

In partnership with



Bristol Property Agents

BRISTOL HEAT NETWORKS INSIGHTS & NET ZERO AMBITIONS

THURSDAY 7 JULY, 5 - 7:30PM BURGES SALMON, ONE GLASS WHARF, BS2 0ZX

Councillor Kye Dudd Bristol City Council

Jon Sankey Bristol Heat Networks

Steve Bluff Redcliffe & Temple BID

REDCLIFFE & TEMPLE BID

Levy payers voted yes to the BID Business plan for 2021 to 2025.

Over £4M of levy will be reinvested into the area under the below themes:

- 1. Creating and maintaining quality space
- 2. Improving sustainability and the environment
- 3. Creating and promoting a vibrant place
- 4. Connecting and representing businesses
- 5. Building a safe and caring community

MAP OF REDCLIFFE & TEMPLE BID AREA





APRIL 2022

GREEN INFRASTRUCTURE -IMPROVING OUR OUTDOOR ENVIRONMENT

ACTION PLAN

Landsmith Associates



GREEN INFRASTRUCTURE ACTION PLAN

- Four workshops and 3 exploratory walks + desktop
- 4 themes : Cooling Cities, Cities in Nature, Creating Social Spaces, Designing Cities with Women
- Low tree canopy at 10%, One City Plan is 25%
- Much of the area is a high flood risk in EA flood zone 3
- High risk of heat vulnerability
- Perceptions of being a "grey" part of the city with some unsafe spaces
- Action plan to deliver improvements over the short, medium and long term
- Prioritising the key projects in 2022/23: Working groups from mid July



SUSTAINABILITY MATURITY ASSESSMENT SURVEY

- Short questionnaire for BID businesses
- In partnership with local sustainability specialist SustainIT
- Understand where businesses are on their journey and discover what support needed to meet Net Zero
- Aim is to develop a BID Sustainability Charter and share best practice
- All completed surveys enter a draw for £100 to their business charity of choice and a free SustainIT consultation

HOW SUSTAINABLE IS YOUR BUSINESS?





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Decarbonising Bristol's buildings an introduction to Bristol Heat Networks



Climate emergency declaration Bristol: Net Zero by 2030

THE GREATEST THREAT





Zero carbon means zero carbon heat ... it also means the right heating solution for each building

61616



A clear heading – leaving gas behind



Bristol is on a clear heading to leave fossil-fuelled heating behind There is cross-party support and One City consensus on how to achieve this

But, it needs the support of businesses, land owners and developers to succeed!



What are heat networks?





What are heat networks – energy centres

Energy Centres can generate heat using a range of technologies or capture waste heat



Data centre - Stockholm

Bunhill energy centre Waste heat from the Northern Line - Islington



What are heat networks – buried network

Major complex infrastructure requiring large capital investment, careful design and co-ordination



Bristol has a strong track record of building heat networks, despite its challenges



What are heat networks – heat substations

Heat substations are the interface between the heat network and buildings



Existing gas boilers can be replaced like for like with a heat substation to facilitate a connection to the Bristol Heat Network



What are heat networks?

Energy Centres provide hot water to the Primary Network which transports bulk heat to the Heat Substation in each building. There is a clear delineation between areas of responsibility at the point of supply.





Why bother with heat networks in Bristol?

proven track record in Europe and for BHN in Bristol

The main benefit is to reduce the carbon footprint of Bristol's buildings – but there are plenty of others

Additional benefits to heat consumers Benefits to owner operators Lower capital and operational costs than other low carbon heating technologies future-proof alternatives Space saving when compared to conventional and low **Resilience** against price volatility • carbon alternatives Simple and transparent tariffs Flexible capacities based on need, no unnecessary financial investment in oversizing **Benefits to Bristol** Security of supply through supply and demand diversity, technical and commercial structures, in an otherwise volatile energy market region for energy purchase Future-proofed and agnostic to a range of heat sources **Air quality** improvements from cleaner sources \bullet and compliance with current and emerging, local and **Reduced fuel poverty** and reliable supply national regulations and policies. ۲ Experience curve well advanced – we know it works! HN Jobs in design, construction, maintenance etc \bullet

By connecting to the network, new developments and existing buildings contribute to bringing all these benefits to other buildings, residents and businesses across the city

- **Reduced energy costs** through efficiency gains and other

- **Increased self-reliance** leads to less money leaving city



Existing systems and alternatives - VRF



VRF systems can be replaced with a heat network connection during refurbishment

Variable refrigerant flow systems can deliver cooling to some zones and heating to others, with no reheat need (an air source system is shown here).

This is one of the most common alternatives and is found in many office buildings.

Though cheap, it is increasingly frowned upon due to the refrigerants having a high global warming potential leading to high whole life carbon (equiv) emissions.



Bristol's heat network plans

Heat Priority Area



Current and Planned Heat Network Areas



Is it doable? Copenhagen can – why not Bristol?





