BiWaRE - Biomass and Waste for Renewable Energy

RENEWABLE ENERGY NEEDS PROMOTION

Renewable energy refers to energy resources that are replaced rapidly by natural processes, e.g. solar, geothermal, wind and biomass energy. Against the background of the worldwide increasing energy demand, the depletion of natural resources and global warming, renewable energy using biomass and organic waste represents a sustainable alternative for energy development all over the world.

Two forms of renewable energy are particularly interesting for decentralised applications in countries like Vietnam and Thailand: the generation of **biogas** by anaerobic digestion of organic substances and **biomass combustion**. Due to the climatic conditions and economic structure, organic substrates from agriculture, forestry, households and industry are very abundant. Renewable energy can provide environmentally, economically and socially sound energy supply to households and companies. Furthermore the solid products can be utilised as a secondary raw material fertiliser, representing the recycling of valuable substances, like phosphorus.

The application of renewable energy needs promotion. Typical constraints are legal and institutional barriers, the lack of systematic data for developing renewable energy policies on supply and demand and the lack of technology transfer and know-how.

BiWaRE SUPPORTS THE APPLICATION OF RENEWABLE ENERGY

'BiWaRE- Biomass and Waste for Renewable Energy' has been an EU-supported joint applied research project in the AUNP Programme, carried out in 2004 and 2005.

The purpose of this project has been to develop an integrated **'Decision Support System' (DSS)** for the application of renewable energy technologies from organic substrates, by biogas and biomass combustion processes. Framework conditions of **Vietnam** and **Thailand** are particularly considered.

Furthermore **training materials** are developed, to integrate the results into the curricula of the BiWaRE Partner Universities in Vietnam, Thailand, Germany and the United Kingdom, contributing to a more practically oriented and innovative education.

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DECISION SUPPORT SYSTEM (DSS) FOR THE APPLICATION OF BIOGAS AND BIOMASS COMBUSTION

Particularly for Vietnam and Thailand

Reliable, cost-efficient und sustainable energy supply is one of the main factors for development and economic growth. Therefore the identification of potential renewable energy options and their careful selection for each situation are of utmost importance.

Many factors need to be considered for the selection of energy options, e.g. energy demand, site conditions, socio-cultural framework, socio-economic implications, legislation and policy, and the economic feasibility. In addition, with biogas and biomass combustion, even more factors need to be evaluated, e.g. the quality and quantity of suitable substrates, seasonal distributions, shelf life and logistics, etc.. Therefore the assessment of the feasibility of potential projects is complex, especially for decision-makers or planners, who are not familiar with renewable energy from organic substrates.

The Decision Support System (DSS) shall support decision-makers and planners for an initial evaluation, whether biogas or biomass combustion could be a feasible option for their energy project, e.g. the electrification of a particular community or the supply of an industrial firm.

The DSS is intended to be applied during the first stages of the project development (fig.1). Its application represents a **pre-feasibility study** and leads to an initial decision, whether or not biogas or biomass combustion is potentially suitable for the project in question and whether it is worth to proceed with a costly further project development.

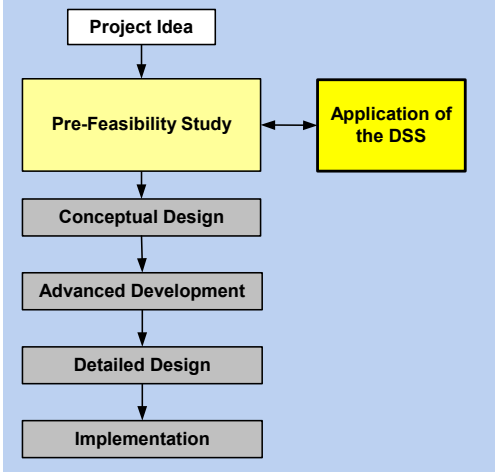

fig. 1: Scope of the DSS

OVERALL OBJECTIVES OF DSS:

- to promote the increased use of biogas and biomass combustion process for the generation of renewable energy
- to promote the transfer of knowledge and know-how in the field of renewable energy
- to promote environmental awareness with decision-makers, planners, suppliers and students
- and to provide the basis for training.

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ELEMENTS OF THE DSS

The DSS integrates all relevant aspects, like energy production and utilisation, pre-dimensioning, framework conditions, socio-economic and environmental impact as well as project economics. Thus it has a unique quality.

The main elements of the DSS are the **Decision Tree flow-chart** (fig. 2) which guides the user systematically through the decision-making process, step by step , and an **excel-based application aid** (fig 3). Furthermore **tools** (calculation aids or data bases) are provided to support the user.

The DSS is provided in form of a handbook and a digital version.

