



DUCHY *of* CORNWALL



## Carbon Report

Year Ended 31<sup>st</sup> March 2014



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# Carbon Report

## Year Ended 31<sup>st</sup> March 2014

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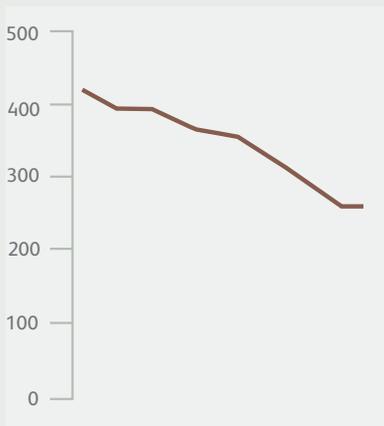
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This Carbon Report develops information presented in the Financial Statements of the Duchy of Cornwall for the Year Ended 31<sup>st</sup> March 2014 available from [www.duchyofcornwall.org](http://www.duchyofcornwall.org)

# Summary

The six year target to reduce CO<sub>2</sub> emissions by 40% by 2012 has been exceeded

The Duchy of Cornwall is fully committed to understanding and reducing its carbon footprint. It has calculated and published carbon footprint data for the last eight years. The original target of a 25% reduction on baseline by 2012 was met by 08/09 and a new target to reduce emissions by 40% on baseline by 2012 was also met. This year emissions are down to 229 tonnes carbon dioxide equivalent, a 54% reduction on baseline.



Carbon Footprint 05/06 to 13/14 - tCO<sub>2</sub>e



- 54% ▼  
Emissions since baseline
- 13% ▼  
Travel emissions
- 83% ▼  
Property emissions

## 2013/14 Performance

Overall emissions have decreased by 54% since the baseline year of 1990 – Kyoto protocol targets typically use a baseline year of 1990.

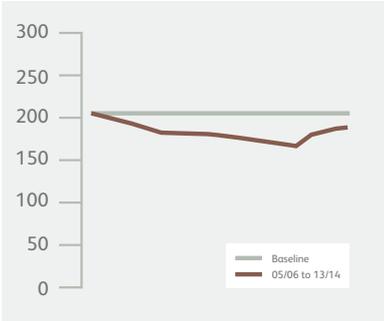
Emissions from travel have decreased by 13% since baseline, but risen slightly over the last couple of years. The decrease is mainly due to the purchase, five years ago, of a much more fuel efficient boat for the St Mary’s harbour on the Isles of Scilly, which is used both as a pilot boat and for inter-island travel. The recent increase arises from increased travel to the Isles of Scilly using longer journey fixed-wing aircraft now that the helicopter service from Penzance has ceased.

Emissions from energy used in operational properties and property which is temporarily in hand have dropped by 83% against baseline. This is partly due to the switch to renewable fuels, and partly due to a programme of works designed to convert offices to renewable heating systems or upgrade and improve the efficiency of existing systems. All offices and trading businesses purchase only electricity generated from renewable sources backed by Renewable Energy Guarantee of Origin (REGOs) certificates, and purchase gas backed by Renewable Gas Guarantees of Origin registered through the Green Gas Certification Scheme (GGCS).

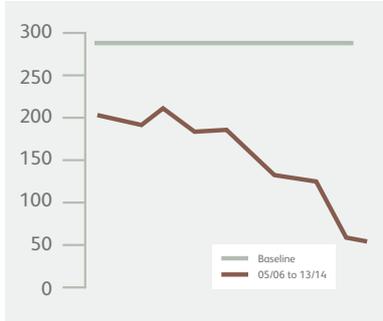
The volume of gas and heating oil consumed has fallen this year compared to last, but the volume of non-renewable electricity used has risen again. While the Duchy can control usage in the offices it occupies, when previously let properties come back in hand we need to be quicker in moving contracts to renewable fuel sources.

While there has been a very large reduction (83%) in emissions from properties, it is proving harder to reduce emissions from travel. While the average gCO<sub>2</sub>/km of cars driven by office-based staff has fallen from 167 in 09/10 to 152 this year, the number of business miles driven is static, and the total staff commute has risen, as more staff are employed.

