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The social construction of economic activities:

Entrepreneurs, skills and accreditation in the solar energy sector

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Sub-theme 17: Markets Inside the Ecological Revolution

Introduction

The ‘green revolution’ may be seen, in economic terms, as an opportunity for the emergence of new activities, goods and markets. From this standpoint, the revival of economic sociology can offer precious assistance in understanding the phenomena underway.¹ This renewal of interest marked the desire to re-examine the field of economic activity and market exchanges from a specifically sociological perspective. By reiterating the idea that economic phenomena should be considered as sociological phenomena, the authors at the source of this movement placed particular emphasis on the social embeddedness of market relations and focused their attention on the social construction of markets. There have been many studies along these lines, in Europe and the United States alike. Economic sociology gives us the opportunity to grasp what is actually at stake in the emergence of new activities and markets: what are the mechanisms, players, relationships and instruments underlying this emergence and influencing the organisation of the activities and the structuring of the markets? The ‘green revolution’ gives us the possibility of observing them life sized, so to speak. At the same time, it also permits us to re-examine certain recent arguments and conceptions coming from economic sociology.

¹ . On this revival, see, for example, Smelser and Swedberg (1994).

In adopting this perspective to look at a particular sector of this ‘green revolution’, namely the installation of solar energy equipment, our paper lies at the intersection of these two questions. We shall begin by calling for a reconsideration of an excessively micro vision of the processes involved in constructing the markets, in order to stress the decisive role played by institutions such as the state in the very possibility of the emergence of new activities, the definition of their perimeters and the way they are organised. We shall then look at another category of stakeholders: the entrepreneurs. Observations carried out in the course of two studies show that, at the territorial level studied (see the box below for the presentation of these studies), three types of companies position themselves in the market potentially opened

This paper draws on the findings of two different studies carried out in 2009 in the Provence-Alpes-Côte d’Azur Region in south-eastern France:

- The first sought to analyse the role of qualifications in the economic dynamics of several areas in this administrative region. The observations on renewable energies were conducted in a Metropolitan Community which is particularly active in this field (Lamanthe 2009).
- The second studied the relations between qualifications and new energy, thermal and environmental technologies in the building sector, on the scale of one administrative *département*. It examined the building-shell and finishings trades, with a focus on solar installation (Amarillo 2009).²

The data was collected through semi-structured interviews with entrepreneurs and employees, trade organisations, local training and employment actors and representatives of local communities. Twenty-five interviews were conducted with company heads in establishments which were for the most part traditional (fewer than 10 employees). Questions were asked about the entrepreneur’s training and career pathways and number of years in the activity, the economic and technological choices, recruitment criteria and inter-company relations. Regular follow-up and documentary updates were also carried out on this set of themes.

up by renewable energies. The entrepreneurial dynamics and underlying forms of organisation reflect the differences in the socialisation and social embeddedness of the itineraries of the individuals involved. This economic sociology of entrepreneurs sheds light on the processes underway but does not suffice to bring out the fact that what is at play here is an economic

² . This research was carried out within the framework of a study agreement between the French Institute for Social and Economic Research (IRES) and the CGT trade union.

competition, and that, in the specific case of an emerging activity, such competition is also associated with these players' struggle to participate in its definition, as well as the definition of its forms of exercise and regulation. Finally, we shall describe in greater detail how this struggle is expressed around two major issues: standardisation, which is aimed at defining and fixing the methods for recognising the quality of products and services, and training, which is aimed at defining the relevant qualification for exercising this activity.

1. The state: a pivotal actor in the 'green revolution'

The new economic sociology has once again highlighted the idea that the economy is embedded in groups of relationships and has legitimated a representation of the market as the result of a social process. There is no need to dwell here on the pioneering work of H. White (1981) or M. Granovetter (1985). As of the mid 1980s, there were increasing numbers of studies attempting to support this representation, in particular by showing the way social relations and interactions underlie concrete markets, which are created by actors who are themselves integrated into social networks. Today, however, these approaches have in some ways revealed their limitations. By attempting to describe the market construction mechanisms appreciated as closely as possible to individual action, unique situations or social networks, they have locked themselves into essentially micro- and meso-sociological visions of the phenomenon. Through their plea for an economic sociology of capitalism, authors such as Nee and Swedberg (2005) call for a return to more comprehensive visions. Coming back to the ambition of the founders would mean returning to the large social structures at the heart of economic life in order to understand the institutional change associated with the dynamics of capitalism: 'The eclipse in analytical interest in the classical themes of comparative analysis pioneered by Max Weber and Karl Polanyi, who coined the concept of embeddedness, limited the New Economic Sociology largely to descriptive studies of economic life. The problem with focusing solely on specifying proximate causes stems from overlooking the deeper underlying causes of institutional change' (p. XXXVI). Along the same lines, N. Fligstein insists in particular on the role of states and governments in the emergence and structuring of new economic opportunities. He shows that, even in a country like the United States today and in the high-tech sectors, their actions continue to be decisive (2002). Through legislation and the enactment of rules, fiscal policies and its action as an economic player, the state influences the conditions in which the activity is carried out. It has the power to define which

strategic behaviours are competitive and which are not, by encouraging, for example, certain companies in certain activities (Fligstein 1996, 2005).

