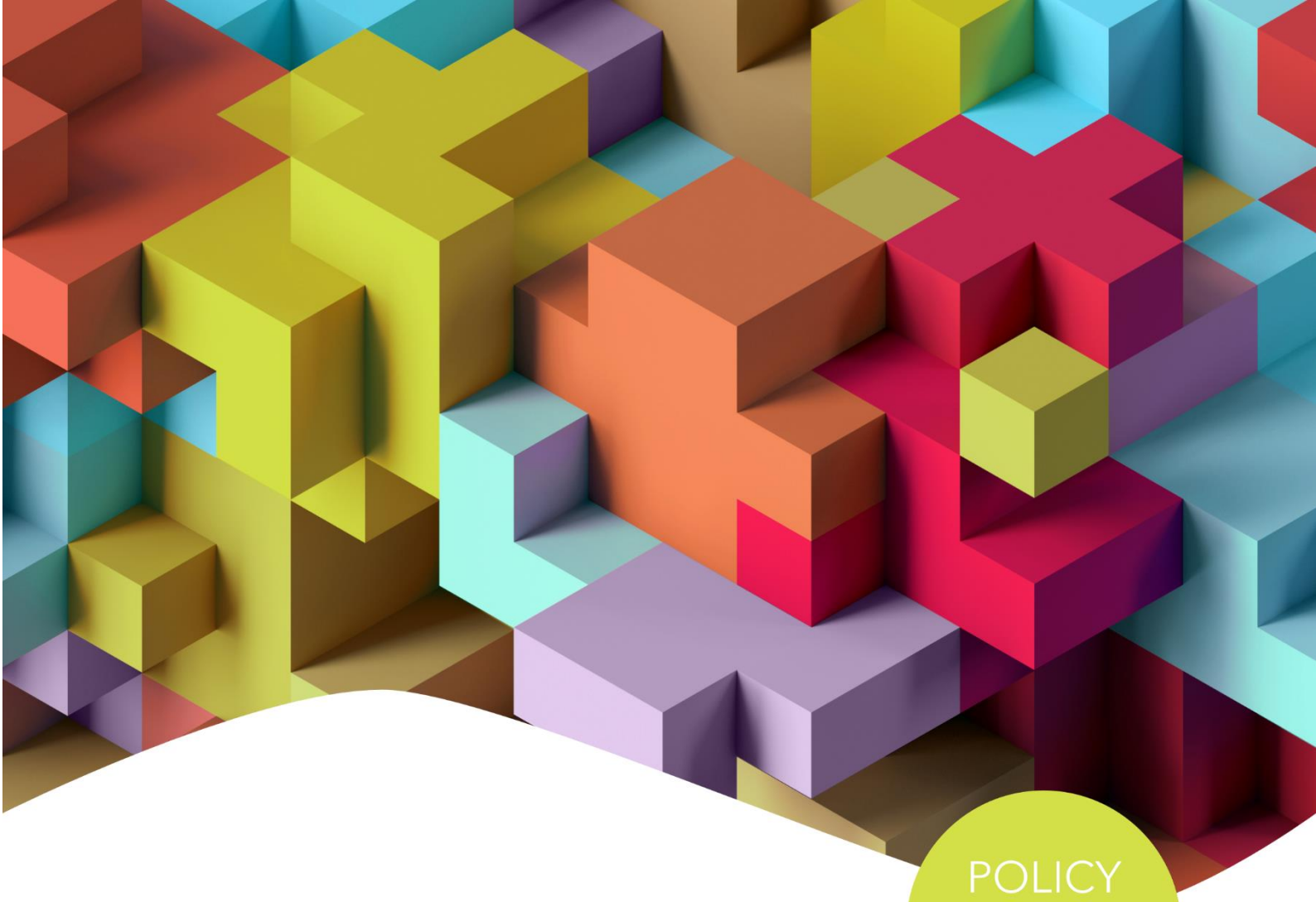

POLICY CASE STUDY

Spin-offs support at Tecnalia, Spain – Transforming technology into GDP

Case study contribution to the OECD TIP Knowledge Transfer and Policies project

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Spin-offs support at Tecnalia, Spain - Transforming technology into GDP: Case study contribution to the OECD TIP Knowledge Transfer and Policies project

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Executive Summary

We believe that the term “technology transfer” is increasingly evolving into “venture building of technology-based business opportunities”, where the focus is set on combining different type of people profiles / skills towards proving how technology can resolve in a differential way P&L problems to end users / companies.

