



ENERGY
SERVICE
BRISTOL



City Leap Prospectus

A soft market testing exercise for potential partners in a city-scale low carbon, smart energy infrastructure programme.

In partnership with:



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Foreword

Bristol is leading by example in taking action on climate change and I have committed us to being a carbon neutral city by 2050. Since 2005, Bristol City Council has delivered a wide programme of energy efficiency and investment initiatives, investing tens of millions of pounds in renewable energy generation and energy efficiency and meeting our 2020 corporate carbon reduction target three years early.

We are now moving forwards with innovative pilot schemes that will help build the city's future smart energy system. This level of delivery, coupled with the city's thriving community energy scene and a wealth of socially responsible organisations, is just one of the reasons why Bristol is internationally recognised as a leading energy city in the UK.

Building on all that we've achieved, we need to up the pace of delivery to help us meet our 2050 target. Through this Prospectus, we are seeking long-term partners to work with us to achieve our shared goals and build a resilient city where no one is left behind.

City Leap is a series of energy and infrastructure investment opportunities that the council will be publishing over the coming months and years and represents a big step towards a resilient future. This will not only create a healthier and fairer city for all our residents, but also allows us to share our success. It will help to create jobs, maintain our economic competitiveness, de-carbonise the city, build strong partnerships and empower people to take their future into their own hands.

The energy element of City Leap, as outlined in this document, is a call out to those organisations, investors and innovators that have the vision, energy and the heart to join us in becoming the architects of Bristol's sustainable future.

This is our opportunity to deliver something truly transformative for Bristol, building a citywide energy system that will protect the environment and improve the quality of life for the people of Bristol.

We look forward to working with partners of all sizes and sectors to achieve our aspirations and hearing the new ideas that you can bring to the table.

Mayor of Bristol, Marvin Rees

Contents

1	Introduction	4
2	Achievements, assets and enablers	6
3	City Leap Programme – Potential investment opportunities	10
1	Heat networks	12
2	Smart energy systems	14
3	Domestic energy efficiency	16
4	Commercial energy efficiency	17
5	Renewable energy	18
6	Monitoring, dissemination and evaluation	20
4	Other potential energy-related opportunities	21
7	Transport	21
8	Hydrogen	22
9	Marine energy	22
5	Non-energy investment opportunities	23
	Temple Quarter	23
	Western Harbour	24
6	Smart City	25
7	Public engagement	27
8	Partnerships that we are seeking	38
9	Responding to the City Leap Prospectus	30

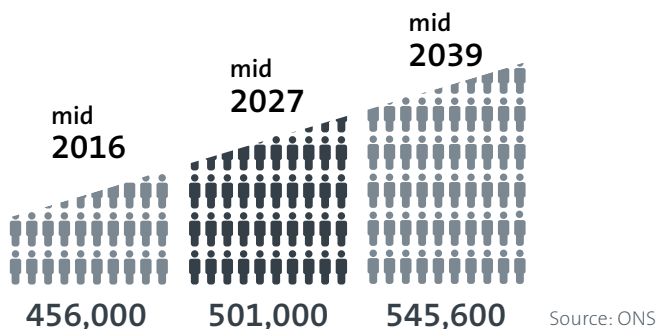


1 Introduction

Bristol is a vibrant, creative and ever expanding city – home to over 456,000 with a population set to increase to nearly 545,600 by the year 2039. The Guardian has ranked it as one of the best places to live in the world and we are currently the only Core City outside of London to make a net positive contribution to the UK Exchequer – a testament to our strong local economy. The development of a low carbon, resilient and sustainable city is a cornerstone of our approach to remaining competitive in the global economy.

Bristol has long led the way in the fields of energy, sustainability, digital and **future start-up companies**. It has the lowest carbon footprint of any of the UK's Core Cities, was the UK's first **European Green Capital in 2015**, has possibly the largest environmental network of its kind in Bristol Green Capital Partnership, **won the 2018 GLOMO Smart City Award**, was voted **the number one smart city in the UK in 2017**, successfully delivered c£50m of low carbon energy investment between 2012 and 2016 and set up one of the only municipally-owned energy companies in the UK in 2015, **Bristol Energy**, which now has over 120,000 customers.

The city enjoys a strong reputation for energy-related engineering consultancy and legal expertise and the national charity, the Centre for Sustainable Energy (CSE), is based here. Bristol also has many engaged residents and community energy initiatives, including Bristol Energy Network and Bristol Energy Co-operative.



Our Mayor and political leadership, across all parties, is committed to continued delivery and want to achieve a step change in the delivery of low carbon and smart energy infrastructure, enabling Bristol to continue on its path to becoming a carbon neutral city by 2050.

Low carbon and smart energy infrastructure is a broad agenda, covering both organisational and technological innovation, the latter including low carbon heat and power generation, heat networks, private wire, battery storage, energy efficiency and low/no emission vehicle infrastructure, all connected by innovative digital technologies to minimise energy consumption and maximise value generation.

We are aware that achieving this vision will result in a massive transformation of the city and its energy system and, although we have made a strong start, we cannot do this alone. This Prospectus is our platform for seeking a range of local, national and international partners to join us on this journey.

The scale of the task and the purpose of this Prospectus is to attract, facilitate and deliver up to £1bn of low carbon and smart energy infrastructure investment in Bristol's energy system over the next ten years. Whilst the council may wish to, and reserves the right to, invest in some or all of these projects, it is likely that the large majority of the investment will be made by its partners.

It should be noted that this £1bn of investment is in addition to the investment that the city will need to undertake in, for example, transport and non-energy digital infrastructure.

Delivering the activities outlined in the Prospectus will lead to significant additional benefits for Bristol's residents and businesses, including reducing fuel poverty, the creation of jobs, warmer and cosier homes for residents, improvements to residents' physical and mental wellbeing, better digital connectivity, significant business opportunities, inclusive growth and low carbon energy security and resilience. In essence, a future city fit for its residents, businesses and visitors in the 21st Century, a city that will continue to successfully compete at a global level and be a net fiscal contributor to the UK. We have called this programme "City Leap".

A key principle underpinning our approach is Bristol City Council's philosophy, supported by its **Corporate Strategy** and set out in the council's '**Our Resilient Future: A Framework for Climate and Energy Security**', which is currently being refreshed and will

set out the long-term roadmap for Bristol's journey towards becoming carbon neutral by 2050.

The aim of this philosophy is to encourage and facilitate a partnership approach to the engagement and deployment of the full range of energy-related technologies (including supply, generation, efficiency and smart) across the city, involving as many citizens and organisations as possible. Our key objective is to maximise and equitably share the social, environmental and economic benefits that will arise from the City Leap Programme.

