



# Research, Development & Innovation

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**Cross-Border Cooperation Clusters Conference**

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## General Technology & Market Trends

**SUSTAINABILITY – FLEXIBILITY – NEW  
BUSINESS MODELS**

# General Trends: Sustainability



## Why:

- Stricter legal requirements for cleaner, more resource-efficient manufacturing & greener/healthier products
- Market demand for clean/green/ethical products + more transparency, more surveillance (gov., NGO's, consumers)



## What:

- Sustainable materials
- Energy-efficient processes/clean technologies
- Sustainable business operations



**Energy Made-to-Measure**

ENERGY EFFICIENCY  
IN THE EUROPEAN TEXTILE-CLOTHING  
INDUSTRY



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AND TEXTILE INDUSTRY

# General Trends: Flexibility



## Why:

- Growth & profitability are in fast fashion, quick fulfilment, customised/niche products



## What:

- Flexible business processes & manufacturing technologies
- Integration of processes with suppliers/customers (digital supply chain)





EURATEX

- Mass-production+mass-distribution = 20<sup>th</sup> century
- A profitable 21<sup>st</sup> century business must be smarter

- 100% customer focus
- Anticipating customer needs = deep market knowledge
- Customising products
- Linking product with value-adding services





## Process Innovation

**MATERIALS – RESOURCE-EFFICIENCY – NEW  
TECHNOLOGIES - DIGITALISATION**



## Fibres & filaments

- New properties & functions based on:
  - New/improved polymers & additives
  - Multicomponent fibres and multifilaments
  - Fibre-shape/dimension (micro-/nano-fibres)
  - Fibre surface
- New, improved fibre blends
- Innovative uses for conventional fibres
- Better sustainability profile of fibres (recycled fibres, renewables/bio-polymers)



## Textile structures and surfaces

- Novel material properties based on new structures/structuring technologies (e.g. non-wovens, circular knitting, 3D weaving, spacer fabrics...)
- Innovative surface treatments & functionalisations

## Complex, hybrid & smart materials

- Multimaterial combinations & textile/non-textile hybrid materials
- Functional & reactive materials (microcapsules, photochromics, SMA's...)
- Integration of smart components (sensors, LED's, photovoltaics, energy harvesting & storage components...)

# Process Innovation: Resource-efficiency



## Materials

- Low-waste production & valorisation of production waste (recycling)
- Use of fibres with favourable environmental footprint

## Energy

- Low-energy production technologies
- Measurement & monitoring of energy-consumption
- Better production planning/organisation



## Water & chemicals/auxiliaries

- Low-water processing technologies
- Water recycling and re-use
- Efficient chemicals use and post-process recovery
- Use of environmental friendly chemicals (e.g. bio-chemistry)

## General strategy & behaviour

- Management focus & worker incentives related to resource-efficiency

# Process Innovation: New Technologies



## **New materials processing**

- Production technologies for high-performance fibres & yarns (e.g. carbon, ceramic, metal)
- Technologies for delicate/small-scale materials (nano-fibres, electrospinning, medical purpose materials)
- Surface treatment of new materials

## **New structures & surfaces**

- Very-large or very-small scale structures
- Hybrid, multiaxial & shaped structures
- Innovative finishing/surface treatment technologies

## **Efficiency**

- Low resource consumption technologies
- High-speed/high-precision production
- Low defect technology & on-line quality control
- Process integration & intensification

## **Flexibility/Versatility**

- Efficient small batch/lot processing/manufacturing technologies
- Multimaterial/multiprocess technologies



## Process Innovation: Digitalisation



## Machine/process


- CAD/CAM/CIM technology
- Digital processes (e.g. digital printing & finishing)
- Smart, self-adjusting machines
- Intuitive human-machine interfaces



