



Composting & Anaerobic Digestion
Association of Ireland

Planning for an Anaerobic Digestion Facility Training Course

18 & 19 June 2012, Dunraven Arms, Adare, Limerick

Overview

With the introduction of government incentives, such as ROCs (Northern Ireland) and REFIT (Ireland) for the production of renewable energy, anaerobic digestion (AD) is now a viable technology that offers huge potential for revenue generation for farmers and waste operators alike.

Anaerobic digestion produces a high energy containing gas, known as biogas, which can be used for green energy production. The technology is simple, yet robust, and well developed across the continent. AD is a new development for Northern Ireland and offers great opportunity for those who wish to enter the renewable energy market.

To facilitate the growth of the sector Cré has developed a "Planning for Anaerobic Digestion Facility" training course. The course is a highly intensive 2 day training course targeted specifically at projects in Northern Ireland and Ireland. The course will give participants a clear understanding of what anaerobic digestion is, basic design criteria, planning & regulatory requirements, grid connection, project economics, financing, and much more. The course includes a visit to an operational anaerobic digestion plant. The course will prepare participants wishing to develop anaerobic digestion plants and allow individuals to up skill in the area of Anaerobic Digestion.

The objective of the course is to educate individuals involved in anaerobic digestion, be it farmers, waste operators, planners, decision makers with all the knowledge to assist them in developing an anaerobic digestion project. The course will not allow participants to design their own plant but will provide them with sufficient knowledge when dealing with technology providers, government agencies, planners, banks, to make well informed decisions.

Comments from People Who Completed the Course in 2011:

- ▶ "Just a short note to say well done on an excellent course in Adare. It was exactly what I needed and I came home very satisfied with two days well spent. The programme, its pace, the calibre of the speakers, the time for formal/informal discussion and all ancillary issues were of a top professional standard".
- ▶ "Good mix of attendees, very interesting presentations across the AD sector issues"
- ▶ "The course was good because of the amount of expertise available to answer questions"
- ▶ "Very informative, covers many angles, great for anyone considering involvement in anaerobic digestion"
- ▶ "The group exercises were great at demonstrating the effect of all the different variables on the process"

All the people who completed the course were surveyed and said the course was value for money.

Intended For

- ▶ **Farmers** – wishing to develop their own projects will now learn steps involved in getting a project off the ground. How to access their feedstock for biogas potential and if the project is economical.
- ▶ **Project Developers** – for use in development of anaerobic digestion projects. The principles described in the course are designed to assist developers understand the basics of plant design and potential "red tape" that could slow down projects.
- ▶ **Waste Industry** – wishing to develop their own projects will now learn steps involved in getting a project off the ground. How to access their feedstock for biogas potential and if the project is economical
- ▶ **Planners and Decision Makers**- for use in understanding basic principles of anaerobic digestion plants. As planners and decision makers will gain a better understanding of what is required for successful plants, they will be better equipped to support planning applications for anaerobic digestion facility projects.
- ▶ **Consultants and Designers**- for use in designing and assisting clients with the development of their anaerobic digestion projects.
- ▶ **Regulators and Enforcement Agencies**- for use in understanding basic principles of anaerobic digestion plants, which will assist them in their role as regulators of anaerobic digestion facilities.
- ▶ **Individuals** – Who wish to gain an understanding of anaerobic digestion
- ▶ **Investor and Financial Institutions** – Will provide an understanding of the potential project risks and how to properly access the economics of anaerobic digestion projects.

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Programme

Introduction and Overview

- ▶ Participants will have an understanding of who Cré are and the role Cré play in the development of anaerobic digestion.
- ▶ Overview of current development of anaerobic digestion facilities and number of facility built/operational
- ▶ What anaerobic digestion is, definitions and units used
- ▶ Basic understating of biology and biogas

Biology and Biogas

- ▶ Participants will understand digester biology and what process parameters are important to maintain biogas production
- ▶ How the biology works in a digester to produce biogas
- ▶ Why feedstock give different biogas yields. Importance of dry matter contents, volatile organic solids and methane yields

