
Combined Heat and Power (CHP) in Irish Hotels

Days Hotel Galway Case Study

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Mr. Aidan McDonnell
Business Manager
F4energy



Presentation Outline

- **About F4energy**
- **Combined Heat and Power Explained**
- **The Combined Heat and Power (CHP) Project at Days Hotel**
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 - **Why Combined Heat and Power?**
 - **Project Steps: Feasibility, Installation, Commissioning**
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 - **Net Energy Savings Produced per annum**
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About F4energy

F4energy was founded in late 2001 by former ESB and Siemens professionals, to design, deliver and maintain Combined Heat and Power (CHP) solutions in the Irish market.

F4energy currently operates approx. 55 CHP plants in Ireland installed in Hospitals, Hotels, Factories, and Third Level Institutions.

Clients include Radisson, Marriott, Hilton, Days Hotels, Tesco Ireland, Health Services Executive, NUI Galway and University of Limerick.



DG HOTELS



Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

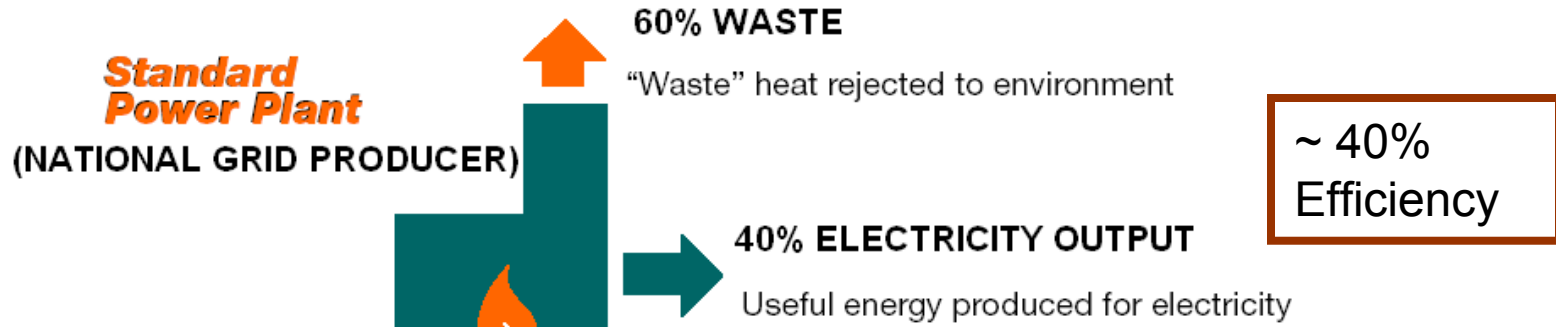


National University of Ireland, Galway
Ollscoil na bÉireann, Gaillimh

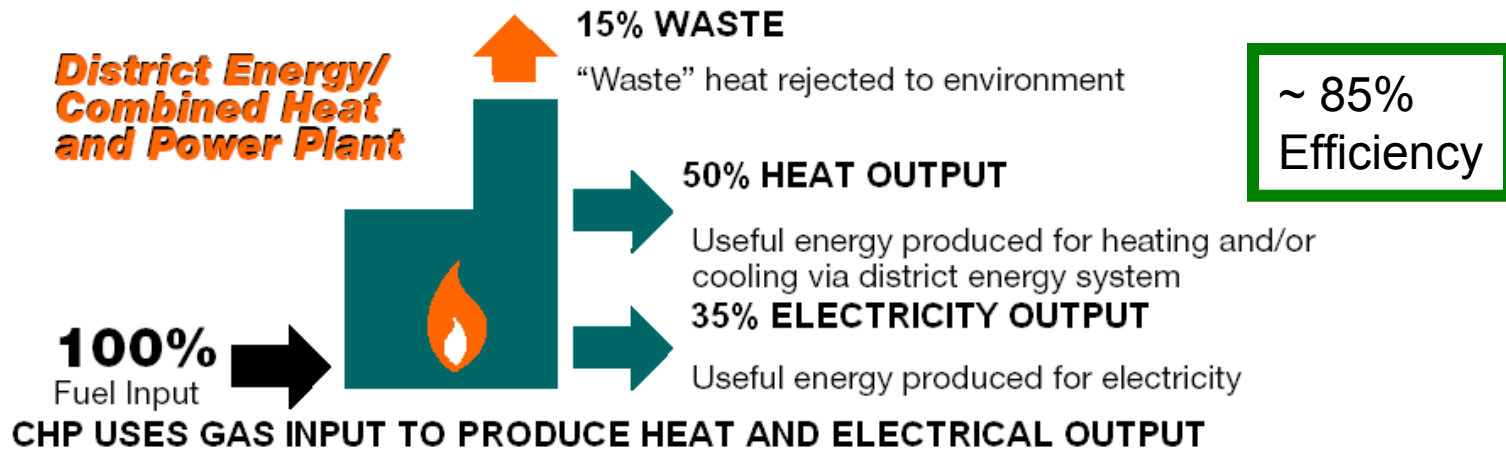


Combined Heat and Power Explained

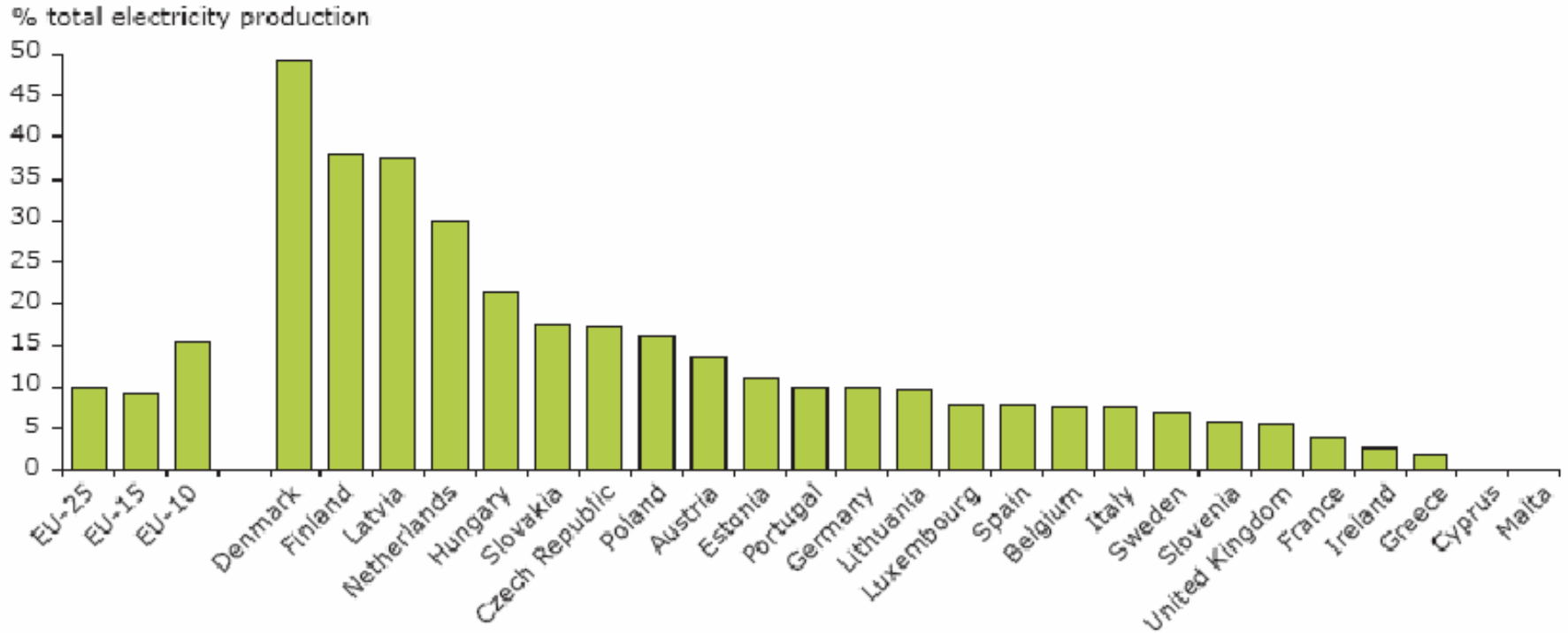
Combined Heat and Power (CHP) is the Simultaneous production of electricity and useful heat.
(steam, air or hot water)



versus



Combined Heat and Power in Europe



In Europe, 9% of all power production is produced using Combined Heat and Power.....