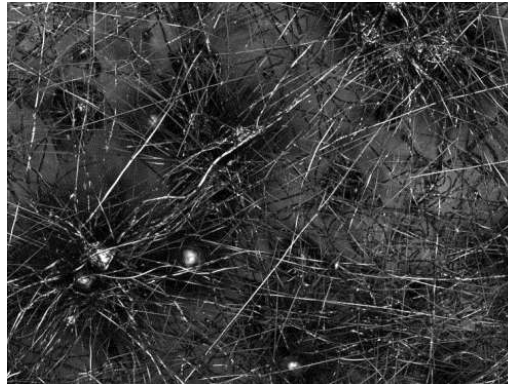
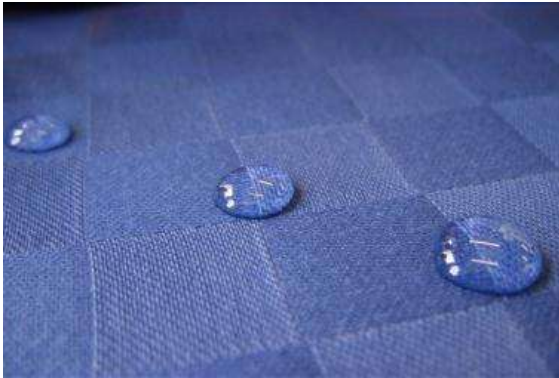
## Factory/company

- IT-based production planning, scheduling & control
- Smart intra-factory logistics and warehousing (RFID, real-time batch, order, single-piece tracking)
- PLM (virtual product design & collection management)

## Value chain

- e-business (IT integration with suppliers, service providers and customers)
  - Use of RFID, smart labels, real-time feedback
  - e-commerce & end-consumer interaction
- 





## Product Innovation

**SURFACE FUNCTIONALITIES – STRUCTURAL  
PROPERTIES – SMART PRODUCTS & SERVICES**



# Product Innovation: surface functionalities



## **Traditional functionalities using improved/new technologies**

- Higher quality products through better controlled dyeing & finishing
- Greener products using more less-toxic, more environmental friendly processes & chemical agents (e.g. REACH-compliant dyes/finishes, enzymes, natural/bio-based dyes & auxiliaries...)
- Pre-treatment, coloration and finishing with new technologies (digital printing, plasma, UV,

## **New functionalities on traditional materials**

- Highly functional finishes on conventional textiles (e.g. hydrophobic cotton, flame-retardant synthetics, antimicrobial finishes...)
- Functional coatings, microcapsules, nano-structured surfaces (e.g. lotus effect)

## **New functionalities on new materials**

- Coloration & technical finishes of technical textiles
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# Product Innovation: Structural properties



## **Traditional yarns/ fabrics with improved performance**

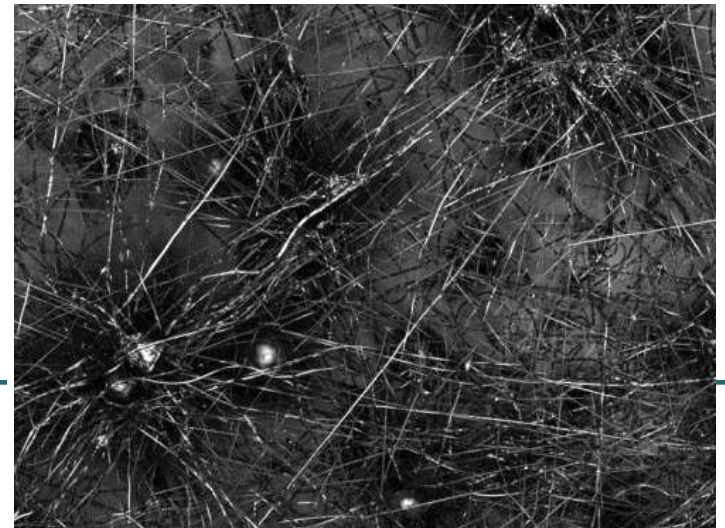
- High quality, low defect materials
- Innovative blends & combinations (combining advantages of different materials)

## **New yarns/fabrics for specialised applications**

- Technical yarns & fabrics
- Multifunctional materials (sports wear, technical applications)

## **New textile constructions**

- Multi-component filaments
- Non-wovens
- Braided, warp-knitted structures
- Technical knits
- 3D structures, spacer fabrics



# Product Innovation: Smart products & services



## **Adding value through product features**

- Add technical properties/features to your product that the customer values (improved user experience, saving cost of use)
- Adding intangible value (design, brand, authenticity, sustainability)

## **Adding value through customisation & personalisation**

- Making the product unique
- Involve the customer in the product conception process

## **Added value services**

- Smart logistics/availability
- Product care & maintenance
- Quality/service guarantees, return options
- Customer education & training





