THE ENERGY, EMISSIONS, ECOLOGY AND AGRICULTURAL SYSTEM INTEGRATION (EASI) PROGRAMME, CONCLUSIONS AND RECOMMENDATIONS

1 Introduction

1.1 The EASI Programme began in 2007, with the aim of providing practical information to farmers and landowners on ways to increase their overall energy efficiency, reduce their carbon footprint and develop their potential to produce on-farm energy, in a sustainable, ecological way. The tool, that has been developed since the Programme began, achieves these objectives by collecting and presenting data on a number of key areas:

- The efficiency of the different farm enterprises in terms of energy in/energy out;
- Energy use relative to benchmark figures;
- Potential energy yield from such areas as farm woodlands, animal manures and slurries;
- Carbon footprint of the entire farm and each enterprise;
- Carbon sequestration and carbon storage.

1.2 Once the necessary data is collected key indicators are calculated and a report is compiled detailing areas where the farm could save money and reduce its carbon impact and/or generate energy. The breadth and detail of the EASI assessment tool is 'broad brush' in approach but essentially covers two key areas – environmental and economic impacts.

2 Development of the tool – results from the six pilot farms

2.1 Throughout the development of the assessment tool a total of six pilot farms were assessed, this included a range of farm types; a beef and arable farm, a dairy farm, a stockless arable farm, a stockless agroforestry/arable farm, a beef and sheep farm and a field vegetable/ arable farm.

2.2 From collating the results of the pilot farm audits, it is possible to see that the domestic energy use was consistently high, in relation to other areas. Arable and field vegetables energy use was also high. This is to be expected because of the fossil fuel intensive nature of most modern production systems.

