

Clean Growth Case Study

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WMREDI

Policy Briefing Series

Clean Growth Case Study: Greater Birmingham and Solihull Local Enterprise Partnership (GBSLEP) and Tyseley Energy Park



Author: Juliane Schwarz

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Policy Recommendations

Upfront investment to unlock further clean growth development is often key and difficult to justify.

- Processes and procedure to guarantee these investments need to be put into place, in particular, if they affect future high priority areas such as clean growth, to strengthen innovation and guarantee competitiveness and increase resilience for the region.

Clean growth solution requires generous upfront investments.

- This needs to be taken into account in all stages of project and infrastructure development, in particular, the planning stages.

Clean growth solutions are often more expensive.

- Future funding needs to reflect and provide for this.

Private sector reluctance to invest in high risk of clean growth innovation

- Clean growth solutions should be taken into account in all processes and procedures, (supply chain, infrastructure, etc.) and awards of public sector funding

Introduction

This case study was developed by Dr Juliane Schwarz whilst on a secondment to GBSLEP. It illustrated Tyseley Energy Park (TEP) as an example of GBSLEP supporting clean growth as set out in the UK government [Clean Growth Strategy](#). It complements WMREDI research on [STEM Asset in the West Midlands Innovation Landscape: Tyseley Energy Park](#).

The aim of this case study is to understand the value and function of public funding by the Greater Birmingham and Solihull Local Enterprise Partnership (GBSLEP) into clean growth initiatives, such as Tyseley Energy Park (TEP), and how this supports [clean growth in the West Midlands](#) to become a net zero carbon economy by 2041.

This case study report describes the background of TEP and its development, its significance for energy innovation and clean growth, the impact of public funding by the GBSLEP and lessons from the case of GBSLEP funding at TEP for clean growth.

This case study is based on desk research, analysis of GBSLEP internal documents and financial and monitoring data interviews with main stakeholders, including representatives from Tyseley Energy Park (TEP), Birmingham Energy Innovation Centre (BEIC), Birmingham Centre for Energy Storage (BCES) and GPSLEP case champion.

Tyseley Energy Park

[Tyseley Energy Park](#) (TEP) is located in an area that is one of the most deprived in the City of Birmingham and is within the [10% most deprived areas in the UK](#) (Birmingham City Council, 2019). The site is owned by Webster and Horsfall Limited, a family-owned company founded in 1720. Since 1848, they have been operating a wire-drawing business at the site.

Due to a [weakening of competitiveness](#) of manufacturing, the sector went into a period of steady decline in the 1960s and 1970s. The once-thriving industrial area of

Tyseley faced serious social and economic challenges. In 2010, Webster and Horsfall Ltds needed to [consolidate](#) their business away from volume production onto high quality specialist wire and wire rope products. The company released 10 acres (4.04 ha) of land for redevelopment on a rebranded Tyseley Energy Park (TEP). Consideration was given to the best use of surplus land and property, considering the infrastructure in the area and the optimum consolidation strategy for the manufacturing business.

Box 1: TEP mission statement

Tyseley Energy Park is committed to delivering low and zero carbon power, transport, heat, waste and recycling solutions for a greener, cleaner, healthier Birmingham.

