

Energy Technology Partnership

Analysis of survey results

This is an analysis of responses received to a web-based survey questionnaire issued on behalf of the ETP by SQW Consulting during late September, 2009. The invitation to participate was distributed through the following channels:

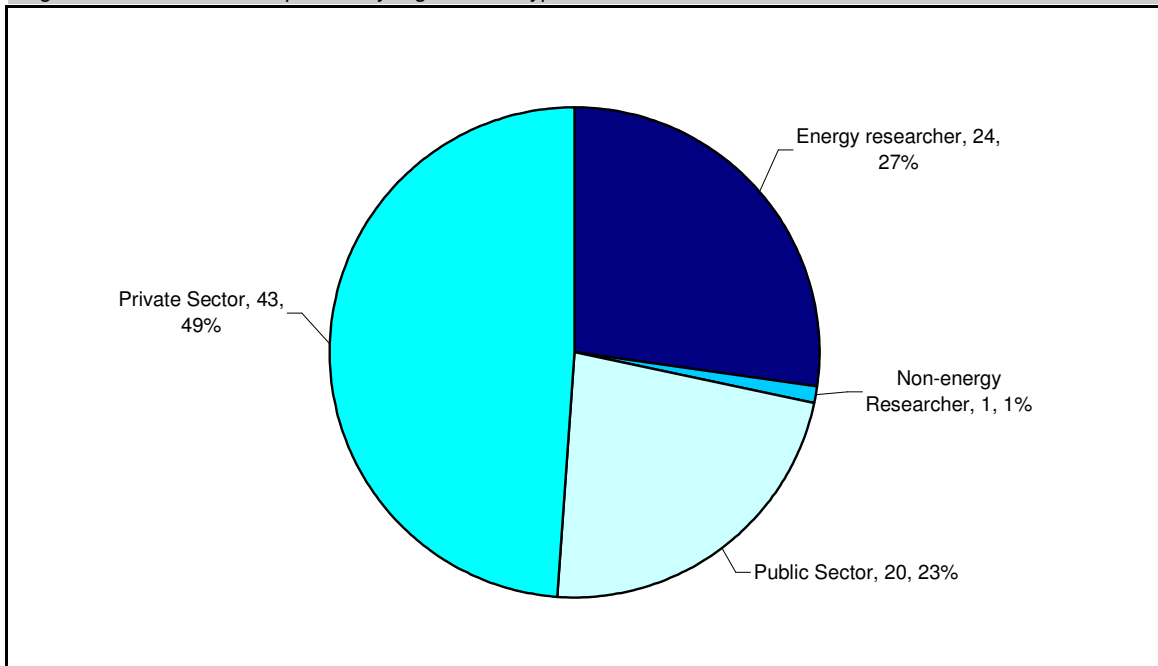
- emailed to the Energy Technology Partnership (ETP) mailing list
- emailed to the Industrial Power Association mailing list
- emailed to contacts provided by Scottish Enterprise
- link placed in the Scottish Renewables Newsletter for two days.

A total of 88 responses were received out of an estimated 400 potential respondents, a 22% response rate.

Profile of respondents

Of the 88 respondents, all indicated the type of organisation they worked for. Those involved in the private sector provided almost half of responses, with energy researchers and public sector each making up around a quarter. Only one response was received from a non-energy researcher.

Figure 1 Breakdown of responses by organisation type



Source: SQW Consulting, N=55

Of those respondents who did work in a university or research institute undertaking energy research, 23 gave the name of their institution. Table 1 gives a breakdown of the named institutions.

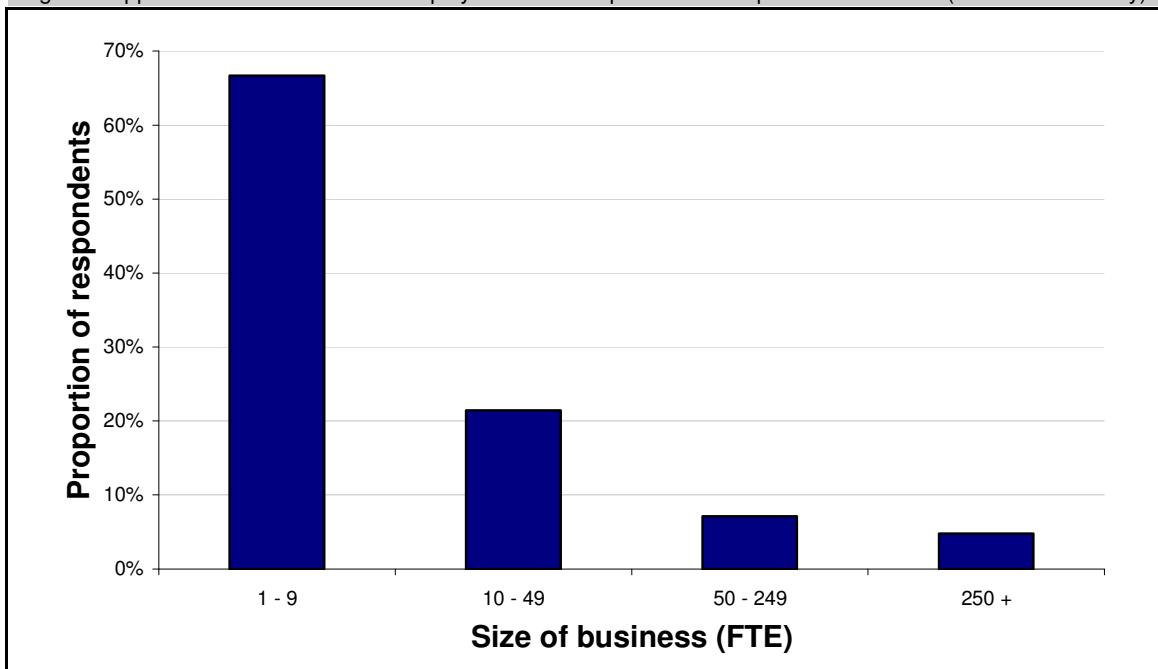
Table 1 Breakdown of academic/researcher respondents' host university/research institution

University	No of respondents
University of Strathclyde	6
University of Glasgow	4
Glasgow Caledonian University	3
Heriot-Watt University	3
University of St Andrews	2
Dundee University	1
Edinburgh Napier University	1
Lews Castle College UHI	1
University of Edinburgh	1
University of Coimbra, Portugal	1

Source: SQW Consulting, N = 23

For the private sector, the majority (67%) of businesses are very small, with less than 10 FTE employees. Businesses with between 10 and 49 FTE employees made up around 20% of responses while businesses with more than 50 FTE employees made up around 10% of responses.

