



EUROPEAN COOPERATION NETWORK
ON ENERGY TRANSITION
IN ELECTRICITY TR@NSENER

TR@NSENER

Réseau Européen de coopération sur la Transition
Énergétique en Electricité (SOE1/P1/F0005)

Open Innovation models characterization
for the energy sector
-SUDOE area-



1. Introducing Open Innovation



The open innovation model is based on collaboration between different agents

A model focused on the development of new technologies and business opportunities. It involves employing all the mechanisms that allow access to knowledge and existing opportunities outside the limits of a single agent.



A model driven by market needs in response to breakthrough of technologies

The open innovation model arises in response to the growing demand for increasingly innovative and multidisciplinary solutions, which require development capabilities and agility that a single agent can hardly provide.



Open innovation models allow to accelerate innovation processes

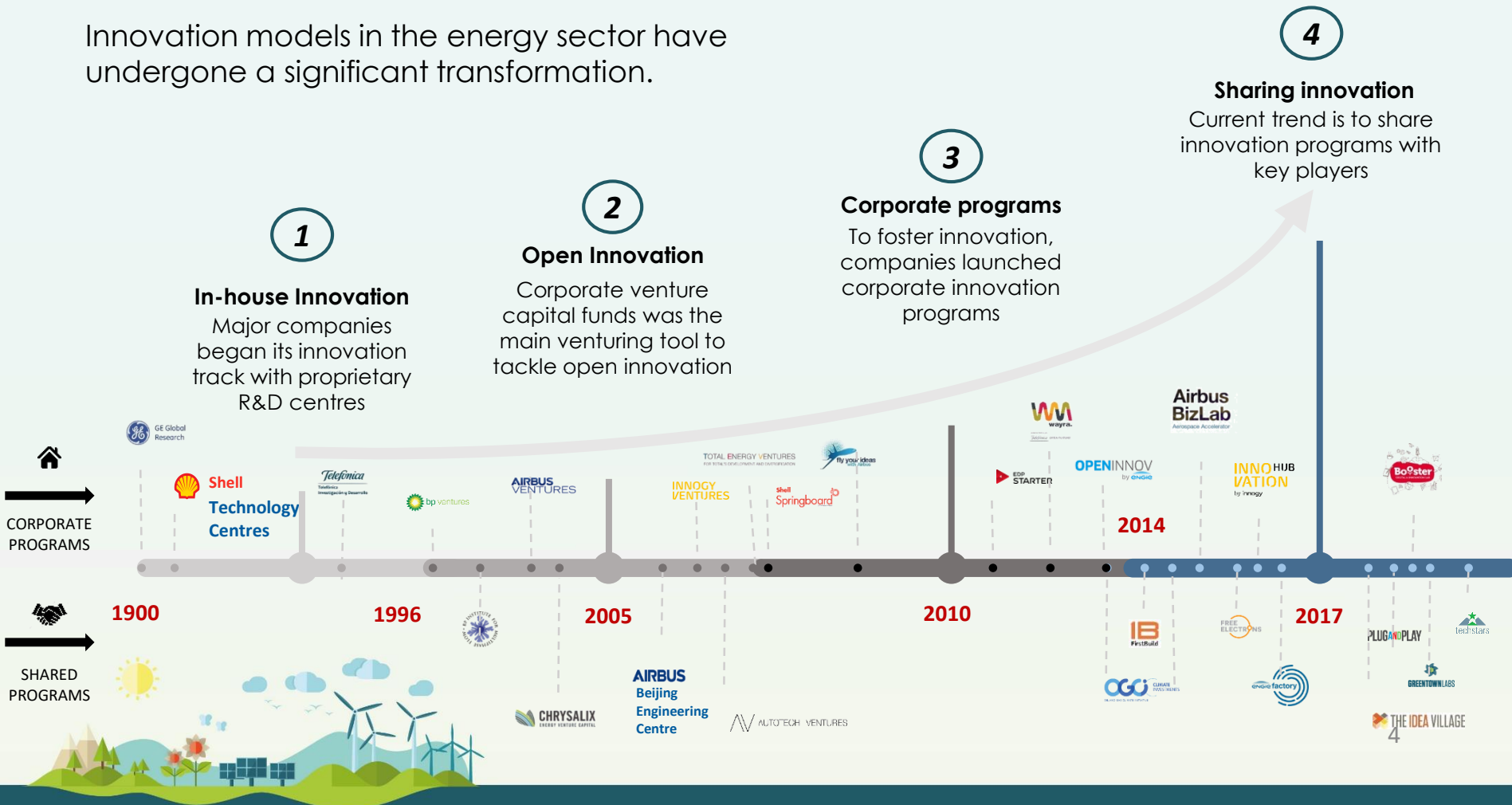
These models impact positively by shortening development and commercialization times, while at the same time allowing a real perception of technological trends and the market's needs.

