MCS

LOW CARBON LANDSCAPES

SMALL-SCALE RENEWABLE ENERGY INSTALLATIONS

MARCH 2020 - DECEMBER 2021

“
The MCS Installations Database (MID) is a data goldmine; a record of more than 1.3million MCS certified low carbon heat and power installations across the UK. This Low Carbon Landscapes report draws on this unique resource, providing a suite of data-driven insights that you can use to analyse the uptake of small-scale renewables across the UK at this vital time for our country's energy policy and generation.
”

IAN RIPPIN
CEO OF MCS

Giving you confidence in home-grown energy

With rising energy costs, climate change affecting us all, and a drive towards net-zero, low carbon technology has a huge role to play in the future of UK energy. MCS is here to ensure it’s a positive one.

Working with industry we define, maintain, and improve quality – certifying small-scale renewables and installers so people can have confidence in the low carbon technologies used to heat and power their homes.

From solar and heat pumps to battery storage, biomass, and wind, we want to inspire a new generation of home-grown energy, fit for the needs of every UK home and community.

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Home-grown energy: The UK's Low Carbon Landscapes

Ian Rippin
CEO of MCS

The MCS Installations Database (MID) is a data goldmine; a record of more than 1.3million MCS certified low carbon heat and power installations across the UK by the end of 2021.

This puts MCS in a unique position to share data-driven insights about the UK's small-scale renewable energy landscape.

Our inaugural report, Renewing Britain, showcased the 14 years' worth of data held within the MID, painting a vivid picture of the steps already taken to decarbonise the UK's homes.

Building on that report's ambition, we are launching Low Carbon Landscapes – which will make invaluable MCS data more readily available to the sector and policymakers.

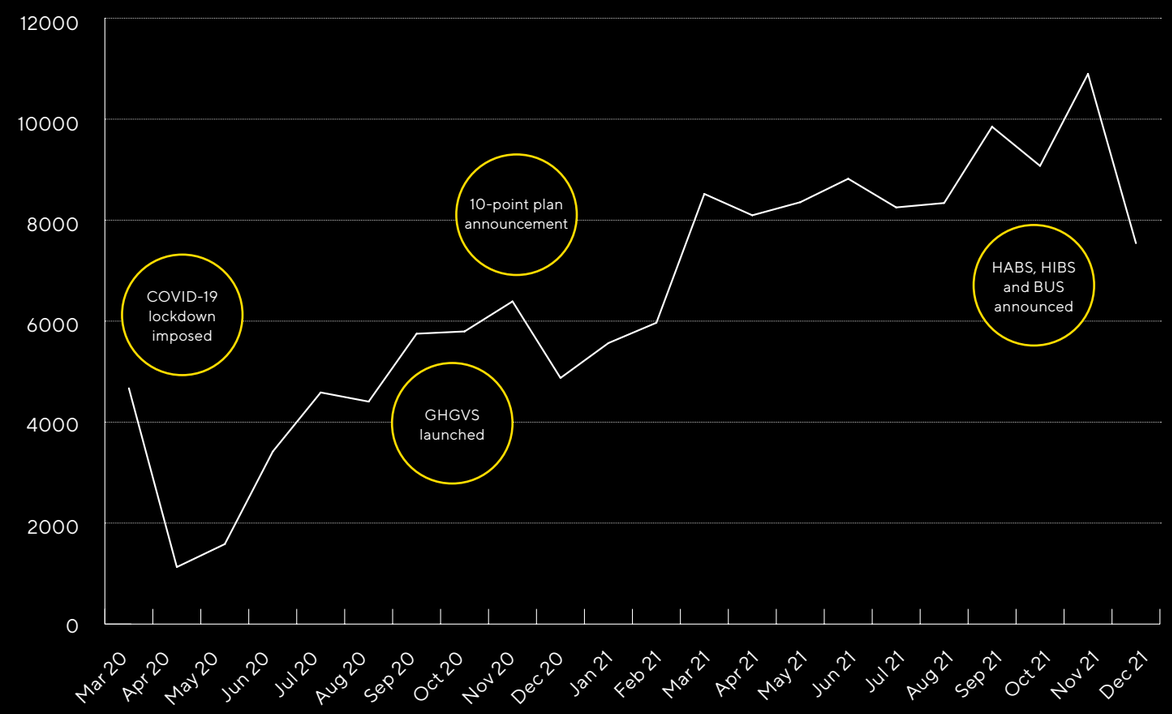
Low Carbon Landscapes is a suite of data-driven insights that you can use to analyse the uptake of small-scale renewables across the UK at this vital time for our country's energy policy and generation.

Launching alongside this report is the MCS Data Dashboard, the first release of a fully interactive digital tool that allows users to delve into the MID in real-time.

The Low Carbon Landscapes report series will provide an annual market outlook, summarising the adoption of low carbon technologies and analysing the trends and policies that drive uptake.

CONT.

Total MCS Certified Installations



GHGVS – Green Homes Grant Voucher Scheme

HABS – Heat and Buildings Strategy (England and Wales)

HIBS – Heat in Buildings Strategy (Scotland)

BUS – Boiler Upgrade Scheme

This report spans March 2020 – December 2021, a period of incredible upheaval for everyone in the UK. In March 2020, we entered the first lockdown of the global pandemic.

The lockdown forced us all to stay at home, placing huge pressure on businesses' ability to install new, small-scale systems. The year began with an average of 4,000 – 5,000 installations per month. By April 2020 that had fallen to well below 2,000.

From June 2020, the market began a rapid recovery, reflecting the broader national trend of increased spending in the home improvement sector. Installations stood at 1,583 in May 2020. By June 2020, they had doubled to 3,416.

Then along came the ill-fated Green Homes Grant Voucher Scheme (GHGVS), which launched in England and Wales in September 2020, forming part of a wider £3 billion green jobs package pledged to aid economic recovery during the pandemic.

The sector was given a much-needed boost by the scheme; monthly installation numbers began to exceed 6,000 by November that year. However, the scheme was problematic from the outset, including payment delays and supply chain issues caused by a backlog of pre-pandemic work affecting delivery.

Though we successfully lobbied on behalf of the industry to have the scheme extended to allow more installers to clear their work backlog, the Government pulled it after just six months.

Though confidence levels within the industry ultimately declined because of this policy uncertainty, the scheme had a somewhat positive legacy: our data shows that average monthly installations ranged between 8,000 – 9,000 from March to October 2021. Public awareness of heat pumps grew, and solar thermal was given a much-needed revival.

In October 2021, the government launched its long-awaited Heat and Buildings Strategy (HABS) for England and Wales. This outlined long-term policy support for renewables, notably to increase annual heat pump installations to 600,000 annually by 2028.

The package of support proposed by the HABS included the Boiler Upgrade Scheme (BUS), a £450m fund to subsidise the upfront cost of installing heat pumps (air and ground source) and biomass systems in limited circumstances for homeowners.

Following the announcement of the HABS, installations reached a high of nearly 11,000 in November 2021 – the highest monthly deployment since March 2013.

Similarly, the Heat in Buildings Strategy (HIBS) launched in October 2021, outlining Scotland's commitment to decarbonising homes and tackling fuel poverty.

The onset of the energy crisis in late 2021 combined with more homeowners wanting to embrace the benefits of greener ways to heat or power their homes, means the deployment of small-scale renewables continues to thrive, and the technologies are on their way to becoming the 'new normal'.

This Low Carbon Landscapes report will provide in-depth, industry-leading analysis of how different small-scale renewables performed across the UK from March 2020 to December 2021.

The data can be accessed using the MCS Data Dashboard, available at datadashboard.mcscertified.com.

This innovative tool, combined with our Low Carbon Landscapes report, demonstrates that MCS is the industry authority that you can rely on to give you confidence in the home-grown energy market.

Ian Rippin
CEO of MCS

< 2,000
monthly installations by April 2020

8-9k
average monthly installations from March – October 2021

"The deployment of small-scale renewables continues to thrive, and the technologies are on their way to becoming the 'new normal'"

£450M
fund in the Heat and Buildings Strategy in October 2021 to help homeowners

11,000
installations by November 2021 – a strong rebound

Introducing the MCS Data Dashboard

Low Carbon Landscapes is our way of showcasing the valuable data available to MCS and making our insights accessible to the sector.

The MCS Installations Database (MID) holds the details of every MCS certified, small-scale renewable energy installation in the UK since 2008. The abundance of information in the MID puts MCS in a privileged position to share data-driven insights with the sector.

What is the MCS Data Dashboard?

The MCS Data Dashboard is a brand new, interactive tool that is designed to provide near-real-time updates on MID data, to track the adoption of small-scale renewable installations in the UK.

It puts our insights in your hands to monitor the current uptake of small-scale renewables, highlight current or past trends and identify opportunities for sector growth.

How it works

By producing data visualisations, the MCS Data Dashboard paints a dynamic picture of the uptake and distribution of small-scale renewable installations in the UK. It also provides insight into the MCS contractor community.

- The MCS Data Dashboard is divided into two sections: Installation Insights and Scheme Insights. Both can be filtered by year, location, technology type and installation type. Image and data exports are also available for download from each visualisation.
- The system will be updated every 24 hours as new installation data becomes available in the MID, enabling users to view industry growth in near-to-real-time.

ACCESS THE MCS DATA DASHBOARD VIA OUR WEBSITE
datadashboard.mcscertified.com

Low carbon peaks: Renewable success stories

The installation of small-scale, low carbon technologies plays a vital part in the decarbonisation of the UK's homes. Data held by MCS showcases how far we've come in pursuit of this aim and shines a light on the notable renewable success stories since the scheme began in 2008.

Read on to dig down into the data on this increasingly important sector.

CONT.

The story so far: 2008 – 2021

By analysing MCS data since the scheme began in 2008, a vivid picture of the UK's Low Carbon Landscapes begins to emerge. Here are the key headlines.

1,341,042

MCS certified installations across the UK

47,734 GWh

total cumulative generation for all installations between 2008 - 2021

equivalent to the heat generation of nearly 4 million homes in one year using mains gas

12,000,000 Tonnes

total cumulative CO2e savings for all installations between 2008 - 2021

the same CO2e emitted by **11.4 million typical long haul passenger journeys** by air from the UK to the US

>3GW

electrical capacity installed between 2008 - 2021

the same capacity as Hinckley Point C nuclear power plant

Low Carbon Landscapes: March 2020 – December 2021

From the rise in solar PV and heat pumps, to a resurgence in solar thermal, our data shows that the uptake of low carbon technologies eventually overcame the substantial challenges of the global pandemic.

Here are the key headlines from this exceptional point in history – and a significant part of the UK's path towards net-zero.

141,639

MCS certified installations

680 gWh

total annual generation of all small-scale renewable installations between March 2020 - December 2021

enough to make everyone in London a **daily cup of tea for four years**

solar PV electricity generation is enough to **power all the 103,500 homes in Derby for a year**

the total heat generation in 2021 alone is **more than the average gas consumption of every home in Glasgow**

219,250 Tonnes

of CO2 saved between March 2020 - December 2021

equivalent to everyone in the UK **watching the first season of Tiger King 9.5 times** during the lockdown

Unprecedented times

March 2020 – December 2021

After the UK Government imposed a full lockdown in March 2020 due to the pandemic, the sector effectively downed tools and monthly installations dipped to below 2,000.

As the first lockdown measures eased, domestic small-scale renewables deployment began to bounce back and installers resumed work that had been put on hold by the March 2020 lockdown. In June 2020, monthly installation deployment doubled to 3,416, compared with 1,583 in May.

The sector benefitted from the lockdown effect of homeowners spending more time at home with increased disposable income to invest in home improvements such as renewable energy systems and other energy efficiency measures.

Solar PV is powering on

Solar PV accounted for 64% of total installations, with 90,820 installations registered. The technology continued to power on as the most deployed in the UK – even in a post-Feed-in Tariff (FiT) world. While leading the way in terms of renewable energy generation, the overall proportion of total installations for solar PV narrowed slightly as more consumers also began to invest in renewable heat technology.

More than 1,000 solar PV installations were registered in 14 local authorities, including areas in England such as South Cambridgeshire and the City of Bristol.

