

Delivering renewable energy from our forests

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In the current economic climate, Irish businesses cannot afford to ignore the high cost of energy. Most businesses are exposed to the volatile nature of traditional oil-based fossil fuel prices. However, unlike oil or gas, biomass is close to carbon neutral and Coillte is playing a key leadership role in the supply of sustainable biomass energy solutions to Irish industry and business. Coillte provides long term, secure biomass-fuel supply contracts to its clients and assists in the evaluation of both the technical and commercial viability of projects for large-scale energy users.

The Government White Paper on Energy Policy set a target of 12% of thermal energy to come from renewable energy sources by 2020. However, the renewable heat sector remains largely undeveloped, having grown slowly to 5.7% (2013), mainly as a result of wood waste utilisation in the timber processing sector. Based on our current heat from renewable energy sources (RES-H) trajectory, Ireland's 2020 target will not be achieved (Figure 1) with the risk EU fines will be imposed on Ireland.

Under the EU Tracking Roadmap,¹ prepared for the European Commission in 2014, it was noted that Ireland had no programs for the development of certain technologies such as high efficiency combined heat and power (CHP) generating systems or others to more efficiently utilise biomass. One of the recommendations from that report was



Figure 1: Ireland's progress in obtaining thermal energy from renewable energy sources (RES-H) during the period 1990 to 2013 (Source: SEAI).

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¹ Source: http://www.keepontrack.eu/contents/publicationseutrackingroadmap/kot_eutrackingroadmap2014.pdf [Accessed July 2015].

to introduce a reliable RES-H strategy with appropriate support schemes. It stated that Ireland was deploying less biomass than planned and that previous support programs had expired and had not been replaced. In response, the Department of Communications, Energy and Natural Resources (DCENR) published a draft Bioenergy Plan² in October 2014 that acknowledged a gap in meeting 2020 RES-H target of 200 ktoe³ and announced the intention to introduce a Renewable Heat Incentive (RHI) in 2016. This demand-led incentive should provide the much needed catalyst to grow the bio-energy sector and the market for biomass in Ireland. An unintended consequence of that announcement has been that the market has stalled due to the uncertainty created. Most interested parties that had been considering biomass as an energy source have postponed project investment decisions until clarity is given on the RHI qualifying criteria and the proposed tariff banding. The Irish BioEnergy Association (IrBEA), the industry body representing the bio-energy sector, has called upon the Minister for Energy to confirm that any eligible renewable energy installations, completed during the period from the date of the announcement to the date that the RHI becomes operational, will benefit from the new support as if the installation had been completed on the date the relevant scheme launches – a so-called “grandfathering” commitment. It would ensure that projects can start the process of planning, negotiating with boiler and fuel suppliers and commence construction secure in the knowledge that they will not be excluded from the scheme. A similar approach was adopted successfully in the UK prior to the launch of its RHI. A further consultation on the RHI was launched at the end of July 2015⁴ and the industry concern regarding “grandfathering” is now being considered. Clarification is awaited.

Developing the Bio-Energy Sector

The bio-energy sector reduces energy costs for industry in Ireland, allowing a displacement of expensive fossil fuel to improve competitiveness. Reducing Ireland’s reliance on fossil fuel imports, reducing national greenhouse gas emissions and improving domestic fuel security are key pillars for developing a green economy. The bio-energy sector also stimulates rural development and local job creation in the processing and logistics of wood chip and in the design, installation and maintenance of boiler technology. It provides an outlet for our growing private timber resource and a channel to market for growers of energy crops. Stimulating increased demand with the RHI will mobilise our forest resource and allow the establishment of local grower groups who in turn will be able to supply biomass energy to local industry with the economic benefits being shared locally (Figure 2).

² Source: <http://www.dcenr.gov.ie/energy/sustainable+and+renewable+energy+division/draft+bioenergy+plan.htm> [Accessed July 2015].

³ Kilo-tonnes of oil equivalent.

⁴ Source : <http://www.dcenr.gov.ie/energy/Lists/Consultations%20Documents/Renewable%20Energy/Renewable%20Heat%20Incentive%20-%20Technology%20Review%20consultation%20-%20final.pdf> [Accessed July 2015].

