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Zentrale Wissenschaftliche Einrichtung

SPIRE Stakeholder Workshop:
Strategic SPIRE 2050 Roadmap in the European Context

The Relevance of Non-technological Topics

Antonius Schröder
TU Dortmund University

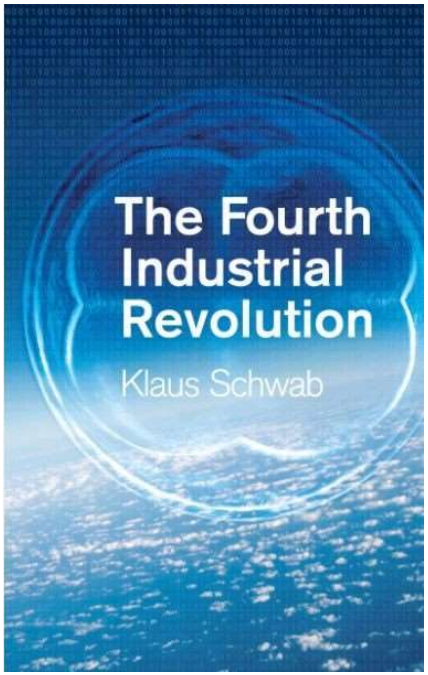
Brussels, 3rd of December 2019

The Fourth Industrial Revolution and the Consequences for Society

Schwab calls for leaders and citizens to

"together shape a future that works for all by **putting people first**, empowering them and constantly reminding ourselves that all of these **new technologies are first and foremost tools made by people for people.**"

Professor Klaus Schwab, Founder and Executive Chairman of the World Economic Forum



New Innovation Process

Starting point:

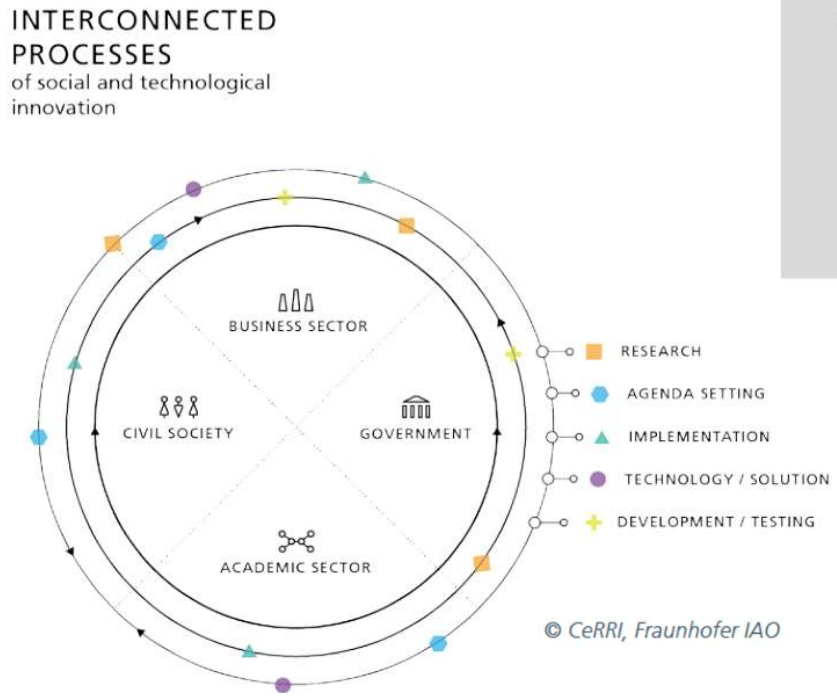
A lot of technological innovation is not being used and implemented

- **Every technological or economical innovation is also a social innovation (process)**, which is decisive for or at least co-determining efficiency and effectiveness, success and failure of an innovation.
- Technology is an **enabler** of innovation.
  "A New Nature of Innovation" (OECD 2010).

