



Short Knowledge Transfer Partnerships In the East Midlands Low Carbon Sector

March 2011

**EMFEC
Robins Wood House
Robins Wood Road
Aspley
Nottingham NG8 3NH**

Acknowledgements

This report has been produced for EMDA/AoC East Midlands Skills for a Low Carbon Economy Task Group by EMFEC. It draws on data gathered via primary and secondary research examining the feasibility and provision of Short Knowledge Transfer Partnerships (sKTPs) linked to the low carbon sector. The FE Low Carbon Task Group acknowledges and thanks all those who contributed to report, participated in the surveys and provided information.

Acknowledgements also to:

Phil Fone, former college Principal, an associate providing specialist advice and support; and FE task group members.

Short Knowledge Transfer Partnerships

Contents

Context	4
Objectives of Low Carbon SKTP Programme	4
sKTP Work Plan	4
Defining Low Carbon Sector	5
Technology Strategy Board (TSB) Announcement December 2010	6
Experience of Progressing sKTP Expression of Interest	7
Problems, Difficulties and Success in Operating sKTPs	8
Suitability of sKTPs for Developing Low Carbon Skills in FE Colleges	8
Capacity and Expertise of Colleges to Deliver sKTPs	9
Suitability and Relevance of the sKTP enquiries and outline Proposals	9
Criteria for Successful KTPs (university experiences)	10
Low Carbon Skills Capacity Building and Knowledge Transfer	11
Recommendations regarding Adapting KTPs for FE Colleges	11
Alternative Approaches to Knowledge Transfer in FE Colleges	12
Conclusion	?
Appendices	
A sKTP Finder Service Booklet	?
B Project Update 17 February 2011	?
C TSB Briefing on New Eligibility Criteria for KTPs December 2010	?

Context to the sKTP Programme

The main context for this project is the government policies and priorities for economic growth in the Low Carbon Economy Goods and Services (LCEGS) Sector.

Part of this strategy is the need to ensure a growth in the skills sector to supply businesses with competent and qualified staff able to sustain employment in the sectors contributing to low carbon prosperity.

To encourage growth in Low Carbon (LC)skills capacity in further and higher education a number of initiatives have been undertaken.

The East Midland Regional Development Agency (emda) has been working with Further Education Colleges in the East Midlands for over three years on a number of projects designed to expand FE's provision of low carbon skills. These include the Skills4Energy project, a capital investment programme for colleges to acquire low carbon technology and funding for a number of projects to encourage expansion in low carbon expertise and technology capacity.

As part of this set of initiatives a proposal was made to introduce Knowledge Transfer Partnerships (KTP) to the FE sector specifically targeted at low carbon sector projects.

Via the FE Colleges Energy Task Group, co-ordinated by AoC East Midlands and EMFEC, a project was developed to encourage colleges to become partners in a shortened version of KTP, known as sKTPs, details of which are identified below.

The intention was to encourage colleges to work with business partners on projects designed to stimulate technology transfer between them.

This report identifies the stages in the project, the processes and experiences of the project, identifies its successes and problems and makes recommendations regarding future technology/knowledge transfer strategies for FE Colleges.

Objectives of the Low Carbon sKTP Programme

The objectives of the emda funded programme were as follows:

- 1 To facilitate employer engagement between businesses in the low carbon sector and FE colleges developing their low carbon expertise and curriculum.
- 2 To offer CPD opportunities for employees of both organisations and the “ associate” to grow the quantum of low carbon technology expertise in the sector.
- 3 To encourage the applied research and development programmes for curriculum development in colleges by stimulating new and innovative approaches to skills development and delivery.

Overall sKTPs were encouraged as an ideal vehicle for stimulating the FE sector's engagement in low carbon technology transfer and thereby contributing to the regional low carbon strategy.

sKTP Work Plan

The following elements in the Work Plan were scheduled with the intention of achieving up to 20 live sKTPs by March 2011.

- 1 Promotion of sKTP via the East Midland Colleges Energy Task Group – including a one day training programme on sKTP led by the founder service, Technology Strategy Board (TSB)/KTP regional staff and emda.

- 2 Appointment of a KTP “Finder Service”, funded by emda to promote KTPs and search for businesses which were interested in participating in the scheme.
- 3 Contract issued to EMFEC to finance a brokerage service to assist colleges in engaging with enquiries from the Finder Service and identifying colleges with the most appropriate expertise to partner with the business.
- 4 Progress reporting via the LC/Energy Task Group to emda officials.

