



Joint Submission to
Department of Communications, Energy, & Natural Resources

On the
Renewable Heat Incentive – Technology Review Consultation

in relation to Anaerobic Digestion

From:
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1. Anaerobic Digestion

Ireland has a golden opportunity to establish a new industry in rural Ireland that will create jobs and help meet our commitments for renewable energy.

Anaerobic Digestion (AD) is a proven and environmentally friendly technology that can deliver multiple energy, climate, environmental, societal and economic benefits.

It has the potential to create 2,250 direct permanent jobs, with many more in the construction phase, spread across all counties in Ireland.

AD has the capability to supply enough electricity to power 20% of Irish homes, or to replace 7.5% of the fossil-based natural gas used today via the national gas grid with renewable “green” gas.

The readily available renewable energy supply from anaerobic digestion could be the equivalent of a corporation tax incentive to attract new foreign investment into Ireland, enabling major companies such as Apple to gain marketing traction by meeting their sustainability goals.

1.1 POLICY CHANGES REQUIRED

For this to happen, a number of key policy changes must be implemented nationally. The model already exists in the EU, typically in Germany, Italy and the UK.

1. Introduce a Renewable Heat Incentive (RHI), which includes biogas from ADCHP and injection of biomethane into the national gas grid.
2. Provide adequate support for electricity generation from AD.
3. Provide incentives for the use of agricultural organic residues and manures as feedstock for AD, as in Germany.
4. All incentives should be “grandfathered”, meaning investors should qualify from (9th July 2014), even if the legislative instruments are not in place.
5. Encourage the separate collection and processing of food waste as feedstock for AD in Ireland, and make it easier for AD developers to obtain long-term contracts of supply for such feedstock.

1.2 THE BENEFITS OF ANAEROBIC DIGESTION

Anaerobic Digestion (AD) produces renewable biogas from materials such as agricultural and industrial organic residues and domestic and commercial food waste. It is a proven technology widely used across the EU and the world. It provides a constant (dispatchable) supply of electricity, gas and/or heat. This means it can be used to provide a stable base-load of renewable energy to the electricity grid.

AD can help Ireland achieve its renewable energy targets for 2020 across all sectors, heat, electricity, transport. This can be achieved with no negative impact on the food supply capability in Ireland, and no significant change in land use.

Energy sourced from AD will diversify the national fuel mix, provide a more secure clean energy supply, and reduce the country’s reliance on imported fossil fuels, whose prices are subject to global energy market trends.

The use of biogas from AD to provide pipeline quality renewable natural gas can enable Ireland to meet the RES-T transport target using the natural gas pipeline, a significantly underutilised national resource.

AD can make a significant contribution to the management of organic waste in Ireland as well as helping achieve national and EU waste recycling targets. Rather than sending organic waste to landfill and land spreading, AD can convert this material to renewable energy and organic-rich fertiliser.

The challenge facing the agriculture sector to moderate its GHG emissions (32% of Ireland's total) and convert to a low carbon sector in the context of major growth to achieve the Food Harvest 2020 targets, could be addressed by AD. It has the added benefit of significant job creation in the rural economy, another farm income stream and better control of energy costs for farmers.

A further benefit is the support AD provides for sustainable smart agriculture, a key component in the promotion of Ireland's food exports under the banner of the Bord Bia initiative, Origin Green.

AD provides farmers with a valuable recycled source of fertiliser, closing the loop on nitrogen and phosphorous management, and providing environmental and health benefits by replacing artificial fertiliser and avoiding land spreading of untreated manure.

Over 9000 plants have been built in Germany since the year 2000 due to the positive stimulus provided by the German government over a decade. Similarly, the AD industry has flourished in the UK in the last 5 years with over 180 commercial plants now in operation, with more than 200 others initiated in the development pipeline.

The significant plans for AD development in Northern Ireland are a direct result of the incentives available there. In contrast, Ireland only has a few small scale plants operating and in planning. The major roadblock to expansion in Ireland has been an ongoing lack of economic viability for developers and investors. Improved fiscal incentives are required to enhance the attractiveness of AD in Ireland for investment.