## Applications & Markets

**PROTECTION & SPORTS – HEALTH & WELL-BEING –  
FUNCTIONAL INTERIORS – TECHNICAL APPLICATIONS**

# Applications: Protection, sports Protech/Sportech/Clothtech



## **Protective clothing & equipment for high & multi-risk environments**

- Heat & flame protection (fire fighters, military, energy, petro-/chemical, basic metals industries)
- CBRN protection (military, first responders, nuclear energy, chemical industry)
- Ballistic & explosive protection (military & civil security services)

## **Protective clothing & equipment for medium risk environment**

- High-visibility wear (first responders, construction workers...)
- Fall & impact protection (construction workers, first responders)
- Buoyancy & flotation equipment for off-shore workers

## **Workwear & low-risk protective clothing**

- Cut, puncture & abrasion resistance
- Foul weather protection
- Good combination of comfort & function

## **Sports & functional leisure wear**

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# Applications: health & well-being

## MedTech



### Medical devices

- External application materials & devices (wound dressings, compresses, orthotics...)
- Internal application materials & devices (implantable structures & materials)
- Medical equipment & wear (gowns, gloves, masks, filters, bags, pads, wipes...)

### Hygiene

- Female & infant hygiene, incontinence products
- Towels, wipes, pads
- Household cleaning equipment

### Consumer health products

- Functional wear (compression stockings...)
- Braces & bandages
- Cosmetotextiles





# Applications: functional interiors

## Hometech



### Floor covering:

- Functional & smart carpets (insulation, acoustics, guidance & detection, indoor climate, safety...)

### Wall & window dressing:

- Functional wall covers (insulation, acoustics, lighting)
- Functional curtains & blinds (light & temperature management, indoor air quality, acoustics...)

### Furniture:

- Functionalised upholstery
- Textile-based furniture parts

### Bedding:

- Functional pillows and bedsheets (anti-microbial, anti-mite/mosquito, anti-allergic, odour emitting)





# Applications: Technical applications

## Transport sector (Mobiltech)

- Automotive: interiors, tyre cords, safety belts, airbags, truck covers, nets & bags, fibre composite parts
- Aerospace: interiors, belts, nets, hoses, fibre composite parts
- Waterborne: interiors, (mooring) ropes, nets, sails, large bags, flexible tanks

## Construction & architecture (Buildtech)

- Membrane structures (roofs, tents, sails...)
- Textile reinforcements (TRC, tunnel linings, rotor blades)

## Agriculture, earth works, environmental applications (Geo/Agro/OekoTech)

- Crop protection & guiding
- Soil stabilisation & erosion protection
- Water management/irrigation/flood protection

## Industrial Applications (Indutech/Packtech)

- Conveyor belts
- Filters
- Bags, nets, covers & other flexible packagings





## R&D Support

UNIVERSITIES – INSTITUTES – CLUSTERS –  
EU FUNDING – TEXTILE-ETP

# R&D support: Universities



- **Role:** Higher Education & (fundamental) research
- **Main activities:**
  - Graduation of bachelor, master & PhD students in textile technology, clothing technology, textile chemistry, textile management
  - Academic research on textile materials & processes
  - Some collaborative activities with industry (applied research, training)
- **European capacities:**
  - Most EU universities with textile departments are members of **AUTEX, Association of Universities for Textiles** ([www.autex.org](http://www.autex.org))
  - In addition education of bachelor & master students in textile & fashion related subjects takes place in universities of applied sciences, technical & fashion/design colleges, in the process of setting up a new European network NETFAS (contact: Prof. Ger Brinks, Saxion University/NL, [G.j.brinks@saxion.nl](mailto:G.j.brinks@saxion.nl))



# R&D support: Institutes



- **Role:** applied research & technology-related industry support
- **Main activities:**
  - Collaborative research with industry
  - Technology transfer, consulting, training
  - Demonstration and pilot production
  - Testing & certification
- **European capacities:**
  - Most EU textile research institutes are members of Textranet – European Network of Textile Research Organisations [www.textranet.eu](http://www.textranet.eu)



# R&D support: Clusters



- **Role:**
  - Local/regional support structure to facilitate collaboration between the 3 main innovation stakeholders (*triple helix*): industry, research, public authorities
- **Main activities:**
  - Networking/brokerage
  - Access to infrastructure & public funding
  - Market & technology exploration
  - National/international promotion
- **European capacities:**
  - 20-30 regional/local cluster organisations across Europe, informal collaboration through various European projects (CrossTexNet, Textile 2020...)



