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Lessons from a Technology Park and its engagement with citizens and SMEs.

PLENARY 5
The new role for STPs: driving city change

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Executive Summary

In this paper, we reflect on the portfolio of work conducted at Coventry University Technology Park since it opened in 1998. The paper highlights a number of critical success factors to demonstrate how CUTP has helped to stimulate economic development by engaging with and supporting local businesses, particularly SMES, the formation of spin-out companies and the drawing down of EU funding into the region. Economic impact is also evidenced in CUTPs hosting external conferences bringing new money into the economy. In this sense the paper addresses the way in which an STP can contribute to driving city change and growth in relation to intelligent infrastructure, new ways of urban life, and business opportunities. We conclude that engaging users is essential to developing effective products and services for SMEs. The best way of maximising opportunities is through collaboration and demonstration through real world trials and experiments involving private and public entities.

Introduction

In the 60 years of existence, science and technology parks (STPs) parks have become established as a key part of the economic development debate (Castells and Hall, 1994; Kung, 2001; IASP, 2002). Several seminal publications have emerged to highlight the pervasiveness of the science park phenomenon, and the effect of their environments on innovation and entrepreneurship, especially through their links with higher education institutions (e.g. Monck *et al*., 1988; Castells and Hall, 1994; Massey *et al*., 1992; Westhead, 1997; Gönel, 1999). Through a case study of the Coventry University Technology Park in the West Midlands region of the United Kingdom the purpose of this paper is to demonstrate how technology parks can contribute to driving economic development in relation to intelligent infrastructure, new ways of urban life, and business opportunities. It is organized in four sections, firstly providing an overview of the science and technology park literature focusing on their purpose and function, links with higher education institutions and their critical success factors. It then provides a brief overview of the emergence and growth of STPs in the UK, before presenting a case study of Coventry University Technology Park (CUTP) and in particular the extent to which links with the University, especially through its commercial trading arm Coventry University Enterprises has contributed to the success of the Park in stimulating innovation and economic development. It concludes by presenting lessons and examples of good practice for other STPs to benefit from.

STPs: a review of literature on purpose and function, links with academia and success factors

The Role, Purpose and Function of Science Parks

A consensus definition of STPs is elusive. MacDonald (1987) implies that science park is a generic term used to describe a property-based initiative close to a place of learning which provides high quality units in a pleasant environment (cited in Löfsten and Lindelöf, 2002:861). UK Trade and Investment (UKTI) define a science park as a business support and technology transfer initiative that is innovation-focused and a platform for international firms with formal ties to Higher Education Institutions[1], whereas the EU focuses on incubation and job creation and defines an STP as 'a place where newly created firms are concentrated in a limited space….Its aim is to improve the chance of growth and rate of survival' (European Union, 1990).

For the most part, the literature follows the three reasons identified by Castells and Hall (1994) for establishing STPs, with their overriding function being '*to generate the basic materials of the informational economy*' (1994:1)

- '*reindustrialization*' *(the creation of new jobs in new industries, to replace old jobs in old industries*)
- '*regional development*' (*to concentrate reindustrialization in regions based on need*)
- '*synergy creation*' (*the generation of new and valuable information though human interaction*).

Felsenstein (1994:93-94) contends that one of the primary objectives of science parks is to be a '*seedbed*' for technology by playing '*an incubator role*' (nurture small firms, encourage knowledge transfer and spinouts from HEIs) and '*to act as a catalyst for regional economic development and promote growth*'. Westhead (1997) also agrees that 'the role of science parks is to transform basic university research into commercially viable innovations (Cited in Hansson *et al*., 2004:1). Felsenstein (1994:93-94) notes two further objectives that closely relate to incubation: to be a '*growth sector leading the area . . . into a spiral of propulsive expansion*' and to be '*innovation inducers*' rather than '*innovation entrenchers*'. This suggests that the purpose of STPS is primarily to be 'growth poles' and technology brokers (cited in Markman *et al*., 2005) by virtue of promoting regional development from a platform of technology transfer and innovation inducement. However, if STPs are not directly affiliated to higher education institutions, then the process of facilitating technology transfer, whether through innovation inducement or entrenchment, is arguably more challenging.