In this context, **startups emerge as a vehicle for innovation**, being a transfer instrument that allows collaboration between different agents.



2. The evolution of open innovation: the case of the energy sector

Innovation models in the energy sector have undergone a significant transformation.



3. Innovation Ecosystems

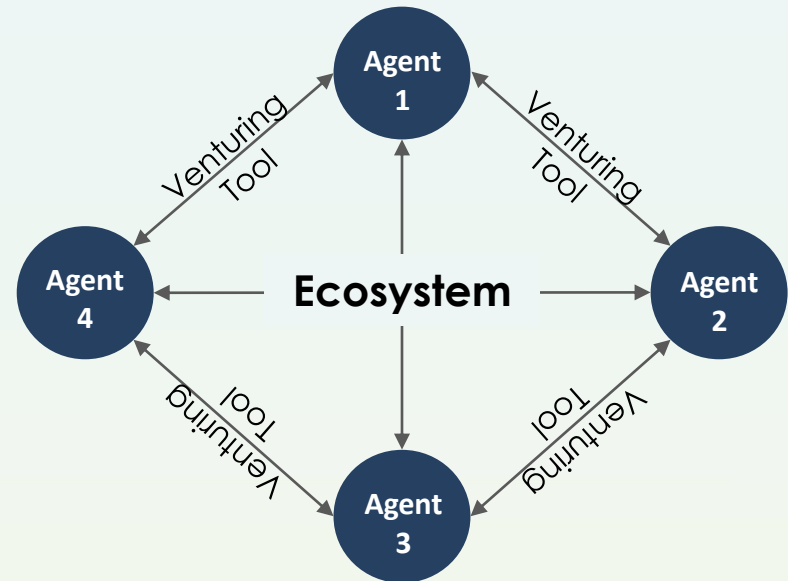
We will define **innovation ecosystem** as a community of independent agents that **interact with each other through the use of venturing tools** to stimulate the development of technological solutions in a specific field or industry, being all the startups involved the transfer vehicle.



Open Innovation covers **collaboration schemes** among a single agent and one or several startups.



Innovation ecosystems **provide a series of benefits**, both at a regional level and at a sectorial level.



3.1 Agents of the Ecosystem

Innovation ecosystems are characterized by **relating different agents** with a common objective; booster and develop innovative solutions.



Corporate Agents

Set of corporations with open innovation initiatives and presence in the ecosystem.



Innovation Providers

Set of private and independent agents, whose ultimate goal is the promotion and development of innovation.



