

## Sustainable Process and Optimized Technologies for Efficient Water Usage in the Steel, Dairy & Paper Industry

### 8:30 Registration and welcome coffee

### 9:00 Welcome and introduction of the Workshop

Maria Theresa Rodriguez Montequin (Global R&D Portfolio Process Director, ArcelorMittal)  
Mihai Barcanescu (Programme Manager, A.SPIRE)  
Eric Fourrest (SpotView coordinator, Centre Technique du Papier)

### Session 1: Steel Industry (Chairing by Elorri IGOS, LIST)

**9:30 Innovative water treatment and use of alternative water resources in iron and steel industry**  
Martin Hubrich, Matthias Kozariszczuk, (VDEH-Betriebsforschungsanstalt GmbH)  
Elena Piedra Fernandez, Beatriz Padilla Vivas (ARCELORMITTAL Innovation)

**10:00 Efficient water use in steel industry by innovative and sustainable solutions**  
(INSPIREWATER Project)  
Martin Hubrich, Matthias Kozariszczuk, (VDEH-Betriebsforschungsanstalt GmbH)  
Beatriz Padilla Vivas (ARCELORMITTAL Innovation)

### 10:30 Break - - Posters session

### Session 2: Dairy Industry (Chairing by Narinder BAINS, SERE)

**11:00 Issues and strategies for effluent stream valorization and water conservation in the Dairy industry**  
Sioutopoulos Dimitrios, Anastasios Karabelas (Centre for Research and Technology-Hellas)  
Konstantinos Georgakidis (MEVGAL)

**11:30 Innovative technologies for valuable substance recovery and water reuse in the Dairy Industry**  
Sioutopoulos Dimitrios, Anastasios Karabelas (Centre for Research and Technology-Hellas),  
Narinder Bains (SERE-Tech), Konstantinos Georgakidis (MEVGAL)

### 12:30 Networking Lunch - Posters session

### Session 2: Paper Industry (Chairing by Serge ANDRES, SAICA)

**14:00 Effluent reuse for fresh water reduction in the Pulp and Paper Industry**  
Stéphanie Prasse, Patrick Huber (Centre Technique du Papier)

**14:30 Onsite generation of biocides for process water and effluent reuse,**  
Paulina Tuklainen, Heikki Pajari and Antti Grönroos (VTI)

**15:00 Strategies and Technologies for valuable substance recovery in the Paper Industry**  
Christophe Neyret, Eric Fourrest (Centre Technique du Papier), Serge Andres (SAICA), Pauline Thibault, Xavier Lacour, Alain Lascas (KADANT)

### 15:30 Break - Posters session

**16:00 Pitching session: new technologies for process water efficiency**  
(Chairing by Hank VLEEMING, Process Design Center, NL)

**16:00 Chemical Heat Pump application in Steel and Paper Industries**  
Wouter DUCHEYNE (QPinch)

**16:10 AkvoFloat: Innovative Floation - Ceramic Filtration Process for Low energy Oily Wastewater Treatment.**  
Mario RIZKALLAL (AKVOLA Technologies)

**16:20 SERE-Tech Elevated Pressure Sonication**  
Narinder Bains (SERE-Tech)

**16:30 Valmet Ultrafiltration for Tissue mills**  
Timo SUTELA (VALMET Technologies)

**16:45 Discussion and Conclusions: future prospects for technology demonstration, exploitation scenario and impact assessment**

### 17:30 End of the Workshop and networking coffee (-17:30 end)

## Venue and accommodation

**Place of the Workshop** is **Niemeyer center**, Avda del Zinc, s/n 33400 Avilès, Spain

**The nearest Airport** is **Asturias Airport**: <http://www.aena.es/en/asturias-airport/index.html>

**From the airport to Avilès**, there are **buses** (<https://www.alsa.com/en/web/bus/home/>), **taxis** (+34 985 502 121) or **car rental** (Avis, Europcar, Rent a Car)

