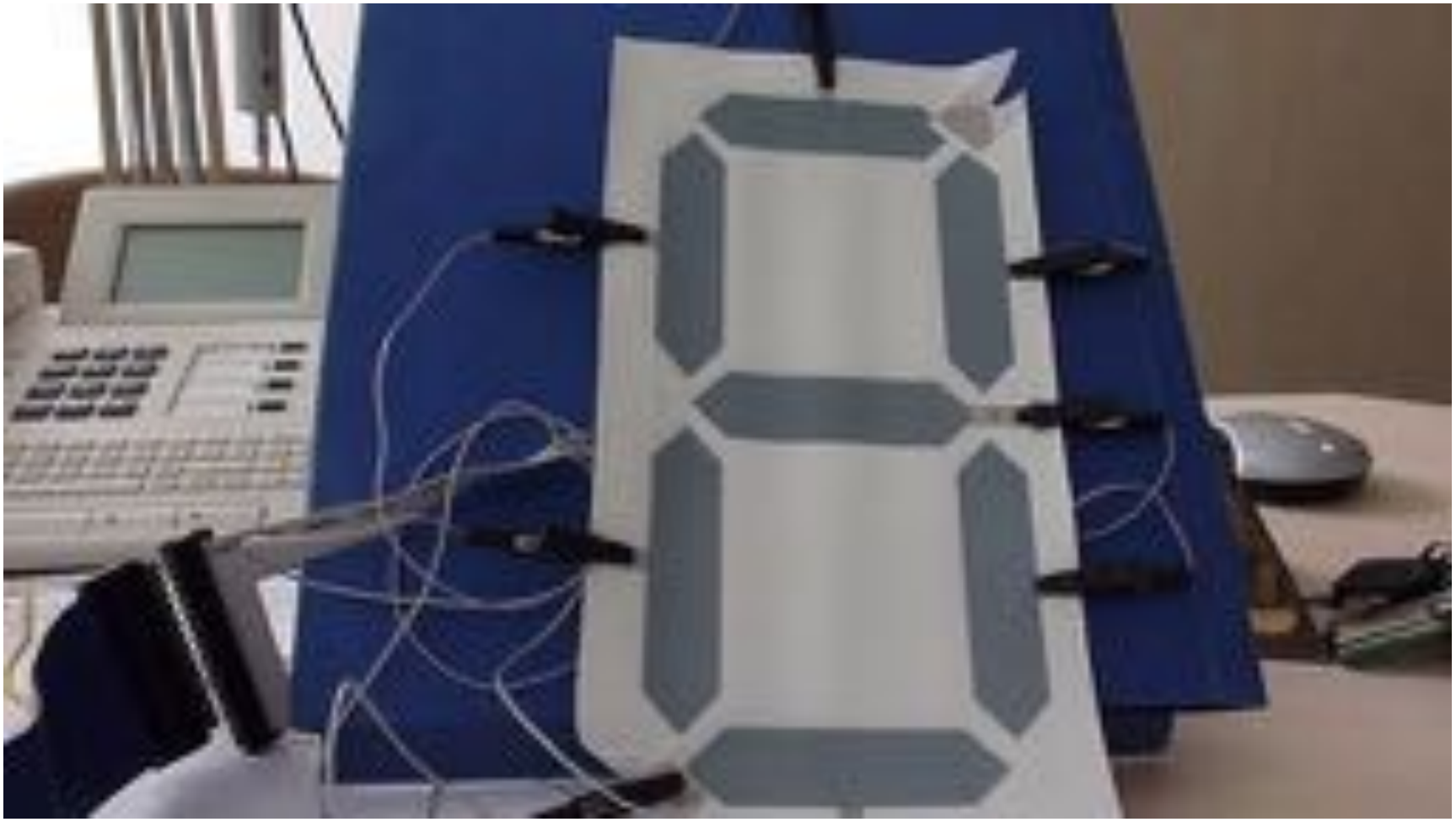

COLOUR = RESPONSIVE


- DESIGNING with:

  Electroluminescence inks
  Conductive inks
  Chromic sensors

# Electroluminescence inks

Textile materials emitting light in response to an electric current passing through them or to a strong electric field being applied to them.




And then
there was light
POLEOT

# Musical Textile

# Interactive textile

Can we change people's attitude? and get more people to take the stairs over the escalator?

**Answer: by making it fun to do !**

# Invisible encoding

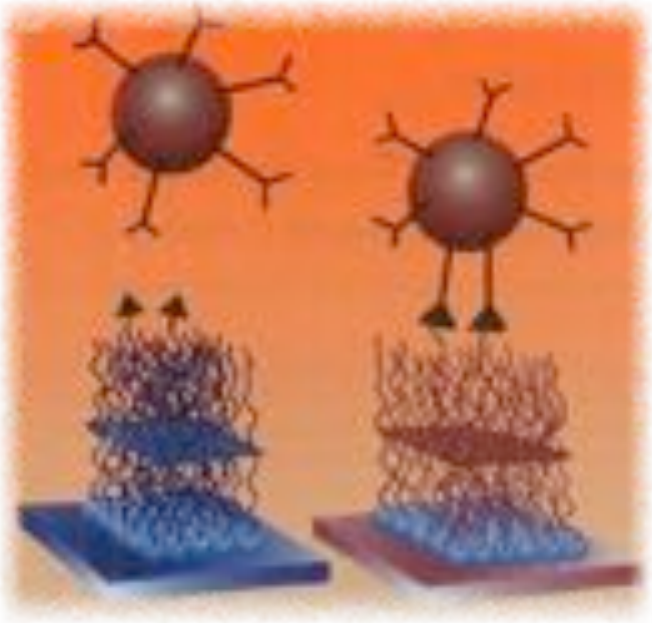
**Development of waterborne and 100% UV LED-curable encoding inks**

→ Anticounterfeiting fabrics
→ For tracking and tracing


Textile HERE is ART

# Playing with UV-inks

# Specialty inks: Bacteria markers



*E.coli*

*Salmonella*

Sensing:

1. Microbial contamination
2. Durablity of AM-treatment

*Interaction bewteen printed textile and e-devices (ipad, iphone …)*

# ‘LIVING TEXTILE’

# Daily excercise

***Every morning in Africa a antelope wakes up, it knows it must outrun the fastest lion, or it will be killed.***

***Every morning a lion wakes up, it knows it must run faster than the the slowest antelope, or it will starve to die.***

***It doesn't matter if you are a antelope***

***or a lion, when the sun comes up, you'd better be running!***

# Digital Technologies

transform even SMEs
in ‘big’ successful companies

Many thanks

Prof. Dr. Em. Marc van Parys
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# THANK YOU FOR YOUR ATTENTION


