SPIRE 2050 VISION

EU Process Industries as Hubs for Circularity

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Executive Director

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ASTURIAS INNOVATION CAMP

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Covadonga, Spain

The **European Process Industry** at the **forefront of innovation**

Strengths

- 6.3 million direct jobs
- 19 million indirect jobs
- 450,000 enterprises
- €1,8 trillion/y turnover
- 4.7% OF EU28 GDP

Challenges

- Resources & energy
- Competitiveness
- High-risks/long-term investments

SPIRE ADDED VALUE

+140
Members teaming up

SPIRE
Sustainable Process Industry through Resource and Energy Efficiency

89
Projects

€900
Million budget

8
Sectors

20
Countries

95%
Of investments in EU

GOVERNANCE SPIRE cPPP

PRIVATE PARTNER

- Discuss priorities
- Propose call topics
- Form consortia
- Apply to calls

ASSOCIATION SPIRE

PARTNERSHIP BOARD

- Discuss priorities & call topics
- Assess progress

SPIRE
Sustainable Process Industry through Resource and Energy Efficiency

PUBLIC PARTNER

- Develop work programme
- Publish open calls

European Commission

GOVERNANCE SPIRE cPPP (2)

PRIVATE PARTNER
ASSOCIATION SPIRE

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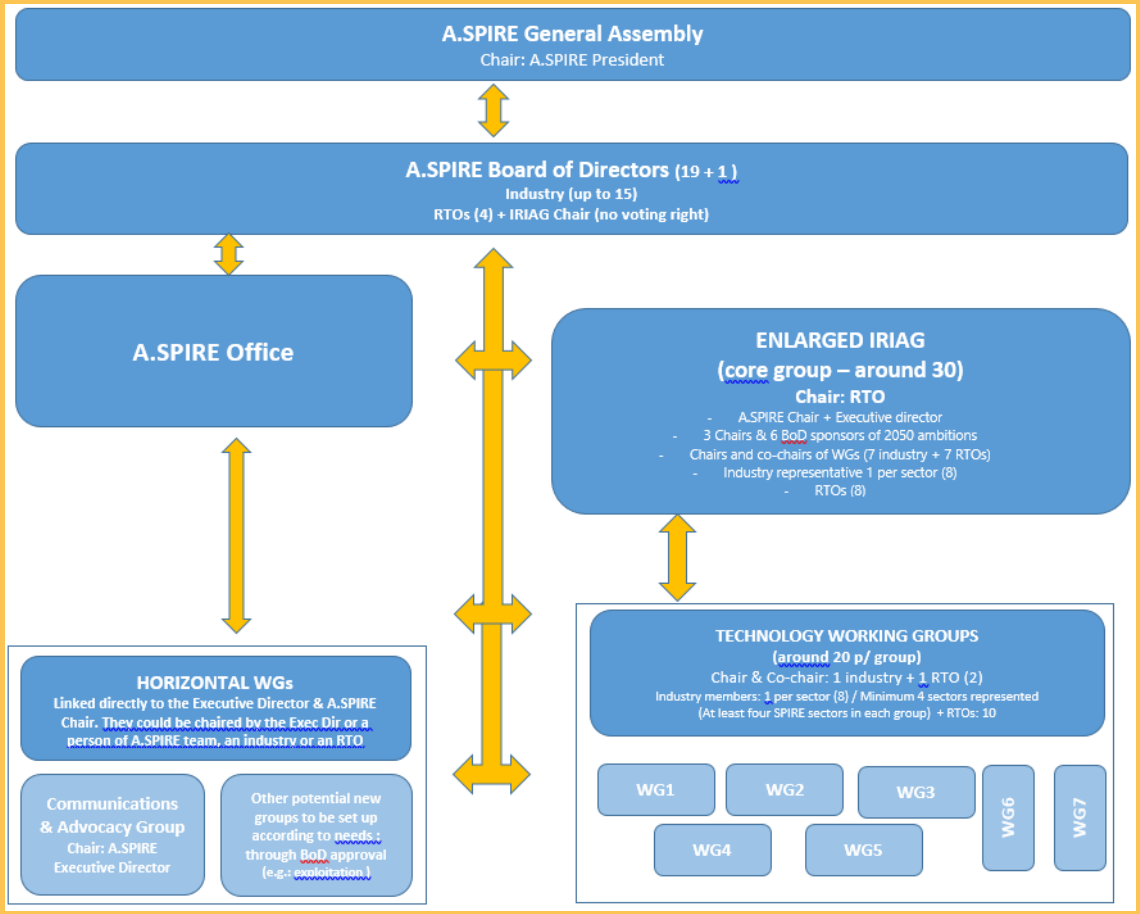

