coillte

BUILDERS SISK CONTRACTORS EST. 1859 CELEBRATING 150 YEARS

cesenergy

GREEN ENERGY SOLUTIONS

MANAGING YOUR TRANSITION TO GREEN ENERGY THROUGH TURNKEY BIOMASS SOLUTIONS

BIOMASS HEAT, BIOMASS CHP, ESCo SOLUTIONS, FUEL SUPPLY LOGISTICS

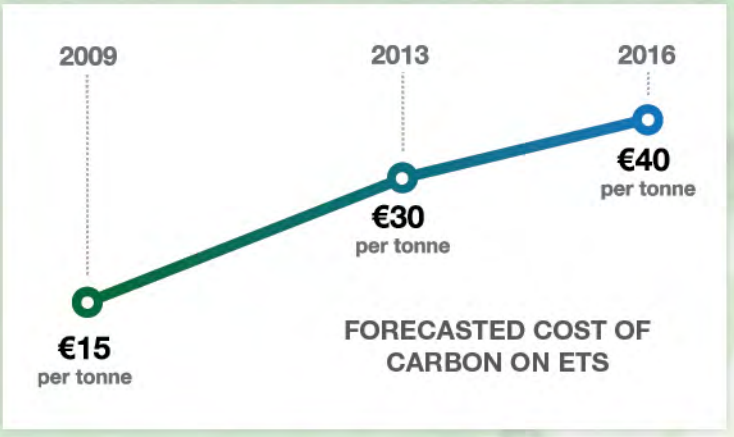
DELIVERING SUSTAINABLE BIOMASS BUSINESS SOLUTIONS THROUGH PARTNERSHIP

In today's volatile and uncertain climate, Irish businesses can no longer afford to ignore the high cost of energy. Ireland's dependence on imported energy and fossil fuel has left the industrial sector vulnerable in terms of security of supply, rising energy costs and exposure to carbon tax. The Irish biomass resource can help offset these risks, while playing an important role in contributing to the reduction in greenhouse gas emissions.

Switching to biomass to generate your hot water, steam and/or electricity requirements will result in a decoupling from the volatile costs associated with fossil fuel and carbon tax levies. In addition, your organisation would be demonstrating best practice environmental management through use of renewables. To encourage the utilization of biomass, there are a number of capital allowance incentives and other support mechanisms currently available.

The Coillte Sisk CES Energy partnership has a clear vision to become market leader in turnkey on-site biomass energy solutions for industrial scale clients. Combining Coillte's considerable biomass supply expertise with Sisk-CES Energy's design, project management, construction and O&M expertise we offer our clients the unsurpassed ability to deliver the optimum carbon neutral energy solution.

WE OFFER UP TO 30% SAVINGS ON ANNUAL ENERGY COSTS



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- Commercial semi-state company established 1989
- Turnover 2008 €249M, profit €9.2M
- Assets of €1.4 BN
- Own and manage 445,000ha of forestry land
- Supplies 2.6M m3 of fibre to processing industry annually
- Dedicated harvesting and logistics team managing all aspects of supply chain logistics
- Accurate inventory and GIS based resource tools

- Established in 1859
- Turnover in 2008 €1.1Billion
- We are a Relationship based company seeking to add value for our Clients in every project we deliver
- Best financial rating in Irish Construction Industry
- Safety is a core value – AFR (2009) 0.19
- Dedicated Energy Sector Team
- Sisk have built 50% of Ireland's Power Stations

- Headquartered in Clontarf, Dublin
- Part of international group of companies, established in 1996
- Offices in Dublin, London, Melbourne, Sydney
- Team of highly skilled engineers, with full in house design capability
- Expertise and proven track record in the design, installation, management and operation of high efficiency on-site power generation solutions

OUR MISSION STATEMENT

*'To provide **Biomass Energy Solutions** to Irish industry, **reducing fossil fuel consumption**, **CO_2 emissions** and exposure to **price volatility**'*

