

# Competenze per l'economia circolare e la simbiosi industriale.

## L'esperienza del progetto SPIRE-SAIS



*Daniela Sani* (ART-ER)

[daniela.sani@art-er.it](mailto:daniela.sani@art-er.it)

29 Febbraio 2024, Rimini  
Padiglione Hall SUD Stand 110



**Missione: adeguamento - guidato dall'industria - delle future richieste di competenze su EE e IS sviluppate dall'industria e per l'industria.**

## **Obiettivi principali**

- Adeguamenti con il coinvolgimento dell'industria delle competenze: analisi dei nuovi requisiti formativi e curriculari
- Migliore gestione della conoscenza, del reclutamento e la fidelizzazione dei talenti
- Misure di sostegno politico, anche attraverso individuazione di programmi settoriali di miglioramento delle competenze di successo

## **Componenti chiave di SPIRE-SAIS**

- Basarsi sul coordinamento e le attività esistenti di A.SPIRE con approccio intersettoriale
- Associazioni di settore come snodo centrale di comunicazione e diffusione



A.SPIRE è l'Associazione Europea impegnata a gestire e implementare la Partnership co-programmata Processes4Planet (ex SPIRE).

Rappresenta le industrie di processo innovative, il 20% del totale del settore manifatturiero europeo in termini di occupazione e fatturato, e più di 170 stakeholder dei processi industriali e di ricerca provenienti da più di 20 paesi sparsi in tutta Europa.

La missione di A.SPIRE è garantire lo sviluppo di tecnologie abilitanti e migliori pratiche lungo tutte le fasi delle produzioni esistenti della catena del valore su larga scala che contribuiranno a un'industria di processo efficiente sotto il profilo delle risorse.

### **I settori:**

- **cemento, ceramica, prodotti chimici, ingegneria, minerali e metalli non ferrosi, pasta di legno e carta, raffinazione, acciaio e acqua**

