European Good Practices in Eco-creativity, natural fibres, short value chains

ECO CREATION WITH DESIGN THINKING

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CETI

5th RESET Seminar on
"Eco-creativity, natural fibres, short value chains"
Lodz, 17th October 2017

European Center for Textile Innovation

An unique location in the North of France & Europe

Inside a true hub dedicated to innovation ….

- Research and development team
- Cluster
- Business incubator
- Professional federations and nurturing structures
- Organization of Textile events

CETI

Technological & digital platform

*To produce together innovative textile solutions for **tomorrow's uses***





PRESENTING

CETI is dedicated to research and innovation through 3 kinds of activities :

- **OWN RESEARCH**

Investigation of innovative concepts while developing knowledge and pluridisciplinarity skills.

- **COLLABORATIVE RESEARCH**

Contribution to collaborative R&D research programs thanks to its skilled staff and pilot equipment. Funding as partner or sub-contractor.

- **PRIVATE RESEARCH**

Participation in private R&D programs on customers' request.

ACTIVITIES

Innovation Design

R&D Products and Processes

Prototyping

Sampling

Transfer

PROOF OF INNOVATION

RESET
Interreg Europe

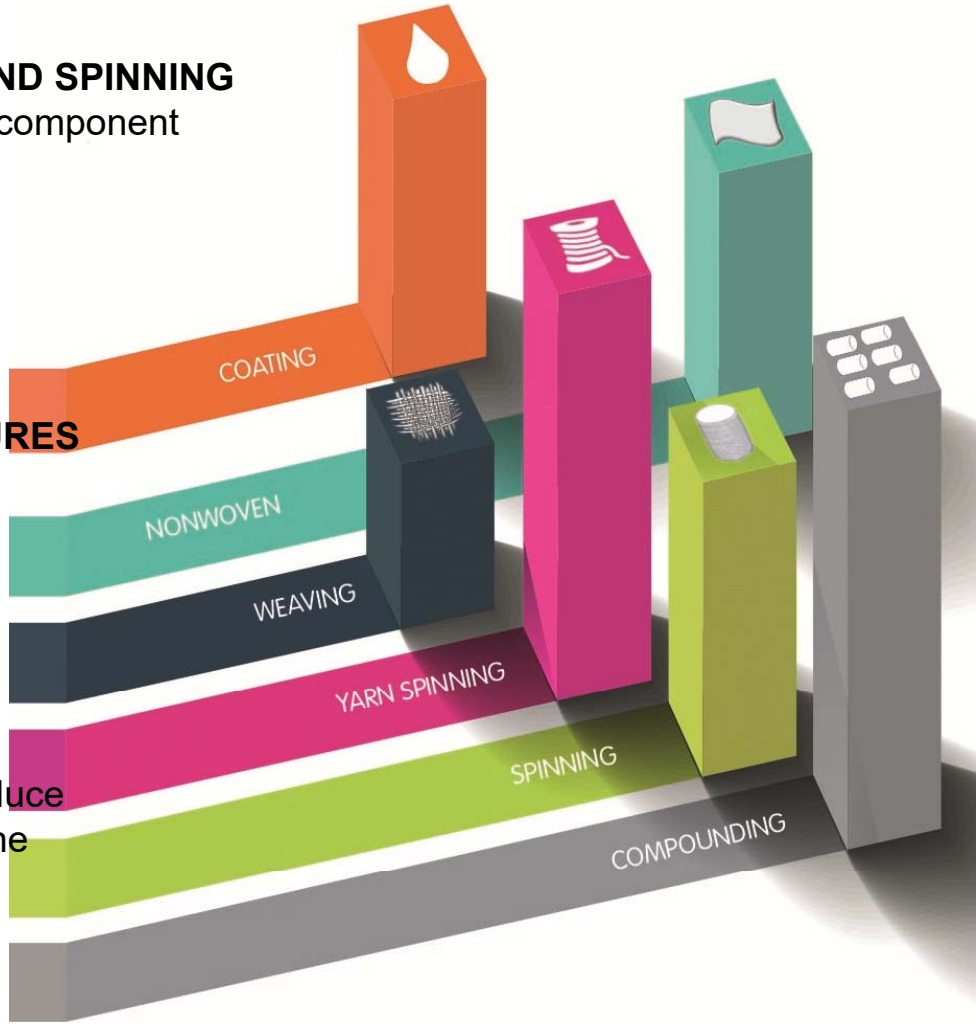
A complete pilot offer to take on **TECHNOLOGICAL CHALLENGES**

TO CREATE NEW MATERIALS : COMPOUNDING AND SPINNING
The CETI owns one of the world's five platforms for tri-component spinning.

- Test spinnability of new polymers,
- Create functionalized filaments
- Create fine filaments and fibres
- Combine polymers in a filament or in fabrics

TO PROTOTYPE TRADITIONAL TEXTILE STRUCTURES
CETI's spinning, weaving and coating units offer the possibility for industrial prototyping of traditional textile structures.

TO CREATE NEW TEXTILE STRUCTURES FOR NONWOVENS
Thanks to the flexible configuration of its "drylaid" & "spunlaid" pilot lines, the CETI has a capacity to produce demonstrators for textile composites that is unique in the world. **Over 100 possible combinations.**

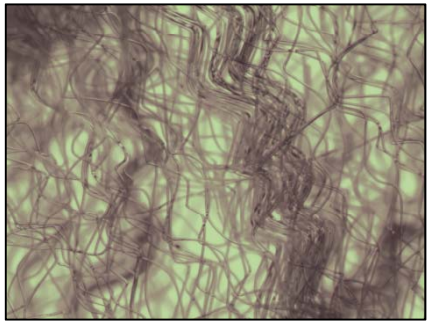


ECO-DESIGN

DESIGNING the parameters of eco-design

The use of **BIO-BASED MATERIALS**

RECYCLA BILITY



LIGHTENING UP structures (ultra-thin fibers)

The idea of **VIRTUALIZING** products and procedures

What's behind:

BIO-BASED FIBERS OR BIO-SOURCED FIBERS

Natural fibers

Man made fibers, synthetic fibers, bio-based polymers

Bio-based carbon content: fraction of carbon derived from biomass in a product (EN 16575 Bio-based products – Vocabulary)

Polyethylene	**PE**	100%	Glucose
Polyhydroxyalkanoates	**PHA**	100%	Oil plant
Polylactic acid	**PLA**	**100%**	Glucose
Polyamid 11	**PA**	40% to 100%	Oil plant

BUSINESS CASE

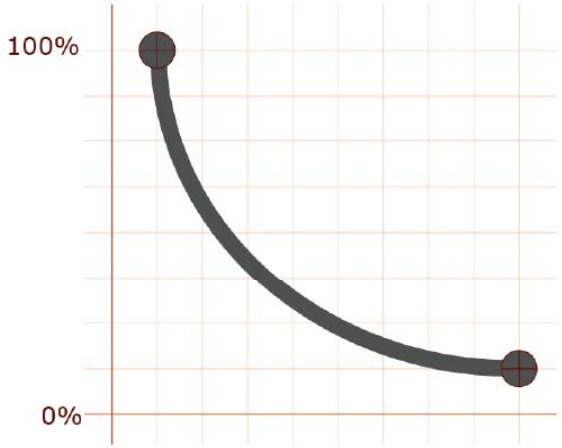
The eco-design of a bio-based, biodegradable WIPE using a "*design thinking*" process.