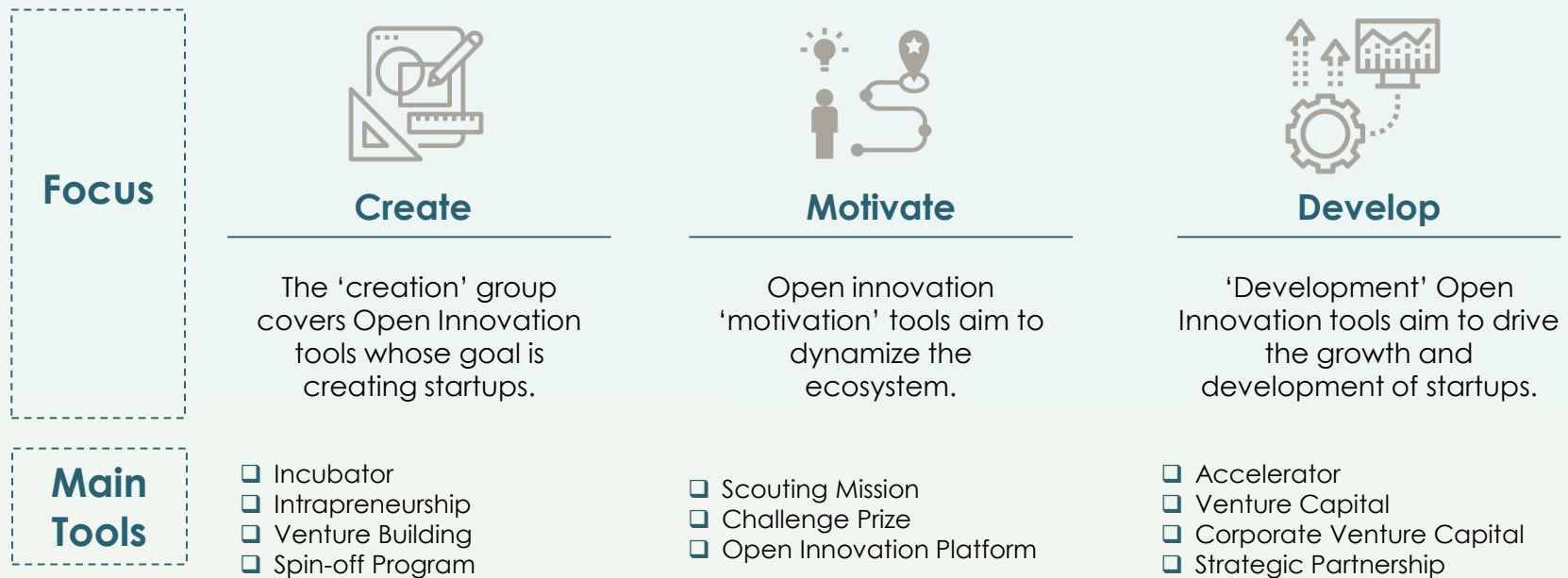
Public Agents

Set of agents and organizations supported or financed directly by public entities.



