



PRESENTATION



Engineering Waste Into Sustainable Energy

Presented By;

H&L Environmental Services Limited



About Us

Martin Hogan:

Director / Transport Manager

Tom Larkin :

Director / Operations Manager.

H & L was formed in 2007 to manage municipal waste .

Martin Hogan – Hogans Drain & Pipe Cleaning.

Tom Larkin – Agricultural Consultant.



LOCATION / PLANNING

Address – Derryville, Moyne, Thurles.

Planning – Planning Permission sought and acquired for an energy park in Nov 2011.

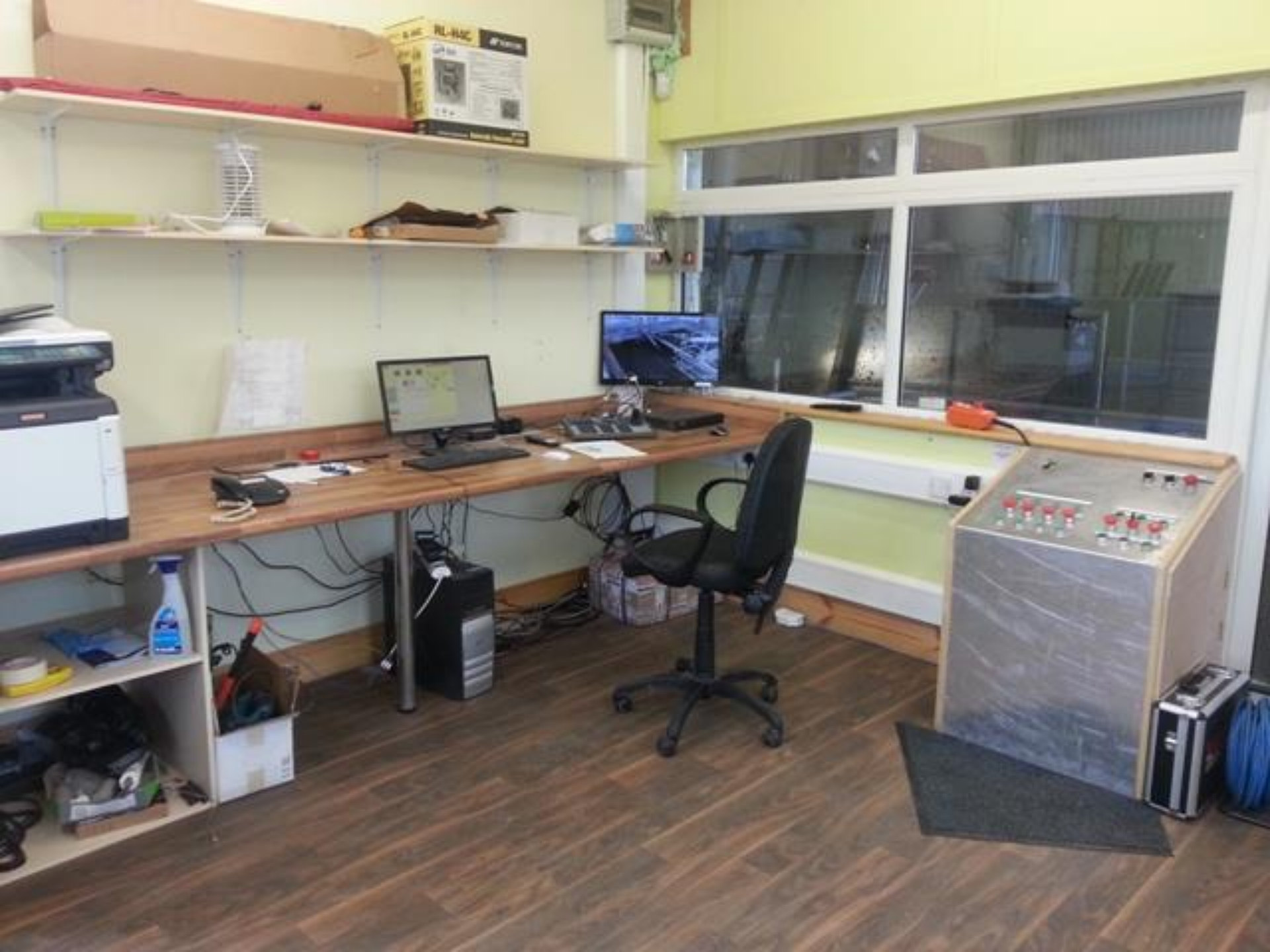
Planning Ref No – 11510331.