Figure 2 Approximate number of FTE employees within respondent's companies in Scotland (Private sector only)

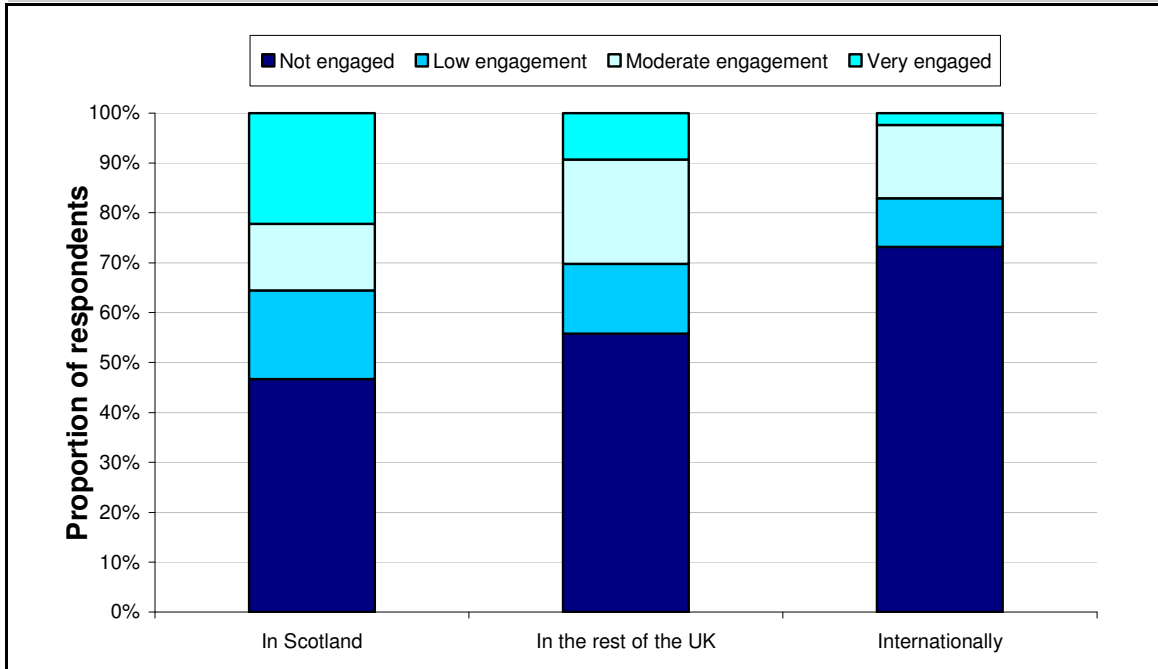


Source: SQW Consulting, N=42

The private sector respondents were also asked if their Scottish operations engaged with university-based energy researchers in Scotland, the rest of the UK and internationally. More than half of firms (53%) reported engagement with Scottish energy researchers while less than half (44%) were engaged with energy researchers in the rest of the UK and just 27% were engaged with energy researchers overseas.

There is a similar pattern in terms of the *level* of engagement, with almost a quarter (22%) of respondents stating that their organisation's Scottish operations were very engaged with Scottish energy researchers compared to 9% and 2% stating that their organisations Scottish operations were very engaged with UK and international energy research respectively.

Figure 3 Level of engagement with university-based energy researchers by respondent's Scotland-based operation? (Private sector only)

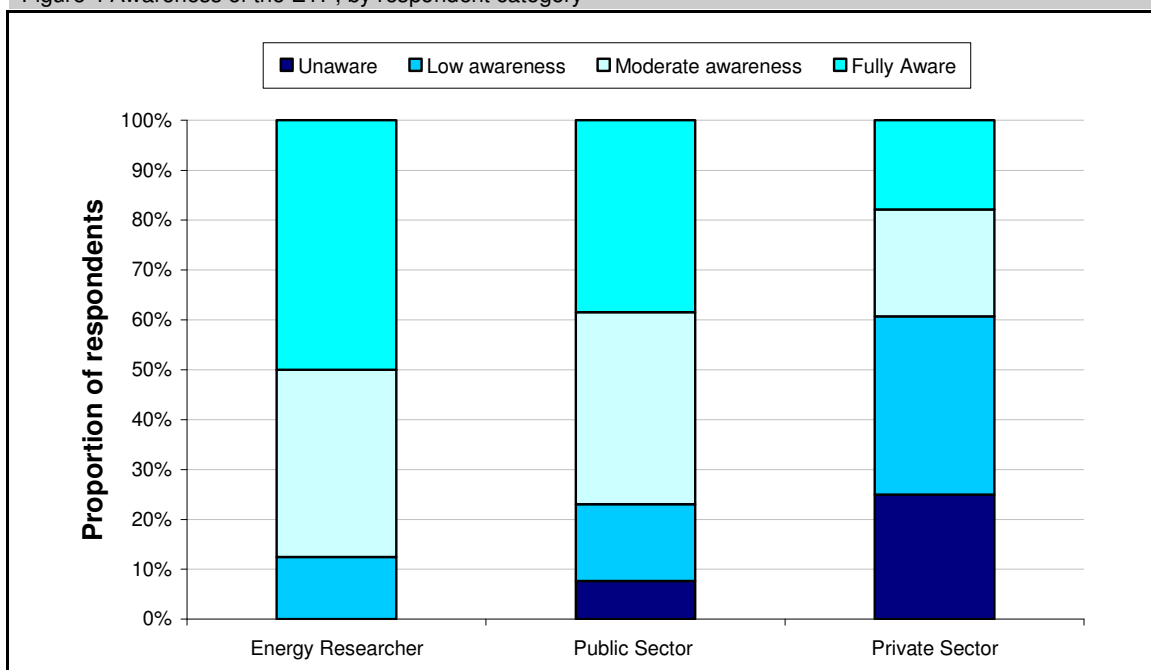


Source: SQW Consulting, N =45

Views on the ETP

There is a high level of awareness of the ETP among energy researchers and the public sector but more than six out of ten private sector respondents (61%) had either low or no awareness of the ETP before taking part in the survey.