Ireland urgently needs prompt decisions from the Department of Communications Energy and Natural Resources regarding a renewable electricity support scheme and renewable heat incentive (RHI), to enable numerous projects currently held back, to proceed, which would deliver all the positive benefits mentioned. Leadership is needed across the political spectrum to realise that Ireland is missing a golden opportunity for jobs creation, import substitution, better energy security, sustainable waste management, rural development, and many environmental benefits.

1.3 REFERENCES AND SUPPORTING DOCUMENTATION

A 2014 European Biogas Association (EBA) report shows 68,500 jobs in the EU biogas industry and the sector produces 11,539 MW of biogas. This means that for every MW 5.9 jobs are created.

In 2011 the Joint Oireathas Committee on Communications, Energy and Natural Resources published a report 'The Development of Anaerobic Digestion in Ireland'. This report states that there is potential for 1000 AD plants of average 380kw in size. Based on these numbers and the EBA numbers, 2,250 permanent jobs could be created.

The Bord Gais Report 'The Future of Renewable Gas in Ireland' states that up to 7.5% of renewable gas demand in Ireland could come from biomethane. This would directly substitute for €170 million euro in imports.

2. Responses to Consultation Questions

Process Layout and Approach

Q 1. Is the structure and approach to the process to develop the support scheme appropriate?

Cré & IrBEA Response:

Yes, the proposed consultation structure and approach to the process is appropriate.

A fixed tariff supporting the injection of biomethane into the National Gas Transmission Network should be examined to maximise efficiency in distribution and usage.

Q 2. Are there any additional considerations to build into the process?

Cré & IrBEA Response:

Account should be taken of the benefits, in addition to provision of renewable energy and increased energy security for Ireland, across a wide range of aspects:

- Significant employment increase potential
- Carbon emission reduction from Irish agriculture (digestion of by-products and animal slurries)
- Carbon emission reduction from Irish industry and waste management (digestion of biodegradable by-products and wastes)
- Benefits to Irish agriculture in providing sustainable organic fertilisers
- Carbon emission reduction from Irish transport and heat usage from biomethane distributed through the national gas grid.

Policy Context

Q 3. Are there any additional aspects, such as policies, publications or reports that should be considered?

Cré & IrBEA Response:

AD is a proven and efficient technology that will deliver multiple energy, climate, environmental, societal and economic benefits. It can help Ireland achieve a number of important EU and national policy commitments and has wide ranging cross-sectoral benefits.

AD provides a constant supply of electricity, gas and/or heat. It therefore can be used to provide a stable base-load of renewable energy to the grid. It has the potential to supply enough electricity to power 20% of Irish homes, or to replace 7.5% of the fossil-based natural gas used via the national gas grid with renewable 'green' gas.

The use of biogas from anaerobic digestion to provide pipeline quality renewable natural gas can enable us to meet the RES-T target using our natural gas pipeline, a significantly underutilised national resource.

If the full potential of AD development is realised, 2,250 direct permanent jobs could be created across Ireland, with many more generated in the construction phase (Ref: 'The Development of Anaerobic Digestion in Ireland' – Report prepared by the Joint Committee on Communications, Energy and Natural Resources, 2011, <http://www.oireachtas.ie/documents/committees30thdail/j.../20110126.1.doc> and the 2014 European Biogas Association Report)

AD can make a significant contribution to the management of domestic, commercial, industrial and agricultural organic waste in Ireland as well as helping achieve national and EU waste recycling and landfill diversion targets. Rather than sending organic waste to landfill and land spreading, AD can convert this material to renewable energy and organic-rich fertiliser.

The challenge facing the agriculture sector to moderate its GHG emissions (32% of Ireland's total) and convert to a low carbon sector in the context of major growth to achieve the Food Harvest 2020 targets, could be addressed by AD. It has the added benefit of significant job creation in the rural economy, another farm income stream and better control of energy costs for farmers.

A further benefit is the support AD provides for sustainable smart agriculture, a key component in the promotion of Ireland's food exports under the banner of the Bord Bia initiative, Origin Green.

AD provides farmers with a valuable recycled source of fertiliser, closing the loop on nitrogen and phosphorous management, and providing environmental and health benefits by replacing artificial fertiliser and avoiding land spreading of untreated manure.

Clear Air Policy- Technology Exclusions

Incineration technologies (gasification, pyrolysis, thermal oxidisers etc) should not qualify for any renewable incentive for the treatment of organic waste.