A fully detailed description of sKTPs and their operation is contained in Appendix A.

Defining the Low Carbon Economy

For the purposes of the sKTP programme the low carbon sectors which were eligible for support were prescribed by the partners, with advice from emda, as follows:

Knowledge and Technology Transfer Areas: Scopes of Activity
Manufacturing
<ul style="list-style-type: none"> • EMS/QMS • Resource efficiency – clean/lean manufacturing • Process innovation • Design • Innovation and markets/diversification • R&D
Vehicles
<ul style="list-style-type: none"> • Maintenance and Servicing • Low carbon fuels • Energy storage ie fuel cells and batteries • Transmission/drive trains • Fuelling infrastructure
Renewable Energy
<ul style="list-style-type: none"> • Wind turbines and system • Solar (heat and PV) panels • Ground/air/water source heat pumps • Biomass boilers • Waste to energy boilers • Domestic and commercial/industrial
Building Services
<ul style="list-style-type: none"> • Space and water heating • Power and lighting • Mechanical systems ie conveyors/machinery/lifts • Design and innovation • Maintenance • CHP
Energy Networks
<ul style="list-style-type: none"> • Conventional electricity distribution and transmission sectors and supply chain • Private wire systems • District heating • Decentralised systems
Management and Innovation
<ul style="list-style-type: none"> • Change management • Access to markets/marketing • Growth • Opportunity identification

- | |
|---|
| <ul style="list-style-type: none">• Skills/technology/markets analysis• People development |
|---|

It is interesting to note that these sectors differ from those defined in a parallel project on mapping low carbon skills, commissioned by emda and informed by a research report produced by Ekosgen. For example, inclusions in the sKTP sector include manufacturing, management and innovation which are not covered by Ekosgen, who instead include pollution and water technology but exclude vehicles.

Nevertheless, the colleges' finder service and brokerage service agreed not to exclude any proposal provided it met the criteria of TSB which would receive applications for sKTP funding. The regional representative of TSB was party to these discussions.

On the basis of the sKTP project timetable, a number of activities were undertaken in parallel. These were:

- 1 KTP Finder Service seeking prospective business partners
- 2 Promoting to sKTP to colleges and employer groups
- 3 Following up enquiries and expressions of interest generated from 1 and 2.

A list of all the enquiries, expressions of interest and project proposals is contained in Appendix B.

At this stage (Nov – Dec 2010) all the early work was based upon the sKTP model. In December 2010 the TSB announced fundamental changes to the KTP programme including sKTPs, the effect of which was to disrupt the work plan and the targeted outputs.

TSB Announcement December 2010

In December 2010 the TSB announced changes to the criteria for supporting KTP projects. A copy of their bulletin is contained in Appendix C. The primary reason for these changes was the public expenditure cuts and the closure of several quangos which funded TSB – such as the Regional Development Agencies.

As a consequence the TSB introduced the following changes:

- A moratorium on KTP applications generally including the non-availability of the portal for applications
- Withdrawal of sKTPs and the introduction of a minimum qualifying project period of six months and substantially high financial contributions from partners

The effect of this announcement was to impact significantly on the remainder of the project. The reasons why these changes had a special impact were as follows

- 1 The project was in its infancy and the partners had little or no experience of KTPs
- 2 The period of promoting the project was immediately prior to the announcement thus undermining the work which had already been done
- 3 The new criteria for applying for KTP effectively “raised the bar” for FE Colleges to a point where they would have much greater difficulty in commencing and fulfilling their obligations under the scheme (see later section of barriers to FE participation in KTPs)
- 4 Other parts of the public sector were experiencing the same financial pressures and this meant the extra funding requirements for “classic” KTPs put them out of reach of most colleges suffering funding cuts.
- 5 The tightening of the criteria for application also affected the FE initiative because the TSB signalled that only projects with “life changing” potential would be considered against a much more rigorous set of criteria which would preclude many of the “toe in the water” type projects suitable for FE to take their first steps in knowledge transfer.

