IAgrE and the ES-KTN

Welcome you to the

Oxford Farming Conference 2013

Agricultural Engineering offers solutions

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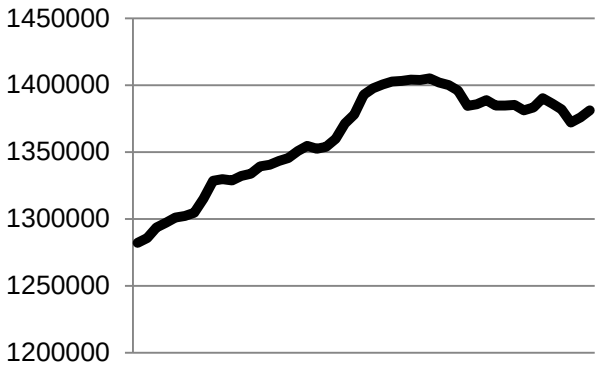
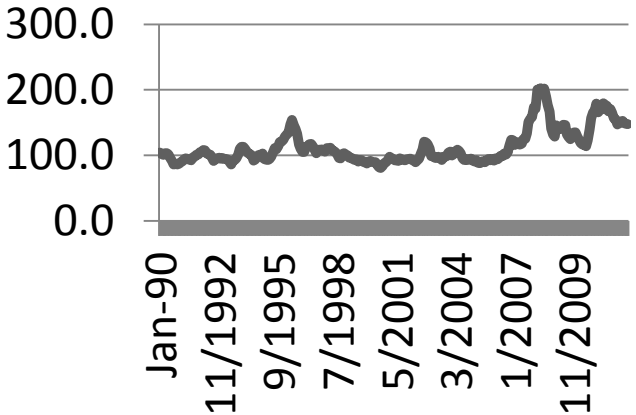
What is the problem?

- More people, getting richer, with less agricultural land, requires more food and biofuel produced per hectare with less emissions
- Global change, including climate change e.g. weather extremes, requires resilient production systems

Global area of arable and permanent crops from 1961 to 2009 (thousands of hectares) (FAOSTAT)



Cereals Price Index (FAO)



Three big challenges ahead

- Water management using precision irrigation and intelligent field drainage
- Energy management including on-farm energy production
- Nutrient management to reduce inputs and reduce polluting emissions

Intensive grazed pasture dairy system:

- 945 litres of water per litre of raw milk*
- 22ml diesel per litre of raw milk**
- 476kJ indirect energy input as N fertiliser per litre of raw milk**, with ~ 55% N utilization

* Zonderland-Thomassen & Ledgard (2012)
** Saunders and Barber (2007)

Agricultural Engineering

- Integrates and transforms science to tools and processes that improve the productivity and environmental performance of agriculture and other land-based industries
- Drives the mechanisation, informatics and land engineering needed to secure global food production while limiting the environmental impacts of intensification.

Recycling nitrogen

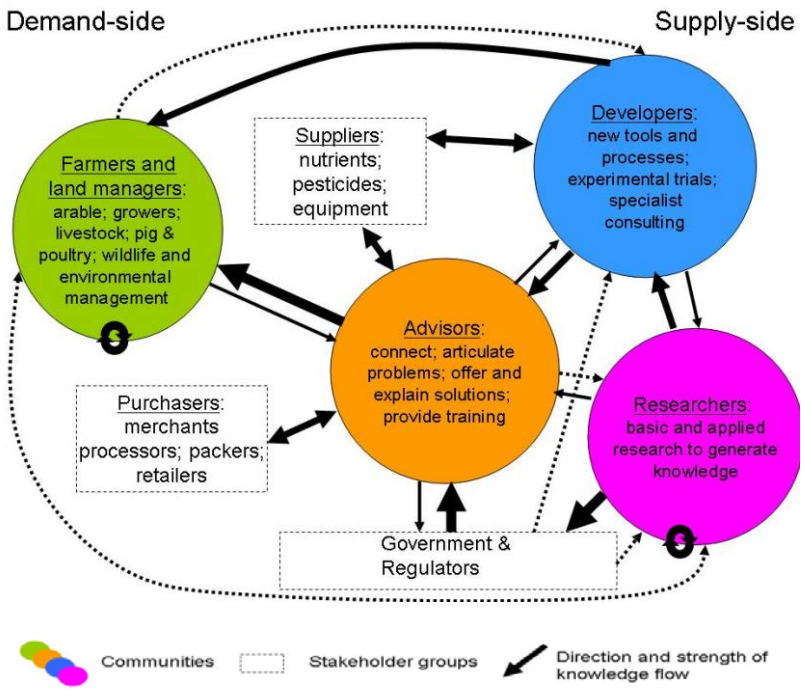
Teagasc

Engineering microclimates

How can Agricultural Engineering contribute more?

