



# Imperative Energy

THE TRUSTED NAME IN BIOENERGY SOLUTIONS

## Renewable Heat – An Enterprise Perspective

**Joe O'Carroll**  
**Managing Director**

Connect to the biomass pipeline

# PRESENTATION CONTENTS

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- The Big Picture
- Company Overview
- Capturing the Benefits

## THE BIG PICTURE

- The transition from fossil fuels to renewable / clean energy technologies is a global imperative, driven by underlying fundamental issues:
  - Global energy demand
  - Fossil fuel prices
  - Security of supply
  - Climate Change



## OIL PRICES US\$/bbl

- US\$/bbl: **Quadrupled** in 7 years to Feb 2012 but 16% off record high



\$123  
(Feb 22<sup>nd</sup>, 2012)

\$110  
(May 15<sup>th</sup>, 2012)



# OIL PRICES €/bbl

- EURO/bbl: All time high March 2012



€94.21/bbl  
(Mar 26<sup>th</sup>, 2012)

€84.67/bbl  
(May 15<sup>th</sup>, 2012)

# WHAT IS DRIVING THE MARKET

- Regulatory imperative
  - *Renewable Energy is central to aggressive Government targets for reduction in Carbon emissions*
- Economic imperative
  - *Biomass is far cheaper than oil, and more secure in its supply, over the medium term*



# BRIEF COMPANY HISTORY



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- Founded in September 2007
- Offices in Maynooth, Ireland and Cheshire, UK
- Strategically aligned with leading sector partners to extend capabilities
- August 2009 – 1<sup>st</sup> round fundraising
- 40+ Active Installations across UK and Ireland
- October 2011 – MBO completed
- November 2011 – won “Best in Bioenergy” at GCCA Awards
- February 2012 – 2<sup>nd</sup> round fundraising

# Latest Investment



- Investment advisors to the Carbon Trust
- Fund Managers for Northwest Fund, backed by EIB



The Environmental Infrastructure Development Company

- specialist environmental infrastructure development and investment company
- personally backed by Jon Moulton



# FUEL SUPPLY PARTNER

- Green Belt Ltd
- Deep Expertise in forest management and SCM
- Developing customer focused delivery logistics
- Secured access to sufficient quantity of biomass to supply 135MW of capacity



# PRODUCT/SERVICE OFFERING



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1. Turnkey solution provider for biomass heating & biomass CHP
  - Design, implementation, project management and maintenance
  - Proven technology and flexible customised design
2. Energy Supply Company (ESCO)
  - ESCO means we finance, build and operate entire system
  - Customer only pays for metered heat on a long term contract
  - Eliminates the need for capital cost and produces lower energy costs and carbon emissions
  - Imperative Energy assumes all the operational risk
  - Only interested in biomass led ESCo, preferably to single client