In Ireland, less than 3% of the nation's power production is produced using Combined Heat and Power

The Combined Heat and Power Project

About the Days Hotel Galway



- *Full Service Hotel of approx. 20,000m²*
- 311 Bedroom Hotel, 55 Apartments/Suites, Conference Facilities, Leisure Centre (20m pool), Bar, Restaurant
- Located on the Dublin Road, Galway City
- Annual Energy Costs in Excess of € 400,000 per annum

The Combined Heat and Power Project

Why Consider Combined Heat and Power?

- Rising annual energy prices (2004/5, 2006, 2007 the ESB prices increased by 5%, 16% and 12% respectively)
- Rising cost of Oil/LPG (used for Swimming Pool Boilerhouse)
- Possibility of On-Site Back Up Generation using CHP Plant

Combined Heat and Power offered the chance to:

- i) Reduce Energy Costs through on-site efficient generation
- ii) Replace expensive LPG & Oil-fired Swimming Pool Heating with low cost natural gas-fired CHP Heat
- iii) Provide on-site Back-Up generation in the event on National Grid Outage

The Combined Heat and Power Project

STEP 1: Combined Heat and Power Feasibility Study (Oct 2006)

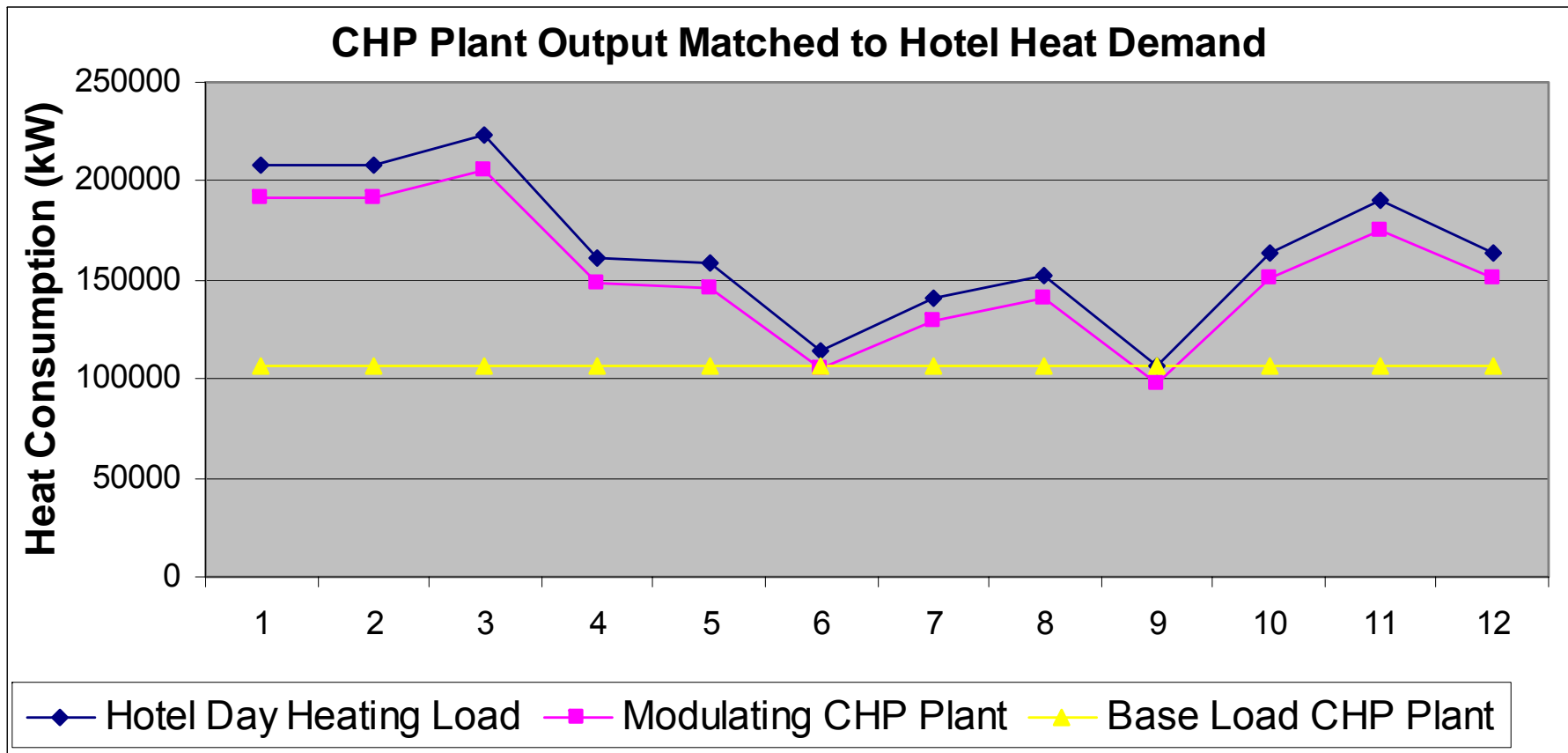
A Feasibility Study Report was drawn up by F4energy incorporating:

