

# Biomass and Renewable Energy

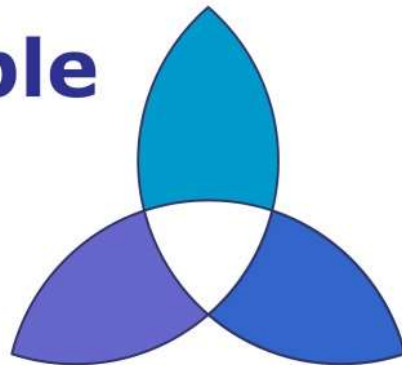
A Green Growth Platform event  
Delivered by the Sustainable Business Network

Lewes, 29<sup>th</sup> January 2015



Working in partnership...

**Sustainable  
Business  
Network**



Green**Growth**  
**PLATFORM**



**University of Brighton**

# What's coming up?

**08:30 Welcome**

Rowan Wallis, Sustainable Business Network

**08:35 Biomass and the Renewable Heat Incentive**

Jonny Starmer, Baystar Energy

**08:50 Biomass Fuel and Availability**

Mike Chapman, South East Wood Fuels

**09:00 Best Practice Case Study**

Environment Team, University of Brighton

**09:15 Round-the-Tables**

**09:25 Green Growth Platform – what's on offer?**

Jo Carpenter, Green Growth Platform

**09:30 Networking & Refreshments**

# Biomass Boiler Installations



Jonny Starmer, Director, Baystar Energy  
Tessa Guy, Director, Baystar Energy

# Who are Baystar?

Our company was originally formed of three individuals who have over twenty years of combined experience in heating systems engineering, and construction.

- **Jonny Starmer** - A quantity surveyor specialising in commercial construction and a full member of the Chartered Institute of Building
- **Tessa Guy** – A mechanical engineer who has worked closely with developers and housebuilders on project finance.
- **Jason Bayliss**- Experienced heating engineer who specialises in Renewable and energy systems and controls
- **Robin Curtis** – A mechanical engineer and geothermal expert. Who has designed heat pump systems for the 30yrs, incl some of the 1<sup>st</sup> UK systems.
- 3 permanent office staff & a specialist system designer, 4 full time installers and a regular local sub-contracting team of ground workers & electricians.



# Introduction

Installing and Running a Biomass Boiler can:

**Significantly** reduce  
and future proof  
*your* energy costs.



# The Benefits of Biomass...

- **Suited to older properties**
- **Fuel savings and security**
- **Carbon neutral**
- **Lucrative RHI Tariff**
- **Local benefits**

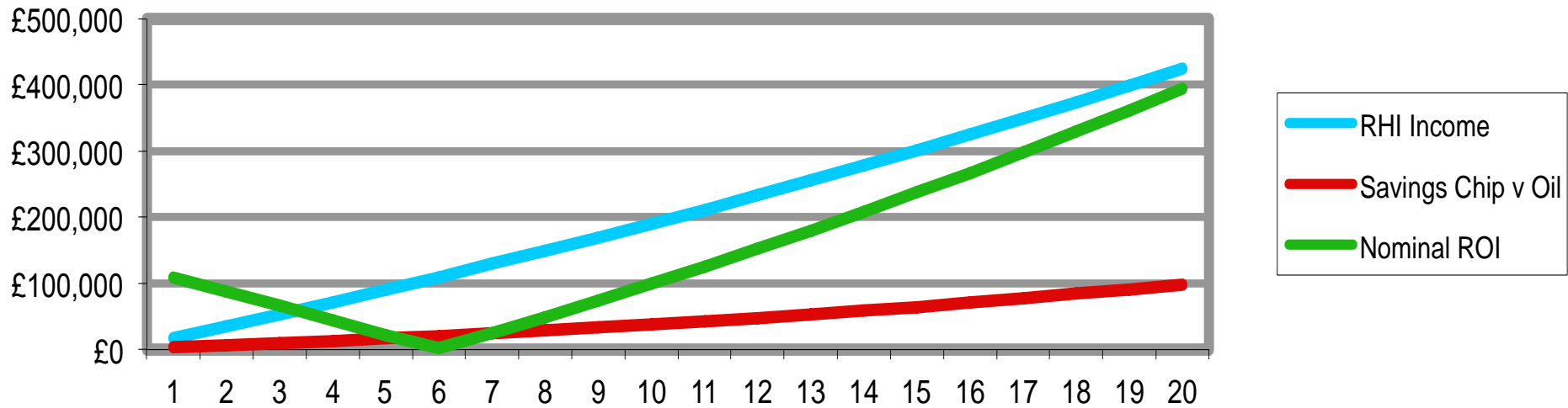


# Renewable Heat Incentive – Financials

Per Year	In first year
Estimated oil cost (main building)	£70,000
Estimated pellet cost	£45,000
<b>Savings Pellet v Oil</b>	<b>£25,000</b>
Maintenance cost	-£1,000
RHI Tier 1	£22,500
RHI Tier 2	£9,000
<b>Total Income RHI</b>	<b>£31,500</b>
<b>Total income plus savings, profit &amp; maintenance</b>	<b>£56,500</b>
ROI	16.0%
Payback Time	6 years

# Renewable Heat Incentive – Financials.

Cost benefit of Biomass including inflation



## Payback Example



# The Technology Explained...

- Environmentally friendly - burn wood pellets, chip or logs. These fuel types are classed as a renewable, carbon neutral fuel.
- Pellets are made from a wood material which is dried and compressed to a low moisture level with no additives.
- High calorific value - burn easily and efficiently to supply constant heat.
- Biomass pellet boilers are fully automatic. Automated controls regulate the amount of fuel being delivered to the boiler to match heat demand.
- Auger feeds pellets from the hopper to the burner where it is lit by an ignition element. The burner controls the feed rate of the pellets to achieve the required set temperature.
- Efficiency level of approximately 92% making them a highly favored Green alternative to fossil fuel burning boilers.



