



21st ANNUAL CONFERENCE
28-30 MARCH 2017

 GLOBAL GOALS:
LOCAL ACTION



The Rocky Road to Carbon Reduction – Lancaster's Carbon Management Plan

Headline Sponsor



CarbonCredentials

Introductions



Jonathan Mills – Carbon, Environment & Sustainability manager

Jan Bastiaans – Energy Manager

Session Agenda



- Introduction to LU Carbon management Plan
- Case Study 1 – Wind Turbine
- Case Study 2 – Energy Centre Projects
- Case Study 3 – Insulation Projects
- Case Study 4 – Lighting Projects
- Case Study 5 – Green IT Projects
- Case Study 6 - Student Engagement Projects
- Questions & Answers
- Your CMP? – Workshop Session

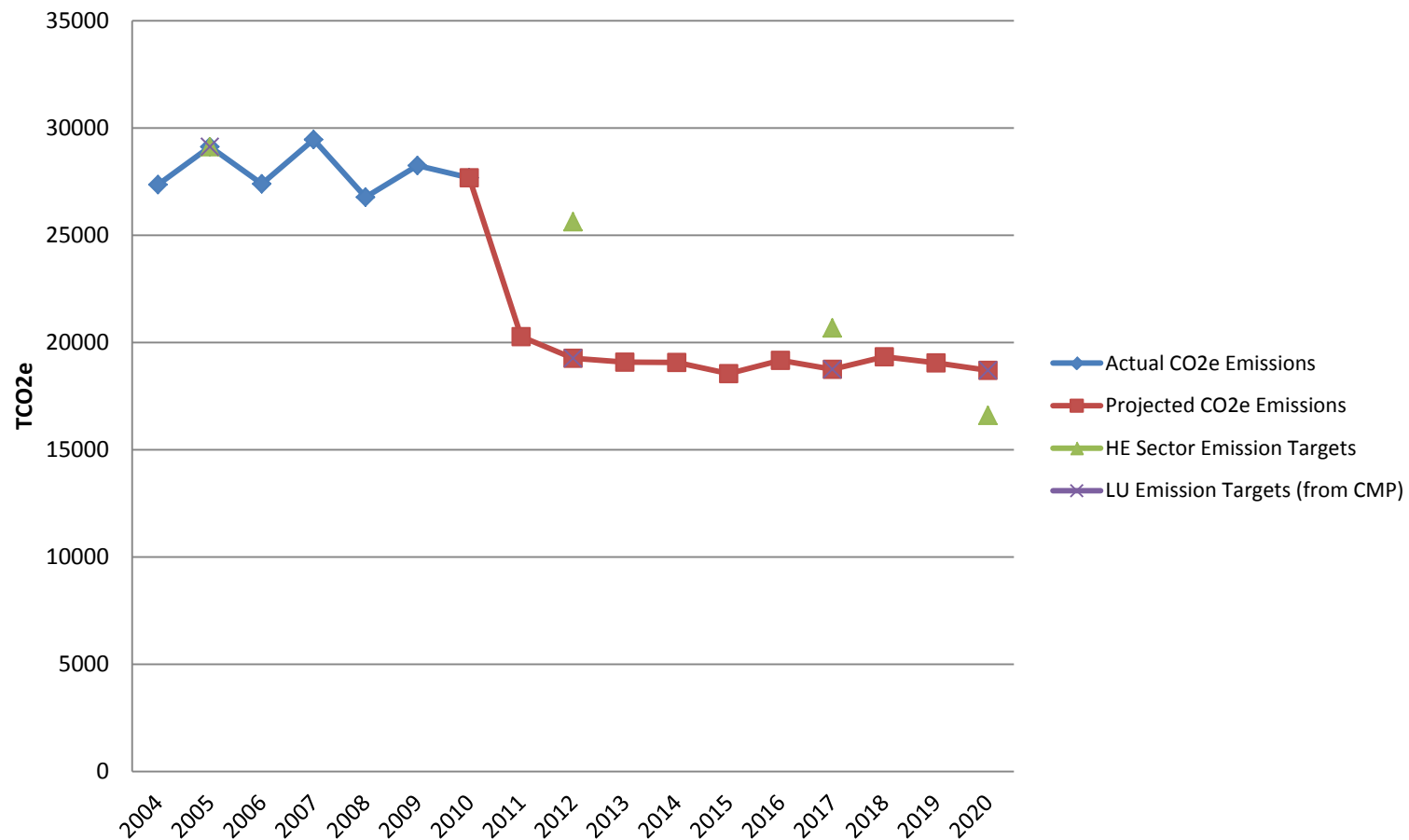
Lancaster University Carbon Management Plan

- CMP adopted in 2010
- LU targets for 2020 & 2050 with 2005 baseline (25,899tCO₂e)
- Interim targets for 2012 & 2017
- CMP Objective – decarbonise and enable LU expansion!
- *Based on implementation of all projects in CMP*

