

LOCAL ENERGY ACCELERATOR

CITIGEN

Futureproofing energy for the historic City of London

WHAT IS LEA?

The Mayor of London's Local Energy Accelerator (LEA) supports the development of clean and flexible local energy projects including heat networks in London to transform the way energy is generated, supplied, and used in buildings.

An initial £6m programme was co-funded by the Mayor of London and the European Regional Development Fund (ERDF) with a further £3m funding provided for the programme by the Mayor as part of the project's extension.

LEA is a continuation of the Decentralised Energy Enabling Project (DEEP) which supported 44 decentralised energy projects. It is an important part of the Mayor's commitments to creating a greener, cleaner future for London.

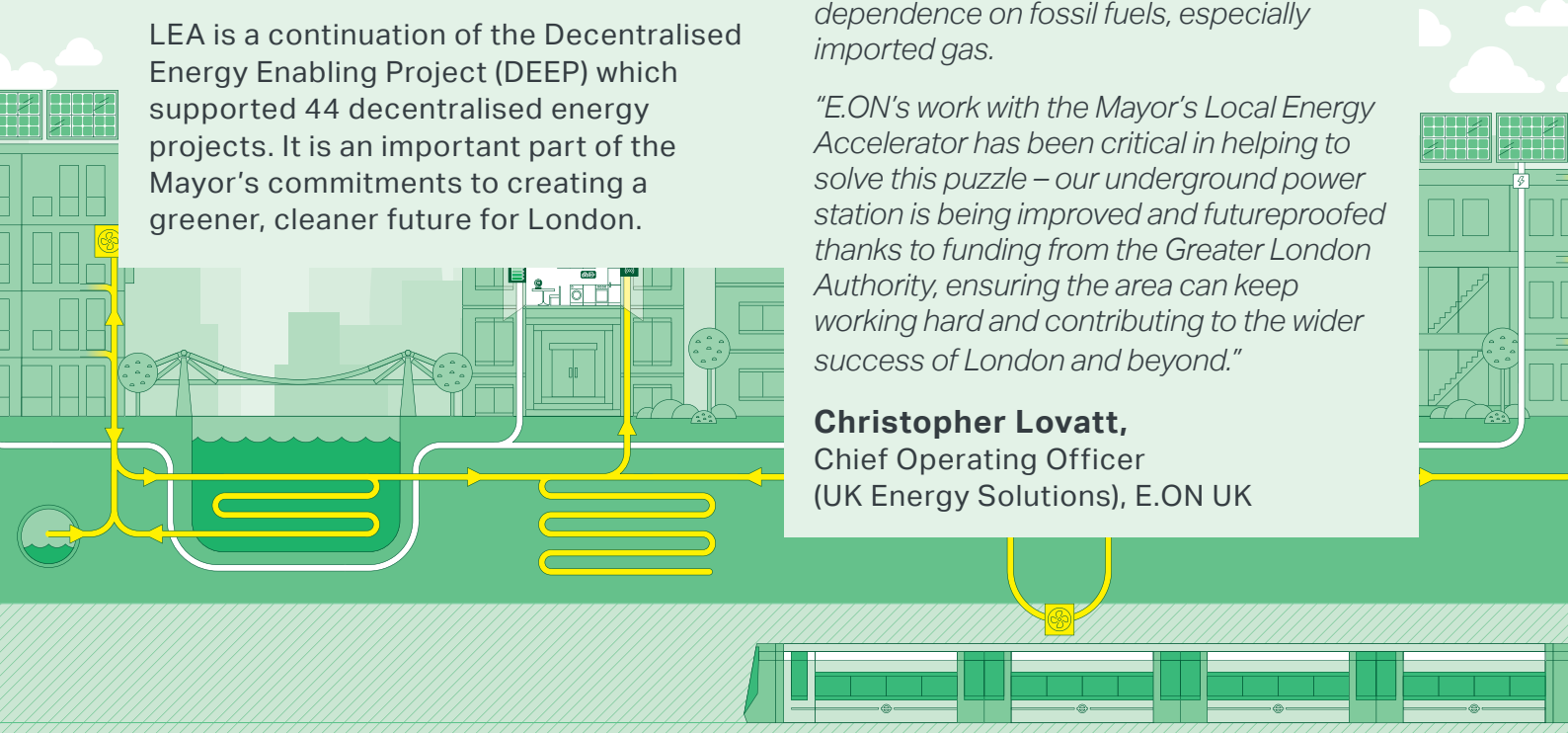
"The City of London dates back to Roman settlers in the 1st Century AD and has a unique role and history as part of our capital. Today it is a hive of economic activity – its intensity is a core part of its identity.

"The City and surrounding areas of central London face many of the same challenges that places around the world are grappling with – how do we sustain this level of energy use in the context of the climate crisis? How can these places become energy resilient and increasingly self sufficient?"

"The twin wins of Citigen are in tackling the environmental impact of heating, especially for densely populated areas, and showcasing the types of technology that will help the UK wean itself off its dependence on fossil fuels, especially imported gas.

"E.ON's work with the Mayor's Local Energy Accelerator has been critical in helping to solve this puzzle – our underground power station is being improved and futureproofed thanks to funding from the Greater London Authority, ensuring the area can keep working hard and contributing to the wider success of London and beyond."

Christopher Lovatt,
Chief Operating Officer
(UK Energy Solutions), E.ON UK



DECARBONISING THE CITY OF LONDON

The City of London has ambitious sustainability plans, with an objective to generate zero emissions, so it can continue to thrive for generations to come.