- i) Review of site's 12 month historic heat (gas) and electricity Energy Consumption
- ii) Optimal CHP Plant Output Selection: Site energy demand was mapped onto CHP plant options to determine the optimal CHP plant output level.
- iii) Detailed Annual Energy Savings Calculations: The energy costs of a Pre-CHP Vs Post-CHP scenario were calculated and presented.
- iv) Site Survey: Location of proposed CHP plant, site-specific installation considerations etc.
- iv) Choice of CHP Investment Options offered:
 - ▶ Capital Purchase or ▶ Phased Purchase or ▶ Energy Supply Contract

The Combined Heat and Power Project

CHP Design Approach:

CHP Plants are available in a wide range of outputs. The Feasibility Study matches the client's Energy Demand Profile with the optimal CHP output range.



The Combined Heat and Power Project

STEP 2: SEI Grant Application, Approval, Plant Order, Installation & Commissioning (Jan - Mar 2006)

The decision in principle to proceed with the CHP project was made in Jan 2007, following which a grant application was submitted to Sustainable Energy Ireland.

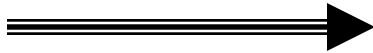
Feb 2007	March 2007	March 27th, 2007
CHP Plant Order		CHP Plant Delivery		
		CHP installation works		CHP Plant Commissioning

- Sustainable Energy Ireland Grant Approval took 7 weeks
- Project Duration from Order to Commissioning took 8 weeks
- F4energy liaised with Bord Gais and ESB as required
- No interruption to Hotel hot water or electricity during installation
- Swimming Pool & Main Hotel Boilerhouse linked as part of CHP Project

The Days Hotel CHP Plant

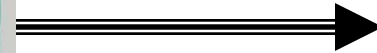
Metered Input

Natural Gas
934kW



Metered Outputs

Electricity
334kW



Heat
497kW



Used for:

- Hot Water
- Swimming Pool
- Central Heating

- Schmitt Enertec (Mercedes) 12 Cylinder Turbo Engine
- Operates 15 Hours Daily X 365 Days
- Producing ~ 65% Hotel Electricity / ~ 80% of the Hotel's Heat
- All Inputs and Outputs Metered and valued at current tariffs

