Planning for an Anaerobic Digestion Facility
Training Course

8th & 9th November, Crowne Plaza, Dundalk

22nd November, Kildare

cré
Composting & Anaerobic Digestion Association *of* Ireland

Overview

With the impending introduction of new incentives from government, such as the Renewable Heat Obligation (RHO) to produce renewable energy, anaerobic digestion (AD) is a financially 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 on multiple feedstocks.

To facilitate the growth of the sector Cré developed a "Planning for Anaerobic Digestion Facility" training course. The course is a highly intensive three-day training course targeted specifically at projects in Ireland. The course was delivered twice previously with over fifty people attending. The course will give participants a clear understanding of what anaerobic digestion is, basic design criteria, planning and regulatory requirements, grid connection, project economics, financing, and much more. The course includes visits to operational anaerobic digestion plants and will prepare participants wishing to develop their knowledge in anaerobic digestion plants and to up skill in anaerobic digestion operations.

The objective of the course is to educate individuals involved in anaerobic digestion, be it farmers, waste operators, planners, decision markers 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:

"Just a short note to say well done on an excellent course. 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"

Students from last course

Planning for an Anaerobic Digestion Facility
Training Course

cré
Composting & Anaerobic Digestion Association *of* Ireland

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 then in their role as regulators of anaerobic digestion facilities.

- I**ndividuals** – who wish to gain an understanding of anaerobic digestion.

- **Investor and Financial Instructions** – will provide an understanding of the potential project risks and how to properly access the economics of anaerobic digestion projects.

Planning for an Anaerobic Digestion Facility
Training Course

cré
Composting & Anaerobic Digestion Association *of* Ireland

Course Overview

Introduction and Overview
- Participants will understand 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
- Ideal conditions for bacteria to thrive
- 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- CHP, Gas Upgrading
- Participants will understand the basics of biogas utilisation and combined heat and power engines.
- Understand the difference between gas engines and dual fuel engines
- Understanding of ancillary equipment that can aid in performance of the biogas plant.
- Understand the ways to upgrade the quality of biogas produced.
- Other products available for extraction / recovery from the gas fraction

Grid Connections, Gas, Electrical
- 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 participant's 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
- Challenges to planning and permits.
- Participants will learn about all the regulatory requirements for their project for animal by-product regulations.
- 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 timelines.
- This is high level overview so participants are aware of the requirements for their project.

Planning for an Anaerobic Digestion Facility
Training Course

cré
Composting & Anaerobic Digestion Association *of* Ireland

Course Overview

Gilfresh AD, Loughgall, Co. Armagh
- **Capacity** - operational since 2016
- **Feedstock**…Vegetable waste, chicken litter, cattle slurry, grass silage, fodder beet, hybrid rye, and maize
- **Generating capacity**…Originally 500 kWe, but now 1MW electric. In 2017 the second 500kWe CHP provides heat and electricity for a neighbouring greenhouse

Green Generation, Nurney, Co. Kildare
- **Capacity** – circa 25,000 tonnes per year, operational since 2015
- **Feedstock**…Agricultural wastes, and food waste
- **Generating capacity**…1 MW CHP and biomethane to gas grid.

https://greengeneration.ie/
https://youtu.be/q9yvu6_-zro

Course Delivery
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 two operational AD plants.

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.

Planning for an Anaerobic Digestion Facility
Training Course

cré
Composting & Anaerobic Digestion Association *of* Ireland

Schedule

Wednesday 8th November 2023:

Times	Module	Speaker
09:45 – 10:30	Introduction and Overview including Feedstock	Dr. Stephen Wise, Ben Martin & Percy Foster
10:30 – 11:15	Biology and Biogas Generation	Dr. Lalitha Gottumukkala
11:15 – 11:45	Break (Tea & Coffee)	All
11:45 – 12:00	Group Exercise – How to calculate Biogas yields. Importance of Sampling & Testing	Dr. Stephen Wise Dr. Lalitha Gottumukkala
12:00 – 12:45	Biogas Technology & Plant Layout considerations	Ben Martin & Dr. Les Gornall
12.45 – 13.30	Lunch	All
13.30 – 14.00	Health & Safety Considerations	Dr. Les Gornall
14.00 – 14.45	Biogas Utilisation	Julian Beatty & Garrett Dalcz
14.45 – 15.30	Digestate & By-Product utilisation	Dr. Stephen Wise
15.30 – 15.45	Break (Tea & Coffee)	
15.45 – 18.30	Site Visit – Gilfresh AD Plant	

Thursday 9th November 2023:

Times	Module	Speaker
09:30 – 10:30	Planning Permission & Waste Regulations	Dr. Stephen Wise
10:30 – 11:15	Animal By Products & DAFM Regulations	Percy Foster
11:15 – 11:45	Break (Tea & Coffee)	All
11:45 – 12:45	Support Schemes and Government Incentives	Dr. Stephen Wise
12:45 – 13:45	Lunch	All
13:45 – 14:30	Financing an AD project	Russell Smyth
14:30 – 15:00	Group Exercise / Q&A Open Session	Dr. Stephen Wise / Ben Martin
15:00 – 15:30	Break (Tea & Coffee)	All
15:30 – 16:30	Grid Connection (Electrical & Gas)	Ian Kilgannon / Rory Mullan
16:30 – 17:00	Summary & Departure Message	Ben Martin

22 November 2023

Visit Green Generation. We will meet at the Kildare House Hotel, Kildare town and get a bus to the site.

