

## ENVIRONMENTAL AND HYGIENIC SAFETY

To ensure environmental and hygienic safety **wastewater and sewage sludge must be pre-treated** before being used in SRPs. Their agricultural application is regulated in the EU through:

- **Nitrates Directive** (91/676/EEC),
- **Sewage Sludge Directive** (86/278/EEC), and
- related **national specifications**

defining maximum application loads for nutrients and chemical pollutants. Pre-treatment further reduces pathogenic risks and allows compliance with local legislation for soil and water quality.



## TRAINING AND DISSEMINATION MATERIAL

To promote BIOPROS project results the following materials have been developed in 8 different languages and are available for training and further dissemination at [www.biopros.info](http://www.biopros.info) or upon request from your national project representative:

- **DVD Video:** "Short Rotation Plantations - Opportunities for efficient biomass production with the safe application of wastewater and sewage sludge"
- **CD-ROM:** PC presentations detailing project activities and results
- **SRP Guidelines:** "Short Rotation Plantations - Guidelines for Efficient Biomass Production with the Safe Application of Pre-treated Wastewater and Sewage Sludge"
- **Project Poster and Leaflets:** 3 different leaflets with information for farmers and municipalities



## PROJECT COORDINATORS



EUBIA  
European Biomass Industry Association  
[www.eubia.org](http://www.eubia.org)



ttz Bremerhaven  
Germany  
[www.ttz-bremerhaven.de](http://www.ttz-bremerhaven.de)

## EUBIA European Biomass Industry Association

Renewable Energy House  
Rue d'Arlon 63-65  
B-1040 Brussels, Belgium  
+32 2 400 10 20  
[eubia@eubia.org](mailto:eubia@eubia.org)

For more information visit  
the BIOPROS project website  
[www.biopros.info](http://www.biopros.info)

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[www.etaflorence.it](http://www.etaflorence.it)

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[www.iees.ch](http://www.iees.ch)



SIXTH FRAMEWORK  
PROGRAMME



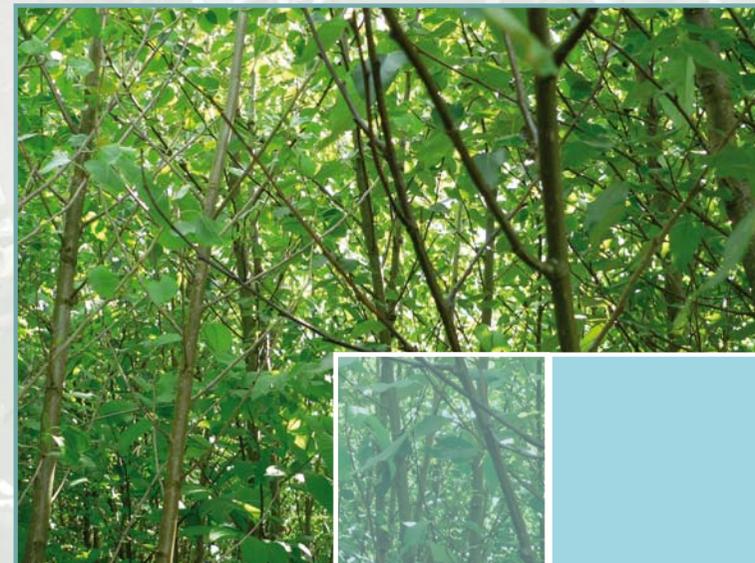
HORIZONTAL ACTIVITIES  
INVOLVING SMEs

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## Short Rotation Plantations

Opportunities for efficient  
biomass production with  
the safe application of  
wastewater and sewage  
sludge

Developed with funding from the European  
Commission BIOPROS research project.





### WHAT IS A "SHORT ROTATION PLANTATION"



Short Rotation Plantations (SRPs) are land-use systems combining agricultural and forestry practices (Agroforestry). Fast growing tree species such as willow and poplar are managed in short coppicing cycles (1-5 years). These non-food/non-fodder crops have a high demand for nutrients and water, which may alternatively be met by reusing pre-treated wastewater and sewage sludge enabling a sustainable nutrient recycling. The woody biomass produced can be used as a renewable and clean fuel for heat and power generation, or for further processing into liquid biofuels.

### REUSE OF MUNICIPAL WASTEWATER

Municipal wastewater consists of effluents from households, commercial establishments and industry. Besides valuable plant nutrients, it may contain certain amounts of pathogens, organic and inorganic pollutants which must be reduced before wastewater can be reused for irrigation. BIOPROS results suggest that SRPs have a high bio-filter capacity for nutrients and may be used as a final purification step for pre-treated wastewater. Therefore, SRPs present a cost-efficient and safe way of improving the performance of existing and newly planned wastewater treatment plants.

