



Ireland Country Report

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seai  **SUSTAINABLE ENERGY AUTHORITY OF IRELAND**

Ireland's Bio Based Economy



1. Irish Market Dynamics

- a. Indigenous Supply Chain & Markets
- b. Policy & Regulatory Developments

2. Irish Market Opportunities & Market Development



Ireland Eco-Environmental Profile

Small Open Trading Nation

Reliant on a Bio Based Economy

• Perception: Rural Agricultural “Green Isle”

- 4.5m (6.0m with NI) population –
- 40% rurally disbursed over 4m hct

- **GDP €180 Bn: recession impacted economy, capital availability & gov’t financing**
- **Export Oriented Agri Food & Cleantech Industries: agri food 2020 target = 40% growth**
 - Dairy Processing
 - Meat processing
 - Brewing & Distilling
 - Pharmaceutical & Biomedical technology



Ireland Policy is to Protect “Green” Image



Irish Industrial Production Infrastructure

- Heavily Oriented Toward Agri Food & Cleantech
- Excellent Bio Tech Skills & Production Infrastructure
- Means to Aggregate Agricultural Feedstocks & Access to Global Markets
- Under Utilised Residues
 - Dairy – whey as animal feed
 - Meat Processing – underutilised paunch contents, exported Class 3 MBM
 - Brewing & Distilling – spent grains used as animal feed

Municipal Waste – Privatisation Resulted in Consolidation & Investment in Collection / Management Infrastructure

- Ireland exports majority of MSW materials
 - 500K MT of paper waste exported
 - Most RDF exported
- Municipal & Industrial Wastewaters - 1,000 Plants use Aerobic WWT systems
 - Substantial sludge Volume land spread – discouraged in Org. Fertiliser Regulations



Supply Chain is Substantial but Fragmented – Challenges:

Value chains not requiring scale – Value chains can use aggregated residues (character variations)



Indigenous Energy Market

Energy Profile – 85% Supplied via Imported Fossil Fuels	Current Market			Renewable Profile				
	ktoe	Share %	€ Est. Value	Current ktoe	Mkt %	2020 ktoe	2020 %	2020 €Value
Electricity	2,405	23%	€3.2 B	546	22.7%	423	40%	€1.3B

- Coal & peat power plants being phased out in favour of gas fired power plants.
- REFIT subventions promote RES E - primarily promotes wind/wave +/- biomass HE CHP
- Strong wind programme ensures 2020 targets will be met – facing increasing public opposition to turbines
- Planning approval granted for 40 MW biomass plant and 2 X large waste incinerators

Heating/Cooling	4,239	41%	€7.2B	280	6.6%	509	12%	€1.87B
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- Industrial heat demand predominantly supplied by NG – gas grid serves > 80% of population
- Balance of demand supplied by heating oil & to lesser extent solid fuels
- RHI imminent subject to current consultation process. - targeted primarily at increasing use of LC biomass
- Biogas incentive to follow subject to economic review - grid injection protocol TBD

Transport	3,777	36%	€1.6B	117	5.2% (3.1%)	227	10% (6.0%)	€1B
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- Petrol/Diesel fuels supplied c. 65% via import & c. 35% via domestic refinery
- RES T transport fuels underpinned by BBO - 95% of RES T fuels imported
- 1 X biodiesel plant processing waste cooking oil - exports biodiesel output
- Early policy initiatives promoting electrical transport – mixed results
- Current policy considering promotion of gaseous transport fuels (preferential excise tax established)

Market Dynamics

Indigenous Raw Materials Markets



Much of Industrial / Consumer Raw Materials Are Imported

- Energy - Fossil Fuel imports € 6,500 M
- Organic Chemical Imports € 3,500 M
- Paper Imports € 375 M
- Bulk Plastic Imports € 200 M
- Fertiliser Imports € 150 M

Substantial Under Exploited Indigenous Market Opportunities

Irish Atmospheric Emissions Profile

Binding Climate Change 2020 Oblig'n = 20% reduct'n in GHG vs 2005



- Emissions Trading Scheme (ETS - cap and trade) largely compliant
- Non ETS obligation fall on state – Irish profile = 73% non-ETS vs 60% non-ETS avg EU
 - Ireland will find it difficult to hit 2020 GHG - Currently 3% below 2005 level but economic recovery & herd growth = (c. 4M mt CO_{2-eq} req'd)
 - Means to address agricultural, transport & domestic sector GHG emissions –
 - Increase Renewable Energy to address Transport and Domestic Sector
 - Methane emissions related to animal husbandry are more difficult –
 - Use of animal waste as renewable energy source
 - Recycling of nutrients (NO_x reduction

