

TSEC-Biosys:
A whole systems approach to bioenergy
demand and supply
www.tsec-biosys.ac.uk

Prof. Peter Pearson
Imperial College London

*Stakeholders' validation workshop ,
The Royal Society, London: 19th January 2009*



The TSEC-Biosys Project

- ❑ Part of TSEC – the Research Councils' *Towards a Sustainable Energy Economy* Programme
- ❑ Funded through NERC (2005-2009)
- ❑ *A whole systems approach to bioenergy demand and supply – mobilising the long-term potential of UK bioenergy*
 - ❑ A multi-disciplinary team with strong bioenergy expertise
 - ❑ Project coordination - ICEPT, Imperial College:
 - ❑ Project Coordinator: Dr Ausilio Bauen, assisted by Dr Calliope Panoutsou
 - ❑ PI: Prof. Peter Pearson
- ❑ Mentors:
 - ❑ Prof. Tony Bridgwater, Aston University
 - ❑ Dr Mike Carver, Bical



Fifteen Consortium Partners

- ❑ Imperial College London
 - ❑ Centre for Energy Policy and Technology – ICEPT (Coordinators)
 - ❑ Centre for Process Systems Engineering – CPSE
 - ❑ Biology Department
- ❑ Centre for Ecology and Hydrology
- ❑ Edinburgh Centre for Carbon Management
- ❑ Forest Research
- ❑ Institute for European Environmental Policy
- ❑ North Energy Associates
- ❑ Oxford University Centre for the Environment
- ❑ Rothamsted Research University of Aberdeen
- ❑ Scottish Agricultural College
- ❑ University of Birmingham
- ❑ University of Glamorgan
- ❑ University of Southampton
- ❑ University of Surrey

Four Interconnected Work Packages & Themes

❑ 1: (**Leader: Dr Ausilio Bauen**)

- ❑ An integrated analysis of bioenergy demand and supply dynamics

❑ 2: (**Leader: Prof. Gail Taylor**)

- ❑ Analysis of potential evolution and implications of UK biomass supply

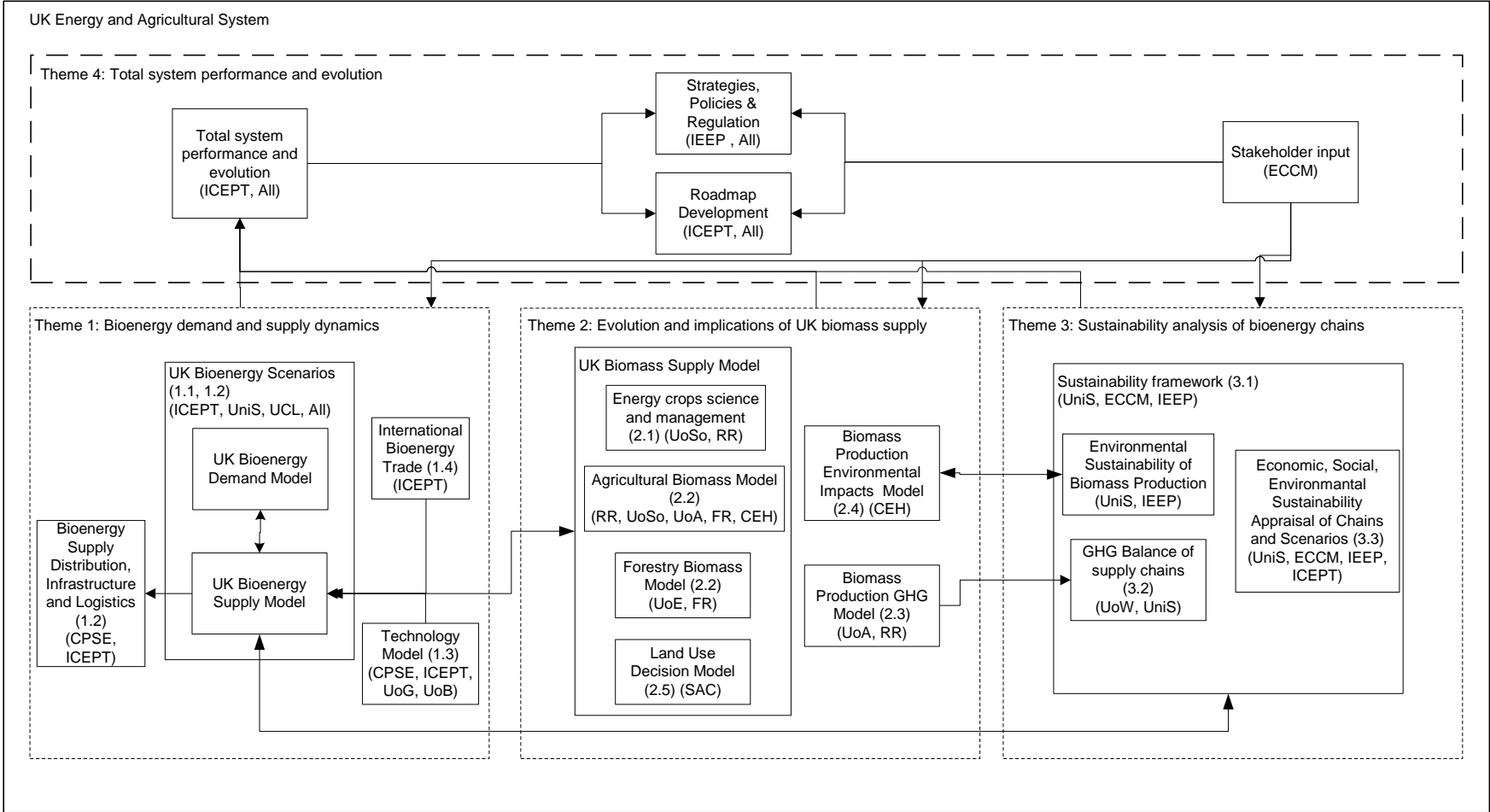
❑ 3: (**Leader: Prof Roland Clift**)

- ❑ Sustainability analysis of bioenergy supply chains for heat, power and transport.

