

An overview of the SUPERGEN Bioenergy Hub

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SUPERGEN Bioenergy Hub

SGB Hub Aim & Objectives

- **Increasing UK bioenergy to meet strategic targets in a coherent, sustainable and cost-effective manner**
- Focal point for sharing and dissemination of scientific knowledge and engineering understanding
- Investigate and develop new approaches to engineering challenges associated with novel technology deployment
- Improve scientific understanding of biomass/conversion
- Whole-systems perspective
- Interdisciplinary: impacts on ecosystems, social responses, economic context; policy





 **SUPERGEN** Bioenergy Hub
SGB Hub Projects

1. Emissions from solid biomass
2. Impact of feedstock parameters on airborne emissions
3. Evaluation of substitute natural gas
4. Streamlining the supply chain
5. Carbon uncertainties in the supply chain
6. Gasification integration
7. Torrefaction integrated assessment
8. Carbon capture & storage enabling technologies
9. Bio-oil upgrading




 **SUPERGEN Bioenergy Hub**
SGB Hub Projects

10. Whole systems analysis of novel biofuel technologies
11. Clean energy from rice straw
12. Photocatalytic bioethanol production
13. Increasing energy yield from the integration of anaerobic digestion and pyrolysis
14. Clean energy utilisation from biogas and biomass gasification
15. Development of fast pyrolysis based advanced bioenergy technologies for biofuels
16. Bioenergy value chains – whole systems analysis and optimisation
17. Gasification integration



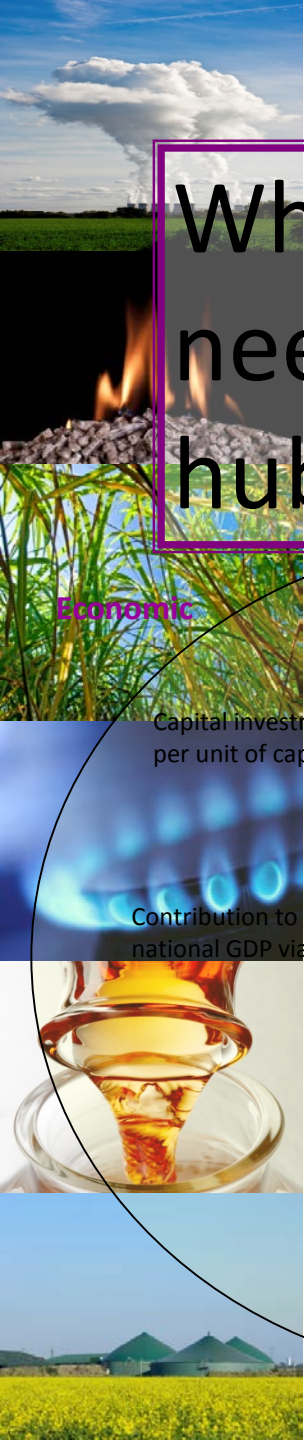
SUPERGEN Bioenergy Hub
SGB Hub Projects

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18. Low energy plasma upgarding of syngas
 19. Measurement and analysis of greenhouse gases and land use interfaces
 20. Development issues associated with anaerobic digestion
 21. Bioproducts
 22. Stakeholder perceptions of land-use for energy
 23. ??????

Themes

1. Airborne emissions
2. Greenhouse gas balances
3. System sustainability
4. Advanced conversion technologies
5. Systems engineering