Bearing this in mind, Bristol City Council is seeking, via this Prospectus, to undertake soft market testing with potential partners for the energy element of the City Leap Programme prior to undertaking appropriate procurement exercises later in 2018/19.

For those outside Bristol, the programme outlined below is replicable nationally and internationally. The City Leap Programme provides an urban living laboratory mechanism to demonstrate how to strategically manage such a wide ranging, diverse programme of works, as well as demonstrating the framing and catalytic role of local and central government.

City Leap Programme at a glance

Potential investment opportunity	Estimated investment opportunity over ten years
Heat networks	£300m
Smart energy system	£125m
Domestic energy efficiency	£300m
Commercial energy efficiency	£100m
Renewable energy	£40m
Monitoring, dissemination and evaluation	£10m
Transport	Additional
Hydrogen	Additional
Marine energy	Additional
Total	£875m



2 Achievements, assets and enablers

Bristol City Council has been active across a range of energy and sustainability policies, programmes and projects for over a decade. A non-exhaustive list of its notable successes over the years can be found below, to provide an insight into our ability to deliver, and enablers that prospective partners could leverage. Additional detail regarding specific enablers for particular aspects of the City Leap Programme can be found under each section following.

Organisational innovation

- **Bristol is Open**; a joint venture partnership between Bristol City Council and the University of Bristol in advanced digital infrastructure and the internet of things. Through Bristol is Open we have a number of existing partnerships with technology providers.
- **Bristol Energy**; a 100% Bristol City Council owned energy retail supply company, one of only two municipally-owned energy supply companies in the UK, which now has over 120,000 customers and purchases renewable electricity and gas from around 30 generators.
- **Bristol Waste**; a 100% Bristol City Council owned waste company.
- The future Bristol Housing Company; a proposed new company to be established by the council to facilitate the construction and development of new homes for the city.

Energy generation and supply

- 5MW of wind generation in Avonmouth – Bristol City Council remains one of the only local authorities in the UK to own large scale wind turbines.
- c4MW of solar PV on council-owned buildings and land.
- Biomass boilers with a generating capacity of c3MW.

- Capital investment of c£10m in heat networks approved to date.
- c1,000 social housing properties connected to heat networks to date.
- c£2m annual income via Feed in Tariff, Power Purchase Agreement and Renewable Heat Incentive income streams.

Energy efficiency

- Delivered an energy efficiency programme which has cut emissions in the council's buildings by 60%, achieving the council's 2020 carbon reduction target three years ahead of schedule.
- Manage a £1.8 m revolving SALIX loan fund, delivering a £3.6m investment in energy efficiency with sub five year payback to date.
- Delivered energy efficiency upgrades to 10,000 social housing and private domestic properties.
- Installation of energy efficient street lighting across the entire city council portfolio and now commencing a further staged upgrade to LED lighting.

Sustainable transport

- Currently delivering an additional c120 public and c80 private EV charge points across the West of England (covering the four local authorities that make up the West of England; Bristol, Bath & North East Somerset, South Gloucestershire and North Somerset).
- Joining an alliance of local authorities, the Welsh Government, electricity companies and car manufacturers along the M4 corridor between Swindon and Cardiff, seeking a Government grant to install infrastructure for electric vehicles. The funding under the 'Plugged-In Places' initiative would pay for 50% of the cost of providing charging points for public car parks and private off road commuter parking.

Social housing

- The council remains, by some distance, the largest social landlord in the area, providing over 27,000 homes in the city, with well over half of these homes (14,647) being flats or maisonettes in a variety of block types.
- The council still own just under 1,300 homes which were purchased from the private sector rather than purpose built – these are mainly Victorian terraced homes and many are listed buildings or in conservation areas.

Corporate estate

- The council owns over 2,000 property assets and over 5000ha of land, representing approximately 40% of the total land area of the city.
- The asset base includes operational land (in use for service delivery and office accommodation); investment property (used to generate income for the council) and development land (available to drive regeneration and new housing development).



Finance

Bristol City Council has access to sources of relatively low cost finance for delivery of public infrastructure. Capital funding from these sources may, therefore, be available to support particular aspects of the City Leap Programme, subject to due diligence on financial business cases and the council's internal approvals process.

We are also aware that the Government is seeking to support innovative energy-related projects at the city level through, for example, the **Industrial Strategy Challenge Fund**. This may present an additional opportunity for us to increase the pace and expand the scope of our ambition further than is possible without Central Government support through leveraging additional private sector investment. We would welcome Expressions of Interest from potential partners who wish to submit applications for such funding in partnership with the council.

R&D Projects and Smart Technology

Bristol City Council has an extensive track record of taking research and development projects through the pipeline from innovation to delivery. As a Smart City, we aim to apply new solutions to old problems, achieving better citizen outcomes and realising efficiencies for the council. To achieve this, we employ an innovation process which sees ideas develop through pilots to larger scale demonstrations and then on to become mainstream services.

This process allows rapid development and learning at the outset to build knowledge and experience of the business case and efficiencies.

Some of the pilot projects we have undertaken to date include:

SoLa Project

Investigated the potential for battery storage to be used in conjunction with Solar PV generation within 26 homes, five schools and an office block to provide network and customer benefits. A variable tariff was trialled to incentivise customers to use the battery to reduce electricity consumption at peak times.

Digital Environment Home Energy Management System (DEHEMS)

Directly addressed issues and moved beyond the then current smart metering energy 'input' models. The smart meters monitored household energy consumption, whilst energy 'performance' models looked at the way energy was used and brought together sensor data in areas such as household heat loss and appliance performance.

3EHouses

Building on the findings of the DEHEMS project, 3EHouses was a European project financed under the Competitiveness and Innovation Framework Programme (CIP). The project looked to increase the efficiency of state-subsidised residences through:

- the installation of information and communication technology (ICT) in homes,
- promoting energy savings by helping tenants find out how and when they consume, and learn about how they can manage their consumption to achieve savings, and
- analysing how information, and adopting energy efficiency measures, influence energy consumption in the different European areas represented by the four participating countries.

SmartSpaces - Saving Energy in Europe's Public Buildings Using ICT

Looked to enable public authorities in Europe to significantly improve their management of energy in the buildings they occupy. The project created and introduced an energy optimisation service exploiting the potential of ICT, including smart metering, to enable significant energy saving in public buildings.