The Days Hotel CHP Plant



Plant Footprint: 4 meters Long X 1.45 meters Wide X 2.45m High

The Days Hotel CHP Plant



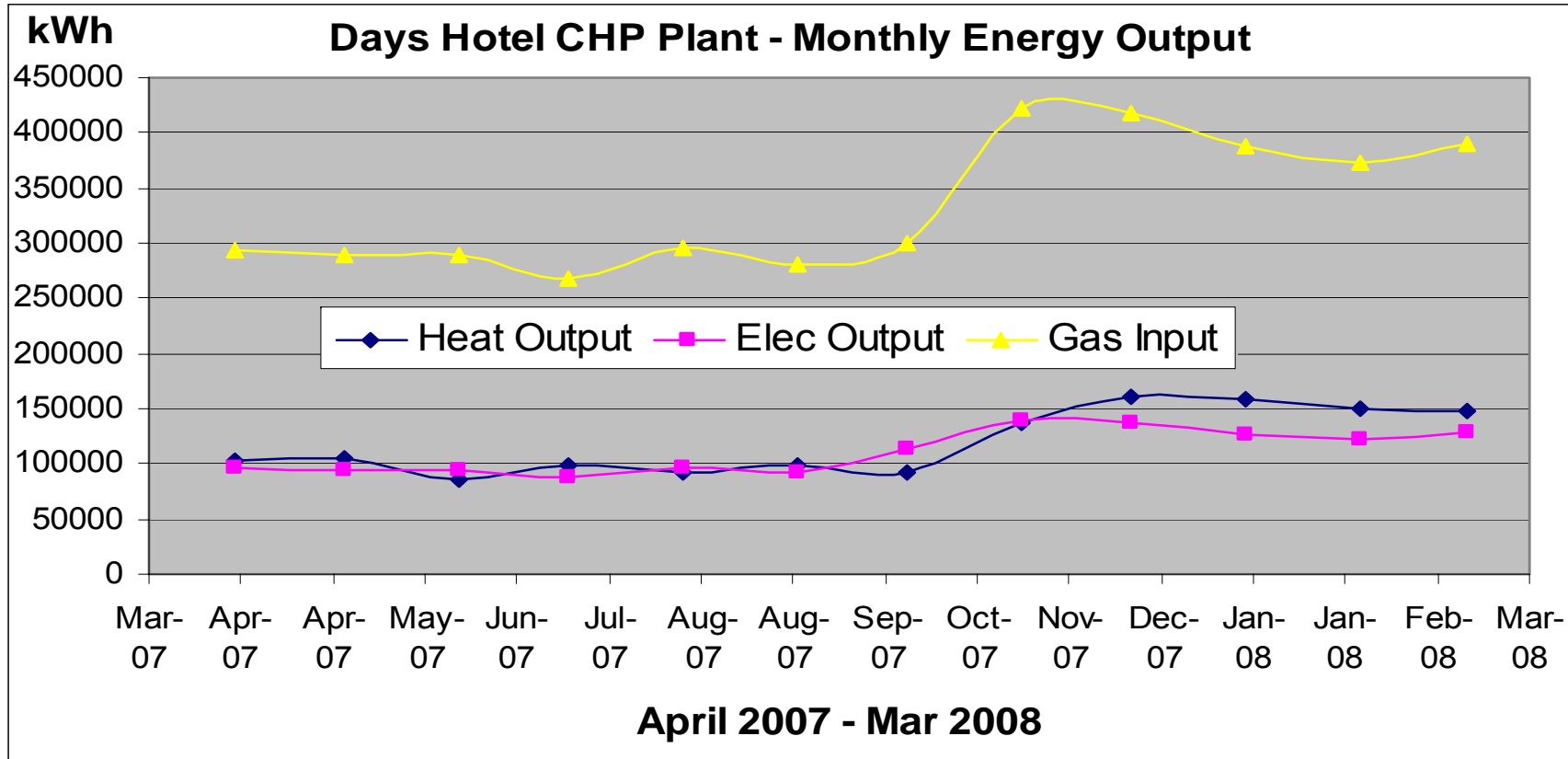
External Enclosure Footprint: 6m L x 3m W x 3m H

