Towards a territory-based economic model for regional energy efficiency programmes: learning from past initiatives

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Abstract

Many Energy Efficiency programmes have been undertaken in the name of Energy savings and with a view to efficiency-cost assessment. Energy savings targets had to be met. In this case, the relevant question was to find the least expensive way of achieving this when considering a merit order on which EE actions are ordered given a ratio expressed in €/saved MWh. Many energy suppliers have been involved in this programme in order to meet their EE obligations (e.g. in a white certificate scheme) or in the frame of territorial industrial challenge (undersized energy transport or distribution network for instance). Yet such EE local programmes could be carried out in the frame of self-financed and economically viable activity. However, relevant economic models based on a territorial and multi-partnership approach must be identified. This paper is based on the review of several EE regional programmes with the insight of the functional economic model in order to identify key success factors to the development of such economic models.

Findings underlined the crucial importance of the consideration of specific local challenge – beyond energy aspects – when designing an EE scheme, for instance, the problems raised by an aging local population or by increasing fuel poverty. The ability to manage deep partnership with an approach focused on "functional sphere" instead of driven by a traditional sector-based vision is a key point. For instance a comprehensive intermediation activity (technical, financial and professional) is a key added value source to monetize and to convert into financial flow. It is also important to develop a long-term relevant assessment procedure beyond traditional measurable effects (energy savings) and which encompasses intangible effects. These findings should complete popular business-model tools so that this "functional sphere" based vision can be embodied in a more comprehensive, sustainability and territorial-based economic model canvas!

Introduction

The climatic and energy-saving issues are intrinsically linked, as can be seen in the many IPCC reports (IPCC, 2014). Actions to enhance energy efficiency (EE) have concerned energy-intensive industries for a long time (Grubb *et al.*, 2014); they are easily identifiable and suitable for concentrated actions. Buildings, which are set apart from one another by definition, did not draw attention until later on, in spite of their major impact on CO_2 emissions, which have risen from 4 Gt in 1970 to a probable total of 30 Gt in 2030 (IPCC 2007, Noailly *et al.*, 2011). In fact, numerous political schemes (*Energy Performance in Building Directive, Energy Efficiency Directive*) at European and national levels have resulted in more restrictive thermal regulations and national programmes to encourage steps enhancing energy efficiency in buildings, combining regulations, grants, energy-saving certificate systems and tax credits (BPIE, etc.). These programmes are based on a cost-efficiency analysis for long-term actions: starting from a predefined target level of reductions in energy consumption, the aim is to identify the actions that bring about such reductions at the lowest cost. This presupposes establishing a merit order that classifies these actions by increasing ratio expressed in EUR per MWh saved (Grubb, 2014). The energy companies

can be asked to participate in such programmes, for example in France (EEC system) or the United Kingdom (past EEC programmes, Warm Front, ECO, Green Deal, etc.).

Nonetheless, the progress made in energy efficiency for buildings would seem small as compared with their technical potential (IEA, 2014) and even their technical and economic potential (Grubb, 2014), as numerous energy efficiency actions in the building industry would have a positive net present value (the financial evaluation of the cumulative, adjusted energy savings would exceed the initial investment) over their service life.

Moreover, in this logic, the energy suppliers are considered as players on which it is necessary to place constraints, and they are indeed seen as such, because of their special customer relations. Nevertheless, the effects linked to energy efficiency actions go much further than simple energy savings, and many non-energy benefits have been highlighted (IEA 2014) such as reductions in local air pollution, the impact on asset value, health and well-being, economic growth and jobs (macro-economic impacts and employment), etc. (IEA, 2014, Ürge Vosatz *et al.*, 2009).

Indeed, methods with broader perimeters have been implemented for economic evaluation of energy efficiency programmes (CPUC 2011, National action Plan for Energy Efficiency, 2008, Osso *et al.*, 2016) and their deployment will enable more pertinent assessment of their economic advantages. However, these evaluations, which stem directly from cost-benefit analyses (CBAs) and not cost-efficiency analyses, rely implicitly on the Kaldor-Hicks criterion stipulating that the players who "win" (expressing a Willingness To Pay) are "able" to compensate those who "lose" (expressing a Willingness To Receive) (Pearce *et al.*, 2006). This vision was pertinent for a long time to define public policies of "all-powerful states" that were able to take on both roles, make the major initial investments and deal with the consecutive transfers. Now that states have lost some of their capacity for financial involvement, integration of private players has become necessary, and the latter are not likely to make any such broad-based CBAs if their own private interests are not brought to the fore. Thus at a sub-territorial level (district or block), joint methodologies have been put forward for broadened economic evaluation of energy efficiency projects and developing compatible economic models (Nösperger *et al.*, 2016). However, at a territorial level, the link between economic evaluation of energy efficiency programmes and economic models of the companies behind the programmes, based on multiple partnerships and encompassing the territory, would not seem to have been examined in depth. *Ad hoc* (*ex-ante* or *ex-post*) evaluations of regional energy efficiency programmes (Guennec et al., 2009, Osso *et al.*, 2016) or national ones (Tirado-Herrero, 2011) have thus shown creation of potential value that goes far beyond energy savings and could hence remunerate the private players instigating them.

This article sets out to analyse several energy efficiency programmes orchestrated by EDF in various regions of France and based on the functionality and cooperation economic model in order to identify key factors for the emergence of viable economic models linked to these programmes.

