Digital Innovation Hubs contribution to digital transformation in Energy sector

DIHs in MS and regions are contributing to the digital transformation of enterprises in many sectors. When it comes to Energy (and selecting "Electricity, Gas & Water supply" in the online DIH catalogue of the S3P[1]) 72 fully operational DIHs declare offering digitisation services to companies and contributing to the digital transformation process in the energy sector[2].

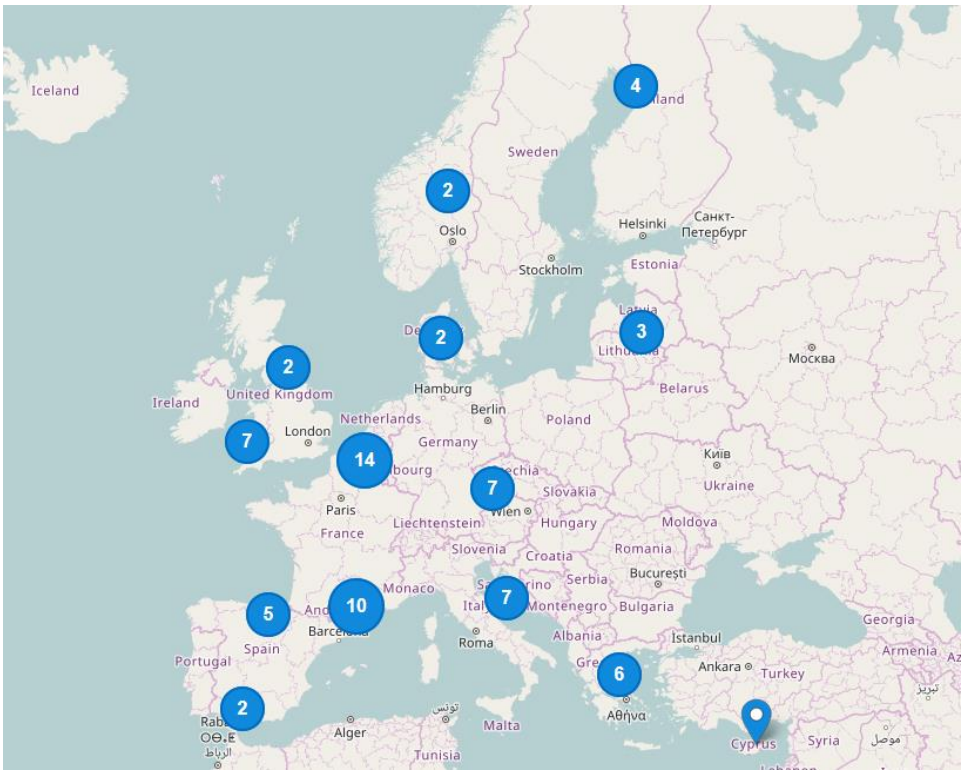

Figure 1: Geographical distribution of DIHs in Energy sector (Fully Operational)

[1] http://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool

[2] **Disclaimer**: The DIH Catalogue website is a "yellow pages" of Digital Innovation Hubs. The information provided about each entry is based on self-declaration. The European Commission cannot take any responsibility for the provided information. Currently all the entries in the catalogue are being verified (based on the provided information) if they comply to the following 4 criteria:

1. Be part of a regional, national or European policy initiative to digitise the industry;
2. Be a non-profit organisation;
3. Have a physical presence in the region and present an updated website clearly explaining the DIHs' activities and services provided related to the digital transformation of SMEs/Midcaps or industrial sectors currently insufficiently taking up digital technologies
4. Have at least 3 examples of how the DIH has helped a company with their digital transformation, referring to publicly available information, identifying for each:
    - Client profile
    - Client need
    - Provided solution to meet the needs

The purpose of the catalogue is to support networking of Digital Innovation Hubs and to provide an overview of the landscape of Digital Innovation Hubs in Europe, supported by Regional, National and European initiatives for the digitalisation of industry. There is no relation between being present in the catalogue and being able to receive funding of the European Commission.