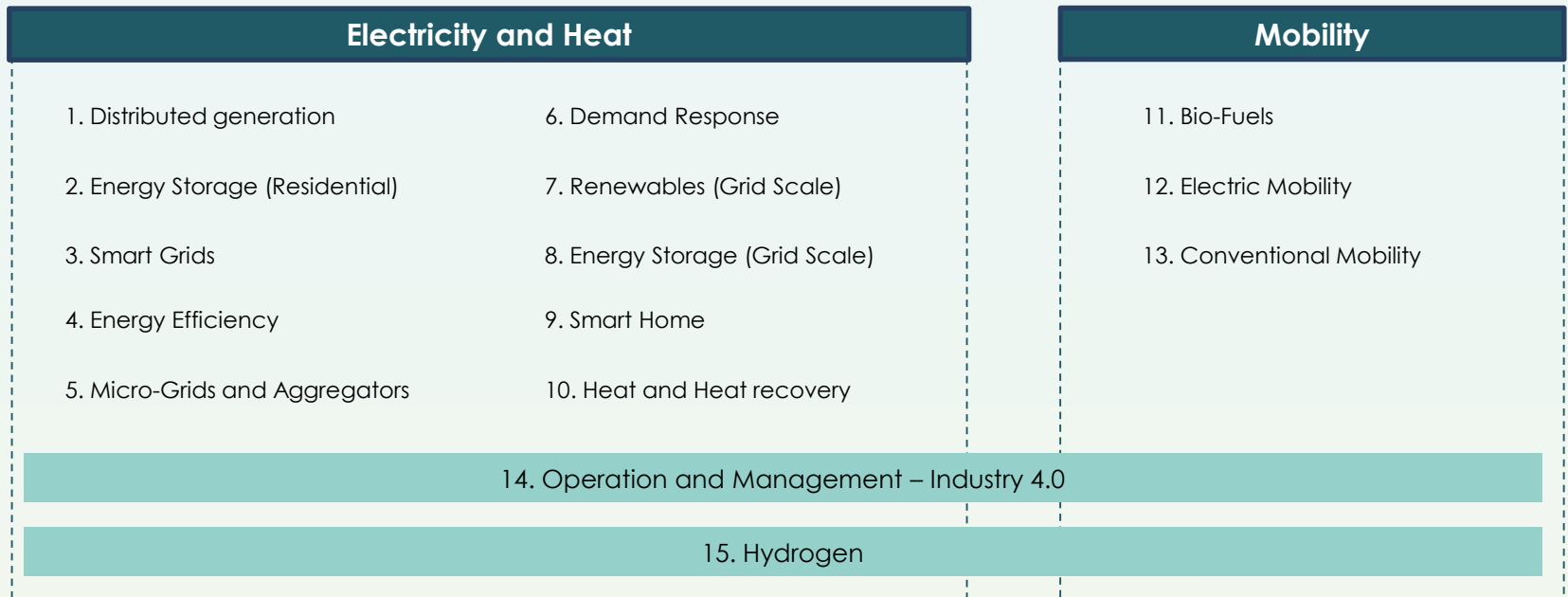
3.2 Venturing Tools

Open innovation uses different **venturing tools that allow the collaboration of agents** present in the ecosystem with startups as a vehicle for innovation.



4. Technological Innovation Fields

Open innovation initiatives seek for collaboration between agents for the development of **different technologies**, which will be further classified in **certain technology fields**.



5. Open innovation ecosystem in the SUDOE area

In order to analyze the existing models of open innovation in the SUDOE area, a search for exhaustive information has been carried out with the aim of cataloguing and characterizing the agents present in the innovation ecosystem who present open innovation initiatives in the field of energy.

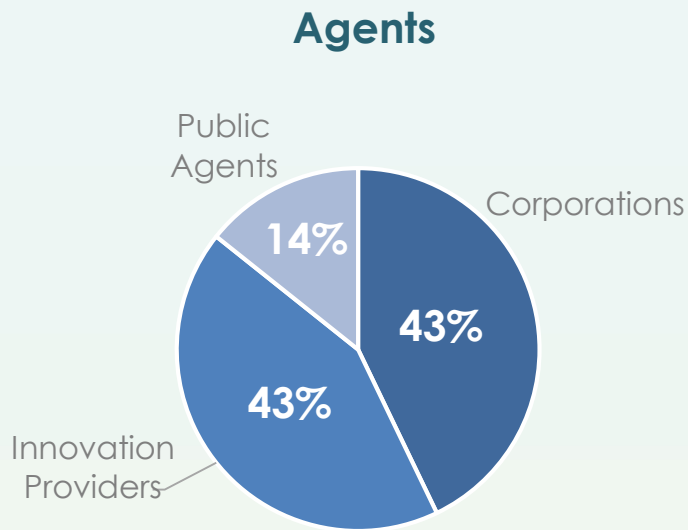
Main insights

- France is the region with the largest number of agents and initiatives.
- The Spanish open innovation ecosystem is led by corporations.
- The representation of public agents is less significant in the Iberia area



State of the Art			
Regions	Portugal	Spain	France
Agents (Initiatives)	21 (21)	49 (50)	62 (63)
Agent Type			
Corporations	9	23	15
Innovation Providers	9	15	28
Public Agents	3	12	19

5.1 Portugal (I/III)



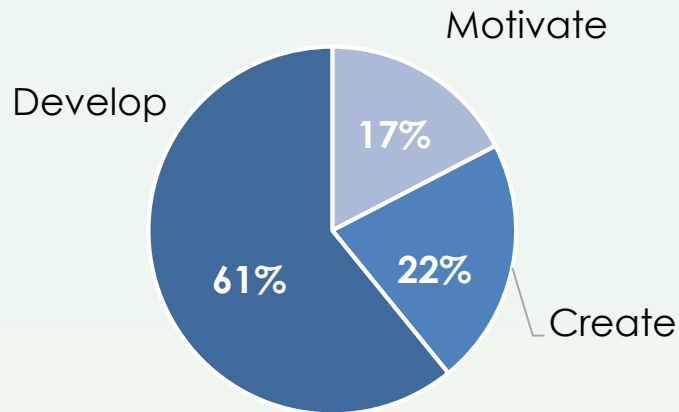
- **Corporations**, together with innovation providers, are the **type of agent with the greatest presence** in the Portuguese ecosystem.
- Relevant presence in the Portuguese region of **foreign groups** belonging to the **transport and automotive sectors**.
- The main activity sectors from which the agents present in the Portuguese ecosystem come from are the **energy sector** and the **transport sector**



