



EMCC case studies

Energy sector: Basque energy cluster, Spain

Introduction

The historic context: Creation of the cluster

Cluster de Energia – the Basque energy cluster

Activities and cluster synergies

Challenges and future activities

Summary

Contact details

Bibliography

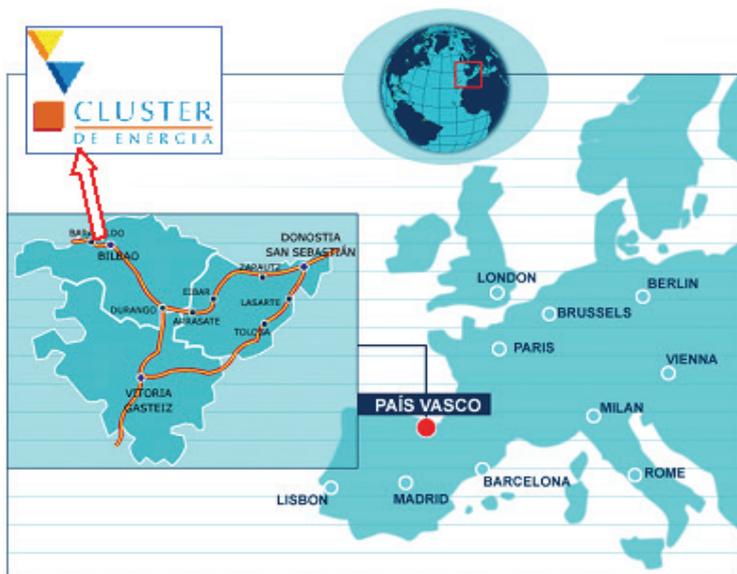


Introduction

Energy is one of the most important building blocks of modern society, and the energy sector has played a crucial role in European treaties and policies since the very foundation of the European Union. Further, along with the liberalisation and commercialisation of the energy sector, private investors as well as governmental bodies and agencies have realised that the energy sector is not just crucial for business in other sectors, but is also big business in itself, creating many jobs and ensuring economic growth. The ongoing climate debate and the EU policy on lowering CO₂ emissions have put an even stronger focus on the substantial existing commercial opportunities for companies, regions and countries that are able to develop and deliver the highly demanded renewable energy and the connected technology.

The development of a strong and innovative energy sector has therefore become an explicit aim of industrial and competitive policies in the EU as well as in many of the Member States. This has resulted in an increasing number of regional cluster projects and initiatives within the European energy sector, which aim to make companies along the energy sector value chain join forces in creating a competitive and sustainable energy sector, thereby creating jobs and value for the specific region or country.

Many of these cluster initiatives and formations are only in their initial stages. However, in the Basque Country (País Vasco) in the north of Spain, the local government understood the economic potential of having a strong and innovative energy sector as early as the mid-1990s. Together with key energy players, they established Cluster de Energia, or the Basque Energy Cluster. Due to its relatively many years of existence and the fact that the cluster hosts some of the leading companies within the European energy sector, the cluster makes for an interesting case, containing important learning perspectives for other emerging European cluster initiatives.



The cluster organisation of Cluster de Energia is based in Bilbao, the commercial capital of the Basque Country, which also hosts the headquarters of many of the member companies.

The cluster organisation has members from all parts of the energy sector value chain. The single biggest company within the cluster, hence also one of the most important, is Iberdrola. With the acquisitions of Scottish Power in 2006 and

Energy East (US) in 2007, Iberdrola has become one of Europe's biggest energy companies, thereby creating a unique flagship for the Basque energy cluster as well as for the Spanish and Basque industry as a whole. The first elected energy cluster president was from Iberdrola.

Most of the cluster companies have their important markets – and for some, even their main markets – within the Basque Country, but several cluster companies also have considerable international activities, together being present in about 35 countries worldwide.