# Projects currently being installed/commissioned



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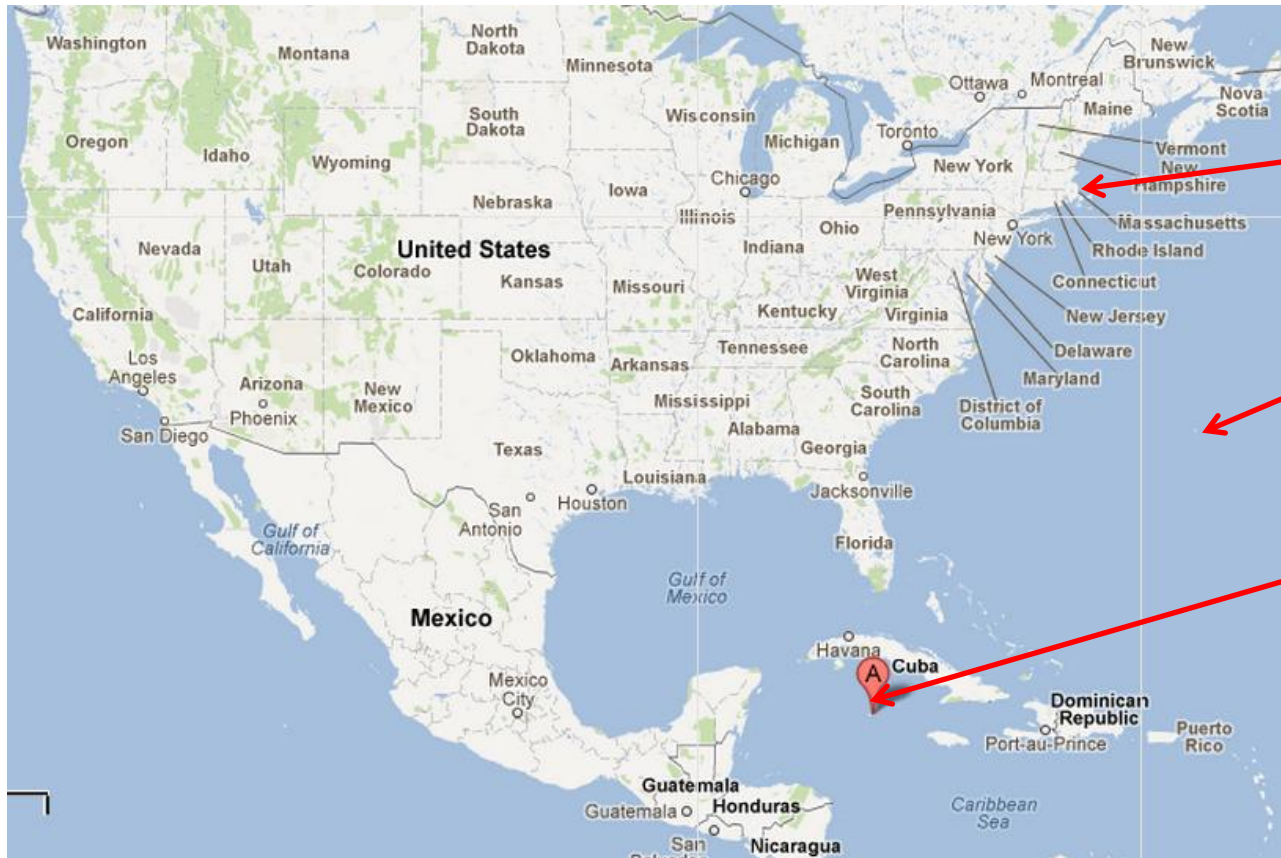


# Projects at feasibility stage



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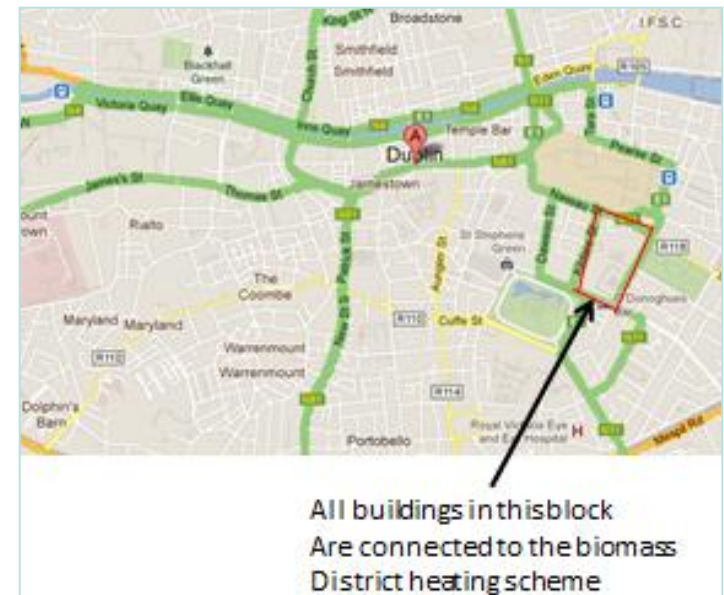
Taunton, MA