The first part includes a brief presentation of the stakes involved for these various regional energy efficiency programmes, while the second part examines the notion of economic model in greater detail and sets out in particular the key principles underlying the functionality and cooperation economic model. The following part goes over the key factors of success identified. The concluding part identifies development and analysis actions and sets out in particular an alternative to classic business model definition tools that would seem more suitable for dealing with territorial energy problems.

Presentation of the regional energy efficiency programmes

Regional or local energy efficiency programmes are of particular interest as they tackle local constraints which are not always targeted by national energy policy (Raynaud et al., 2015). Moreover, local programmes can be designed to better comply with area-specific factors which a national policy cannot do (Aste et al. 2014; Blackhurst et al. 2011; Broc 2006). For example, in France, various regional energy efficiency programmes including supplementary targets like economic support (EDF 2010; Suerkemper et al. 2012) or electricity supply management (EDF 2014) have been set up. Such programmes are briefly depicted in this section.

THE MDE 52-55 PROGRAMME

In the French *départements* of Haute-Marne and Meuse located in the east of France, EDF has set up a territorial energy efficiency programme in partnership with the *département* councils, with a view to encouraging efficient renovation of publicly owned buildings (whatever their heating energy source) on the one hand, thus reducing the residents' energy bills, and on the other hand accompanying the professional activities to enable the firms concerned to organize training and methods to meet the demand stemming from these programmes. Moving beyond wide-ranging, technically demanding energy renovation, the programme, which has been named MDE 52-55, is aimed over the long term at creating or maintaining highly qualified jobs on that market. A specific structure has been implemented under the programme to accompany innovative industrial concerns, artisans, and the various meetings and deliberations within the field of activity and among the local authorities. Under the programme, two local initiatives have been set up to accompany overall housing energy renovations (structures and systems) carried out by joint ventures involving firms in various trades:

- In one village, thanks to the personal involvement of the mayor, who literally went canvassing door to door to tell the local residents about the local system covering energy audits, recommendations, preparation of renovation projects and the corresponding financial files, execution of the work and subsequent inspections (Kotnarovsky et al., 2013);
- In a sub-prefecture with a population of 7,000: implementation of a joint interest cooperative society (SCIC) to cover an offer of energy performance contracts for the residential sector. The local authority takes part in governance of the society, together with the firms carrying out the work, the customers and EDF(Kotnarovsky et al., 2016);.

ENBRIN (ENERGIE BRETAGNE INNOVATION)

The French State, the Brittany Region, RTE (French TSO), ADEME (French national energy & environment agency) and ANAH (French housing agency) entered into a commitment

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in December 2010 to implement an energy saving plan for the Brittany region (NW France) aimed at securing the electrical future of the region (EDF, 2015). In particular, EDF has set up the ENBRIN programme to achieve the following objectives:

- Accelerating and increasing demand management for electricity consumption,
- Developing centralized and decentralized renewable energy sources,
- Optimizing existing electricity production,
- Contributing to reducing greenhouse gas emissions.

The ENBRIN programme was applicable for home renovation actions such as insulation, installation of a biomass heating system (stove or wood insert, replacement of existing electric direct heating by a heat pump …), or replacement of existing electric direct heating by a heat pump. This programme entitles households to subsidized loans through Domofinance (a subsidiary of EDF). Moreover, white certificates of compliance with an energy efficiency obligation (EEO) are issued for completed renovation actions, for EDF (ATEE, 2014).

JE RÉNOVE BBC (ENERGY EFFICIENCY PROGRAMME IN THE ALSACE REGION)

In November 2008, the Alsace Region and the EDF Group (EDF and ES[1]) signed an agreement covering sustainable development for Alsace. Under the agreement, two regional programmes were implemented (”50 Chantiers Pionniers” - “50 Pioneer Sites” - between 2008 and 2010, followed by ”Je Rénove BBC”- “I renovate BBC”- from 2010 on) with a view to supporting energy renovation for individual houses (the main type of housing in France) to limit levels of greenhouse gas emissions, and reduce energy consumption while avoiding and combating energy insecurity. In all, just under 500 individual houses were the object of general energy renovation to reach a level equivalent to “low consumption”, applying two key principles: giving priority to enhancing levels of external wall insulation and implementation of a specific control and accompaniment procedure for each operation (obligation to entrust work supervision to a qualified project manager). The EDF group, the Alsace Region and the local authorities provided financial backing for the work via grants covering part of the work and supervision costs, mainly for insulation work.

ENERGY EFFICIENCY PROGRAMME IN PROVENCE ALPES CÔTE D'AZUR

The Provence Alpes Côte d'Azur (PACA) region is located at the end of the power network, and it can be seen as a peninsula from an electrical standpoint, as the local production represents just 40% of consumption. As in Brittany, the situation is particularly difficult due to generalized development of new buildings and the corresponding consumption (air conditioning, lighting). Further difficulties arise from the absence of a unified joint policy on the part of the elected officials and the impossibility of installing new structures (high-voltage lines, power plants) because of the high levels of urban density. Indeed, they would have to be installed in protected areas (which are the only areas still available) and projects of this type are faced with the opposition of the local residents. There are three complementary ways of securing electricity supplies for the PACA region:

- Support for energy efficiency actions such as the energy renovation operations. Here, however, this aspect would not seem to constitute the linchpin of the scheme;
- Intelligent management of the networks and the load curves, on the other hand, constitutes the core of the project (in communication and technical experimentation). Systems offsetting calls for power (or smoothing them out) keep regional demand for power at a level compatible with the regional production and transport capacities. These intelligent networks should also facilitate integration of the distributed power generation units that are to become an integral part of the future overall electricity supply system.
- Networking between innovative start up and urban projects such micro district heating or zero carbon districts …

The functionality-based economic model in chart form

The economic model implies (du Tertre 2011, Nösperger et al, 2015.) gathering the following prerequisites:

- A basis for value creation and distribution (capturing) between the actors;
- The basis and formal structure of relationships between actors (contracts, formal or informal partnerships, “cooperative” society, etc.);
- Sources of mutual investment or financing operations;
- The nature of work performed by these players: skills, qualifications, activities produced independently or co-constructed (co-production).