The ‘green revolution’, in its economic dimensions at least, is a product of such a dynamics. The construction of the new markets which it potentially opens up cannot be understood without considering the decisive action of the states. In France, through its triple role of providing incentives, support and regulations, the state has generated the prospect of substantial economic development related to environmental concerns. The fact that such issues are being taken into account in the construction sector thus raises the hope that coming years will see the development of an entire market in which companies will be trying to find a place.³ Laws and regulations have created new economic opportunities through a group of regulatory requirements and financial incentives. This process stems in part from the government’s launching of the Grenelle Environment Forum (Grenelle de l’environnement) in late 2007. Initiated on the basis of multipartite meetings and consultations, this structure was intended to make important decisions on environmental and sustainable development issues. In August 2009, it resulted in the so-called Grenelle 1 Law, which set energy objectives to be attained by the year 2020: control of energy consumption and an increased share of renewable energies within total consumption.⁴ In the construction sector, major objectives concern the acceleration of the thermal renovation of buildings and the development of renewable energy sources. The standards for energy use in the buildings are redefined (thermal regulations, energy performance standards, low-consumption buildings, etc.). One of the main financial incentive schemes introduced for individuals is the zero-interest eco-loan, which provides for interest-free loans for insulation work which are reimbursed through savings on the electricity bill. Legislators also demanded that construction professionals develop an overall vision of their buildings, whilst individuals, in order to obtain an eco-loan, are required to carry out a ‘package’ of work consisting of two kinds of improvements (e.g., insulating the walls and installing a solar water heater). In addition, this loan can be combined with an earlier scheme, the sustainable development tax credit, which permits a tax reduction of between 25 and 50 % of the cost of certain equipment. According to the government, combining the two schemes

³ . In its early 2010 report, France’s Employment Policy Council (Conseil d’orientation pour l’emploi, COE) estimates that ‘green growth’ will permit the creation or preservation of 600,000 jobs, half of which will be in the building sector. This potential does not seem to be confirmed, however, since the beginning of 2011 was in fact marked by job losses in the solar sector. These followed the government moratorium on large-scale photovoltaic installations announced in December 2010 (see below for further discussion).

⁴ . Programme law no. 2009-967 of 3 August 2009 for the implementation of the measures adopted by the Grenelle Environment Forum.

would permit a 50 % subsidy of work carried out by individuals. There is also state aid for the installation of certain equipment (the solar water heater in particular), which can be contributed by local communities. This is the case, for example, with the Regional Council and the Metropolitan Community where we carried out our research. In all, these aid schemes can cover between 40 and 50 % of the cost of the installation. In order to benefit from them, individuals must call upon companies with a specific accreditation. The installation of photovoltaic roof panels in order to sell the electricity produced to the national operator, Électricité de France (EDF), is an additional incentive aimed at individuals and professionals alike. Strongly encouraged by the public authorities, it is intended to increase the share of renewable energy sources in overall consumption.

This last measure, in some ways a victim of its own success, was recently subject to a moratorium (decree of 9 December 2010) which imposed a three-month freeze on projects underway for photovoltaic installations on professional buildings and public edifices (individuals were not concerned). This decision brings out the tensions between the different registers of state action: the support for new activities which stimulate growth and create jobs, trade-offs in the area of public expenditures and the regulation of an emerging activity. The government's choice was based on several arguments. For one thing, the success of the scheme and the very large number of projects submitted led authorities to consider that the objectives for the share of renewable energies in total energy consumption had been surpassed for 2012. For another, the funding was called into question: in order to encourage the production of photovoltaic solar energy, the state has introduced a system of reselling this energy to EDF at extremely attractive feed-in tariffs which are considerably higher than the price fixed for the end consumer. The additional cost is, however, compensated for by that consumer, whose bill is increased by a specific tax for that purpose. This means that the more success the scheme has, the more consumers may see their electricity bills rise, and this creates a problem in terms of public interest. In addition, this incentive has led to what is seen as a haphazard spread of installations and the moratorium was also aimed at permitting the establishment of a new regulatory framework. The decision provoked sharp dissatisfaction amongst professionals and their organisations, who consider that it calls their activity into question. They denounce the state's turnaround and demand the establishment of a stable regulatory framework. Indeed, such a framework is a necessary condition for the exercise of economic activity in rational capitalism which, as Max Weber indicated in his *General Economic History* (1923; trans. 1984), needs regularity and predictability in order to

anticipate its investments and profits. Some companies now find themselves in difficulty. A group of eighty SMEs unsuccessfully appealed the moratorium before the State Council. New regulations have been introduced with the establishment of a system of bids to tender for new projects, with negotiated tariffs and power ceilings; this system is placed under the authority of an Energy Regulatory Commission (Commission de regulation de l'énergie) which will decide on the projects selected. Some operators view these new regulations as a means of bringing order to the market and the activity, whilst others denounce the fact that the state's choices will favour the big players at the expense of the small ones. For the state, it is thus a way of rolling back from its means of supporting the activity and making choices about the way that activity is organised.

2. Companies and entrepreneurs in the market

Our observations in the field bring out the fact that three different kinds of companies are positioning themselves in the potential market for the installation of solar equipment. Taking an economic sociology approach to the entrepreneurs involved in these organisations means going beyond a Schumpeterian conception of the entrepreneur as an isolated, atomised individual, a 'singular hero' characterised by his or her capacities for innovation, risk-taking and mastery of uncertainty, as well as the ability to seize new opportunities for making profits. Economic sociology leads us to resituate entrepreneurs within a set of affiliations and social relations: the entrepreneurs, and the activities they carry out, can then be apprehended within the multiple social embedding processes in which they participate (Zalio 2009). The entrepreneurs' embeddedness in social networks and the position they occupy within them are supports for their very economic performance (Granovetter 2003). Moreover, the entrepreneurs themselves must be considered as the result of a social construction, because certain conditions, at once social, cultural, organisational and legal, must be fulfilled in order to make their involvement in the economic activity possible. This is why it is necessary to take note of the heterogeneousness of this category and its pervasive social differentiation, which can be perceived through, amongst others, the diversity of careers and trajectories (Zalio 2007). We thus find that the three types of companies identified are associated with different entrepreneur profiles and trajectories, which we would qualify as 'solarists', 'traditionals' and 'installers' (who are in fact installation subcontractors). These types permit us to define and distinguish the motivations behind the economic activity, the preferred forms of organisation and the conceptions and practices of the activity associated with different

visions of the relevant qualifications. In addition, they are integrated into networks which differ amongst themselves (see Table 1).