Science parks are sometimes established to change a region's image. Based on the case histories of several properties, for example, Stanford Research Park and MetroTech Center, STPs can have the effect of regenerating regions and making '*useful contribution(s) to economic development*' (Monck *et al*., 1988:252). At the same time other researchers find no conclusive proof, questioning the idea that science parks drive local economic development. For example, Goldstein and Luger (1991) matched counties in the US in a 'before and after science park' study and found 'scant evidence' in employment growth between counties with STPs and those without. However, science park-led economic growth should not be seen solely as a result of 'growing firms from scratch',

[1] http://www.invest.uktradeinvest.gov.uk/rd/sciParks/index.cfm Accessed 130105

since there is at least one other generally acknowledged way of generating STP-led growth by attracting firms (Elstrom *et al*., 1997).

Finally, Gower and Harris (1994:25) argue that science parks may be an opportunistic property supply response to a technology demand, that the need for '*increased spatial accommodation*' has mirrored the rise in technology as high-technology industries have required accommodation. The authors also argue that '*an environment that befits such industry*' was required, '*i.e. buildings and locations which project a modern image of the product of the industry'*.

Science parks and higher education institutions

Universities and science parks are genetically linked. Science parks were first *'designed to help meet the needs of entrepreneurially-minded academics'* with the continuing development of STPs bringing *'into reckoning the roles of a whole range of stakeholders, firmly embedding the parks in the economy and through this process, the role of universities in regional development'* (Mitra 2012:205). Science parks have been developed with universities as key stakeholders and deployed as practical policy tools in regions around the world, to which the well-publicised stories of Stanford Research Park, Research Triangle Park and Heriot-Watt University Research Park bear testament.

There are several links that can be examined to demonstrate the close relationship between universities and science parks, for example, the sharing of services, infrastructure and research, both basic and applied. Higher Education Institutions (HEIs) are singularly important to science parks although the actual level of collaboration can range from 'none or little' to 'steady and passive' to 'some and increasing' to 'much and active' involvement.

In 'Investigating Business-University Innovation Linkages', Simpson *et al*. (2008) explore *'the role of geographic proximity in firm university innovation linkages for Great Britain and investigates the presence of spatially mediated knowledge spillovers from university research'*. The research addressed two questions: *'whether firms locate their (R&D) facilities near to university research departments'* and *'whether innovative firms situated closer to university research are more likely to engage with universities ...'*. The research finds that certain sectors locate R&D activities within close proximity ('10 km') of university research departments but that STPs also play an important role because *'many R&D-intensive and science-based businesses'* spin out of universities and locate in nearby science parks (2008:9). These findings are confirmed by the International Association of Science Parks, which shows that 97% of science parks have between 1 and more than 20 HEIs within a 50km radius. This physical closeness allows for sharing of infrastructure, services and R&D, in addition to a growing number of parks that host technology transfer offices (TTOs).

Science parks as knowledge and technology brokers between HEIs and resident new technology firms are recurring themes in the literature and are two of the defining roles of a science park. Science parks are a link in the innovation chain between the basic research or 'university-grown' knowledge and industry and assumed to have a

positive effect on new technology firms. Link and Scott (2002) find that '*universities seek external research relationships in an effort to enrich both the knowledge in their research base and the financial value of that knowledge*', but this may not be a universal occurrence, which suggests that the effect on new technology firms is less convincing.

Science parks are presumed to confer benefits on tenanted new technology firms and possibly affect the number of start-ups and academic spin-outs. However, in their study of UK parks, Massey *et al*. (1992:38) find variable evidence of academic start-ups, also observing no discernible differences between on-park and off-park firms, findings that are mirrored elsewhere. For example, Felsenstein (1994) concludes that '*the attraction of science park location could be due to perceived status and prestige conferred rather than benefits in terms of technology transfer and information flow*'.