How to proceed to create NEW BIO-BASED BIODEGRADABLE WIPES ?

2 SYSTEMATIC APPROACHES

From cradle to grave

Reduce environmental impact and anticipate health risks

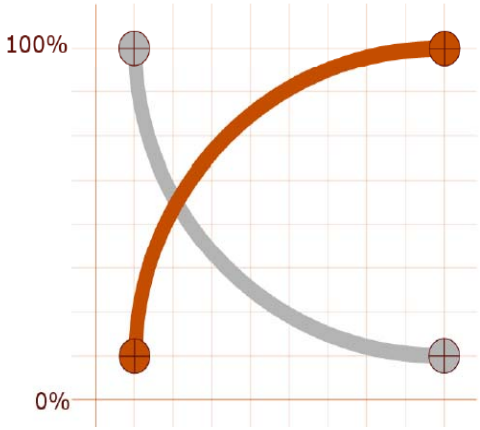


REDUCE
AVOID
MINIMIZE
PREVENT

ECO-EFFICIENCY

From Cradle to Cradle

Create products that can be indefinitely recycled, either biologically or technically

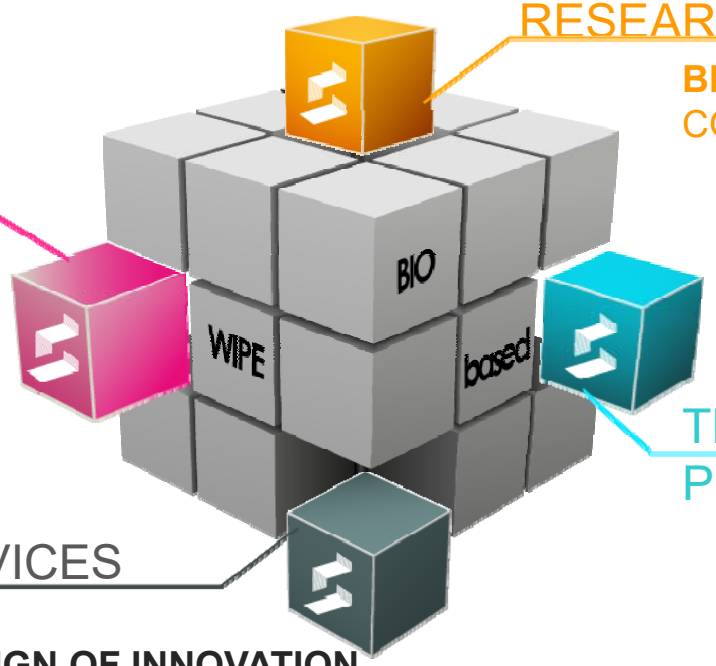


ECO-INNOVATION

DEFINE
INCREASE
SUPPORT
OPTIMIZE

MATCH POINT WITH OUR SKILLS

RESET
Interreg Europe



RESEARCH

BIO-POLYMERS
CONNECTED TEXTILES

MARKET

MEDICAL/HEALTH
HEALTH & MEDICAL EQUIPMENT
INDIVIDUALS (PERSONAL CARE)
SPORT & LEISURE
TRANSPORTATION
COMPOSITE HYBRIDS
INDUSTRY
FILTRATION
BUILDING & CONSTRUCTION

