



OPIN Workshop

Advanced Materials and Manufacturing (Composite focus)

12/11/18 Nantes

Manufacturing and cross-sectors considerations through IRT Jules Verne Activities

OPIN Workshop – Advanced Materials and Manufacturing

Nantes, 12/11/2019

P. Le Bot, B. Lascoup, M. Weiss

SUMMARY OF PRESENTATION

- ✓ **INSTITUTE JULES VERNE: A short presentation**
- ✓ **Manufacturing and cross-sectors considerations through IRT Jules Verne Activities – Focus on composites.**
- ✓ **Some Renewable energy activity examples**
- ✓ **Jules Verne Europe Unit**

**IRT
JULES
VERNE**

THE FUTURE OF YOUR FACTORIES

► The DNA of the Jules Verne Institute



Our Dedication to Manufacturing

OUR VOCATION

To reinforce the competitiveness of the French industry

OUR MISSION

To accelerate innovation and promote technology transfer to the factories

OUR CORE BUSINESS

Collaborative research



FRENCH
INSTITUTES OF
TECHNOLOGY



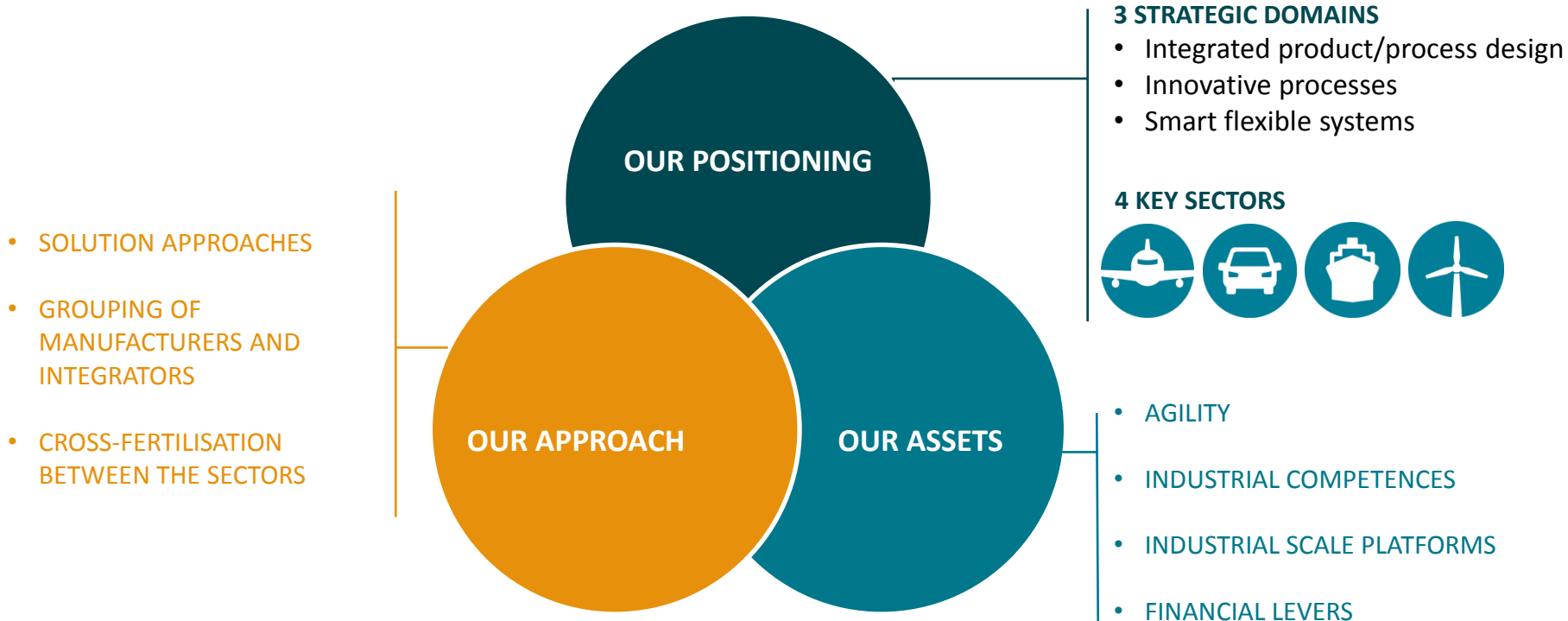
115M€ from the Programme of Investments for the Future