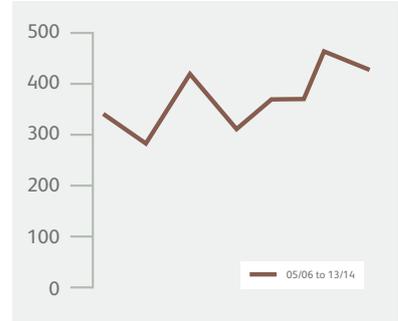
**Travel emissions**  
tCO<sub>2</sub>e



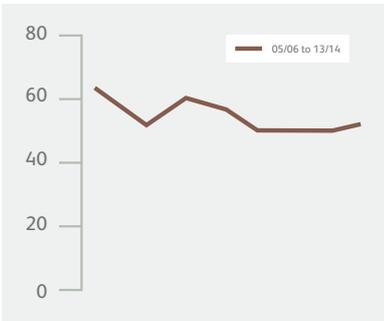
**Property emissions**  
tCO<sub>2</sub>e



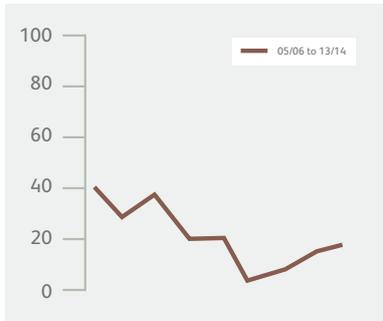
**Gas**  
MWh



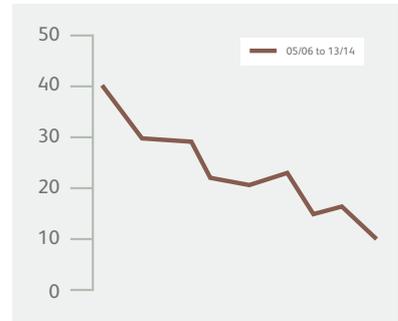
**Business miles**  
tCO<sub>2</sub>e



**Electricity**  
% brown by £



**Heating oil**  
litres, thousands



## Sequestration and renewable energy projects

10,575 tCO<sub>2</sub>  
sequestered per year

### Duchy Woodlands

The Duchy directly manages 1,761 hectares of woodlands which sequester annually an estimated 10,575 tonnes of carbon dioxide, 45 times the annual emissions from the assets and activities under the ownership and direct management of the Duchy.

It is also evident that forestry management practices can have a significant impact on the carbon sequestration potential of woodland, and the Duchy's approach is being further tailored to maximise this where this is compatible with other objectives. For example, there is a detrimental impact on a woodland's ability to absorb carbon in switching from fast growing non-native softwoods with a high annual yield (and thus carbon sequestration) to slower growing native species which are better suited to our countryside, its feel and biodiversity.



Duchy timber

Enough renewable gas produced each year for 1,800 houses

## Rainbarrow Farm Anaerobic Digester and Biomethane Plant

The Duchy is a partner and lead investor in J V Energen LLP. This partnership with local farmers has built and runs an anaerobic digestion plant. The biogas from this plant is used to generate renewable electricity and is also purified to produce biomethane which is injected in to the local gas distribution network. These energy sources are used in residential and commercial properties at the Duchy’s nearby development at Poundbury and across Dorset.

During the year the plant generated 27,789MWh of green gas for injection in to the local gas distribution network, enough for around 1,800 houses. Burning the same amount of natural (fossil) gas would have emitted 5,114 tonnes of CO<sub>2</sub>. The plant also generated 2,706MWh of renewable electricity, enough for the annual needs of over 800 houses.

The by-product of the anaerobic digestion process, digestate, is rich in organic matter and essential plant nutrients, and is spread back on land to displace inorganic fertilisers.

The project, which was the first commercial biomethane to grid plant in the UK, won the Environmental Impact Award at the 2013 Energy Innovation Awards run by the gas and electricity industry, for creating “a meaningful, lasting legacy on the energy network”. J V Energen won the Leadership Award at the British Renewable Energy Association 2013 Awards. REA Chief Executive Gaynor Hartnell said “[This] is a complex project, achieving various firsts, requiring great teamwork, conviction, and of course, demonstrating fabulous leadership.”

01. Biogas to grid plant  
02. EIC Winner Award



414MWh renewable electricity produced, enough for 125 houses

## Farm building solar panels

To date the Duchy has invested £1.1m in seven major solar photovoltaic installations on farm buildings on the Duchy estates. Over the last year these generated 362MWh, enough for the annual needs of 110 houses. The majority of the power generated is used on site, to provide power to dairies, potato and grain stores, and farmhouses. Surplus power is exported to the grid.