Critical Success Factors for Science and Technology Parks

This section discusses the key determinants, influences and influencers on the creation, development and success of STPs. The factors that influence science parks can be viewed in two ways: those that contribute directly to or cause the initial formation and those that contribute to or cause success. Of the first, many factors have been promoted in the literature as contributing to, causing or significantly influencing the initial and continuing development of science parks (Monck *et al*., 1988; Massey *et al*., 1992; Castells and Hall, 1994). Six prominent factors appear in the literature highlighting the crucial role played by HEIs: *visionary personality*, *HEI involvement*, *HEI collaboration*, *HEI proximity*, *technology innovation and entrepreneurship* and *public sector support*. In addition several success factors are identified: *image and reputation* and the *factor inputs* to the competitive diamond.

The literature suggests four determinants that relate to HEIs, presumed to be necessary for STP development (AURRP, 1998; Link and Link, 1998). First, HEIs are involved as owners; whereas an individual may be an academic, local government official, company executive or land developer, the HEI may appear in several guises as owner (sole or part), supplier of intellectual capital to meet labour demands (Charles, 2003) or a nearby source of facilities (*e.g.* wet laboratories and library). Second, STP-HEI collaboration is also well documented in the literature (Westhead and Storey, 1995; Link and Scott, 2006) and for example, in the stories of Cambridge Science Park, St John Innovation Centre and Cambridge University (Segal *et al*., 1985), Oxford Science Park and Oxford University and the three North Carolina universities that encase Research Triangle Park (Link, 2002). Third, several less well-known science parks have co-located with HEIs in order to facilitate collaboration or have expressly created HEIs for the purpose; Technopolis and Oulu University in Finland being a classic example. Collaboration is *'assumed to encourage innovation and production*' (Westhead and Storey 1995: 346). A fourth determinant is HEI proximity or adjacency, which figures in the location decisions of many science parks or alternatively, in development decisions. In the UK, *'proximity of the science park in relation to the HEI or research centre has been highlighted as an*

important factor affecting the potential performance of the science park development' (Gower and Harris, 1994:26). A recent illustrative example of the perceived need for proximity is the EU-funded On-Line Innovation Project (ONLI)[2], which links Science parks, universities, and technology transfer centres in a(n) European virtual one-stop-shop network, and provides on-line services related to innovation management, technology transfer and spin-off support to European SMEs (Durao *et al*., 2004:240).

In addition to the HEI-related determinants, at least two others exist: public sector support (PSS) and technology innovation and entrepreneurship. New technology-based firms can hail from several sources: be spun out or spun off from the nearby or other universities, onsite firms, offsite firms and the wider community (Westhead, 1997; Charles *et al*., 2001; Wallsten, 2001; Harrison *et al*., 2004). Notwithstanding their origin, if entrepreneurs proliferate and new products and companies result from sustained innovation, the likelihood is that employment will increase (Monck *et al*., 1988). However, various researchers allege that science parks have not made any significant difference to university commercialisation, and that no proof exists that firms would not have started anyway (Felsenstein, 1994; Westhead, 1997; Wallsten, 2001).

A key determinant of STP success has been support from the 'public sector', through a range of federal, national, regional and municipal organisations and programmes including *'subsidies of the physical development of parks, public financing of R&D, government grants and loans, public sector contracts, financing of start-ups and privileged access to publicly funded research'* (Gower and Harris, 1994; Massey *et al*., 1992:209). The support of the public sector is and continues to be a critical ingredient to STP formation and success in the UK. For example, during the busiest period of park development in the mid-1980s, 62% of the total spending was contributed by the public sector (Gower and Harris, 1994:27, quoting UKSPA data[3]). This 'high degree of dependence' in the UK (as well as in other countries) is not evident everywhere and other parks have been developed solely on private investment. The public generosity does not appear to have been replicated in other jurisdictions such as parts of the US and some European countries, including Finland, Denmark and The Netherlands, or indeed, all parts of the UK.