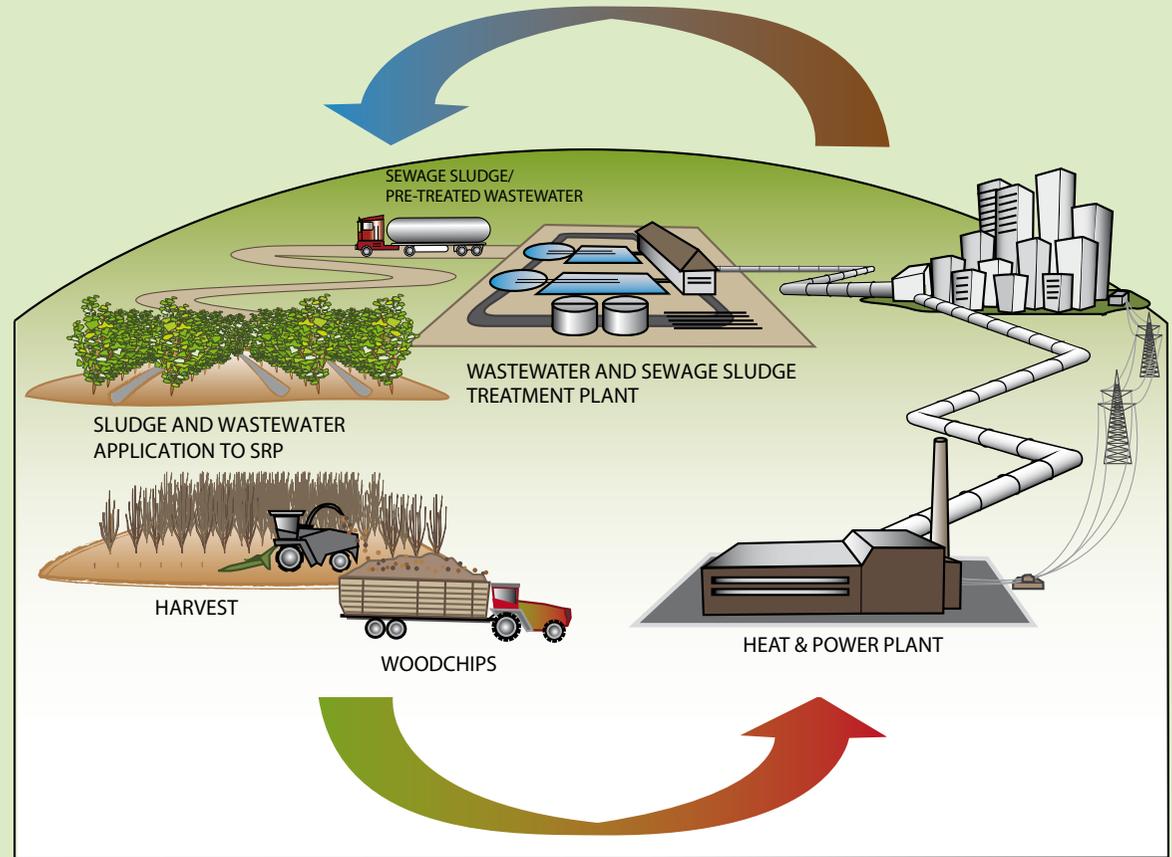


### FERTILIZATION WITH SEWAGE SLUDGE



Sewage sludge is the solid by-product of wastewater treatment which contains high amounts of organic matter and plant nutrients. Pathogens and pollutants can be effectively reduced by a series of stabilization treatments. If treated in compliance with EU and local regulations, sewage sludge may be safely applied to agricultural land as an effective way of increasing soil fertility.

## COMBINED BIOMASS PRODUCTION AND WASTEWATER PURIFICATION AS AN INTEGRATED LAND-USE SYSTEM



### BENEFITS FOR FARMERS

- New source of income from energy crops
- New source of income from wastewater/sludge recycling
- Alternative fertilization and irrigation method at low cost
- Increased income from improved biomass yields due to irrigation and fertilization
- Increase in soil organic matter content and soil fertility

### BENEFITS FOR LOCAL COMMUNITIES AND SOCIETY

- Opportunities to reduce costs for conventional wastewater treatment (investment, operation, disposal)
- Supporting compliance with environmental legislation if treatment standards are currently not met
- Opportunities to produce renewable biomass for local heat and power generation
- Supporting local economy by establishing local biomass supply chains
- Recycling of local water and nutrient sources
- Reduction of energy consumption requirements for the production of artificial fertilizer
- Supporting sustainable rural development by reducing dependency upon fossil fuels