# Evaluation of the Knowledge Exchange Network Project

Report to the Energy Technology Partnership, December 2014

Stewart Brown Associates Limited t. 07827 159 389 e. sb@stewartbrown-associates.eu

## Executive summary

This is the report of an evaluation of the Knowledge Exchange Network (KEN). It was undertaken by Stewart Brown Associates Limited on behalf of the Energy Technology Partnership (ETP) during August to November, 2014.

The evaluation of the KEN project covers the operational period June 2011 to August 2014 although some additional information and data for the period up to end November 2014 are referenced where appropriate. It has the following objectives:

- to assess the extent to which the KEN's high level objectives have been or are likely to be achieved
- to assess the efficacy and quality of its operational processes and quality of its management, staff and documentation
- to assess the project's performance against the targets that were set for it
- to assess the outputs and impacts achieved and likely to be achieved
- to determine the economic impact at the Scotland level of the KEN, to date and reasonably anticipated
- to assess the project's contribution to the key objectives of the project's co-funders (ERDF, Scottish Government, Scottish Enterprise and the Scottish Funding Council).

### *Achievements relative to ERDF measures*

The activities undertaken as part of the KEN project up to end August 2014 include:

- 230 "Company Supports" (75% achievement of the ERDF target total of 308)
- 75 "Collaborative Supports" (85% of the ERDF target total of 88)
- 84 "Consultancy Projects" (105% of the ERDF target total of 80).

Achievements to end November 2014 are reported to be 246 Company Supports (80% achievement against target), 75 Collaborative Projects (85% achievement) and 95 Consultancy Projects (119% achievement).

In terms of ERDF 'results' measures, the evidence from 29 firms interviewed during this study permits a gross turnover forecast attributable to the KEN in year 2018-19 (in 5 years) of c.£11.0m. This is highly dependent on the forecasts of two firms. The gross turnover 'results' target in the ERDF contract is £15m. The same sample of firms permits the forecast of c. 27 (gross) jobs being created by 2018-19. This figure is highly dependent on the forecast made by one company. The ERDF gross jobs created target is 74.

Based on responses from the 29 firms interviewed:

- three Collaboration Support initiatives delivered by the KEN have progressed either to production or the 'next stage' in development
- 4 Consultancy Projects are reported as moving to production
- for several firms a Consultancy Project has demonstrated that a business idea is not feasible - this is deemed to be a valuable outcome by the companies involved
- for other firms, the work supported by the KEN is still ongoing or the company has not yet decided on next steps, if any.

For many of these measures, the figures may increase over time as more projects undertaken for the population of firms supported by the KEN and their associated business outcomes mature. Also, it should be noted that the KEN project will continue through Quarter 1 of 2015.

### *Economic impact*

The headline economic impact figures that have been estimated for the KEN are as follows. In each case the impact is expressed as the contribution to the economy at the Scotland level:

| PARAMETER | DIRECT IMPACT | WITH MULTIPLIER | |
|---|---|---|---|
| Net additional GVA in the year 2018-19 | £2.7m | £4.3m | Type II GVA Multiplier of 1.6 is used (see Annex C) |
| Net additional GVA aggregated over the period up to and including 2018-19 | £6.0m | £9.6m | as above |
| Net Present Value of the KEN | £3.9m | £7.5m | Calculated for the period up to and including 2018-19 |
| Ratio of GVA contribution to cost of intervention | 2.8 : 1 | 4.5 : 1 | |
| Net additional employment in the year 2018-19 | 19 full time equivalents (i.e. the forecast number of 'direct' jobs supported in this year) | 30 ftes | Type II Employment Multiplier of 1.6 is used (see Annex C) |

Other key findings are:

- the focus of the KEN project on renewable energy and related low carbon innovation retains a strong 'fit' with Scottish Government energy policy and with economic development priorities in Scotland
- in terms of effecting changes in business capability (in aspects of what is often called 'absorptive capacity'), the KEN has made a positive contribution
- the overall picture is one of a high level of satisfaction amongst company clients with the KEN: a large majority of respondents are satisfied or very satisfied with what they experienced. In some cases, respondents are fulsome in their praise of individual Business Development Managers (BDMs). However, the KEN has a small number of very dissatisfied clients: to avoid reputational risk, KEN management should review its client management/feedback procedures in order to sense and respond effectively when problems with individual clients arise, as they inevitably will from time to time.

The following matters arise from consultations with BDMs:

- the ETP/KEN should re-assess the operational relationship with Scottish Enterprise and Business Gateway in terms of cross-referral of businesses who would benefit from the support of the various parties
- KEN management need to be wary of its financial resources for projects being drawn on too much for the benefit of the 'supply-side', of academics and their students - this requires appropriate metrics to ensure that a strong degree of business 'pull' is inherent in the process of project formulation, even if initially stimulated by a BDM
- BDMs note the benefits of the increase in funding available for a Consultancy Project (now up to £20k) - it will be important that the benefit here is not (just) in terms of attracting academics to the work. This more substantial amount should be accompanied by greater 'diligence' on the demand-side and greater participation throughout the process by the business partner
- given the technology and market knowledge and experience of the BDMs, one suggestion is that the KEN becomes involved in work with (private) investors in energy technologies and businesses.

On strategic issues:

- there is an urgency for the KEN to re-fresh its vision/strategic objectives and modes of operation to take account of a much changed innovation support landscape in Scotland - a number of substantial initiatives have emerged in recent times in the renewable energy and associated low carbon innovation support space that is occupied by the KEN
- in this context, it is important to re-assess the KEN's commitment to working with SMEs, and in particular to smaller enterprises, and to assess whether for example it should: (a) differentiate itself as a source of capability development support for small firms with limited extant absorptive capacity; and/or (b) to work with 'more capable' SMEs and in a more explicit supply chain context.

Responses from firms to questions about likely contributions to reductions in carbon emissions and/or energy consumption as a result of engaging with the KEN reveal marked variations and a high level of uncertainty over the extent to which, upon fruition of the product or service developments being supported by the KEN, low carbon policy objectives will have been advanced.

## 1. Introduction

This is the report of an evaluation of the Knowledge Exchange Network (KEN). It was undertaken by Stewart Brown Associates Limited on behalf of the Energy Technology Partnership (ETP) during August to November 2014.

### *1.1 Scope and objectives of the evaluation*

The evaluation of the KEN project covers the operational period June 2011 to August 2014 although some additional information and data up to end November 2014 are referenced where appropriate. It has the following objectives:

- to assess the extent to which the KEN's high level objectives have been or are likely to be achieved
- to assess the efficacy and quality of its operational processes and quality of its management, staff and documentation
- to assess the project's performance against the targets that were set for it
- to assess the outputs and impacts achieved and likely to be achieved
- to determine the economic impact at the Scotland level of the KEN to date and reasonably anticipated
- to assess the project's contribution to the key objectives of the project's co-funders (ERDF, Scottish Government, Scottish Enterprise and the Scottish Funding Council).

### *1.2 Report structure*

The remainder of this report is structured as follows:

- *Section 2*: provides a description of the research methodology used in the evaluation
- *Section 3*: provides background information on the KEN - it also sets out the original objectives and targets for the KEN project
- *Section 4*: examines the strategic context and 'fit' of the project at the outset and how it is positioned now within the present innovation support landscape in Scotland
- *Section 5*: examines inputs to the KEN project
- *Section 6:* examines the KEN's activities (including governance and management) and outputs - it also reports on levels of client satisfaction with the KEN
- *Section 7*: examines what business outcomes/benefits have been realised to date and are anticipated
- *Section 8*: establishes the gross and net additional economic impact of the KEN at the Scotland level - this includes impact to date and reasonably anticipated
- *Section 9*: provides conclusions and points up learning for development.

The report includes the following annexes:

- *Annex A*: lists all contributors to the primary research
- *Annex B*: contains a copy of the questionnaire used in the business interviews
- *Annex C:* provides information on how the economic impact of the KEN has been calculated, including definitions of terms, process steps and information on the assumptions used

- *Annex D (supplied as a separate MS Excel file)*: contains tables which record feedback from interviews on business outcomes and impact, and also the calculations to determine economic impact in terms of Gross Value Add (GVA) and employment.

## 2. Methodology

The evaluation has drawn on both qualitative and quantitative evidence. This has come from various secondary and primary sources:

- project approval documentation
- project monitoring information
- public domain strategy documents from the project's co-funders
- interviews with staff delivering the KEN (the Business Development Managers: hereafter BDMs)
- interviews with a sample of businesses that have received support from the KEN
- interviews with other stakeholders in universities and the public sector - selected on the basis of client referral.

A list of all contributors to the primary research is given in Annex A.

A population of 72 companies in receipt of substantive KEN support was identified in discussion with the KEN manager. Of these, six had already participated in research undertake recently by Scottish Enterprise (SE) and were omitted from the list of candidates for interview during this study at SE's request, giving a potential list of 66 candidate interviewees in receipt of Consultancy Projects and/or Collaboration Support. The original aim, as set out in the brief, was to target 50 telephone interviews: in the event, 29 interviews were conducted after best efforts to engage with the 'approachable' population of 66 firms i.e. a response rate of a little over 40% was achieved. Only one company explicitly declined to participate, several companies were no longer trading and the remainder failed to respond despite persistent 'chasing'.

It should be noted that a small minority of businesses reported an engagement with the KEN but did not recognise this as consultancy or collaboration: these views account for some minor differences in the precise number of firms assisted by specific products as reported in the KEN's monitoring data and in the evaluation findings.

As will be seen later in this report, the nature of the evidence derived from business interviews has presented notable challenges, especially in establishing economic impact. Only six firms out of the sample of 29 were able or willing to indicate a quantifiable impact attributable to the KEN project in terms of change in turnover or employment. Of these, two had KEN projects ongoing and their forecasts may be predicated to some extent on successful project outcomes; some firms were able only to forecast ahead one year; and the scale of forecasts within this cohort of six varied by up to two orders of magnitude. This has required certain assumptions and extrapolations to be made: these are explained where they occur.

Also, in order to obtain a reasonably consistent set of data which permits aggregation across the cohort of six firms, albeit with caveats, the forward forecasting of economic impact has been restricted to five years up to and including 2018-19 rather than also the ten years that is sought typically by for example SE. Not only do the business responses make this time restriction necessary but given the positioning of many KEN projects at the feasibility or early prototyping stage it is also judged to be 'sensible'. It is also understood that ERDF 'results' measures (see later) are based on achievements five years hence.

## 3. About the Knowledge Exchange Network project

The KEN is operated by the Energy Technology Partnership (ETP), an alliance[1] of twelve Scottish universities formed in 2008 which are engaged in energy-related research, development and demonstration (RD&D) activities. The ETP claims to be the largest power and energy research partnership in Europe: its overarching function is to promote greater levels of collaboration between universities and industry, and to deliver "unparalleled" energy RD&D capability across a spectrum of energy technologies.

The executive of the ETP and the management of the KEN project are located at the University of Strathclyde: Strathclyde also provides financial accounting, legal and other related administrative support. The universities which host the KEN management function and the individual BDMs provide staff with office accommodation and basic services. BDMs are employed by the institutions that host them.

The KEN project is funded with c.£3m drawn from multiple sources: from the European Regional Development Fund (ERDF), Scottish Government, SE, Scottish Funding Council (SFC) and the ETP's partner universities. The ERDF covers 35% of eligible costs. Only Scottish SMEs are eligible for assistance and furthermore, due to the terms of the ERDF award, only 10% of the available funding can be used for SMEs in the Highlands & Islands region.

In scope, the KEN project is focused on the following technology and market areas:

- wind energy
- marine energy
- bio-energy
- carbon capture & storage
- solar energy
- energy storage & conversion
- electricity power grids
- energy utilisation in the built environment.

The oil & gas sector is also eligible for support but only in the context of SMEs in this sector seeking to diversify into one of the other areas listed above. Other low carbon sectors such as nuclear, hydroelectricity and geothermal have not been pursued within the KEN project.

### *3.1 Aims and objectives*

The overarching aim of the KEN project is: "to accelerate KE activity between academia and SMEs thereby increasing innovation, advancing the development of the low carbon economy in Scotland and supporting Scotland, UK and the EU to meet ambitious 2020 low carbon targets". Scotland-based SMEs are the intended beneficiaries: the purpose of the KEN is to provide these firms with energy technology-related business and technical support. The intention is to raise competitiveness through enhanced access to research expertise and value adding collaborations. The original proposal to funders and the brief for this evaluation refers to the following objectives:

- to support directly the delivery of EU, UK and Scottish low carbon targets by working with enterprises to achieve near-term emissions reduction and/or reduced carbon demonstration and deployment projects
- to contribute to the reduction of carbon emissions from:
    - the deployment of renewable energy devices

[1] The ETP is not a legal entity.

  - reduced energy demand
  - reduced carbon intensity

- to develop a monitoring framework to identify and record carbon savings in addition to other project measures
- to promote the ETP's R&D and knowledge exchange capability in support of enhancing Scotland's reputation as a global leader in establishing a low carbon economy
- to increase the rate and extent of research commercialisation from the ETP's universities
- to improve, through the development of the Scottish Energy Laboratory (SEL), the visibility and accessibility of Scotland's energy test and demonstration facilities
- to increase the ability of SMEs to secure new funding as a direct result of their interaction with the KEN - and to monitor this
- to increase the absorptive capacity of SMEs on a sustainable, longer term basis
- to increase the performance of the ETP's universities in achieving the SFC's Knowledge Transfer Grant (KTG) measures for: outreach; enterprise schemes; consultancy; CPD; research grants/contracts; IP licensing; and new firm formation.

**COMMENT**

From a critical review of the statements of the various objectives for the KEN, in our judgement a number of them fail the test of 'SMARTness' (i.e. for Specific, Measurable, Agreed or Achievable, Relevant, Time-bound objectives), in particular on 'measurability'.

Also, it is not apparent that measurement and monitoring procedures on carbon savings or on securing additional funding have been devised and implemented.

It is not clear how the objective associated with absorptive capacity has been pursued: this may have been regarded as (just) a 'natural' outcome of enabling engagement with the KEN and its supply-side contributors (we return to this later).

The reference to increasing performance with regard to the KTG measures is, arguably, 'trivial' without additional information on performance above a baseline. References to "rate and extent of commercialisation", to contributions to low carbon targets, and to the status of the SEL also fail a SMART test without establishing some form of baseline or benchmark for each and then monitoring performance against this.

### *3.2 ERDF measures*

The objectives for the KEN project are also expressed in a set of "outputs" and "results" measures specified for the ERDF funding. These are listed below:

- ***outputs:*** number of enterprises supported; number of research networks and collaborations supported; number of renewable energy projects supported
- ***results***: number of new products/services developed by supported enterprises and research centres; number of new products/services developed by supported research networks; increase in turnover in supported enterprises; number of gross jobs created.

The targets set for each of these are shown in the Table 1. (It is understood that achievement with respect to results relates to five years following the intervention.) The KEN's performance to date is assessed later in this report.

**TABLE 1: SUMMARY OF ERDF METRICS**

| 3 year ERDF targets | Type of measure (after ERDF) | Numerical targets in original ERDF contract | Stretch targets referenced in Notification of Change* |
|---|---|---|---|
| number of enterprises supported | output | 308 | +55 |
| number of research networks and collaborations supported | output | 88 | +10 |
| number of renewable energy projects supported | output | 80 | +13 |
| number of new products/services developed by supported enterprises and research centres | result | 41 | |
| increase in turnover in supported enterprises | result | £15m | |
| number of new products/services developed by supported research networks | result | 22 | |
| number of gross jobs created | result | 74 | |

*The main purpose of the Notification of Change was extension to programme duration and virement of budget. However, it also stated stretch targets which were considered difficult but reflected an ambition to "over-achieve".

## 4. Strategic context

The original assessment of the strategic 'fit' of the KEN was based in large part on reference to the Scottish Government's Low Carbon Economic Strategy published in 2010. Reference was also made to the research 'pooling' initiatives being pursued by the SFC, notably the Energy Technology Partnership (ETP) itself and the Marine Alliance for Science and Technology for Scotland (MASTS). Also relevant was the focus on renewables and low carbon innovations by SE and Scottish Development International (SDI).

The rationale for the KEN project from the outset has also been underpinned by the aims and objectives of other funders:

- ***ERDF*** - "to improve the competitiveness of the Lowlands & Uplands Scotland enterprise base through increased innovation and a fuller use of its RTD base". The successful ERDF bid also refers to:
  - building on energy research 'pooling' across Scotland's universities
  - providing industry with a "clear line of sight to the most relevant academics and researchers" within the ETP
  - result in much greater levels of Knowledge Exchange (KE) and collaboration between the ETP and SMEs in Scotland
  - increase the absorptive capacity of SMEs for innovation
  - promote investment in Business Enterprise Research and Development (BERD).
- ***Scottish Enterprise*** - linking to the following: "Promote the commercialisation of our academic research". The brief for this evaluation contains references to the following statements from SE: "The world class research carried out by our universities and research institutes is one of the biggest assets we have at our disposal. If we are to improve Scotland's productivity we must create more value from this research for

Scotland's economy" and "We will give greater emphasis to getting the most out of our intellectual assets and where appropriate, we will bring in additional entrepreneurial expertise to help drive these projects out of the universities and company base and turn them into fast growing companies".

- ***Scottish Funding Council*** - which on the subject of knowledge exchange has stated: "Working with Scotland's colleges and universities, and our key delivery partners, we will aim to achieve: an effective, demand-driven exchange of knowledge and expertise with business and public and third sector organisations, which enhances competitiveness and promotes economic growth; the formation of new knowledge-based businesses; easy access for small and medium-sized enterprises (SMEs) to the facilities and services of colleges and universities".

Of course in addition to the above, the focus of the KEN's work, namely to support SMEs to access information, expertise and funding for innovation, is widely regarded as a persistent area of market failure which provides further justification for the public sector to intervene through providing financial support.