Figure 4 Awareness of the ETP, by respondent category



Source: SQW Consulting, N = 57

Respondents were asked to rate the importance of the ETP's four key objectives which had been described in the introduction to the questionnaire. Nearly all respondents (96%) stated that relationship building was moderately or very important; 91% stated capacity building was moderately or very important; 87% stated that economic impact was moderately or very important; and 77% stated that internationalisation was moderately or very important (see Table 2).

Table 2 Importance ratings for ETP objectives

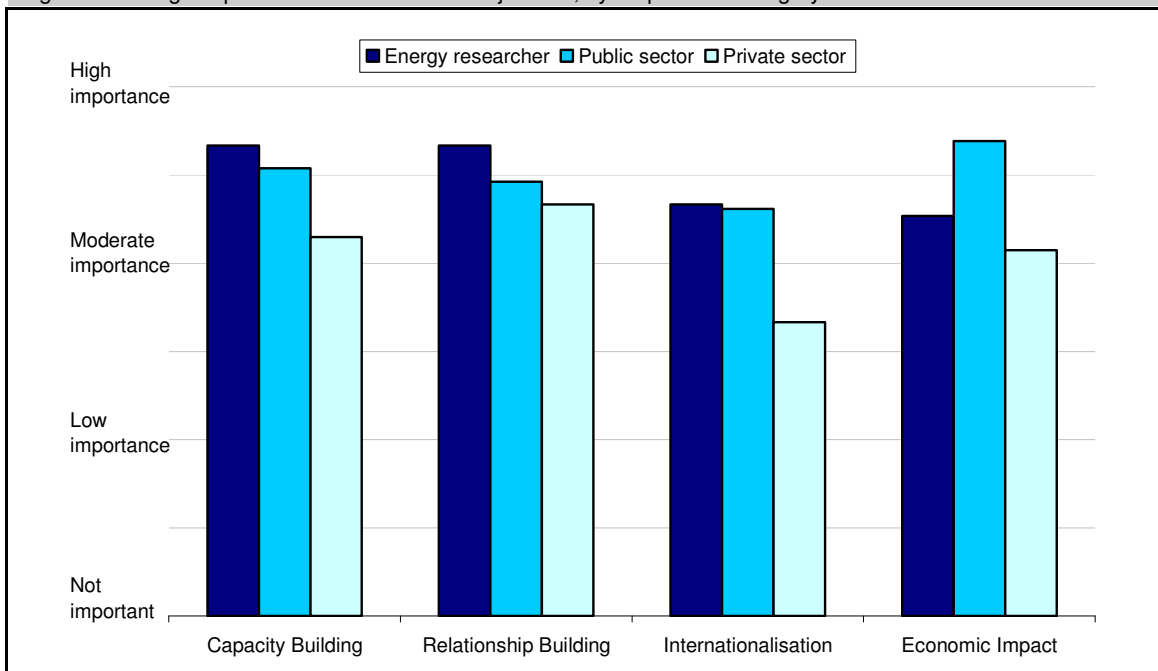
Objective	Not important	Low importance	Moderate importance	Very important
Capacity Building	5%	4%	38%	53%
Relationship Building	0%	4%	47%	49%
Internationalisation	5%	18%	47%	29%
Economic Impact	4%	9%	44%	44%

Source: SQW Consulting, N=55

The average rating achieved for each of the objectives by respondent category are shown in Figure 5. Among researchers, the most important objectives were relationship building and capacity building, followed by internationalisation and economic impact. Public sector importance ratings were slightly lower than the researchers' responses except for the economic impact objective which the public sector rated as the most important. The private sector consistently rated the objectives as of lower importance than the other respondent categories. The private sector respondents stated that

relationship building was the most important of the objectives and internationalisation as the least important.

Figure 5 Average importance scores for ETP objectives, by respondent category



Source: SQW Consulting, N=55

Table 3 gives detailed comments from respondents about the ETP objectives. Some respondents offered the same or similar comments on different objective areas.

Table 3 Respondent comments on ETP objectives

Capacity building	Relationship building	Internationalisation	Economic Impact
The ETP is valued as a forum for bringing together researchers and interested end-users of our research; also as a means to increase awareness (broadly and in more focused terms) of what we do and are capable of doing.	Without the relationships and real projects there is no ETP. Scotland has a very minor and limited capability which needs to be greatly expanded before we try to export our talents.	Energy usage and development will rely on international and national relationships.	As an economic development agency, we would wish to see our research facilities making a positive economic impact on our area, and capacity building is likely to be a huge part of that.
Establishing the strengths in the energy community and between academia and industry in Scotland and developing connectivity with the best beyond Scotland are the priorities.	The priorities should be to encourage working between institutions in sharing and supporting near market research. Internationalisation and economic impact will follow as a consequence.	Working in the field of the internationalisation of energy RDD&D, the ETP is crucial to gaining knowledge and expertise on this.	The commercialisation of know-how from the universities is going to be an important element of how Scotland derives economic value from the developing energy sector.
Via capacity building and relationship building (with the right people in place) the rest will follow. However, if people are just going to fight for their share and lose sight of the bigger picture ("what I've heard so far") then this will not happen and the ETP will fade away.	We are very keen to build on the knowledge base that we have built up in a niche market place in the UK. We want to continue our own research programme and also try to involve academic research institutions to advance our expertise in our market sector and then to look at how we can expand internationally as we saturate the relatively small	For academic scientists, economic impact is a lower priority than the development of an international network of individuals and groups with the common goal of developing energy science and technology. Such an international network will undoubtedly lead to economic effects,	Maximum economic benefit can only be achieved through close liaison with industry - the route to market. Economic impact is a prime consideration for a small country like Scotland - using our clean natural resources to boost our economy.