Researchers have also identified success factors for STPs once operational; the presence of a good image and reputation being one example (Ylinenpää; 2001:12). This claim clearly depends on how success is measured; if by number and growth of tenant firms attracted, then the claim is plausible and can be substantiated by surveying tenants. If success is measured in another way, however, for example by the quantity and quality of basic research successfully commercialised, then the claim may be more difficult to validate. Additional success factors include accessibility issues such as a proximate market for goods and services, access to buyers and suppliers, venture

[2] http://www.newventuretools.net/index.html Accessed 110306.
[3] N.B. Gower and Harris (1994) include government, local authorities and HEIs in the public sector.

funding, skills, infrastructure and an attractive working and living environment (Ylinenpää 2001:2). Attending the list of 'environmental' factors are internal factors that include how the property is managed and operated, flexible tenure for corporate growth and the comprehensiveness of services portfolios.

Science parks and economic development in the UK and the West Midlands Region

Science Parks first emerged in the UK in the early 1980s, with Heriot-Watt Science Park (Edinburgh) followed by Cambridge Science Park in 1982. As indicated by Table 1 there are now over 60 STPs in the UK, geographically focused in the south and east. According to the UK Science Park Association (UKSPA[4]), founded in the 1980s to support member Parks *'there is (still) a strong regional and local focus to their establishment'* (and) *'Science Parks remain diversified and specifically cater for local needs, and are not part of a national 'one size fits all' model'*.

Table 1: UK Science Parks by Region

Region	No. STPS's
South West	4
London & South East	11
East of England	12
East Midlands	6
West Midlands	**8**
North West	5
Yorkshire & Humberside	3
North East	2
Northern Ireland	1
Scotland	9
Wales	0
TOTAL	**61**

In the West Midlands where the Coventry University Technology Park is located, the regional economy is long-founded on manufacturing and a number of distinctive products that defined its cities. For example, Birmingham became famous for guns, buttons, toys, trinkets, jewellery and the motor industry; the Black Country for coal mining, bicycles, cars, armaments, machine tools and aero engines. Coventry produced watches, sewing machines, bicycles, motorcycles, aero engines, tractors, machine tools and cars; while the potteries made china, earthenware, bricks, tiles and pipes (Green and Berkeley, 2006). Perhaps the most telling economic event to have defined the West Midlands over the last number of decades has been the enormous decline in the manufacturing sector, accounting for over 1 million and 50% of all regional jobs in 1971 to 325,000 and 14% of jobs by 2008. The decline

[4] Paul Wright, Chief Executive

in manufacturing employment has been offset by a corresponding rise in services, greatly altering the economic structure of the region in the last three to four decades. The growth and development of STPs has been a key feature of the changing economic development landscape in the region as a mechanism to diversify the economy, creating new knowledge intensive business and employment opportunities, as well as regenerating redundant industrial 'brownfield' land and developing new previously undeveloped 'greenfield' sites.

The first STP in the West Midlands Region, Birmingham Science Park Aston, was established in 1982 occupying a former iron foundry site in inner-city Birmingham. Further developments have occurred on greenfield as well as brownfield sites with the most recent, Longbridge, opening in 2007 on land long associated with the automotive industry. The region is now home to eight STPs, the majority of which are located within the urban industrial core of the region, in Birmingham, Coventry and Wolverhampton. All but two of the Parks are joint ventures, typically between a University and Local Authority (Birmingham Research Park, Coventry, Warwick and Wolverhampton) or between different Local Authorities (Malvern). Longbridge represents the only private-led development, whilst Aston (Birmingham City Council) and Keele (Keele University) are wholly-owned. The regions STPs vary enormously in size from 32,000 square metres to 170,000 square metres, reflected in the number of tenant companies ranging from 14 to well over 100. All but two STPs have 'host' Universities and have well developed links with academics and facilities as well as providing space for spin-out and start-up activity. Key sectors of tenant companies are a reflection of host institution specialisms, local/regional strengths and the shift toward high value, knowledge-based activities. All Parks provide a range of accommodation in multiple buildings, providing space for new, existing and growing companies. Shared services are also a common feature and include: meeting and conference space, IT, office services, business development and business support, and access to University staff and facilities.

