



Sustainable heating

**Reducing costs;  
Improving comfort; and  
Lowering carbon emissions**

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Learning from the impacts of the Wyndford Estate district heating project

## About this report

This report provides a review of the overall sustainability – social, environmental and economic – impacts of the Wyndford Estate district heating project located in Glasgow, Scotland.

Whilst popular in other countries, district heating remains in its infancy in the UK and rare within Scotland. The findings of this study therefore aim to be instructive for future UK and Scottish district heating projects, particularly to understand the potential benefits of retrofit projects which remain more unusual. The report demonstrates that sensible and strategic investment in improving the UK's housing stock can have significant positive impacts for energy customers, local economies and the global environment.

Most of the analysis within this report was undertaken in-house by SSE, with a significant proportion of social impact findings from extensive primary research carried out by the University of Edinburgh.

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## About SSE

SSE Plc is the UK's broadest-based energy company with the core purpose 'to provide the energy people need in a reliable and sustainable way'. SSE aims to deliver sustained real growth through investment in and efficient operation of energy production, storage, transmission, distribution, supply and related services in the UK and Ireland.

SSE operates through its four business segments: Wholesale, Networks, Retail and Enterprise.



### Wholesale

SSE's wholesale business provides energy and related services for customers in wholesale energy markets in Great Britain and Ireland. This is delivered through Energy Portfolio Management and Electricity Generation, Gas Production and Gas Storage. Amongst other things, it is one of the leading generators of electricity from renewable sources across the UK and Ireland.



### Networks

SSE's networks businesses cover electricity transmission in the north of Scotland, electricity distribution in the north of Scotland and southern central England, and in gas distribution in Scotland and southern England. These businesses are subject to economic regulation by Ofgem.



### Retail

Through its retail business, SSE supplies electricity, gas and related services such as telecoms and broadband in Great Britain and Ireland. SSE currently has over 8m business and household customer accounts.



### Enterprise

SSE Enterprise covers the whole of the UK, providing business-to-business services across all the utilities. Its operations include the delivery of contracting, heat and lighting solutions, multi-utility networks, energy management, energy efficiency projects and telecoms for organisations of all sizes.

## Foreword

Over the past ten years, Scotland and the rest of the UK have made significant progress in removing carbon from electricity generation. Electricity from renewable energy has increased dramatically – in 2006 it represented less than 5% of energy consumed in the UK, whereas by the end of 2015 it had reached 22.3%. While there remains more to do, there is no doubt there is a consensus nationally and internationally to tackle climate change.

But we also understand that the power sector is not the only energy sector that must undergo a similar transformation. As a country, we consume more heat energy than we need to because our homes leak energy from their doors, windows and walls and the boilers we use are limited in their efficiencies.

This report is about delivering heat to homes in a different way. By doing things differently, we have an opportunity to bring about the sort of transformation that will be needed to both conserve heat energy and generate it in a more efficient and environmentally friendly way.

The Wyndford Estate district heating scheme in the heart of Glasgow was a ground breaking project for SSE to be involved with. Cube Housing Association had a vision and provided leadership that would result in a dramatic increase in the standard of living for the people who lived in 1,800 properties on the Wyndford Estate.

The purpose of this report is to shine a light on the range of impacts that resulted from the installation of district heating in an existing housing estate.

Retrofitting a district heating network is normally considered a tougher ask than building one in a new development. Roads and paths must be dug up, disruption can be caused in people's homes – and the transition from one form of heating system to another can be tricky for householders to contend with.

As an advocate of district heating, I am delighted this report tells us – comprehensively – the scale of the impacts that can be found. From the jobs created through construction, the improvements in home comfort and the positive impacts that can be found on levels of fuel poverty too. And of course, district heating is more efficient than individual boilers because for every unit of primary energy both electricity and heat are generated – thereby delivering more energy 'bang for buck' and significantly reducing emissions in the process.

Of course, we need to learn too. District heating remains rare – and retrofitting is even rarer. I know we at SSE have learned from the Wyndford project and we hope the publication of this report contributes to the wider debate on the benefits of district heating and how we can build even greater projects in the future.

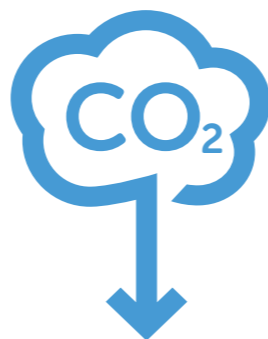
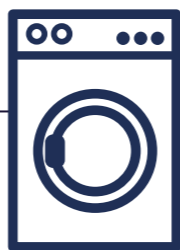


### Nathan Sanders

Managing Director SSE Enterprise Utilities

# Impact summary: The Wyndford Estate district heating project

**£100,000** worth of white goods were provided to residents for free



Enough CO<sub>2</sub> emissions saved to drive 20,000,000km



The equivalent of driving from



Construction added £10m to UK GDP, of which £6.5m was contributed to the Scottish economy

Construction has supported 176 years of UK employment, of which 114 are in Scotland

Residents feeling too cold at home all or most of the time during last winter fell –

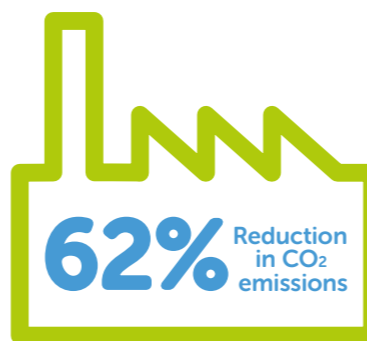
**53%** to **4%** for tenants  
**39%** to **8%** for owners



once district heating was installed



37 customers helped to clear £12,268 of debt from their accounts



**30,000 TIMES**

GLASGOW

LONDON

## Change in heating satisfaction



70% of tenants and 95% of owners reported feeling satisfied with their heating after installation, compared to 27% and 38% before the new heating system was installed



Almost 3x more tenants paying 10% or less of their income on energy

**81% tenants**

**90% owners**



Said they felt warmer with the new heating system

**£2,240**

16 customers assisted to qualify for a Warm Home Discount of £140 each



60% fewer tenants and 80% fewer owners reported going to bed early to keep warm

80% fewer tenants and 85% fewer owners reported avoiding going outside because it was too hard to get warm again

# The Wyndford Estate: Project background

In 2012, Cube Housing Association partnered with SSE to install a district heating system at the Wyndford Estate in Maryhill, Glasgow. This aimed to improve comfort levels and the energy efficiency of almost 1,800 homes; mainly social housing with a small number of privately owned houses in an area with higher than average levels of economic deprivation.