< 2,000

monthly installations in March 2020

90,820 solar PV installations between March 2020 & December 2021

7 out of 10

local authorities with the most solar PV installations were in Scotland over the period

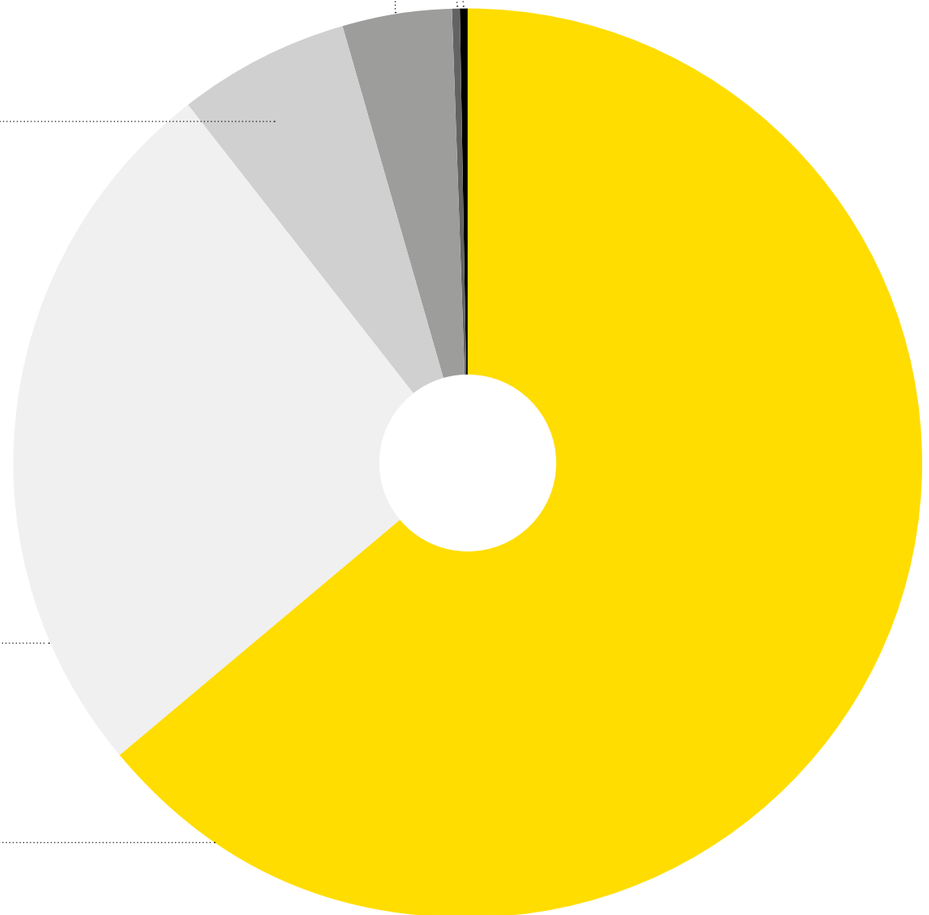
From March 2020 - December 2021, solar PV was the most deployed technology type. Air source heat pumps and solar thermal saw huge rises in installation numbers, driven by interest from consumers who wanted to access the Green Homes Grant Voucher Scheme.

Micro-CHP
0.01%
(9)

Biomass
0.38%
(537)

Ground/Water source heat pump
4.05%
(5,730)

Solar thermal
5.89%
(8,347)



Air source heat pump
25.55%
(36,196)

solar PV
64.12%
(90,820)

Heat pumps are warming up

Heat pump adoption accounted for nearly 30% of total installations in 2021 alone – up from 20% in 2019.

The electrification of heat took a stride forward in this study period. The Green Homes Grant Voucher Scheme increased public awareness of heat pumps as a source of low carbon heat for their homes, as evidenced by the increased installation numbers following the scheme's launch.

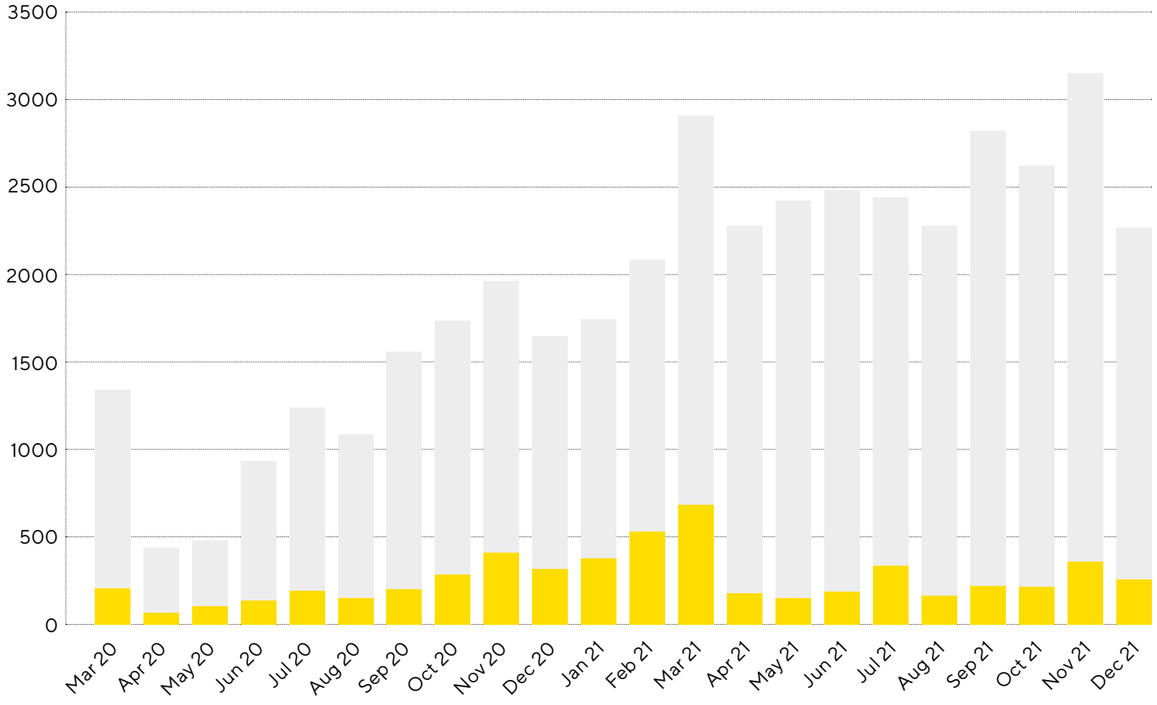
On average, 99 air source heat pumps and 19 ground/water source heat pumps were installed in the UK's local authorities in the study period.

There were nine local authorities that installed no air source heat pump installations in the study period. All these areas were either based in Northern Ireland or London.

Only Manchester (529 in total) installed more than 500 ground/water source heat pumps in the study period.

Given the Government targets in the HABS for 600,000 heat pumps to be installed each year by 2028, the ramping up of heat pump deployment was hugely positive – while demonstrating how effective policy intervention can be.

Air source vs. ground/water source heat pump installations



Reinvigoration of solar thermal

Solar thermal can provide high volumes of water heating at low cost, even in cold climates. It can be used alone or integrated into almost any type of heating system.

For example, homes of the future could have integrated power-to-heat technologies that work to optimise domestic consumption. Smart whole-house solutions can use electrical heat storage or solar-powered heat pumps to heat homes using home-grown energy.

On average, local authorities in the UK registered 24 solar thermal installations in the study period. Based on raw installation numbers, Bolton and Manchester ramped up their solar thermal deployment the most (343 and 224 respectively).

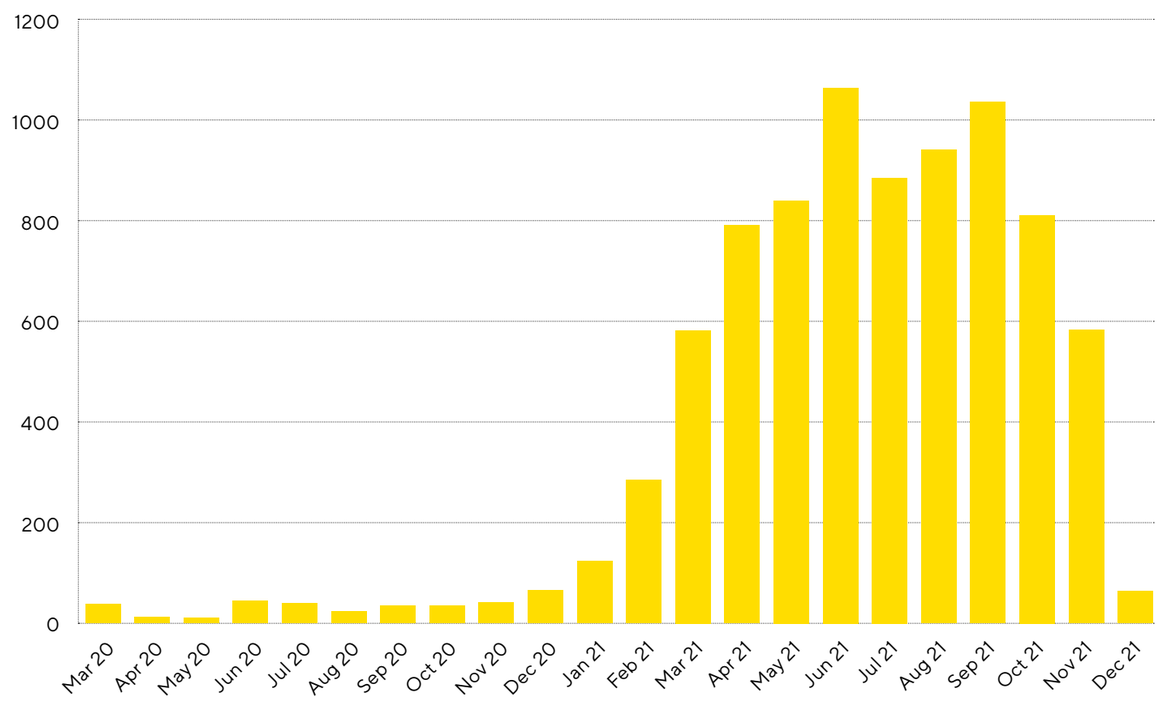
Out of the top 10 areas that installed the most solar thermal installations, 60% were in North West England. Most of the 30 local authorities that did not install any solar thermal installations were in Scotland and Northern Ireland.

In recent years, the deployment of solar thermal has remained relatively low, with averages of around 2,000 installations per year since the sector saw peak deployment of nearly 8,000 solar thermal installations annually in the early 2010s.

The introduction of the GHGVS in September 2020 generated demand in solar thermal among homeowners, with 8,006 solar thermal installations installed in 2021 alone.

Comparing these numbers to 2019, there was a 93% increase in annual solar thermal deployment, reflecting the role that policy – however short-lived – played in triggering a reinvigoration of the technology.

Solar thermal installation numbers



The changing landscape of renewables: March 2020 – December 2021

As well as ranking local authorities based on the total number of installations carried out, MCS also calculated the number of certified installations as a percentage of the number of households in those areas. All local authorities in the UK installed small-scale renewables from March 2020 – December 2021, with certain areas thriving or falling behind.

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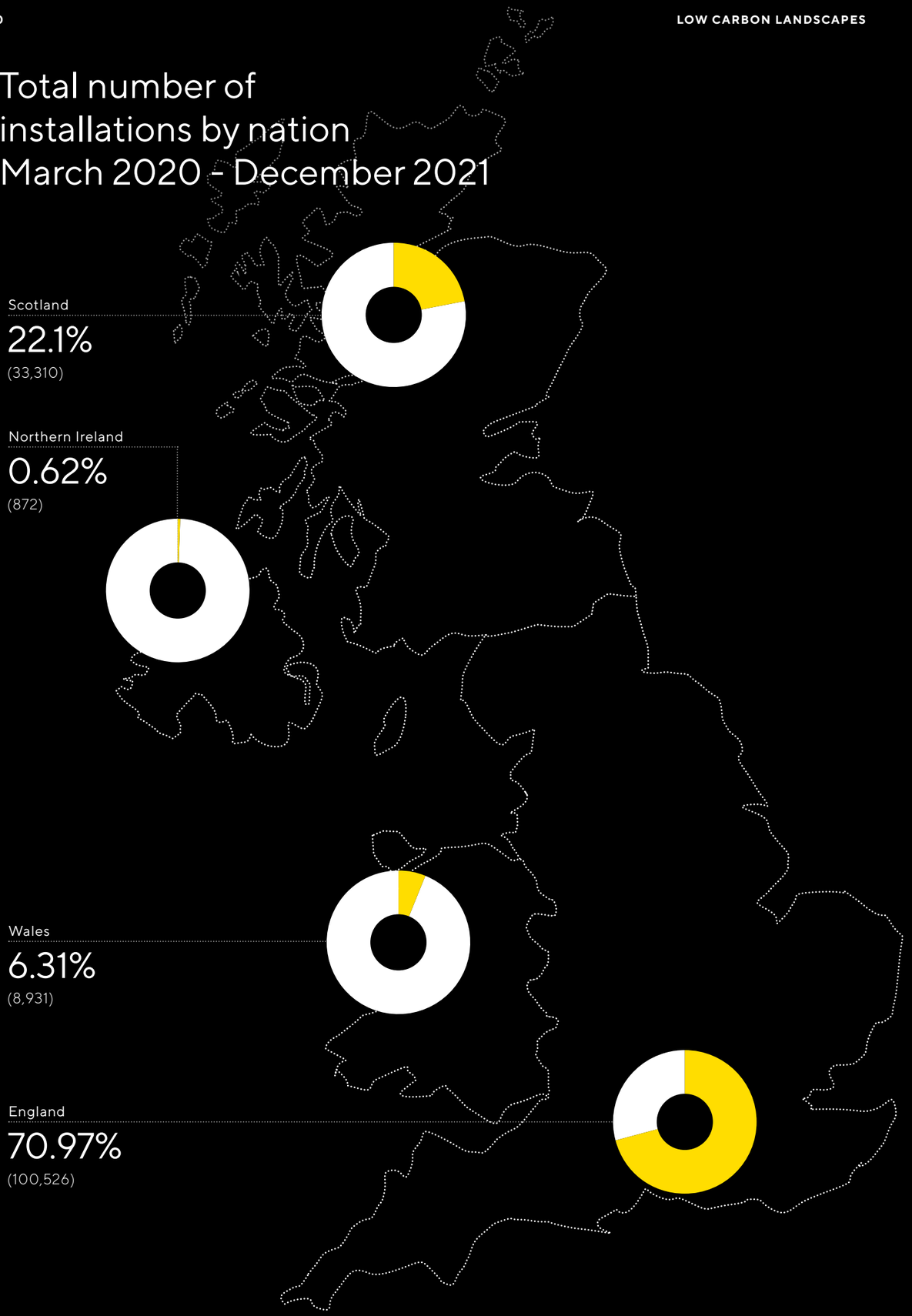
Total number of installations by nation March 2020 - December 2021



Which areas are thriving?

