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Italy: Alto Garda Power/Cartiere del Garda case study

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About

Case study name:
The greening of industries in the EU

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Energy

Alto Garda Power (AGPower) was founded in 2006 in order to manage a co-generation power plant that supplies electricity and steam to the Cartiere del Garda paper mill. Besides meeting the energy requirements of the mill, this plant supplies a district heating service for the town of Riva del Garda. The introduction of the new co-generation plant has allowed the paper mill to keep its production in an urban and touristic area, turning some limits linked to the context into real opportunities.

Introduction

District heating (or teleheating) is a system aimed at distributing heat generated in a centralised plant for residential and commercial heating installations. The heat is often obtained from a co-generation plant burning fossil fuels, but increasingly biomass, geothermal heating and central solar heating are also used, as well as nuclear power. District heating systems can provide higher efficiencies and better pollution control than localised boilers: district heating has proven to be a major contributor to greenhouse gas (GHG) reduction in many European countries (International Energy Agency data).

In Italy, the development and spread of district heating systems is in its infancy: only 4% of the total population is served by district heating (District Heating Barometer 2010 data). In particular, teleheating is used in some neighbourhoods of medium-to-large cities (for instance, Bergamo, Brescia, Bolzano, Ferrara, Milan, Reggio Emilia and Turin). In recent years, interest in district heating systems has increased, especially due to its capability to reduce both costs for citizens and firms, and polluting emissions (Unioncamere, Symbola 2011). This report presents an example of a district heating system able to achieve economic, social and environmental aims.

Alto Garda Power (AGPower) was founded in 2006 (and started working in 2008) in order to manage the new co-generation plant (or heat plant), which supplies electricity and steam to the Cartiere del Garda (CDG) paper mill. AGPower is owned by CDG and Alto Garda Servizi (AGS), a public utility supplying services (electricity, natural gas, water) in the upper Garda area. In particular, AGS owns 20% of AGPower, while 80% is owned by CDG.

The new co-generation plant – based on a technologically advanced jet turbine – is able to meet the paper mill's total energy requirements, as well as recovering gases for recycling in a district heating system that supplies heating to private and public buildings in the touristic urban area of Riva del Garda, on the banks of Lake Garda.

Part of the energy produced by the heat plant thus goes to the paper mill, while another part is sold. In particular AGPower sells hot water to Alto Garda Services (AGS). The hot water produced by the new co-generation plant allows AGS to supply the district heating service at competitive prices compared with those of the traditional services – significantly reducing the costs of maintaining plants for private use.

Beyond the positive effects from an environmental point of view, the new heat plant has improved the energy efficiency in the paper mill, reducing production costs. Hence the new heat plant has produced positive employment effects: more efficient energy use, and consequently the reduction of the production costs, has allowed CDG to keep the same number of workers, even during the economic crisis.

Drivers and motivations

First of all construction of the new co-generation plant was motivated by technical and economic exigencies: the paper mill had to reduce the cost of energy production, which significantly affected the entire manufacturing process. The previous heat plant used by the paper mill had limits of performance due to the technology employed. In particular, the small size of four gas turbines prevented high yields. At present,

according to the company, alternative solutions to fossil fuel are not economically feasible. The paper mill consequently sought a solution that would enable it to use such fuel more efficiently. The basic idea was to exploit the energy produced by the fossil fuel to the maximum while trying to reduce wastage.

But social and environmental motivations also contributed to the creation of the new co-generation plant. In fact, the improvements in terms of energy efficiency produced by the new plant have reduced production costs, enabling the paper mill to offer competitive products in an unstable market. The AGPower project has therefore increased the company's profit margins, allowing the paper mill to maintain its labour force unchanged even in difficult market conditions.

Moreover, the decision to create a new company (AGPower) in order to manage the new heat plant allowed for the sale of some of the energy produced. In particular, as noted above, AGPower sells hot water for the district heating system. This system has produced positive environmental effects for the community in which the paper mill is embedded.

Another of the drivers of actions aimed at better environmental sustainability has been the need by Cartiere del Garda to counter an often aggressive media campaign against the paper industry. The latter has been associated with extremely harmful effects on the environment and on the residents in areas where cellulose is produced (the campaigns frequently refer to deforestation and the exploitation of particularly poor communities for logging). In this regard, CDG has adhered to the European Two Sides project promoted by the paper industry associations aimed at extending efficient paper recycling and renewal practices and providing accurate and detailed information about the activities of companies.

