

## Turning waste into a resource

*Sustainable solutions to agricultural waste streams, which can benefit others*

Agricultural waste can be costly and difficult to get rid of. In France, 60 million tons of agricultural and food waste go un-recycled every year. New technologies are however providing solutions. There are now accessible ways to transform by-products from agricultural production into an energy source, turning a problem into a resource. Green Research is a research laboratory and SME based in Normandy, France, which specialises in the transformation of green waste into energy. They have been working with a local community and the Chamber of Agriculture on a pilot project to recycle horse manure.



The project is not only finding solutions for farmers, but it is creating new local energy sources, putting old industrial buildings to good use and creating jobs.

### Plenty of horses means plenty of horse manure

Normandy is a region which is very proud of its equestrian heritage. Horses of many different breeds graze in the Normandy countryside. It is also known for horseracing, nearly half of all thoroughbred race horses in France are bred and registered in Normandy, it is the only region in France to have a competitive cluster dedicated to the horse industry and in August 2014, the region even hosted the World Equestrian Games. Green Research was inspired by this regional love for horses.

There are options for farmers and breeders when it comes putting equine waste to use. However, this can often be quite costly in terms of time and money. This is particularly the case in Normandy where there are plenty of horses. Green research has been finding ways to turn this waste into a resource.

### Technological and social innovation

In 2014, Green Research started working on a pilot project called "Equiénergie" aiming to turn horse manure into biofuel. "We promote both technological and social innovation" says Patrick Jouin, President of Green Research. They propose the installation of the latest innovative technologies to produce energy from green waste. They also work on developing an eco-system for the local community around the production of the energy- involving as many local people and organisations as possible. The idea of promoting a circular economy is very important to this company.



They offer the research, feasibility studies and installation for systems of producing energy from biomass. After extensive research, they have developed a patented system to produce fuel pellets from compressed biomass which conform to the French Norm NF 444. Products which respect this norm can be used with any fuel burning material, and this can be quite difficult to achieve with some agricultural by-products. The pellets are easily transportable, Green Research helps communities look into how best to put it to use, it could be

to heat the local swimming pool or other public or private buildings. Energy is also needed to transform the waste into fuel pellets: pellet mills dry the equine waste before compressing it into fuel pellets, and Green Research has thought of this too. They have a partnership with another organisation who are specialised in anaerobic digestion systems which also run on green waste, breaking down the organic matter and producing energy in the form of heat.

Equiénergie began in 2014 and it now has 18 different sites across France, each of which involves up to 150 small towns and villages. Each of the sites becomes a 'mini enterprise' creating local jobs. Green Research leads the mini enterprises and local people can become shareholders. Green Research's team of researchers carefully looks into the best system for the local context, taking into account the needs of everyone involved or affected. 11 000 tons of manure per year can be transformed by one pellet mill. Farmers will sell their equine and bovine waste to the mini enterprise, this can be a valuable resource. They can also re-use the by-product from the anaerobic digestion process to use as fertiliser on the fields, so this is another example of putting waste to good use.

As this pilot project is still in its early phases, the first complete systems are expected to be installed in 2015, one of the sites has already seen the installation of their anaerobic digester and the final feasibility study is under way.

The project has led different members of the local community to find a common solution to the benefit of everyone. Investment and the creation of jobs have occurred in areas which are relatively "unattractive" to investment. Costs are reduced and solutions provided to waste stream issues for farmers, and of course, it now means local areas can have a sustainable, renewable energy source.

## Green Research

Green Research has won several prizes both on a regional and national scale. They are now working on other projects on transforming biomass from wine production and apple production into energy. They are also currently carrying out research on reducing the CO<sub>2</sub> produced when the fuel is burned. They are involved in an EU exchange project "[Bridge](#)" to look at similar initiatives in the UK.

Agriculture is evolving, and not only will we depend on it for food in the future, but it will also be able to provide us with sources of energy, even by giving value to waste products from this sector. There are other similar projects as Equiénergie currently running in Europe.

[www.greenresearch.fr](http://www.greenresearch.fr)

You can watch a video on the project [here](#) (in French with English subtitles)

Photos: Green Research