# Plant Rooms & Fuel Stores

**Above ground built  
fuel stores & plant rooms**



**Purpose built plant and store**



**Added to existing building**

**Fully & partially underground bunkers**



**Below ground**



**Built into hill**

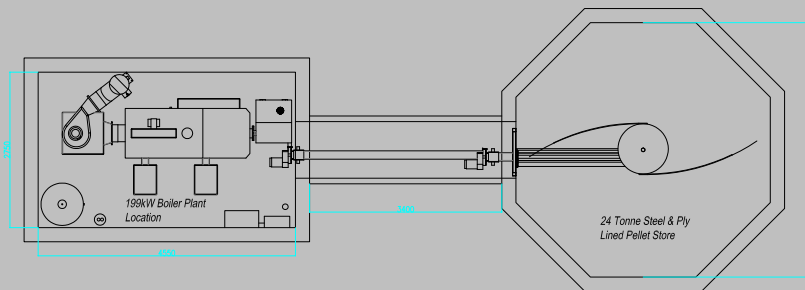
# Plant Rooms & Fuel Stores



Utilizing a portion of existing barns



Silos, hoppers and walking floors



Converting existing structures



Mobile hook bin deliveries

# Plant Rooms & Fuel Stores

Fuel Deliveries – How you get the fuel in!!



**Telehandler / tractor and bucket**



**Chipshifter**



**Blown**



**Tipping trailer direct to store**

# Pre Insulated Pipe and Ground Works

- Key to preventing heat loss and to improve efficiency
- Trenching & Pipe Runs
  - Working around obstacles
  - Route work

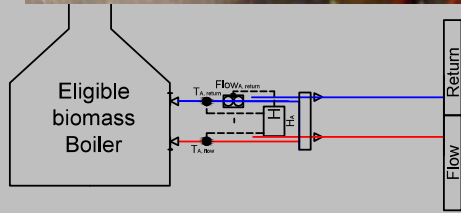


# HEATING CIRCUITS

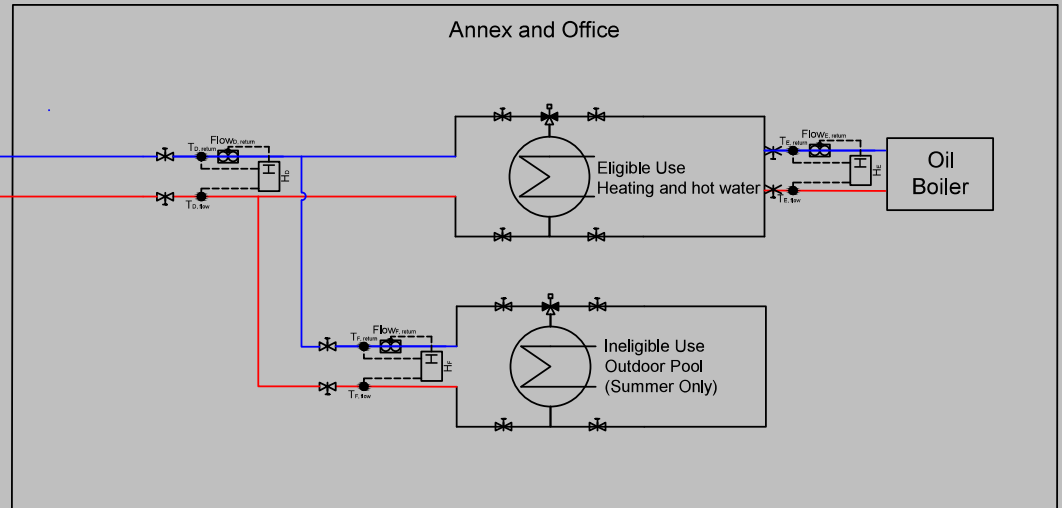
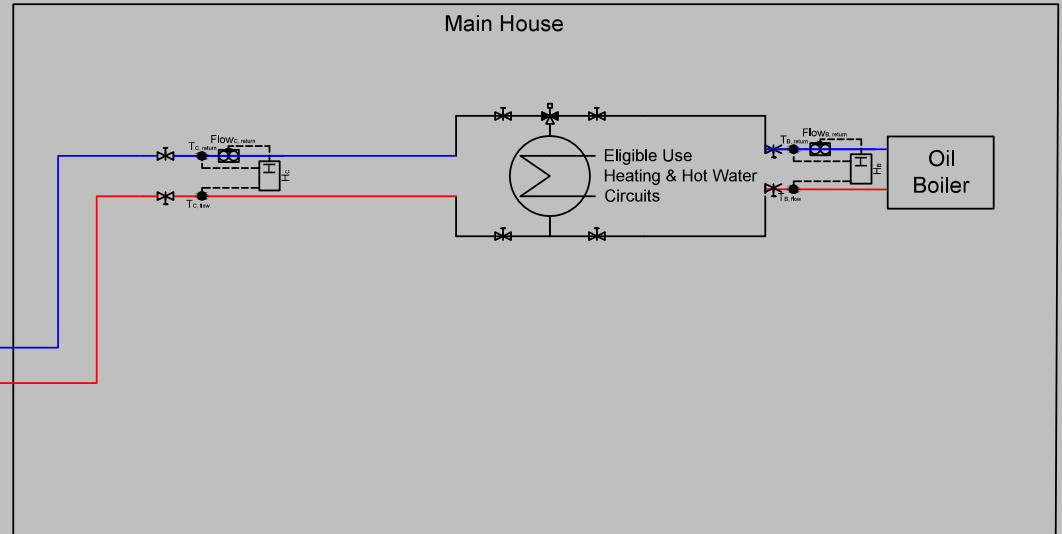
- HOW DOES IT CONNECT TO THE EXISTING SYSTEM?



# METERING



Eligible vs Ineligible



# Post Installation...

- **Controls** – Detailed ‘Handover’ running through the operating instructions and maintenance needs for the installed system.
- **Comprehensive service and maintenance packages**
- **Cost** – Minimal servicing
- **Cost** – Minimal breakdowns.
- **‘Fit & Forget’**



# Conclusion

No installation problem is insurmountable if the overall property or estate is suitable.

There is a high capital outlay BUT  
It makes *incredibly* good financial sense!!



200kW Biomass Boiler



New fuel bill £10,000 p.a



RHI : £22,500



200kW Oil Boiler



Oil £18,000 p.a



Cash back £0

## Case Study – 199kW Biomass Woodchip Boiler

An economical, efficient & environmentally compatible heating solution.