The scope covered by the concept of economic model is larger than the business model, which is its monetary (financial) translation. The following table helps to distinguish these 4 economic model types under two criteria:

- The consideration of territorial context;
- A service-oriented approach (with a strong interaction with the client) vs. an industrial approach (top-down approach relying on the deployment of one designed solution with limited interaction with clients).

A Functional Economy (or Service Economy or Performance Economy) (Stahel, 1994, 1997, 2006) is based on the production and sale of a solution comprised of an integrated and compliant set of products and services realized by a service provider. The customer no longer buys goods but rather a service which provides the needed goods. The functional offer is implemented by both the service provider and the client in the framework of a co-constructed process. The service provider contracts with the customer to ensure results and performance. The economic agreement deals with an assessable performance (for instance the energy performance of a building) rather than with the supply of disjoined products and services (Stahel, 2006; du Tertre, 2011).

The functional economy model offers several relevant and original ideas for the economic analysis of regional energy ef-

1. Electricité de Strasbourg, a subsidiary of EDF since 1954.

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Table 1. Overview of economic model types (du Tertre et al., 2011).

	Lack of territorial involvement	Presence of territorial involvement
Industrial logic/ Tangible technologies	"Clean industrial" model	Model of "industrial ecology"
Services logic/ Intangible technologies	Model Intelligent services involving the beneficiary	"Functionality and cooperation" economic model

ficiency programmes (Nösperger et al., 2015, Guennec et al., 2009):

- **The incorporation of external factors (externalities) in meeting functional needs**. Unlike some assessment methods, which incorporate external factors (the "polluter pays" principle, carbon credits, and energy saving certificates) as "obligations" to be respected, the Functional Economy model considers externalities as value-creating opportunities inasmuch as they can be integrated in the functional offer process. For instance, the external effects of one stage in the process can be a resource for another stage: a global programme for school energy retrofits might have an impact on local employment, provided the selected solutions are consistent with the skill level of the local work force. This programme is therefore a resource for the economic development programme of the local authority. Another example is the impact of energy retrofit programs on indoor air quality, which has been proved to influence the health and productivity of building occupants.
- **The creation of value is distinct from the production of objects**. It constitutes a real break with current economic models. In the Functional Economy theory, value depends, among other things, on gains achieved through integrating operations and valuing positive environmental and social external factors by adopting a broader performance assessment scope consistent with local territorial challenges (infrastructure development, local employment, attractiveness of the local region, etc.). This creation of value in such projects depends therefore on closer cooperation between private actors and local public bodies, the latter considering it relevant to contribute to (or to partially fund) them. In the Functional Economy model, the creation of value is no longer related (or with a weaker link) to physical production, which is the basis of sustainable development.
- **A high level of interaction with the economic development of the local area**. Territories are not just seen as a "neutral" location where economic activities are developed: they are considered as service co-constructors and resource providers. In this perspective, the service provider has strong interactions with the territory during the response process, which can generate local economic value creation. In the case of a building-related project, this local economic value creation is likely to trigger potential co-funding opportunities for this type of investment, therefore presenting a more attractive situation to the building's owner from a financial perspective.

During analysis of these programmes, the 4 key economic model characteristics referred to above were dealt with by examining how they were adapted to each programme and how they could have been adapted under a functionality-based economic logic. The rest of this article sets out the main conclusions stemming from the analyses of these programmes, regarding their "services based" aspects, and goes on to examine the conditions under which one or more players could accompany the territorial energy programmes within the framework of a viable economic model.

Moving towards regional programmes for control of energy demand under a "services based" logic of intermediation rather than an "industrial" logic

The aim of this part is to identify the nature of EDF's activities in the previous regional energy efficiency programmes to enable their implementation. These added value activities will be used as a basis for an economic model that is suitable for deployment (but not for duplication) of this type of local or regional programmes.

The traditional dynamics of an industrial approach consists of designing a project (designed as a product) that best reflects the representation that the firm has regarding demand, and then arranging for it to be accepted. When the project objective shifts towards contribution to local development, the project design activity moves towards joint design work, in order to take account of the expectations of the potential partners as far upstream as possible.

CAPTURING THE DYNAMICS OF PLAYERS IN A CENTRAL ROLE OF INTERMEDIATION

This new approach, which is "services based" to the extent that the project is designed jointly in the same way as services, leads to redrawing of the pertinent perimeter for the partners and giving the players in charge of intermediation a central role.

Analysis of the programmes referred to above shows that four types of players are concerned by the projects: the territorial authorities, the specific institutional players in the fields of activity such as those in the building industry sector, including the professional federations (CAPEB - artisans federation and FFB-building company federation) and the occupational training organizations, the partner artisans themselves and the local population, as the final beneficiaries of the renovation programmes.

