

## Chapter 8

# Social Aspects of H<sub>2</sub> Supply Chains: Hydrogen Technologies Genesis and Development: The Case of Myrte Platform

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### 8.1 INTRODUCTION

The transition toward a sustainable energy system is situated at the intersection of technical innovations, the evolution of consumption, new economic models, and new forms of governance. Smart grids that aim to integrate all users' behaviors and actions in order to allow a direct management of offer and demand, the injection of renewable electricity into the network, and the increase of effectiveness of the whole system, fully contribute to this issue. Along with energy storage, they are recognized as one of the most important factors in the current energy transitions (ETPS, 2006, 2007, 2010, 2012). If current technologies show some limits, interesting perspectives arise around hydrogen (Becherif et al., 2015) and experimental projects have been developed in several European countries, such as Belgium (Don Quixote Project), Germany (Enertag Hybrid station), and France (Grhyd a Dunkirk urban community). Nevertheless, it still does not appear as an obvious solution, at least in France, as the recent energy transition law project makes little mention of hydrogen.<sup>1</sup> In this context, initiatives come from territorial regions and various stakeholders, as in Corsica where the Myrte platform (Mission hydrogen renewable for the integration to the

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1. The first law project did not mention hydrogen. It was finally inserted thanks to amendments made during the votes of the Parliament at the end of 2014 (National Assembly) and at the beginning of 2015 (Senate) linked to renewable energy storage issues.

electrical network), which associates a solar central, an electrolyzer, and fuel cells, has been subjected to a complex arrangement between academics, politicians, and manufacturers. Moreover, this case refers to technical parameters as well as social processes.

Based on an ethnographic investigation carried out in 2015<sup>2</sup> on the development of this specific technological system, this paper aims to analyze the Corsican hydrogen storage emergence dynamics. Our investigation was based on seven semidirective interviews with various stakeholders of the platform (industrial companies, scientific research team), on the analysis of archives (reports of the Scientific Interest Group, activity reports), and on ethnographic observations of the site. More precisely, and thanks to the theoretical and methodological tools of the science studies, we would like to look into the socio-technical conditions according to which this kind of project can expand, as well as the series of trials and controversies through which it passes. As we pay attention to the action “in the making,” we make perceptible the states of doubt, oppositions of value, legitimizations, and the commitments that take part in the construction of the hydrogen economy, and its diffusion or its blockage. We will first clarify the particularities of the island context and their impact on the project. The second part will demonstrate how the shaping of the project depends on a treatment of the problem that closely links technical aspects to political obligations. We will next see that structural modifications are necessary to make the platform with the multiplication of stakeholders. Finally, we will question the stability of their relations to understand the mechanisms that determine the success and the failure of such an operation.

## 8.2 AN ISLAND CONTEXT PROMOTING INNOVATION

The European policy on energy has known different phases forming the pattern of a slow European energy system construction process (Cabaret and Picard, 2015). If energy was historically one of the first fields of expertise in the European communities, energy policy has only been part of the European treaties since the Treaty of Lisbon in 2007. The objectives retained in the field of electricity aim to develop a more distributed electricity network with ambitious goals in terms of the diffusion of renewable energy sources, especially through decentralized renewable energy production gathered around mini grids. On islands, energy issues are more important because there is no connection, or very few connections, with the continental network. Islanders then have to produce the energy they use and are more exposed to overconsumption risks and blackouts. In addition, this production is sometimes more expensive and eco-destructive. These territories then represent favorable places for experimentation, with identifiable market potential.

In addition to these specific characteristics in Corsica, the technical, economic, political, and social situation creates perfect conditions for innovation.

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2. The authors would like to thank all the people who agreed to answer their questions. This research project was supported by GDR SEEDS in 2014.