### COUNTRY ESTATE CHOOSES RENEWABLE ENERGY SYSTEM AND ALL THE BENEFITS OF A WOODCHIP BIOMASS DISTRICT HEATING SCHEME.

#### BACKGROUND

Stunning 1890's 9- bedroom manor house and estate located in the beautiful Southdowns national park area in East Sussex. The estate also includes a 2 bedroom flat, a 2 bedroom cottage and a 3 bedroom house .

#### THE REQUIREMENT

The client selected a biomass boiler to utilise both locally sourced and own woodchip produced on site. The system was to provide heating and hot water for 3 separate buildings using a single centrally located plant room and district heating system. The aim was to be fully renewable with no requirement for backup.

This private country estate has had a 199kW woodchip biomass system installed - which not only provides heating and hot water - but also generates an income from the RHI (Renewable Heat Incentive scheme.)

*Fully replaced the oil boilers in the main house and is now providing continuous heating and hot water to the additional properties on the Estate with the addition of wet systems to some buildings. Also heats large out door pool in summer months*



Base of Plant Room



Chip Shifter



199kW Boiler

*"Providing heating to all buildings across estate. Stable cottages have been without heating but they have now never been so warm. Moving towards goal of being self sustainable and generating a good income at the same time."*

#### ABOUT BAYSTAR LTD

We design, supply, install and maintain complete ground source/ biomass systems for commercial, domestic, district heating and RHI projects.

Baystar is a 'one stop shop' taking renewable projects from inception to installation, providing systems which offer real energy savings.

## Case Study – 199kW Pellet & Chip Biomass

Tenants and owner reap the benefits of biomass heating system for rural business park



**Rural business park with 40 acres of woodland – commissioned Baystar to install a 199kW pellet biomass renewable energy system incorporating a district heating scheme across part of the estate.**

A 199kW pellet boiler was installed to provide heating and hot water for four office buildings and main farmhouse whilst generating a substantial income from the RHI (Renewable Heat Incentive).

*"Part of a larger scheme to increase renewables on site. Fully replaced the electric boilers for one section of the business park and main farmhouse. Allows us to generate additional revenue from RHI payments and offer tenants lower heating bills" (Owner)*

#### Background

Well located rural business park comprising converted farm buildings set in 18 acres, with 50 acres of own adjoining woodland.

#### The Requirement

The system is used to supply heat and hot water to the four office buildings and farm house. The client wanted the option of burning either pellet or woodchip potentially sourced on site.

#### The Solution

A 199kW biomass boiler was installed. Baystar designed and erected a plant room and pellet store, also suitable for woodchip.

Two existing oil boilers were retained for back up if ever needed.



Internal view of Pellet fuel store.



Concrete slab for plant room and pellet fuel store



199kW System Kurri boiler



Plant room and pellet fuel store, designed and installed by Baystar

#### About Baystar Ltd:

We design, supply, install and maintain complete ground source/ biomass systems for commercial, domestic, district heating and RHI projects.

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# Baystar offers an unparalleled renewables service from inception to installation. Experienced installers for Europe's leading equipment.

- Renewable Consultancy Services
- System Design and Installation
- Heating Systems - Domestic & Commercial
- Full RHI service
- Country homes and estates
- Biomass- Pellet & Solid Fuel
- Heat recovery & Air Source systems
- Ground/ Lake Source Heat Pumps
- District Heating & RHI
- Solar Thermal & Photovoltaic



*Comfortable heating. With wood!*



Beechover Court  
Forest Road  
Colgate, Horsham  
West Sussex

RH12 4SY

Telephone +44 (0)1293  
851459

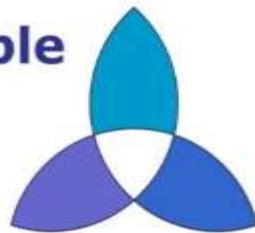
Email [info@baystar.co.uk](mailto:info@baystar.co.uk)

Web [www.baystar.co.uk](http://www.baystar.co.uk)

Baystar offers a continuous development policy and specifications may have changed since the production of this literature. Please check with Baystar for latest updates.

# Biomass and Renewable Energy

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**University of Brighton**

# Woodfuel in East Sussex

Mike Chapman  
Operations Manager  
South East Woodfuels



RHI support

Advice

Self Supply Services

















SEWF South East Wood Fuels Ltd

White sheet - SEWF copy  
Yellow sheet - Customer copy  
Pink sheet - Supply hub copy

South East Wood Fuels: Shefford, Leighton Leids  
Lagdon, East Tower, MK45 0LZ  
Tel: 0845 869 3775 Email: info@sewf.co.uk

**Delivery Note** No. 3857

Date: 11-1-15	Time: 07:45
Delivery Addr. Post Code: UK, South West	Producer / Code:
Trailer: GILPIN	Vehicle Type: ARTIC
Driver: JMC-B	Vehicle Reg: G460HBS

Wood Chip		
Moisture Content %	Average %	Grade (e.g. 050)
Sample 1		
Sample 2	30%	G50
Sample 3		
Volume (m <sup>3</sup> or %)	Total (m <sup>3</sup> )	Weight (tn)
Hardwood	47	
Softwood	Metres	
Other (e.g. mixed)		

Observations / Comments

Customer Name	Cust. Rep. Name	Cust. Rep. Signature
Signature of Driver	<i>[Signature]</i>	

www.sewf.co.uk ■ Providers of quality wood fuels to the south east  
South East Wood Fuels Ltd, Registered in England 09064791



CALL US NOW **0845 869 3775**











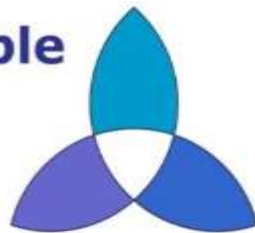


# Thanks for Listening

..we also supply wood pellets

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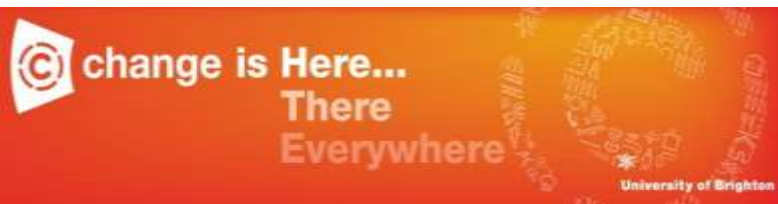