- Producer focused development, driven by problems (strategic as well as operational)
- Focus more public and private investment on the application of scientific research to agriculture and on the transformation of technology developed in other sectors
- Educate, train and develop agricultural engineers.

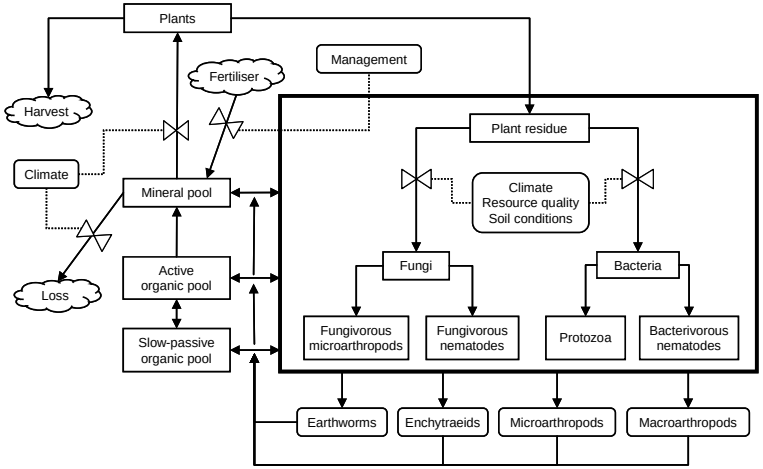
More investment is needed in developers



Kibblewhite, Deeks and Clarke (2010)

Immediate steps?

- Work together on industry-led or partnered proposals to the research funders (e.g. TSB, BBSRC, EC) to turn science in to useful tools
- Develop relationships with ICT professionals in other sectors and pull their innovation in to agriculture
- Support students and early-career professionals in the UK and internationally.



Kibblewhite, Ritz & Swift (2008)

How can engineering exploit new knowledge about soil biology to increase agricultural productivity?

Priorities for Farm Machinery

- More publicly funded non-competitive strategic research into innovative machinery
- More emphasis on smaller machines (ATVs) and towed implements for the smaller field sizes in Africa and elsewhere
- Better explanation of the benefits to animal health of robotic milking machines
- Research to sustainably wean farming off fossil fuels
- Improved machinery for sustainable irrigation

Strategic requirement

- More understanding and recognition by Government and others of the role of Agricultural Engineering.

Environmental Sustainability KTN mission:

Accelerating the **transition to a low carbon, resource and energy efficient economy** by connecting businesses, universities, other research organisations & Government agencies