Here are some examples of areas with greater numbers of small-scale renewables:

- 7 out of the 10 local authorities that installed the most in the study period were in Scotland
- Aberdeenshire (3,317) and Cornwall (3,240) ranked top in theUK, reflecting the abundance of installations in Scotland and South West England.
- The Scottish cities Glasgow and Edinburgh made more than 2,000 installations each
- Behind Cornwall, Wiltshire undertook the second highest number of installations in England (1,969), followed by Winchester (1,609)
- English cities Bristol, Leeds and Manchester all carried out more than 1,000 installations

Cornwall installed the highest number (3,240) of small-scale renewables in England from March 2020 – December 2021.

Which areas are falling behind?

At the other end of the scale during this period:

- Almost one third (30%) of the 10 areas that installed the fewest systems were located in Northern Ireland: Fermanagh and Omagh (27), Belfast (31) and Mid & East Antrim (39).
- Half of the 10 areas with the fewest installations are London boroughs; just 0.04% of households in Kensington and Chelsea installed renewables.
- Belfast has the lowest proportion of households installing small-scale renewables (0.02%).

Just 0.04% of households in Kensington and Chelsea installed renewables.

HOME-GROWN ENERGY IN THE HOME NATIONS:

England

71%

of the total 141,639 installations in the UK were in England

To understand the full extent of installation uptake, we should consider how many households are in each of the home nations. A total of 71% of the 141,639 installations in the UK were in England – the most of all the home nations.

Between March 2020 and December 2021 however, that only equates to 0.44% of the homes in England. Therefore, simply looking at the number of installations does not paint a truly accurate picture of what is happening in the UK's low carbon landscapes. We must also consider the total number of installations as a proportion of households.

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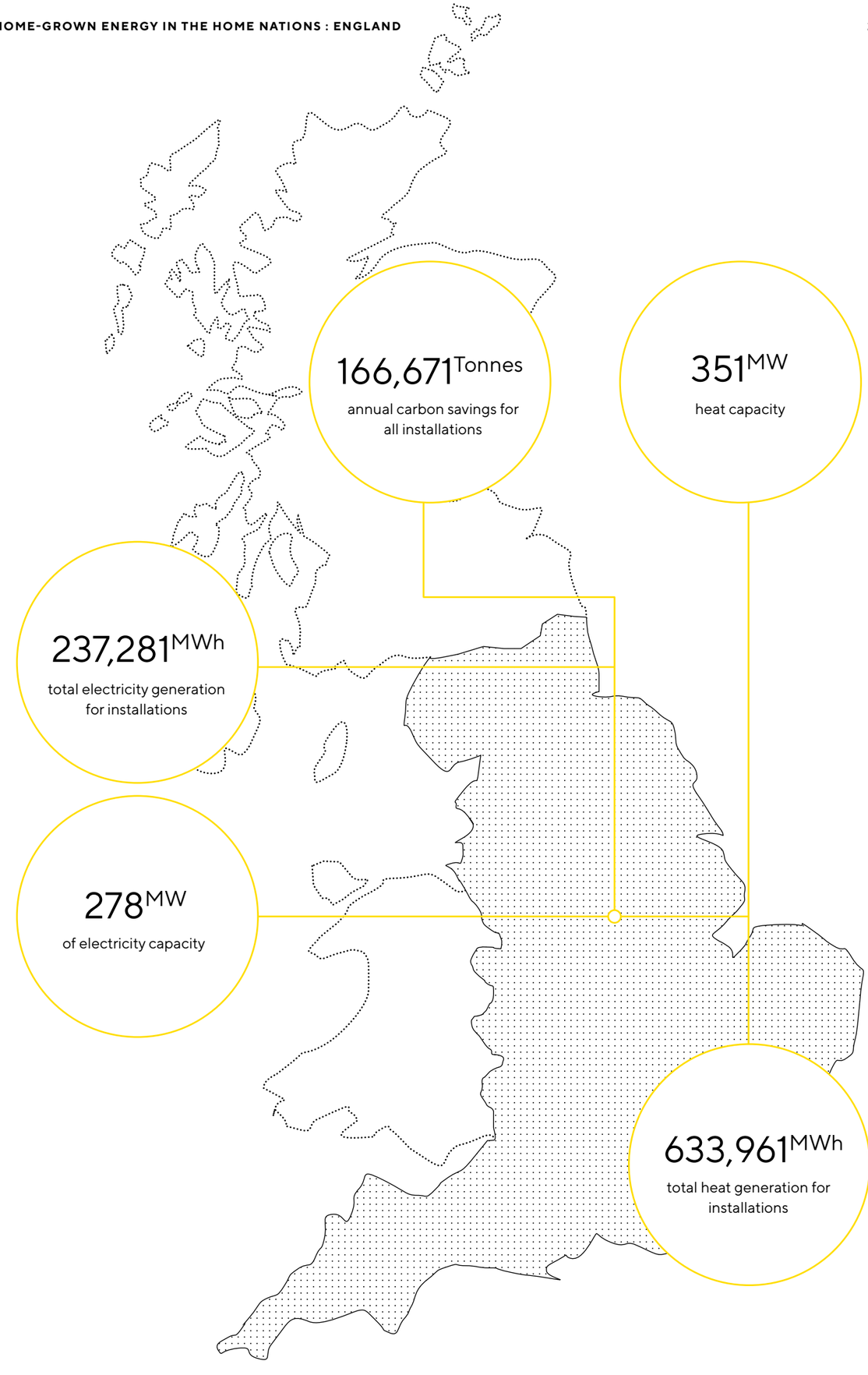

The uptake in each region of England also varies: the South East accounted for most of the installations (20,226), equating to 14% of total UK installations. This was followed by the South West, with a total of 18,477 installations.

Winchester and West Devon were the only two local authorities in England to rank among the 10 areas with the highest proportion of households that installed small-scale renewables.

At the other end of the scale, half of the bottom 10 areas were London boroughs, which registered 5,317 installations, representing 0.16% of households.

Nearly 96% of solar thermal installations were installed in England, as well as 66% of air source heat pumps.

The English policy landscape: March 2020 – December 2021

England's low carbon policies are driven by Westminster's net-zero aims, as well as regional and local commitments.

The GHGVS spearheaded adoption of heat pumps and solar thermal during this study period. At a regional or local level, additional funding was awarded to several councils across the country through dedicated schemes.

For example, the Local Authority Delivery Scheme delivered low carbon heating and solar PV to some of the least energy efficient properties in the country, significantly reducing both their carbon footprint and energy bills.

London has some way to go when it comes to decarbonising its homes: half of the bottom 10 areas with small-scale renewable energy installations were boroughs in the city

20,226

installations within the South East of England between March 2020 – December 2021

18,477

installations in the South West of England

96% of all Solar Thermal installations across the UK were in England

A start-up success story: Cotswold Energy Group

cotswoldenergy group

WEBSITE

cotswold.energy

When three school friends from Gloucestershire met one evening in a pub in 2018, they did more than have a drink – they established Cotswold Energy Group.

Robin Hodge, Aaron Stuart-Kelso and Jon Bonnar grew up in Gloucestershire. Over the years, each developed their own interest in making a difference via renewable energy and heating installation.

Managing director, Jon, achieved a Business Studies degree in 2002 and always had a flair for new technologies, strategy and people management.

Co-founder, Robin, began his journey to renewables after completing an Environmental Geoscience degree at Bristol University, before moving onto technical sales of heat pumps in 2013.

Aaron qualified as a heating engineer in 2007, having learnt the trade with several established businesses. He quickly went on to set up his own business, employing several heating engineers, before switching his focus to renewable installations by teaming up with Robin and Jon at Cotswold Energy Group a few months after it was founded.

CONT.

> Installing an air source heat pump tends to be quick, with little disruption and is easy to manage for homeowners, as no planning permission is required.

Founding Cotswold Energy Group

By the end of that evening in the pub, the trio agreed that providing specialist heat pump consultation and installation was the way forward.

They spent £4,000 to set up an MCS certified business and focused on making heat pumps financially viable for the average homeowner.

In their first year they achieved a turnover of £1.3million, and forecast £6.5m in 2022.

Cotswold Energy Group reports that air source heat pumps have experienced an exponential growth in popularity with year-on-year increases in enquiries and installations.

Since the publication of the government's Heat and Buildings Strategy (HABS) in October 2021, the business saw three times the number of enquiries versus the same period in the previous year.

Between March 2020 and December 2021 Cotswold Energy Group completed 100 air source heat pump installations.

With more people now considering small-scale renewables as a feasible option for their home, Cotswold Energy Group has seen the average customer change. Having started out installing heat pumps at much larger homes, projects now range from two-bedroom terraces all the way up to commercial buildings.

Jon explained: "Installing an air source heat pump tends to be quick, with little disruption and is easy to manage for homeowners, as no planning permission is required. We are often in and out within a week."

Cotswold Energy Group is hopeful that interest in heat pumps continues to soar, as customers gain confidence and are incentivised by the introduction of the Boiler Upgrade Scheme.

100
installations completed between March 2020 and December 2021

£1.3 million
turnover achieved within their first year

Founders Robin Hodge, Aaron Stuart-Kelso and Jon Bonnar of Cotsworld Energy Group

HOME-GROWN ENERGY IN THE HOME NATIONS

Northern Ireland

0.12%
of Northern Ireland homes have installed small-scale renewables

Northern Ireland saw the lowest overall numbers of installations and the lowest adoption rate of any of the UK nations; the country also had the lowest installation numbers for any of the individual technologies.

Between March 2020 and December 2021, there were fewer than 1,000 installations in Northern Ireland, representing less than 1% of the UK total. At 0.12%, Northern Ireland also had the lowest proportion of homes that installed small-scale renewables.