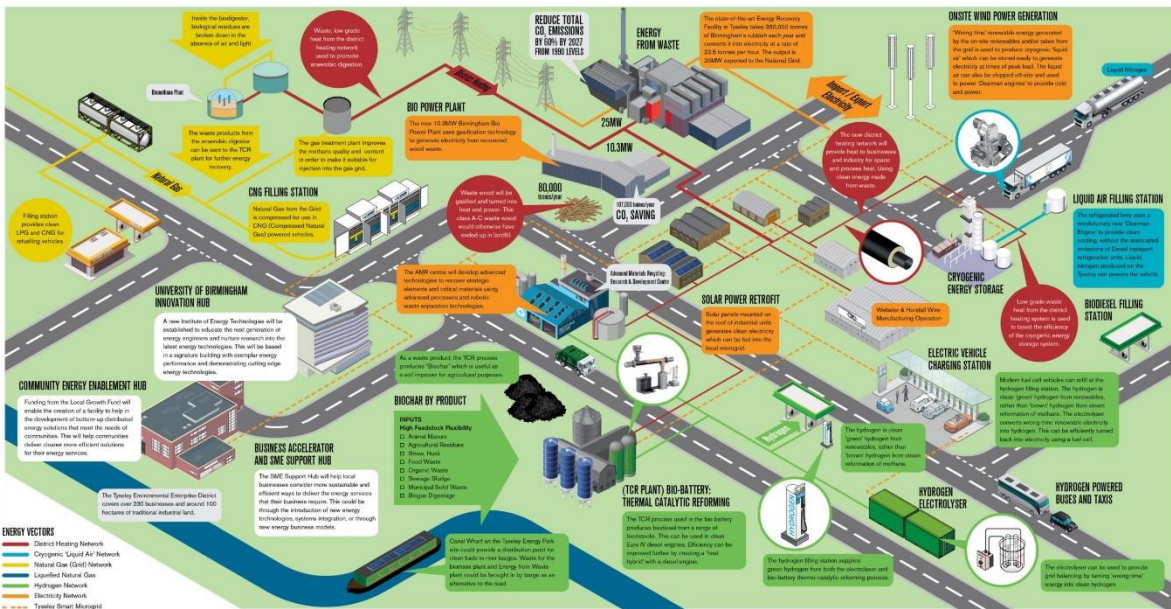
TEP is focused on:

- **Generating** low and zero carbon energy and fuels from waste
- **Producing** low and zero carbon transport fuels including Hydrogen, Electric charging, Biogas and Bio Diesel / GTL
- **Innovating** clean technology business through direct access to world class, research, testing and laboratory facilities at the University of Birmingham's Energy Innovation Centre
- **Leading** the low carbon heating agenda via the National Centre for the Decarbonisation of Heat

- **Incubating** companies/technologies through the Energy Incubation Hub that will shape the future of:
 - fuel cell and hydrogen production
 - smart grids
 - decarbonisation of heating and cooling
 - and recycling critical materials, e.g. rare earth metals
- **Influencing** and shaping regional policy to support clean growth and driving change

Source: [Tyseley Energy Park Homepage](https://www.tyseleyenergy.com)

Development of Tyseley Energy Park



The TEP masterplan, a document describing the layout of the park, its future growth and development, includes five development phases:

Source: [Tyseley Energy Park Masterplan](#).

Phase 1:

Construction of 10MW waste wood biomass power plant, supplying the site's tenants with renewable electricity. The plant uses wood chippings which would otherwise have ended on waste landfill sites. This is funded by a [consortium](#) comprised of Green Investment Bank (GIB), Balfour Beatty, Eternity Capital Management, Foresight's UK Waste Resources and Energy Investments (UKWREI) fund, and Carbonarius' GCP Infrastructure Fund (GCP).

Phase 2:

Construction of a low and zero carbon refuelling station, supplying public and commercial vehicles with a range of sustainable fuels. The refuelling station is privately funded; however, GBSLEP funded an access road to the park.

Phase 3:

Currently in development and aims at developing future waste reprocessing technologies using clean energy (biomass, solar, and wind) and thermocatalytic reforming (TCR) technology to power advanced processes.

Phase 4:

The stimulation of research and development (R&D) in the Birmingham Energy Innovation Centre to overcome Birmingham's local energy and low carbon transport challenges. The University of Birmingham developed the Birmingham Energy Innovation Centre ([BEIC](#)). BEIC is funded by the GBSLEP.

Phase 5:

The development of the Tyseley Incubator for Clean Energy (TYCE) supporting low carbon-focused SMEs and the commercialisation of innovative technologies. GBSLEP funds the refurbishment of the old energy park.

Importance of Tyseley Energy Park for energy innovation and clean growth

TEP combines waste, energy and transport and on one site and thus seems to be unique nationally and globally also in its approach to collaborative work with Midlands based technology innovators, academics, scientists, project developers and proactive public sector bodies.