Altogether these new proposals disrupted the project substantially. However, with the support of emda it was decided that having contracted for the project the most beneficial solution was to continue with the project as follows:

- 1 Continue with the finder service and brokerage arrangements to identify further opportunities which could be developed into KTPs (under the new criteria) or as employer engagement projects for colleges. This was, and still is, important as colleges need to grow their low carbon sector specialism and expertise. In the absence of other mechanisms for this to happen it was felt that continuing the project and encouraging engagement was the most beneficial option.
- 2 Record the progress of the project, gathering evidence of how knowledge transfer could and should operate in the low carbon sector, to assist FE to grow its capacity.
- 3 Identify the issues and barriers to progressing the projects including any further contact with TSB, if and when their capacity to receive and progress KTP applications improves.
- 4 Identify the components of a successful KTP and see if these can be translated into an FE environment given the constraints of such.
- 5 Recording the progress, or otherwise, of the sKTP expressions of interest
- 6 Collation of the final report making recommendations on how KTPs could be adapted to be attractive to FE, identify the benefits in particular of using KTPs to facilitate and encourage the growth of low carbon skills capacity in colleges.

Experiences of Progressing sKTP Expressions of Interest

Over the period November 2010 to February 2011 the finder service, brokerage and colleges were engaged in identifying potential business partners for sKTPs, the majority of enquiries being generated by the finder service.

A full list of the progress and status of each of these is contained in Appendix D.

In order to progress each enquiry, liaison was maintained between the company, the college, the regional KTP scheme and the finder service.

In addition to the problems caused by the TSB's enforced changes to the KTP application criteria, it became clear that even if these had not taken place many colleges were facing challenges in progressing their interest in a project.

In collaboration with emda, it was agreed that it would be beneficial to capture these experiences and ensure that the barriers, difficulties and issues which were constraining the development of sKTPs be identified and reported. Also it was agreed that the report should make recommendations regarding the future engagement of colleges in KTPs so that potential benefits could be achieved for all parties.

Therefore a detailed study of the early experiences of sKTP was undertaken with interviews of colleges, feedback from members of the Energy Task Group and other partners in the project.

Following on from this study, emda requested that proposals and recommendations be made to improve the process. Consequently the remainder of the project focuses on the experiences of the project, identification of the problems and barriers and recommendations as to the future technology transfer component of the FE Colleges' low carbon skills development strategy.

Problems, Difficulties and Successes in Operating Low Carbon sKTPs in FE Colleges

In addition to the impact of the TSB changes previously mentioned, the following three categories of problems were identified:

- 1 Suitability of the sKTP programme as a mechanism/process for developing low carbon skills capacity and employer engagement in FE Colleges
- 2 Capacity/Expertise of the colleges in KTPs in low carbon technology
- 3 Suitability and relevance of the enquiries and outline proposals generated by the finder service and others.

Lessons and recommendations are also identified from the projects which currently are proceeding so that potentially successful projects can be used as a means of capturing the features and characteristics of that success.

Suitability of sKTPs as a Mechanism for Developing Low Carbon Skills Capacity in FE Colleges

The potential benefits of using KTPs to develop low carbon provision in colleges are:

- It enables colleges to engage with businesses in the sector and upskill staff in the latest technology
- It enables staff to share their expertise and so benefit the business

However, in the case of low carbon technology, it has to be recognised that colleges are, in many cases, only at the starting point of developing their expertise and do not have staff who are sufficiently qualified and experienced to add value to a project. Therefore the KTP becomes a “one way street” of exchange from the firm to the college.

Whilst KTPs have been in existence for 30+ years they have not been taken up by FE generally, let alone in a new technology such as low carbon, because of some inherent difficulties, whether real or perceived. It is important to identify these so that strategies and recommendations can be made to reduce these.

- The KTP application process is seen as being convoluted, bureaucratic and intrusive. For example, the business’ financial health has to be verified and evaluated before receiving public funding.
- The vocabulary is complex and the pathways to gaining approval are not clear.
- To qualify colleges need to have been teaching at Level 4 or above provision which is often not the case.
- The criteria for making a successful bid are ambiguous and often do not correspond with the objectives of the partnership for the FE partner (ie to gain knowledge and expertise relevant to curriculum development and raising student achievement levels).
- Whereas universities have RAE and other R&D targets, this is not the case in FE where the college’s mission, strategies and targets are generally imposed or, at least, heavily influenced by external agencies such as Government or Ofsted which set no targets or objectives for colleges in this regard. There is no pressure or target imposed on colleges to deliver KTP or the applied research associated with them. There is no ready supply of or support for post graduates to act as associates.

Consequently many of the facilitation and support arrangements needed for successful KTPs is missing from a typical mainstream FE college (but could exist in some HE/FE hybrid institutions) and there appears to be no incentive on the part of colleges to grow them.