01. Farm building solar PV installation, Somerset  
02. Farm building solar PV installation, Gloucestershire



## Works to reduce emissions

In 2013/14 £257k was invested in renewable energy projects and works to reduce emissions

£257,000 was invested during 13/14 in renewable energy projects and work to reduce emissions. There were two major projects. A large ground source heat pump system was installed as part of a large barn conversion project. This included drilling four boreholes each over 130 metres deep. Together with a wood burning stove, it provides the four bedroom property with all its heating and hot water requirements. The Duchy has opened another holiday cottage complex, at Loskeyle, Cornwall, which uses an air source heat pump system for all heating and hot water.

There have also been a number of smaller projects, including insulation, double and secondary glazing, wood burning stoves and replacement domestic energy efficient gas boilers.



01



02



03

- 01. Drilling boreholes for the ground source heat pump, Priory Farm Barns, Newton Park Estate, Somerset
- 02. Hot water accumulator tanks for the ground source heat pump
- 03. Duchy Holiday Cottages, Loskeyle, Cornwall

## Offsetting and carbon neutrality

All emissions are offset through additional planting on Duchy land

Since it first measured its carbon footprint eight years ago the Duchy has offset the emissions from the assets and activities under its ownership and direct management. This is now undertaken through additional specific tree planting on Duchy land. The carbon credits from these plantations, two areas in Somerset, three in Herefordshire and one in Cornwall, have been verified by a third party.

Over 24 hectares has been planted, which will offset an estimated 9,600 tonnes of carbon dioxide. Surplus credits are sold at cost to sister organisations.

All new woodlands link to existing woodland habitats. Consideration is always given to improving the contribution new woods make to the landscape and biodiversity of the area. All new tree planting, including amenity and carbon offset planting, has been brought in-hand and under the Forestry Stewardship Council scheme.

# Carbon Statement<sup>1</sup>

	Baseline tCO <sub>2</sub>	09/10 tCO <sub>2</sub>	10/11 tCO <sub>2</sub>	11/12 tCO <sub>2</sub>	12/13 tCO <sub>2</sub>	13/14 tCO <sub>2</sub>
<b>Operational management</b>						
Offices, in-hand property						
Travel – business	132	79	77	81	86	95
Travel – commuting	52	56	54	49	62	63
Energy used in properties	225	106	98	100	39	30
Sub total	409	241	229	230	187	187
<b>Trading activities</b>						
Holiday lets, nurseries						
Travel – business	9	12	11	9	6	6
Travel – commuting	17	23	23	17	22	18
Energy used in properties	60	83	46	15	17	17
Sub total	86	118	80	41	45	42
<b>Total emissions</b>	<b>495</b>	<b>359</b>	<b>309</b>	<b>271</b>	<b>232</b>	<b>229</b>
Total travel related emissions	210	170	165	156	176	181
Total energy used in properties	285	189	144	115	56	47
<b>Total emissions</b>	<b>495</b>	<b>359</b>	<b>309</b>	<b>271</b>	<b>232</b>	<b>229</b>
Reduction on baseline		28%	38%	45%	53%	54%
<b>Energy used in properties</b>						
Gas - gross	54	69	72	73	89	80
Emissions reduction <sup>3</sup>	-	-	-	-	-89	-80
Gas - net	54	69	72	73	0	0
Electricity - gross	156	251	267	248	278	292
Emissions reduction <sup>4</sup>	-	-184	251	-235	-258	-265
Electricity - net	156	67	16	14	19	27
Oil - gross	75	58	56	28	37	20
<b>Total</b>	<b>285</b>	<b>189</b>	<b>144</b>	<b>115</b>	<b>56</b>	<b>47</b>

## Notes

1. This Carbon Statement presents the carbon emission data from the activities and assets under the ownership and direct management of the Duchy, and from the commuting of Duchy staff. It has been prepared in accordance with the Duchy's Carbon Reporting Policy set out below. This Policy was developed in 08/09 to provide a formal basis for the preparation of the Carbon Statement.
2. PricewaterhouseCoopers LLP provided assurance over the Duchy's 08/09 carbon emissions data. The data for the baseline and all other years has not been subject to assurance. Assurance will be obtained in future either when there is a significant change in the assets and activities of the Duchy or in general carbon reporting practice.
3. Gas emissions reductions are achieved through purchases via the Green Gas Certification Scheme of biomethane credits from the Rainbarrow Farm AD and Biomethane Plant.
4. Electricity emissions reductions are achieved through the purchase of renewable electricity generated from renewable sources backed by Renewable Energy Guarantee of Origin (REGOs) certificates.

