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EDITORIAL

A SPECIAL ISSUE DEDICATED TO

BIOMASS – A SOURCE OF CHEMICAL AND ENERGY FOR SUSTAINABLE DEVELOPMENT

In the top 25 major questions concerning science over the next quarter century, the following question is on 24th place: “**What could replace cheap oil and when?**” At present, less than 10% of the chemicals and raw materials offered by the chemical industry are generated from biomass.

At the European level it was proposed that 20% of the overall energy consumption by 2020 should be covered by renewable energy sources and that 10% of the road transport should run on biofuels. In this context, it seems that biomass will play an important part.

That is why the *Editorial Board of Environmental Engineering and Management Journal* decided to publish a special issue dedicated to the following subject: **Biomass – a source of chemical and energy for sustainable development**. As a consequence this special issue gathered papers which demonstrate that biomass could represent a valuable solution to solve the problem of energy and raw materials for chemical industry and not only. At the same time, a new philosophy could lead to the new opportunities to assure an increasing compatibility between biomass processing and environmental protection according to the concept of green chemistry.

Having in mind that in 2030, 90% of energy consumption will be based on fossil resources, the use of biomass for energy can be one way to reduce the ever-increasing emissions of carbon dioxide, one of the main gases responsible for global warming.

Biomass for energy uses and chemical production presents the following important advantages:

- it is mainly an indigenous source and therefore reduces dependency on energy imports and increases security of supply;
- like the other renewable, it has an enormous potential for job creation predominantly in agriculture and forestry and in small and medium sized enterprises;
- technologies for renewable energy carriers of European industry offer promising business opportunities, because world energy consumption is expected to grow;
- in many industries biomass is a by-product of industrial processes, so its utilization solves both a waste and energy problem.

Moral responsibility for future generations forces industrial nations to aspire to sustainability. In the long term, sustainability cannot rely on finite resources and biomass as a renewable raw material could correspond to this concept. All these aspects are demonstrated in the papers published in this special issue. Thus, some of the papers present the possibilities to obtain energy and chemicals from biomass using thermochemical, biochemical and chemical ways.

The option for one of them depends on the accessibility of raw material and the efficiency calculated as a function of its characteristics (humidity content, chemical composition and applied technology).

Some applications refer to the utilization of wastes resulting from industry by direct combustion of them or in the mixture with fossil fuels in the cogeneration of energy. There are also presented some case studies in Romania, Latvia and Hungary. Biofuels can be obtained by methanization of different wastes resulting from industry. In this case an important role is played by the composition of wastes and microorganisms used for fermentation.

It is important to mention that the application of biotechnological processes which are environmentally friendly allow us to obtain valuable products and their utilization in bioremediation.

Different aspects are developed in this field, such as: immobilization of bacteria, utilization of biomass or compost resulted from it to remove some toxic metal ions.

Very interesting are the aspects concerning cultivation of plants having capacity to synthesize compounds with biological properties for phytotherapy.

Biomass or by products resulted from industry could represent valuable resource to obtain different chemicals (e.g. biocides), and composites.

Therefore, biomass production and its use bring additional environmental and social benefits.

Correctly managed biomass is a sustainable fuel that can deliver a significant reduction in net carbon emissions when compared with fossil fuels.

Biomass fuels generate lower levels of such atmospheric pollutants as sulphur dioxide that contributes to "acid rains".

At the same time, by renewable capacity, biomass could provide an important resource for compounds which can be used in a closed cycle due to their compatibility with the environment.

The possibility to include biomass among other solutions to solve the crisis of energy and raw materials is sustained by huge volume resulted by biosynthesis and which is estimated to be of $150 \cdot 10^9$ t/year at world level.

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