CROSSTEXNET



# R&D support: EU Programmes



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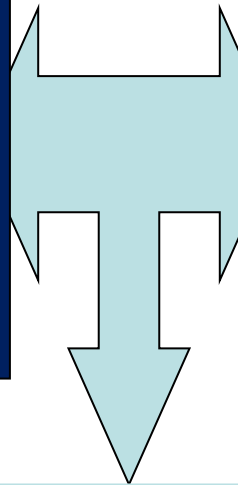
# HORIZON 2020

The EU Research & Innovation Funding Programme  
for 2014 to 2020



**Total budget € 70 billion (over 7 years)**

**Societal  
Challenges**  
€ 29.7 billion



**Enabling and  
industrial  
technologies**  
€ 17 billion

## Scientific Excellence

Frontier research (ERC & FET)

-Skills & career development (Marie Curie)

-Priority research infrastructures

**€ 24.4 billion**

# HORIZON 2020

## How it works – in a nutshell



- Funding is provided for collaborative projects (industry+research, cross-border) on the basis of open competitive calls
- EU co-funding rates are 70%-100% of eligible costs + 25% overheads
- All EU + HORIZON 2020 associated countries (Iceland, Norway, Albania, Bosnia and Herzegovina, Former Yugoslav Republic of Macedonia, Montenegro, Serbia, Turkey, Israel, Moldova) are eligible for funding
- Other countries can participate with funding on case-by-case basis – partners from Mediterranean countries would most likely receive EU funding
- Call topics are published annually in the form of thematic work programmes
- Research results can be exploited & IPR protected by project partners, but obligation to disseminate about research activities

# Examples of HORIZON 2020 Research Topics (2014-2015)



- NMP 18: Materials solutions for use in the creative industry sector
- NMP 22: Fibre-based materials for non-clothing applications
- NMP 36: Business models with new supply chains for sustainable customer-driven small series production
- EeB 1: Materials for building envelope
- FoF 10: Manufacturing of custom made parts for personalised products
- FoF 12: Industrial technologies for advanced joining and assembly processes for multi-materials
- SPIRE 06: Energy and resource management systems for improved efficiency in the process industries
- CS5-20-2014: Boosting the potential of small businesses for eco-innovation and a sustainable supply of raw materials (SME instrument)
- BIOTEC-5a-2014: SME boosting biotechnology-based industrial processes driving competitiveness and sustainability (SME instrument)
- WASTE-6a: Eco-innovative solutions

**There is no specific funding programme for  
the textile & clothing industry!**

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# Further EU Funding Programmes



- **LIFE Programme:** supporting projects in the field of *environmental protection* & climate change, <http://ec.europa.eu/environment/life/> funded participation generally limited to EU countries
- **COSME Programme:** supporting access to finance, *SME support*, entrepreneurship, digitalisation [http://ec.europa.eu/enterprise/initiatives/cosme/index\\_en.htm](http://ec.europa.eu/enterprise/initiatives/cosme/index_en.htm), funded participation for EU and some third countries (negotiations on-going)
- **ERASMUS+:** supporting *education, training*, youth & sport [http://ec.europa.eu/programmes/erasmus-plus/index\\_en.htm](http://ec.europa.eu/programmes/erasmus-plus/index_en.htm), funded participation generally limited to EU countries

# R&D support: Textile ETP



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# What is the Textile ETP?

European  
Technology  
Platform  
for the future of  
textiles  
and  
clothing

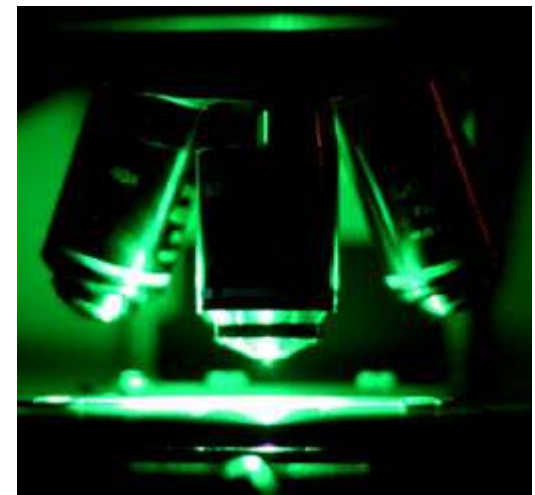


- Industry-led initiative launched in 2004
- Largest Network for Textile Research & Innovation in Europe
- 600+ registered expert members

