Sustainable Energy Research Network

Country Report Ireland

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epa Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

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Supports for AD as electricity

As of May 2010 tariffs are indexed and offered on a 15-year basis and include:

- AD CHP equal to or less than 500 kW: 15 c/kW_eh;
- AD CHP greater than 500 kW: 13 c/kW_eh
- AD (non CHP) equal to or less than 500 kW: 11 c/kW_eh;
- AD (non CHP) greater than 500 kW: 10 c/kW_eh

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Biogas Plant Inventory

- Summary of AD Plants:

- 8 Biogas Facilities
- 15 Industrial, Sewage sludge, Municipal (biowaste)
- 7 Landfill Gas projects in Ireland

Landfill Gas

Dunsink Landfill, Dublin	5 MWe
Friarstown, Tallaght, Co. Dublin	1 MWe
Ballyogan, Leopardstown, Co.Dublin	2 MWe
Balleally, Lusk, Co.Dublin	5 MWe
Tramore Valley, Cork	2 MWe
Arthurstown, Kill, Co Kildare	4.2 MWe
Kilkullen, Co Kildare	1.2 MWe
Total	18.4 MWe

Maximum electrical potential 30 – 40 MWe

Commercial feasibility requires site of 50 – 100,000 t

From: Aine Car: “Landfill Gas resource 2010/2020 potential and scenario development” Sustainable Energy Authority Ireland (SEAI)

Farm slurries in Ireland

	Cattle[a]			Pig[a]			Sheep[a]			Poultry[b]			Total		
	2007	2010	2020	2007	2010	2020	2007	2010	2020	2007	2010	2020	2007	2010	2020
Number of heads (M)	6.00	5.89	5.5	1.62	1.6	1.49	3.83	3.45	3.28	12.95	12	12	24.40	22.94	22.27
Slurry quantity (Mt/a)	30.51	29.95	27.97	2.35	2.32	2.16	0.19	0.17	0.16	1.84	1.70	1.70	34.89	34.14	31.99
Biogas[c] (Mm_n^3/a)	671.22	658.90	615.27	51.70	51.02	47.52	10.34	9.15	8.70	81.88	75.81	75.81	815.14	794.88	747.30
CH_4 production[c] (Mm_n^3/a)	369.17	362.39	338.40	28.44	28.06	26.13	5.68	5.03	4.78	45.03	41.70	41.70	448.32	437.19	411.01
Total[d] energy (PJ/a)	13.95	13.69	12.78	1.07	1.06	0.99	0.21	0.19	0.18	1.70	1.58	1.58	16.94	16.52	15.53
Practical energy (PJ/a)	0.14	0.27	0.64	0.01	0.02	0.05	0.002	0.004	0.01	0.00	0.79	1.18	0.15	1.09	1.88

Slaughter waste in Ireland

	Cattle			Pig			Sheep			Poultry			Total		
	2007	2010	2020	2007	2010	2020	2007	2010	2020	2007	2010	2020	2007	2010	2020
Number of heads[a] (M)	1.78	1.67	1.59	2.62	2.60	2.47	3.26	2.74	2.85	12.95	12.00	12.00	20.61	19.01	18.91
Slaughter waste (Mt)	0.37	0.35	0.33	0.07	0.07	0.07	0.02	0.02	0.02	0.007	0.006	0.006	0.47	0.44	0.42
Biogas potential (Mm_n^3)	57.76	54.19	51.59	11.04	10.95	10.40	3.51	2.95	3.07	0.74	0.69	0.69	73.04	68.77	65.75
Methane potential (Mm_n^3)	31.77	29.80	28.38	6.07	6.02	5.72	1.93	1.62	1.69	0.41	0.38	0.38	40.17	37.83	36.16
Total energy potential (PJ)	1.20	1.13	1.07	0.23	0.23	0.22	0.07	0.06	0.06	0.02	0.01	0.01	1.52	1.43	1.37
Practical energy potential (PJ)	0.00	0.00	0.54	0.00	0.00	0.11	0.00	0.00	0.03	0.00	0.00	0.01	0.00	0.00	0.68

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Biogas Plants

Facility name	Capacity (tpa)	Size	Digester volume (m^3)	Primary feedstock
Adamstown, Co. Wexford	5,000	200kW$_e$ 300kW$_{th}$	600	Manure, biosolids, biowaste
Beofs, Co. Kilkenny	10,000	200 kW$_{th}$	150 + 450 + Storage	Manure & substrates
Methanogen, Co. Waterford	10,000	50kW$_{th}$	144	Manure
McDonnell, Co. Limerick	10,000	250 kW$_e$ 263 kW$_{th}$	200 + 980 + 2,500	Dairy and poultry manure
Roughty Valley Co-operative, Co. Kerry		245kW$_{th}$	1350	Manure
Silver Hill Duck Farm, Co. Monaghan				Duck slurry
Kerry Foods		1000kW$_e$		Milk processing wastes
Ormonde, Portlaw		1000kW$_e$		Under Construction

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Energy is not all about electricity

Table 1 Forecasted final energy consumption in Ireland in 2020. Adapted from[11].