# Analisi dello stato dell'arte 1/2



## Technological and Economic Demands and Skills Requirements

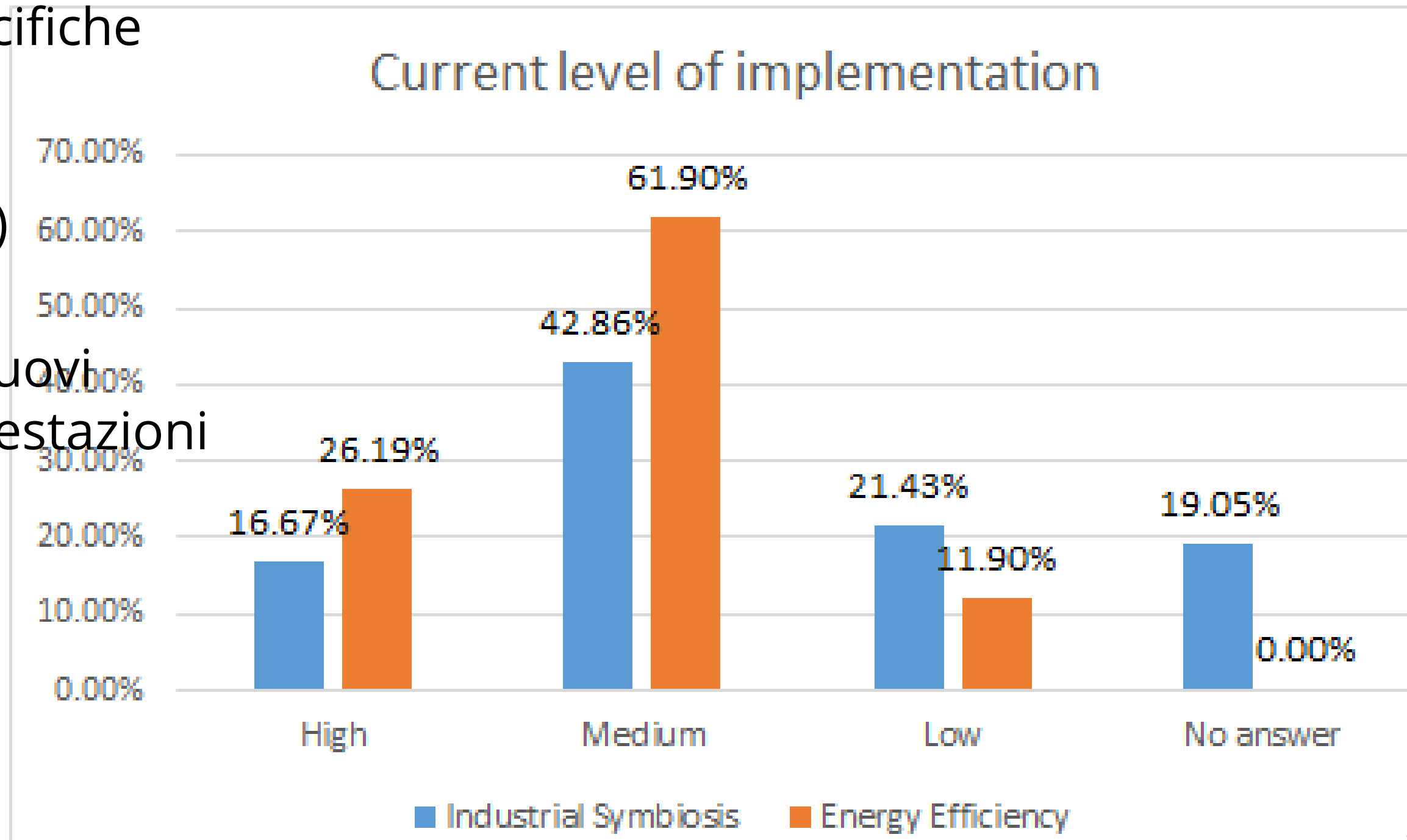
- L'attuale livello di implementazione e di competenze è più elevato per l'EE che per l'IS
- Gli attori pubblici sono anche i principali attori di IS (41%) ed EE (48%)
- I principali ostacoli per EE/IS:
  - costo degli investimenti
  - questioni normative
  - impianti, infrastrutture e attrezzature obsolete
  - sfide della cooperazione, integrazione degli stakeholder locali (filiere)
  - **lacune di competenze**
- Principalmente nessun programma di formazione specifico (**57% EE, 74% IS**)
- In maggioranza i programmi di formazione sono principalmente non formali/non strutturate