TARGET GROUPS

- Decision-makers involved in planning processes of energy supply
- Suppliers of renewable energy processes/ equipment
- Communities and companies interested in alternative energy strategies
- Students of environmental sciences/ engineering, energy supply, agriculture, civil engineering, process engineering, environmental economics, integrated planning, etc.
- All other parties interested in renewable energy

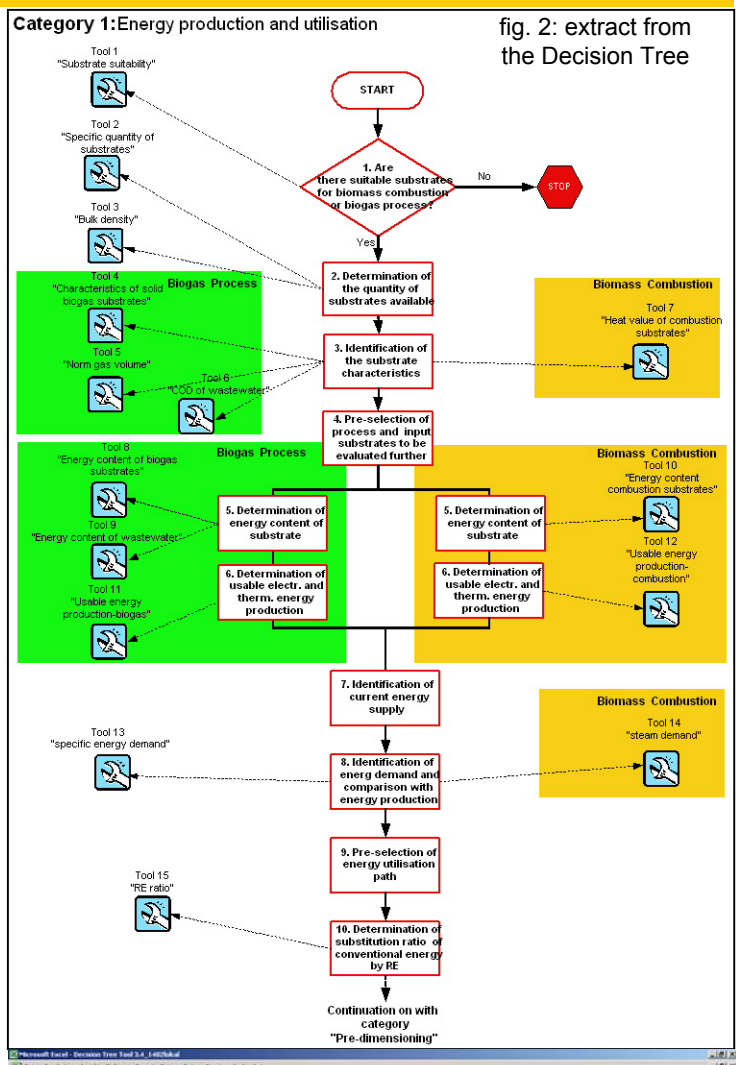

fig. 2: extract from the Decision Tree

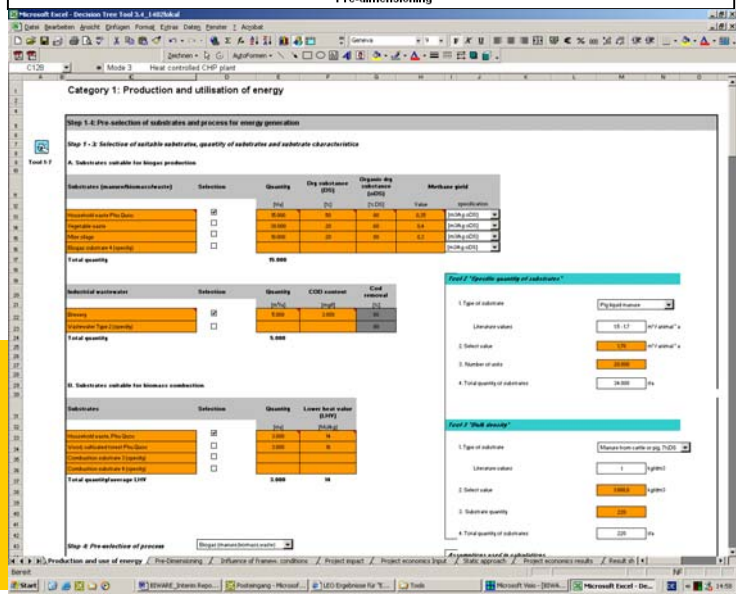

fig. 3: Screen-shot of the excel- based application aid, a main element of the DSS

DOWNLOADS

- BiWaRE- DSS handbook,
- excel-based application aid,
- training modules and
- further information:

➢ www.biware.hs-bremen.de

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THE BiWaRE PARTNERS

BiWaRE has been the joint effort of the following partners:

- Bremen University of Applied Sciences, Germany (www.hs-bremen.de)
  project co-ordinator
- Dresden University of Technology, Germany (www.tu-dresden.de)
- University of Wales, Cardiff, UK (www.cf.ac.uk)
- Can Tho University, Vietnam (www.ctu.edu.vn)
- King Mongkut's University of Technology Thonburi, Thailand (http://www.kmutt.ac.th)

THE AUNP-PROGRAMME OF THE EU

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For further information:
www.eu.int/comm/europeaid/projects/aunp/index_en.htm

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