Capacity building	Relationship building	Internationalisation	Economic Impact
	UK market for that expertise.	particularly in a field like energy research, but this is a potential consequence rather than an aim of the intended contribution.	
Capacity building I assume in the sense of people? If so, this is a crucial issue for next 20 years or so - especially with large amounts of new nuclear and wind coming online.	Increasing awareness of ETP activities and economic impact are important to Housing Associations in relation to property design and tenant / customer benefit.	Forging international project collaborations is important.	Converting the wealth of academic expertise into economic impact is important for Scotland's continued growth and to ensure that these academics have a key part to play in the future in energy and power generation.
Research needs capacity and networks.	The role is to assist companies and researchers develop relationships and partnerships with a view to achieving these other benefits.	Energy usage and development will rely on international and national relationships.	Communication and financial impact is essential in all areas of business. Capacity building is an action based on this success or otherwise.
Can ETP help universities to research products etc?	There is a need to make SMEs more aware of research on renewable energy in universities.		Increasing awareness of ETP activities, economic impact is important to Housing Association's in relation to property design, tenant / customer benefit.
Worth looking at co-ordinated training i.e. doing more than just research.	Can the ETP find new business contacts for Scottish universities or businesses?		Better understanding of the contribution that research makes to Scotland's economic development is needed.
	Research needs capacity and networks.		Provide demonstrable benefit to the Scottish economy.
	Fostering greater cooperation will help to ensure that "UK plc" can exploit its expertise globally.		Helping Scottish firms to grow or be created as the energy market place changes.
	Energy usage and development will rely on international and national relationships.		

Source: SQW Consulting

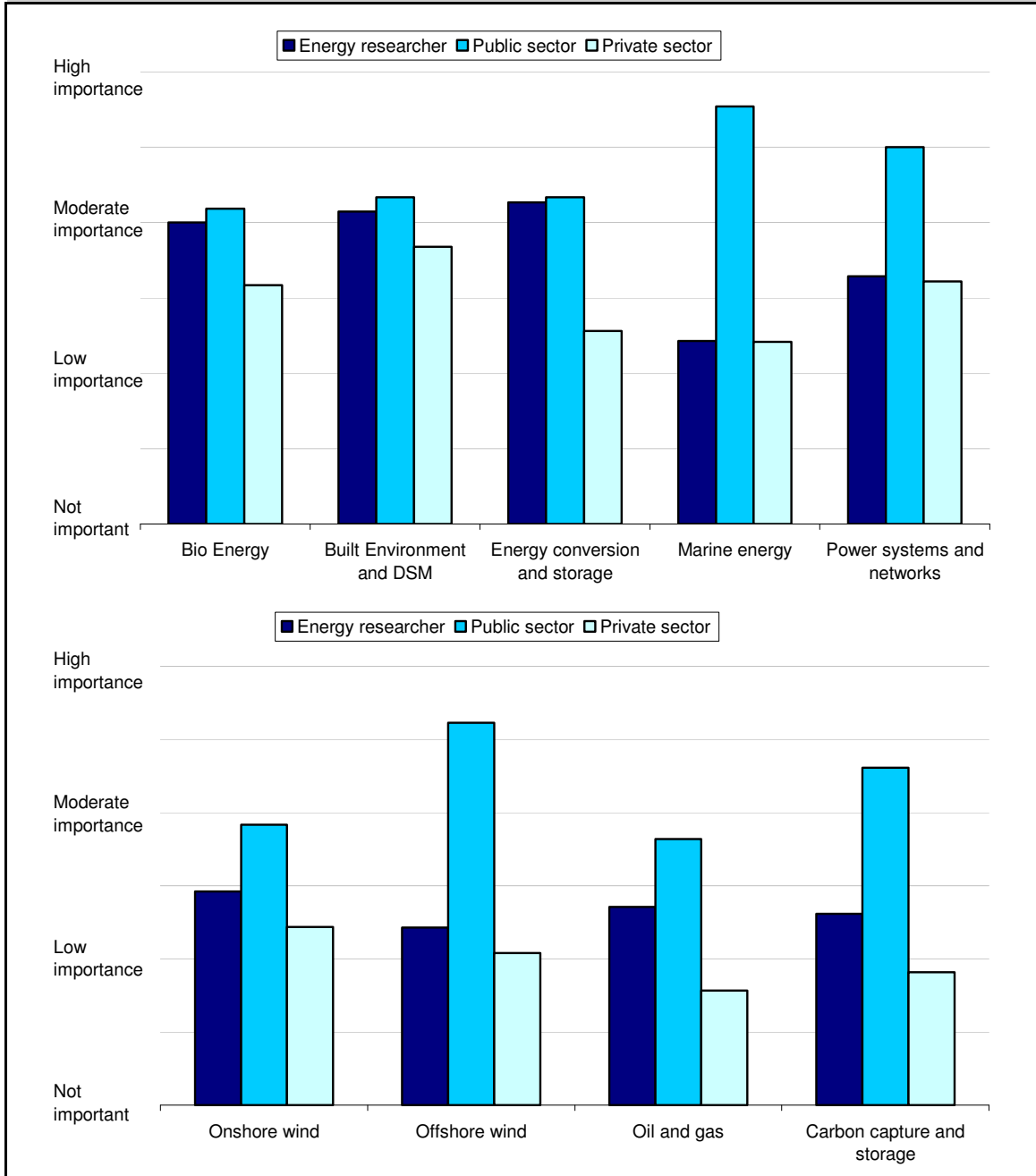
Respondents were also asked what additional or alternative activities they thought the ETP should focus on. Few additional themes were proposed which may suggest that the ETP is focusing on the correct themes. In fact, one respondent said that the ETP should not increase the number of objectives since “too many objectives will reduce focus”.

Respondents were asked to indicate how important the ETP’s main energy technology themes are to **their own organisation** and to **Scotland’s energy industry and economy** over the medium to long term.