# Analisi dello stato dell'arte 2/2

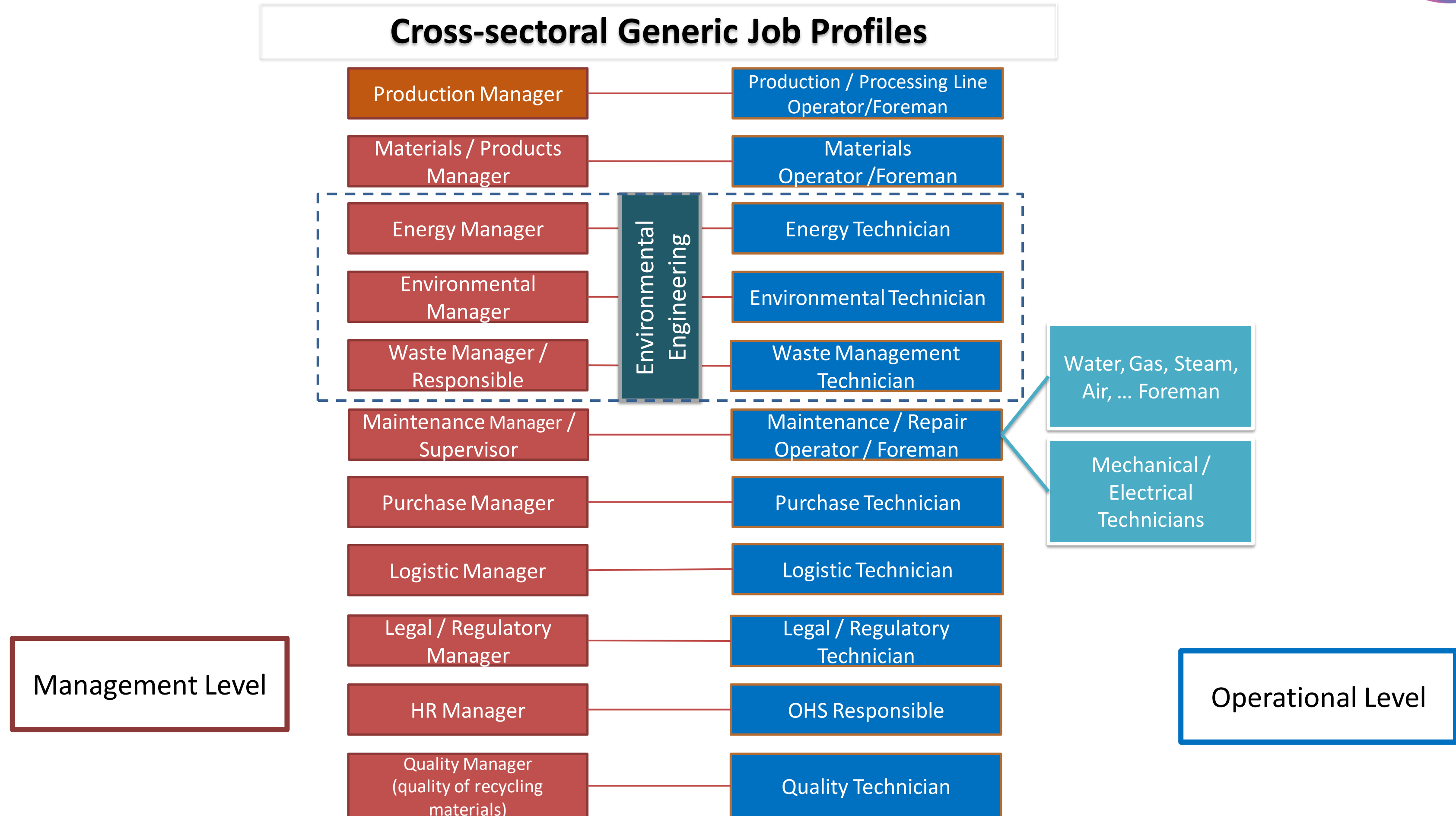


## Technological and Economic Demands and Skills Requirements

- Il livello **medio/basso (tecnici specializzati)** delle competenze deve essere aggiornato
  - competenze tecnico/professionali specifiche legate alla mansione
  - competenze trasversali (in particolare competenze digitali, green e personali)
  - abilità manageriali
- Sarà la Simbiosi industriale a portare a nuovi posti di lavoro/professioni e a migliori prestazioni della forza lavoro