Solution:

- Setting up of **social innovation concepts and processes** (innovation process design):
  stakeholder and user involvement right from the beginning considering co-creation, impact, organisational and personnel development

Combining Technological and Social Innovation



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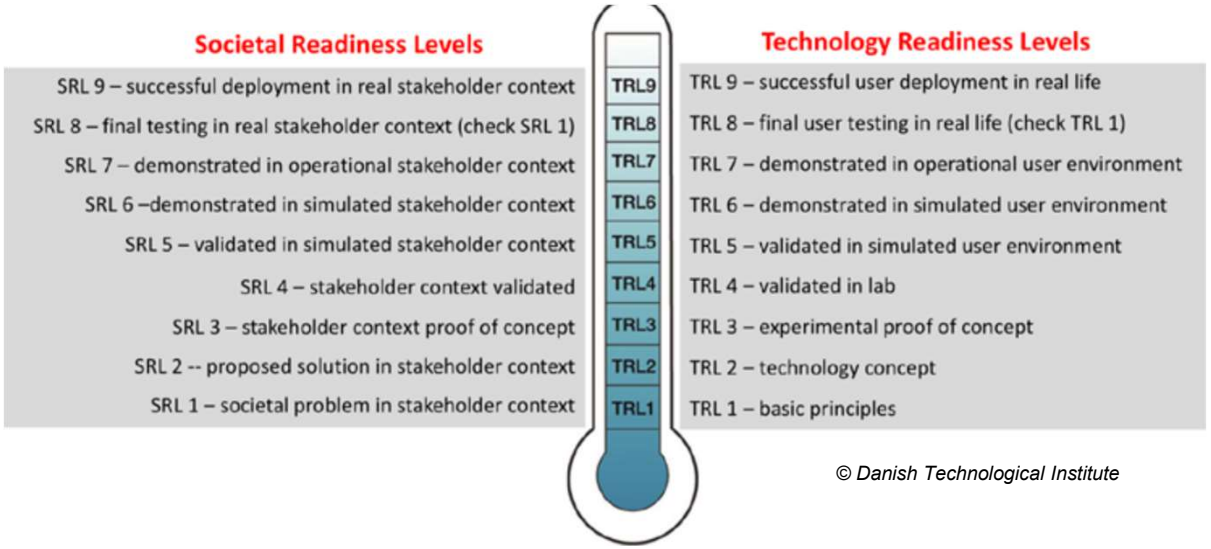

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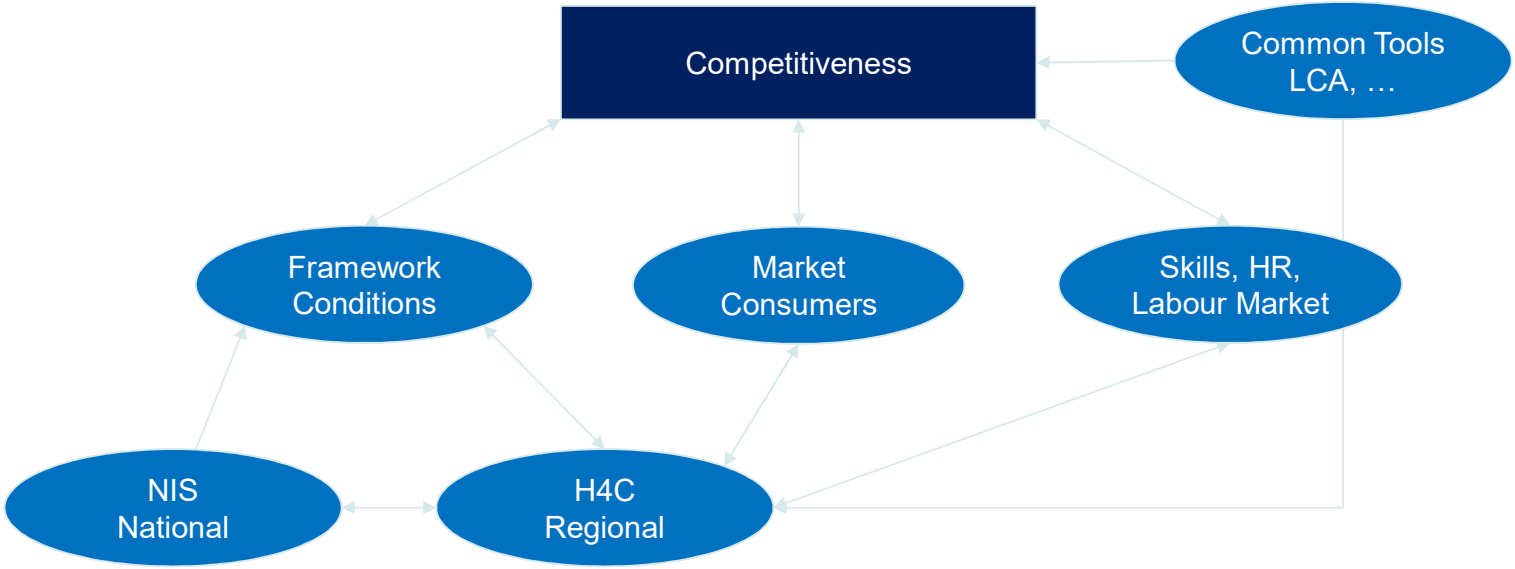
Fraunhofer Policy Paper:
Social Innovation – The Potential for Technology Development, RTOS and Industry, 2019
http://publica.fraunhofer.de/eprints/urn_nbn_de_0011-n-5349272.pdf

