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**Research,  
Enterprise &  
Innovation**



# **Knowledge Exchange Institute**

# Contents

Introduction	1
Case studies	2
<b>Resin d'être</b> Resin production is big business. We find out how LSBU's partnership with Nuplex, a global chemical company, improved its resin production process.	2
<b>A+ ideas</b> How one research project led to another and an entirely new product.	4
<b>A light bulb moment</b> A consortium of housing associations is working with LSBU to tackle the issues caused by taking a short-term approach to procurement with the aim of overhauling the entire approach – reducing costs and making it more environmentally friendly.	6
<b>The heat is on</b> A consortium led by LSBU and ICAX has a £2.9 million grant to develop a balanced heating network to heat and cool buildings on the LSBU Southwark campus. The project could have enormous implications for the UK's carbon footprint.	8
<b>What's it worth?</b> LSBU worked with the Construction Youth Trust to help it develop a method to calculate the social value of the impact of its work.	10
About LSBU	12

## Our range of Knowledge Exchange Programmes offer businesses tailored solutions to optimise company performance, by providing access to expertise and skilled resources.

**Our programmes support a variety of needs and requirements, as the inspiring stories in this brochure demonstrate, areas such as new product development, streamlining and product development and testing.**

We are also able to access funding schemes, such as the Innovate UK Knowledge Transfer Partnerships, which provides 67% of project funding, or our own Knowledge Exchange Voucher Scheme where the University provides a bursary for a PhD student to work with you, helping you to reduce project costs and minimise financial investment.

All funded programmes are subject to qualifying criteria and we will work with you through this process. If you want to find out more or you'd like to discuss one of your own ideas and how we can work with you, please get in touch.

Together, we'll develop an approach that suits your needs and meets your objectives.

# Resin d'êre

**One of the raw materials for making industrial paint, which is used on everything from skyscrapers to cars, is powder coating, which is in turn made from resin. Resin production is big business: in 2014 the global unsaturated polyester resin market was valued at over \$7 billion dollars and is set to double by 2022, offering considerable opportunity for organisations operating in the sector.**

The global chemical company Nuplex is one such organisation; it specialises in the production of polyester resin for the powder coatings market.

Its resin is manufactured in discrete batches. The process is finished by cooling the resin from over 200°C to form a 2mm thick sheet. That sheet is fed into dicing machines that crush it into a powder, which is sold as the end product. It's an exact science but, as with any industrial process, there are always improvements and efficiencies to be made.

Nuplex came to LSBU looking for help in exploring ways to hone its cooling process. It wanted the cooled resin to be more uniform with less variation but it still had to arrive at the dicing

machine in a solid state to avoid the production line grinding to a halt. It goes without saying that delays in production are extremely costly.