5.1 Portugal (II/III)



Initiatives



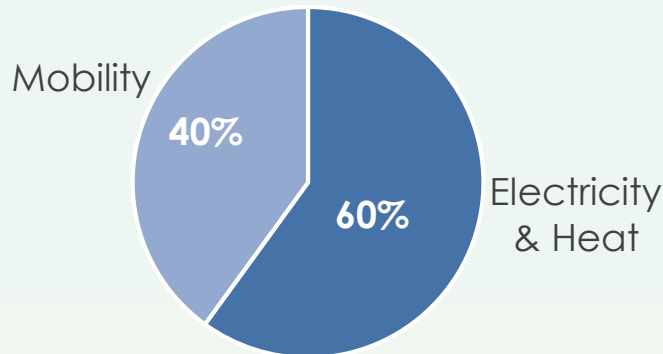
- Out of the 21 open innovation initiatives identified in Portugal, the **'development'** initiatives on Open innovation **comprises the largest share**.
- From the total amount of startup **'development'** initiatives, **70% respond to multi-corporate programs**.
- Startup **'creation'** initiatives account for the second most represented type in the Portuguese region. These initiatives are **mainly shared programs for incubation purposes**, led by corporations.



5.1 Portugal (III/III)



Technology Fields



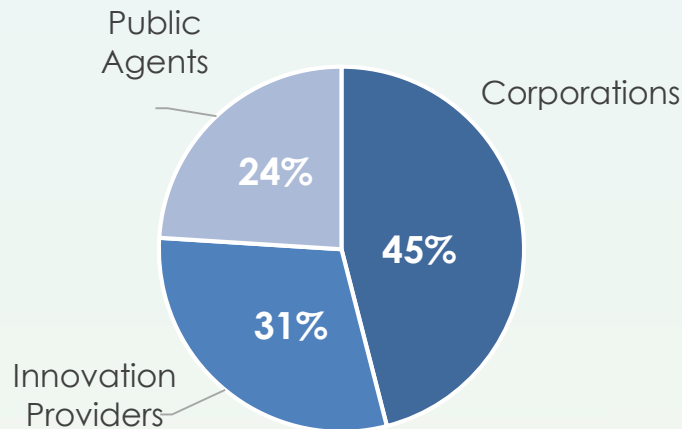
- The **main field of technological innovation** of the open innovation programs in the region of Portugal is **electricity and heat**.
- **Mobility** is a technological field of great relevance in the Portuguese innovation landscape.
- Within the electricity and heat, **energy efficiency** can be found as the greatest line of innovation.
- In the field of Mobility, **electric mobility** is the technological line of greatest interest.



5.2 Spain (I/III)



Agents



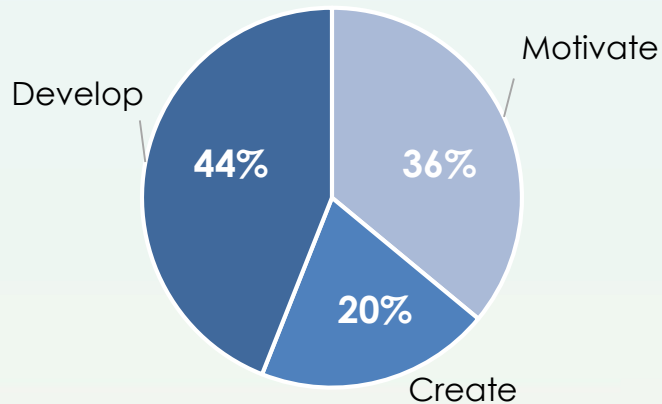
- The open innovation ecosystem is **led by corporations**. Four of the leading energy companies participate in more than 68% of the open innovation initiatives in the region.
- **Innovation providers** are the second agent in terms of number of initiatives in the Spanish ecosystem. **60% of innovation providers** in Spain are **technology centres**.
- Regarding to the activity sectors of the Spanish agents, there is a **significant segmentation**.