TEXTILE INDUSTRY
PROCESS

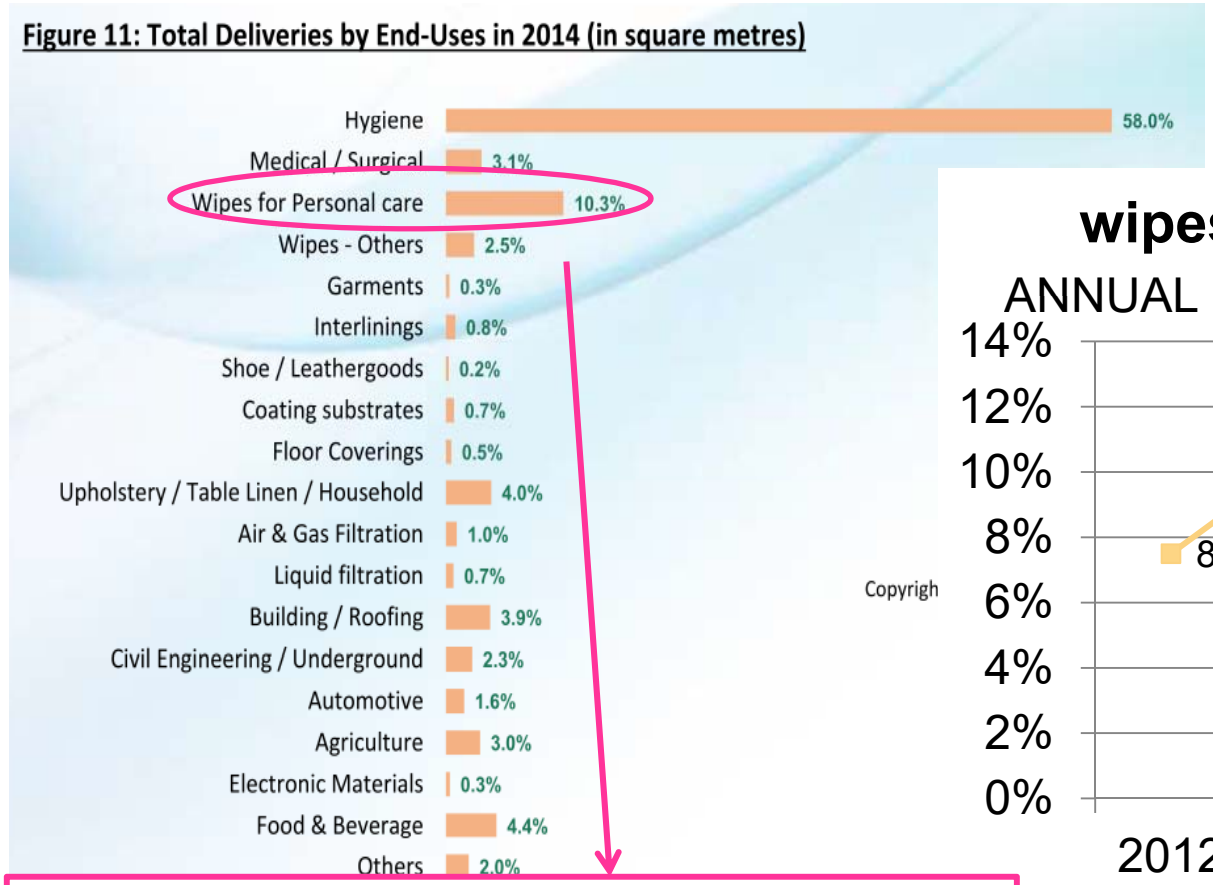
RAW MATERIAL
FILAMENT
FIBERS
TEXTILE STRUCTURE
END-UP PRODUCT

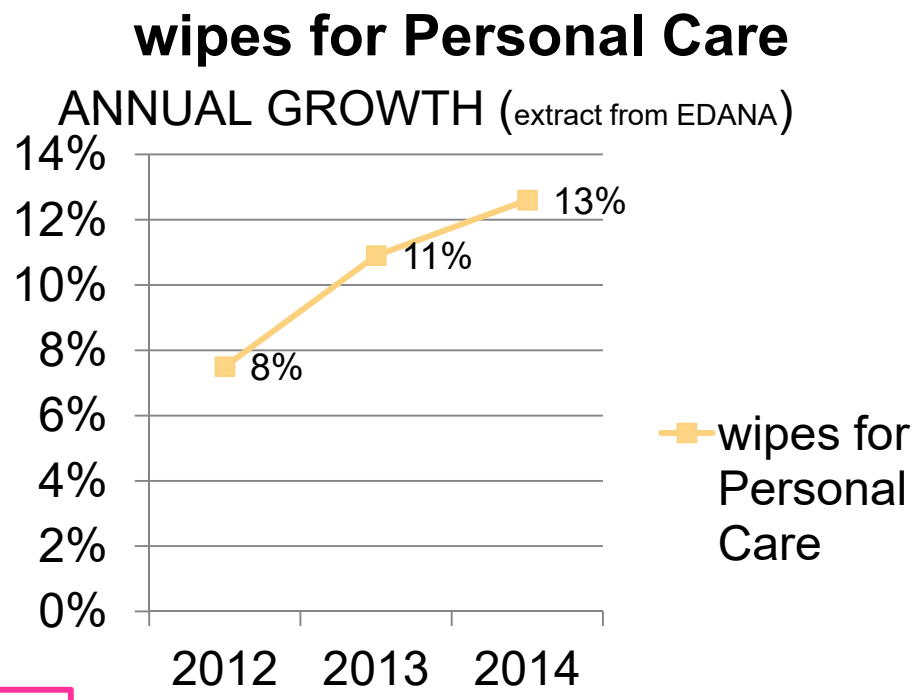
SERVICES

DESIGN OF INNOVATION
R&D PRODUCTS AND PROCESSES
PROTOTYPING
SAMPLING
TRANSFER

ECO-DESIGN OF A BIO-BASED BIODEGRADABLE WIPE

MARKET RESEARCH ON THE WIPES





Wipes for personal care Production in Europe
430 000 T/year equivalent to
10 millions sqm

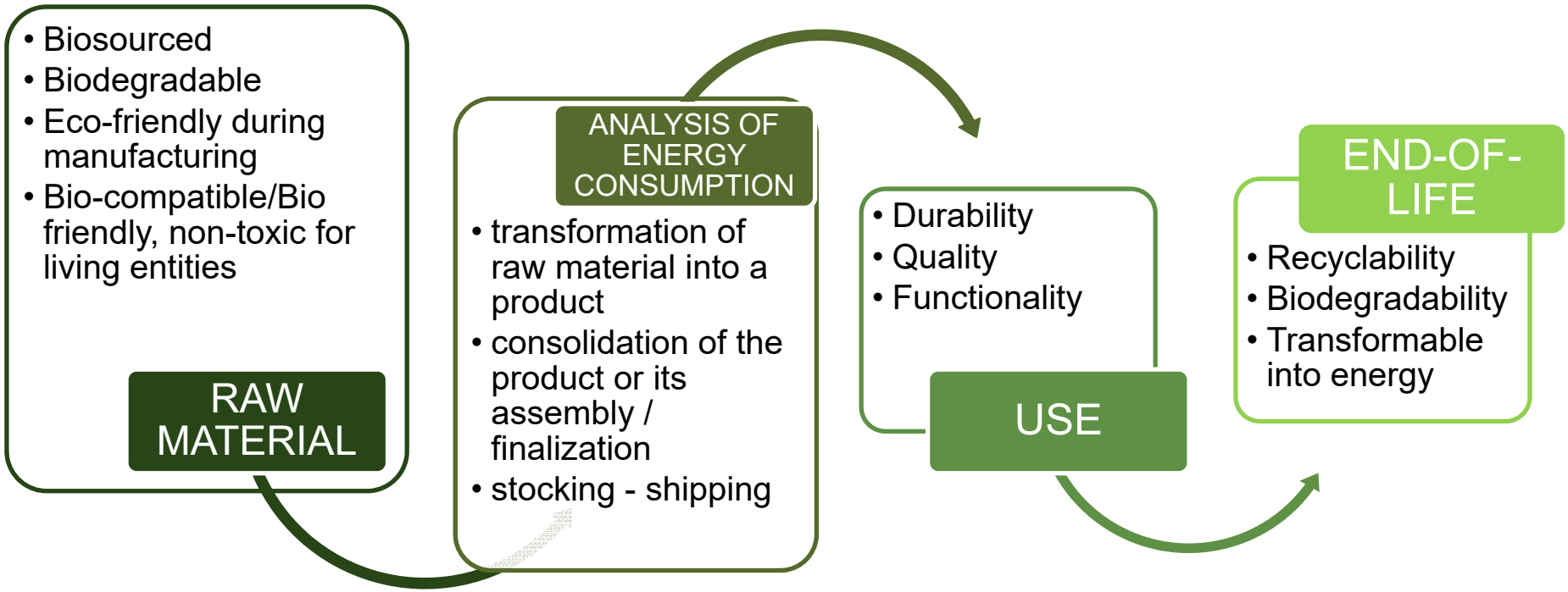
RAW MATERIAL SELECTION

Polylactic acid (PLA) is 100% bio-based and biodegradable.
PLA is industrially compostable.