Progress to date and planned network

So far:

- 2 live network areas in Old Market and Redcliffe
- 2 networks in construction in Bedminster and Temple
- 25 buildings contracted for connection
 - 13.2MW of peak demand
 - 21.1GWh of annual heat demand
 - 2,366 residences
- 37 building connections in advanced negotiation
- 145 building connections in early stage discussions





Castle Park: 3MW water source heat pump

The new energy centre in the middle of Bristol will house England's largest water source heat pump.



Heat pump delivered 🚚

One of the lowest-carbon solutions around, the water source heat pump will provide heat for up to 2,500 homes on Bristol Heat Network

Carbon & cost: decarbonisation of the network

Decarbonisation shown below is deliverable using existing sources of funding (grants) through to 2029

Continual decarbonisation by increasing reliance on electrically generated heat

Carbon & cost: BHN pricing – ASHP benchmark

Heating and hot water supply from Bristol Heat Networks should represent a lower cost option compared with an on-site, low carbon alternative. Charges comprise of two parts:

Connection Charges

A standard cost in £/KW of connection capacity

A variable <u>heat charge</u> for heat usage Any additional costs for a 'non-standard connection' ulletCharged as p/kWh: lacksquareInstalled ASHP Costs Indexed annually against wholesale electricity lacksquare**Installed ASHP** prices – transparent costs based on UK f2.00 A fixed <u>service charge</u> for heat capacity ullet**Govt research** Charged as £/kW based on installed capacity £1,500 lacksquareIndexed annually against inflation ulletThis charge also covers all the costs of **BHN charge** \bullet maintenance and eventual replacement of the connection and heat substation

Transparency, certainty and fairness in pricing are core to the BHN offering

Supply Charges

Ongoing heat charges comprise of 2 elements

Carbon & cost: office comparison

Whole Life Carbon & Cost – BHN favourable comparison with other options

nt	Operation		Cost		
		EDO	`	£3,500	
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				£3,000	$/m^2$
				£1,500	Ч
				£1,000	
		-		£500	
0HN and	hydronic HP with heat recovery unit	VRF H Coo DHN	leating and oling and I for DHW only	£O	
	84%		98%	% of highes	t
	94%		91%	option	

City Leap – decarbonising Bristol into 2030

424 million pounds in low-carbon energy infrastructure across heat networks, renewable energy, heat pumps, energy efficiency and electric vehicle charging.

When to get in contact with BHN?... ASAP

Trigger point for contact with Bristol Heat Networks

New developments

Before submitting a planning application or pre-app

Existing buildings/ businesses At any point when you are considering how to decarbonise, refurbish or when existing plant needs to be replaced – early engagement is key!

Your support would be most appreciated!

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Q&A Or get in contact at: heatnetwork@bristol.gov.uk jon.sankey@bristol.gov.uk andrew.foulkes@bristol.gov.uk

More information at: <u>energyservicebristol.co.uk/cityleap</u> <u>energyservicebristol.co.uk/business/heat-networks</u>

City Leap Energy Partnership

Bristol's Leadership

29

City Leap Energy Partnership

- Bristol has reduced emissions by 42% since 2005 and has the lowest emissions per capita of Core Cities
- Bristol City Council has reduced its own direct emissions by 50% since 2015 and aims to achieve net zero by 2025 (Scope 1&2)
- In November 2018, the council became the first UK local authority to declare a Climate Emergency and set a goal for the city to be net zero by 2030
- There is an urgent need to accelerate the pace of delivery in Bristol if the City and the council are to achieve these targets.

ENERGY

BRISTOL

BRISTOL

ONE CITY

The council's delivery to date

Over £92m invested in low-carbon projects over the years including:

- £7m in the installation of two 2.5MW wind turbines;
- £42m in energy efficiency for 10,000 social homes;
- £15m in low carbon heat networks and the first commercial connections secured;
- £5m in 4MW of solar PV on council-owned buildings and land;
- projects to deliver 120 new public EV charging points in the West of England region by 2021;
- facilitating the delivery of a 4.2MW community-owned solar farm;
- supporting 52 local community energy projects with £250k of grant funding; and
- launching the South West Energy Unit to deliver £38m of investment in low carbon energy infrastructure across three local authorities.

What is City Leap?

- A new approach towards public and private sector partnership for the delivery up to £1bn of low carbon energy infrastructure investment.
- Focus on a range of project types, including low-carbon heat networks, renewable energy from wind and solar, energy efficiency, EV charging and smart energy systems.
- Builds on the council's investment to date and works to leverage the local knowledge and expertise that we have established over the years.
- Supports the council's and national government's decarbonisation targets and creates a scalable and replicable model for other cities to follow.

