

## DOSSIER

## Renewable energies and agriculture

Agriculture occupies approximately 40% of the Rhone-Alps region. Its economic influence is modest with small structures and a small level of competitiveness. With approximately 50,000 operations, its share of employment represents almost 2.8% of the assets. It is also the most diversified employment sector in France. Rhone-Alpine agriculture is comprised of one third quality marked products (AOC-Red Label, Biological, etc.), and is also one of the most active in the response to environmental solicitations from local authorities and an essential link to the beauty of the region. Its final energy consumption of 1.4% of the total energy consumed in the Rhone-Alps region is minority; however, the emergence of renewable energies gives it a particular role to play. Farmers today question their tendency for energetic autonomy or the sale of energy. This can be seen to be in competition with food production, leading to legitimate interrogations in the society.

The extensive experience in direct sales, appreciation of products, working in cooperation, innovation to survive in often difficult operating conditions (50% of agricultural areas are located in mountainous areas), are significant assets for developing projects in the field of energy or for becoming involved in those of local authorities.

### Two pitfalls must be avoided in these farmer-local authority relations:

- The first is that the local authority only sees the farmer as a service provider, and does not place this action in the context of supporting agricultural diversification in its region.

For example, for wood energy, local economic reasoning alone is not enough. The local authority must become involved with the farmers in the setting up and structuring of a local supply so that all of the economical and territorial profits linked to the production and supply of wood energy from rural sources are actual profits.

In this case, the local authority will neglect the positive value of a nearby, dynamic farmer contributing to the quality of the environment.

- The second is linked to the difficulty of beginning long-term contractual relations and sharing tools. The investments structuring the chains, such as anaerobic digestion, the wood heat networks or the production of pure vegetable oils can be seen as a regional planning act supported by the local authority and at the same time, designed in partnership and managed by the farmers or their organisation. The local authority must therefore guarantee sustainability of the action, and unite entrepreneurship with the farmer's risk taking and long-term goals exceeding the energy issue.

The Chambers of Agriculture, CUMA<sup>1</sup> Federations, promotional bodies or in a more general manner, farming executives have been looking into these energy questions for several years, and have hired people to help farmers to develop their project or take part in setting up a chain. A "biomass energy" work group is being led by Coop de France Rhône-Alpes Auvergne with this in mind.

The Chamber of Agriculture of the Drôme *Département*, for example, led the setting up of a partnership and an agro-resources-energy charter with all local authorities, energy and agriculture role-players. The Isère charter is largely involved in the Tenerrdis<sup>2</sup> competitive cluster alongside the researchers.

### Photovoltaics in an agricultural environment: a booming chain

Photovoltaics in the agricultural environment has undergone a significant boom since adjustment in 2006 to the tariff for purchasing the electricity produced. Indeed, agricultural operations often have large roofs available, which are suitable for photovoltaic facilities; this is so much the case that in the Rhone-Alps region, numerous projects are beginning to see the light of day.

The implantation of photovoltaics onto agricultural buildings constitutes in itself an interesting means of developing the chain on a large scale and of contributing to achieving the European objectives for 2020<sup>3</sup>. However, this involves the agriculture operators making sure that the facility does not hinder the use of their building (weight of the panels on the roof structure, orientation of the building easing natural ventilation and not necessarily solar panel productivity, etc.) and above all, that the revenue emanating from the sale of electricity is optimised and suitably integrated into the tax system. This last problem is

particularly tricky. The agricultural tax system has recently evolved in order to enable the possibility of electricity sale to be progressively taken into account. However the conditions under which photovoltaic activity is possible still remain subjected to numerous limits and other derogations which must be known by the farmer before entering into a project.

Leading this keen interest in the agricultural sector, privately owned operators have quickly proposed offers to farmers regarding their buildings as much as their land. These proposals integrate the new legal set-ups for which case law is lacking, and which can possibly threaten agricultural activity. Caution is required with respect to these offers.

The development of land power stations is coming to the forefront. Making the most of still inexistent regulations, some operators propose agriculture operators land rental (sometimes farmable land) at prices much higher than their operational revenue on leases which bind the farmers for

long terms. A new order and a change in the law should subject land projects over a certain size to construction permits and impact studies. In these administrative phases, local authorities must intervene in order to estimate the impact of the photovoltaic project on the regional agricultural and environmental issues.

Projects for agricultural buildings can also give rise to complex set-ups, to which the farmer must be vigilant, such as the free construction of a building in exchange for use of the photovoltaic roof.