Country distribution of Fully Operational DIHs in Energy

The country distribution of the above mentioned 72 DIHs that provide digitilisation services in the Energy sector are distributed per country as following:

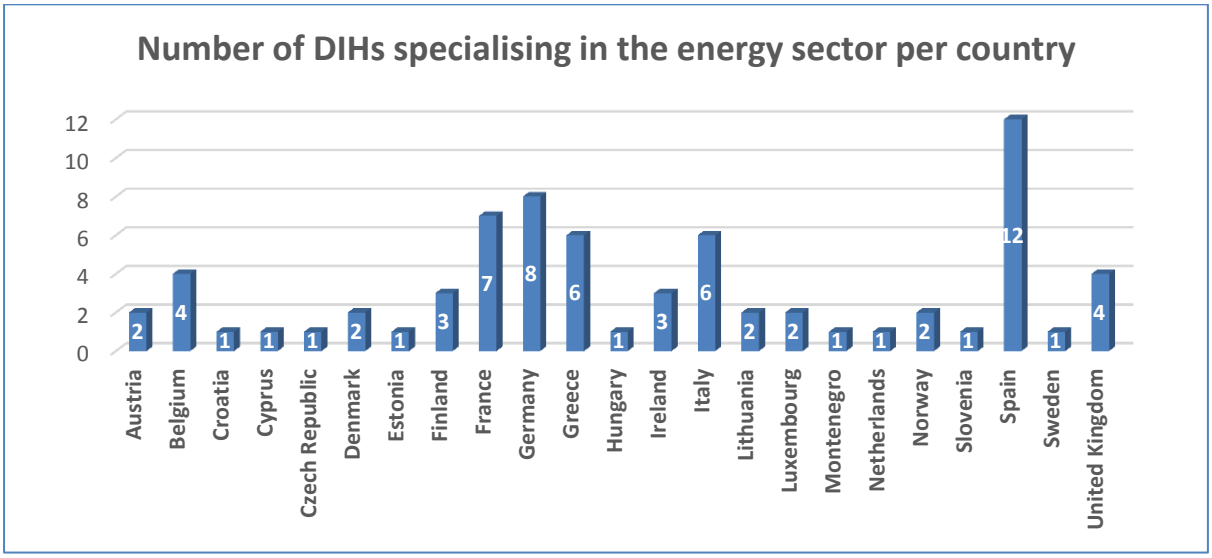

Figure 2: Number of DIHs specialising in the energy sector per country

The identified DIHs possess a number of technical competences and offer a range of services to businesses in the Energy sector. Following is some information on the frequency of technical competences and the range of services provided.

Frequency of technical competences of Fully Operational DIHs in Energy ("Electricity, Gas & Water supply")

- Organic and Large Area Electronics (OLAE)
- Laser based manufacturing
- Other
- Screens and display technologies
- Gamification
- New Media technologies
- Internet services (e.g. web development, web production, design, networking, and e-commerce)
- Photonics, electronic and optical functional materials
- Micro and nano electronics, smart system integration
- Broadband and other communication networks (e.g. 5G)
- Advanced or High performance computing
- Additive manufacturing (3D printing)
- ICT management, logistics and business systems
- Cyber security (including biometrics)
- Interaction technologies (e.g. human-machine Interaction, motion recognition and language technologies)
- Cloud computing
- Software as a service and service architectures
- Location based technologies (e.g. GPS, GIS, in-house localization)

- Cyber physical systems (e.g. embedded systems)
- Augmented and virtual reality, visualization
- Robotics and autonomous systems
- Sensors, actuators, MEMS, NEMS, RF
- Simulation and modelling
- Artificial Intelligence and cognitive systems
- Data mining, big data, database management
- Internet of Things (e.g. connected devices, sensors and actuators networks)