The winter of 2005 forced EDF (French power supplier) to organize selective power cuts to avoid blackouts between February the 28th and March the 11th. This highlighted the imperfections of the regional electricity network, and new requirements in terms of territorial energy policy emerged for Corsica.<sup>3</sup> It was decided to diversify production and supply to reduce disruptions. A connection with Sardinia, the development of renewable energy on the island, and efforts toward energy efficiency completed the role that was essentially held by thermal plants until then. At the same time, a regional delegation from the CapEnergies center of excellence was created to galvanize employment and research in the energy sector. It is in this context that the Université of Corsica began to forge links with the CEA (the French Alternative Energies and Atomic Energy Commission) and Helion, an Areva subsidiary specializing in hydrogen technologies.<sup>4</sup> Philippe Poggi, energy university lecturer and researcher at the University of Corsica and Pierre Serre-Combe, and the head of the CEA Hydrogen and Fuel Cells Program, saw an opportunity to present a large-scale experimental project that associates a photovoltaic plant to a hydrogen network.

Myrte is generally seen as a life-sized test, which aims to demonstrate the feasibility of a solar energy storage solution overcoming the intermittency of renewable energy production. More precisely, the electricity produced by the photovoltaic panels can be directly injected into the network or stored during a certain amount of time in tanks after its transformation into hydrogen thanks to an electrolyzer (Darras et al., 2012)<sup>5</sup> When the power produced by the photovoltaic panels is not sufficient compared to needs, fuel cells take over and transform once more the stored hydrogen into electricity (Fig. 8.1).

### 8.3 WHEN TECHNOLOGY ENTERS POLITICS AND POLITICS ENTER TECHNOLOGY

However, the task is quite difficult. Philippe Poggi and Pierre Serre-Combe needed to convince academics, manufacturers, and politicians of the legitimacy of their project. As Christian Morel (2002) shows in his analysis of the steps that led to the explosion of the Challenger space shuttle in 1986, a problem is perceived differently by social stakeholders according to their rationality, their cognitive characteristics, their jobs, and their respective hierarchical positions.<sup>6</sup> Likewise, Picard and Rey (2012) reveal the importance of the contradictory visions that stakeholders have of them and others in the orientation of scientific

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3. See: “Plan Énergétique de la Corse”, Délibération N 05-225 AC du 24 novembre 2005.

4. Helion was created in 2001 to bring Areva Technicatome’s military technologies and applications (fuel cells and electrolytes used in submarines) into civil society.

5. An electrolyzer aims to break down water (H<sub>2</sub>O) thanks to electric power to produce hydrogen (H<sub>2</sub>) and oxygen (O<sub>2</sub>).

6. With the analysis of the space shuttle explosion, the sociologist demonstrated that all individuals did not possess the same perception of risks: the seals distention problem was known. However, some engineers estimated the launch failure probability around 1%, whereas NASA managers evaluated it around 1 over 10,000 and even 1 over 100,000.