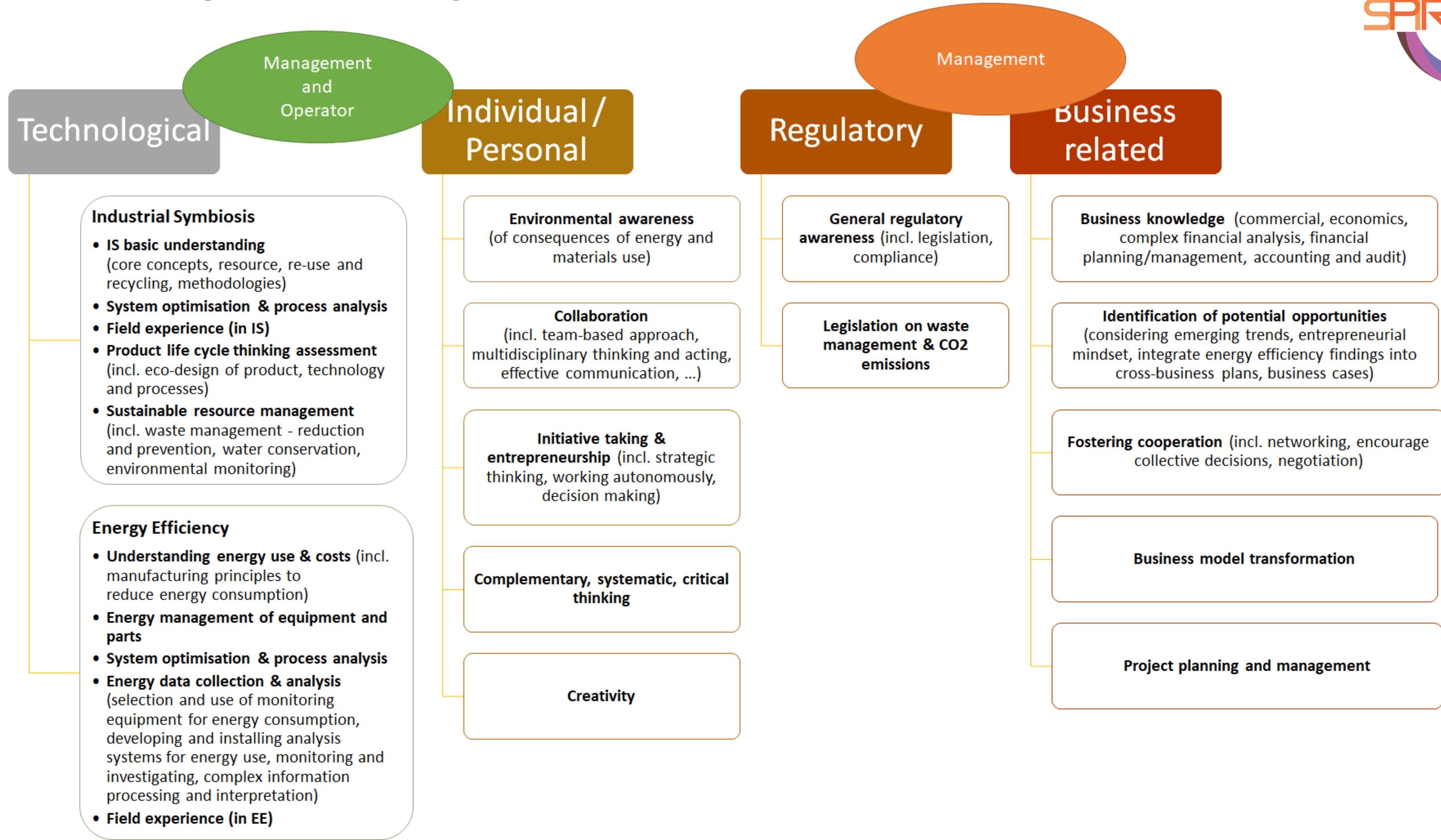


# Un esempio di impatto sulla struttura organizzativa di una impresa





# Un esempio di integrazione



# Impostazione formativa



## Generic IS/EE Training

### Thematic Indepth / Advanced Training Courses

### Sector Specific Illustrations / Specifications

### Job Profile / Function Related Courses

Financial  
Assessment

Critical Raw  
Materials

Energy  
Efficiency



Cement



Ceramics



Chemicals



Engineering



Non-ferrous  
metals

Production  
Areas

Manager

Functional  
Areas

H2, new  
energetic  
vector

....



Minerals



Pulp & paper



Refining



Steel



Water

IS/EE  
Facilitator





# Modulo formativo (esempio settore ceramico)



**Duration:** 5h approx.

## Structure of the course:

- 1. The ceramic product (1h)**
  - a. General concepts of the sector
  - b. Ceramic manufacturing process
- 2. Energy efficiency and decarbonisation in the ceramics sector (2h)**
  - a. Energy use and consumption in the ceramic industry
  - b. Energy Optimisation Actions in the Combustion Stages
    - i. Spry-drying stage
    - ii. Drying stage
    - iii. Firing stage
  - c. Roadmap for decarbonisation in the ceramics cluster
- 3. Circular economy and industrial symbiosis in the ceramics sector (2h)**
  - a. Basic concepts of CE and IS
  - b. Synergy detection methodology
  - c. Barriers and success factors
  - d. Current IS practices in the ceramic sector
  - e. Potential resources to be shared

## Learning outcomes:

### **Module 1:**

- Demonstrate a comprehensive understanding of the general concepts and terminology related to the ceramics sector.
- Describe the key stages of the ceramic manufacturing process, from raw materials to finished products.