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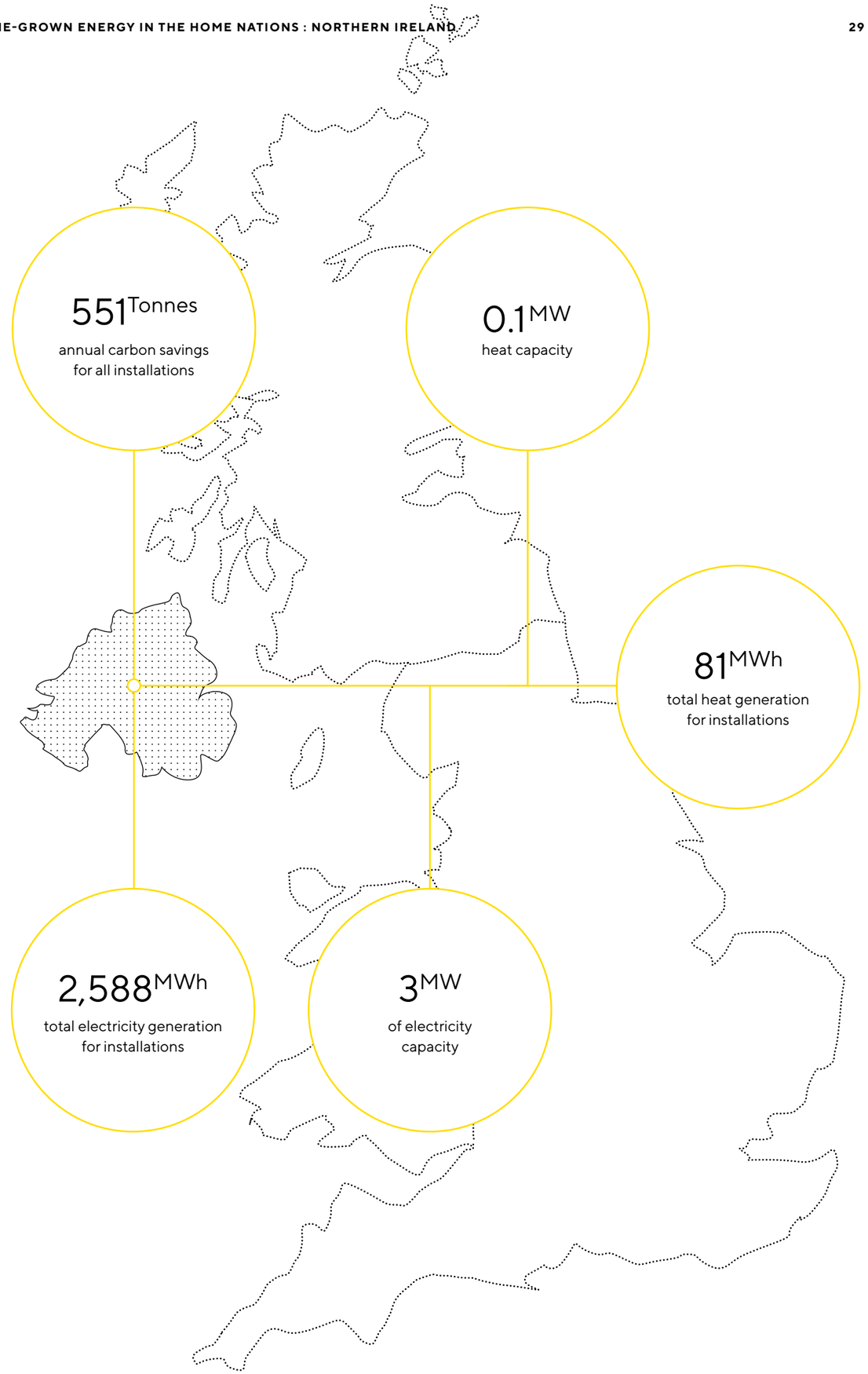


Of the top 10 areas with the highest proportion of domestic renewable technologies installed, none were in Northern Ireland.

A total of four of the bottom 10 local authorities for uptake of residential renewables were in Northern Ireland, making the nation second only to London in representation at the bottom of the table.

The Northern Irish policy landscape: March 2020 – December 2021

Energy policy in Northern Ireland is devolved and has not been as effective in supporting wide-scale installations of renewable energy and heat technologies as in other home nations.

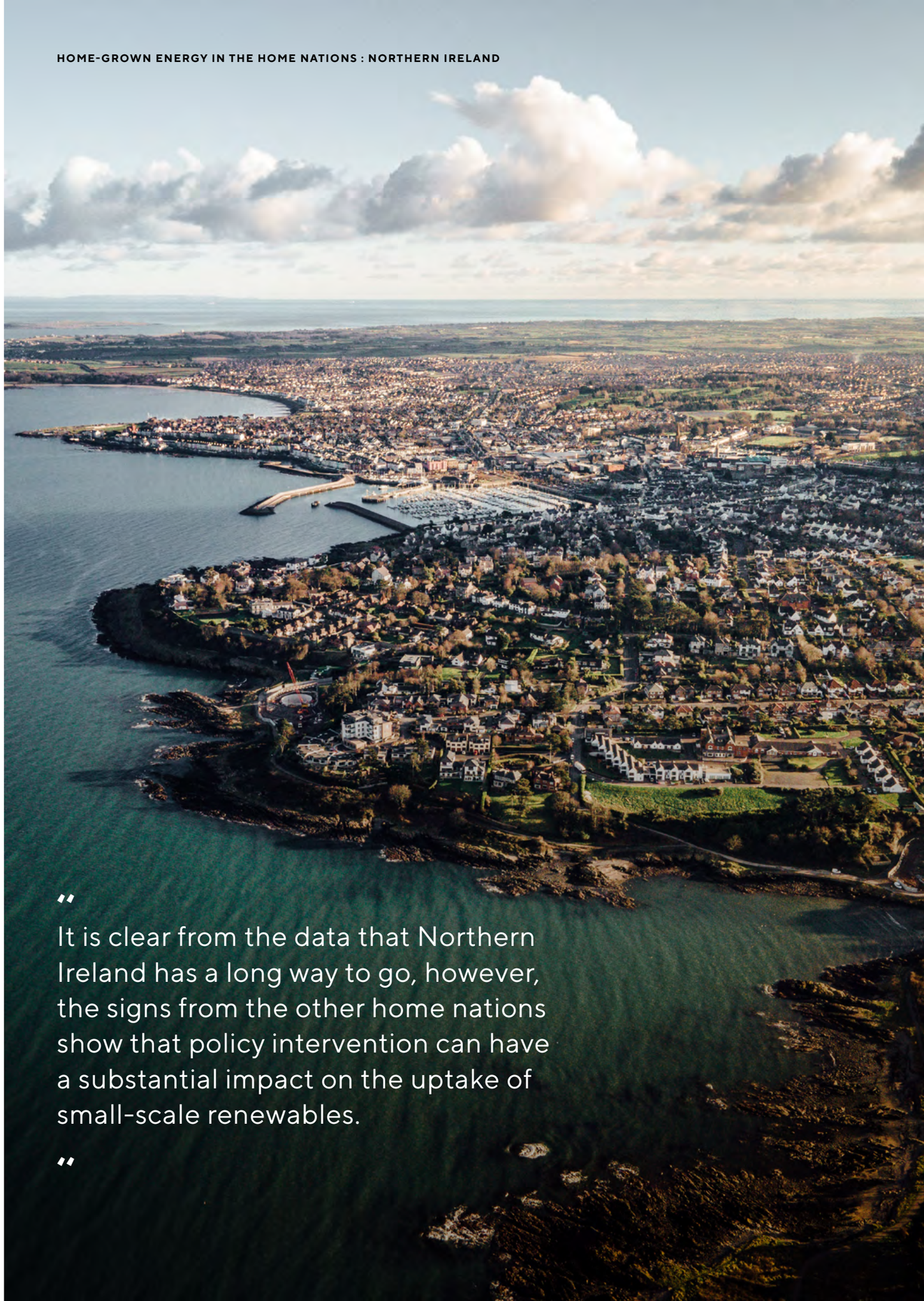
The existing programmes to improve the energy efficiency of housing in Northern Ireland currently do not include renewables. This was set to change in 2022 with the launch of a new domestic retrofit scheme that will include heat pumps, however at the time of writing it is not in place.

It is clear from the data that Northern Ireland has a long way to go, however, the signs from the other home nations show that policy intervention can have a substantial impact on the uptake of small-scale renewables.

Energy policy in Northern Ireland is devolved and has not been as effective in supporting wide-scale installations

4/10

of the bottom local authorities for uptake of residential renewables were in Northern Ireland



“It is clear from the data that Northern Ireland has a long way to go, however, the signs from the other home nations show that policy intervention can have a substantial impact on the uptake of small-scale renewables.”

HOME-GROWN ENERGY IN THE HOME NATIONS

Scotland

31,310
overall installations across Scotland

Although England had three times more installations than Scotland's 31,310 installations overall, Scotland had the highest adoption rate. Between March 2020 and December 2021, approximately 1.3% of homes in Scotland installed renewable technologies.

Of the top 10 areas across the whole of the UK with the highest proportion of households installing small-scale renewable technologies, seven were in Scotland.

None of the bottom 10 areas in the study period were in Scotland, cementing the nation's position as the UK's low carbon powerhouse.

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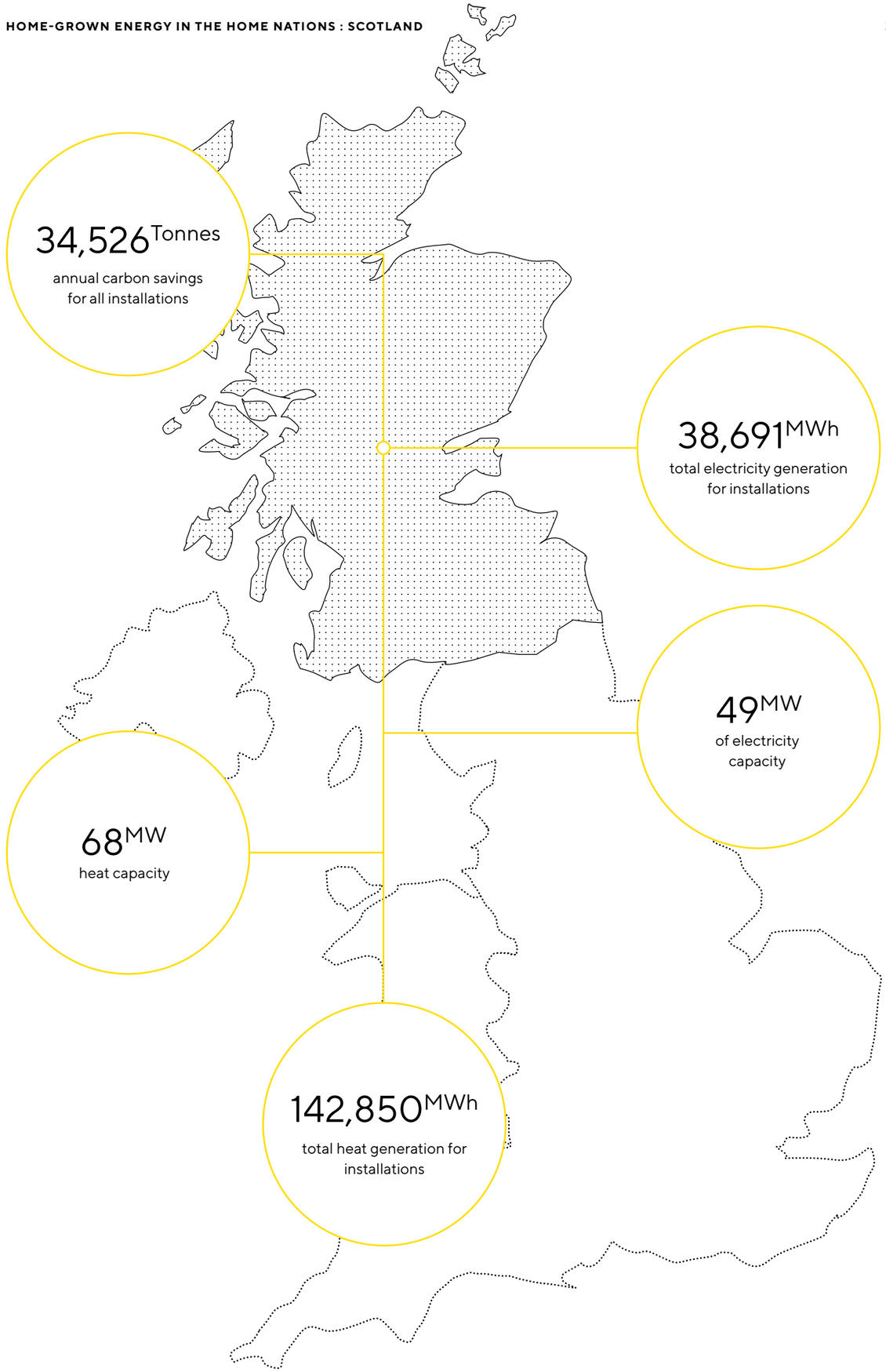


Unlike in England, renewables are almost as widespread in major cities as in rural areas. For example, Glasgow saw the second highest number of installations of ground/water source heat pumps of any area in the UK.

Scotland was particularly notable for solar PV installations, with 70% of the top 10 installation areas being Scottish. At the top of the list was Aberdeenshire, where approximately one in 41 homes have solar PV installations.

The Scottish policy landscape: March 2020 – December 2021

Energy policy is devolved in Scotland, and the policy environment is supporting the installation of renewable technology at scale.