PARTNERSHIP BOARD

- Discuss priorities & call topics
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SPIRE
Sustainable Process Industry through Resource and Energy Efficiency

PUBLIC PARTNER

- Develop work programme
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European Commission

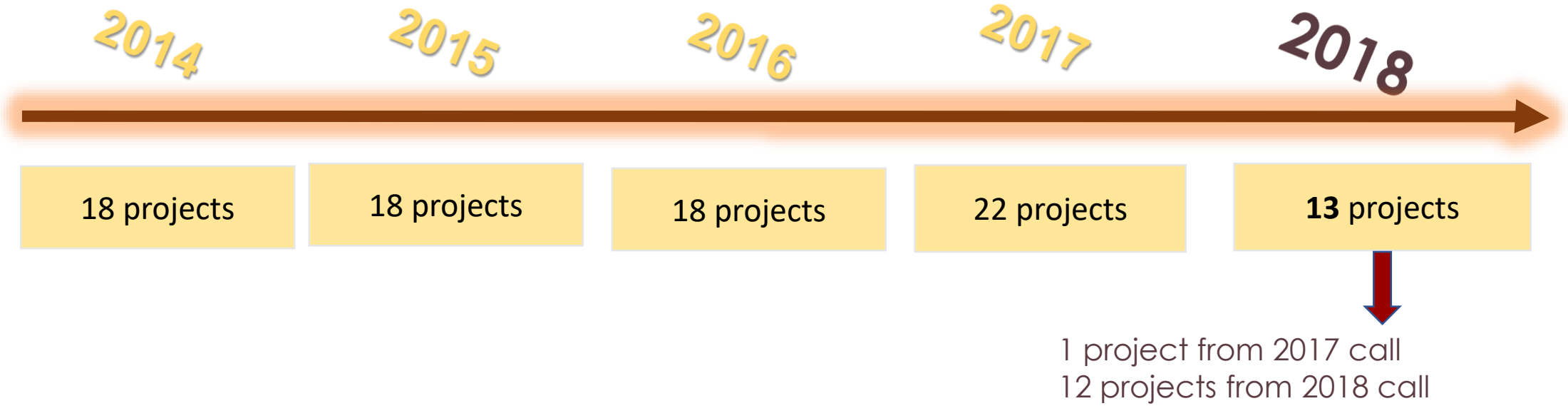
SPIRE IMPACT
SPIRE PMR'18

Sustainable Process Industry through Resource and Energy Efficiency

PRIVATE LEVERAGE	• **7 leverage factor** *(Target: 5 to 10)* • INVESTED by COMPANIES: 3 bn €
ENVIRONMENTAL KPIs	•30% reduction of emissions *(Target: 40%)* •36% less dependency on fossil energy *(Target: 30%)* •25% less dependency of non-renewable, primary resources *(Target: 20%)* • 32% reduction of waste (*no initial target established*)
JOBS	• 83 new jobs being created, directly related to projects • 438 new Jobs created, directly related to SPIRE companies
SIGNIFICANT INNOVATIONS	• 221 developed or being developed (of which 74 major innovations) *(Target: 40)* • 65% of projects planning to patent / commercialise / deploy
SPIRE SMEs	• 9 new employees / SME *(higher than EU average = 2)* • 25% growth in turnover *(double than EU average)* • 16% increase in sales