5.2 Spain (II/III)



Initiatives



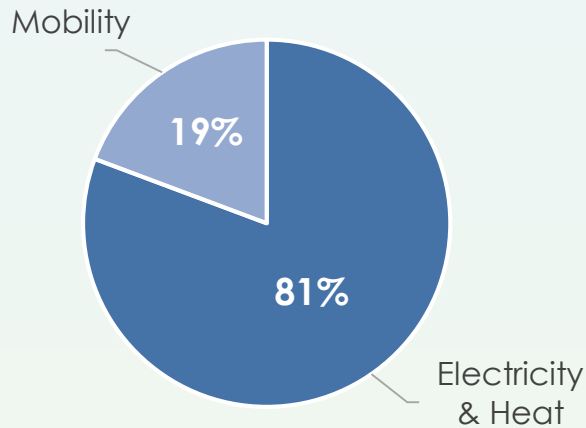
- The initiatives for the **development of startups** are the most implemented tools in Spain. Among these, **acceleration programs** are the most frequent initiative
- Programs to **motivate innovation** are, also, mostly **led by corporations**. However, there are some initiatives promoted by **universities**.
- The tools for the **creation of startups** are the least implemented in the Spanish ecosystem. These initiatives are **mainly led by corporations through incubation programmes**



5.2 Spain (III/III)



Technology Fields



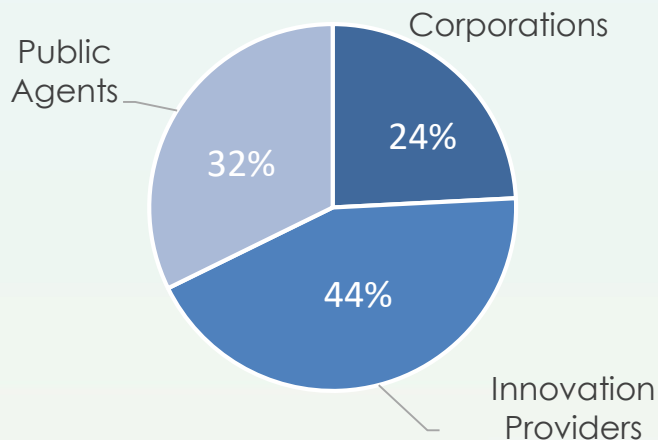
- **Electricity and heat** is the main field of technological innovation in open innovation programs in Spain.
- The low number of corporations from the transport sector participating in energy initiatives reflects in the **limited number of initiatives related to mobility**.
- Within the field of electrification, the most relevant technological lines are **Renewable Energies, Energy Efficiency and Energy Storage**.
- **Electric mobility** is the most relevant technological line within the field of mobility, driven mainly by the participation of electricity companies



5.3 France (I/III)



Agents



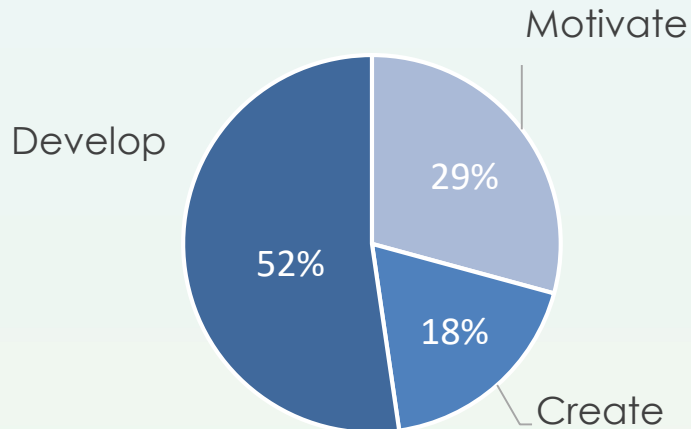
- **Innovation providers lead the open innovation ecosystem.** Private venture capital investment funds are the largest group, accounting for 30% of the players with presence in the ecosystem.
- **Public agents are the second largest players** with representation in the French ecosystem. **Public universities** are the most relevant within this category, representing **42% of this agents group**.
- **Corporations** only represent 24% of the agents in the ecosystem. Despite the low number of agents, these are large corporations with an **active participation in the ecosystem**.