Methodology and sources of information

The main components of data collection for the case study are the interviews with cluster executives Mr Baltasar Errasti, president, Mr Juan José Alonso, managing director, and Mr Iñaki Gorriño, technological assessor of the cluster organisation, as well as with representatives of two member companies, Iberdrola and Ingelectric Team, both of which were among the founding members. To carry out interviews and collect additional materials, the cluster was visited in October 2007.

Further, data has been collected through existing articles and reports mentioning the cluster. Presentations and other non-published material provided by the cluster organisation and the interviewed companies have also been deemed important sources; hence, there are few references in the case study.

The historic context: Creation of the cluster

The Basque Energy Cluster was founded in November 1996 on the initiative of the Basque government, which invited 15 of the region's leading energy companies to join the initiative. The driving agency in the foundation process was the Basque Department of Industry, Commerce and Tourism, which still plays a key role in the development and financing of the cluster organisation and its activities. Among the founding members were some of the region's most important private and public energy companies, such as Iberdrola, Petronor, Sener, Ingelectric Team, Grupo EVE (the Basque Energy Board), Bilbao Bizkaia Water Utility and the important Basque bank, BBVA.

As a result of the participation of important companies such as Iberdrola and EVE and the strong presence of the Basque government, the cluster organisation found no difficulties in recruiting further members, many of whom are suppliers of the big member companies. In less than three years, the cluster numbered 50 members, a number that has increased to 83 today.

The revitalisation of the Basque economy

The formation of the cluster organisation was part of the larger reform of Basque industry policy aimed at revitalising a Basque economy in deep crisis. Traditionally, the Basque economy was dominated by heavy industries, such as steel and iron factories, and shipyards. As globalisation accelerated during the 1980s and competition from cheaper developing countries increased, especially within the heavy industry sector, the Basque economy stagnated and unemployment rose dramatically (<http://www.fdimagazine.com>, 2007).

As a reaction to the economic crisis, the Basque government launched several initiatives in the early 1990s. The initiatives aimed at modernising the Basque industry and economy as well as investing heavily in new infrastructure and huge regeneration projects, the most renowned of which is probably the regeneration of the riverbank in central Bilbao, including the world-famous Guggenheim Museum Bilbao, which has become a symbol of the impressive Basque progress.

País Vasco – The Basque Country

The Basque Country is a part of Spain, but is a region enjoying a high degree of autonomy. Official languages are both Spanish and Basque.

- Area: 7.235 km².
- Population: 2.1 million.
- Population density: 293.7 inhabitants/km².
- Capital: Vitoria.
- Biggest city: Bilbao (345,000 inhabitants).
- GDP per inhabitant: €26,515.

Source: *Cluster de Energia/Wikipedia.org 2007*

Besides the construction of museums, waterfronts, an airport and a metro system, the initiatives included a new approach to industrial development, putting a strong focus on cooperation and cluster formations. The Basque government believed that cooperation through clusters was the key to strengthened competitiveness. In cooperation with Professor Michael Porter, a cluster programme was designed. The most important cluster-like industries in the Basque Country were identified and 11 strategic sectors were selected, among them the significant Basque energy industry (Grajirena, Gamboa and Molina, 2003).

‘The Bilbao Effect’

As part of its revitalising project, the Basque government invested €100 million to construct the famous Guggenheim Museum Bilbao. Leading local companies, such as Iberdrola and BBVA from the energy cluster, played an important role in the realisation of the project since they contributed significant sponsorships.

The museum greatly contributed to putting Bilbao and the Basque Country on the world map, attracting tourists, business and investors, and changing the image of the region from a backwards industrial wasteland to a highly dynamic, innovative, and cultural centre.