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— GHERZI PRESENTATION —

ITMF

ITMF Annual Conference 2017 / Bali, Indonesia

# A New Era for Nonwovens: Drivers and Opportunities

GHERZI

Laurent Aucouturier

Gherzi Textil Organisation AG

16th September 2017

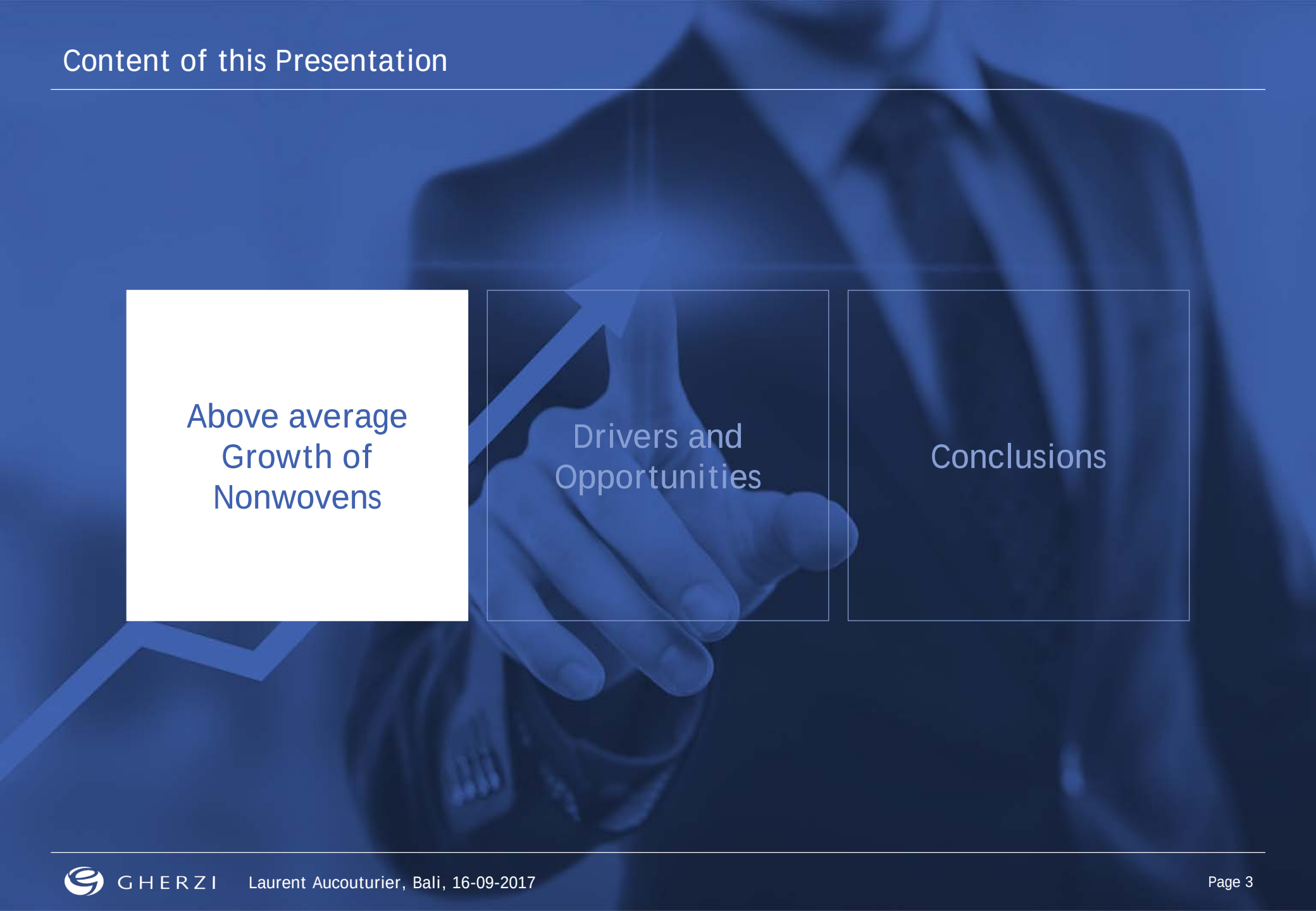
We are a global Management Consulting and Engineering company.

Gherzi is a leader for strategic development and expansion of companies in the textile industry, from production to retail.

Our services range from Engineering of new factories to strategy consulting as well as corporate finance.

GHERZI

# Content of this Presentation



Above average Growth of Nonwovens

Drivers and Opportunities

Conclusions

# In 2014, 31% of world Technical Textiles ('TechTex') consumption in volume (tons) concerned Nonwovens

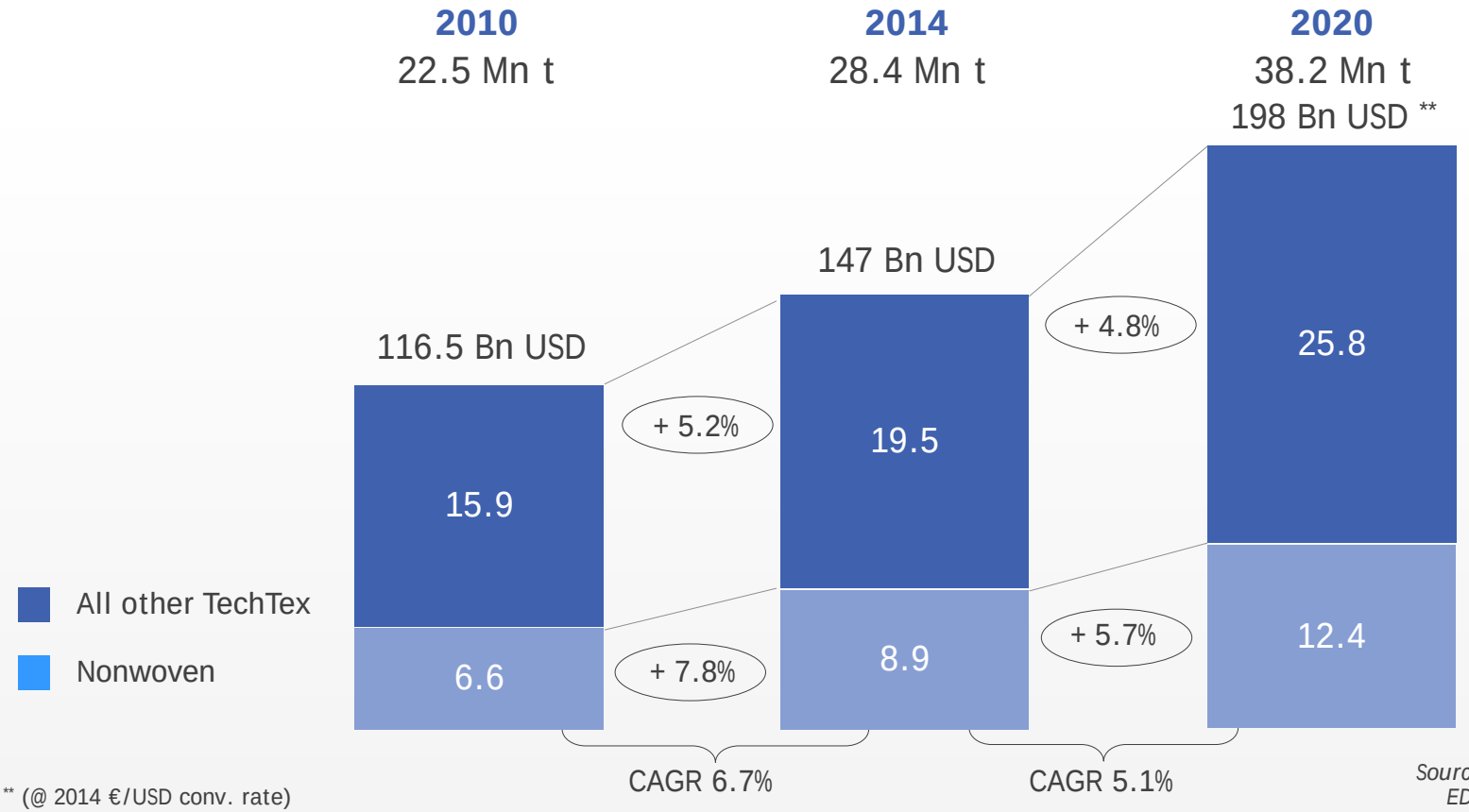

| | | Mn t | Typical Products |
|---|---|---|---|
| Yarn Type 10.2 Bn USD | 69% | 1.4 [1] | Sewing threads, medical sutures, ropes and cords, etc. |
| Fabric Type 109.0 Bn USD | 69% | 18.1 [1] | Coated fabrics, FIBC, sun shading and blinds, tire cord, medical bandages, narrow wovens, filament fabrics for filtration or digital print substrate, glass fabrics for composites, etc. |
| Nonwovens 27.8 Bn USD* | 31% | 8.9 [2] | Hygiene cover stock, wipes, filter material, auto acoustics, cotton pads, etc. |
| | **100%** | **28.4 Mn t** | |

*nota bene.: 35.6 Bn USD as of EDANA (Gherzi world TechTex market model has different average prices)