**University of Brighton**

# University of Brighton: Reducing Our Carbon Footprint

Abigail Dombey

Environmental Manager  
and12@brighton.ac.uk



**University of Brighton**



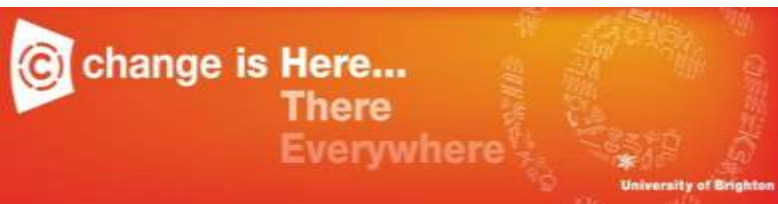
# Background

## Reasons to act:

- Minimise climate change
- Reduce consumption of resources
- Meet Government targets
- Comply with legislation
- Reduce costs
- Establish a strong brand image



...It's the right thing to do AND it makes financial sense



**University of Brighton**

# University of Brighton



Falmer, Brighton



Hastings

Moulsecoomb,  
Brighton



Grand Parade,  
Brighton

Eastbourne

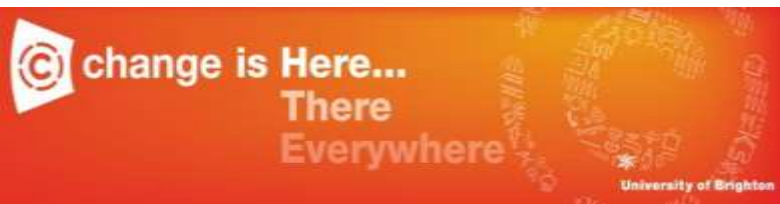


# University of Brighton Target:

**50% reduction in 5 years**

## Key aim:

To significantly reduce the carbon footprint of the university against a growing estate, without diminishing the student experience.

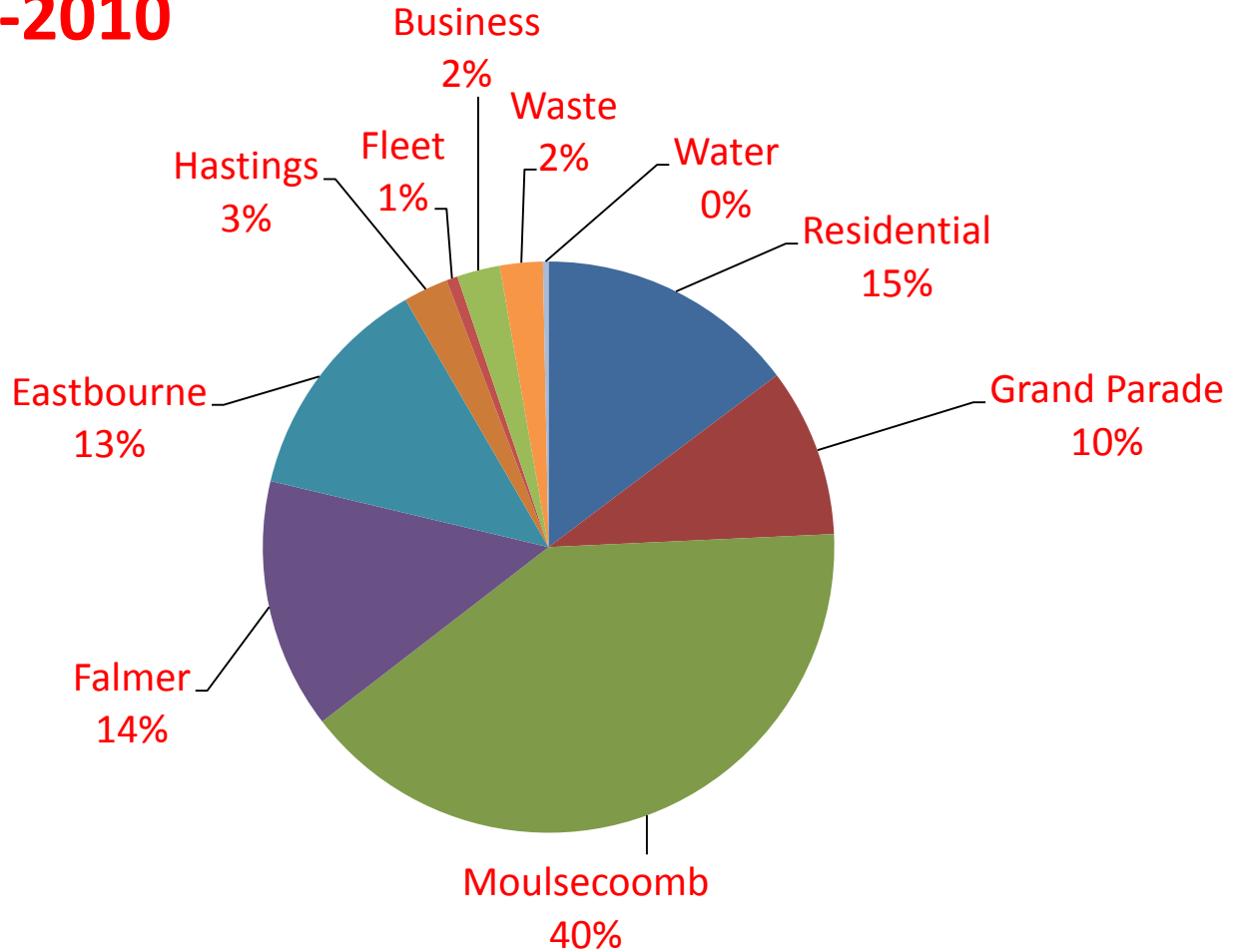


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# What is our footprint?