The Days Hotel CHP Plant



Inside External Enclosure

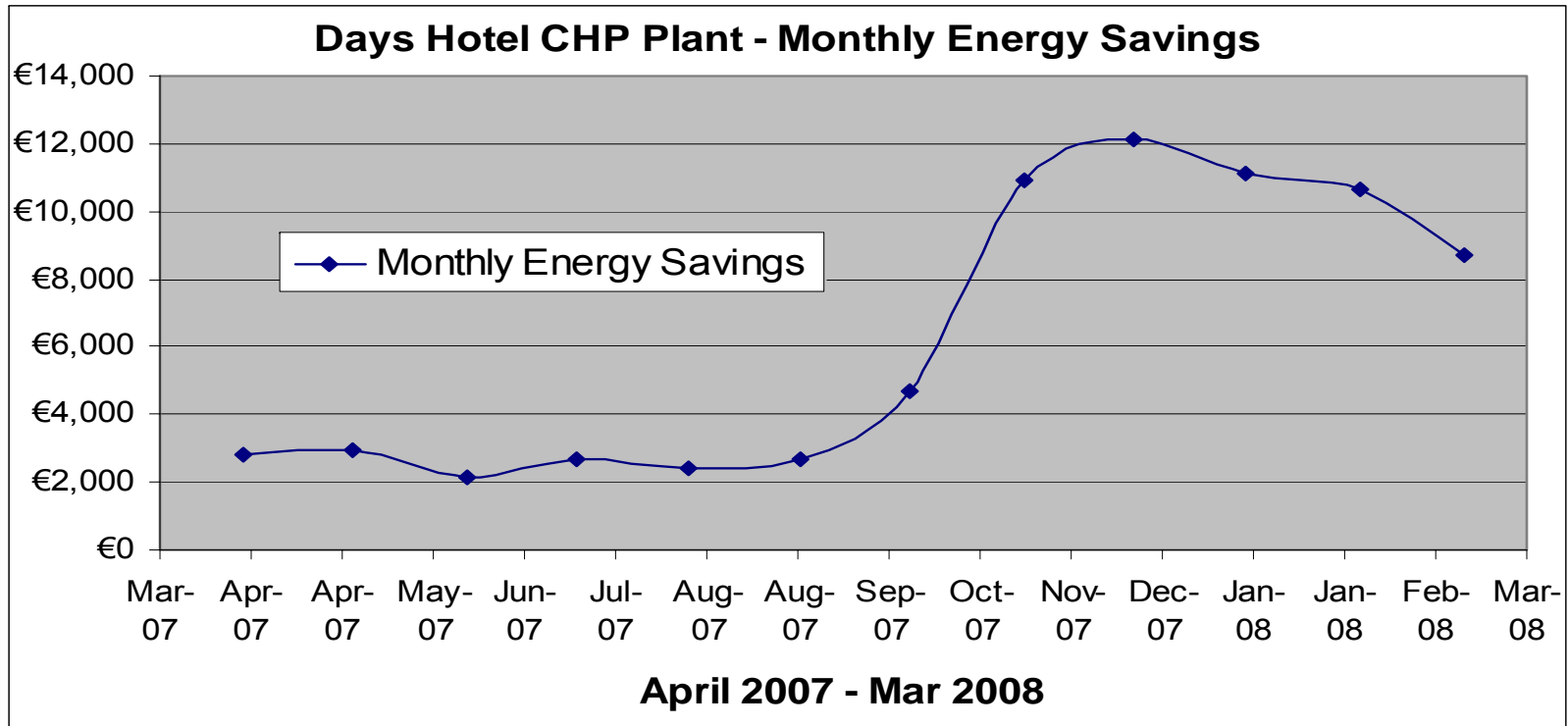
Performance of Days Hotel Galway CHP Plant



- **CHP Plant Reduces Output during Low Heat Demand Periods (Summer) & Increases Output during High Heat Demand Periods (Winter)**
- **All Inputs and Outputs Metered and valued at current tariffs**

Financials of Days Hotel Galway CHP Project

Net Annual Cost Savings of €73,700 in Year 1



- Value of Electricity Output + Heat Output Less Gas Input Less Maintenance
- Project Generated an investment payback of less than 3 years after SEI Grant
- Additional Cost Savings achieved through avoided Capex on Back-Up Genset

The Environmental Benefits

By displacing national grid electricity, the Days Hotel CHP plant reduces the site's carbon emissions by ~ 600 TONNES CO₂ yearly.

The Equivalent of Removing 160 cars off the Road EVERY YEAR
Or
Planting 750 TREES EVERY YEAR!

(Source: Carbon Trust)

Thank You For Your Time

Aidan McDonnell
Business Manager

F4energy
Unit 14
Penrose Wharf
Cork City
www.f4energy.com



F4energy
Distributed Power Solutions