## Project objectives:



Help tackle fuel poverty



Increase heat comfort and warmth



Decrease carbon emissions



Contribute to local economies and support local jobs

Before the district heating was installed, the majority of residents at Wyndford heated their homes using electric storage heaters. This system charged residents a lower price for electricity used overnight but a higher than standard rate tariff for daytime use, with many residents paying for their heating by prepayment meters. Advancing energy efficiency and heat technology since this heating system was installed meant the system had become both environmentally and financially wasteful and unsustainable for residents.

Investment in the new district heating system at the Wyndford Estate paid for the removal of the outdated storage heaters from the properties and the upgrade to a new, modern and efficient centralised heating and hot water system. The main construction and installation phase started in January 2012 and was completed within 12 months, benefiting the social housing rented properties. The second phase of the project, funded by the Scottish Government and SSE, connected the remaining privately owned properties to the district heating network and was completed by early 2014.

To help further improve energy efficiency at the Estate and decrease bills for residents, the multi-storey block properties were also fitted with external cladding and new windows by British Gas as part of the UK government Community Energy Saving Programme (CESP). Whilst this work is not formally considered within this analysis, it will inevitably have contributed to some of the impacts detailed within this report.

## Project partners

### Cube Housing Association

Cube Housing Association has more than 3,400 social homes across the West of Scotland. It is a member of Wheatley Group, Scotland's leading housing, care and property-management group, and is responsible for 1,532 properties on the Wyndford Estate. Cube provided the majority of funding for the scheme and, following an open competitive tender exercise, Cube selected SSE to design, build, maintain and operate the Energy Centre and associated heat network.

### SSE Heat Networks Limited

SSE Heat Networks Limited, part of SSE's Enterprise business, made a significant financial contribution to the construction and installation of the district heating and continues to operate, maintain and optimise the system at the Estate. SSE provides full customer services including billing and metering services for heat supplies to the residents at Wyndford.

### Vital Energi

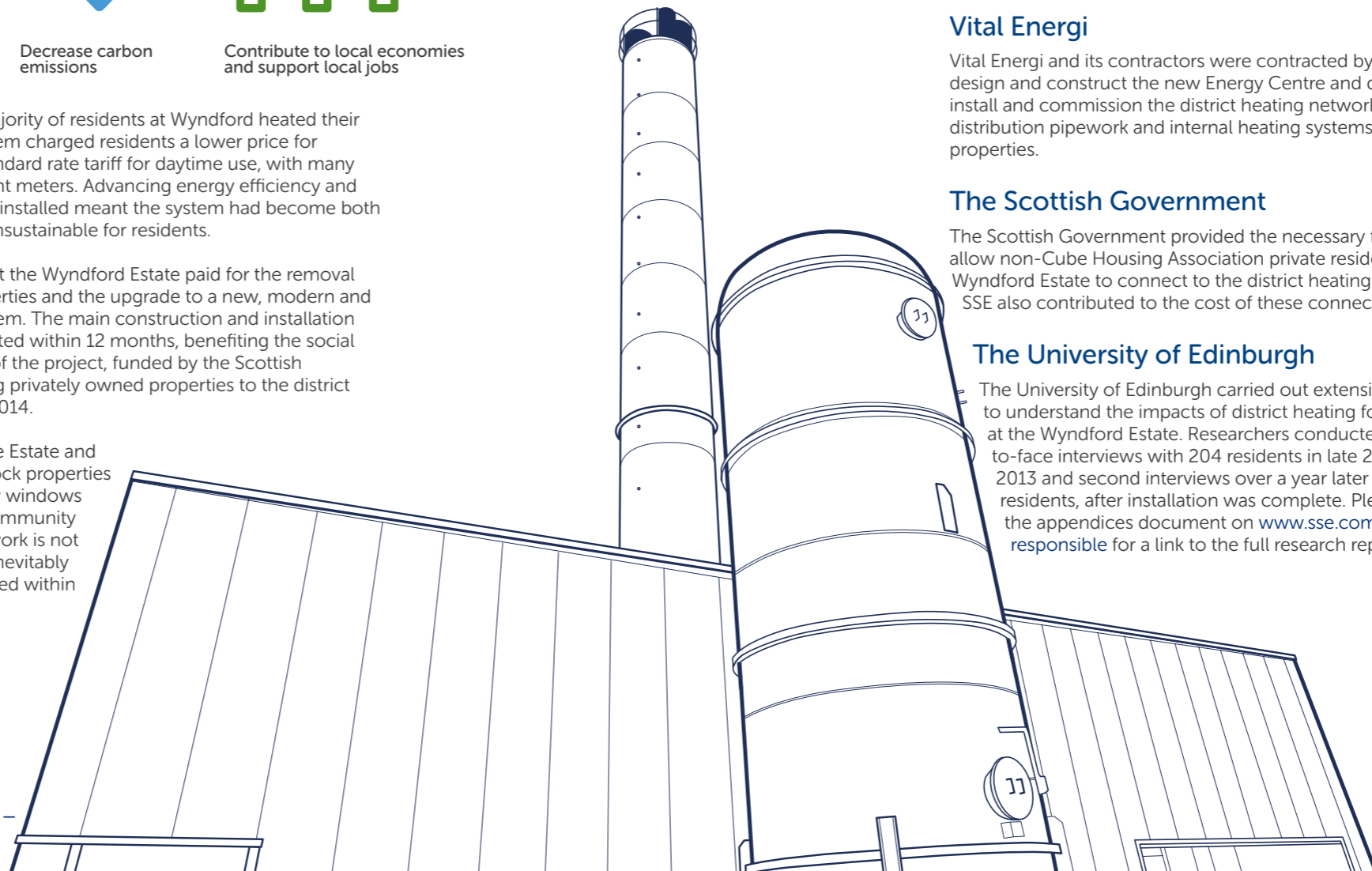
Vital Energi and its contractors were contracted by SSE to design and construct the new Energy Centre and design, install and commission the district heating network, distribution pipework and internal heating systems to properties.