Local authorities

Regarding the territorial authorities, the aim is to set up a type of "political agreement" in the sense that the project as determined has to form part of the political priorities of the institutions considered. Taking into account the complexity of the issues involved, it can be easier for a player wishing to imple-

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ment economically viable renovation programmes of this type to start by contacting mayors, as the operational aspects of the projects are usually quickly understood by the municipality or the federation of municipalities. This was the case in the Meuse and Haute Marne *départements*. However, the extension of the project should lead the guiding entities to set up relations with the political territorial institutions on a wider scale. This change of scale consists of taking initiatives regarding the political and institutional bodies, which act over greater distances than the mayors, as regards the actual ways of life of the local populations. In fact, the idea here is to carry out activities whose end purpose consists of taking into account the political strategies aimed at territorial development at a more global, complex level, and finding the most efficient way of inserting the energy-saving project in those policies. This entails a specific activity of intermediation at the intersection of the operational and political spheres.

The institutional players in the building industry sector

Concerning the players in the building industry sector, the purpose here is to be able to mobilize various trades, to the extent that the effects of renovation on cutting energy consumption require implementation of synergies between the technical approaches of the various trades involved (Nösperger *et al.*, 2011). From this standpoint, the diagnostics activity regarding the condition of the buildings, which determines the operations to be carried out, is essential. In fact, it has to be admitted that the technical expertise of the artisans, even those holding certification, is insufficient (Nösperger et al., 2011, Killip *et al.*, 2013). It does exist, but it requires complementary, specific technical expertise that is specialized in diagnostics, whose scope widely exceeds that of a given trade. The tasks here involve global expertise, i.e. the ability to draw up evaluations, make recommendations and carry out energy renovation work covering the full range of the structures (insulation, heating, ventilation). This expertise activity involves technical intermediation, which in fact reaches beyond the issues of diagnostics and involves the ability of the artisan concerned to interface with other trades (Nösperger et al, 2011). It would seem important for the occupational training organizations to be able to enhance, in their training offer, the modules covering the strategic nature of regulating the interfaces between different trades. Indeed, each artisan has to move beyond mastery of the technical aspects of renovation corresponding to his trade, and also be familiar with the issues involving other trades with an impact on the systemic approach of renovation and its effects on cutting energy consumption (Frances and Tricoire, 2016). Collective learning processes have to be applied. This presupposes feedback from experience to enable the players in the building trade to fully master the times, forms and technical aspects of suitable regulation of the interfaces. A player wishing to play a central role in energy efficiency programmes is called on to supervise these collective technical learning processes and encourage their dynamic implementation, jointly with a the institutional players in the sector (such as trade organizations for example).

Artisans

Over and above the technical aspects referred to above, the decisive issue concerning artisans is that of being able to take the residents' expectations into account, in order to adapt their approach and their work to suit the specific uses of the housing and their customers' ways of life. This ability to listen forms part of the skills that are not covered during training courses, but are acquired on the basis of feedback from experience and discussions between people at equivalent levels. It is useful to make arrangements for this type of discussions to take place between artisans, concerning their understanding of customer expectations in particular. This comes under the heading of boosting intangible investments, which it should be possible to further and finance on a joint basis between a central player, the territorial authorities and the trade institutions. Moreover, a project can lead to improved relations between the artisans involved, through the emergence of joint ventures run by that player and able to provide such interfacing (Nösperger *et al.*, 2011) while taking steps to maintain the spirit of freedom among the artisans taking part in the joint venture. The advantage of implementing this type of structures is that they enhance the quality of the interfaces, and more generally that of the links that are built up between members of a given joint venture. The fact of setting up joint ventures facilitates awarding of approval, especially at the level of a municipality or a federation of municipalities, which can act as a lever to strengthen the trust that is essential for the project. Trust is a strategic intangible asset of a project that has to be preserved, maintained and developed.

Residents

Communication with the residents represents another key activity of a project. This is more than just information, in the sense of informing the residents about the project; it involves communication, i.e. the ability to listen to the residents, and take in to account their "ways of seeing" and their "ways of thinking" as the project progresses. Without such communication, which involves visits, surveys, and public meetings, the various categories of residents are unable to express their reservations and expectations, or talk about their ways of life. Indeed, there is much more involved than just providing an offer of renovation; it is also necessary to include the will to renovate in an approach that pays special attention to changes in use of the buildings by the residents. If the customs and their specific local aspects are not taken into account, the initiative could well fall flat and fail to trigger the dynamics of development. Communication is one of the intangible activities that are vital for success of a project. The projects also proposed financial arrangements for the residents to help them to meet the major outlays entailed by renovation of their housing.

This stakeholder scope can be enlarged to social housing organisations or private landlords.

In fact, the projects concerning reductions in energy consumption referred to above involve promoting three support systems covering the fields of finance, technical expertise and communication. These support functions constitute activities of intermediation (financial, technical and communicational intermediation).

FROM INTERMEDIATION TO INTEGRATION ACTIVITIES

The possibility of implementing a project that lies within the scope of local development depends on the ability of the local players to adopt the territorial energy efficiency programme,

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and inversely, on the ability of the enterprise backing the programme (EDF in the examples above) to take its partners' constraints and issues into account. The players in charge of the intermediation activities play a strategic role here. That role is different from the one played in the traditional framework of "local" deployment of an "industrial" programme.

Financial intermediation

One of the main requirements of the projects, especially those linked to overall renovation, concerns the financial engineering to be implemented. The MDE 52–55 programme involved specific interest-free loans, arranged mainly via Domofinance, EDF's financing subsidiary. On the other hand, in the overall renovation project covering only a small village, it was the artisans who took on the role, explaining to the residents the conditions for obtaining loans, helping them to draw up their application files and forwarding the files to Domofinance. In a way, the artisans widened their field of skills by taking on activities that were not assigned to them beforehand.