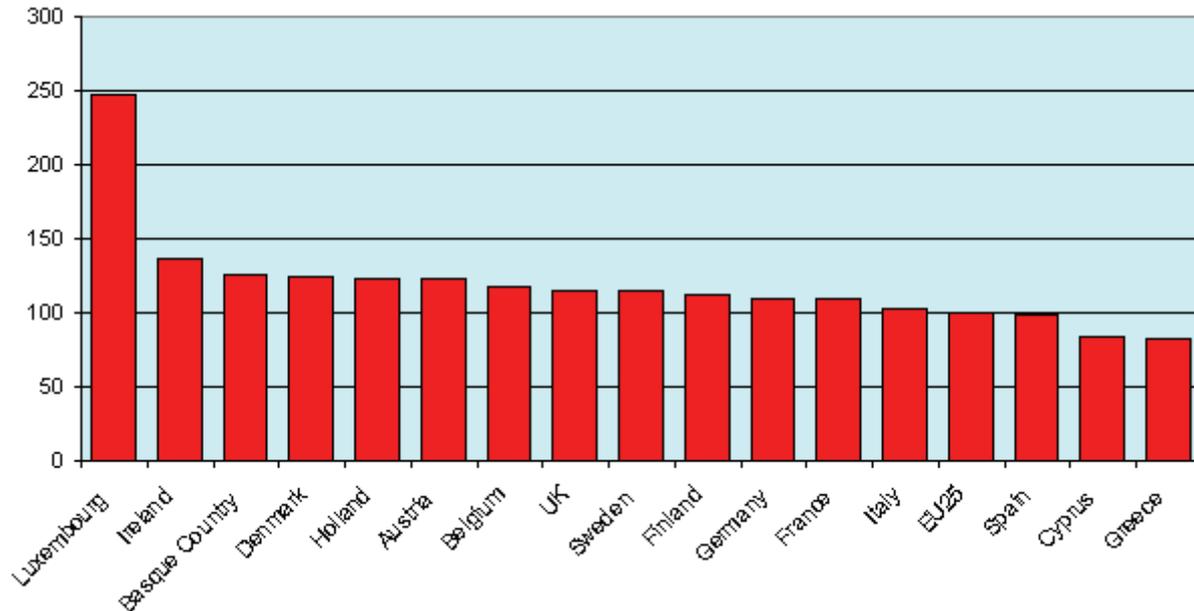
The Guggenheim Museum has become a symbol of the ‘Basque miracle’ and its multiplying economic effect has become known as the ‘Bilbao effect’.

In connection with each of the selected sectors, a cluster organisation was created. The common goal of all 11 cluster projects was and still is to improve cooperation among companies, public authorities, universities and other research environments within areas such as technological innovation, improvement of management and internationalisation. The Basque government finances a maximum of 60% of the cluster organisations’ activities, with a limit of €240,000 for each cluster (Grajirena, Gamboa and Molina, 2003).

One of the major challenges for the cluster projects has been to extend and improve cooperation among companies. Yet according to the Basque Department for Industry, Commerce and Tourism, the formation of the clusters has indeed

contributed to changing the traditional Basque industry culture towards a more cooperative approach to, for example, R&D and innovation, and as such has been an important contributor to the overall dynamic revitalisation the Basque economy has experienced in the last decade (Grajirena, Gamboa and Molina, 2003).

Figure 1: *GDP per inhabitant index, 2005 (EU25=100)*



Source: *Energia de Cluster (Eurostat)*

Thanks to the combined investment and focus on culture, infrastructure, industrial relations and cross-sector cooperation, the Basque Country today has a thriving economy and has become one of the richest and most dynamic regions in Europe. Figure 1 compares the Basque GDP with selected EU countries, showing that the Basque economy has equalled some of the leading economies in the EU. The Basque GDP was projected to grow by 2.5% in 2007, compared to the EU average of 1.8% (<http://www.fdimagazine.com>, 2007).

Cluster de Energia – the Basque energy cluster

With its 83 associated companies – a number that is still growing – the Basque energy sector is a well-consolidated cluster in terms of membership.

Seen as a whole, the energy cluster is a considerable part of Basque industry and the economy.

As shown in Table 1, cluster companies employ 25,000 people and generate a turnover of around €12.5 billion. This represents 10% of the total industrial employment in the Basque Country and 25% of the Basque industry’s turnover. The €2 billion of exports represents almost 20% of total Basque exports.

