



DANUBIOM PROJECT CONCEPT

IMPROVING SUSTAINABLE BIOENERGY USE WITH MULTINATIONAL CO-OPERATION IN THE DANUBE REGION

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15 October 2014



Project Relevance

Biomass based energy production has a long history in the Danube Region. The patterns and characteristics of production, however, changed tremendously in recent years, when large scale power generation and cogeneration was established and picked up steam. These set in motion an industrialised and intensive use of these resources. Besides firing, new ways of utilisation also emerged: biomass-to-liquids and biomass-to-plastics technologies, highly efficient home sized cogeneration and gasification units, etc. These new developments changed the traditional way of use and challenged societies and traditional regulatory frameworks by triggering both social and ecological problems.

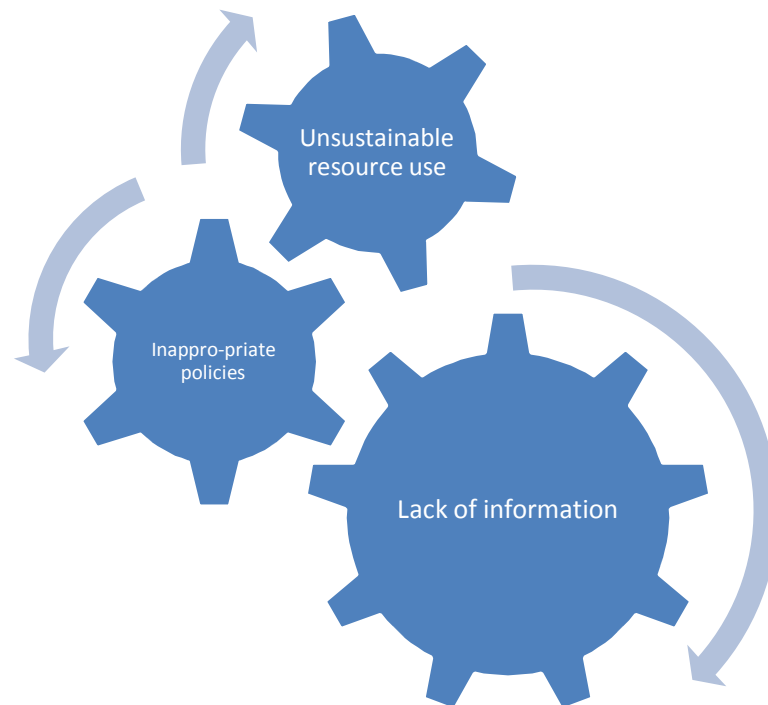
Challenges addressed

From the researchers' perspective the main problem areas are defined as follows:

- information deficit: general knowledge on renewable energy technologies (RET), environmental aspects, quality requirements of biofuels, liability of commercial partners/providers – consumer protection;
- fragmented bioenergy market and energy infrastructure;
- contradictory/not relevant national and EU level policies;
 - i. inefficient energy utilisation;
- inappropriate technologies:
 - i. missing holistic technologies: lack of knowledge related to complex decentralised energy systems/value chains based different biomass feed stocks;
 - ii. problem of fit of investments emerging from different regional circumstances (infrastructure, economic situation, social aspects).

In many cases the sources of conflicts originate in a lack of information of both socio-economic and ecological nature that are exacerbated by the inappropriate policy measures fostering unsustainable resource utilisation and creating vicious circles. In these cases lost-lost situations often emerge burdening both society and the ecosystems.

This chain of events causes a cogwheel effect:



Project objectives

Concerning these bioenergy related issues as they are also assigned in the Biomass Action Plan of the Danube Region Strategy, the multi-national cooperation of the DANUBIOM project has the following main objectives to overcome challenges touched upon above:

1. define criteria of an environmentally sustainable bioenergy utilisation in the Danube Region;
2. rank most common technologies according to their performance in sustainability;
3. improve environmentally sustainable and energy efficient bioenergy utilisation in the Danube Region;
4. assist the development of a sustainable bioenergy infrastructure;
5. enable a well-functioning bioenergy market;
6. propose necessary harmonization of policies in line with the sustainability requirements.