### **Module 2:**

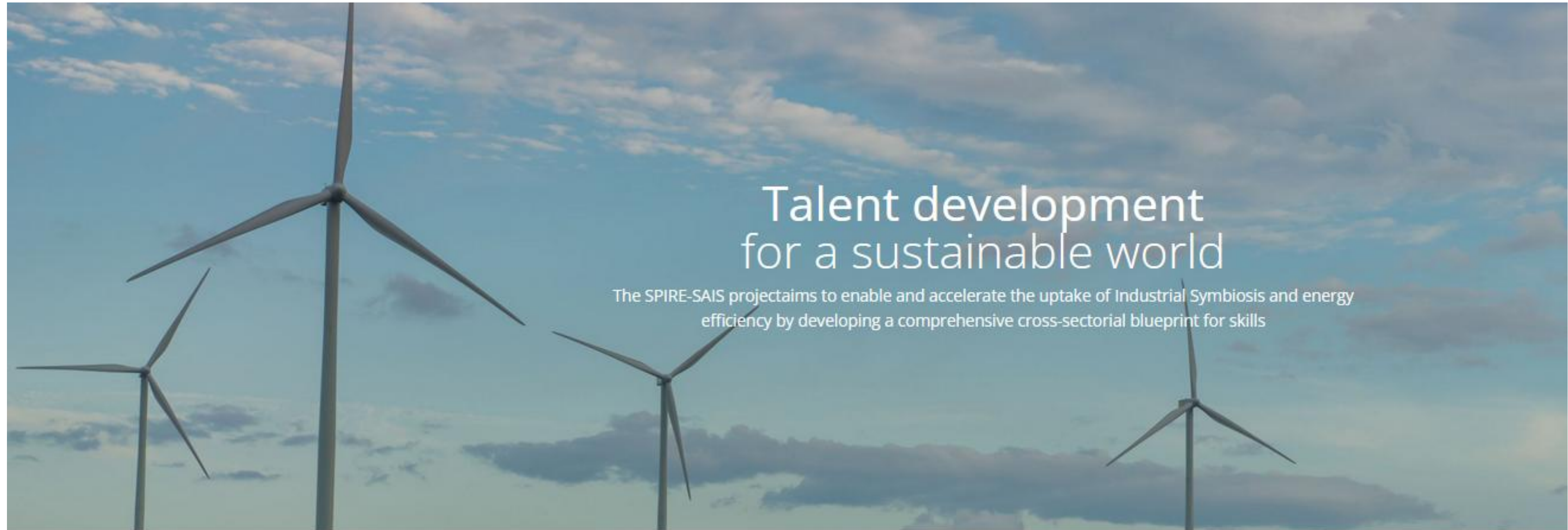
- Assess and quantify energy use and consumption in the ceramic industry.
- Recognize the environmental impact of energy consumption in ceramic production.
- Develop strategies for optimizing energy use in combustion stages of ceramic manufacturing.
- Identify key milestones and actions to reduce carbon emissions in ceramic production.

### **Module 3:**

- Explain the significance of adopting CE principles in the ceramics industry.
- Evaluate the potential for IS practices within the ceramics sector.
- Identify common barriers to implementing CE and IS in ceramics.
- Describe current IS practices in the ceramic sector, citing specific examples.
- Analyze potential resources that can be shared within the ceramics cluster to promote sustainability.