All relevant innovation ecosystems in the World share the common feature of having Minds (scientific capabilities) interacting with Management (entrepreneurial profiles) and providing as a result a critical mass of deal-flow that attracts the attention of Money (smart capital). The role of Tech Transfer Offices (TTOs) will increasingly evolve into being catalysers of this process.

Introduction

Tecnalia Research & Innovation was set up in 2011 through the merger of the eight pre-existing RTOs in the Basque Country, the oldest dating back to the 1950s.

Tecnalia is the benchmark market oriented research and technological development center in Spain and one of the reference centers in Europe, with 1,400 experts of 30 different nationalities, focusing on transforming technology into GDP by creating business opportunities for companies and improving people's quality of life.

With over 100MM EUR in revenue and links with 4000 companies ranging from SMEs to blue-chip organizations, Tecnalia is a private foundation with a board of trustees mostly represented by companies that are clients of the organization.

Tecnalia´s headquarters are based in Basque Country with offices in Madrid; Colombia; Ecuador; Mexico; France; Italy; Germany and Serbia.

Tecnalia is structured around 6 business divisions: Energy and Environment; ICT; Industry and Transport; Lab Services; Health and Building Technologies.

TECNALIA Ventures is a subsidiary of TECNALIA that was set up in 2013 and provides acceleration incubation and venture building services to TECNALIA's most promising technologies - thus transforming these technologies into technology-based business opportunities that are commercialized either via new licenses or via spin-offs. Tecnalia Ventures plays a critical role in fulfilling Tecnalia´s mission of transforming technology into GDP.

With more than 20 employees, TECNALIA Ventures has also developed a consulting arm that provides R&D valorization services to a wide array of organizations ranging from governments to universities, RTOs (Research and Technology Organisations), companies and to investors in Europe; Latin America and Asia.

Tecnalia Ventures' way involves identifying technologically disruptive solutions to profit and loss (P&L) problems that matter to companies and exposing these solutions since the early stages of development to "what investors want" type of investment criteria, focusing the efforts on the business opportunities with highest commercialization potential.

Some of the key items used as investment criteria are the following:

- Resolution of a relevant P&L problem by the means of a differential technological value proposition.
- Competitive advantage based, among others, on industrial/intellectual property.
- Well-rounded team with skin in the game combining both technological and mainly commercial / selling (to clients; to workers; to investors; to partners) skills.
- Potential impact in terms of creating a new market (v.g. moving from zero to one in Peter Thiel´s terms), thus transforming a spin-off into a growing SME and as a result generating quality jobs and GDP.

1. Strategy to support spin-offs

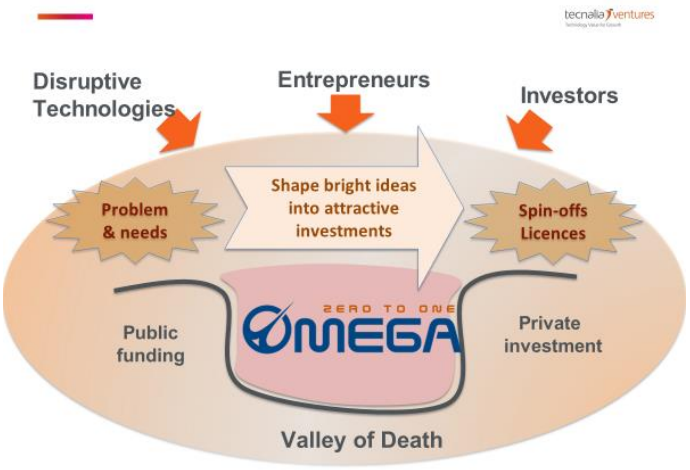
Spin-offs are a key method for transferring technology to the market at Tecnalia and as a result Tecnalia Ventures was created to manage this process inspired by Israeli tech transfer models.

We believe that the technology transfer model based, mainly, on the licensing of industrial property has less and less travel. Companies´ mantra is growth / obtaining new revenue streams and are not interested in technology itself but rather on technology based business opportunities that can generate future income. This requires the development of "skin in the game" venture building schemes.

The first strategic cornerstone was to move from the usual “technology push” driven new technologies development process associated with RTOs to a “market pull” inspired one. Meaning to put technological capabilities at the service of business opportunities or focusing the technological capabilities of the RTO in solving Profit and Loss (P&L) problems of the industry.

We achieved this “market pull” technology development focus by bringing early in the process the view of “what investors want”. Investors, meaning: corporate venturing; family offices; business angels; companies; VCs, are in fact the ultimate “client” of the technology based business opportunities that we develop.