	Target Years			
	2012	2017	2020	2050
Higher Education Sector Target for carbon reduction (%)	-12	-29	-43	-83
Lancaster University Target for carbon reduction (%)	-34.9	-35.6	-43	-83
Lancaster University Target for carbon reduction (tCO ₂ e)	16,860	16,678	14,762	4,402

Carbon Management Plan – Projected Emissions 2010

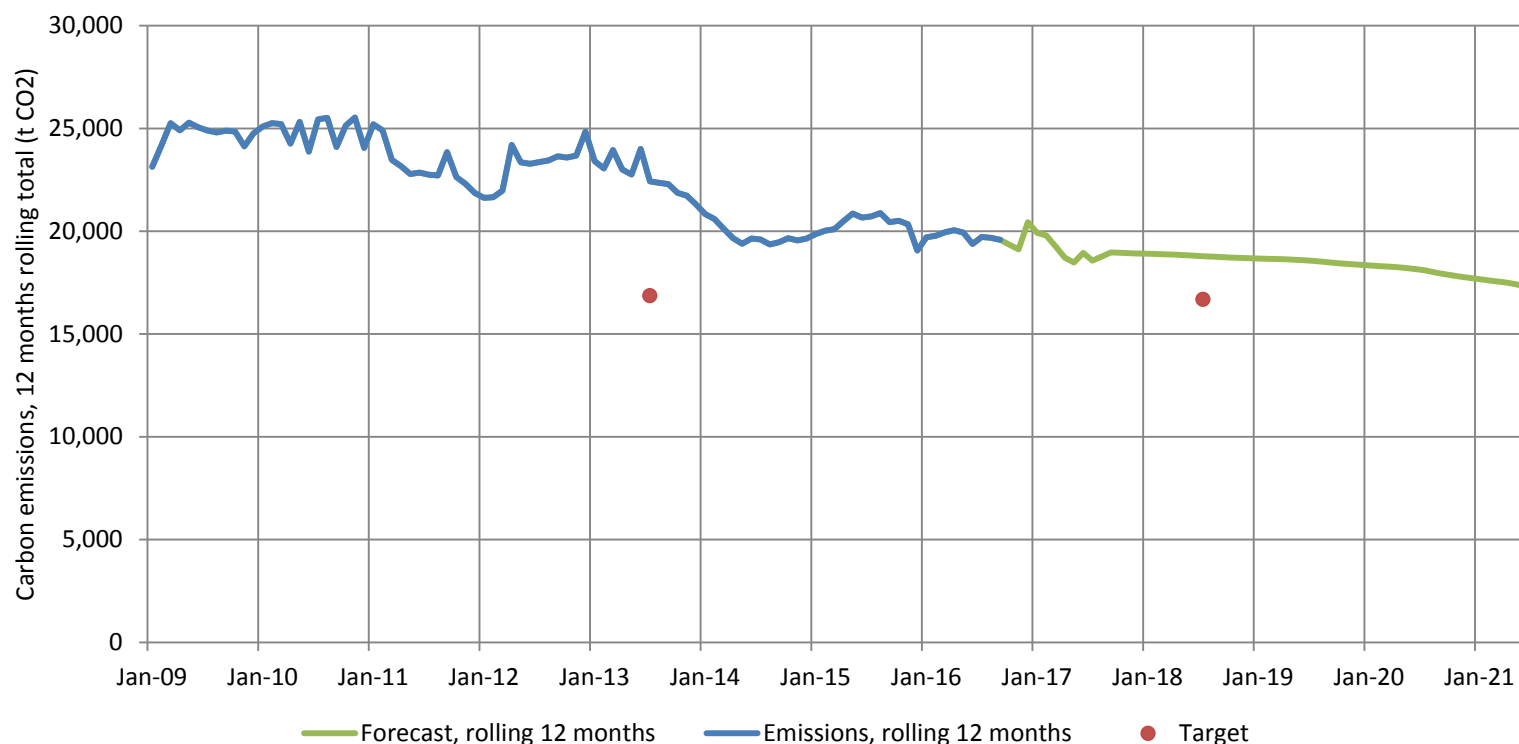
LU Projected Carbon Emissions (from CMP 2010)



Carbon Management Plan – What Happened

- Carbon emissions reduced by 20% by 2015/16
- Projected below 20,000tCO₂e in 2016-17

Lancaster University emissions profile



Carbon Management Plan Projects

CMP Contributing Projects

- Wind Turbine
- Energy Centre Projects
- Insulation Projects
- Lighting & Heating Control Projects
- Green IT Projects
- Student Engagement



Case Study: Wind Turbine

- Enercon E77 2.3MW
- Generates 5,000 MWh per annum (15% consumption)
- Carbon reduction 2,000tCO₂
- Cost £3.76 million
- Wind turbine project won 'Green Gown' award for Carbon reduction in Nov 14



Case Study: Wind Turbine

Project Issues

- Feasibility & site constraints.
- Identifying a windy site!
- Project Finance
- Obtaining Planning Permission
- Securing a grid connection
- EIA Stops – CAA/MOD, noise,

Verdict: Fantastic – big carbon reductions and it works!