Energy researchers reported that the most important research themes for their own organisations were energy conservation, built environment and demand side management (DSM), and bio-energy. The top three most important themes for private sector organisations were built environment and demand

side management (DSM), power systems and networks, and bio-energy. Finally, public sector organisations stated that marine energy, offshore wind, and power systems and networks were the most important themes. Generally, the public sector rated the themes as more important than either the energy researchers or private sector respondents.

Figure 6 Importance of the ETP's themes to own organisation, by respondent category



Source: SQW Consulting, N = 52

Table 4 shows explanations given by respondents in relation to their responses on technology priorities. It also pulls out relevant responses to a question which asked respondents to list the three top priorities for the ETP over the next three years. It is important to note that there were recurring comments regarding the absence of both nuclear and solar as ETP technology themes.

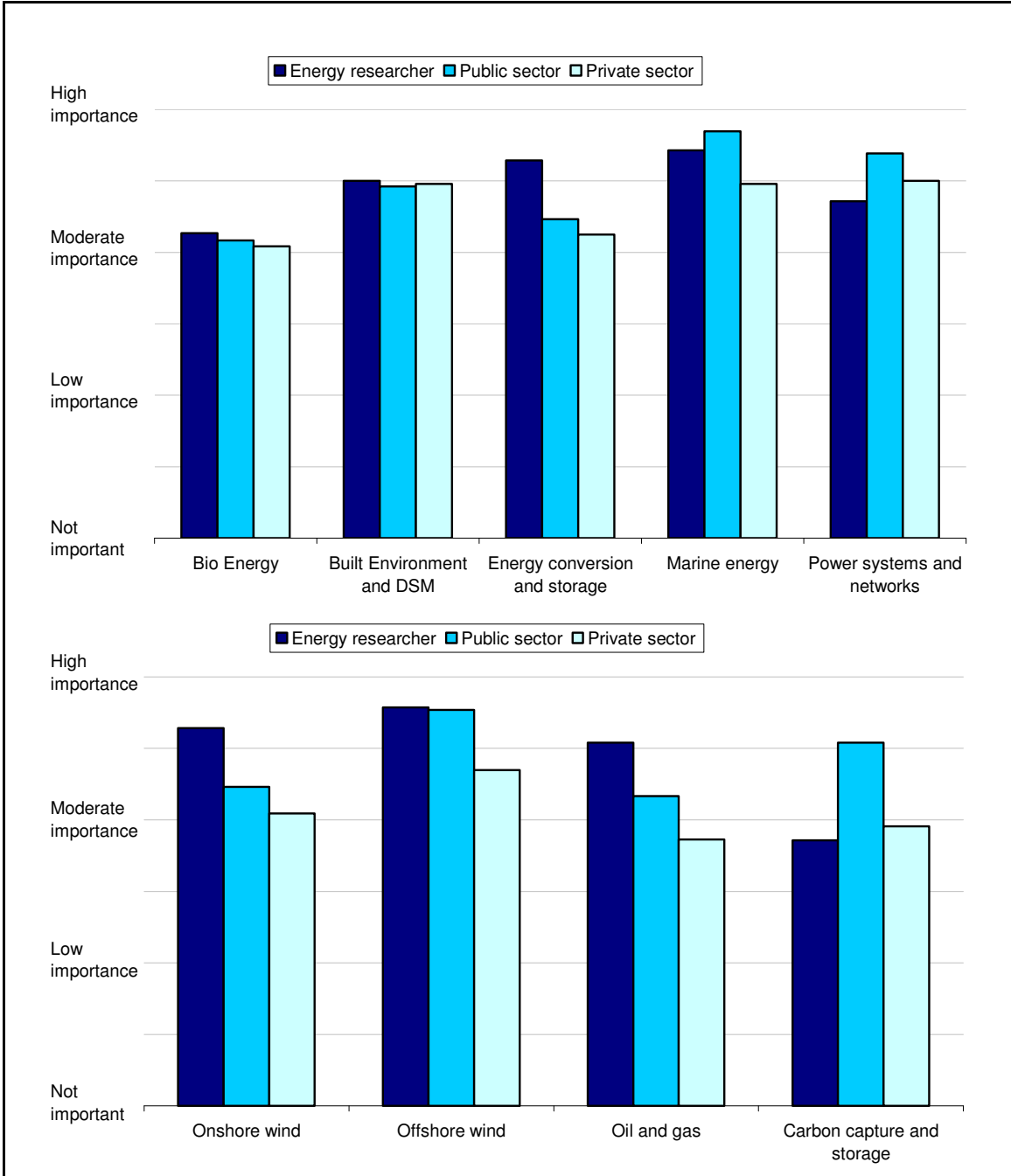
Table 4 Respondent's comment on the technology themes

Themes	Comments from survey on priorities
Marine	<ul style="list-style-type: none"> Supporting the testing and deployment of offshore renewable technologies Scotland's long term decarbonisation of its electricity generation needs to come via CCS and offshore renewables since onshore capacity is largely used up.
DSM	<ul style="list-style-type: none"> Energy conservation is a priority Transport Scotland needs to focus on low carbon and energy efficiency. But it will be impossible to sustain expertise across all areas Energy efficiency is crucial to reducing overall levels of demand, though demand will actually go up if we have electrical vehicles and heating. Development of Smart Grids & CHP
Carbon Capture & storage	<ul style="list-style-type: none"> Scotland's long term decarbonisation of its electricity generation needs to come via CCS and offshore renewables since onshore capacity largely used up. also energy storage (H2 etc) Important to find cost-effective ways of managing demand and storing energy (the latter a centuries old problem!). Carbon capture is too expensive for what it does, some would say the same of wind.
Fuel Cells	<ul style="list-style-type: none"> Fuel Cells for onsite energy generation to include specifically the fuel cells technology for mobile and large onsite decentralised energy generation, like remote sites away from the grid, and e.g. > 200 kW to about 5 MW using biogas, renewables fuels. Fuel cells can operate continuously and independently with biogas or natural gas or other methane content biogas...to back up the other renewables sources like wind, solar...etc...and in remote locations in Scotland...Fuel cell is new highly efficiently energy conversion technology ...potential for new industry and jobs in the country.
Nuclear	<ul style="list-style-type: none"> Consideration needed as to why ETP does not cover nuclear energy and if to do so would be appropriate. Surprised nuclear is not an option in your list.
Solar	<ul style="list-style-type: none"> An area where at least one university is very strong, solar, is not represented at all. Why?! I notice no solar field. Although we do not get much sunshine in Scotland, there is a place and time for solar generation, and with the price of silicon collapsing I think solar will have its place very soon. Scotland has the potential to become a world leader in the area of building integrated photovoltaic and solar thermal energy solutions - it would be good to at least see this on the ETP agenda. PV is a booming field, growing at over 40% p.a. for the last decade, whereas there are no off-the-shelf proven wave and tidal energy devices.
Heating systems	<ul style="list-style-type: none"> Heating is something that should be included in ETP priorities because it actually makes up around 45% of emissions. This organisation provides renewable heat systems using heat pump technology. This is not included as a technology in your list. Is there a reason for this exclusion?