2.1 The solarists

The 'solarists' include new companies which have been created in the renewable energies niche. For the entrepreneurs, what is involved is making solar energy a specific activity in its own right: concentrated around the installation of solar equipment, it is often the company's only activity. In fact, we did not encounter any companies of this type which also install other equipment such as heat pumps or air conditioners. On the other hand, they do provide equipment for other forms of energy considered more ecological, such as wood burning. The solarists position themselves on the provision of a comprehensive approach for their clients: the search for an overall energy and environmental solution along with advice to customers on thermal renovation work to be undertaken before proceeding to the installation of a solar energy system. The solarists do not limit themselves to installing equipment moreover; in general, they seek to work on both the design phase and the carrying out of the project.

We are dealing here with new profiles of entrepreneurs coming from other sectors, with higher education and training, and who have often held high-level posts in large companies in the manufacturing and service sectors (telecommunications engineer, production systems engineer, etc.). Their trajectories are marked by 'bifurcations' (Grossetti, Bessin and Bidart 2010) which take the form of retraining or abrupt changes of occupation. In this case, a career plan is combined with an activist stance (ecology, the choice of solar energy); the direction the activity takes is fed at once by this activist stance and the company heads' own trajectories. In some sense, the creation of the cultural and social conditions leading to the emergence of these entrepreneurs who defend alternative environmental solutions necessitated the acquisition of a specific civic-minded culture (to borrow the categories developed by Boltanski and Thévenot [1991; trans. 2006]), expressed through the ecological commitment, in combination with the critique of the large capitalist industrial enterprise (drawing on the critique of the industrial dimension which flourished in the 1970s).⁵ In their business strategy, these entrepreneurs highlight their profiles as engineers or technicians and their positioning as solar professionals: the ability to adapt the equipment to clients' needs, the ability to provide comprehensive service from the planning stage to the installation, the ability to evolve with

⁵ . On this critique, see Boltanski and Chiapello (1999; trans. 2005).

the changing technologies. Their careers in large companies provide them with the ‘resources’ useful for developing the managerial skills employed on the ‘social scene’ of ecological solar energy. But these company heads are also newcomers in the sector. They have to acquire the specialised technical skills they do not have, not only in the area of solar energy itself, but also in different related technical aspects such as plumbing, heating, roofing and weatherproofing. They gain this knowledge in various ways: training courses offered by the manufacturers, networks of family and friends, working with other companies or hiring interns and employees with these skills.

A company head in renewable energies

After university studies in telecommunications, he worked for eleven years in a multinational microelectronics firm, where his career advanced very rapidly. No longer ‘recognising himself’ in the way the company was evolving (a financial logic following its integration into a North American group), he decided to benefit from a redundancy programme to switch fields. He thus studied business administration at higher education level and decided to create his own structure in January 2006. He acquired the specialised technical skills he lacked through various means, including an internship with a manufacturer, recourse to his family (a cousin in the plumbing trade) and an AFPA training course to obtain accreditation.⁶ The company is located on the premises of the Metropolitan Community’s business incubator. It benefits from the assistance of the ‘local initiative platform’, loans and individualised support.

‘With renewable energies, we’re seeing new profiles arrive in the profession. People coming into this activity because of ecological convictions, wanting to set up their own business, with the desire to be autonomous and at the same time, doing something compatible with their ideas and having the impression of accomplishing something, making a small contribution, which means that the activity isn’t purely commercial’.

In these companies, the overall training level of the employees is higher than the average found in the finishings sector: many of them have a level equal to the *baccalauréat* or higher or are in the process of acquiring a qualification at that level. For the sake of comparison, we may note that 55.6 % of skilled workers employed in the finishings sector of the building industry have a Level V qualification (CAP, BEP) and only 12.1 % have a higher-level

⁶ . AFPA = Association Nationale pour la Formation Professionnelle des Adultes, the national association for adult vocational education and training.

qualification.⁷ The employees also share the company's ecological commitment, which creates a special relationship to the work and the job. Motivated by the search for a job which will meet their demands (ecology, independence, initiative), they demonstrate considerable professional mobility. They accord importance to work where they spend time learning and refuse a careerist logic. Their relationship to training is particularly interesting to observe: they express a desire to learn by themselves, which we can analyse as a contemporary manifestation of a phenomenon known for a long time, namely worker autonomy. This activist motivation may explain the fact that the solarists indicate they do not experience the recruitment problems faced by most building enterprises; on the contrary, there are many candidates.⁸

2.2 The traditionals

The company heads we have named the 'traditionals' are those whose main activity already falls within a building trade and who are trying to develop an additional activity by integrating renewable energies. The different cases we find in this new market include both small trade concerns and large-size construction companies, of long standing or of recent date. They are thus seeking to integrate the question of renewable energies into their core business (which may be heating, plumbing, electricity, etc.) in a complementary but coherent way, within the traditional logic of the skilled trade. These companies and the employers' organisations in the building sector believe that sustainable energies should be based on existing trades rather than giving rise to new ones. This position is also motivated by caution: the market seems promising but it is still recent, uncertain and fragile (cf. the heavy dependency on public aid); the technologies and regulations themselves are undergoing constant change and the competition is keen. This caution is much less present amongst the solarists, who are convinced that the development of renewable energies is already an inevitable process.

'We don't do any ads, or radio announcements, so what we tell people, you know, is, OK, there are lots of people who've set themselves up on it (*sic*) because it's in style, and it's a growth market. But we have another activity alongside, so that, well, when solar energy doesn't work any more, we'll still be there. That's what – in fact, that's

⁷ . According to the regional data of the 1999 census, which was the latest available at the time of our research. Source: INSEE, the French National Institute of Statistics and Economic Studies. CAP = vocational aptitude certificate; BEP = vocational studies certificate.

