Beyond regulatory compliance! An opportunity to reduce carbon emissions, generate savings and benefit local communities.

_Cifal Findhorn Event, Forres, Scotland_
8th February, 2011

Professor Martin A. Blake BSc MBA DBA
Chairman, Carbon Zero Solutions
Formerly Head of Sustainability, Royal Mail Group
Agenda and Content

• Introduction to Case Study – Royal Mail
• Carbon and Energy Data Management
• Drilling Deeper with the Data
• The Creation and use of Abatement Curves
• The Creation of the Cumulative Investment Returns Curve
• The Future of Carbon Disclosure and Regulation
• Questions (for you!) and the need for further case studies!
• Questions (for me!)
CSR and Sustainability Awards

- **Winner** - Quality in Print Media Environmental Award, Quality In Print Awards 2008
- **Winner** – Best use of payroll giving award, Institute of Fundraising Awards 2008
- **Winner** – Corporate Social Responsibility category, 2008 World Mail Awards
- **Winner** – Environmental Improvement – Chartered Institute of Logistics and Transport Awards for Excellence 2007
- **Winners** – Best payroll giving award – Pay Magazine Awards 2007
- **Big Tick** – Excellence in Health Award, BITC Awards for Excellence 2007
- **Silver Jubilee Big Tick** – Royal Mail Education Programme – BITC Awards for Excellence 2007
- **Big Tick** – Feeling First Class Award, BITC Awards for Excellence 2007
- **Winner** - Corporate Social Responsibility category, 2006 World Mail Awards
- **Winner** – Best CSR Programme of the Year, Strategic Risk European Risk Management Awards 2006
- **Winner** – Traffic & Transport Management Category – City of London’s Liveable City Awards 2006
- **Winner** – Transport, Storage and Distribution Industry Sector, ROSPA Awards 2006

Signatories to the UN Global Compact

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Carbon Trust Standard

- Royal Mail Group were one of the first companies to be awarded the Carbon Trust Standard in 2008.

- The scheme aims to encourage companies to measure, manage and reduce their carbon footprints through real reductions.
Royal Mail – Gross Carbon Footprint (Circa 2004)

- Scope 1 Business road
- Scope 1 Natural gas and oil
- Scope 2 Grid electricity
- Scope 3 Commuting to work
- Scope 3 Business air & rail
- Scope 3 Personal road
- Scope 3 Personal air & rail & Authorised cars on delivery
RMG Carbon Management Programme

Communications + Employee Engagement (project 1)

Fuel and Transport - Light (Project 5A)
Fuel and Transport - Heavy (Project 5B)
Buildings New (Project 6A)
Buildings Current (Project 6B)
Policy, Risk + Regulation (Project 7)

(AVOID)
(REDUCE)
(REPLACE)

Innovations (Project 2)
Commercial Opportunities (Project 3)
Supply Chain (Project 4)

KPI's, Data + Reporting (Project 8)

Offsetting/Sequestration (Project 9) (OFFSET)

Report to Board quarterly:
1, 5A, 5B, 6A, 6B, 8
Report on rotation:
2, 3, 4, 7, 9

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The Roadmap for Carbon Reduction

Government carbon reduction targets

March 2010
Reduce business road CO2 emissions by 20%
Reduce building energy emissions by 10%
Reduce waste sent to landfill by 25%
Reduce water consumption by 5%

2010
22% by 2012

2015
28% by 2017

End of 2015
Total 50% reduction
Offset residual for neutrality

2020
34% by 2022

End 2010
Guardian 10:10

Royal Mail Group carbon reduction targets

* Based on 2004/05 baseline

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Drilling Deeper with the Data!
Buildings: -
Proportion of Carbon Footprint by Building Type

- 64 Mail centres largest consumers of energy representing over 40% of total consumption and most energy intense per metre²
- Around 35% of consumption is in delivery offices
- Other buildings are PFWW, POL, garage network
Regional Distribution Centre’s

- Majority heating and lighting loads similar to large DO’s
- Worst in practice is Warrington CHP site
- 1 site below best in practice average all 6 above average

<table>
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<tr>
<th>Electricity</th>
<th>Gas</th>
<th>Combined</th>
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<tbody>
<tr>
<td></td>
<td>kWh/m²</td>
<td>kgCO₂/m²</td>
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<tr>
<td>Best In Practice Average</td>
<td>82.05</td>
<td>44.35</td>
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<tr>
<td>Estate Average</td>
<td>108.04</td>
<td>58.40</td>
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<tr>
<td>Worst in Practice Average</td>
<td>133.88</td>
<td>72.37</td>
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Notes:
- Ventilation Optimise (7%)
- R22 Gas replacement (47%)
- Building energy reduction project (24%)
- Green champions (22%)
- Smartlight

Graph based on Warrington RDC
Mail Centres

Mail Centre Summary

- Over 30% automation load without any direct plans to reduce energy consumption
- Worst in practice are generally sites operating CHP; policy being reviewed in FM
- 21 MC’s best in practice or better
- 19 Average to worse
- 24 Worst in practice average or worse