The Heat in Buildings Strategy (HIBS), introduced in October 2021, set out a pathway to zero emissions in buildings by 2045 and detailed a series of near-term actions, as well as a range of further, longer-term commitments to accelerate the transformation of the nation's building stock. Its vision is for more than one million homes in Scotland to convert to zero emissions heating by 2030. As such, emissions from heat in buildings will have to fall by 68% by 2030 as compared to 2020.

Other measures in Scotland include the Private Rented Sector Landlord Loan, Warmer Homes Scotland Scheme, and the Home Energy Scotland Loan scheme, which are available for both private and public households to help cover the costs of installing renewables.

Aberdeenshire, where approximately one in 41 homes have solar PV installations.

70%

of the top 10 installation areas for solar PV were in Scotland between March 2020 - December 2021

1 Million

homes in Scotland to convert to zero emissions heating by 2030 (HIBS)

HOME-GROWN ENERGY IN THE HOME NATIONS : SCOTLAND

Leading the UK in small-scale renewables: Orkney Renewable Energy Forum

OREF
ORKNEY RENEWABLE ENERGY FORUM

WEBSITE

oref.co.uk

At a regional level, the Orkney Islands are the standout low carbon powerhouse across the whole of the UK, with the equivalent of one-in-five homes having some form of MCS certified small-scale installation since 2008.

The Orkney Renewable Energy Forum (OREF) works to reduce the Islands' dependency on fossil fuels and motivate homeowners to take steps towards net-zero.

One of the main drivers for renewable heating and power in Orkney is the cost of energy. The climate in Orkney is generally wetter, windier and cooler than many other places in the UK, so heating is generally on for longer in the year meaning that energy prices are a particular issue.

Wind power was of initial interest in Orkney, with the Islands' population of just over 22,000 people installing over one-ninth of all FiT-eligible wind power in the UK but this has since expanded to include domestic solar PV electricity.

The falling cost of solar PV has seen its popularity grow. OREF reports that the availability of certified battery storage systems alongside solar panels has helped this demand grow even further. The average cost of solar panels is now 88% lower in Orkney than it was in 2010.

CONT.

> The OREF hopes to continue its work of the past 22 years into the future and keep growing its now 150-strong membership of local individuals and businesses.

There are also local policies driving the uptake of small-scale renewables alongside the hard work of OREF members. The Orkney Islands Council has implemented its Sustainable Energy Strategy until 2025 and a supporting Action Plan. The strategy sets specific targets for Orkney to reduce carbon emissions, eradicate fuel poverty, develop a secure net-zero energy supply and position itself as a globally recognised region for innovation in energy systems.

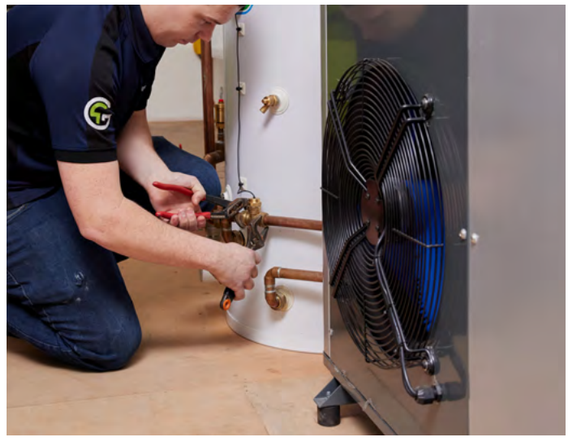
Home Energy Scotland also introduced interest-free loans of up to £17,500 for homeowners fitting renewable heating and energy technologies, making the upfront capital costs of systems more affordable and achievable for the average homeowner. The move has led to an uptake of renewable heating systems alongside energy technologies, with Orkney also recording high levels of air source heat pump installations.

The OREF hopes to continue its work of the past 22 years into the future and keep growing its now 150-strong membership of local individuals and businesses. Speaking of the importance of community collaboration, they told us they regularly 'gather together to discuss energy conservation and new renewable technologies, and, in doing so, we inform ourselves and also motivate others to take steps.'

£17,500

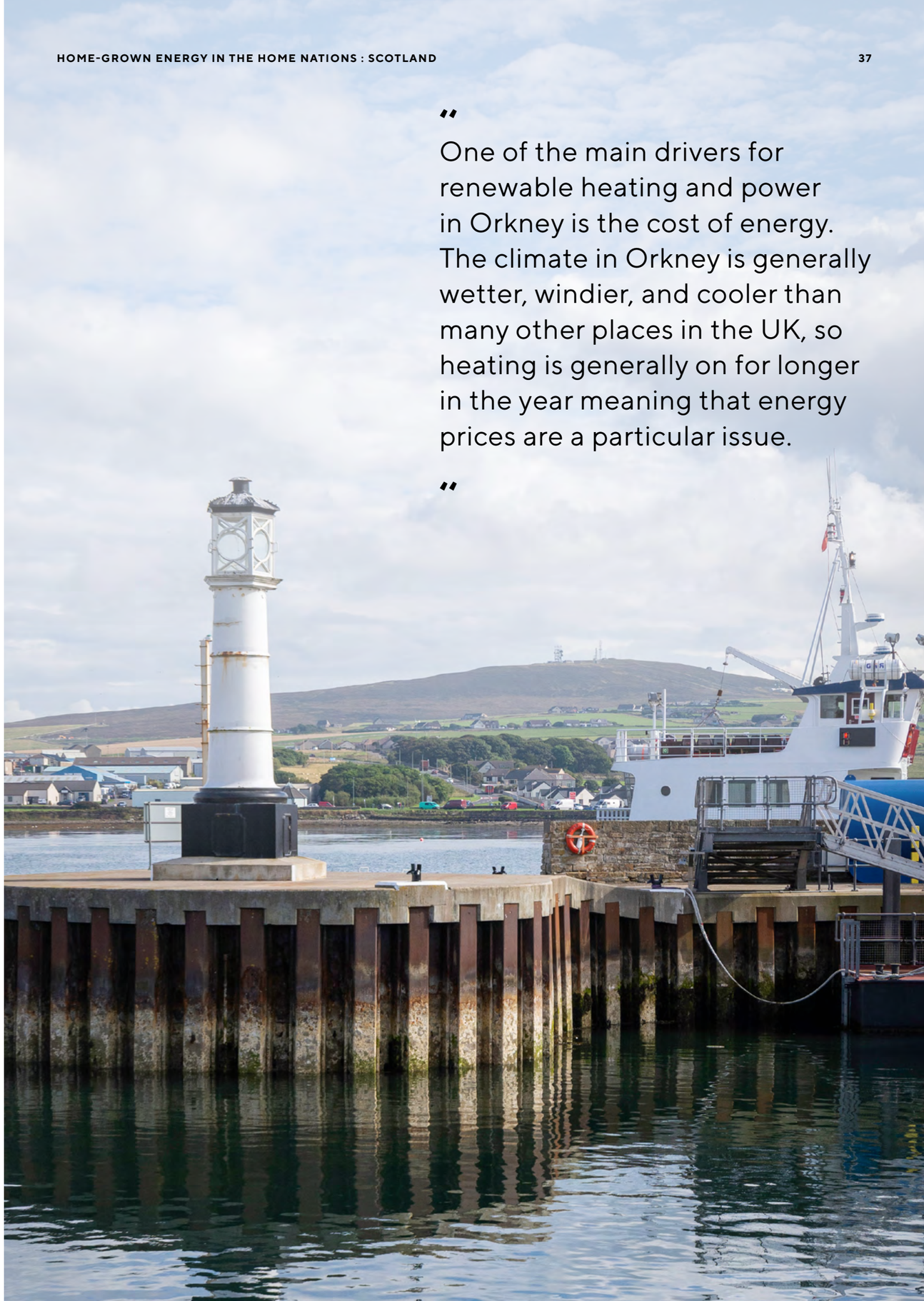
interest-free loans introduced by Home Energy Scotland

Orkney has recorded high levels of air source heat pump installations



An installer carrying out an air source heat pump installation – a popular renewable energy technology on Orkney

> One of the main drivers for renewable heating and power in Orkney is the cost of energy. The climate in Orkney is generally wetter, windier, and cooler than many other places in the UK, so heating is generally on for longer in the year meaning that energy prices are a particular issue.



HOME-GROWN ENERGY IN THE HOME NATIONS

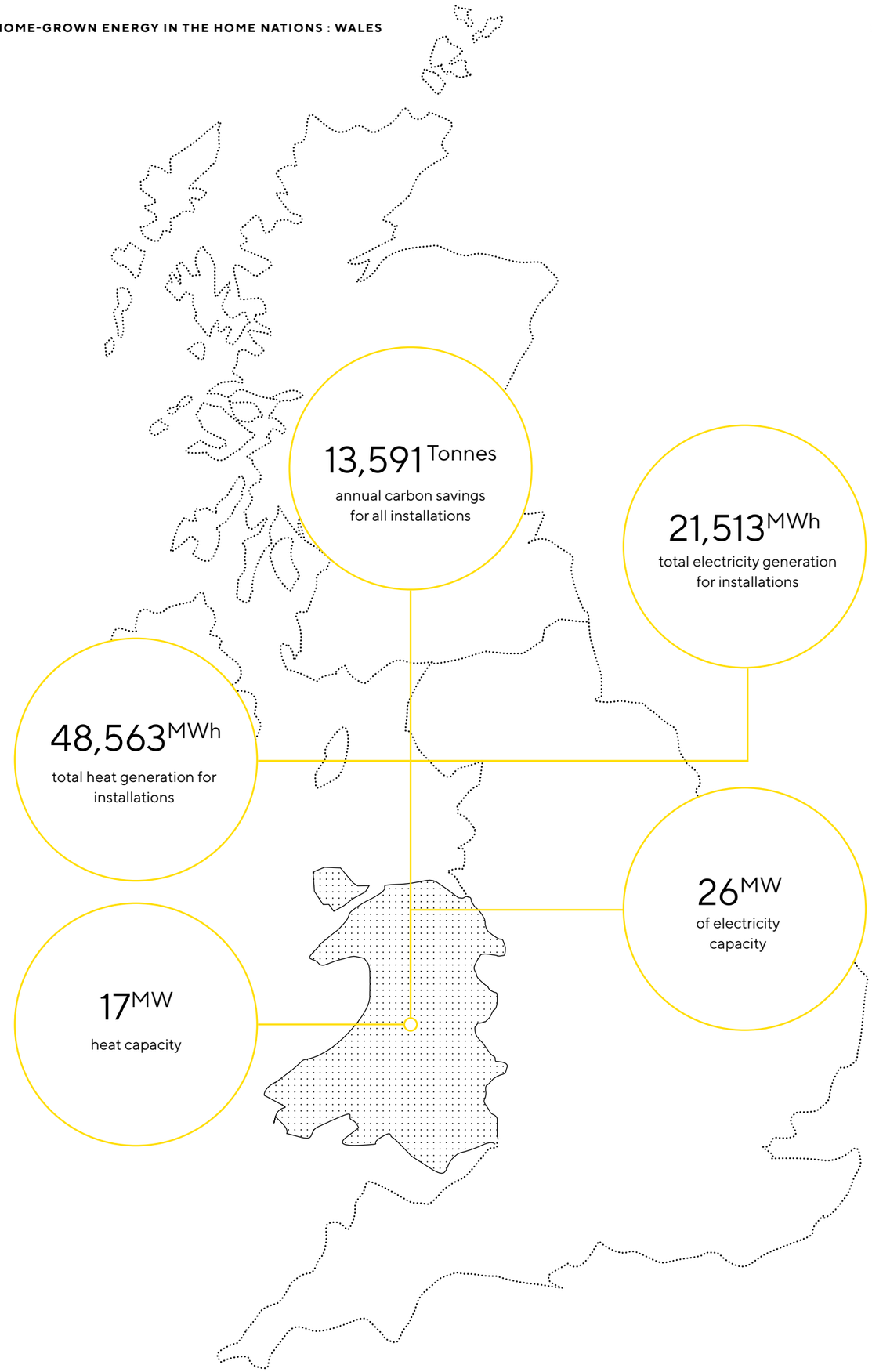
Wales

6%
of installations in the UK between March 2020 and December 2021 were in Wales

Like the picture in Scotland, Wales also had far fewer installations than England but the Welsh adoption rate was 0.66%, the second highest of the home nations. The 8,931 installations between March 2020 and December 2021 were 6% of the UK total.

Wales saw the biggest uptake of biomass boilers, with Powys and Carmarthenshire having the UK's highest adoption rates. However, this technology was generally installed in very low numbers across the UK.

CONT.



The Isle of Anglesey – where 42% of households are fuel-poor and 83% classed as rural – is the only Welsh area to rank in the 10 areas with the most households with small-scale renewable installations.