Q 4. The RHI in the UK is a particular example that can be examined in the context of the RHI in Ireland. Are there any other particular support schemes in other Member States that would be beneficial to consider in the context of the RHI? If so please provide evidence and reasoning.

Cré & IrBEA Response:

The UK has the most appropriate scheme to reference in an Irish context. The UK Non-Domestic Renewable Heat Incentive (RHI) is a Government environmental programme that provides financial incentives to increase the uptake of renewable heat. For the non-domestic sector broadly speaking it provides a subsidy, payable for 20 years, to eligible, non-domestic renewable heat generators and producers of biomethane for injection into the national gas grid.

The financial incentives paid are in the form of a premium fixed feed in tariff (a fixed payment per kWh in addition to the market price paid for the heat/biomethane) and vary depending on the technology and the capacity rating of the installation. Over 1GW of installed capacity has now been accredited under the Non-Domestic RHI since the scheme opened three years ago.

Technology related

Q 5. What technologies should be considered for support?

Cré & IrBEA Response:

Anaerobic digestion should be supported both for the production of biomethane for grid injection and for the utilisation of heat from CHP engines.

Q 6. What are the likely characteristics of deployment?

Cré & IrBEA Response:

Renewable gas produced by AD can be deployed into a wide variety of applications, usually dictated by local factors as well as overall economic performance. The gas may be used 100% for heat application or may be a by product of electricity generation, or may be upgraded for injection into the natural gas grid for heat. All these methods of deployment should be supported in the RHI scheme.

See response to Question 7 below.

Q 7. Is there a range of potential deployment characteristics, for example in terms of technology type, installed capacity, fuel etc?**Cré & IrBEA Response:**

While there has been little anaerobic digestion development in Ireland to date there is potential to develop 1,000 anaerobic digestion plants in Ireland (Ref: 'The Development of Anaerobic Digestion in Ireland' – Report prepared by the Joint Committee on Communications, Energy and Natural Resources, 2011).

Based on experience of other European countries there is likely to be a range of plant sizes between 100kw and 10 MW thermal capacity. Typically larger plants will process waste materials and smaller on-farm plants will process animal slurries, agricultural residues and energy crops. Enhanced tariffs should be introduced to ensure the commercial viability of the smaller scale rural based plants using agri wastes or crops as feedstocks.

Q 8. What is the anticipated energy utilisation from the technology given a typical deployment, running hours and load factor?**Cré & IrBEA Response:**

A typical 5MWth biomethane to grid biogas installation with running hours in excess of 8,000 per annum and a load factor in excess of 90% would have a parasitic power demand of c.10%. Parasitic power and heat is generally provided by a small on-site CHP utilising biomethane produced from the plant. Smaller biomethane plants (less than 1MW) will typically run for less hours per annum, due to seasonality in the heat demand for example.

Q 9. What potential categorisation of technologies would be appropriate?**Cré & IrBEA Response:**

Due to economies of scale smaller plants require higher financial supports. Therefore categories should be put in place, however the future scheme should avoid 'cliff edges' that lead to shaping of installation sizes immediately below the category thresholds and it should be designed to ensure that artificial direction of appliance size does not happen. For example, refer to the tiering system implemented in the UK RHI scheme.

10. How could technologies that can generate heat and electricity be best supported?**Cré & IrBEA Response:**

1. Biogas technologies are best supported by a fixed feed in tariff for a defined period. This provides certainty to the market, to investors and potential funders.
2. In the UK system biogas plants producing biomethane for export to grid receive the RHI tariff based on the calorific value (converted to kWh) of the biomethane exported to grid. The quantity and calorific value are continuously metered at the point of export. The parasitic electricity and heat used on site by the slave CHP also receives the FIT (for electricity) and RHI (for heat use) based on the meters installed in the plant.
3. The useful heat produced should be supported under the RHI scheme and the electricity should be supported under the proposed renewable electricity supports.

Q 11. What is the levelised cost of energy (LCOE) per MWh for each category? Please provide a breakdown of what costs have been included and how these costs have been derived.**Cré & IrBEA Response:**

For biomethane from anaerobic digestion the LCOE varies depending on the scale of the facility, location, feedstock, operating costs and the regulatory environment.