Biogas Technology and Plant Layout

- ▶ Participants will be able to select a suitable technology for different feedstocks
- ▶ Understand the differences in technology types, the key components of a wet anaerobic digestion system will be entered into in more detail
- ▶ The components of a biogas plant and the roll these features play in biogas production
- ▶ Why specific materials are necessary in the construction of a plant
- ▶ Participants will learn about health and safety on a biogas plant

Biogas Utilisation Technologies

- ▶ Participants will understand the basics of biogas utilisation and combined heat and power engines
- ▶ Understand the difference between gas engines and dual fuel engines

Grid Connection

- ▶ Participants will be able to access engine sizing and grid connection requirements
- ▶ Participants will gain an understanding of equipment necessary for grid connection
- ▶ Participants will learn about the grid connection application process and associated costs

Project Appraisal and Finance

- ▶ Participants will go through economic modelling and cash flows to access the rates and returns of a anaerobic digestion project.
- ▶ Will provide participants with sufficient information so they can access their own projects
- ▶ Will go into detail on assumptions that must be made when modelling, how to calculate electricity from feedstock, parasitic loads, electricity, heat & digestate sales and operational costs
- ▶ The course will not be able to provide economics for each participants project, as project needs vary case by case, but the course will provide participants with a good foundation so that they know what questions to ask technology providers
- ▶ Participants will learn how best to raise finance for their projects

Planning and Regulations for a Biogas project

- ▶ Participants will learn about all the regulatory requirements for their project from animal by-product regulations through to planning and permits
- ▶ Detailed ABP section on how to prepare a stage 1 and stage 2 application
- ▶ What are the steps required in gaining a generation licence and time lines
- ▶ This is high level overview so participants are aware of the requirements for their project

Visit to Green Gas Anaerobic Digestion Plant

A tour to Green Gas AD plant will be provided by David McDonnell. The plant is located only 15km from Adare. There will be sufficient time to ask David and his Father Michael about the development of the plant. Greengas AD Plant is a small company located at Dunmoylan, Shanagolden, Co. Limerick adjacent to the family farm. The AD Plant processes farm manure from cattle and poultry as well as other organic material, up to a capacity of approximately 12,000 tons annually.

Training Requirement

As anaerobic digestion is a new development in Ireland, there is a need for training. As part of Cré's mission statement, Cré are committed to educating and providing training to its members. To ensure members receive the highest standard of training, Cré is developing a training course to meet the "Planning Stage" of development of an anaerobic digestion facility. Currently the majority of anaerobic digestion projects are going through the planning stages, be it initial concept, economic assessment or through the planning process. Cré have aimed this course at individuals planning to develop anaerobic digestion projects. The course is a two day intensive training programme with a site visit to an operational anaerobic digestion plant producing electricity. The course is designed to provide individuals with a complete overview of all the requirements for developing a project. Participants will have a full understanding of how to plan for an anaerobic digestion facility from feedstock appraisal through to planning and grid connection.

Methodology

The course is delivered by a team of approved tutors who have extensive national and international experience in the field of anaerobic digestion. Copies of all presentations will be provided to everyone, as well as hand-outs with more detailed information. It will be taught in a classroom and there will be a site visit to the Green Gas AD plant.

Duration

The course will last two consecutive days.

Class Size

In order to facilitate a good discussion, the class sizes are being kept small.

Cost

- ▶ The cost includes all presentations, coffee breaks, lunches and bus to the AD facility.
- ▶ The cost per person is €495 for Cré members and €695 for non-members.
- ▶ There is no VAT charged on training.
- ▶ Additional people from a company will get a reduced rate of 10%.

Course Dates

The course will be held on 18 & 19 June 2012.

Further Details & Booking

If interested in attending the course please email Percy Foster **Email: percy@cre.ie** or **Tel: 00 353 (0)86 8129260**. This event will be offered to Cré members on a first come first served basis, any remaining places will be offered to non-Cré members.

Cré

Is a non-for profit organisation representing the Composting and Anaerobic Digestion sector in Northern Ireland and the Republic of Ireland. you or your company are interested in become a member, or would like to learn more about the benefits of becoming a member please email Percy Foster **Email: percy@cre.ie** or **Tel: 00 353 (0)86 8129260**.

