

Energy, Emissions and Agricultural Systems Integration

EASI is all about:

- **Development of a tool which will enable farm managers to incorporate energy and emissions factors into decision making.**
- **Be holistic: energy, emissions, ecology.**
- **Be focused on the individual farm's potential: recognising the problems of benchmarking.**

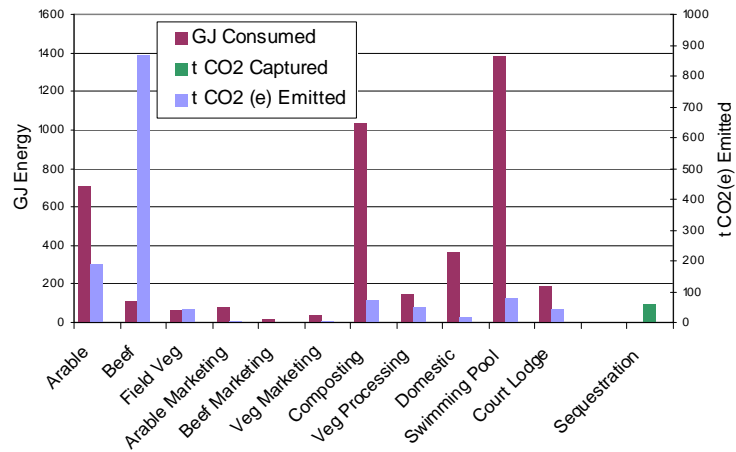
Challenges

- **Recording at the farm level.**
 - ◆ Accounts for finances, fuel records for energy audits.
- **Some data makes use of standard figures**
 - ◆ Nitrous oxides
 - ◆ Methane from cows
- **Broad elements can conflict, requiring value judgements: landscape and emissions; energy and economics.**

Achievements

- **Profiling of two pilot farms**
- **Production of audit reports:**
 - ◆ Energy and emissions 'hot spots'
 - ◆ Recommendations on how to make improvements
 - ◆ Input : output figures for efficiency ratings
 - ◆ Full audit report.

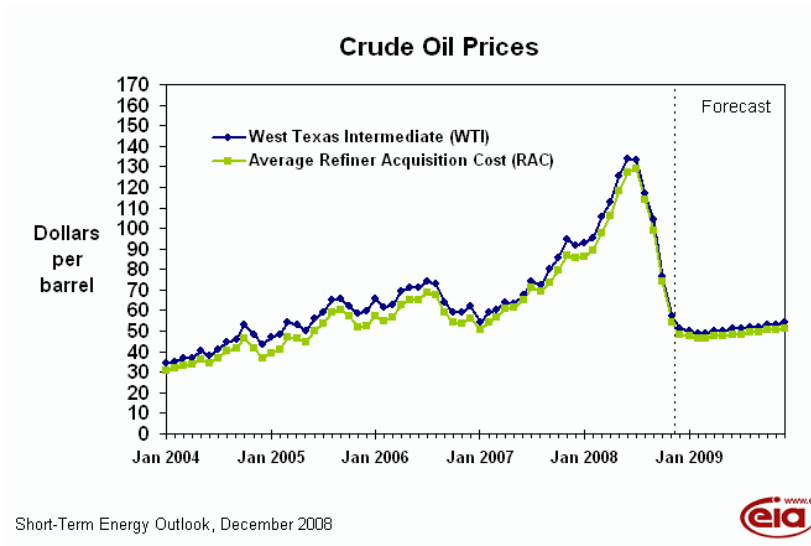
Estate Energy And Emissions Overview



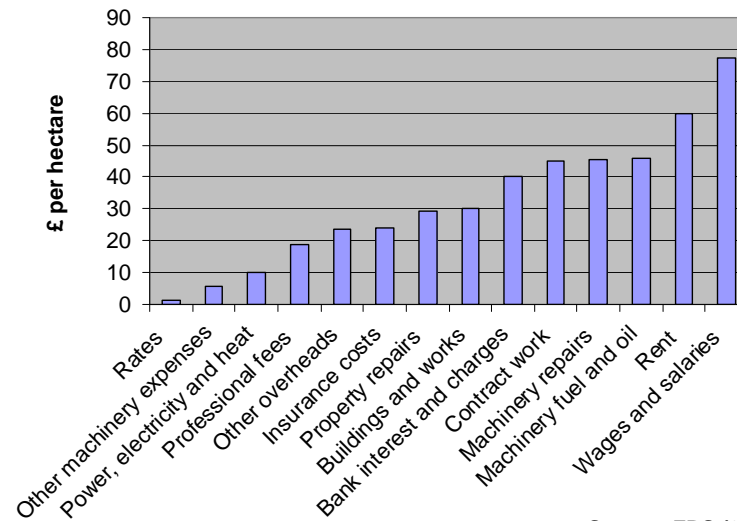
Some recommendations for Arable farms: research findings from the EASI Programme