Figure 1. Omega program



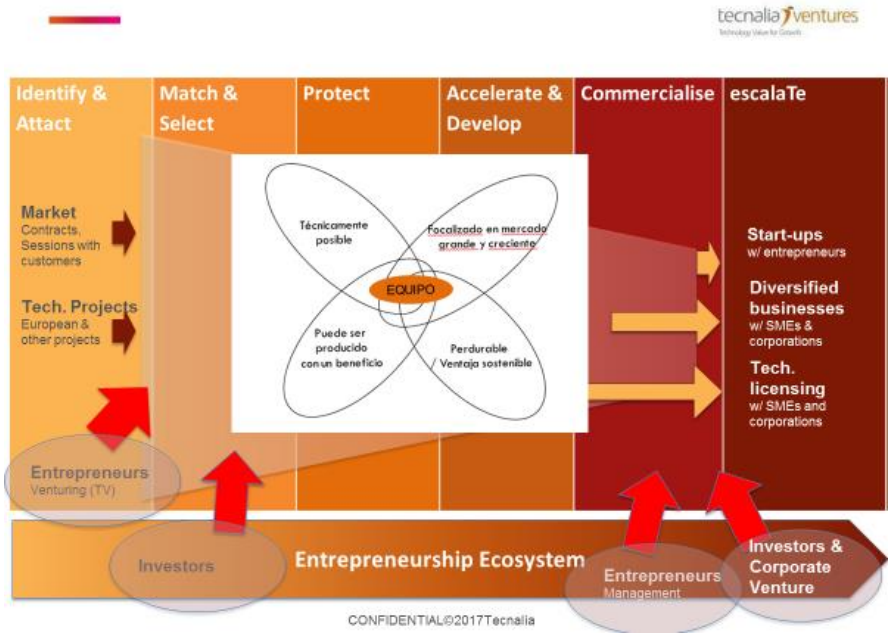
This whole process of focusing technological capabilities to addressing large P&L problems emanating from the industry is articulated around an innovative accelerator incubator program called Omega.

Any new technological development in Tecnalia requires first to be pitched, in the context of pitching sessions that occur 4 times a year, to an investment committee made out of both real investors and people from different divisions of Tecnalia (hence, fostering transversal cooperation).

For the business opportunities that are selected to integrate the Omega program, a budget is unlocked towards the achievement of clear milestones both technological and business based. If these milestones are met new milestones will be set out until we obtain the

minimum viable prototype / product that could trigger private smart capital investment. All this process is articulated around the IMPACT ® methodology.

Figure 2. Tecnalia Ventures process

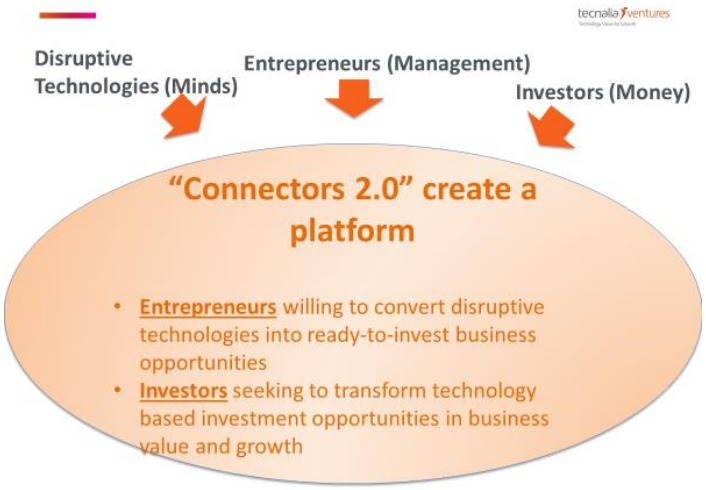


In addition to the methodology itself, internal incentives play a paramount role for business divisions to deploy their best research resources.

The second strategic dimension behind the innovative spin-off creation process is the development of an innovation ecosystem in the region. This venture building ecosystem helps TECNALIA transfer its technology to the market. It connects the three fundamental pillars of any innovation ecosystem: minds, management and money.

- MINDS: people / organizations focused on the generation of technology-based business opportunities that solve P&L problems to the industry.
- MANAGEMENT: people with an entrepreneurial profile / business vision capable of transferring the technology developed by the minds to the market, thus developing the business opportunities to their full potential. These are profiles to which the value proposition of transforming a technological spin-off into a fast-growing SME will be enticing to them.
- MONEY: smart investors that not only provide the necessary financial muscle to transforming technologies into revenues but also are committed to supporting the development of the company.