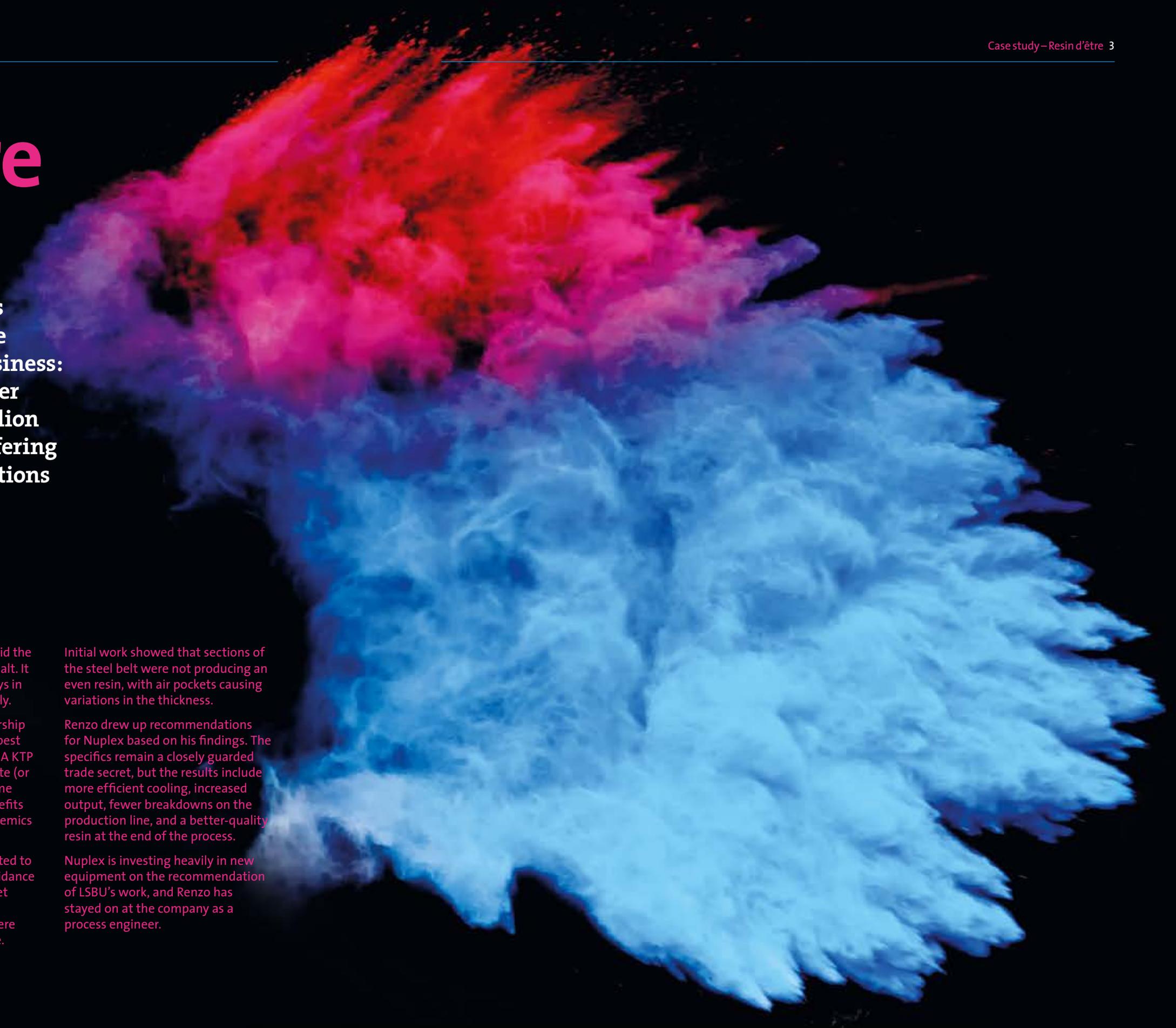
A Knowledge Transfer Partnership (KTP) was established as the best way of delivering the project. A KTP includes funding for a graduate (or KTP Associate) to work full time within the company who benefits from the support of two academics with relevant expertise.