*Sources: [1] Gherzi world TechTex consumption Model, [2] EDANA*

# On a global scale, Nonwovens are outgrowing yarn type and fabric type Technical Textiles

## World TechTex Market Growth

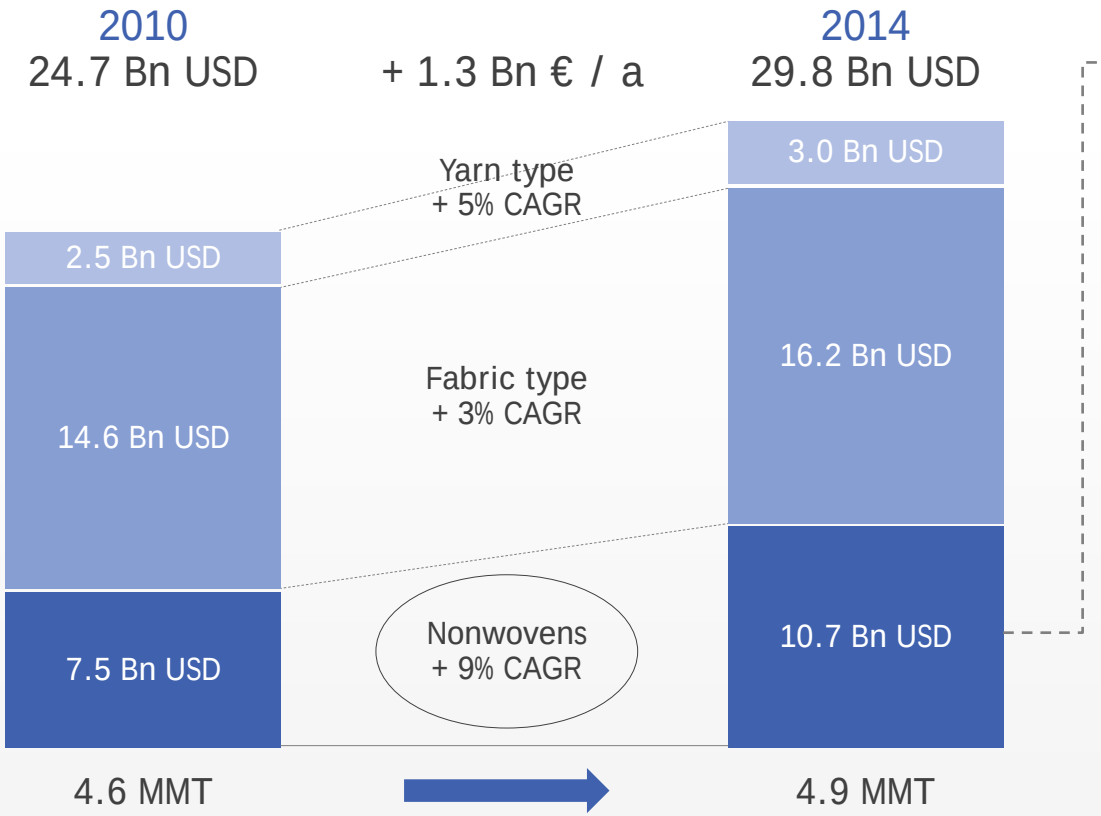



** (@ 2014 €/USD conv. rate)

*Sources: Gherzi world TechTex model, EDANA & 'Gherzi forecast) for 2020*

# EU TechTex production has grown at 1.3 Bn USD p.a. between 2010 and 2014. 62% of this growth has been generated by Nonwovens (+ 0.8 Bn USD/a)

## EU28 TechTex Production

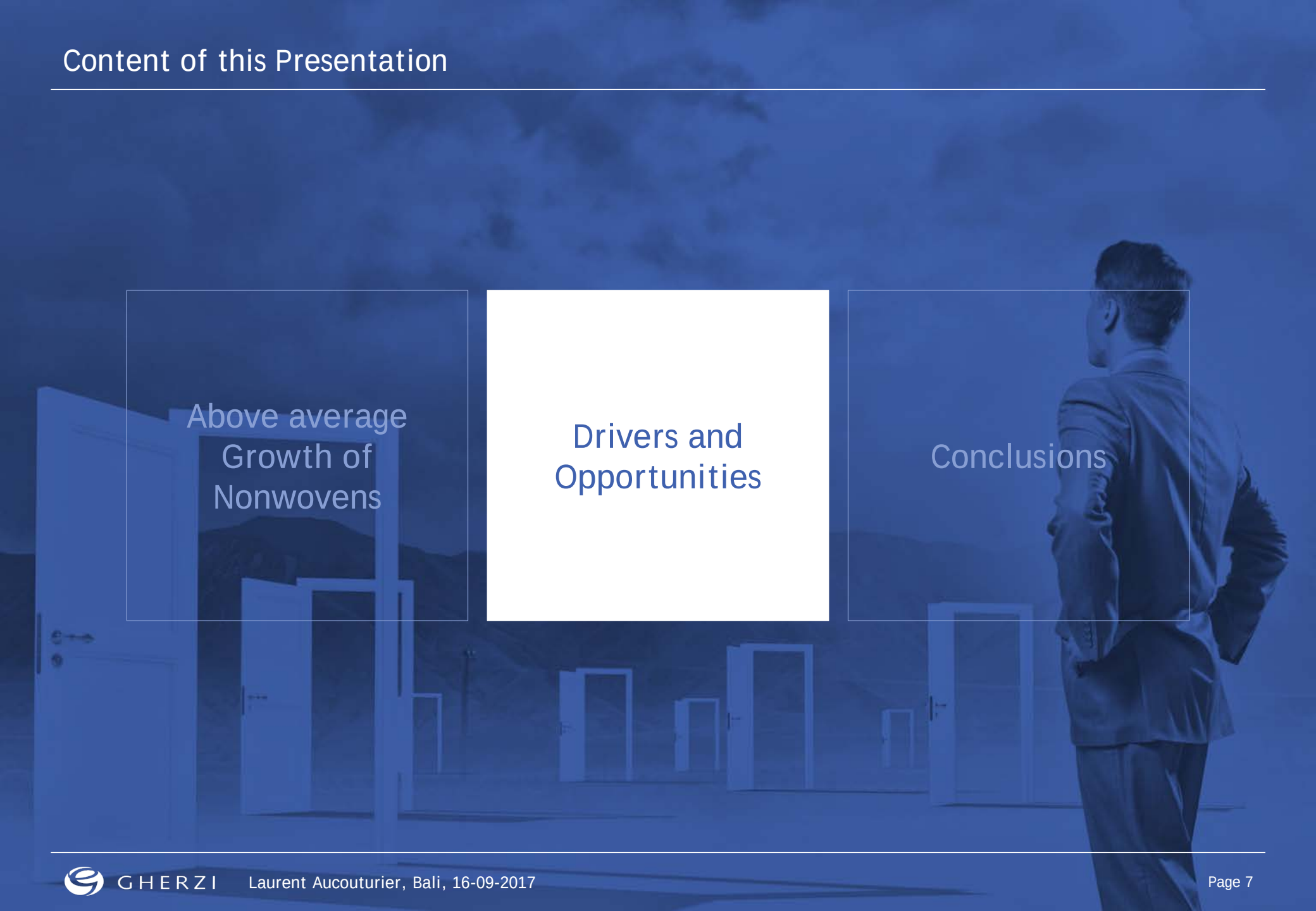




*nota bene: Prodcom definition of Nonwovens is not entirely identical to EDANA definition