5.3 France (II/III)



Initiatives



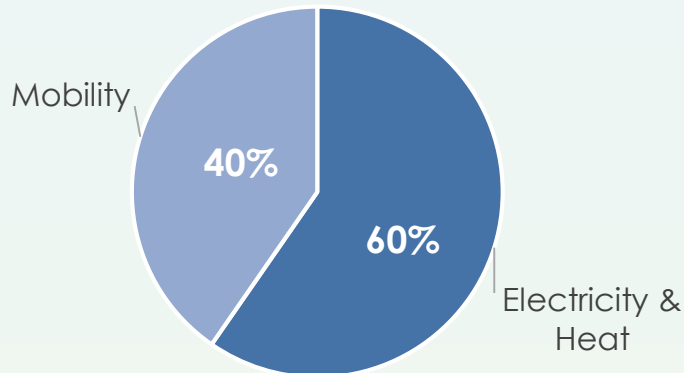
- The most deployed tools in the French ecosystem are those for the **development of startups**, where, **Acceleration programs** are the most implemented initiative
- The initiatives to **motivate innovation**, the second most relevant type, are characterized by the **collaboration** of the three players of the ecosystem
- The initiatives to **create startups** only represent 18% of the share. Most of them are **led by public bodies**, mainly universities and public incubators, through the use of incubation programs.



5.3 France (III/III)



Technology Fields



- In the field of energy, **electrification is the most important field** of technological innovation in the French region.
- There is also a significant presence of initiatives on the field of **mobility**.
- In the field of mobility, corporations lead innovation, promoting the development of **electric mobility** solutions through corporate investment.
- The influence of the large electricity corporations promote the implementation of technological lines aligned with their activities such as **Energy Efficiency**.

