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COOLING THE PLANET



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# “Engineering Ireland's €2 billion Green Renaissance”

# CROWLEY CARBON OVERVIEW

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- Ireland's largest energy efficiency company
- Operations in Ireland, UK, France and UAE
- Broad spectrum Energy Efficiency and Services Company:
  - Specification and Design
  - Project Management
  - New product development and manufacture
  - Financing – Energy Performance Contracting
- Focus on Large Commercial and Industrial businesses
- Management team sold their previous business for \$500 million and so we're serious about this 😊

# This is getting serious !!



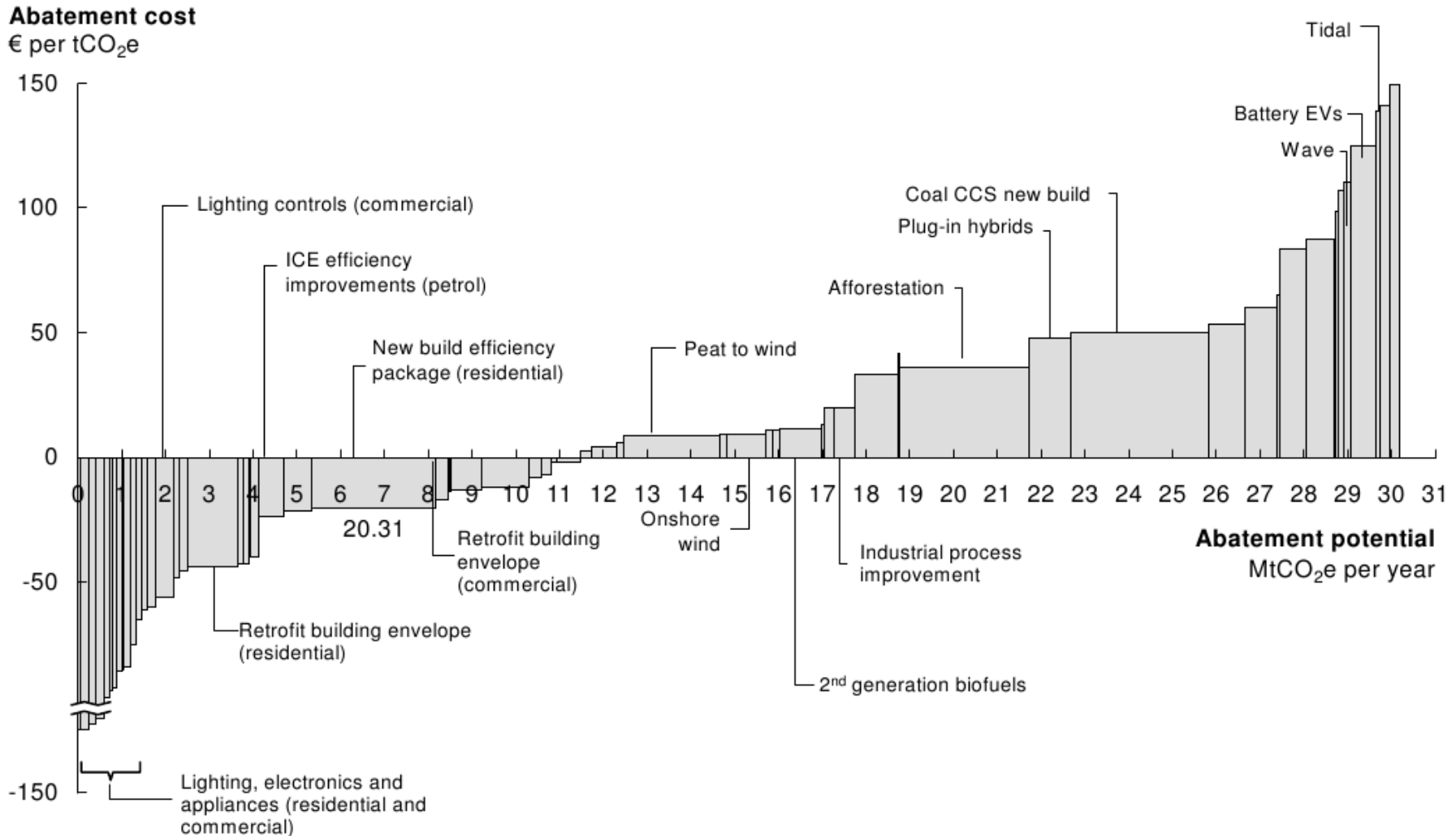
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- According to the latest IPCC report, sea levels will rise by three feet between now and 2100 but if the current rate continues to accelerate then sea levels could rise by as much as 6 feet !!
- There is one glacier (Thwaites Glacier), if it breaks free and moves into the ocean then levels will rise by a further 10 feet !
- IPCC reckon that the minimum climate change cost between now and 2100 is \$35 trillion (9% of global GDP)
- We are now getting a 100 year storm every 3 to 5 years
- Miami along with 50 other cities and countries will almost certainly disappear by 2100
- By 2050 there will be over 200 million climate migrants and they may not be stopped by passport control