None of the bottom 10 areas in the study period are in Wales, again showing how well the country performs in terms of small-scale renewables adoption.

In terms of technologies, Wales had the highest number of ground source heat pump installations when looking at the proportion of households.

The Welsh policy landscape: March 2020 – December 2021

Energy policy in Wales is determined in Westminster and through the Welsh Government at a local level. Wales is included in national schemes to promote renewables alongside England, so the GHGVS increased the take up of heat pump technology in Wales during this study period.

The scheme was superseded by the announcement of the Boiler Upgrade Scheme in late 2021, with Welsh households eligible for this scheme too.

In addition, the Welsh Government Warm Homes Programme provided funding for energy efficiency improvements including solar PV and heat pumps to low-income households and those living in deprived communities across Wales through the Nest and Arbed schemes..

The Isle of Anglesey is the only Welsh area to rank in the 10 areas with the most households with small-scale renewable installations.

Wales had the highest number of ground source heat pump installations when looking at the proportion of households

42%

of households on the Isle of Anglesey are classed as fuel-poor

0.66%

adoption rate across the whole of Wales

Solar success in Wales: Chris Allen Heating Limited

WEBSITE

chrisallenheating.com

When MCS certified, Chris Allen Heating Limited, diversified into installing renewable power and heating systems, the company soon found solar PV was their most popular offering with a ready and waiting consumer base.

Chris Allen and his colleagues transitioned into small-scale renewables after more than 35 years of experience in installing traditional heating and electrical technologies. With experience in fitting air source heat pumps already, Chris and the team chose to become MCS certified for solar PV technologies too. Having successfully secured MCS certification, they completed 74 solar PV installations in 2021 alone.

Chris described the company's move towards renewable technology and MCS certification as a natural transition to ensure its continued viability – especially as homeowners recognise the role heat pumps and solar PV will play in the UK's journey to net-zero.

Following the publication of the Government's Heat and Buildings Strategy, Chris reported more and more enquiries from homeowners. As renewable technology became a viable and affordable solution for everyone, a new demographic of consumers expressed interest in renewables, rather than just affluent households.

CONT.

> “Not only can the customers see the savings very quickly to their electric bill, but once installed, there are very few, if any, changes to how the customer uses the existing systems in their homes”

CHRIS ALLEN
CHRIS ALLEN HEATING LTD

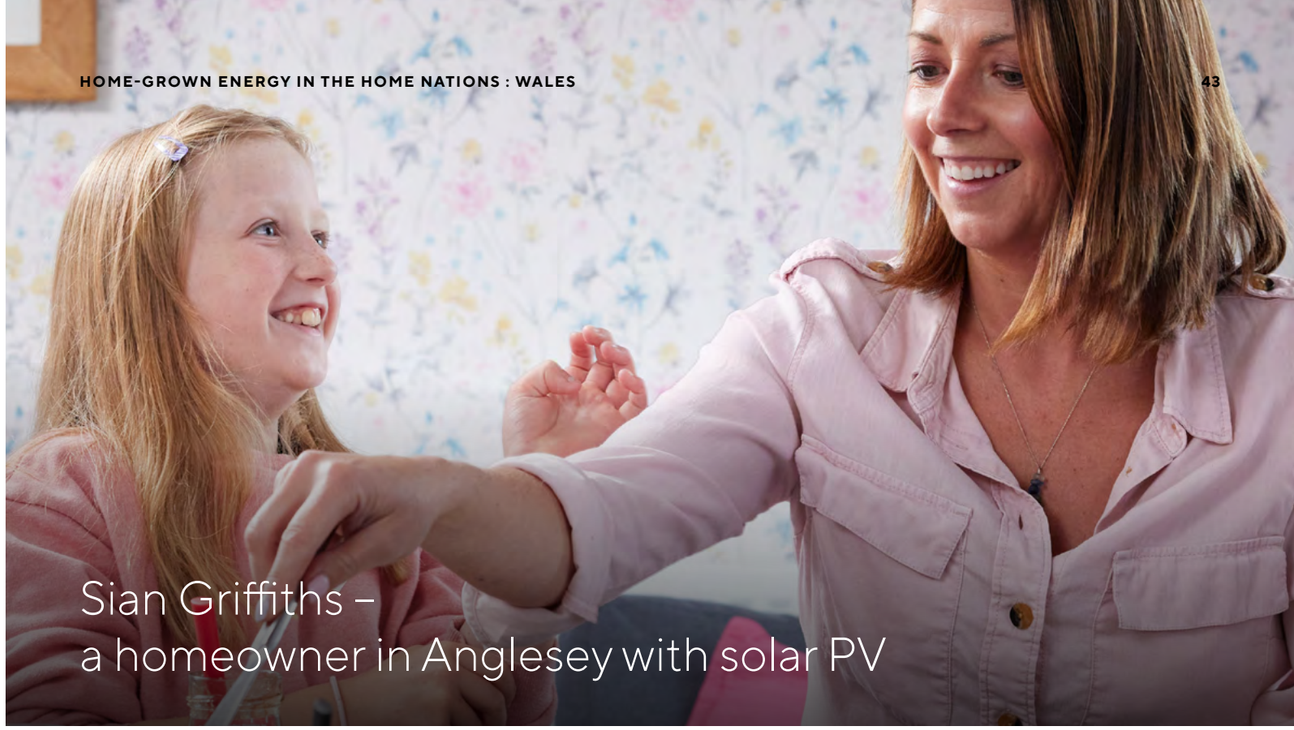
One impact on consumer awareness was Warm Homes Arbed, a scheme launched by the Welsh Government and Arbed am Byth to provide funding for energy efficiency improvements.

Chris believes solar PV is their most popular technology due to the instant impact: “Not only can the customers see the savings very quickly to their electric bill, but once installed, there are very few, if any, changes to how the customer uses the existing systems in their homes.”

He expects renewable installations will continue to increase year-on-year and believes it is inevitable that fossil fuels will be slowly phased out as they become less affordable. He also sees MCS certification as the way forward for his company, opening doors for future opportunities.

On becoming certified, Chris said: “To us it makes total sense becoming MCS certified; they have kept us at the forefront of our industry. Being certified allows us to keep our engineers highly trained, while bringing apprentices into the workforce and letting us do our bit towards helping the environment and meeting government goals on carbon.”

Chris Allen has more than 35 years of heating industry experience and now specialises in renewable energy



Sian Griffiths – a homeowner in Anglesey with solar PV

TECHNOLOGY
solar PV

Sian, a primary school teacher, lives in Anglesey in North Wales. She grew up in the same village where she now lives and has been in her current four-bedroom home with her three children for the past 16 years.

In 2021, she noticed that several of her neighbours had solar PV installed and and found out from them about the Welsh Government's Warm Homes Arbed Scheme: an area-based energy efficiency improvement scheme.

Despite her parents having solar PV for about 10 years, Sian admitted to not knowing too much about the technology. But given her concerns around climate change and the desire to reduce her carbon footprint, and the potential savings on her energy bill, she contacted Arbed to arrange for a surveyor to visit and advise her of her options.

She said it “made perfect sense” to have the panels fitted once the surveyor had explained how they worked, and that her south-facing roof was an ideal location for them. Under the Arbed scheme, Sian qualified to have the panels fitted free of charge. Her only concern at the time was whether fitting the panels would damage her roof – which the surveyors assured her they wouldn’t. Their assurance, coupled with the 12-year product warranty they offered, convinced her to go ahead.

CONT.

The system was installed in July 2021 and immediately started paying dividends for Sian.

Local MCS certified installer, Chris Allen Heating Limited, provided instructions on how to make the most of the panels by doing as many of their electricity-hungry activities, such as clothes washing, during the day when the panels were generating at their peak.

Sian also had a solar diverter fitted that takes surplus solar energy from the panels to heat her hot water when required; it also sends any remaining surplus back to the grid for which she receives payment from her energy supplier through the Government-backed Smart Export Guarantee.

She said: "I'm much more aware of using electricity now. I can get up and put the washing machine on first thing in the morning, and with my smart meter I can see that it's costing me nothing."

Sian estimates that she is saving around £100 a month on her electricity bills since having the panels installed – and one month during the summer her electricity supplier ended up owing her money due to how much she had exported back to the grid.

The Arbed scheme was "an absolute lifesaver" for her and her family as they benefit from generating truly home-grown energy to help power their home.

£100

per month estimated saving on her electricity bills since having the panels installed

The Warm Homes Programme, including the Arbed scheme, enabled Sian to access funding to install solar PV on her home

"It made perfect sense to have solar panels fitted... I'm much more aware of using electricity now."

SIAN GRIFFITHS

The future of the UK's Low Carbon Landscapes

Our installation data from March 2020 to the end of 2021 demonstrates that the UK is one step closer to reaching the Government's legally binding net-zero targets.

A total of 141,639 installations – equating to more than 200,000 tonnes of carbon saved – means that the UK had 1,341,042 small-scale renewables in people's homes by the end of 2021.

Small-scale renewables continue to be installed everywhere in the UK, and it is positive to see the rise in installation numbers increasing the contribution of home-grown energy to the UK's power infrastructure.

Given the global pandemic and unstable Government incentives, the journey of uptake in the study period was turbulent, but the figures ultimately paint a positive picture that more homeowners than ever are starting to embrace low carbon heat and power.

In 2021 alone, installation numbers exceeded 2020 totals by around 47,000, with a significant increase in renewable heat deployment.

Many UK households are still without renewable energy systems, especially where stable, long-term policies do not support uptake. However, the future for small-scale renewables is bright, with their appeal enhanced by ongoing energy security shocks which continue to raise the cost of heating and powering our homes.

APPENDIX 1

MCS Low Carbon Landscapes: the local authority league table (MCS installations from 2008 to end of 2021)

No.	Local Authority	% of households with installations	Installation volume (2008-2021)	1 in x households
1	Orkney Islands	25.7	2390	1 in 4 households
2	Western Isles	19.98	2578	1 in 5 households
3	West Devon	18.29	4133	1 in 5 households
4	Peterborough	17.79	14465	1 in 6 households
5	Lincoln	14.89	6222	1 in 7 households
6	Winchester	14.15	7527	1 in 7 households
7	North Norfolk	13.6	6432	1 in 7 households
8	Torridge	13.52	3934	1 in 7 households
9	Monmouthshire	13.51	5228	1 in 7 households
10	South Somerset	13.28	8882	1 in 8 households
11	Blaby	12.52	5070	1 in 8 households
12	Scottish Borders	12.38	6376	1 in 8 households
13	West Suffolk	12.26	8726	1 in 8 households
14	South Hams	11.98	4506	1 in 8 households
15	Aberdeenshire	11.97	14063	1 in 8 households
16	Cornwall	11.95	29003	1 in 8 households
17	Highland	11.61	13590	1 in 9 households
18	South Norfolk	11.6	6958	1 in 9 households
19	Ipswich	11.51	6446	1 in 9 households
20	Tandridge	11.37	3445	1 in 9 households
21	West Oxfordshire	11.21	4954	1 in 9 households
22	Pembrokeshire	11.08	6270	1 in 9 households
23	North Somerset	11.06	10131	1 in 9 households
24	Richmondshire	10.96	2795	1 in 9 households
25	Mid Suffolk	10.88	4636	1 in 9 households
26	Shropshire	10.79	14510	1 in 9 households
27	Dumfries and Galloway	10.79	7615	1 in 9 households
28	Argyll and Bute	10.62	4345	1 in 9 households
29	Isle of Anglesey	10.61	3342	1 in 9 households
30	North East Derbyshire	10.54	4394	1 in 9 households
31	Mid Devon	10.53	3813	1 in 9 households
32	Ryedale	10.51	2470	1 in 10 households
33	Eden	10.48	2547	1 in 10 households
34	Exeter	10.44	5567	1 in 10 households
35	Stirling	10.39	4354	1 in 10 households
36	South Cambridgeshire	10.33	7055	1 in 10 households
37	Clackmannanshire	10.04	2239	1 in 10 households
38	Powys	10.01	6064	1 in 10 households
39	North Lincolnshire	9.87	7570	1 in 10 households
40	Maldon	9.81	2462	1 in 10 households
41	Newark and Sherwood	9.77	4974	1 in 10 households
42	Ribble Valley	9.68	2439	1 in 10 households
43	North Devon	9.56	4283	1 in 10 households
44	Shetland Islands	9.54	1002	1 in 10 households