Bermuda

Grand Cayman

# GOVERNMENT BUILDINGS

- District Heating Scheme Both Houses of Parliament in Ireland
  - The Dail
  - The Seanad
- The offices of all TDs
- The Dept of Agriculture and Food
- The Dept of An Taoiseach (Prime Minister)
- The Dept of Finance
- The Dept of Jobs, Enterprise and Innovation
- The National Gallery
- The Natural History Museum
- The National Museum
- 2MW MTHW Biomass boiler
- Client: **OPW**



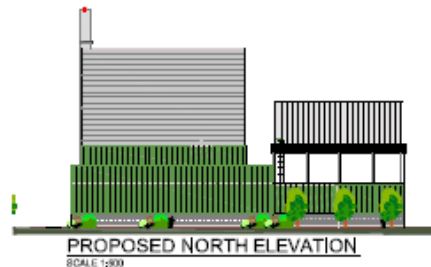
# Larger Projects - CHP

- 15.0MWe Biomass CHP (NEC, Birmingham)
- >£75m CapEx
- Large Commercial District Heating Network



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# LARGE PROJECTS

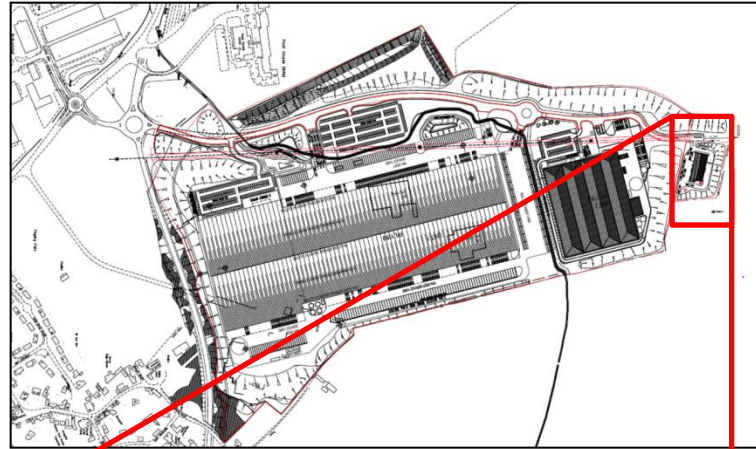
## - Process Steam



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- Industrial process
- 1m sq.ft. warehouse
- 15 MW of medium pressure steam
- 20 year supply agreement
- Revenue from heat sales and RHI





# WHY BIOENERGY?

- Bioenergy is a completely sustainable energy source, which can be generated from local agricultural activity
- Bioenergy is the most proven form of renewable/clean energy
  - 80% of renewable energy is currently derived from biomass
  - Mature technology & business models in many markets, particularly in Scandinavia & Central Europe
- Bioenergy is the most flexible form of renewable energy
  - Can be used for Heat, Power/Electricity, and Transport
  - Can be used in Combined Heat & Power (CHP), offering high conversion efficiencies
  - Can be stored & used on demand, unlike wind energy
- The disadvantage of Bioenergy compared to other sources of renewable energy is its finite capacity
  - Access to fuel supply is key