*Sources: Prodcom*, Gherzi analysis*

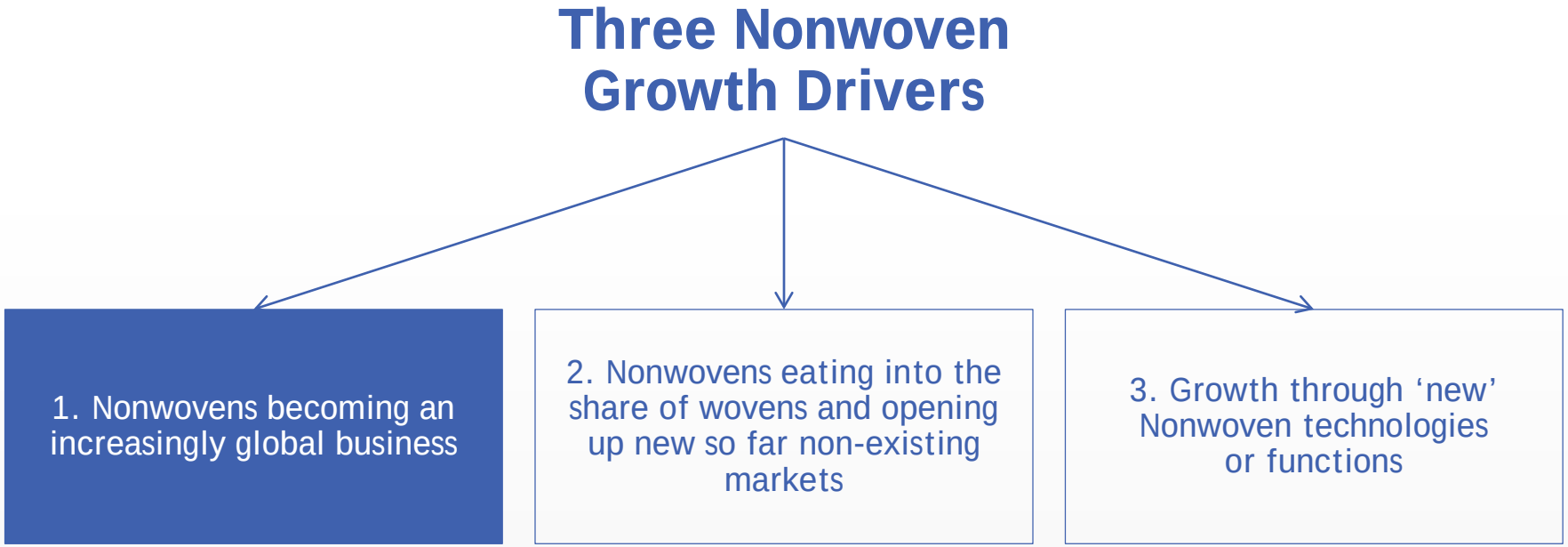
# Content of this Presentation



Above average Growth of Nonwovens

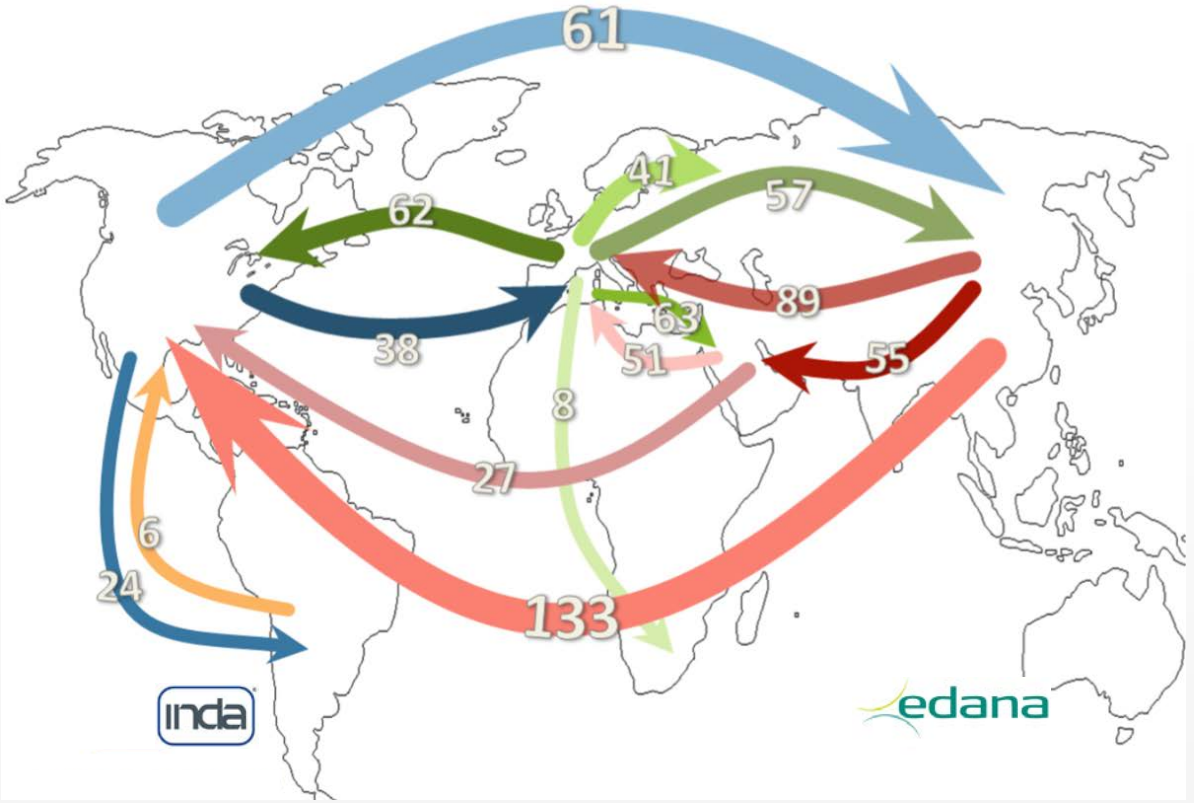
**Drivers and Opportunities**

Conclusions


Three Nonwoven Growth Drivers
1. Nonwovens becoming an increasingly global business
2. Nonwovens eating into the share of wovens and opening up new so far non-existing markets
3. Growth through 'new' Nonwoven technologies or functions

## … not only but also FTAs have been supporting the globalisation of Nonwoven sales

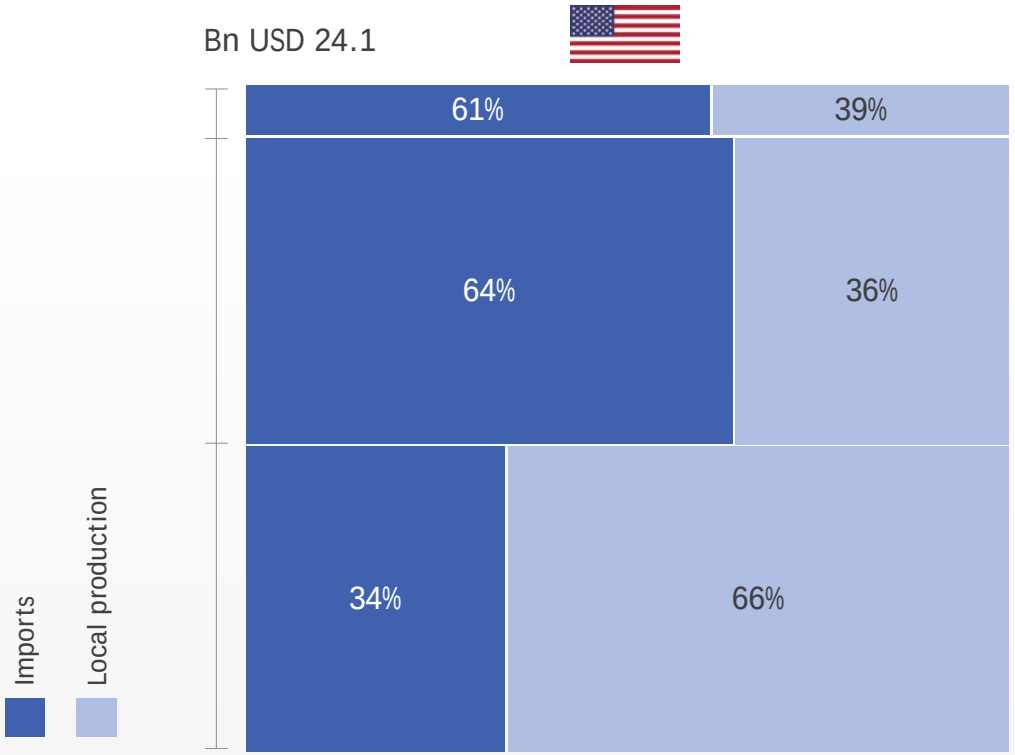
### International trade flows of nonwovens roll goods in 2014 (k tons)