REPLICATE

These single themed projects have acted as a precursor to the current **REPLICATE** project, which incorporates learning from each of the above projects to provide a holistic approach to addressing smart city solutions for Bristol.

REPLICATE is a European research and development project that aims to deploy integrated energy, mobility and ICT solutions across three European city districts, including Bristol, to co-create smart city services.

Policy and planning

- The Mayor of Bristol has committed the city to being carbon neutral by 2050 and having net zero direct carbon emissions from energy use and transport. This commitment has long standing cross-party support.
- Bristol's pioneering approach towards energy is just one of the reasons why Bristol was given the title of European Green Capital in 2015 – the UK's first ever city to win this award.
- We have developed a **Climate and Energy Security Framework** which provides the strategic framework for our various initiatives and projects, ensuring alignment with the council's overall objectives. This framework is currently in the process of being refreshed.
- As part of our core strategy, a key statutory land use policy requirement is for 20% onsite renewable energy in every new development. This has stimulated the energy efficiency of new development and the creation of a successful solar industry in the city.
- The council is currently looking at the viability of increasing this target to 100%, with the possibility of interim targets.
- Requirement for new developments within defined 'heat priority areas' to connect to heat networks where financially and technically viable as part of planning policy.
- The council is currently drafting a Zero Carbon Heat Strategy, which aims to decarbonise the city's heat demand as part of our roadmap to carbon neutrality.
- **The Economics of Low Carbon Cities: A mini-Stern review for the City of Bristol.** An analysis of the most practical methods of de-carbonising a city, including a ranking of the most effective technological approaches.

Delivery capability

Our award winning Energy Service is one of the driving forces behind much of the above activities, alongside the council's City Innovation & Sustainability Team and Housing Services, who manage our social housing portfolio, delivering projects that benefit the social, economic and environmental health of our city and partners.

The Energy Service consists of 35 energy professionals and has done much of the groundwork to prepare the basis of the programme of work set out in this Prospectus, to ensure that any subsequent City Leap Programme will hit the ground running.





3 City Leap Programme - Potential investment opportunities

Set out on the following pages is the programme of work that Bristol City Council currently envisages will be its focus over the next ten years. This programme of work reflects the strategically co-ordinated range of projects that Bristol City Council is currently pursuing to meet its 2050 carbon neutrality target.

However, recognising that there is substantial innovation in the energy sector, particularly in relation to the future smart energy system, the City Leap Programme could easily be expanded to include other activities, reflecting innovative business models or ideas proposed by potential partners, and the council would welcome proposals that extend beyond the programme of work as set out in this Prospectus.

The intention underpinning the City Leap Programme is to enable the city to increase the pace and scale of delivery of these innovative and state-of-the-art projects to meet its carbon neutrality target as quickly and cost-effectively as possible, whilst learning how to strategically co-ordinate such a diverse range of projects.

This will enable the building of replicable, investable business cases across the full range of energy-related technologies at city-scale for the benefit of residents, businesses, the council and Programme partners.

The council advocates that devolving infrastructure decisions to the local level, enabling local solutions to be developed, will deliver effective management and realisation of synergies and trade-offs across a range of objectives. It is also recognised that market and regulatory structures can obstruct innovative approaches to engaging citizens and the process for approving certain infrastructure investment decisions. Bristol City Council intends to engage with regulators, such as Ofgem, to identify opportunities to use City Leap to test new ways to save costs and deliver benefits to citizens through the transformation of the local energy system.



The City Leap Programme aims to maximise the value arising from the financial and carbon savings delivered by a smart energy system approach and to share this value equitably. It seeks to integrate investments in energy efficiency, smart technologies, low carbon heat generation and delivery, and low/no emission transport infrastructure to achieve the greatest benefit at least cost. Carrying out projects simultaneously in one city may reveal problems/solutions more quickly than a piecemeal or 'business as usual' approach across many cities.

The programme outlined below is replicable across the UK or internationally and provides an urban living laboratory to demonstrate how the costs of such a programme do not need to fall primarily on the public purse.



1. Heat networks

A key aspect of infrastructure for future cities to resolve is the delivery of low carbon heat to its residents and businesses, which represents 45% of final UK energy demand. The provision of heat networks in urban areas allows the delivery of low carbon heat to be undertaken in the most efficient manner, whilst improving the overall efficiency, resilience and capacity of the UK energy system through the connection of Combined Heat & Power plants, waste heat, geothermal and other zero carbon heat generation technologies to heat networks.

This wide range of heat supply options allows for greater flexibility of the system and can easily be upgraded to new low or zero carbon heat generation technologies over time. Heat networks can also be integrated into wider city urban growth and regeneration plans, helping to address fuel poverty and environmental issues such as air quality.

What are we doing in Bristol?

The council has been installing new heat networks for several years, with a particular focus on the city centre. We have also undertaken a significant amount of investigation into the feasibility of further heat works including, in conjunction with South Gloucestershire Council, a heat network supplied by Energy from Waste plants located in the Avonmouth area of Bristol which will connect to the city centre.

The City Leap opportunity

The attraction of partners to support this area of activity would accelerate and build upon the following programmes of work to build a city-scale heat network:

- a) The development of a large-scale heat transmission spine from Avonmouth and Severnside via existing anchor loads and new developments to bring waste heat generated by Energy from Waste plants into the city centre.
- b) To increase the pace of heat network development around **Temple Quarter Enterprise Zone (TQEZ)** to the south of the city centre alongside build out of the TQEZ, including the University of Bristol's £300m **Temple Quarter Campus**.

- c) To increase the pace of heat network development around the Bristol Royal Infirmary and University of Bristol's existing campus to the north of the city centre area, connecting new developments of offices and housing to existing council buildings.
- d) The development and installation of a new heat network in the city's commercial and old town districts, with connections across the harbour, linking the networks to the north and south of the city centre.
- e) The development and installation of heat networks as part of significant new build developments across the city.
- f) Supply of low carbon heat to the heat network.
- g) Supporting the development of a Phase Change Material (PCM) to store surplus heat to be transported between heat networks.
- h) To secure the council's wood chip production facility onto a commercial footing, so that it can source and supply the council's and other local customers' biomass requirements, through the council's arboreal arisings from its parks, local land owners and other public sector bodies.