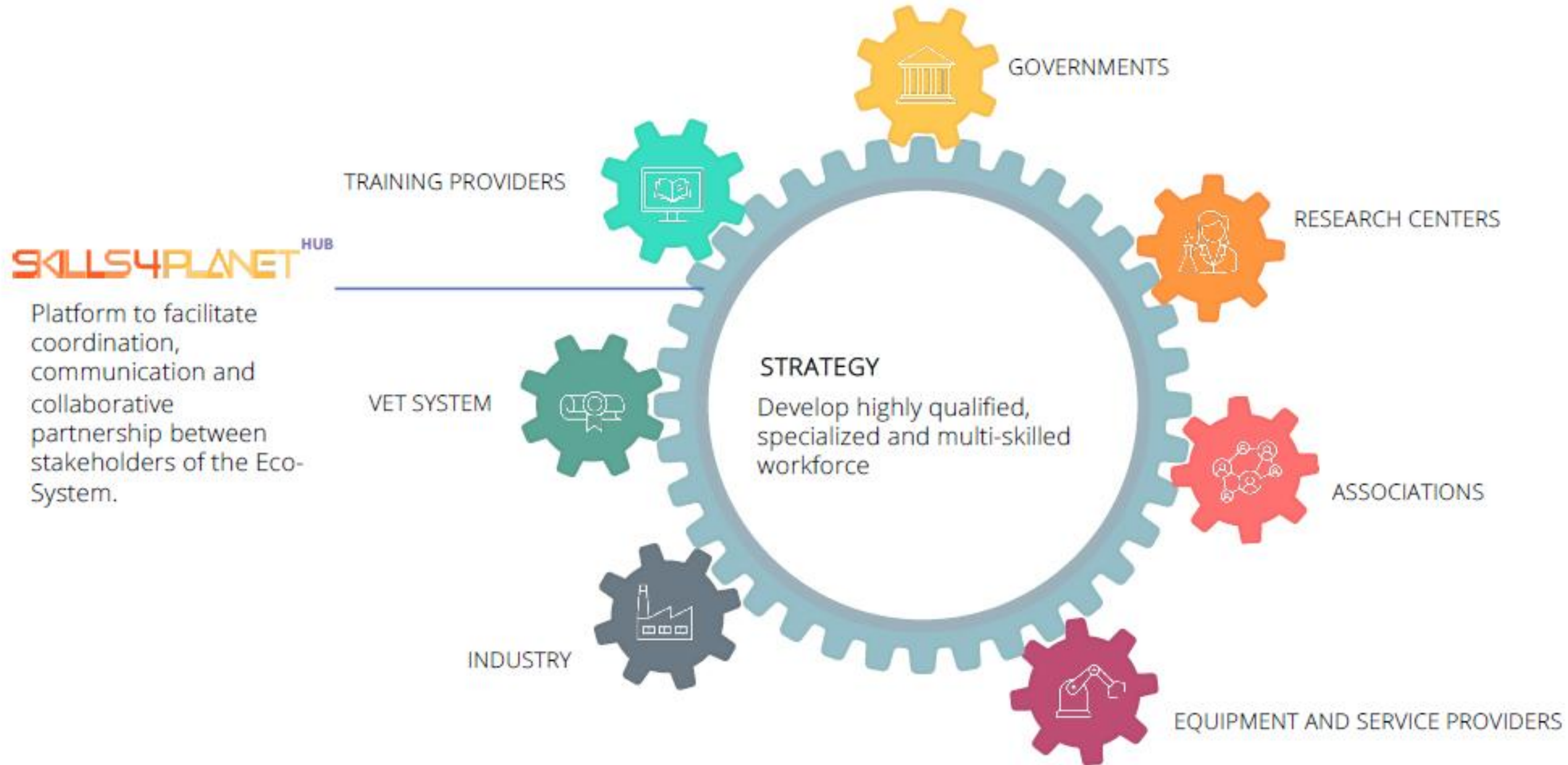


# Piattaforma formativa e di integrazione Online Training Platform: SKILLS4Planet



Get content from the **best publishers**  
on engineering and sustainability

# Gli attori della formazione e il ruolo della piattaforma



# Come funziona. Le 4 directory: offerta, bisogni, autoanalisi e della certificazione



## Learning solution Directory

Collection of learning solutions provided by experts and organizations into skills4planet.



## Skill Directory

Skill and knowledge directory that represent the current and future training needs of the Energy Intensive Industries.



## Capability Assessor

Solutions to deliver capability assessments to organization and individuals to design customized development path.



## Delivery

Flexible integration options to meet the unique needs of organizations of different size and type as well as individuals.



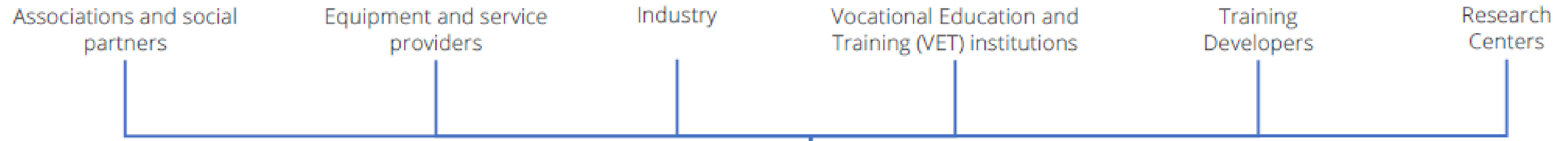
Technology infrastructure that facilitate communication and partnership between stakeholders of the Online Training Ecosystem.