⁸ . This is attested by the numerous applications received by these employers, especially from graduates of technical or vocational higher education.

what we say: we don't say we're going to do solar energy for the rest of our lives; if there's no more market, we won't do it any more. On the other hand, if you do a solar installation with us, in twenty years, there's more chance that we'll be there than the guy who just does that. At least we hope so. Touch wood' (head of the solar division, electrical company, 140 employees).

In their offer, these companies point up the skills they have within their core business, and present renewable energies as a single component, an extension of their speciality. They are not trying to provide a specialised offer but, on the contrary, emphasise their ability to integrate this offer into the range of skills deemed necessary to it (plumbing, roofing, heating etc.). They propose diversified solutions for equipment and energy sources (solar, thermal, etc.) and combine them with other, more classical ones. They do not position themselves on solar design; rather, they limit themselves to installation.

A large company specialised in electricity

This company of 140 employees has existed for 10 years (following the takeover of an existing structure). It tenders for contracts from property developers and has just created a solar division in order to position itself in this new niche. The company head's son has been appointed to run this division. A sales manager who previously worked in a company specialised in renewable energies has been hired. Four employees were trained to install the equipment through courses in roofing and frame-building organised in order to obtain accreditation. They receive support from the manufacturers for the equipment and the company also draws on their skills for minor repairs. For the time being, these workers are not specialised in solar energy and continue to work on electricity installations.

'Well, where we're going to set ourselves apart ourselves is that we're a company which is, where the core business is electricity, so that's part of one of our activities. So it's important, compared to other companies who only do that. And that means we have know-how, which is really to – we're electricians and photovoltaic energy, that's producing electricity, so it's really part of our profession' (sales manager).

These traditionalists are characterised by a 'minimum' employee training level – CAP-BEP – in the building trades. At the same time, developing an activity in the renewable energies field requires the acquisition of new knowledge and skills, concerning the materials in particular and in other building specialities (e.g., roofing and weatherproofing for electricians or heating

specialists). These are not seen as specific or specialised, however, but are integrated into the basic trades.

Heating specialist company head

In 1979 he entered the family business (founded by his father in 1963) and succeeded his father in 1985. The integration of renewable energies got underway in the 1980s and now represents 4 % of the activity. The company has seventeen full-time employees and five temporary workers. The company head is a member of the CAPEB (the employers' organisation for the building trades) and an association of renewable energy professionals. He is presently in a training programme set up by the CAPEB which should lead to an 'Eco Artisan' (Eco Tradesperson) quality label.

'In the beginning, [renewable energy] was something new but very close to our usual work. We had the same training because we were dealing with the same thing, domestic water, but with just the means which changed (solar energy). There were also tanks, but which used other energy sources. Today, it's still very basic, only the collectors and the controller are specific to solar energy. The only training we needed was to understand the heat transfer fluid [a kind of oil]'

In his company, the development of this market relies on traditional skills and trades in their recourse to heating specialists (to install the tanks), plumbing and zinc workers (for the interventions on the roofs and the weatherproofing), refrigeration technicians (heat pumps, air conditioning) and electricians. The ways the qualifications are obtained remain traditional as well: apprenticeship, hiring of adults coming from the AFPA and on-the-job training. The solar field requires the acquisition of new competences, however: 'All the people we have got their knowledge about solar energy in the company . . . , they went to the manufacturers, they went for training courses'. According to this company head, the solar market does not permit the activity to specialise in these technologies and it is thus necessary to maintain a comprehensive offer on heating. In this sense, he insists on his company's ability to handle broad heating problems ('the heating, ventilation and air conditioning trade' [HVAC]) and prides himself on his twenty years of experience: 'We learned a long time ago; at the request of EDF, we took training courses at the AFPA in order to install the first heat pumps'.

2.3 The installation sub-contractors

The prospects of a lucrative market have given rise to a considerable commercial offer from companies without technical skills in the solar field. Because their activity is purely commercial, these companies do not wish to acquire such specialised skills; at other times, they may sell products unrelated to solar energy. They thus call on other professionals for the installation of the equipment they sell. These installers, who are generally self-employed, work for them as subcontractors. They specialise in a category of tasks, a product or a kind of equipment. They simply carry out the installation indicated on the order form.

A sales company

It has ten dealers around the Mediterranean. Its local office has some sixty employees, half of whom are technical advisors and the other half, telephone salespersons. This company subcontracts the majority of the installations of the products it sells and its installers only use these same products. There is one technical supervisor for each seven installers. The supervisor interviewed insisted on the importance of having an accreditation in the choice of installers even if, in his view, this is not necessarily synonymous with significant professional competence in the solar field. His role is to monitor the installations and their quality on the basis of a form filled out by the customers.

These installation companies are in a subordinate position; their employees simply carry out the decisions of the prime contractor. The skills called for are basic, related to the traditional building trades. The companies also employ unskilled personnel – labourers and warehousemen. In this niche, what counts is the accreditation; it is a necessity in a context where financial incentives constitute a major selling point.

A small installation company

The manager, born abroad, set up his own business in 2007. Trained as an electrician, he has worked in the building sector all his life. He spent three years as a salaried employee in a company where he acquired experience in photovoltaics and went into that field because he was aware of the needs in the sector. He also worked as a framework carpenter, which in his view gives him an advantage because the fixing of the panels creates problems of weatherproofing.

‘We work for other companies which sell either to individuals or professionals. We’re just involved with the installation. We don’t market the product, we’re just the installer’.