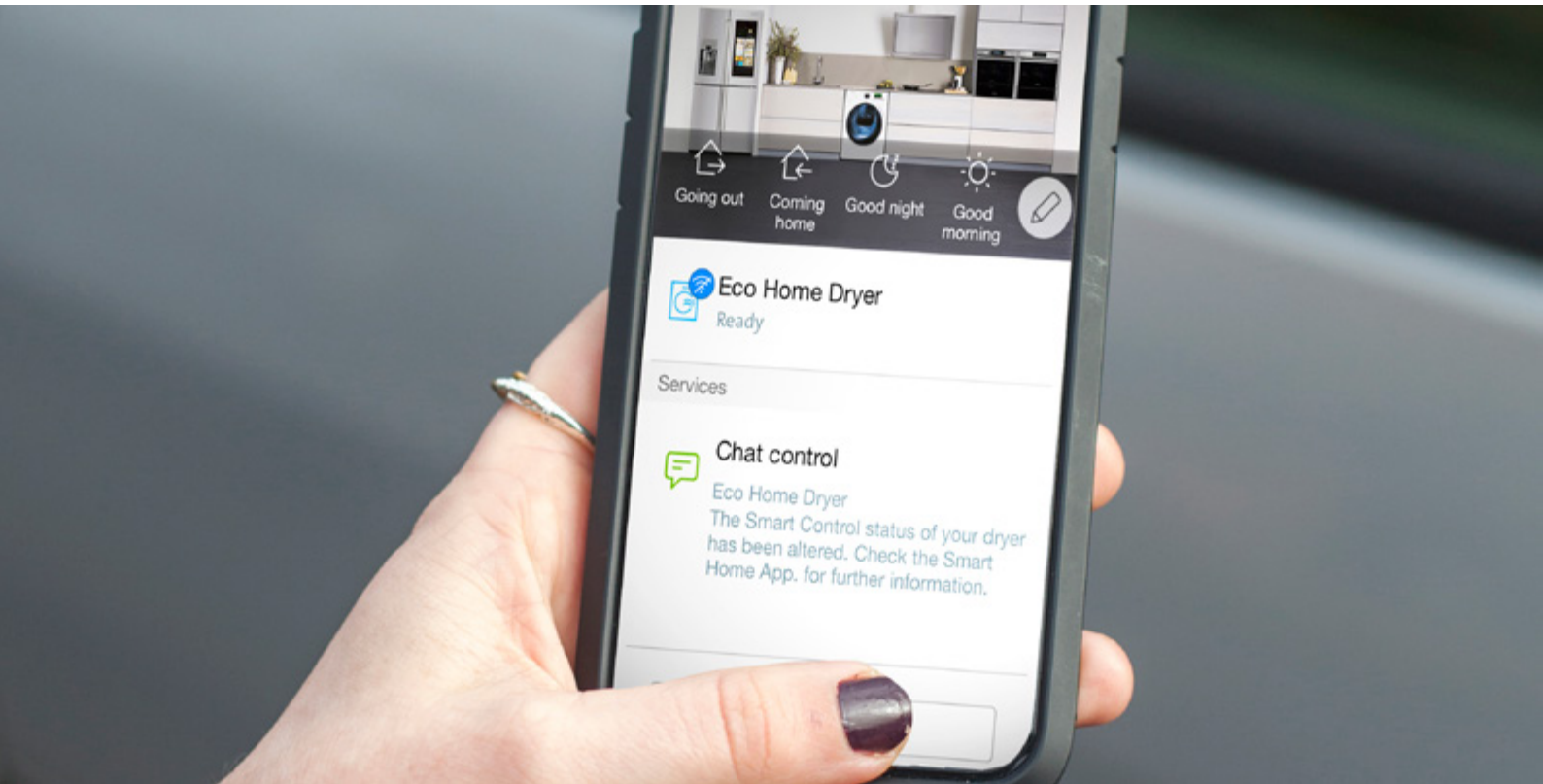
Delivery partner offer

As a heat network developer and local authority, Bristol City Council has a number of 'enablers' that support the delivery of a city-wide heat network, including:

- **Supportive planning policy.** The council's Planning Policy currently requires new development within the heat priority area to connect to a heat network:
 - Where a Day 1 heat connection can be achieved, the council is using this requirement to secure heat supply and connection agreements to new developments.
 - Where a Day 1 heat connection is not achievable, new developments are required to be 'Heat Network (District Heating) ready', i.e. have a basement/ground floor plant room and space for a heat substation to be installed.
- **Masterplanning and feasibility studies.** The council has carried out significant masterplanning and feasibility work to facilitate the development of a city-wide heat network.

- **Heat network connection agreements and contracts.** The council has developed a suite of connection and heat supply agreements and contracts for connection of new and existing buildings to the heat network.
- **Technical design pack.** The council has developed a technical guide for connecting new developments to the council's heat network in line with the latest Codes of Practice. This ensures new developments are designed correctly to ensure efficient operation of the heat network and heat losses within buildings are minimised.
- **Land ownership.** The council is a major landowner within the city and can potentially make sites available for the development of energy centre locations and the connection of anchor heat loads that are developed on council owned sites.
- **Highways.** As the highways authority, the council has the legal ability to install heat network pipework within the highway.
- **In-house expertise.** The Energy Service's Infrastructure team, which is responsible for delivering heat networks on behalf of the council, has built up in-depth knowledge in the delivery of heat networks and significant local knowledge to support future development of the city-wide heat network.
- **Grant funding experience.** The council has been successful in applying for various grant funding opportunities to support project delivery, including an EIB ELENA grant, EU Horizon 2020 funding (REPLICATE) and, specifically in regards to heat networks, **the highest grant awarded** by the Department of Business, Energy and Industrial Strategy (BEIS) to any Local Authority for the development of heat networks. The council currently intends to submit a bid to the forthcoming call for applications to BEIS's **Heat Networks Investment Project (HNIP)** to support the build out of the heat network.

Estimated investment potential up to 2027
£300m



2. Smart energy systems

The UK's energy system is on the cusp of transformational change, where the end goal is a cost effective, sustainable and secure low carbon energy system. Such a system will involve the integration and co-ordination of decentralised renewable energy production, associated infrastructure and end user consumption through enabling technologies. Such a system would deliver bill savings for end consumers via services that provide greater control and flexibility over their energy usage, reducing the need for expensive new generation capacity and Grid reinforcement.

Added to this, the modal shift to electric vehicles is well and truly underway and the issue of the decarbonisation of heat generation will also need to be tackled soon. Both of these shifts will create issues, not least an increased demand for electricity and the change of use of a network not designed to cope with both small and medium sized electricity producers, but also opportunities.

Bristol City Council feels that it is imperative that the city moves to a smart energy system as quickly as is practicably and financially possible, but that as part of this move, we also take a partnership approach to meet our energy challenges and opportunities.

What are we doing in Bristol?