# Un esempio di intersezione tra la domanda e l'offerta

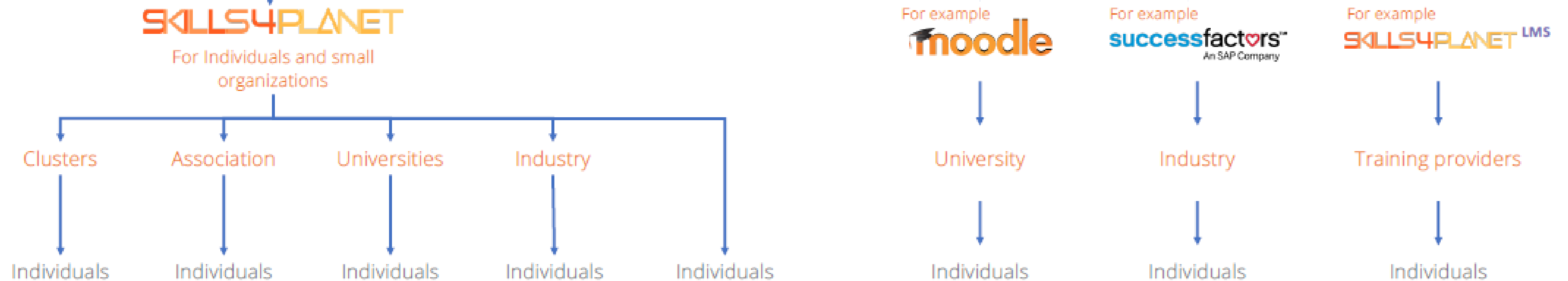


Offer



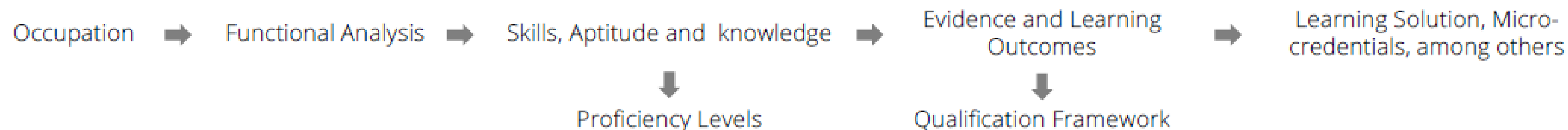
SKILLS4PLANET<sup>HUB</sup>

Demand





# Un esempio di delivery con rilascio crediti secondo standard EQF



Skill Definition	Levels	Question example for Self-Assessment	Learning Outcomes	Qualification Framework														
<b>Manage Budget</b>  Gather information and prepare budgets for the organization to support short- and long-term business plans. Engage colleagues and stakeholders in the process. Submit them to decision-makers and agree final budgets to be implemented. Monitoring budgetary performance, taking corrective actions when required. Propose revisions and provide reports to decision-makers, including identifying potential fraud is necessary.	1	You have a general understanding of budgeting concepts and processes. You are able to create and manage simple budgets and can perform basic financial analysis..	Negotiate the proposed budgets with decision-makers to agree final budgets  Take corrective action when required to manage budgets  Produce budget proposals based on your evaluation of the information gathered  How to discuss, negotiate and confirm a budget with those with budgetary responsibility and the key factors that should be covered  The main causes of budget variances, how to identify them and the different types of corrective action.  Your organisation's key performance indicators (KPIs)	<table border="1"> <thead> <tr> <th>Category</th> <th>EQF Level</th> </tr> </thead> <tbody> <tr> <td>Practical</td> <td>5</td> </tr> <tr> <td>Practical</td> <td>5</td> </tr> <tr> <td>Cognitive</td> <td>5</td> </tr> <tr> <td>Cognitive</td> <td>5</td> </tr> <tr> <td>Theoretical</td> <td>2</td> </tr> <tr> <td>Factual</td> <td>2</td> </tr> </tbody> </table>	Category	EQF Level	Practical	5	Practical	5	Cognitive	5	Cognitive	5	Theoretical	2	Factual	2
	Category	EQF Level																
	Practical	5																
	Practical	5																
Cognitive	5																	
Cognitive	5																	
Theoretical	2																	
Factual	2																	
2	You have an in-depth understanding of budgeting processes and concepts. You are able to create and manage more complex budgets and perform financial analysis to identify trends and issues.																	
3	You have a high level of expertise in budgeting processes and concepts. You are able to create and manage complex budgets, perform financial analysis to identify opportunities for cost savings and revenue growth, and provide strategic advice to senior management on financial matters.																	
4	You have a deep understanding of budgeting processes and concepts and are recognized as leaders in the field. You are able to develop and implement innovative budgeting strategies, identify and manage financial risks, and provide expert advice to senior management on financial matters.																	