BRISTOL

The vision for City Leap

Taking advantage of the opportunity presented by the transition to a decentralised energy system to:

- Create an interconnected, low-carbon, smart and resilient energy system that Bristol and its communities can be proud of.
- Take a significant step towards carbon neutrality by delivering at least £1bn of low carbon, smart energy infrastructure investment in Bristol.
- Leverage the council's leadership, energy expertise and the opportunities it can provide to build low carbon energy infrastructure assets on its estate drive city-wide action.
- Working in partnership to maximise and share the social, environmental and economic benefits for Bristol that will arise from this opportunity.

BRIS

BRIST

The value proposition

There are two key elements that, taken together, comprise the foundation of Leap:

- The council itself, with its reputation as a leading energy city, the opportunities it can provide to City Leap to execute low carbon projects on its estate and its trusted brand in Bristol;
- The council's **Energy Service** and its strong track record of delivering low carbon energy infrastructure and services in Bristol.

What the council has procured

- The council is letting a **20-year concession** to a City Leap Strategic Partner to fund and deliver low carbon energy projects across the council's estate.
- The council and the Strategic Partner will set up and co-own a 50:50 joint venture company, the City Leap Energy Partnership.
- The council will have a pre-procured partner in City Leap which will seek to leverage work on the council's estate to deliver projects in the residential and commercial sectors, as well as working with other local authorities and public bodies.

What does this mean for the city?

- **Environment:** increased delivery to address targets for climate change, air quality and the environment.
- **Economic Development:** investment in local facilities; local jobs in the energy supply chain; affordable energy for local industry.
- Health and Social Welfare: warmer, healthier homes and cleaner air drive improved health; jobs and affordable energy reduce fuel poverty and drive social welfare.
- **Reputation:** City Leap builds from and further develops Bristol's reputation as a forward thinker, innovator and green leader.

What does this mean for investors?

- Return on assets: opportunities to invest in new energy assets with a well-defined route to monetise these assets and achieve an appropriate return on investment.
- New, service-based revenue streams: participation in advanced service-based energy propositions and solutions.
- New business models: an early opportunity to trial and develop the new business models that are emerging from the energy system's transition to a smarter, digital, decentralised model of generation, distribution and consumption.
- **True partnership:** a unique opportunity to work with a renowned global city and play an active role in our journey towards carbon neutrality.

The Winning Bidder

AMERESCOQ

With...

VATTENFALL

(Essential Sub-contractor)

City Leap Energy Partnership

Initial business plan commitments

- Deliver **139ktCO2e savings** and capital investment of circa **£424m** over the 5 years to 2027 and **2.2 million tCO2e** and £987m over the partnership.
- Committed to making the council's own operations carbon neutral by 2025.
- Decarbonisation of Authority's Social Housing by 2030, achieving a minimum EPC rating of 'C'.
- Continuing the build out of the Heat Network the Strategic Heat Main to decarbonise the Heat Network by 2030.
- Maximising opportunities for grant funding to progress retrofit projects, delivered through close partnership working with community groups and social housing residents.

How City Leap works

BRISTOL

ONE CITY

The ethos of partners

City Leap Energy Partnership

About Ameresco

Comprehensive Portfolio

Objective approach and in-house technical expertise delivers the most advanced technologies to meet the unique needs of each customer. Majority of projects are budget-neutral, funded by energy cost savings.

Customer Driven

Federal and Municipal Governments, Commercial and Industrial, Higher Ed, K12, Public Housing, Healthcare, Airports. Market reputation across North America & Europe for excellence in customer satisfaction.

Over £7.7 Billion in energy solution projects, 280+ MWe of Owned Assets in Operation

1,250+ Employees throughout North America and the United Kingdom

60+ Offices providing local expertise in markets served

8,000+ Customers benefitting from energy efficiency measures and renewable energy generation

Up to 45% Energy cost savings with comprehensive, audit-based improvements

BRISTOL

cityleap

In 2020, our renewable energy assets and customer projects delivered a carbon offset equivalent to approx. 12.6M Tonnes of CO,

BRISTOL

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About Vattenfall

Vattenfall...

- Is one of Europe's largest producers of • electricity and heat
- Is 100% owned by the Swedish state •
- Has its main markets in Sweden, Germany, the Netherlands, Denmark and the U.K
- •

Has 2 million customers on heat networks

City Leap Opportunities

- communities.
- One City Plan.
- mission.

A once in a generation chance to create a smart, decarbonised and resilient energy system for Bristol's

An international partnership to deliver on the council and the city's net zero commitments – supporting the

Involvement in the creation of a brand new organisation with values based on a social and environmental

Taking the council's £100m of low-carbon projects over the last five years and increasing the pace of delivery to enable £424m of delivery over the next five years.

BRISTOL

city leap

BRIST

ONE C

Indicative Heat Network Phasing

Equivalent to 27,900 homes *

*OFGEM TDCV 12,500 KWh for gas x 0.8 for losses =10,000 KWh per home.

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