SPIRE Projects overview

Sustainable Process Industry through Resource and Energy Efficiency

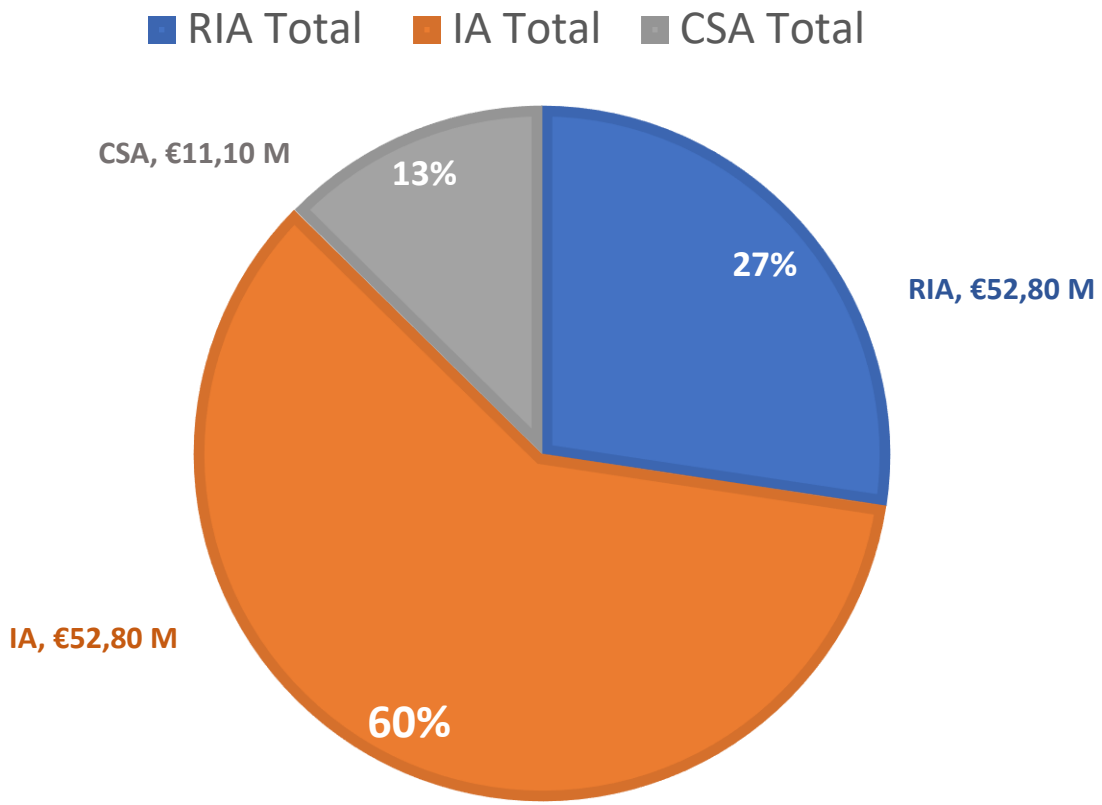


70 on-going projects + 19 finalised = 89 SPIRE Projects

35 RIAs / 46 IAs / 8 CSAs

SPIRE budget dedicated to Industrial Symbiosis (M€)

From 2014 - 2018



Industrial Symbiosis (IS) SPIRE projects funded so far:

RIA Total	€24.1M
IA Total	€52,80
CSA Total	€11.1M
INDUSTRIAL SYMBIOSIS	**€88 M**

P4P report on Low Carbon Process Industry (See here)
Recommendation on Industrial Symbiosis

Sustainable Process Industry through Resource and Energy Efficiency

✓Develop a supportive framework to promote industrial symbiosis (IS)

- ***A SPIRE dedicated Thematic Workshop on IS in 2017***

- ***2 dedicated SPIRE CALLS:***

SPIRE-06-2015: Energy and resource management systems for improved efficiency in the process industries (RIA)

CE-SPIRE-01-2020: Industrial symbiosis (IA)

Several calls on Process Control

- ***88 M€ SPIRE funds for IS projects (to date)***

2014: WASTE 01 – Circular Economy
- RESYNTEX (IA)
- FISSAC (IA)

2015: SPIRE 06 – Energy & Resource management systems
- EPOS (RIA)
- MAESTRI (RIA)
- SHAREBOX (RIA)
- SYMBIOPTIMA (RIA)

2017: SPIRE 13 – Industrial Symbiosis
- SCALER (CSA)

2018: SPIRE 02 – Energy & resource flexibility in energy intensive industries (IA, 50%)
- PreMa
- CIRMET
- BAMBOO

SPIRE Topics in 2020

Sustainable Process Industry through Resource and Energy Efficiency

- CE-**SPIRE**-01-2020: Tapping into the potential of **Industrial Symbiosis** (IA, 50% / 70%)
- CE-**SPIRE**-07-2020: Near zero discharge for fresh **water** used by industry (IA, 70%)
- CE-**SPIRE**-08-2020: Novel **high performance materials and components** for future low carbon technologies and processes (RIA)
- CE-**SPIRE**-09-2020: **Mineral waste, by-products and recycled material** as feed for high volume production (IA, 70%)