### The Scottish Government

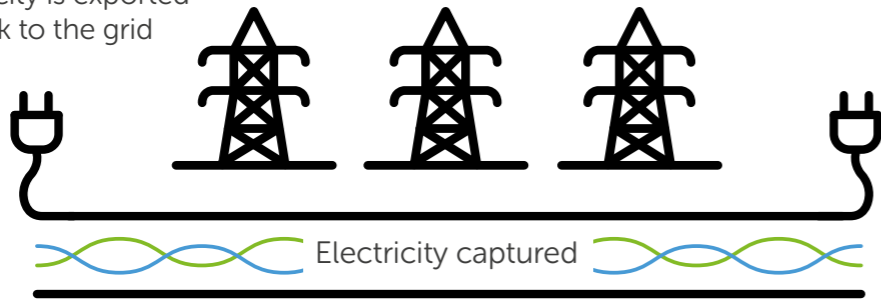
The Scottish Government provided the necessary funding to allow non-Cube Housing Association private residents on the Wyndford Estate to connect to the district heating scheme. SSE also contributed to the cost of these connections.

### The University of Edinburgh

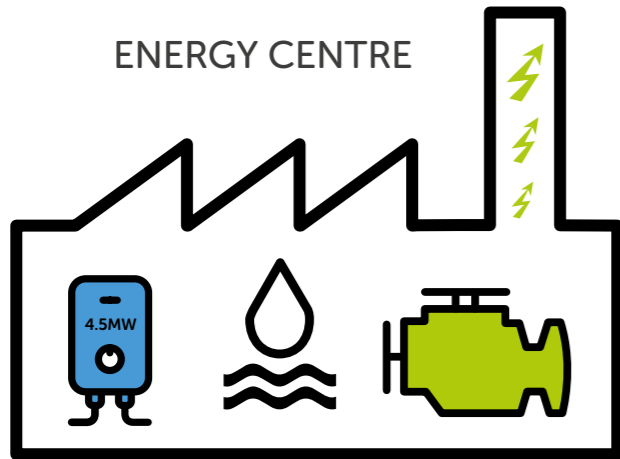
The University of Edinburgh carried out extensive research to understand the impacts of district heating for residents at the Wyndford Estate. Researchers conducted face-to-face interviews with 204 residents in late 2012/early 2013 and second interviews over a year later with 119 residents, after installation was complete. Please see the appendices document on [www.sse.com/being-responsible](http://www.sse.com/being-responsible) for a link to the full research report.



Electricity is exported back to the grid



### ENERGY CENTRE



Heat is generated by central boilers and combined heat and power (CHP) units. CHP produces power (electricity) whilst also capturing the heat produced as a by-product during the electricity generation process

Heat is captured as hot water and transferred through underground pipes

The pipes are heavily insulated to help maintain heat and minimise energy loss



The hot water is transported as hot water to taps and radiators in each property

Each property has its own meter to calculate the heat and hot water for billing purposes

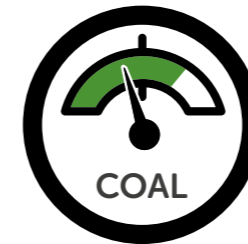


The heat is delivered more efficiently to homes compared to gas / coal fired power

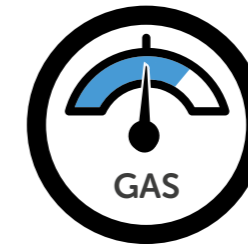
## What is district heating?

District heating provides heat from a central heat source, the Energy Centre, to more than one property. This heat is generated by central boilers and combined heat and power (CHP) units. CHP produces power (electricity), whilst also capturing the heat produced as a by-product during the electricity generation process.

Under conventional methods of generating electricity this heat is usually lost into the atmosphere, meaning a significant amount of energy is wasted. Coal and gas fired power stations can lose up to two thirds of total energy through heat loss. This means that CHP is very efficient, reaching efficiency ratings of about 80% compared to approximately 50% for gas power and only around 40% for coal-fired power.



ENERGY EFFICIENCY  
Coal approx 40%



ENERGY EFFICIENCY  
Gas approx 50%

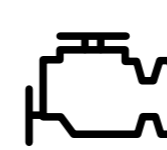


ENERGY EFFICIENCY  
CHP approx 80%

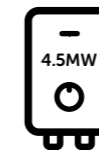
At the Wyndford Estate, the Energy Centre houses a 1.2 MW CHP engine, three 4.5 MW gas boilers and a 120,000 litre thermal store, together with pipework, equipment and controls. The district heating system transfers hot water from the Energy Centre through 5km of underground pipes which are heavily insulated to help maintain heat and minimise energy loss during this journey.

The heat is delivered to almost 1,800 homes at Wyndford as hot water into radiators taps in each property, removing the need for individual boilers for residents. Individual meters in each property accurately record heat and hot water use for billing purposes.

### At the Wyndford Estate:



1.2MW  
CHP  
engine



3 x 4.5MW  
gas boilers



120,000  
litre thermal  
store



5km of  
underground  
insulated  
pipes



1,800 homes  
heated  
directly

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"The district heating scheme is already making a huge difference in Wyndford. Our tenants and factored homeowners are enjoying the benefits of living in warmer, more energy-efficient homes and saving money on their fuel bills too.

"That puts more money in people's pockets in these tough economic times and helps us address fuel poverty at the same time. We are delighted to have worked with SSE on this innovative project."

Cube Housing Director,  
**David MacKenzie**

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## Social impacts

The main driver of any retrofit heating project should be to benefit residents and improve their daily lives. Not being able to afford adequate heating can have serious and long-term repercussions – in terms of both social and health impacts. District heating provides an efficient and cost effective way of increasing heat comfort for residents.

The analysis shows there are many different and complex social impacts from the new heating system installation. Working together, Cube and SSE learned how to engage better with residents and help them achieve the greatest benefits from their new heating: significantly more comfort without additional cost.