Bristol has been leading the thinking about how to deliver and disaggregate the benefits of a smart energy system at city-scale. In 2015, a strong cross-sector partnership (convened by the Centre for Sustainable Energy and including Bristol City Council, the Universities across the region, Western Power Distribution (WPD), Bristol Energy, local smart energy businesses and community energy initiatives) formed the **Bristol Smart Energy City Collaboration** to explore how the city should take advantage of these opportunities.

REPLICATE is a key research project which is taking forward previous learning to test and develop a model to create a smart energy system. It is funded by the European Commission's Horizon 2020 Smart Cities and Communities programme and started in January 2016. The REPLICATE project's objective is to test how citizens are empowered, through technology, to take control of their energy demand and switch to clean energy.

The project is deploying an energy demand management system and smart ICT platform which integrates and optimises that use of home energy efficiency measures, solar PV electricity generation, electric vehicle charging, smart home appliances, and heat networks. To achieve this, the REPLICATE project is retrofitting 240 homes, of which 150 will be smart homes with connected wet white goods, within a specific geographical area.

A key objective of the project is to develop self-sustaining business models, which generate value for citizens, not for profit organisations and businesses. The City Leap Programme will look to utilise this learning for future development and commercialisation with partners.

The City Leap opportunity

The involvement of relevant partners would enable the council to work with residents, businesses, the local and national distribution network operators and aggregators, to build significant demand-side response capacity on the local electricity network and to increase the uptake of electric vehicles, embedded generation and smart appliances, linked to smart metering and Time-of-Use tariffs.

Particular areas of focus could be:

- a) The creation of a 'Bristol battery' providing balancing services to the local and national transmission networks, consisting of:
 - large-scale uptake of electric vehicles and bicycles by residents and businesses.
 - V2G electric vehicle charging points on the street, driveways and on commercial premises, e.g. to serve vehicle fleets.
 - smart domestic appliances and controls.
 - battery storage at Grid, community and building level (linked to solar PV and electric vehicle charging).
 - heat pumps and other forms of low or zero carbon heat generation technologies.
 - mass roll out of smart meters linked to Time-of-Use tariffs (domestic and commercial).
- b) Aggregation technologies and trading platforms to enable optimum value to be generated and captured by this local infrastructure.

However, the council is aware that this area of smart energy systems is seeing intense R&D activity at the present time and the pace of technological development is rapid. We are therefore very open to working strategically with partners to develop and implement a city-wide smart energy system strategy that will achieve the council's objectives, however we are also keen to take the lead in installing smart energy technologies at scale.

**Estimated investment potential up to 2027
£125m**



3. Domestic energy efficiency

The most cost effective way to reduce carbon emissions is through investment in energy efficiency, however activity in this market in the UK has typically been ‘boom and bust’ and largely driven by, and dependent upon, grant funding. This has led to the supply chain disengaging from the retrofit market.

The council is of the view that this approach has not been successful in delivering energy efficiency measures at the scale required to meet its carbon reduction targets and wishes to see a significant increase in the scale of delivery.

The City Leap Programme could enable Bristol City Council to, for example;

- Facilitate a local and potentially regional retrofit market supplied by skilled local firms.
- Implement sustainable revolving loan fund to provide low cost finance to fund energy efficiency measures.

If successful, the model could be replicated on a UK-wide basis.

What are we doing in Bristol?

Bristol City Council launched its Warm Up Bristol scheme in October 2014. Since launch it has installed over £4.5m of energy efficiency measures in private domestic properties, mainly solid wall insulation.

The council has also undertaken an extensive energy efficiency programme in its own c27,000 social housing properties.

The City Leap opportunity

City Leap would provide the finance, create the demand and engage the supply chain, all of which are required to deliver an energy efficiency programme at scale, the key components of which are envisaged as being as follows:

- a) The development of a revolving loan fund for householders for the Warm Up Bristol scheme based upon the **Wessex Resolutions Community Interest Company** (agreement with Wessex in place and £300k funding already provided by Bristol City Council) to ensure the long-term sustainability of the scheme.
- b) Fuel Poverty Programme – develop a best practice city-based energy efficiency programme for low income households, with the objective of ensuring

that all treated properties reach Band C Energy Performance Certificates (within agreed cost effectiveness parameters). This programme would include outreach activities to engage with low income households.

- c) The programme to be backed by high standards and guarantees in line with **Bonfield Review** recommendations, supported by a project to engage with the supply chain and build supply chain skills within the city.
- d) A consumer confidence building programme to help drive up residents' demand for energy efficiency retrofits, in particular amongst those who are able to pay, thereby helping to create long-term demand and encouraging the supply chain to participate.

**Estimated investment potential up to 2027
£300m**

- b) Development of a comprehensive and targeted suite of advice and support to SME business to enable them to undertake a range of energy efficiency and environmental sustainability programmes of work, including:

- Daylight sensing and lighting upgrades.
- Power correction and variable speed pumps.
- Heating upgrades, e.g. boilers, controls, heat recovery and systems.
- Cooling and chiller upgrades.
- General fabric improvements e.g. windows, airtightness, insulation.

- c) The development of a revolving loan fund for businesses and community buildings to ensure the long-term sustainability of the scheme.

**Estimated investment potential up to 2027
£100m (although the Bristol mini-Stern report
identified a potential £440m pipeline)**

4. Commercial energy efficiency

Key to Bristol remaining competitive in the future global economy is the provision of energy efficiency measures to the commercial sector, especially to the SME sector, which does not have the resource or capacity to undertake its own programmes and therefore requires assistance. There is also the significant barrier of the landlord/tenant split incentive to overcome, although incoming commercial buildings minimum energy efficiency standards may help to begin to address this issue.

Installing such measures can substantially reduce the pressure on bottom lines and increase competitiveness. The work with SMEs could be based upon the successful revolving loan SALIX financing model through the provision of low cost loans.

The City Leap opportunity

The work programme outlined below aims to establish a comprehensive suite of support to the commercial sector:

- a) Development and delivery of a long-term behavioural change and advice programme relevant for SMEs.



5. Renewable energy

The council, businesses and community energy groups have installed, or facilitated, a variety of renewable electricity and heat generation measures across the city over the last decade. We wish to continue to deliver and support this activity through a number of existing routes that have been established and proved successful in terms of delivery but are open to proposals for new delivery routes.

