Biopropane
for the off-grid sector

Energy and Utilities Alliance (EUA)

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Executive Summary

Previous attempts to reduce the carbon footprint of the off-gas grid sector have been limited in their success. Despite noble intentions, the Renewable Heat Incentive (RHI) has only encouraged limited uptake of new heating technologies. Using information from the English Housing Survey and the National Energy Efficiency Data Framework, EUA have explored the energy efficiency of the on and off grid sectors of the British housing stock.

This paper also highlights the misleading nature of the SAP methodology for assessing the energy efficiency of homes. Since it takes into account the cost of fuels, it provides a biased view of the true energy efficiency and environmental impact of a home. As a result, this paper reiterates EUA's call for a review of the SAP mechanism, which would result in a fuel cost neutral methodology that better reflects the environmental benefits of new technologies.

Having identified the heightened need for carbon reduction in the off-grid sector, we propose biopropane as an option for homes that currently use LPG as their primary heating fuel. Unlike the technologies proposed under the RHI, this would be minimally disruptive for homeowners as they would be able to continue using their current heating system.

By considering the cost implications and carbon savings of supporting the incremental introduction of biopropane, we conclude that this would be a sensible policy option in the LPG heating sector. Doing so would reduce carbon emissions from residential LPG use to just 17% of current levels. Moreover, **our analysis demonstrates that biopropane could reduce carbon at approximately 40% of the cost to Government of the current RHI.**

This paper has been prepared by the Energy and Utilities Alliance (EUA).

Founded in 1905, the Energy and Utilities Alliance (EUA) is a not-for-profit trade association that provides a leading industry voice to help shape the future policy direction within the energy sector. Using its wealth of expertise and over 100 years of experience, it acts to further the best interests of its members and the wider community in working towards a sustainable, energy secure and energy efficient future.

Introduction

When discussing the energy efficiency of British homes, it is often left unmentioned that **a significant number of British homes have no mains gas provision**. Although 92% of all homes in Great Britain have a connection to the gas grid, mains gas is the primary heating fuel for only 83% of households. The remaining households rely on liquefied petroleum gas (LPG), heating oil, solid fuel or electricity to provide their heating needs.

Of the recent government energy efficiency schemes, the Renewable Heat Incentive (RHI) was the only one aimed directly at off-grid homeowners (although the scheme was also open to those on the gas grid) and provided incentives to invest in renewable heating technologies, namely air and ground source heat pumps, biomass boilers and solar thermal systems.

Between April 2014 and October 2015, a total of 31,477 accreditations were given to RHI installations in off-grid households. Of these, just 1,714 were installations where LPG heating was displaced by a renewable technology (a further 231 were solar thermal systems, which will be used alongside the existing LPG heating).

Despite these less than impressive deployment statistics, the RHI is a relative success story for energy efficiency in the rural off-grid sector.

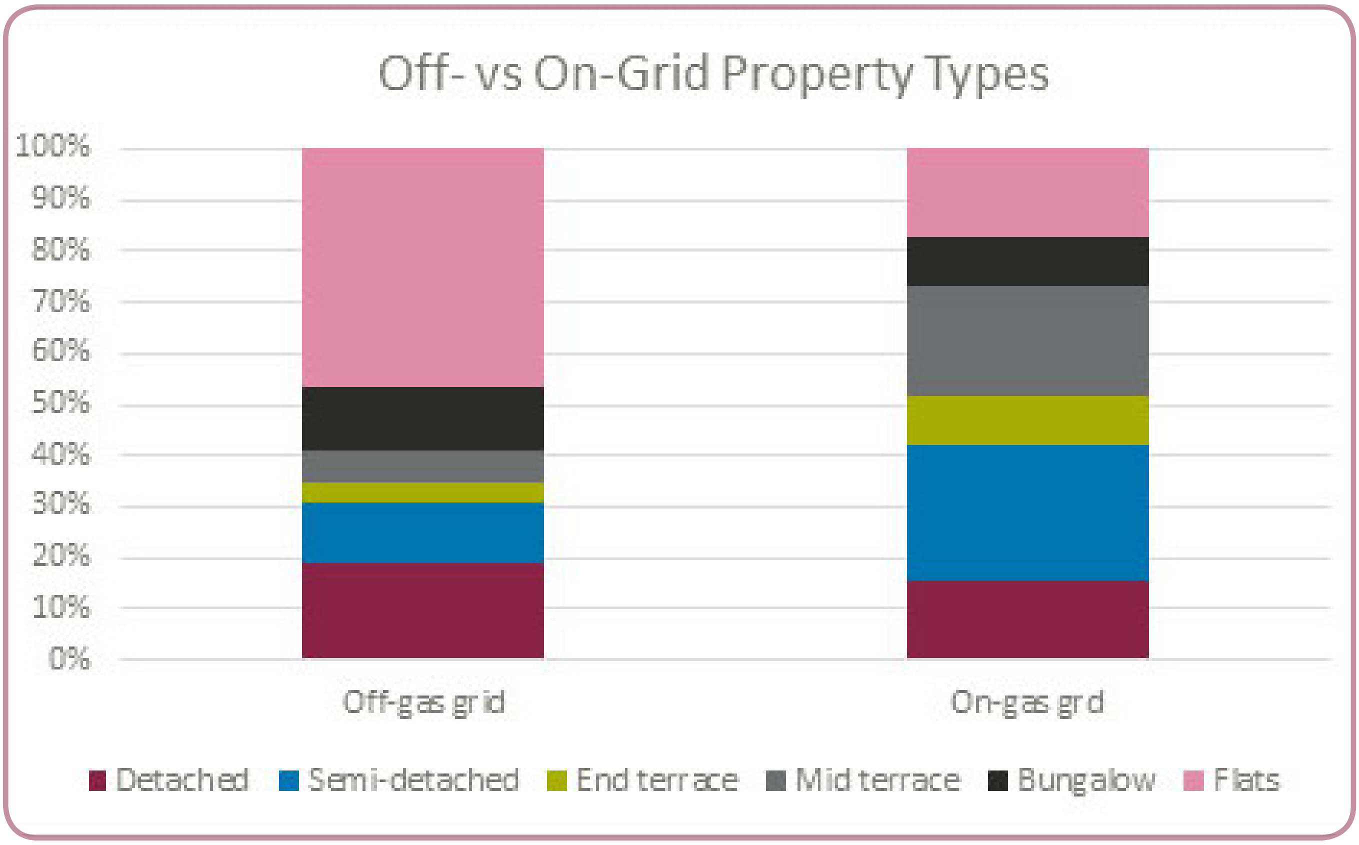
The one consistent feature of the litany of previous Government energy efficiency schemes (CERT, CESP, ECO, GDHIF etc.) has been their inability to promote energy efficiency measures in the rural off-grid sector. [1]

This paper outlines one way that a new technology could reduce carbon emissions from this sector: namely the use of biopropane in place of LPG.