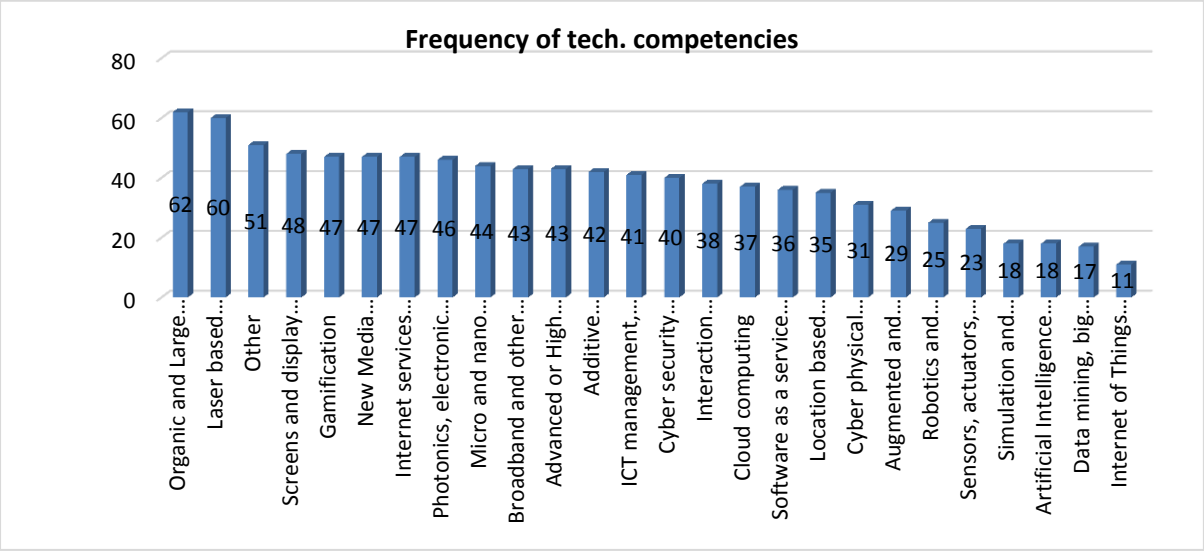

Figure 3: Frequency of technical competencies of DIHs specialising in the energy sector

Most common services offered by Fully Operational DIHs on Energy ("Electricity, Gas & Water supply")

There is a broad range of services provided by DIHs depending on their capacities and also on the level of maturity of SMEs in their process of digital transformation. The types of services most commonly mentioned by DIHs that provide support to SMEs in the Energy sector are the following:

- Other
- Commercial infrastructure
- Voice of the customer, product consortia
- Pre-competitive series production
- Access to Funding and Investor Readiness Services
- Digital Maturity Assessment
- Market intelligence
- Visioning and Strategy Development for Businesses
- Mentoring
- Incubator/accelerator support
- Concept validation and prototyping
- Testing and validation
- Awareness creation
- Education and skills development
- Collaborative Research
- Ecosystem building, scouting, brokerage, networking