▶ Location

The course will be held in the Dunraven Arms, Adare, Co. Limerick.

The Dunraven Arms has a B&B rate of €80. Contact the hotel on 061-605900.

B&B accommodation is available in Adare Village. See the following link for details <http://www.adarevillage.com/bandb.php> e.g. Adare Village Inn (Tel: 0872517102) offered a room only rate of €40/night.

Woodlands Hotel is only 2km away and the rate there is €59-69 B&B. www.woodlands-hotel.ie Tel: 061-605100



Participants on the Course in 2011 at the GreenGas AD Plant

Schedule

Day 1		Monday 18 th June	
Start	Finish	Class	Speaker
09:00	09:45	Introduction and Overview	Percy Foster, Cré
09:45	10:45	Biology, Biogas and Feedstock	Dr. Jerry Murphy, University College Cork
10:45	11:15	Break	
11:15	11:45	Group Exercise- Feedstock Gas Yields	David McDonnell, GreenGas & Percy Foster, Cré
11:45	12:45	Biogas Technology, Plant Layout and Design Basics	David McDonnell, GreenGas
12:45	13:45	Lunch	
13:45	14:15	Health and Safety	David McDonnell, GreenGas
14:15	15:15	Biogas Utilisation Technologies	Ian Farr, Edina
15:15	15:30	Digestate	Percy Foster, Cré
15:30	16:00	Break	
16:00	18:30	Site Visit to GreenGas AD Plant	David McDonnell, GreenGas Joseph Maher (Edina) will guide the tour around the CHP unit

Day 2		Tuesday 19 th June	
Start	Finish	Class	Speaker
08:30	09:30	Planning and Regulations for an Anaerobic Digestion Project in Northern Ireland	Alan Mitchell, SLR Consulting
09:30	10:30	Planning and Regulations for an Anaerobic Digestion Project in Ireland	Maeve English, Fehily Timoney & Co
10:30	11:00	Break	
11:00	12:00	ABP Regulations in the Republic of Ireland and Northern Ireland	Percy Foster, Cré
12:00	12:30	REFIT 3/High Efficiency CHP and ROCs Application Processes	Percy Foster, Cré
12:30	13:30	Lunch	
13:30	14:30	Finance Options for Anaerobic Digestion Projects	Jack O'Keeffe, Larchmount Consulting
14:30	15:15	Group Exercise - Economics	Jack O'Keeffe, Larchmount Consulting
15:15	15:30	Break	
15:30	16:30	Grid Connection in Ireland	Ciaran Donnelly, Wind Prospect
16:30	17:30	Grid Connection in Northern Ireland	Ciaran Donnelly, Wind Prospect

TRAINERS

Dr. Jerry D Murphy, University College Cork, has a PhD in energy production from waste (1999 – 2003). He serves as Lecturer in Transportation Engineering in University College Cork and Principle Investigator (PI) in Bioenergy and Biofuels in the Environmental Research Institute (ERI). He has supervised to completion 15 postgraduate students. Jerry served as the International Energy Agency (IEA) Country Representative for Ireland for Task 39 Liquid Biofuels (2007 - 2009) and at present serves on IEA Task 37 Energy from Biogas (2010 - 2012). Jerry served as Chair of an International Energy Agency (IEA) Biofuels Conference in Cork in 2008 and an EPA biomethane conference in Cork in 2010. He has published extensively with ca 42 peer review journal papers, 21 international conference papers and a further 22 invited lectures; his work has been cited over 420 times in peer review press (H factor of 13). He is on the editorial board of Renewable Energy.

David McDonnell is involved in different areas of renewable energy development. He has a background in agriculture, specialising in the dairy and poultry sectors. David has various agriculture qualifications as well as a B.A. from University of Limerick. He is a member of the Irish Wind Energy Association, Irish BioEnergy Association and Cré. Currently, he is overseeing the management of an AD plant on his family's farm.

Percy Foster is the CEO of Cré since 2006. His role he coordinates the affairs of the association, participation in projects such as the compost standard project, development of training courses and lobbying Government Departments. Percy Foster has Master of Science degree (by research) in composting and market development and an honours degree in Environmental Science and Technology from Institute of Technology, Sligo.