It begins with a brief exploration of the energy efficiency and heating systems of off-grid homes; highlighting why the issue of off-grid energy efficiency needs to be addressed, before detailing the carbon savings that could be made through the use of **biopropane as a heating fuel**.

Off-Grid Housing Stock

This paper uses the National Energy Efficiency Data-Framework[2] to assess the energy efficiency of the off-grid housing sector and data from the English Housing Survey/ Consumer Focus[3] to identify the heating systems within these homes.



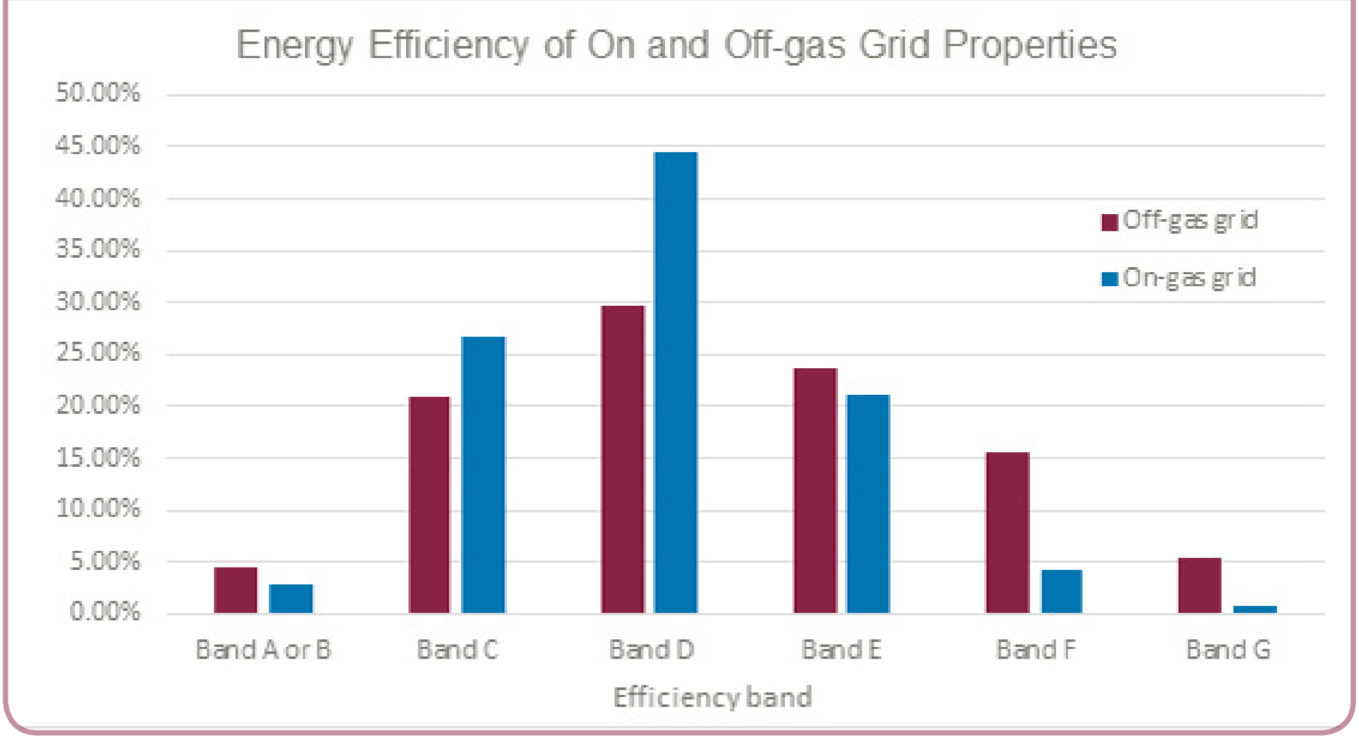
Property Types

Over 45% of off-grid homes are flats, compared with 15% of their on-grid counterparts. Contrary to the stereotypical view of remote and rural off-grid properties, the majority of these flats will be in urban areas.

We also find that detached households are marginally more common off-grid than on. The preponderance of flats off-grid is one possible reason that the RHI did not have the desired impact – GSHPs, ASHPs and biomass boilers typically take up more space than more traditional heating systems, making them less suitable for use in flats.

Energy Efficiency

There is a great deal of variation in energy efficiency between off-grid and on-grid homes. Only 0.7% of on-grid homes receive a "Band G" energy rating – the lowest possible – yet this rating is given to 5.5% of off-grid homes. Overall, nearly half (44.9%) of off-gas grid homes receive one of the three least efficient ratings (E, F and G) compared with only a quarter of (26.0%) on-gas grid homes.



However, it should be noted that the RdSAP methodology penalises buildings that use more expensive fuels. Given the higher prices of oil, LPG, solid fuel and electricity, compared with mains gas, off-grid properties receive lower energy efficiency ratings than similar mains gas properties.