The development of energy innovation infrastructure at Tyseley that was initiated by TEP has led to the creation of the Energy Innovation Zone and an enterprise district. It is one of six Energy Innovation Zones across the West Midlands Combined Authority area which are developed to integrate low carbon technologies, to develop the business models and infrastructure needed to support new approaches to clean energy as well as overcome the regulatory barriers necessary for them to flourish. TEP is the most developed of the six Energy Innovation Zones in the West Midlands.

TEP provides space for innovators, entrepreneurs and academics concerned with transformation for

integrated smart energy solutions. This transformation can be seen most clearly in the generation of low and zero carbon energy and fuels at the biomass plant. The biomass plant produces green electricity for the park and the grid. Its location is highly symbolic as it is located next to the Tyseley Incinerator which is described as ‘a dinosaur’ by one of the participants. The Tyseley Incinerator is a waste plant and the largest source of CO₂ emissions in Birmingham (creating [308,485 tonnes](#) of CO₂ in 2019).

The Park is home to various clean growth initiatives, amongst them:

10MW Waste Wood Biomass Power Plant, a £47 million investment that supplies Webster and Horsfall’s manufacturing operation and tenants across the sixteen acre site with renewable electricity. The plant provides the foundations for a decentralised controllable Distributed Energy System in this location.

The **UK’s first multi-fuel, open access, low and zero carbon fuel refuelling station** offering Hydrogen,

Compressed Natural Gas, Biodiesel and Electrical Vehicle charging options

Birmingham Energy Innovation Centre (BEIC) the energy incubator, which is supporting the development of a kerosene replacement for the aviation industry.

Located within the recently constructed BEIC, the **Energy Transition Centre (ETC)** offers newly refurbished offices, laboratory and

industrial units to help SMEs to establish their businesses.

The Centre for Decarbonisation (currently in proposal), which focuses both on the development of technology and teaching new skills around heating solutions and ‘retrofitting’ buildings to make them more energy efficient including the use of heat pumps.

GBSLEP investment

The total value of investments by GBSLEP included in this case study was £9,634,226 which leveraged a further £11,549,217 of public sector funding and £949,942 private sector funding. It does not include proposals being considered at the time of the case study was undertaken (March 2022).

	Sum of Agreed Original Grant Allocation (£)	Sum of Public Sector Original Match Funding (£)	Sum of Private Sector Original Match Funding (£)
Tyseley Energy Park (Access Road)	1,438,498	2,399,218	
Birmingham Energy Innovation Centre (BEIC) (Previously TSESRIC)	7,000,000	8,999,999	
Tyseley Incubator for Clean Energy Project UoB - Phase 1	892,471	150,000	949,942
Tyseley Incubator for Clean Energy - Phase 2 (TICE) (Development Funding)	20,000		
Tyseley Incubator for Clean Energy - Phase 2 (TICE)	283,257		
Grand Total	9,634,226	11,549,217	949,942

Table 1: Value of investments by GBSLEP included in case study of TEP

Much of GBSLEP investment has been to support enabling infrastructure to allow other strategic important interventions to happen. These include:

1) The **construction of an access road and surface infrastructure route off the A45** through to the Tyseley Energy Park (TEP). This:

- enabled the UK's first low and zero carbon refilling station to be built.
- has leveraged a further 8m Pounds of investment in low and zero carbon refilling infrastructure, and
- enabled the deployment of low and zero carbon vehicles across the region.

2) **Birmingham Energy Innovation Centre (BEIC)** formerly (Tyseley Sustainable Energy Systems Research and Innovation Centre, TSESRIC) is a new build with the purpose of providing a physical applied research and innovation facility at TEP.

- Investment into BEIC has enabled the University of Birmingham to bring forward a sustainable energy research and innovation centre based at TEP that promotes innovation in waste, energy and low carbon vehicle systems across the West Midlands.
- The BEIC is home to R&D, benchmarking and validation,

business support, manufacturing systems integration and modelling expertise across the (public/private/academic) energy, waste and transportation systems sectors all in the one facility.

- Working with existing energy and transportation system stakeholders, the BEIC is stimulating collaborative research and development projects to overcome local energy and low carbon transport challenges, demonstrating new and emerging technologies.