Ecological



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Greenhouse gas savings

Plantation biodiversity

Regional biodiversity

Genetic modification

Pesticide use

Social & environmental assessment of new plantations

Wider impacts of land use change

Fertilizer use

Water demand vs local availability

Minimum grade of land required

Impact on crop rotations

Soil chemical changes

Soil physical changes
Energy delivered per unit of land used

Economic

Use of fire for land clearance

Surface and ground water pollution

Capital investment per unit of capacity

Air borne pollution

Accidental fire risk from feedstock production

Contribution to national economy via employment and manufacturing

Waste arisings

Legal system transparent &

Visual/landscape impact of crop

Contribution to national GDP via tax

Use of inappropriately acknowledged obtained land

Impact on global food prices

Cost of delivered energy product

Conflict with local food production

Appropriate training of workers

Contribution to energy security
Community benefits

Appropriate community consultation

Legal non-compliance

Technology risk – potential for failure

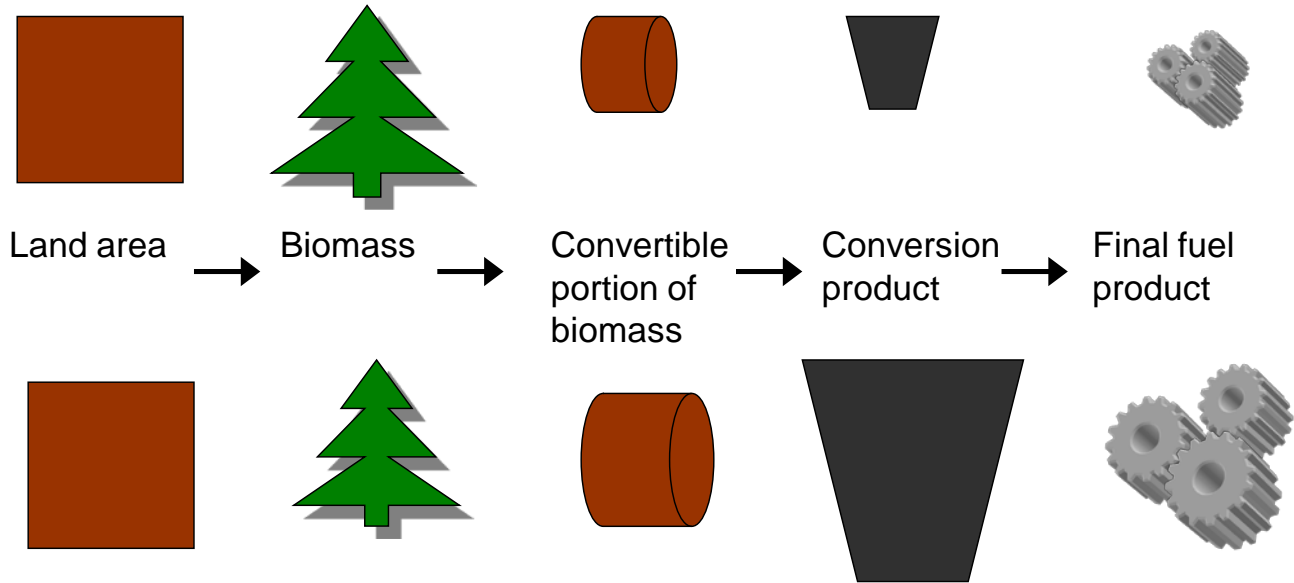
Minimum standards for treatment of workers and protection of rights

Inappropriate handling of complaints

Social

The importance of the whole systems perspective for bioenergy

First generation



Second generation

Thornley, P., "Biofuels Review", Report for Government Office for Science, prepared as part of the Foresight Programme, June 2012



Opportunities

Themes /interdisciplinary opportunities/Systems

Stakeholders

SHARE network

Small grant fund

Engagement

EERA Bioenergy

Events – IMechE Biomass Sustainability – 19 November,
London

Bioenergy – an engine for growth in the global south?,
London, 28 January

Southern African opportunities

Developing country opportunities

Impact

Website





www.supergen-bioenergy.net

Live webstream for assembly

<http://www.supergen-bioenergy.net/news-and-events/supergen-hub-assembly-live-stream/>

Follow discussions on
Twitter [@SupergenBioHub](https://twitter.com/SupergenBioHub)
#SBHA #bioenergy

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