About half a million people commute daily to the City. Its location, mix of buildings and varied utility needs can make supplying reliable, cost-effective and sustainable energy a major challenge. E.ON's Citigen plant is part of the plan to overcome this. It is an underground power station – hidden behind two listed building façades – which supplies decentralised district energy into the heart of London.

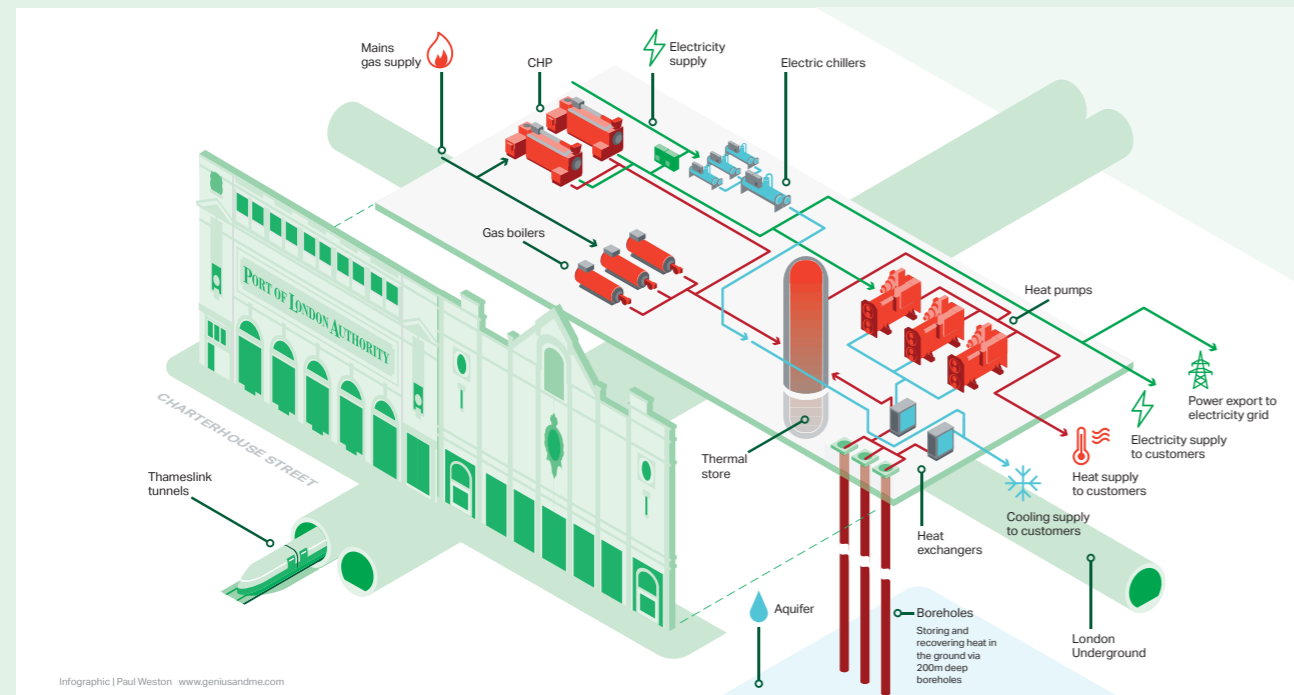
Citigen provides heating, electricity and cooling to this highly populated part of London with ever-growing and changing energy needs.

It is a tri-generation system – generating heating, cooling and electricity from a

mixture of combined heat and power engines and renewable energy. Recent investments by E.ON in the site have installed new high efficiency heat pumps and even geothermal energy sources which capture natural heat energy from the London Aquifer 200m below the city streets. This new technology will reduce emissions from the energy generated by as much as 30%.

The network has 27 substations and covers more than 10km of heating and cooling pipes to residential and commercial properties including the Guildhall and Barbican Centre, providing heating and cooling for the equivalent of more than 13,000 homes.

Citigen is also home to E.ON's UK City Energy control room – where more than 60 district heating sites are monitored and managed in real-time.



A representation of Citigen's tri-generation system power station


HOW LEA HAS SUPPORTED CITIGEN

LEA has supported Citigen to consider and prepare for future operations of the network, and decarbonise the energy used in the existing network.


The consultancy team funded by LEA, with support from the PDU has looked at how the aquifer heat source and connected heat pumps can be used at a maximum to replace heat from the existing combined heat and power engines and gas boilers. The project used hydraulic modelling to investigate

how much further the existing cooling and heating network can be decarbonised and expanded. A number of scenarios were tested including the addition of future loads and future integration of waste heat from a data centre which could provide further decarbonisation to the City of London. The outputs identified potential constraints and modifications required in the network for each scenario, allowing E.ON to more confidently engage with future connections.


With help from LEA, E.ON's Citigen is becoming more sustainable and prepared for the future.



1,150 tonnes of carbon will be saved in the first year of operation



There is potential to save more than 7,000 tonnes of carbon per year if the full potential is realised with other waste heat sources captured, the network expanded and the heat pumps used to full capacity



The heat pumps also contribute to reduction of NOx emissions by replacing use of CHPs and reducing operational costs for Citigen

The Local Energy Accelerator supports low-carbon decentralised energy in London, with eligible organisations able to benefit from revenue funding as well as free technical, commercial, strategic and project management services. Find out more by contacting lea@london.gov.uk