### *4.1 Present context*

Supporting renewable energy in Scotland, both technology development and energy generation, continues to be one of the Scottish Government's key priorities. This is articulated by for example the Government's '2020 Routemap for Renewable Energy in Scotland'[2] published in 2011. It is further indicated by more recent funding announcements by the Scottish Government: £6m for the wave and tidal energy sub-sectors in April 2014 and £2m for marine energy in February 2014. The focus on renewables together with other low carbon technologies such as carbon capture and storage (CCS) is part of a wider policy agenda associated with progressing to a low carbon economy.

In response to this policy priority, SE currently offers a range of services to support innovative renewable energy and related projects, including:

- *Renewable Energy Investment Fund (REIF)* - delivered by the Scottish Investment Bank, the REIF provides loans, equity finance or financial guarantees for commercial or community projects in Scotland: funding is to support projects at the "test or commercialisation stage"
- *Smart Grid project funding* - aimed at companies, it supports innovation in the areas of power transmission and distribution
- *Scottish Energy Laboratory* - an initiative which promotes Scotland's test and demonstration facilities that are relevant to research through to deployment of various energy technologies (including renewables, CCS and oil & gas).

Other support referred to by the SE website[3] include:

- *Prototyping for Offshore Wind Energy Renewables Scotland (POWERS)* - a fund open to Offshore Wind turbine manufacturers: it supports the capital costs associated with the full scale production (not individual component parts) of next generation wind turbine prototypes
- *Offshore Wind Expert Support programme* - offers up to two full days of free, one-to-one advice and guidance about diversification of a business into the offshore wind sector
- *National Renewables Infrastructure Fund* - established to stimulate an offshore wind supply chain in Scotland, it is aimed at port and near-port manufacturing locations for offshore wind turbines and related developments, including support for test and demonstration activity.

---

[2] http://www.scotland.gov.uk/Resource/Doc/917/0118802.pdf

[3] www.scottish-enterprise.com/industry-support/renewable-energy

These SE initiatives confirm the ongoing strategic importance of the energy industry to economic development in Scotland. By extension, they help to re-affirm that the ETP's KEN initiative, given its focus on innovation in renewable energy and related low carbon technologies, remains well positioned in terms of strategic priorities.

Scottish Development International and SE currently promote Scotland's capabilities in renewable energy towards potential inward investors, including by reference to three major facilities:

- *International Technology and Renewable Energy Zone* (ITREZ) - an alliance of the public, private and academic sectors which aims to attract investment and innovation to Scotland's renewable energy sector. ITREZ is already home to the Offshore Renewable Energy Catapult and close to the University of Strathclyde's new Technology and Innovation Centre
- *Energetica* - a 25-year planned development of an 'exemplar low carbon, sustainable development corridor that will attract energy organisations and individuals' to the Aberdeen area
- *Energy Park Fife* - a facility to support the growth of the renewable energy sector in Scotland, especially suited for a range of marine energy activities in e.g. R&D, manufacturing, operations and maintenance.

Scotland's other economic development agency, Highlands and Islands Enterprise (HIE), continues to regard renewable energy as a priority, growth sector: its web site[4] states that "the Highlands and Islands is bidding to be a world capital for renewable energy".

The SFC's Strategic Plan 2012-15 ("Delivering ambitious change") records a commitment to supporting world-class research in Scotland in selected areas which include renewable energy. The strategy notes: "there will continue to be a policy focus in Scotland on promoting environmental sustainability by using resources more efficiently, and on a 42% reduction in carbon emissions by 2020. The combination of our research expertise, engineering and industrial base, and our natural resources in wind, water and offsite storage capacity, will also provide an economic opportunity for Scotland to become a world-leader in renewable energy technologies and services". Much of this research expertise resides in the university members of the ETP.

The SFC, working in partnership with SE and HIE, has recently established eight new Innovation Centres that are hosted by Scottish universities. These include: (i) CENSIS, a centre focused on sensor and imaging systems - CENSIS identifies renewables as one of its key markets; (ii) Construction Scotland Innovation Centre which is likely to establish innovation support activities relevant to the built environment in a low carbon economy; and (iii) the Data Lab which is establishing links with the energy and utilities sector by partnering with companies working in wave, tidal, offshore wind and hydro energy. So whilst there is no dedicated centre for the renewables sector, a number of the new innovation centres have interests in technologies and markets similar to those that are in scope for the KEN.

Another entrant to the innovation support system is the Offshore Renewable Energy Catapult[5], a UK-wide initiative funded by Innovate UK (formerly the Technology Strategy Board) which has links to the ETP: there is an overlap in board membership of the ETP and the Catapult. The Catapult's activities and services include an "SME offer". As with the KEN and its links to the Scottish Energy Laboratory, the Catapult refers to development and testing of offshore renewable energy technologies amongst its intended areas of activity.

---

[4] www.hie.co.uk/growth-sectors/energy

[5] https://ore.catapult.org.uk/about-us

**COMMENT**

Overall, support in Scotland for innovation and for business and supply chain development in renewable energy and related low carbon technologies remains high and this is likely to continue for some considerable time to be a key policy priority. To this extent, the focus areas of the KEN remain highly relevant to Scotland's economic development.

In the original ERDF submission there is an explicit reference to part of the KEN funding being used to *"re-enforce* connectivity" between related projects and "provide synergy*"* in the planning and funding of collaborative activities such as marketing, joint events, feasibility studies, shared administration etc.

These references are notable in the context of considering the place of the KEN going forward in the changed innovation support landscape in Scotland: an important issue for the KEN's management (and indeed for the ETP's) is the degree to which it is still strategically positioned to provide linking functions across the broad scope of energy and related low carbon technology developments, especially in light of the new entrants to the landscape in Scotland.

### *4.2 Stakeholder perspectives on strategic issues*

Findings from the primary research with stakeholders are relevant here. These include assessments of the KEN project and its achievements to date: the stakeholders also offer views on the relevance and strategic positioning of the KEN going forward given the nature of the innovation support landscape that has now developed in Scotland.

#### *University perspectives*

This section draws on the views contributed by two senior academics involved with the KEN at a strategic level. The academic contacts were those advised by the client.

In terms of personal and institutional involvement with the KEN, both have strategic board/advisory roles - one as a member of ETP's Advisory Group who was involved both in writing the initial funding bid and with the appointment of key ETP staff, including some of the BDMs; the second as co-Director of the ETP and line manager for the BDM for Energy Storage & Conversion.

The consultees do not often become involved directly in the KEN other than where appropriate in an advisory role to ensure a candidate project is feasible and achievable in the available timeframe, or to advise on re-framing when a project proposal is unsuccessful. The academic consultees' role can also extend to the provision of technical advice to a BDM and, in a few cases where a project has reflected the academic's own particular specialism, they have participated directly in project work. When involved with a project, they report that it has brought them useful new contacts in other institutions (for example within a Catapult Centre).

In terms of the value to their institution, the KEN's offer is considered to be a useful and effective adjunct to similar work the universities fund themselves. It covers both a wide spectrum but also provides a specific technological focus that the universities are not necessarily able to provide.

Of particular relevance to this section of the report on strategic context and 'fit', the consultees were asked about the positioning of the KEN. One consultee described the KEN as "playing in the same court" as the Scottish Government in terms of supporting the Government's agenda and priorities, and also those of SE. Moreover, a lot of work and people, including SE's Scottish Energy Laboratory (SEL), map onto the KEN's activity. In a similar vein, and as mentioned earlier, there is no SFC Innovation Centre which overlaps with the KEN's key themes, other than the Oil & Gas Innovation Centre: the KEN is seen as addressing a gap which neither the universities nor the cognate support infrastructure fully focus on. In the academic consultees' opinion, the relationships that exist between the public bodies in Scotland and the KEN are positive and effective: there is commonality and complementarity in their roles.

The view was also expressed by one consultee that *"the KEN undertakes a role that is more suited than SE in addressing the challenge of taking innovation from universities to industry".* Whilst initially one of the

academic consultees had reservations about the KEN, now it was felt that the ETP and the KEN were proving to be “a good model that has worked better than expected”.

It was acknowledged that managing the transition between current and future KEN contracts in the context of addressing funding renewal will be challenging. The coming months will need careful managing in terms of identifying future sources of funding and dealing with the inevitable staff churn that occurs towards the end of a contract.

**COMMENT**

University stakeholders emphasise the ongoing ‘fit’ between the scope of the KEN and the policy context and economic priorities for Scotland. They acknowledge changes in the innovation support landscape but appear to be confident that the KEN can continue to play a useful part within the range of support now on offer.

Given the timing of the funding renewal requirement for the KEN in 2015 and the new entrants in the innovation support system, it is likely that the KEN will need to be modelled/refreshed with this new landscape in mind if it is to retain or indeed enhance its strategic importance. Current supporters such as SE and SFC are closely involved in the funding and development of new cognate initiatives in support of innovation in renewables.

### *Public sector stakeholder perspectives*

Two stakeholder consultees provided perspectives from the Scottish Government and SE. It should be noted that the feedback was specific to each of their differing remits, which either related to an aspect of the energy industry within the KEN's overall offer, or to a strategic, representational role towards framing the direction of the ETP and the KEN.

On the significance of the KEN for policy objectives, its portfolio of activity aligns with SE's priorities in relation to Offshore Wind and Smart Grids, in which one of the consultees is engaged. It provides useful, practical support to this aspect of energy in that it links into other services that SE provides and enhances the coherence of the range of support on offer to a company operating in the field. The KEN is undertaking work with companies in areas not necessarily directly provided for before (Smart Grids was cited); it refers companies and accepts referrals; and the regular meetings that take place between SE and the ETP enable sharing of knowledge and experience, with updates on progress on relevant projects. All this has brought synergistic benefit to both parties.

Strategically, the Scottish Government representative still sees much value in the KEN offer: on the research side the consultee maintains that the ETP has achieved appreciably in terms of putting in place good doctoral students and in leveraging in money from industry to support students. This was commended as a success.

In terms of the annual events run for students and stakeholders, the impression gained was that a very successful community has been established for students and businesses, and those engaging with the ETP/KEN seem genuinely to be pleased.

On the structure of the KEN and role of the BDMs, the KEN’s broad mix of energy strands enables the ETP to cover all bases in energy in Scotland: this is very helpful to the Scottish Government. The unpredictability in some cases of the speed at which certain areas of energy technology and systems develop was raised. Carbon Capture & Storage (CCS) was cited as an example where it was thought that the technology would come to the fore but for reasons beyond ETP and the KEN it has not developed as fast as was envisaged. Whilst this is outside KEN's sphere of influence, there is therefore a need for operational flexibility within KEN: it is acknowledged that this can be an operational challenge as, for example, a “BDM with specialist expertise in CCS cannot suddenly transfer to biomass”. However, it is acknowledged that the KEN is already “reasonably flexible because of the way it is set up”.

A further challenge for the KEN is the sense that it lies both within and out with the university sector. This view reflects the tension identified elsewhere in this evaluation, in some cases by academic consultees and by BDMs.

Another issue is the perception sometimes that the KEN is a Strathclyde University initiative rather than a collaborative one in which only the central function sitting within this university. (The question of whether the BDMs have university or 'etp' email addresses was raised as an example of something that can cause confusion.)

Staff recruitment is recognised as a problem in some cases. The instance of recruiting the BDM and Technology Transfer Manager in Wind and Power is given as an example: there were few appropriate candidates and recruiting the Technology Transfer post was unsuccessful originally. In the end it was agreed with ERDF that the technology transfer input would be a shared resource, coming from a range of sources dependent on company needs. One consultee acknowledged that this may have turned out to be a benefit, but in the process time was lost - a particular problem with a time-limited contract.

The question of staff retention was also raised, again always a problem with fixed term contracts: “The loss of people is always an issue ... it is the nature of this type of programme”. However, the question was raised as to whether the BDM contract could be made more attractive because the posts are short-term (in terms of salary) and whether this could counter the danger of losing key staff. However, it was recognised that people will always start to look around as contracts draw to an end (of course potentially this is the situation now facing the KEN).

The 'stop-start' nature of relatively short-term funding was raised in relation to maintaining the pipeline of referrals and projects that have been built up. If some mechanism can be put in place to ensure a relatively seamless transfer between one phase of funding and the next, that would be useful. Equally, capturing and disseminating the learning that has emerged through the experience of the initiative is important even if the initiative ends.

Management of the funding cycle, and funding throughout the cycle, are also issues raised by one consultee. Two matters in particular are noted:

- first, although the KEN is coming to the end of its current funding cycle it is not clear that there is a long-term plan in place for continuing the initiative after this cycle ends. The importance of considering the question of future funding, and funding sources, at an early stage is emphasised. (It is understood from KEN management that future funding was raised at the ETP Advisory Group meeting in March 2014.)

- second, the Scottish Government operates a budget line rather than maintaining a specific funding pot marked ‘ETP’. This means that if ETP/KEN underspend, the funding does not transfer to KEN's budget for the following year but is rolled into the Government's budget for the following year and deployed elsewhere. If the money is not claimed as scheduled this results in problems for the funder’s budgeting. It was recognised that a number of issues may arise here: funders may not articulate reporting needs sufficiently clearly; the nuances of funding processes differ between sources; and the ETP is reliant on various ‘satellite’ organisations to gather information which contributes to grant claims. Finally, whilst it was raised as an issue to be reported here, it was also acknowledged that the ETP/KEN is no worse than other funded initiatives. (It should be noted that the KEN project manager believes claims have been submitted on time.)

A final point raised in relation to the operation of the KEN concerned its visibility and whether sufficient visibility is being generated beyond the ETP's customer base. There was uncertainty as to how ETP/KEN market themselves in general but in particular to Government. Whilst funders receive Board reports, these in themselves do not provide confidence that the ETP/KEN is feeding into the key funders and their strategic structures at a high level: where beyond the Board is the material contained in Board reports visible?

Quarterly briefings were suggested to provide clarity on and articulate the ETP/KEN's differentiation and justification for continued funding, and also to give early notification of any variances to budget.

On KEN's targeting, the ERDF's requirement to target support at SMEs is understood. However, the capacity of very small businesses in particular to work with universities, is raised having previously been broached in an interim review (according to the consultee). Concern was expressed as to how much capacity a very small company has to undertake KEN-type projects: on the positive side, the KEN projects could be viewed as being about starting to build the capacity of micro-businesses to work with universities. Whether capacity development projects with micro-businesses would be attractive to academics, or generate impact of the nature and in the timescale required by ERDF, is unclear: the consultee admittedly did not know what the ideal mix of company clients would be if the ERDF limitations did not exist.

The importance of involving larger companies in order for SMEs to develop was noted: some areas of energy have lost out to others because of where SMEs are located and due to the nature of the firms involved e.g. in wind the companies involved in the sector are mainly large, not SMEs. Other energy themes have also been challenging for the KEN, raising the question as to whether the current targeting is optimal. Offshore Wind, for example, has taken longer to get up and running than was envisaged when the KEN was set up, and CCS is similar, having faced delays and a reduction in funding for establishing demonstrators.

**COMMENT**

The consultees offered a positive view of the KEN albeit with recommendations to re-examine its operating practices in a number of specific ways. These are interpreted here as:

- a re-assessment of the KEN's branding and marketing in the context of its relationship with individual universities and with the ETP
- a more proactive approach to strategic briefing/marketing towards its funders
- a review of its staff recruitment and retention incentives - with particular concerns about continuity of staff as the present funding comes to an end
- a re-assessment of what is the optimal targeting of the KEN's products and services - in terms of energy themes and types (sizes) of companies.

The support environment has changed since ETP was launched, and it is important that the overlaps are understood. These need to be mapped and the findings fed into any analysis used to inform future design of the KEN's structure and products. Indeed it is important to determine, on the basis of all the additional support that has come on-stream since the ETP and the KEN were set up, whether the KEN project is still necessary. Important changes include:

- the Catapults coming on stream: the ORE Catapult (Offshore Renewable Energy Catapult) based in Glasgow, is part of the Renewable Energy Zone and is running facilities at NAREC. It is operating in part of the same landscape as the KEN offer[6]. Such a UK-wide initiative represents a significant change to how facilities might be accessed and could also provide opportunities to broaden the KEN
- Innovate UK is also involved in this area: the question was raised as to whether there is an opportunity to look to it to form an association with the ETP/KEN as the former provides significant funding to projects in the energy area
- the SFC's work with SE on the Innovation Centres was also mentioned: collaborative programmes were noted, although these are apparently not presently in Energy and Renewables

[6] The KEN BDM for wind energy is on part-time secondment to the ORE Catapult.

  - the eight Innovation Centres approved with funding for ten years can provide companies with access to university expertise and to opportunities to undertake collaborative research. It will be important to look at how ETP and the KEN are connected to the Innovation Centres and to make sure there is clarity in the market over respective roles: there is potential for confusion

- another area of potential confusion is in biofuels: SE is involved in a collaborative project, the Scottish Biofuels Programme (SBP), which is run out of Edinburgh Napier University. ETP is not a part of this although it does have a biomass BDM. The consultee did not know why there is no link between the two and argued for the importance of making connections between the ETP, the Scottish Biofuels Programme and the Innovation Centres. (A briefing on this issue from KEN management reports the following: the KEN's BDM for biomass is working closely with a counterpart in the Scottish Biofuels Programme having agreed that ETP will focus on engineering aspects and SBP focus on other areas. They have forwarded opportunities to each other and attend each other's events. In addition, the ETP set up two meetings of the project managers of related ERDF projects including the SBP, although these were held in the early phase of the KEN project.)

- similarly, in the Low Carbon Built Environment, the Construction Scotland Innovation Centre is likely to be undertaking similar work to that which the BDM for the Built Environment undertakes within the KEN.