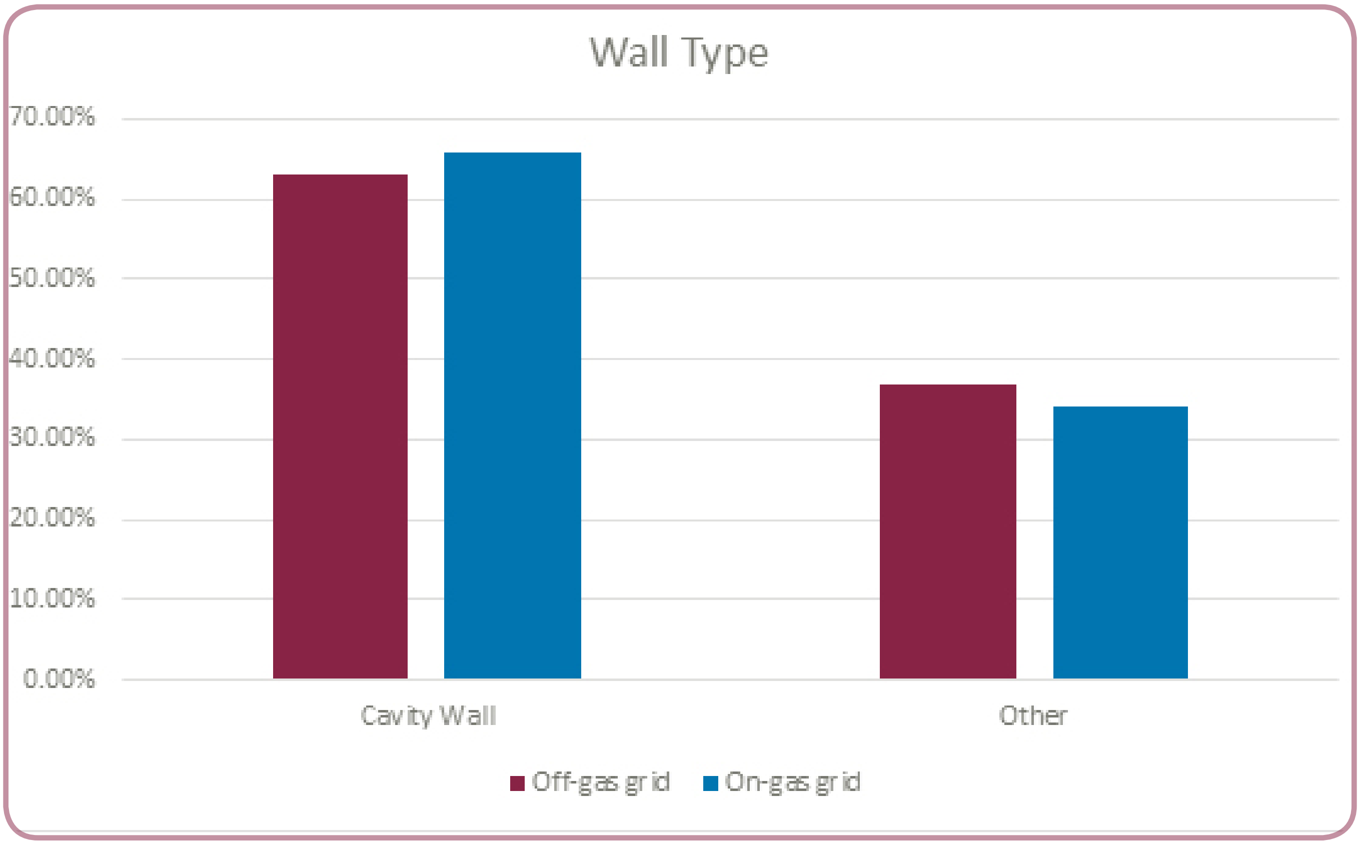
As detailed in EUA's manifesto, "A prescription for UK energy"[4], it is strongly recommended that the SAP methodology should be reviewed, in order to allow for energy efficiency ratings that allow for more meaningful comparisons of energy efficiency.

The next section of this analysis explores if these lower efficiency ratings are a result of expensive fuels or if some of the variation can be explained by lower insulation levels.

Insulation

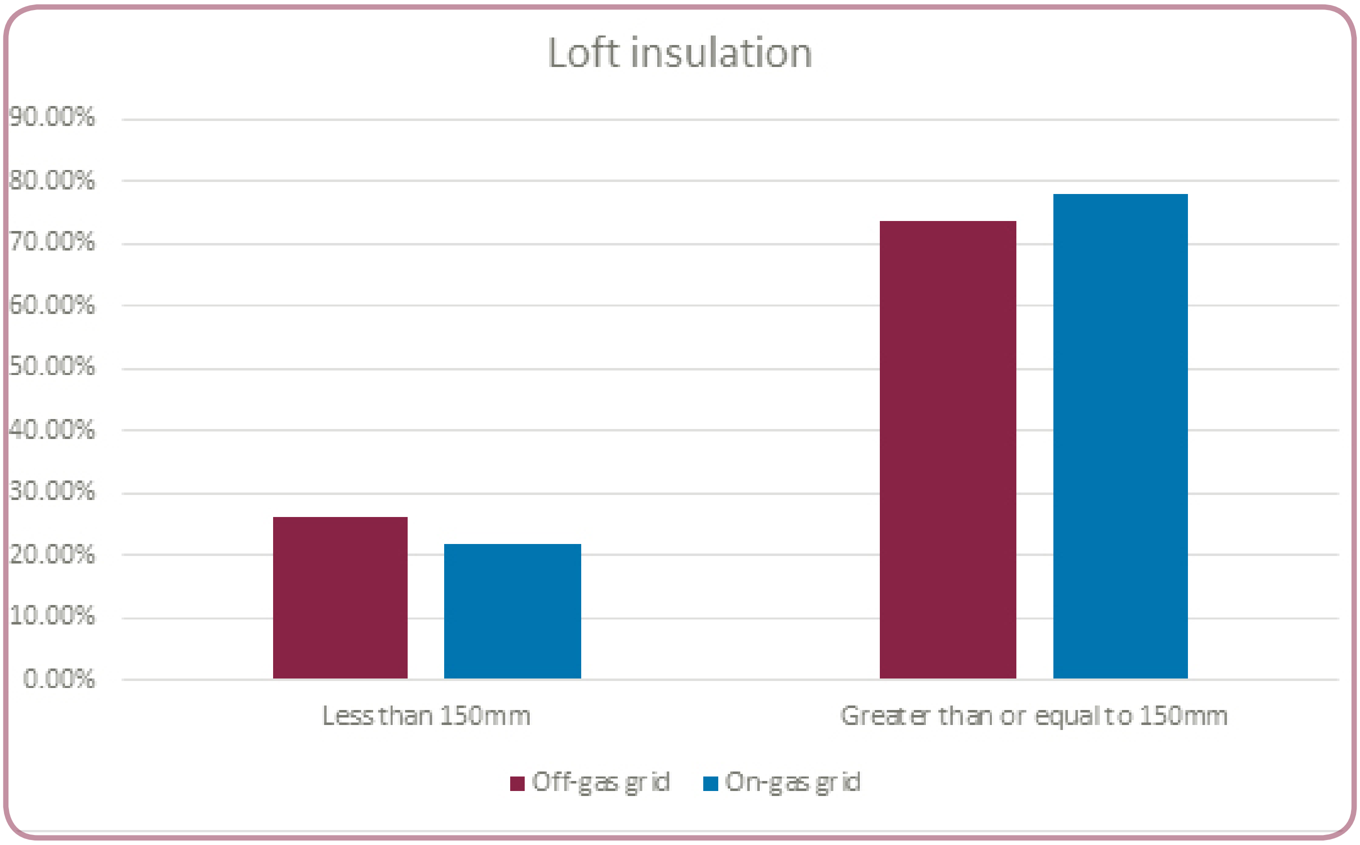
As mentioned previously, off-grid homes are penalised with lower energy efficiency ratings since they are handicapped by heating systems that use more expensive fuels. To check if these low ratings are purely a result of heating fuel, it is useful to compare the insulation levels found in homes across the two sectors.

Solid walls are slightly more prevalent in off-grid homes than their on-grid counterparts - 37% compared with 34%. On-grid homes with cavity walls are found to be twice as likely to have cavity wall insulation as off-grid homes with cavity walls.



37% of off-grid homes have solid walls, compared with 34%. of their on-grid counterparts

Off-grid homes are also shown to have slightly lower levels of loft insulation - 78% of on-grid homes have over 150mm of loft insulation, compared with 73% off-grid.