*Source: National statistical institutes*

# In general, the USA is an 'import friendly' market with 12 Bn USD Technical Textiles being imported in 2014

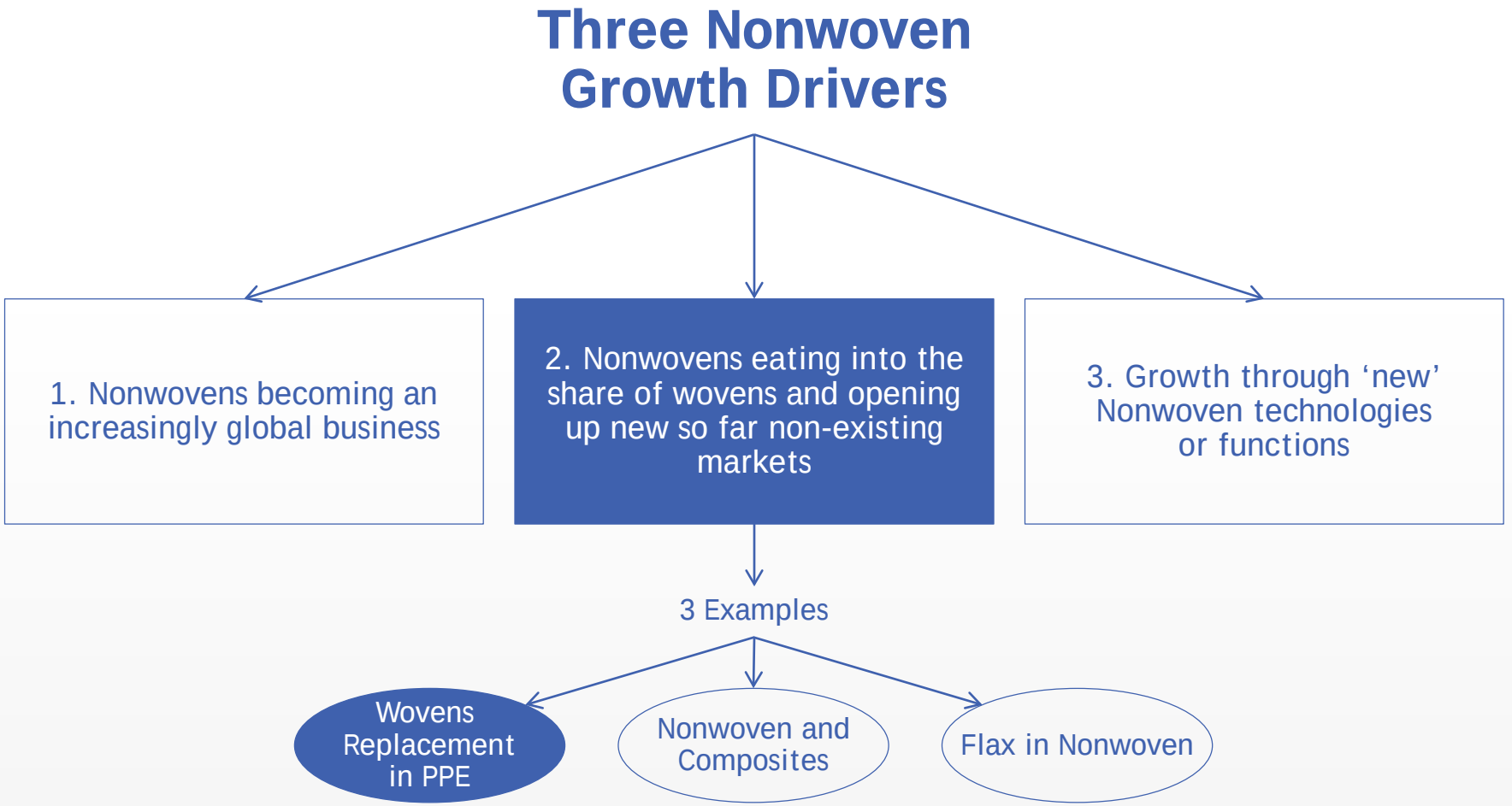
## US TechTex market scenario 2014




| | 2014 US Market size Bn USD | Of which imports Bn USD | EU export to the US % CAGR 2010-2014 |
|---|---|---|---|
| Yarn type | 1.98 | 1.21 | -1.5% |
| Fabric type | 11.76 | 7.49 | 9.0% |
| Nonwoven | 10.34 | 3.50 [1)] | 13.0% |
| | **24.1** | **12.2** | **8.0%** |

[1)] Scope of Nonwovens as of UN Comtrade (thus broader than in the EDANA (Inda) definition), e.g. including HS code 961900 (sanitary towels, tampons and napkins + napkin liners for babies and similar articles of any material)

*Sources: Gherzi world and regional market model, UN Comtrade, Gherzi estimates*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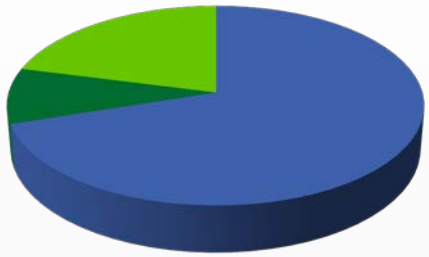
3 Examples
Wovens Replacement in PPE
Nonwoven and Composites
Flax in Nonwoven

# The vast majority (est. 70%) of the world PPE fabric market is still occupied by wovens. The Nonwoven share has risen to > 20%, though

**World PPE Fabric Market 2015**

8.0 Bn USD




| End-Use | Mill US $ 2015 (est.) | Main technology employed: woven | knitted | Nonwoven | Unspun | Main raw material employed |
|---|---|---|---|---|---|---|
| Protech FR clothing | 1095 | *** | | | | PES FR or FR treated cotton |
| Protech NBC | 15 | *** | | | | activated carbon coated (PES) fabric |
| Protech cut / slash protection | 550 | ** | *** | * | | Para-Aramide (Kevlar) |
| Ballistic protection | 290 | *** | | | ** | Para-Aramide (Kevlar) plus ceramic inserts |
| Face masks | 265 | | | *** | | PP spunbond / SMS |
| Dust protection | 365 | ** | | *** | | PP spunbond or PES filament woven |
| Chemical protection | 730 | * | * | *** | | PP or PES spunbond possibly with coating (silicone) |
| FWC (foul weather cloth) | 4400 | *** | | | | PES filament woven PU coated / with breathable membrane |
| Hi-visibility fabric | 235 | *** | ** | | | dope dyed PES filament warp-knit or woven |
| Harnesses | 55 | *** | | | | narrow wovens from dope dyed PP or PES filament |
| Total world fabric Market | 8.0 Bn USD (100%) | 70% | 8% | 21% | bel. 1% | |

*Sources: Gherzi estimates and analysis*

# 3 examples of nonwovens development in the PPE sector

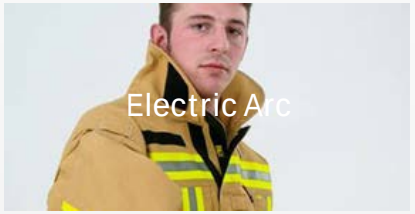
1 | Traditional Nonwoven applications in PPE include hospital, clean room and laboratory wear as well as chemical and biological protection (all chiefly based on spunmelt Nonwovens)


*Source of pictures: Du Pont (Tyvek) and Dach Schutzbekleidung GmbH*

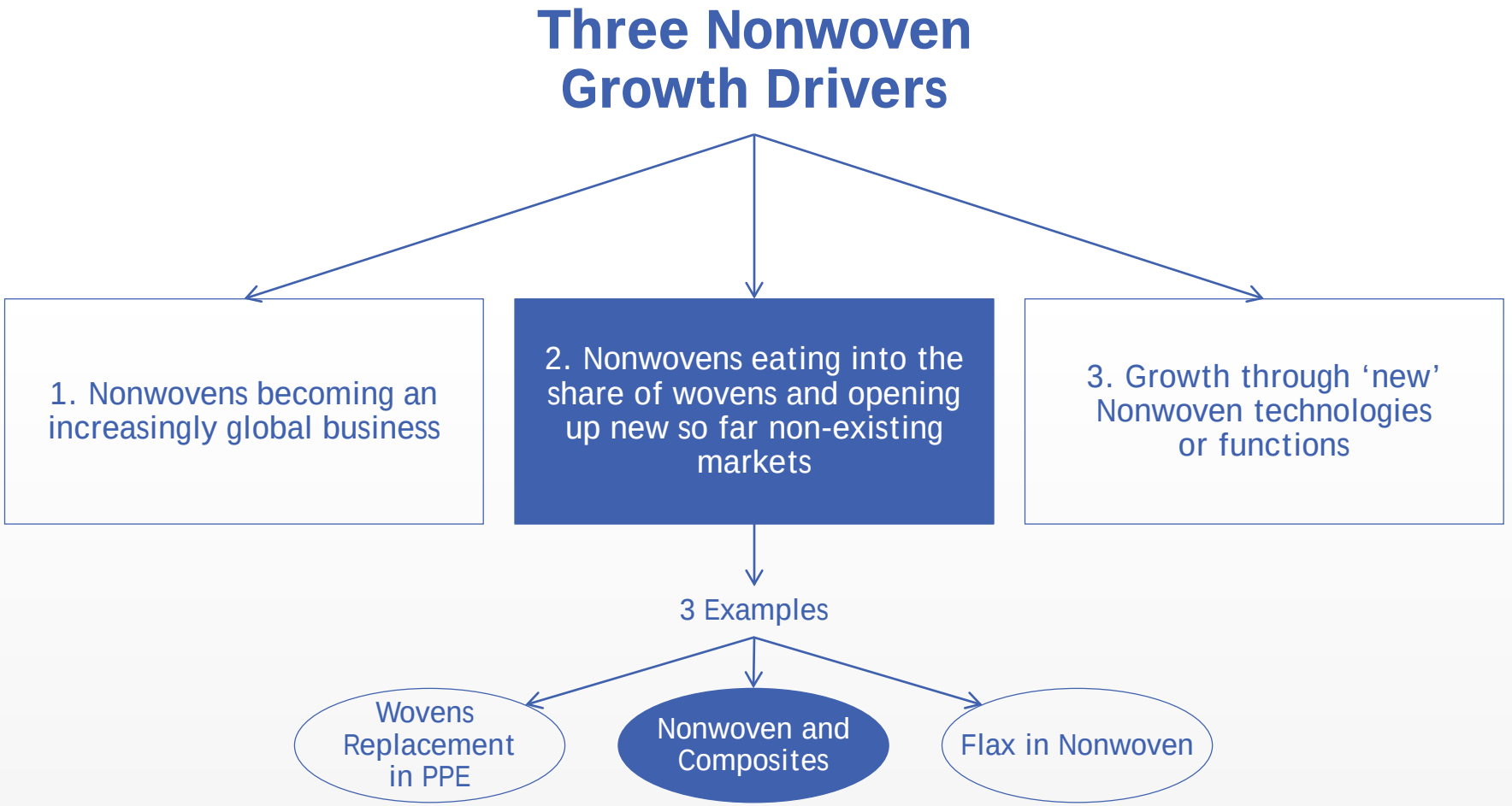
2 | Spunmelt Nonwovens have also started to eat into the woven shares in oil and gas (against plain Poly-Cotton and FR treated cottons) as well as FWC (against coated or membrane laminated wovens)