Coventry University Technology Park

Coventry University Technology Park (CUTP) opened in 1998 developing brownfield land, on a former industrial site occupied by Rolls Royce aero engines. On a 20 acre site, comprising 14 unique dedicated business facilities, the aim of the park is to encourage and support the start-up and development of innovation-led, high-growth, knowledge-based businesses. A joint venture between Coventry University, Coventry City Council and the former Regional Development Agency, Advantage West Midlands, it comprises five property developments (a Conference Centre; Innovation Centre; Enterprise Centre; Design Hub and Innovation Village) providing units for start-up firms, grow-on businesses as well as those requiring 'own-front door' accommodation. The Park is currently home to over 65 firms in sectors such as automotive design, software development; and creative media.

Funding to establish CUTP came from a mixture of private and public sector sources, which reflects the importance of the development to the local economy. Advantage West Midlands contributed over £6 million, which covered part of the acquisition costs, the demolition of old buildings on the site, service of the site and the road and

landscaping infrastructure. Coventry City Council the local government contributed £1 million and also ensured the compulsory purchase of the site, whilst Coventry University invested £1.6 million in the development of the site. From the private sector, British Telecom was a prime partner as they invested £1 million in leading-edge ICT infrastructure on the site. Finally, the University were able to access and draw down a European Structural Funding grant of £5 million to build the Park and to support operational management of the services during the early years. Later stages of the site development have also included other private sector investment from national and international based businesses.

CUTP is managed and operated by Coventry University Enterprises Ltd (CUE) a wholly owned subsidiary of Coventry University. CUE is one of the largest university enterprise organisations in Europe, employing over 140 people directly within the field of business support and technology transfer. Having provided business incubation support for over 15 years, CUE is seen as a market leader in much of its delivery activity, including its mentoring, advice and specialist support programmes for young entrepreneurs, SMEs and large enterprises on a regional, national and international basis. It delivers business support to over 5000 businesses per year, offering an activity portfolio covering a broad spectrum from pre-incubation and incubation through to spin-out company formation and development, with internationalisation business advice. Due to the close links with the University, CUE is highly experienced in the field of commercialisation of university research and the development of intellectual property portfolios maintaining a focus on high technology and high growth potential enterprises. The EBN Annual Benchmarking report (2012) showed CUE limited supported start-ups generating 90 new jobs and also supported SMEs generating over 180 new jobs.

From its base at Coventry University Technology Park (CUTP), CUE offers a full and progressive package of office space and specialist facilities to new and growing businesses. Shared services include telephone and data services; high-speed IT networks; free meeting rooms; conference, workshop and testing facilities; social break-out zone; business support and advice; complimentary access to University library facilities. The availability of office space, plus virtual office environments, as part of the incubation process has proved to be a key factor in the success of both the incubation Programs and the businesses that have established and grown within it over the last few years. There are several levels of office facilities, and several types of sector-specific facilities, that a business can access dependent on their stage of development and requirements.