## Carbon management – approach and performance

The Duchy of Cornwall is fully committed to understanding and reducing its carbon footprint. It has calculated and published carbon footprint data for the last six years. In 2009 the Duchy revised its Carbon Reporting Policy, extended its carbon reporting, provided further information on the work being done and obtained external assurance from PricewaterhouseCoopers on the carbon emissions data for 2009 contained in the Carbon Statement.

The Duchy estate encompasses a wide variety of assets and activities. A few are under the ownership and direct management of the Duchy, but the vast majority of the Duchy’s land and buildings are occupied and managed by tenants. The approach to carbon management and emissions reporting is determined by the nature of the Duchy’s involvement and degree of influence.

Assets and activities fall into three main categories:

### Duchy owns and directly manages

Assets and activities which are under the ownership and direct management of the Duchy include offices, trading activities, business travel and the upkeep of property which is temporarily in hand awaiting re-letting or sale. For these assets and activities the carbon emissions are measured, physical steps are taken to reduce them, and performance targets are in place. For the purposes of reporting, although it is not directly controllable by the Duchy, commuting undertaken by Duchy staff is also included in this category. Emissions from this category of assets and activities are offset.

### Duchy provides and manages infrastructure, tenant in occupation

Properties where the Duchy provides the building infrastructure but tenants are in occupation. The Duchy is able to take steps to influence the carbon impact through the design and facilities provided, but cannot exercise any direct control over the tenant. Work is underway to assess this area, and to determine where the biggest impact can be made. A condition survey of all Duchy buildings is now complete, and will lead to a programme of works to address, inter alia, the energy efficiency of these buildings. Work is already underway in this area.

### Properties and land occupied and managed by tenants

Properties and land which are occupied and managed by tenants, in particular farms and commercial premises. In these cases the Duchy can only influence tenants through encouragement, co-operation and incentive. There are a number of programmes in place to encourage the tenants and related communities to adopt certain land management, animal husbandry and business practices.

The Duchy recognises that it can play an active role in developing an improved understanding of the carbon impact of different land management techniques. As a result the Duchy continues to be active in various collaborative initiatives. These include working with a number of Duchy tenants to undertake farm carbon footprint audits; part-funding a research project on upland peat bogs and their response to climate change and the bogs’ ability to contribute positively to carbon sequestration and water management; and developing an understanding of the carbon impact of soil management, and how best this can be shared with those who manage its land.



*Twin Windhager wood pellet boilers and pellet store, Park Farm, Newton Park Estate, Somerset*

## Carbon reporting and emissions factors

Since carbon footprint work began in the Duchy, use has been made each year of the latest conversion factors supplied by the UK Government. The most recent update was in May 2014. Data is taken from the Greenhouse Gas Conversion Factor Repository. This tool was developed by Carbon Smart using 2013 conversion factors calculated by Ricardo-AEA under contract to the government.

In 2010 indirect emission factors (also known as fuel cycle or well-to-tank emission factors) associated with the production of fuels were added by Defra, who used to publish the conversion factors. Prior to this, emissions factors were only provided for direct emissions of CO<sub>2</sub>, with the other greenhouse gases methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) added in 2009. Having taken external advice, and in line with common practice, the Duchy just uses direct emissions factors. The inclusion of indirect emissions factors would render the 2011 to 2014 data inconsistent with previous years' data and baseline. The alternative would have been to restate all history and baseline: the trend over time and proportionate reduction on baseline are unlikely to vary whichever route is adopted.

## Carbon footprint measurement

Kyoto protocol targets typically use a baseline year of 1990. By taking the first year of the Duchy's calculated carbon footprint and including material changes in energy use the baseline emissions figure was determined to be 495 tonnes. In line with the Household of Their Royal Highnesses The Prince of Wales and The Duchess of Cornwall, a target was set to reduce emissions by 25 % by 2012. The Duchy met this target by 2009, and a new target to reduce emissions by 40 % on baseline by 2012 was set, and exceeded. This year, with emissions down to 229 tonnes carbon dioxide equivalent, there has been a 54 % reduction on baseline.