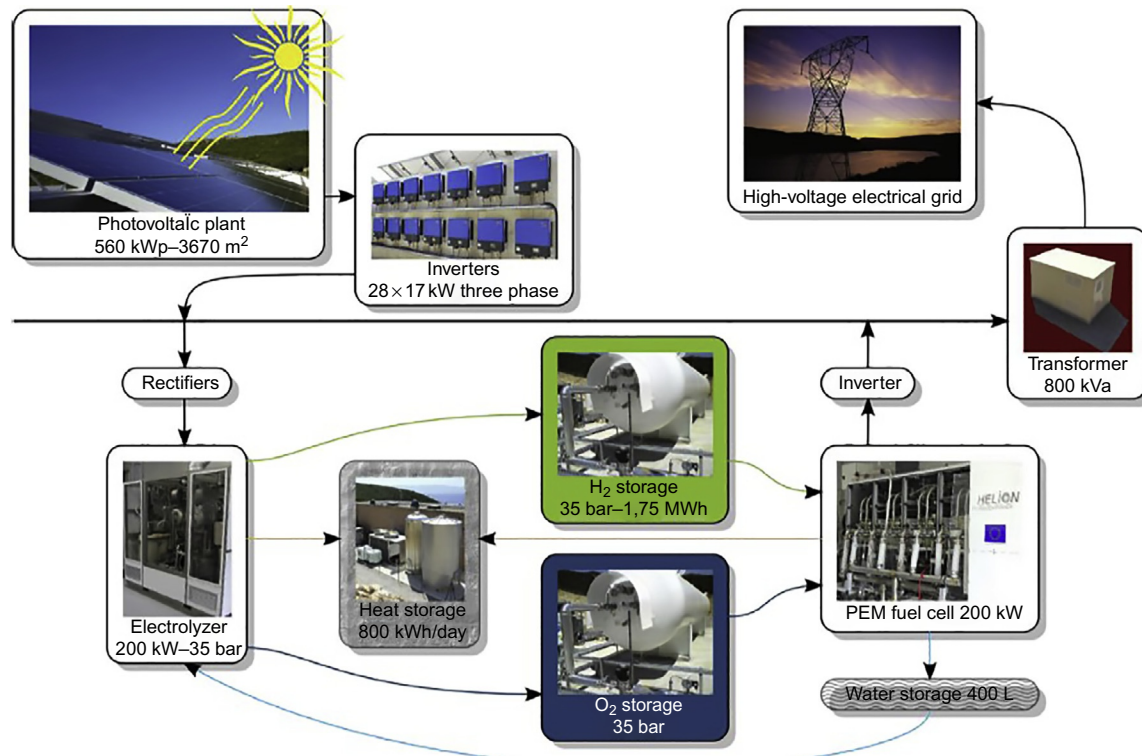


FIG. 8.1 Simplified illustration of the components and operations of the MYRTE platform (Darras et al., 2012).

research. How then to fill this gap between the logic of the researcher, the manufacturer, and the politician? How to gather varied representations and divergent interests around the same goal?

When they offered to develop this technology, Philippe Poggi and Pierre Serre-Combe did not only make a scientific hypothesis. To convince potential partners to join them, they formulated a real scenario for society; they put human desires into technology (Barthe, 2009), allocated skills to objects, territories and, institutions, and split the work among all the program stakeholders they designated. Thus, from the beginning, the Myrte project incorporated in its definition a new world in which it is believed to be built:

*“Corsica has to deal with important stakes in the fields of energy supply, economic development and environment quality control. In our island particular context, there is no doubt that the renewable energies large-scale development will be a solution and a top opportunity at the same time. This project aims to test and developing life-size practical technical solutions for the Corsican network’s electricity supply and to federate all different stakeholders from R&D to technology transfer, (initial, lifelong and professional) formation and the industrial economic world, the whole of them being a part of a strong territorial dynamics in terms of renewable energies, under the authority of the Corsican Economical Development Agency, the CapEnergies center of excellence’s regional organisation. [...] This reference project for Corsica also answer to the objectives defined in the energy plan adopted in November 2005 by the Corsican Territorial Collectivity to satisfy the island needs by mobilizing all the energy power sources and in particular the new renewable energies.”*

(Christian Cristofari, Philippe Poggi et Jean-Pierre Roger, CapEnergies, 2007)

As the problem was formulated, the first speeches on Myrte involved a certain number of stakeholders and linked them and met their interests at the same time. As such, this socio-technical project formed a “device of intersement” (Akrich, 1989). Thanks to its technical attributes, all of the stakeholders should be satisfied. For the University of Corsica, Myrte is a scientific research instrument that lets the institution increase its skills and even legitimize its academic position after it obtained recently more autonomy in the framework of the LRU, the French law on the liberties and responsibilities of universities.<sup>7</sup> For the CEA, it is a life-size test that could prove the validity of hydrogen technologies, while for Helion it is a demonstration of its equipment quality for the conquest of future markets. Raffalli, a local public works company, joined the team with the objective of developing the photovoltaic industry in the territory. Regional public institutions (the city of Ajaccio, the Territorial Collectivity, the Corsican Economic Development Agency) also see the project as a way to improve the

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7. The French law on universities’ liberties and responsibilities promulgated in august 2007 aims to reinforce the budgetary autonomy of French universities and transferring them skills in terms of human resources and property assets.

quality of energy supply and to preserve their environment. The French State and the European Union at last support this kind of initiative, which prefigures the energy transition.