Green business practices

The idea of exploiting thermal energy produced by exhaust gases first arose in 2002, when Alto Garda Services (AGS) asked Cartiere del Garda if it could use the energy produced by the exhaust gases to deliver district heating service to the town of Riva del Garda. In order to develop this idea, the two companies did some analysis that highlighted the low level of energy efficiency of the old co-generation plant. In particular, the maximum efficiency achieved by the previous plant under optimal conditions was 73%. This empirical evidence was the starting point for the project of the new heat plant.

The technological principles that inspired the new plant were the same as those on which the previous one had been constructed: that is, a co-generation thermo-electrical plant with a gas turbine as its principal component. The exhaust gases are collected in a recovery boiler, which in turn produces high-pressure steam. This steam, before feeding the process, passes into another thermal machine (a steam turbine). In the previous plant, the process just described was performed by machines (based on four small turbines) with a certain flexibility in their use, but with lower overall thermal output. The new plant allows a more efficient use of the thermal energy produced by the exhaust gases. Now, with the new plant, the maximum yield is 85%. Moreover, the new plant gives the paper mill an annual saving of 40,000 petrol-equivalent tons (PET) in terms of methane gas and unburnt fuel. The high efficiency of the plant has also produced an approximately 53% annual decrease in emissions of carbon monoxide (CO) and nitrogen oxide (NO_X), allowing the paper mill to achieve emission levels well below those established by law.

The new co-generation plant and the creation of AGPower are among several actions that the paper mill has taken in order to optimise the entire paper production system. Over the years, the company has received various important environmental certifications. Specifically, in 2000 the paper mill received the UNI EN ISO 14001 certification and in 2005 it completed the process of implementing its Environmental Management System (EMS), in compliance with the European Eco-Management and Audit Scheme (EMAS) – among the highest standards set for corporate environmental management. In 2006 CDG obtained the Forest Stewardship Council (FSC) certification and in 2007 the Programme for Endorsement of Forest Certification schemes (PEFC) certification. Both these certifications are related to the use of pulp coming from well managed or certified forests.

Anticipation and management of the impact of green change on quantity and quality of jobs

Impact on quantity of jobs

The installation of the new heat plant and the creation of AGPower have made it possible to maintain employment levels at the paper mill unchanged despite the recent economic crisis, which has produced significant negative effects in the paper sector.

AGPower and Cartiere del Garda have put in place an open-ended service contract that regulates the management of the new co-generation plant. In particular, 20 people work at the new plant; all of them employees of Cartiere del Garda (formally AGPower does not have any employees). The number of workers employed in the new plant has not changed in comparison to the number of workers previously involved in management of the old heat plant.

According to the management of the paper mill, the new co-generation plant will not create new jobs in the next five years, but cost savings guaranteed by the new plant will allow the paper mill to keep the number of jobs unchanged on the long run: 'With the current difficult market conditions, not having a high-performance heat plant would threaten the possibility to guarantee jobs for the paper mill's employees', the CDG Industrial General Director said.

Whilst the management of the new heat plant will not produce new employment in the next years, the same cannot be said of the district heating services. Alto Garda Services (AGS), in fact, would extend the services to the nearby town of Arco, creating new job opportunities. Furthermore, according to the president of AGS, teleheating in Riva del Garda has already produced subcontracted and outsourced activities amounting to more than €4 million, with contract orders and new jobs. Extension of the service to the Arco area could therefore strengthen such activities and further improve employment prospects.

Impact on quality of jobs

The personnel working in the new heat plant have the same pay levels and working conditions as the blue-collar workers of the paper mill: in fact, the workers employed in the plant are subject to the same job classification system and have the same type of collective work agreements. The new co-generation plant, as well as the paper mill, operates in continuous cycle (24 hours a day, 7 days a week) with scheduled shutdowns for the installation of new systems, modifications to existing ones, and ordinary or extraordinary maintenance. For this reason, the 20 workers who manage the new plant work in shifts that keep it going all year, 24 hours a day.

With regard to job tasks, the workers managing the new heat plant took on new responsibilities compared to the past. In fact they manage the water treatment plant beyond the co-generation plant. Cartiere del Garda previously outsourced this activity. The new heat plant – with its higher degree of automation and computerisation – has allowed the company to optimise the use of internal human resources.