Table 1: *Basque Energy Cluster Facts*

Associated companies	83
Employment within the cluster	25,000 employees
Total turnover of cluster companies	€12.5 billion
Total export of cluster companies	€2 billion
Staff in the cluster organisation	3 people
Income/turnover of the cluster organisation	€270,000

Source: *Cluster de Energia 2007*

The cluster organisation itself employs three people: the director, a technology assessor and an assistant. The yearly income of the cluster organisation is €270,000. Fifty per cent of this is provided by the Basque Department for Industry, Commerce and Tourism and the rest comes from membership fees. Membership fees are regulated according to the size of the member company, with the biggest companies paying the highest amount.

It should be noted that the €270,000 does not reflect the total value of activities initiated and coordinated by the cluster organisation. In most projects, the cluster organisation acts as a facilitator, hence participating companies pay the actual costs of the projects by contributing, for example, manpower and research equipment and facilities. Besides this, the cluster organisation also manages or participates in some EU-funded projects.

Members and key players

Member companies of the cluster organisation can be divided into the following groups, reflecting different parts of the energy sector supply chain. Some companies are present in several parts of the chain.

- Utilities (end users): Iberdrola, Grupo EVE, Petronor and Bilbao Bizkaia Water Utility.
- Consultancy and engineering: Grupo EVE, Iberese and Sener.
- Main contractors: Cobra, Gamesa Energia and Grupo Guascor.
- Suppliers of mechanical and thermo mechanical goods: Cyprosal, Lointek and Grupo Guascor.
- Suppliers of electromechanical goods: ABB Power Tech, Siemens and Alstom Power.
- Suppliers of instrumentation and control equipment: Ingelectric Team, Siemens and Elecnor.
- Other auxiliary goods and services: Electra Vitoria, Tubos Reunidos and ACB.
- Banks: BBVA and BBK.

Public authority members are EVE (the Basque Energy Board) and the Basque Department for Industry, Commerce and Tourism (BDICT). As previously mentioned, BDICT has a key role concerning the finances of the cluster organisation. The department uses the cluster forums to inform everyone about new policies and regulations as well as to gain information for sector analysis and knowledge on trends and the needs of the Basque energy sector. EVE, also being a utility and an operator, has a more traditional member role as a company.

There are no universities or other public research institutes among the members of the cluster, but the cluster organisation has a close relationship with the University of the Basque Country and with the Basque technology centres, which are private enterprise foundations with large institutional support. Both often participate in cluster activities, especially the technology centres, which host many innovation and development projects.

Since the aim of the cluster is to promote and extend cooperation both between public entities and companies and between companies from different parts of the value chain, no specific member or company can be deemed the most important. However, big utilities such as Iberdrola and EVE play a crucial role in attracting the minor suppliers to become members. Their size and considerable national as well as international presence also make them unique in terms of visibility and marketing of the cluster. In most cases, undertaking large-scale research and development projects within the cluster will only be possible with the participation of some of the big companies/end users of the technology and products.

Though important for the success of a cluster, the presence of such a big company as Iberdrola can also be problematic. Activities and projects easily come to serve and evolve around urgent needs of the dominant company or companies, thus hindering multilateral cooperation and more radical innovations. According to both Iberdrola and the cluster organisation, Iberdrola is aware of this tendency, therefore, it limits its use of the cluster organisation and its activities in order to avoid dominating the cluster too much.

Strategy and organisation

The mission of the cluster organisation follows the overall aim of the Basque government's cluster initiative: to improve competitiveness through increased cooperation between enterprises and other stakeholders within a sector – in this case, the energy sector.