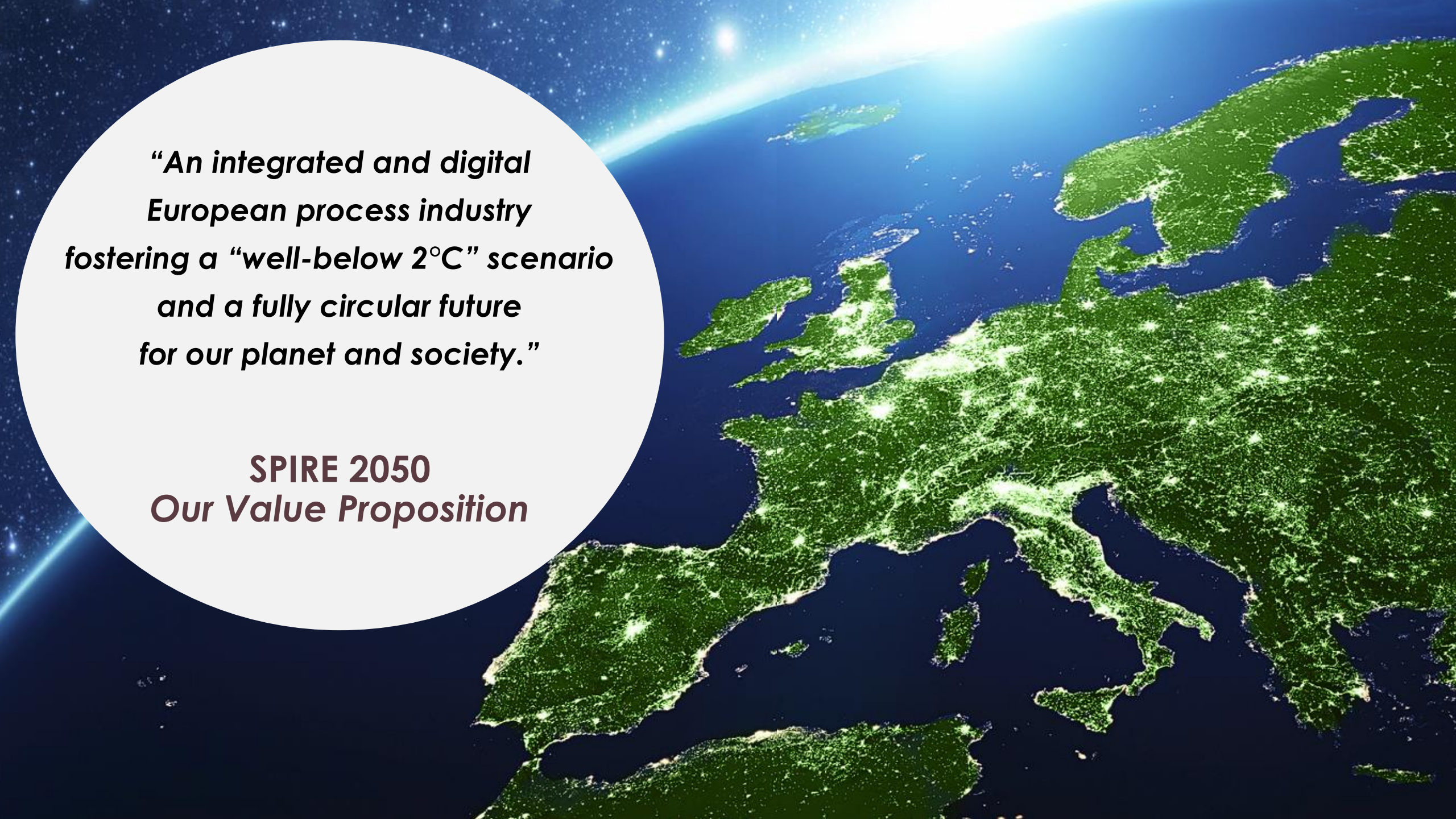
- NMBP-xx-2020: **Materials lifecycle analysis** methodology for the circular economy (RIA)
- CE-**SPIRE**-xx-2020: Harnessing the power of **Artificial Intelligence** for Process Industries (CSA)

Sustainable Process Industry through Resource and Energy Efficiency

SPIRE 2050 VISION

Answering:

- Global Challenges
- The demands from society



"An integrated and digital European process industry fostering a "well-below 2°C" scenario and a fully circular future for our planet and society."