SPIRE: The Non-technological Perspective
or better: Comprehensive / Holistic Innovation Paradigm

Fostering competitiveness of the SPIRE sectors from a non-technological, social perspective (potential enablers or barriers):



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Combining the Innovation Programmes with Horizontal Factors

WG Innovation Area	Innovation Programme			Horizontal Factors					
		Description	Ambitions	Market / Consumers	Framework Conditions	Human Resources	(Eco-) Systems Governance	Additional issues (e.g. common tools)	Link to SPIRE projects
WP6 Industrial-Urban Symbiosis									
IA1 Process technologies	IP1-1	Processing of side/ waste streams (materials, water, energy and gas)	Development of technologies to make waste streams re-usable	Integrating of consumer behavior, new side / waste stream markets	Regional roadmap for implementation	New skills for new technologies and (company/regional) implementation	Regional implementation of the technologies	Eco-system implementation, social innovation process, …	EPOS?
	IP1-2	Symbiotic supply chain: management of complex and interconnected material flows across company limits	Set up of solutions to manage/optimize networks and interconnected companies and to secure secondary resources supply				Set up of a regional eco-system as a governance/ coordinating platform)		
	IP1-3	Dealing with used material flows/secondary resources	Development of dissembling, sorting, recycling and treatment technologies						

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Specific Horizontal Innovation Programs / Projects

Innovation Area	Innovation Programme		Horizontal Factors						
	Description	Ambitions	Market / Consumer	Framework Conditions	Human Resources	(Eco-) Systems Governance	Additional issues (e.g. common tools)	Link to IP of WGs	Link to SPIRE projects
Overarching horizontal innovation programmes									
IA1 Hubs for Circularity	Tool to align and join forces, driven by Process Industry with the support and coordination of local authorities	Collective problems and needs in the region addressed by market players and turned into solutions and opportunities. H4C as new business centre of the future				Setting up of European, sectoral, national regional industrial symbiosis eco-systems	Based on existing cooperation, e.g. - Basque Region - Gjovik City (Norway) 'bioSIP' (bio-based smart industrial park)		
IA2 Skills Alliances and Strategies for Industrial Symbiosis (SPIRE-SAIS)	A proactive adjustment of new skills needed by a close cooperation of the projects with the SPIRE-SAIS project	Considering skills needs right from the beginning of technological innovation development		VET-systems up-taking industry skills and qualification demands	Skills as a needed precondition to unfold and implement the potential of new technologies	Set-up of a sectoral Skills Alliance and Strategy	Governance structures	General topic of almost every IP and WG	This is an already existing and funded project (Erasmus+) which could be easily linked
IA3 Common Tool Database	Stocktaking of tools of interest in a common database (LCA, Business Models, Governance Approaches, KPIs, etc.)	Not to reinvent the wheel several times, easy adaption to specific project conditions							
IA4 Cross-sector Transfer of Innovative Solutions	Stimulate a cross-sector transfer of solutions to other SPIRE sectors	To foster transferability of innovations, stocktaking of innovative solutions all over the SPIRE community (and beyond?)							

