Energy Opportunities Within The Poultry Sector

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Energy efficiency in poultry

- Lighting
- Cold weather ventilation
- Record & monitor
- Insulation & building sealing
- Ventilation system maintenance
- Replacement policy fans
- Variable Speed Drives for electric motors
- Farmhouses

How much, where & when?

- A standard 73 x 18m 26,000 bird broiler house consumes 36,000 – 40,000 litres of LPG per year and 35,000 kWh of electricity.

Broiler House	Emission Factor	CO2 produced	Cost
40,000 litres LPG	0.229 kg of CO2 per kWh	9.1 tonnes	€28,000
35,000 kWh electricity	0.437 kg of CO2 per kWh	15.3 tonnes	€6,300
Total		**24.4 tonnes**	**€32,300**

LED Lighting

Cost of LED Lighting and fitting €71 + €4	€75
Energy used by LED light	25 W
Energy used by double fluorescent tubes	116 W
Hours of light per day	14
Saving in electricity (116W – 25W)	91 W
At 14 hours per day (14 x 91W)	1274 Wh
For 365 days	465 kWh
At 18 cent per kWh / unit of electricity = 465 x 0.18	€84
Accelerated Capital Allowances (TAX)	

Potential opportunities in Renewable Energy

- Biomass - heating, electricity, transport
- Hydro - electricity
- Solar - heating, electricity
- Geothermal – heating
- Wave/tidal - electricity
- Fuel cells/Hydrogen – electricity, heating, transport
- Wind - electricity

Photovoltaics

- One kilo Watt Photovoltaic, produces 822 kWh in year one with output declining by 0.7% per year.
- Average output of 764 kWh per year over 20 years
- Requires RESS in form of REFIT to support.

- Using 100% in the business
- 764 kWh (18.0 cent per kWh) = €137 payback/yr.

- At a cost of €1,200 per kW installed gives a simple payback of **8.7 years**

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PV cuts your Carbon Footprint

- Each kWh of electricity generated by fossil fuels produces around 0.44 kg of carbon dioxide.
- A 20 kW PV system will produce about 20 x 800 kWh per year (16,000 kWh)
- This reduces the carbon footprint of the business by 16,000 x 0.44 kg = 7,040 kg of CO2 or **7 tonnes**

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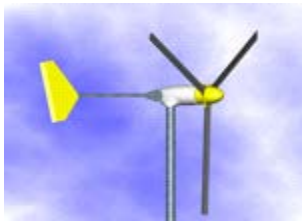
Feasibility Study – Solar PV

- Review of prospective site area and site orientation.
- Assessment of potential electricity generation from solar.
- Assessment of the most suitable form of PV array for the area.
- Provision of advice in relation to costs, cost savings and payback.
- Advice in relation to Health and Safety and maintenance of solar systems.
- Advice in relation to carbon savings
- Advice on specific planning and building control procedures in particular listing building guidelines and application processes.

100 kW – Wind Turbine cutting the Carbon Footprint

- Each kWh of electricity generated by fossil fuels produces 0.44 kg of carbon dioxide.
- A 100 kW wind turbine will produce on average 245,000 kWh per year depending on the site.
- This reduces the carbon footprint of the farm business by 107,800 kg or 107.8 tonnes of CO2 each year



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Heat Pump Technologies

- ASHP – 300 – 400% efficient
- GSHP – Generally more efficient than ASHP

What is the SSRH?

- Govt. scheme
- Financial support to renewable heat generators
- 15 year period
- Administered by SEAI
- Technologies – Solid Biomass Boilers & Heat Pumps
- Non-domestic sector

Sustainable Support for Renewable Heat (SSRH)

- The Irish Government expects the SSRH to make a significant contribution towards their 2020 ambition of having 12 per cent of heating coming from renewable sources.

Phase one of the SSRH:

- Phase 1: the introduction of the SSRH for non-domestic installations in the industrial, business and public sectors.

How will SSRH be regulated?

- SEAI will administer the scheme
- SEAI will produce documentation that sets out requirements for a project.
- SEAI will make payments to acceptable applicants and ensure compliance

Plan Projects Carefully

- Ascertain what type of fuel suits you best.
- Solid fuel (manual handling), pellets or chip (automated)
- Fuel supply, storage and delivery
- Eligibility of boiler, installer and final use of heat
- Boiler sizing
- Biomass must be the primary fuel source
- Installers will be very busy – unforeseen setbacks
- Look at track record of supplier, manufacturer and installer

Use of Heat

- Inefficient drying practices in order to maximise payments.
- Grain drying
- Wood-fuel drying
- Swimming Pools – (Municipal or Commercial)

Rules should not stifle innovation – open to change

SSRH is designed to off-set use of fossil fuels

Process of drying is major consumer of fossil fuels in our maritime climate.

Fuel Requirement

- Rule of Thumb – Biomass boilers require about 1t of dried woodchip a year (30% moisture) for every kilowatt installed.
- Logistics is key – transport is expensive
- Woodchip has a range of moisture contents
- Quality Assurance

Fuel Storage Requirements

Boiler Output	80 kW	350 kW	1,000 kW	2,000 kW
Fuel input	25 kg/hr (100 kW)	100 kg/hr (400 kW)	300 kg/hr (1,200 kW)	600 kg/hr (2,400 kW)
1 m3 / 150 kg storage	6 hrs	1.5 hrs	Too small	Too small
4 m3 / 600 kg storage	24 hrs	Too small	Too small	Too small
16 m3 / 2,400 kg	4 days	24 hrs	8 hrs	Too small
48 m3 / 7200 kg	12 days	3 days	24 hrs	12 hours
55 m3 / 8250 kg	14 days	3.4 days	28 hrs	14 hours
500 m3 / 75,000 kg	Too big	31 days	10 days	5 days

SSRH proposed tariff levels (Cent for each kWh of heat produced)

Tier	Lower Limit (MWh/yr)	Upper Limit (MWh yr)	Biomass Heating Systems Tariff (c/kWh yr)	Anaerobic Digestion (c/kWh yr)
1	0	300	5.66	2.95
2	300	1,000	3.02	2.95
3	1,000	2,400	0.5	0.5
4	2,400	10,000	0.5	0.0
5	10,000	50,000	0.37	0.0
6	50,000	N/A	0.0	0.0

Market Opportunities

- Does not contain banded sweet spots like UK – 199kW or 999kW
- Leisure centres, hotels, hospitals, nursing homes, poultry and pig units where 1,000 MWh of heat are covered by the two first tariffs.
- Running installations of around 300kW to 400kW at 3000 full load hours – securing €38,000

Feasibility Study – Biomass

- Assessment of current heating systems and back up heating.
- Sizing of heating systems.
- Assessment of options for location of boiler equipment.
- Assessment of options for fuel types, storage and delivery.
- Advice on installation and maintenance costs.
- Review of planning and building control requirements including listing building requirements.
- Calculation of projected carbon savings.
- Provision of projected generation and Government incentives (Renewable Heat Incentive).

Take Home Message

ENERGY EFFICIENCY IS PARAMOUNT

GET TO KNOW THE FUEL YOU'RE GOING TO USE

- Understand the fuel you're going to use, it's pros and cons, key design considerations, availability - and stick to it.

DESIGN YOUR FUEL STORAGE AND RECEPTION AROUND YOUR FUEL CHOICE

- Think about lifecycle costs, practicalities of fuel delivery and storage.

USE PROVEN TECHNOLOGIES

- Don't try to reinvent the wheel.

SSRH

- Presents a range of new business and financial opportunities for the commercial and agricultural sectors.

Thanks
for your attention

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