The company employs what he calls two ‘installation technicians’ whose skills are specifically focused on this operation. It also employs a ‘labourer’. In his recruiting, the manager does not require any particular vocational qualification, even if he indicates that he asks workers for ‘at least a CAP in electricity or experience’ (roofing, framework, weatherproofing). However, he does require the titles necessary for certain categories of installation: ‘The qualifications we want for working in this field, are, in a word, the

Table 1. Three types of companies

Company type	Entrepreneurs	Networks	Activities	Employees
Solarists	Engineer, manager – experience in large companies	Highly independent Construct their own professional networks	Focused on solar installation - Technical performance Combination of design/ installation	Training level above average for finishing Occupational mobility Quality of workmanship Autonomy
Traditionals	Long experience in the heating/ plumbing sector	Relative independence Belong to an existing professional network	Functional flexibility Solar installation as a complement to the heating/plumbing activity	Training level: CAP-BEP Quality of workmanship
Installation sub-contractors	Former workers recently creating their own businesses	Strong economic dependence on contractors Little or no relations with professional networks	Focused on installation Low level of technical performance	Low-skilled employees Presence of labourers

accreditations. You see? It's the QUALIPVs, the QUALIPV construction and the QUALIPV electricity'.⁹

He states that his situation is unfavourable in two respects: financially, because the biggest part of the mark-up goes to the sales companies, and because of his position as an intermediary between the sales representative and the customer, which calls for adjustments between the materials sold and the customer's real needs.

'The problem is that there are many sales reps who sell products, more or less, but it turns out that when we arrive at the house, to install what they've bought, we discover that there are lots of problems. . . . There are lots of things not exactly. . . honest, actually. I mean, normally, an installation should be facing due south, but sometimes when we get there, the house, the roof, is facing due north. So what I mean is that lots of people, they're not – they sign the order forms but, well, behind it, they don't know what's there'.

3. Struggles, tensions and conflicts

The creation of new economic activities and new markets must be seen as a highly conflictual process marked by tensions and the activities arising from the 'green revolution' are no exception. This characteristic is largely overlooked, however, by the authors of the new economic sociology who, by insisting on the role of networking and the micro-sociological level mainly emphasise social proximity, trust and cooperation between stakeholders and the sharing of common values. This approach results in a truncated vision of the phenomenon and necessarily reduces its significance (for an overall critique of these constructions, see Bair 2008). In the areas we have studied, the three types of companies identified compete with each other for positions in the market. They are also competing for access, within an emerging activity, to the bodies which will help to structure the market, to give it a normative and regulatory framework. They thus attempt to influence decisions in their favour and in this way limit potential competitors' access to the activity.¹⁰ This struggle is expressed in different ways: the definition of the activity itself, the criticisms raised on one side or another, the definition of the legitimate quality of the service and product through the development of quality labels and accreditations (which in fact permit the construction of entry barriers), and also, through the struggle to set up a specialised training provision, the definition of the

⁹ . QUALIPV is a quality label for solar photovoltaic installation.

¹⁰ . This process is fairly classic; it can be found in other periods and other business areas (cf., for example, Lamanthe 2004). It is also found in strategies of professions (cf. Dubar and Tripier 1998).

legitimate qualification. Access to the bodies deemed competent to define the rules of entry into the activity and those of its functioning, along with integration into networks giving access to resources reveal the struggles amongst stakeholders to occupy favourable positions in these emerging economic and sectoral areas, as Bourdieu (2000; trans. 2005) has shown. By occupying the dominant positions, or coming closer to decision-makers (quite often the public authorities in this case), some of them are able to define the regulations and rules of the game in the way which is most favourable to their interests and most consistent with their own outlooks and practices.

3.1. Reciprocal criticisms

The three types of companies may be distinguished by their visions of the activity and their positions in the market. The ways they justify their action fall within different logics (Boltanski and Thévenot 1991; trans. 2006). Their points of view and practices are opposed, as the interviews demonstrate through reciprocal criticisms, which also serve to justify each person's position and practices.

The solarists are newcomers in a sector, construction, which is dominated by traditional skilled tradesmen. The two groups are opposed in their conception of the activity and the legitimate qualifications and skills: a specific activity in and of itself versus integration into a traditional core business. As newcomers in the field, the solarists import new practices which interfere with the tradesmen's routines. There is also a social competition between them: the solarists have a higher level of education; as engineers, they have held positions of responsibility in large companies in the leading-edge sectors.

A traditional skilled craftsman's criticisms of the solarists:

‘. . . It's that we, the client, we propose solar energy to him, we propose changing his boiler, we propose installing a heat pump, we propose a whole range of possibilities, and we're not in favour of any particular one. When companies only do solar energy . . . , they encourage doing solar energy, even when that makes no sense at all; when you have collectors facing north, OK? That's it.

‘What we criticise the new companies for is that they stick together. They say that they know how to do solar energy and that we're just handymen, that they're the ones who are professionals’.

A solarist's criticisms of traditional skilled tradesmen and their organisations:

'The traditional tradesmen have done nothing to develop this market. They're just getting into it now, and with a protectionist approach, labels, restricting the market to a little group of companies. They have a big problem with skills because they're not all capable of evolving towards these technologies, which are more sophisticated. There are huge gaps between technical regulations and practices in the field, problems in applying the standards, monitoring them'.

On the other hand, solarists and traditionalists agree in denouncing the practices of sales companies and manufacturers who adopt an essentially commercial outlook. These practices constitute a danger for the activity; they could discredit all the companies in the customers' eyes and make the market go downhill.

Criticisms levelled at the sales companies:

'In our line of business, there are now 'vacuum-cleaner salesmen' who represent a danger for us. They're very ambitious and what they want is to sell materials and equipment to individuals, regardless of whether it's the right equipment for their needs' (solar company head).