# MCKINSEY CARBON ABATEMENT CURVE



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1 Baseline cost curve based on 2007 IEA energy price forecasts (~60 USD / barrel in 2030) and a real cost of capital of 4%

# Republic of Ireland's potential for energy reduction €2.3 to €3.5 billion per annum



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## €1.6 billion in fuel oil and gas alone

Sector	GWH ESTIMATE	Spend per annum	% Savings	Value of potential savings by 2020
Industrial	31000	£1,860,000,000.00	55%	£1,023,000,000.00
Commercial	12000	£720,000,000.00	40%	£288,000,000.00
Public Sector	14000	£840,000,000.00	40%	£336,000,000.00
<b>Totals</b>		<b>£3,420,000,000.00</b>		<b>£1,647,000,000.00</b>

- Value of investment to the Irish Economy - €6 billion plus per annum
- *Energy efficiency alone could support 30,000 new jobs in the hardest hit construction sector*

# Why its not happening faster ?

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- It is...but slower than it should be...
  - Crowley Carbon's Irish clients are now saving €12 million per annum and this number is doubling every year
  
- Policy issues
  - Government slow to legislate businesses on energy efficiency
    - Efficient heat – No steam except for process, from 2020
    - Better Control
    - More efficient chillers and free fooling
    - Efficient lighting only
  
- Financing

# *We have no money !*



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- 
- Leasing Funds - €300m available
    - Offered from two major financial institutions
    - Relatively low cost of capital
    - Very simple contracting process
    - Finances ideally over 5 to 7 years
    - On or Off balance sheet options
  
  - Government Energy Efficiency Fund
    - €70m total fund
    - Available to public and private sector
    - Relatively low cost of capital
    - Attempting to streamline the EPC process
    - Looking for Exemplar projects now
    - Term can be as long as 10 to 15 years
    - On or Off balance sheet options





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# Some Game Changing Technologies in the space