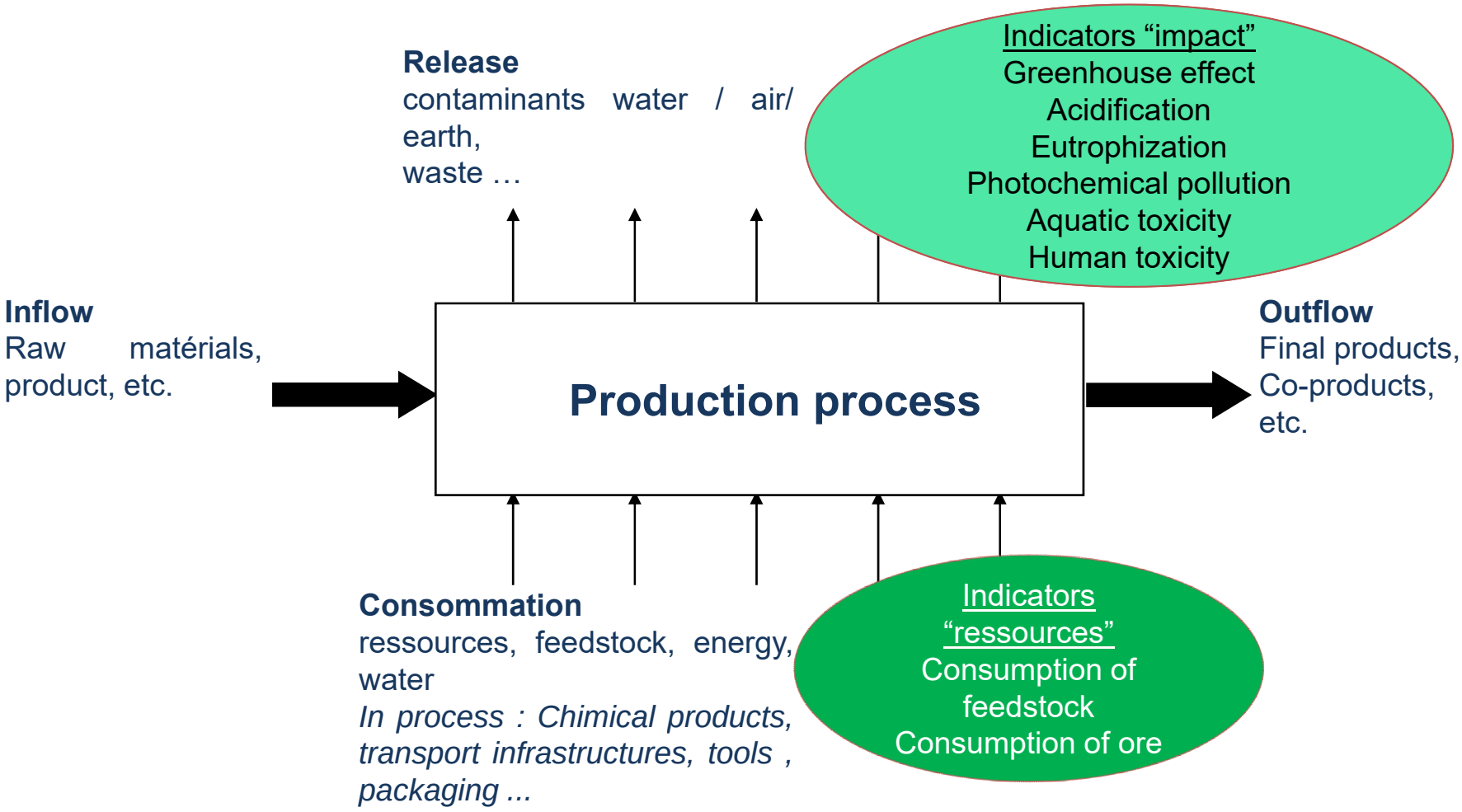
TYPE	ORIGINE	BIO SOURCED	ENVIRONNEMENTAL IMPACT	BIO DEGRADABL	COMPOSTABLE	RECYCLABLE	CLEANLINESS
viscose ®	cellulose		polluting manufacturing procedure	yes			Soft
tencel ®	cellulose		strong carbon footprint	yes			soft, resistant, waterproof
PLA	starch	yes		yes	yes (58°C and humidity)	transparent, heat-resistant as of 60°C **yes**	
Gaïalène®	starch	yes		no		yes	shock-resistant, soft, easy to dye
Bioplast GF®	potato starch	yes		yes	yes (less than 180 days)		gas-proof (O2 CO2)
NatureFlex®	Wood pulp	yes	optimization method for reduction	yes	yes		
viloft®	Wood pulp	yes		yes			soft, flexible, absorbing
Green™ Polyethylene	Sugar cane	yes		no		yes	identical to polyethylene
Flax	Flax	yes		yes	yes	yes	UV filter
Hemp	hemp	yes		yes	no		anti-bacterial, filters radiation
Jute	Jute cellulose	yes		yes	no	yes	
Ramie	nettle	yes		no	no		anti-bacterial, resistant
PHA/PHB/PHBV	bacterial origin (starch and sugar)	yes		yes	yes	yes	rigid polymer, resistant

