

Implementation barriers of energy from biomass: technical and psychological factors

Human-Technology Interaction:

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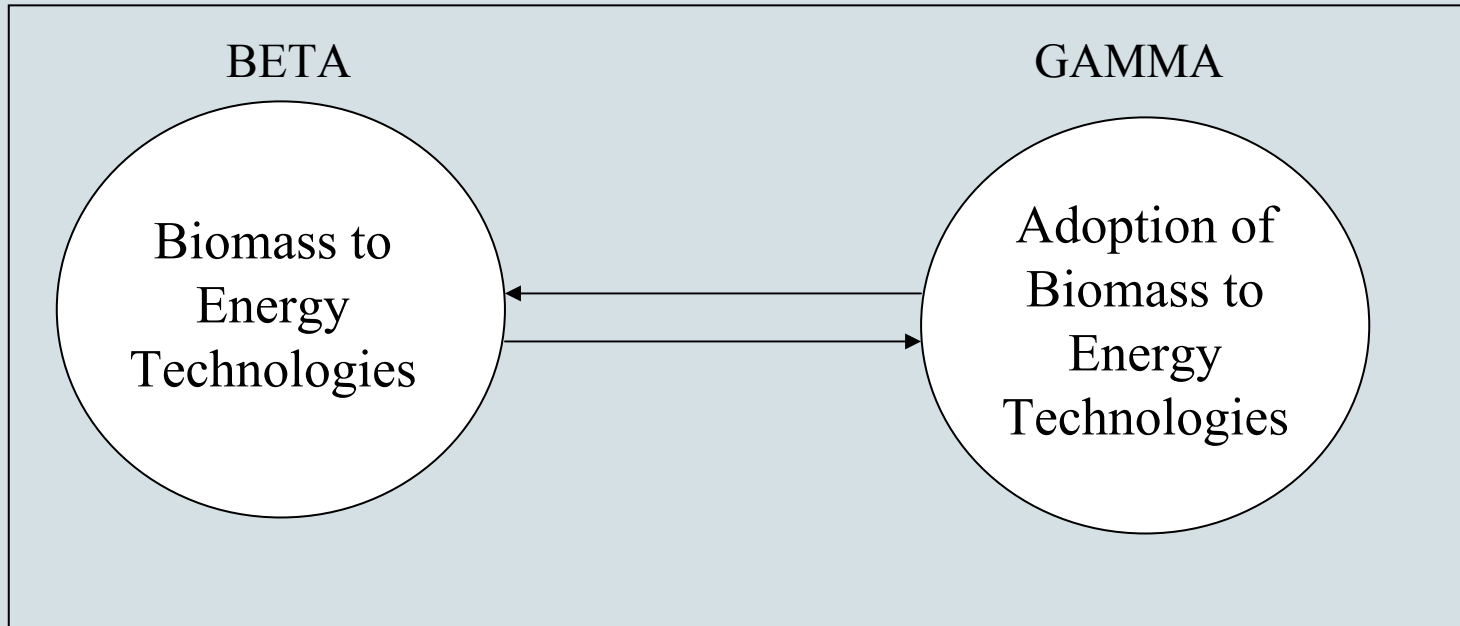
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Technology for Sustainable Development:

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β - γ subjects of investigation



