

Education on standardization in Italy: the experience in the fluid power and absorption heat pumps sectors



Antonino Bonanno, Researcher, Institute for Advanced Energy Technologies Nicola Giordano (ITAE) – Messina - Italy



My experience

Researcher

- Advanced heat pump and thermal storage systems
- Desalination
- New materials for Fluid Power systems (e.g. earth-moving machinery)

Teacher

- Fluid power
- Standardization
- Safety and reliability
- Machinery Directive (Regulation)
- Energy efficiency

2009-2018 – Member of ISO TC 127 and CEN TC 151/WG1

From 2018 – HAS consultant for the Machinery sector

The Executive Master in Fluid Power

Focus

- Provide focused knowledge on specific matters (e.g. how does the machinery directive work?)
- Provide an updated view on recent developments (e.g. new Annex ZA, new Machinery Regulation, etc.)
- Links to standardisation

Participants

- Mainly engineers
- Members from technical and research departments
- Managers

Three full day lessons focused on standardization

Organised by a private Foundation – attended by banks, SMEs, category associations, etc.

The Executive Master in Fluid Power

Structure

- 5 Modules:
 1. Basic design principle for fluid power systems
 2. Circuits architectures
 3. Hydrostatic transmissions
 4. Machinery Directive and risk management
 5. Electronic control systems

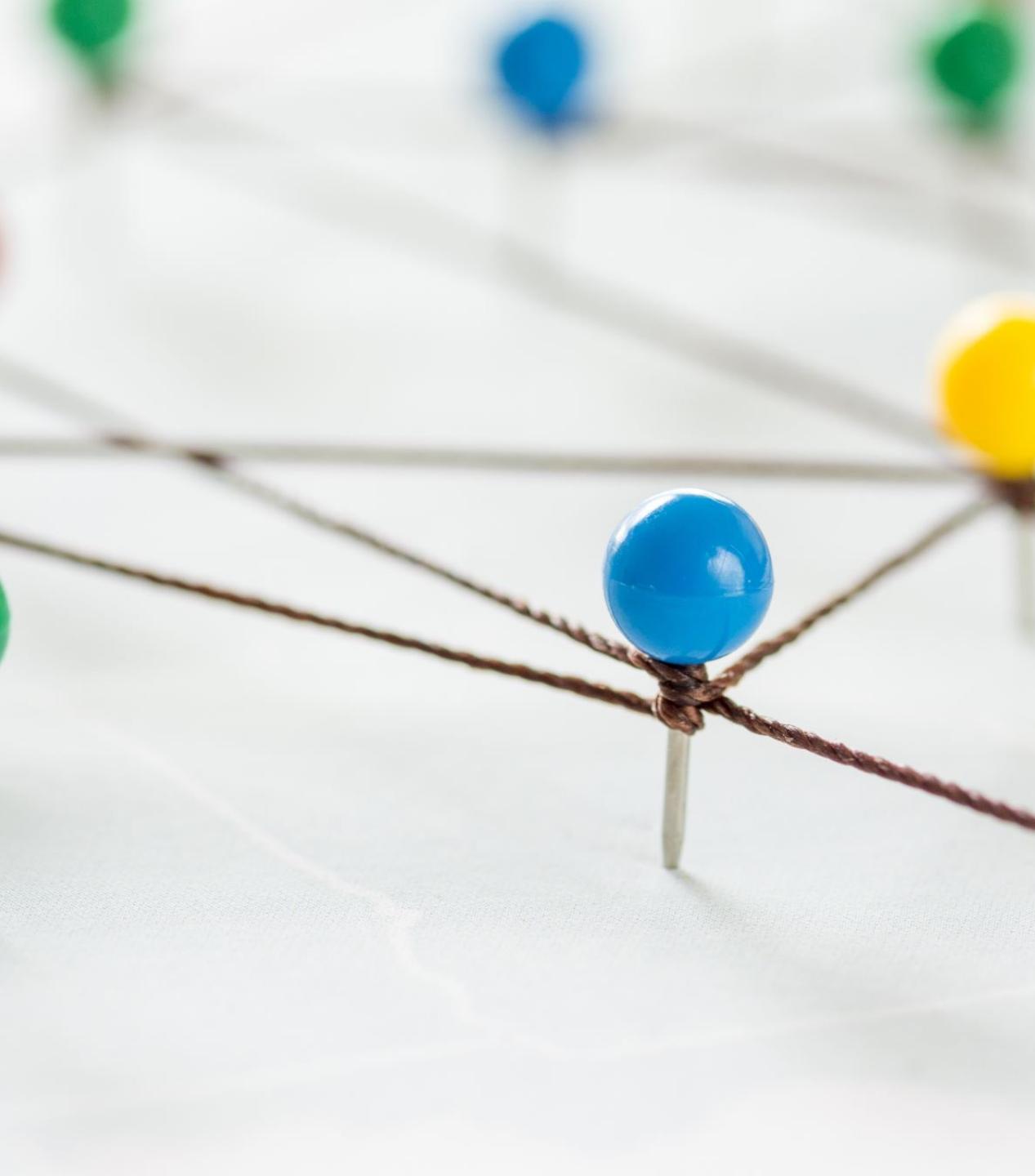
Background

- The idea was to “plug the gaps” in universities courses, answering the requests coming from fluid power industries (mainly SMEs in Italy)
- Taught in presence: full day, 7 hours
- From 2004 to 2010 a post graduate Masters was also organised, but had less success due to the lack of engineers