❑ 4: (**Leader: Dr Ausilio Bauen/Prof. Peter Pearson**)

- ❑ Total system performance and evolution.

TSEC-BIOSYS Project Structure



Main Achievements

- ❑ Developed a framework for whole systems analysis
 - ❑ To address key cross-cutting research issues in bioenergy
- ❑ Carried out multi- & inter-disciplinary research, leading to:
 - ❑ Construction/interrogation of credible scenarios
 - ❑ Modelling tools with interfaces that enable data & analytical exchanges across research teams/disciplines
- ❑ Published key research results
- ❑ Trained/enhanced skills of next generation of researchers:
 - ❑ Six PhD students
 - ❑ UK & EU MSc student theses/publication
 - ❑ Other UK & EU pre & post-doctoral researchers
- ❑ Engaged with key stakeholders & policy dialogues



TSEC BIOSYS has explored:

- ❑ Sectoral UK bioenergy demand
- ❑ Spatial distribution of energy crops in current/future climates
- ❑ Supply chain costs
- ❑ Environmental issues & impacts & stakeholder concerns
- ❑ Developed/enriched bioenergy/biofuels supply chains & data in UKERC's MARKAL UK energy scenario modelling
- ❑ Reviewed & mapped the policy landscape
- ❑ Developed narratives of the sector's evolution & prospects

- ❑ Developed research relationships with UK & international bioenergy research consortia:
 - ❑ SUPERGEN Bioenergy,
 - ❑ RELU Biomass
 - ❑ the UKERC bioenergy roadmap



Purposes of Today's Meeting

- ❑ Present and discuss key research findings
- ❑ Receive critical feedback from key stakeholders
- ❑ Develop new research ideas
 - ❑ Actively considering next research initiatives
 - ❑ Have identified potentially fruitful areas of future research/key questions
 - ❑ We welcome your thoughts on key questions & issues

Today's Sessions

- Morning session - key findings in four areas:
 - *How much biomass do we have in the UK?*
 - *Where could we use the available biomass?*
 - *How could sustainability issues affect supply?*
Impacts on GHG & energy balances, hydrology & biodiversity
 - *How could policy influence future biomass uptake?*
- Afternoon breakout sessions - choose from:
 - *Biomass Supply*
 - *Demand & Future Scenarios*
 - *Sustainability Impacts*
 - *Policy & Narratives*

Agenda



10.00 – 12.30

10.00- 10.15

10.15- 10.45

10.45- 11.15

11.15- 11.45

11.45-12.15

12.15- 12.30

12.30- 13.30

13.30- 15.00

15.00- 15.15

15.30- 16.45

15.15- 15.45

15.45- 16.45

16.30- 16.45

Plenary Session:

Welcome: the TSEC BIOSYS project.

How much biomass do we have in the UK?

Where can we use the available biomass?

How sustainability issues may affect supply? Impacts on GHG and energy balances, hydrology and biodiversity

How policy can influence future biomass uptake?

Discussion

Lunch/ Poster Session

Breakout sessions:

- *Biomass Supply*
- *Demand & Future Scenarios*
- *Sustainability Impacts*
- *Policy & Narratives*

Coffee Break/ Posters Session

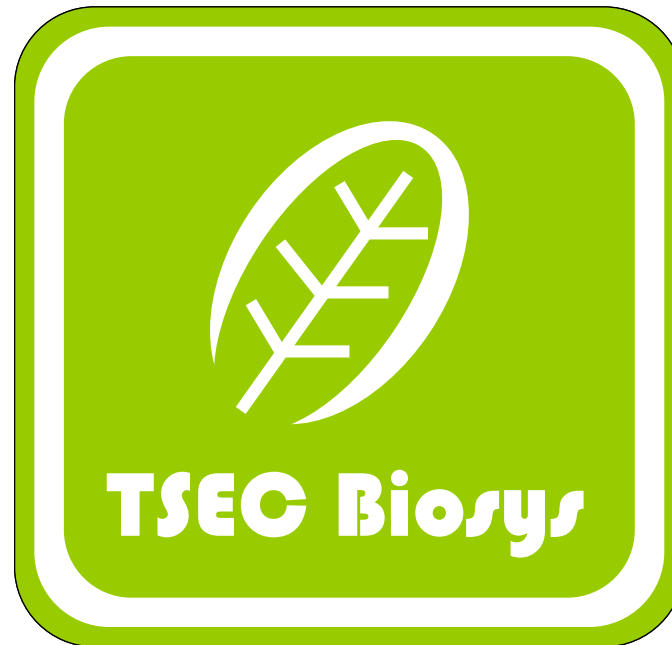
Plenary Session.

Reporting from breakout sessions

Discussion

Closing remarks

Thank you for your attention!



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