Although Philippe Poggi had suffered failure in 2004 with a similar project, his aptitude to translate everyone's concerns into the conception of the Myrte platform permitted him to build it this time. Concretely, the researcher multiplied contacts with partners, especially the regional institutions (direction of the University, administrative centers, General Secretary of Corsican Affairs) and discursively transformed the technical characteristics (solar panels, fuel cells, hydrogen) into social and economic activities (benefits for the region, technology transfer, eco-friendly energy), which are supposed to influence all participants. In short, as he moved objects as well as utterances, Philippe Poggi made science step outside the laboratory and changed it into a homogeneous collective experience:

*"In 2004, we were a small team of 4 or 5 researchers and we thought we could develop an experimental project on the site which would combine a small wind turbine, photovoltaic panels, fuel cells and an electrolyzer. We set up a scientific project and then we met with the Research and Technology Regional Delegate<sup>8</sup> and the Energy and Environment Protection Agency<sup>9</sup> vice-director who told us: 'your project, well, not bad but how will it benefit the region?' We are researchers so the region... (laughs) [...] [About the Myrte platform] There was the center of excellence which gathered institutions, politicians, a research and formation organism, a research and technology transfer organism, the CEA, Raffalli, the local company on which we could have operated the transfer. There was also a national firm which developed processes. It gained skills, it validated its products and made them progress thanks to us. So we had exactly what it takes." (interview with Philippe Poggi, 2015)*

The research made technology enter politics and politics enter technology (Akrich, 1987) in a circular movement, which gave his action some strength: a heterogeneous engineering work was produced (Law, 1989; Hubert and Vinck, 2014). Myrte became a boundary object that coordinates several points of view and carries in itself knowledge, practices, and representations from different social spaces. When the stakeholders are finally convinced and enrolled (Callon, 1986) through reasoning, discursive and shaping operations—not only about the project but also about the reality where it has to be inserted—a first trial is passed: a network is formed where functions and objectives of everyone have been assigned. Thus, technologies, politics, environment, and Corsica's specific characteristics involving geography and social acceptability of solar panels, are linked together. As a direct consequence of this successful

8. In French: DRRT (Délégué régional à la recherche et à la technologie).

9. In French: ADEME (Agence de l'environnement et de la maîtrise de l'énergie).

interesement, a Scientific Interest Group and a steering committee<sup>10</sup> were created in 2009 to fix, legally speaking, the collaboration and to guarantee the work proceedings in which all partners were asked to contribute to the project: the European Union through the European Regional Development Fund (8 millions of euros), the French State (3 millions of euros), the Regional Collectivity (4.5 millions of euros), the University of Corsica (2.1 millions of euros) and the industrial partners (3.4 millions of euros). However, during the construction of the Myrte platform, several other trials successively broke and then the relations established before had to be rebuilt.

## 8.4 HOW TO RENEGOCIATE THE SOCIO-TECHNICAL NETWORK AND TO PRODUCE HOMOGENEITY

A site located in Vignola near Ajaccio, used before as a concentrated solar power station, and built in the 1980s, was selected to build to the platform. Many dismantling and clean-up<sup>11</sup> procedures were carried out, as well as landscape impact studies. At the same time, a file was completed to classify the installation for the protection of the environment.<sup>12</sup> The Regional Direction of Industry, Research and Environment,<sup>13</sup> a regional representative of the industry ministry in charge of industrial development and environmental topics, validated it in the first place. But in 2009, a legislative measure from the Urbanism Code and the Environment Code fixed the rules about photovoltaic systems based on the ground.<sup>14</sup> Power stations that produce more than 250 kWc required new authorizations (building permit, impact study, public study).<sup>15</sup> Moreover, the impact study revealed that a protected species lived on the site, the Hermann's tortoise. A unique land-based tortoise in France, the *Testudo hermanni* is one of the world's most threatened reptiles and has been protected by a national plan since 2007. The construction was thus directly put in danger. The Environment, Planning and Housing Regional Agency, which replaced the former Regional Direction of Industry, Research and Environment,<sup>16</sup> wanted to stop the project.

We can see how definitions and categories, especially the ones concerning the Corsican environment, evolve according to network composition. When unexpected stakeholders are added, they disrupt the group, move frontiers,

10. In 2009, this committee was composed of representatives from CapEnergies, the University of Corsica, Raffalli, Helion, a law firm, and an energy expert assessment office.