The cluster's long-term strategy consists of three objectives:

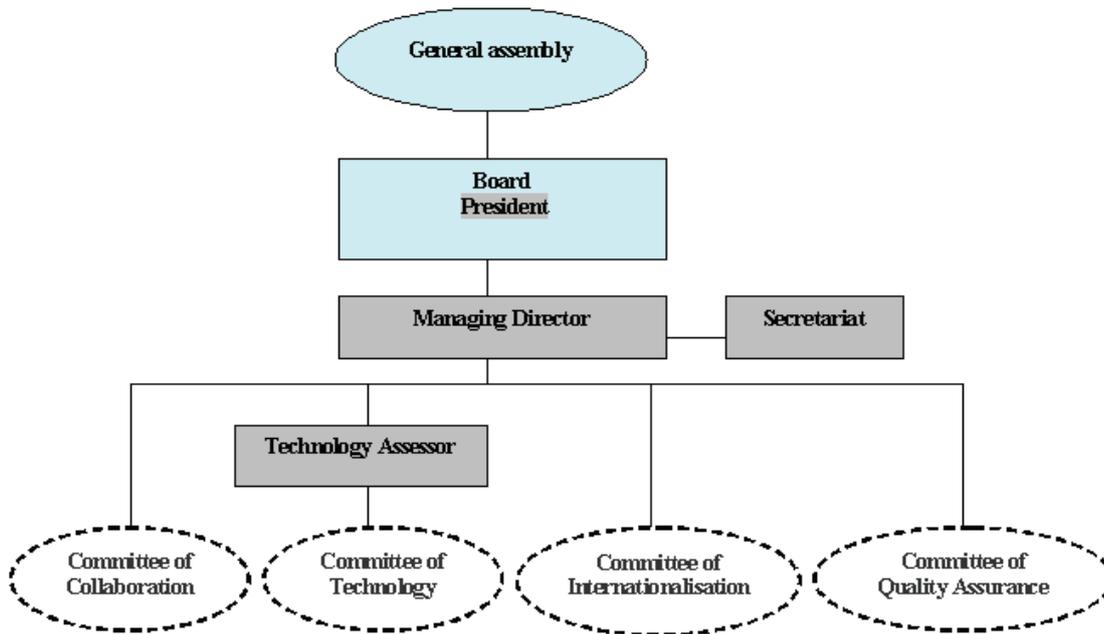
- Making the Basque Country a centre of competence within the energy sector by developing specific centres of excellence.
- Developing company groups with the capacity to lead niches in the international market.
- Turning the Basque Country into a world leader in energy efficiency and sustainability.

The strategic goals for 2008 are ambitious and include the following.

- **Creating a centre of competence** by establishing a centre of innovation and competence with at least five participating companies; increasing the presence of private R&D units in the area from two to 10; and increasing R&D spending within the sector from €128 million to €250 million.
- **Developing and attracting leading energy companies:** At least 12 companies with more than 500 employees should have their headquarters in the Basque Country (today there are eight); 40% of cluster members' business should come from external markets; and six multinational companies should be present in the country.
- **Improving energy efficiency and sustainability:** Two strategic infrastructures for demonstration should be created; 10 new energy efficiency initiatives at company level should be started; and Basque energy intensity should not exceed 88%.

The cluster organisation is characterised as an association that leaves overall decision- and strategy-making to the members, i.e. the general assembly and the elected board. The committees are similar to working groups in which most cluster activities are carried out. They have been created in the context of the strategic goals and the four different themes reflect the main activities of the cluster organisation.

Figure 2: Organisation Basque Energy Cluster



At the moment, the cluster organisation is in the process of formulating new strategies and working methods. Among others, considerations are being made to change the structure of the cluster and create different strategic units with more autonomy and specific activities than the previous committees. Proposed units could be an institute for electricity studies, a society for financing international projects and centres of excellence for specific technologies.

Activities and cluster synergies

Next to the strategic goals, the objective of the cluster's activities is to increase the volume of business for its members while at the same time decreasing their production costs. This is done through a list of different activities and synergies, as illustrated in Figure 3. Activities include joint marketing initiatives, R&D projects and internationalisation initiatives.