A study carried out by the Centre for Sustainable Energy in 2009, identified the following potential for renewable energy in the City of Bristol:

Technology	Resource potential	Estimated potential investment value
On-shore wind	22MWe	£25m
Private Housing Solar PV	74MWe	£60m
Social Housing Solar PV	22MWe	£28m
Commercial Solar PV	46MWe	£39m
TOTAL	164MWe	£152m

The Energy Service has also undertaken detailed analysis of the potential for rooftop solar in the council's social housing and has identified a total resource capacity of 22.8MWe, with an investment potential of c£28m.

The City Leap opportunity

The City Leap Programme would provide the financial and strategic planning capacity required to deliver the programme at scale. The key components are as follows:

- a) The continuation of the use of council land and property for renewable energy generation, financed by various co-financing models including crowdfunding, community groups, social equity and debt investors as appropriate. The council will derive benefit from lower fuel bills and potentially enter into power purchase agreements to sell the electricity through Bristol Energy to local households and businesses. Emerging peer-to-peer trading platforms are of particular interest.
- b) The continuation of the installation and facilitation of solar PV on private domestic housing, and corporate roofs across the city, either standalone or in conjunction with battery storage.
- c) The deployment of air, ground and water-source heat pumps and other low and zero carbon heat generation technologies.
- d) The exploration of hydropower systems on the River Avon, leading to the installation of hydropower on a number of weirs and lock gates.

**Estimated investment potential up to 2027
£40m**



6. Monitoring, dissemination and evaluation

A major gap at the moment is that, across the UK, energy efficiency and renewable programmes are generally not independently monitored and evaluated at the local level. This means that there is little reliable data available to improve the future management of such programmes.

This results in the same data sets and figures being used at local and national level to devise new strategies and programmes, rather than learning from previous experiences, which is a major barrier to the continuous improvement of strategies and plans.

To help address this, it is proposed that a joint monitoring, evaluation and dissemination group is established covering leading academia, government, businesses, NGOs and other public sector bodies to act as a sounding board and quality assurance mechanism for the programme of work. This will underpin Bristol's status as a centre of excellence in this field from which others can learn. The particular work programme of the group would be:

- a) The monitoring and evaluating of the work from a number of perspectives, e.g. the success in reducing carbon emissions, success in decreasing the number of homes in fuel poverty, the current and future economic benefits of the programme, changes in the scale and patterns of energy usage and behaviour within the city.

- b) Dissemination of the results of the City Leap is paramount to the success of the programme and its replicability across the UK. This dissemination will produce a series of best practice guides and an annual report for government, which can be widely used for dissemination purposes including on government websites, partner websites, for debates and discussions, as well as seminars and workshops. It is also proposed to organise workshops in conjunction with, or to coincide with, major conferences and exhibitions e.g. the National Infrastructure conference, Ecobuild, etc.
- c) Bristol has a strong profile overseas as a leading smart, sustainable and innovative city. The city also has extensive reach through global networks such as Enercities, Rockefeller 100 Resilient Cities, Eurocities, the Global Parliament of Mayors, the UK Foreign and Commonwealth/Department for International Trade network overseas, as well as city-to-city partnerships in Europe, US and Asia. We propose to use this network to share learning and to promote the work of our partners in the City Leap Programme who may wish to allocate resource to this area because of the value it could generate for them.

**Estimated investment potential up to 2027
£10m**





4 Other potential energy-related opportunities

7. Transport

A variety of transport measures have been developed and are being discussed with Central Government, including the forthcoming Bristol Transport Strategy. The programme of work will focus on rapid mass transit, low emission vehicles, autonomous vehicles trials, behaviour change and the integration of smart operating systems.

Although this potential investment opportunity has not been included within this Prospectus, it is fully recognised that transport is a critical issue the city will need to address, in order to meet its carbon emission target and should be integrated with the other projects as comprehensively as possible, as part of an integrated systems approach.

Potential partners interested in supporting the shift to low/no emission transport and associated infrastructure are welcome to respond to this Prospectus.

8. Hydrogen

Bristol City Council is aware that if the city is to achieve its carbon neutrality target, then the development of hydrogen source energy production and capacity is likely to be required, given that heat and transport represent 85% of the UK's final energy demand.

The City Leap Programme would seek to cluster emerging hydrogen R&D applications and test them for market readiness. We currently envisage that this work programme would start in the 2020s and would be linked to research grant and private sector R&D funding but we would welcome early pioneer proposals from potential partners.



9. Marine energy

For the South West of England, the development of wave and tidal energy as a new energy source has significant economic and commercial opportunities. The skills, assets and broad range of capabilities required to deliver marine energy technology represent an excellent fit with Bristol's engineering and maritime capability.

The UK is well positioned to capture significant value from the marine energy market. In the South West of England, there are currently over 300 companies engaged in the wave and tidal sector, either as technology developers/investors, or in the supply chain. Many of these companies are highly innovative and are in the vanguard of the industry both at home and abroad. The number of direct jobs created by the sector has grown to over 450 – many of which are in Cornwall, Plymouth and Bristol – and the sector has the potential to reach over 3,500 high value jobs by 2030 as it reaches commercial maturity.

Bristol City Council has supported the development and maintenance of professional skills within this sector over a period of time and has a dedicated marine energy officer to develop this sector further, in line with the economic potential. The City Leap Programme could provide significant support to the development of this sector by facilitating the deployment of devices in the water to explore the following three key challenges:

- a) Proving the technology performance and reliability in the marine environment.
- b) Securing finance to enable pilot and first array projects.
- c) Reducing the cost of energy – through economies of scale, innovation and improving energy yield - to make the industry cost competitive.



5 Non-energy investment opportunities

In addition to the energy element of the City Leap Programme, there are significant investment opportunities that the council would like to draw to the attention of potential partners.

Temple Quarter

The area around Temple Meads railway station in the heart of the city is becoming a new hotspot for burgeoning work and residential communities. The famed entrepreneurial spirit that has contributed to Bristol's unique character is in evidence once again in the city's Temple Quarter, where one of the largest urban regeneration projects in the UK is underway.

Around 40.4 hectares of former industrial land in the centre of the city is transforming into a pulsating new district, with historic Temple Meads station at its core. Led by enterprise and innovation, the ambition is to deliver 22,000 jobs, 4,000 new homes and 300,000sq m of commercial space over 25 years, creating a new destination with superb connections within the city, to London and the rest of the UK.

Since 2012, Temple Quarter has already attracted more than 3,200 jobs from over 150 employers, including names such as Coutts bank, PwC and IBM.

At a glance...

- 100 hectare site in central Bristol
- £21 million on access improvements
- £11 million investment in low carbon heat networks
- £300 million new University of Bristol campus
- £100 million on new train routes and services
- More than 27,870sq m of commercial floor space being refurbished or developed



Western Harbour

Bristol's waterside has played a part in the city's economic growth for centuries and now the council is presenting a significant opportunity at Western Harbour, forming an extension of the established and fashionable Harbourside.