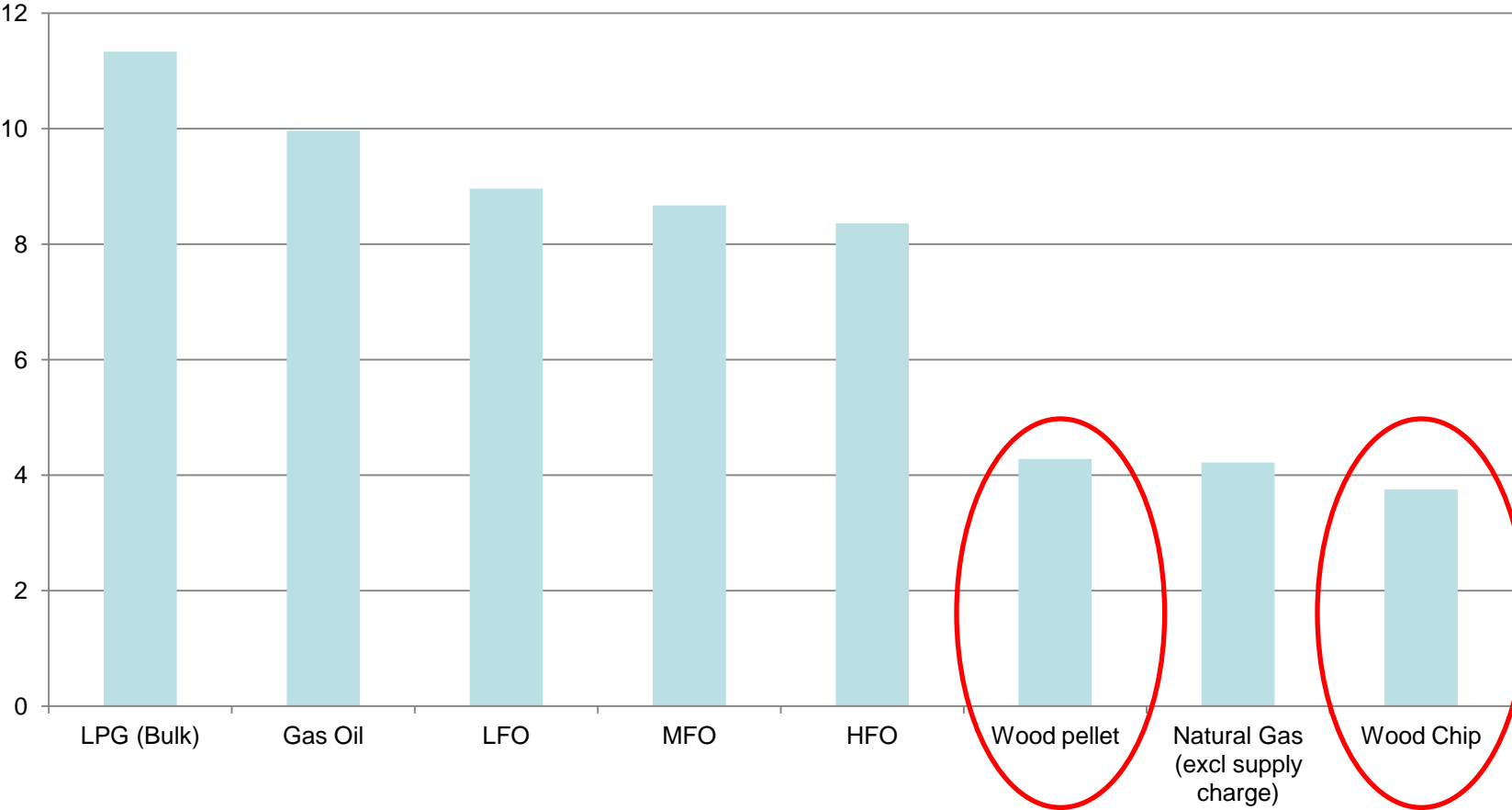


## Best Use of Biomass

1. Significant baseload of thermal energy (heating and/or cooling)
2. Suitable for:
  - a. Leisure Centres
  - b. Healthcare Facilities
  - c. Processing sector (food and drink, pharma)
  - d. District heating
3. Unlikely to be suitable for schools (low operating hours – long payback period)
4. Only consider biomass CHP where there is consistent demand for low grade heat
5. Better to displace oil than natural gas

# Fuel Cost Comparison (SEAI, Jan '12)

c/kWhr (Delivered Heat)



# Critical success factors for biomass projects

1. Reliable, reputable equipment
2. Engineering competence and credibility
3. Access to sustainable, clean biomass
4. After sales service and support
5. Not just about the boiler – need a full biomass system

Getting any of these wrong will cost you!