Energy Park ? – Anaerobic Digester , crop drying shed, research.











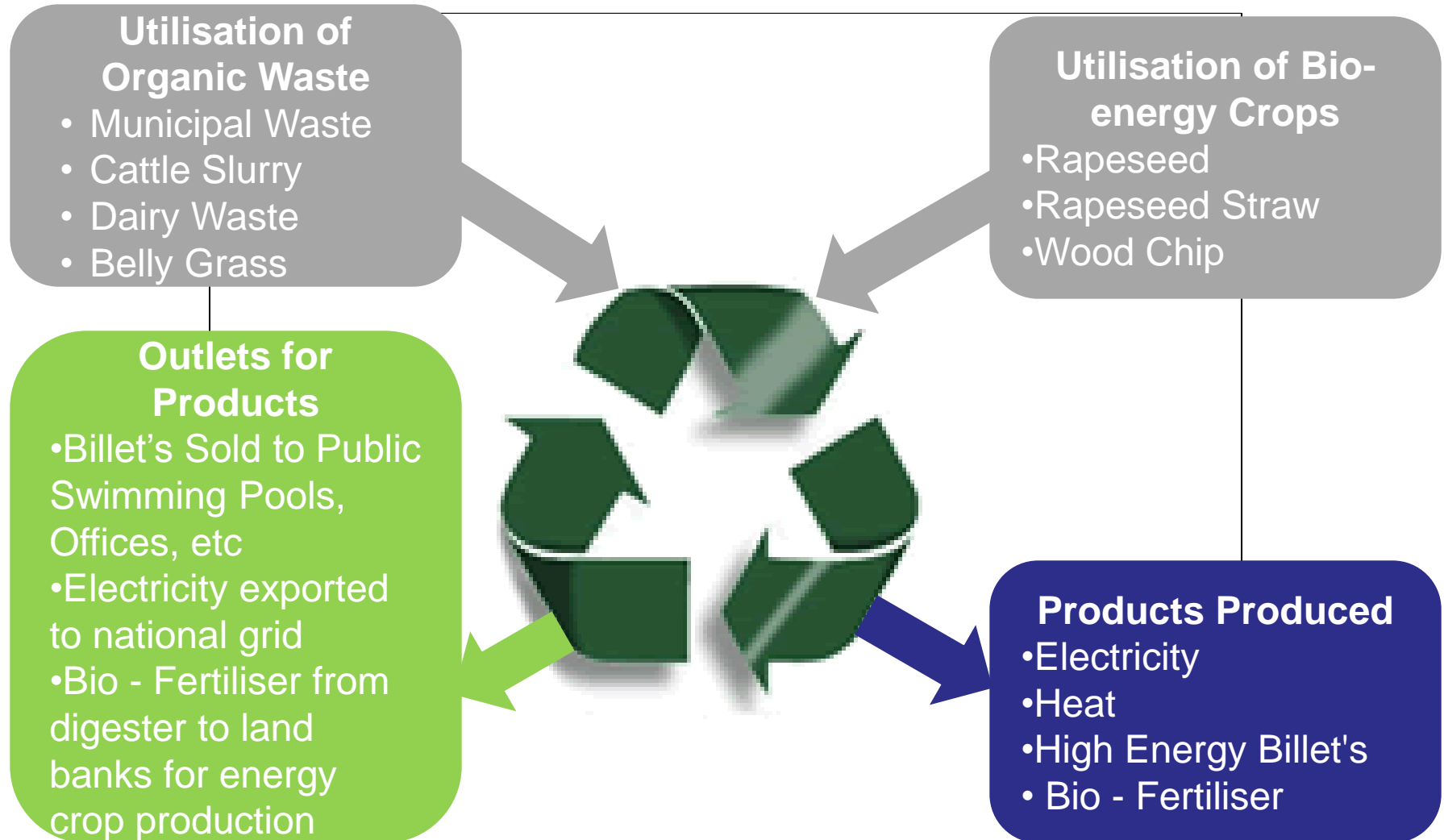




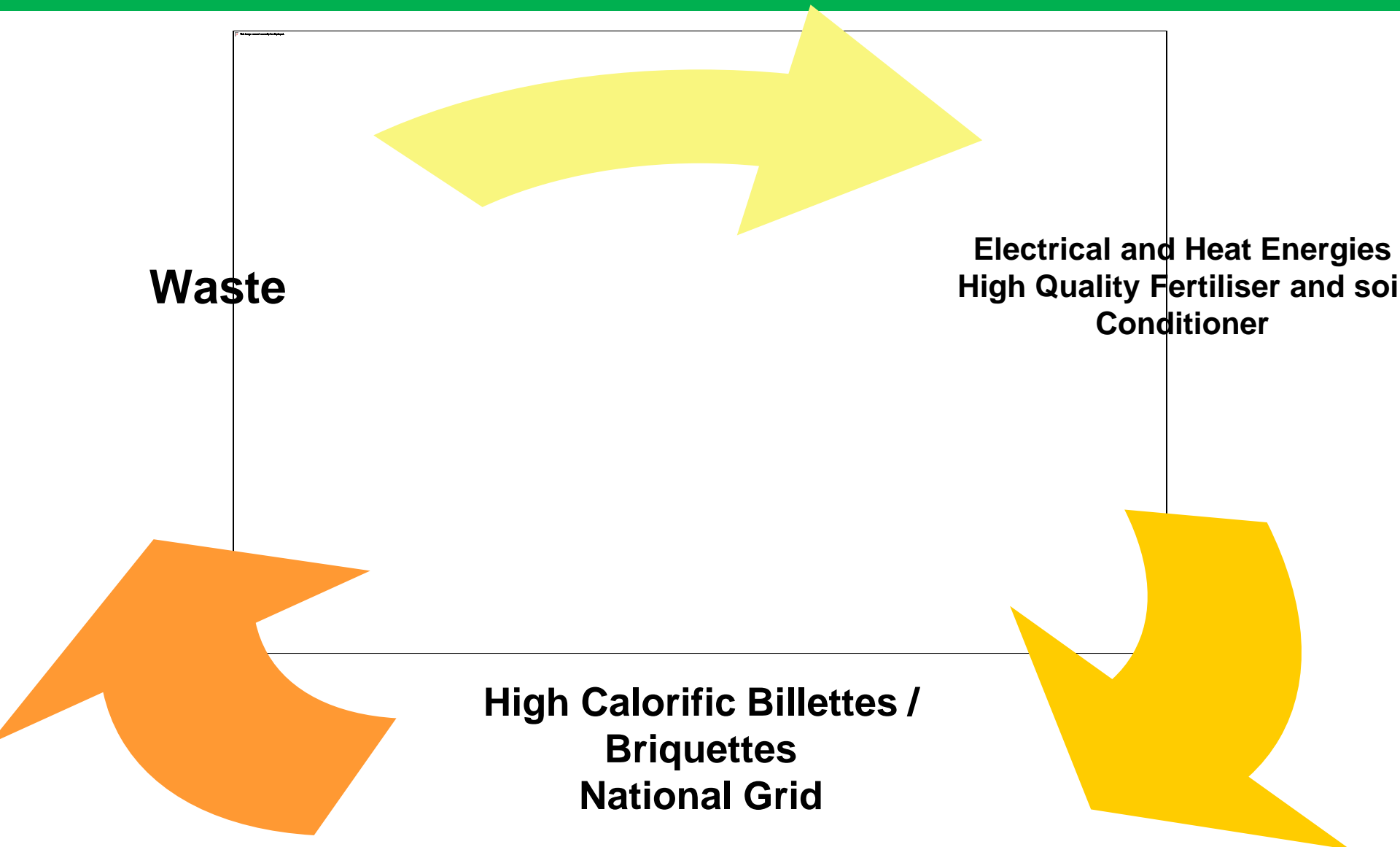




Energy Park Operations.



Summary



Development in 3 Phases.

- Phase 1 – Digester – Gas production, compliance .
- Phase 2 – Crop drying shed, billette/briquette production, district heating. Commencing June 2015
- Phase 3 – Research - (a) Pyrolysis, Gassification, cdm.

(b) nutrient value of biofertiliser to land.



Research Into Project

Aim – To build a model best suited to the Irish Environment.

- Inspections and Reviews of Plant Facilities and Management in Germany, Denmark and Holland.
- Assessment of bio-energy plants and waste management systems in the various countries . Particularly Germany.
- Attended the University of Hohenheim, Stuttgart, Germany .



Why Anaerobic Digestion

- Production Of A Sustainable Energy = Monetary and Environmental Value
- Reduction In Green House Gas Emissions(CH_4 , N_2O). CO_2 Cycle Closed Within A Very Short Period = Environmental Value
- Flexible And Efficient End Use Of Biogas = Monetary and Environmental Value
- Production Of Power And Heat As Renewable Energy Source From The CHP Plant = Monetary Value
- Reduction On The Dependency Of Fossil Fuels = Environmental Value
- Contribution To EU Energy And Environmental Targets, Kyoto = Env. Value
- Reduce The Need For Landfill In The Local Area = Environmental Value
- Creation of Jobs locally. Opportunity for other businesses to develop.



