



# AGROCYCLE

for a circular economy

Co-ordinator: Professor Shane Ward

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Ireland



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No. 690142 in collaboration with the People's Republic of China and the Hong Kong Government



# Manor Farm

Origin Green

In partnership with

Enviroeye Consulting Engineers



Enviroeye Engineering Ltd  
Consulting Engineers

Micheál Galvin  
BSc(Eng) MSc CEng MIEI



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## Manor Farm – Vertical SUPPLY CHAIN

Energy Planning

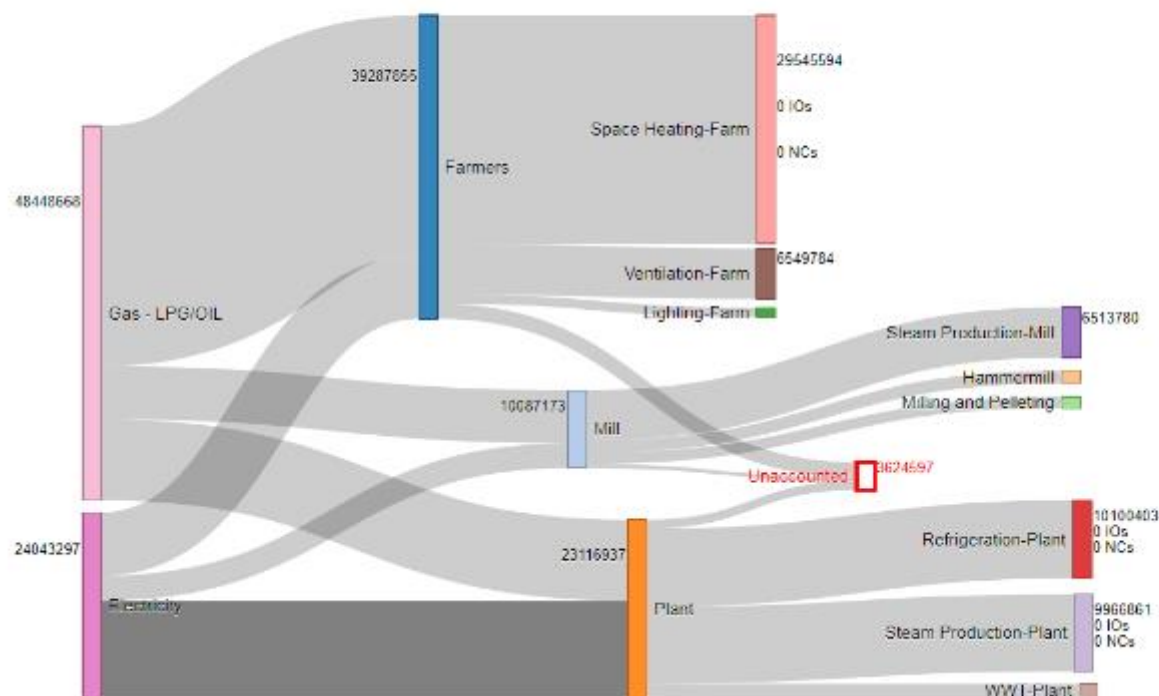
Period: 01/01/2016 to: 31/12/2016

Energy Sources

£ 72491965 kWh

Energy Uses

£ 68867368 kWh



Energy Planning gives an overview of the site from energy sources to which SEU's are the most energy intensive. It also shows any energy that is unaccounted for.