2009-2010

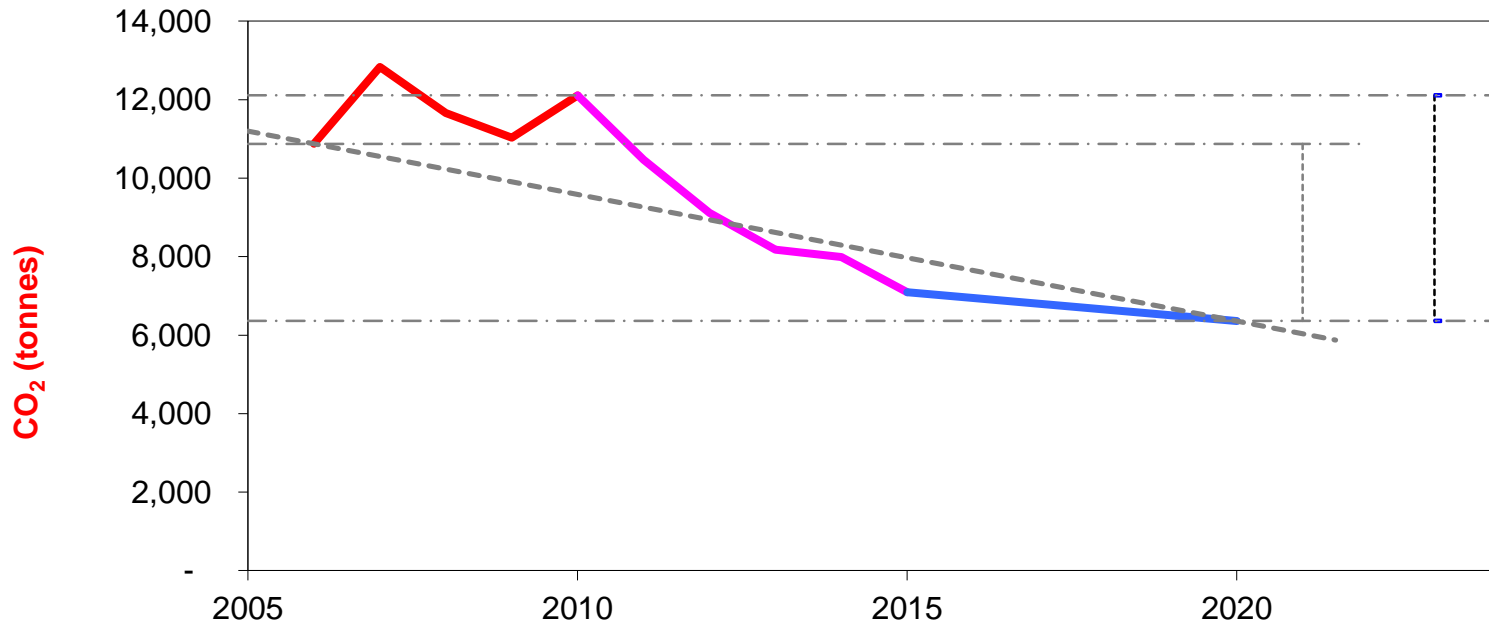


£2.2m cost  
(gas & electricity)

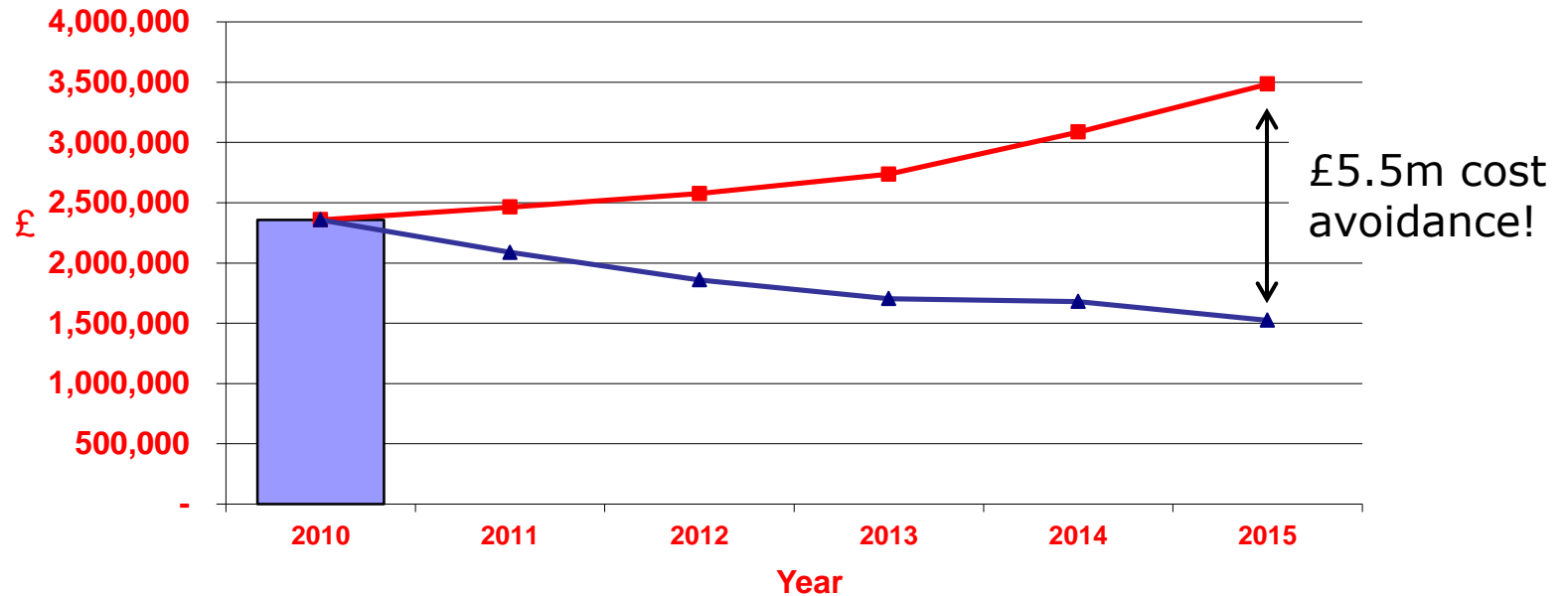
12,110 tonnes CO<sub>2</sub>

# Carbon Emissions and Targets

## Summary of Carbon Emissions and Targets



# Carbon Management Plan



Carbon  
Management  
Budget

hefce

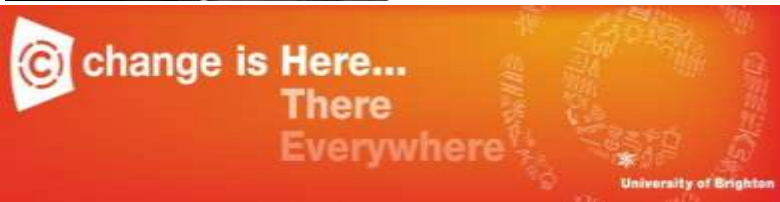
SALOX

# Energy Hierarchy

Lean: use less energy

Clean: supply energy more efficiently

Green: use renewable energy



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# Efficiency Projects (Lean)