Mayor Rees has announced his intention to realise this potential by replacing the dominant road system on the Cumberland Basin – which limits current development – with lower impact options, releasing 15-20ha of prime land. The area has the potential to provide 3,500 homes, with a gross development value estimated at over £1 billion, as well as commercial and leisure space.

With views of Brunel's world famous suspension bridge, the Avon Gorge, Bristol Harbour, and the open, green expanses of Ashton Court estate, the Western Harbour could be one of the most desirable development locations in the UK.

The area is within 25 minute walk of the city centre, or a seven minute cycle ride on dedicated lanes, and the launch of a new Metrobus Rapid Transit route to the city centre and Temple Meads will make access even easier.

The opportunity also exists to combine better access to the historic harbour running through the city, while also providing essential flood defences that are resilient to climate change. The council owns 75% of the land.

Further information on Temple Quarter and Western Harbour can be obtained by contacting the Mayor's Office at mayor@bristol.gov.uk



6 Smart City

Digital technology is key to creating a smart energy system, as described earlier, but also creates a wide range of opportunities for new solutions to help us realise our plan of becoming a low carbon, resilient and sustainable city. Bristol is well placed to take advantage of these opportunities, being awarded the **2018 GLOMO Smart City award** and topping the **Huawei UK Smart City Index 2017**.

Bristol City Council's state-of-the-art Smart City Operations Centre integrates the council's and partners' emergency control, traffic and bus control, community safety (CCTV) and Telecare systems. It is connected with the city through a council-owned network of over 100km of duct and fibre, and the council is planning significant expansion of this network to link further key public sector locations.

The operations centre provides significant immediate opportunities for energy management and low carbon systems but also for a range of other smart city solutions. As part of the City Leap Programme, we are keen to explore these opportunities with partners.

The council is also working with the University of Bristol and commercial partners through a joint venture called Bristol is Open (BiO). BiO is a vehicle for experimental broadband, wireless and high-performance computing infrastructure that will stimulate and study the convergence in cities of different telecommunication, software, hardware, data and sensing technologies.

The prime focus is on big trends such as Smart Cities, Software Defined Networks (SDN), the Internet of Things (IoT) and Big Data, with the aim of facilitating the exploration of innovative ways to address urban challenges, such as mobility, energy efficiency and meeting the care needs of an ageing population.

BiO will also enable new technologies for media broadcast, entertainment, culture and the visitor economy and will bring benefits for the development of autonomous systems, robotics and advanced manufacturing. Importantly, the local community in Bristol is central to the opportunity that an Open Programmable City provides and the project takes a human-centric approach to Smart City enablement.

The BiO infrastructure sits alongside the operational council network and consists of a fibre ring linking four key city centre locations; University of Bristol (UoB) and its high performance computer, **We the Curious** (science centre), **Watershed** (arts and digital innovation centre) and **Engine Shed** (technology business incubator). Further connections expand the network at street level cabinets and a wide area wireless mesh network.

A city operating system will dynamically host this machine-to-machine communication, allowing the development of a wide range of applications. The BiO network is well established in the city centre and is now ready to extend out to the wider area over the next three years.

The BiO network is for research and development projects and does not provide free or commercial broadband access. The objective is to open opportunities for people, local, national and international businesses, local and national government bodies to join in experimental projects, some of which could potentially be energy-related.

Where appropriate, all data generated through the BiO network will be anonymised, aggregated and made publicly available through Bristol's 'open data' portal. By enhancing the public's access to this data and information, we believe this will enable new tools to be built for public service provision, design and delivery. This will help to improve efficiency and allow the council, public and businesses to directly benefit from digital innovation.

BiO is welcoming a range of partners to the project, including local, national and international businesses, in areas such as Internet of Things, AI, Data Storage, telecom and software companies, small hi-tech start-ups, public service delivery organisations, academics and others. Participants can utilise a slice of the network for their experimentation. The active, wireless and mesh network will be technology agnostic, built on open network principles, using software defined network technologies, that enable network function virtualisation.





7 Public engagement

The City Leap Programme has the potential to have a significant impact on the City of Bristol and its residents. It is, therefore, extremely important that residents are engaged with as part of the programme to ensure their active consent and participation in City Leap – it is their city after all!

Where successful, engagement activities can build understanding as well as create active interest in realising and benefiting from system changes. Engagement can also generate greater enthusiasm for renewable energy technologies, such as wind and solar, and is key to driving consumer behaviours and normalising new technological developments.

The City Leap Programme offers an ideal opportunity to engage the people of Bristol in the potential opportunities and benefits of a low carbon and smart energy system. As well as the council itself, the city's community groups, such as the members of Bristol Energy Network and other advocacy organisations, such as the Centre for Sustainable Energy, are well placed to play their part in this engagement.

There are also opportunities to engage the commercial sector, by publicising the good examples of energy management and carbon emission reductions achieved by the council and the wider public sector. Local initiatives like **Go Green (Low Carbon South West)** and the **Bristol Green Capital Partnership** could also provide opportunities to showcase these examples and draw more businesses into taking steps to move towards a low carbon business model.

Through the ambitious nature of the City Leap Programme and its associated opportunities, and building on the extensive range of community activities already in existence in the city, Bristol has the expertise and channels to organise a coherent and scalable programme of public engagement. This could deliver an approach which could be used as the template for the rest of the UK.

Given the above, we would strongly encourage potential partners to consider how they might seek to engage with, and gain the consent of, Bristol's residents and businesses for the opportunities they wish to participate in as part of City Leap.



8 Partnerships that we are seeking

The primary purpose of this Prospectus is to invite Expressions of Interest from potential partners setting out the type of relationship, levels of investment and expected outcomes that could be facilitated by a subsequent partnership with Bristol City Council prior to the council undertaking appropriate procurement exercises.

Bristol City Council is seeking a different way of delivering significant transformation change, which aligns with its social, environmental and economic goals and priorities. There is an opportunity for forward looking organisations to establish a new, 21st Century public – private business model that delivers against the challenges of this century.