11. For example, the old concentrated solar power station contained asbestos.

12. The installations likely to present risks are submitted to specific regulations.

13. In French: DRIRE (Direction régionale de l'industrie, de la recherche et de l'environnement).

14. Décret n° 2009-1414 du 19 novembre 2009.

15. Article R421-1 du code de l'urbanisme.

16. The DRIRE were nationally reorganized between 2009 and 2010. Their missions were given to the Environment, Planning and Housing Regional Agencies (DREAL in French) and to the Companies, Concurrence, Consumption, Work and Employment Regional Agencies (DIRECCTE in French).



and establish others (Simoncini, 2014). Before the environment experts, who became spokespersons and translators for the fauna and flora, transposed tortoises into a document that they presented against the platform (Latour, 2010), they did not exist. Philippe Poggi said it very well himself, “Tortoises appeared when there was the impact study.” The perception of the project suddenly turned. From eco-friendly, it became eco-destructive. Philippe Poggi and his team then tried to renegotiate these conditions by concluding new alliances (Charvolin, 2012). Whereas a first step of the project consisted of putting the territory into the device, the device was now connected to the territory. First, a compromise was found with the Environment, Planning and Housing Regional Agency. An offer to dig holes into the fence to let tortoises, which have a large range, go around the site as they want, was made. During the building work, the team committed to catch and place the few present specimens into an adapted pen.<sup>17</sup>

Other socio-technical devices were implemented to interest and enroll traditional users of the local environment, including the Ajaccio Astronomy Club, which uses the old power station located on a small hill as a sky observation point, the close natural reserve,<sup>18</sup> and hunters who track prey around. They were not only subjected to communication strategies, but also to technical operations:

*“The site was not enclosed enough, it was in the middle of the maquis and there are wild boars. So we asked ourselves a lot of questions about the tanks. I was not relaxed: Could the tanks resist to shotgun bullets? That was my problem. Areva gave us all the calculations that proved it could resist. But I was still not convinced. So we buried them [aimed to reduce landscape impact].” (interview with Philippe Laclau, Head of the University of Corsica’s assets, 2015)*

Likewise, the area was redefined to welcome astronomers thanks to the construction of an appropriated building on the site, and all the structures were reconfigured to melt into the landscape (wood cover, ground turned green, trees plantation, etc.). As the network of its components became more complex after passing through a hybrid forum (Callon et al., 2001; Laborie et al., 2014), the platform became a mediator of relations between human and nonhuman stakeholders (tortoises, stars, wild boars, shotgun bullets). Moreover, the research team integrated these incidents into its orders of justification to increase the legitimacy of its approach (Lafaye and Thevenot, 1993). By demonstrating

17. Electricité de France will come later to ask advice from the Myrte team to settle a similar problem elsewhere on the island.

18. The Sanguinaires Archipelago and the Punta di Parata are classified “Zone Natura” 2000 and “Zone naturelle d’intérêt écologique, faunistique et floristique”.



in public space that it was capable of adapting technology to wild life, it changed again the definition of the project:

*“We settle that with the regional administrative center and it transformed into a symbol for the operation since Europe wrote articles on it: we protect Hermann’s tortoises. We managed to turn the constraint into an advantage. [...] The dialogue process with the media was very interesting, the way we dealt with it. We did not do it deliberately but when you put things into perspective, we did it the way it had to be done.” (interview with Philippe Poggi, 2015)*

Resolving this controversy allowed the team to acquire new media competencies that it made the most of to enroll the general public and to establish the importance of its work in the long term. In particular, the team conducted campaigns to raise awareness in schools, organized site visits, and produced meticulous educational short films. In one of them, entitled “Bottling the sun,”<sup>19</sup> an eloquent equivalence is set up between hydrogen and our star:

*“[...] there is no nuclear plant here, we are on an island, Corsica. And as much other islands, the electricity power production is reduced. [...] The wind does not blow constantly. Some days, there is less sun light. And during the night, there is no sun light at all. These are called intermittent energy sources. We are never sure how much electricity they will produce. Nevertheless when the sun shines, it produced a lot of electricity. But you cannot bottle the sun. Although... Do you see these big demijohns? Well in a way they hold the energy of the sun.”*