These figures suggest that the poorer energy efficiency ratings of off-grid homes do not arise solely because alternative fuels are penalised in EPC calculations.

As previously mentioned, this is no surprise given the inability of various government schemes to address energy efficiency in the off-grid sector. As explained in more detail by Calor in the 2013 Labour Party Hot Book[5], it is clear that more needs to be done to rectify this failing.

73% of off-grid homes have over 150mm of loft insulation

Off-Grid Heating

All Households

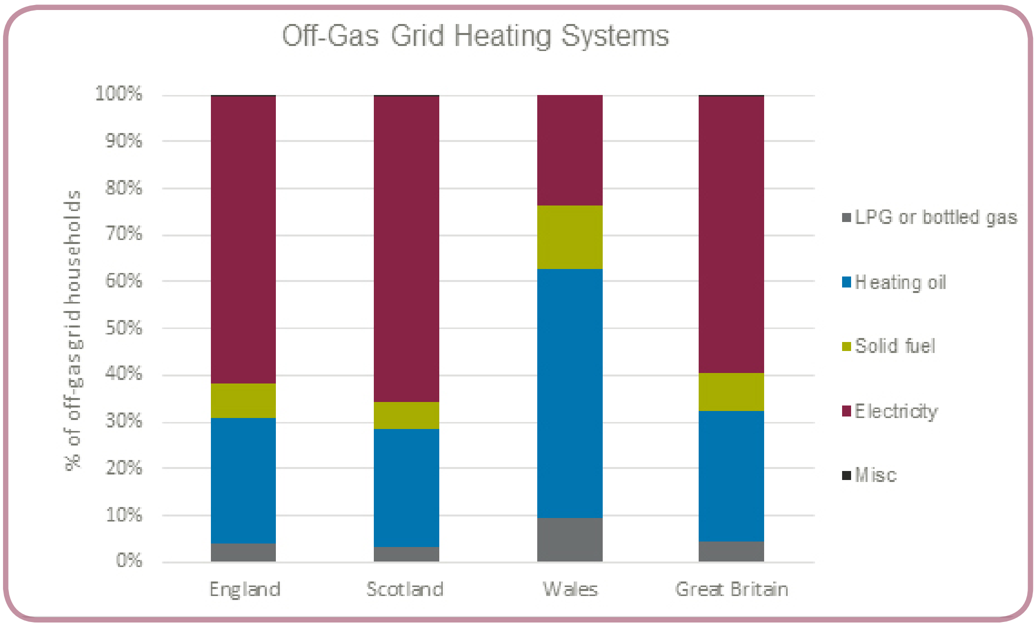
Before discussing the potential application of biopropane, it is useful to outline the heating systems currently in use throughout Great Britain. Despite 92% gas grid coverage, only 83% of homes use mains gas heating. Grid coverage is lower in Scotland and Wales than in England – 86%, 85% and 93% respectively. Consequently, mains gas heating is also less prevalent in Scotland and Wales than in England – 76%, 79% and 84%. It should be noted that data from Northern Ireland were not available in this format, hence her exclusion from this table. Anecdotally, the Northern Irish gas grid is much less extensive than that of Britain, so the use of oil and LPG will be widespread.

	England		Scotland		Wales		Great Britain	
	000s	**%**	**000s**	**%**	**000s**	**%**	**000s**	**%**
Total on mains gas grid	19,872	92.8	2,013	86.4	1,079	85.1	22,964	91.8
Mains gas heating	18,031	84.2	1,773	76.1	996	78.5	20,779	83.2
Communal heating	262	1.2	16	0.7	5	0.4	283	1.1
LPG or bottled gas	128	0.6	18	0.8	25	2.0	171	0.7
Heating oil	828	3.9	135	5.8	143	11.3	1,106	4.4
Solid fuel	240	1.1	33	1.4	37	2.9	310	1.2
Electricity	1,919	9.0	354	15.2	63	5.0	2,336	9.3
Misc	5	0.0	1	0.0	0	0.0	6	0.0
All non-gas heating fuels	3,120	14.6	541	23.2	268	21.1	3,929	15.7
Total households	**21,407**	**100.0**	**2,330**	**100.0**	**1,268**	**100.0**	**25,005**	**100.0**

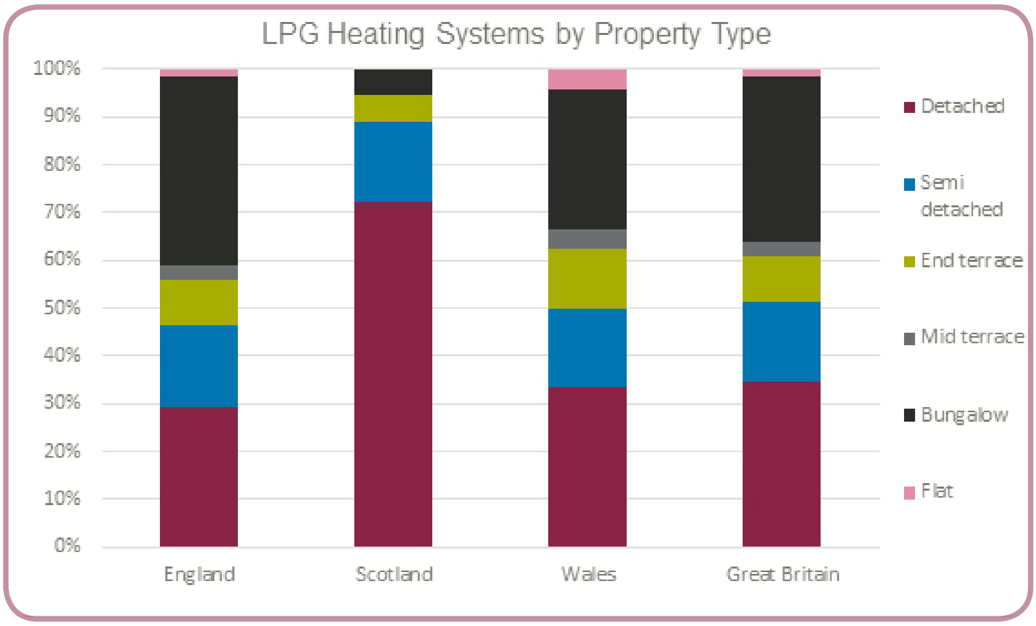
Of those households without mains gas heating, electric heating is the most common alternative and is found in 9.3% of British homes. Heating oil boilers can be found in 1.1 million homes throughout Britain and are particularly common in Wales, where they provide heating for 11% of homes.

Of particular interest to this paper are the estimated 171,000 British homes using LPG boilers to heat their homes.

LPG heating is most prevalent in Wales, where it is found in 2% of all homes, followed by Scotland (0.8% of homes) and England (0.6%) of homes.