PROJECT EXECUTION

1. INITIAL CLIENT CONSULTATION/SITE VISIT
   - Examine suitability of Biomass for plant
2. SYSTEM MODEL TO SATISFY SPECIFIC ENERGY REQUIREMENTS
3. RESOURCE ASSESSMENT
   - Biomass resource supply and demand analysis within the economic catchment of plant
   - Supply logistics, handling and storage
   - Development of formal commercial supply proposal to include, Term, Price, Volumes, Price review mechanism, Fuel Specifications
4. SOURCE MOST SUITABLE TECHNOLOGY

FLEXIBILE FINANCIAL MODELS (WE OFFER THE FOLLOWING OPTIONS)

LONG TERM POWER PURCHASE AGREEMENT (PPA)

with no capital spend for client (ESCo type model)

- Coillte Sisk CES acts as 'Energy Supply Company', or ESCo ➡ System fully financed by Coillte Sisk CES
- Client signs PPA with Coillte Sisk CES for agreed term

LONG TERM POWER PURCHASE AGREEMENT (PPA)

with shared capital spend

- System cost shared by Coillte Sisk CES and Client
- Client signs PPA with Coillte Sisk CES for agreed term

DESIGN & BUILD TYPE AGREEMENT

full project funding by client

- Coillte Sisk CES acts as a contractor, designing and building system for Client
- Entire benefit of system savings goes to Client
- Provision of fuel supply contract

DESIGN & BUILD

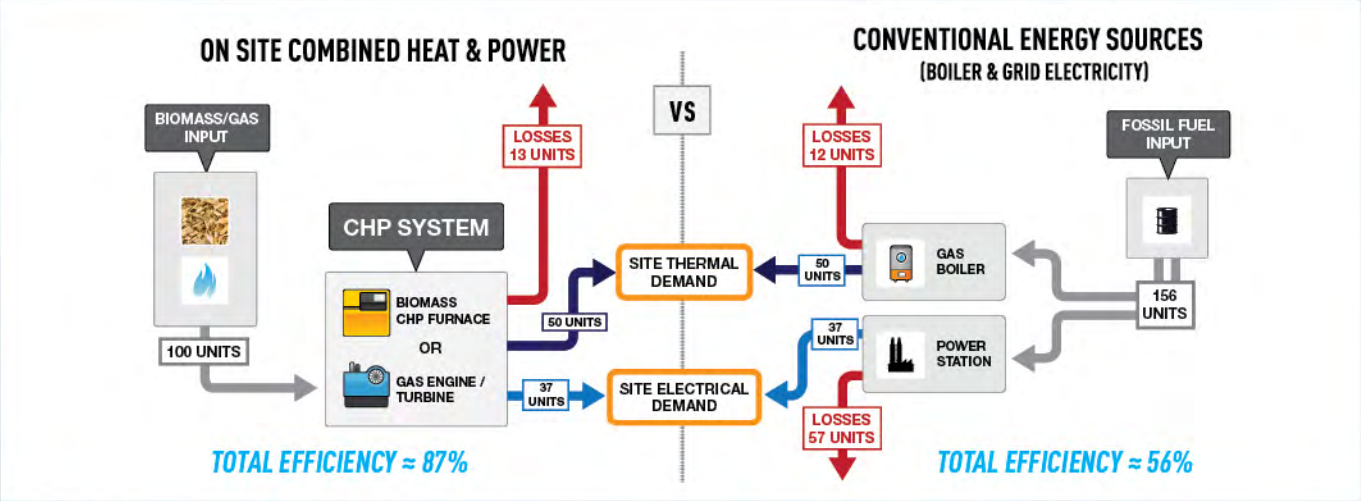
- Coillte Sisk CES can design and build a bespoke solution for the Client
- Assistance provided in all planning and permitting applications
- Installation, commissioning and handover completed by Coillte Sisk CES team
- Highest health and safety standards met and exceeded

OPERATION & MAINTENANCE

- Coillte Sisk CES offer operation and maintenance contracts for 10 + years in duration
- Client staff trained in the routine operation of each system
- In conjunction with the system manufacturers, Coillte Sisk CES will ensure that the availability targets for the system are met
- All systems monitored remotely

TECHNOLOGY OVERVIEW

Combined Heat and Power (CHP) is the simultaneous generation of usable heat and power (usually electricity) in a single process.