	PJ	% total
Electricity	124	21.5
Thermal	223	38.9
Transport (road and rail)	188	32.8
Other transport (not covered by RES-T)	39	6.8
Total	574	100

Directive 2009/28/EC
(Renewable Energy Directive)

•Share of renewable energy sources in transport (RES-T) by 2020 at least 10%

•The share of biofuels from cereal and other starch rich crops, sugar and oil crops limited to 7% as of April 2015.

•Biofuels (from **(1) grasses (2) algae**, municipal solid waste, manures and residues) and **(3) gaseous fuels from non biological origin** shall be considered at 2 times energy content.

•**Also require Green Energy in Industry (FDI) and heating**

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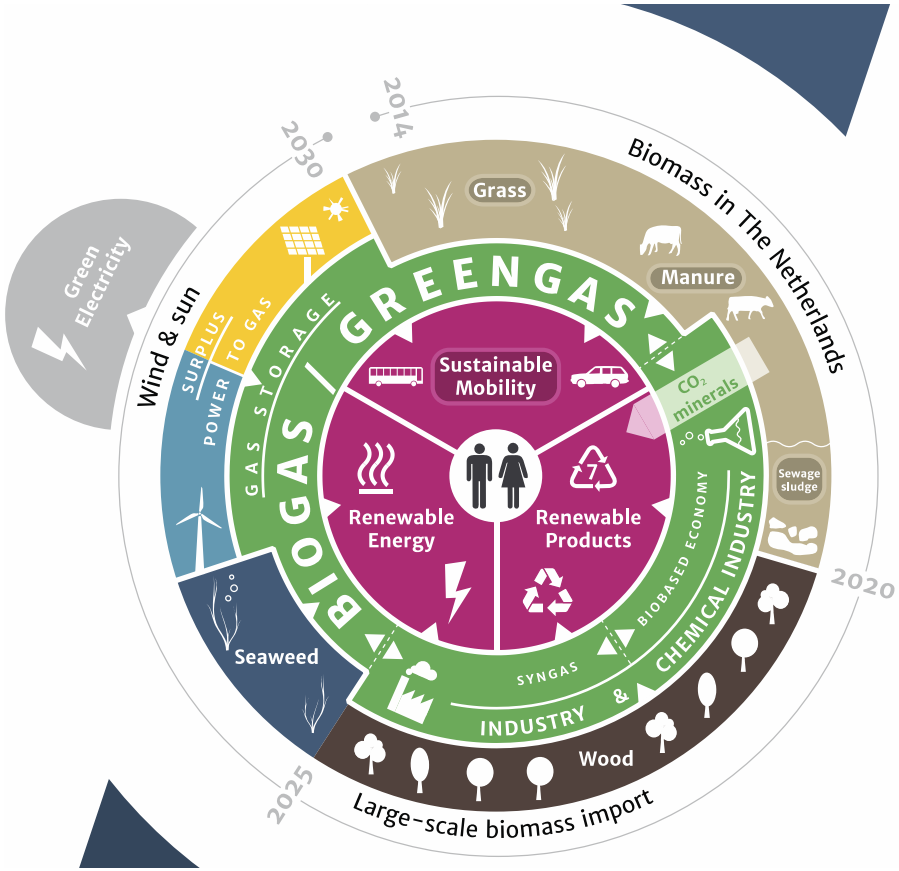
Green (Renewable) Gas



6 European gas grids have committed to 100% green gas in the gas grid by 2050

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Green Gas in Ireland

Network Development Plan 2015

assessing future demand and supply position

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Annual RNG Capacity (GWh)	20	170	400	960	1440	2280	2640	3120	4350	5980
% of Demand	0.04%	0.34%	0.8%	2%	3%	5%	5%	6%	9%	12%

Major demand for Green Gas is FDI. Factories of the future will use green gas

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Green Gas in Ireland used as a transport biofuel

Gas as a transport fuel liable to 3 Biofuel Obligation Certificates (BOCs)
1 BOC is the difference between cost of 1 L diesel and 1L of biodiesel
1 BOC trades between 15 and 30c
3 BOCs equivalent to 45 and 90c
Add sale price of natural gas 24c/m3 CH4

Revenue is 69 to 104 c/Nm3
Equivalent to 6.9 to 10.4 c/Nm3
Equivalent to 19.7 to 29.7 c/kWeh if (35% electrical efficiency)

MaREI

Research Projects

- Science Foundation Ireland (SFI) MaREI €32M
  - Marine Renewable Gas from Marine Sources

ATBEST (ADVANCED TECHNOLOGIES FOR BIOGAS EFFICIENCY SUSTAINABILITY AND TRANSPORT).