## Energy used for business travel and staff commuting

The carbon footprint of the commuting and business travel of each member of staff is calculated and this information is shared with the staff. It is important for Duchy staff to travel on the estate, to manage the land and to work with tenants, but every effort is made to keep travel to a minimum by lift sharing and well planned journeys. Based mainly in the countryside, public transport is rarely a viable option, but for longer distances good use is made of the rail network.

Various projects and policies are helping to control the carbon dioxide emissions from travel: capping mileage

reimbursement rates at the HMRC 2000cc band and not paying the higher rates for cars with larger engines; trialling the use of 100 % biodiesel produced in the UK from waste vegetable oils; implementing a cycle to work scheme.

## Energy used in properties

The Duchy operates out of seven offices, in London, Bath, Liskeard, Princetown on Dartmoor, in Herefordshire, on St Mary's, Isles of Scilly, and at Poundbury. Most of the offices are in old, and often listed, buildings. This presents challenges for reducing the carbon footprint of these buildings.

Since the Duchy began to look at its carbon footprint the following initiatives have been undertaken: All offices and trading businesses purchase only electricity generated from renewable sources backed by Renewable Energy Guarantee of Origin (REGOs) certificates, and purchase gas backed by Renewable Gas Guarantees of Origin registered through the Green Gas Certification Scheme (GGCS); the old oil boiler in the office in Herefordshire has been replaced with a ground source heat pump, reducing emissions by around nine tonnes of carbon dioxide per year; two other offices have had their gas boilers replaced with high efficiency condensing gas boilers, and further upgrades are planned; a 2.3kWp solar photovoltaic array has been installed on the roof of the office near Bath; the major redevelopment of Restormel Manor has at its core a woodchip boiler which provides heat and hot water to all nine holiday lets as well as to the new Restormel Estate Office, which replaced the old Duchy office in Liskeard; at the Duchy Nursery at Lostwithiel in Cornwall heating of the new greenhouse and the retail areas is now managed through a wood pellet boiler, replacing an oil fired system.



GGCS Certificate

## Carbon Reporting Policy

This Carbon Reporting Policy (CRP) supports the preparation and reporting of the Carbon Statement of the Duchy of Cornwall for the year 1<sup>st</sup> April to 31<sup>st</sup> March. The CRP formalises and extends prior years' reporting arrangements building on initial work completed in 2006. The CRP focuses exclusively on the accounting and reporting of carbon emissions; it does not cover financial accounting and reporting policies.

In preparing the CRP, consideration has been given to the World Resources Institute / World Business Council for Sustainable Development Greenhouse Gas Protocol: A Carbon Reporting and Accounting Standard, March 2004 as well as the Accounting Standards Board Statement of principles for financial reporting and other generally accepted reporting and accounting principles. The most pertinent are with respect to:

### Information Preparation

The primary principles are relevance (to users) and reliability (taking into account purpose) including completeness and material accuracy.

### Information Reporting

The primary principles are comparability / consistency (with other data including prior year) and ease of understanding / transparency (clarity to users).

## Carbon Reporting Policy – Scope

The Carbon Statement includes carbon dioxide emissions arising from assets and activities under the ownership and direct management of the Duchy of Cornwall. This is divided into two parts.

### Operational management

The Duchy operates out of seven offices, in London, Bath, Liskeard, Princetown on Dartmoor, in Herefordshire, on St. Mary's, Isles of Scilly, and at Poundbury. Also included is property which is temporarily in hand awaiting re-letting or sale. These in hand properties are included for the period of time which they are vacant.

Operational travel includes the travel of the staff employed by the Duchy that is required to complete their duties. This includes business miles driven by car (including private cars, Duchy owned vehicles and hire cars), travel by train and taxi; as well as boat and air travel, mainly incurred in travel to and from the Isles of Scilly.

## Trading Activities

Properties included within trading activities include the Duchy Nursery at Lostwithiel in Cornwall (and, in some prior years, Close Nursery near Tetbury), 23 holiday let cottages (the remaining two fall under the remit of the Prince of Wales's Office) and in hand woodlands. The latter comprise those woodlands which are managed by the Duchy and used for carbon offset purposes as well as for sourcing timber materials including wood chip.

Travel associated with trading activities includes the travel of the specific staff involved with the operation of the commercial premises managed by the Duchy. It also includes the emissions from the estate maintenance vehicles owned by the Duchy operated on Duchy managed land.