Case Study: Energy Centre Projects

Projects

- **CHP** – 2.2/1.9MW gas engine, generates 5,000-10,000 MWh p/a
- **Gas Boilers** – 3 x 4.8MW units
- **Biomass boiler** – 1 x 1MW unit
- Electricity supplied to site HV network
- Hot water supplied to LU district heating system



Case Study: Energy Centre Projects

Project Issues

- System integration, new with old
- Biomass is labour intensive

Verdict: Mixed, but should work eventually with significant carbon savings!



Case Study: Insulation Projects

Projects

- Cavity Wall Insulation
- District Heating Insulation

Project Issues

- Suitability and quality issues
- Value engineering

Verdict: Mixed



Case Study: Lighting & Heating Control Projects

Projects

- LEC Greenhouses LED Lighting
- Thermostatic Radiator Valves

Project Issues

- Spectrum quality issues
- iTRV communications
- User acceptance

Verdicts: Mixed? iTRV scalable with potentially large savings



Case Study: Green IT Projects (1)

Projects

- Co-location
- Application virtualisation
- PC Power management
- Consolidated Print Service

Project Issues

- Physical server estate much reduced
- PC power management – PC labs
- Printers reduced by 45%

Verdict: Generally very good



Case Study: Green IT Projects (2)

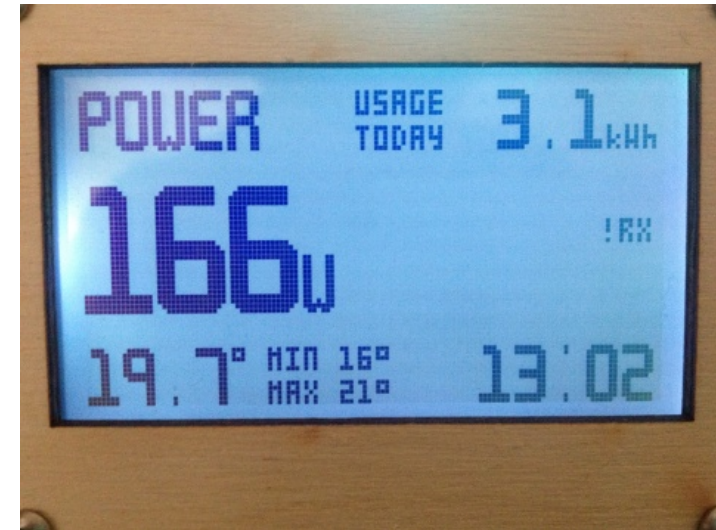
Projects

- Energy information system (EIS)

Project Issues

- Large scale, diversity
- Data quality
- Extracting value

Verdict: Promising so far



Case Study: Student Engagement Projects

Projects

- Carbon Awareness Events
- Carbon Competitions

Project Issues

- Metering issues, data quality, prize types, student engagement, staff resources

*Verdict: Mixed, moderate carbon savings but much effort and limited cost savings! –
Automation sometimes easier*



Revised Carbon Management Plan – What's Next?

Revised CMP – Contributing Projects

- Energy Information System
- District Heating improvement project
- CHP & Biomass utilisation
- Wind Turbine 2
- Behaviour Change Plan
- iTRV project
- Cavity wall insulation

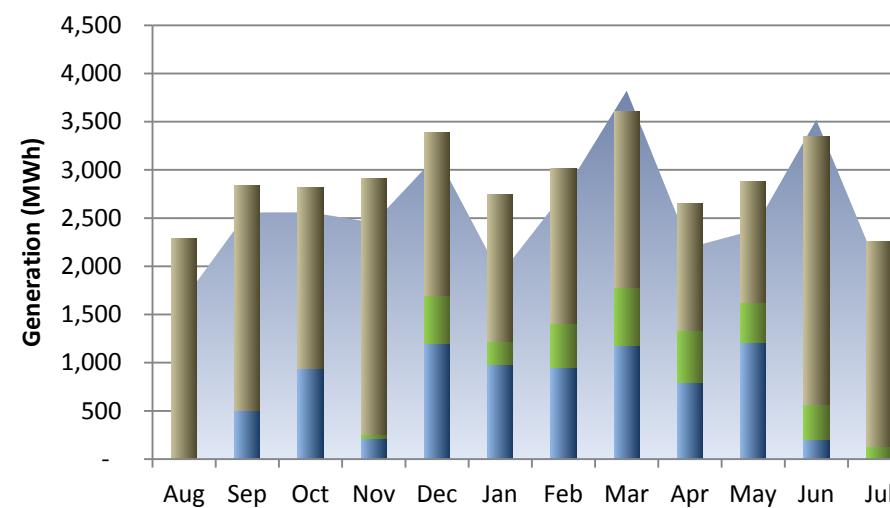


Questions & Answers



Electricity Generation Mix

■ Budget ■ CHP ■ Wind ■ Grid



Workshop Session – Your CMP