THE LCA APPROACH

Study of environmental problems at each step of a product's conception

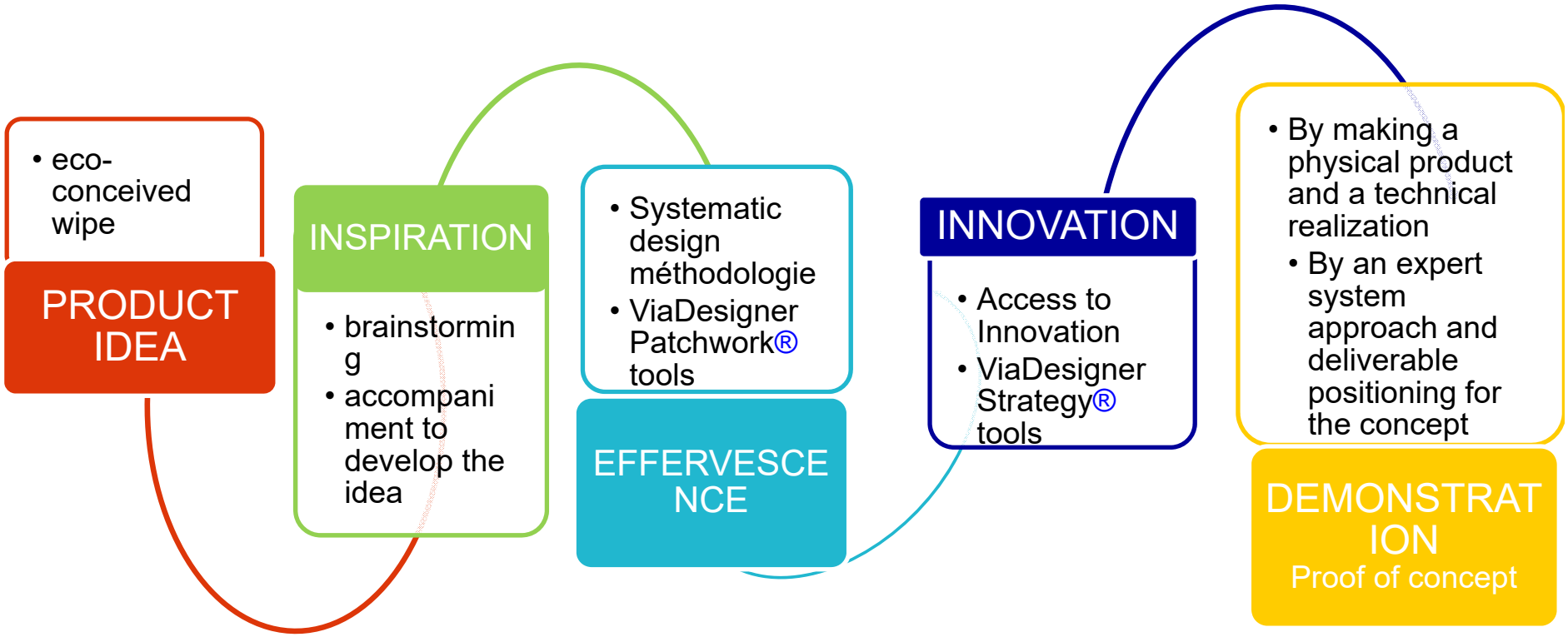


LCA Indicators



Flows involved in elementary production process

OUR APPROACH: INNOVATION DESIGN



The eco-design of a product consists of a reflective approach revolving around **the final user** beginning with an **idea** and **identifying the need** and all the way to **prototype the product**.

DESIGN THINKING METHODOLOGY ViaDesigner Strategy®

A **way to integrate each important variable** of an innovative project:

1/ Describing the context and the role of innovation

2/ Analyzing the key needs and functions anticipated by targeted users

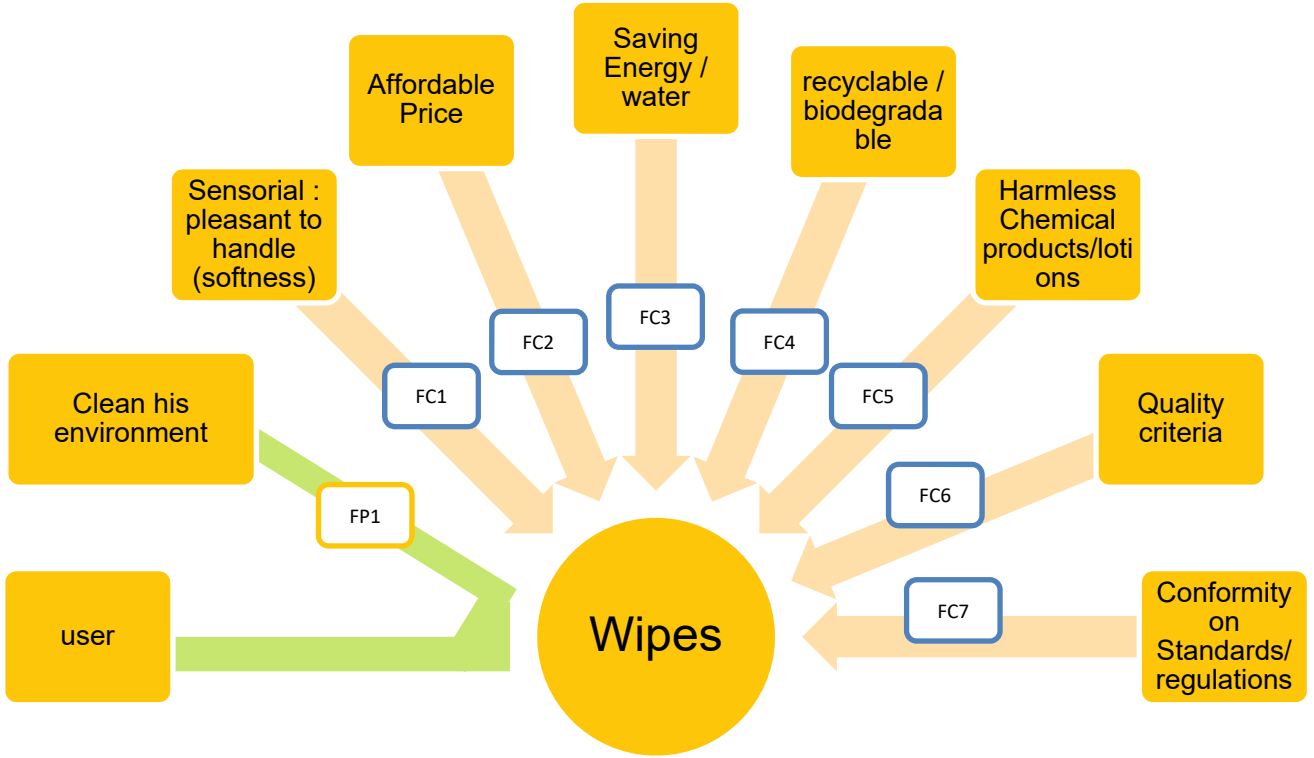
3/ Listing each solution proposed

4/ Defining the players involved

5/ Positioning the offer based on different market segments

6/ Analyzing the pertinence of each offer

FOCUS ON WIPES functionality (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