One important recommendation therefore is the need to understand the current environment and where the ETP and the KEN now fit in. One consultee believes there is potentially a continuing role for the ETP but it is necessary to recognise that it is now operating in a different market place. That said, this consultee believes that fundamentally the KEN is now delivering what had been hoped for at the outset.

**COMMENT**

Given the changes to the energy-related innovation support landscape in Scotland since the ETP and the KEN were established, plus the short time to the end of the KEN funding, a priority in seeking to secure continuation will be to set out a re-freshed vision and a mode of operation for the KEN (perhaps also for the ETP) that is relevant and adds substantial value, taking into account the new entrants.

Candidly, in the realm of public sector support, there can be an attraction to 'novelty' at the expense of the tried-and-tested.

Stakeholder feedback suggests that the KEN has a window of opportunity to make the case for continuity - and to do so with a measure of goodwill as a legacy of its achievements to date.

On support for projects, one point was raised regarding the identification and definition of projects under the KEN. It was emphasised that project proposals need to be company-led: the company needs to approach the university. (However, from an ETP/KEN viewpoint this is expressed preferably as: ".. project proposals need to be demand-led in that the company needs have to be addressed by the university".) According to the consultee, the starting point for establishing the ETP and the KEN was universities and Government holding the view that university-business collaboration will be "good for businesses". The KEN did not originate from the businesses themselves identifying they have this need. So the challenge that ETP and the KEN face is trying to match the top-down policy position that "this is a good thing to do", with a bottom-up approach where businesses recognise the benefits of working with a university in order to move their innovations and developments forward.

**COMMENT**

This is a key observation, that in may respects the KEN projects are not necessarily 'demand-led'. If businesses are offered the opportunity to access funding through an 'easy' procedure, and have to take 'no skin in the game' then both the learning process for the companies and their commitment to engage and consider project outputs fully may be called into doubt.

Success in this situation may be dependent largely on the skills and influence of the BDM: it may also be dependent on the level of pressure to undertake work which counts towards metrics - which may be not be always clearly or consistently defined, or fully justified by explicit company demand.

If the KEN is to continue to work with small enterprises there would be merit in re-examining how managers in these companies (as the potential end users of what the BDMs help put in place) can be incentivised and resourced to be more active participants in the Consultancy Projects that are being undertaken within the universities.

On the future of the KEN, one consultee notes that whilst some very interesting projects have been generated as a result of its intervention, there would be value in further information and insight into what happens next and any impacts that have been achieved. Whilst it is recognised that any tangible impacts can be difficult to identify because a lot of the KEN work with SMEs is at an early stage in the R&D and innovation process, this consultee is looking for reassurance that the projects are being targeted appropriately, are sufficiently challenging in terms of what they will deliver, and are of sufficient interest to academics in order to engage them[7]. It is noted that one of the challenges of interventions such as the KEN is that the need to meet targets can dominate: it can influence the type of project taken on - "activity may take precedence". It is important for the management of the ETP and the KEN to give funders a sense of:

- *what makes a successful project* - and whether follow-on work through other interventions (e.g. Knowledge Transfer Partnerships etc.) are being considered, and whether the company is more willing to contribute resources themselves as they become aware of the benefits of the KEN's intervention. In a nutshell, more clarity is required as to whether a KEN project is a one-off or the start of a journey
- *the matching process* - which it is suggested is extremely important: if the company, the academic and the BDM 'click' there is likely to be a shared understanding and clarity about what is going to be produced i.e. the purpose of the project, the outputs and the business benefit
- *whether the 'right' kind of projects are being delivered for the 'right' kind of companies* - and that both the academic and the company have the time and resources to implement appropriately the findings of the project. One consultee noted that sometimes it may be necessary to decide not to go ahead with a project - "and that can be difficult" - but the funding will be used most effectively with a rigorous process of assessment in place at the outset.

**COMMENT**

Some of the issues raised above are addressed later in this evaluation report. There are several important observations to make at this point:

- it is not clear that an explicit process of through-project engagement between company and project provider is in place - one should be considered
- it is not clear that an explicit process of after project assessment with the company is in place nor that an aftercare or onward referral process is in place with companies - these should be considered.

There is a sense that these types of activities may be undertaken sometimes, but relatively informally and only by some BDMs.

[7] ETP/KEN management reports that the fact that ERDF does not allow for full economic costs to be paid (i.e. only gross salary is met, not overheads) has been a significant barrier to engagement with some academics / universities.

## 5. Inputs to the KEN project

This section examines the background documents and monitoring records for the KEN project. On activities and outputs, it compares 'actuals' with target metrics. It also reports on the level of client satisfaction with the operation of the KEN.

### *5.1 Financial inputs*

The financial input to the KEN to date consists of c. £3m from a mix of sources: the European Regional Development Fund (ERDF), Scottish Government, Scottish Funding Council, Scottish Enterprise and ETP Member Universities. It is understand that the breakdown of the financial input is as follows:

- total project cost: £3,003,926 spread over the period November 2011 to March 2015
- grant support from the ERDF: £1,051,374 (an intervention rate of 35%)
- matching funds for the period:
    - ETP universities: £150,000
    - other public sector sources: £500,000 from Scottish Enterprise; £396,000 from the Scottish Funding Council; £900,000 from the Scottish Government
    - £6,552 from other places.

The ERDF funding comes from the Lowlands and Uplands Scotland European Regional Development Fund 2007-2013 programme. The award was made to the University of Strathclyde for the KEN project to run from 1 June 2011 to 31 May 2014.

It is understood that due to early delays in recruitment of staff, the KEN experienced an underspend and this has led to an agreement with funders to extend the term of the KEN initiative by c.10 months, to end quarter 1 of 2015.

**TABLE 2 : SUMMARY OF BUDGET INFORMATION (AS OF JANUARY 2014)**

| Total Budget for 2011-2015 | ORIGINAL | REVISION (of 1.4.10) | VIREMENT |
|---|---|---|---|
| Total project cost | £3,003,926 | £3,003,926 | |
| Eligible Match Funding | £1,952,552 | £1,952,552 | |
| Structural Funds Grant | £1,051,374 | £1,051,374 | |
| Intervention rate | 0.35 | 0.35 | |
| Project start date | 1 June 2011 | 1 Nov 2011 | |
| Project (physical) end date | 31 May 2014 | 31 March 2015 | |
| Staff costs | £2,746,926 | £2,188,670 | - £558,256 |
| Consultancy & Secondments | £100,000 | £538,256 | + £438,256 |
| Staff travel | £114,000 | £114,000 | |
| Marketing | £43,000 | £163,000 | + £120,000 |
| TOTAL: | £3,003,926 | £3,003,926 | |

**TABLE 3: SPEND PROFILE PER ANNUM**

| | Yr 1 (Nov 11 to Nov 12) | Yr 2 (Dec 12 to Nov. 13) | Yr 3 (Dec 13 to Nov. 14) | Yr 4 (Dec 14 to March 15) | TOTALS |
|---|---|---|---|---|---|
| Staff costs | £590,387 | £608,032 | £707,898 | £282,353 | £2,188,670 |
| Consultancy and secondments | £0 | £66,087 | £434,190 | £37,979 | £538,256 |
| Staff travel | £20,899 | £36,101 | £43,000 | £14,000 | £114,000 |
| Marketing | £38,614 | £37,929 | £77,232 | £9,225 | £163,000 |
| TOTALS: | £649,900 | £748,149 | £1,262,320 | £343,557 | £3,003,926 |

*Notification of change in budget profile*

The term and budget profile of the KEN was subject to a variation of the funding agreement earlier in 2014. The end date of the contract with all funders was extended to 31 March, 2015. A formal Notification of Change Assessment form was submitted in January 2014. It set out a number of reasons for the change request:

- to restructure the budget in order to increase Consultancy Project funding
- to restructure staffing as the single discipline Technology Transfer Manager (TTM) role was no longer considered effective
    - reference made to the CCS theme needing Business Development Managers (BDMs) with technical expertise and network support rather than Technology Transfer Managers (TTMs)
- reduction in headcount from 19 to 15: this now includes a new project assistant role
- an initial delay in recruitment.

### *5.2 Staffing inputs*

The KEN funding has supported a cadre of BDMs which, working as a team with specialist as well as generalist knowledge, offers support in the following thematic areas:

- marine renewables
- grid & power networks & systems
- wind energy
- solar
- energy conversion & storage
- energy utilisation in buildings
- carbon capture & storage - three staff members assigned to this theme[8]
- bio-energy

[8] There is reference in contextual documents made available to this evaluation of a further grant of £2m approved in February 2011 to a CCS '*Knowledge Hub*' at the University of Edinburgh, Heriot-Watt University and the British Geological Survey (BGS): the funds provided employ staff at the two universities.

- plus a link person to the testing facilities and services of the Scottish Energy Laboratory[9].

It is understood that an early distinction between technology transfer and business development roles was abandoned in favour of a combined job description as Business Development Managers (BDMs). Also, a theme associated with diversification by SMEs in the upstream oil & gas sector was abandoned as a suitable recruit to the BDM position could not be obtained.

The precise number and identify of BDMs has changed over time but the brief for this evaluation (i.e. at September, 2014) referred to a staff resource of 11 BDMs plus input from a dedicated KEN manager, a contribution from the ETP Executive Director and an administrator. Table 4 shows the staffing breakdown in the original project plan (V.1) and in December 2013 when a Notification of Change was submitted (V.2).

**TABLE 4: SUMMARY OF STAFFING LEVEL ALLOCATION AND RETENTION**

| | Staff post allocation **(V.1)** | Staff post allocation **(V.2)** | **Retention** |
|---|---|---|---|
| ETP KEN director/management/admin | 3 | 4 | Project Assistant remains same |
| Power Systems | 2 (1 unfilled) | 1 | Remains same |
| Wind | 2 (1 unfilled) | 1 | Remains same |
| Marine | 2 | 1 | One remains same |
| CCS | 4 | 3 | Only one remains same |
| Storage | 1 | 1 | Remains same |
| SEL | 1 | - | Reportedly the post was vacant (at time of V2) pending resource being secured from a funder. |
| Built environments | 1 | 1 | Remains same |
| Bio-energy | 1 | 1 | Remains same |
| Solar | 1 | 1 | Remains same |
| O&G Diversification | 1 (unfilled) | 1 (unfilled) | |
| TOTALS: | 19 posts in original project plan | 15 posts in revised project plan | |

The BDMs are dispersed throughout a sub-set of the allied universities viz. Aberdeen, St Andrews, Edinburgh and Heriot-Watt as well as Strathclyde. The BDMs are employed by their host institution. They are expected to engage with all 12 ETP universities: they are expected to cross-refer approaches from firms to appropriate points of contact across Network.

[9] www.scottishenergylaboratory.com

**COMMENT**

Staff recruitment and retention appear to have introduced operational challenges for the KEN.

We understand that it was an initial delay in recruitment that created the need for a 3 month extension of the project into 2015.

From the information in Table 4, it appears that three posts remained unfilled throughout. We estimate that c. 6 posts have seen changes in staff over the course of the project, including at senior management level. The management changes date from mid-2013.

Future resourcing of the KEN will need to re-assess what is required in terms of remuneration in order to be competitive in attracting staff with the necessary knowledge and experience.

(We refer elsewhere in this report to the implications of one unfilled post and its links to the 'lost' opportunity to support diversification amongst SMEs in the upstream oil & gas sector.)

## 6. Activities and outputs

### *6.1 Governance and management*

It is at the level of the ETP that governance and steering issues of relevance to the KEN initiative are handled. The ETP Directorate provides senior-level research leadership from each of three Scottish regional engineering research 'pools' (in Glasgow, Edinburgh, Aberdeen) as well as from the energy conversion & storage expertise at the University of St. Andrews. The remit of the Directorate, which contains six university representatives plus the ETP Executive Director, includes:

- development of the ETP's basic, strategic and applied research agendas
- building/consolidation of ETP research partnerships and co-operative working
- coordination of the regional research 'pool's' energy research activities
- building ETP's energy research reputation, capacity and capabilities
- outreach and co-operation with other research 'pools' in Scotland
- positioning the ETP alongside all relevant funding opportunities, and identification of common R&D opportunities
- supporting the coordination of ETP engagement with external organisations.

An Advisory Group provides strategic advice and support to the ETP in relation to industry and policy matters of relevance to the Scottish RD&D community: members include senior industry and public sector agency representatives as well as representatives of a sub-set of ETP universities. This group's remit includes:

- consideration of the interaction between industry and policy issues with the ETP's basic, strategic and applied RD&D agenda and activities
- contribution to the practical development and sustainability of the ETP
- assistance in the identification of generic energy research funding opportunities
- provision of independent, transparent validation of ETP development
- oversight and review of ETP programmes and activities
- biannual meeting for engagement with the ETP Directorate.

The executive management team for the ETP and for the KEN changed in mid 2013. It has not been an objective of this evaluation to undertake a 'before and after' operational process comparison. However, reportedly the definition of KEN products and performance metrics were tightened up by the new management team.

The original bid for support for the KEN included reference to market demand evidence for industrial development in each of the ETP's thematic areas. This evidence was derived from prior market intelligence studies commissioned by SE, input from the ETP Advisory Board, reportedly high levels of enquiry going directly to ETP academics, and from market research undertaken on behalf of the Scottish Energy Laboratory. The prior research identified a highly fragmented SME base in low carbon industry sectors with a strong need for support to de-risk innovative ideas and opportunities.

In this context, the case was made for access to 'pump priming' support from the public sector: it was seen as too early for ETP to seek significant co-funding for its work from industry. However, it was clear that a key success factor would be the ability to leverage in new industry and other funding following this initial project phase.

The original bid for ERDF funding refers to an equalities assessment, specifically on: (i) equal, non-discriminatory recruitment; and (ii) outputs delivered to SMEs and others in a non-discriminatory basis. This evaluation has not encountered any evidence to suggest other than that these principles have been adhered to. We understand that ETP university members have their own equalities and diversity policies which govern recruitment of posts to the various institutions hosting BDMs: again the evaluation has not encountered any evidence that these have not been adhered to for the KEN project. The original bid indicated that the KEN project would have no direct impact on social inclusion although its support for the creation or safeguarding of employment may make a relevant contribution. Based on the evidence gathered for this evaluation, this remains a fair statement of the position.

### *Management*

The following vignettes report on issues raised by individual businesses during interview that are relevant to the management of the KEN. They raise questions over the KEN's role in quality assurance and control over the project work that it funds.

**Finding the right people from a small pool of experts is an important service**

One company needed expert support to test a proposition. The consultee found out about ETP via the Internet. The consultee said there are only a handful of people who could have done the research that was required and the KEN sourced them: "We could not have done the research without them". The research showed the idea to be feasible but for reasons unrelated to the KEN study the project did not proceed, although the idea remains to be developed in future, should the opportunity arise. ***The consultee said that the ETP needs to do more to advertise itself as many firms could benefit from working with it. The consultee also said that the ETP needs to show firms how to work with universities in order to make the most of the opportunities on offer.***

**Successful projects operate a two-way process with both sides investing as much as the other**

One company was involved in a consultancy project that was essentially a 'mentoring' project. The basic approach to the process was for the company to ask for input from the mentor and then listen to and act on the advice that was given. The company consultee described the process as having generated a useful and flexible exchange of information. The firm now has a prototype and expects to move into pre-production and then on to full production within 6 months. ***The main lessons the company consultee drew from the project was that the firm needs to put in as much effort as the academics, that everyone needs to understand each party has a role to play, and that the relationship with the academic should be developed as early as possible in the process, in order for he or she to add most value.***

**Poor communication and different expectations of the process can sometimes occur**

One company required a prototype to be developed and tested. An introduction to the KEN was made via personal networks: initial conversations with the KEN were said to be 'very positive'. The consultee thought the process would be that staff at the university would build a scale model based on the concept provided and that the company would be involved in testing it – but that is not what transpired. The consultee indicated the process was supposed to have been completed by late November 2013, but the prototype was not built until Easter 2014. The consultee was invited to see the prototype but it was not available when the visit to the university was made. At the time of this consultation, in September 2014, the firm had received a 4-page report but still had not seen the model. The consultee thought the university seemed to be too busy – and was not sure the idea had been taken seriously. The consultee indicated that the company had learned from the process: if it was to do it again, it would be more 'forceful'. ***This is interpreted here as the KEN needs to re-assess the role of the BDMs in quality assurance and control.***

**Universities and researchers can be thought to pursue their own agendas rather than respond to a brief**

One company was happy with the engagement it had had with the KEN but was unhappy with the prototype that had been produced by postgraduate students: it was also unhappy with the process by which the prototype had been developed. The consultee indicated that the prototype was not at the scale originally envisaged nor was it made of the materials that had been expected. The consultee indicated that this meant the results from any tests would add little to what is needed to be known. The consultee observed that for individuals or small businesses with limited resources there appears to be no option but to "go through universities to get funds to support R&D and innovation", but that universities/researchers can pursue their own agendas rather than carry out the work required by a small firm. ***The consultee went on to say that a grant to enable an engineering company to be commissioned to build a prototype may have been of more use than support for the work to be carried out in a university.***

### *6.2 Activities and outputs*

There are three main elements to the assistance that the KEN project offers to SMEs:[10]

- '*Company Supports*' - this involves a minimum of 4 hours of advice or "other useful engagement" with an SME
- '*Collaboration Supports'* - this involves facilitating a collaborative venture between an SME, a university and another organisation. The brief for this evaluation gives the following examples: "putting an SME in contact with a potential end-user for the product it is delivering, introducing the SME to a consortium bidding for grant funding, or introducing the SME into a network or association with common interests*"*.
- '*Consultancy Project*' - this involves an ETP university or an external consultant being funded to undertake a project to support an SME, at no cost to the SME. The support here is typically for feasibility studies, laboratory evaluations/testing or access to facilities for testing prototypes. Projects vary in scale of the finance provided: according to the evaluation brief "many have been around £5k and it would be exceptional for the cost to be over £30k".