For low carbon technology these problems are magnified by the infancy and newness of much of the technology with which the staff are supposed to engage with. Developing low carbon technical expertise is costly and despite recent capital investment from emda many colleges are deficient in resources. KTPs do not invest in capital and the “return on investment” in a KTP is seen by colleges as being very low and often below the return which can be achieved by running full cost courses with the same level of staff resources.

Colleges view KTPs as being too specialist, narrow and disconnected from the FE curriculum to offer appropriate development opportunities for staff or to bring in suitable curriculum material or technology relevant to the needs of learners at levels 1-3 who are the mainstream clients for the majority of FE. For the limited time and funding available for KT or TT, colleges believe there are more effective ways of achieving the objective of growing capacity in low carbon skills.

Capacity and Expertise of Colleges to Deliver KTPs in Low Carbon Technology

Following on from the issues related to the suitability of KTPs to FE must be the hurdles associated with FE coping with the introduction of a new technology per se.

- Just as with computer and information technology in the 1980s, FE is only just starting to “low carbonise” its curriculum and range of courses. Much of the provision is in its infancy and staff are destined to implementing a new set of technologies in line with external parameters from Government, SSC, Awarding Bodies and employers. In many respects low carbon technology is innovative and new to many FE staff who have not experienced it anywhere else.
- There are little or no staff development (CPD) opportunities in low carbon technology and yet staff have been expected to engage in knowledge transfer when they have little to offer themselves. This has been exacerbated because the projects identified by the finder service have not been, in most cases, in areas which link directly to the curriculum development needs of the college.
- To qualify for a KTP, colleges are supposed to have provision at least at Level 4. Whilst some colleges do it is clear that many have only a little and often this is not in the areas of low carbon technology.
- Staff in building, construction and motor vehicle technology are often technically qualified themselves to Level 3 or 4. They have no experience of R&D, or of supervising an associate or research assistant who may be at Level 5/6.
- Recent financial and targeting pressures on colleges do not create a climate for innovation, R&D and risk taking. College performances are not measured by the rate of innovation in low carbon or any other technology. Indeed quality assessments including inspections stay away from inspecting technical innovations and this is infrequently reported upon in Ofsted inspection reports.
- College “climates” are therefore ill equipped to take advantage of the potential benefits of KTP, a fact which is reflected in the low take-up of them nationally across all areas of technology. KTPs have had minimal success in FE generally and expecting this approach to be successful in a new technology was, and still is, a “bridge too far” for FE.

Suitability and Relevance of the KTP Enquiries and Outline Proposals

Given that FE colleges are at the early stages of introducing low carbon technology to the curriculum, it was important that the sKTP proposals, enquiries and employers engaged in this should reflect and be associated with the specific curriculum areas being developed by the colleges. It would have been fortuitous if all the enquiries had come from businesses in the Ekosgen Survey of low carbon clusters which in many ways reflect the categorisation of technologies in colleges.

However, this was not the case, which resulted in some expressions of interest receiving no response from the colleges.

In total ten leads have currently been generated by the finder service. An update on their status is contained in Appendix E.

A further small number of enquiries generated outside the finder service are also being progressed.

Unfortunately the TSB imposed changes to the eligibility criteria has meant that the majority of the projects would not qualify for support. This has been the most disappointing aspect of the programme, resulting in a lot of work and effort being wasted and some frustration on the part of colleges and businesses who were originally potentially eligible for a sKTP.

It is imperative that if future rounds of KTPs are adapted to make them suitable for FE colleges that the selection criteria for business partners reflects the interests and expertise of the college (see Recommendations). In particular the projects should focus not on high level R&D but on developing skills needed to install/commission/maintain/inspect/rectify technology in “field” conditions – the technician level skills which are capable of being delivered by FE and which, in the case of low carbon, are in need of urgent attention in order to satisfy the growing demand from employers.

Finally, feedback from colleges has identified that the financial aspects of KTP is not attractive and does not offer value for money for the investment in time and resources needed to initiate and operate a successful project. When these projects sit outside the areas of interest, capability or capacity of the college, it makes the decision not to participate even easier.

Criteria for Successful KTPs (using university based projects as examples)

Using the KTP online web site and experiences shared at interview, there emerges a series of key features which help KTPs to be successful. However, many of these relate to “classic” KTPs run on traditional lines involving universities with a long track record in knowledge and technology transfer.