Source: SQW Consulting

In terms of importance to Scotland, there tended to be more agreement between the three respondent groups and a tighter range of values for importance for each of the themes. Overall the most important themes were marine energy, offshore wind, and power systems and networks. Among energy researchers, the most important were offshore wind, marine energy and onshore wind: the public sector rated marine energy as the most important, followed by offshore wind and power systems, while the private sector chose the most important themes as power systems followed by built environment and DSM, and marine energy (see Figure 7).

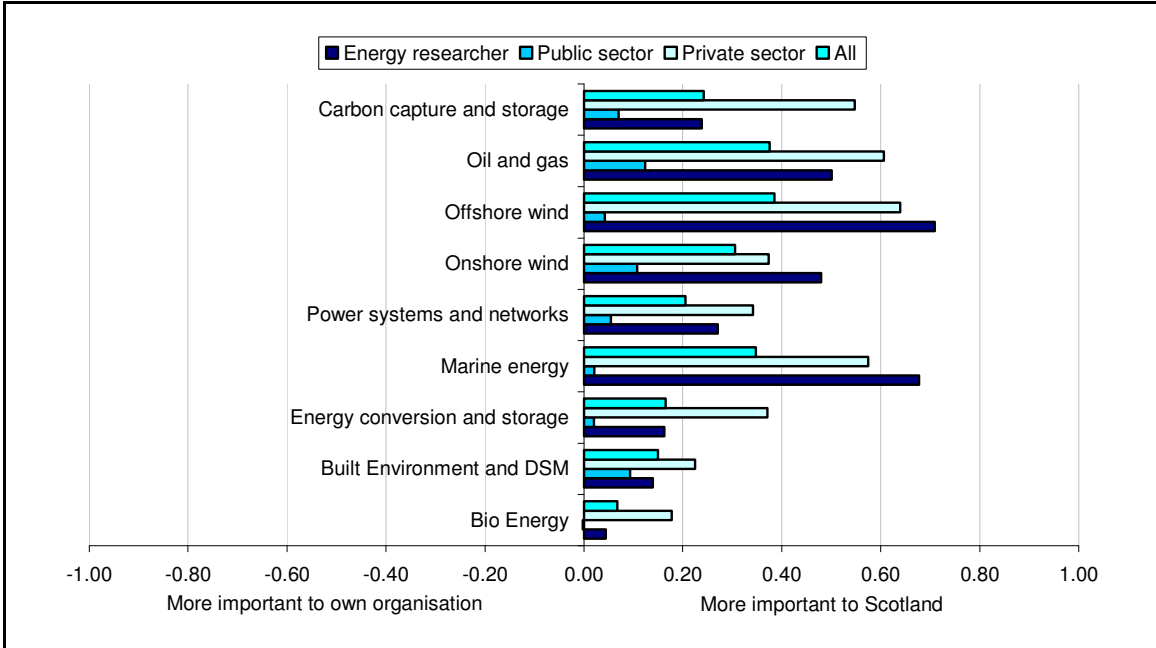
Figure 7 Importance of the ETP's themes to Scotland's energy industry and economy, by respondent category



Source: SQW Consulting, N = 51

Respondents stated that all the themes were more important to the Scottish energy industry/economy than for their own organisation. The public sector's importance ratings for own organisation and the Scottish economy overall were the most closely aligned, unsurprisingly.

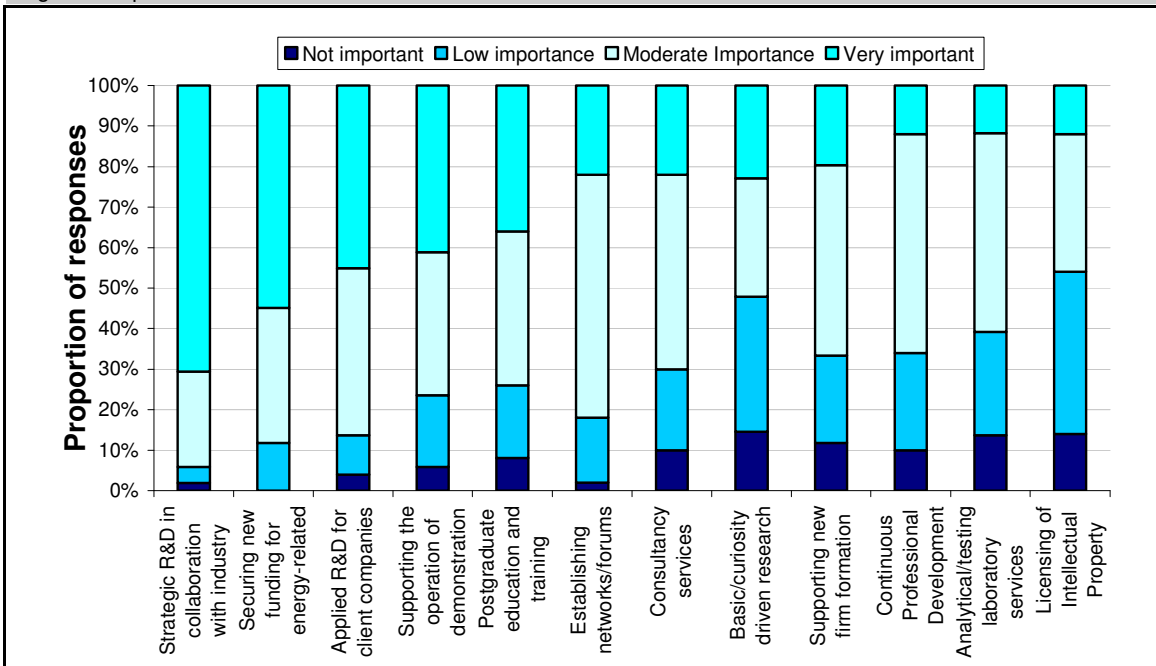
Figure 8 Relative importance of themes to Scotland's energy industry/economy and respondent's organisation