Figure 3: Goals, actions and synergies of the Basque energy cluster



Source: *Cluster de Energia, 2007*

In terms of internationalisation, different approaches are taken. For example, the cluster organisation is the managing partner of an EU project connecting energy clusters all over Europe. However, it is also facilitating cooperation between the big multinational companies, such as Iberdrola, and minor sub-suppliers. This connects the minor suppliers to international projects, thereby giving them access to external markets.

Another internationalisation initiative is the Gececuba group, focusing on trading and technological interchange between the Basque Country and Cuba. The group consists of 36 companies from the energy cluster and, among other issues, cooperates on delivering top-quality technological solutions to Cuban industries and the Cuban energy sector at reasonable prices.

Payments from Cuba can often be delayed due to the economic difficulties that exist in the country, but Gececuba members have the opportunity to obtain a bank guarantee made in cooperation between the Basque government and Basque banks which are also members of the energy cluster, like BBVA. While Basque trade with Cuba in general decreased by 8% in 2004, exports from Gececuba members to Cuba increased by 30%, reaching almost €30 million (<http://www.confebask.es>, 2007).

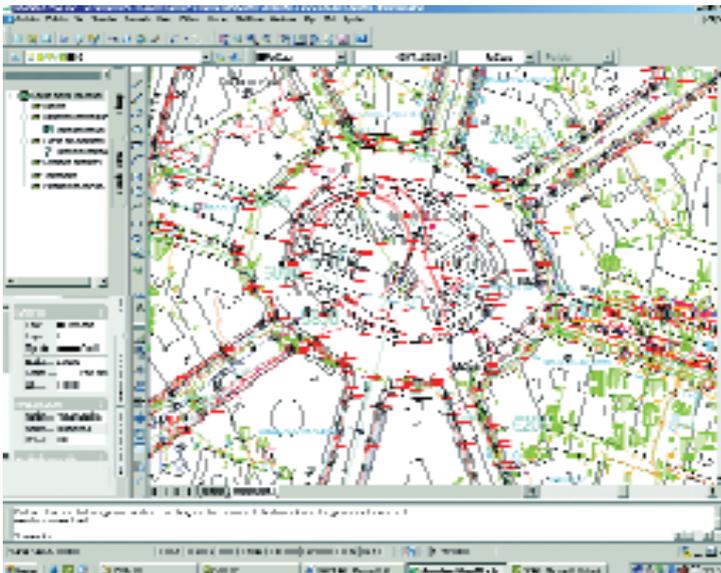
Technological cooperation in particular focuses on joint projects and cooperation regarding quality assurance. The work regarding quality assurance has been placed in its own committee and has evolved to be one of the most important themes for cooperation and activities within the cluster. An interviewed representative from Iberdrola also expressed the importance of quality assurance in their use of the cluster: ‘To improve and ensure the quality of our products, infrastructure and services is a key challenge for Iberdrola and one of the cornerstones of our strategy. Cooperation with our suppliers within the cluster is very important in our continuous work with quality assurance. The cooperation with our industrial and technological suppliers has been improved remarkably through the cluster – before, it was much more superficial.’

Joint projects

An example of a successful project with the cooperation of many different partners from the cluster is the Inkolan project. The aim of the project is to coordinate and manage information on underground electricity, gas, water and telecommunications infrastructure in order to prevent damages and short cuts when carrying out construction and maintenance work of roads and the like.

As shown in Figure 4, a web portal has been created that is able to visualise underground grids and infrastructures. Moreover, planned projects and work in progress in connection with the infrastructure can be viewed.

Figure 4: *Inkolan web*



Source: *Cluster de Energia 2007*

The project was initiated in 1997 on the initiative of the energy cluster. Participants were some of the most important operators within the sectors of gas, electricity, water and telecommunications. Around 1,200 companies have used the Inkolan web since it began operating, and last year 2,000 downloads were made. It is estimated that ruptures and breakages have reduced by 20% since the start of the initiative.

Another project within the cluster is a highly profiled R&D project aimed at developing and testing low-voltage micro grids for electricity distribution. The existing distribution net faces considerable challenges both in meeting the ever-increasing demand and in incorporating electricity from the often minor and more scattered renewable energy sources. Low-voltage micro grids are more flexible regarding the common fluctuations in electricity coming from small renewable energy sources such as minor wind turbines. Further, they are more easily installed in rural areas with low population density.