As mentioned above, the new heat plant included new technologies that contribute to maximise the efficiency in the whole system. Also for this reason, the plant was installed by an external company that specialises in building and implementing energy control technologies. The external company also managed the start-up activities, which included training sessions at the workplace and in classrooms. Special courses were held for the 20 workers on the functioning of the new heating machinery.

Since the introduction of the plant the 20 workers have attended specific training courses according to the activities they perform at the workplace; most of these courses were outsourced. Courses attended range in subject from risk prevention and first aid to electrical protection and emissions control, besides the instruction on the operation of the new machinery.

Actors involved in the green change

The project of the new co-generation plant and the creation of AGPower involved various actors: the Lecta Group (which took over CDG in 1997), Cartiere del Garda, Alto Garda Services, the paper mill workers, the trade unions and the local authorities (specifically the Autonomous Province of Trento and the municipality of Riva del Garda).

Externally to the company, CDG promoted frequent exchanges of information with the local authorities. In particular, the chief executive of CDG was strongly involved in building effective and collaborative relations with all the different parties. The company had long had a good relationship with the local authorities, and in the past company decisions had respected social and local needs.

In the case of the new heat plant, the local authorities worked to simplify the 'red tape', reducing time taken by the start-up procedures to a few months: 'The bureaucratic procedures in this case were exceptionally brief, if we bear in mind the time usually taken in our country to accomplish projects of such a scale', the CDG Industrial General Director declared.

Moreover, the company was able to access provincial law no. 6/1999, which provides for incentives for entrepreneurial activities (legge provinciale sugli incentivi alle imprese, 6/1999). In this case, the economic fund was used to cover the costs of environmental aspects of the project. Many of these costs were incurred because the plant is located in an urban and touristic area so some crucial infrastructures were necessary to preserve the surroundings (for instance, sound barriers, emissions filters, special devices aimed to minimise the environmental impact of the new heat plant). The funds (€9 million) were delivered by the European Investment Bank (EIB) to the Autonomous Province of Trento. During the negotiation process, the Province was especially concerned about job levels in the long run. For this reason CDG and the Province agreed to maintain the same number of jobs for 10 years.

Internally to the company, Cartiere del Garda held various meetings with trade unions to explain the advantages of the new heat plant and the functions of AGPower. Trade unions and workers supported the project, particularly because the new heat plant guarantees the continuation of paper production in the Riva del Garda plant.

More generally, the CDG has developed formal procedures concerning the anticipation and management of change, which are largely based on information and consultation measures. The company organises weekly meetings for technicians, workers employed in production units, employees in R&D, and maintenance experts. The aim of these meetings is to discuss problems and development projects for the plant, as well as to share the company's economic results, strategies, and information on future investments. In addition, since the environmental management system (EMS) was introduced, specific meetings are held on the environmental impact of the company's productive activity.

Finally, at the corporate level, there are regular meetings between the general management and the plant's managers on company's strategies and future investments.

Conclusions

The new co-generation plant and the creation of AGPower have produced several positive effects from economic, social and environmental points of view. These effects have affected shareholders (company, management, trade unions, workers) and stakeholders (local authorities and local community). In particular, the development of a district heating system, recycling the recovered gases created by the paper mill's heat plant, has produced positive effects for the environment, enabling the elimination of numerous boilers owned by private consumers. With the creation of AGPower and the consequent development of the teleheating system, the paper mill has become more closely embedded in the local community.

At company level, this green business practice was important in order to cope with the negative effects of the recent economic crisis. In fact, the installation of the new co-generation plant was the necessary condition in order to maintain employment levels at the paper mill unchanged. The company did not reduce its labour force and in return obtained more flexibility in work organisation and the access to economic incentives provided by the Autonomous Province of Trento. Moreover the new heat plant has contributed to the diffusion of services linked to the district heating system, creating new job opportunities in the energy sector.

This case study illustrates how multidimensional the industrial restructuring process leading to the adoption of green practice is. In this case, it was characterised by the interactions of several actors and actions: company managers, the CDG chief executive, trade unions, workers, local authorities, local community, a participatory model of industrial relations, collaborative relations between the company and local actors. Furthermore, the AGPower case has highlighted that a continuous mobilisation of local actors and effective information procedures (inside and outside the company) were crucial factors not only during restructuring, but also during the planning processes. But the peculiarity of the AGPower case is mainly due to the fact that the continuous and collaborative relations between actors did not prolong the process, but, on the contrary, they fostered a more effective use of time to discuss, argue, agree and implement restructuring strategies.

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