Ian Farr is responsible for the sales of Edina CHP equipment into the AD industry. As a biochemical engineer by training he has worked with anaerobic digestion in various capacities all his career. This includes time with the UK Water Research Centres processes and with the Energy Technical Support Unit. At ETSU he managed the UK Government R and D into anaerobic digestion of MSW. Prior to Edina he was General Manager for an environmental company producing nutrients for wastewater and anaerobic digestion plants.

Alan Mitchell is an Associate with SLR based in the company's Dublin office. He has over 13 years experience of securing planning permission and project managing utilities, waste and minerals projects in the Republic of Ireland, Northern Ireland and Great Britain. His experience includes dealing with Planning Authorities across the Republic of Ireland and with the DoE Planning Service in Northern Ireland. Alan has handled a significant number of Planning Appeals including Public Inquiries and Hearings and has undertaken research and due diligence internationally for clients in the UK, the Middle East and Africa. He has also led workshops on the subjects of securing planning permission and handling community engagement in the planning process. He has experience in planning applications for many types of recycling activities including anaerobic digestion, composting and MBT.

Jack O'Keeffe has a MBA from Northwestern University. Presently he works at Larchmont Consulting which is a financial consultancy company whose focus is on the Renewable Energy Sector. Larchmont Consulting is comprised of professional advisors who have direct experience in structuring projects, project management, due diligence, investment appraisal, advice on funding of projects as well as fund raising for specific projects. Jack has been in the financial services area in Ireland and the US for over 30 years. During this time he was Chief Operating Officer at Cova, Executive Chairman at Independent Trustee Company, Director Private Clients at Davy Stockbrokers, General Manager at First Active, Director Group Marketing & Communications at Anglo Irish Bank and Associate Director/Senior Manager at AIB Group.

Maeve English, is a Principal Scientist with Fehily Timoney and Company. Maeve holds a BSc from the National University of Ireland Cork, an MSc in Applied Environmental Science from Queens University Belfast and has recently completed a Diploma in Environmental and Planning Law from the Law Society of Ireland. Maeve is a Chartered Scientist and Chartered Environmentalist and a member of the CIWEM Expert Panel on Waste Management. Maeve has over 12 years experience in consultancy with particular expertise in preparing statutory consent applications. Maeve has successfully project managed the delivery of planning applications, environmental impact statements, waste licence and permits applications for waste transfer stations, material recovery facilities, biological treatment facilities and residual landfills. Maeve has coordinated and advised public and private sector clients on a wide variety of projects including strategic infrastructure applications as well as significant commercial and industrial planning applications and planning appeals. Maeve has given expert witness evidence at An Bord Pleanála hearings.

Ciarán Donnelly has over nine years experience as an electrical engineer specialising in grid connection and regulations. He has is a Chartered Engineer with a Bachelor of Electrical/Electronic Engineering from Dublin Institute of Technology and a Masters in Engineering Management from University College Dublin. He spent the first 5 years of his career working on large CCGT projects in ESBI. This included Coolkeeragh CCGT in Northern Ireland and Moneypoint Retrofit in Co. Clare. He subsequently worked for an R&D tidal turbine developer called Openhydro for over 3 years who became the first grid connected tidal turbine in 2009. He has spent the last two years working as a grid connections specialist in Wind Prospect. He is a member of Irish Wind Energy Association's grid committee and sit on a number of panel and working groups in ESBN and EirGrid including the DS3 working group and the distribution code review panel.

GERONIMO II – BIOGAS

GERONIMO II – BIOGAS is a 30 month initiative, supported by the Intelligent Energy Europe Programme, which aims to work closely with dairy and pig farmers from across Europe to unlock the potential that biogas can offer as a cost effective and environmentally friendly means of managing manure. The Geronimo II Irish partner is the Business Support Unit, Limerick County Council. see <http://energy4farms.eu/>. If farmers from County Limerick are interested in attending the course, there is a subsidised rate available from Anthony Colman in Limerick County Council.