- Mission:

***Ensure long-term competitiveness EU Textile & Clothing Industry through collaborative, market-oriented research & innovation***

- Key-objectives:
  - Establishment effective EU-wide expert network
  - Development Strategic Research Agenda (**SRA**)
  - Implementing the SRA (e.g. Projects, Financing)
  - Collaborating with related sectors
  - Bringing results to the industry
  - Promoting a positive, innovative industry image





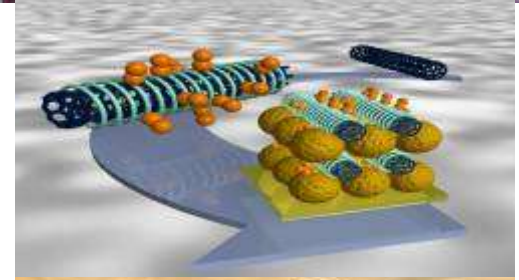
# Future Vision for EU T/C Industry

European  
Technology  
Platform  
for the future of  
textiles  
and  
clothing



## Major Long-Term Industry Trends

- Increased use of textiles as material of choice in many sectors and application fields.
- Move from commodities towards specialty products from high-tech processes.
- Move towards customisation, personalisation, as well as on-demand production.
- Innovation in resource efficiency, low environmental-impact technologies and promotion of consumer health and safety in products.



**Towards the 4<sup>th</sup> Industrial Revolution for  
Textiles and Clothing**

# Future Vision

European  
Technology  
Platform  
*for the future of*  
textiles  
*and*  
clothing



## Global Growth Markets

- Buildings & Interiors
- Protection & Healthcare
- Mobility & Energy
- Ressource-efficiency & environment protection
- Fashion & Creativity





# Research Funding

## Textile Projects in FP7 (2007-2013)

European  
Technology  
Platform  
for the future of  
textiles  
and  
clothing



MODSIMTex

Eco-Tex-Design  
POLYTECT  
Integrated Project for SMEs

ARTISAN

EcoMeTex



FibreChain



bacteri•safe





# Research Funding

*Textile Projects in FP7 (2007-2012)*

European  
Technology  
Platform  
for the future of  
textiles  
and  
clothing



MODSIMTex



Development of Photovoltaic Textiles  
based on novel fibres

Eco-Tex-Design  
POLYTECT  
Integrated Project for SMEs



FibreChain

bacteri•safe



PROSPIE



ARTISAN

NOTEREFIGA

NO BUG

INTIMICE

**400+ Organisations**

**€ 270 million of project budget**

**€ 200 million EU funding**

FLY-BAG

MICROFLEX

LEAP  
FROG

ME WEAR

pasta

SAFE  
PROTEX  
High protective clothing for complex  
emergency operations

TexWIN

CoR  
T

Deco  
coat



PROTEX safe@sea

Protect  
PROFLEX  
Advanced Protective Environment

NuWave

Microdress

SmartNets

STAY COOL

CROSSTEXNET

SUSTA-SMART

PROSUMER-NET

smart@fire

3D LIGHT  
TRANS

# Textile ETP Today

## Membership Structure

European  
Technology  
Platform  
for the future of  
textiles  
and  
clothing



- **Full members:** (baseline funding, board representation)
  - Euratex
  - Textranet
  - AUTEX
- **Associated members** (annual subscription premium or standard, represented in the General Assembly)
  - European T&C research/technology/education/consulting organisations not members of Euratex, Textranet or AUTEX
  - European companies from textile/clothing & related industry sectors
  - European organisations from related research domains
- **Corresponding members** (very small or no subscription, no board or GA representation)
  - Europe-based organisations or individual experts with interest in textile research or innovation



**Currently: total network of 200 affiliated organisations  
and over 600 registered individual experts**



# Textile ETP Today

## The Activities & Services

European  
Technology  
Platform  
*for the future of*  
textiles  
and  
clothing



### ➤ Networking

- Finding knowledge or technology providers and potential collaboration partners at European level
- Get direct access to EU research policy makers and programme managers
- Present own pre-commercial developments to a European audience