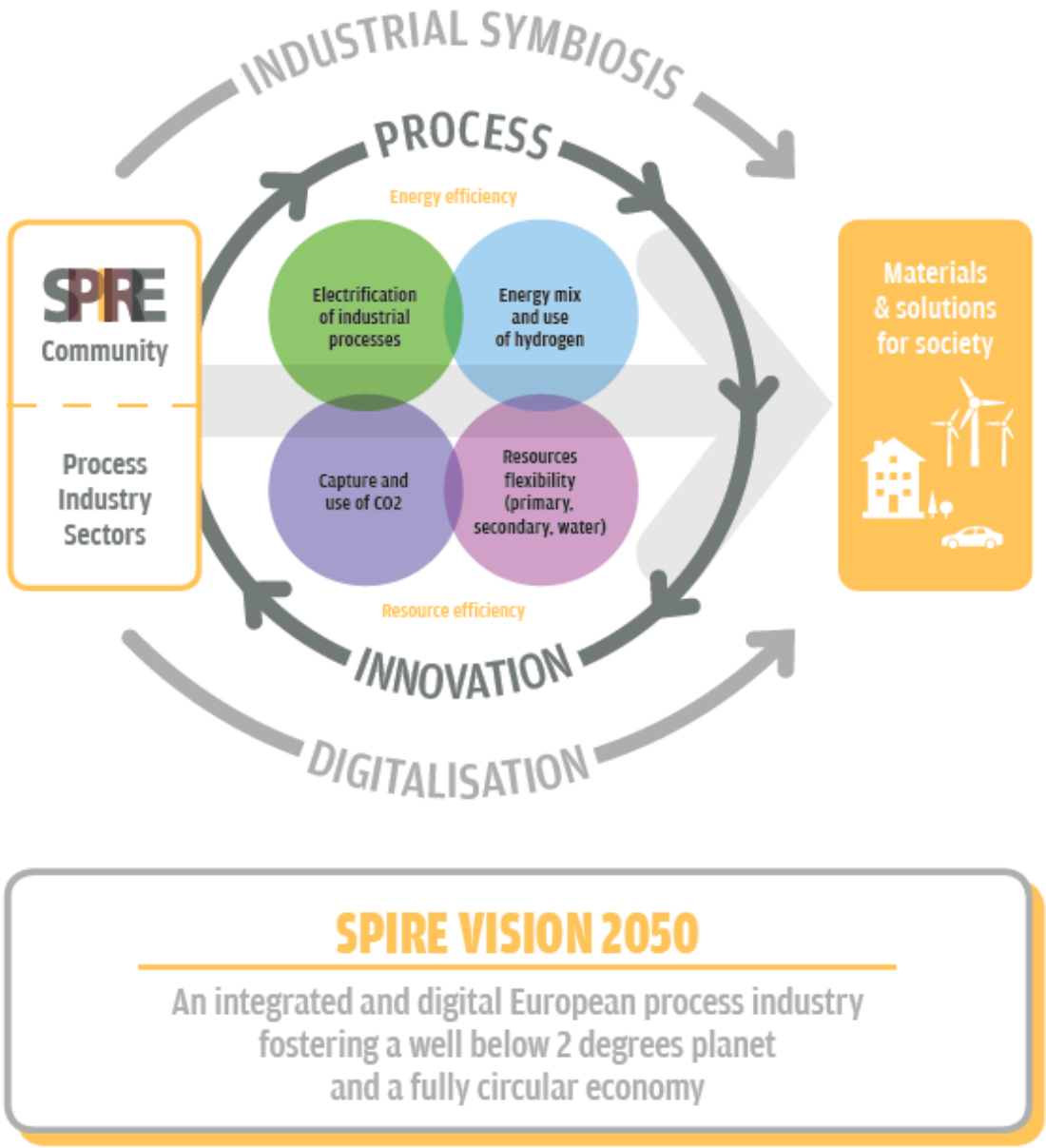
SPIRE 2050
Our Value Proposition

4 technological drivers

Electrification
Energy mix and H_2
Capture and Use of CO/CO_2
Resources flexibility

2 transversal topics

Digitalisation
Industrial symbiosis



SPIRE VISION 2050

An integrated and digital European process industry fostering a well below 2 degrees planet and a fully circular economy

Our ambitions

Sustainable Process Industry through Resource and Energy Efficiency

Closing the climate technological gap

Development of the required solutions to fully contribute to the EU Climate Policy targets

2015
-37% in $CO_{2éq}$ emissions versus 1990

2030
key technologies of SPIRE Vision 2050 ready for deployment (TRL9)

2050
-80% in $CO_{2éq}$ emissions versus 1990

Process industries as Hubs for circularity

Development of required solutions to move towards zero-waste-to-landfill and create Hubs for circularity across Europe

2030
key technologies of SPIRE Vision 2050 ready for deployment (TRL9)

2050
ZERO landfilling of recyclable / recoverable waste in the EU

Global competitiveness

Development of technologies which create new investment opportunities for globally competitive EU Process Industries

Average growth in Gross Value Added of SPIRE sectors over the period 2021-2050 above average GDP growth in the European Union