The energy field is incredibly diverse, from offshore wind farms to behavioural energy advice in a consumer's home and we anticipate that the range of potential partners that could be part of Bristol City Council's City Leap Programme could be equally diverse, including but not limited to:

- Institutional and private investors seeking long-term, stable returns from energy-related infrastructure.
- Owners and operators of energy-related infrastructure, including low carbon heat and power generation, power and heat storage, heat networks, energy delivery and balancing services, from single domestic properties through to multi-MW operations.
- Information technology and software companies with innovative energy supply and demand management solutions at all scales, from single domestic properties through to community and Grid-scale.
- Electric vehicles (EV) manufacturers and charging infrastructure players, including autonomous vehicles.
- Innovators of all kinds, including those who are seeking to partner with the council in funding bids, e.g. to the Industrial Strategy Challenge Fund.

- Community and third sector organisations interested in participating in the City Leap Programme, either as partners in particular projects or bringing forward their own innovative programme of work.
- Consortia of the above.

For clarity, the council is not seeking to enter into discussions with or to procure 'delivery only' contractors at this stage. Expressions of Interest from such contractors will be noted and acknowledged but not acted upon.

To assist potential partners in responding to this Prospectus, we have previously outlined particular areas that we envisage being part of the City Leap Programme, based on the current portfolio of energy-related projects being undertaken by the council and the existing partnerships and/or collaborations that Bristol City Council already has in place.

However, Bristol City Council is also keen to work with partners with innovative energy-related business models and ideas that are not directly linked to the areas of potential activity listed and potential partners are welcome to include these in their responses to this Prospectus.

Existing arrangements and partners

We anticipate that potential partners could choose to, where appropriate, collaborate and work with our existing arrangements and partners, as follows:

- **Bristol is Open**; a joint venture partnership between Bristol City Council and the University of Bristol in advanced digital infrastructure and the Internet of Things. Through Bristol is Open we have a number of existing partnerships with technology providers.
- **Bristol Energy**; a 100% Bristol City Council owned energy retail supplier.
- The future Bristol Housing Company; a proposed new company to be established by the council to facilitate the construction and development of new homes for the city.
- **Western Power Distribution**; the local Distribution Network Operator who are acting in an advisory capacity to the energy element of the City Leap Programme.

- **University of Bristol Cabot Institute for the Environment**; the University of Bristol's first flagship cross-disciplinary research institute exploring how we impact and depend on the Earth.
- **University of the West of England**; contributing to a sustainable and healthy future through applied research and collaborations with organisations and communities.
- **Bristol Green Capital Partnership**; a unique network of more than 800 member organisations from across public, private, third and voluntary sectors, all committed to working towards a 'sustainable city with a high-quality of life for all'. The Partnership has the city's carbon neutral 2050 target as a rallying point for its work. Its members include Bristol Energy, Bristol Waste and Bristol is Open, among many others.
- **Invest in Bristol and Bath**; the region's inward investment agency.
- **E3G**; an independent climate change think tank operating to accelerate the global transition to a low carbon economy.

We would be interested to hear from prospective partners, either in their Expressions of Interest or subsequent discussions, about how they envisage doing this.



Photo courtesy of Destination Bristol

9 Responding to the City Leap Prospectus

- 1 Expressions of interest (EOIs) regarding potential partnership opportunities with the council must be submitted by **23:50 BST on Friday 31st August 2018**. Please note that the council will start to action the EOIs as we receive them but will not enter into any discussions with organisations that submit EOIs after the deadline. Please complete the secure webform on the Energy Service's website: **www.energyservicebristol.co.uk/prospectus** to submit your Expression of Interest.
- 2 Depending on the responses received, we may hold a series of meetings, workshops and events to enable further understanding of the council's and potential partners' positions.
- 3 Interested parties are responsible for ensuring that they are fully familiar with the nature and extent of the council's City Leap Prospectus document. For the avoidance of doubt, the purpose of this document is to conduct a soft market testing exercise to determine whether the council wishes to enter into one or more partnerships for the energy element of Bristol City Council's proposed City Leap Programme. Any subsequent partnerships entered into by Bristol City Council with third parties will be subject to appropriate procurement, as required.
- 4 Interested parties shall obtain for themselves, at their own expense, all information necessary for the preparation of their submissions of interest. No claim arising out of want of knowledge will be accepted.

- 5 None of the Authority, the Authority's members, directors, officers, employees, agents or advisers make any representation or warranty as to, or (save in the case of fraudulent misrepresentation) accept any liability or responsibility in relation to the adequacy, accuracy, reasonableness or completeness of this City Leap Prospectus document or any part of it (including but not limited to any loss, damage or costs arising as a result of reliance by the interested party on any part of this document).
- 6 The council understands that there is considerable trade secret, commercial value and sensitivity around the potential for partnering with Bristol City Council in relation to the City Leap Programme. Therefore, the council will maintain confidentiality of expressions of interest regarding this matter. To assist us to do this, please only e-mail any additional information or requests to **energy.prospectus@bristol.gov.uk** and no other email address. Enquiry discussions will be managed by Bristol City Council's Head of Energy Services.
- 7 The council reserves the right at any time:
 1. Not to consider Expressions of Interest for any reason whatsoever.
 2. Not to enter into any partnership or arrangement for any reason whatsoever.
 3. To discuss solutions with one or more parties during the period prior to any Public Procurement Regulations compliant procurement exercise as required.
 4. To issue amendments or modifications to the Prospectus at any time for any reason whatsoever.
 5. To alter the timetable set out in this Prospectus or that which applies to subsequent discussions with potential partners for any reason whatsoever.
 6. To end discussions with any potential partner at any time for any reason whatsoever.
- 8 Any and all costs, expenses and/or losses incurred by any organisation or other person, in relation to this Prospectus, will not be reimbursed by the council and neither the council nor any of their representatives (including their advisory team) will be liable in any way to any organisation, or other person, for any costs, expenses or losses incurred by any organisation or other person in connection with this soft market testing process.
- 9 This Prospectus and all documents and information will be prepared in the English language. All subsequent discussions, negotiations, partnership arrangements and/or vehicles and associated procurement exercises will be subject to English Law and the exclusive jurisdiction of the English Courts.
- 10 Direct or indirect canvassing of any councillor, public sector employee or agent by any organisation or their agent concerning this Prospectus, or any attempt to procure information from any councillor, public sector employee or agent concerning this Prospectus, may result in the disqualification of that organisation from the associated soft market testing exercise.
- 11 All documentation supplied by Bristol City Council shall remain its property and confidential to it and should be returned at the time of tender or upon request. Organisations may not, without Bristol City Council's written consent, at any time use for their own purposes or disclose to any other person (except as may be required by law) this Prospectus or any information or material, which Bristol City Council may make available to organisations from time to time.



www.energyservicebristol.co.uk

✉ energy.prospectus@bristol.gov.uk

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