In the project, new products, equipment and systems facilitating the deployment of electrical micro grids integrated in the distribution grid are developed. The project provides real experiments with different demand scenarios in the Zamudio technology park near Bilbao. The project is led and promoted by Iberdrola, Grupo EVE and Tecnalia Energia in cooperation with the cluster organisation. The project will be concluded in December 2007 and both Iberdrola and Ingelectric Team mentioned this project during the interview as being highly successful and valuable for them.

Different needs of member companies

The needs of the cluster's member companies vary in relation to their size.

Small companies mostly need information on joint projects, support possibilities and conferences and developments within the technology and market sectors. They normally do not have systematised channels of information, hence they could miss many support and cooperation opportunities. Because of their limited resources, joint projects within marketing and especially R&D are also of great value for the minor companies.

Big companies are normally well informed. They need assistance with networking and contact with existing or potential suppliers in order to enter into joint projects or have a closer dialogue on, for example, quality control with suppliers. The cluster facilitates networking and fosters the required trust among the member companies.

Iñaki Gorriño, technology assessor of the cluster organisation, is convinced that advantages of the cluster are most pronounced for the minor companies. They have the biggest need for joining forces in relation to marketing, R&D and internationalisation and in networking with the big companies as their potential customers.

Synergies and effects of the cluster

Locating in clusters is a central tendency in most sectors in Europe. There are many reasons for this, but basically, it is now widely recognised that companies located in cluster-like environments are generally better off in terms of innovation than other companies. The close geographical proximity of companies and organisations facilitates the easy and rapid dissemination of information and ideas and movements of products and goods. Also, trust and networking become easier as a result of proximity. All these make cooperation easier, thus allowing companies to exploit common opportunities and solve common problems (Oxford Research, 2007).

These synergies also seem to be present in the Basque energy cluster. However, documenting and measuring the overall synergies and tangible effects of a cluster and cluster organisation can be quite difficult. The same is true for the Basque energy cluster, since it has no exact documentation or measurement of the effects of its work, but interviews with member companies point toward the cluster being perceived as having great importance. Eduardo Urturi, marketing director of Ingelectric Team, a company specialising in automatisisation technology, puts it this way:

'The motivation for being a member of the cluster is clear. Our products demand a very close cooperation with our customers, and many of them are members of the cluster today. Of course, we knew our customers before entering the cluster, but the cluster has improved our cooperation with them a lot.'

'The cluster also gives us some important possibilities in joining R&D projects. One of the early R&D projects initiated by the cluster organisation has been crucial for our development. The technological developments of the project have contributed greatly to our expansion within wind power technology.'

'I think the most important advantage of being part of the cluster clearly is the easy access to technological know-how and the joint R&D projects.'

At Iberdrola, they are convinced that the cluster has had a positive impact on the company and its way of doing business, though it is hard to measure the exact effect:

'It's not only because of the cluster, but the cluster has, for sure, contributed to changing our way of perceiving business as one with a more cooperative approach. Our cooperation with our technological sub-suppliers has especially been strengthened. We have even cooperated with some of our competitors. That would have never happened without the cluster.'

'Also, well, of course you can't measure it, but we think the cluster contributes to increasing the political and public focus on the Basque energy sector, thus making it easier to get public funding for projects and attracting investments'.

Challenges and future activities

The overall challenge for the cluster organisation is the same as in the beginning: to create value for the members, although in the beginning, the focus of the cluster was more on recruiting members in order to consolidate the cluster. This also meant that the thematic focus was quite broad. Their new strategy will focus more on quality and less on quantity. New members are of course more than welcome, but the cluster will work hard in identifying, focusing on and strengthening the areas where synergies and collaboration give most value for money. Today, there are examples of members joining for a tender. These kinds of collaborations and consortia should be increased and strengthened, especially among international projects.