**Hotels** near the Niemeyer Center.

- Hotel NH Collection: <https://www.nh-hotels.es/hotel/nh-collection-palacio-de-aviles>
- Hotel Silken Villa de Avilès: <https://www.hoteles-silken.com/es/hotel-villa-de-aviles/>
- Hotel 40 Nudos: <http://www.hotel40nudos.com/>
- Hotel Palacio Valdés: <http://hotelpalaciovaldes.com/>

**For more information, please contact:**

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Global Research and Development



Horizon 2020  
European Union Funding  
for Research & Innovation



## A new industrial partnership for water efficiency

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“The projects have received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreements No 723577”

Mayte Rodriguez  
ArcelorMittal  
Global R&D Process Portfolio Director -

$$\frac{\partial f_{i,j}(\vec{x}, \vec{c})}{\partial x_i} = \sum_{k \neq i} c_{k,j}$$

The right formula  
for the steels of the future

R&D  
STEEL



Welcome to Asturias “Natural Paradise”

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Rain:  
1000 l/m<sup>2</sup>



## Asturias 2017: Water Scarcity



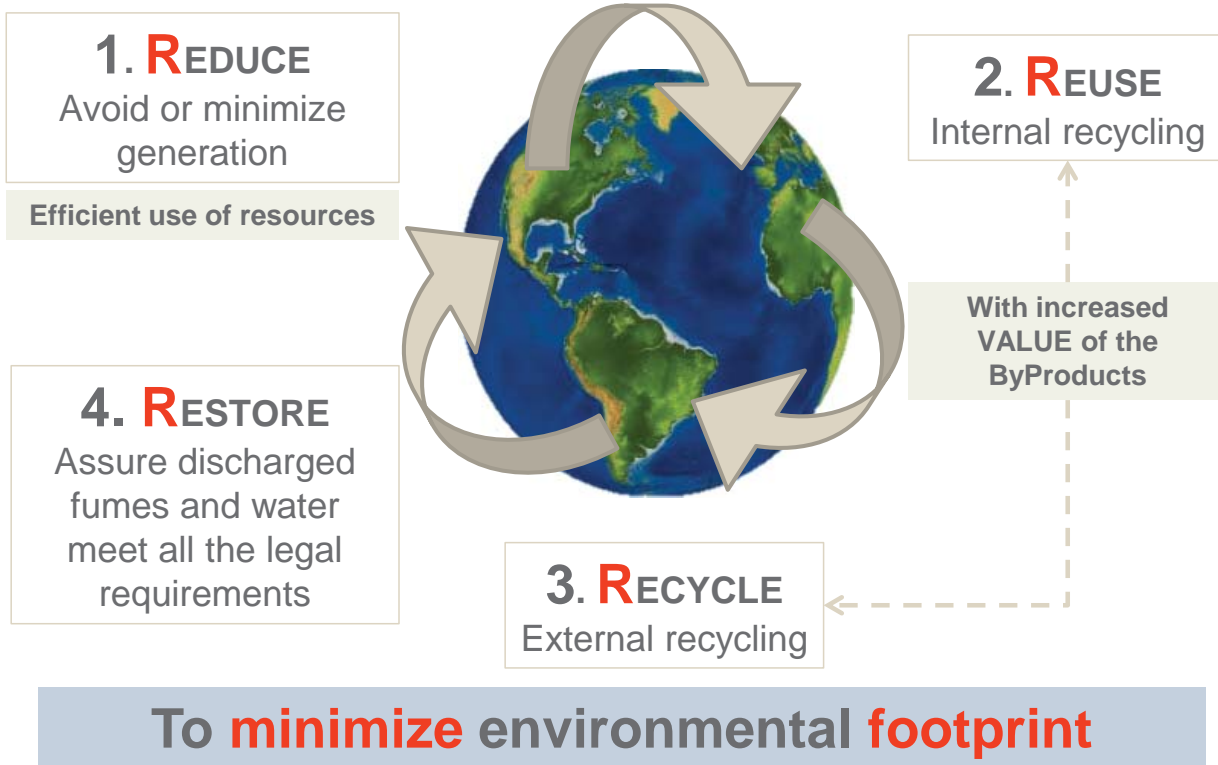
**Water Supply Constraints (Jun-Nov 2017)**