On the other hand, in the overall renovation project covering a small town (Commercy), the change of scale entailed a leap in the complexity of the approaches. A new professional player would seem useful here: in this instance it took the form of a new structure professionalized in the field of intermediation activities, SAVECOM (Kotnarovsky et Lejeune, 2016). Its status as an SCIC (Cooperative Society of collective interest) enabled it to mobilize the local partners of EDF (local authorities and joint ventures set up by artisans) in its society capital and its governance system. In fact, the process led to the emergence of a new player with an activity of intermediation.

Technical intermediation

This intermediation activity is also deployed in the technical field. Originally, as the field of technical expertise exceeded that of the artisans, it was dealt with by the EDF R&D division, which took on the twin roles of design firm and tool designer. The division is able to design and mobilize tools that can be used to assess the level of pertinence of a given technical solution. The EDF field technical sales experts reporting to the sales divisions will soon be able to familiarize themselves with the tools designed by the R&D division.

However, as the project evolves, the issues of financial and technical intermediation grow increasingly complex and are broadened to cover social and institutional communication. In the light of the prospects of increasingly local dynamics of development, the EDF R&D division on its own is no longer able to deal with the issues involved. A logic of transferability of knowledge is envisaged. This process cannot be implemented spontaneously and it involves more than just training logics. An accompaniment enabling problematization and contextualization of knowledge has to be undertaken. This accounts for the growing predominance of the role taken on by Savecom in the intermediation activities stemming from the technical field, over and above the financial aspects.

Communicational intermediation

There are also requirements involving accompaniment and organization that stem from communication. The latter entails specific skills. These skills are linked to economic, management and relational expertise (sense of politics) rather than technical skills. In some aspects, these skills are linked to consultancy and research in social sciences.

From an intermediation function to an integration function

Although the actions of all the players involved in the projects are partially linked to the dynamics of intermediation, the success of the projects as they grow larger in scale entails the emergence of a player able to deal with this field of action from a professional standpoint. In the case of the Haute Marne and Meuse *départements*, the new structure (SAVECOM) emerged at the initiative of EDF. Nonetheless, the increasingly structuring role of this player in the project is becoming a lever for the extension and success of the project. In a way, although EDF dealt with initiation of the project and the intermediation player, the long-term structuring of the project will depend on the stability and the professional character of the newly created intermediation structure. There is a difference between the initiating player (here, EDF) which played an essential role, and the structuring player (here, SAVECOM), which is positioned locally as an integrator. This is the specific aspect of local development relying on services dynamics.

This part showed the role of this triple intermediation (financial, technical, and communicational) in implementing regional or local energy efficiency programmes. It has also shown that it was possible to provide a complete offer on a wider, more systematic scale, provided that such triple intermediation is included in a new structure. However, as stated in the introduction to this part, an industrial logic cannot be applied in the form of systematic replication of an integrating structure of this type, even with strong territorial anchoring. The following part sets out the conditions under which a viable model can be developed for promoting a regional energy renovation programme.

From furthering a regional energy efficiency programme to furthering a regional development programme through EE

It is possible to design an economic enterprise model around territorial development based on energy issues, but this involves moving beyond mutual agreements towards more systemic actions, to envisage new missions and undertake new activities. From this standpoint, it is necessary to cover not only the direct, immediate aspects of projects, but also the indirect, mediate ones linked in particular to the intangible side of the activities associated with the projects: the competence of the players, the trust between them and the pertinence of their actions are key levers for extension of the projects and their effects on local development.

COMPETENCE/TRUST/PERTINENCE: TOWARDS CONSOLIDATION OF TERRITORIALIZED INTANGIBLE ASSETS

The progress in the competence shown by the players in the building industry sector is undeniable, from a technological standpoint (like the programme in Alsace), and also as regards management of complex projects or relational aspects. The progress in the quality of relations between artisans and residents,

and also between artisans and all the other territorial players, constitutes a strength for future projects in France. It is also useful to point out that new competencies have emerged in the country. This is the case, in particular, for competencies in financial, technological and communicational intermediation via the creation of Savecom.

Trust between players has been another decisive element in the progress shown by the projects. It has been furthered by all the partnerships: the commitment shown by the local authorities (even personalized by the mayor in the case of the renovation project in a village), creation of joint ventures between artisans, the prolonged aspect of the commitment shown by EDF in each locality, mobilizing various competencies within its structure or in that of its subsidiaries, have all been decisive. Trust is also to be seen outside the mutual agreements, drawn up between two of the players; it forms part of a dynamic collective effort relying on the systems set up.

The pertinence of the arrangements between players and the solutions proposed for residents tends to progress: pertinence of the systems set up to ensure the reliability of the technical solutions, adequacy of the solutions for the residents' ways of life, etc. The artisans, for their part, highlight the pertinence of the system by setting up joint ventures.

In fine, competence, trust, and pertinence represent three facets of a single intangible process representing a set of resources that are essential in encouraging local and regional development. A player furthering a regional energy efficiency programme as a source of economic development is at the core of the efforts to constitute that asset. The success of the projects and their extension are based not on miraculous solutions, but on the ability to implement these three "key" intangible resources, initially on a small scale, and then at a more ambitious level.