Consumer Profil

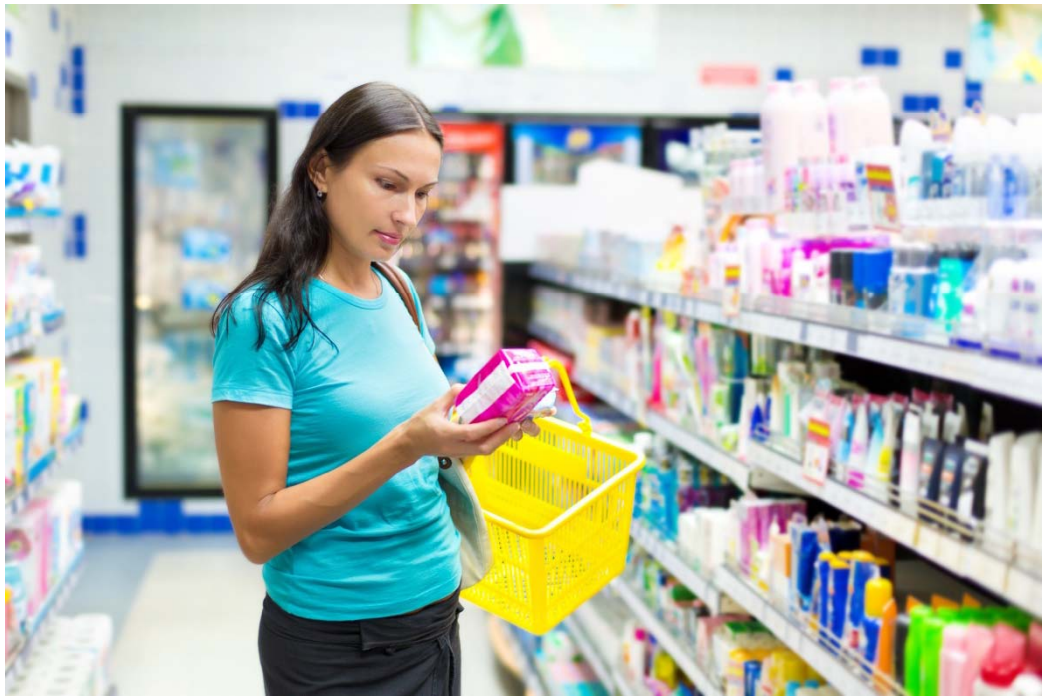
Profil type

WOMAN

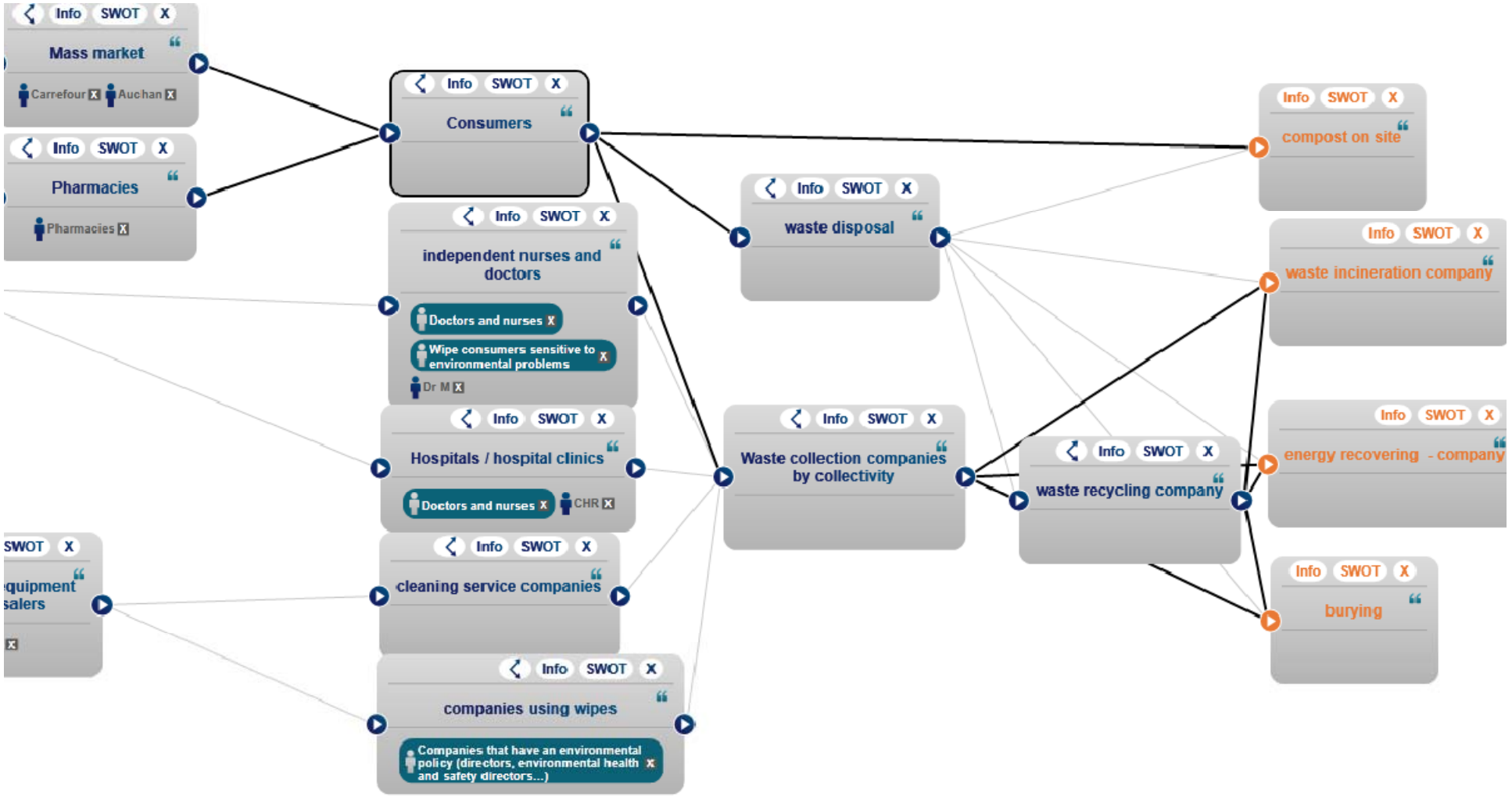
Aged between 20-45 years old

Sensitive to environnmental issues (72% vs 38% men)

Run the house



VALUE NETWORK



PROOF OF INNOVATION

NONWOVEN PILOT LINE

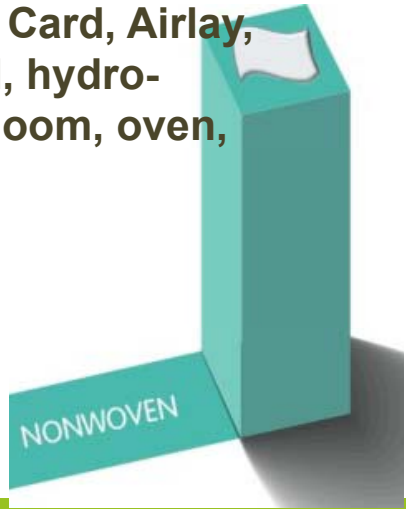
To combine 2 polymers in a filament or in fabrics