Better option: Contracting Energy (ESCO)

*Leave the risks to those best positioned to manage them*



## SAMPLE PROJECT 1 (Commercial)

- Leisure Centre (public sector)
- Using 115,000 million litres Gas Oil per annum
- Oil based emissions 322 tCO<sub>2</sub> p.a.
- Oil cost: >€100,000 per annum (and rising – up 25% in 12 mths)

### **Switching to biomass EScO with Imperative Energy Ltd:**

- No CapEx, No OpEx (on biomass system)
- Annual energy cost €85,000 per annum
- *15% saving for ZERO CapEX*



## SAMPLE PROJECT 2 (Industrial)

- Food Processing
- Using 3.5 million litres HFO per annum
- Oil based emissions  $>10,000\text{tCO}_2$  p.a.
- Oil cost: £3.3m per annum

### **Switching to biomass EScO with Imperative Energy Ltd:**

- No CapEx, No OpEx (on biomass system)
- Annual energy cost £2.4 m per annum
- *27% saving for ZERO CapEx*



## IRELAND'S OPPORTUNITY

- Biomass yields in Ireland higher than elsewhere in Europe
- Agricultural heritage
- Low level of forest cover
- Bioenergy is more employment intensive than any other form of renewable energy

***HOW CAN WE DEVELOP THE  
SECTOR IN THE CURRENT  
ECONOMIC CLIMATE***



# STIMULATING ECONOMIC ACTIVITY



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## Immediate low cost policy initiatives

1. direct all public bodies to procure Renewable Heat
2. District Heating (switch future gas network distribution to water)

## Sector needs **MARKET ACCESS, NOT CAPITAL GRANTS**

### Benefits:

- Reduce energy imports & carbon emissions
- Generate market pull for biomass (forestry and energy crops)
- Stimulate rural employment
- Strengthen Irish bioenergy companies for export markets



# 1. Public Sector Procurement

- Annual fuel usage for heat in public sector:
  - 430,000,000 litres of oil equivalent
  - Approximate cost of €300 million
- Current heat procurement:
  - Find capital budget
  - Appoint consultant to spec a boiler
  - Purchase and install boiler with third party contractor
  - Purchase fuel on annual tender

## Problem:

- No capital budget, no renewable heat
- No way off installed oil and gas infrastructure



# 1. Public Sector Procurement

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- Alternative heat procurement:
  - Purchase the desired input (i.e. renewable heat)
  - Let energy contracting companies compete to supply on long-term contracts
  - No capital cost to public bodies
  - Displaced (imported) fossil fuel with local grown biomass
  - Stimulate market for 1.2 million tonnes of biomass
  - 70,000 hectares of biomass

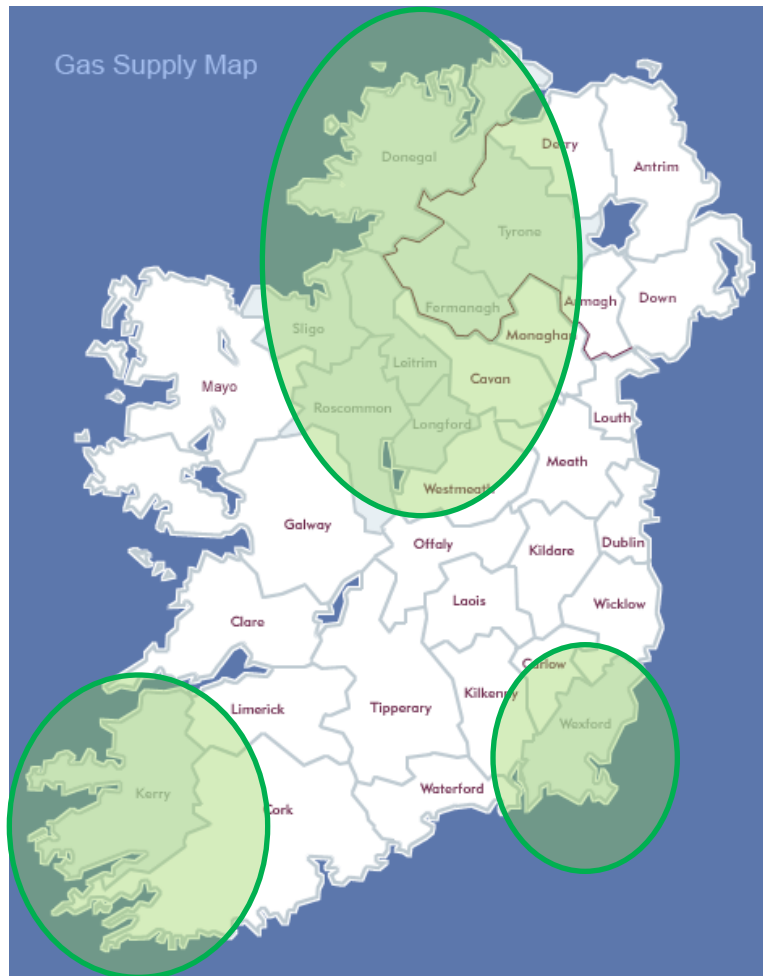
**SEAI has actively engaged with the sector in developing to public sector procurement process to enable implementation of this policy**