*Source of pictures: Du Pont (Tyvek)*

3 | The carded – spunlace Nonwoven technology route has opened further PPE fabric markets to Nonwovens outside of the spunmelt occupied applications and product segments




*Source of pictures: Norafin*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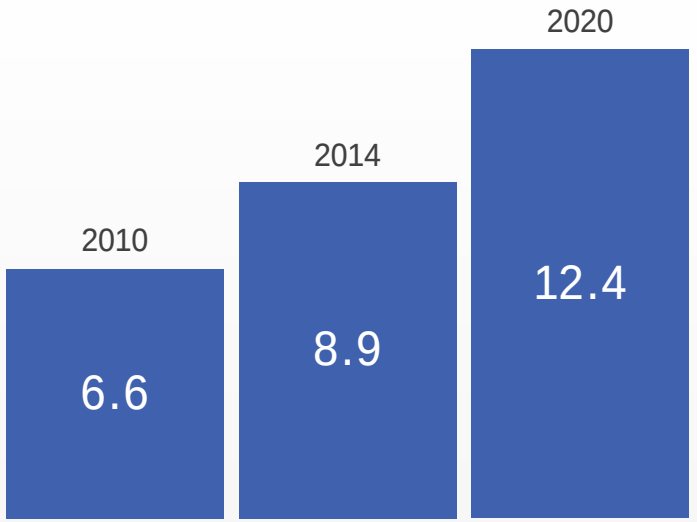
# Nonwovens & Composites - Convergence of two fast growing sectors

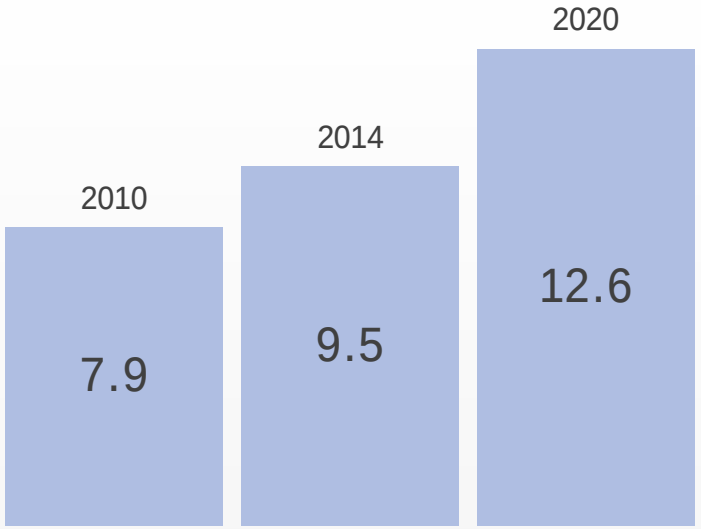
## World Nonwoven Growth

(000 kt)




## World Composite Growth

(000 kt, incl. matrix)



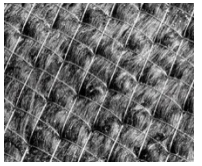

*Sources: JEC, EDANA, Gherzi estimates*

# 5 examples of nonwovens and composites interdependencies

1 | Carbon Fibre waste recycling (carded stichbonded nonwoven)

SGL AUTOMOTIVE CARBON FIBERS

*Germany*

- Mobiltech

2 | PET needlefelt nonwoven as GFRP or CFRP improvement media

LANTOR

*Germany*



- Composites

3 | Spunlace carded nonwovens as composite reinforcement substrate

Norafin

*Germany*



- Protech
- Buildtech
- Sporttech

4 | Spunbond PA Nonwoven as surface quality improvement

Fusion™ Superior Surfacing Veils

*USA*

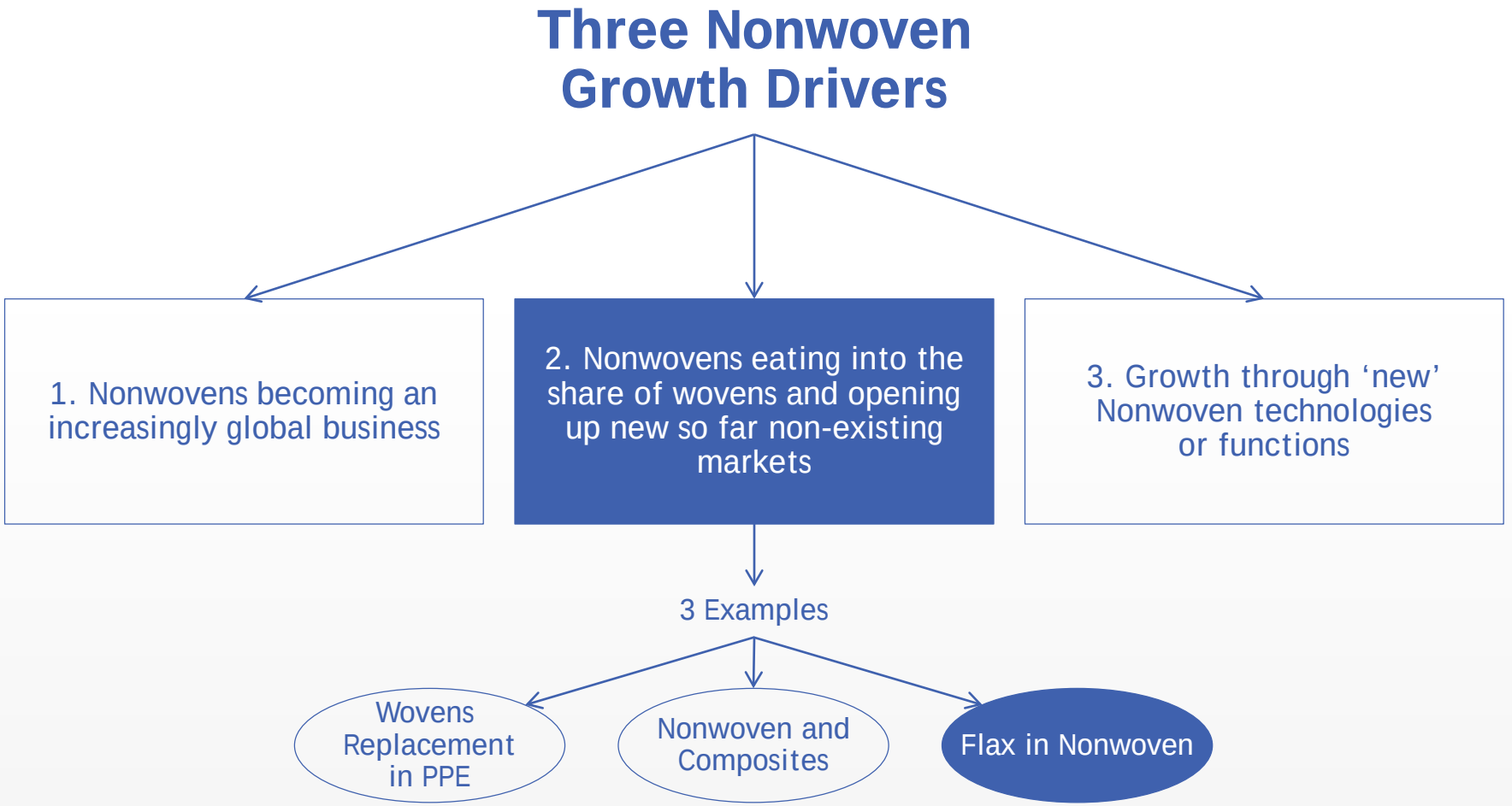

- Sporttech

5 | Wet Laid Nonwoven as surface quality improvement

Optiveil™ Performance without the weight

*UK*

- Composites


Three Nonwoven Growth Drivers
1. Nonwovens becoming an increasingly global business
2. Nonwovens eating into the share of wovens and opening up new so far non-existing markets
3. Growth through 'new' Nonwoven technologies or functions
3 Examples
Wovens Replacement in PPE
Nonwoven and Composites
Flax in Nonwoven