2021
Kick-off Horizon Europe

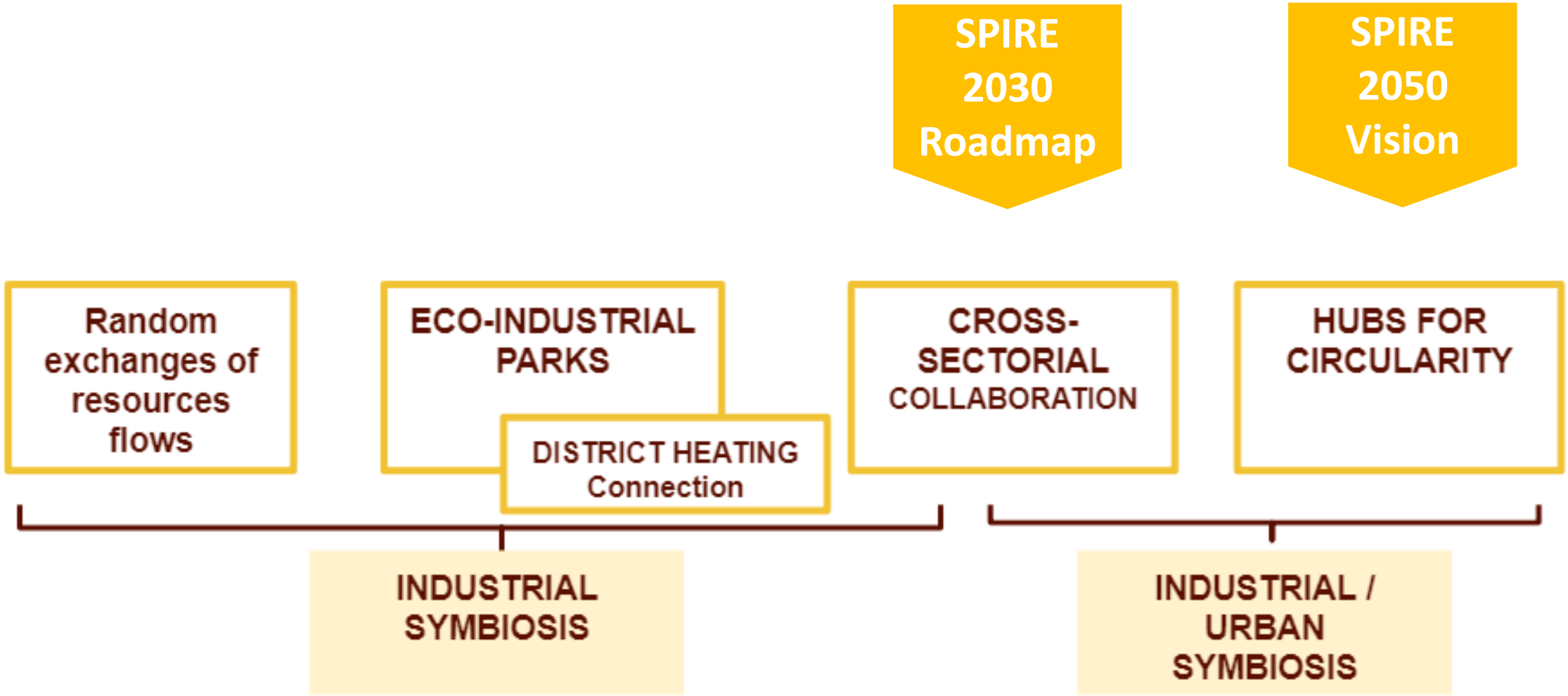
2030
key technologies of SPIRE Vision 2050 ready for deployment (TRL9)