### The University of Edinburgh research

SSE and Cube are very thankful to the University of Edinburgh for their extensive primary research carried out at the Wyndford Estate which provides the majority of findings within this section. This research splits results into two groups: residents that rent their properties ("tenants") and residents in privately owned homes ("owners"). Residents were interviewed before the new heating system was installed (T1) and after it was installed (T2).

### Improving comfort

Ensuring residents experienced a noticeable improvement in their heating, and that this contributed to a significant change in their level of comfort, was a key objective of the district heating project at the Wyndford Estate. The Edinburgh University research therefore assessed this outcome, and the results were striking: over 70% of tenants and 95% of owners reported feeling satisfied with their heating after installation, compared to 27% and 38% before the new system was installed. Tenants reporting dissatisfaction fell from 53% to 18%, and for owners it fell from 49% to 6%. Residents were quoted as saying things like they had a "better feel of well-being with the new heating" and for the first time felt "warm and cosy" at home.



81% of tenants and 90% of owners said they felt warmer with the new heating system



Residents never feeling too cold during the last winter increased from 9% to 80% for tenants and 26% to 84% for owners



Residents feeling too cold at home all or most of the time during the last winter fell from 53% to 4% for tenants and from 39% to 8% for owners

## Support using the new system

The Edinburgh University research showed that, as a group, Wyndford households were paying approximately the same as they had been before the new heating system was installed, but had benefited significantly by improvements in warmth and comfort. This implies residents had lower heat demand before the district heating system was installed which is consistent with the other research findings: that residents were considerably colder before the new heating system and insulation was installed.

These energy bill results differ from the SSE energy cost analysis (see p16-17) for two key reasons. Firstly, the Edinburgh University analysis uses a different methodology. Secondly, the final interviews were carried out by Edinburgh University researchers not long after the new heating was installed. Consequently, there were still a relatively high number of residents at that time reporting trouble using the new heating system efficiently, which inevitably has an impact on cost. Residents were quoted within the research saying things like "Maybe I am using more [energy] because I don't know how to work it... something's wrong with the system" and "Maybe if I used the [household heating] programmer it would be better".

Following these interviews and further feedback from residents to Cube Housing and SSE, many measures have been taken to help ensure residents have the best understanding of how to most effectively use their new heating:

- A home energy advisor has been assigned to the Wyndford Estate.
- Numerous open day information sessions on site at the local Community Centre.
- Free home visits are offered to residents to talk them through how to best use their energy system.
- Advice and FAQs are frequently posted out to residents.
- SSE call centre employees are trained to help customers who phone up having difficulty or queries about using the heating system.

SSE now records very low levels of complaints from Wyndford residents. Although there are inevitably residents who still require further assistance, it appears that these ongoing efforts by Cube Housing and SSE have been successful in significantly improving the proportion of residents who are getting the most out of the district heating system – more comfort for a lower cost.



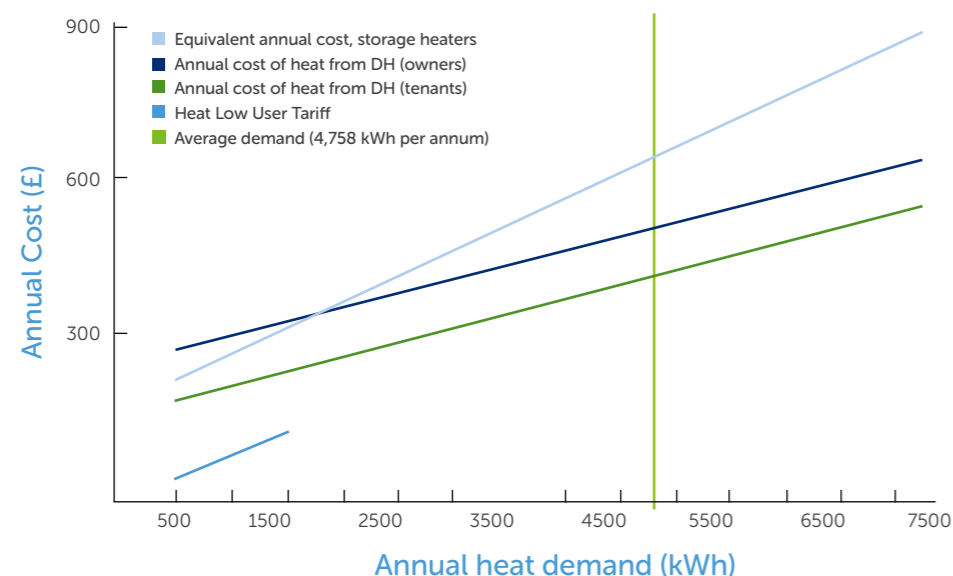
## More heat for your money

Improving comfort and warmth is undoubtedly one of the most important impacts of installing a new heating system. However, it is important this increase doesn't come at the cost of higher energy costs for customers. SSE therefore undertook analysis to estimate the financial impact this change in comfort has had on bills for residents at Wyndford since it was installed.

SSE collects daily meter readings from every property on the Estate, providing detailed and accurate data to assess consumption patterns. Using this data, the average energy consumption of residents using the district heating scheme has been estimated at 4,500–4,800kWh per property per year.

In late 2015 SSE used this information to compare the average annual household bill at the Wyndford Estate against the estimated costs for equivalent levels of energy demand but with costs associated with the old storage heating system. This means the analysis is not a comparison between the actual consumption and costs for residents prior to the new system being installed and after the district heating system was in use. Rather, it calculates what the current heat demand, which is likely to be lower as a result of improved insulation and energy efficiency measures at the Estate, would have cost residents using the old storage heaters. The methodology for this calculation can be found in the appendices on [www.sse.com/beingresponsible](http://www.sse.com/beingresponsible).

The graph below shows that the new district heating system should be significantly cheaper for customers compared to the cost of the old heating system.



### Notes on the graph

- The equivalent annual cost of storage heaters includes: an estimate of the capital cost of the storage heaters; 15% top-up using peak electric heating; and additional cost of daytime electricity due to higher day rates on off peak tariffs.
- The equivalent cost of storage heaters is modelled and may not reflect actual bills at the time storage heaters were in use.
- Private owners have a higher tariff because they pay towards the lifecycle plant replacement costs. For tenants the social landlord pays this component of their bill.