COMBINED HEAT AND POWER



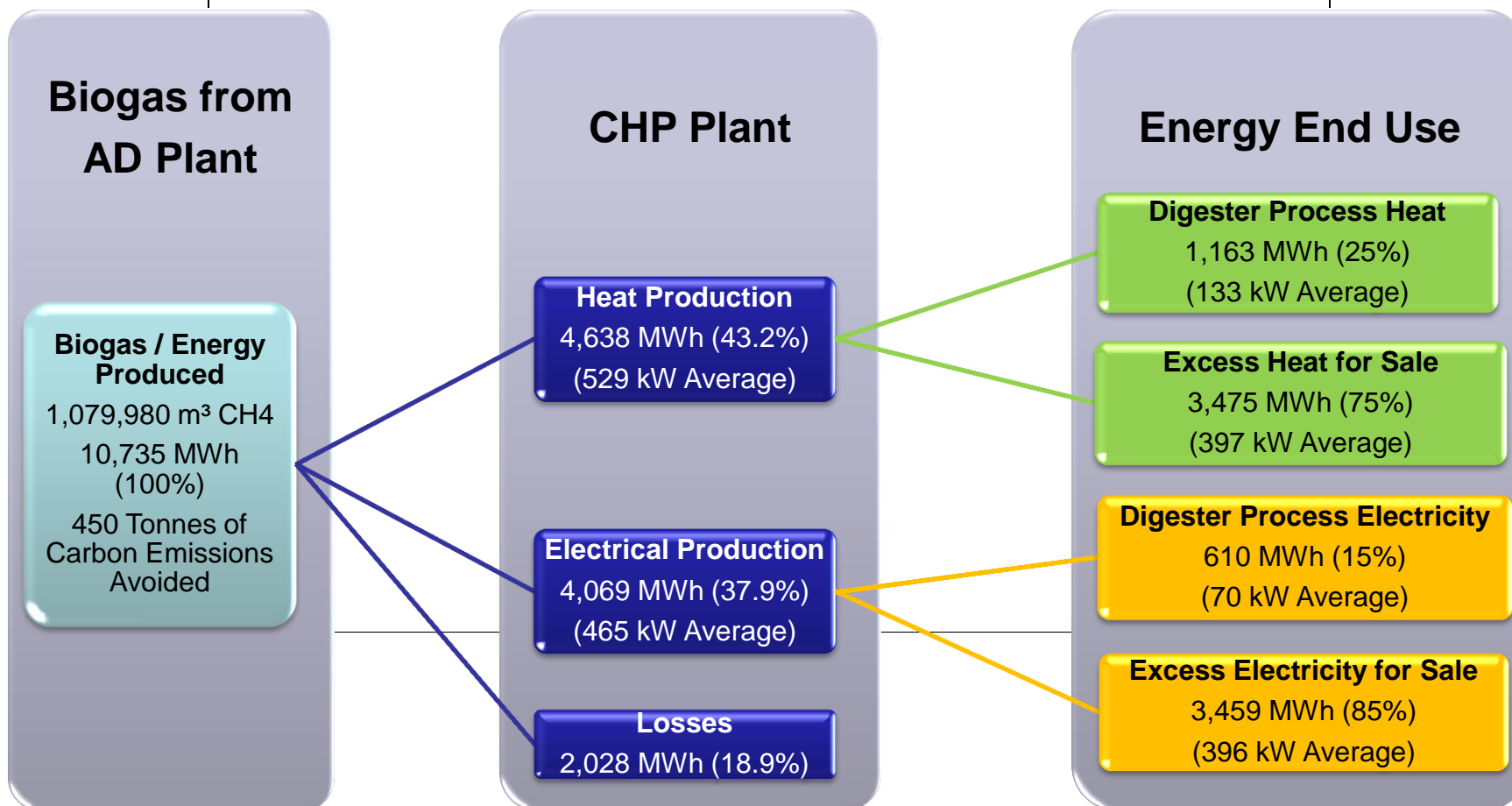
Advantages of CHP

- Makes a very significant reduction in the electrical consumption from the ESB.
- Has the most beneficial payback of the plant options considered.
- CHP is a revenue earning investment and gives an average payback period of 5 years.
- CHP gives security of electrical supply on site, it can be used as a standby generator, totally independent of the Electrical Utility.
- CHP heat rejection can be utilised within building leading to further energy savings.



AD CHP PLANT OUTPUT

Anaerobic Digester Plant Outputs Based On Existing Organic Waste
Sourced Locally





Why Use Bio energy

- POTENTIAL TO REDUCE HEATING ENERGY BILLS
- CARBON DIOXIDE NEUTRAL (HIGH CARBON TAX SAVINGS)
- COST EFFECTIVE INDIGENOUS ENERGY RESOURCE
- BEST DIRECT REPLACEMENT FOR OIL / GAS BOILERS

Produces the same LPHW water temperatures, which ensures the easy integration of the biomass boiler plant into the existing heating system.

- ALTERNATIVE INCOME FOR FARMERS / BUSINESSES
- LOW ASH CONTENT
- ASH IS RICH IN MINERALS AND CAN BE RECYCLED TO FERTILISE FORESTS, PARKS OR GARDENS.

AUTOMATIC BIOMASS SYSTEMS CAN BE UTILISED FOR HEATING IN DOMESTIC, COMMERCIAL AND INDUSTRIAL APPLICATIONS. TYPICAL APPLICATIONS ARE AS FOLLOWS;

- **Commercial Buildings:**

Offices, Hotels, Leisure Centres, Hospitals, Nursing Homes and Public Buildings.

- **Domestic:**

Large Houses and District Heating Schemes.