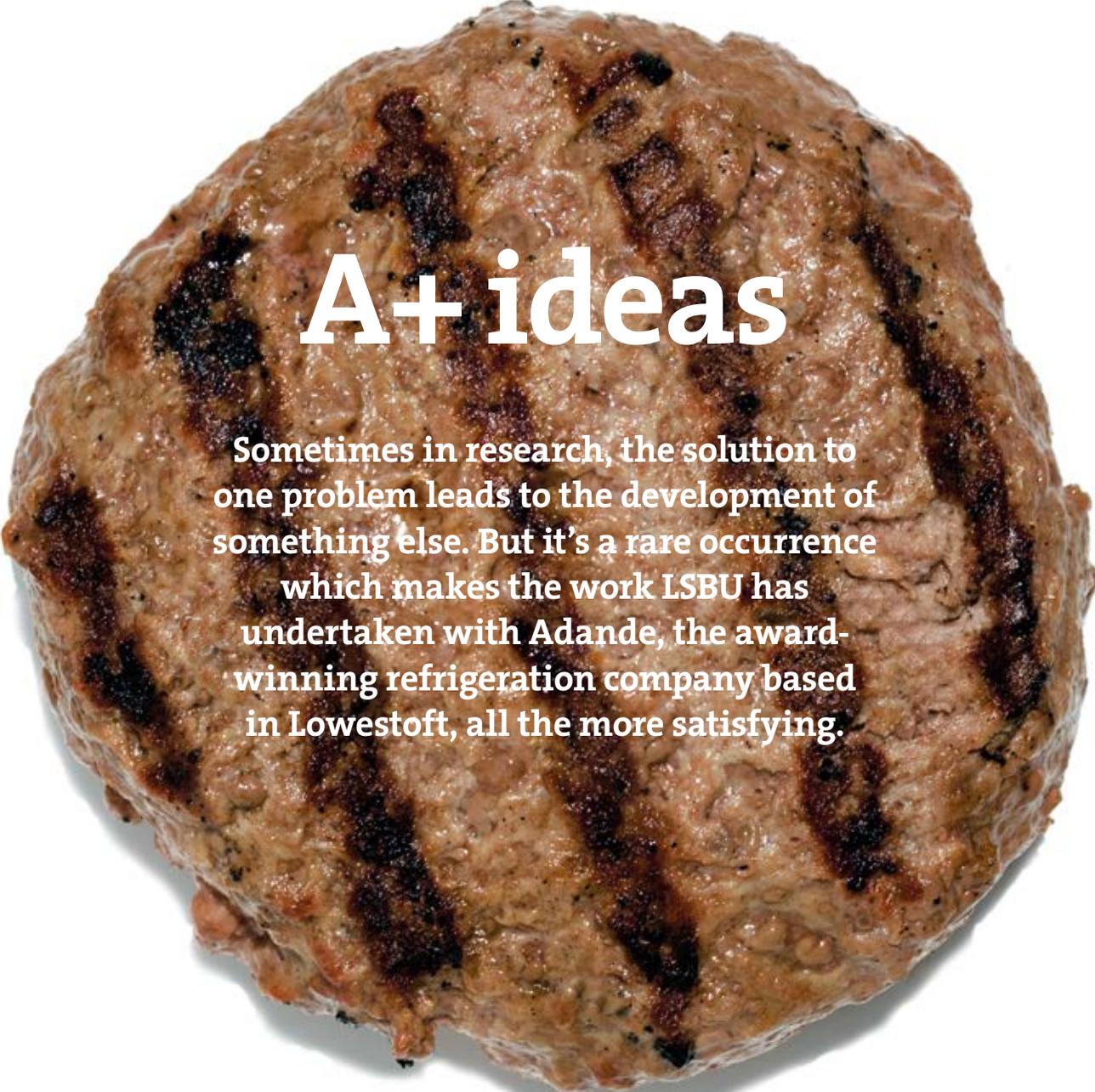
Renzo Huaynates was appointed to the role, with support and guidance from LSBU academics. They set about examining the cooling process, identifying areas where improvements could be made.

Initial work showed that sections of the steel belt were not producing an even resin, with air pockets causing variations in the thickness.

Renzo drew up recommendations for Nuplex based on his findings. The specifics remain a closely guarded trade secret, but the results include more efficient cooling, increased output, fewer breakdowns on the production line, and a better-quality resin at the end of the process.

Nuplex is investing heavily in new equipment on the recommendation of LSBU's work, and Renzo has stayed on at the company as a process engineer.





# A+ ideas

Sometimes in research, the solution to one problem leads to the development of something else. But it's a rare occurrence which makes the work LSBU has undertaken with Adande, the award-winning refrigeration company based in Lowestoft, all the more satisfying.



The collaboration began with a short Knowledge Transfer Partnership (KTP) and grew, as Catarina Marques, the LSBU graduate at the heart of the research, explains.

“After initially working on a short KTP aimed at reducing the noise of the Adande professional refrigerator, I helped them to develop a longer KTP aim to develop an A++ energy rated household refrigeration product. From there, I moved on to developing a tempering cabinet – which is designed to provide consistent and controlled tempering times for food condiments, maintaining their quality and safety.”