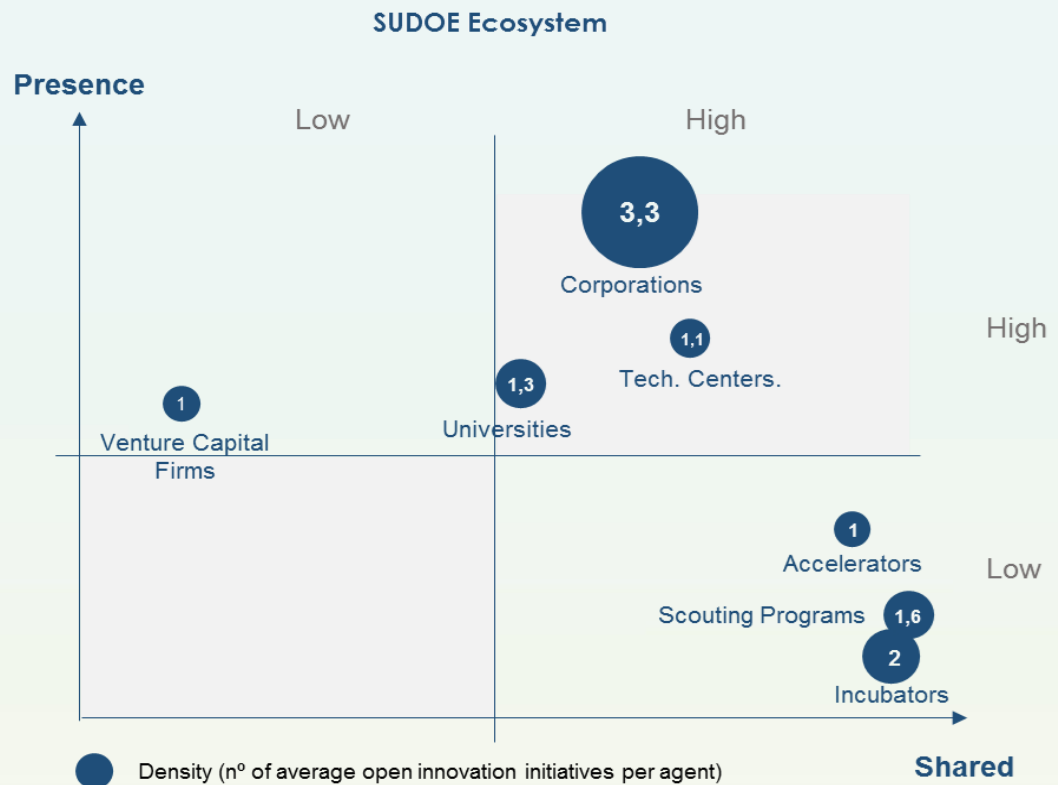


6. Open innovation models in the SUDOE area

With the objective of categorizing the different players in the open innovation ecosystem inside the SUDOE area, an analysis of the seven players with the greatest presence have been carried out.

Main insights

- **Corporations, universities, and technology centres** sustain the highest score based on the established criteria



6.1 Open innovation model of corporations

The open innovation ecosystem in the field of energy is characterized by the **strong presence of corporations**. These represent 35% of the different players present in the regions analyzed, and are involved not only in the energy sector, but also in the transport and industry sectors.

Main Open Innovation Models



Co-investment models

The traditional “private” investment model has evolved towards a co-investment model, where corporations invest through a multi-corporate fund, or participate in third-party investment initiatives.



Acceleration and incubation models

In this type of initiatives, the multidisciplinary nature of the startups has derived in the involvement of different innovation providers in the management of these initiatives.



Scouting and challenge prizes models

The main goal of the scouting initiatives is to identify those startups and technological solutions able to meet the needs inherent to the challenges previously defined by the corporation.



6.2 Open innovation model of universities

Universities are one of the **most relevant players in the ecosystem** of open innovation, especially in the field of energy. Universities are considered as the main **source of knowledge and intellectual property** with the high potential to be transformed into technological startups. Universities represent **14% of the players** that are involved in the set of regions in the analyzed ecosystem.

Main Open Innovation Models



Spin-off model

The technological spin-off models are models led by universities, which aim to create technological startups from technological assets or intellectual property developed within the university.



Scouting model

Universities actively participate in Scouting initiatives aiming to foster innovative projects born in the university and to connect the startups that may derived from these innovative projects with corporations.



Challenge Prizes model

Universities' Challenge Prizes models are generally shared models that respond to challenges proposed by third parties such as corporations.



Incubation and investment model

Incubation and investment models in universities are an increasingly popular trend. These models aims to create new startups though incubators or public-funded scientific centers, responding to internal structures.



6.3 Open innovation model of technology centers

Technology Centers are the **third most relevant players within the innovation ecosystem**. They have the capability to participate both as technological development sources and intellectual property and knowledge pools. Technology Centers account for **13% of the agents** with presence in the ecosystems.

With regards to open innovation models, the research and development model (R&D Model), where different agents participate (corporations, public funds, universities, etc.), represents the most common model used by Technology Centers, in projects such as the H2020 consortium projects. However, these **R&D innovation models, have not been included in the scope of this report**.

Main Open Innovation Models



Spin-off model

The development of technological spin-offs, is generally the most common open innovation model used by Technology Centers. This Spin-off creation model aims to create technology-based startups. These startups surged from technological assets or intellectual property developed as a result of the R&D projects performed by these centers.



7. Conclusions

As a result of the analysis carried out the following conclusions are stated below:

1.

The adoption and use of open innovation in the SUDOE area is a reality

2.

The Iberian region accounts for the largest number of players and open innovation initiatives of players and initiatives

3.

Public agents should get more involved within the open innovation ecosystems

4.

The major part of the open innovation initiatives present a lack of specialisation in terms of technology focus



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