**ArcelorMittal: Sincerely committed to**



**Water: A Raw Material mandatory to survive**

# Our Environmental roadmap



## Focus on Environmental research

### Our MISSION

Find innovative ways to enhance positive impacts and mitigate negative impacts of our operations on the environment, focusing on:

- Water Management
- By-Products
- Air Quality



a. Air Lab: End of pipe technologies (6000 Nm<sup>3</sup>/h)

### Our RESOURCES

Specialized team and internal laboratories:

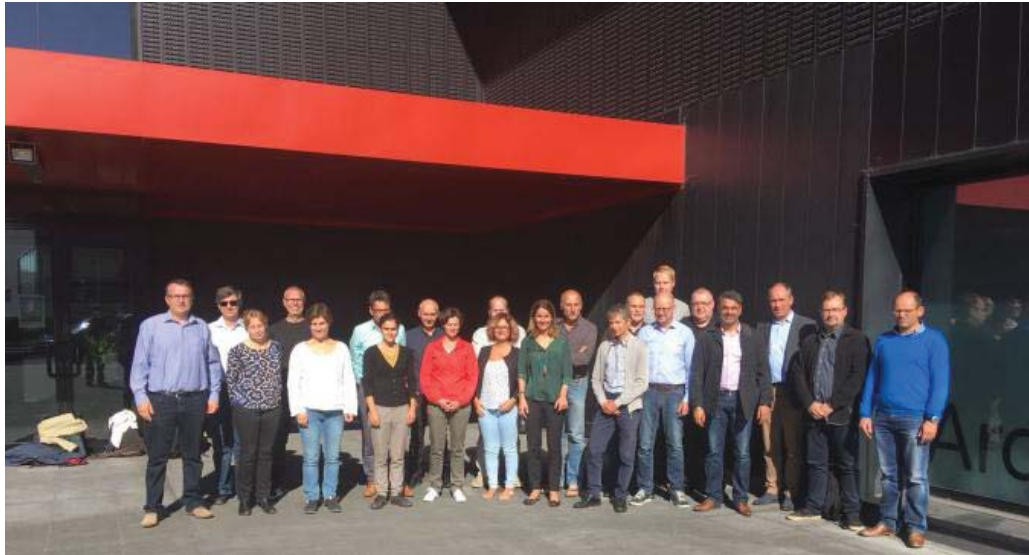
- Pilot Plants at semi-industrial scale
- Co-innovation with scientific partners and suppliers



b. Water Lab: Water Treatments (300 l/h)

# Big Challenges- Big Solutions

## Building Synergies – Developing Knowledge and Technology





## SPiRE cPPP

Sustainable Process Industries  
through Resource & Energy  
Efficiency

[www.spire2030.eu](http://www.spire2030.eu)

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## cPPPs characteristics

- A public procurement arrangement (business relationship) between the **public sector and business** where risks, rewards and responsibilities are shared.
- The contractual arrangement specifies an indicative **7 years EU funding**

- **Budget** is only committed on an **annual basis** through H2020 calls in bi-annual Work Programmes
- Work Programmes are prepared on the basis of an **industry-led multi-annual roadmap**
- **Calls are open to all** and come with high leverage factors (not legally binding)



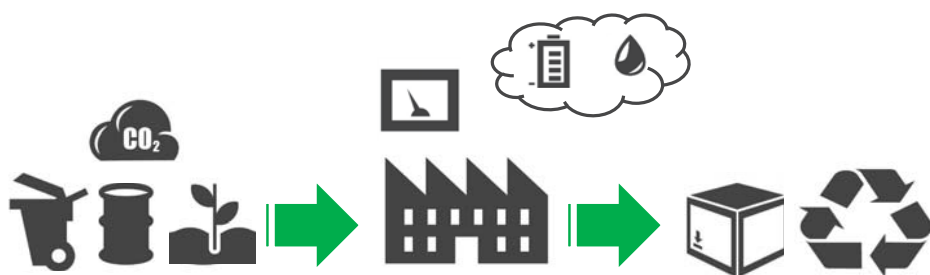
- **Industry has a leading role** in defining research & innovation priorities in this roadmap (allowing long-term investment plans)
- More emphasis on relevance of industry and **impact towards** sustainability
- Focused on **enabling industrial technologies** – European competitiveness