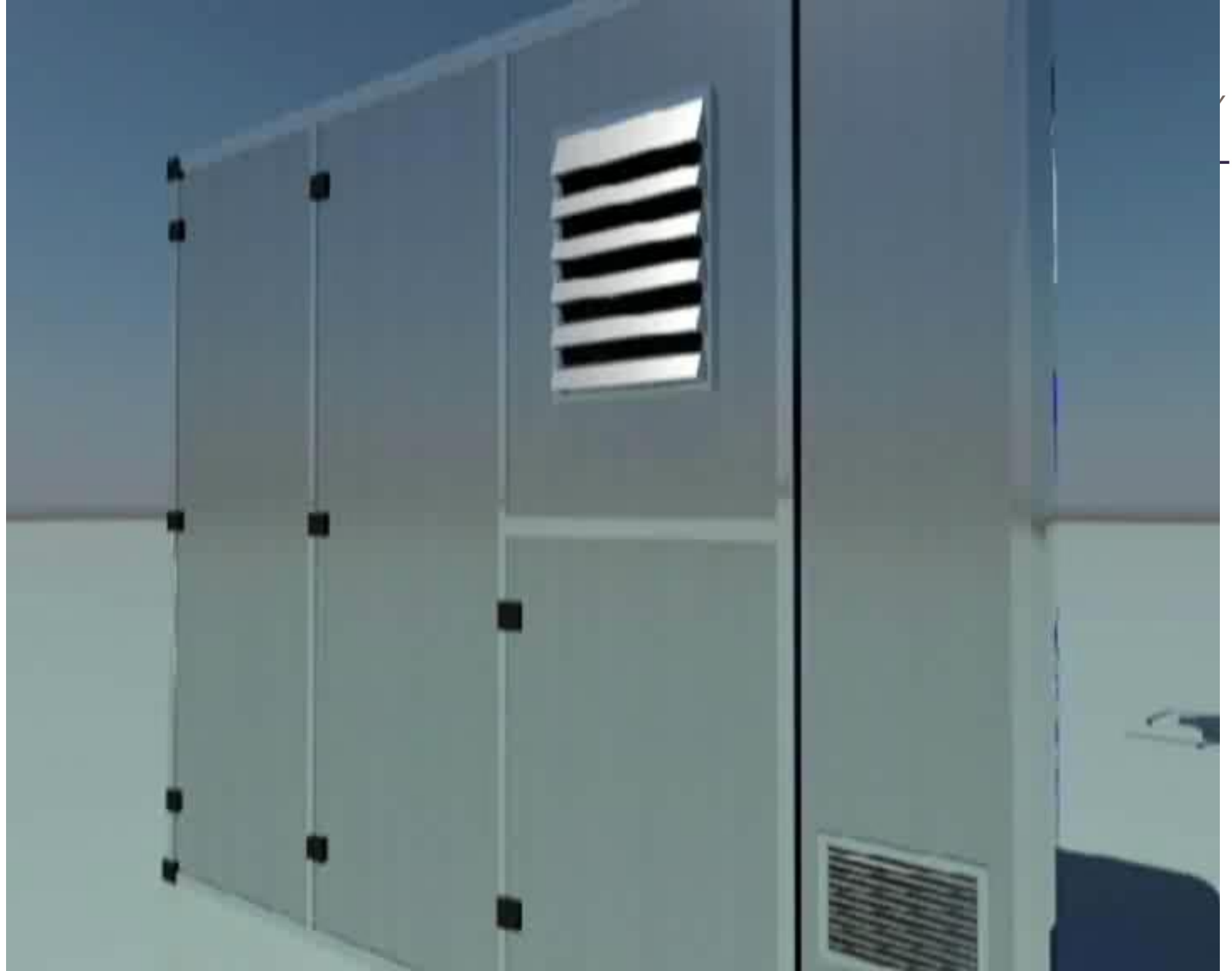
# *Thermal Server – 80% less energy*



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- 80% less fuel than a standard boiler
- Leverages waste heat or geo thermal heat to deliver low cost hot water
- Units available in 200kw to 2MW
- Modular delivery
- Enclosures for indoor and out door
- Can be controlled remotely with smart phone
- Fully managed service, you pay per kw