### ➤ Information Services

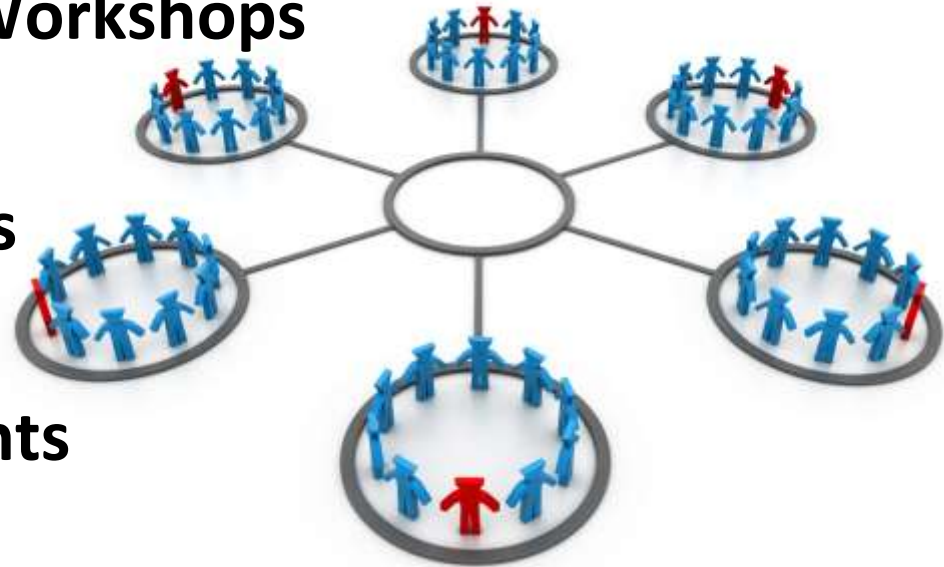
- Timely and customised information and individual advice on EU research funding opportunities
  - Latest research and technology developments incl. results of EU research projects
  - General news on textile research, new projects, events... from across Europe
-

# Networking Activities

European  
Technology  
Platform  
*for the future of*  
textiles  
*and*  
clothing



- **Conferences, Seminars, Workshops**
- **Textile Flagship Initiatives**
- **TEPPIES + brokerage events**
- **European Textile Technology Marketplace (ETTMa)**



**Access for free or at discount for ETP members**

# Information Services

European  
Technology  
Platform  
*for the future of*  
textiles  
and  
clothing



- Regular and ad-hoc news on EU policies, funding opportunities, ETP and member activities
- Web-based experts database and document repository
- Project Dissemination Platform



**Available for members according to subscription**

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# Participation Opportunities for EuroMed Organisation

European  
Technology  
Platform  
for the future of  
textiles  
and  
clothing



## Becoming a member:

- Textile-related organisations and professionals from all countries associated with the EU Research Framework Programme HORIZON 2020
- Organisations from further countries can join too, based on Governing Board approval

## Benefits:

- Connecting to the largest European research and innovation network
- Join EU consortia for collaborative research and innovation projects
- Learn about textile research and innovation policies/strategies in the EU and adapt them to the national context





## Recommendations

**RESEARCH & TECHNOLOGY CAPACITY –  
BUSINESS INNOVATION – FUNDING/PUBLIC  
SUPPORT**



# Recommendations: Research & Technology Capacities



- 1. Understand what competences/technologies are really needed by the local industry**
- 2. Develop these competences/technological capacities strategically together with industry**
- 3. Identify & build strategic (international) partnerships**
- 4. Adapt best practices from elsewhere to your reality – don't copy!**
- 5. Focus on people's knowledge & competences – make them move between the research & industry worlds**



# Recommendations: Business Innovation



- 1. Understand your competitive advantages (and your weaknesses)**
- 2. Improve your current business (quality, efficiency, reliability, response time, competences, added value services)**
- 3. Explore incremental « easy » market opportunities (think close to home, think close to existing competences & capacities)**
- 4. Collaborate with local/regional competence & technology providers (if they don't exist look further afield)**
- 5. Identify & build strategic (international) partnerships**



# Recommendations: Funding/Public Support



- 1. Get organised in a triple helix cluster/network (research+industry+ authorities) and build trust**
- 2. Communicate strategic needs clearly & professionally to public authorities (be ambitious, clear & persistent)**
- 3. Make use of all available funding opportunities (be creative!)**
- 4. Show the results of funded projects (policy makers like to know what happened to the taxpayers money spent)**
- 5. Collaborate with clusters/networks in other sectors & countries & learn from them – benchmark yourself!**



# Thank you for your attention

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[www.euratex.eu](http://www.euratex.eu)

[www.textile-platform.eu](http://www.textile-platform.eu)