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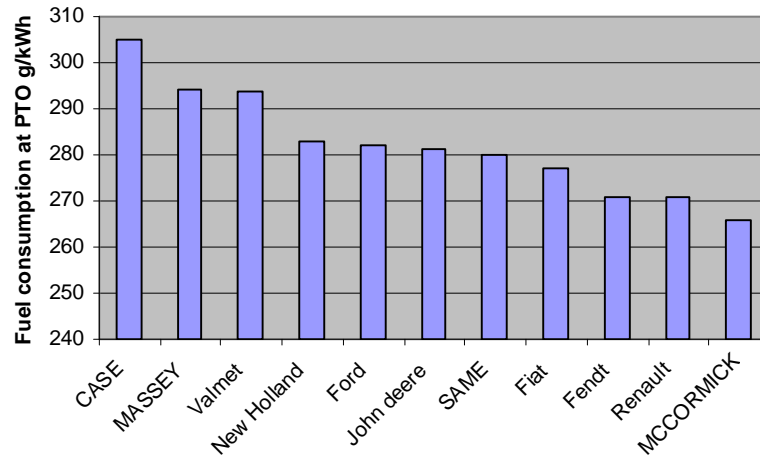


Variable costs per ha of an average sized arable farm in England (233 ha)



Source: FBS (2008)

Average fuel efficiency of tractor types

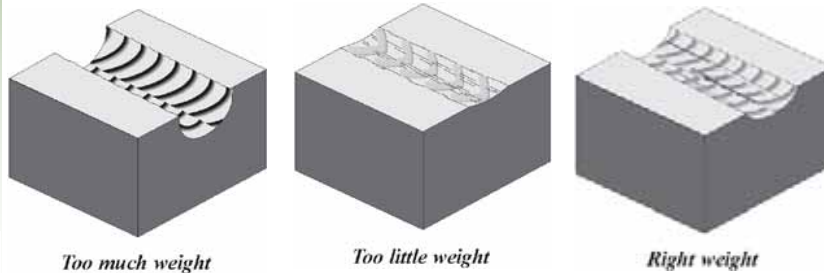


Some recommendations

- Use correct tyre pressures
- Reduce engine revs where possible. John Deere research suggests that reducing RPM by 20% saves 15-40% on fuel
- Install fuel meters
- Regular service and maintenance
- Is each cultivation really necessary?



- **Most farmers use more than 80 per cent of available power only 15 to 20 per cent of the time.**
- **Ballast distribution between the front and back wheels should not be overlooked.**



Drying and storage

- **Largest single item of direct fuel usage in cereal production**
- **High temperature drier will consume 55 litres of fuel oil for each hectare of crop that is harvested**
- **Improvements in management and equipment can often improve the quality and value of the produce stored**

Some of the questions to be asking:

- **Do you record energy use?**
- **Is maintenance carried out?**
- **Are moisture levels measured accurately?**
- **Are controls set accurately?**
- **Is steady progressive operation maintained?**

Crop rotation

- **Consider changing to lower input crops**
- **Undersowing of cereals**
- **Alternate root depths within rotation**
- **Make best use of N from legumes**

Keeping records is most important

- **Make sure fuel tanks are metered**
- **Record your monthly consumption by referring to fuel bills**
- **Consult users manual to obtain vehicle fuel usage data**
- **If data unavailable consider fitting fuel flow meters. See www.rangerinstruments.co.uk for details**

Farm energy audits

- **Can help identify £ savings and reduce CO²**
- **Current tools = broad brush & use ‘conventional’ benchmarks**
- **The EASI tool can offer tailored advice**
- **Looking to develop this tool in future**

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