



# BIRMINGHAM ENERGY INSTITUTE AND FRAUNHOFER UMSICHT COLLABORATION

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With our global community consuming more energy than ever before, the demand for energy is rising. But this increasing demand is occurring at a time when climate change and the use of fossil fuels is a growing concern.

With decreasing resources, there is a need for clean, alternative sources of energy to meet the growing global appetite for clean energy and fuels. There is also a pressing need to manage our resources better with more prudent processing and exploitation of waste, with a greater focus on the production of energy and biofuels from waste.

The Birmingham Energy Institute and Fraunhofer UMSICHT are combining academic expertise with industrial capability to develop a Joint Research Platform that will deliver new approaches to energy and waste management with the beneficiaries being cities and communities. As such, this new collaboration will address the practical challenges that sit at the heart of the energy waste nexus, applying academic insight to accelerate innovation to the market place.

The Birmingham Energy Institute drives technology innovation and develops thinking required to solve the challenges facing the global community as it seeks to develop sustainable energy solutions in transport, electricity and heat supply. The Institute is the focal point for the University of Birmingham, and its national and international partners to create change in the way we deliver, consume and think about energy. It harnesses expertise from the fundamental sciences, technology and engineering through to business and economics to deliver co-ordinated research, education and the development of global partnerships.

Fraunhofer UMSICHT's expertise will enable the acceleration of innovation to market. The research institute, based in Sulzbach-Rosenberg and Oberhausen, Germany, develops concepts and processes for direct application. The target focus is the efficient use of energy, raw and functional materials. The main research interests are the development of integrated and decentralised energy conversion and storage solutions. This includes researching heat and chemical storages; energy from biomass and waste; resource management and recycling; and the development of innovative materials and coatings for energy technological applications. Integrated process monitoring for efficient, sustainable and economical solutions is central to Fraunhofer UMSICHT's work.

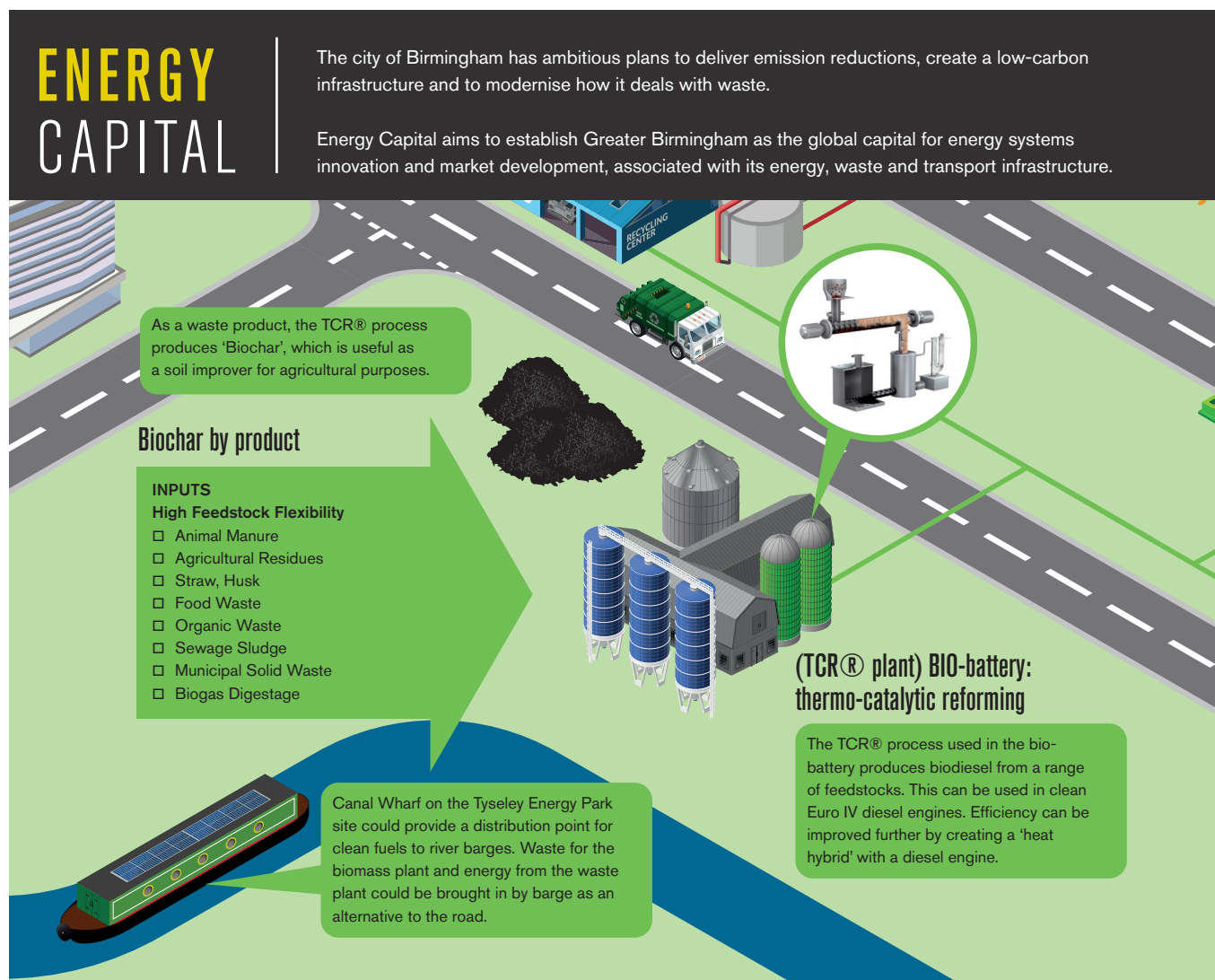


The collaboration will initially focus on the new Thermo-Catalytic Reforming (TCR®) technology. TCR® technology converts waste biomass (such as organic feedstocks, animal manure, and agricultural residues amongst others) into liquid fuels and hydrogen. These are then used as renewable fuels for transport, heat and power appliances. The TCR® process is producing charcoal (Biochar). It is produced from plant matter and can be stored in the soil as a means of removing carbon dioxide from the atmosphere, as soil improver, fertiliser or just for soil remediation purpose. In the case of agriculture wastes, the biochar will be produced and returned to the soil to further agricultural development.

The initial demonstrator for the TCR® technology is based at Tyseley Energy Park in the city of Birmingham, a central hub for Energy Innovation as part of the Energy Capital vision for the West Midlands. This technology will prove the TCR® concept, with a view to the construction of future demonstrators on a commercial scale.

This collaboration will promote the exchange of research staff and students between two organisations to encourage knowledge exchange and facilitate the development of new science. It will also speed up renewable energy technology routes to market.

In the future, the collaboration will look to progress a chain of commercial-scale thermo-catalytic reforming plants around the city of Birmingham, taking a range of organic wastes and turning them into useful fuels. This concept, developed by Professor Andreas Hornung, has been called the 'Thermal Belt'. If developed, the technology will have the potential to transform the way that we think about waste and energy, and start providing a solution to the growing demand for clean energy and fuels on a global scale. The Tyseley Energy Park has the potential to be a world-leading demonstrator of waste processing technologies linked into a low-carbon energy generation system, linked to a low-carbon transport hub in one of the major UK cities.



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