These intangible resources are not independent; they strengthen (or weaken) one another mutually. In all projects or actions, the players have to trust one another. This is a prior requirement. On this basis, competencies can be applied. They never correspond completely to the requirements and ambitions of a project, but they enable all concerned to move on to an operational level. This gives rise to an iterative process between the players, whose aim is to enhance the pertinence of the solutions designed and provided by the project, even if this entails acquiring further skills. This iterative process is difficult to apply, because it presupposes that there are entities in charge of providing feedback from experience, places for communication,

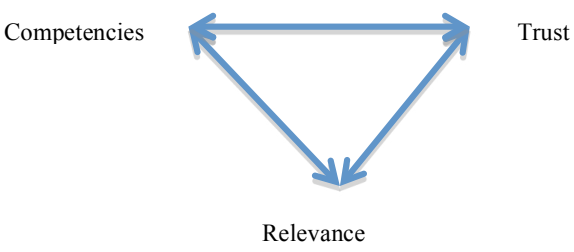

Figure 1. Shared intangible assets.

and a main player taking on a role of intermediation and considered as legitimate to ensure governance and integration of the project. Once the impetus has been given, trust is strengthened and a virtuous cycle enhances the synergies between these three strategic assets. Progressively, the impetus thus gained enables launches of projects of an increasingly complex nature; the competencies evolve on the basis of feedback from experience and the fresh knowledge that the intermediation organizations are able to provide. These intangible resources tend to grow and constitute an intangible territorial asset that is available for new development projects.

A NECESSARY OVERLAP OF REGIONAL ENERGY EFFICIENCY PROJECTS IN FUNCTIONAL SPHERES

The projects presented here were often initially centred on building renovation work with a view to enhancing the energy efficiency of housing. However, the impetus given has indirect effects on other issues that can be considered as important by the territorial players. Although the indirect effects of the projects are considered as "incidental" by EDF, they can take on far greater importance for the other players.

In the "village", for example, the project was set up as an energy saving project. However, it very quickly tied up with the mayor's project to make up for the fact that although the traditional wood-fired heating system based on collection agreements was almost free of charge, it was nonetheless beyond the reach of the elderly. The renovation work also provided a means of facilitating access to other types of heating and hence enabling the elderly to stay on in the village on an autonomous basis. Here, the financing implemented by EDF provided a way of ensuring that the financial resources of the elderly were no longer an obstacle to their remaining in their homes over a long period. On a dynamic basis, this could have led all involved to reflect on the links between the possibility for the residents to continue living at home and their state of health. In other words, the "energy efficiency" input comes within the scope of more wide-ranging concerns linked to a sphere of activity associated with enabling the elderly to continue living at home and maintaining their state of health.

In Commercy, the EDF project tied in with the mayor's firm intention to deal with fuel poverty. The question of the residents' income over the long term was posed. In Alsace, the issue seemed to be centred on setting up a highly qualified, competitive sector to counter enterprises from neighbouring countries (Germany and Switzerland) that enjoyed good reputations and charged competitive prices rather than on a logic oriented towards the residents. In the PACA region (south-east France) and Brittany, the issue was that of local development, and in particular accompaniment of demographic changes, in a context of long-term limitations in the capacities of the transport and distribution networks (Osso *et al.*, 2016). They could be reviewed in the light of possible laying of underground cables, on completion of any such scheme.

DEVELOPMENT OF AD HOC ASSESSMENT SYSTEMS THAT MOVE BEYOND QUANTITATIVE ASPECTS

To determine how energy efficiency projects contribute to territorial development through the dynamics of integration of activities stemming from a "functional sphere" logic, it would seem necessary to implement an assessment system that goes beyond

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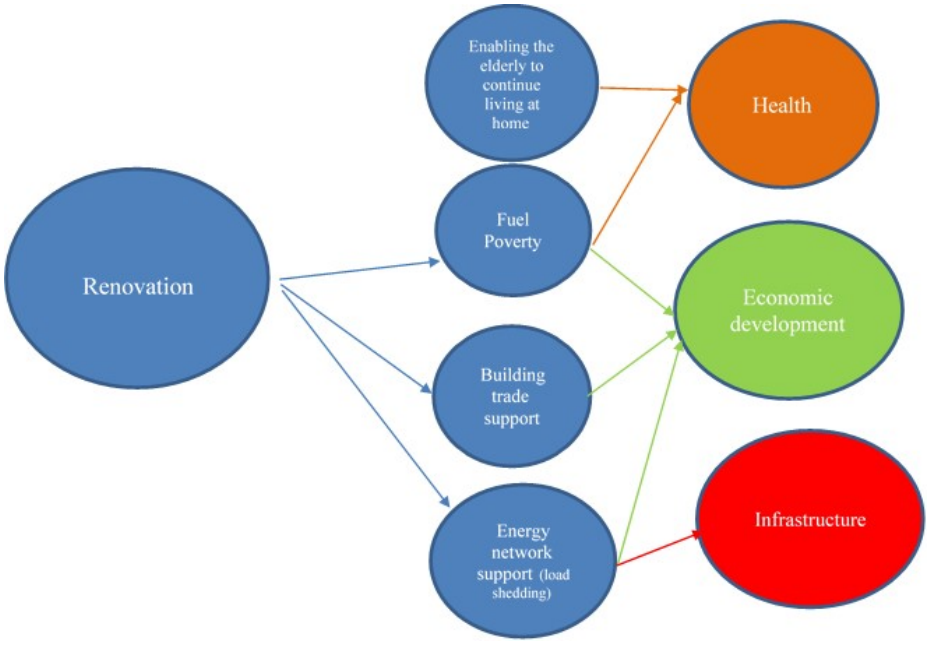

Figure 2. Overlap of functional spheres around a regional energy efficiency programme.

the initial issues and the material aspects of the projects, the ones that are measurable and countable (i.e. quantitative).