Energy Uses

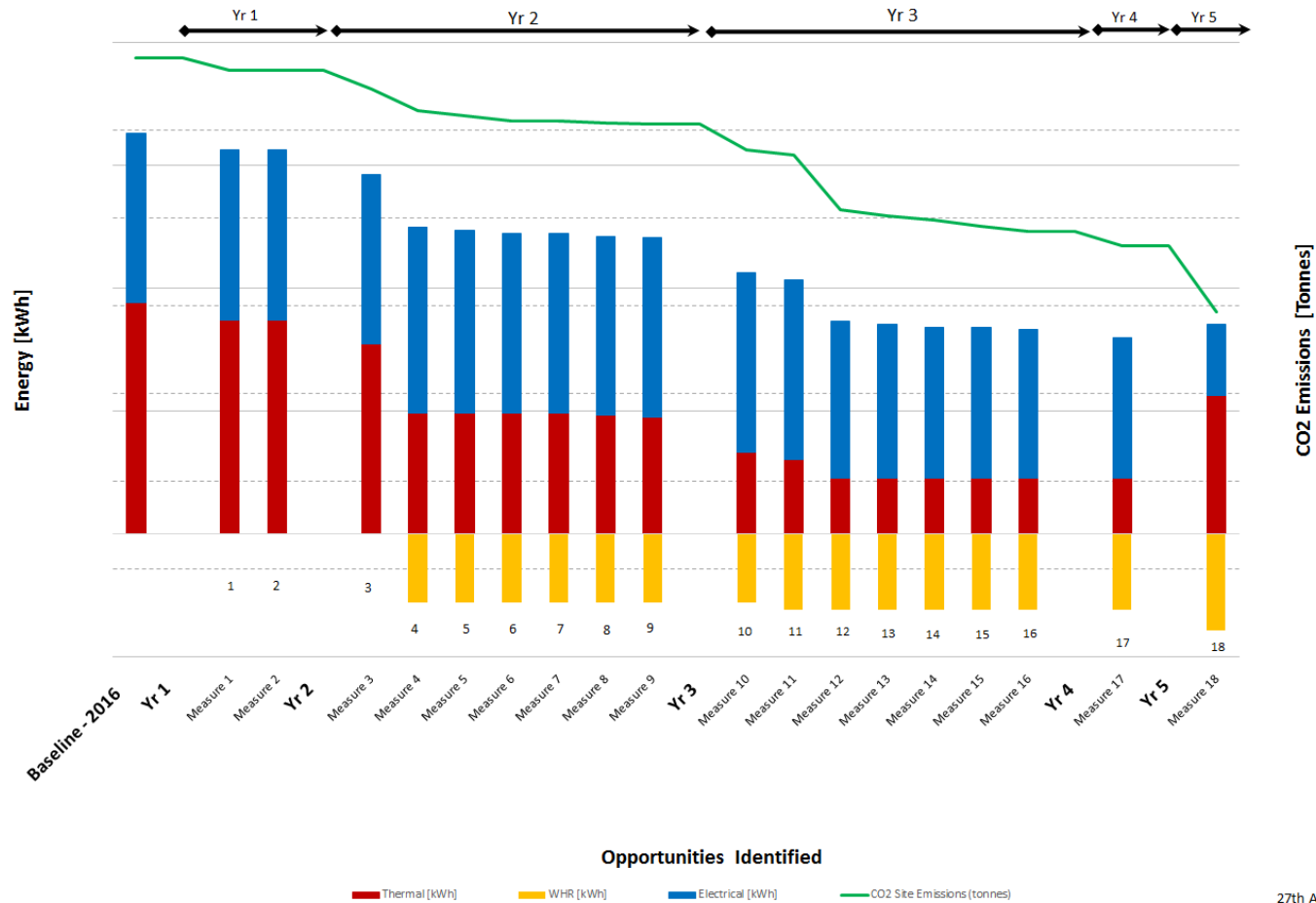
Create Energy Use

Title	SEU	kWh	Location
Space Heating-Farm	0	29545594	Manor Farm
Refrigeration-Plant	0	10100403	Manor Farm
Steam Production-Plant	0	9966061	Manor Farm
Ventilation-Farm	0	6549784	Manor Farm
Steam Production-Mill	0	6513780	Manor Farm
WWT-Plant	0	1893826	Manor Farm
Hammormill	0	1615282	Manor Farm
Milling and Pelleting	0	1453753	Manor Farm
Lighting-Farm	0	1228085	Manor Farm

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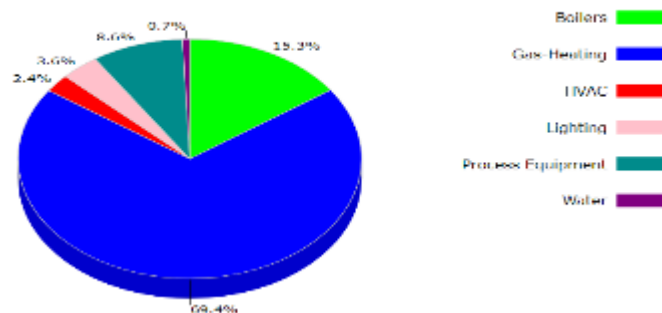
## Manor Farm – The Sustainable Strategy(Route)



## Manor Farm – Co2 – What are we doing about it ?

### Objectives & Targets

IO Estimated FOR REVIEW Cost Savings



Objectives & Targets can be entered and tracked to see how the improvement opportunity is progressing.