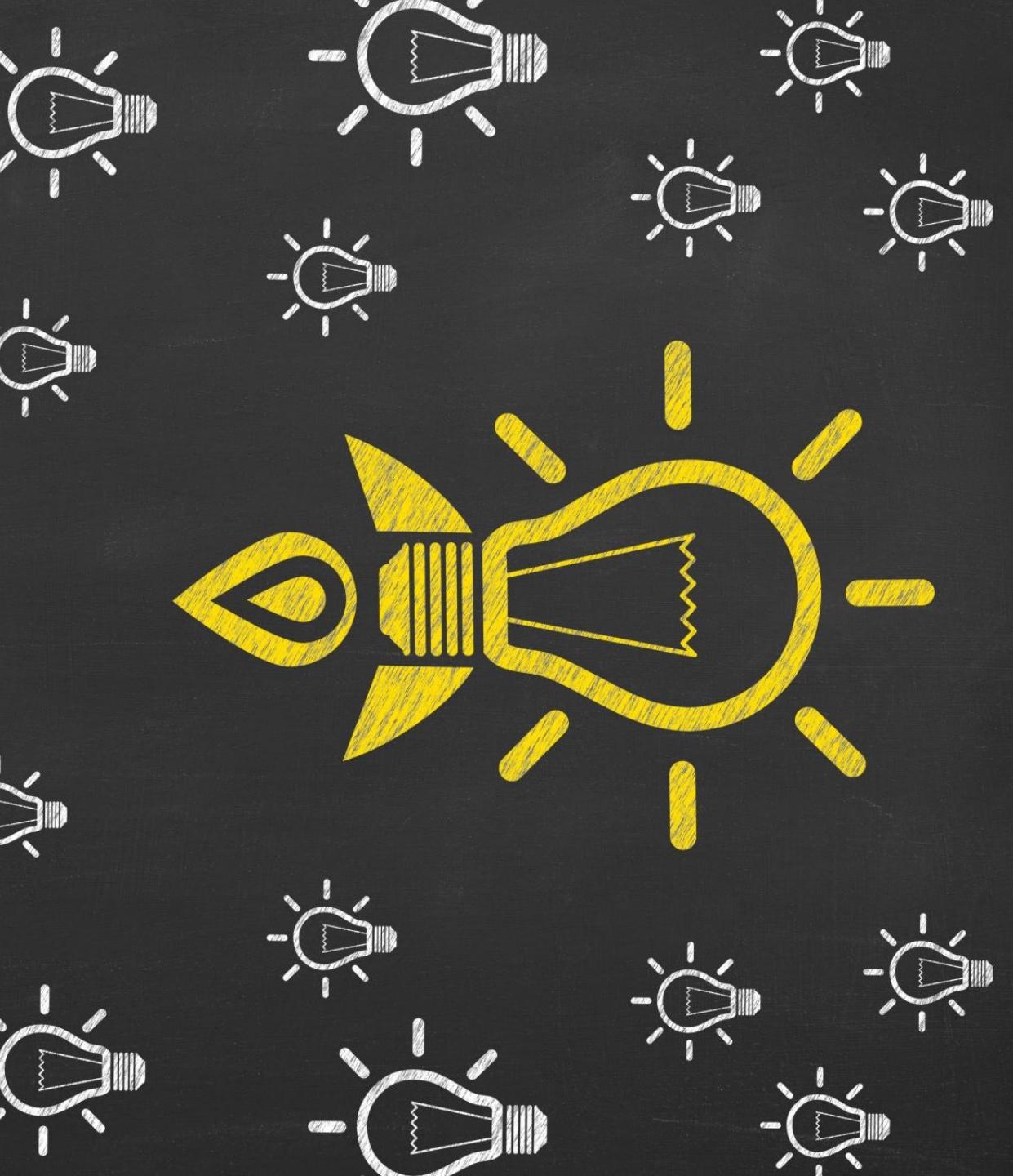
My experience in a nutshell

- 4 participants in 2010 – 40 participants in 2024 (sometimes they come back after 2 or 3 years for updating)
- SMEs = more than 90% of attendants
- Very few have previous experiences in standardization
- Often, the single SME asks for a dedicated course on standardization to spread the knowledge



Some critical points

- Lack of dedicated courses at Universities
- Companies that are too small cannot dedicate a full-time person to follow standardization issues
- Difficulty in participating in TC work, seen as a cost, not as an opportunity