As would be expected, the type of heating system varies between different property types. LPG heating is most often found in bungalows, detached and semi-detached houses. These property types are typically larger than other properties and will therefore have a higher heat demand.



Biopropane

Traditionally, LPG is comprised of propane or butane, which are typically produced as a by-product of crude oil refining and natural gas processing.
Biopropane is a term usually used to describe LPG that is derived from production processes that use a variety of biological materials as a feedstock. Organic plant material, vegetable oil and animal fats are all examples of potential feedstocks for biopropane.

Biopropane has two primary benefits when compared with LPG. Firstly, it prevents depletion of finite fossil fuel stocks.

Secondly, and perhaps more importantly, it is a **low-carbon fuel**, since growing the feedstock used in the production of biopropane removes carbon dioxide from the atmosphere. It also has a significant advantage over some of the alternative heating technologies in that it would allow households to continue to use their current heating systems, rather than facing an expensive and disruptive installation.

Carbon Savings

Although not a wholly zero carbon fuel source, biopropane could offer an opportunity for LPG households to significantly reduce their carbon footprint.

The combustion of biopropane does result in carbon being emitted, but this is offset by the carbon that was removed from the atmosphere when the biomass feedstock was cultivated. However, the production of biopropane does produce carbon dioxide. Carbon emissions will result from the fertilisation of the feedstock, as well as from the transformation of the feedstock into a useable form of bioenergy. The exact carbon footprint of biopropane d epends upon all of these factors, but also upon whether it is defined as a residue or a co-product under the European Union's Renewable Energy Directive (RED).

In the following analysis, we consider the use of biopropane that has been generated as a waste product of NESTÉ Oil's HVO biodiesel refining process. This has been classified as a residue under RED, with a carbon footprint of 0.036 kgCO2e/kWh.

We consider the future emissions from three scenarios:

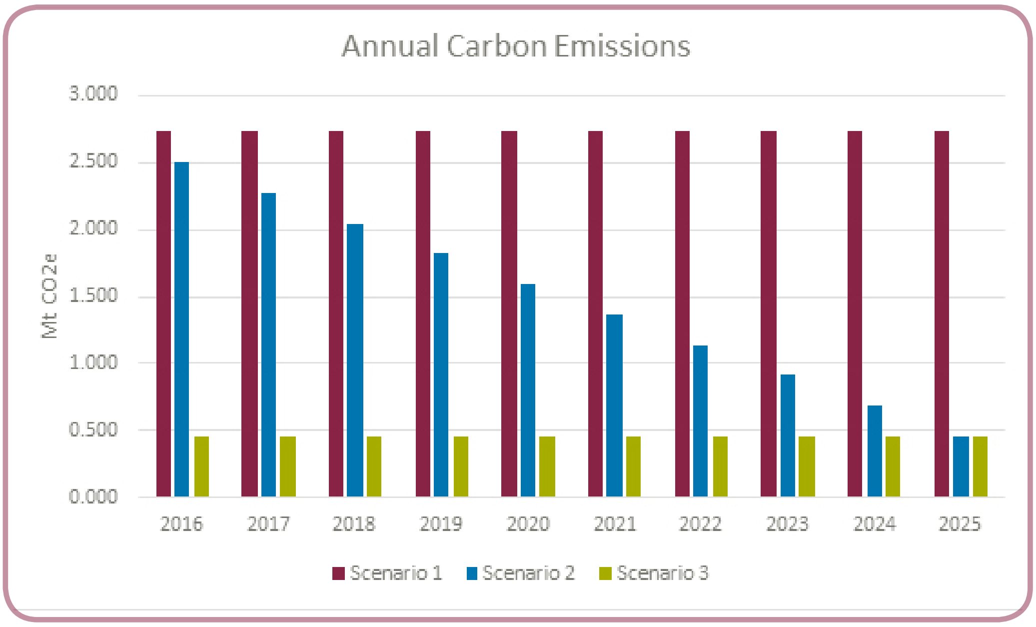
Scenario 1 – All households currently using LPG as their primary heating fuel continue to do so. For simplicity, it is assumed that LPG use for residential heating maintains its current level of 0.93 million tonnes per annum[6](approximately 12.7 x 109 kWh). Using the DEFRA carbon factor of 0.21468 kgCO2e/kWh, this results in annual carbon emissions from residential use of LPG of 2.7 MtCo2e.

Scenario 2 - In this scenario, a tenth of the off-grid households that currently use LPG make the switch to biopropane each year. In this way, biopropane use is universal by 2025.

Scenario 3 - All households that currently use LPG make an immediate switch to biopropane. This scenario would not be technically feasible at present, but is included for illustrative purposes.

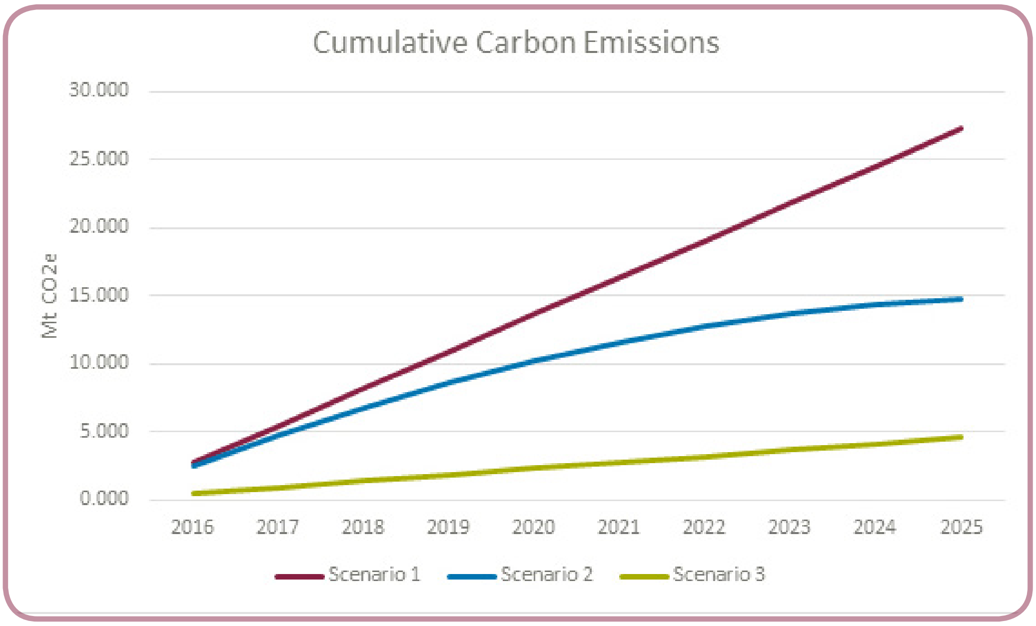
The annual carbon dioxide equivalent (CO_2e) savings from each of the scenarios are presented in the table and graph below. Scenario 1 results in emissions of 2.7 million tonnes of CO_2e (Mt CO_2e) for each of the next ten years. The incremental switching approach in Scenario 2 reduces emissions by an additional 0.22 $MtCO_2e$ each year, resulting in annual emissions of 0.46 $MtCO_2e$ in 2025. The wholesale switching seen in Scenario 3 reduces annual emissions immediately to 0.46 $MtCO_2e$ and maintains this level until 2025.