BIOMASS BOILER

- Furnace burns biomass fuel (woodchip, straw, sludge, etc)
- Biomass Boilers; Hot water / Steam / Thermal oil
- 2 MWth – 25 MWth
- Carbon neutral technology

BIOMASS CHP

- Furnace burns biomass fuel (woodchip, straw, sludge, etc)
- Exhaust gases generate steam, which drives steam engine/ turbine to generate electricity
- Excess steam can be used to satisfy process demand
- Heat rejected by steam engine/turbine can satisfy hot water demand
- Financial savings depending on electrical and biomass rates
- Carbon neutral technology

FREQUENTLY ASKED QUESTIONS

WHAT IS COMBINED HEAT & POWER? Combined Heat and Power (CHP) is the simultaneous generation of usable heat and power (usually electricity) in a single process. Through the use of an absorption cooling cycle, Tri-Generation schemes can also be developed.

WHAT IS BIOMASS? Any organic matter which is available on a renewable basis including, but not limited to, pulpwood, forestry residues, agricultural crops, wood wastes, animal wastes, livestock operation residue, aquatic plants.

WHY IS BIOMASS CONSIDERED TO BE RENEWABLE? Biomass can be used as a source of renewable energy because plant matter is renewed continuously by photosynthesis in a short re-growth cycle. Biomass absorbs CO_2 from the atmosphere when it is growing, so it is recognised as a carbon neutral fuel.

WHAT INCENTIVES OR SUPPORT MECHANISMS ARE AVAILABLE TO SWITCH TO BIOMASS? Financial assistance is available to contribute towards the initial biomass technical feasibility study. Capital grants are available towards the installation of the biomass technology. In addition, where biomass CHP is employed and electricity is exported back to the grid there are guaranteed index linked feed in tariffs for producing renewable electricity. Coillte Sisk CES would be happy to advise on the various support mechanisms available.

DO BIOMASS FACILITIES NEED PLANNING PERMISSION? Under new planning and development regulations 2008 (SI235 of 2008) Biomass/CHP plants under 500m^2 are planning exempt.

KEY CLIENTS OF COILLTE SISK & CES ENERGY

DIAGEO, BROOKS, Baxter, DELL, Boston Scientific, A&LG, Abbott, OPW, ALSTOM, genzyme, intel, AIB, IBM, Airtricity, bluefrog, Bord na Móna, MERCK, Microsoft, coillte, medite SmartPly, INDAVER, ANALOG DEVICES, Beacon Medical Group, Pfizer, Lilly, citi, Wyeth, Coca-Cola, Johnson & Johnson

A&L GOODBODY TRI-GENERATION SYSTEM

CENTOCOR

CHP ENGINE AT A&L GOODBODY

SYSTEM OVERVIEW

- **Technology:** 1MWe Trigeneration System
  - CHP Electricity: 1006 kW_e
  - CHP Heat: 1272 kW_{th}
  - Absorption Chiller Cooling: 445 kW_{th}
- **Location:** A&L Goodbody Solicitors, IFSCh, Dublin
- **Installation Date:** October 2004

FINANCIAL MODEL

- 'ESCo' type agreement
- CES Energy responsible for redesign, finance, operation and maintenance of system
- 15 year contract term agreed
- Fixed discount on energy prices offered
- All risk relating to plant and equipment maintenance, replacement etc transferred to CES Energy

BENEFITS OF INSTALLATION

- Savings on annual energy costs > €50,000
- Reduction in CO_2 emissions ~ 1,400 tonnes
- Capital Expenditure offset
- Improved Building Energy Rating (BER)
- Independence and security of power supply

"We are extremely happy with the CHP plant operating under CES Energy over the past years. The operation of the CHP plant by CES Energy has resulted in a substantial reduction in greenhouse gas emissions which is in line with our company ethos."

