

RELU

Dissemination event

28th September 2010
University of Reading

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University of Southampton



Integrated systems for farm diversification into energy production by anaerobic digestion: implications for rural development, land use & environment



Research Aim

To assess the potential for energy production on farms by anaerobic digestion (AD) of energy crops and agricultural residues, and the contribution this could make to rural development and diversification of agricultural practice.

- The work is set in the context of
 - A rapidly developing European agenda for renewable energy
 - The removal of farm subsidies and the introduction of the single payment
 - The debate around land use for food or fuel
- The output is viewed in terms of
 - Contribution towards strengthening the rural economy and protecting the environment.



Research Team

- School of Civil Engineering University of Southampton
 - Prof Charles Banks, Dr Andrew Salter, Ms Sarika Jain
- School of Biological Sciences, University of Southampton
 - Prof Guy Poppy, Dr Donna Clarke, Dr Andreas Muskolus, Ms Laura Clements
- Agricultural Strategy Unit, University of Reading.
 - Prof Alan Swinbank, Mr Richard Tranter, Mr Philip Jones



Big questions

- What are the drivers that are likely to make farmers diversify into energy production through AD?
- How do we balance these drivers to ensure we maximise the value-added use of the agricultural biomass resource without detriment to food production?
- How will diversification into farm energy production impact on ecosystem services?
- What will be the social, community and economic benefits and drawbacks to farmers and the wider rural community?

Tools for assessing sustainability

- Development of powerful models to:
 - Assess net energy gains for different scenarios
 - Plan land use and compare economic outcomes
 - Use of these models to assess where drivers are needed, and whether these should be in the form of rewards or penalties

Measuring impacts and benefits associated with ecosystem services

- Development of a risk-based approach to assess management and mitigation measures that can protect or enhance the ecosystem
 - requires a tool kit that allows us to quantify the effect on ecosystem services
 - requires knowledge of the land use patterns likely to emerge if AD is adopted on farms

Engagement with stakeholders

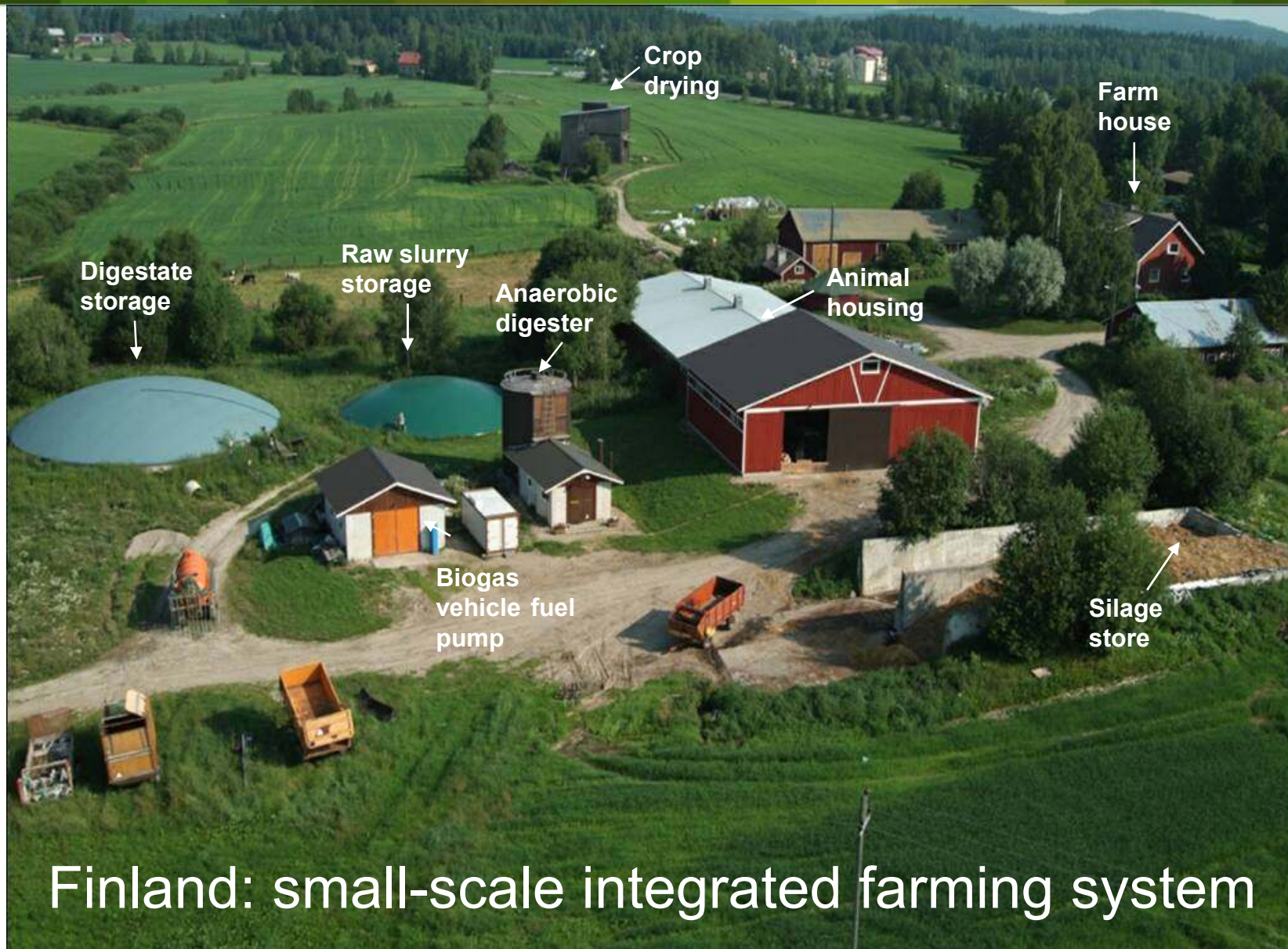
- Farmers and estate managers
- The rural community
- Government policy-makers
- Energy providers and planners
- Professional and technical associations
- Agro-businesses