The UK currently has premium tariffs of €0.04/kWh to €0.09/kWh which are paid on top of the wholesale gas price of approximately €0.03/kWh which gives a total price of between €0.07 and €0.12/kWh (note the higher premium is paid on the first 40,000 kWh of production). The premium paid was recently degressed by approximately 15% to the figures above and while under the previous tariffs there was a moderate build out of biomethane plants using a variety of feedstocks at a range of different scales there has been a notable slowdown in development since the tariffs degressed.

A premium fixed price tariff of €0.06 to €0.10/kWh is needed to support the injection of biomethane into the grid.

A higher fixed premium tariff is required in Ireland to cover higher grid connection (electrical and gas) cost.

These figures are supported by economic analysis which Cré & IrBEA would be happy to present to the Department if further information is required.

For heat from anaerobic digestion CHP, the LCOE depends not only on the scale of the facility, location, feedstock, operating costs and the regulatory environment, but on the price paid for the electricity under the new proposed support scheme and so cannot be analysed on its own. Nonetheless it still needs support to make it viable to transport and for appropriate use of the heat. The UK RHI gives a fixed price premium of between €0.03 and €0.10/kWh depending on the scale of production which would seem to be a good approximation of the requirement for Irish plants.

Q 12. What should the LCOE be compared to in order to determine the level of support?**Cré & IrBEA Response:**

Other models should be used which treat renewable gas from anaerobic digestion more fairly, such as the model used by SEAI.

Eligibility**Q 13. Who are the potential applicants for support under the scheme?****Cré & IrBEA Response:**

Biomethane and anaerobic digestion CHP plant owners.

Q 14. What eligibility criteria should apply to applicants?**Cré & IrBEA Response:**

No comment.

Q 15. Should they always be the owner of an installation?**Cré & IrBEA Response:**

No comment.

Q 16. What verification details should be required?**Cré & IrBEA Response:**

No comment.

Q 17. Where should the boundary of an 'installation' be set – at the level of a single source of heat or a broader boundary?**Cré & IrBEA Response:**

The boundary should be the interface between the plant and the third party purchaser.

Q 18. Based on the guidelines for state aid, what aspects of the cost of deployment should be eligible for support?**Cré & IrBEA Response:**

Supports should be confined to the biomethane/heat generated. Grant funding should only be made available for R&D projects.

Q 19. Should all fuel sources in paragraph 7.11 be considered? Should any additional fuel sources be considered?**Cré & IrBEA Response:**

Biogas can be produced from a wide range of fuels and should not be restricted to a specific list, rather it should be defined as being produced from organic wastes, by-products or energy crops.

In any case the following should also be considered:

- Sewage sludge
- Brown bin material
- Food processing by-products and residues
- Brewing wastes
- Slaughtering wastes and other animal by-products
- Other industrial organic bio-degradable wastes
- Agricultural manures
- Grass and maize silage
- Other agri wastes such as waste fruit and vegetables and waste animal feed

Q 20. Do you have any considerations in the context of the three heat uses outlined as eligible heat uses?**Cré & IrBEA Response:**

For the purposes of administering the tariff, similar to the UK, the heat use potential of biomethane at the point of export to the national grid should be considered as eligible. The ultimate use of that biomethane cannot be known.

Q 21. Are the current definitions of useful heat and economically justifiable heat useful to determining the heat that should be supported?**Cré & IrBEA Response:**

In addition to current definitions of useful heat, the heat use potential of biomethane at the point of export to the national grid should be considered as economically justifiable heat use. In addition the heat generated and used by biogas site slave CHPs (fueled by biomethane) should be considered as economically justifiable heat.

Q 22. What criteria should be utilised to assess eligibility for support?**Cré & IrBEA Response:**

No comment.

Q 23. Are there any particular criteria that should be applied to individual technology categories?**Cré & IrBEA Response:**

No comment.

Q 24. Should energy efficiency measures/audits form part of the eligibility criteria for inclusion in the RHI? If so what measures would be appropriate?**Cré & IrBEA Response:**

Energy efficiency is not a useful metric where the heat is a by-product or where biomethane is injected into the grid. The project developer is incentivised to be as efficient as possible by being paid for the heat produced and which is usefully used.

Q 25. Are liquid and steam the only heat delivery mediums that should be considered?**Cré & IrBEA Response:**

The most efficient method to distribute heat to end users is through biomethane injection to the grid and it is important that this application is supported in the proposed RHI.