## Non-carbon fibers for composite nonwovens: Flax appears as one of the currently most interesting fiber

**Why?**

**45% lighter as glass fiber**

**Mechanical strength similar to glass**

**Cradle-to-Cradle compatible (with corresponding matrix)**

**Sustainability image und eco-look**

**Cost-effective (suitable for cars)**

# 3 examples of flax nonwovens development

1 | EcoTechnilin

*France*

Ecotechnilin, France (www.eco-technilin.com) produces 6.5 kt flax nonwoven p.a. and other natural fibre for composites - compression moulding. (With suitability for semi-structural components)

2 | LINEO

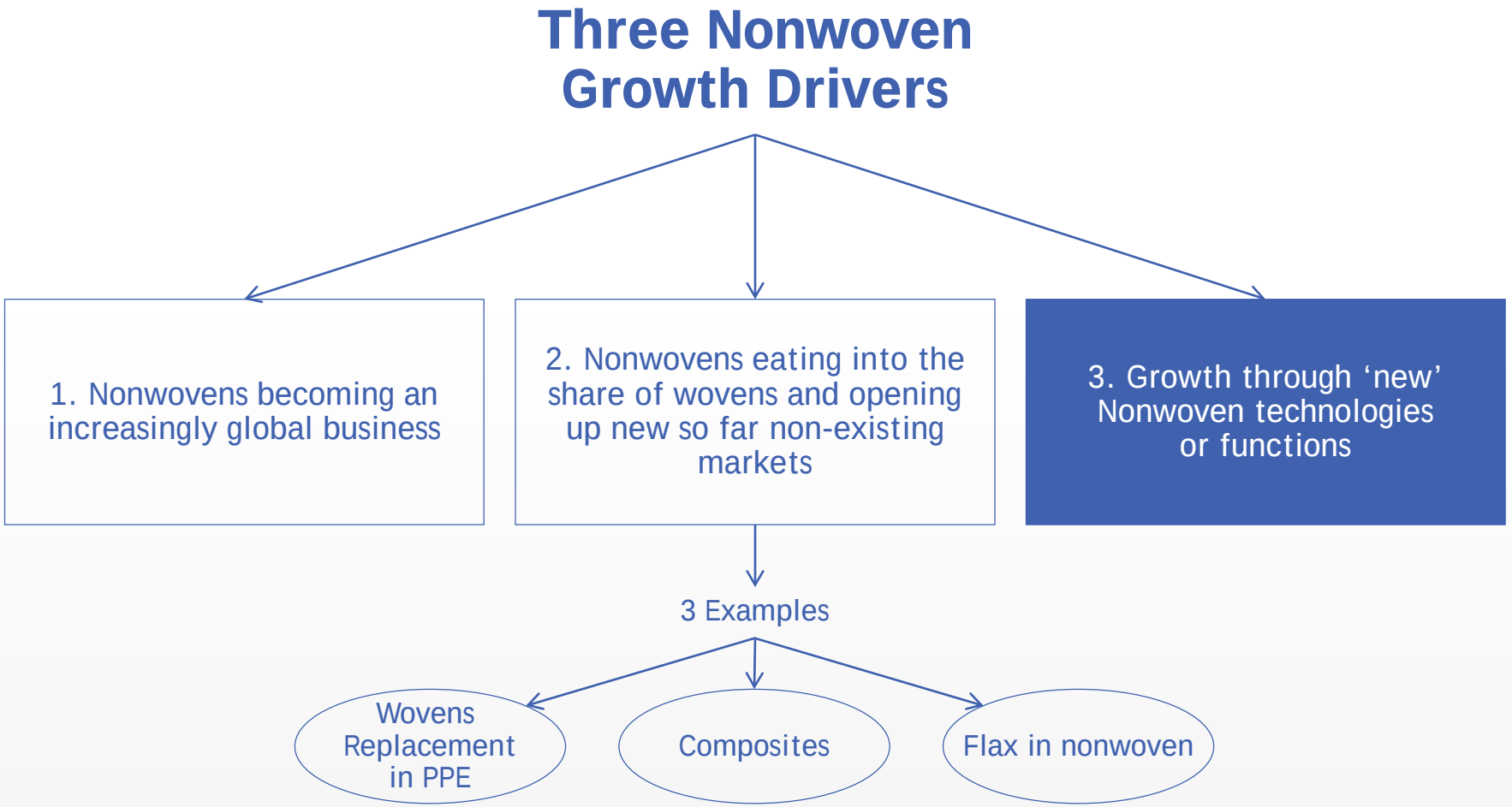
*France*

Lineo, France (www.lineo.eu) has developed a polyester/ flax unidirectional prepreg with Faurecia for passenger car composite interior structures