Internal/External  
Insulation

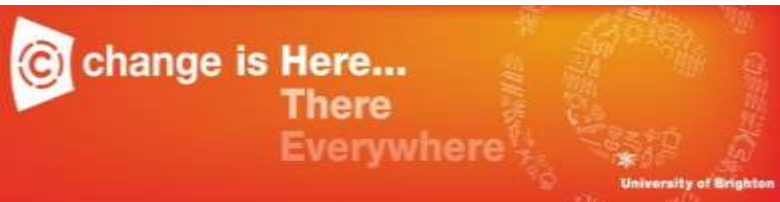
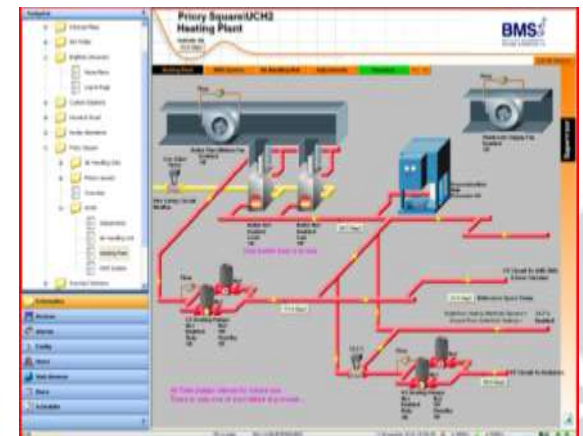
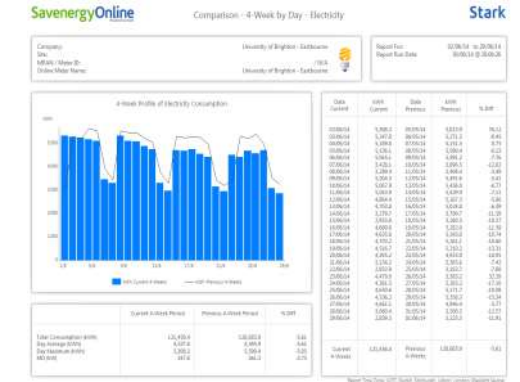
Energy Efficient Data  
Centre

PC Power Management

BMS Enhancements

Energy Metering System

Lighting Upgrades



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# Low Carbon / Renewable Energy Projects



Combined Heat & Power (CHP)  
District Heating  
Solar water heaters  
Solar PV array