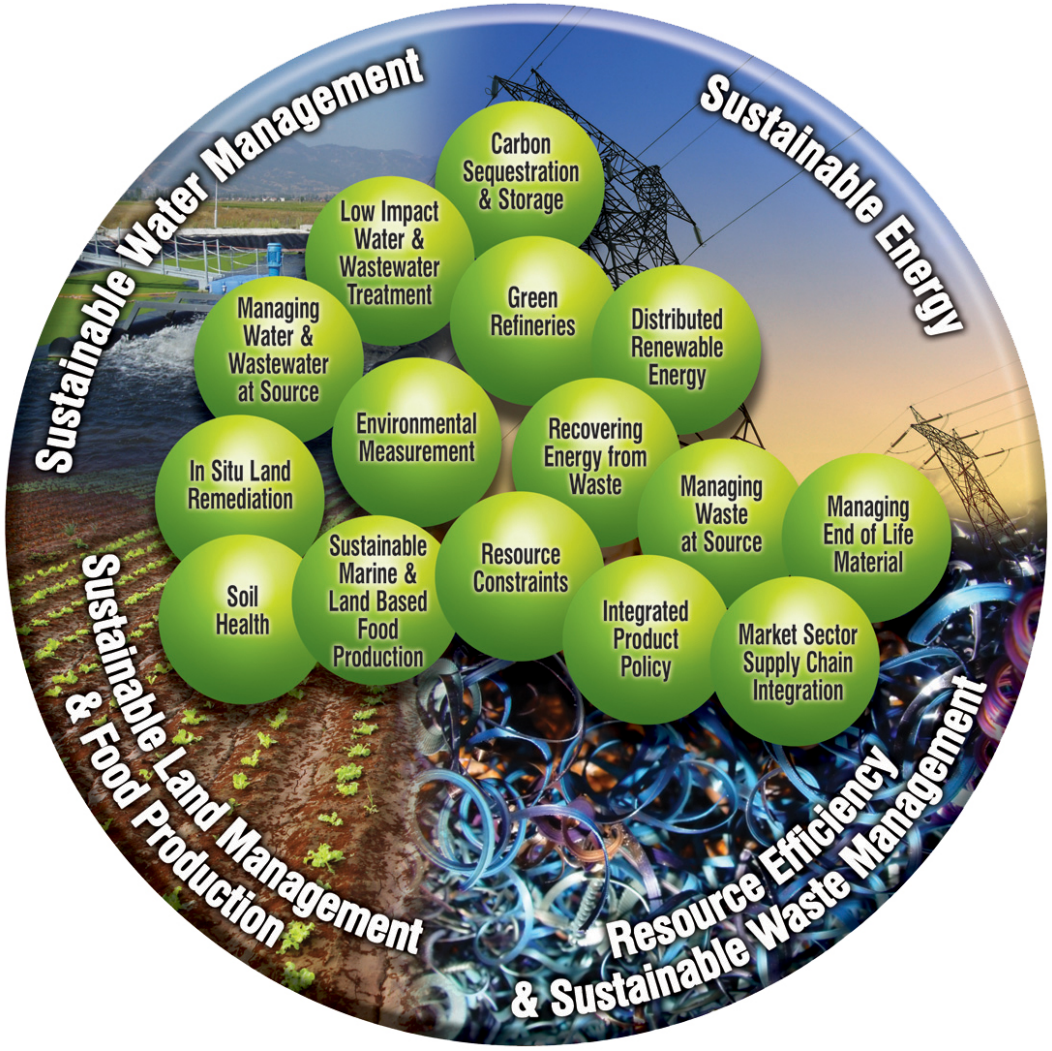
Catalysing innovation across emerging environmental technologies

