The Italian company of Cremona offers a comprehensive service that includes post-sale assistance.

Biogas? Is a business if produced by Rota Guido

The product and service package offered in the biogas field by Rota Guido is composed of technical and financial feasibility study, plant designing, processing of requests for authorization, plant construction, start-up, and electromechanical and biological assistance. Biogas is a fast growing sector due to the positive political scenario and economic success forecast.
In line with other European countries, Italy aims at producing 17% of its energy demand from renewable energies by 2012, although in 2006 only 2,5% was produced from green energy. This brought to extend a number of concessions relating to the legal minimum price per kW due to the electricity distribution network operator (that is obliged to buy the energy produced by the farmers without limitation of quantity), the directives that regulate the green certificate market, the inclusion of energy production in the agricultural income (now subject to tax relief typical of farming), the permissions to farm biomasses for energy purposes on set-aside fields or to use slaughter waste for energy production.
Even the potential economic gain is big: in addition to saving money on electricity bills, a biogas plant can yield up to 0,2 kW/hour considering the benefit from selling energy to the distribution network operator and green certificates. By multiplying this sum by the thousand kW-hours produced in a day by a middle-sized plant you will obtain a good sum of money in one year.
"*It is important* – says Mr Giuseppe Volta, Technical Director of Rota Guido – *that the farmer is properly counselled on the right type of plant that is able to meet the requirements of the farm.*" In other words the plant must be adjusted to the farm's productivity which depends on the number of animals and hectares available. The farm must be guarantee the highest yield in terms of productivity, that is cubic meters of biogas (methan in particular) per ton of biomass used, and in terms of energy, that is number of kW produced by the cogenerator (cubic meters of biogas and methan produced being equal).

Available types
In order to meet its target, Rota Guido Srl offers breeders three different types of biogas plants in addition to the experience and professionalism of its planers. ***Plug-flow plants*** are supplied with the liquid fraction of dejections and require the installation of a separator. These are small plants that are suitable for energy self-sufficient farms.
Up-flow plants use very large quantities of untreated bovine and

swine dejections produced by about 300 milking cows and 4.000 fattening pigs. This type of plant has a greater biogas yield and needs 2 digestors (the second one contains a biogas with a larger concentration of methan). The up-flow plants can be supplied only with vegetable biomasses or mixed material, animal dejections and vegetable products (such as silocorn).
Finally, there are the ***Super-flow plants***. They are the most efficient in terms of energy yield and usually have 2 digesters (the second one contains a biogas richer in nitrogen) and can be supplied with vegetable biomasses or mixed material, animal sewage and vegetable material (such as silocorn). In this second case the digested material is richer in nitrogen compare to the material derived from animal dejections only. For this reason special stocking basins and a larger spreading area are required (in particular, in vulnerable areas about 2 hectares more for every 60-80 tons silocorn used yearly).
If necessary, a plant can be added to the biogas plant for reducing the concentration of nitrogen. This solution is suitable both for single breeders and for cooperatives for an optimal economic sustainability.
"*Mixed plants* – adds Mr. Volta – *must be correctly supplied with the right quantities of animal dejections and vegetable biomass. They must also rely on suitable technologies, be simple and reliable, and finally ensure maximum yield. All this depends on a correct supply system, a well mixed biomass, an efficient reduction of the hydrogen sulphide level – a gas that hinders energy production – and a number of other important aspects such as the right choice of cogenerator."*

Maximum yield
The biomass supply system of Rota Guido's biogas plants require a high-precision component called Vielfraß® that determines the dosage of the medium concentration – either vegetable or animal – to be supplied to the digestor. The quantity may be changed during the day by varying anytime the number of daily material immissions on the switch board. The tank is filled with the product up to the groundwater surface and a very large shovel called "paddel gigant" mixes the biomass in order to avoid deposits and a superficial crust that prevents the correct formation of biogas. The digestor's roof frame is made of wood. This material keeps the desulphuring bacteria alive. Their action reduces the concentration of hydrogen sulphide produced during fermentation (after a "biological" desulphurization a final desulphurization takes place thanks to an activated carbon filter before the biogas

enters the cogeneration engine).

Automatic management
Another great “plus” of plants by Rota Guido is the heating system that maintains the biomass temperature at 42°C and the mesophilic environment in the highest temperature range that ensures methan production. The inspection windows are provided with wipers to allow visual inspection of the biomass. The special elastic material of the cupolas allows to check the amount of gas produced (the cupolas are tight when they are full of gas). The switch board controls automatically all production phases. Among optionals there is a device that allows to automatically check the quality of the gas produced in the digestor and therefore quantify the percentage concentration of methan, carbon dioxide and hydrogen sulphide contained in the biogas.

Types of engines
We should not forget the main component of the cogeneration plant. “*We use* – underlines Mr Volta – *two types of engines: those that function with gas only and those that run with bi-fuel, which is made up of gas and small concentration of diesel. The latter is a good solution when the biomass is highly variable and produces different yields: some diesel is sprayed inside the engine and the power yield reaches 45%, that is 20% more than with engines that run with gas only. In other words a bi-fuel engine saves 20% biomass, and for this reason, it may be an appropriate choice when the amount of available biomass is small.*” For sure biogas is worth it but only if properly counselled by professionals.
of 200.000 euros.