Source: SQW Consulting, N = 51

In terms of activities undertaken by the ETP, very few respondents stated that any of the activities were not important. Licensing of Intellectual Property, basic research and analytical/testing laboratory services were rated as the least important activities. The most important activities were strategic R&D in collaboration with industry, securing funding and applied R&D for client companies. The general knowledge exchange related activities were rated as less important than ones more closely focused on the conduct of R&D.

Figure 9 Importance of ETP activities



Source: SQW Consulting, N = 51

Respondents were also asked to list what they felt the ETP's top three priorities should be over the next three years, based on their view of the challenges and opportunities facing the energy sector in Scotland. Table 5 summarises responses.

Table 5 Respondent comments on ETP broad activities

Relationships between researchers	Relationships with industry	Demonstration	Research	Skills, Education & Training	Funding
Network Development - wide engagement across all Institutions.	Ensuring networks/partnerships exist to compete in energy market.	Deliver real demonstrator projects.	Promote commissioning of more research.	Help to growing the skill base.	Secure more R&D funding.
Bringing Scottish researchers together to capitalise on strengths - even in small subject fields there are so many development options.	Aligning research with industry needs to ensure connectivity of the RDD&D activities in Scotland.	Foster more demonstration projects.	Develop a specialised research institute dedicated to renewable energy research in Scotland.	Installation, operation and performance monitoring; training of the local skilled personnel to handle the fuel cells.	Developing funding mechanisms for the marine renewables industry.
Motivate researchers to be active and take part in solving the energy problems of the future - there are a lot of people with a lot of knowledge who are not particularly active in R&D.	Assistance in the development of working relationships between academia and industry.	Live demo projects need support.	Practical and applied research across energy sector.	Increasing technology skills at all levels - not just undergraduate and postgraduate - we need excellent technicians.	Concentrate on what the ETP is currently doing well - representing all universities to secure shared funding for energy research.
Encouraging and fostering full co-operation across Scottish Universities to create joined-up thinking.	Working with industry to help develop commercial applications for new technology.	Offer as much support as possible to demonstrations and prototype deployments in Scotland.	Promote basic/curiosity driven research.	Public education needs support.	Increase funding opportunities for the research community in the energy area.
Collaboration across institutions.	Extending good inter-university co-operation to even better industry-university co-operation - more outreach & placement.	Demonstration facilities are needed.	Supporting individual centres of excellence.	Support the development of appropriate training.	Securing funds for multi centre, cross disciplinary projects.
Build links with the UK's best research groups where Scotland has weaknesses in its research - Scottish companies need the very best support, not just the best in Scotland. Try not to get too distracted with overseas universities unless they are particularly relevant as the real costs of interaction are high compared to UK entities.	Bringing together world class players in energy R&D in academia and industry.	Establishing collaborative international demonstration projects in CCS, offshore grid and offshore wind.	Help Scotland become an international centre of knowledge.	Educate more professionals for leadership in the future.	Establish and lobby for the areas of greatest research and/or funding need.
Enhance collaborations	Engaging with Industry and	Sponsor near market pilot	Applied R&D for client	Increasing the capacity of our	Improve links to EU and

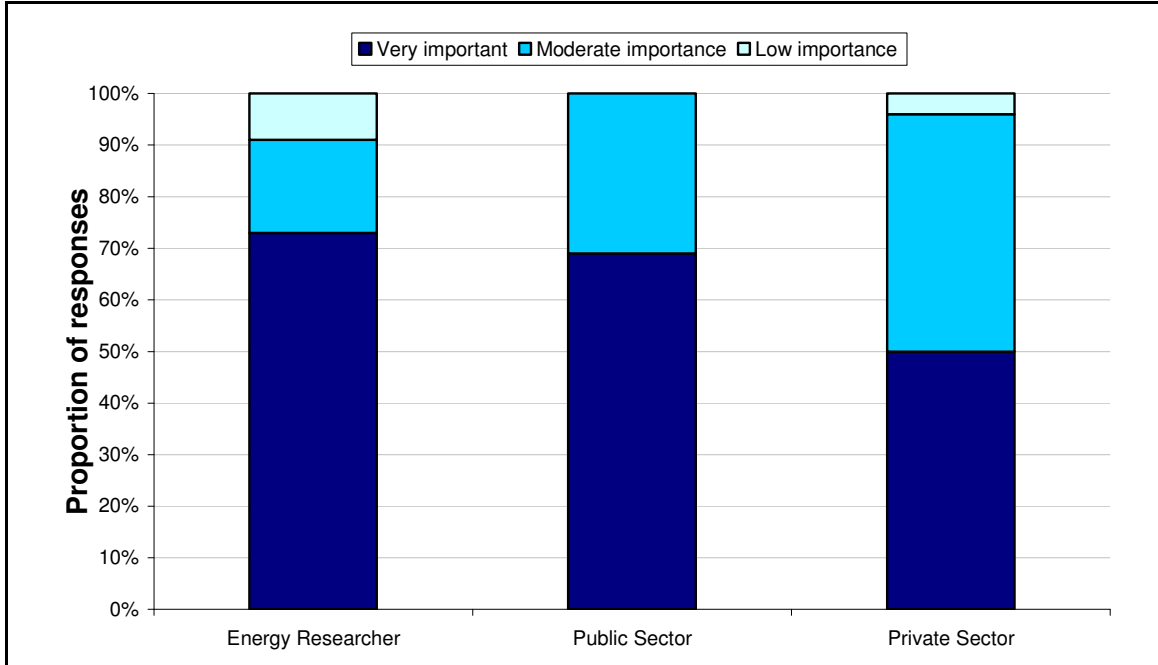
Relationships between researchers	Relationships with industry	Demonstration	Research	Skills, Education & Training	Funding
among research institutions.	addressing research to solving immediate problems.	scale demonstration projects for researchers.	companies.	nation to respond to the challenge - facilities and people.	funding sources for energy-related research.
Maintaining a forum for knowledge interchange and collaboration.	Creating collaborative relationships with industry.				Link sponsorship of near market pilot scale demonstration projects for researchers with funding opportunities.
Networks/ forums are important.	Getting existing know-how to market.				Securing Governmental funding to support training and public education
ALL the research in ALL Scottish Universities is less than that in Cambridge University, so building links with UK Universities is a critical next stage of development.	Assistance in the development of working relationships between academia and industry.				Securing funding, working with and developing meaningful projects with existing businesses.
ETP's importance will be judged by how it manages to engage widely with the sector and not replicate what others are delivering - a comprehensive, co-ordinated network of players is required to ensure true advancements are made	Increasing the involvement of industry in collaborative demonstration ventures - making the investment case.				There is a desperate need for researchers to obtain funding for pilot scale demonstration projects before they involve SMEs or form a spin out, so that their research is more inviting to the commercial arena.
Devising licensing system to promote the sharing of IP among research institutes and industry to better facilitate industry growth.	Creating collaborative relationships with industry.				Fund new spin outs and SMEs in the renewable energy sector.
	Formulating coherent plan for research involving universities and industry.				Collaboration with industry and attraction of research funds.
	Linking expertise in Higher				Help secure targeted funding