Market Dynamics

Policy Initiatives



Irish Bio-economic Development Heavily Agri – Food Centric

Supportive Policies & Frameworks –

➤ Supportive Bio Energy Policy

- *Extension of Supportive REFIT subventions for high efficiency CHP*
- *Imminent introduction of Renewable Heat Incentive*
- *Continuing afforestation policy & energy crop grant schemes*
- *Upcoming grid access framework for biogas injection to gas grid*
- *Attractive Excise Tax Rate Enshrined for Use of Gaseous Fuels*
- *BBO Obligation increasing from 6% to 8% 2017*

➤ Climate Action & Low Carbon Dev Bill – enshrines state compliance re EU Obligations

– *Prepare a Low Carbon National Mitigation Plan & Expert Advisory Council on Climate Change*

➤ DAFM initiative re National Bio economy Policy- *Bio Eire*

➤ DAFM R&D Programme on Biorefinery Demonstration

➤ DAFM Grass Based AD Test Plant under construction

Range of Policy Initiatives Promote Bio Economic Development

Market Opportunities & Activities



Supportive Policies & AMFM Feedstock Availability Offer Means to Exploit Market Opportunities

Biomass/Waste to Energy: Near term commercial focus

- 40 MW biomass CHP plant – *Mayo Renewable Power*
- AD of Agri- Food Residues + Biomass –
 - *Gas Networks Ireland (Gas utility) - Grid Injection target 20% Green Gas by 2030*
 - *Off Grid applications - Biogas Transport, Displacement of Heating Oil / Distillates*
- Anaerobic WWT – *NVP Energy developing high rate low temp AD for WWT*
 - *Irish Water (newly privatised water utility) now operator of WWT plants*
- Farm-scale FBC for poultry & equine litter – *Biomass Heating Solutions Ltd.*
 - *New Reg's classify farm scale poultry litter as ABP vs Waste – viable*
- Continuous Pyrolysis System for Biomass HE CHP – *Premier Green Energy*



Market Opportunities & Activities Ct'd



Biorefining - Biofuels : R&D Focus

- R&D on VFA based platform energy carrier
- R&D on lignocellulosic derived levulinic acid for aviation fuel

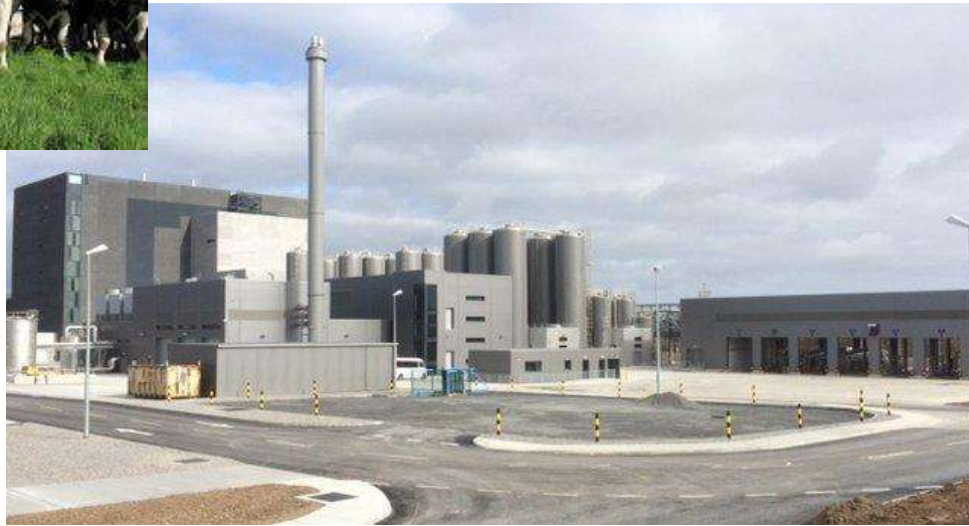
Biorefining – Nutraceuticals: R&D and Early Commercial Stage

- Food for Health Technology Centre – State Sponsored R&D
 - *Bioadditives from Dairy Extracts*
- Bio Marine Ingredients -Donegal Based Fish Processing-R&D
 - *Bioactive extracts from fish processing residues*
- Biopharmed-West – R&D
 - *Anti fungal and antibacterial applications from willow bark extracts*
- Hemp based essential oil extracts



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