This “cosmogram” (Latour, 2010) aimed to produce homogeneity. By arranging and linking different beings and modes of existence together into practical life forms, it inserted the platform in the territory and allowed it an essential role: when the sun disappears, Myrte replaces it. Thanks to multiple operations, delicate intervals between visibility and invisibility were performed here. On one hand, stabilization and smoothing devices aligned all the stakeholders in the network (Houdart, 2015) and made their interactions more fluid. On the other hand, some translations were employed to make the technology step outside the laboratory and to connect it to the world (Pictures 8.1 and 8.2).

## 8.5 BACK TO THE LAB: THE DISINTEGRATION OF RELATIONSHIPS

Nevertheless, in December 2010, an unexpected development arose. Just when negotiations with relevant institutions about tortoises came to an end, a new regulation came into effect that suspended the obligation to buy electricity

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19. In French: “Du soleil en bouteilles”. This is a play on words that already existed in the 19th century when the first solar energy power devices were developed (Jarrigue, 2010).



**PICTURE 8.1** Roads for turtles in fences (authors' pictures, April 2015).



**PICTURE 8.2** Burials of hydrogen and oxygen tanks (authors' pictures, April 2015).

produced by photovoltaic installations of more than 3 kW.<sup>20</sup> In this context, a network connection application had to be submitted to ErDF (a power energy company) and new studies had to be done. This was another substantial problem for the University and Raffalli, which planned to sell the electricity generated. Therefore, negotiations were initiated with the Energy Control Commission in charge of power regulations and EDF SEI (EDF in Corsica and overseas departments) to fix a purchase price that could satisfy everyone. But the Energy Control Commission gave a negative decision, arguing that its role is not to fund research activities. This intersement failure had consequences. Indeed, Raffalli, which was supposed to install the electric nodes (lightening study, high-voltage network, low-voltage distribution boards, etc.), decided to withdraw from the project. Without any short term prospect of economic profits, the company could not hope for an amortization of its investment in the Myrte construction. To reduce the impact of this incident on the work planning, the University of Corsica took over the responsibility for its missions, which were entrusted to its assets department. This last trial clearly demonstrated the instability of relations between the stakeholders. Everything can still be called into question; nothing is definitively placed in a black box (Callon and Latour, 1981).

The platform was finally inaugurated in January 2012 after 1 year of work. Nonetheless it was still subject to controversies. Myrte especially concentrated struggles around its identity and its objectives. In the same time period, the principal industrial partner suffered important changes in its structure and its commercial and industrial strategy. Helion disappeared under the pressure of the market and was replaced by Areva ES (Energy Storage), which brought its hydrogen activities closer to the group research division. This phenomenon was a response to the lateness of the European storage energy commercial development in relation to the optimistic estimations of rising markets made at the end of the nineties and at the beginning of the 21st century. According to an Areva ES executive, this lateness can be explained by “the gas and oil prices drop, the absence of political pressure on carbon and the heterogeneity of storage applications” (2015). Despite the Greenergy Box production, Myrte did not represent a priority for the French industry firm:

*“Current affairs imply to know what is going to be kept and how we can capitalize things. We do not want everything just to disappear. Unfortunately the logic we have now is declining. On the University’s side it has been a strategic position tool, it has combined development works on electric networks, renewable energies and island issues. It has been a huge success in comparison to initial objectives.*

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20. Décret n° 2010-1510 du 9 décembre 2010. After the State created support measures for the photovoltaic industry (especially with purchase prices around 50–60 cents/kWc), many companies invested in the market, which quickly reached saturation point. In December 2010, as the price of installations began to decrease—after the Chinese imports increased—the State decided to reduce its subsidies and temporarily suspended authorizations for new projects.