These buildings can also be the medium for technological innovations. In the Loire, for example, Rhônalpénergie-Environnement has monitored a photovoltaic power plant/solar drying project, which should be brought into operation in autumn 2009, the first of its kind in France enabling such energy optimisation.

### Agricultural anaerobic digestion: a first in the Rhone-Alps region

Anaerobic digestion is a degradation process for organic material without oxygen. This transformation occurs in a closed environment and enables a biogas and a digestate to be produced at the same time. In agricultural use, anaerobic digestion unites the management of by-products, of back to the ground, energy autonomy, diversification of sources of income and ideally, the development of the local economy. The greenhouse gas balance is thus favourable thanks to the valorisation of the deposit of nearby organic material and the production of energy locally.

The GAEC des Châtelets, located in Gruffy (74), wanted to develop an anaerobic digestion unit in order to create an additional source of income without increasing agri-

cultural surface area (165 hectares) or livestock numbers (170 cattle). These operations require thermal energy for the milking parlour, drying the fodder and for the farmer's housing. Several houses are located near to the livestock building and can be linked to a renewable heat network.

The unit, whose implementation is planned to take place in 2009, will be made up from a steel digester, with heating and a mixer, a feed hopper, a cogeneration module, a phase splitter, two digestate tanks and an input storage platform. The treatment of operational by-products, surrounding industries and intercommunal waste, whilst ensuring the distribution of heat via a public network, provides an interesting regional perspective. One of the short-term objecti-

ves also integrates the establishment of a young farmer as the third associate.

Rhônalpénergie-Environnement accompanies agricultural anaerobic digestion projects on the farm and regional projects. Regarding the GAEC des Châtelets, the regional agency provided its experience in the fields of energy networks and took part in the setting up of subsidy files and in the validation of provisional operational reports in order to ensure project sustainability over 15 years of electricity sale. This embodiment will see the implementation of the first agricultural anaerobic digestion unit in the Rhone-Alps region, which could be followed by other units in the months to come.

## EDITORIAL



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Facing the problems of climate change and the depletion of fossil fuels, all the role-players in our company must become involved. Farmers are the first to be affected by climate change: they must adapt their productions to the new climate, the rate of petrol or raw materials, and must respond to the demands for relocating productions and commercialisation circuits.

Aware of the impact that energy has on their products, some have already integrated an approach for energy conservation and development of renewable energies, often with regional support, and particularly in Regional Nature Park areas. However, energy consumption is often concealed: in the fertilisers, the purchase of proteins, in the method of raising livestock, etc. We accompany farmers in a new approach to their productions with the development of biological agriculture and orientation of their livestock farming towards more autonomy, with respect to both energy and food; this dynamic was launched at the beginning of the year, accompanied by new tools, both technical and financial in nature.

Owners of a significant share in rural and periurban land, farmers play a key role in the development of renewable energies. Following the example of Austria, where they have become major role players in wood energy, farmers in the Rhone-Alps region are involved in the development of biogas, the wind turbine, photovoltaics, wood energy etc. whilst ensuring that this does not counter food production operations on agricultural land, and whilst remaining vigilant of take over of operations by the younger generations.

This must take place via partnerships between role-players from the agricultural world and the world of rural development, local authorities, Region, Ademe (Agence de l'Environnement et de la Maîtrise de l'Énergie - French Environment and Energy Management Agency), etc. by benefiting from the Rhônalpénergie-Environnement networks and resource centre function with respect to energy and food.

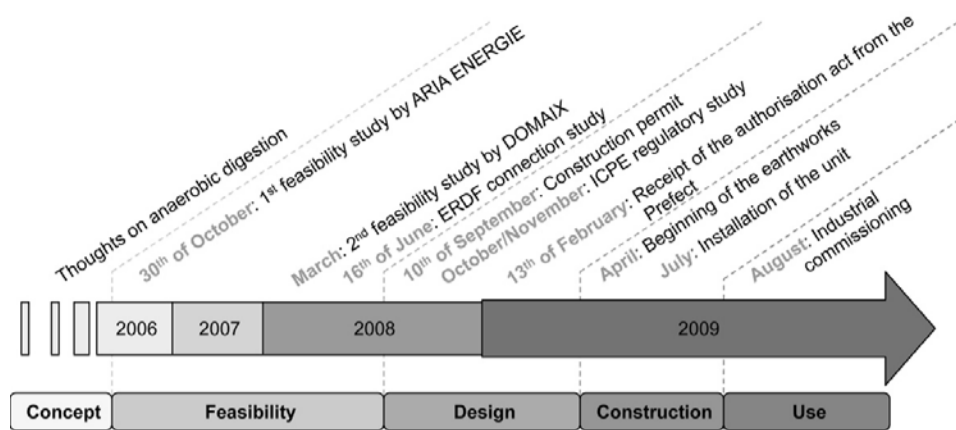
1. Cooperative for the use of agricultural machinery.