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SPIRE-SAIS: Skills Alliance for Industrial Symbiosis (SAIS) – A Cross-sectoral Blueprint for a Sustainable Process Industry (SPIRE) (2020-2023)

Key components of SPIRE-SAIS:

- Build on existing SPIRE coordination, projects and activities
- **Cross-sectoral approach**, covering all the eight SPIRE energy intensive industry sectors
- Combining industrial symbiosis with **proactive skills adjustment**
- Extended concept of innovation, a new innovation paradigm, **systematically linking technological, organisational and human resources development**
- **Social innovation process**, integrating all the relevant stakeholders from the beginning, considering impact right from the beginning
- Establishment of **new actor constellation and alliances** and new future oriented anticipation perspectives
- **Learning process** for all the partners involved and hopefully the whole sector institutions and actors
- Involving **different rationalities** of the involved policy fields and institutions
- **Open dialogue** or (if necessary) negotiation process
- Blueprint as a common accepted **SPIRE framework of orientation, reflective and anticipating governance**

➢ **Our Mission:**

Industry driven proactive adjustment of the future skills demands across SPIRE sectors!
New skills to unfold the potential of digital transformation within the companies and beyond.

Integrating all the relevant Industry Actors

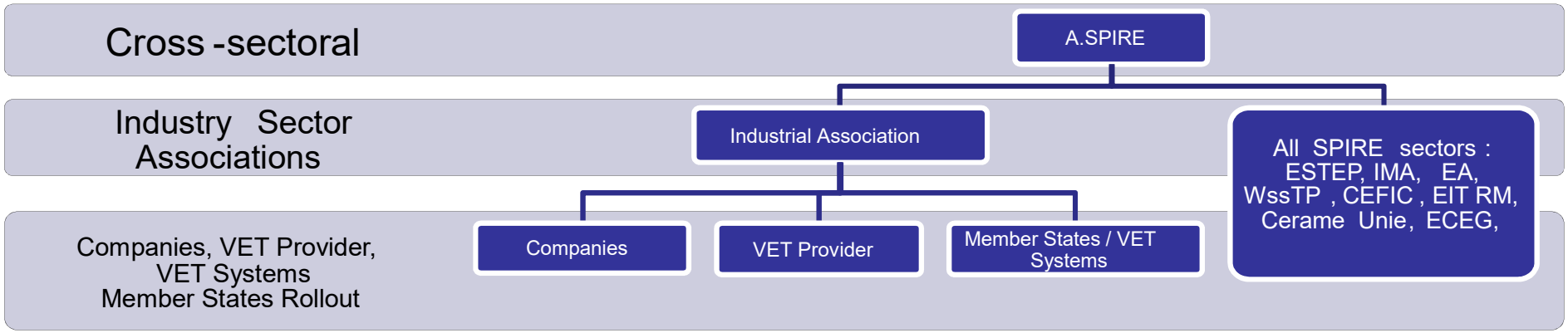
- **Companies** (and their relevant departments) (steel making and processing)
- **Research, education and training institutions** (universities, vocational schools, training enterprises and associated partners e.g. sector agencies)
- **Social partners** on the EU (such as sector associations and industriALL) and national level
- **European** and **national** Vocational Education and Training (VET) **institutions** (such as CEDEFOP)
- **SPIRE sector platforms** (A.SPIRE, ESTEP, IMA, European Aluminum, CEFIC, EIT RM, WE)
- National funding institutions (national VET programmes, ESF, EFRE …)
  (for a sustainable **national roll-out** of the blueprint)
- Technological, educational, training, human resources and economic **experts**
- Representatives of the **European Commission** (DG Employment, Research an Innovation, Grow, Connect, Education and Culture, …)

Partnership (24) partners

- **SPIRE sectors (all):**
  Steel, Chemicals, Minerals, Non-ferrous Metals, Water, Engineering, Ceramics, Cement
- **Industry sector associations (6):**
  A.SPIRE, ESTEP, IMA, European Aluminum, Water Europe, ECEG
- **Companies (6)**:
  Chemicals: Covestro; Steel: Ferriere Nord, Sidenor; Minerals: Carmeuse; Aluminum: MYTILINEOS; Water: Suez
- **Education and training providers (also RTO) (6):**
  Scuola Superiore Sant'Anna, Fundation Circe, ITC, ISQ, International Synergies, H2Opeople
- **Research institutions (5):**
  TU Dortmund University, CSM/RINA, Visionary Analytics, IMNR, IMN
- **Other (1):**
  ART-ER (regional institution),
- **Associated partners**:
  EIT Raw Materials, ThyssenKruppSteel Europe, CEFIC, CEMBUREAU, ITQ (Universitat Politècnica de València), Carbon Market Watch
- **12 countries:** Belgium, France, Germany, Greece, Italy, Lithuania, Netherlands, Poland, Portugal, Romania, Spain, United Kingdom