Within the short project descriptions available to this evaluation, there is a small minority that refer to "mentorship" or "secondment". It is notable that the current ETP website refers to the launch of "three new products*"* viz. (i) ETP Energy Mentorships; (ii) ETP Industry Secondments; and (iii) ETP Enterprise Consultancy. These appear to replace or at least to be configured or branded differently from the products listed above.[11] The ETP should ensure consistency of product descriptions and branding.

---

[10] It should be noted that in the KEN's early stages there appears to have been some confusion as to definitions of outputs and how to categorise certain types of support provided to firms.

[11] Interestingly, the ETP web site also refers to activities associated with the well-established Knowledge Transfer Partnership (KTP) scheme. For KTPs, reportedly the current average project costs are around £65,000, albeit the proportion of public funding varies by company size. For an input of £65k the ETP website states that on average a business beneficiary of a KTP will experience the following changes in business performance: (i) an increase of over £300,000 in annual profits before tax; (ii) the creation of two "genuine*"* new jobs; and (iii) an increase in the skills of existing staff.

*Assessment of outputs*

The following draws on output data up to August 2014 supplied by the KEN management. It analyses totals achieved relative to the original ERDF targets. Full data are given in Table 5.

The activities undertaken as part of the KEN project up to August 2014 included:

- 230 "Company Supports" (75% achievement of the ERDF target total of 308).
- 75 "Collaborative Supports" (85% of the ERDF target total of 88). Of these, the following involved multiple "supports" for an individual company
  - 3 firms received two units of "Collaborative Supports"
  - 1 firm received four units of similar support
- 84 "Consultancy Projects" (105% of the ERDF target total of 80). The following involved multiple projects for an individual company
  - 7 firms received support for two projects
  - 3 firms received support for three projects.

Achievements to end November 2014 are reported to be 246 Company Supports (80% achievement against target), 75 Collaborative Projects (85% achievement) and 95 Consultancy Projects (119% achievement).

**COMMENT**

Based on this analysis, the KEN has already exceeded its (numerical) ERDF target for Consultancy Projects but still has some way to go to meet the targets for the other two modes of support. The project will operate until end March 2015 and so scope remains to make progress in these other areas.

However, as other evaluation evidence suggests, it is the Consultancy Projects that in general appear to add most value.

Table 5 provides details by 'product' and technology/energy sub-sector based on data provided by the KEN manager in late November 2014.

**TABLE 5: SUMMARY OF ACTIVITY PERFORMANCE OVER THREE YEAR PERIOD**

| Company Support Activity | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Sub Total |
| CCS | 1 | | | | 3 | | 2 | | | 3 | 10 | | | | 19 |
| Marine | 2 | 1 | 3 | 5 | 3 | 3 | 4 | 5 | 5 | 1 | 3 | | | | 35 |
| Wind | | 2 | | 4 | | 3 | 5 | | 2 | | 6 | | | | 22 |
| Power | | 1 | 2 | 2 | 1 | 6 | 5 | 3 | 3 | | 3 | | | | 26 |
| Solar | 1 | 3 | | 4 | | 7 | 3 | 5 | 3 | 1 | | | | | 27 |
| Bio-Energy | | | | 3 | 5 | 4 | 5 | 3 | | 1 | 4 | | | | 25 |
| Built Environment | | 2 | 7 | | 9 | 5 | 6 | | 6 | | 11 | | | | 46 |
| Conversion/Storage | | | | 1 | | | | 4 | 2 | | 6 | | | | 13 |
| Oil & Gas | | | | | | | | | | | | | | | 0 |
| SEL | 5 | 1 | 4 | 3 | 2 | | 2 | | | | | | | | 17 |
| Totals | 9 | 10 | 16 | 22 | 23 | 28 | 32 | 20 | 21 | 6 | 43 | 0 | 0 | 0 | 230 |

| Collaboration Support Activity | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Sub Total |
| CCS | | | | | | 1 | | | 1 | | | | | | 2 |
| Marine | | | | 5 | 2 | 2 | 5 | 3 | 5 | | | | | | 22 |
| Wind | | | | 1 | 2 | | | 1 | | | | | | | 4 |
| Power | | | | | | | | | | | | | | | 0 |
| Solar | 3 | | | | | | | 1 | | | | | | | 4 |
| Bio- Energy | | | | 1 | | 6 | 2 | 5 | 8 | | | | | | 22 |
| Built Environment | | 1 | 2 | | | 2 | 2 | 1 | 1 | | | | | | 9 |
| Conversion/Storage | 1 | | 1 | | 1 | 2 | | 6 | | | | | | | 11 |
| Oil & Gas | | | | | | | | | | | | | | | 0 |
| SEL | 1 | | | | | | | | | | | | | | 1 |
| Totals | 5 | 1 | 3 | 7 | 5 | 13 | 9 | 17 | 15 | 0 | 0 | 0 | 0 | 0 | 75 |

| Consultancy Projects Activity | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Sub Total |
| CCS | | | | | | | 1 | 3 | | | | | | | 4 |
| Marine | | | | | | | 1 | | 4 | | 3 | | | | 8 |
| Wind | | | | | | 2 | | | 1 | 1 | 10 | | | | 14 |
| Power | | | | 5 | 1 | 1 | 1 | 4 | 4 | 2 | 2 | | | | 20 |
| Solar | | | | | | 2 | | | 3 | | 1 | | | | 6 |
| Bio- Energy | | | | | | | | | 6 | 4 | 3 | | | | 13 |
| Built Environment | | | | | | | 1 | | | | 1 | | | | 2 |
| Conversion/Storage | | | | | | | | 1 | 2 | | 1 | | | | 4 |
| Oil & Gas | | | | | | | | | | | | | | | 0 |
| SEL | 6 | 2 | | | | | 5 | | | | | | | | 13 |
| Totals | 6 | 2 | 0 | 5 | 1 | 5 | 9 | 8 | 20 | 7 | 21 | 0 | 0 | 0 | 84 |

## COMMENT

As the oil & gas business base in Scotland has very substantive capability in offshore engineering that is of likely relevance to offshore renewable energy sub-sectors, the strategic significance of the absence of KEN activity on diversification should be examined carefully in the context of designing the KEN for the future. On the face of it, it may be an important missed opportunity.

Looking across the data for the three 'products' in Table 5, there are a number of features worthy of note: (i) whilst the Built Environment has the highest activity level for Company Supports (46), it has one of the lowest achievements for Consultancy Projects (two); and (ii) for marine, the achieved levels for Company Supports, Consultancy Projects and Collaboration Projects are 35, 8 and 22 respectively whereas, for example, for Solar the equivalent figures are 27, 6 and 4, i.e. a much lower conversion from initial engagement to a more intensive (potentially more impactful) intervention. On the face of it, these activity levels do not correspond to what might be expected from a process which delivers Company Support as an initial step in assessing the potential for more intensive support - why does a relatively high level of initial engagement translate for some themes into very low levels of take up of other products? In any future design of targets for and resource allocation to themes and 'products', KEN management should look more closely into the underlying reasons for this variability.

We have also been able to analyse activity data distributed by individual BDMs (or 'record managers') based on KEN monitoring records.[12] There is a highly variable pattern of 'conversion' from the initial Company Support to follow-on, potentially higher added value support. It ranges from 37 Company Supports to 5 follow-on activities at one extreme, to 25 Company Supports and 24 follow-on activities at the other. The

[12] This is based on activity data supplied to for study on 5 August 2014.

data also indicate substantial variations in the relative outputs by Collaboration Support and Consultancy Projects e.g. in one case the ratio is 2:19 and for another the same ratio is 10:3.

| COMMENT |
| --- |
| We have not undertaken a detailed audit of these data and there may be many reasons for the variability. We suspect that the ratios rather than the absolute numbers are of more significance. However, we suggest the different ratios are worthy of review by the KEN management going forward. One reason may be different definitions over time of what falls within the different KEN product categories. |

The KEN records also indicate which organisations have undertaken the consultancy projects on behalf of its client firms. The data in Table 6 shows the marked emphasis on support from a small number of providers.

**TABLE 6: SUMMARY OF CONSULTANCY PROJECTS BY PROVIDER**

| ORGANISATION | NUMBER OF PROJECTS |
| --- | --- |
| Aberdeen University | 2 |
| Edinburgh Napier University | 2 |
| Energy Technology Centre (ETC) | 11 |
| Flowave Ocean Energy Research Facility | 3 |
| Glasgow Caledonian University | 2 |
| Heriot-Watt University | 8 |
| PlySim Analysis Services | 1 |
| University of Edinburgh | 11 |
| University of Glasgow | 2 |
| University of Strathclyde | 40 |
| Energy Systems Research Unit (ESRU) | 1 |
| University of the Highlands and Islands | 1 |
| **TOTAL:** | 84 |

The data in Table 6 show a substantial emphasis on projects undertaken by one provider, namely the University of Strathclyde. Of the 84 projects listed in the table, 40 were undertaken at Strathclyde and one other involved Strathclyde in a collaboration. However, ETP/KEN management reports that Strathclyde's project activity has only been 31% by value (financial input) and that its level of activity is mainly attributable to projects in wind and power & grids, which management notes are the two SE priority areas.

**COMMENT**

The data on KEN activity reveals two notable factors: (i) the apparently low take-up in Consultancy Projects of the facilities offered by the SEL; and (ii) the dominance of projects that are undertaken by the University of Strathclyde.

This raises questions about the extent to which the KEN is exploiting the full rage of expertise and facilities in Scotland on behalf of its client companies: does meeting the needs of the KEN's clients require such a broad range of sources of support? And if not, can its BDM services be provided in a more concentrated way and without the need to disperse its staff to the same extent as at present?

### *6.3 Client satisfaction with KEN project processes*

Businesses were asked at interview to respond to queries concerning the quality and effectiveness of the KEN's delivery processes. The results are summarised below.

The scores are those provided by company interviewees that: (i) felt the factor was relevant to their engagement with the KEN; and/or (ii) were able to offer a score for the different forms of support received. On the latter point, some respondents appear to conflate what had been received under different KEN 'product' types and offer only an overall score. For these reasons, the total number of company responses on each factor listed in the table varies. Two firms declined to respond to the questions due to the minor level of input and benefits from the KEN during Collaboration Support. One firm declined to comment on satisfaction levels: "it is to early to judge". Two firms declined to respond due to a high level of dissatisfaction overall (see later).

**TABLE 7: BUSINESS RESPONSES SATISFACTION WITH THE KEN**

| Factor | 1 (very dissatisfied) | 2 (dissatisfied) | 3 (neither satisfied or dissatisfied) | 4 (satisfied) | 5 (very satisfied) |
|---|---|---|---|---|---|
| Quality of market-related advice and support from KEN staff | 1 | | 1 | 1 | 4 |
| Quality of technology-related advice and support from KEN staff | 2 | 1 | | 5 | 10 |
| Efficiency of the KEN's processes - timely delivery of what was promised | 3 | 1 | 2 | 4 | 12 |
| Your experience of working with university support for your project | 1 | | 4 | 6 | 13 |
| The overall quality/ value of the Company Support you received | | | 1 | 2 | 1 |
| The overall quality/ value of the Collaboration support you received | | | 1 | 2 | 6 |
| The quality/value of the output of the Consultancy Project | 2 | | 2 | 4 | 11 |

In a minority of cases, a number of polarised and in some cases highly critical views were expressed. The latter in particular should give the KEN's management cause for concern.

**Example 1:** The KEN's delivery process was efficient, delivering what was promised in a timely fashion. However, some of the academics involved did not understand commercial timescales: it is important to 'find the right academic who understands the commercialisation process'.

**Example 2:** One respondent observed that for small businesses with limited resources, there appears to be no option but to go through universities to get funds to support R&D and innovation. However, in his view, universities often seem to be pursuing their own agendas rather than carrying out the work required. He observed, for example, PhD students do not want simply to produce a prototype based on someone else's original work, as they have to show they have carried out original work themselves. All along he had simply wanted support to produce a prototype based on his design.

The respondent's experience with the KEN BDM has been more positive than his experience working with the university provider. It would have been more useful if the business could have obtained a grant to get an engineering company to build a prototype rather than having to work with a university.

**Example 3:** One part of the university support has in the view of the respondent, let the company down. "*It's a big department used to working with large companies*.' Whilst generally satisfied with the support received from the KEN, the problem is that it has taken around two years to get as far as they have: "the pace of movement is glacial". The respondent also thinks that the BDM involved is '*overloaded with work'*.

Two firms were especially dissatisfied with their experience of the KEN project. They declined to respond to the structured questioning during interview (i.e. their views are not reflected in the scores in Table 7) . Comments made during their interviews include: being confused about the process - lack of clarity over what KEN is and how it works; querying whether they had actually received any valid support; disputing the description of support and the named collaborators in the KEN activity records; its been "just a lot of hassle".

| COMMENT |
| --- |
| The overall picture is one of a high level of satisfaction with the KEN: a large majority of respondents are satisfied or very satisfied with what they experienced under the factors listed in Table 7. In some cases, respondents are fulsome in their praise of an individual BDM.<br><br>However, whilst it is expected that in such a survey of views there will be negative responses, the KEN appears to have a small number of very dissatisfied (irritated) clients. As these can harm the 'brand', to avoid such reputational risk the KEN management should review its client management/feedback procedures in order to sense and respond effectively when problems with individual clients arise, as they inevitably will from time to time. |

### *6.4 Activity and output monitoring records*

On 'Company Supports', the activity record includes company name; contact details; two fields for an 'opportunity' name and description; and 'record manager' which is the name of the relevant BDM. The records show:

- one client which appears to be an inventor rather than a company
- clients which vary in size from a sole trader to (at least) medium sized firms
- a university-based centre as a client
- highly variable content in the opportunity description field e.g. ranging from no entry in 11 cases, to text with little content ('Stakeholder meeting' or 'Company support') to entries which describe the company and/or summarise the opportunity or requirement. In some cases a BDM's recommendation on next steps is recorded.

On 'Collaboration Supports', the activity records include company name; contact details; two fields for the 'opportunity' name and description which appear to be used in quite a variable way; and the Record Manager. The record lists one 'client' which is a university network rather than a company.

Those KEN activity records that have been made available to this evaluation[13] have highly variable opportunity/project descriptions. In general, the Record Managers appear to have used the description fields for different purposes. In particular, there is no consistent usage in terms of what the KEN has either agreed to do (i.e. prospective information) or has in fact delivered in terms of output to the client.

**COMMENT**

In future, there would be merit in introducing more specific fields in activity/output records. The following are examples.

- for the 'Company Supports' records:
  - start and end date(s) of engagement with the company
  - short description of company
  - a sub-sector allocation
  - short description of the 'opportunity' or requirement identified for the company
  - BDM recommendation for next step(s)
  - status of the engagement - ongoing, closed without further action; action taken

- for the 'Collaboration Supports' records:
  - start and end date(s) of engagement with the company
  - short description of company
  - a sub-sector allocation
  - short description of the collaboration 'opportunity' or requirement identified for the company
  - parties to the collaboration support action
  - actions on the KEN BDM
  - description of output and outcome
  - status of the engagement - to be initiated, ongoing, closed

- for the 'Consultancy Project' records:
  - dates of project initiation and completion
  - link to a short description of company
  - a sub-sector allocation
  - short description of the project objectives
  - parties to project delivery
  - actions on the KEN BDM
  - description of output and outcome
  - status of the engagement - to be initiated, ongoing, closed.

### *6.5 University stakeholder perspectives on operational matters*

In an operational sense, the universities and their individual academics do not always have an obvious route to make contact with SMEs and they can be unsure as to the funding landscape. The KEN products, and the work of the BDMs, 'uncover' and generate opportunities which a university and its staff would have been unlikely to find on their own. Not only would any benefits generated not have been achieved without KEN, in the consultees' opinion, but doors may not have been opened to the SMEs in the first place. In some projects more than one university has been involved and, again, this cross-fertilisation of universities and disciplines/specialisms would probably not have happened without the KEN.

A further benefit is the possibility of a project with an SME leading to a longer term relationship which can develop significantly, for example with further Innovate UK, EPSRC or other funding, or through the funding of a PhD. In universities, the industry engagement tends to focus on long-term projects: the KEN enables universities to engage initially with SMEs where no previous relationship has existed, and either deliver relatively small, short-term R&D contributions or develop the foundations of a longer term, deeper association.

#### *The structure of the KEN and the role of the BDMs*

[13] Other, fuller records may be held by the KEN project management.

Considerable focus was placed during these consultations on the role of the BDMs, where they sit within the university and the ETP, and how they interact with the Network's universities. The consultees offered views on operational improvements that should be considered.

***Location of the BDMs:*** the dispersal of BDMs around the country was an issue raised by academic consultees. This structure was set up initially so that each BDM was based in a university that had particular strengths in the energy theme for which the BDM was responsible. However, questions were raised as to how much time a BDM actually spends in their hosting university (although it was noted that there may be quite a difference between how much the BDMs travel to and engage with all the universities in the ETP). It is also questioned whether a university is benefiting because of a BDM being based there. Moving the BDMs to somewhere central may, in practical terms, be sensible. However, the 'political' dimension of having a full geographical distribution is acknowledged, as well as the fact there will probably never be an ideal operating solution. It was recommended that the ETP reviews the travel movements of BDMs to identify where the 'centre of gravity' actually lies.

***Network Communication***: another concern raised is that of communication between academic leaders, line managers and the BDMs. It was noted that in the early days of the KEN the academic leaders and BDMs used to meet on a regular basis, but this has dropped off. It was recommended that a regular workshop be organised to bring together the three KEN components (administrative line managers from each university, key academics and BDMs) and for experiences and opinions be shared in order to build for the future. It was recognised that this will be a challenging process which will need "to be prepared for and managed forensically", but there was a feeling that "air needs clearing": prior failings and missed opportunities need to be recognised, and also for what has worked well to be acknowledged explicitly.