Relationships between researchers	Relationships with industry	Demonstration	Research	Skills, Education & Training	Funding
	Education to Industry.				
	Joint venture / industry participation.				Supporting the case for investment in ETs with government and financiers.
	Encouraging SME - academic partnerships.				
	Handover of proven technology to existing business.				
	Strategic R&D in collaboration with industry.				

Source: SQW Consulting

Overall, respondents rate the ETP as being an important resource to Scotland’s energy sector over the next three years: 64% stated that it will be very important and a further 32% stated it would be of moderate importance. By category, all of the public sector respondents stated that the ETP would be a very important resource, half of private sector respondents stated that it would be very important and just under a half (46%) stated it would be of moderate importance. There was a greater range of views among energy researchers: 73% thought it was very important, 18% moderately important and 9% of low importance (see Figure10).

Figure 10 Important of the ETP over the next 3 years as a resource to Scotland’s energy sector, by respondent category



Source: SQW Consulting, N = 48

Respondents were invited to make additional comments on the ETP. A number of respondents praised the work that the ETP has done up until this point:

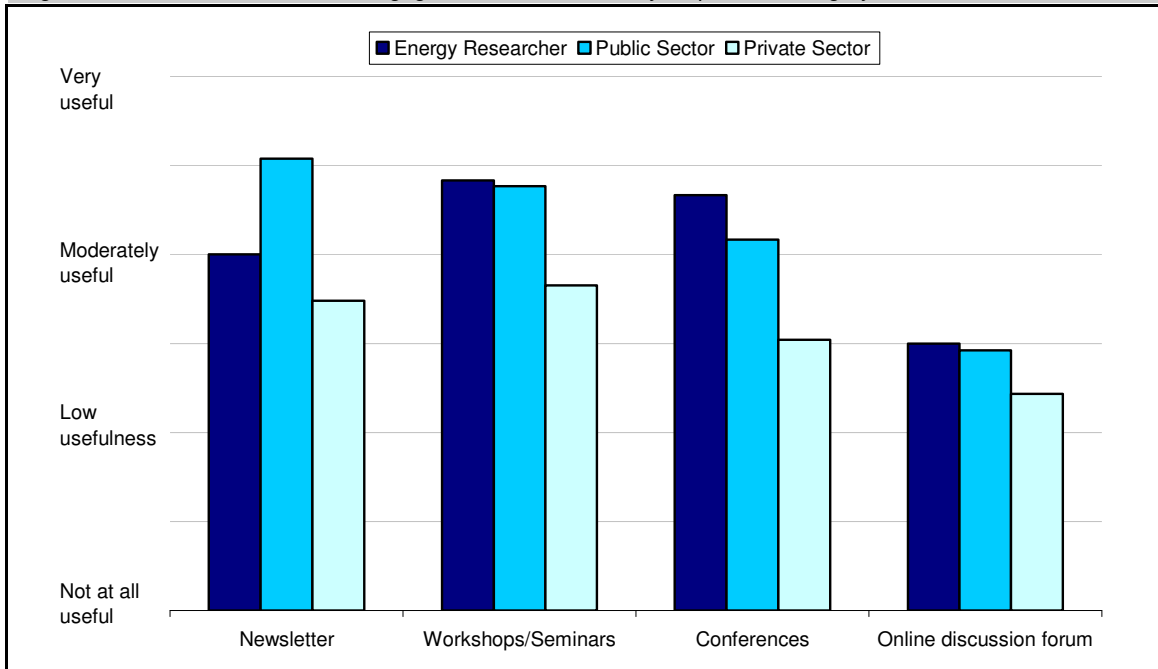
- ETP has made a very successful start
- it is becoming successful in achieving current objectives
- ETP has done a very good job drawing together Scottish Universities and allowing them to bid as one.

It was recognised by others that the ETP must be selective and realistic about the areas in which Scotland can become world class: “taking a strategic approach to RDD&D, focused on Scotland's strengths, not spreading us too thinly.” According to one source, over the next three years, the ETP’s priority should be to become “market and thought leaders in selected areas” by “focussing academic activities in high growth areas of sector development”.

Engaging with the ETP

In terms of engaging with the ETP, the most popular option overall was through workshops and/or seminars, followed by newsletters and conferences. Online discussion forums were the least popular option. The private sector was the least interested in all of the options (see Figure 11).

Figure 11 Usefulness of means of engagement with the ETP, by respondent category



Source: SQW Consulting, N=48