A project assessment centred on immediate, easily measurable results (this is rarely the case for non-energy benefits, which are noted over the long term) fails to take into account the indirect and long-term effects, which can have a strategic impact on development of the territory. The idea here is to assess in what ways a project creates new resources that can be mobilized for others subsequently. The fact of limiting assessments to measurable aspects (even if they concern NEBs) can entail failing to note intangible resources and their contribution to development of the territorial assets.

To take these issues into account, the assessment system has to include procedures that involve paying careful attention to "events" that point to growth (or shrinkage) of the intangible resources: competence of the players, trust between partners, and relevance of the solutions put forward. It is also necessary to trigger events that are able to reflect the evolution of the intangible assets that can be re-mobilized in other projects. In the light of this prospect, the collective identity evolves, an evolution that is usually underlined by the production of specific expressions translating a memory that is being constituted. The increasing levels of diversity among the players involved in the projects and the solutions put forward is also a clear sign of evolution in these intangible aspects.

In other words, the relevant, legitimate aspects of the assessment system are essential for the dynamics of the territorial development undertaken. The times at which these assessment activities are carried out are a strategic factor. They stem from discontinuous processes. In fact, the assessment takes on a recapitulatory or accounting aspect (covering the efficiency of an action) and a learning aspect (understanding and improving the actions). This helps to further strengthen trust between players, their competencies (their ability to act in the light of their know-how and their environment) and the relevance of their interventions.

Conclusion: From furthering a regional EE programme to furthering a regional development programme through energy efficiency

The previous parts have shown that deployment of regional energy efficiency programmes on an economically viable basis cannot be designed on an industrial basis; it requires close cooperation with the economic, political and financial players in the territory. Indeed, if such programmes reach a certain size, space has to be left to enable a recognized, legitimate player to ensure the financial, technical and communicational integration of the projects in close cooperation with the partners in the territory. Such legitimation cannot be imposed under a logic of authoritarian projection of a national model at a local level; it has to be based on the ability to bring about fructification of a local intangible asset of trust between players, competencies and relevance of the actions. To fully embrace the territorial aspect, regional programmes have to shed their initial aspect of "energy efficiency", which stems from a non-territorial view, and become programmes of territorial development through energy efficiency. This change of attitude is aimed at integrating energy efficiency programmes in a wider functional sphere that meets a specific issue for the territory (attractiveness; combat against poverty; ageing and enabling the elderly to continue living at home).

A player wishing to adopt this central role of intermediation/integration has to develop new working methods on an internal basis:

- A culture of cooperation. The progress made in the work highlights the importance of cooperation regarding coordination. Coordination enables new links to be forged between elements that have been separated by the processes of specialization and professionalization based on the division of labour. It is hence the counterpart of segmentation of activities. Cooperation entails the necessity of taking the constraints and competencies of others into account in the

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ways in which each staff member carries out his work. It also refers to the meaning and end purpose of the projects.

- Drawing up a shared doctrine. Cooperating presupposes sharing the same "values" and the same references. Indeed, the quality of cooperation depends on the conditions under which the players' approach is based on shared "ways of thinking". A doctrine is hence required at all times. Its relevance is well worth working on explicitly, outside any single industrial logic.
- Making the most of feedback from experience. To enable the doctrine to take on an operational scope, it has to be in phase with the players' experience, i.e. it must enhance analysis of the positive or negative aspects of the actions. Feedback from experience is thus essential. For example, it would seem essential to translate the competencies stemming from energy questions into related competencies that enable links to be set up between energy issues and issues concerning other factors. The teams then have to have "analysis charts" at their disposal, linking the doctrine to structuring elements of the project and hence facilitating operational involvement in full awareness of its indirect effects.
- Development of professional attitudes. Any such dynamics presuppose changes in attitudes towards the question of specific trades. The latter are not only structured around professional knowledge or skills; they also involve "professional attitudes". This is the case in particular for a "listening attitude" regarding the other players' expectations, which is essential within the framework of an activity aimed at local territorial development.
- Communication. This is not limited to information; it is a fully-fledged activity that reflects the strategic role of cooperation. It involves listening as much as passing on information. In some of the programmes analysed, the former technical sales activities tend to evolve towards more relational aspects and searches for specific solutions based fundamentally on a services innovation strategy.

The traditional design aid tools used to draw up economic and business models, such as the Business Model Canvas (Osterwalder & Piguer, 2010) are not fully relevant for an activity as an integrator of a programme for regional development through energy efficiency. Although concepts such as "key activities", "key resources" (which can be tangible or intangible), and "value propositions" are indeed suitable, the view of a bilateral relation between an offerer and a customer (or two within the framework of bi-facial offers), represented by the "customer relationships", "customer segments" and "channels" sections, have to be completed under a logic of development of multiple intermediation activities (and hence linked to numerous "beneficiaries" and "partners"). Indeed, moreover, the territorial aspect would not seem to be vital in this type of approach, and the questions of external aspects, systems of players (dealt with solely from the standpoint of "key partners"), and direct and indirect beneficiaries are not covered. This means that the financial aspect (the business model) is seen only as a question of cost structures and revenue streams (which are of course essential aspects!) and it hence neglects the questions of shared costs and tangible and intangible financing. Its static view does not enable us to assess the methods for strengthening (or weakening) the intangible assets either: which activities enable us to obtain feedback from experience? Or to regulate working methods? How do they develop competencies?