Brian Montague CEO, A&L Goodbody

WOODCHIP BIOMASS BOILER

SYSTEM OVERVIEW

- **Technology:** Biomass Steam Boiler 2.1MWth
  - Process Steam: 2,500 kg / hour at 8 bar
- First Biomass Boiler in the Irish pharmaceutical industry
- **Location:** Ringaskiddy, Co. Cork
- **Installation Date:** September 2008

CLIENT DRIVERS

- Stated corporate policy to reduce CO_2 emissions by 10%
- J&J Corporate Social Responsibility policy
- Reduce dependence on fossil fuel
- Reduce costs

PROJECT STATISTICS

- Boiler rated at 2MW steam at 8bar
- 5000tons/year of woodchip required
- Operation is 24/7
- Designed, built, handed over in 7 months
- Reduce CO2 by 3,000 tonnes / year
- Reduce energy costs by €400,000/year

"We had projected in 2009 to spend almost €900,000 on natural gas, the Biomass Boiler will allow us to cut this in half, so there is a real financial benefit to the company as well as an environmental benefit."

Jonathan Sowerbutts, Director of Engineering, Centocor Biologics (Ireland)

COILLTE SISK CES *'THE BIOMASS SUPPLY CHAIN EXPERTS'*

FSC

SA-FM/COC-0706

The Mark of Responsible Forestry

FSC certification means that the forest of origin has been independently inspected and evaluated according to economic, social and environmental principles and criteria agreed by the Forestry Stewardship Council A.C. (FSC).

FSC is an international non-profit association whose membership includes environmental and social groups and progressive forestry and wood retail companies in partnership to improve forest management worldwide.

www.fsc.org

CASE STUDY: SUPPLY CHAIN LOGISTICS

Coillte supplies 2.6 million m^3 of logs to sawmills, panel board mills and other users, including energy users every year. Approximately 1/3 of this is classified as pulpwood biomass.

Two of the largest consumers of small diameter, locally sourced, pulpwood in Ireland are Smartply in Waterford and Medite in Clonmel.

These two production facilities utilize an annual combined consumption of approximately 700,000 m^3 pulpwood and an additional 400,000m^3 is sourced by Coillte from sawmill residues for production purposes. Medite consume 50,000 Tonnes of biomass in their dedicated wood chip boilers.

Greater than 75% of the heat requirements for the plants are generated from biomass; equating to approximately 115 truck haulage deliveries per day.

To handle all of the supply chain logistics for its customers, including the two panel board mills, Coillte's dedicated harvesting and logistics teams employ up to 1,500 harvesting and haulage contractor staff each year.

Neither Smartply or Medite has experienced any downtime due to supply issues since they commenced operations. This is a testament to the supply chain expertise employed by Coillte.

Smartply, Waterford

Medite, Clonmel

BUSINESS DRIVERS

RISING ENERGY PRICES & ENERGY PRICE VOLATILITY

- Ireland is extremely dependent on external fossil fuel resources, and as a result has seen fluctuations of over 50% in energy rise in last 4 years

SECURITY OF SUPPLY

- Ireland imports 90% of its energy as fossil fuels

'GREEN AGENDA'

- Improves Corporate Social Responsibility
- Benefits marketing activities – be seen as an ethical producer
- Satisfies personal goals of many stakeholders

ENVIRONMENTAL REGULATIONS

- Emissions Trading Scheme - EU imposed restrictions on industrial facilities regarding emissions
- EU strategy is to reduce CO_2 emissions by 8% from 1990 levels as part of the KYOTO Protocol
- Future introduction of a 'Carbon Tax' scheme in Ireland

ENERGY EXPORT

- Additional revenue stream for a business
- Renewable Energy Feed-In Tariff (REFIT) offers guaranteed minimum rates for export of electricity
- Excess heat can be sold to a neighbouring facility via a district heating scheme

SUITABLE FACILITIES

Biomass CHP Suitable for:

- ✔ Large 24/7 base electrical and heat/cooling demand
- ✔ Minimal plant downtime
- ✔ Particularly if natural gas is unavailable
- ✔ Large footprint available for construction of system
- ✔ Sites with high social and environmental standards

KEY BENEFITS

FINANCIAL BENEFITS

- ✔ **Reduced annual energy spend**
- ✔ **Reduced exposure to fuel price volatility**
- ✔ **Reduced carbon costs**

OTHER PRIMARY BENEFITS

- ✔ **Reduced fossil fuel usage**
- ✔ **Reduced CO_2 emissions**
- ✔ **Improved company image**

'SECOND-TIER' BENEFITS

- ✔ **Offset of capital expenditure on replacement of existing plant**
- ✔ **Job creation**
- ✔ **Increased equipment redundancy**

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