2050

INDUSTRIAL SYMBIOSIS
THE FUTURE IS CIRCULAR

Sustainable Process Industry through Resource and Energy Efficiency

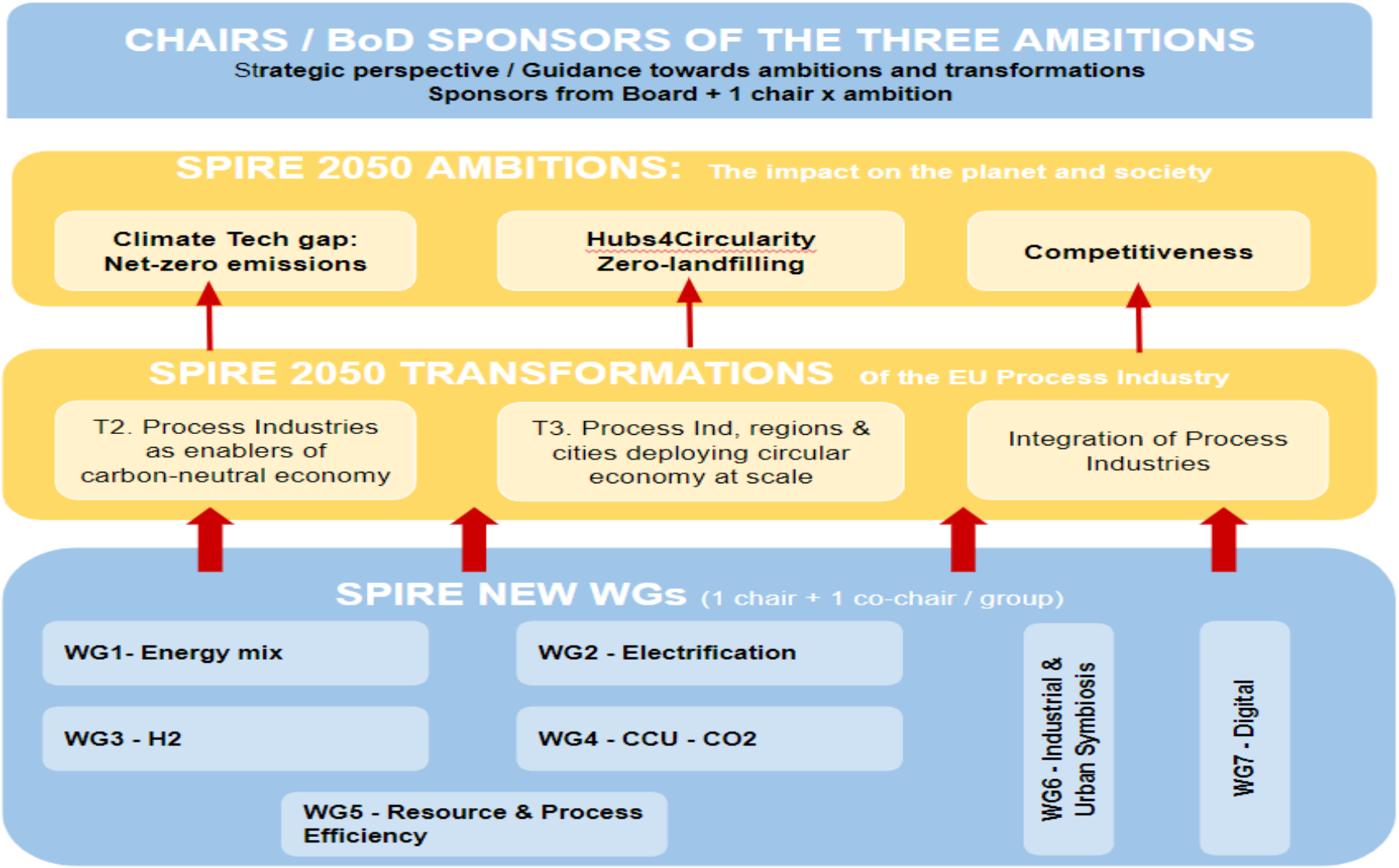
MOVING FROM INDUSTRIAL TO "HOLISTIC" PERSPECTIVE



SPIRE 2050 ROADMAP – NEW WGs

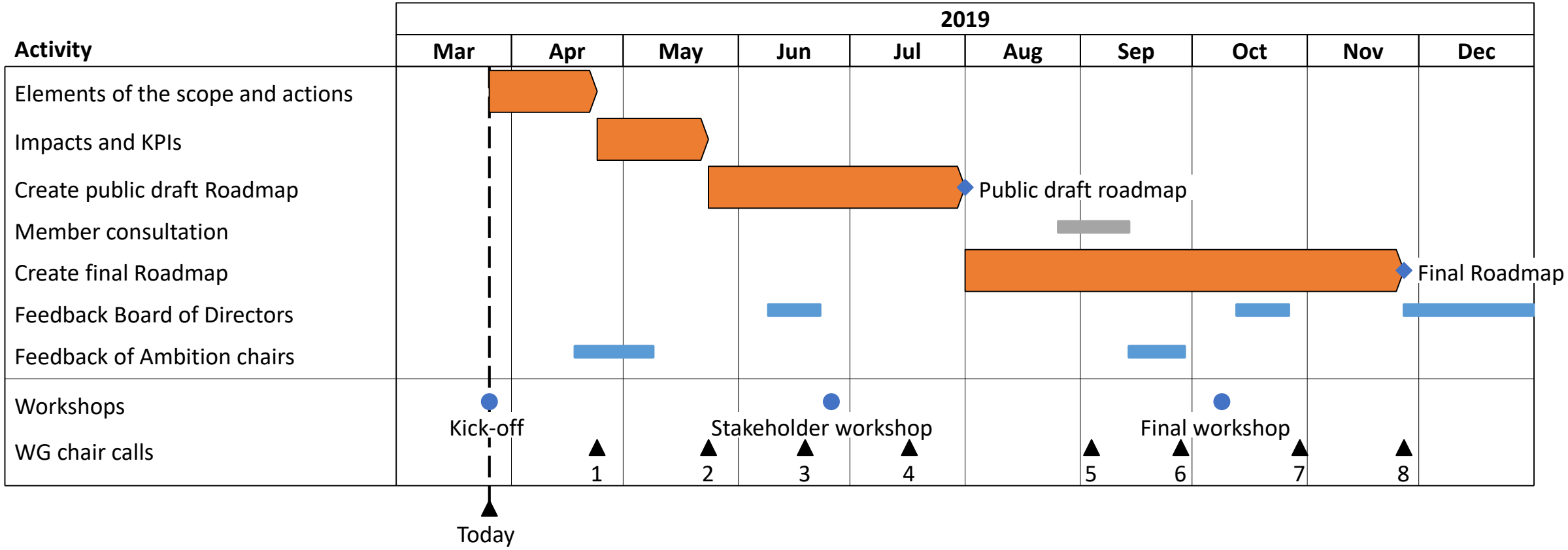
BE PART OF IT: JOIN US TO DEFINE THE NEXT DECADES OF R&I