- Contractual Public-Private Partnership between European Commission & A.SPIRE supporting R&I for **Process industries**
- SPIRE Budget: €850M (DG RTD) + €50M (DG ENER)= **€900M**
- Participation under **Horizon 2020** rules

## SPIRE 2030 roadmap

### TO TOMORROW'S SCENARIO:



- **(Re)invent** feedstock (waste, bio, CO<sub>2</sub>)
- **Reduce** emissions; **(re)invent** energy & resource management concepts, incl. industrial symbiosis
- **Introduce** digital devices for better monitoring and control
- **(Re)invent** materials for optimised processes
- **(Re)invent** processes & materials with a significantly increased impact on resource & energy efficiency down the value chain: transport, housing
- **Reduce** waste & **(re)invent** technologies for valorisation of waste streams within and across sectors



## Expected Impacts

R+I to integrate and demonstrate at least 40 innovative systems and technologies:

- 7 in Adaptable processes able to use different feedstocks
- 6 in Reduction and re-use of waste with ambition to close the loop
- 9 in Innovative processes leading to CO<sub>2</sub> reduction
- 8 in Green technologies to develop novel materials for new and existing markets
- 6 in Industrial processes reducing water use
- 4 using Technology uptake within/between sectors to enable industrial symbiosis

... and capable of achieving across process industry (by 2030):

- A reduction in fossil energy intensity of up to 30%
- A reduction in non-renewable, primary raw material intensity of up to 20%
- Efficiency improvement of CO<sub>2</sub>-equivalent footprints of up to 40%
- 10 new types of high-skilled jobs

## KPIs at Project impact level

- KPI I. Scale of reduction in energy, material resources and waste
- KPI II. Project results taken-up for further investments (into higher TRLs)
- KPI III. Trainings for a higher quality workforce
- KPI IV. Patents and activities leading to standardisation



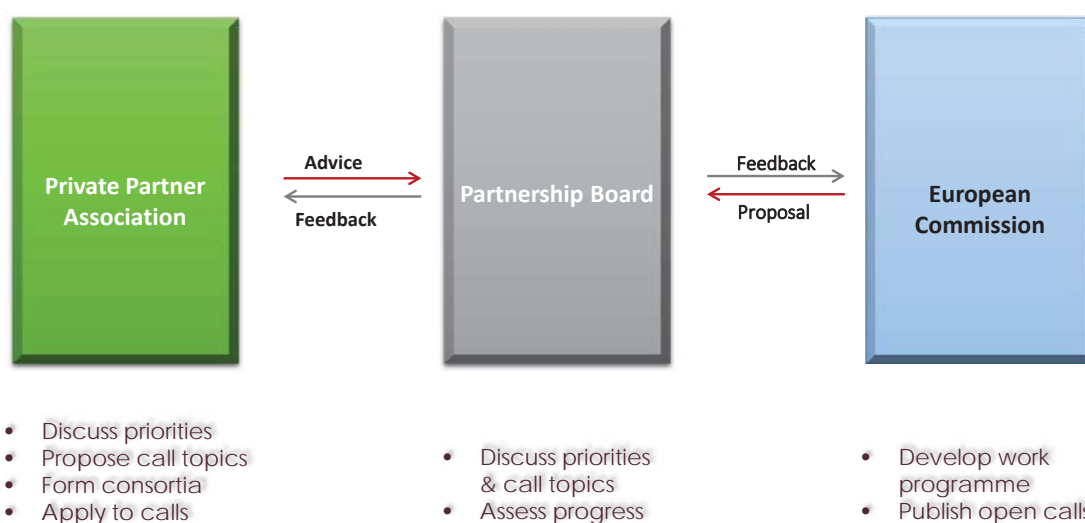
# QUESTIONNAIRE FOR SPIRE PROJECTS' COORDINATORS

The survey is divided in five parts. Each part can be filled in by the coordinator or by a project partner considering the specific input required:

- PART A: Project Fundamentals
- PART B: Innovation outcomes - Business impact
- PART C: Environmental impact
- PART D: Socio-economic impact
- PART E: Success Stories

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## The Governance



# 2018 Membership



Member type	Count of membership
Industry - large	29
Industry - intermediate	3
Industry - medium	3
Industry - small	14
Industry associations	14
Research - large	44
Research - small	32
Associate members	13
<b>Total</b>	<b>152</b>



## Projects are core for a PPP

**70 running projects + 7 finished = 77 SPIRE Projects**  
35 RIAs / 34 IAs / 8 CSAs

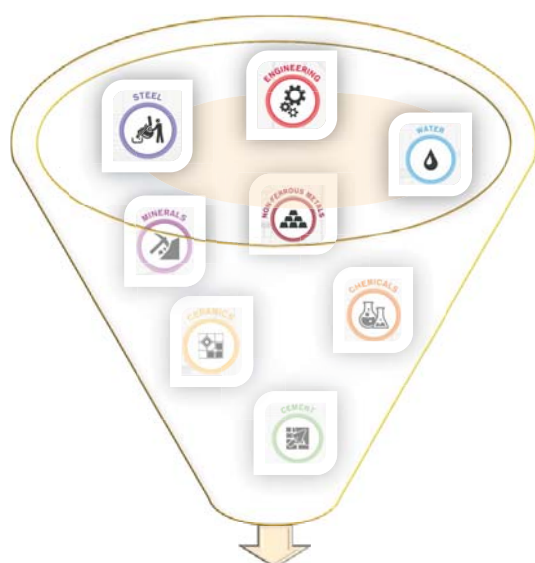


**Results - Impact**

**Synergies**

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# Cross-sectorial approach



**SPIRE PROJECTS**

Cross-sectorial collaboration is cornerstone for SPIRE projects:

- Minimum: 2 sectors/project
- 7 or 8 sectors together are collaborating in various projects
- Average: +2.67 sectors/per project

## Projects – EC / A.SPIRE – Industry WIN – WIN – WIN



- Keep track of impact
- Foresee feasibility in industrial environments
- Identify & evaluate non-technological barriers
- Identify skills needs

SPIRE questionnaires  
(impact & private investment)



- You are / should NOT be alone
- Find synergies with other projects
- Use & support A.SPIRE
- Use & feed A.SPIRE tools
  - Events
  - Projects brochure / newsletter
  - SPIRE Knowledge platform





## A.SPIRE communication tools



### Projects

- Videos of projects 2014 - 2016
- Communication support document
- SPIRE label

### Publications & stands

- SPIRE Roadmap
- SPIRE Brochure (A4)
- SPIRE Projects' Portfolio (A5)
- Roll-up
- Pop-up stand
- Business cards
- Folders

### Presentations

### Social media



### Events



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## MAIN SPIRE 2018 EVENTS



- **EU INDUSTRY DAYS**, 22-23 February 2018, Brussels
- **ADVANCED FACTORIES CONGRESS** – Connecting to the Digital Factories – 13-15 March 2018, Barcelona
- **ACHEMA 2018** (11 - 15 June 2018) + **Brokerage**, Frankfurt am Main, Germany (A.SPIRE booth) + 14 June – 3<sup>rd</sup> SPIRE Thematic Workshop
- **cPPPs Conference** 26 June 2018, Brussels
- SPIRE Projects day (tbd)
- **ProcessNet-Jahrestagung 2018**, 10-13 September 2018, Aachen, Germany (A.SPIRE booth)
- SPIRE Digital Workshop, 1 October 2018, Brussels
- **SPIRE 2050 Stakeholders' Workshop, 2 October 2018, Brussels**
- **Industrial Technologies Conference 2018**, 29-31 October 2018, Vienna
- SPIRE at K4I Innovation week, End November (date tbc), Brussels
- UN Climate Change Conference COP24 Conference, SPIRE Workshop, 11 December, Katowice

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Sustainable Process Industry through  
Resource and Energy Efficiency



## **SPIRE 2050 VISION**

**Towards the Next Generation of  
Process Industry**