## 2. District Heating

- Currently spending €25m distributing gas around:
  - Cashel, Co Tipperary
  - Cahir, Co Tipperary
  - Gort, Co. Galway
  - Loughrea, Co Galway
  - Ballinrobe, Co Mayo
  - Monasterevin, Co Kildare
  - Dozens more in Phase 3
- Planned System:
  - Transmission (large pipes)
  - Distribution (small pipes)
  - Individual gas boilers to convert gas to hot water

# Proposed Bioenergy Zones

## Areas with no current gas networks

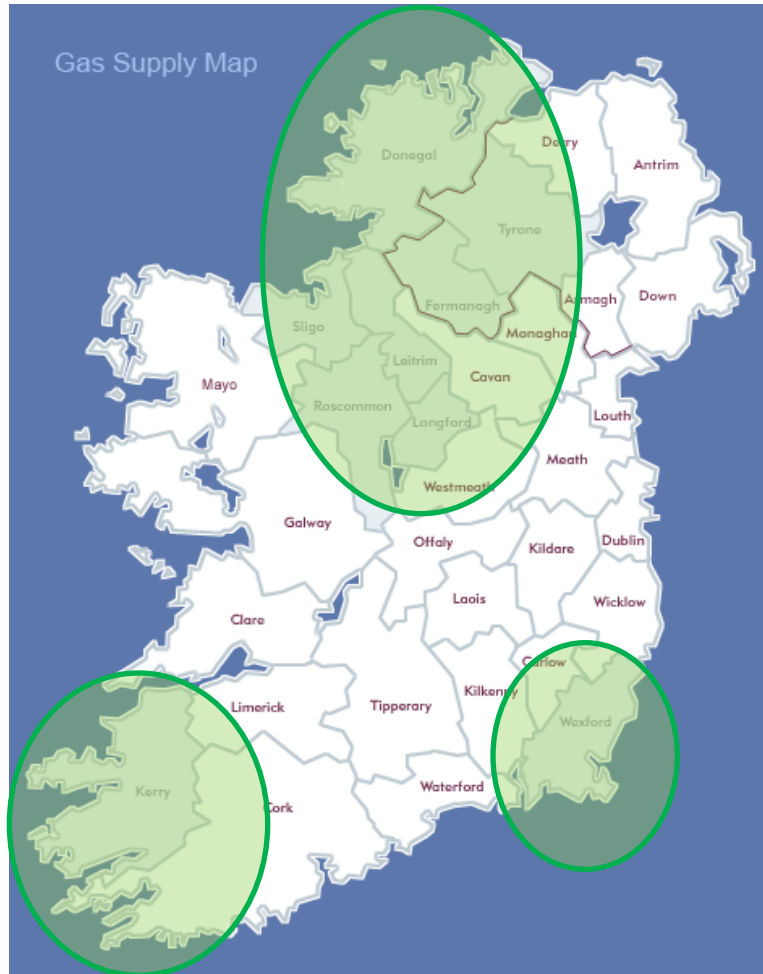


1. Northwest:
  - Donegal
  - Tyrone
  - Fermanagh
  - Leitrim
  - Sligo
  - Roscommon
  - Longford
  - Cavan (part)
  - Monaghan (part)
2. Southwest
  - Kerry
  - West Cork
3. Southeast
  - Wexford