	Scenario 1	**Scenario 2**		**Scenario 3**	
Year	Annual Carbon Emissions MtCO2e	Annual Carbon Emissions MtCO2e	Annual Carbon Savings compared with Scenario 1	Annual Carbon Emissions MtCO2e	Annual Carbon Savings compared with Scenario 1
2016	2.729	2.502	0.227	0.458	2.271
2017	2.729	2.275	0.454	0.458	2.271
2018	2.729	2.047	0.681	0.458	2.271
2019	2.729	1.820	0.908	0.458	2.271
2020	2.729	1.593	1.136	0.458	2.271
2021	2.729	1.366	1.363	0.458	2.271
2022	2.729	1.139	1.590	0.458	2.271
2023	2.729	0.912	1.817	0.458	2.271
2024	2.729	0.685	2.044	0.458	2.271
2025	2.729	0.458	2.271	0.458	2.271



The cumulative carbon savings are presented in the table and graph below. Scenario 1 results in cumulative carbon emissions of 27.2 $MtCO_2e$ by the end of 2025. Scenario 2 improves the situation, with cumulative emissions of 14.8 $MtCO_2e$ by 2025 – a saving of 12.5 $MtCO_2e$ in comparison with Scenario 1. Scenario 3 results in cumulative carbon emissions of 4.6 MtCo2e – saving 22.7 $MtCO_2e$ in over Scenario 1.

	Scenario 1	**Scenario 2**		**Scenario 3**	
Year	Cumulative Carbon Emissions MtCO2e	Cumulative Carbon Emissions MtCO2e	Cumulative Carbon Savings compared with Scenario 1	Cumulative Carbon Emissions MtCO2e	Cumulative Carbon Savings compared with Scenario 1
2016	2.729	2.502	0.227	0.458	2.271
2017	5.458	4.776	0.681	0.915	4.542
2018	8.187	6.824	1.363	1.373	6.814
2019	10.915	8.644	2.271	1.830	9.085
2020	13.644	10.237	3.407	2.288	11.356
2021	16.373	11.603	4.770	2.746	13.627
2022	19.102	12.742	6.359	3.203	15.899
2023	21.831	13.654	8.176	3.661	18.170
2024	24.560	14.339	10.221	4.118	20.441
2025	27.288	14.797	12.492	4.576	22.712



Cost Analysis

It is necessary to assess the likely additional costs of using biopropane as a substitute for LPG. At present, LPG and biopropane cost 6.9p/kWh and 8.4 p/kWh respectively. As a result, the use of biopropane would result in an additional cost to the consumer of 1.5 pence for each kilowatt hour of energy used.

As noted previously, LPG heating is most commonly found in bungalows, detached and semi-detached houses. Using data found in NEED concerning the average gas usage in these types of property, we estimate the costs to the bill payer of using gas, LPG and biopropane. The results are presented in the table below:

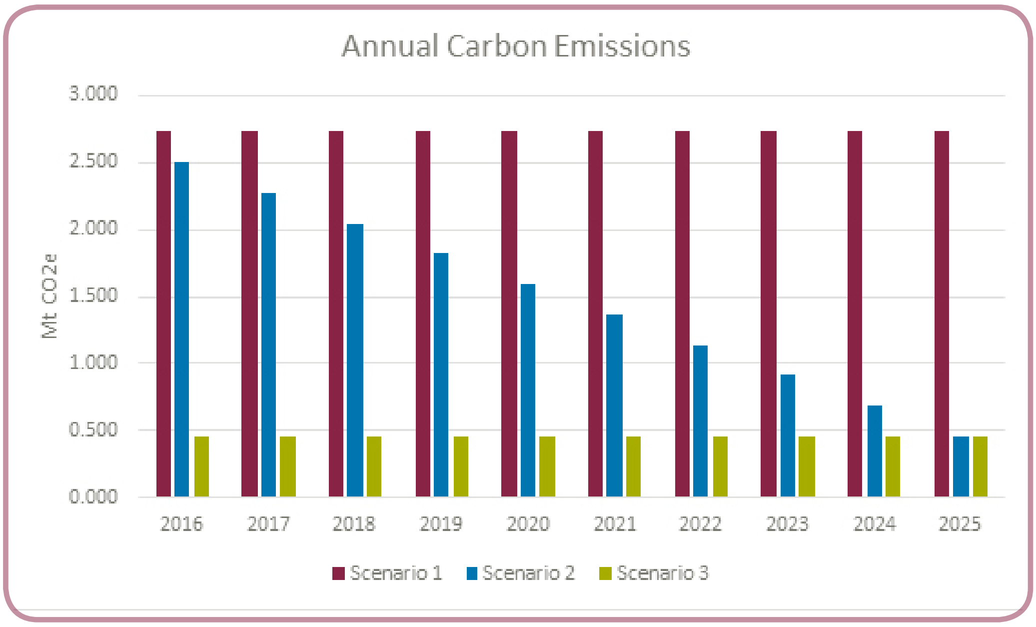
	Annual gas usage (kWh)	Gas cost	LPG equivalent cost	Biopropane equivalent cost
Detached	20.031	£859	£1,382	£1,683
Semi-detached	14,758	£633	£1,018	£1,240
Bungalow	13,971	£599	£964	£1,174
Overall	13,869	£595	£957	£1,165