Planning for an Anaerobic Digestion Facility
Training Course

cré
Composting & Anaerobic Digestion Association *of* Ireland

Trainers

Dr. Stephen Wise has spent his career within the waste, resources, renewables and environment sectors, obtaining a 1st Class degree in Environment Management, before then successfully completing his Engineering Doctorate at Cranfield University. He has helped to deliver £500m of waste treatment and renewable energy infrastructure; also working with Government to help shape policy.

Ben Martin has spent his career within the anaerobic digestion, renewables and environment sectors, completing a BSc in Environment Management and a Level 8 Data Analysis for Business. Ben has managed some of the largest AD facilities in Ireland and dedicates his attention to the operational optimisation of facilities. Bens a certified world rugby coach educator and utilises those skills to ensure the operations teams onsite are correctly and sufficiently trained to operate the complex systems deployed in a biogas plant.

Percy Foster is an environmentalist and waste management professional and has been involved in the waste sector for over twenty years. He originally trained as environmental scientist (B Sc Hons) and developed a passion for research while doing his Masters of Science. As CEO for Cré-Composting and Anaerobic Digestion Association of Ireland from 2006 to the present, Percy has coordinated and managed the activities of the association, representing the composting and anaerobic digestion industry at Government and European level. He is a former board member of the European Compost Network. He also currently manages a waste compliance for Ireland which licenced by the Minister for Environment, Climate and Communications to operate.

Dr. Les Gornall has been building, operating, designing, commissioning anaerobic digesters, CHP units, waste and waste water treatment plants since 1978. AKA 'Dr.Sludge'. Partner in AD.Ingenuity LLP with Russell Mulliner. Previously working for PM Group's amazing PROjEN team with a > 35 year track record of delivering excellent projects including the winner of the 2013 IChemE Bioprocessing Award. Still happily working with PM Projen via AD Pilot Plus and on Digester Support projects. UK Engineering Contractor of the year 2005, ADBA's AD Hero of the Year 2016, Winner of the MUARC Shield for services to amateur radio 2018. In 2021 he calculated over 10 Million tonnes of organic waste has now been digested in projects in which he has designed/commissioned or optimised.

Julian Beatty established Nova Q to bring best-in-class environmental sustainability solutions to innovative customers. Julian works across our range of sectors, with a breadth of technical knowledge based on his decades of experience. He really is passionate about uncovering new applications for our technologies – a passion that he has made sure is at the heart of Nova Q's approach.

Russell Smyth leads KPMG's Sustainable Futures team. He has over 15 years' experience in renewable energy, low carbon fundraising and project finance transactions, as well as corporate strategy and M&A advisory services.

Planning for an Anaerobic Digestion Facility
Training Course

cré
Composting & Anaerobic Digestion Association *of* Ireland

Trainers

Rory Mullan MEng MBA is a recognised expert in the connection of renewable generation in Ireland and Northern Ireland. Rory has been working in the Irish electricity industry since 1998. Prior to becoming a senior consultant , Rory has a background of working in commercial and technical roles in NIE, ESB and EirGrid. Rory is a member of the IWEA council and has been chairperson of the IWEA and the NIRIG grid committees. Rory is also a member of the ISEA grid committee. Through his roles in the renewable trade associations he has been at the forefront of the development of connection policy over the past eight years.

Ian Kilgallon is the Innovation and Business Development Manager in Gas Networks Ireland. His experience involves development and coordination of research, development, design, and demonstration projects. He is involved in stakeholder coordination and collaboration programs. He has also experience in development and coordination of new business development opportunities.

Logistics

Duration
The course will last two consecutive days with an optional visit to another biogas plant two weeks after the course.

Class Size
In order to facilitate a good discussion, the class sizes are being kept small to 30 people.

Cost
The cost includes a certificate of attendance from Cré, printed presentations, coffee breaks, lunches and bus to the AD facilities.

The cost per person is €900 plus vat for Cré members and €999 plus vat for non-members. Additional people from a company will get a reduced rate of 10%.

Location
The course will be held in Crowne Plaza Hotel, Dundalk for the first two days.

Course Dates
The course will be held on the 8th and 9th November 2023. The optional third day visit to Green Generation is 22 November.

Further Details & Booking
If interested in attending the course, please book online here

If you have addition people attending the course, please contact Sinead to avail of the discount and she will invoice you.

Any queries contact Sinead Clinton Email: sinead@cre.ie
Tel: 00 353 (0)861747941


cré
Composting & Anaerobic Digestion
Association of Ireland