# Proposed Bioenergy Zones

## Areas with no current gas networks



Within these zones, Bioenergy:

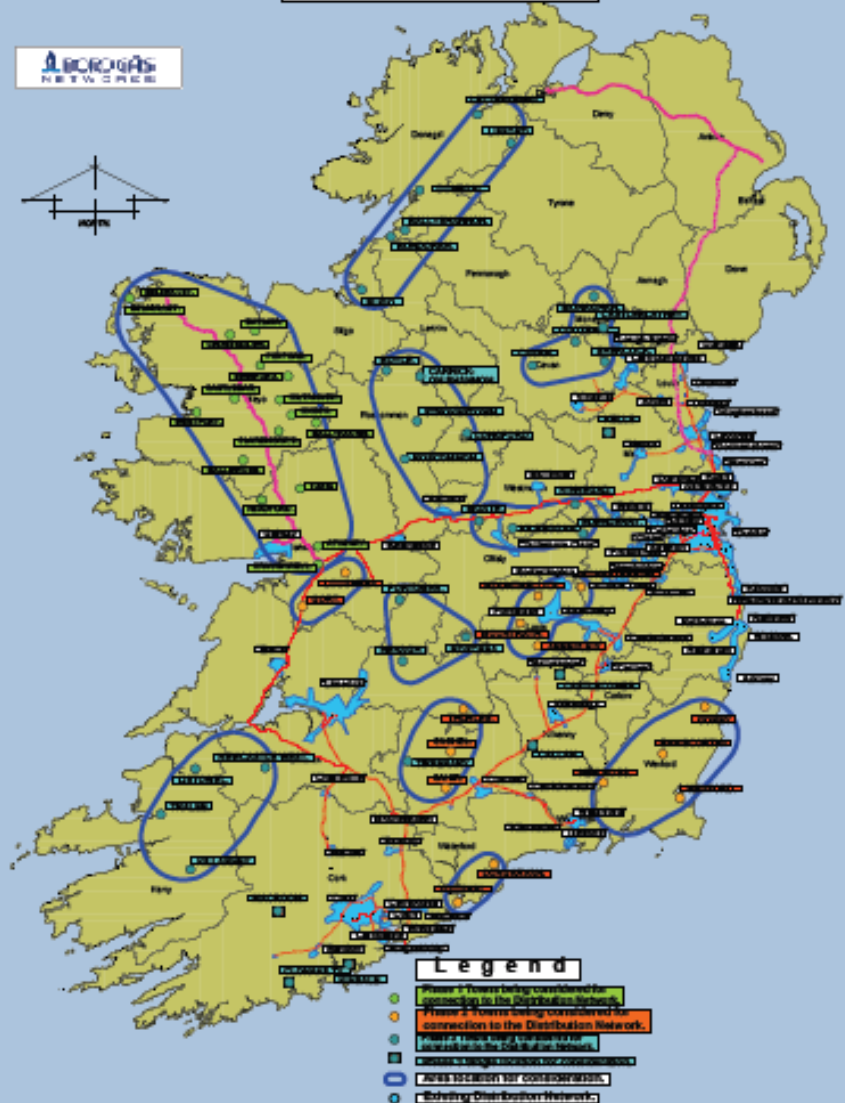
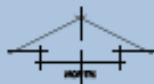
- is the energy source of first resort
- supported by county dev. plans
- used by compulsion on new builds

Also,

- Bioenergy crop scheme targeted in these areas
- Retrofitting of towns with high heat densities with District Heating Schemes

Outside these zones there are still Localised opportunities

**BORD GÁIS NEW TOWNS ANALYSIS  
PHASE 1,2 & 3 TOWNS**



Distribution Network Area  
Scale: Not to Scale  
Plot Date: 14/06/07  
Dwg. No.: SK / 540g



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Time running out

- Gas is coming to a town near you soon!