Figure 1: Energy use by enterprise for each of the EASI Pilot farms

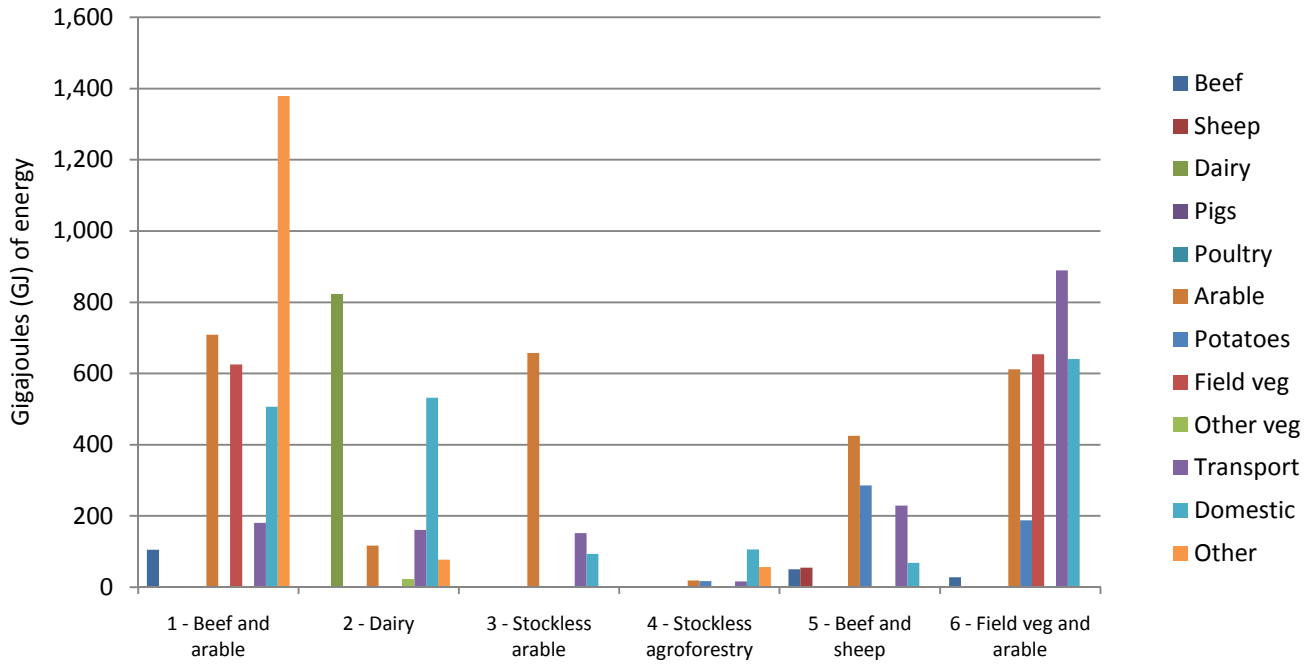
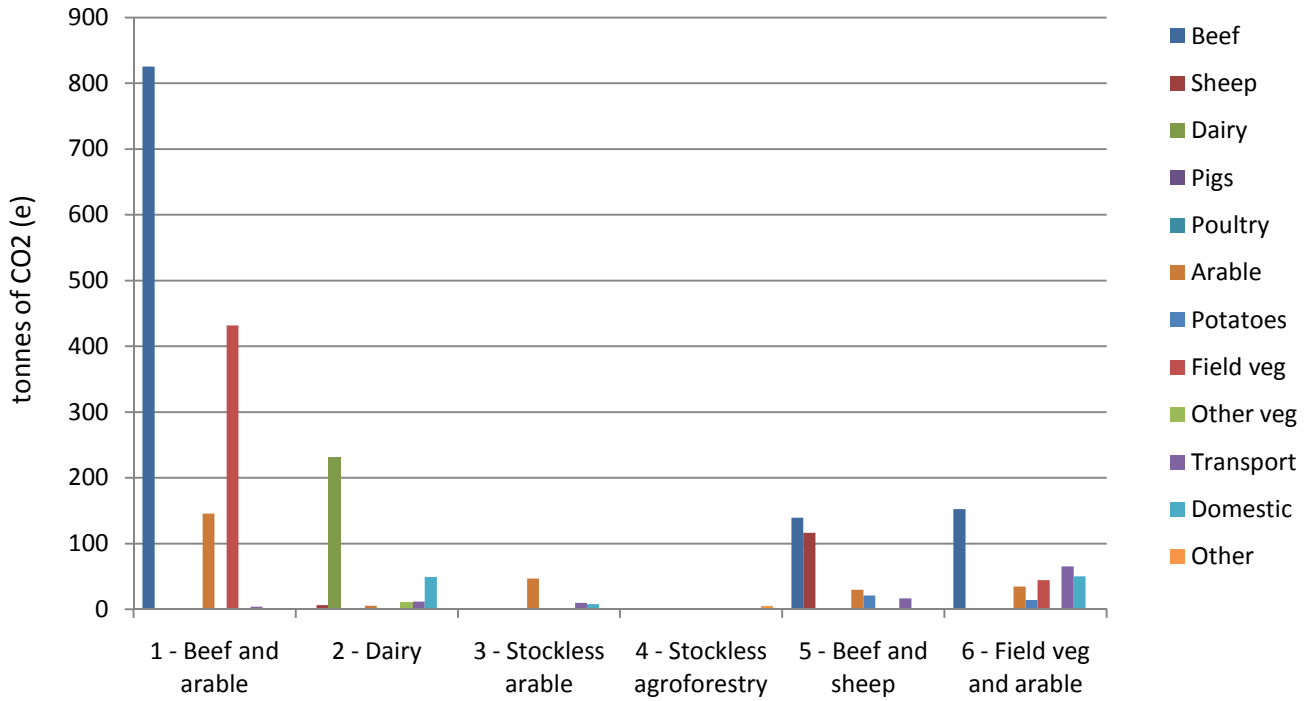


Figure 2: Emissions by enterprise for each of the EASI Pilot farms



2.3 In terms of emissions, it is clear from Figure 2 that livestock is the highest source. This is to be expected because of the high Global Warming Potential of Methane (23 times more damaging than CO2) and Nitrous Oxide (296 times more damaging than CO2) arising from enteric fermentation, manure/urine deposition.#

2.4 The pilot farms were compared to benchmark data collected by ADAS, for 900 farms of varying sizes and types (CALU, 2007). Although these data were not for organic farms, the farmers assessed found it useful to compare their fossil fuel use to an average figure.

Table 1: Farm energy use compared to CALU benchmarks

Farm number	% of benchmark					
	Domestic	Diesel	DERV	Petrol	Grain drying	Electricity use
1	586%	75%	69%	81%	N/A	180%
2	189%	82%	92%	24%	N/A	154%
3	109%	147%	18%	41%	5%	10%
4	56%	51%	39%	10%	N/A	60%
5	79%	90%	180%	250%	80%	76%
6	370%	51%	7%	76%	269%	68%
AVG:	**232%**	**83%**	**115%**	**80%**	**118%**	**91%**

2.5 Overall it can be seen that the organic farms compared well to the benchmarks for diesel, electricity and petrol use.

2.6 In terms of recommendations it is clear that addressing domestic energy use will result in savings, in addition to paying attention to energy intensive processes, such as grain drying and flame-weeding in arable systems. More self-sufficient systems (e.g: in feed) were also found to be more efficient in terms of emissions per tonne produced, due to reduced transport costs. Reducing livestock numbers in relation to arable will also increase CO2 efficiency, however land use must remain appropriate to land-type.