The tempering cabinet addresses an operational issue faced by many restaurants where food orders placed at different times can be delivered at varying temperatures – leading to customer complaints and wastage.

In addition to these projects, Catarina worked alongside the engineering and sales teams, to develop a product tool that uses various inputs to determine the time cost required to develop new products. The tool allows Adande to quickly and effectively analyse the commercial benefit of any potential new product and helps to prioritise improvements to its current range.

As a result of her hard work, Catarina has been appointed Adande's Engineering Manager for the foodservice division, picking up a Business Leader of the Future award along the way.

Catarina isn't the only one to benefit from the partnership. Adande is building on the success of its A++ refrigerator: it recently launched the first professional cabinet on the EU market to achieve an A+ rating.

# A light bulb moment



**Housing associations are under constant pressure from the Government to reduce costs without compromising quality. It's an extremely challenging environment in which to operate, forcing housing associations to implement regular cost-cutting exercises, such as using cheaper products. These save money in the short term but frequently drive up maintenance and replacement costs in the long term.**

**Many housing associations are concerned by this trend and are keen to look at innovative ways of addressing the issue.**

LSBU's Life-cycle Components Project is doing exactly that, challenging the culture of short-termism within the housing association procurement process. Launched in 2016, it involves LSBU working as part of a consortium alongside local authorities, housing authorities, suppliers, contractors, consultants and those who live in the houses themselves. The project aims to demonstrate that investing in components that are proven to have a long life-cycle will ultimately save money.

The experiment will see some houses fitted with products chosen specifically for their longevity and low maintenance costs, while others will be fitted with traditional components. The difference in performance between the two will be monitored and measured, with the findings helping to inform future procurement decisions.

The project is due to run for 16 months, and the team at LSBU will assess a number of key measures to

track the cost-effectiveness of the behaviour of the scheme partners.

**Key measures will include:**

- the cost of installing equipment
- how much it costs over its life-cycle
- how satisfied tenants and landlords are with its performance
- the carbon supply chain and maintenance
- satisfaction levels within the supply chain

It will feature findings from at least 500 properties, and the team is hopeful that the work will encourage a cultural shift within procurement in housing associations. By providing products that work better, require fewer maintenance callouts, make residents and landlords happy and have a reduced carbon footprint, the team believes it has the chance to make a difference that will benefit everyone involved.

Alex Opoku, the Project Lead and Director of LSBU's Centre for Sustainability and Resilient Infrastructure & Communities, certainly hopes so. "We believe that these reliable and cost-effective

life-cycle components have the potential to revolutionise affordable housing provision and the role of supply chains," he says. "Initial purchase costs should not be the only important factor in building component procurement decisions; the costs over the life-cycle of the parts ought to be considered too. If proven successful, this model could help housing providers across all sectors build more smartly and sustainably."

A significant shift in the procurement culture may be on the horizon; the project has already acquired 33 partners, all eager to learn how they can save money without compromising on quality...time will tell.

**The experiment will see some houses fitted with products chosen specifically for their longevity and low maintenance costs.**

# The heat is on

**The Paris Climate Agreement, and its subsequent ratification, sets out some challenging targets for the UK. LSBU is working hard to find ways of minimising the impact of civilisation on the environment and contribute to decarbonising the economy.**

**New design practices mean the buildings we construct today have less of an impact on the environment, but around 90% of the buildings that will comprise London in 2050 are already built.**

The majority of the existing building stock in the UK is extremely energy inefficient, especially in regards to heating, which makes up half the UK's energy use. The Climate Change Committee says the Paris targets are unachievable without a near complete decarbonisation from the heating sector. The UK currently has no answer to this challenge. A new way of tackling the problem is needed – and a consortium including LSBU experts might have a solution. A Balanced Energy Network (BEN) could have a big impact on reducing the UK's carbon emissions. It works on a simple principle – managing the use of available heat before consuming grid gas and electricity. BEN balances the delivery of heating, cooling, and electricity in a way that minimises costs and carbon emissions. The network is a complex system of innovative technologies working together to effectively manage heat loads across multiple buildings. Using water to transfer heat in winter and to cool in summer; The Balanced Energy Network can effectively take advantage of overheating different types of buildings and utilise the waste heat in other spaces or even store or recover heat from the London Aquifer.