The scheme should also have the flexibility to allow consideration of other less commonly used heat transfer mediums, such as molten salt.

Q 26. In determining the definition 'new' what types of changes to a site should be anticipated/accommodated? i.e. installation / disconnection / reconnection / relocation**Cré & IrBEA Response:**

No comment.

Support Period Start Date**Q 27. Is the use of a commissioning date or 'commissioned' status the most effective date for beginning of support?****Cré & IrBEA Response:**

Yes.

Q 28. Do you foresee any difficulties with the definitions as currently outlined in the UK support schemes?**Cré & IrBEA Response:**

No comment.

Support mechanism

Q 29. Taking into account the State Aid guidelines and the information you have available on technologies and deployments, have you any suggestions on the design of the support mechanism?

Cré & IrBEA Response:

No comment.

Q 30. Is a direct fixed premium payment for renewable heat the most effective way to provide the support?

Cré & IrBEA Response:

Yes.

Q 31. Are there any advantages incorporating variable components into the support mechanism based on a reference?

Cré & IrBEA Response:

Yes, to incentivise rural/farm based biomethane to grid installations processing agri wastes and crops in addition to industrial biomethane to grid installations processing by-products and wastes.

Q 32. Should the payments be level throughout or sculpted differently?

Cré & IrBEA Response:

Yes, higher tariffs should apply based on scale, with larger unit payments from smaller facilities and there should be a cap on large scale installations to prevent their distorting effects. Payment should be indexed annually.

Allocation Mechanism

Q 33. Should competitive allocation form part of the allocation of support under the RHI?

Cré & IrBEA Response:

Only insofar as a cap is placed on the budget allocated to provide supports. Systems such as Contracts for Difference (CFD) auctions have proved problematic in other jurisdictions resulting in funding challenges and impeding development.

Previous competitive bidding schemes in Ireland produced very few projects due to companies bidding with unrealistic prices. In order to be successful any bidding scheme would require winners to put a substantial deposit in place. This is likely to rule out all but the largest developers in the state and substantially reduce the competitive aspect of the process.

A competitive process would neither deliver the required capacity nor deliver the best value for money for the consumer, as well as causing greater uncertainty for project investors.

Cré and IrBEA are strongly against any form of competitive bidding process.

Scheme Limits / Cost controls

Q 34. Do you have any points for consideration in the setting of limits or controls on the scheme?

Cré & IrBEA Response:

No comment.

Tariffs

Q 35. Should degression be introduced for tariffs under the RHI? If so on what basis should tariffs be degressed?

Cré & IrBEA Response:

Tariffs should initially be set to stimulate development in the sector. Once the budget allocated for this initial phase has expired and the market appetite and tariff level is tested and confirmed the tariff should be degressed to a level judged to maintain development at the desired level.

If development of new projects stops for a period of time DCENR should be able to revise the tariff upward to restart development.

Q 36. Do you consider inflation relevant to any of the costs components and if so what index do you consider appropriate?

Cré & IrBEA Response:

Inflation is relevant. As biogas technology is relatively mature and biogas plants are comprised of civils and mechanical components and the principal feed inputs are commodities, the most appropriate index is the CPI.

Measurement/Verification

Q 37. Do you consider the metering standard outlined appropriate?

Cré & IrBEA Response:

For biomethane to grid plants, continuous monitoring and metering at the point of export to the grid is the most appropriate.

Q 38. Does the existing REFIT 3 process for ex-post verification by fuel input work for RHI?

Cré & IrBEA Response:

No, the current system under REFIT 3 is cumbersome and time consuming. We would suggest that electricity and heat supports be decoupled in terms of eligibility. i.e. a biogas plant with CHP would apply for electricity support and heat support separately, each would be independently run and would not require the input of the other. This will lower considerably the administration burden for user and authority.

Q 39. How should losses be accounted for in the scheme?

Cré & IrBEA Response:

The heat meter/gas to grid meter should be at the point of export. Electricity should be at the meter at the point of generation.

Q 40. What level of auditing and verification would be appropriate to the scheme? Are there any examples of auditing and verification approaches from other sectors that would provide a useful example?

Cré & IrBEA Response:

Heat, gas and electricity metering.