Marie Curie Initial Training Networks Call: FP7-PEOPLE-2013-ITN

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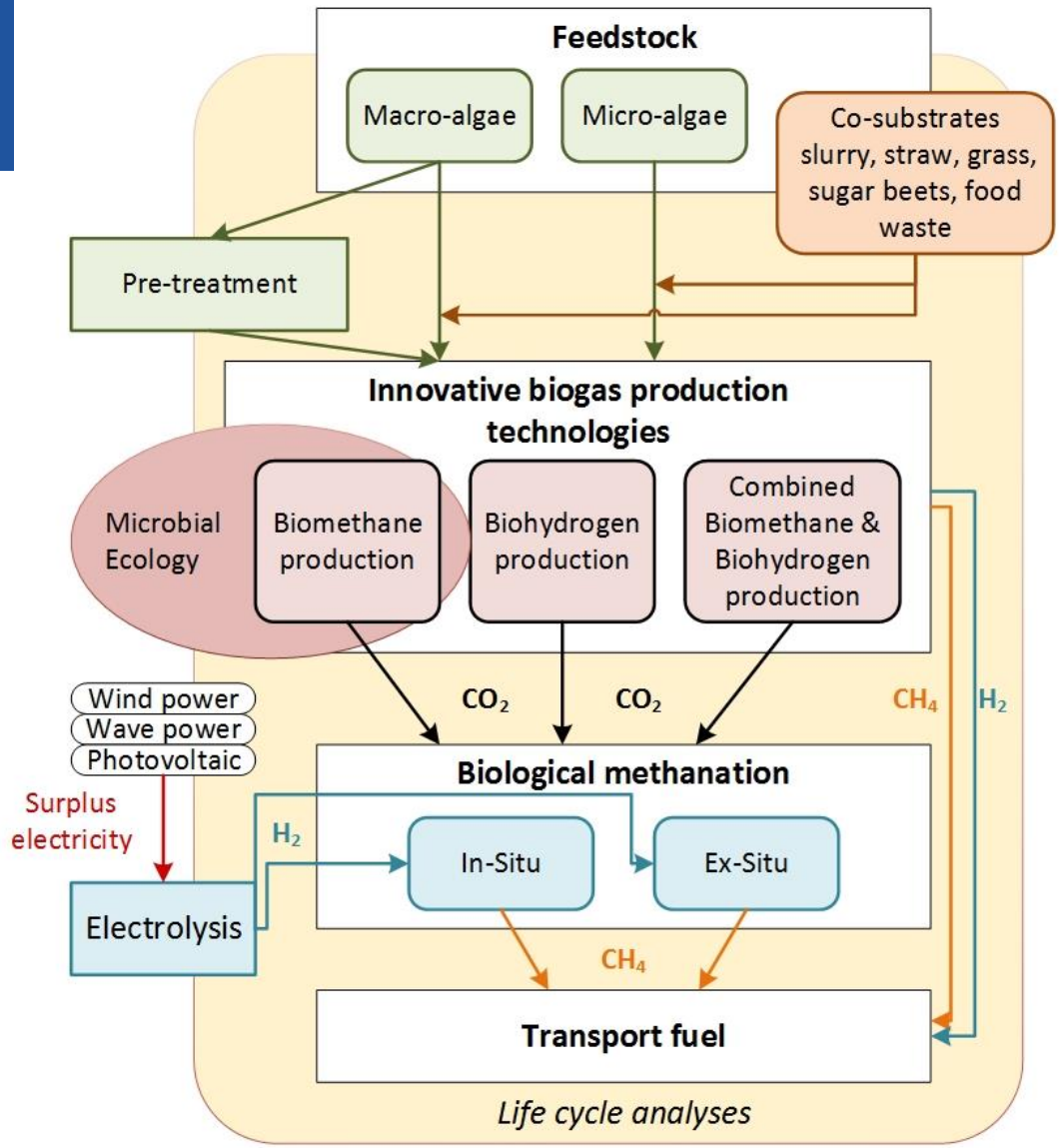

Renewable Gas from marine sources

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