*The question is: What will happen next? It does not have to be especially about Myrte future developments but we need to do something after, from an academic and an industrial point of view, for Corsica and the network. For more operational projects for the Corsican collectivity. On Helion's side, it was a very important step that allowed us to demonstrate the reliability of our technologies. It showed that it was possible to do things after, to start a more industrial stage. That already has been done with Myrte 2, with the container. The logic stage for Helion was to start standardization and sales. [...] Which has still not been done today.” (interview with a former Helion executive, 2015)*

On the other hand, the political support given to the platform started to decline. A specific event allows this to be understood. During the project proceedings, political turnover was important. The people who composed the national (Government, Parliament), regional (presidency of the University, prefecture, Territorial Collectivity, Corsican Economic Development Agency, Environment, Planning and Housing Regional Agency), and local institutions (the city of Ajaccio) were replaced. Then, the technology could not be appropriated. Alliances were broken too often and the Myrte team had to reengage new translations continually in the hope of stirring interest again in public authorities. Philippe Poggi explains:

*“At one point elections, intern reorganizations and a change of majority happened. It took some time before everything was reorganized and messages were not heard very well. We were not supported by the Corsican Economic Development Agency anymore, etc. So the situation was confused at a local level. And after we lost time because of planning issues linked to regulatory aspects, we came too late in relation to political turn-over. That is why there was no technology appropriation by politicians and administrations. And that is what I miss today. They all consider that it is my project and they come to ask me what are the benefits for the region. But I do not have to answer this question. Politicians and administrations have to.” (interview with Philippe Poggi, 2015)*

Thus, the definition of Myrte seemed to be revised downward. After the platform stepped outside the laboratory, it was sent back. Whereas it had obtained a preindustrial experimental status, it became a scientific experiment again that could not be transferred to society anymore. This became visible when the Myrte transfer to a local stakeholder was aborted. As Ajaccio's hospital needed to be rebuilt in line with High Quality Environment Standards, the head of the project offered to start a partnership with the University of Corsica and Areva for the installation of a device just like Myrte. But the lack of public funds and the withdrawal of the manufacturer led to the cancellation of the operation. As a result of the division (Dodier, 1995), the network structure ended up contracting and organizing around the research team with a new Scientific Interest Group for 2015–20. Nevertheless, the research team had difficulties in highlighting the platform's scientific aspects through scientific papers and risks to be downgraded.

*“When I hold conferences, I am the only one to show actual curves, not projects. The problem is we are judged on our papers, our conferences. We did some. But how do I increase the Myrte’s value? It is complicated: it is an industrial-type platform, managed by a research and formation organism with its own indicators. This is not a paper [on a screen he show us the curve of a test carried out during the 20/03/2015 solar eclipse. During the eclipse fuel cells took over from photovoltaic panels to maintain continuous electricity supply] but for hydrogen industry it is very important.” (interview with Philippe Poggi, 2015)*

If this is a typical example of the difficulties endured by public and private stakeholders in the framework of cooperative innovation situations (Laperche et al., 2013), then differences between them in terms of relations to time and future prospects are well-known factors of failure. But this kind of conflict also refers to classifications in action (Chauvin, 2006), which question the frame of reference (Flichy, 2003) stabilized before. With this in mind, opposition between the different functions given to Myrte constitute a mechanism of negotiation and correction of categories. As the platform does not mean the same thing for all stakeholders, its properties can always be discussed again and reinterpreted. Thus, these conflicts about the technology definition are also legitimization operations of identities from stakeholders, who describe in their technical choices their political and economic positions and in the modification of their commitments what are their new domains of competences and their new interests.

## 8.6 CONCLUSIONS

In this chapter, we tried to clarify a device that prefigures the energy transition by apprehending the political processes it contains. When discussing the technical details, we showed that the conception and the construction of the Myrte platform strongly depended on the ability of stakeholders to model its form to integrate within it social constraints from all of the different trials experienced. In return, the territory, the Corsican environment, and the stakeholders themselves also changed through their relation with the machine. Therefore, we can see how it is impossible to think of the platform outside the network in which it works: both are intimately interconnected. The movements of the first have an effect on the second and this situation leads to technical, political, economic, and social negotiations and conflicts. From tortoises to hunters, the sun, regional public authorities, and the general public, it is an entire universe that is aligned at the end as the technology unfolds. For this reason, the definition of Myrte never really stabilized: it continues to evolve according to the association of heterogeneous entities and beings who support it.

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