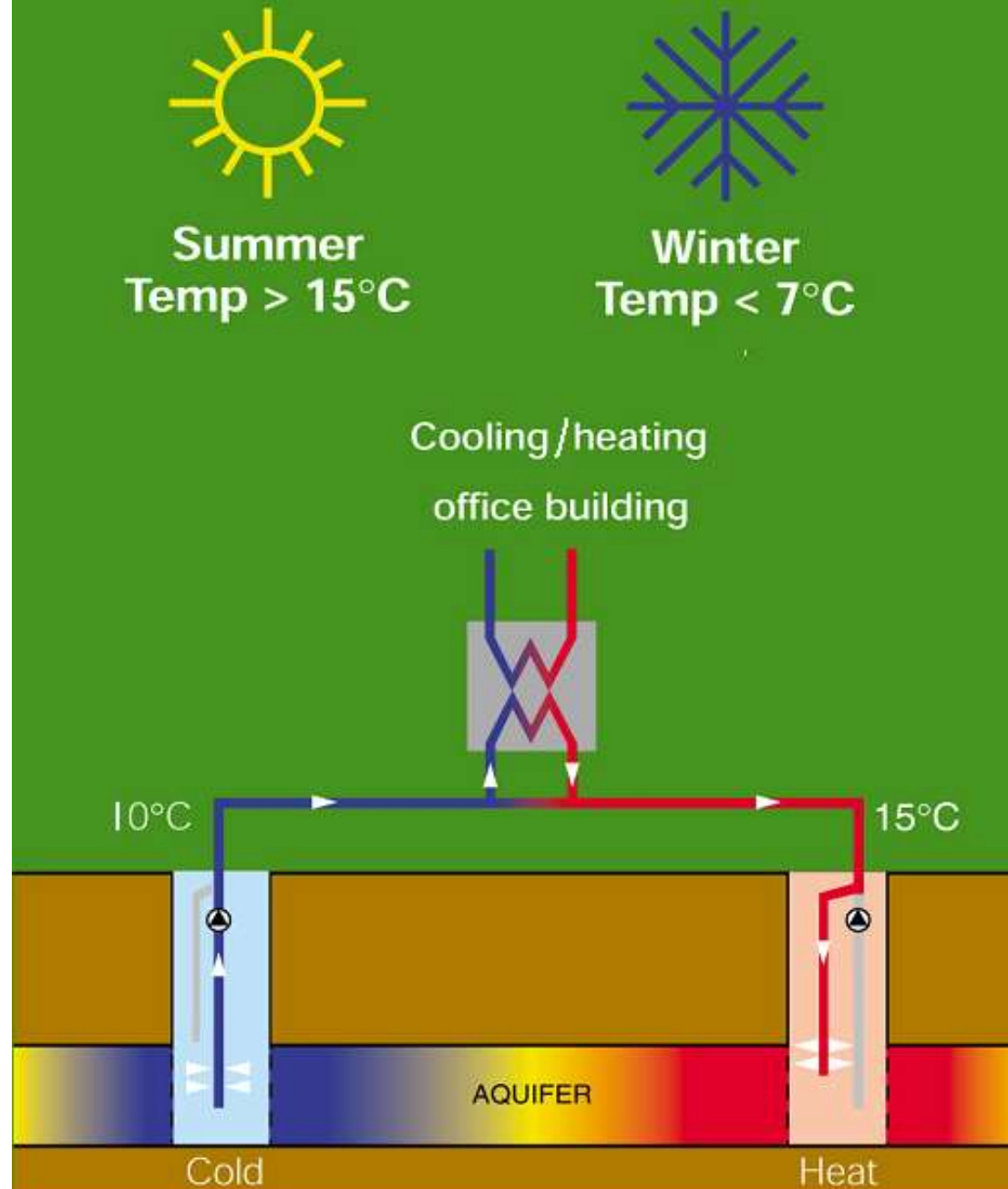


The largest generator of renewable power in Brighton

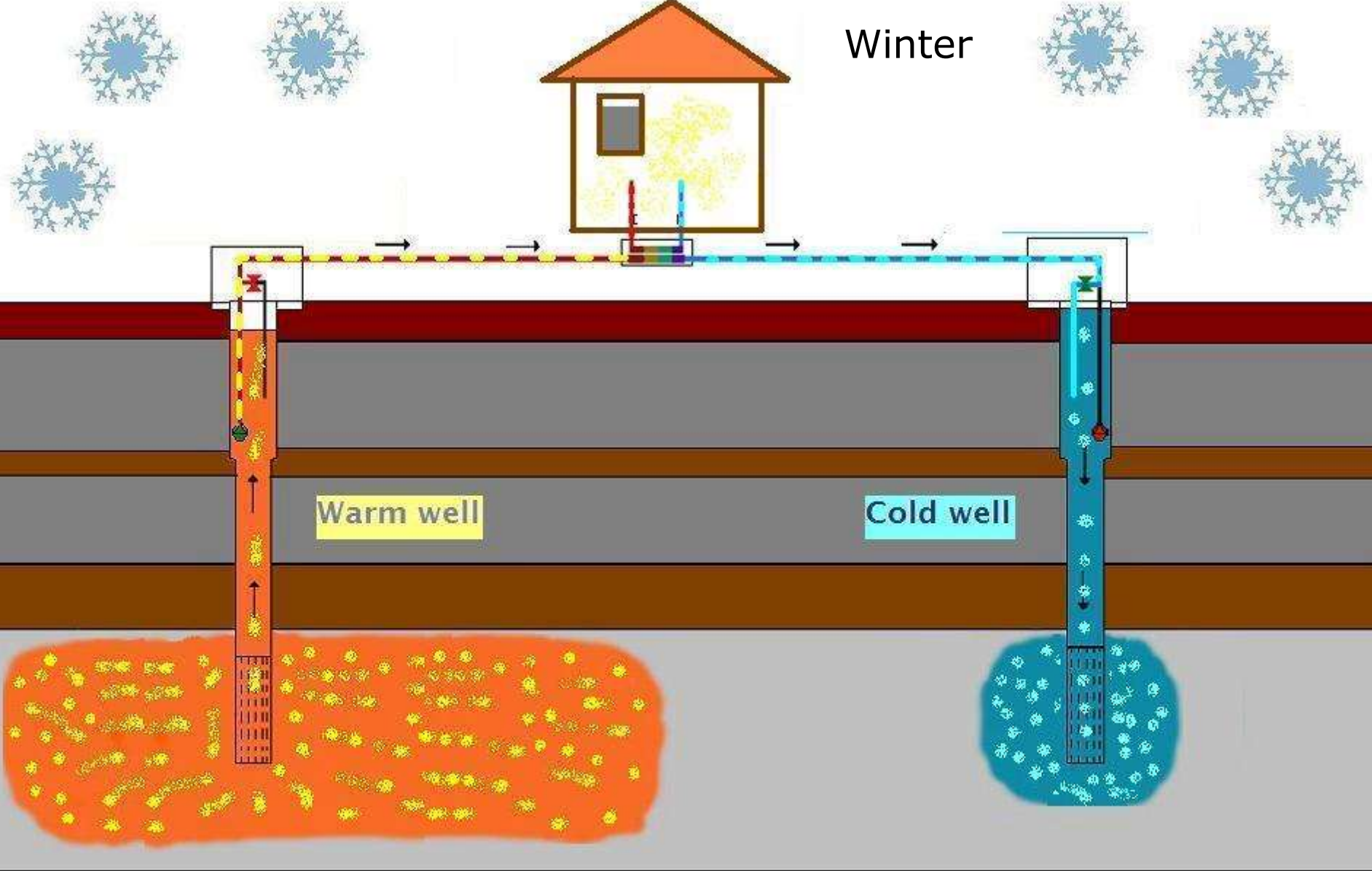


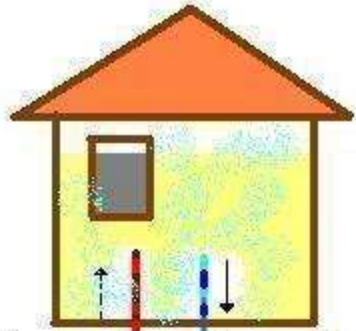
# Aquifer Thermal Energy Storage (ATES)