Figure 3. Elements of the innovation ecosystem



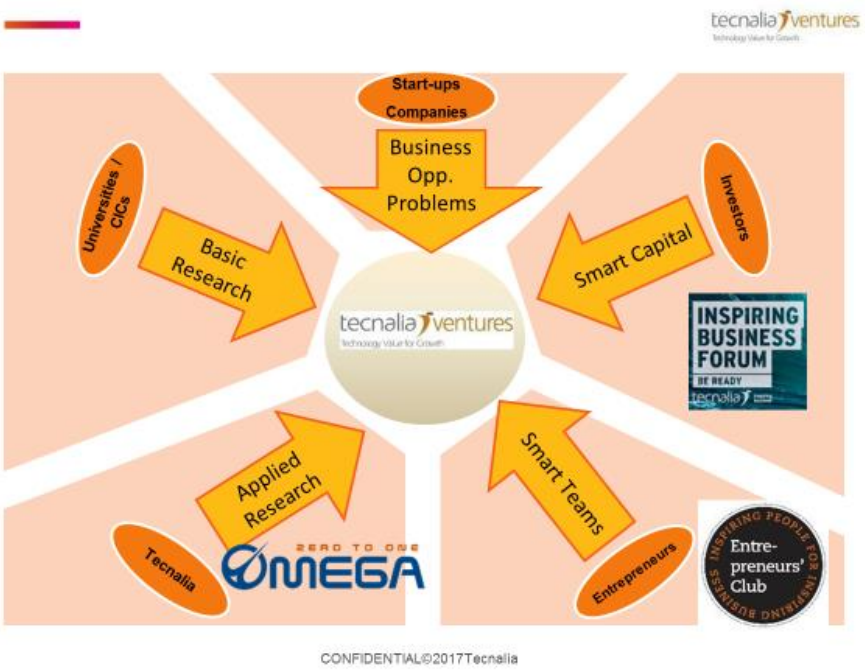
In relation to investors, TECNALIA Ventures maintains a close relationship with a network of about 25 investors to which it offers a portfolio of technological business opportunities in different phases of development. Such investors include a variety of entities such as business angels, family offices, venture capital funds, corporate venturing and companies, not only from the Basque Country or the rest of Spain, but occasionally from other countries as well.

TECNALIA Ventures helps investors to assess the technological aspects of a business opportunity as a prior validation of an investment. For this, it contrasts all aspects related to the technology, including valuation, protection, standards, integration, etc. and as a result, they obtain a report with the conclusions and risks identified.

TECNALIA Ventures manages the Inspiring Business Forum (IBF), a corporate investment forum consisting of leading companies with the ability to innovate, seeking technology-based opportunities with a high potential for investment, diversification and expansion of their businesses. The IBF is the channel through which TECNALIA systematically offers its members business opportunities derived from its R&D&I activities and those of its ecosystem. The forum is a place where members can not only find business opportunities that have been carefully selected and prepared by TECNALIA, but also express their needs with regards to investment and diversification, identifying unique ventures that can be channeled into new technological developments and partnership strategies.

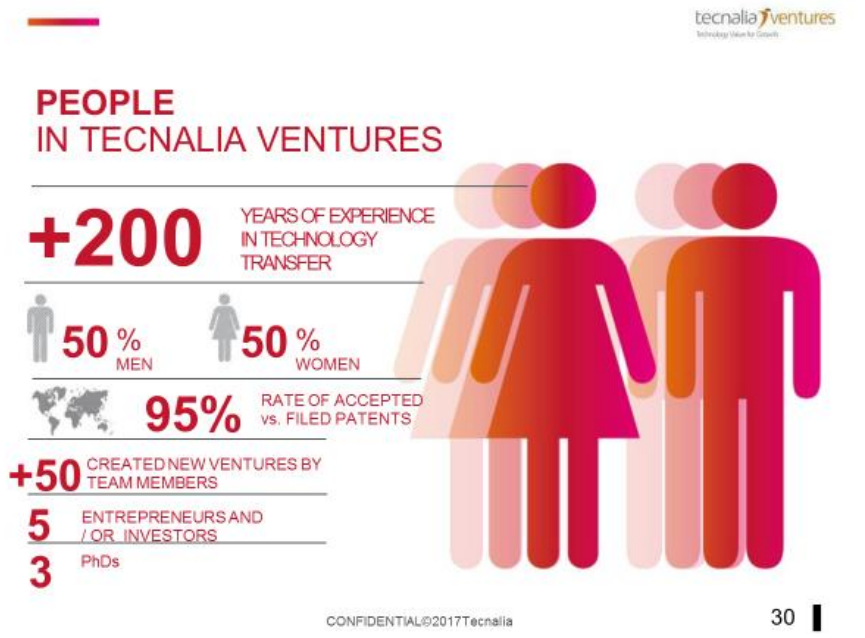
In relation to "Management" (entrepreneurs), Tecnalia Ventures launched the Tecnalia´s Entrepreneur Club with the motto of "Inspiring People for Inspiring Business". A wide array of specific events are articulated such as: inspiring talks; coaching sessions; human capital investment forums where CEOs are sought after or former Tecnalia spin-off cases are portrayed. The Entrepreneurs' Club is basically a way for TECNALIA Ventures to develop entrepreneurial culture and connect with entrepreneurs in the region.