To create new nonwovens structure by the flexibility of the configuration of its lines " spunlaid" and " drylaid " (more than 100 possible combinations)

To Produce hybrid webs

Web formation and consolidation line

Spunbond, Meltblown, Card, Airlay, calander, cross-lapped, hydro-entanglement, needle-loom, oven,



PROTOTYPING of A BIODEGRADABLE, BIO-BASED WIPE

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3 PROTOTYPED WIPES :

- **100% Viscose**
- **70 %Viscose / 30 % PP**
- **70 % Viscose / 30 % PLA**

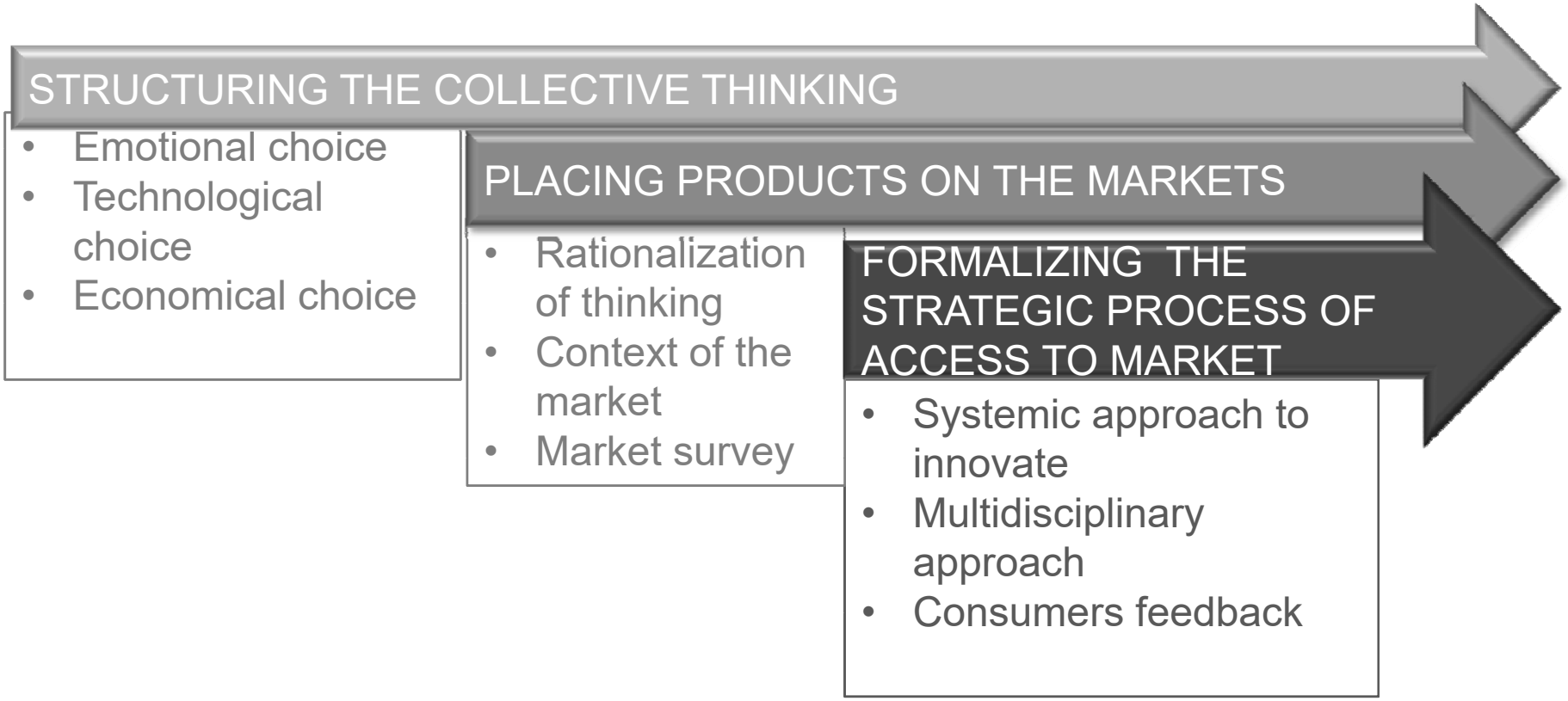
With 2 differents Web consolidation

- **PROCESS 1** : Drylaid process with 1Xhydro entanglement for web consolidation
- **PROCESS 2 :** 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	Thickness0.5 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

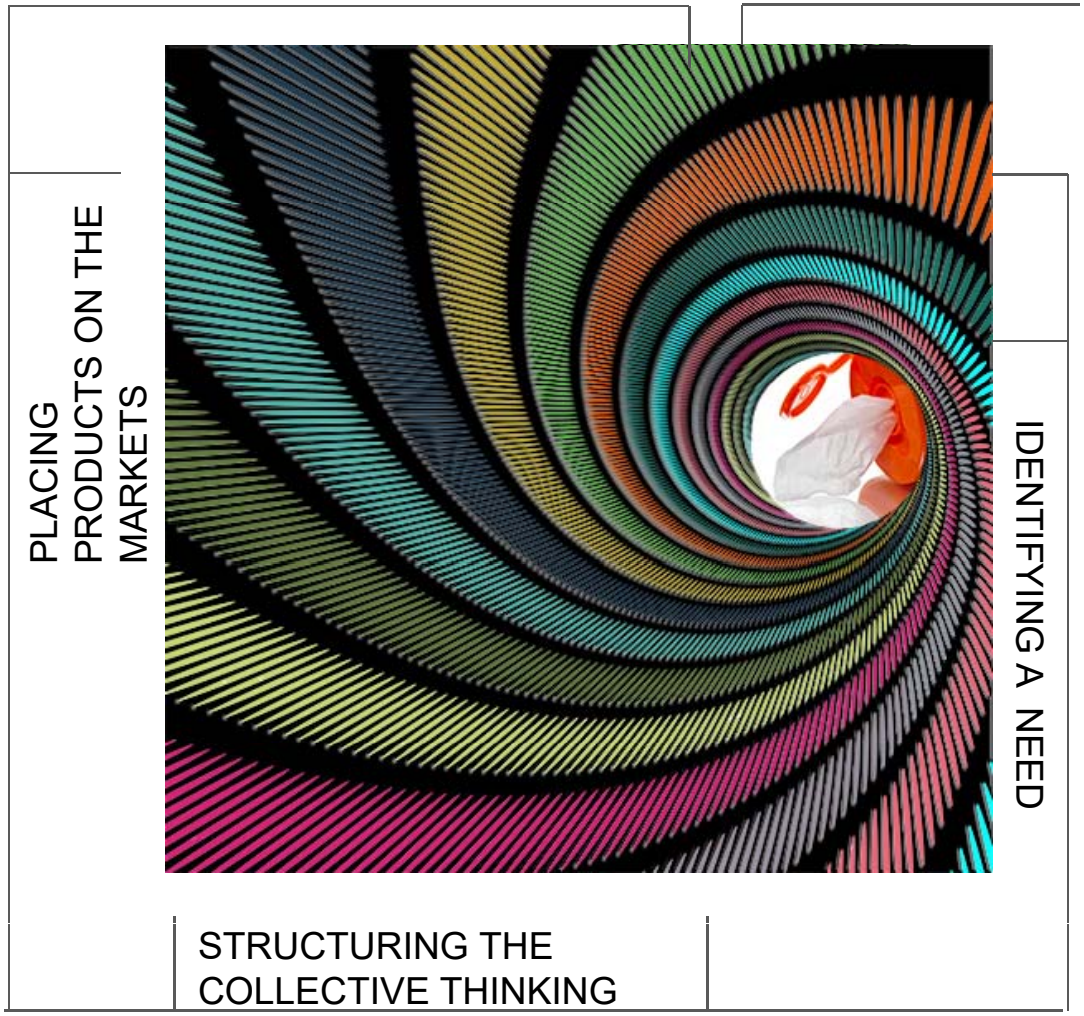
Compositions made of **100% biodegradable materials (PLA base)** have **characteristics** similar, if not **better**, to those made with petro-chemicals **(PP base)**

