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FROM LABSCALE TO FULL SCALE BIOGAS PLANTS

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Abstract
Anaerobic digestion process is a complex biological process. To obtain the best results it is necessary have a good planning of the activities that will conduct at the realization of the reactor starting from the laboratory activities to the choice of the reactor. In this paper will be shortly described the possible approaches.

Introduction
The renewed interest around anaerobic digestion during these last years is strictly connected with the possibility of this process to produce energy with a neutral impact on the greenhouse gasses emission and reduce the organic load of the substrate used, and consequently reduce its potential pollution impact on the environment.The other important aspect of this process is that the energetic balance is absolutely positive and this can generate a great advantage compared with other possible biological or non-biological treatments of the organic matter.
For this reason several wastes (animal manure, agricultural wastes, agroindustrial wastes, organic fraction of municipal solid wastes) and wastewaters flows are diverted from other possible processes to the anaerobic digestion. For the same reason even several crops are specifically cultivated for their use in the anaerobic reactors for energy production.
This determine a wide range of substrates that can be used in anaerobic digestion, but at the same time the characteristics of these substrates not always are well known. The consequent design and management of an anaerobic reactor can be strongly affected by the substrate used.
For these reason it is important in presence of new substrates precedes the design with some specific test in lab scale or pilot scale reactors.

Conclusions
The success of a anaerobic digester depends largely by a good design, a good choice of the mechanical devices, but it depends even strongly from the management of the reactor. Before start the introduction of new organic materials it is very useful test it in laboratory and obtain the basic information regarding its biodegradability and biogas methane potential. In this case it is possible to prevent decreasing of production due to low or excessive biodegradability, or any other possible toxic effect connected with the characteristics of the substrate.

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