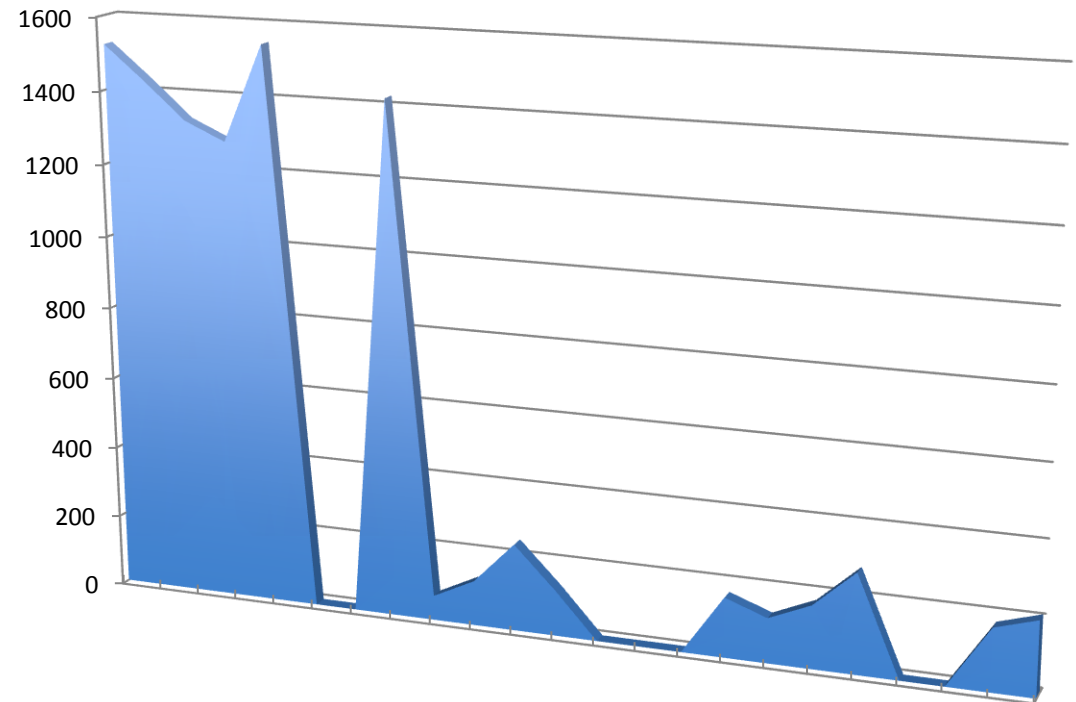


# Thermal Server – Case Study



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- Large food producer with locations in the UK and Ireland
- Major retrofit of technologies including
  - Heat recovery from cooking flues
  - Heat recovery from Refrigeration Systems
  - Thermal Server
- **Results**
  - **Over €435,000 in energy saved.**
  - **Capital cost of €885,000.**



# *Worlds First Carbon Control Centre*



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- Almost all businesses have no idea where their energy is used
- All business waste 30% to 40% of energy consumed
- Cost of control and metering systems is dropping all the time
- The advent of the Internet Of Things is starting to become real
- Carbon Control Centre monitors and controls energy in real time with engineers in the driving seat





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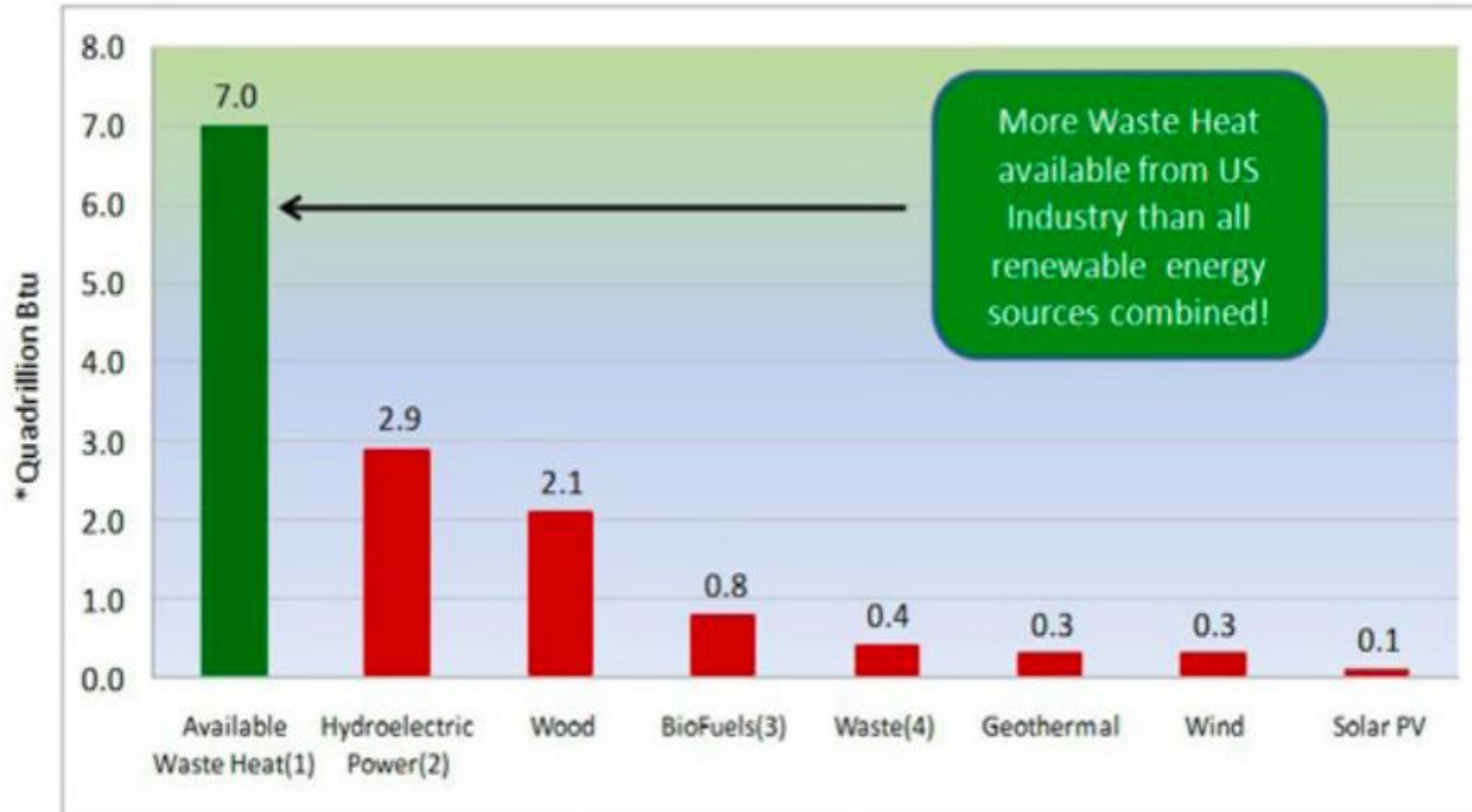
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...And at the very  
cutting edge