3) The **Tyseley Incubator for Clean Energy (TICE)** Project (Phase 1) is a business incubator developed by the University of Birmingham to support the Tyseley Energy Park's flagship Energy Innovation Zone whose mission is to stimulate energy innovation by demonstrating new technologies and supporting them into commercially viable energy system solutions that contribute to Birmingham's commitments to reduce CO₂ emissions by 2030. The objective of the incubator is:

- to provide high quality refurbished office and workshop space for SMEs to commercialise and adopt low carbon energy and clean mobility products and services.

- an investment in clean economic growth in the region.
- building on the innovation and research located at the Birmingham Energy Innovation Centre (BEIC) at the Tyseley Energy Park (TEP).

The funding provided for the refurbishment of up to 2000sqm of testing, demonstration and incubation space to drive cutting edge waste, energy and mobility solutions delivered by SMEs across the GBS area.

By investing in the Incubation Hub at TEP, University of Birmingham is able to offer integrated package of support to drive business growth amongst low-carbon energy businesses. This initiative has been

developed in partnership with the University of Birmingham's Energy Institute SME Engagement Programme, [ATETA](#).

The **most recent funding application to GBSLEP** (late March 2022) is set to creating the world's first **[short loop rare earth magnet recycling facility](#)** at TEP. Rare earth metals are considered to be the most critical material in the UK and EU in terms of strategic importance and availability of supply. With no indigenous source of these materials this patented recycling process could provide a local and sustainable source of critical materials to UK manufacturing. If funding is awarded commercial activities will be due to start in 2023.

Significance of public investment by Greater Birmingham and Solihull Local Enterprise Partnership into Tyseley Energy Park

Opening the site to development by improved access.

The access road, part-funded by the GBSLEP is part of Phase 2 development at TEP, connects TEP to the A45 and makes the energy park more accessible. The existing road runs through built up area and would not have been able to cope with additional envisaged traffic of HGVs, buses, taxis using the planned hydrogen refuelling station that was subsequently built.

All interviewees unanimously describe the access road funded by the GBSLEP as a fundamental investment for the park. It enabled the UK's first low and zero carbon refuelling station to be built. They indicate that without the new access the park would not have been able to build the fuelling station which, in turn, encouraged further investment in infrastructure.



This GBSLEP infrastructure investment was a requisite and a critical enabler significant precursor for opening up the site for phase 2 of TEP development and subsequent developments including improved support for innovation in the energy sector, attracting businesses, job creation, and the wider regeneration of the surrounding area (Phases 3-5). Without the investment, the site could not have been developed.

Hence, as one interviewee described it: *'The investment into the road should be seen as investment into the Energy Park, not just only a road.'*

The Hydrogen Refuelling Station

The investment of road made it possible to create the hydrogen refuelling station at the TEP. With the road infrastructure in place, the hydrogen refuelling station was developed. This made it possible for organisations, like Birmingham City Council, to invest into new carbon-neutral forms of transport. Birmingham City Council piloted the move from diesel to electric and hydrogen powered vehicles. Birmingham City Council and Birmingham University submitted parallel projects for hydrogen buses.

Enabled Birmingham to be early adopter of hydrogen buses, alongside London and Aberdeen. In addition to supporting Birmingham and the West Midlands to make progress in its ambition for a carbon neutral fleet. The investment in 20 hydrogen buses by Birmingham City Council provided an evidence base needed by other cities with similar ambitions.

The hydrogen refuelling station **has enabled to develop a proposal for a national trial of hydrogen heavy goods vehicles (H₂GVs) within the Midlands.** TEP is part of wider consortium of industrial and academic partners who have recently completed a feasibility study to support the trial design. Through the trial TEP is helping Birmingham retain its role within the logistics golden triangle: the area between the M1, M6 and M42 motorways with its high density of distribution facilities, and potentially the development of supply chain for production of H₂GVs.

What worked

Generating national profile for energy innovation within Birmingham.

The success of TEP and its role in supporting innovation in clean energy and cluster development within the energy sector has attracted high-profile visits in recent times at the park including both the leader of the opposition and the levelling-up minister. There are a number of elements which contributed to the success of TEP in terms of innovation and clean growth.