Asociación de Investigación de las Industrias Cerámicas (ITC-AICE)  
ArcelorMittal Spain Holding  
Cardiff University  
Celsa Group  
CIELFFA  
CIRCE - Centro Tecnológico  
**EIT Raw Material Academy**  
EUROFER - The European Steel Association  
European Federation for Welding, Joining and Cutting  
European Steel Technology Platform ESTEP  
**Ferriere Nord**  
H2O-People  
Höchst Industriepark  
IDENER  
**IMA-Europe**  
industriALL  
INEGI - Institute of Science and Innovation in Mechanical and Industrial Engineering  
InnoGlobal  
Instituto de Soldadura e Qualidade  
Liberty Steel Group  
National Research&Development Institute for Non-ferrous and Rare Metals - IMNR  
NCE EYDE  
**Pittini Group**  
Provadis Hochschule  
**RINA Consulting - Centro Sviluppo Materiali S.p.A.**  
**SCUOLA SUPERIORE SANT'ANNA**  
Sidenor Aceros Especiales SLU  
thyssenkrupp Steel Europe AG  
TU Dortmund University  
University of DEUSTO  
worldsteel  
Zaragoza Logistics Center



# European Pact for Skills: Large Scale Partnership Energy Intensive Industries



An initiative of the European Commission



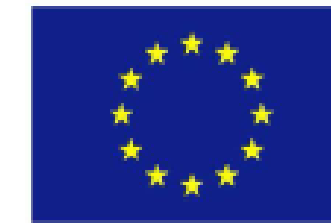
[www.art-er.it](http://www.art-er.it)

<https://www.aspire2050.eu/>

<https://hub.skills4planet.eu>

[https://pact-for-skills.ec.europa.eu/about/industrial-ecosystems-and-partnerships/energy-intensive-industries\\_en](https://pact-for-skills.ec.europa.eu/about/industrial-ecosystems-and-partnerships/energy-intensive-industries_en)

#SPIRESAISBlueprint



## Skills Alliance for Industrial Symbiosis: A Cross-sectoral Blueprint for a Sustainable Process Industry (SPIRE-SAIS)

### Prototype of the Blueprint New Skills Agenda Energy Intensive Industries

Deliverable D5.2  
(Status: 30.12.2021)

Project acronym:	SPIRE-SAIS
Project title:	Skills Alliance for Industrial Symbiosis: A Cross-sectoral Blueprint for a Sustainable Process Industry
Project number:	612429-EPP-1-2019-1-DE-EPPKA2-SSA-B
Coordinator:	TU Dortmund University (TUDO)
Funding Scheme:	Erasmus+
Due date of deliverable:	December 2021
Actual submission date:	30 <sup>th</sup> of December 2021
Project duration:	01.01.2020 – 31.12.2023 (48 months)
Work package:	WP 5 – European Blueprint
Work package leader:	TU Dortmund University
Authors:	Antonius Schröder (TUDO) with contributions of the work package leaders: Simonas Gaunas (VA), Teresa Branca, Valentina Colla (SSSA), Felix Bayon (Sidenor), Irina Celades (ITC), James Woodcock (ISL), Raquel Almeida (ISQ)
Dissemination level:	Public



Project Number  
612429-EPP-1-2019-1-DE-EPPKA2-SSA-B