'When a company has combed – I won't even mention the town of B., it's the size of a postage stamp – has combed the Marseilles area, when they can't work in the Marseilles areas any more, they're going to attack the Alpes-de-Haute-Provence and when they can't do that anymore, they're going to do the Alpes-Maritimes, and when they can't do anything anymore, they're going to go farther north. In other words, these are people who sell solar because they sell solar; they even sell windows now. So it's a growth market, you sell solar and you sell . . . it's not the desire to do an installation for a customer, so that the customer's happy, satisfied, and that one brings you other customers who come to see you for other things, to keep your client. . . .' (traditional company head).

Criticism levelled at installation subcontractors:

' . . . They don't know how to sell, they don't know how to design, they don't know how to do anything, they just install collectors. They install collectors and that means they'll never be able to break away from him [the manufacturer]. . . .' (idem).

Criticisms levelled at manufacturers:

‘In this business there are also companies who’re looking for growth markets. Like J. In the beginning, he was a manufacturer, and one day, he went too far. He started authorising people, installers, with the idea of selling his materials. That paved the way for people who are dealers, salesmen who are killers. They sell the materials and then they look for somebody to install them. Since they can’t find anyone, they now have people who do it for them, all over France, they’re either their employees or subcontractors’ (traditional company head).

The lure of profit in this new market is criticised by everyone, including the installation subcontractors, in the name of guaranteeing the long-term existence of the activity and respecting customers and convictions alike.

‘There are lots of companies who don’t respect the customers, no? They earn, they want to earn money at all costs but . . . the problem is that it won’t last, all of that . . . ’ (installation subcontractor).

‘Myself, I’m part of the wave of those who made their way into solar energy when there was state aid, and when there was that famous rush, where people saw it as more of the lure of money than as a personal conviction’ (traditional company head).

3.2 Accreditations, quality labels and networks

The creation of a standard, such as a quality label, a certification or an accreditation, is generally intended to unify the companies’ economic choices by encouraging them to produce goods and services meeting a common standard. This is also a precondition for the circulation of goods on vast markets (Eymard-Duvernay 1986). It is expected to reduce disagreements over the quality of these goods and services and the definition of the criteria for establishing it. However, our observations in the field permit us to say that existing standards are far from putting an end to the quarrels surrounding these quality criteria. The different solar installation segments contest the validity of existing standards and in most cases try to impose other criteria. In fact, these standards tend to crystallise the struggles between the different categories of companies around social, economic and symbolic interests. Here too, the normative process is embedded in the social construction of the economic activity.

According to the solarists and traditional tradesmen, the main certifications in force in the solar sector – QUALISOL and QUALIPV – provide only a very basic distinction between the services offered by the different categories of companies.¹¹ For these two segments, the labels give information about a minimum level of quality and do not assess the different levels of service. They all criticise solar accreditation for being too easily attributed to the companies. In their view, moreover, it informs customers badly about the quality of the installers. Such certification thus does not resolve the problem of consumer information, as this solarist indicates: ‘QUALISOL, it’s a required rubber stamp which has no value. For me. And which, on the contrary, is even annoying for the end customer, which is to say, they’re selling him or her a label. . . .’ What’s more, the lack of transparency in the certifying organisations’ assessment of the installations is often reproached as well.

The entrepreneurs in these two categories are looking for new ways of distinguishing themselves in the market. They participate in initiatives aimed at creating new labels and getting them recognised. Such initiatives are undertaken in different networks. We may cite, for example, the case of a solarist who is a member of a sustainable building and construction scheme initiated by the Regional Council and which has as one of its priorities the creation of a label for the entire construction sector. In this way, the company head seeks to participate in its definition in order to channel it in a direction which is favourable to his own representation of the activity. This label will give visibility to the way he conceives his activity and sanction a form of recognition for it in the market. Several solarists also participate in a Regional Council initiative for innovative activities; their specialisation in renewable energies facilitates their selection insofar as they are more easily identified as belonging to an innovative sector than the traditionalists. The manager of a trade company, meanwhile, is taking a training course initiated by the professional organisation he belongs to, CAPEB, in order to obtain the ‘Eco Artisan’ label which this same organisation created and which it reserves for trade companies in its field.

On the other hand, for installers who are motivated above all by a commercial strategy, existing accreditations represent a sufficient certification which they do not hesitate to play up with their clientele. For them, it often represents a maximum level of quality which the

¹¹ . QUALISOL is the label for solar thermal installation. There are three quality labels (QUALISOL, QUALIPV and QUALIBOIS, the last of which -- ‘QUALIWOOD’ in English – concerns the installation of wood burners); they are managed by the association QUALIT’ENR, founded in early 2006 by five nationwide trade organisations.

company does not intend to go beyond. This level is most often seen as a constraint, moreover. That said, certain differentiation strategies may also appear in this segment. Take, for example, the strategy of the owner of a small company within a network of franchisees who finds that the QUALIPV accreditation alone does not allow him to obtain a better market position for his specific offer. Unlike other franchisors, this small network proposes an 'integrated package' including heating appliances and products for thermal renovations (insulation of attics, double glazing, etc.) for which the installation is subcontracted. The owner would like to hire two solar installation technicians in order to increase the company's expertise and train the subcontracted installers to improve their qualification. It is expected that all of these steps will be accredited with a label specific to the network.

These strategies for positioning and distinguishing the company in the market rely on the mobilisation of resources and a variety of networks and relations. Unlike the traditional skilled tradesmen, the solarists benefit from a cultural and social capital which allows them to develop relationships more easily with public actors who can provide them with the resources they lack (financial ones in particular). They refuse to join the trade organisations in the construction sector. Rather, they are more inclined to participate in peer networks (of entrepreneurs sharing a similar background and vision of the activity) within which they pool certain resources (premises, competences, information, etc.) and put together package offers for customers. The traditionals maintain a greater distance from the public actors and participate in the powerful network of trade organisations, which guarantees them access to information as well as to training programmes leading to specific accreditations. The trade organisations use these accreditations in an attempt to create entry barriers to the entry of new candidates, including the solarists. For lack of a CAP, for example, a solarist entrepreneur with an engineering background cannot be enrolled in the official trade register which would allow him to be recognised as a skilled tradesman and consequently, to gain access to certain accreditations:

'In the beginning, when I didn't exist and I wanted to set up my business, I went to the Chamber of Trade. And there, very simple: I did my engineering thesis on the production of solar collectors. But they told me: No, you're not qualified. They really have some catching up to do!'