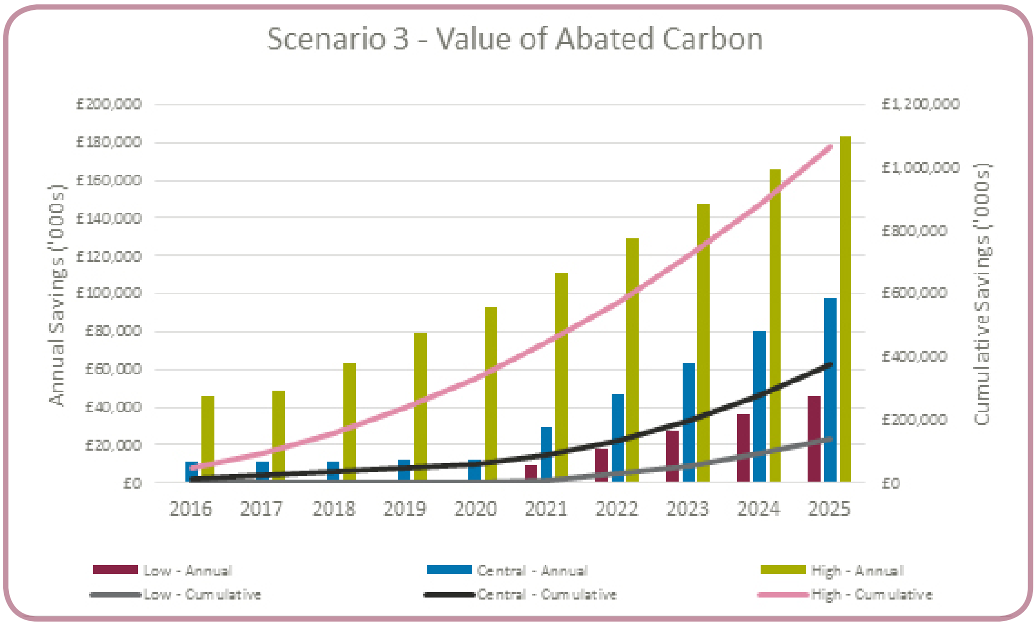
The fact that biopropane imposes an additional cost to the consumer cannot be avoided. However, it is reasonable to suppose that the price differential between the LPG and biopropane will narrow as biopropane use becomes more widespread. As this happens, economies of scale and increased competition should result in the price of biopropane falling.

It is worthwhile considering the value of the carbon that would be saved by the increased use of biopropane. DECC's 2014 carbon values (low, medium and high) for policy appraisal (converted to 2015 £s) have been used to estimate the value of the saved carbon for each of the scenarios. The results are presented in the table below:

	Scenario 2 - Value of Saved Carbon			**Scenario 3 - Value of Saved Carbon**		
Year	Low ('000s)	Central ('000s)	High ('000s)	Low ('000s)	Central ('000s)	High ('000s)
2016	£0	£1,095	£4,622	£0	£10,954	£46,216
2017	£0	£2,247	£9,821	£0	£11,237	£49,107
2018	£0	£3,505	£18,844	£0	£11,683	£62,812
2019	£0	£4,852	£31,744	£0	£12,130	£79,361
2020	£0	£6,288	£46,615	£0	£12,576	£93,230
2021	£5,473	£17,743	£66,770	£9,121	£29,572	£111,284
2022	£12,786	£32,598	£90,553	£18,265	£46,568	£129,361
2023	£21,909	£50,851	£117,932	£27,386	£63,564	£147,415
2024	£32,856	£72,504	£148,922	£36,507	£80,560	£165,468
2025	£45,651	£97,579	£183,546	£45,651	£97,579	£183,546
Total	£118,675	£289,263	£719,368	£136,930	£376,424	£1,067,799

In Scenario 2, the total value of the abated carbon between 2016 and 2025 ranges from £119 million in the low carbon cost scenario to £719 million when the carbon cost is high. In Scenario 3, the value of the abated carbon ranges from £137 million to £1.068 billion.





Although the value of the carbon saved does not exceed the cost of the policy (future costs discounted at 3.5%), this is also true of many other carbon reduction schemes that have received government backing. The true test is how much the policy would cost for each unit of carbon dioxide equivalent that would be saved. The table below assesses the cost effectiveness of biopropane in reducing carbon emissions and shows that replacing LPG with biopropane would abate carbon at a cost of £66.22/tCO2e.

	Scenario 2	Scenario 3
Cost	£827,228,453	£1,585,715,494
MtCO2e saved	12.491844	22.71244363
£/tCO2e saved	£66	£66

This compares very favourably with the carbon cost effectiveness of the RHI, which was found to be £169/tCO2 (NB. the units given are £/tCO2, not £/tCO2e) in the RHI Impact Assessment[7]. These figures suggest that biopropane would reduce carbon at 40% of the cost of the RHI. As a result, this paper recommends that biopropane should be strongly considered as a policy option for reducing the carbon footprint of the off-gas grid sector.

Policy Proposal

One option to encourage uptake is a subsidy, in order to eliminate the price differential between biopropane and LPG. If we assume an average boiler efficiency of 81%[8] and a price difference of 1.5 p/kWh, this equates to a tariff of 1.85 p/kWh of delivered renewable heat.
This is much lower than the tariffs currently paid by the RHI: 7.42 p/kWh (ASHP), 7.14 p/kWh (biomass), 19.1 p/kWh (GSHP) and 19.51 p/kWh (solar thermal)[9].

If linked to a suitable degression mechanism, the size of this subsidy could fall until biopropane achieves cost parity with LPG, at which point no further state support would be necessary. Faced with the option of LPG and equally priced biopropane, it is reasonable to suppose that households will opt for the low-carbon option.

Unlike other low-carbon heating alternatives, the use of biopropane does not face significant barriers to uptake. It requires no additional capital outlay, nor does it require the householders to change the way in which they use their heating system. Alternative technologies, such as heat pumps, may require new radiators and better levels of insulation in order to facilitate a lower temperature heating circuit. Instead, householders will merely purchase a different fuel and their heating system will continue to function as before. Consequently, eliminating the price differential between LPG and biopropane would provide sufficient incentive to stimulate the uptake of biopropane.

When discussing biofuels, it is often mentioned that their mass production can result in land-use changes. These changes could exacerbate climate change, decrease biodiversity and have a negative impact on food security. However, as stated in DECC's 2014 Evidence Report: Biopropane for Grid Injection: *"biopropane has an advantage in this respect, because it can be sourced to a large degree from non-food feedstocks, such as inedible fractions of palm oil, animal fats and wastes (such as used cooking oil)."* As long as adequate sustainability criteria are imposed – such as those imposed upon biomass under the RHI – the use of biopropane should have no negative ecological consequences.

As with any new energy source, it is necessary to evaluate the current capacity and potential scalability of the UK market. Initially, it is estimated that 40,000 tonnes of biopropane will be available within Europe annually. The vast majority of this would be destined for the British market and would be sufficient to heat 30,000 homes. Over the coming years, global production of biopropane could be increased dramatically by taking advantage of worldwide HVO production and developing new pathways for production.

A report published by GreenEA[10] in September 2015 estimated that the production capacity of HVO within Europe will increase by 88.5% in the next three years. This rate of growth would be sufficient to sustain the deployment detailed in the second scenario in our analysis.

Conclusion

This analysis has demonstrated the potential for biopropane as a heating fuel for the off-gas grid housing sector. **By supporting biopropane through the domestic RHI scheme, the Government could take an important step towards meeting its renewable energy targets.**

At a tariff of 1.85p/kWh of delivered renewable heat, biopropane would require less support per unit of heat than any of the existing options without necessitating any change in behaviour or upfront capital expenditure by the householder. Moreover, it would provide much-needed support for the deployment of low carbon heat in a sector that has seen limited uptake to existing schemes.