OVERVIEW


STRUCTURING THE COLLECTIVE THINKING
• Emotional choice
• Technological choice
• Economical choice
PLACING PRODUCTS ON THE MARKETS
• Rationalization of thinking
• Context of the market
• Market survey
FORMALIZING THE STRATEGIC PROCESS OF ACCESS TO MARKET
• Systemic approach to innovate
• Multidisciplinary approach
• Consumers feedback

CONCLUSION OF THE STUDY

DESIGN INNOVATION APPROACH

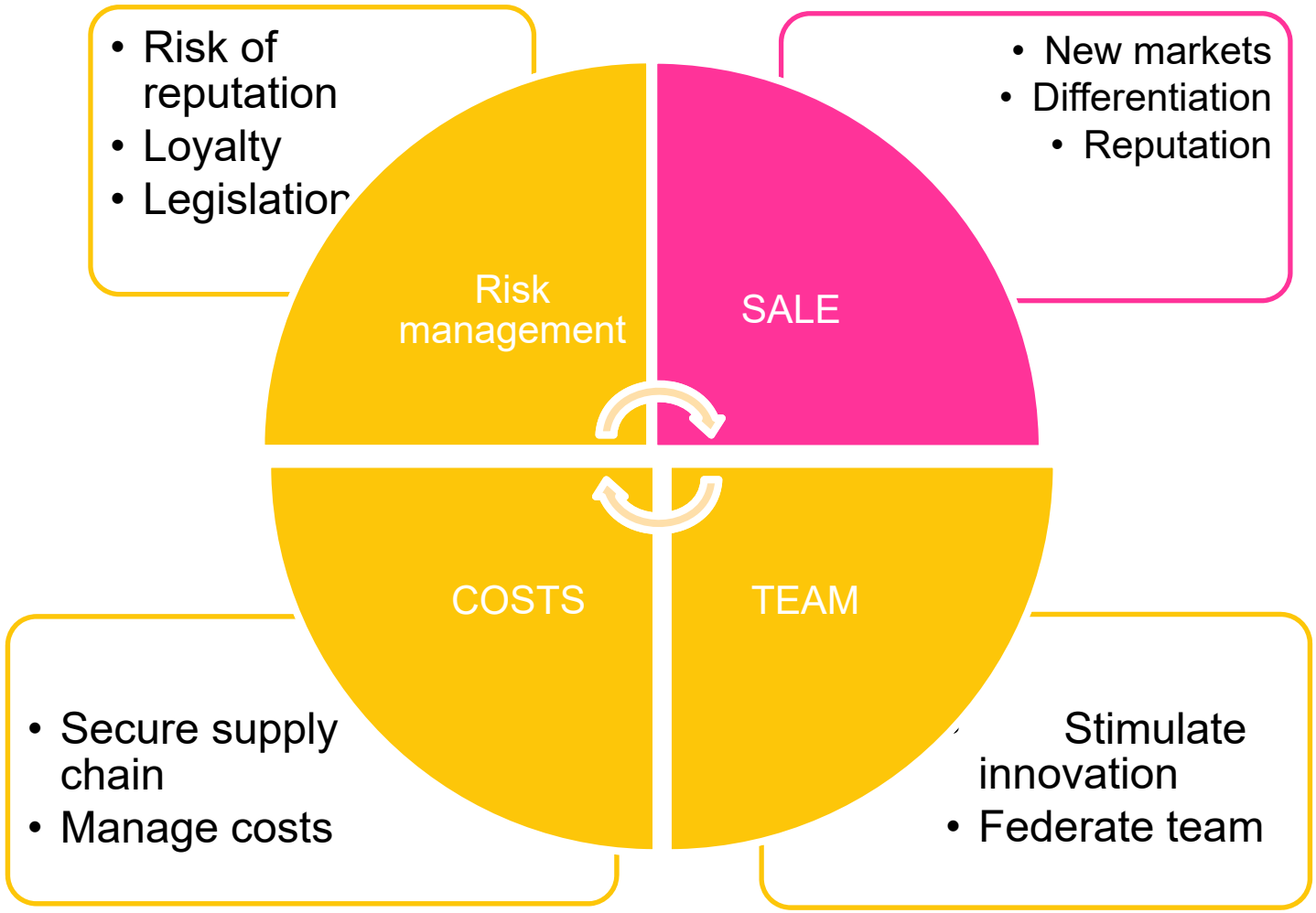


LCA ANALYSIS

- Product impact on the market
- Consumer needs.
- Process validation with procedures optimization
- **Environmental Impact**
- High value network from raw materials production to end-life product
- Prototype validation on Pilot line equipment ready to transfer on industrial site.

Wipes for personal care with PLA base fibers meet environmental criteria and satisfies the final user.

ECO-DESIGN ADDED VALUE



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European Union
European Regional
Development Fund

THANKS YOU FOR YOUR ATTENTION

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