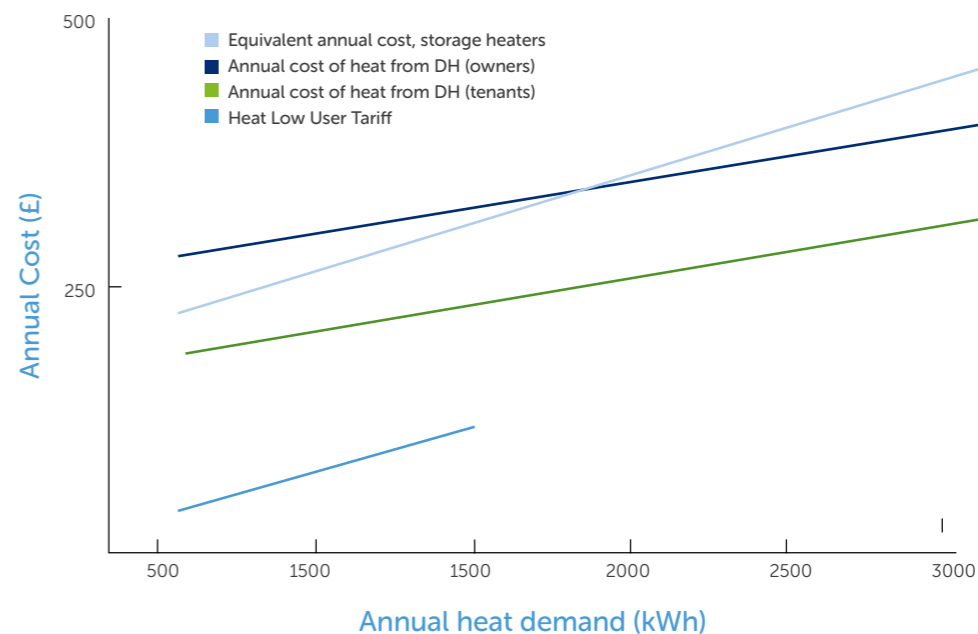
## Creating the Low User Tariff

A few months after the scheme moved into the operational phase, concerns were raised to SSE by Cube Housing Association and the local Residents Association that some of the Wyndford Estate's most vulnerable and low income residents were struggling to afford the standing charge associated with the district heating scheme and were therefore effectively self-disconnecting by not topping up their prepayment meters.

In direct response, SSE created and introduced a new Low User Tariff to address the concerns of these residents. This tariff is specifically designed for vulnerable customers at Wyndford with very low consumption rates, less than 1,500kWh per year, and who are eligible for certain pre-determined qualifying benefits. The criteria used for this was the same as SSE's Energy Supply qualifying criteria for the Warm Home Discount Scheme. More information about the Low User Tariff at Wyndford can be found in the appendices on [www.sse.com/beingresponsible](http://www.sse.com/beingresponsible).

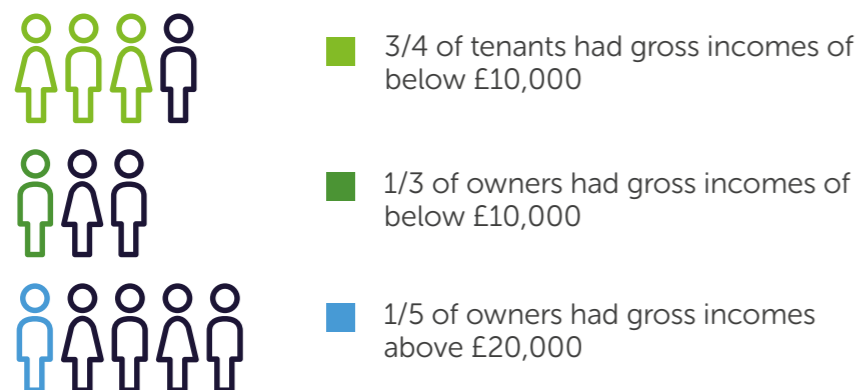
Out of the 1,784 properties at the Wyndford Estate, 131 are currently on the Low User Tariff. SSE continues to actively seek out possible customers that could qualify and benefit from this tariff, monitoring and reviewing the energy use of residents every six months and contacting residents to inform them that they could be entitled to cheaper energy. Likewise, if there are any households already on the Low User Tariff who are now using higher levels of energy and would therefore benefit from moving back onto the standard tariff at Wyndford, SSE will pro-actively contact these residents. All customers are offered free advice to make sure they are on the best tariff for their specific energy needs.

The graph below shows the financial impact of the Low User Tariff and the reduction in heating costs for customers with very low levels of energy use.



## Impacting fuel poverty

The residents at the Wyndford Estate come from a range of social and economic backgrounds. To understand the impact of the changes at Wyndford on fuel poverty, the University of Edinburgh research looked at the levels of income poverty at the Estate. The UK median full-time income in 2012, when the interviews were carried out, was £25,960.



The Scottish Government states 'A household is in fuel poverty if, in order to maintain a satisfactory heating regime, it would be required to spend more than 10% of its income (including Housing Benefit or Income Support for Mortgage Interest) on all household fuel use'. Residents were therefore asked to assess what proportion of their income was spent on energy costs at the two time periods. These results cannot be used to accurately measure fuel poverty at the Estate as they are based on interview responses rather than recorded data, but they do imply there were likely high levels of fuel poverty at the Estate.

While around a third of owners reported spending around 10% or less of their income both before and after the changes to the heating in their homes, there were significant reported changes for tenants.

**3x more**  
tenants reported paying  
10% or less for heating\*

\*T1 = 14, T2 = 39

**50% fewer**  
tenants reported paying  
30% or more for heating\*

\*T1 = 11, T2 = 5

## Coping with the cold: a reduction in extreme measures

The University of Edinburgh research found that the installation of the new district heating system resulted in overall significant decrease in the number of residents taking measures – either physical or financial – to cope with the cold at home.