However, there are lessons which a FE based KTP should take onboard in order to improve the probability of success. The key factors quoted in the case studies include:

- Selecting the right associate and ensuring that the business partner is clear about the level of support needed. Most associates are operating at postgraduate or doctorate level and have R&D skills as well as level 5+ qualifications in the relevant areas.
- The business partner must be able to support the associate and ensure that the project aligns itself with the business need. Mentorship from both institutions needs to be effective and well co-ordinated.
- The associate needs to have their experiences co-ordinated using a detailed development plan with clear milestones and targets agreed by all partners.
- The associate needs to have good access to staffing and resources in the academic institution and support in the work place needs to be readily available and at an appropriate level.

One interview with an employer who had undertaken a KTP based in the East Midlands revealed difficulties in the continuity of associates, with more than one person being the associate during the life of the project. This underlines the need for a clear commitment from the associate for the duration of the project and the need for the academic institution to provide support outside the typical academic year/vacation calendar.

Given that businesses operate much less generous holiday arrangements it is important to clarify the terms and conditions of the associate support from the university at the outset.

Interpreting this experience and translating it into the setting of a FE based project is difficult but the review of successful KTPs in the university sector does indicate the need for experience in managing R&D projects and associates operating at post graduate level – experience which is lacking in most FE colleges.

For these reasons it is essential that if FE is to participate in KTPs then a thorough preliminary process of establishing the management arrangements for the project need to be put in place prior to commencement.

New Models of Supply Side Capacity Building and Knowledge Transfer

When developing its low carbon technology provision the dilemma for colleges is:

- (a) Should it grow its provision and then seek employer engagement from a position of being able to offer high quality, response provision or
- (b) Engage with employers to assist in guiding and defining the growth in capacity to ensure that it is what employers want and the engagement process helps staff to raise their eyes to what is happening in business and improve their own competencies.

Most colleges have taken a pragmatic view of investing in new facilities by developing capacity through a “reverse engineering” model which takes its lead from business and uses its leadership to define the direction of capital investment and curriculum development. This process has, in many ways, been usurped by Sector Skills Councils, Awarding Bodies and others who have been given powers to intervene in what is being delivered to students.

Against this backdrop, the challenge for colleges engaged in growing their low carbon technology and skills capacity is to (either independently or collectively), introduce new models of employer engagement and associated technology and skills transfer, which will together increase the supply side and their ability to satisfy the increasing demand for low carbon skills.

Recommendations

There is a broad set of recommendations to be made and then a specific set relating to the adaptation of KTPs as a vehicle for contributing to the supply side and technology transfer in particular.

These first broad recommendations reflect the innovative nature of the low carbon technology skills supply side in FE colleges and the need to invest in it urgently. The following recommendations are made:

- Identifying, investing in and establishing national, regional or sub region centres for specific types of low carbon provision which would enable investment to be fully utilised, achieve economies of scale, grow expertise faster and be able to link more directly with employers.

This builds on the National Skills Academy programme where the Environmental Technologies Academy is already having a major beneficial impact on provision.

- Closer collaboration with employers, businesses and trade associations, including agreements to deliver training on behalf of equipment and systems manufacturers.
- Earmarked investment from central government, regeneration agencies and college funding bodies should be targeted at low carbon teaching facilities in colleges
- In the East Midlands the emda and NTI funded projects provided the most significant investment in facilities in the region – far outweighing the college’s own internal investment funding which in many cases has been minimal.
- The SFA/Funding Agency should consider changes to the funding methodology to encourage the growth of low carbon provision.
- Because low carbon is the fastest changing area of the curriculum, colleges should prioritise CPD, R&D and investment in facilities for this sector.

- Staff Development, secondments, shadowing and technical and professional updating of staff in low carbon should be a priority.
- R&D in colleges should be more recognised, formalised and funded – linking with HEIs/universities and research bodies such as TSB through the KTP and similar programmes.
- Governing Bodies should take a closer interest in low carbon, setting targets for innovation and responsiveness in the college's curriculum. This power is available to them within the Instruments and Articles of Governance.

Alternative Approaches to Knowledge Transfer in FE Colleges

Conclusion

Appendix A: sKTP Finder Service Booklet

Appendix B: Project Update 17 February 2011

Appendix C: TSB Briefing on New Eligibility Criteria for KTPs December 2010