3 | twe group smart nonwoven solutions

*Germany*

Isowood, Germany (www.twe-group.com) runs tests with STFI Flachs / CF for lightweight passenger car door linings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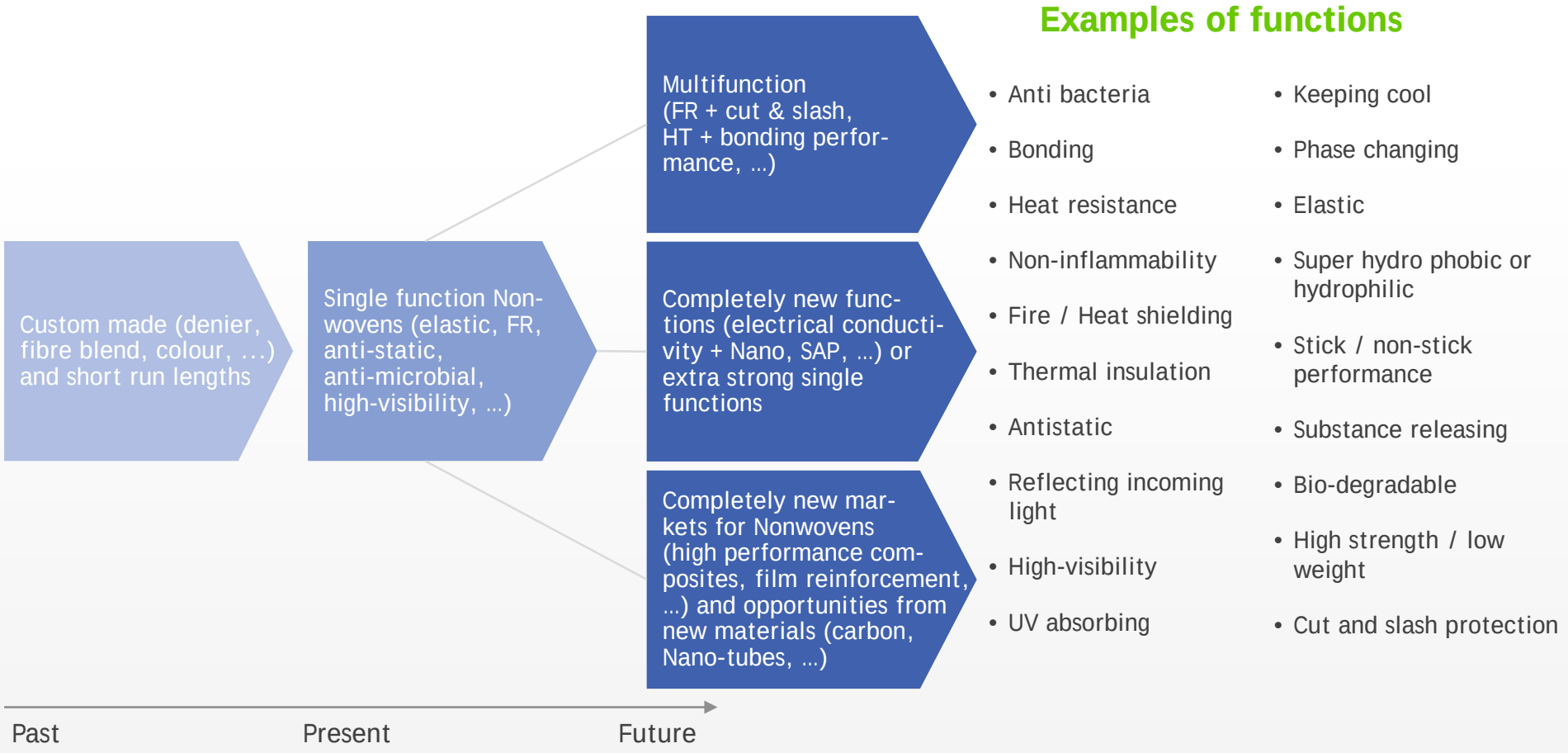
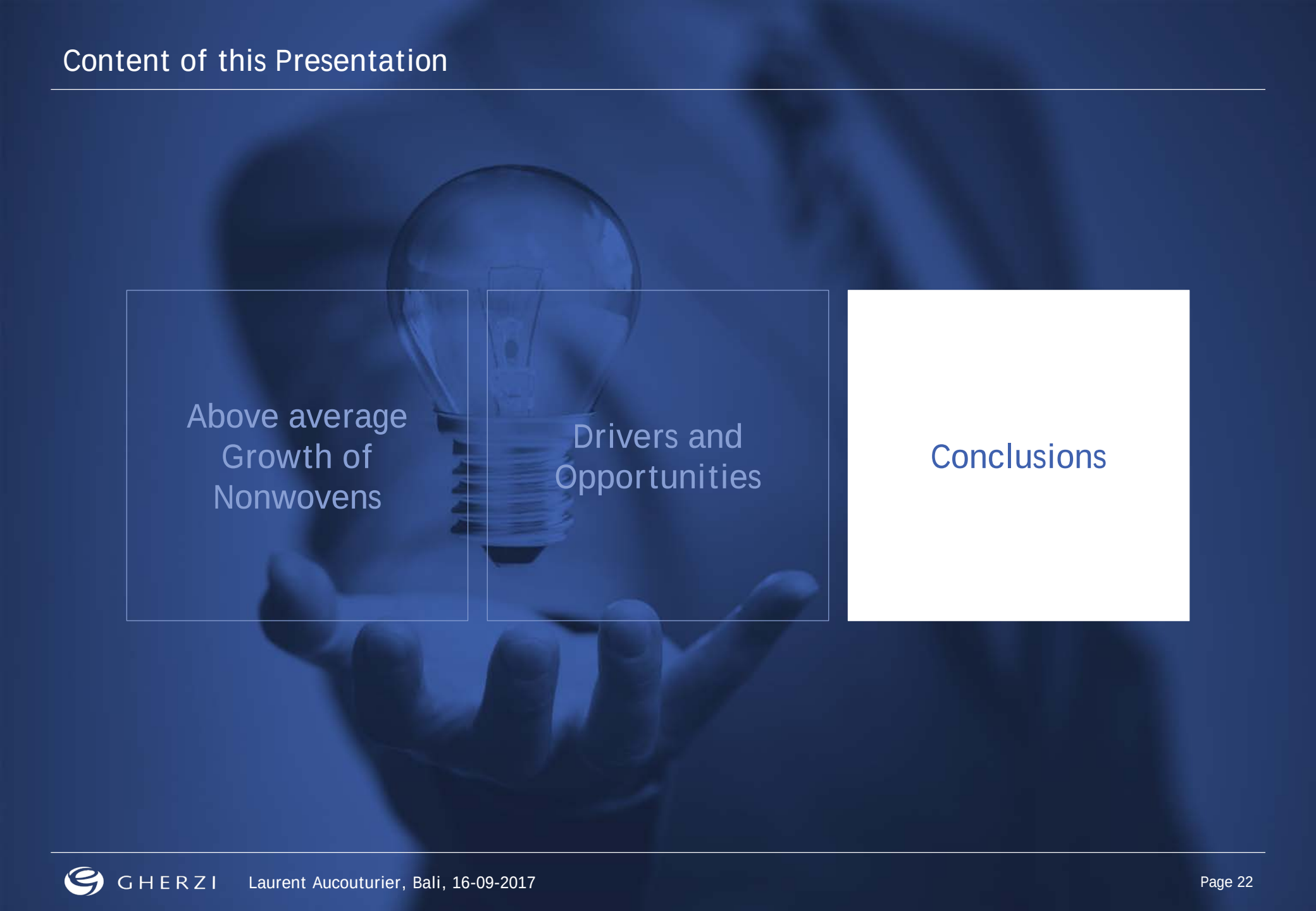
# High value added (per kg) product trends in Nonwovens: from custom made to Multifunction




## Examples of functions

- Anti bacteria
- Bonding
- Heat resistance
- Non-inflammability
- Fire / Heat shielding
- Thermal insulation
- Antistatic
- Reflecting incoming light
- High-visibility
- UV absorbing
- Keeping cool
- Phase changing
- Elastic
- Super hydro phobic or hydrophilic
- Stick / non-stick performance
- Substance releasing
- Bio-degradable
- High strength / low weight
- Cut and slash protection

# Content of this Presentation

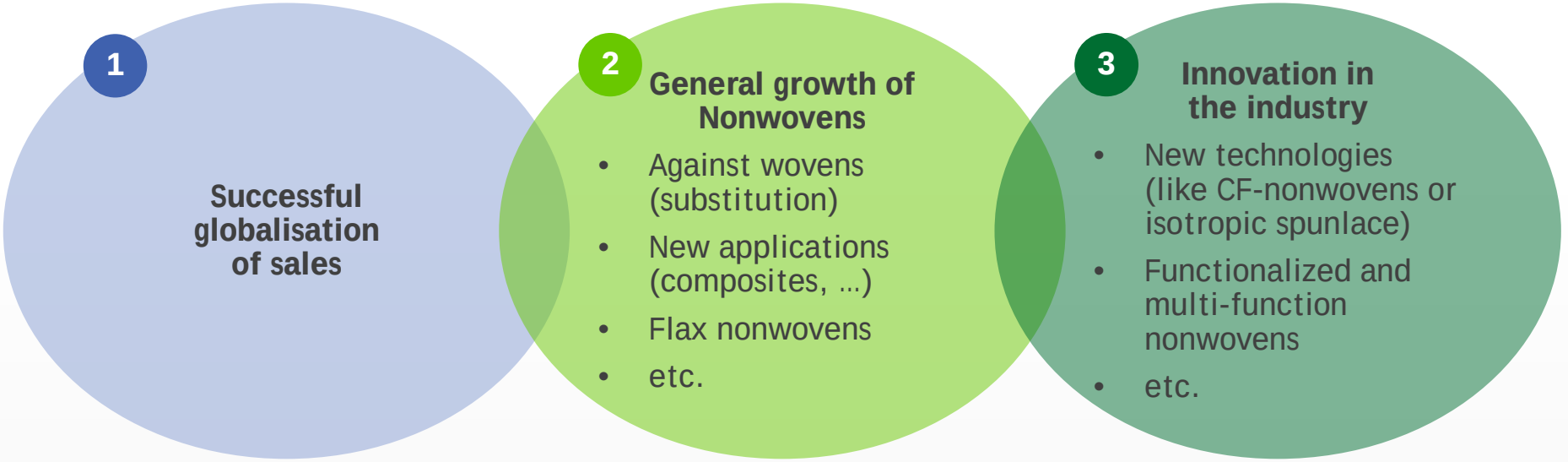


Above average Growth of Nonwovens

Drivers and Opportunities

Conclusions

# Nonwoven production is and remains a growth industry




## Future growth depends on

1 | Continuing high investments into manufacturing technology and R&D

2 | Possibly more and more delocalised plants closer to the final user (ex. in the USA)

# Thank you

## for your interest and attention

GHERZI

Gherzi Textil Organisation AG
Advisors to industry