Last of all, we observe increasing numbers of networks of materials manufacturers and sales companies (franchises, dealers, private accreditations, etc.) which draw in the installation

subcontractors, the entrepreneurs who have the least amount of resources. These networks offer them the double possibility of distinguishing themselves in the market and obtaining certain resources otherwise beyond their reach (for access to the market itself because they lack sufficient sales capacities). But at the same time, because of their dependence, they become captives of these networks.

3.3 A struggle for the development of training provision

Two years prior to our investigation, training for an ‘installer-maintenance technician in solar and photovoltaic systems’ was introduced by an adult vocational training centre (GRETA) in the Metropolitan Community.¹² This initiative followed discussions amongst local actors (elected officials, the local youth employment mission, professionals, the GRETA etc.) which had brought out the growing need for labour in order to face up to the expansion of the activity and the absence of training offer meeting such needs. Indeed, these problems had hardly been taken into account, if at all, in the training systems. Attempts were thus getting underway to integrate such issues into existing programmes, whether school-based initial training or adult education provided by the AFPA (which was now revising its vocational diplomas and preparing its instructors).

The setting up of this new training programme reveals the tensions and oppositions between diverse conceptions of both the activity and the qualifications. The differing viewpoints brought out by the local consultation correspond to the positions of the different types of businesses.

The disagreements bore on training content. In discussions between professionals concerning the aims and purposes to be given to the training, one large local manufacturer came in conflict with solarist and traditional company heads: the manufacturer defended the idea of basic training in the installation of solar panels and water heaters whilst the other two subscribed to a broader vision involving the training of specialists who would be able to carry out a complete installation.

‘During the discussions, we fought for giving these people a body of knowledge, behind the collector – in other words, when you install a collector, you install a

¹². The GRETAs are a national network of adult vocational education and training centres attached to public schools.

controller and you connect to something. You have to know what you're connecting to, to know what a water supply system is, because we take people coming from unemployment, people who're light years away. So we wanted to give them a knowledge of "plumbing", quote-unquote, because to install a collector the right way, they have to know how to bend a pipe. Afterwards, we said, it would be good for them to know a little about electricity, because the controllers, you have to connect them. So we gave them a little training in electricity, and during the courses, since we opened the door to training courses, the instructors even explained what a boiler was, now because solar is connected to boilers, so that the guy, when he comes up against an installation in a company, he's not going to show up and say, I only know how to install collectors' (traditional company head).

A second divergence between solarists and traditionalists concerned the profiles of the individuals who would be admitted to this training programme (which was intended for job-seekers) The solarists wanted the recruiting to be as open as possible, which would give them an opportunity to attract new profiles into the sector:

'Renewable energies are a fabulous opportunity to attract new people into construction, [people] with a high level of motivation for renewable energies. . . . I don't agree with all the arguments of the trade organisations; it's necessary to open up to people from outside, in order to raise the level' (solarist company head).

Conversely, the traditionalists wanted to restrict entry into this training programme to individuals who already had experience as heating specialists. Their argument was that an overspecialisation in solar energy would not allow the people trained to find a job or set themselves up in business with the best chances of success. In addition, they wanted to be able to hire self-sufficient individuals in a larger field than that of solar power alone.

The training programme (the second of its kind in France) opened in 2006; it had thus admitted its second class at the time of the study. It was addressed at a population of jobseekers who had experience in the building trades and wanted to switch to the installation of solar equipment or set up a new business. The first year, it offered Level V training not leading to a qualification; open to young and adult jobseekers, it was funded by the Regional Council within the framework of a specific scheme (support for local initiatives and territorial projects) and included a total of fifteen participants. The training offered the second year was

more ambitious, notably at the request of the Regional Council, which had integrated the programme into its Regional Training Plan. It consisted of Level 4 training leading to a qualification. The question of accreditation raised a problem, however, because there is no diploma from the French education system in the field. The programme was thus accredited by a vocational qualification certificate (*certification de qualification professionnelle*, CQP) set up by the Union climatique de France (a trade organisation for HVAC installers). In response to the latter's initial reluctance to accredit this training, the programme underwent a partial overhaul which called for integrating photovoltaic energy, not anticipated at the outset, and increasing the number of hours (a total of 1,200, including 686 in the centre). The programme simultaneously prepares trainees for a CAP in thermal energy in order to reinforce their position in heating. This offer thus reveals the compromises between the different stakeholders.

Conclusion

On the basis of our observations, solar installation in France appears to be a locus of struggle than a locus of cooperation, thus tempering the widely held theory of 'coopetition' (Lazega 2006). The role of the public authorities is central. The state is one of the main actors in the emergence and construction of the solar energy sector in France: through regulations, it establishes an obligation; through tax incentives, it stimulates demand and makes it viable. This situation reveals the importance of 'structural' embeddedness (Steiner 2007). At the territorial level studied, local communities also have considerable response capacities for building and structuring this field, through the creation of business support schemes, the funding of training and so on. The trade organisations themselves, in conjunction with the public authorities, play a central role via the definition and attribution of quality labels and certifications. It thus appears that the social networks, even if they constitute a relevant structure, are not in themselves sufficient for creating new activities and markets.