The Biomass Supply Model

Coillte are already at the forefront of mobilising the bio-energy sector. Coillte has established a network of regional hubs to ensure the continued supply of biomass to customers. These long-term biomass supply contracts displace several thousand litres of imported fossil fuel per week by providing more competitive energy costs for the businesses concerned, thereby helping to maintain competitiveness and securing local jobs. Coillte plan to establish new hubs as new demand for wood chip arises. Through these regional hubs, wood chip will be supplied to clients in the pharmaceutical, textile, industrial and hotel sectors.

Each regional biomass fuel-supply hub operated by Coillte typically comprises a large 4 to 5 ha secure log-storage yard and covered wood chip fuel-storage sheds (Figure 3). In addition, a weighbridge and a quality testing laboratory in place at each hub. Each hub will have a range of specialist chipping machinery and equipment capable of producing wood chip and access to a range of delivery vehicles for haulage.

Coillte is committed to a strategy that matches renewable energy requirements with local biomass supply. Small diameter pulp logs are sourced through a local Coillte forestry team from both state and private sector sources within a region. These logs are sourced and delivered on a pre-planned basis several months in advance. Logs are systematically stacked for open-air drying to the required moisture contents specific to each customer's boiler requirements. The key to ensuring good quality wood chip at the correct moisture content at each hub is to manage stock rotation and replenishment and to ensure suitable air flow through



Figure 2: Biomass wood chip production at Coillte's biomass processing hub in Caherciveen, Co. Kerry.



Figure 3: Coillte's biomass processing hub in Drumkeen, Co. Donegal. Image shows the level of log storage required to ensure sufficient volumes of dry chip are available year round to supply the local heat market. Lower Image: The hub at Drumkeen contributes significantly to the local economy.

the stacks. Stacks are covered during the winter months. Seasonal variations in log moisture need to be anticipated and controlled with great care at each hub. This can only be achieved through experience and by having a strong partnership with supply contractors.

All wood chip is produced strictly in accordance with quality specifications set out in I.S. CEN/TS 14961: 2005. Wood samples are gathered in pre-approved aluminum sampling trays to determine moisture content using the oven-dry method and/or using pre-approved and calibrated moisture testing devices (Figure 4). Particle size is controlled during the chipping process by the provision of the appropriate size screens on the chipper feed. Regular testing is undertaken to assess the percentage of fine material mixed in with the chips.



Figure 4: Panel A shows a wood chip auger infed to an industrial biomass boiler for steam production. Panel B shows part of the routine quality testing procedures employed to ensure the quality parameters of supply lots. Variation in quality parameters (moisture and others) can be high so processing plants rely greatly on the knowledge and experience of contractors to help ensure that a consistently high quality product is supplied.



Figure 5: Biomass haulage. Image shows moving floor trailer deliveries to an industrial scale boiler. Trailers typically carry 20 to 24 t and can off-loaded at the client's fuel store in about 15 minutes.

The wood chip delivery vehicle fleet is comprised of a range of vehicles, from large moving floor trailers (carrying 20 to 24 t loads, see Figure 5) to smaller tipping vehicles with side blowers (8 to 16 t loads) depending on a specific client's fuel handling and on-site storage infrastructure. The biomass loads that are delivered are checked for compliance with moisture content, particle size and percentage fines⁵ criteria. Each client is then invoiced per Giga Joule of energy delivered.

Coillte aims to be a producer and supplier of sustainable energy products well into the future (Figure 6).



Figure 6: The three main benefits from Coillte's provision of biomass for renewable energy.¹ *Competitive terms* – Coillte offers long term fuel supply contracts, typically 5- to 7-year terms. Annual price reviews are indexed and linked to 3rd party indices. Clients can make the investment in a boiler system safe in the knowledge that Coillte will provide a long-term commitment to supply material at attractive rates.

⁵The chip material is screened to the correct size and only a certain proportion of fines/dust is tolerated in the mix. Ideally, a clean chip with very little dust is the most desirable product. The CEN standard has the permitted limits for each chip size.