ESKTN Key Priority Areas

Knowledge Transfer Network

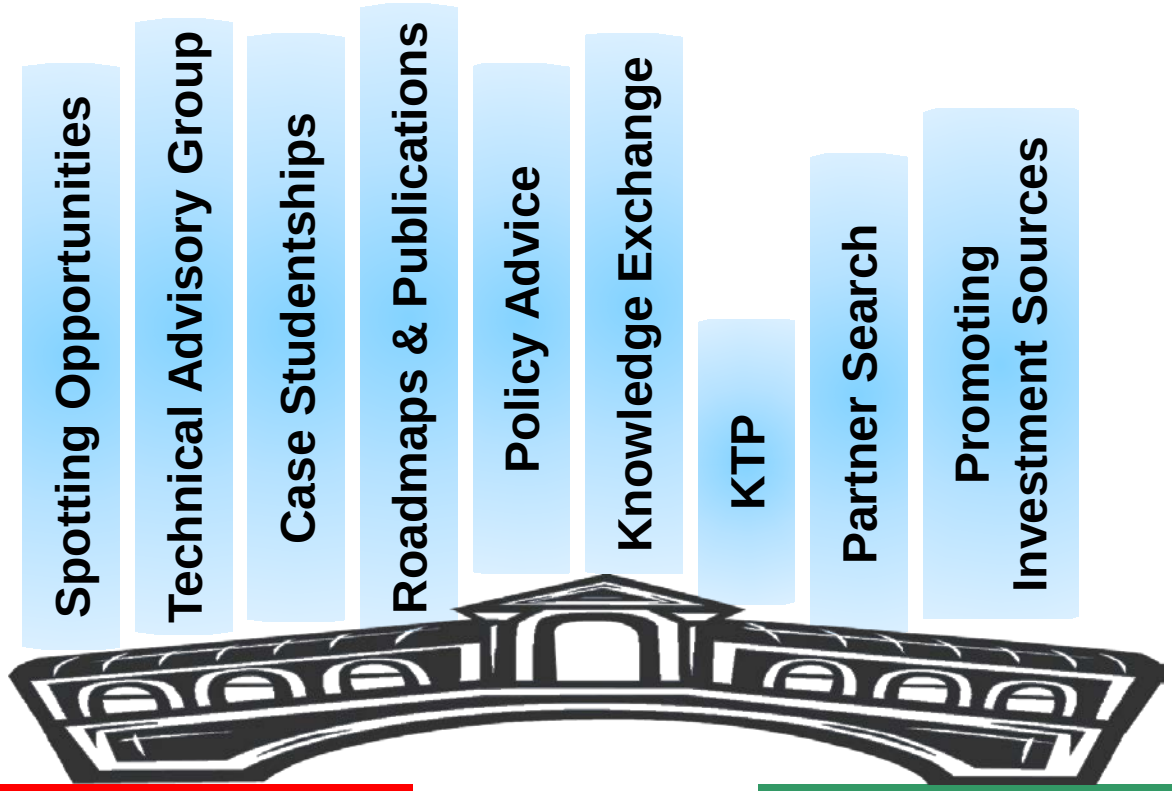
Environmental Sustainability

Our Priority Areas have been identified as those offering the greatest potential for businesses to develop innovative and environmentally sustainable products and services.



IAgrE

Connecting for Innovation



Universities and other R&D

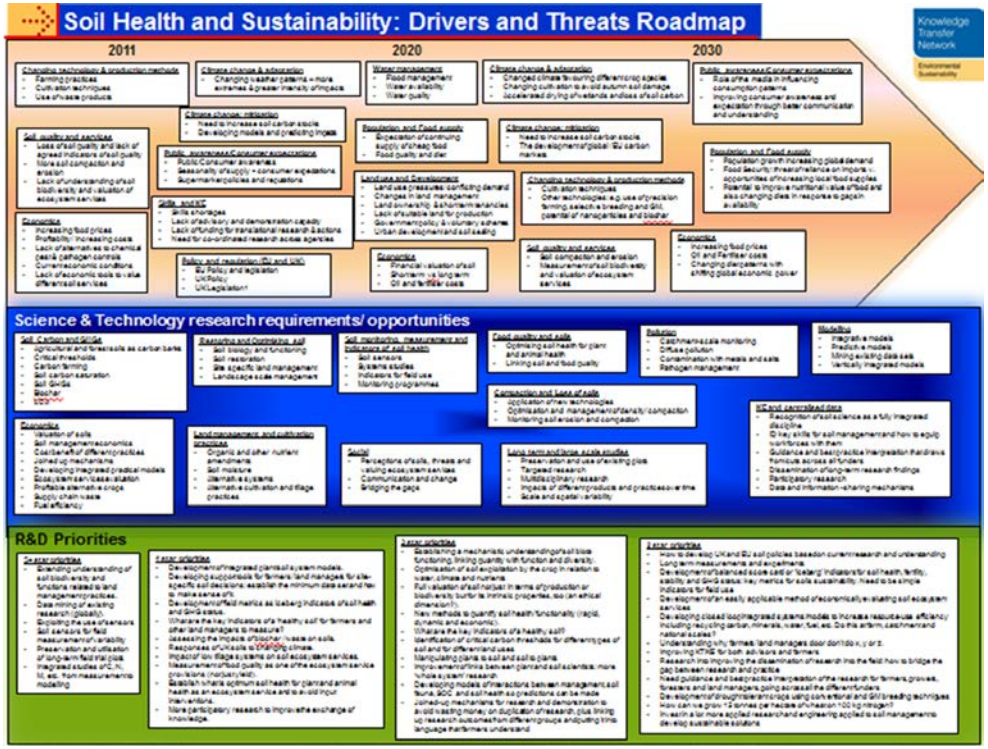
Industry

Overview and R&D strategic reports

Knowledge Transfer Network
Environmental Sustainability

Technology Strategy Board
Driving Innovation

Environmentally Sustainable Agri-Food Production



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www.iagre.org

Knowledge Transfer Network
Environmental Sustainability