The overarching goal of these objectives is to enhance a more sustainable and efficient use of bioenergy by defining mutually acceptable criteria, and harmonizing key policy measures. In order to manifest these objectives, the project intends to apply the activities below:

- analyse best- and worst-practices;
- exchange experiences in bioenergy use;
- identify bottlenecks and problem areas that hinder a sustainable utilisation;
- establish a uniform biomass and bioenergy statistics of the Danube Region DANUBIOMSTAT;
- create training centres for demonstrating and teaching the sustainable practices by involving industry partners, develop e-learning and training materials;
- disseminate most relevant standards and EU directives for technology, for environmental requirements, and for quality of biofuels;
- propose adequate regional bioenergy policy papers;
- involvement of the governmental (ministries, management organisations), non-governmental (professional associations), and the for-profit sector;
- assist development decisions/investments by comparing complex value chains to characterise environmental and energy performance;
- promote tailored technology transfer specified according to the local/regional circumstances.

Key project results and outputs

First an easily accessible information basis (DANUBIOMSTAT) will be founded that provides up-to-date information of biomass potential and utilisation patterns in the Danube Region. Based on the data sources of DANUBIOMSTAT using SUSTAINABILITY PERFORMANCE INDICATORS the thorough analysis of best and worst practices bottlenecks can be made. On the basis of these information sources sustainable value chains can be characterised and appropriate training and awareness raising activities, proper policy measures and suitable decision support can be provided. Additionally, in order to support environmental assessments in early phases of bioenergy developments a SUSTAINABILITY ASSESSMENT TOOL is planned to be established using the developed indicators above. Here robust principles are to be set up like:

- Close material cycles;
- Minimize harmful emissions;
- Shorten energy transformation routes;
- Limit energy losses.



The experiences from the activities above provide valuable knowledge to properly adjust legislative environments that encourages environmentally effective technology transfer thus inducing a more sustainable resource use.

The concrete outputs of the project are the following:

- Establishing a bioenergy statistical data base;
- Creating a sustainability assessment tool;
- Characterising sustainable value chains;
- Demonstrating ready-to-use biomass based alternatives on demonstration sites;
- Providing up-to-date planning practices;
- Policy analysis and proposal for an adequate bioenergy policy amendment;
- Technology development for standardised feed-stock production, and innovations for improving environmental performance and energy efficiency.

Targeted stakeholders

The proposed cooperation from both the profit and non-profit sector enhances exchange of knowledge and experiences not just among partner countries, but also between research institutions and their SME counterparts. In this regard potential project partners may come from the following areas or institutions:

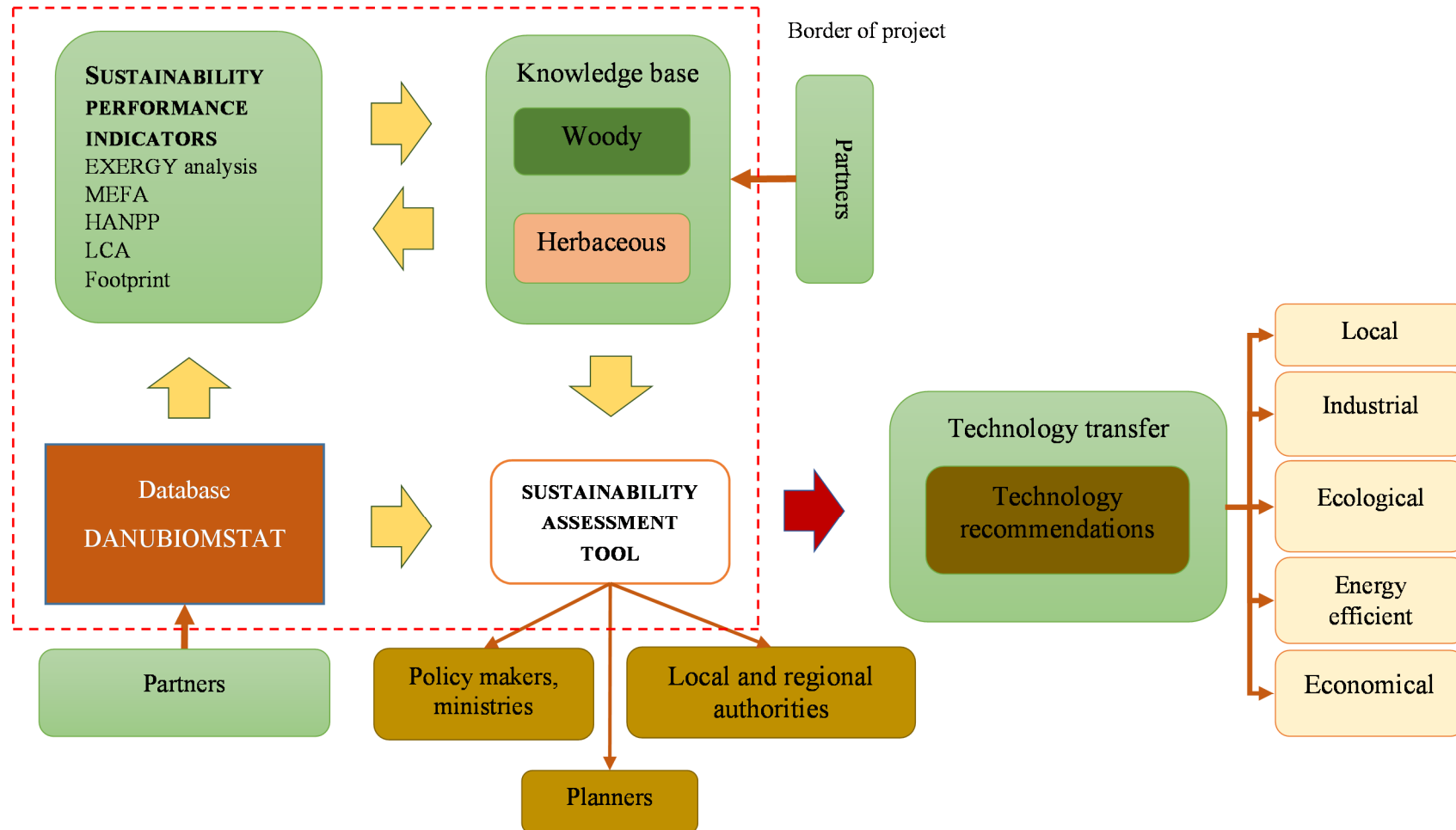
- research institutions in the renewable energy sector dealing with both technical and social aspects of energy transition;
- entrepreneurs providing technology and services in the renewable energy sector
- typical governmental and private energy consumers.

The possible stakeholders and target groups are:

- users of biomass based energy sources like households, municipalities, entrepreneurs
- energy providers, ESCO-s;
- feed-stock providers: forestry and agricultural companies, biomass processing SME-s;
- technology providers: stove and boiler producers.

The proposed knowledge transfer including information and training activities intends to assist a more sustainable and efficient bioenergy use that safeguards fragile natural resources and provides sustainable and long-term biomass based services for societies.

Summary of project concept



Participants from Szent István University who compiled the DANUBIOM project concept:

- **Csaba GYURICZA**, PhD in Agricultural Sciences, Assoc. Prof., Dean of the Faculty of Agricultural and Environmental Sciences, Director of Institute of Crop Production.

Areas of expertise: land use, energy crop production systems, biomass utilisation.

- **Norbert KOHLHEB**, PhD in Social Sciences, Assoc. Prof. of the Institute of Environmental and Landscape Management.

Areas of expertise: environmentally sustainable bioenergy utilisation, social assessment of renewable energy sources.

- **Gergő Péter KOVÁCS**, PhD in Agricultural Sciences, Assist. Prof. of the Institute of Crop Production, Director of SZIU Pilot Farm for Crop Production and Biomass Utilisation.

Areas of expertise: biomass utilisation techniques, energy crop production systems.

- **Péter TÓVÁRI**, MSc in Agricultural Engineering, Assist. Prof. of the Institute of Crop Production.

Areas of expertise: biomass utilisation methods, complex decentralised energy systems.