These business model design aid tools have to evolve towards a wider canvas of identification of economic business models that also include the social and environmental aspects of sustainable territorial development. That canvas has to deal as a central matter with the question of the positive external effects of the activities linked to the programme (defined initially as an energy efficiency programme) – how are they internalized in a logic of territorial development? – and that of the effects of reflexivity (how the activities linked to the programme involving multiple players reinforce mutual trust, the competencies of each and in fine their relevance in the face of the territorial issues identified). An example of a canvas of this type is shown in Figure 4.

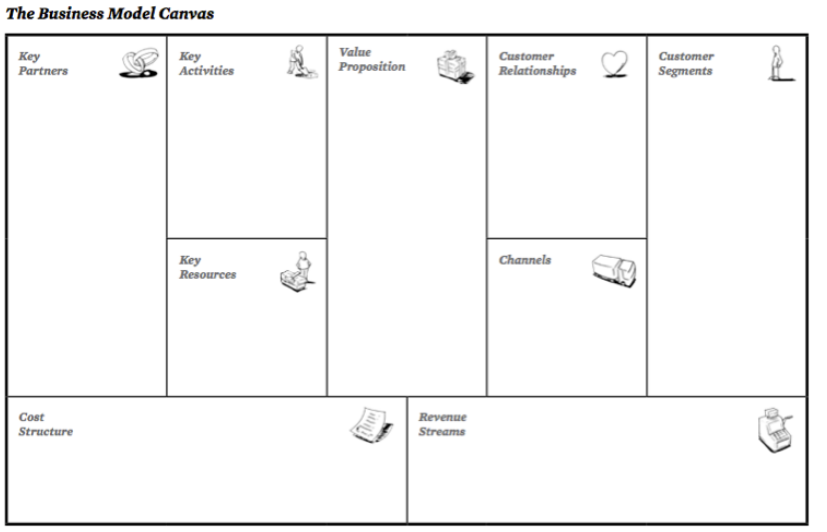

Figure 3. Business Model Canvas (Osterwalder & Pigneur, 2010).

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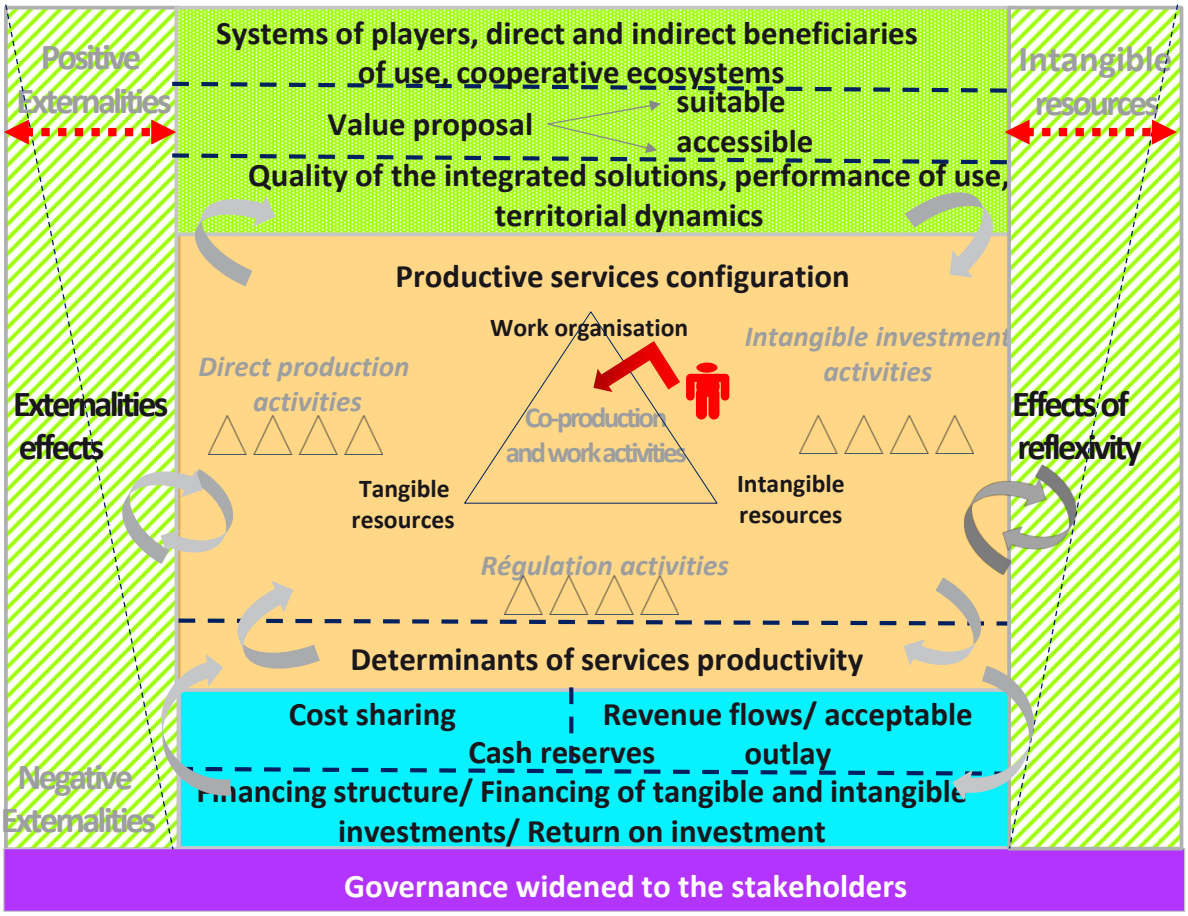

Figure 4. An economic model canvas adapted to suit programmes of territorial development through EE.

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