Entrepreneurship Support

CUE is also home to the Institute of Applied Entrepreneurship (IAE) providing the first entry point to office accommodation. IAE is home to all enterprise and entrepreneurship activities at Coventry University and offers the region, its students, graduates and staff a broad range of entrepreneurial support and services for every level and

stage of business start-up and growth. The IAE has become an internationally recognised institute of excellence which promotes an entrepreneurial lifestyle and mind-set within the University community and its stakeholders. Extensive consultation with pre-start and start-up companies was held throughout 2006 and it came to light that the missing piece of the jigsaw was a bridging facility between the pre-incubation facilities and the fully tenanted office accommodation available on the Technology Park. In response to this identified demand, 'Phase 2' for early stage growth businesses was established. Based in the same open plan office area as the pre-incubation clients, 'Phase 2' is a pay-as-you-go service designed to be flexible to the needs of newly established micro businesses.

Following on from the pre-incubation and Phase 2, CUE offers a range of fully-serviced, tenanted office facilities across the Innovation Centre, Enterprise Centre, Design Hub and Innovation Village buildings, which includes the sector specific and focussed environments of the Institutes. Offices range from small units for one or two persons to larger spaces for established grow-on companies. Each building is designed to be flexible to the progression needs of a growing business and extra support is provided by a dedicated Centre Management team to ease the transition between office locations when size dictates.

Business working with Academia

CUE is the intermediary through which academia and industry are brought together. One of the subsidiary company's key roles is to act as a broker for the University's expertise and facilities and to convey to companies the benefits of liaising with an academic institution such as Coventry University. This is an important role that exists to avoid the problem of disconnection between firms and the host University that has often been cited by STP critics. The University research laboratory facilities are also being used in support of local industry. A recent example of this is the Sustainable Building Futures projects which links the brand new £55 million Engineering & Computing building, which is a live demonstrator for sustainable construction, to support services for the construction sector. Additionally, based on the Technology Park, the Health Design Technology Institute and Serious Games Institute deliver applied research, innovation support, business incubation and learning within a holistic environment that brings together SMEs, MNCs, researchers, charities, and public sector organisations.

The economic impact of CUTP

CUTP is able to contribute significantly to economic impact through the engagement and support of local businesses, the formation of University spin out companies and the drawing down of European funding into the region. Some of these impacts are difficult to quantify in economic terms. However, the scale of activity in each of these areas is captured by the Higher Education Business Community Interaction Survey (HEBCI) and it is useful here to elaborate each in turn.

Coventry University's (CU) HEBCI return for 2011/2012 categorises engagement with outside organisations into contract research services, consultancy services and the provision of access to facilities and equipment. Assessment of these data highlights four key points worthy of mention here. First, the level of engagement with external organisations with well over 10,000 firms engaged by CUE in 2011/12 is in itself exceptionally high, generating over £7 million in revenue. Second the data reveals that interaction with SMEs accounted for 88% of all activities recorded. In turn, the nature of the engagement with SMEs was overwhelmingly through consultancy services (99%). Third, though non-commercial organisations comprise just 9% of the engagement activity noted, they account for 69% of the contract research services rendered by CU during the year. Fourth, the provision of access to facilities and equipment to external organisations represents a very small component of CU's external engagement activities (just 1.6%). Notwithstanding this low level of activity, the provision of such services is an area where uptake by SMEs and other larger commercial organisations is roughly equal. Significantly, in recognition of the University's work with the business community, it received the Times Higher Award for Entrepreneurial University of the Year in 2011.

Economic impact is also evidenced through CUTP hosting external conferences and events. During 2011/2012 there were 837 separate events run by 77 outside organisations, with a total of 12,706 delegates attending. Aside from the direct venue hire and catering revenue received from such events economic impact for the City is derived from bringing people into Coventry including for overnight stays. Whilst data are not collected which would enable this impact to be quantified, the effect of local spending by conference attendees is potentially significant, particularly where they are spending one or more nights in the City.

The second of area of impact captured by the CU Group's HEBCI return concerns the creation of spin-out companies. Table 2 below illustrates the companies 'spun-out' from CU since 2000. In most cases, reciprocal relationships between Coventry University and the new businesses are maintained, with the majority of companies located on CUTP. Crucially, the businesses formed are predominantly in new high technology and creative industries sectors, thereby supporting knowledge-based economic development in the City, sub-region and region.