Our Positioning on Manufacturing



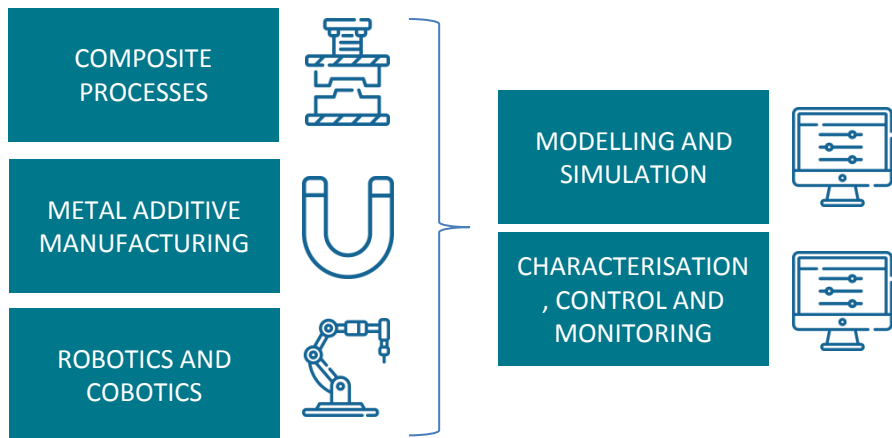
2020-2025 PLAN – 3 PRIORITY AXES



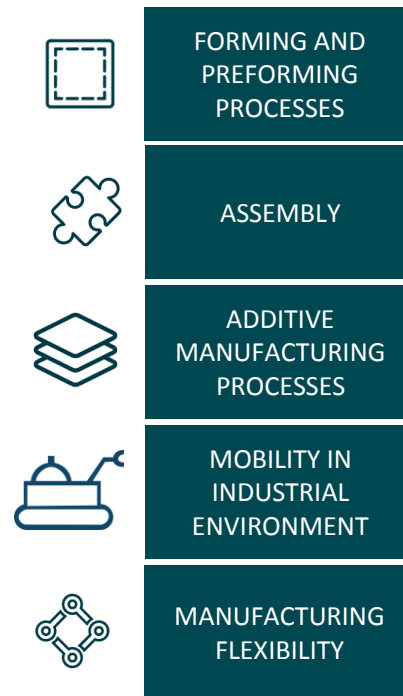


Our Market-oriented Roadmap

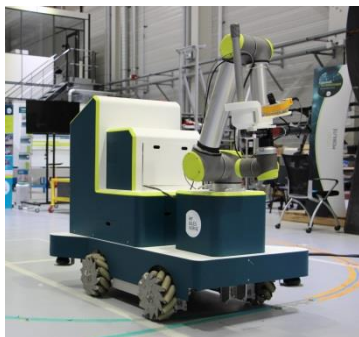
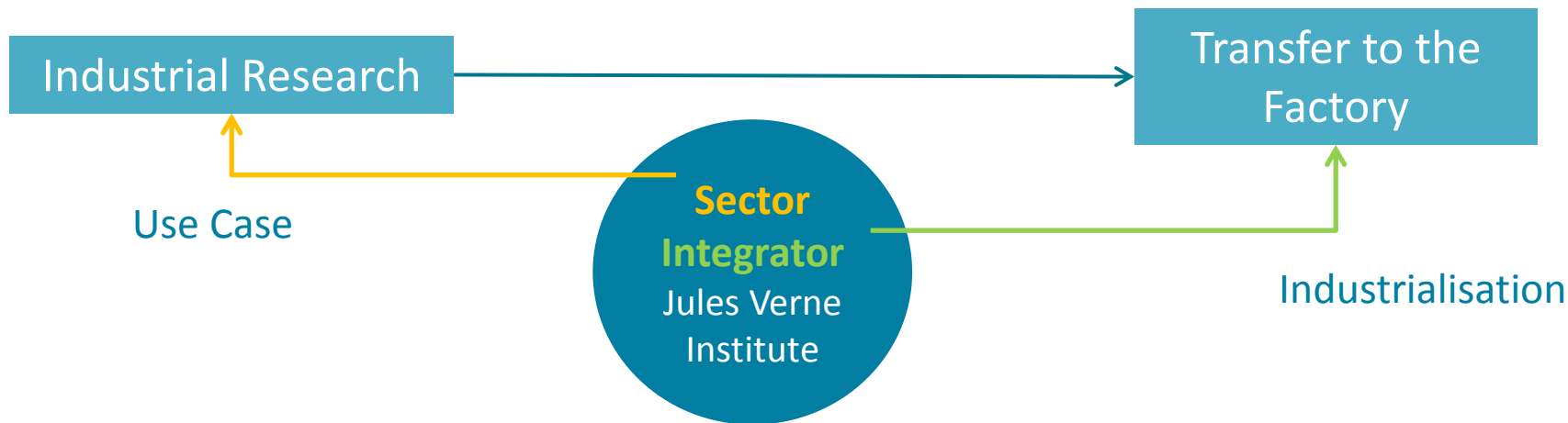
TECHNOLOGICAL EXPERTISE