Residents reported using more 'conventional' methods of reducing heating costs, such as wearing warmer clothes or turning the heating down in some rooms. Generally though, rates of using these measures were much lower after the new heating system was installed. The number of residents taking more extreme physical actions decreased significantly:



The significant reduction in tenants taking more extreme financial measures to afford their energy bills also shows the huge benefits of the new heating system. Before the new system was installed, 13% of tenants reported they would cut back on food expenditure, borrow money or run up debt and defer payment of other bills, to cope with the cold at home and/or energy bills. After installation, this had reduced by 70% with a total of 4% of tenants stating they used all three of these extreme actions. Both before and after the new heating system was installed, very low levels of owners reported taking these serious measures.

### Reduction in tenants taking more extreme financial measures to afford energy

Tenants cutting back on food expenditure fell

**50%**

Tenants borrowing money for heating fell

**60%**

Tenants putting off paying other bills fell

**40%**

## Environmental impacts

District heating utilises the heat produced while generating electricity, rather than wasting it as energy losses. This means district heating is significantly more efficient than other forms of energy production, and consequently has a proportionately smaller carbon footprint for each unit of energy consumed compared to other methods of heating.

### Calculating CO<sub>2</sub> emissions savings

SSE calculated the annual carbon emissions savings resulting from the new district heating system at the Wyndford Estate.

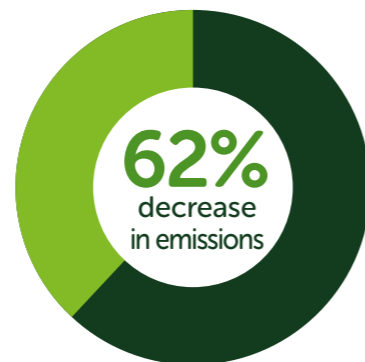
This is based on real metered data of residents' monthly heat consumption from December 2014 to November 2015 (inclusive) and is compared against the estimated emissions from the old heating system for the same level of heating. This is based on an underlying assumption that heat demand would have been the same whether supplied by storage heaters or district heating, meaning that the estimated savings are attributable to the heating system only. Actual energy use (and therefore emissions) at Wyndford would have been further reduced through the insulation improvements not considered within this analysis.

Overall emissions from the district heating system for this period are from total gas consumption in the Energy Centre for providing heating to all households, less a credit for displaced grid electricity. The emissions from the old heating system are calculated assuming that the same quantity of heat had been delivered using electricity as the fuel, as would have been the case had district heating not been installed. The total emissions saving is the difference between the two.

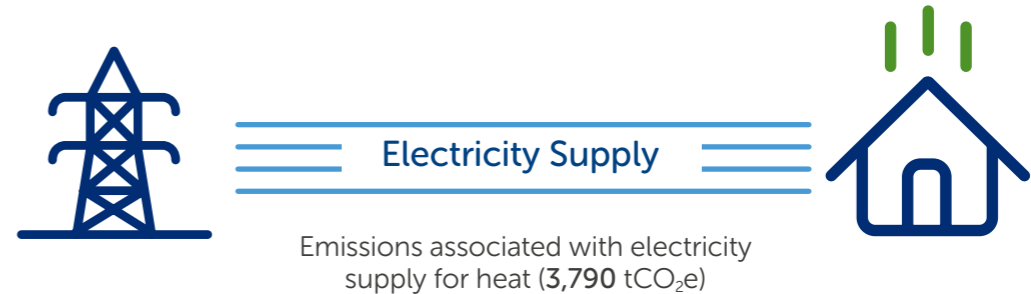
### Emissions savings: the results

The calculation, which can be found in more detail within the appendices on [www.sse.com/beingresponsible](http://www.sse.com/beingresponsible), shows that an estimated 3,790 tCO<sub>2</sub>e would be emitted via storage heaters to supply the current heat demand at Wyndford, compared to the 1,433 tCO<sub>2</sub>e (4,058 tCO<sub>2</sub>e less 2,624 tCO<sub>2</sub>e) associated with the new district heating system.

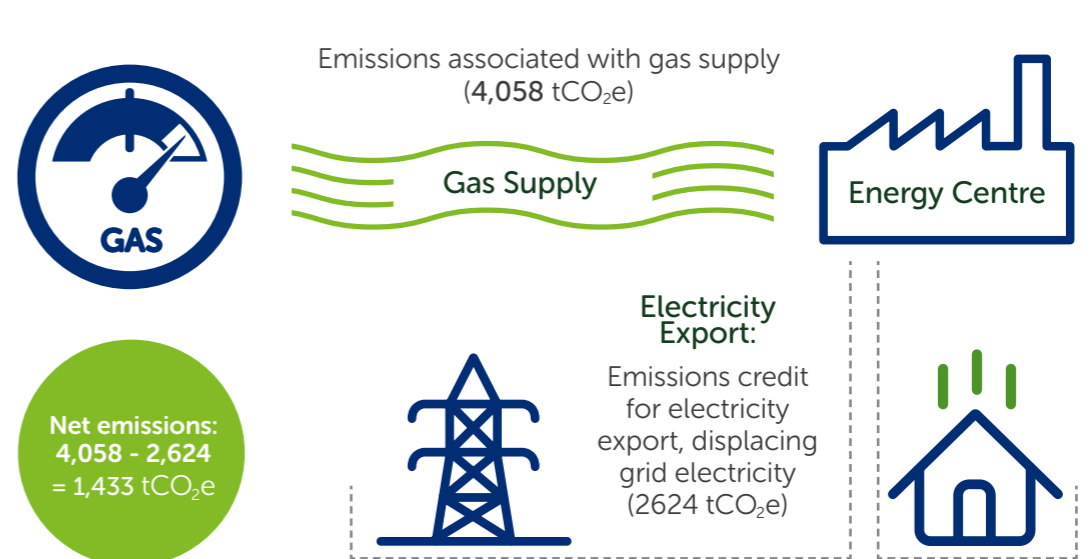
This means for the present level of heat comfort for residents, there is an emissions saving of 2,357 tCO<sub>2</sub>e per annum from the new district heating system compared to the old storage heaters. This represents a 62% decrease in emissions. Using UK government statistics from June 2015, this can be compared to the emissions from driving a newly registered average car almost 20,000,000km – the equivalent of driving from Glasgow to London 30,000 times.