Table 2: Companies spun out from the CU Group 2000-2012

Company Name	Principal Activity	Formed
Sprue Aegis Ltd.	Design and production of smoke and carbon monoxide detecting equipment	2000
Microcab Ltd.	Design and production of Hydrogen fuel cell vehicles	2002
GPS Vision Ltd.	Consultancy for organisational development	2003
Health Behaviour Research Ltd.	Development of evidence based health interventions and assessment tools	2005
Exilica Ltd.	Manufacturers of spherical polymer particles and hollow	2005

	silica shells, for use in functional plastics and liquid polymers	
Trucktrain Knowhow Ltd.	Development of new rail solutions for the carriage of freight	2006
Intelligent Paving Systems Ltd.	Provision of research facilities and support for clients developing products with environmental impact	2006
UK Unplugged Ltd.	Development of location based services	2007
Weee Suitcase Ltd.	Development and provision Waste Electrical & Electronic Equipment container solutions	2008
Tortrix Ltd.	Information Technology solutions	2008
Virtualis3d Ltd.	Creation of 3D interactive visualisations of real and imagined spaces for the creative industries	2011

The final area of wider impact revealed by the HEBCI return concerns the drawing down of European funding into the West Midlands. These funds represent new public investment in the region which, without CUE's involvement, might not otherwise take place. The scale of this draw down was approximately £2.3m in 2011/2012, itself an increase on the previous year's level (£2m).

CUE is also a member of the EU funded European Enterprise Network, managing and running the project for and on behalf of the East and West Midlands nodes in the UK. This is the official EU business support network which seeks to provide partner companies for SME's in all sectors across Europe. With over 600 partner organisations in 40 countries this organisation has tremendous reach for any businesses looking to partner for supply chain reasons and we believe provides a replicable model which can be developed internationally. CUE manages the EU-funded Innovation Networks scheme which offers grants to SMEs in the West Midlands working with at least two other companies to develop new products or services. It also runs an Innovation University Enterprise Network to support businesses access new business opportunities through open innovation. In addition, CUE has a dedicated International Trade team in partnership with a Government Department, UK Trade and Investment. The aim of this team is to support SMEs in accessing global markets. The service includes research reports, access to events and exhibitions, market visits and hands on support with regard to contracts and joint ventures. The Annual Benchmarking report from the EBN showed in 2012 that CUE gave 865 SMEs internationalisation business support; a substantial number compared to the UK national average of EU accredited Business & Innovation Centres.

The economic value of the work of CUTP has also been recognised in a recent report "*Driving Growth: Supporting Business Innovation in Coventry and Warwickshire*" published by the influential Think Tank - the *Centre for Cities*. The purpose of their research was to provide an in-depth understanding of business innovation capacity and performance within Coventry & Warwickshire set in the context that support for innovation is a key priority for the Coventry and Warwickshire Local Enterprise Partnership (CWLEP), the body charged with delivering economic development. The report describes how the region "boasts some world class innovation-related assets. It is home to several of the UK's most innovative companies and universities producing cutting-edge research. There is a large

concentration of research and development (R&D) activity in Coventry and Warwickshire" (Centre for Cities, 2013, p.1).