Ideas

- Dedicated funding to support standardization training for SME
- A guideline could be the project “Industry 5.0”, recently approved by the Italian government:
 - Focus on energy efficiency (45% of the amount of expenses for R&D projects focused on industrial energy efficiency can be covered by a subsidized loan)
 - Incentives covering up to 10% of total costs, with a maximum limit of 300,000 euros per project; training must be provided by external parties



Ideas

- Greater involvement of manufacturers associations (e.g. experts shared between multiple SMEs)
- Create dedicated courses (taught by staff with "in field" experience) at Universities
- Incentivize TCs to follow the activities of European research projects - TCs are often concentrated only on market driven solutions



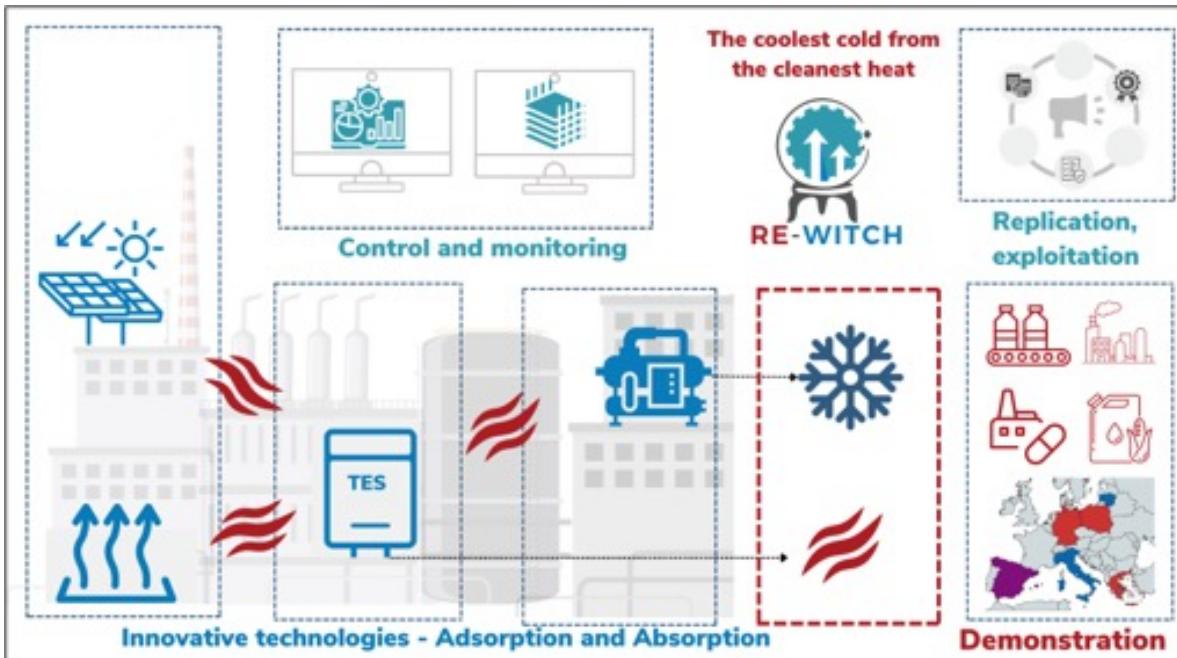
Zhenit is an example of a European project where SMEs are actively involved in standardization activities

- The project is driven by a consortium of 13 partners from 6 countries composed by innovative SMEs (B4B, ECT, SORTECH, KYMA, SIGLA) and excellent R&D Centres (CNR, UoB, TECNALIA, NTUA - expert in both WHR systems and sustainable shipping) and coordinated by innovation oriented engineering company (RINA-C), one of the most important **EU naval classification bodies**
- The solutions developed (fresh water from sea water, trigenerative WHR-ORC-HP solutions, TES) are **analyzed from a standardization point of view** and spread to stakeholders for a proper marketability between 2027-2030
- **Interaction with relevant Authorities** (e.g. IMO, WATERBORNE, EMSA) is planned thanks to the involvement of the Italian Naval Registry (RINA)

Zhenit: grant agreement 101056801

Re-Witch: second example of SME involvement in standardisation

- Innovative solutions need to be standardized to be accepted from the market
- Some technical solutions could find barriers in actual standards



- Many RE-WITCH Project Partners are SMEs/start-ups
- The main goal is to involve relevant TCs to standardize the innovative solutions developed in the project

Re-Witch: grant agreement 101138697



Conclusions

- Often SMEs see the standards as an “obligation” instead of a guide
- SMEs are standardization knowledge “hungry” but often they do not know how to manage: dedicated courses could help
- Dedicated financial programs focused, for example, on energy efficiency where a bonus is recognized to standardization educational training
- EU research projects could help to bring the gap between innovations and TCs activities, involving SMEs in the process
- Standards education activities need to become more “engaging”
- Professors' carriers are based on research, this sometimes does not help their involvement into standardization activities