Figure 4. Tecnalia ventures partners



The third critical element in the strategy are people. Most specifically the blend of profiles within Tecnalia Ventures that facilitate the interaction with Minds – Management – Money.

Figure 5. Facts and figures about Tecnalia Ventures



2. Results achieved so far

Currently, there are 14 spin-off companies in the portfolio of Tecnalia Ventures. In 2018 two new spin-offs were created, and one in 2017.

Figure 6. Results

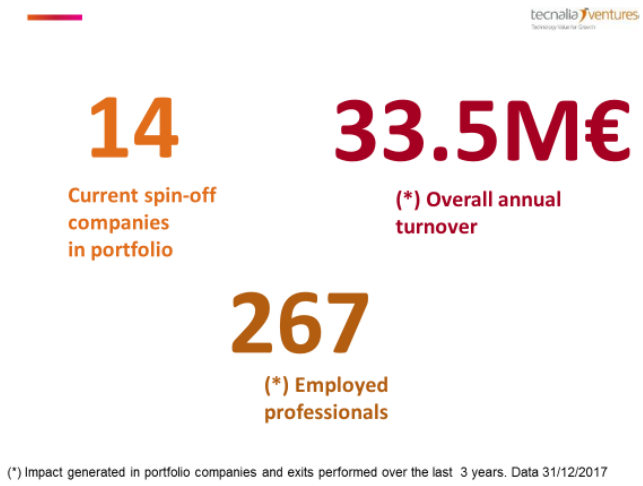
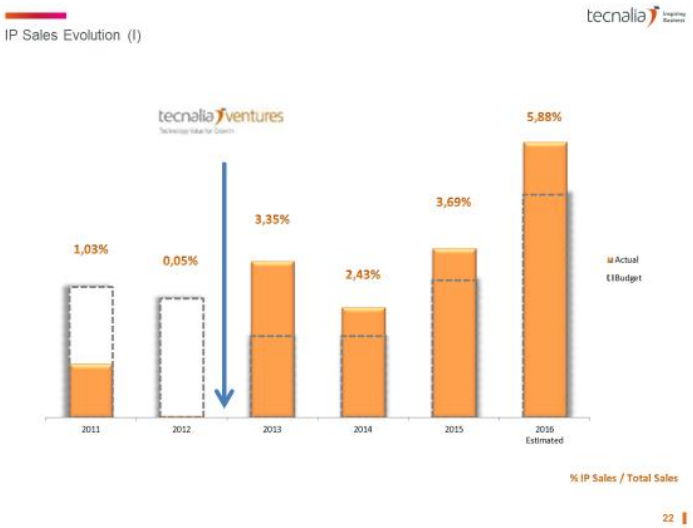


Figure 7. IP sales evolution



Key figures related to Tecnalia's patenting activity:

- 167 patent families in portfolio
- 555 patents in portfolio
- 81 EPO/PCT patent applications from 2014 to 2017

- 95% of success rate in patent concessions
- 2nd Spanish company in EPO/PCT applications in 2017 with 27

Key figures on OMEGA Incubation Acceleration Program (2013 – 2017):

- >350 business opportunities presented
- On average at any time circa 40 business opportunities are in the accelerator

Success story:

In 2015, TECNALIA sold to GAMESA its participation in the shareholding of NEM Solutions company which has a turnover of 4.2M € and employs 41 people. In this way, TECNALIA Ventures has managed successfully the entire lifecycle of the technological asset on which NEM Solutions was based, obtaining the highest return on the investment in R&D performed by TECNALIA in it.