Collaboration with the local municipality

As a city centre university, that occupies approximately one-third of the city centre, partnership with the municipality is paramount. In terms of supporting local economic development, this evidenced in numerous ways, for example working in partnership with Coventry City Council and partners to drive the diversification and development of the local economy notably through property developments such as CUTP. The University also works closely with the City Council in the development and modernisation of its city centre estate helping to generate significant economic impact. Coventry University and CUE staff are active players in CWLEP, having board representation as well as providing key input in driving economy strategy. This reflects both the importance of the University in supporting local economic development through the capacity and skills of its staff, but also the important role that CUTP plays as an innovation asset. CWLEP gives particular focus in its economic development strategy to sectors where CUE and Coventry University have strengths, highlighting the importance of CUTP in this process: advanced engineering, low carbon vehicles, intelligent mobility and digital technology. The relationship between Coventry University and the municipality has been formalised through the creation of Coventry CityLab, a joint venture between Coventry University and Coventry City Council, set up to address the major societal challenges within the context of ICT in the city or rather: the Smart City context. The University and the City Council own 90% of the land within Coventry City Centre and offering this location for use as a real-life experimentation environment where citizens (users) and producers (companies, especially SMEs) can co-create and test innovations. City Lab Coventry includes:

- access to citizens, vehicles, buildings, roads and IT infrastructure within the city
- a serious games studio/app lab, staffed by 30 developers providing specialist support in the creation of 3D immersive simulations and serious games, from prototype development through to full commercialisation
- business support, working with SMEs, start-up businesses and corporate organisations
- large-scale low carbon vehicle, low impact building, digital media and assisted living trials

A good example of how this works in practice is provided by the CABLED low carbon vehicle demonstrator trial. This was a classic triple helix collaboration of businesses (Jaguar Land Rover, Tata Motors, Mitsubishi, EoN, Arup), academia (Coventry, Birmingham and Aston Universities) and municipalities (Coventry and Birmingham City Councils) that developed and delivered a world leading public trial of 110 low carbon vehicles over a 12 month period in Coventry and Birmingham in 2010/11. Coventry University were directly involved several ways (i) designing and developing hydrogen fuel cell vehicles for the trial through a CUTP spin-out company – Microcab (ii) installation of a hydrogen fuel station (iii) installation of electric charging points on CUTP and (iv) evaluating driver

experience post trial. Coventry City Council provided electric charging points in public car parks and close to prominent city centre buildings.

Discussion and conclusion

This paper has highlighted how Coventry University Technology Park since its inception in 1998 has evolved to become a major innovation asset to the sub-regional and regional economy. The Park is home to some 65 firms in modern high-value industries such as automotive design, software development and creative media. It has generated numerous spin-outs and achieves significant economic impact. It has helped to diversify the local economy driving change in respect of providing direct and indirect business and employment opportunities in the knowledge and information economy, helping to transform derelict industrial land providing modern high-tech infrastructure on the edge of the city centre. Most notably CUTP has contributed to economic development and growth through engaging with and supporting local businesses, particularly SMES, the formation of spin-out companies and the drawing down of EU funding into the region. Economic impact is also evidenced in CUTPs hosting external conferences and events.

A number of transferable factors can be seen to be critical in underpinning the success of CUTP. First is the dedicated role of CUE. As one of the largest enterprise organisations in the EU, CUE provides an exceptionally high level of two-way engagement with companies, especially SMES, in providing services, support and facilities that they need to survive and grow. This is evidenced not only in the absolute numbers of SMEs CUE provides support to, but also in the way in they respond and react to user needs, for example identifying the need to provide bridging facilities between pre-incubation and fully tenanted office accommodation as a direct result of consultation with local entrepreneurs. Second, the direct relationship with the University and academic research institutes has been crucial with CUE acting as a broker to connect local firms with University staff, facilities and expertise. This bridging role is important to avoid the disconnect that often exists between firms on technology parks and their host academic institution. Thirdly, the triple helix collaboration with public sector partners (Coventry City Council), local economic development delivery agencies (CWLEP), as well as the private sector has been paramount not only in delivering CUTP but also in delivering local economic development projects and initiatives to drive the local economy. The CityLab collaboration between the University and City Council is presented as a case study example where local citizens and companies can co-create and test innovations in a real-world experimentation environment. Going forward it is important that CUTP builds upon this success. Literature on the *4th generation* STP suggests the importance of multi-stakeholder engagement and experimental labs. In these respects CUTP is doing well but can't afford to stand still.