Groundwater is pumped between wells in winter or summer

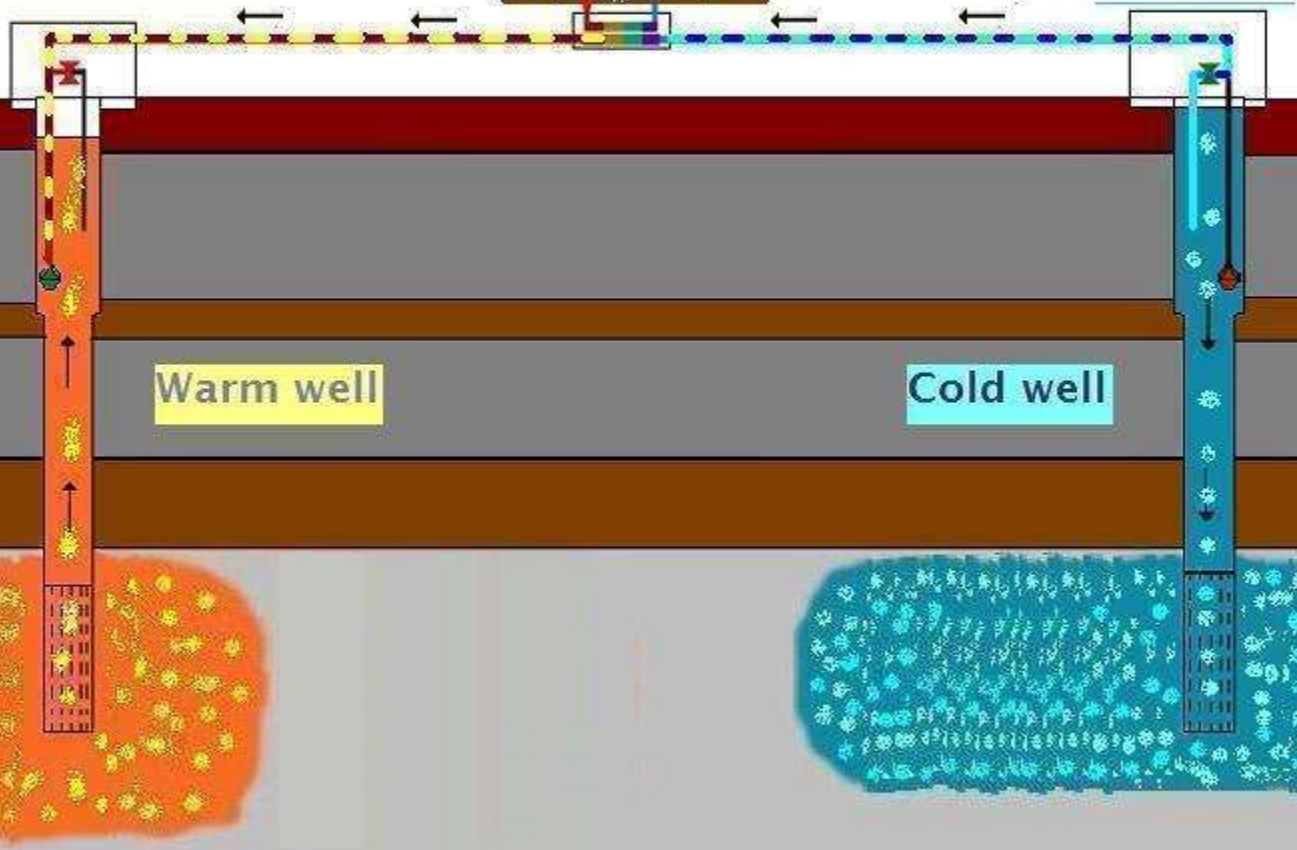


Winter





Summer



Warm well

Cold well

# Engagement Campaigns

Green  
Impact

nus

green impact

Travel Week



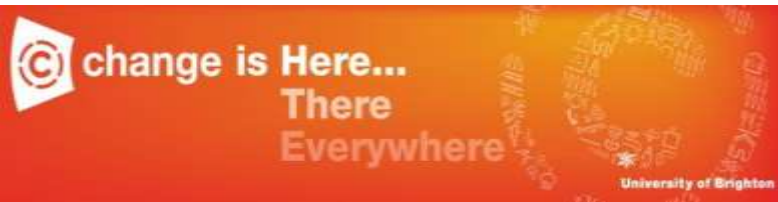
C-Change



Green Week



Staff Induction

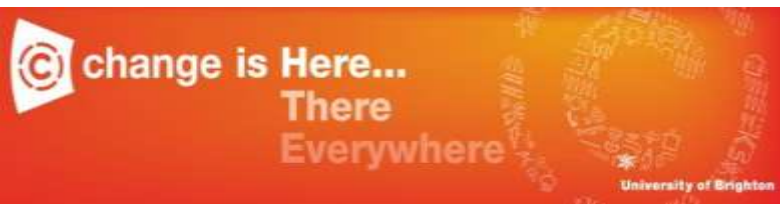


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## C-Change:

- Addresses the behavioural aspect of our Carbon Management Plan
- Launched November 2012
- Seeks to engage 3,500 staff & 22,000 students



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# Other Schemes

## Recycling / Waste Management



## Biodiversity on campus



# Outcomes



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## Summary

Senior management buy-in is crucial

Long term goals not short term fixes

Bang for your buck!

Engage with staff and students



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# Thanks for Listening

Abigail Dombey  
Environmental Manager  
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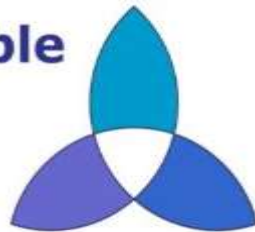
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# Round-the-Tables

Business intros...

**Sustainable  
Business  
Network**



Green**Growth**  
**PLATFORM**



**University of Brighton**

# Green **Growth** **PLATFORM**



**University of Brighton**

**Unlocking** business potential

Green**Growth**  
**PLATFORM**



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# 4 SERVICE AREAS

**1-2-1 BUSINESS SUPPORT**

**BUSINESS EVENTS AND  
OPPORTUNITIES**

**INNOVATION, RESEARCH AND  
DEVELOPMENT**

**SKILLS AND TRAINING**

**[www.greengrowthplatform.co.uk](http://www.greengrowthplatform.co.uk)**

# Join us again...

## Industry Insight Tours

Newhaven Energy-from-Waste - 10<sup>th</sup> & 24<sup>th</sup> February

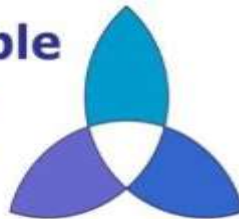
Peacehaven Wastewater - 4<sup>th</sup>, 11<sup>th</sup> & 18<sup>th</sup> March

## Raising Green Investment

Brighthelm Centre, Brighton - 25th February

[www.sustainablebusiness.org.uk](http://www.sustainablebusiness.org.uk)

**Sustainable  
Business  
Network**



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