Aspects of biomass as energy source

Economical aspects

- Productivity/yield
- Land availability
- Labour use
- Transport cost

Biomass

Technological aspects

- Feasibility
- Efficiency
- (export of) know-how
- Technology services

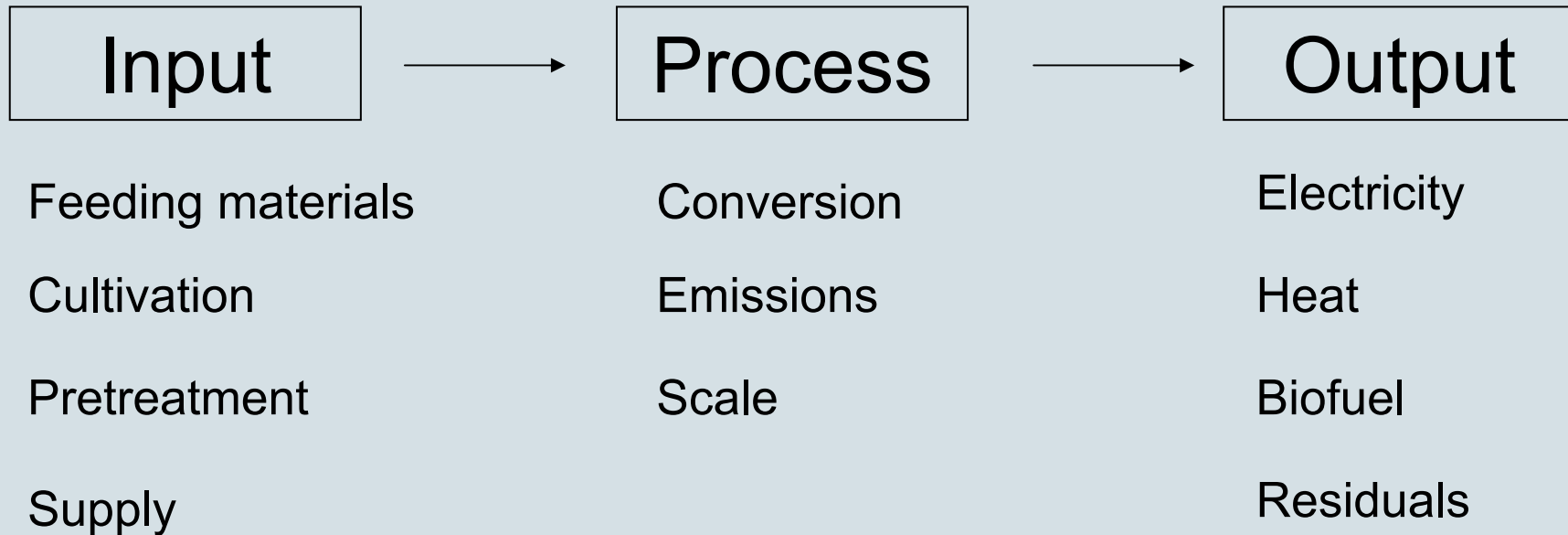
Environmental aspects

- Water supply
- Fertilizer required?
- Emissions
- Transport

Social aspects

- Attitudes, emotions, beliefs
- Experiences (e.g., nuisances)
- Communication

Biomass technology system



β - γ interface

feeding types

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graph TD; A[feeding types] -- "e.g., moisture" --> B["β Feasibility & efficiency"]; A -- "e.g., grown/waste" --> C["γ Perceptions & attitudes"];
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e.g., moisture

e.g., grown/waste

β Feasibility & efficiency

- Suitability for gasification
- Fuel properties obtained from ECN's Phyllis database
- Results show that gasification properties of biomass could be improved → new research line

γ Perceptions & attitudes

- Experiments and surveys among electricity consumers:
- Categorisation of feeding types
 - Basis, structure and strength of attitudes towards feeding types
 - Impact of direct experience and information on attitudes

β - γ interface

feeding materials in power plants

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graph TD; A[feeding materials in power plants] --> B[β Feasibility & efficiency]; A --> C[γ Perceptions & attitudes];
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β Feasibility & efficiency

- Technology assessment
- Compare LCA's of different plants with different feeding materials
- Problems: many variables, complexity, data availability, depth, time

γ Perceptions & attitudes

Survey among plant neighbours:

- Basis, structure and strength of attitudes towards use of feeding materials for electricity generation in plants
- Impact of direct experience and information on attitudes

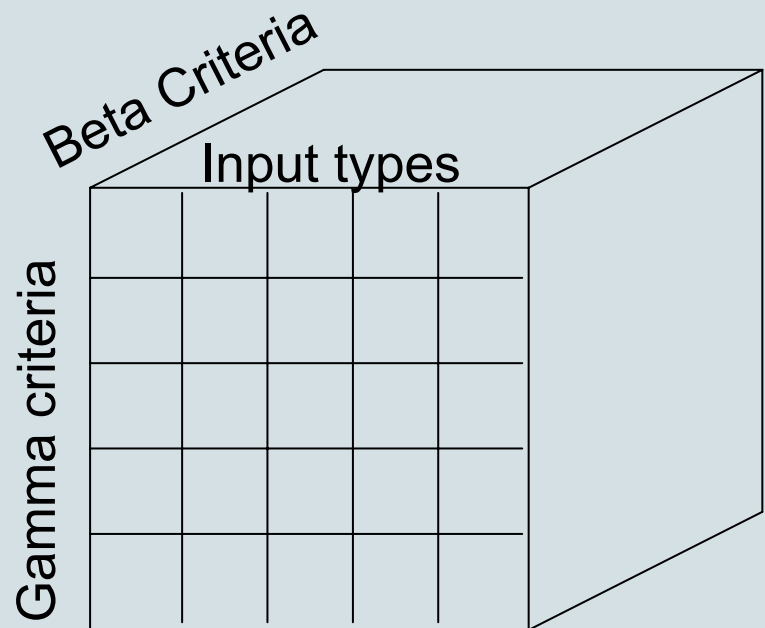
Pros and cons of β - γ collaboration

Biggest Plus

- Different viewpoints
 - > Innovativeness
- Subject selection based on multiple criteria
 - > Practical relevance

Biggest Challenge

- Choosing research subjects for which β and γ research are complimentary and mono-disciplinary depth is possible
- Integrating results



Success factors for collaboration

- Subject of investigation
- Willingness and openness of researchers
- Proximity of researchers
- (Flexible) planning of exchange