### *6.6 BDM perspectives*

The evaluation benefited from a number of interviews with BDMs that covered a wide range of issues, primarily focused on operational matters but also gaining insights on strategic and forward-looking issues. Inputs are summarised below. These views are presented in a fairly full way whilst acknowledging that they are essentially a form of anecdotal rather than consensual evidence.

#### *General reflections on arrangements and delivery*

***Buy-in:*** although the funding for the ETP and KEN is based around university collaboration, in the view of some BDMs there has been variable levels of buy-in to the ETP/KEN from the universities.

***KEN start-up:*** one strong view expressed summarises the status in the early part of the KEN initiative as: no process, patchy stakeholder buy-in, no clear vision, no business plan and no operational process; and poor project and project management. However, matters are said to have improved since Summer 2013 when a new management team was put in place.

***Definitional matters***: definitions of company support, collaboration and consultancy projects were unclear at the start of the KEN initiative, and may have led to similar activities being characterised and reported differently by different BDMs: matters are now said to be much tighter and clearer.

***Demand-led support?***: in the view of one BDM, because of relatively small scale of funding and nature of the project work that is possible, KEN projects have been viewed as "nice to have" by some companies, not "mission critical".

***Aftercare***: there appears to be no consistent approach to 'aftercare' from KEN with its clients, with any aftercare seen potentially as a role for SE and/or Business Gateway rather the KEN.

***Relationship with SE and Business Gateway***: one BDM feels that there should be a closer relationship between ETP/KEN on the one hand and SE and Business Gateway, and a clear agreement on how this should operate.

*BDMs interface with the their host institution*

***Staff reporting lines:*** one BDM explained the relationship with ETP/KEN: "ETP is a funding mechanism, not an employer". Whilst the BDM is funded by the ETP's budget for the KEN, the employer is the hosting university. As a result there can be a "problem" because the university is not sure of the BDM's reporting status. This BDM explained that the annual staff performance review is carried out by the university but, in this BDM's view, the university does not understand what the BDM is trying to achieve viz. the KEN's targets. Furthermore, in practice universities and their academic staff are said to want contact and relationships with large businesses (with research resources of their own), and an ERDF-funded project focused on SMEs, such as KEN, cannot easily provide these. There can, therefore, be a tension between a host institution's objectives and those of a BDM seeking to deliver ERDF-focused objectives.

*Recruitment of companies*

BDMs work to establish contact with SMEs in a variety of ways, including:

- seeking to make contacts proactively, e.g. by hosting or speaking at events and conferences in order to raise awareness and make contacts, and by attending events and conferences held by others in order to make contacts with companies and understand their needs - the most common method
- approaches from academics who already have a company partner but require funding
- direct approaches by companies e.g. by companies that have discovered the KEN via Internet searches
- approaches/referrals from Interface
- referrals from Encompass at Strathclyde University
- SE/Business Gateway referrals - the least common route.

With regard to recruiting firms:

- one BDM suggested the ETP should hold more themed or targeted events rather than general events in order to attract attendees with similar interests.
- BDM consultees remarked on company recruitment difficulties arising from the fact that large companies cannot be beneficiaries of ERDF but are often the vital element in a supply chain and the most likely mechanism for attracting SMEs to engage with KEN activities. One consultee has used resources from another source to engage large companies and then worked with these large firms to attract SMEs to KEN events where potential collaborations and consultancy projects could be discussed.

*Recruit academics to participate in the initiative*

BDM consultees indicate that it is sometimes difficult to find academics who are willing and able to find time to engage with KEN projects. This means that sometimes it has taken months from the initial engagement with the company for a project to get underway.

With regard to recruiting academics:

- BDMs indicate that, within their own sphere, they tend to have good knowledge of and contact with specialist academics. More broadly regarding other research fields, they work with KEN BDM peers, university websites and make direct enquiries at universities. The quality and ease of navigation of different university websites and systems is said to vary.
- BDMs indicate that universities and academics are not always easy to persuade to engage with a research proposal from an SME, especially given the relatively small sums of money and short

timescales involved (the increase from £5k to £20k for KE Consultancy Projects reportedly has made a difference here).

- BDMs also suggest that younger academics seeking to establish contacts and "a name" are more likely to engage with the KEN process and can be keener to work with industry; however, they are also often more interested in early stage, further from market research.

*BDMs' experiences with KEN's products*

BDMs expressed views on the merits of KEN's products:

- for reasons of simplicity and clarity, one of the consultees does not refer to KEN's named products (or targets) when talking with firms: rather this BDM tries to identify firms' needs and then source the relevant support – whether that is arranging a consultancy or collaboration, a student placement or signposting
- one BDM uses the Consultancy Project product a lot because it provides 100% funding and does not involve the exchange of an equity stake for the company to work with the university - the BDM notes that universities can be quite "aggressive" about IP
- one BDM said 'collaboration supports' tend to have more of an academic focus, with businesses being brought in if there is an opportunity of interest to the academic – hence this product is used by this individual less frequently than Consultancy Projects. It was also noted that collaborations are more time consuming and can take longer to set up than Consultancy Projects
- placements were mentioned by two BDMs. One referred to approaches by academics in order to find company placements for students. It was noted, however, that as the client-base is mainly SMEs this is not easy to achieve: working with larger companies would make it easier for BDMs to help academics find placements for students. Another BDM echoed this, reporting that their student placements had all been with large companies, not SMEs.

*KEN's benefits and impacts on businesses and host universities*

BDM consultees were asked to identify the KEN's main benefits and impacts on businesses and participating universities.

- two of the BDMs felt it was too early to say with any certainty what the impact of projects has been on companies
- ¡t was pointed out that as a BDM "you don't always know what happens after the support has been set up – and so you don't know what the impact on the company and/or the researcher has been*"*. Although BDMs do in some cases try to stay in touch with companies in order to find out what happened, it was reported that this is not always easy.
- one BDM described the KEN as "tremendous", the benefit of the KEN being that the BDM is in a unique position to understand what is happening in the sector and the technologies, and can therefore steer SMEs towards where real market opportunities might be.

*What in the KEN works well/less well for companies, academics and the role of BDMs*

BDMs were asked to outline what had worked well and less well for them, companies and participating academics. The following views were expressed:

- one BDM argues that the KEN's proactive approach to finding academics for SMEs works well because it "saves time for SMEs"

- the KEN process is becoming more difficult as money in its budget gets tighter, but the increase in funding for consultancy from £5k to £20-£30k has helped to attract academics, in particular the more senior academics. The original £5k was, in the BDMs' opinion, simply too small an amount to attract many academics' interest

- one BDM thinks that ETP could work with investors to provide a fund to support Renewable Energy ventures or bring funding to the table

- another BDM suggests the need for a clearer structure of how the ETP and individual university relationships should work: "There has never been any real structure of how to engage and work with the universities. Some universities may have had high expectations and feel let down. The universities on the periphery will not see as much activity from ETP"

- competition and institutional politics play a role, e.g. one BDM reports three knowledge exchange networks in their field, and observes that it can be difficult to get an academic to engage with the KEN if he or she is already involved with one of the other networks

- BDMs report different views on what has and has not worked well from their perspective. One has felt distant from the KEN and at times poorly informed as to what is happening in the ETP and KEN centrally. Another reported valuing the monthly KEN meetings with their exchange of information and sharing of techniques of how to approach SMEs. Yet another BDM expressed a desire to be better informed about the work of the other BDMs, e.g. their practice, progress, achievements, etc. These views are held notwithstanding the KEN's monthly progress meetings at which the presence of all BDMs is requested. One consultee suggests the KEN should hold its monthly meetings in different universities and invite academics from the institution to attend the meeting.

**COMMENT**

BDMs offered a number of suggestions for developing the KEN based on their experience. These are summarised with comments below:

- re-assess the relationship operationally with SE and Business Gateway in terms of cross-referral of businesses who would benefit from the support of the various parties

- there appear to some HR/career management issues faced by BDMs who are employed by a university but work to ETP/KEN objectives and metrics - this merits management attention

- there appears to be a frustration amongst some BDMs about their need to focus on SMEs, and not the large companies that are seen a 'better' candidates for working with universities - the nature of the KEN's products/services and how it recruits SMEs should be re-examined: (i) to assess the feasibility of the KEN being explicitly a source of capacity building support for small firms; and (ii) working with SMEs but in a more explicit supply chain context

- from a number of BDM comments, the KEN management need to be wary of its resources being drawn on too much for the benefit of the supply-side, the academic and his/her students - this requires appropriate metrics to ensure that some measure of business 'pull' is inherent in the process even if initially stimulated by a BDM

- BDMs note the benefits of the increase in funding available for a Consultancy Project (up to £20k) - however it will be important that the benefit here is not (just) in terms of attracting academics to the work, as was the point made by one BDM. This more substantial amount should be accompanied by more diligence on the demand-side and greater 'participation' in the process by the business partner

- given the knowledge and experience of the BDMs, one suggestion is that the KEN becomes involved in work with (private) investors in energy technologies and businesses.

## 7. Outcomes/benefits for businesses

This section presents research findings on what outcomes/benefits have been realised based on the views of businesses that have been supported by the KEN. This includes benefits to date and anticipated: it includes quantifiable changes in business performance, to date and anticipated. It also includes an assessment of changes in business capabilities and attitudes to innovation.

Annex A provides a list of the 29 firms consulted and Annex B provides a copy of the questions covered in the consultations. It should be noted, not all questions were relevant to all consultees, e.g. some consultees were individuals rather than businesses, which meant questions on for example business processes were not relevant to them, and some consultees were in businesses that had not traded at the time of the consultation and therefore had no turnover figures to report. Annex D has a spreadsheet which provides a summary of all the different types of project outcomes that business consultees reported. They include:

- project ongoing (3 respondents)
- idea not feasible (2 respondents) - it should be noted that this is a positive result in that, as one consultee noted: “resources may now be channeled to more fruitful activities”
- idea not progressed for reasons unrelated to the Network (3 respondents); e.g. a developer could not reach an agreement with local landowners to enable a project to go ahead
- idea progressed to the next stage of development (10 respondents); i.e. ideas are still in the pre-revenue stage
- unhappiness with the project and little progress made (3 respondents); e.g. a prototype did not meet a client’s requirements and therefore results produced from tests were of no use in moving to the next stage of development
- idea progressing to production (4 respondents)
- competitor research assisted a firm’s decision-making (1 respondent); i.e. the project was an aid to a firm’s activity but, by its very nature, could not result in new products or services
- partnership failed so proposed collaboration could not proceed (1 respondent)
- the respondents did not believe they had been engaged in a valid project (2 respondents); e.g. one consultee said the organisation was a supplier working with the Network, not a beneficiary of the Network, and another consultee did not believe the interaction the business had with the Network fitted the definition of a project or collaboration – it may be that these responses can be explained by inputting errors in the monitoring data.

Business consultees were asked a series of questions regarding the benefits to their business of engaging with the KEN. Response data are given in Table 8. No firm reported a negative impact on its business due to engagement with the Network. Fifteen of the 21 respondents who expressed a view (71%) reported a positive change with regard to their knowledge of how to access sources of information on technology and markets, and 12 of the 16 respondents who expressed a view (75%) said there had been a positive change in the likelihood that they would seek to exploit external sources of intelligence on technology and markets in future. Sixteen of the 23 respondents who expressed a view (70%) reported a positive impact on their firm’s knowledge of how to access and benefit from specialist expertise or facilities in Scottish universities; whilst 11 respondents (c.70% of those who expressed a view) said they were more likely to seek access to university support in future as a result of their engagement with the Network.

Sixteen out of 22 respondents expressing a view (73%) said their firm had experienced a positive change with regard to its ability to frame bids for innovation-related project funding from the public sector. Eleven of 19 respondents expressing a view (58%) said their firm’s knowledge of the sources of public funding had

improved, and 10 of 17 respondents expressing a view (59%) indicated that their firm would be more likely to bid for public sector funds to support R&D or innovation in future as a result of engagement with the KEN. When asked to comment on the impact that engagement has had on their firm's view of investing more of its own resources on R&D, 13 of the 19 respondents who expressed a view (68%) reported no change – in many cases this is because respondents believe their firm already has a positive view on investing in R&D. Similarly, 12 out of 17 respondents expressing a view (70%) reported no change in their firm's attitude to investing more of their own resources in market research as a result of their project – it should be noted that few projects dealt with market research. Furthermore, 14 out of 18 respondents who expressed a view (78%) said there had been no change in their company's attitude towards investing its own resources in 'other support for innovation'.

Ten consultees out of the 19 who expressed a view (53%) said engagement with the Network had produced a positive change in the company's knowledge of how to collaborate with universities and/or other companies on innovation-related activities. However, some of the respondents reported negative experiences of working with universities, e.g. delays in work and lack of communication between researchers and clients. Only 6 of 15 consultees who expressed a view (40%) said their company had experienced a positive change in its view of the benefits of employing staff with prior R&D experience – the relatively low response rate to this question is indicative of the relatively large number of early stage businesses with limited or no plans for recruitment. Furthermore, those who did respond to the question had different reasons for their answers due to the different business models they employed; where in-house production was envisaged, technical staff rather than research staff were expected to be employed and some consultees envisaged licensing their product for others to manufacture.

When asked about the impact of engagement with the Network on the company's knowledge or intellectual capital, six respondents out of 15 expressing a view (40%) reported a positive change. This may appear to be a relatively low figure, however, it should be noted that some projects provided an independent test of a firm's own results in order to meet investors' requirements, rather than developing entirely new ideas. Eight of the 17 respondents who expressed a view (47%) said engagement with the Network had had a positive impact on the company's product or service offer – it should be noted that many respondents had yet to enter into production, hence the relatively low response rate to this question. Only two respondents out of 15 respondents who expressed a view (13%) reported a positive impact on the company's internal business processes as a result of engagement with the Network – the number of early stage businesses with only one or two people developing an idea probably helps to explain the relatively low response rate to this question. And only 3 consultees out of 15 who expressed a view (20%) reported an impact on the level of international sales – again it should be noted that the relatively low response rate is due to the early stage nature of many of the businesses consulted, as well as the limited number of firms engaged in international trade to date.

**TABLE 8: BUSINESS BENEFITS REPORTED BY COMPANY**

| BUSINESS BENEFITS | CHANGE AS A RESULT OF ENGAGING WITH THE KEN (i.e. over and above the knowledge and capability the company already had before engaging with the KEN) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| As a direct result of engaging with the KEN, what if anything has changed for the company in the following areas: | -ve CHANGE | NO CHANGE | MINOR +ve CHANGE | MODERATE +ve CHANGE | MAJOR +ve CHANGE | NO RESPONSE | TOTAL | RESPONSES |
| 1. Knowledge of how to access and exploit external sources of information on technology or markets for business use | 0 | 6 | 8 | 3 | 4 | 8 | 29 | 21 |
| 1.1 The likelihood of the company seeking to exploit external sources of technology or market intelligence in future | 0 | 4 | 1 | 7 | 4 | 13 | 29 | 16 |

| BUSINESS BENEFITS | CHANGE AS A RESULT OF ENGAGING WITH THE KEN (i.e. over and above the knowledge and capability the company already had before engaging with the KEN) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| As a direct result of engaging with the KEN, what if anything has changed for the company in the following areas: | -ve CHANGE | NO CHANGE | MINOR +ve CHANGE | MODERATE +ve CHANGE | MAJOR +ve CHANGE | NO RESPONSE | TOTAL | RESPONSES |
| 2. Knowledge of how to access and benefit from the specialist expertise or facilities in Scotland's universities | 0 | 7 | 6 | 7 | 3 | 6 | 29 | 23 |
| 2.1 The likelihood of the company being proactive in seeking to access university support in future | 0 | 5 | 1 | 6 | 4 | 13 | 29 | 16 |
| 3. Knowledge of how to frame bids for innovation-related project funding from the public sector | 0 | 6 | 7 | 5 | 4 | 7 | 29 | 22 |
| 4. Knowledge of sources of public funding for R&D and innovation | 0 | 8 | | 8 | 3 | 10 | 29 | 19 |
| 4.1 The likelihood of your company bidding for public sector funds to support R&D or innovation in future | 0 | 7 | 2 | 4 | 4 | 12 | 29 | 17 |
| 5. The company's view on the value of investing more its own resources in R&D | 0 | 13 | 2 | 1 | 3 | 10 | 29 | 19 |
| 6. The company's view on the value of investing more its own resources in market research | 0 | 12 | 3 | 1 | 1 | 12 | 29 | 17 |
| 7. The company's view on the value of investing more of its own resources in other support for innovation | 0 | 14 | 1 | 2 | 1 | 11 | 29 | 18 |
| 8. Knowledge of how to work collaboratively (with universities and/or other companies) on innovation-related activities | 0 | 9 | 3 | 4 | 3 | 10 | 29 | 19 |

Business consultees were also asked to identify the most significant impacts that their engagement with the KEN has had on their companies and the extent to which these effects would have been achieved without their engagement with the Network. Some business consultees found it difficult to calibrate the impact of engagement with the Network, either in relation to the issues raised by the questions or with regard to their overall collaboration or consultancy project. Furthermore, some business consultees highlighted other impacts, over and above those covered by the issues discussed above (see Section 3 of the business questionnaire at Annex B). The impacts business consultees highlighted include:

- the development process was faster than it would otherwise have been; with one firm noting a 6 to 12 month delay could have been the difference between seizing and missing an opportunity
- the development process was cheaper than it otherwise would have been
- business process improvements arose as a result of the project
- better understanding of EIC 61850 standard (for the design of electrical substation automation) was achieved as a result of the project
- ongoing savings in running costs were achieved as a result of the project (e.g. one firm projected an annual saving of £150,000 through storing own-generated renewable energy)
- access to testing in the FloWave test tank facility
- more evidence to support the proposition that the idea is feasible as a result of the project

- the quality of decisions improved because they were based on good evidence available as a result of the project.