Objectives & Targets EnPIs O&Ts Benchmark Data

	2014	2015	2016	2017	2018	2019	2020		
	kWh		Objective	Total(kWh)		Electrical(kWh)		Thermal(kWh)	
				Target	To-Date	Target	To-Date	Target	To-Date
Total			68867368			2076906	0	17972797	0
►Space Heating-Farm - Manor Farm			29545594	50% Heat Recovery		0	0.00	14772797	0.00
►Refrigeration-Plant - Manor Farm			10100403	Save 10% on refrigeration		1010040	0.00	0	0.00
►Steam Production-Plant - Manor Farm			9966861	Save 20%		0	0.00	1750000	0.00
►Ventilation-Farm - Manor Farm			6549784	Save 5% on ventilation		327489	0.00	0	0.00
►Steam Production-Mill - Manor Farm			6513780	Save 20% on steam production		0	0.00	1450000	0.00
►WWT-Plant - Manor Farm			1893826	Save 5%		94691	0.00	0	0.00
►Hammermill - Manor Farm			1615282	Save 5%		80764	0.00	0	0.00
►Milling and Pelleting - Manor Farm			1453753	Save 5%		72688	0.00	0	0.00
►Lighting-Farm - Manor Farm			1228085	Save 40% on lighting in farms		491234	0.00	0	0.00



## On The Farm – Energy Balance- One House

- 1 Kg of Feed GIVES 0.6 Kgs of LIVE Weight
  - FCR = 1.6
  - 1 Bird @ 2.2 Kgs = 3.5 Kgs of feed

### Production Unit

- 50,000 Broilers = 175 tonnes @ 4t/acre = 43 Acres of space

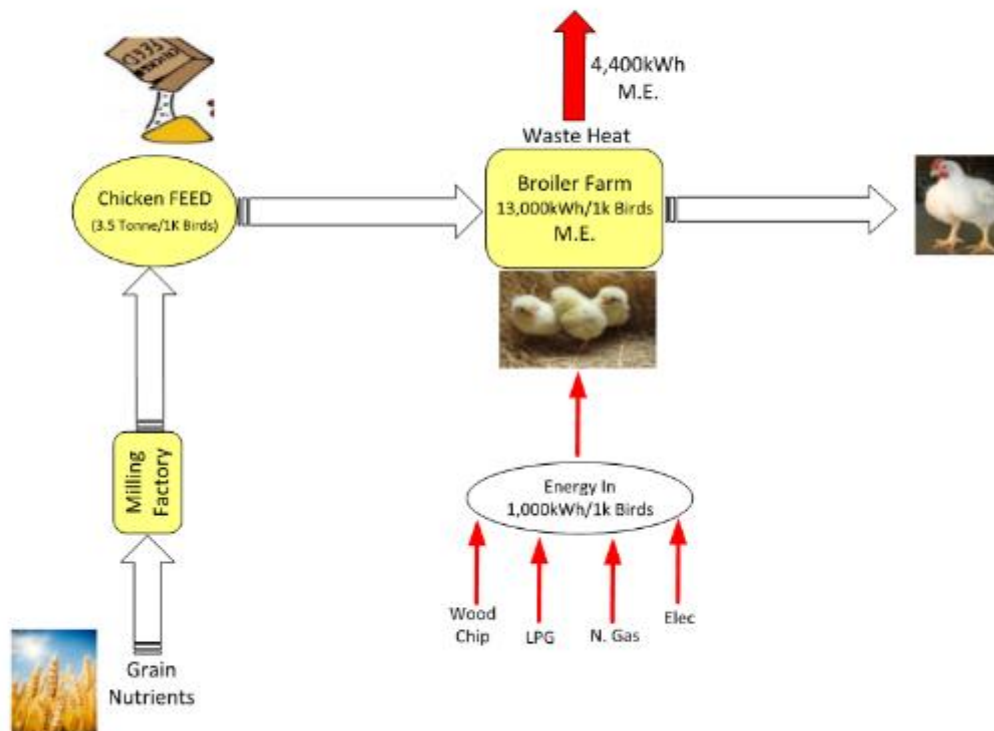
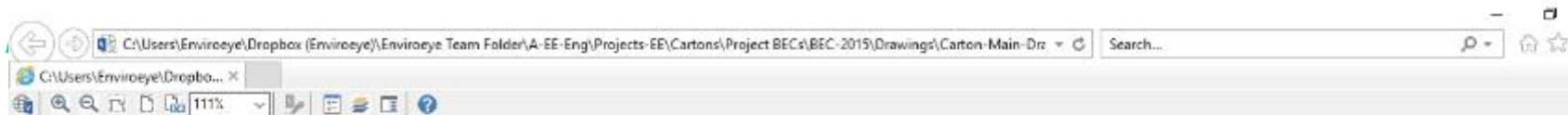
### Inputs:

- Feed = 175 tonnes x 16 MJ/Kg = 823,429 kWh / 81,000 Oil [litres]
- Energy-Space Heating = 30,000 kWh or 3,000 litres of Oil
- Energy-Electricity = 10,000 kWh or 2,500 litres of Oil

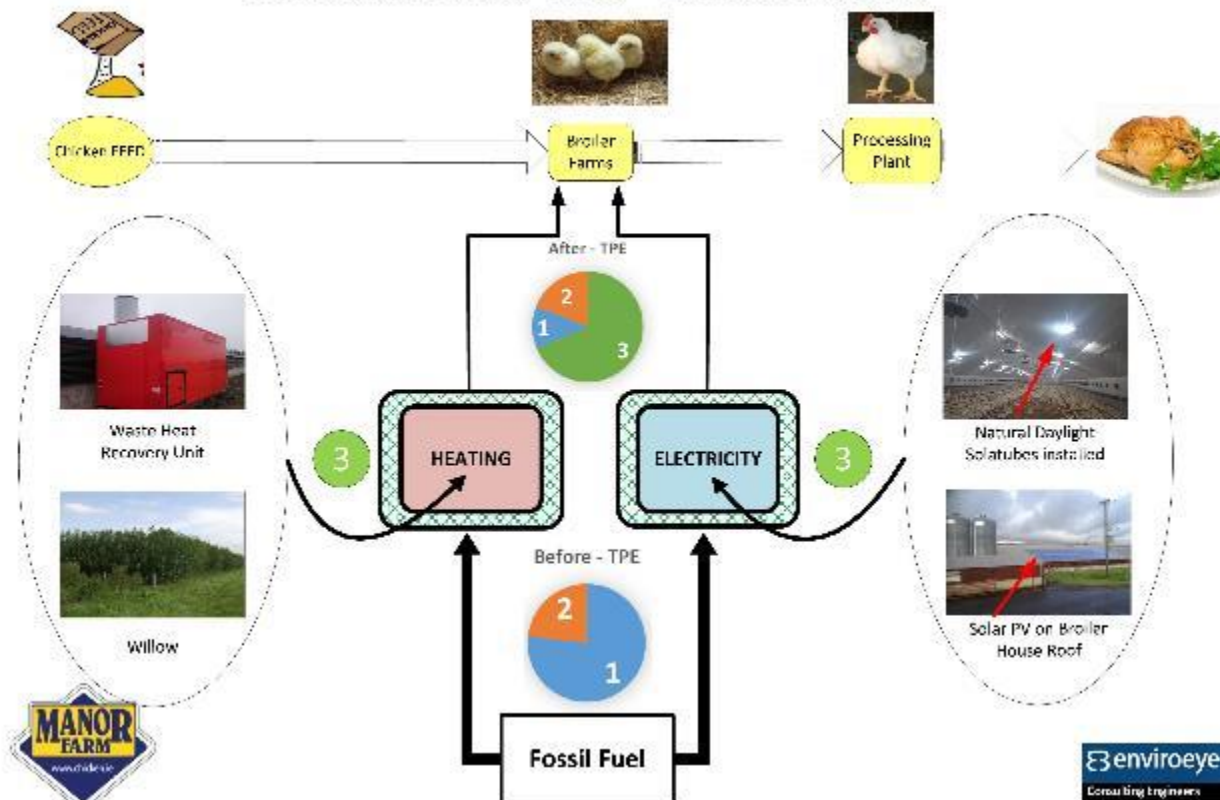
### Outputs:

50 Tonnes litter (digested feed - 13 MJ/kg) per 50k Bird/Batch + Drum Sticks !!!!

[Litter Energy is 191,176 kWh & Site Input Energy 40,000 kWh = 20% (Est)]



## Sustainable Supply Chain - Broiler Production





## Harper Adams University – AD Digester (Mini)



## Ideal Target @ AD-Dry [ 100% Poultry Litter]