2. Competitiveness cluster covering all the "new energy technologies" sectors.

3. 20% of renewable energies in final consumption in Europe in 2020.

## DOSSIER CONTINUED

### Project steps



### Key figures

- An anaerobic digestion unit with a digester measuring 675 m<sup>3</sup>
- A biogas cogeneration module with a power of 104 kW
- Expected production:  
860 MWh/year of thermal energy  
830 MWh/year of electrical energy
- Overall energy efficiency of 70%
- 3,200 tonnes/year of organic material made valuable

- Overall investment: 830 k€

- Subsidy rate: approximately 50% (Rhône-Alps Region, ADEME, General Council of Upper Savoy, etc.)

CO<sub>2</sub> economy: approximately 420 tonnes/year

### Special features:

#### Regional project

- 7 cosubstrates, including intercommunal waste
- 1 100% renewable energy heat network for 8 users

## Valorisation of pure vegetable oils as biofuel

With current production at around 120,000 tonnes of oil, rape and sunflower seeds, Rhone-Alpine agriculture can in theory, cover the equivalent of half of its fuel consumption (2% of the entire consumption by transport in the region). Therefore the farmers are not involved in a regional programme led by the FRCUMA<sup>4</sup> with the idea of replacing petrol for everyone.

Rhônealpennergie-Environnement accompanies this action on an energy efficiency point, a link with the local authorities and quality charter.

Four Rhone-Alpine agriculture groups now

produce pure vegetable oil simply by cold pressing the seeds, and feed approximately twenty tractors transformed to run either 100% on oil or alternating between oil and diesel oil according to the conditions of use, as well as green space motors of the Town of Lyons and household waste collection trucks in Romans-sur-Isère. A chain which is by far the most efficient agrofuel, its potential remains linked in the Rhone-Alps region to the limited place of the oil seeds in culture rotation, that is to say approximately 20% of the surface area and at the capacity of adding value to the cakes in animal fodder

over short chains requiring traceability. Rhônealpennergie-Environnement and the FRCUMA are also engaged in a European project [www.2ndvegoil.eu](http://www.2ndvegoil.eu) (2nd generation, pure vegetable oils), with the John Deere tractor constructor and six other partners in order to further improve filtration and comply with the European emissions standards in 2012, which are becoming more and more strict as much regarding 100% PPO tractors as road vehicles.

### Publications

Soon to be available from Rhônealpennergie-Environnement:

- Anaerobic digestion, an opportunity for our regions (July 2009)
- Photovoltaics connected to the network in an agricultural environment - Assistance guide for setting up projects (September 2009)

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4. Regional Federation of the CUMA of the Rhone-Alps region

## NEWS

### Sustainable development: Rhone-Alpine local authorities are evaluating their approaches

The national frame of reference for the acknowledgement of regional sustainable development projects and MEEDDAT<sup>1</sup> local Agendas 21 listed the shared evaluation and continuous improvement strategy amongst its acknowledgement criteria in 2006. This national referential determines the general theoretical framework of a regional sustainable development approach with an underlying theme, key ideas and overall orientations which enable the local role-players to be guided in their reflections.

Rhônealpennergie-Environnement, which has been accompanying local authorities in the installation of sustainable development approaches for numerous years, is interested in the subject of shared evaluation and continuous improvement of these approaches. In 2007, the first assessment was that in the Rhone-Alps region, no local authority engaged in a local Agenda 21 had integrat-

ed evaluation criteria. The main explanations were the lack of experience as far as evaluation and participative democracy is concerned, the complexity of the approach, difficult to apprehend by an outsider, the lack of political will, insufficient means, confusion between monitoring, evaluation and observation. Moreover, many local authorities had already set-up a certain number of indicators which they considered sufficient for evaluating their approaches. Although, the single evaluation of evolution of indicators cannot in any event be considered as an assessment in itself.