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<td>kgCO₂e/m²</td>
<td>kWh/m²</td>
<td>kgCO₂e/m²</td>
<td>kWh/m²</td>
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<td><strong>Best In Practice Average</strong></td>
<td>155.35</td>
<td>84.54</td>
<td>211.47</td>
<td>38.90</td>
<td>366.83</td>
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<td><strong>Estate Average</strong></td>
<td>191.88</td>
<td>104.42</td>
<td>271.16</td>
<td>49.88</td>
<td>463.05</td>
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<td><strong>Worst in Practice Average</strong></td>
<td>224.60</td>
<td>122.22</td>
<td>324.61</td>
<td>59.72</td>
<td>549.21</td>
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* Mail Centre: IES Model  Northampton Without Renewables

Smartlight

Smartmeter

Building energy reduction project

Ventilation Optimise 13%

R22 Gas replacement 14%

Green champions 16%

32% 18%

7%

MC Strategy

Automation

Lighting

Other loads total

Cooling

Hot water

Space heating

* 27 January 2011
Delivery Office’s

- Heating and lighting 80/20 rule
- Major heating load, move to automation in DO’s will shift profile and increase consumption
- 102 sites out of 541 are best in practice average
- 160 sites are worst in practice ave. or below

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<tr>
<td>kWh/m2</td>
<td>kgCO2e/m2</td>
<td>kWh/m2</td>
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<tr>
<td>Best In Practice Average</td>
<td>61.84</td>
<td>33.65</td>
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<tr>
<td>Estate Average</td>
<td>86.10</td>
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<tr>
<td>Worst in Practice Average</td>
<td>111.73</td>
<td>60.80</td>
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Creating regional footprints

Anglia CO2e emissions by source 2008/09

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<tr>
<th>Region</th>
<th>Scope</th>
<th>Source of CO2e (aka GHG)</th>
<th>2004/05</th>
<th>2008/09</th>
<th>2014/15</th>
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<tbody>
<tr>
<td>Anglia</td>
<td>1</td>
<td>Diesel (fleet)</td>
<td>24,240</td>
<td>20,495</td>
<td>12,120</td>
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<tr>
<td>Anglia</td>
<td>1</td>
<td>Gas (heating)</td>
<td>14,328</td>
<td>10,990</td>
<td>7,164</td>
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<tr>
<td>Anglia</td>
<td>1</td>
<td>Oil (heating)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anglia</td>
<td>2</td>
<td>Electricity</td>
<td>13,431</td>
<td>12,106</td>
<td>6,716</td>
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<tr>
<td></td>
<td></td>
<td><strong>Total GHG emissions in Tonnes</strong></td>
<td>51,999</td>
<td>43,591</td>
<td>25,999</td>
</tr>
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Greenhouse Gas Emissions from Electricity

- London
- Midlands
- North E England
- North W England
- South W England
- South E England
- Thames Valley
- Scotland
- Anglia
- Northern Ireland
- Wales
- Network
The Use of Abatement Curves and Data to Make Informed Investment Decisions
Theory into reality

Enterprise Marginal abatement cost curve
Transport MAC Curve

Vehicle Technology MAC Curve - WTW

Cost/tCO2 saved

-£100  -£50  £0  £50  £100  £150  £200  £250  £300  £350  £400  £450  £500  £550  £600  £650  £700  £750  £800

WTW CO2 t

200  400  600  800  1000  1200  1400  1600  1800  2000  2200  2400  2600  2800

 technologies not yet in production

Carbon Zero Solutions

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The Cumulative Investment Returns Curve
A cumulative Investment Returns Curve improves a company’s ability to decide what to do.

**Investment Returns Curve from CO₂ Abatement Projects**

- **Cumulative IRR**
- **IRR of individual initiatives**

### Key Initiatives

- **Site-wide process integration and optimization of heat requirements**
- **CO₂ capture from hydrogen plant**
- **O&M optimization and continuous emission control program**
- **Optimization of motor systems (compressors, pumps, fans, etc.)**
- **Optimization of heater/burner/boiler combustion efficiency**
- **Flare gas recovery**

#### Key Results

- **4.5Mt p.a. CO₂ reduction with a 51% IRR**
- **16Mt p.a. CO₂ reduction with a 14% IRR**

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27 January 2011
The Future of Carbon Disclosure and Regulation
Can Abatement Curve Disclosure Take the Politics Out of Carbon?

• Should Carbon Disclosure Project move to abatement curve disclosure? CDP and DECC seem to think so!
• The need for an International Standard on MACC Curve construction and reporting?
• The opportunity for third party, private or government investment with confidence
• Everyone wins! What else do we need to do to make it a reality?
Questions (for you!) and a show of hands for my continuing research
Questions to the Audience!

- Aren’t you already collating data for CRC?
- Are you already constructing Carbon Footprints?
- Are you already seeking to reduce your energy costs?
- But, are you creating MACC and IRR financial decision making tools?
- If not, what is the downside risk preventing you from making that step?
- Would you like to create your own MACC, save money and eliminate future regulatory risk at Net Zero Cost?
The Need for Some Further Case Studies!!

• Flagship Case-Studies Required for Research Papers and National examples of Best Practice!

• Any Volunteers?!!
Professor Martin A. Blake, Chairman

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