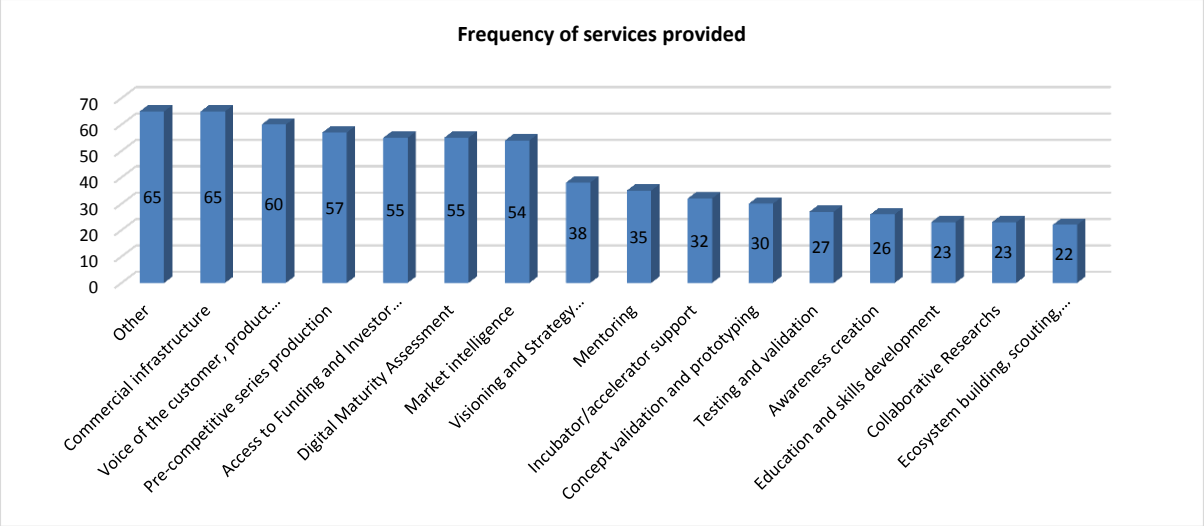

Figure 5: Frequency of services provided by DIHs specialising in the energy sector

➢ Examples of digitalisation services in Energy:

DIHs are already contributing in the digital transformation of businesses in the Energy sector in Europe and in the future their role will be increasingly important. Following are some examples of different kinds of digitisation services provided by DIHs in different countries to beneficiaries related to the Energy sector:

i) New flow reactor

In The Netherlands DIH *Brightlands Materials Center* (https://www.brightlandsmaterialscenter.com) provides expertise on how nano materials could be used in the sustainable energy sector.

BMC and its partners have developed a flow reactor for producing a specific type of nano material. This will decrease the nasty light reflections of displays and increase the outcoupling of the light. This nano material can be incorporated into the display's film and may also find applications in solar panels and in the greenhouse horticultural sector. This is the first time that such a flow reactor has been developed. The flow reactor simplifies the production of nanoparticles, increases the speed and helps improve the quality of the product. These benefits have been used both by one of the companies in the consortium (who produces coatings based on nanoparticles) and by one of the knowledge centers in the consortium.

ii) Energy Management Solution

In Greece DIH *nZEB Smart House* (https://smarthome.iti.gr) provides digitisation services for near-Zero Energy buildings.

Need:
With implicit and explicit DSM Strategies flooding the energy market there is a need for smart infrastructures that can provide that level of monitoring and control, towards optimally exploiting the innovative energy efficiency in buildings (Smart Everything Solution).

Services:
Real-time energy monitoring (production, consumption), advanced control capabilities, automated decision support system, grid-connected and islanded mode capabilities. By digitizing information regarding all energy-related aspects it becomes easier to reveal available energy flexibility as well as to fully exploit DSM services, such as DR signals taking into account building occupancy in real-time.

Customer Examples:
WATT-&-VOLT
Pragma-IoT
More details: https://smarteverything.gr/landing

iii) Building and Energy Applications

In Belgium DIH Centre de recherche en aéronautique ASBL, Cenaero (http://www.cenaero.be/) is mainly active in the aerospace (in particular turbomachinery), process engineering, energy and building sectors.

Simulation and HPC technologies adoption, driving innovation-based competitiveness and industry decarbonising, is a shared challenge for EU industrial transformation. This is particularly critical for SME and so-called low-tech sectors as Construction for which both technology transfer and domain cross-fertilization have been identified as key elements for succeeding. The DIH, initially supporting Aerospace companies, has hence impulsed several support actions in that sense, jointly with the Belgian Building Research Institute and other industry clusters (CAP2020, Greenwin,...).

Among those, they organized in the last 5 years, 5 "Simulation for Building & Energy Applications" regional exchange days and master classes, attracting more than 200+ companies (70+% of SME). This impulse also delivered success stories as the DIH accompanied Construction SME such as Stûv, to design a highly efficient and ergonomic pellet stove (awarded by Red dot award product design 2016), 3E, by further developing an IoT and model based predictive control platform for buildings energy management, Cover Group and 1Spatial, by automatically connecting simulation tools in their building frame modeler and GIS city database software for providing new applications through the Cloud, thus offering new applications via these tools.