Danish CAD plant





Early German farm-based digesters



Finland: small-scale integrated farming system

Austrian farm-based AD plant



Maize silage and agro-wastes



Digestion plant

Centralised anaerobic digestion plant - UK



Biogas Nord plant at Lowbrook farm, Dorset

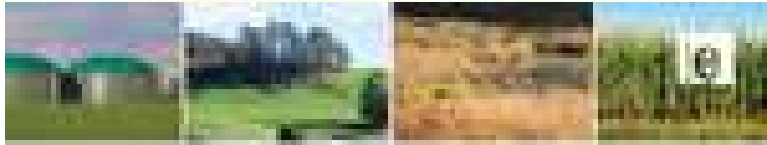


On-farm digester near Wrexham



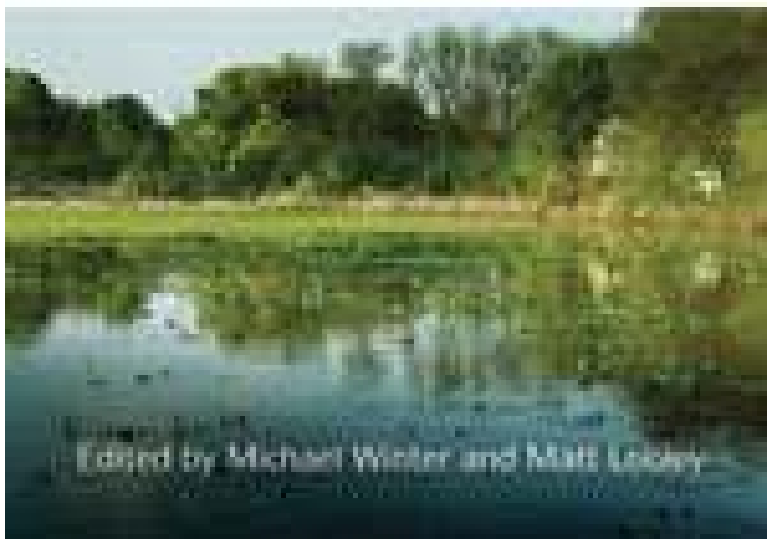
Barfoots of Botley – Farm vegetable waste





What is Land for?

The Food, Fuel and Climate Change Debate



Edited by Michael Winter and Matt Unwin

Anaerobic digestion and its implications for land use

Charles Banks
Alan Swinbank
Guy Poppy