R&D THEMATICS



► Integrated Research and Transfer



Cobotics – MASCOT Project



Additive Manufacturing – FATAL Project



Robotics – CHARMAN Project

► Our major Industrial Members



AIRBUS DAHER

STELIA SAFRAN
AEROSPACE DEFENCE SECURITY

DASSAULT AVIATION LATÉCOÈRE

LIEBHERR ZODIAC AEROSPACE



faurecia PSA GROUPE



RENAULT



PLASTIO OMNIUM

Valeo

SINTEX NP



NAVAL GROUP

CHANTIERS DE L'ATLANTIQUE



Adwen
AN AREVA GAMESA COMPANY

edf NAVAL GROUP

CHANTIERS DE L'ATLANTIQUE



fives

ARKEMA
INNOVATIVE CHEMISTRY

SOLVAY
making more from chemistry

TOTAL

AddUp

EIFFAGE
ENERGIE SYSTEMES

SNEF

ACB
An Aries Alliance Company



EUROPE TECHNOLOGIES

LOIRETECH



socomore



Key Figures (since 2012)



82
R&D Projects

including

6

H2020 Projects



128M€
Project Portfolio

25M€
Annual Revenue



16M€
Equipment
Investments



110
Employees



55
Industrial Members

16
SME Members

16
Academic Members



31
Patents

* Figures from 31 December 2018

A blue-tinted photograph of three men in an office or server room. One man is standing and leaning over a desk, pointing at a laptop. Two other men are seated at the desk, looking at the laptop. They are all wearing lanyards. The background shows server racks and office equipment.

IRT
JULES
VERNE

Focus on our Expertise

Focus on composite activities



High Volume Complex Preform

High rate lay-up processes

Complex / multifunctional preforms

- Conception & Design.
- Function integration
- Low cost manufacturing Process

Multi-material structure & Assembly

Design of multimaterial structures

Automated assembling processes

- Assembly conception & design
- Joining technologies

Composite forming

Design, prototyping and Validation of forming processes

- Process Hybridation
- Heat transfer management
- Automation

In-line and off line process control

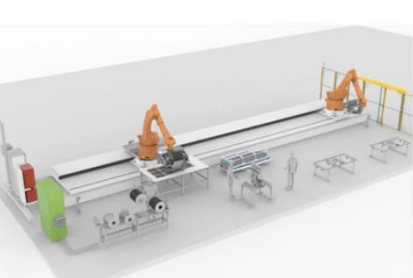
Ensure the stability of the process and the quality of product

- Adapt NDT technique for on-line monitoring of product
- SHM techniques

► Focus on composite activities



High Volume Complex Preform



Automated NCF+UD lay-up & forming (Q3 2019)