Another strategic aim is to contribute to making the Basque Country an international flagship within energy and energy technology – focus will be on renewables and energy efficiency solutions in particular. The cluster organisation is trying to increase international awareness of the cluster and its competences, for example, by promoting internationalisation among its members and by participating in international conferences and projects such as the EU-funded CENCE project (<http://www.europe-innova.org/CENCE>). Participation in international R&D programmes and projects is of course also an important element.

There is also a big challenge in contributing to improving the image of the energy sector and in finding solutions to the sector's increasing recruitment problem. After many years of rationalisations, the energy sector today faces serious difficulties in attracting skilled young workers. Further, many of the technical education courses relevant to the energy sector struggle to attract enough students. In the Basque energy cluster, they have debated the problem and its consequences for some time. Now they are considering how the cluster in praxis can contribute to solving the problem.

Summary

Relatively, it took the Basque energy cluster just a few years to achieve great success in recruiting members and forging joint activities. The cluster formation is part of the Basque government's industrial policy, thus it contributes to a more cooperative approach within the Basque energy industry and plays an important role in the revitalisation of the Basque economy. In particular, cooperation between the cluster's big companies and their minor sub-suppliers has been strengthened through the cluster.

Even though the cluster is well consolidated and has achieved many results, the new strategy of the cluster organisation is highly ambitious, since it has wide-ranging objectives which all aim to make the cluster a leading international centre of excellence within energy and energy technology.

The cluster organisation is also aware of the overall challenges facing the European energy sector. Within the cluster, projects and strategies particularly focus on developing and increasing renewable energy sources and energy efficiency solutions. The cluster has begun discovering how it can contribute to overcoming the challenges of the increasing demand for skills in the energy sector vis-à-vis the difficulties in attracting young skilled workers.

A theme that perhaps should receive more attention is the challenge of documenting and evaluating synergies and effects of the cluster and the work of the cluster organisation. It is a difficult task, but it will be easier in the coming years, since the new strategy of the cluster is concretised in a list of tangible objectives.

Learning perspectives

The central learning perspective of the Basque energy cluster case is that the work of identifying and strengthening collaboration and synergies across the value chain, which is crucial for a cluster in order to create value for its members, is a continuous task that does not end even when the cluster has been well consolidated.

Moreover, the importance of attracting both big companies as end users of the value chain and sub-supplying SMEs is well illustrated by the Basque energy cluster. Having extensive resources and publicity, big companies are often drivers in the foundation process and development of a cluster, but the need for joint projects and activities is often bigger among SMEs. Further, good possibilities for improving and increasing the cooperation between SMEs and the bigger multinational companies exist.

From the perspective of the staff of the cluster organisation, the most important lesson learned is that dialogue with and trust among members are the indispensable building blocks of a successful cluster. It is also of crucial importance to identify specific needs of members and know their expectations with regard to the cluster organisation and being a member.

Contact details

Basque Energy Cluster
Asociación Cluster de Energía
Edificio Albia I - 2ª Plta.
S. Vicente, 8. 48001 Bilbao, Spain
Web: <http://www.clusterenergia.com>
Phone: +34 94 424 02 11
Fax: +34 94 424 60 01
Email: info@clusterenergia.com

Bibliography

Cluster de Energia, *PowerPoint presentation of the Basque energy cluster*, 2007.

Grajirena, J.M., Gamboa, I. and Molina, A., *Los clusters como fuente de competitividad: el caso de la Comunidad Autónoma del País Vasco*, Universidad País Vasco, 2003.

Oxford Research, *Oxford-klyngehåndbogen. En inføring i teori og praksis*, 2007.

Websites:

Confebask.es: <http://www.confebask.es/Castellano/revista/0303/noticia3.htm>, 7 August 2007.

FDIMagazine.com:

http://www.fdimagazine.com/news/fullstory.php/aid/634/Bizkaia%92s_breathtaking_progress.html, 7 August 2007.

Oxford Research

EF/08/19/EN 1