On 23rd January 2008 the EU leaders commissioned proposals to cut CO₂ emissions by at least 20% by 2020 (30% if global targets can be agreed on) and to set a **binding 20% target for the use of renewable energy sources**. The overall goal is to cap global temperature increases at 2°C



UTILISATION OF OILSEED RAPE



Benefits for Farmers

- Alternative Crops Generating Income for farmers.
- Biofertiliser is an Excellent Fertiliser .
- Closed Nutrient Cycle - Some Carbon Compounds Remain In Digestate, So Improving The Carbon Content Of Soil.
- Already digested , nutrients readily available for absorption.
- Addition of minor trace elements
- Reduction in chemical fertiliser applications.



Oilseed Rape

- Products
 - Oilseed rape seed
 - Oilseed rape straw
- Products of pressing oilseed rape
 - Oil
 - Cake
- 100% renewable fuel for diesel engines
- Carbon Neutral



Yield Oilseed Rape

Oilseed Rape Target Yield:

- 4 – 5 Tonne / Hectare

1 Tonne of Oilseed Rape will yield:

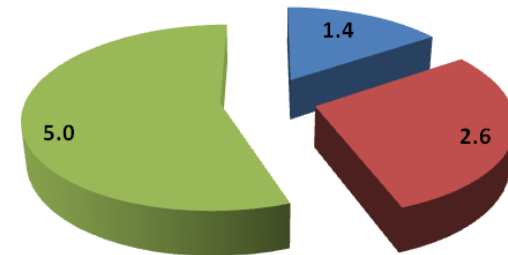
- 350kg oil (approx):
engine fuel
- 650kg cake (approx):
combustion/heating

Oilseed Rape Straw Target Yield:

- 5 Tonne / Hectare

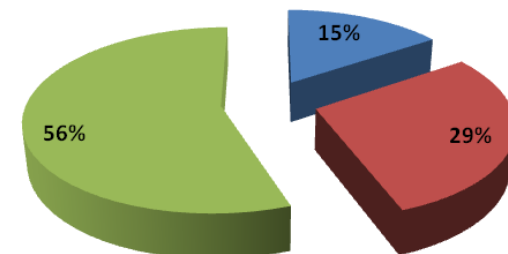
Oilseed Rape Yield
(Tonnes / Hectare)

■ Oilseed Rape Oil ■ Oilseed Rape Cake ■ Oilseed Rape Straw



Oilseed Rape Harvest Products
(Percentage Yield / Hectare)

■ Oilseed Rape Oil ■ Oilseed Rape Cake ■ Oilseed Rape Straw





Fuel Comparison

Energy cost comparison

Fuel	Unit Of Supply	Moisture Content (%)	Gross Calorific Value (kWh/unit)	Volume Required to Offset 1,000 Liters of Gas Oil	Harvest Volume of Fuel Per Hectare (Tones)	Hectares Required to Offset 1,000 Liters of Gas Oil	Price Per Unit (€)	Delivered Energy Cost (cent/kWh)	Energy Cost Savings vs. Gas Oil
Gas Oil	Liter	n/a	10.55	1,000.00	n/a	n/a	€0.75	7.109	n/a
Rapeseed Billet	kg	10%	4.47	2,360.18	6.59	0.414	€0.13	2.908	59.09%
Willow	kg	25%	4.222	2,498.82	13.03	0.221	€0.13	3.103	56.35%
Willow	kg	15%	4.667	2,260.55	12.00	0.218	€0.14	3.064	56.90%
Misconstrues	kg	20%	4.395	2,400.46	12.00	0.231	€0.14	3.254	54.23%
Woodchip	kg	35%	3.2	3,296.88	n/a	n/a	€0.13	4.063	42.85%
Wood pellet	kg	8 - 10%	4.8	2,197.92	n/a	n/a	€0.23	4.792	32.60%

A photograph of a green and white industrial building, possibly a greenhouse or a large storage facility, situated in a rural area. A wind turbine is visible in the background to the right. The foreground is filled with bare, brown branches and some green foliage. The sky is overcast and grey. The text "Thank you for your attention" is overlaid in white, sans-serif font in the lower center of the image.

Thank you for
your attention