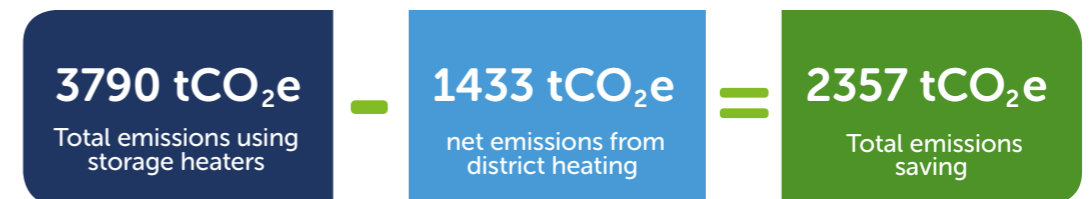
### Before District Heating Installed



### After District Heating Installed



### Emissions Saving



## Economic impacts

The Wyndford Estate district heating project represented a significant investment in local businesses within the Glasgow area, as well as across Scotland and the rest of the UK. SSE has undertaken analysis to try and better understand the economic boost of this expenditure at a local and national level.

### Employment in the local economy

SSE is the only major energy company both head quartered in the UK and operating solely within the UK and Ireland, with its core operations aiming to benefit local economies and communities.

Where feasible, SSE encourages the use of local contractors and suppliers. For the Wyndford Estate project, more than half of all project expenditure was within Scotland. Much of this was spent with local businesses which employ local people in the Glasgow area.

Examples of local suppliers and subcontractors on the Wyndford Estate project include:

- City Building (Contracts) LLP and McGill Electrical Ltd who received large sub-contractor packages and were responsible for the installation of distribution pipework and internal heating systems.
- CCG (Scotland) Ltd for the construction of Energy Centre.
- HF Electrical Ltd for electrical fit-out of Energy Centre.
- Cleartech Water Solutions Ltd for water treatment to district heating network.
- Darroch Insulation Services Ltd who provided thermal insulation to pipework and equipment in Energy Centre.
- West Coast Controls Ltd for the Building Management System (BMS) control system in the Energy Centre.

In addition to employing local businesses on site, wages from individuals employed on the project will have been spent in the local economy around the wider Glasgow area, giving a further boost to the economy.

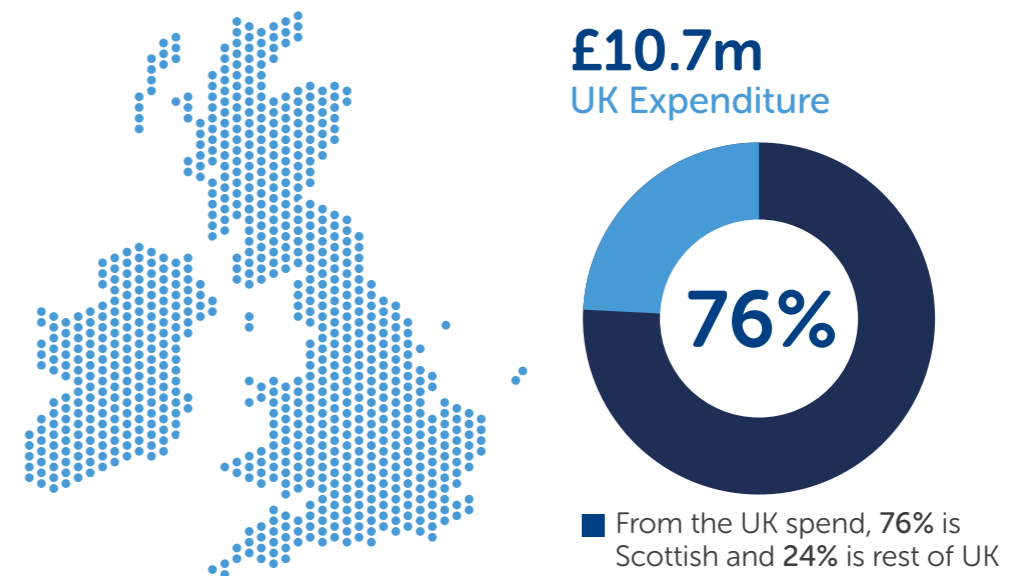
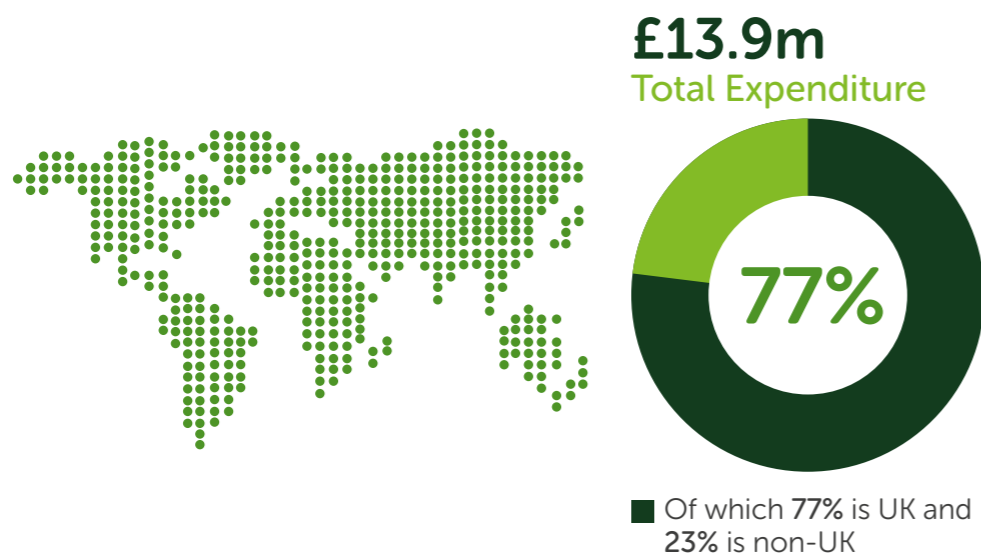
### Case Study: Vital Energi

SSE invited David Raley, Vital Energi's Project Manager responsible for managing the day to day running of the Wyndford Estate project, to give his insight on the success and challenges of the project.