No.	Local Authority	% of households with installations	Installation volume (2008-2021)	1 in x households
45	Sedgemoor	9.53	5087	1 in 10 households
46	Colchester	9.46	7140	1 in 11 households
47	Malvern Hills	9.38	2973	1 in 11 households
48	Wrexham	9.27	5396	1 in 11 households
49	Bassetlaw	9.27	4283	1 in 11 households
50	Wyre	9.22	4287	1 in 11 households
51	Carmarthenshire	9.17	7619	1 in 11 households
52	Stoke-on-Trent	9.15	9730	1 in 11 households
53	East Lindsey	9.13	5406	1 in 11 households
54	Somerset West and Taunton	9.1	5685	1 in 11 households
55	Chichester	9.08	4330	1 in 11 households
56	Perth and Kinross	9.03	6035	1 in 11 households
57	Uttlesford	8.97	3102	1 in 11 households
58	Ceredigion	8.81	3058	1 in 11 households
59	East Suffolk	8.8	9057	1 in 11 households
60	Waverley	8.74	4145	1 in 11 households
61	Wychavon	8.63	4676	1 in 12 households
62	Babergh	8.61	3072	1 in 12 households
63	Sunderland	8.51	10253	1 in 12 households
64	Cherwell	8.35	4636	1 in 12 households
65	Wealden	8.34	5140	1 in 12 households
66	Fenland	8.33	3639	1 in 12 households
67	Rutland	8.27	1323	1 in 12 households
68	Selby	8.23	2882	1 in 12 households
69	South Holland	8.22	3066	1 in 12 households
70	Plymouth	8.12	8845	1 in 12 households
71	Reading	7.93	5533	1 in 13 households
72	Boston	7.78	2241	1 in 13 households
73	Denbighshire	7.78	3298	1 in 13 households
74	Flintshire	7.73	5216	1 in 13 households
75	Northumberland	7.71	10888	1 in 13 households
76	Herefordshire, County of	7.67	6564	1 in 13 households
77	Doncaster	7.6	9620	1 in 13 households
78	Harrogate	7.57	4847	1 in 13 households
79	East Lothian	7.55	3254	1 in 13 households
80	Stratford-on-Avon	7.53	4227	1 in 13 households
81	Ashford	7.51	3990	1 in 13 households
82	Broxtowe	7.49	3543	1 in 13 households
83	East Devon	7.49	4357	1 in 13 households
84	Breckland	7.48	4452	1 in 13 households
85	South Oxfordshire	7.43	4107	1 in 13 households
86	Hambleton	7.37	2861	1 in 14 households
87	Moray	7.35	3116	1 in 14 households
88	Mid Sussex	7.3	4826	1 in 14 households
89	Derbyshire Dales	7.28	2038	1 in 14 households
90	Chorley	7.27	3323	1 in 14 households
91	Gwynedd	7.25	3797	1 in 14 households
92	Harborough	7.24	2910	1 in 14 households
93	Worcester	7.22	2852	1 in 14 households
94	King's Lynn and West Norfolk	7.21	4599	1 in 14 households
95	Wiltshire	7.17	15076	1 in 14 households

No.	Local Authority	% of households with installations	Installation volume (2008-2021)	1 in x households
96	Reigate and Banstead	7.17	4106	1 in 14 households
97	Dorset	7.05	11105	1 in 14 households
98	Craven	6.95	1599	1 in 14 households
99	Hinckley and Bosworth	6.92	3216	1 in 14 households
100	Isle of Wight	6.91	4325	1 in 14 households
101	Tunbridge Wells	6.9	2862	1 in 15 households
102	York	6.86	6203	1 in 15 households
103	Bedford	6.78	5020	1 in 15 households
104	Fareham	6.76	3050	1 in 15 households
105	East Ayrshire	6.75	3715	1 in 15 households
106	Scarborough	6.71	2792	1 in 15 households
107	North West Leicestershire	6.67	2843	1 in 15 households
108	Teignbridge	6.66	3508	1 in 15 households
109	South Lanarkshire	6.65	9769	1 in 15 households
110	South Gloucestershire	6.6	7416	1 in 15 households
111	East Cambridgeshire	6.58	2515	1 in 15 households
112	Midlothian	6.51	2513	1 in 15 households
113	Vale of Glamorgan	6.5	3460	1 in 15 households
114	Fermanagh and Omagh	6.49	2927	1 in 15 households
115	East Riding of Yorkshire	6.48	9414	1 in 15 households
116	Rotherham	6.46	7439	1 in 15 households
117	Cheltenham	6.41	3158	1 in 16 households
118	Tendring	6.39	3932	1 in 16 households
119	Stafford	6.33	3721	1 in 16 households
120	Bath and North East Somerset	6.3	4982	1 in 16 households
121	Staffordshire Moorlands	6.3	2500	1 in 16 households
122	Woking	6.27	2723	1 in 16 households
123	Isles of Scilly	6.27	87	1 in 16 households
124	Mole Valley	6.22	2134	1 in 16 households
125	Warwick	6.22	3562	1 in 16 households
126	Horsham	6.21	3250	1 in 16 households
127	Rushcliffe	6.16	2890	1 in 16 households
128	Angus	6.15	3292	1 in 16 households
129	Rugby	6.11	2534	1 in 16 households
130	South Derbyshire	6.09	2288	1 in 16 households
131	North Hertfordshire	6.07	3239	1 in 16 households
132	Tonbridge and Malling	6.06	3264	1 in 17 households
133	Newry, Mourne and Down	6	4023	1 in 17 households
134	Derry City and Strabane	5.96	3494	1 in 17 households
135	Hart	5.93	2094	1 in 17 households
136	Milton Keynes	5.93	6314	1 in 17 households
137	Vale of White Horse	5.86	3136	1 in 17 households
138	Melton	5.86	1307	1 in 17 households
139	South Lakeland	5.84	2628	1 in 17 households
140	New Forest	5.83	4221	1 in 17 households
141	Eastleigh	5.83	3018	1 in 17 households
142	Lisburn and Castlereagh	5.82	3383	1 in 17 households
143	North Northamptonshire	5.77	7813	1 in 17 households
144	Carlisle	5.76	2561	1 in 17 households
145	Gloucester	5.75	3075	1 in 17 households
146	Allerdale	5.71	2445	1 in 18 households
147	Stroud	5.69	2924	1 in 18 households
148	Braintree	5.63	3425	1 in 18 households
149	Cambridge	5.63	2960	1 in 18 households
150	Broadland	5.6	3015	1 in 18 households
151	Wakefield	5.6	8120	1 in 18 households
152	Folkestone and Hythe	5.52	2674	1 in 18 households
153	Test Valley	5.5	2769	1 in 18 households
154	Mid Ulster	5.5	3175	1 in 18 households
155	Rossendale	5.49	1439	1 in 18 households
156	East Hampshire	5.46	2697	1 in 18 households
157	Darlington	5.42	2541	1 in 18 households
158	Bridgend	5.39	3386	1 in 19 households
159	Bournemouth, Christchurch and Poole	5.39	9190	1 in 19 households
160	Bromsgrove	5.37	2012	1 in 19 households
161	Stockton-on-Tees	5.37	4421	1 in 19 households
162	Huntingdonshire	5.31	3866	1 in 19 households
163	Barnsley	5.29	5728	1 in 19 households
164	Derby	5.29	5476	1 in 19 households
165	Wyre Forest	5.27	2241	1 in 19 households
166	Cotswold	5.27	1908	1 in 19 households
167	County Durham	5.26	11651	1 in 19 households
168	Falkirk	5.25	3677	1 in 19 households
169	South Staffordshire	5.23	2243	1 in 19 households
170	Redcar and Cleveland	5.23	3184	1 in 19 households
171	Surrey Heath	5.21	1945	1 in 19 households
172	Gravesham	5.2	2144	1 in 19 households
173	Canterbury	5.19	3349	1 in 19 households
174	North Ayrshire	5.11	3200	1 in 20 households
175	Tamworth	5.08	1533	1 in 20 households
176	Warrington	5.06	4360	1 in 20 households
177	Lewes	5.05	2321	1 in 20 households
178	Forest of Dean	5.04	1799	1 in 20 households
179	West Dunbartonshire	5.04	2227	1 in 20 households
180	Fife	5.02	8312	1 in 20 households
181	Nottingham	5	6855	1 in 20 households
182	Knowsley	4.97	3170	1 in 20 households
183	West Lancashire	4.92	2196	1 in 20 households
184	West Northamptonshire	4.91	7731	1 in 20 households
185	Welwyn Hatfield	4.85	2546	1 in 21 households
186	Pendle	4.82	1777	1 in 21 households
187	Torbay	4.76	2787	1 in 21 households
188	Rother	4.76	1875	1 in 21 households
189	Cheshire West and Chester	4.72	6749	1 in 21 households
190	Swindon	4.7	4170	1 in 21 households
191	Neath Port Talbot	4.7	2872	1 in 21 households
192	Swale	4.69	2530	1 in 21 households
193	Newport	4.69	2933	1 in 21 households
194	South Ribble	4.69	2024	1 in 21 households
195	Torfaen	4.63	1820	1 in 22 households
196	Tameside	4.62	4626	1 in 22 households
197	Charnwood	4.61	3301	1 in 22 households

No.	Local Authority	% of households with installations	Installation volume (2008-2021)	1 in x households
198	Telford and Wrekin	4.57	3352	1 in 22 households
199	Renfrewshire	4.55	3616	1 in 22 households
200	Mansfield	4.54	2230	1 in 22 households
201	Rochford	4.53	1644	1 in 22 households
202	Manchester	4.53	10302	1 in 22 households
203	Maidstone	4.5	3305	1 in 22 households
204	Chelmsford	4.47	3269	1 in 22 households
205	Runnymede	4.47	1493	1 in 22 households
206	South Kesteven	4.46	2847	1 in 22 households
207	Gedling	4.46	2135	1 in 22 households
208	Dundee City	4.45	3080	1 in 22 households
209	Hartlepool	4.44	1920	1 in 23 households
210	East Staffordshire	4.43	1983	1 in 23 households
211	Conwy	4.37	2327	1 in 23 households
212	Havant	4.36	2245	1 in 23 households
213	Cheshire East	4.32	7005	1 in 23 households
214	Spelthorne	4.31	1668	1 in 23 households
215	Caerphilly	4.31	3295	1 in 23 households
216	North Tyneside	4.3	4052	1 in 23 households
217	South Tyneside	4.24	2877	1 in 24 households
218	North East Lincolnshire	4.22	2914	1 in 24 households
219	Blackburn with Darwen	4.22	2325	1 in 24 households
220	St. Helens	4.22	3381	1 in 24 households
221	Thurrock	4.13	2753	1 in 24 households
222	Central Bedfordshire	4.1	4864	1 in 24 households
223	Amber Valley	4.09	2208	1 in 24 households
224	Causeway Coast and Glens	3.99	2351	1 in 25 households
225	North Lanarkshire	3.99	6197	1 in 25 households
226	Lancaster	3.88	2237	1 in 26 households
227	Copeland	3.81	1272	1 in 26 households
228	South Ayrshire	3.79	1946	1 in 26 households
229	Blaenau Gwent	3.79	1167	1 in 26 households
230	Chesterfield	3.78	1719	1 in 26 households
231	Kirklees	3.77	6752	1 in 26 households
232	Wokingham	3.74	2396	1 in 27 households
233	Stevenage	3.69	1231	1 in 27 households
234	Brentwood	3.67	1082	1 in 27 households
235	West Lothian	3.64	2738	1 in 27 households
236	Dartford	3.64	1491	1 in 27 households
237	Great Yarmouth	3.61	1422	1 in 28 households
238	Buckinghamshire	3.6	7458	1 in 28 households
239	Epping Forest	3.59	1772	1 in 28 households
240	Stockport	3.59	4469	1 in 28 households
241	Swansea	3.57	3697	1 in 28 households
242	Three Rivers	3.56	1482	1 in 28 households
243	Guildford	3.55	2181	1 in 28 households
244	Dacorum	3.54	2155	1 in 28 households
245	Bristol, City of	3.52	6600	1 in 28 households
246	Bracknell Forest	3.52	1709	1 in 28 households
247	West Lindsey	3.51	1391	1 in 28 households
248	Lichfield	3.46	1548	1 in 29 households