A regional work group was created with the aim of drawing up and testing reproducible joint evaluation methods together, enabling the involvement of elected officials and technicians as much as citizens living in the region. Today, this groups together twelve Rhone-Alpine regions already engaged in an

Agenda 21 approach, and is led by Rhônealpennergie-Environnement, who signed, in this respect, an agreement with the National Centre for Regional Public Services (CNFPT - Centre National de la Fonction Publique Territoriale).

An action-training programme was drawn up. It is comprised of a three-day training programme followed by an accompaniment of member local authorities on-site, by a specialised design office (Argos). Upstream, a questionnaire was sent to them in order to establish an inventory and target the different shortfalls.

This personalised accompaniment consists of defining the organisation and leading the local authority's joint evaluation projects, the choice of projects to be evaluated and evaluation questions, the constitution of joint evaluation workshops on the basis of 3 boards (elected officials, technicians, citizens

and/or socioprofessionals), and the installation of joint evaluation workshops on four themes (action report, hearings, evaluation opinions, recommendations). This regional testing also includes jointly drawing up shared tools: observatory, programme monitoring chart, technical tools (method for choosing evaluation fields, etc.).

Two of the twelve regions have successfully completed their project, one is underway and several are being prepared. This programme will be an opportunity for the drawing up of a document on capitalising experiences, etc.

1. The Ministry of Ecology, Energy, Sustainable Development and Regional Development

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### Field trip to Bavaria, the country of renewable energies

Within the scope of the Alpenenergy European project, Rhônealpennergie-Environnement organised a field trip to the South of Germany, in Bavaria, on the 28th and 29th of May just passed. The Allgäu electricity public corporation: AÜW, Alpenenergy project leader welcomed 15 Rhone-Alpine participants: technicians and elected officials from departmental energy syndicates and from an electricity public corporation.

The AÜW public corporation is the largest supplier of electricity in the Allgäu region, and supplies approximately 94,000 customers. 25% of the electricity which it distributes is renewable. It manages production facilities, the connection of independent producers, electricity purchases, distribution and invoicing customers. It should be known that the German electricity production and management model is very different to the French model. 830 distribution companies such as AÜW are present in Germany (of which 270

are located in Bavaria).

Over the AÜW network, almost 91 MW of electricity is provided by different sources of green energy so as to satisfy the demand (230 MW at peak times): 3,000 photovoltaic facilities, 77 hydroelectric power stations, 45 anaerobic digestion units and several wind turbines.

This encounter showed the participants that a strong level of penetration of renewable energies over the network was possible. The trip also was the occasion to visit several renewable energy production facilities (biogas, photovoltaics, wind turbine).

The town of Wildpoldsried (2,600 inhabitants) produces 250% of its needs in green energy and is targeting an objective of 400% in 2 years. It has recently been awarded on a federal level for being the first German renewable energy producing town in its category.

In this milk producing region, farmers acted very early on and can, in this milk crisis, draw

substantial revenue from energy production. In Wildpoldsried, an "energy farmer" showed us around his biogas facility essentially fuelled by liquid manure and grass. This facility is part of a cooperative which adds value to the electrical production of 500 kW of biogas and 400 kW of photovoltaics. A cogeneration located as close to the town's heat network as possible, is fuelled by the biogas produced during operation, thanks to a 3 km pipeline thus enabling optimal valorisation of the heat.

In 2005, the village of Görisried (1,200 inhabitants) invested in a photovoltaic facility of 1,600 kW. The 12,500 m<sup>2</sup> of modules, representing an investment of 6.5 M€ was installed on an old military base, thus benefiting from a specific tariff of 41 c€/kWh. Even if the town had borrowed the entirety of the invested capital, this enables them to release the profits and also to refund the debts taken out.

A study conducted by the AÜW public corporation shows that the economic potential which can be developed in Allgäu is 280 GWh/year of photovoltaic energy and 260 GWh/year of wind energy. The public corporation's objective for 2020 is to reach 40% renewable

electricity! This will require it asking for investments in its electricity network and management. The Alpenenergy project should provide it with answers on the tools to implement so as to adapt the production as much as possible to its regional demand.

A report of the field trip will soon be available on the website [www.raee.org](http://www.raee.org)

### The Alpenenergy European project

The purpose of this project is to develop virtual electricity systems. Its application aims at developing electricity network intelligence systems integrated into the electricity market, which enable productions and consumptions to be integrated, managed, balanced and controlled on a regional scale. The idea is to minimise the financial and environmental costs of local consumption with the use of technical or economic tools: decentralised production management, storage capacities, demand management, intelligent counters, etc.

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