Strong and committed private sector partner

Webster and Horsfall Ltds demonstrated a huge amount of commitment towards the industrial site and its redevelopment. Rather than selling of the land, the company and its young leadership team decided to pivot their business They invested into new technology and innovation and decided to stay committed to the local community and Birmingham as a whole.

Strong university partner

The University of Birmingham became an anchor institution at TEP. With its Innovation Centre, the university established a research base at the energy park and opened up collaboration with industry.

Its business incubator, BEIC opened in July 2021 and hosts now 5-6 businesses working on energy and recycling (electric vehicle charging, battery maintenance, hydrogen trains, technologies to support recycling of magnets and hydrogen vehicles). This has created a cluster of businesses developing complementary technologies and share know-how and other mutual benefits from being co-located. The Incubator vision is that these companies scale up and will move into premises on the enterprise park. Thus, they create new employment opportunities in the area and a community with a high deprivation rate.

BEIC has attracted both public and private investments in addition to GBSLEP funding as it is acting as catalyst for new collaborations. Thus,

it is well placed to develop viable and attractive value propositions for funders interested in investing in green energy.

Local intelligence and trust within the GBSLEP and committing to a ‘not very exciting’ infrastructure project

The initial GBSLEP funding was important as there were few other funding streams that would support infrastructure that is ‘not very exciting’, such as access roads, refurbishing old buildings that were necessary precursor to investing in new technologies.

The initial investment into TEP and the vision of an energy park some time before a net zero or clean growth became established indicates commitment, foresight, and determination. GBSLEP, including the CEO and the board, became a carbon neutral champion for the region. Local intelligence within GBSLEP helped to understand the importance of investing in a road which, albeit not a particularly 'exciting' capital project, would be pivotal for the delivery of the overall vision and ambition. This and the development of strong relationships between GBSLEP, TEP

and the University of Birmingham creating trust in the organisations needed to deliver the project.

Synergy and collaborative advantage of the partnership

The collaborative advantage created based on the synergies of TEP having a long-term vision, an academic institution and the GBSLEP and other partners have worked very productively to date to create a momentum for clean growth attracting UK Government and EU funding. Each partner brought different strengths and capabilities to proposed developments leading to more viable and successful projects.

High strategic fit

The access road to the TEP refuelling station is a high strategy fit and in full alignment with the green book approach. It unlocks economic and social development in a deprived area of Birmingham and helps to attract new business sustainability and growth.

What can be learned

Proof of concept

During the application process of TEP's initial funding stream, clean growth was not a priority area. The main criterion for a successful tender was to demonstrate economic growth rather than explore how 'sustainable' this growth should be. This caused challenges and needed much persuasion to convince decision makers as most clean growth innovation requires [high upfront investment](#) and high [risk on returns](#).

To invest into hydrogen buses does not make sense from a pure economic point of view as the costs for a hydrogen bus is about half a million pounds whereas a diesel bus costs £150K. However, the potential of this development in relation to clean growth is highly significant. To make a convincing argument, the investment case had to be driven by economic benefits, i.e., innovation, high tech, new jobs, new opportunities, rather than the benefits for the environment and clean growth. Nevertheless, GBSLEP was willing to take a risk and invest in an ambition, rather than in a project that was standard.

Dependence of future high priority areas on committed individuals

Clean growth initiatives seem to be dependent on a strong and committed private sector driver with a clear vision and a very high degree of commitment towards clean growth. The driving force of Tyseley and thus, one of the most prominent sites for clean growth, came from Webster and Horsfall Ltd. rather than being driven by a political commitment towards clean growth.

Future commitment to publicly funded capital projects

Investment in high-risk initiatives with uncertain return is difficult. For clean growth initiatives such as TEP to thrive, public capital investment is significant as revenue seems to follow capital investment. An understanding where capital investment is coming from is vital to secure and extend the scope of energy and clean growth initiatives. One interviewee describes this as 'Industry does not have enough motivation to invest in project or, if they do, they would only fund as far as their own interests are involved'.

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