Firms also provided the following additional examples:

- the collaborative work undertaken as a result of engagement with the Network encouraged consultees to look beyond their personal networks for expertise and support (see Box 7.1)
- the opening up of possibilities and connections to applications and opportunities that only academics could have brought to the project (see Box 7.2)
- the project enhanced the business case that is to be put to potential investors at an accelerated pace as a result of engagement with the KEN (see Box 7.3).

**Box 7.1: Engagement with the Knowledge Exchange Network encourages firms to access external support from outside personal networks**

One company in the pre-revenue stage (with no full-time, paid staff) had received a SMART award prior to the Knowledge Exchange Network project, worked with the KEN to fund a PhD student. The research findings allowed the company to produce a detailed (and "intriguing") specification for the development of a prototype that it placed on Interface and which attracted a response from the Glasgow School of Art, an institution that was outside the firm's engineering-based network. The prototype has worked well. The firm now needs to understand likely unit costs of manufacture, identify which markets it should focus on, and attract investors. Thus, the Network played an essential role in helping the company progress the development of its idea and has had a permanent impact on the way the company understands the nature of the external expertise that is available and how it may be accessed.

**Box 7.2: Engagement with the Knowledge Exchange Network provides access to independent research required by investors**

One company had developed its own mathematical model to test its idea but required an independent assessment – both to reassure themselves of the validity of their work and to reassure potential investors of the validity of their findings. The KEN organised a relatively small project (of fewer then 4 days) that validated the firm's own findings. The company went on to develop and test a physical prototype and the test results validated those of the mathematical model. The firm hopes to attract an investor (to make a seven figure investment). The KEN project helped to speed up the process of testing and putting independent data before potential investors.

**Box 7.3: Engagement with the Knowledge Exchange Network provides access to academics with awareness of developments in their field that businesses cannot track**

One company sought to test the properties of a new product against an existing product. The academics who carried out the research suggested they should create the comparator substance in order fully to compare characteristics. The findings were not what the company had expected but the research highlighted how the new product might be used. From the firm's perspective the KEN found people with exactly the right skills, which saved time and meant the researchers could add value to the process. The company indicated that the project 'opened up a whole new vista of opportunities' as the research team brought experience that an SME would not have the resources to match. The consultee also said the project had a two-way relationship that was more dynamic than what they had experienced during a project supported by the Technology Strategy Board.

Thus, the overall results show that of the 29 responses received, 14 (just less than 50%) refer to projects that are 'progressing' in terms of development and preparedness for application. Three projects are still ongoing and interviewees were unwilling or unable to express a clear view yet on likely outcomes. The firms that learned from a project that an idea was not feasible still regarded this as a beneficial result.

There are a number of other notable findings, including:

- a majority of firms report positive benefits in terms of knowing how to access external sources of expertise and being more likely to do so in future

- a majority of firms report that they are more likely and better able to bid for public sources of innovation support in future
- there is, for the majority of respondents, no change in their views on investing their *own* resources on R&D, Market research and other aspects of innovation support
- there is a more equal split between no change and a positive learning benefit in terms of how to work collaboratively on innovation-related activities.

*Additionality*

Business respondents were asked to comment, for the main benefits or changes their firm had experienced, on the extent to which these could have been achieved without the inputs received from the KEN project. The purpose here is to ascertain the likely level of additionality associated with the KEN initiative given its use of public sector funds. Candidly, many respondents were unsure.

The majority of respondents that did offer a view indicated that their company would not have achieved any or achieved only a small part of the benefits/changes without the support of the KEN project (12 out of 16 responses). The dominant position is one of partial additionality viz. *'* Would achieve only a small part of the benefit/s without the KEN support*'* (9 out of 16 responses). Only 2 out of the 16 respondents indicated that they could have achieved everything anyway without inputs from the KEN project. Where respondents were able to differentiate between different forms of additionality (e.g. between time, quality and scale), most identified a degree of time and quality additionality.

The following reports some individual positive comments:

- the KEN support prevented a delay of 6-12 months which "may have been equivalent to a lost opportunity"
- "without the support, the project would have gone forward, but it would have taken longer and lacked professionalism and credibility without the university being involved"
- "would have gone ahead without the KEN input but would have had to do it ourselves. KEN facilitates the process - it could have taken another year. The KEN BDM also brought own expertise to the project"
- "not sure we would have gone ahead with the PhD study without KEN support. The ETP contribution to that was the final brick in the wall - very very helpful as the company could not have bridged the funding gap"
- "has taken us a massive leap forward, but we had SE funding in place too, so would have gone ahead, but ETP funding has enabled us to do a lot more for the money: it has sped up the development process and extended the firm's capacity to do the work"
- without ETP the respondent believes it would have obtained support via Innovate UK as it is "well connected and has done work with it before". The company has also been in touch with someone in Inverness from a business development organisation offering "something similar to ETP". It was also talking with Business Gateway and considers that it could have obtained direction and support from it and also from SE. The company would have achieved what it is hoping to achieve anyway and it would not have taken much longer to make contact with the academic who is now involved.

### *7.1 Assessment of outcomes relative to ERDF targets*

In the terminology used in the ERDF project plan "results" are equivalent to outcomes (projects/products supported) and to impact (changes in gross turnover and jobs created). Economic impact of the KEN is considered in Section 8. Table 9 shows the ERDF targets in terms of products and services developed: it is understood from the KEN management that these ERDF measures relate to results to be achieved five years after the intervention.

**TABLE 9: ERDF OUTCOME TARGETS FOR NEW PRODUCTS/SERVICES**

| 3 year ERDF targets | Type of measure (after ERDF) | Original numerical target |
|---|---|---|
| number of new products/services developed by supported enterprises and research centres | result | 41 |
| number of new products/services developed by supported research networks | result | 22 |

Based on the KEN's activity data and responses from the sample of 29 firms (see summary in Annex D):

- overall, there appear to have been 25 different SMEs involved in collaborations albeit at different stages and with different outcomes
- 3 Collaboration Supports experienced by the sample of 29 business consultees had progressed either to production or the 'next stage' in development
- 1 Collaboration Support is ongoing and so it is too early to say what the outcome will be.

In terms of the number of new products/services developed by 'supported enterprises and research centres' 4 projects are reported by business consultees as moving to production. As Annex D records, for some firms the KEN Consultancy Project demonstrated that a business idea was not feasible: this is deemed to be a valuable outcome by the companies. For others, the work is still ongoing or the company has not yet decided on next steps, if any.

### *7.2 Wider contributions to business benefits*

In the course of consultations with the BDMs and discussion with the KEN project manager, there were references to instances of added value delivered to businesses that lie beyond (i.e. value in addition to) the KEN's three formal 'products' and associated ERDF measures.

A set of additional questions for BDMs was agreed with the KEN manager concerning wider contributions to client firms and all were invited to respond. The responses, made in a variety of formats, are summarised below.

**Example 1**: The BDM notes: *'There are times too numerous to mention, but I find myself giving support to companies outside our remit i.e. large companies, or companies from outside Scotland. The large company issue is a complex one, because small-sized companies often do not know that they are not SMEs: they fulfil all the size requirements but, unfortunately, their shareholding prevents them from being classified as an SME. This information is not always held by Companies House.'*

This raises questions not only of filtering firms for eligibility but also the possibility of 'leakage' of the benefit of KEN support to firms (with group head offices) outside Scotland.

**Example 2:** The BDM notes: in 2013, c. 1.5 days of support was provided to Company A which involved introducing it to Company B. Company A had a technical issue to be addressed which it felt would be best addressed by another firm rather than an academic. The BDM introduced the companies and this led to a commercial transaction (value unknown) to address the technical issues: Company A also gained useful new

market experience. No other KEN support was involved. In the view of the BDM, the company supplying the technical solution would not have been aware of the commercial opportunity: the 'buyer' would have attempted to solve its problem internally.

**Example 3:** The BDM notes: in 2013, 3-4 days of supported was provided to Company C. The BDM set up a number of workshops with the company to support management with a review of two key business processes: new product development and sales. Following the sessions, a report was generated which reviewed the current process and recommended changes which would support business growth. It is too early to identify quantifiable business benefits but the process review has supported the company in making a decision to focus on selling technical services rather than products. In the view of the BDM, without this intervention the company may have remained focused on developing products with no real market potential.

**Example 4:** The BDM notes: in 2014, 2 days of support was provided to Company D. In addition to assisting with the development of a technical project involving a collaboration between the University of Strathclyde and the company, the BDM also supported the company in reviewing and refining an application for a Scottish Enterprise SMART award, engaging with the relevant personnel in the SMART grant team. If the bid is successful, the SMART award will have a value of between £75-100k. In the view of the BDM, without the intervention the Company's initial application would have been rejected: the grant application process would have been delayed and may not have been successful.

**Example 5:** The BDM notes: In 2014, 1.5 days of support was provided to Company E. '*Given the funding situation with the ETP, I organised a meeting with the company and a partner organisation to scope out a potential project which could be delivered by one of the latter organisation's Knowledge Exchange Fellows.*' This process was successful and the BDM drafted up a technical work plan for the KE Fellow to deliver on in a timely fashion. The project represents an attempt to get over a technical hurdle critical to the shape and size of the company's planned product. If successful, the company will be able to design a more cost-effective solution to take to a global market. The benefit to the company is that without this intervention the company may not have been able to secure KE support from a Scottish university and may have had to seek out private sector support for the R&D work. The company has also formed two new relationships with Scottish universities as a result of the project.

**Example 6**: The BDM notes: during 2013 10 days of support was provided to Company F. The BDM introduced Company F to firms and institutions active in the development of a relevant technology. The BDM introduced a funding call, brokered collaboration and then supported the drafting of a grant application to the Technology Strategy Board. The value of the bid was c. £600,000. According to the BDM, without this support, Company F would not have entered what was a new market sector or applied to the TSB for funding.

**Example 7:** The BDM notes: during 2012, 2 days of support was provided to Company G. The BDM introduced the Company to two other firms in a market sector with which it had no prior connection. Both introductions were followed by agreements to do experimental work. As the firms concerned included ones that are pre-revenue work was carried out at companies' own expense. In the BDM's view, without this intervention Company G would not have been able to develop products for this sector.

Another BDM provided the following list of contributions to individual companies that are deemed not to be well captured by the formal KEN measures. They include: advice to companies on available funding - national and international; on markets and marketing; on supply chains and networks; policy-related advice; advice on usage of technology/products/services and setting up Masters projects.

| **Instances of other support** |
|---|
| Accessing EPSRC funding |
| Access to funding for a Masters Project, TSB funding and an ETP Studentship |

| |
|---|
| Advice on Biodiesel |
| Access to TSB (now Innovate UK) and Horizon 2020 programme funding |
| Access to TSB Funding |
| Marketing support, linking to Scottish Development International (SDI), market information |
| Supply chain information |
| Policy advice (e.g. on SEPA, Zero Waste Scotland) |
| Access to TSB funding and to Local Authority support |
| Access to an international partnership and to an ETP Studentship |
| Access to a Masters project, TSB India funding, EU Horizon 2020 programme funding |
| Access to an ETP Studentship |

The above examples of outputs and contributions to business outcomes that BDMs do not consider to be well captured in the formal measures for KEN 'products' reveal a number of notable features:

- the BDMs are involved in assisting firms in bidding for R&D/innovation support grant funding - making firms aware of the opportunity, assisting with bid preparation and in some cases helping firms win funding
- the BDMs are also involved in helping firms to access post-graduate project activity within universities
- the BDMs are involved in brokering company connections and providing policy and market advice.

**COMMENT**

The business benefits arising from BDM activities and outputs that are considered not to be well captured in the KEN's formal performance measures must in the context of this evaluation be considered as 'gross' benefits: without research directly with the business beneficiaries it is not possible to assess what the firms would have done in terms of gaining support and achieving the benefits without BDM input. Also, it is not possible to establish here the extent to which efforts on these activities were at the expense of further efforts (greater concentration of resources) on the formal KEN projects. Were these activities linked to, built upon, the BDMs' roles in delivering the KEN's products or associated more generally with the knowledge exchange roles performed by their host universities? Notwithstanding these caveats, it is evident that some at least of the KEN's BDMs are operating in both proactive and responsive modes on activities of business relevance albeit, in their view, not well captured in the KEN project's metrics.

The reference in one BDM's response to working with firms that are, evidently, large companies and working to benefit a company outside Scotland appears on the face of it to be 'problematic' in terms of eligibility issues and potential leakage from Scotland of derived benefits. We have no evidence of this being a major feature of BDM working practices but it is something that the KEN management should review.

### 8: Economic impact

The purpose of this section is to address the element of the evaluation brief concerned with establishing the gross and net additional economic impact of the KEN at the Scotland level, both to date and reasonably anticipated. Economic impact is assessed in terms of Gross Value Added (GVA) and employment

At the time of the business interviews, none of the respondents were yet selling goods or services that had been developed as a result of engagement with the Network (bar one which indicated a positive impact on the business in 2013-14 due to the KEN). Four of the 29 firms taking part in the research indicated that they were progressing to production and provided forecasts of the likely jobs creation and the annual turnover they expected. It should be noted that these consultees offered forecasts with strong caveats concerning their uncertainty over accuracy: they also provided forecasts over different timescales. Therefore, the forecasting of impact necessarily contains a degree of uncertainty and requires a high degree of 'judgement' to enable the calculation to be made.

The information provided by the four firms is summarised below. These are the gross changes in (additions to) turnover and employment that the businesses can attribute to the benefits they have derived from the KEN

- one firm anticipates:
    - an additional £1.5m of turnover between 2015/16 and 2017/18 (with a possible growth trajectory in annual turnover of £250,00 in 2015/16, £500,000 in 2016/17, to £750,000 in 2017/18)
    - an additional 6 FTEs by the end of 2015/16
- one firm anticipates:
    - annual turnover of £50,000 to £100,000 in 2015/16 (its first year of trading)
    - 2 to 4 additional jobs in 2015/16
- one firm reports:
    - 3 jobs created in 2014/15 as a result of engagement with the Network
    - £100,000 of turnover in 2014/15 as a result of engagement with the Network
    - annual turnover of £3m in 2017/18 and £10m in 2018/19
    - 15 jobs in 2017/18 and 25 jobs in 2018/19
- one firm anticipates:
    - annual turnover of £200,000 in 2015/16 (its first year of trading)
    - 0 (zero) additional jobs (as manufacture of the product would be contracted-out and the location of the manufacturing jobs was unknown at the time of the consultation).

A further two companies that had yet to complete their project with the Network provided forecasts of potential employment and turnover. These forecasts are in anticipation of successful project outcomes and should also be treated with caution: the projects are at an earlier stage of development than those undertaken for the four firms cited above.

- one firm (that had had multiple projects with the Network) estimates that:
    - 1 temporary job had been created in 2012/13 as a result of engagement with the Network
    - 1% to 3% of its £680,000 turnover in 2014/15 could be attributed to engagement with the Network
    - 3% to 5% of a forecasted £840,000 turnover in 2017/18 could be attributed to engagement with the Network
    - 1% to 3% of £1.25m turnover in 2019/20 could be attributed to engagement with the Network
- one firm estimates:
    - £5m of annual turnover by 2017/18
    - 15 additional jobs by 2017/18.

Annex C provides further information on how the impact calculation has been undertaken and Annex D contains spreadsheets which tabulate these business performance and impact data: Annex D also demonstrates the calculation of gross and net additional economic impact in terms of Gross Added Value (GVA) and employment. In brief, the steps followed in the turnover to GVA spreadsheet are as follows:

| | |
|---|---|
| 1 | Treating each of the 6 firms (from the sample of 29) separately, gross turnover is converted to net additional turnover by discounting for deadweight, displacement, substitution, leakage and optimism bias - as appropriate to each firm. Annex C provides definitions of these and other terms: it also sets out the assumptions and discount factors deployed in the calculation. |
| 2 | The direct net additional turnover for the sample is summed |
| 3 | Turnover is converted to GVA using the relationship between these parameters for the 'energy including renewables' sector in Scottish Government statistics. Note: this gives the direct net additional GVA. |
| 4 | The net additional turnover for the sample is extrapolated to the population of c. 70 firms. From the 6 firms in the sample of 29 which provided data, 2 are stripped out as 'outliers' before the average turnover for the remaining 4 is calculated and then used in the extrapolation to the population: this assumes a further 8 firms have the average turnover value. The outliers are then added back in to provide turnover data at the population level. Further explanation of this extrapolation is given in Annex C |
| 5 | The turnover for the population is converted to GVA described at Step 3 above. Note: this is the direct net additional GVA. |
| 6 | Using a base year of 2011/12, the Present Value of the GVA contribution is calculated by discounting at the standard 3.5% for public sector investments |
| 7 | The cost of the KEN initiative is profiled and discounted as above to give its Present Value. |
| 8 | Net Present Value is established by subtracting costs of the KEN project from the GVA contribution it makes. |
| | *NOTE 1: all monetised data are expressed in nominal prices.* |
| | *NOTE 2: the assessment of GVA is expressed with and without a multiplier. As the KEN is supported by public funds which if not spent on the KEN would have been used on other economic activities which would also have a multiplier, the preference here is to utilise the GVA figure without the multiplier. Further information on the application of the multiplier is provided in Annex C. Information from individual KEN clients on their sources of bought in goods and services are provided in Annex D* |
| | *The spreadsheet calculating employment impact follows a broadly similar step-wide approach to translate from gross to net: deadweight and (product market) displacement factors are the only ones with an evidence base to call on for this.* |

In terms of ERDF 'results', the evidence from the 29 firms interviewed during this study permits a forecast gross turnover in year 2018-19 of c.£11.0m. This is highly dependent on the forecasts made by two firms ('outliers'). The gross turnover 'results' target in the ERDF contract is £15m. The sample of 29 firms permits a forecast of c. 27 (gross) jobs being created by 2018-19. This figure is highly dependent on the forecast made by one company. The ERDF gross jobs 'results' target is 74. For both gross turnover and employment, the figures may increase as more projects undertaken for the population of firms supported by the KEN and their associated business outcomes mature over time.