Sustainable Process Industry through Resource and Energy Efficiency



SPIRE 2050 ROADMAP

TIMELINE 2019 (1)



Industrial-Urban Symbiosis - Definition

Sustainable Process Industry through Resource and Energy Efficiency

I-US is the use by one company by-products or waste (incl. residues, energy, water, logistics, capacity, expertise, equipment or materials) from another.

→Element contributing towards circularity

→Involves technological, regulatory and socioeconomic aspects

→Works across sectors and along value chains

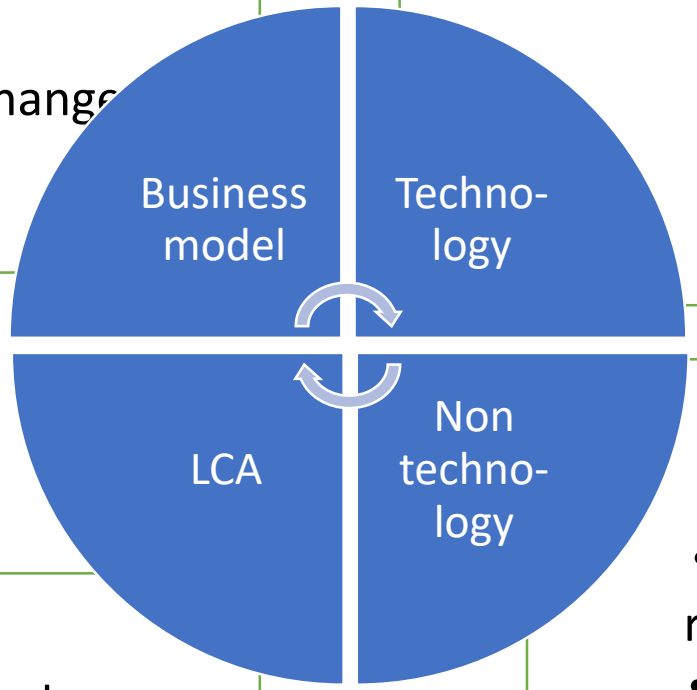
Industrial-Urban Symbiosis - Impact

Sustainable Process Industry through Resource and Energy Efficiency

- No landfills
- Contribution to carbon neutrality
- Use of side streams as alternative feedstocks
- Securing business sustainability by synergies and cost efficiency

Industrial-Urban Symbiosis - Elements

- Multi-owner coordination
- Distribution of gains
- Infrastructure ownership models
- Dealing with confidentiality
- Uncertainty due to possible change of symbiosis partner
- Contractual issues



- Symbiosis value chain demonstrators
- ICT tools and IT-infrastructure for multi-plant operations and (confidential) data integration
- Technologies for the optimisation of flows
- Process redesign for adaptation to IS
- Product design for use after end of life
- Recycling technologies

- Multi-sectorial assessment
- KPIs for value-based assessment
- Existing sustainability standards

- Activities to collect/sort/prepare side streams/unused resources for symbiosis
- Harmonisation of policies on all levels, from regional to EU - dealing with regulatory barriers
- Awareness creation for customer/consumer behaviour

Connected across borders and to citizens

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