What does the case of solar installation allow us to say about the 'green revolution'? For now, the ways of thinking and acting in force in the different 'social worlds' of solar installation which we have identified, however original they might be, remain embedded in strong, historically situated social, political, cultural and economic realities which influence them. The nature of the changes observed seems more incremental than radical. The entrepreneurs whose modes of thought and action are closest to an ecological alternative, and for whom it is

possible to speak of ‘committed production’ – the solarists – are ultimately few in number.¹³ They do not situate themselves ‘outside’ the mainstream market but are, because of their socialisation and convictions, involved in a specific social construction of ‘their’ market, a construction which is necessary in order to innovate significantly in relation to existing practices. But they have to combine this activist stance, and the profitability of their activity within an overall context of competition. Furthermore, it would be too hasty to conclude that the solarists are the only ones associated with a less mercantile version of solar installation. Through the defence of the trade, and the skills they deem legitimate, the traditional entrepreneurs also set limits to an overly accounting approach to economic exchanges. Many actors qualified as ‘commercial’ are also wondering about ways of preserving an expertise which is less subject to immediate business interests.

Perhaps what is at stake, more than an economic revolution with ecological underpinnings, is a kind of reconfiguration of a capitalism capable of fuelling its expansion with new values, ideologies and practices which provide a basis for inventing, and commercialising, new goods and services still serving the same objective: that of making profit. Is it possible that capitalism itself can be transformed by this reconfiguration and the values underlying it? The ‘green revolution’ may be seen as a vast process of this kind, an opportunity to develop economic activities, to produce new goods and services which must have certain features in order to circulate in a market. This also entails a vast effort of organisation. The market for these goods is constructed and institutionalised through a process of trial and error involving conflicts, alliances and power relations between categories of stakeholders, all of which are the expression of the social relations established between them. But because we are dealing with social processes involving a variety of actors in dynamic relationships with one another, their outcome is never given in advance.

¹³ . ‘Committed production’ echoes the term ‘committed consumption’ used by S. Dubuisson-Quellier (2009).

Amarillo Hubert, 2009, *L'enjeu des qualifications face au défi énergétique et environnemental dans la construction*, Aix-en-Provence, Lest, rapport pour la CGT (sous la direction de Martine Gadille)

Bair Jennifer, 2008, « Analysing global economic organization: embedded networks and global chains compared », *Economy and Society*, vol.37, n°3, pp.339-364.

Boltanski Luc, Thévenot Laurent, 2006, *Economies of Worth*, trans. Catherine Porter, Princeton and Oxford, Princeton University Press.

Boltanski Luc, Chiapello Eve, 2005, *The New Spirit of Capitalism*, trans. Gregory Eliot, London and New York, Verso.

Bourdieu Pierre, 2005, *The Social Structures of the Economy*, trans. Chris Turner, Cambridge (UK), Polity.

Conseil d'orientation pour l'emploi, 2010, *Croissance verte et emploi*, rapport.

Dubar Claude, Tripier Pierre, 1998, *Sociologie des professions*, Paris, Armand Colin.

Dubuisson Quellier Sophie, 2009, *La consommation engagée*, Paris, Presses de Sciences Po.

Eymard-Duverney François, 1986, « La qualification des produits », in R. Salais, L. Thévenot (ed), *Le travail : marché, règles, conventions*, Paris, Economica, pp.239-247.

Fligstein Neil, 1996, « Markets as Politics: A Political-Cultural Approach to Market Institutions », *American Sociological Review*, vol.61, n°4, pp.656-673.

Fligstein Neil, 2002, *An Economic Sociology of Twenty-First-Century Capitalist Societies*, Princeton, Princeton University Press.

Fligstein Neil, 2005, « States, Markets and Economic Growth », in V. Nee, R. Swedberg (ed), *The Economic Sociology of Capitalism*, Princeton, Princeton University Press, pp.120-143.

Granovetter Mark, 1985, « Economic Action and Social Structure: the Problem of Embeddedness », *American Journal of Sociology*, n°3, pp.481-510.

Granovetter Mark, 2003, « La sociologie économique des entreprises et des entrepreneurs », *Terrains et Travaux*, vol.1, n°4, pp.167-206.

Grossetti Michel, Bessin Marc, Bidart Claire, 2010, *Bifurcations*, Paris, La Découverte.

Lamanthe Annie, 2004, « Les industries de la conserve dans la planification des années 60 », *Cahiers d'Economie et Sociologie Rurales*, n°71, pp.57-79.

Lamanthe Annie, 2009, *Le rôle des qualifications dans les dynamiques économiques territoriales de trois territoires : Pays d'Aubagne, Grand Avignon, Briançonnais*, Aix-en-Provence, Lest, rapport pour l'ORM.

- Lazega Emmanuel, 2006, « Capital social, processus sociaux et capacité d'action collective », in A. Bevort, M. Lallement (ed), *Capital social : échanges, réciprocité, équité*, Paris, La Découverte, pp. 213-225.
- Nee Victor, Swedberg Richard (ed), 2005, *The Economic Sociology of Capitalism*, Princeton, Princeton University Press.
- Smelser Neil J., Swedberg Richard (ed), 1994, *Handbook of Economic Sociology*, Princeton, Princeton University Press.
- Steiner Philippe, 2007, *La sociologie économique*, Paris, La Découverte, coll. Repères.
- Weber Max, *General Economic History*, trans. Frank H. Knight, New Brunswick (NJ) and London, Transaction Books.
- White Harrison C., 1981, « Where Do Markets Come From? », *American Journal of Sociology*, n°85, pp.517-547
- Zalio Pierre-Paul, 2007, « Les entrepreneurs enquêtés par les récits de carrières : de l'étude des mondes patronaux à celle de la grammaire de l'activité entrepreneuriale », *Sociétés contemporaines*, n°68, pp.23-81.
- Zalio Pierre-Paul, 2009, « Sociologie économique des entrepreneurs », in P. Steiner, F. Vatin (dir), *Traité de sociologie économique*, Paris, Puf, coll. Quadrige Manuels, pp.573-607.