No.	Local Authority	% of households with installations	Installation volume (2008-2021)	1 in x households
249	Gosport	3.46	1293	1 in 29 households
250	Mid and East Antrim	3.45	1886	1 in 29 households
251	Bolsover	3.45	1100	1 in 29 households
252	Sevenoaks	3.45	1672	1 in 29 households
253	Dover	3.42	1562	1 in 29 households
254	Mendip	3.38	1654	1 in 30 households
255	Cannock Chase	3.38	1469	1 in 30 households
256	Windsor and Maidenhead	3.34	2060	1 in 30 households
257	Southampton	3.33	3541	1 in 30 households
258	Ashfield	3.32	1680	1 in 30 households
259	Havering	3.31	3402	1 in 30 households
260	Tewkesbury	3.31	1205	1 in 30 households
261	Salford	3.31	3555	1 in 30 households
262	East Hertfordshire	3.29	2103	1 in 30 households
263	Arun	3.29	2404	1 in 30 households
264	Wigan	3.28	4632	1 in 31 households
265	Rochdale	3.27	2813	1 in 31 households
266	Worthing	3.24	1507	1 in 31 households
267	Norwich	3.24	1990	1 in 31 households
268	Oxford	3.2	1912	1 in 31 households
269	Fylde	3.13	1085	1 in 32 households
270	Leeds	3.11	10391	1 in 32 households
271	Sheffield	3.11	7738	1 in 32 households
272	Luton	3.09	2435	1 in 32 households
273	West Berkshire	3.08	1958	1 in 32 households
274	Ards and North Down	3.06	2071	1 in 33 households
275	Newcastle upon Tyne	3.06	3835	1 in 33 households
276	Calderdale	3.05	2844	1 in 33 households
277	Thanet	3.04	1768	1 in 33 households
278	Preston	2.98	1763	1 in 34 households
279	City of Edinburgh	2.92	6946	1 in 34 households
280	Rhondda Cynon Taf	2.89	3037	1 in 35 households
281	Castle Point	2.87	1061	1 in 35 households
282	Oadby and Wigston	2.86	657	1 in 35 households
283	Redditch	2.85	910	1 in 35 households
284	Basingstoke and Deane	2.84	2158	1 in 35 households
285	Harlow	2.83	971	1 in 35 households
286	North Kesteven	2.82	1321	1 in 35 households
287	Newcastle-under-Lyme	2.81	1662	1 in 36 households
288	Eastbourne	2.81	1273	1 in 36 households
289	Rushmoor	2.8	1018	1 in 36 households
290	Nuneaton and Bedworth	2.79	1483	1 in 36 households
291	North Warwickshire	2.79	666	1 in 36 households
292	Barking and Dagenham	2.73	1962	1 in 37 households
293	Slough	2.72	1445	1 in 37 households
294	Erewash	2.71	1294	1 in 37 households
295	Antrim and Newtownabbey	2.7	1635	1 in 37 households
296	Crawley	2.69	1174	1 in 37 households
297	Glasgow City	2.68	7803	1 in 37 households
298	Barrow-in-Furness	2.67	824	1 in 38 households
299	Gateshead	2.65	2305	1 in 38 households

No.	Local Authority	% of households with installations	Installation volume (2008-2021)	1 in x households
300	Bolton	2.64	3053	1 in 38 households
301	Bradford	2.63	5059	1 in 38 households
302	Waltham Forest	2.63	2657	1 in 38 households
303	Southend-on-Sea	2.63	2022	1 in 38 households
304	Merthyr Tydfil	2.61	687	1 in 38 households
305	Armagh City, Banbridge and Craigavon	2.61	2169	1 in 38 households
306	Cardiff	2.6	3833	1 in 38 households
307	Oldham	2.58	2428	1 in 39 households
308	Halton	2.58	1429	1 in 39 households
309	High Peak	2.57	1099	1 in 39 households
310	St Albans	2.55	1508	1 in 39 households
311	Kingston upon Hull, City of	2.52	2871	1 in 40 households
312	Watford	2.5	956	1 in 40 households
313	Adur	2.48	759	1 in 40 households
314	Elmbridge	2.46	1237	1 in 41 households
315	Solihull	2.45	2154	1 in 41 households
316	Hyndburn	2.44	743	1 in 41 households
317	Portsmouth	2.42	2238	1 in 41 households
318	Sandwell	2.39	2999	1 in 42 households
319	Enfield	2.38	2975	1 in 42 households
320	Inverclyde	2.28	824	1 in 44 households
321	Hastings	2.28	1038	1 in 44 households
322	Brighton and Hove	2.27	2855	1 in 44 households
323	Epsom and Ewell	2.26	661	1 in 44 households
324	Merton	2.19	1787	1 in 46 households
325	Wirral	2.19	3008	1 in 46 households
326	Medway	2.18	2474	1 in 46 households
327	Burnley	2.17	824	1 in 46 households
328	Middlesbrough	2.14	1259	1 in 47 households
329	Basildon	2.11	1582	1 in 47 households
330	Liverpool	2.08	4605	1 in 48 households
331	Walsall	2.06	2402	1 in 49 households
332	Birmingham	2.06	8607	1 in 49 households
333	Bury	2.05	1639	1 in 49 households
334	Hounslow	2.04	2167	1 in 49 households
335	Sefton	2.03	2425	1 in 49 households
336	East Dunbartonshire	2.03	964	1 in 49 households
337	Dudley	2.02	2588	1 in 50 households
338	Wolverhampton	2	2234	1 in 50 households
339	Hillingdon	1.97	2218	1 in 51 households
340	Sutton	1.95	1524	1 in 51 households
341	Kingston upon Thames	1.95	1292	1 in 51 households
342	Coventry	1.92	2975	1 in 52 households
343	Bromley	1.84	2522	1 in 54 households
344	Ealing	1.83	2275	1 in 55 households
345	Croydon	1.81	2664	1 in 55 households
346	Trafford	1.81	1732	1 in 55 households
347	Leicester	1.8	2396	1 in 56 households
348	Greenwich	1.8	2066	1 in 56 households
349	Broxbourne	1.79	725	1 in 56 households
350	East Renfrewshire	1.77	672	1 in 56 households

No.	Local Authority	% of households with installations	Installation volume (2008-2021)	1 in x households
351	Bexley	1.76	1787	1 in 57 households
352	Aberdeen City	1.59	1724	1 in 63 households
353	Hertsmere	1.53	735	1 in 65 households
354	Belfast	1.46	2030	1 in 69 households
355	Barnet	1.39	2011	1 in 72 households
356	Brent	1.33	1355	1 in 75 households
357	Richmond upon Thames	1.27	1001	1 in 79 households
358	Lewisham	1.19	1434	1 in 84 households
359	Redbridge	1.17	1228	1 in 86 households
360	Harrow	1.16	993	1 in 86 households
361	Islington	1.14	1238	1 in 88 households
362	Lambeth	1.08	1314	1 in 93 households
363	Wandsworth	1.04	1347	1 in 96 households
364	Southwark	0.93	1194	1 in 108 households
365	Newham	0.92	1085	1 in 108 households
366	Tower Hamlets	0.9	1087	1 in 111 households
367	Blackpool	0.89	549	1 in 112 households
368	Hammersmith and Fulham	0.86	643	1 in 117 households
369	Haringey	0.83	896	1 in 120 households
370	Westminster	0.79	920	1 in 127 households
371	Camden	0.62	688	1 in 162 households
372	City of London	0.61	27	1 in 163 households
373	Hackney	0.52	535	1 in 194 households
374	Kensington and Chelsea	0.36	260	1 in 279 households

APPENDIX 2

Where did our data come from?

MCS Installations Database
Since the late 2000s, MCS has been gathering data from MCS certified installation companies and other third parties, such as scheme operators.

The MCS Installations Database (MID) is a goldmine of data that has generated a wealth of information on the deployment of small-scale renewables in UK homes and communities over the last 14 years.

The MID now holds information on more than 1.4 million installations, putting MCS in a unique position in the sector to share this valuable market intelligence. The data held within this report provides insight into the deployment of small-scale renewable installations from March 2020 through to the end of 2021 and the current state of the market.

Data integrity
Due to some occurrences of poor-quality data, a small proportion of installation data has been disregarded from certain analysis, mainly due to invalid address details that means geographical analysis of deployment cannot be conducted.

A small pool of installations has also been excluded from the generation/carbon saving analysis, due to invalid energy generation data. Where we have used external data to enhance our own, we have taken care to ensure that this data matches the date range and geography of market records as far as possible.

For example, we have approximated UK census data within a few months, instead of making a precise match to the date of every installation.

Data sources
MCS worked with data technology specialists, Quanovo, to conduct the in-depth data analysis contained in this report. Quanovo used MID data augmented with external data from the UK Census and the Office for National Statistics (ONS). Other external datasets have also helped us tell the wider story of small-scale renewables adoption, based on factors such as gas network connections and fuel poverty levels.

We also worked with our specialist renewables data analysis partners, rb&m, to calculate estimated carbon savings of installations, based on generation totals, demonstrating the contributions that small scale renewables make to net-zero.

Data scope
MCS certification is not a mandatory requirement and, as such, MCS does not capture all small-scale renewable installations in the UK. However, as MCS has been the route to Government incentives, such as the FiT and the Domestic Renewable Heat Incentive (DRHI), we are confident that MCS installation data represents most of the deployment in the UK since 2008.

MCS is also mandated for the Boiler Upgrade Scheme, meaning a high percentage of renewable heating installations completed up to 2025 will most likely take place under the scheme.

MCS installation data extends to self-build but does not typically include new-build homes unless the builder chooses to register their installations with MCS. It is currently unknown what percentage of MCS certified installations have been deployed in new-build properties.

The scope of technologies covered by the scheme is up to 50kW capacity for electricity-generating technologies, such as solar PV, and up to 45kW capacity for heat-generating technologies, such as heat pumps and solar thermal (up to 70kW for multiple products installed in one heating system). There are currently 10 renewable technologies certified under MCS; however, the focus of this report is on the five most deployed MCS technologies: solar PV, air source heat pumps, ground/water source heat pumps, solar thermal, and biomass. For further data insight into the uptake of other technologies such as other heat pump types, micro combined heat and power (micro-CHP), and small wind turbine, you can access this via the MCS Data Dashboard: datadashboard.mcscertified.com

APPENDIX 3

Technical information

Generation and carbon savings
A range of factors are important when calculating the cumulative greenhouse gas emissions (GHG) saved by small-scale renewable installations over time. Most importantly:

- The GHG emissions saved depend on the fuel types displaced. For the heat technologies, these were allocated using Government figures for the fuel displaced by DRHI approved installations.[1] For example, 22 per cent of ASHP installations have replaced oil.
- The carbon intensity of grid supplied electricity. We used the Government's GHG conversion factor reports, the most recent of which is 2021.[2]
- The carbon intensity of other fuels, such as heating oil and mains gas.
- The assumed efficiency of replaced boilers. These were obtained from MCS default assumptions used in performance estimate calculations.
- For example, GHG emissions associated with microgeneration occur due to the manufacturing process which can be energy intensive; or for heat pumps, the electricity consumed. Our analysis allows for a reasonable estimate of gCO2eq/kWh based on available research. The CO2e savings described in this report represent the net benefit.
- Heat pumps were assumed to perform with a Seasonal Performance Factor (SPF) of 3 and the electricity consumed calculated using the carbon intensity of the grid supplied electricity as above. The carbon cost of solar PV, solar thermal and biomass was estimated based on: gCO2eq/kWh using sources cited in the Intergovernmental Panel on Climate Change report: *Climate Change 2014: Mitigation of Climate Change*[3] and various other recent sources.

We calculated cumulative carbon savings using the relevant carbon conversion factors for the individual years covered. This allowed us to estimate accurately carbon savings for each annual cohort of installations over time.

The various carbon saving comparisons were calculated using figures from published research or other reliable sources. For example, the kgCO2eq/km figures used to estimate the carbon cost of car and air transport were obtained from the latest Government GHG conversion factor reports.

[1] Department for Business, Energy, and Industrial Strategy. (2020). Non-Domestic and Domestic Renewable Heat Incentive (RHI) monthly deployment data (Great Britain) January 2020. Available at: https://www.gov.uk/government/statistics/rhi-monthly-deployment-data-january-2020 (Accessed: 1 May 2020). Table S2.2.

[2] Department for Business, Energy, and Industrial Strategy. (2021). Greenhouse gas reporting: conversion factors 2021. Available at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021 (Accessed: 20 June 2022)

[3] Intergovernmental Panel on Climate Change. (2014). Climate Change 2014: Mitigation of Climate Change. Working Group III Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Available at: https://www.ipcc.ch/report/ar5/wg3/ (Accessed: 13 June 2020)

APPENDIX 4

Glossary of terms

Study period

The focus for this report, includes installations that have been commissioned from March 2020 through to the end of 2021

Adoption rate

The % of households in an area that have installed small scale renewables in the study period

Installation volume

The raw number of small-scale renewable installations that areas have installed in the study period

Total annual generation

The expected cumulative total generation (kWh) for a cohort of installations installed in a set period, since the installations have been installed

Total cumulative generation

The expected cumulative total generation (kWh) for a cohort of installations installed in a set period, since the installations have been installed

Thank you to the organisations we have worked with across the years and who have provided data for this report:

rb&m QUANOVO DATA TECHNOLOGIES NUEKER then

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