# Low grade heat



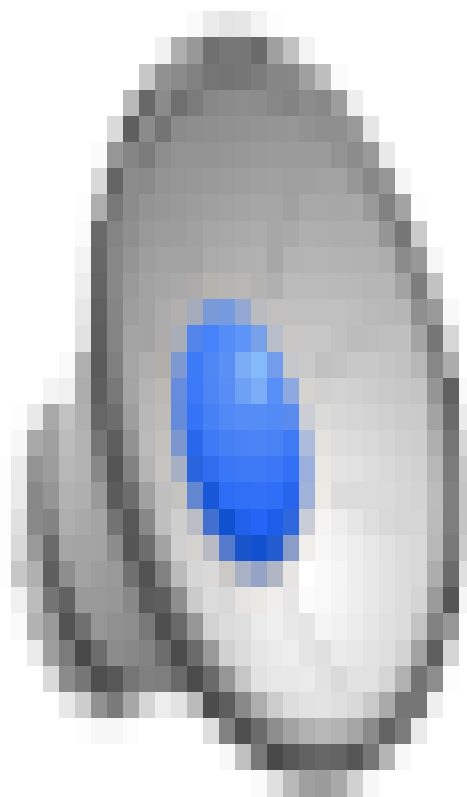
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...Proof of the pudding !

# CASE STUDY 1



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- Large food company with 27 factories across Ireland, UK and South Africa.
- Heat recovery from contaminated steam using a superconducting heat recovery system.
- First of its kind in the world.
- How water was piped over 1KM to sister factory.
- Fully automated solution installed.
- **Results:**
- **Savings : €440,000**
- **Capital costs : €522,000**



# CASE STUDY 2



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- UK Producer of processed bacon for UK supermarkets.
- Thermal Server installed which utilises heat from refrigeration system and increases temperature to 65 degrees C with a COP of 6.2.
- **Results:**
- **Savings : €272,000**
- **Capital costs : €377,000**