Graeme Reeves
Economist, **EUA**

Case Studies

Although the focus of this report is the future deployment of biopropane in the residential LPG sector, it would also present an opportunity for the approximately 1 million off-grid UK businesses, ranging from heavy industry through to small offices, that currently use LPG to significantly reduce their carbon footprints. The case studies presented below provide an illustration of the varied nature of the use of LPG in non-domestic applications.

Many businesses that currently use LPG have chosen to do so since it has the lowest carbon emissions of the conventional fuels that are available to sites off the mains-gas grid. It is therefore reasonable to suppose that there would be an appetite for a biofuel alternative to LPG that would enable them to further reduce their carbon footprints without requiring them to change their heating and hot water systems.

" Woburn Safari Park powered by LPGenius

Established in 1970, Woburn Safari Park near Milton Keynes in Bedfordshire is the second oldest safari park in the UK. Today, Woburn is an award-winning family attraction that strives to make positive and important contributions to the conservation of endangered species, and receives international recognition as a centre of excellence in this field.
Most of the animal species that Woburn looks after are not native to the UK so require specialist indoor environments, more akin to their natural habitats, to make them feel more at home and help them thrive. This means that the enclosures, which house the animals during the winter months, must provide a more temperate climate than the cold British weather at that time of year. These animal enclosures are extremely important to the animals' wellbeing.
Maintaining appropriate conditions for animals such as elephants and rhinos within their enclosures requires a reliable and dependable source of energy. But Woburn Safari Park, like nearly two million other UK homes and businesses, is located 'off-grid', meaning it cannot use the main-line gas that most of us take for granted.
Woburn therefore required a source of power reliable enough for the vital job of supplying heating and energy for the animal enclosures, but also affordable and versatile enough for use throughout the park in areas such as restaurant catering, the children's indoor play centre and the leisure area.
The safari park was initially powered by electric converter generators but over time it was found that these did not meet the power needs of the park.

Paul Williams, Estate and Property Manager at Woburn, explained:
"After several years, we simply found that the electric system didn't match our requirements. The performance was generally poor, taking a long time to heat the spaces, and the cost was excessive." Woburn turned to its buying cooperative – Anglia Farmers – to help find the perfect solution for its energy needs. Together it was decided that Calor LPG was the most suitable solution for a number of reasons."

"We felt that for Woburn, Calor LPG offered an ideal solution. It is versatile, which is obviously important, but when animal welfare is at stake, the security of supply from a brand leader is also key."
Clarke Willis, Managing Director, Anglia Farmers

Upon switching, the advantages of LPG quickly became apparent. **Paul Williams** commented:
"We noticed the difference straight away. Firstly the spaces heat up to the required temperatures far more quickly. As well as simply being convenient, this has a working benefit to us as we may be required to move animals to an inside space at short notice – with LPG we can minimise any delays.
"The second thing we noticed was the price – we were saving approximately 50 per cent on our annual energy bills. It's really important for us to save costs where we can as any additional funds can then be ploughed into our conservation work, so from our perspective LPG is a marked improvement on its predecessor. It was great working with both Anglia Farmers and Dravo to ensure that we could create the best possible environments for our animals."

Dravo, a Northampton-based company renowned for its high-quality industrial and commercial warm air heating equipment, installed the LPG-powered Nozzle Distribution Warm Air System in Woburn's elephant enclosure.

"We were approached by Woburn specifically to find the perfect heating solution for its elephant house. At the time Woburn had recently started using Calor LPG, which we find to be a good fuel source for our systems as it is cleanburning and versatile. The feedback we have had from Woburn has been fantastic; it seems our heating system is suiting them very well."

Neville Parsons, Managing Director, Dravo

Dravo's Nozzle Distribution System was considered particularly suitable as it provides an even and uniform temperature throughout the entire space. In high-roofed buildings especially, static hot air can contribute to energy wastage, but this is vastly minimised with this system.

In addition, the air distribution system is quiet and discreet; a key consideration when creating an environment in which the animals need to feel comfortable and stress-free and not surrounded by technology and industrial equipment. The system is able to cover an area of up to 200,000sq ft, making it suitable for leisure attractions with large indoor spaces such as Woburn.
Many months on it has become clear that Calor LPG has been a real step forward for Woburn and it is not planning on looking back. **Paul Williams** continued:
"I would advise anyone running a business off mains gas to seriously consider LPG. There are other solutions, but none to my mind that make as much business sense and offer as many benefits as LPG."

“Instant warm-up for Britain’s olympic canoeists”

Steve Harris, British Canoeing’s Project Manager explains the reasons for selecting Calor LPG:

“Having access to the right facilities is vital to the performance of any Olympic athlete and, for Britain’s top canoeists, the opening of the Tim Brabants Elite Training Centre at Dorney Lake near Windsor marks a new era in the development of the sport.

“With changing rooms and shower blocks, a warm up area, athlete rest and recovery zones and treatment rooms to name a few, it’s fair to say that we have a constant requirement for heating and hot water. And, with no access to the conveniences of mains gas, we also require a totally dependable source of fuel.

“At certain times of the year, our fuel usage becomes more sporadic as athletes undertake their warm weather training overseas, so we didn’t want to store large quantities of oil on site.

“As LPG has the lowest carbon emissions out of all the fossil fuels available to sites off the mains-gas grid, emitting 11.7 per cent less CO2 per kWh than oil, it fits well with our site’s environmental credentials, making it a logical choice.”

Instant hot water

Rather than opting for a traditional system boiler and hot water tank, or a combi boiler to provide both space and water heating, Dorney selected a Rinnai continuous-flow water heater from Calor, capable of heating up to 1500 litres of temperature-accurate hot water per hour.

The unit is ideal for applications requiring high volumes of instant hot water at intermittent times of the day. The condensing technology incorporates dual heat exchangers achieving optimum water heating from the LPG and residual heat is captured from flue gases and transferred in to the water being heated.

Running from the same LPG supply, an LPG condensing boiler provides high efficiency space heating.
Reliable supply The facility is located right next to the water, so tank siting had to be planned carefully by Calor’s engineering team to accommodate the high water table surrounding the site.

This means that British Canoeing can operate with a single, over ground, 2000 litre bulk tank. The tank also remains the property of Calor so the customer does not have to spend time and money on maintenance.

Tanks have been fitted with Calor’s Think Tank® telemetry system which regularly monitors gas levels via a contents gauge. A transmitter then sends a signal to a built-in dialler unit, which automatically calls Calor’s central computer and informs it of the current gas level.

When more gas is required, a local Calor depot is alerted and a delivery is scheduled.

Find out more at www.calor.co.uk/business

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