Based on the assumptions set out in Annex C and the calculations shown in Annex D, the net additional economic impact of the KEN is estimated to be as follows:

| PARAMETER | DIRECT IMPACT | WITH MULTIPLIER | |
|---|---|---|---|
| Net additional GVA in the year 2018-19 | £2.7m | £4.3m | Type II GVA Multiplier of 1.6 is used (see Annex C) |
| Net additional GVA aggregated over the period up to and including 2018-19 | £6.0m | £9.6m | as above |
| Net Present Value of the KEN | £3.9m | £7.5m | Calculated for the period up to and including 2018-19 |
| Ratio of GVA contribution to cost of intervention | 2.8 : 1 | 4.5 : 1 | |
| Net additional employment in the year 2018-19 | 19 full time equivalents (i.e. the forecast number of 'direct' jobs supported in this year) | 30 ftes | Type II Employment Multiplier of 1.6 is used (see Annex C) |

### *Contribution to the policy objectives*

Given that the KEN project has the aim of contributing to renewable energy and related low carbon policy objectives, business interviewees were asked to offer their best judgement on the likely change in the level of their company's contribution to reducing carbon emissions and/or reducing energy consumption as a result of their engagement with the KEN project. No attempt is made to determine the likely contribution in quantitative terms: the purpose is to obtain an overall sense of relative change in ability to contribute from a business perspective. The responses are recorded in Table 10.

**TABLE 10 : RESPONSES FROM BUSINESSES ON CONTRIBUTIONS TO REDUCING CARBON EMISSIONS OR ENERGY CONSUMPTION**

| Contribution of the companies products or services to: | - be less than before | - not be discernibly different | - be greater by a minor amount | - be greater by a moderate amount | - be greater by a major amount | it is not possible to say |
|---|---|---|---|---|---|---|
| 1) Reducing carbon emissions | | 6 | 1 | | 6 | 9 |
| 2) Reducing energy consumption | | 6 | 1 | 1 | 5 | 9 |

Of the firms that were prepared to respond to this question, nine out of 21 firms indicated that it is 'not possible to say' on both matters of carbon emissions and energy consumption. The other results are notably polarised. Six firms for each of the two factors indicated that the company's contribution would not be discernibly different. Six and five firms respectively indicated that the firm's contribution would be greater by a major amount.

Whilst this is acknowledged as a 'crude' assessment, it is indicative of the high level of uncertainty that remains over the extent to which, upon fruition of the product or service developments being supported by the KEN, policy objectives will have been advanced.

## 9: Summary conclusions and learning for development issues

In addition to the economic impact assessment reported in Section 8, the following are the key findings from this evaluation:

- the focus of the KEN project on renewable energy and related low carbon innovation retains a strong 'fit' with Scottish Government energy policy and with economic development priorities in Scotland
- the KEN has exceeded its ERDF target for Consultancy Projects and has achieved 81% of the target for Company Supports but has some way to go in meeting numerical targets for Collaboration Supports - overall, it appears that the former 'product' in any event delivers greater value to businesses
- there are a number of ways in which the KEN should improve its monitoring procedures - these are detailed earlier in this report
- there is overall a high level of satisfaction with the KEN amongst the majority of firms interviewed - however, there is a small minority who take a polar opposite view
- in terms of changes in business capability (in aspects of what is often called 'absorptive capacity'), the KEN has had a positive effect.

Interpreting ideas and commenting in issues for development emerging from BDMs:

- there should be a re-assessment of the relationship operationally with SE and Business Gateway in terms of cross-referral of businesses who would benefit from the support of the various parties

- the KEN management needs to be wary of resources being drawn on too much for the benefit of the supply-side i.e. the academic and his/her students - this requires appropriate metrics to ensure that some degree of business 'pull' is inherent in the process even if initially stimulated by a BDM
- BDMs note the benefits of the increase in funding available for a Consultancy Project (up to £20k) - it will be important that the benefit here is not (just) in terms of attracting academics to the work. This more substantial amount should be accompanied by more diligence on the demand-side and greater 'participation' in the process by the business partner
- given the knowledge and experience of the BDMs, one suggestion is that the KEN becomes involved in work with (private) investors in energy technologies and businesses.

Strategic issues:

- there is an urgency for the KEN to re-fresh its vision/strategic objectives and modes of operation to take account of a much changed innovation support landscape in Scotland - a number of substantial initiatives have emerged in recent times in the renewable energy and associated low carbon innovation support space that is occupied by the KEN
- in this context it is important to re-assess the KEN's commitment to SMEs, and in particular to smaller enterprises, and to assess whether for example to: (a) differentiate itself as a source of capability development support for small firms with limited extant absorptive capacity; and/or (b) to work with 'more capable' SMEs and in a more explicit supply chain context
- responses from firms to questions about likely contributions to reductions in carbon emissions and energy consumption as a result of engaging with the KEN reveal variations and a high level of uncertainty over the extent to which, upon fruition of the product or service developments being supported by the KEN, low carbon policy objectives will have been advanced.

## Annex A: List of contributors to the primary research

### COMPANIES CONTRIBUTING TO THE EVALUATION

Aberdeen Heat & Power

AJG Parcels

Aquatera Ltd

Bellrock Technology

Bill Gilpin

Caithness Renewables Ltd

Concrete Marine Solutions

Daima Energy

Dukosi

Dunbar Marine

Elimpus Ltd

Energy Improvement Systems

Hook Marine

John Moffat

Mackies of Scotland

Marine Biopolymers

M Power World

Multifuel Burners Limited

OMB Technology Ltd

QED Naval

Pale Blue Dot Energy

Power Textiles

Rotawave

Rural Services Scotland Ltd

Smarter Grid Solutions Ltd

Swift Technology Energy

Treegreen Ltd

Wind Farm Analytics Ltd

WITT Limited

### KEN STAFF CONSULTED

Donald Booth

Ashutosh Choubey

Darren Gardener

Scott Lilley

Philippa Parmiter

Jennifer Smith

Stephen-Mark Williams

**ACADEMICS CONSULTED**

Professor Paul Mitchell, Director, Institute of Energy Technologies, The School of Engineering, University of Aberdeen.

Professor John Irvine, Professor Chemistry, University of St Andrews

**OTHER STAKEHOLDERS CONSULTED**

Dr Linda Pooley, Head of International Low Carbon, Scottish Government

Linda Gosden, Scottish Enterprise

## Annex B: Copy of the questionnaire used in the business interviews

### INTRODUCTION

The purpose of this interview is to obtain evidence on what if any benefits your business has received as a result of its participation in the Knowledge Exchange Network (KEN). In the course of the interview we will explore with you the following:

- any changes in business performance to date as a result of what you have received from participation in the KEN
- any changes in business performance that you anticipate will occur in future as a result of your participation in the KEN
- any benefits you have gained of a less easily quantifiable nature
- based on your experience of engaging with the KEN, your views on what works well/ less well in terms of the nature of the support and how it is delivered.

Please note, your inputs to the interview will be reported in a non-attributable manner unless there are specific matters you wish to rase and have them reported in an attributable way.

### SECTION 1: Profile

| **1.1 The Interviewee** | |
|---|---|
| **Company name** | |
| **Interviewee's name** | |
| **Interviewee's position in the company** | |
| **Date of interview:** | |

| **1.2 Company participation in the KEN** | | | |
|---|---|---|---|
| **ACTIVITY** | **Completed from KEN Activity Records (Yes/No)** | **Completion date (if known from Activity Records)** | **Confirmed/Amended by interviewee** |
| **Support (4hrs)** | | | |
| **Collaboration support** | | | |
| **Consultancy project support** | | | |

#### *1.3 Experience of other forms of support for innovation*

For context, please list any other sources of public sector support for R&D and innovation you have used over the past three years (type, source, purpose).

Also, please list any university collaborations you have experienced over the past three years (institution and purpose).

### SECTION 2: Satisfaction

In this section I wish to obtain your views on what works well/less well in terms of what KEN provides.

| | Please rate your level of satisfaction on a scale of 1-6, where 1 is very dissatisfied and 5 very satisfied | | | | | |
|---|---|---|---|---|---|---|
| **Factor** | **1 (very dissatisfied)** | **2 (dissatisfied)** | **3 (neither satisfied or dissatisfied)** | **4 (satisfied)** | **5 (very satisfied)** | **NOT RELEVANT (i.e. not experienced this)** |
| Quality of market-related advice and support from KEN staff | | | | | | |
| Quality of technology-related advice and support from KEN staff | | | | | | |
| Efficiency of the KEN's processes - timely delivery of what was promised | | | | | | |
| Your experience of working with university support for your project | | | | | | |
| The following 'catch- all' should address each of the KEN products the company has received: | | | | | | |
| The overall quality/value of the Company Support you received | | | | | | |
| The overall quality/value of the Collaboration support you received | | | | | | |
| The quality/ value of the output of the Consultancy Project | | | | | | |

Please add any comments to explain these scores.

## SECTION 3: Benefits from the KEN

### *3.1 Assessing candidate changes/benefits*

For each of the following factors please indicate what if any change in your business capabilities and intentions has occurred (or is likely to occur) as a direct result of what you have gained from the KEN.

In each case please score your assessment of the change attributable to the KEN as follows:

| BUSINESS BENEFITS | CHANGE AS A RESULT OF ENGAGING WITH THE KEN (i.e. over and above the knowledge and capability the company already had before engaging with the KEN) | | | | |
|---|---|---|---|---|---|
| **As a direct result of engaging with the KEN, what if anything has changed in terms of the company in the following areas:** | **NEGATIVE CHANGE** | **NO CHANGE** | **MINOR POSITIVE CHANGE** | **MODERATE POSITIVE CHANGE** | **MAJOR POSITIVE CHANGE** |
| 1. Knowledge of how to access and exploit external sources of information on technology or markets for business use | | | | | |
| *1.1 The likelihood of the company seeking to exploit external sources of technology or market intelligence in future* | | | | | |
| 2. Knowledge of how to access and benefit from the specialist expertise or facilities in Scotland's universities | | | | | |
| *2.1 The likelihood of the company being proactive in seeking to access university support in future* | | | | | |
| 3. Knowledge of how to frame bids for innovation-related project funding from the public sector | | | | | |
| 4. Knowledge of sources of public funding for R&D and innovation | | | | | |
| *4.1 The likelihood of your company bidding for public sector funds to support R&D or innovation in future* | | | | | |
| 5. The company's view on the value of investing more its own resources in R&D | | | | | |
| 6. The company's view on the value of investing more its own resources in market research | | | | | |
| 7. The company's view on the value of investing more of its own resources in other support for innovation | | | | | |
| 8. Knowledge of how to work collaboratively (with universities and/or other companies) on innovation-related activities | | | | | |
| 9. The company's view of the benefits of employing staff with prior R&D experience | | | | | |
| 10. The company's knowledge or intellectual property assets (patents, trademarks) | | | | | |
| 11. The company's product or service offer to the market | | | | | |
| 12. The company's internal business processes | | | | | |

| BUSINESS BENEFITS | CHANGE AS A RESULT OF ENGAGING WITH THE KEN (i.e. over and above the knowledge and capability the company already had before engaging with the KEN) | | | | |
|---|---|---|---|---|---|
| **As a direct result of engaging with the KEN, what if anything has changed in terms of the company in the following areas:** | **NEGATIVE CHANGE** | **NO CHANGE** | **MINOR POSITIVE CHANGE** | **MODERATE POSITIVE CHANGE** | **MAJOR POSITIVE CHANGE** |
| 13. The company's level of international sales | | | | | |

### *3.2 Role of the KEN in achieving the benefits*

For the most notable business changes/benefits that you have indicated, to what extent do you think you could have achieved them anyway without the KEN support?

| **THE MAIN BENEFITS or CHANGES EXPERIENCED** | **Certainly not achieve any of the benefit/s without the KEN support** *(no deadweight)* | **Would achieve only a small part of the benefit/s without the KEN support** *(limited deadweight)* | **Would achieve most but not all benefit/s without the KEN support** *(substantial deadweight)* | **Certainly would achieve all of the benefit/s without the KEN support** *(c. 100% deadweight)* | **Don't know** |
|---|---|---|---|---|---|
| Benefit/change A. | • scale additionality<br>• quality additionality<br>• timing additionality<br>• overall additionality | • scale additionality<br>• quality additionality<br>• timing additionality<br>• overall additionality | | | |
| Benefit/change B. | • scale additionality<br>• quality additionality<br>• timing additionality<br>• overall additionality | • scale additionality<br>• quality additionality<br>• timing additionality<br>• overall additionality | | | |
| Benefit/change C. | • scale additionality<br>• quality additionality<br>• timing additionality<br>• overall additionality | • scale additionality<br>• quality additionality<br>• timing additionality<br>• overall additionality | | | |

### *3.3 Other comments on benefits?*

Are there any other benefits/dis-benefits arising as a result of your company's engagement with the KEN that you wish to report?

**SECTION 4: Contributions to business turnover and employment to date**

*(Turnover is the total value of sales of all goods and services, possibly included in company accounts as income, sales or receipts.)*

In this part of the interview I want to discuss business performance over recent years.

| **4.1 What has been your business turnover in each of the following financial years?** | | | Thinking about turnover generated in each year since you first engaged with the KEN, how much different do you think turnover would have been <u>without</u> the support of the KEN<br><br>*Actual percentage or broad band (1-20%, 21-40%, 41-60%, 61-80%, 81-100%)* | | | |
|---|---|---|---|---|---|---|
| | Amount | Don't know | Lower (i.e. turnover would have been <u>worse</u> without KEN) | Higher (i.e. turnover would have been <u>better</u> without KEN) | No difference | Don't know |
| 2010/11 | £ | | n/a | n/a | n/a | n/a |
| 2011/12 | £ | □ | % | % | □ | □ |
| 2012/13 | £ | □ | % | % | □ | □ |
| 2013/14 | £ | □ | % | % | □ | □ |

| **4.2 What has been your employment (by employment we mean the number of people doing paid work – full-time equivalents and total employees if applicable) in each of the following financial years?** | | | Thinking about employment in each year since you first engaged with the KEN, how much different do you think employment would have been <u>without</u> the support of the KEN?<br><br>***Actual percentage or broad band (1-20%, 21-40%, 41-60%, 61-80%, 81-100%)*** | | | |
|---|---|---|---|---|---|---|
| | Amount | Don't know | Lower (i.e. employment would have been <u>lower</u> without KEN) | Higher (i.e. employment would have been <u>higher</u> without KEN) | No difference | Don't know |
| 2010/11 | | □ | n/a | n/a | n/a | n/a |
| 2011/12 | | □ | % | % | □ | □ |
| 2012/13 | | □ | % | % | □ | □ |
| 2013/14 | | □ | % | % | □ | □ |

## SECTION 5: Market characteristics

In this part of the interview I want to discuss the characteristics of your main market.

***5.1 Thinking about competition in your main area of business, which of the following statements best describe your business?***

| OPTIONS | RESPONSE | Approx. % | |
|---|---|---|---|
| All the businesses I compete with are based in Scotland | | n/a | |
| The majority of the businesses I compete with are based in Scotland | | | |
| Around half of the businesses I compete with are based in Scotland | | | |
| A minority of the businesses I compete with are based in Scotland | | | |
| None of the businesses I compete with are based in Scotland, or I have no direct competitors | | n/a | |

***5.2 Thinking about the market conditions in your main area of business since 2011, how would you describe them?***

| OPTIONS | RESPONSE | |
|---|---|---|
| Declined strongly | | |
| Declined moderately | | |
| Stayed about the same | | |
| Improved moderately | | |
| Improved strongly | | |

## SECTION 6. Inputs to your business

In this part of the interview I want to discuss the sources of the goods and services that your business uses.

***6.1 Thinking about the main supplies that your business relies on, which of the following statements best describes your source of supplies in terms of overall value?***

| OPTIONS | RESPONSE | Approx % | |
|---|---|---|---|
| All our supplies, in terms of value come from Scottish based suppliers | | 100% | |
| The majority of our supplies, in terms of value, come from Scottish based suppliers | | | |
| Around half of our supplies, in terms of value, come from Scottish based suppliers | | | |
| A minority of our supplies, in terms of value, come from Scottish based suppliers | | | |

| OPTIONS | RESPONSE | Approx % | |
|---|---|---|---|
| None of our supplies, in terms of value, come from Scottish based suppliers | | 0% | |

## SECTION 7. Future prospects for your business turnover and employment

In this part of the interview I want to discuss the future potential for business growth.

**7.1 What do you estimate your business turnover will be in each of the following years?**

Thinking about how you will achieve these turnover figures in each year, how much different do you think turnover would be <u>without</u> the support you have already received from the KEN?

*<u>A</u>ctual percentage or broad band (1-20%, 21-40%, 41-60%, 61-80%, 81-100%)*

| | Amount | Don't know | Without KEN turnover would be lower i.e. it has a + ve impact | Without KEN turnover would be higher i.e. it has a - ve impact | KEN will make no difference to turnover | Don't know |
|---|---|---|---|---|---|---|
| This year (2014/15) | £ | □ | % | % | □ | □ |
| Three years from now (2017/18) | £ | □ | % | % | □ | □ |
| Five years from now (2019/20) | £ | □ | % | % | □ | □ |

**7.2 What do you estimate your employment (by employment we mean the number of people doing paid work– full-time equivalents and total employees if applicable) to be in each of the following years?**

Thinking about future employment in each year, how much different do you think it will be <u>without</u> the support you have already received from the KEN?