**“...We cannot be over reliant on natural gas...”**

John Mullins  
CEO

Bord Gáis

February 3rd, 2011

**Bord Gáis Energy, will be seeking a gas price increase of between 10 and 20 per cent in July 2011.**

John Mullins  
CEO

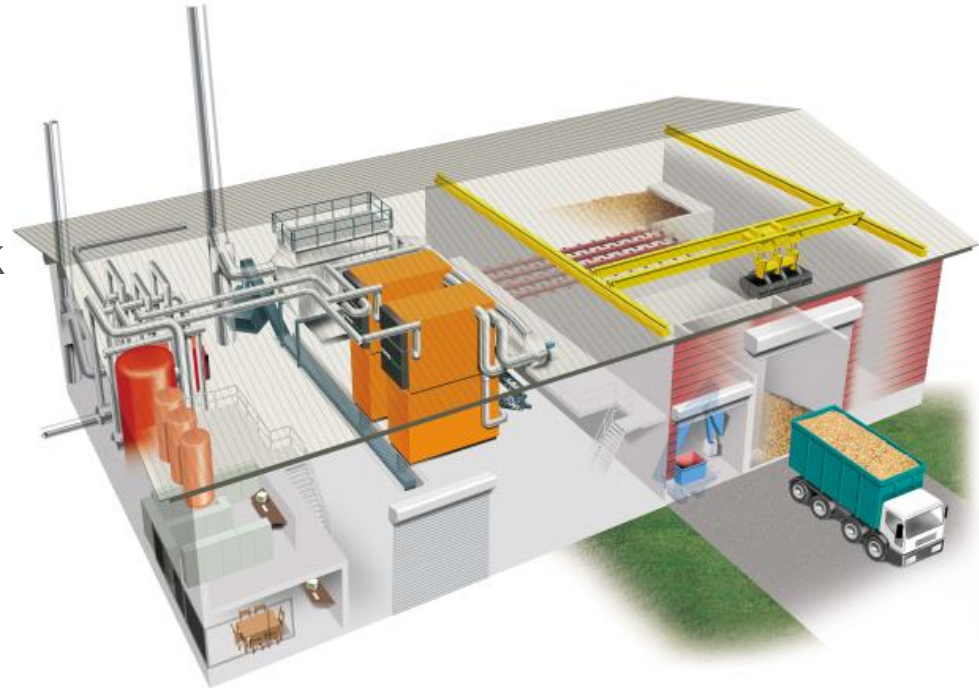
Bord Gáis

May 5th, 2011



## 2. District Heating

- Alternative System:
  - Central energy centre on edge of towns
  - MTHW Distribution network allowing heating and cooling to be delivered
  - Individual heat metering



## 2. District Heating

- Benefits of District Heating
  - Generate Revenue for Local Authorities through JVs
  - Modern water distribution infrastructure can be laid at the same time – major cost benefits and efficiency gains
  - One energy centre, one source of emissions, better for environment
  - Creates energy infrastructure to support multiple technologies
    - Biomass CHP
    - AD
    - Solar
    - Wind
    - Geothermal
    - Even gas, initially, when prices are low

## 2. District Heating

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- Future proofed (100years +) networks
  - No fear of medium term rise on gas prices
- Creates critical mass for biomass
  - Market pull for energy crops, rather than grant aided push
- Major job creation
  - Redeployment of construction sector during build phase
  - Ongoing employment in operational phase
  - Sustaining jobs back through the supply chain
  - Sustaining jobs at businesses on the network – low cost, low carbon energy





## Conclusion

- Biomass for heating is a win-win solution
  - Sustainable Employment creation
  - Market pull for agriculture and forestry products
  - Reduction in emissions
  - 100% fundable by Private Equity under right conditions (Capital Allowances, long term contracts)
  - Reduction in running costs for public and private organisations



# Imperative Energy

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