*Of course, the Wyndford project's biggest success is demonstrating how retrofit projects in social housing help alleviate fuel poverty. But for us, it was also great to see the project contribute to local employment. We made sure our subcontractors like City Building and McGill Electrical used locally based staff and operative, and the success of the project meant we were able to open a permanent office in Glasgow.*

*Thinking more about the challenges, the overarching issue was constructing the Energy Centre and installing the district heating network – with new heating systems in so many properties – within just 12 months. Gaining access to all the properties was very challenging and took a lot of coordination and help from resident liaison managers. There were also difficulties making sure the local roads and bus routes were able to remain open during installation of the 5km underground pipework.*

*But with detailed planning and careful selection and management of our suppliers and subcontractors we met our deadline. The Wyndford project was an incredible achievement for our company and has helped grow Vital Energi's reputation in Scotland as a leading provider of large-scale sustainable energy projects.*



## Contributing to jobs and wealth

SSE estimated the overall financial contribution to the Scottish and UK economies, as well as the number of jobs supported in Scotland and the UK, from the £13.9m investment in the installation of Wyndford's district heating system.

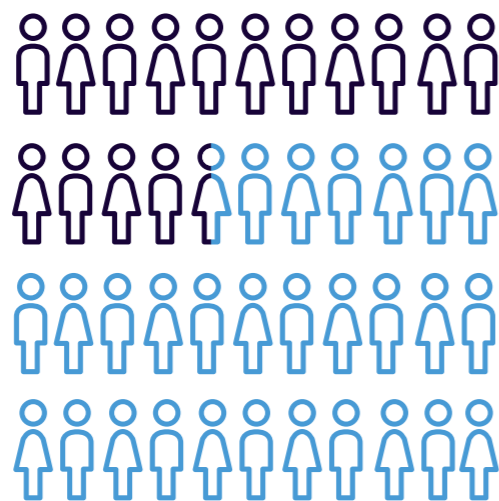
The Input-Output (I-O) economic model was used by SSE to calculate this economic impact from the Wyndford Estate project expenditure. The I-O model calculates the direct impact from project expenditure, as well as the ripple effect across the economy from supplier expenditure and employee wage spending throughout the supply chain. The model generates the economic impact through two key indicators – Gross Value Added (GVA) and years of employment supported.

**Gross Value Added (GVA)** measures the economic contribution from wages and post-tax profits of individual projects, organisations or industry sectors at a national or regional level. The sum of GVA from all these areas equates to the total economic output of a country: the country's Gross Domestic Product (GDP).

**Years of employment supported** are the number of years of full-time employment which resulted from expenditure within the economy. It is measured in 'person years' of employment. This means that eight person years equates to one person working for eight years or sixteen people working for half a year each or any other combination.

## Years of employment supported

176 years of employment supported in the UK economy of which **114 supported in Scotland**



## UK and Scottish economic impacts

In total, 176 person years of employment were supported and just over £10m of value was retained and contributed to the UK economy as a result of the installation of Wyndford's new district heating system.

Over 76%, a total of almost £8m, of all direct UK expenditure for the installation of Wyndford's district heating system was spent with Scottish suppliers and contractors. This expenditure contributed around £6.5m and supported 114 years of employment within the Scottish economy.

The Scottish results appear relatively low compared to the UK findings. This is partly because Scotland is a smaller and more 'open' economy than the UK as a whole. Trade between Scotland and the rest of the UK – which is assumed to be relatively high compared to Scottish trade with other countries – is considered as external trade within the model, whereas within the UK model this is considered to be internal. This means that there is greater 'leakage' out of the Scottish economy. Consequently, the multipliers used to calculate indirect and induced impacts in the I-O model are smaller at more localised levels and so these impacts are lower within the Scottish economy, particularly at indirect and induced levels.

## Gross Value Added (GVA)

£10m added to the UK economy of which **£6.5m contributed to Scotland**



## Conclusion

Heat accounts for a significant proportion of final energy demand and is one of the major contributors of emissions across the UK. In Scotland alone, heat is the largest element of energy use (more than 55%), and contributes 47% of total carbon emissions, with Scottish households and business spending £2.6bn on heating and cooling. Changing the way heating requirements are met presents a significant source for potential decarbonisation.

As one of the UK's leading providers of district heat networks, with 11 heat networks serving over 5,000 customers across the UK and this number set to treble in the near future, SSE Enterprise hopes to play a significant role in the future growth of decarbonised heat in the UK.

This report outlines the social, environmental and economic impacts from the creation of a district heating scheme in the Wyndford Estate in Glasgow. The findings are compelling: lives have improved, comfort has increased, carbon emissions have fallen and jobs and economic value have been created. This is unlikely to be a surprise to proponents of district heating in the UK. The problem is that district heating projects can be complex, involve many partners and require local leadership to make them happen.

That is why SSE has published this report: to contribute to the canon of evidence that makes the case for district heating, and to share the lessons from our practical experience.

SSE has learned an enormous amount from the construction of the project itself, the ongoing engagement with customers and other stakeholders, and from the process of compiling this report itself. The most important aspects are:

- Continuous engagement with customers before, during and after the new heating systems are installed is crucial;
- Customers need support and guidance as to how to use their district heating in the most efficient way: regular and accurate feedback on consumption to customers is key to this;
- Energy suppliers must be responsive with tariffs: one size does not fit all. The feedback received about the balance of fixed costs relative to variable costs was instructive and directly led to SSE establishing a "low user tariff"; and
- Working with suppliers throughout the supply chain helps to maximise the economic benefits for the local area.

SSE wants to be transparent about both the impacts and the learnings because we think it will contribute to the overall development of the district heating sector. SSE would like to thank all those involved with the Wyndford Estate district heating project and those who helped compile this report. In particular we'd like to thank Cube Housing Association, the University of Edinburgh, Vital Energi, the Scottish Government and, perhaps most importantly, our heat customers at the Wyndford Estate. While district heating can be a challenge, it is clear the effort required by all those involved is worth it.





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