“The idea of heat sharing in itself isn't especially new,” explains LSBU's Andy Ford, Professor at LSBU. “It's been done in The Netherlands, although their aquifers are easier to get to than ours, which are buried under some quite complex geology. What we are doing that is different is looking at scaling it up, so rather than a single well working to heat and cool a single building, we can develop and deliver a whole network of connected buildings

that share the same system. That's where the challenge lies, and that's where what we are doing could play a huge part in helping the UK meet its carbon targets in the future.” The pilot scheme, which will be one of the first of its kind, will connect LSBU buildings to the same heating system, giving the team the chance to see how it works in practice, refine their idea, and increase the scope of the project again. “LSBU is a great place to trial it,” says Andy. “Not only is the campus made up of different types of building that represent a microcosm of London, we're also within walking distance of Westminster. That way, the Prime Minister can walk down and see how it works for herself – she won't even need to add to her own carbon footprint to see how she could reduce the nation's.”

**The BEN project coordinator is the Renewable Energy Company ICAX Ltd. LSBU are in a consortium of cross-sector partners including TFGI, Upside, Mixergy, Origen Power, and Cranfield University who have been awarded a £2.9 million grant by Innovate UK, the UK's innovation agency, towards this £4 million project to build BEN on the University's campus.**

LSBU and renewable energy company ICAX are leading a consortium of cross sector partners that have been awarded a £2.9 million grant by Innovate UK, the UK's innovation agency, towards the £4 million project.

# What's it worth?

## Calculating the financial value of social impact with the Construction Youth Trust.

Measuring impact is an enduring problem for charities and third sector organisations. Evidencing the effectiveness of their work is often critical to securing funding but until now it has been almost impossible to measure social return on investment (SROI). We helped the Construction Youth Trust (CYT) to develop tools to calculate SROI, putting it way ahead of other organisations in its sector.

CYT is a dynamic organisation that has been helping disadvantaged young people, aged 14 to 30, receive training, education and employment in the construction industry since 1961. Operating in England and Wales, last year alone it helped more than

4,000 young people. Anecdotally the trust knew that its work was invaluable but didn't have a formal and robust way to analyse and measure the monetary value of any social impacts against the investment it received from funders.

KTP Associate Jemma Bridgeman developed and implemented SROI methods to measure the social value of CYT programmes. With feedback from young people on a practical construction skills course, working together to improve a community centre, she looked at the long-term value-added activities and how they impacted self-esteem.

The SROI metric placed a monetary value of £6.51 on the programme's social impact for every £1 of investment the trust received. This took into account increased income, tax revenues, better health and a reduction in welfare benefits. The young people on CYT programmes also felt they benefited from better relationships with family members, reduced risk of homelessness and increased confidence.

It is anticipated that in future this method of assessing the financial value of an organisation's social impact will become standard practice in the construction industry, as social value becomes a key consideration alongside price.



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### Project outcomes

- CYT has become an expert partner in the construction sector
- Jemma is now employed as Wales Project Coordinator by CYT, creating training courses and further developing the SROI methodology
- CYT now has stronger relationships with existing funders, established new collaborations and a stronger profile in construction
- The charity is now a sought-after corporate social responsibility consultant, regularly joining policymakers and ministers to inform and influence the construction sector

# London South Bank University has been transforming lives, businesses and communities for more than 125 years

When it first opened, the aims of the University were to improve the employment opportunities for the people of south London and to support the community by providing access to relevant applied knowledge.

The core of our mission remains unchanged today.



Our Borough Road building in 1892 and today.

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