Nuevas Estrategias de Mantenimiento S.L., which operates under the trademark NEM Solutions, is a technology-based company focusing on the intelligent maintenance of complex systems. It provides innovation, creativity and efficiency to the field of maintenance, resulting in a competitive product that provides companies a bridge between their daily work and technology and research. In this Way, it allows an interaction full of information and knowledge between the maintainer and the machine, thanks to thanks to the incorporation of state-of-the-art engineering technology maintenance, with the aim of facilitating and optimizing the activity and profitability.

The European Innovation Award was jointly granted to TECNALIA and NEM Solutions by EARTO for the "Impact Delivered" category, which rewards the best technology transfer practice.

3. Lessons learnt

RTOs focused on developing and transferring technology to resolve Profit and Loss (P&L) industry problems are a powerful tool for European companies' competitiveness. There are parts of the developed world where applied research organisations don't have the presence they do in Europe and this usually results in a smaller representation of industrial GDP out of overall GDP in these regions or countries.

Innovation is a very hands-on exercise that ultimately aims at getting the "cash register ringing". For the cash register to ring out of a research project, you need several pieces to come into play. First, you have to make sure that you transform the research project into a technological product that resolves a problem that has a positive P&L impact on the end user companies (most of the research we do is targeted to B2B/B2G business models and in this setting, it is almost axiomatic that you have to focus on resolving P&L problems). Second, you need to protect this technology in a way that will maximise its future economic value. Third, you need a well-rounded team made up of both technological profiles and also, critically, business/marketing/sales profiles that will bring the innovative products to the market.

Last but not least, you need money (smart investors) brought by corporates, venture companies (VCs), family offices, etc. that will provide the "fuel" for the teams to have the

time to sell the innovative products in the market and hence finally get the cash register ringing. Therefore, in strong innovation ecosystems around the world you always find Minds – Management – Money type of stakeholders with critical mass, interacting to transform research into innovation.

Developing best practices for deep-tech spin-off creation involves working in parallel, but in a coordinated way, at three levels:

- People level (researchers, tech transfer teams, DG, overall Organization) by providing: training / sensitization; clear strategy and incentives. In the case of people involved in tech transfer, special training will be required to be able to develop fruitful relationships with the "3 Ms": Minds (researchers); Management (entrepreneurs) and Money (investors).
- Organizational level: it is important where the tech transfer unit sits in the Organization; what are the incentives that the R&D units have; how we arbitrate the short-term P&L focus vs. long term breakthrough innovation internal projects that may not have specific external funding, etc.
- Ecosystem level. An RTO is a source of Minds but in order to foster spin-offs we need to combine these profiles with entrepreneurial / CEO type of profiles and look for smart capital to fund these opportunities. This requires a regional ecosystem development endeavor.

4. Interactions with broader national context

There is a focus in the Basque Country region to develop strong business opportunities around RIS3 regional sector priorities: Advanced manufacturing (mostly Industry 4.0); Energy and Medical Devices. Spin-offs in these domains are a regional priority.

We get funding from Basque Government based on impact outcomes on a wide array of indicators, spin-offs are one of them. In this context, we don´t get any money just for the sheer fact of creating a spin-off but rather for the amount of revenues generated by the spin-offs that we have created over the last 5 years. This results on a strong focus on high impact spin-offs.

In the kind of deep-tech spin-offs we get involved in the problems beyond crossing valley of death / funding schemes are related to:

- Difficulty in getting the first client and hence public purchasing schemes should be further developed.
- Difficulty in selling to large organizations / public ones as often times small / recent companies are penalized in public procurement / RFP contexts
- Complexity to find suitable schemes to integrate CEOs to our companies.
- Positive taxation towards early stage investment and R&D
- Developing a public fund to acquire stakes from the RTOs in the context of spin-offs that are already selling / consolidated and where forcing liquidity events for shareholders could cause trouble in the spin-off otherwise.

When addressing these challenges, policy makers should realize that there are no shortcuts (e.g "we copy the Israeli; MIT; Stanford; Oxford methodology") in developing the type of regional innovation ecosystems that will foster deep-tech spin-off creation. Every region has its own specificities (RIS 3, the regional specialization platform takes this into account), but all the regions that spring to mind as reference innovator regions share a common thread: they have managed to trigger a virtuous circle of Minds (scientific capabilities) interacting with Management (entrepreneurial profiles) in order to provide ongoing differential dealflow to smart capital that eventually locates in the region.