

Dundalk Sustainable Energy Zone - A Campus in the Community

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Dundalk Institute of Technology

- Population 30,000
- Border Town
- Student Population 5,000
- Technical University
 - Business and Humanities
 - Nursing, Midwifery, Health Studies and Applied Science
 - Informatics, Music and Creative Media
 - Engineering
- Research
 - Centre for Renewable Energy (CREDIT)
 - National Centre for Freshwater Studies
 - Centre for Entrepreneurship Research
 - Smooth Muscle Research Centre
 - NetWell Centre
 - Software Technology Research Centre



Dundalk Wind Turbine Overview

- This is a landmark project for Ireland
 - The first "urban turbine" in Ireland
 - The first large turbine in Ireland to be an autoproducer (electricity used locally)
 - The first large commercial wind turbine on a college campus in the world?
 - It will be a major feature of the Dundalk 2020 Sustainable Energy Zone (SEZ)



Project progress

- Feasibility work resulting in SEI grant – 2002
- Full planning permission granted – 2003
- Finance secured, bids solicited and contract awarded to Vestas – 2004
- Civil works – April/May 2005
- Turbine installation – August 2005
- Turbine operation – October 2005



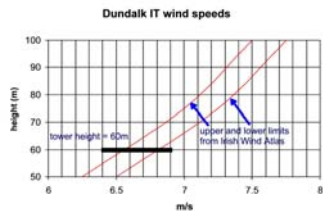
Turbine Specifications

- V52-850kW Vestas machine,
- Average power output of 28% of the rated power – about 240 kilowatts
- Total cost: €1.127m (including 13.5% VAT)
- Grant assisted by Sustainable Energy Ireland (SEI) – National Renewable Energy Agency



Wind resource

- Irish Wind Atlas indicates 6.25 – 6.5 m/s @ 50m
- Expected load factor ~30%
- Typical Irish load factors ~40%

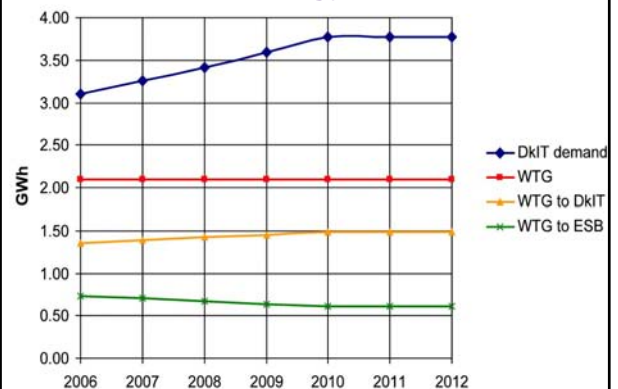


Grid Connection

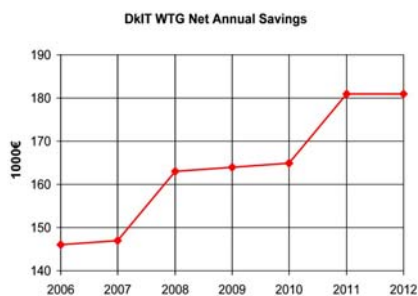
- Initially grid connection agreement allowed no power to be returned to the grid which was of no use
- As an autoproducer and a research project, we are now allowed to export up to 500kW without being part of the Group Connection Process
- This export limit means we must limit the turbine output to 700kW



Future Energy Demands



Financial Savings



Greenhouse Gas Savings

- 52% of Ireland's Energy comes from oil (imported)
- 23% from natural gas (60% of this is imported from UK)
- 13% Coal (imported)
- 8% Peat (Irish Resource)
- 3% Renewable Energy (Irish Resource)
- 0.3% Hydro (Irish Resource)
- 1kWh Electricity (mix of coal, gas, peat) results in emission of ~ 0.635 kg of CO₂ (source: SEI)
- Turbine saves 1300 tonnes of CO₂ per annum



Dundalk Sustainable Energy Zone

- Exemplar region to be developed sustainably
- New in Ireland – 4 km²
- Targets for 2010:
 - 20% of Electricity from Renewables
 - 20% of Heat from Renewables
 - Building efficiency exceeding legislation by 40%
- Incorporating all areas of community
- Supported by EU CONCERTO – ‘Holistic’
 - Partners: Neuchâtel, CH; Mödling, AT
 - Observers: Newry, NI; Aachen, DE; Italian DoE



Dundalk as National Focus

- Sustainable Energy Zones
- Dundalk is primary SEZ
- Roll out to other Zones nationally
- Lessons learned
 - District Heat
 - Large Wind autoproduction
 - Storage
 - Building efficiency



Future Opportunities

- Research
 - Cross Border Memorandum of Understanding
 - Queens University Belfast, Northern Ireland
 - Dublin City University, Republic of Ireland
- Education
 - Masters in Renewable Energy Systems
 - Adult Education - Life Long Learning – Grundtvig
 - Renewable Energy Installers Academy
- Innovation
 - Renewable Energy Enterprise Programme: REEP
 - Incubation space

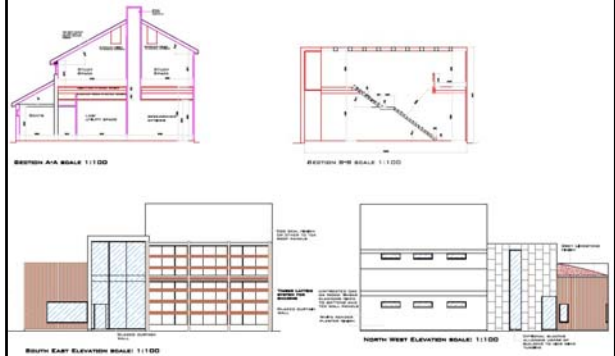


Future Campus Developments

- Demonstration projects in transport
 - Emissions free transport
 - Biofuel public transport
 - On-campus parking
- Renewable Heating
 - Biomass boiler
- Reduce, Reuse, Recycle
- Environment Committee – AD of waste
- Informing the community



Low Energy Building



Learning and Sharing

- Internal
 - Learn about sustainable building
 - Learn about Zero-Emissions Campus
 - Communicate with similar campuses
 - Disseminate local and national experiences
 - Lead in applying technology - storage
- External
 - Best practice in development
 - Transport solutions
 - Education
 - Research



CREDIT Centre for Renewable Energy at Dundalk IT

- With thanks:
 - Dundalk Institute of Technology Staff
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 - Tanja, Bernd, Kolja and Marco