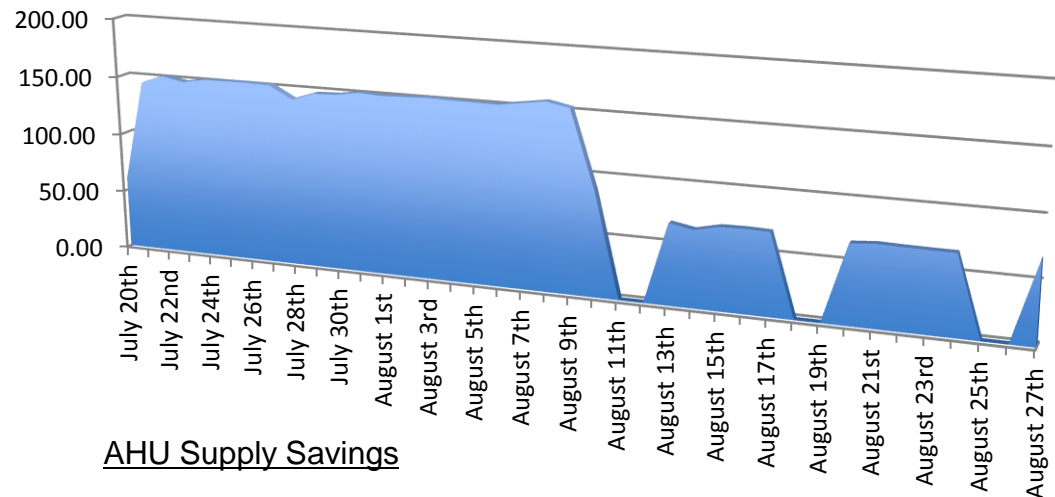
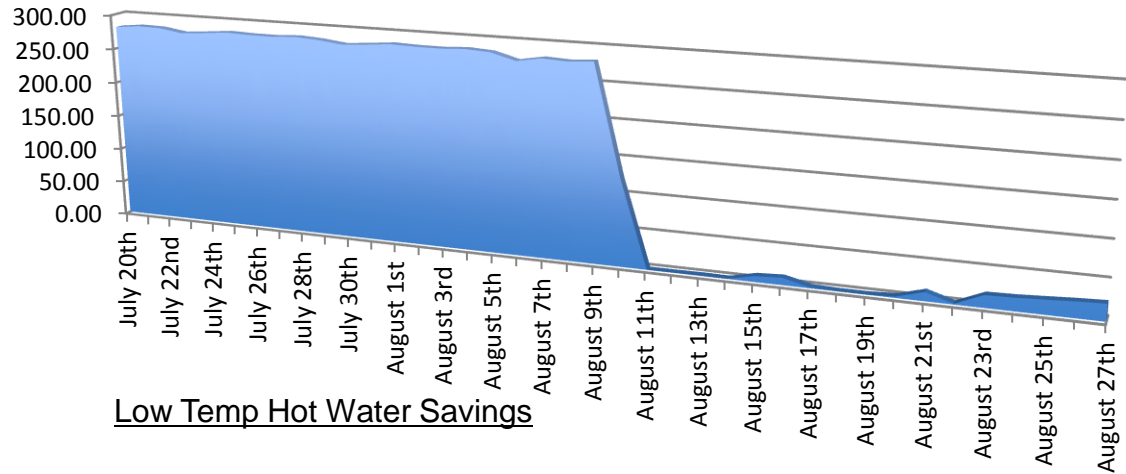


# CASE STUDY 3



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- UK Government offices with over 6500 employees.
- Redesign of the control systems.
- Implement new controls system.
- Implement Automated Continuous Commissioning (ACC).
- Implement motor/fan and pump control.
- **Results:**
- **Savings : €305,000**
- **Capital costs: €122,000**



# CASE STUDY 7



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- Large Headquarters Building.
- 3200 workers.
- Introduction of Automated Continuous Commissioning.
- New Smart Building Control Philosophy.
- Redesign of existing heating and cooling infrastructure.
- Introduction of solar chimney to cool main atrium.
- **Results:**
- **Savings - €230,000.**
- **Capital costs - €431,000.**



# In Summary

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- Climate change will destroy our futures and its not just for our children that will have to pick up the pieces
- The business opportunity around energy efficiency is enormous for Ireland
- Government will not legislate in time to make a meaningful difference
- Technology and Finance is available to make it happen
- It's a very exciting space



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Questions ?