SPIRE-SAIS Blueprint: Open Coordination

SPIRE-SAIS: Open Coordination
European Cross-sectoral Blueprint for a Sustainable Process Industry

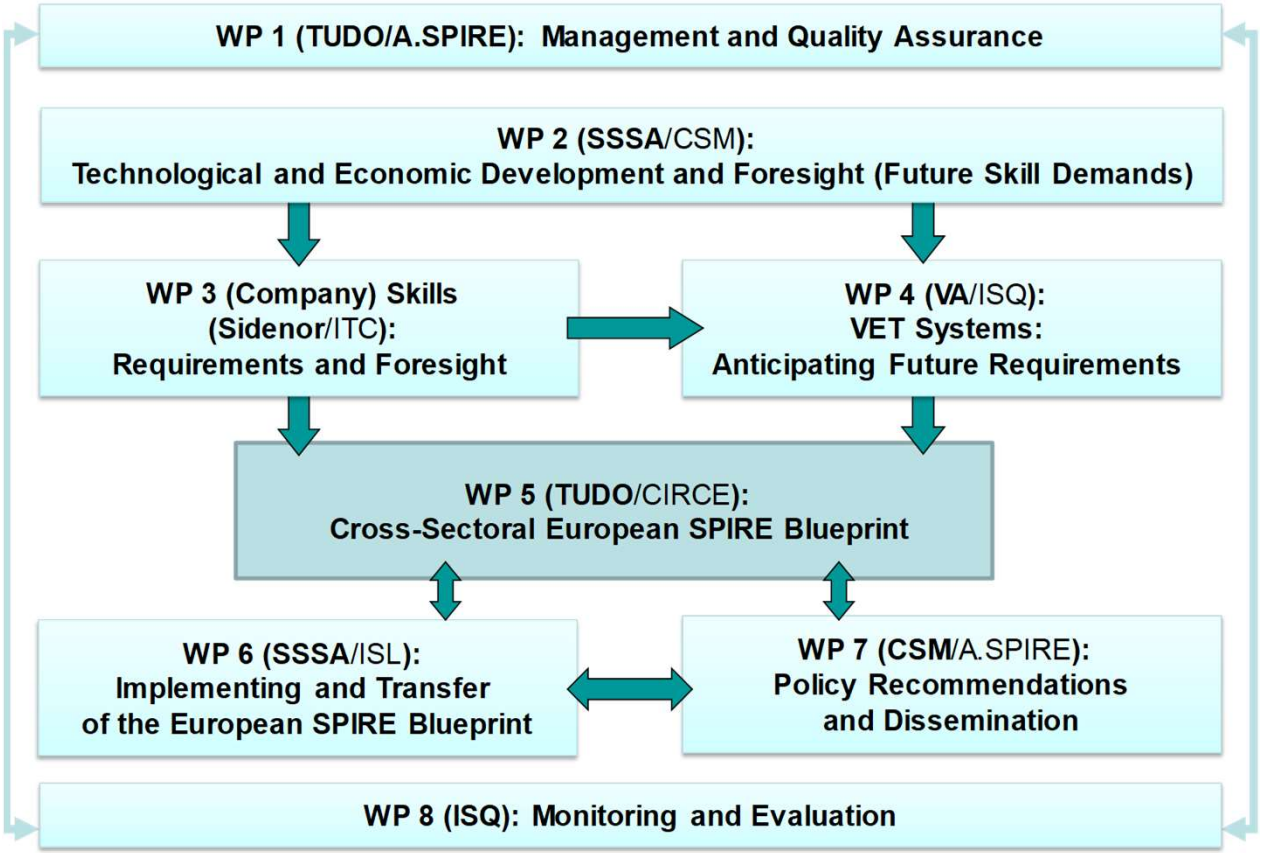


Expected Results

Blueprint for an industry driven long-term skills strategy for steel companies and VET institutions:

- **Adjusting the workforce proactive**, to deploy and implement new technologies aiming at an optimisation of the production process
- **Monitoring and shorten the implementation of industry relevant qualifications in national VET systems, continuously**.
- **Developing** and **exchanging modules, tools and the experiences** with the implementation process of the new skills agenda and strategy
- **Developing a blueprint** to be discussed and compared with the solutions / blueprints of other sectors

Work Plan
Work Packages



Thanks a lot for your attention!