Tailored fiber placement machine



Carbon fiber carbonization prototype line

Multi-material structure & Assembly

Design of multimaterial structures Automated assembling processes

- Assembly conception & design
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Composite forming

Design, prototyping Validation of forming processes

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High Volume Complex Preform



Multi-material structure & Assembly

Design of multimaterial structures
Automated assembling processes

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New process for tidal blade, 2018 *Bio-sourced carbon fibre, 2020*

Composite forming

Design, prototyping
Validation of forming processes

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MIB Compression machine



Thermoset injection machine

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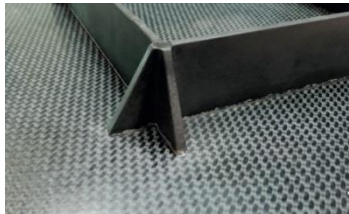
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Composite forming



PEKK stamping overmolding process, 2020



High dimension fatigue device

In-line and off line process control

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Multi-material structure & Assembly



Assembly line



Krauss Maffei Injection molding machine

Composite forming

Design, prototyping

Validation of forming processes

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- Heat transfer management
- Automation

In-line and off line process control

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Multi-material structure & Assembly



*Local reinforcement –
Automotive part , 2018*



*Welded TP PEKK composite
samples, 2019*

Composite forming

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In-line and off line process control

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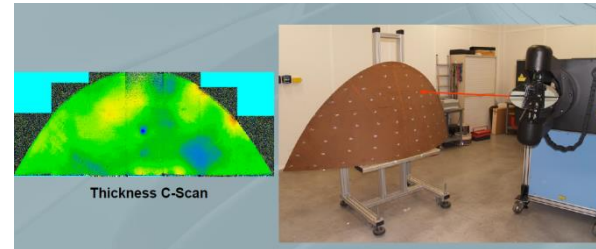
Composite forming

Design, prototyping

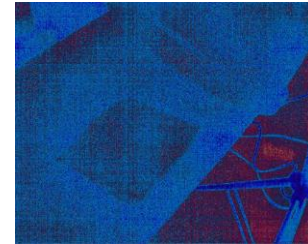
Validation of forming processes

- Process Hybridation
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In-line and off line process control



US laser NDT « LUIS » device



IR NDTdevice

► Focus on composite activities



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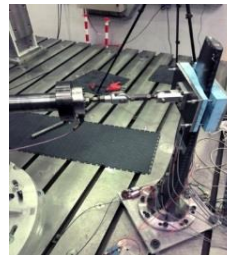
Composite forming

Design, prototyping

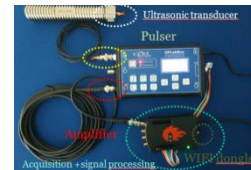
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- Process Hybridation
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In-line and off line process control



*QRS sensors inserted –
response under loading, 2018*



*Embedded US for loss of
tightening in a bolt,
2018*



Renewable Energy – IRT JV Positioning



DURABILITY/AGING (4,1M€)

Fatigue of bonded composites



Fiabilization of bonded assembly



CHANTIERS
DE L'ATLANTIQUE

Composite Aging



Numerical methodology for the evaluation
of defaults in composites



ASSEMBLY PROCESSES (1,6M€)

Automatic assembly of wind turbine
nacelles.



RENAULT
Passion for life



AIRBUS

CHANTIERS
DE L'ATLANTIQUE

Composite processes (4,3M€)

Composite process of Wind turbine blade



High volume low cost tiddle blade manufacturing
– SME Project

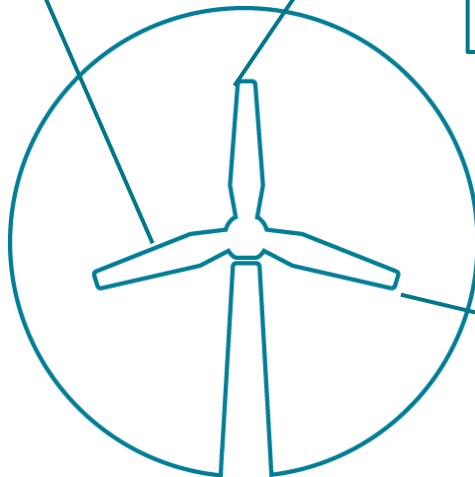


STRUCTURAL HEALTH MONITORING (3,5M€)