*Actual percentage or broad band (1-20%, 21-40%, 41-60%, 61-80%, 81-100%)*

| | Amount | Don't know | Without KEN input, employment would be lower<br>i.e. it has a + ve impact | Without KEN, employment would be higher<br>i.e. it has a - ve impact | KEN makes no difference to employment | Don't know |
|---|---|---|---|---|---|---|
| This year (2014/15) | | □ | % | % | □ | □ |
| Three years from now (2017/18) | | □ | % | % | □ | □ |
| Five years from now (2019/20) | | □ | % | % | □ | □ |

**SECTION 8: Significance for Scotland's policy objectives for a low carbon economy**

Finally, please offer your best judgement on the likely impact of the KEN support on your company's ability to contribute to this.

| | **As a direct result of the inputs received from the KEN, the level of the contribution that your company's own services/products can make will:** | | | | | |
|---|---|---|---|---|---|---|
| **Contribution of the companies products or services to:** | **- be less than before** | **- not be discernibly different** | **- be greater by a minor amount** | **- be greater by a moderate amount** | **- be greater by a major amount** | **it is not possible to say** |
| 1) Reducing carbon emissions | | | | | | |
| 2) Reducing energy consumption | | | | | | |

Please briefly explain your answer.

REQUEST TO PERMIT FOLLOW-UP BY E-MAIL IF REQUIRED, THANKS AND CLOSE.

## Annex C: Technical information supporting the economic impact calculation

### DEFINITIONS

ADDITIONALITY: an impact arising from an intervention is additional if it would not have occurred in the absence of the intervention. LEAKAGE: the proportion of outputs that benefit those outside of the intervention target area or group.

DEADWEIGHT: expenditure to promote a desired activity that would in fact have occurred without the expenditure.

DISPLACEMENT: the proportion of intervention benefits accounted for by reduced benefits elsewhere in the target area.

GROSS ADDED VALUE (GVA): an indicator of wealth creation, measuring the contribution to the economy of each producer, industry or sector and is generally regarded as the best measure of the sum of economic activity within an area. GVA is the difference between the value of goods and services produced (output) and the cost of raw materials and other inputs. It is calculated gross of any deductions for depreciation or consumption of fixed capital. GVA is measured at current basic prices and is equal to Gross Domestic Product (GDP), less taxes on products plus subsidies on products.

In this study, information on company employment and turnover is most readily accessible and this is used to provide broad estimates of GVA using the Scottish Government's published data on gross turnover and GVA estimates at the level of industry sectors in Scotland.

MULTIPLIER: economic benefits of an intervention that are multiplied because of knock-on effects within the economy: this economic activity (jobs, expenditure or income) is associated with additional local income, local supplier purchases and knock-on GVA contributions. A Type II multiplier captures indirected and further, induced contributions to the economy.

NET PRESENT VALUE: the discounted value of a stream of either future costs or benefits. The term Net Present Value (NPV) is used to describe the difference between the present value of a stream of costs and a stream of benefits.

NOMINAL: a nominal variable is one where the effects of inflation have not been accounted for.

PRESENT VALUE: future value expressed in present terms by means of discounting. The discount rate is used to convert all costs and benefits to 'present values', so that they can be compared. The discount rate recommended for public sector investments according to HM Treasury is 3.5%.

OPTIMISM BIAS: the demonstrated systematic tendency to be over-optimistic about key project parameters, including capital costs, operating costs, works duration and benefits delivery.

SUBSTITUTION: where a firm substitutes one activity for a similar one (such as recruiting a jobless person while another employee loses a job) to take advantage of public sector assistance. It can be thought of as 'within firm' displacement.

## DISCOUNTS USED IN THE IMPACT CALCULATION

| FACTOR | |
|---|---|
| Deadweight | Discounts for deadweight are made on a case by case basis, using responses (empirical evidence) from each of the six company respondents. See spreadsheets in Annex D. |
| Displacement | Discounts for displacement are made on case by case basis, using responses from each of the six company respondents to questions on competition in Scotland and recent market condition. See spreadsheets in Annex D. |
| Leakage | Assumed to be 0%, i.e. no leakage. |
| Substitution | Assumed to be 0%, i.e. no substitution. |
| Optimism Bias | Optimism bias is applied to the two firms forecasting relatively much stronger turnover growth (considered to be 'outliers') which also indicate that their market conditions are flat or (only) moderately improving. The discount level applied here is 'judgement based': no empirical evidence is available. Optimism bias is applied to one firm for employment forecasts. See details in the spreadsheets in Annex D. |

## CALCULATION OF GVA

Direct net additional GVA is calculated from the turnover forecasts using Scottish Government Growth Sector statistics for the "Energy including renewables' sector. These data indicate the relationship between GVA and turnover. In converting from turnover to GVA for the purposes of the impact assessment in present study average sector turnover for three years to 2012 and average GVA for the three years to 2012 (the most recent year for which published data are available) are used to obtain conversion factor of 0.41 (i.e. turnover x 0.41 = GVA).

## TREATMENT OF MULTIPLIERS

The assessment of GVA and employment impact is expressed with and without a multiplier (see Section 8 of the main report). However, as the KEN is supported by public funds which if not spent on the KEN would have been used on other economic activities which would also have a multiplier, the preference of the authors of this report is to utilise the GVA and employment figures without the multiplier.

Information from individual KEN clients on their sources of bought in goods and services are provided in Annex D. The empirical evidence from the six firms reporting an attributable business benefit is highly variable: it ranges from 1 firm @ 40% of supplies from within Scotland; 2 @ 100%; 1 @ < 10% and 1 "don't know". The data points are too few to use these data with any confidence.

The firms supported by the KEN also span a range of energy-related sectors/markets and Scottish Government figures for GVA multipliers for energy-related industries are themselves likely to be variable. The table below lists Type II GVA multipliers for other selected industry sectors in Scotland.

Given these factors, it has been decided to adopt a Type II GVA multiplier and to use a 'conservative' value of **1.6**.

| Industry sectors | GVA multiplier in 2009 | .. in 2010 | .. in 2011 |
|---|---|---|---|
| Research & Development | 2.1 | 2.0 | 2.0 |
| Other manufacturing | 1.7 | 1.7 | 1.6 |

| Industry sectors | GVA multiplier in 2009 | .. in 2010 | .. in 2011 |
|---|---|---|---|
| Machinery & equipment | 2.0 | 1.9 | 2.0 |

Using a broadly similar approach, a 'conservative' Type II employment multiplier of 1.6 is used (see table below).

| Industry sectors | Employment multiplier in 2009 | .. in 2010 | .. in 2011 |
|---|---|---|---|
| Research & Development | 1.9 | 1.8 | 1.8 |
| Other manufacturing | 1.6 | 1.5 | 1.7 |
| Machinery & equipment | 2.1 | 2.2 | 2.4 |

**VALUE OF PUBLIC SECTOR CONTRIBUTION**

The total planned funding figure for the KEN is £3,003,926. In the final version of the proposal submitted to ERDF the breakdown is as follows:

- ERDF: £1,051,374
- ETP universities: £150,000
- Other public bodies: £1,796,000 (made up of £500,000 from SE; £900,000 from Scottish Government and £396 from the SFC)
- other sources: £6,552.

The original brief for this assignment focused on evaluation of the KEN project to end August 2014. The population of business beneficiaries and the sampling of this population was based on the list of 'clients' of the KEN's Consultancy Project and Collaboration Support products available at the end of August. Towards the end of this of this evaluation (in late November, 2014) additional information was provided which updates the number of firms in receipt of support. Whilst these new data on company supports have been noted in this report (giving a more up to date picture of achievements with respect to ERDF activity measures), it has not been possible to sample the additional companies for interview. In any event, being only recently in receipt of support, it is unlikely that they will have yet seen much if any business benefit that would be discernible as an economic impact. Therefore the estimation of economic impact is based on the population and sampling agreed with the client at the outset, namely 72 companies in the population of which 66 were candidates for interview. In the event, 29 firms were interviewed.

However, it is notable that since end August 2014 we have been informed of an additional 11 Consultancy Projects. As the KEN project will run through Quarter 1 of 2015, this and other forms of support may well increase still further. Of course this may mean that business benefit and economic impact attributable to the KEN may be higher than the present evaluation can discern. This reflects the timing of the evaluation not only with respect to the end of the current KEN project in 2015 but also with respect to the time elapsed since individual firms received support.

It is not feasible to extrapolate with any confidence from evidence gained from the population at end August 2014 to benefits and impact of support only recently given and that not yet delivered, not least because the impact assessment based on empirical evidence is highly sensitive to what is reported by a small number of beneficiaries (referred to as 'outliers' in the analysis). Therefore

the absolute figures for Present Value of the KEN's GVA and employment impact are based on activity with companies up to end August 2014, as per the original brief.

However, by using only the public sector spend up to end August 2014 rather than the total KEN budget as an input to the NPV and GVA to cost calculations, these figures (and especially the ratio) are indicative of what the overall KEN project will achieve assuming that the return from public sector's financial input from September 2014 to the end of the project remains broadly similar.

Following this approach, in determining the Net Present Value of the KEN and the ratio of GVA impact to the cost of achieving this impact, a figure of £2,227,550 is used as the public sector contribution to end August 2014. This is derived as follows: (i) the financial input for the period is calculated on a pro-rata basis from the budget profile in Table 3; (ii) the public sector contribution (from ERDF, SE, Scottish Government and SFC) is taken as 95% of this based on the breakdown of financial contributions set out above.

In the calculation ERDF funding is included as a public sector contribution alongside SE, Scottish Government and SFC funding as the former is a 'Regional Aid' contribution to economic development in Scotland. It is a contribution based on the UK's membership contribution to the European Commission's budget and to Scotland's relative economic performance amongst EU countries and regions. It is public funding that has been allocated for use in Scotland and if not deployed for this purpose (as with the SE, Scottish Government and SFC funding), it would have been deployed on another economic development initiative in Scotland.

**EXTRAPOLATING THE FINDINGS OF THE IMPACT ASSESSMENT FROM THE EMPIRICAL DATA TO THE POPULATION OF KEN CLIENTS**

Information on attributable turnover change comes from six firms out of the sample of 29 companies which were interviewed. Two firms (numbers 15 and 17 in the summary table in Annex D) are regarded as 'outliers': they forecast substantially higher business turnover change than the others. The figures for direct net additional turnover calculated for these firms are subtracted from the total for the six reporting an impact before an average turnover is established to use in extrapolating to the population. The value for the 'outliers' is added back into the total estimate for the population. The step-wise process for turnover and for employment is set out in more detail in the tables below.

In making these extrapolations, because of the small number of data points (namely six) neither the sample nor the population of firms have been partitioned into firms that have been in receipt of one or more Consultancy Project supports, Collaboration Support or both. In other words, both the sample and the population have been assumed to be 'homogeneous'. Furthermore, for similar reasons of limited data points, the small minority of firms that reported value in Consultancy Project support which demonstrated that a business 'idea' was not feasible is also included in the population. We judge this approach to be both 'pragmatic' and to give a reasonable overall approximation of quantifiable impact.

| | |
|---|---|
| Population of firms in receipt of substantive KEN support i.e. Consultancy Project and/or Collaboration Support (due to firms no longer trading, the 'valid' population is 69 firms) | 69 |
| Sample of firms interviewed during this study | 29 |
| Number in sample reporting a change in turnover attributable to the KEN | 6 |
| Estimated number of additional firms in the population likely to experiencing a change in turnover attributable to the KEN | 8 |

| |
|---|
| Due to differences in levels of reported turnover change, 2 firms out of six are regarded as 'outliers' and are not used in calculating an average value per company. This is achieved through the following steps: |
| 1. THE NET ADDITIONAL TURNOVER FOR 6 FIRMS IN THE SAMPLE OF 29 FIRMS |
| less the TO for Company 17 and Company 15 (the outliers) |
| 2. TURNOVER LESS OUTLIERS IS DIVIDED BY 4 TO OBTAIN AVERAGE TO PER COMPANY |
| 3. THIS AVERAGE IS MULTIPLIED BY 8 TO REFLECT THE LIKELY ADDITIONAL TURNOVER AT THE LEVEL OF THE POPULATION |
| 4. THE FIGURE AT STEP 1 IS ADDED TO THAT AT STEP 3 TO PROVIDE THE EXTRAPOLATION FROM THE SAMPLE TO THE POPULATION |

A similar stepwise process is followed in extrapolating forecast impact on employment from the sample to the population of firms in receipt of substantive support from the KEN. In this case only one firm in the sample is considered to be an 'outlier'. Details of the calculation can be found in Annex D.

## Annex D: Quantitative evidence on changes in business performance and on economic impact

See MS Excel file which accompanies this report: it contains an electronic version of the chart below plus spreadsheets which give the GVA and employment impact calculations

| Index Number - identifier | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Service/s received** | Consultancy | Consultancy | Consultancy | Consultancy | Consultancy | Consultancy | Consultancy | Collaboration | Consultancy | 3 projects | Consultancy | Collaboration | Collaboration | Collaboration | Consultancy |
| **Status** | Final report awaited | Client did not sign-off report | N/A | Project not completed to client's requirements | Completed | Prototype built in 2014 but no final report at time of interview | Project completed 2014 | Completed | Project on-going | 1 completed 2013, 1 completed 2014 and 1 ongoing | Ongoing | Project not completed at time of interview | Ongoing | N/A | Completed |
| **Employment supported by the funding by year - or comment if any explaining why none** | Idea not feasible | Research unusable | Company did not think it had a valid project | Prototype not what was expected so no further progress | Idea feasible but not progressed due to exteranl factors | Research unusable | None to date | Idea not feasible | Project not completed | 1 additional job in 2012-13, not sustained | Idea feasible but not progressed | | Idea has progressed to next stage of development but still pre-revenue | Collaboration failed due to failure of partnership | 3 jobs in 2014-15 |
| **Turnover and employment attributable to the outcomes of the funding to date by year - or comment if any explaining why none** | Idea not feasible | Research unusable | Company did not think it had a valid project | Prototype not what was expected so no further progress | Idea feasible but not progressed due to exteranl factors | Research unusable | None to date | Idea not feasible | Project not completed | None reported up to 2013/14 | Idea feasible but not progressed | | Idea has progressed to next stage of development but still pre-revenue | Collaboration failed due to failure of partnership | £100,000 in 2014-15 |
| **Turnover and employment forecast by year/term - comment if any explaining why none** | Idea not feasible | Research unusable | Company did not think it had a valid project | Prototype not what was expected so no further progress | Idea feasible but not progressed due to exteranl factors | Research unusable | Anticipate an additional £1.5m 2015/16-2017/18. Additional turnover p.a. by 2017/18 c. £750,000 and an additional 6 FTE's by the end of 2015/16. | Idea not feasible | Project not completed | 1-3% of £680,000 t/o 2014-15 . And 3-5% of £840,000 in 2017-18. And 1-3% of £1.25m in 2019/20 | Idea feasible but not progressed | Anticipate £50,000 to £1000,000 t/o in 2015/16 (first year of trading) and 2 to 4 additional jobs in 2015/16 | Idea has progressed to next stage of development but still pre-revenue | Collaboration failed due to failure of partnership | £3m t/o in 2017-18 and £10m t/o in 2018-19. And 15 jobs in 2017-18 and 25 jobs in 2018-19 |

| Index Number - identifier | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Service/s received** | Collaboration | Consultancy | Consultancy | Consultancy | N/A | Consultancy | Consultancy | 2 Consultancy projects | Consultancy | Consultancy | Consultancy | 2 Consultancy projects | Collaboration | Collaboration |
| **Status** | Completed May 2014 | Ongoing | Completed 2014 | Completed | N/A | Completed | Completed | Completed | Ongpoing | Completed | Completed | Completed | Ongoing | Ongoing |
| **Employment supported by the funding by year - or comment if any explaining why none** | Idea has progressed to next stage of development but still pre-revenue | | Idea has progressed to next stage of development but still pre-revenue | Idea has progressed to next stage of development but still pre-revenue | Company did not think it had a valid project | Competitor research informed activity but had no direct economic impact | Idea has progressed to next stage of development but still pre-revenue | 1 additional job 2014-15 | Idea has progressed to next stage of development but still pre-revenue | Idea has progressed to next stage of development but still pre-revenue | Idea has progressed to next stage of development but still pre-revenue | Idea feasible but not progressed due to exteranl factors | Project not completed | Project not completed |
| **Turnover and employment attributable to the outcomes of the funding to date by year - or comment if any explaining why none** | Idea has progressed to next stage of development but still pre-revenue | Idea has progressed to next stage of development but still pre-revenue | Idea has progressed to next stage of development but still pre-revenue | Idea has progressed to next stage of development but still pre-revenue | Company did not think it had a valid project | Competitor research informed activity but had no direct economic impact | Idea has progressed to next stage of development but still pre-revenue | £80,000 in 2014-15 | Idea has progressed to next stage of development but still pre-revenue | Idea has progressed to next stage of development but still pre-revenue | Idea has progressed to next stage of development but still pre-revenue | Idea feasible but not progressed due to exteranl factors | Project not completed | Project not completed |
| **Turnover and employment forecast by year/term - comment if any explaining why none** | Idea has progressed to next stage of development but still pre-revenue | 15 jobs and £5m of turnover by 2017/18 | Idea has progressed to next stage of development but still pre-revenue | Idea has progressed to next stage of development but still pre-revenue | Company did not think it had a valid project | Competitor research informed activity but had no direct economic impact | Idea has progressed to next stage of development but still pre-revenue | £200,000 in 2015-16 (first year of trading). And 0 additional jobs. | Idea has progressed to next stage of development but still pre-revenue | Idea has progressed to next stage of development but still pre-revenue | Idea has progressed to next stage of development but still pre-revenue | Idea feasible but not progressed due to exteranl factors | Project not completed | Project not completed |