## Carbon Reporting Policy – Inclusions and exclusions

In the majority of cases, refurbishment and development of Duchy owned properties are undertaken during periods when the property is in hand. Energy used during this work would therefore typically be included in the data. Where property is sold for development by a third party, for example at Poundbury, these are considered as third party emissions and are not collected by the Duchy. Commuting data is reported for all Duchy employees. Data from other third party activities is not collected by the Duchy.

## Carbon Reporting Policy – Conversion factors

The carbon dioxide emissions associated with the activities noted above have been determined on the basis of measured or estimated energy and fuel use, multiplied by relevant carbon conversion factors. The methods for estimating energy and fuel use and the sources of carbon conversion factors are detailed below.

Carbon conversion factors for the current year have been taken from the Greenhouse Gas Conversion Factor Repository from the gov.uk website, developed by Carbon Smart using 2013 conversion factors calculated by Ricardo-AEA. The only exceptions to this are for helicopter journeys to and from the Isles of Scilly (not applicable in 13/14) and for a few car models where an actual emissions figure is not known. Carbon conversion factors for all previous years are those used for reporting in that year – prior year data has not been restated and any variance would be small.

*Stantonbury Hill, Somerset*

## Carbon Reporting Policy – Reporting Methods – Travel

### Business travel

This includes emissions from the Duchy's vehicles, staff owned vehicles, hire cars, trains, boats, taxis, planes, helicopters and Estate maintenance vehicles. Travel data is obtained from the personal expense claim system and invoicing system which are retained in the accounts reporting system and consolidated through the carbon reporting processes. The journey details, including distance and/or fuel consumed are used as a basis for determining emissions.

For a small number of journeys, insufficient data is available from the expense records to confirm the mode of travel and/or distance travelled. However, the cost of these journeys is known so an estimate for the associated emissions has been included in the total based on the average emissions per £ of travel from journeys where precise details are known.

The distance of taxi journeys is not recorded in the expense records. Emissions have been estimated based on the total cost of travel.

Conversion factors are taken from the Greenhouse Gas Conversion Factor Repository as above, with the exception of the factors used for individual car models which are taken either from the car manufacturers or from the Vehicle Certification Agency.

For planes and helicopters, travel data is similarly obtained through the invoicing system. For scheduled flights carbon conversion factors for domestic and international (short and long haul) flights are taken from the Greenhouse Gas Conversion Factor Repository as above. For helicopter journeys to and from the Isles of Scilly (not applicable in 13/14), emissions are calculated based on the type of helicopter, its engines and flight patterns.

The travel data includes the mileage from the Duchy vehicles which use biodiesel and electricity. Using the quantity of biodiesel sold and the annual mileage in the electric car, the contribution for these sources is determined and credited. The conversion factors used are those for mineral diesel and a medium sized car respectively.

### Staff commuting

This includes the carbon emissions from staff commuting based on an annual staff survey. Emissions are calculated on the basis of the distance travelled, mode of transport, and each individual's own estimation of the number of commutes undertaken annually. Where the make and age of car is known specific emission factors are used. Where these details are not known a nearest equivalent is used or the average fleet value.

## Carbon Reporting Policy – Reporting Methods – Energy

### Electricity

Includes electricity supplied via the Grid and used by the Duchy at the properties within the scope of reporting. Electricity consumption is obtained from invoices from suppliers. Emissions are calculated on the basis of energy consumed multiplied by the relevant conversion factors, including application of a zero emission rating for green tariff supplies generated from renewable sources backed by Renewable Energy Guarantee of Origin (REGOs) certificates.

### Gas

Includes all mains and other gas supplied to the Duchy. Gas consumption is obtained from invoices from suppliers. Gross emissions are calculated on the basis of total mains gas and gas deliveries multiplied by the conversion factors. These emissions are offset via the purchase of Renewable Gas Guarantees of Origin via the Green Gas Certification Scheme (GGCS) administered by Renewable Energy Assurance Ltd.

### Oil

Emissions are calculated on the basis of oil delivered multiplied by the conversion factors, with adjustments for opening and closing stock where material.

In the case of all energy sources 12 months data is used. For electricity and gas the invoicing year does not fully match the reporting year of 1<sup>st</sup> April to 31<sup>st</sup> March. The difference in reporting periods is not considered to have a material impact on the reported consumption data.



# Carbon Report

Year Ended 31<sup>st</sup> March 2014

[www.duchyofcornwall.org](http://www.duchyofcornwall.org)

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