Composite structure monitoring

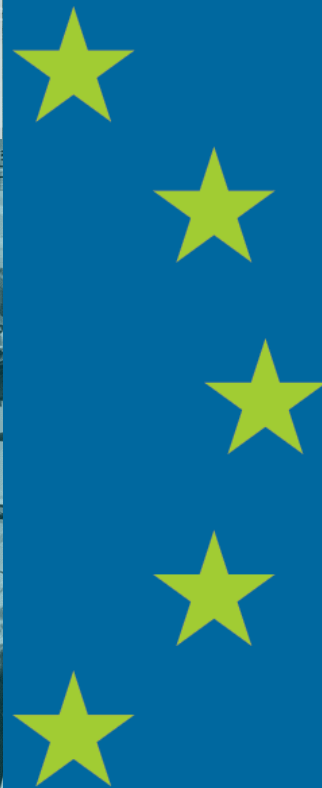


Metallic structure monitoring



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VERNE

EUROPEAN ACTIVITIES



Jules Verne's Europe unit

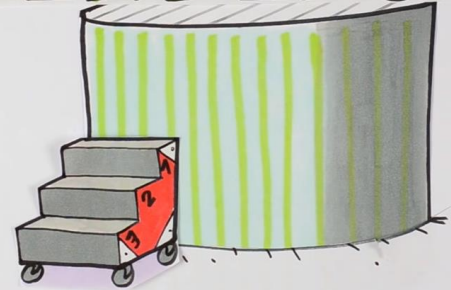
- Europe unit since 2017 dedicated to :
 - ✓ Formal and informal **lobbying**
 - ✓ Set up competitive **proposals**
 - ✓ Efficiently manage **granted projects**
 - ✓ Linkage with the **regional initiatives**



Europe unit: Lobbying



INDUSTRIAL LEADERSHIP



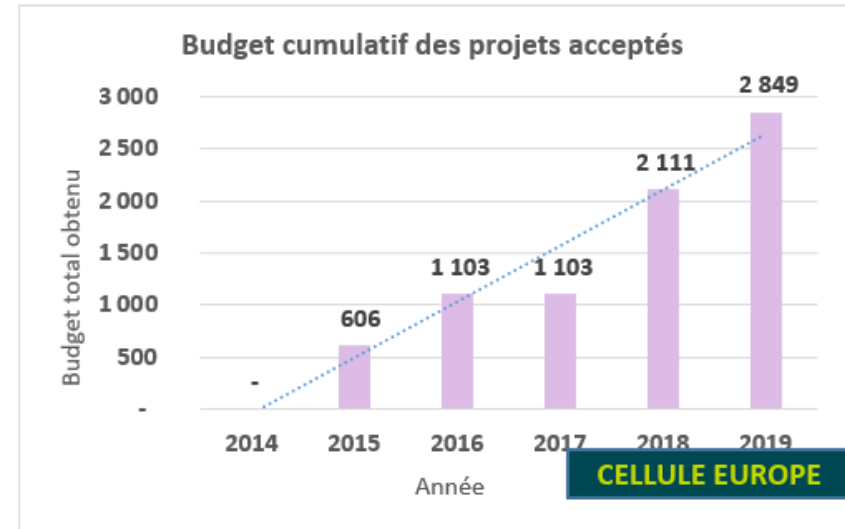
Europe unit: Set up proposals

- Set up competitive proposals mainly on Horizon 2020
 - ✓ Around ~10 proposals submitted each year
 - ✓ Mainly as WP leader
 - ✓ Focus on NMBP, ICT, Transport
 - ✓ Can bring French end users
 - ✓ Looking for new european partners



Europe unit: Grants management

- 6 European projects granted since 2015



Linkage with reg. initiatives



Thank you
for your
attention



Interreg



EUROPEAN UNION

North-West Europe

OPIN

European Regional Development Fund

Thank you!