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Evaluation

Final Report

ADDITIONAL RESEARCH

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Executive Summary.

Introduction.

This report sets out the findings from an evaluation of the Innovation Centres (IC) Programme led by Additional Research on behalf of Scottish Enterprise (SE), the Scottish Funding Council (SFC) and Highlands and Islands Enterprise (HIE).

The following research was undertaken as part of the evaluation between August 2022 and March 2023:

- Desk review of key documents and management information.
- One-to-one stakeholder interviews (funders and ICs).
- Questionnaire surveys of direct beneficiaries, supported students, and wider stakeholders.
- Case studies of a small number of clients and projects for each IC.

Background.

Innovation Centres (ICs) were established to bring the expertise and capabilities of Scotland's universities, research institutes, colleges and businesses, to address industry demand led opportunities that support growth of the Scottish economy. This evaluation provides strong evidence that the ICs are delivering against this vision and that they are bringing overall benefits to the Scottish economy, and society more generally, through supporting opportunities for industry and academia to work collaboratively. However, to date the economic benefits are more limited although this may reflect the time it takes for innovation support to result in commercial benefits.

ICs are part way through their second phase and, as such, they are continuing to develop and evolve. The evidence presented in this evaluation, and highlighted below, shows that the ICs are playing a substantial role in building innovation ecosystems, delivering innovation outcomes and impacts for the private sector, and in many cases, Third Sector and public sector organisations. The conclusions below are structured around the seven main evaluation objectives. Recommendations, linked to the conclusions are also presented.

Findings against main evaluation objectives.

1. ICs delivery of routes to economic and wider benefit through increased levels of collaboration between industry and academia.

ICs are supporting a very considerable volume of collaborative project activity between academia and industry. To date they are meeting high level objectives for GVA and employment impacts, to some extent although this may be reflecting the time taken for innovation support to result in commercial benefits. In addition, there are wider benefits for Scotland. At least 1,169 collaborative projects have been supported (actual), an underestimate given incomplete Monitoring and Evaluation Framework (MEF) data for Phase 1 in particular, which have generated *at least* 2,120 commercial launches and other applications of innovation. Some 520 of the 1,169 collaborative projects have led to follow-on activity, almost a quarter direct to market and a similar proportion signposted to further support from other public funding or support bodies.

The main message from the analysis is that intensity of engagement and triple helix collaboration matters. This is to an extent common sense and is what some IC stakeholders have commented on anecdotally. This evaluation supports such a view. Intensity of engagement in terms of duration of relationship with an IC, the range of supports, the number of repeat collaborative projects, the number of links supported to other ecosystem bodies (not only, but particularly, universities and colleges), all appear to have a positive effect on innovation outcomes and impacts. As does support for securing financial benefits via an IC (see section 2.3.9 on drivers of benefits).

Relationships of a shorter duration, isolated supports, fewer project engagements, fewer linkages established with other ecosystem bodies, and where finance benefits are not part of the package, appear to be associated with a lower frequency of benefits. In other words, building multifaceted relationships (including additional finance benefits) over an extended period time (several years) leads to better innovation outcomes and impacts.

An implication for IC's is to be able to build and maintain client relationships (for example through membership and networking, having appropriate CRM systems, and the staffing to maintain and cultivate relationships with a degree of continuity) **(see recommendation 1)**.

Through collaborative projects, ICs are supporting the progression through the Technology Readiness Levels (TRLs), moving projects from TRL1-3 and above to TRL7-8 in many cases. This is positive and indicative of movement from basic research and proof of concept, through prototyping to demonstration and commercial readiness.

These findings generally apply regardless of client type (private business, university or college, public body or third sector). Larger employers also tend to do better out of IC support (in terms of, for example, introducing new goods, services or processes as well as employment gains). While the difference with smaller organisations is not marked, it reinforces the need to offer continuing access and support to SMEs **(see recommendation 2).**

2. IC role in supporting colleges and universities to maximise their value to Scotland.

This evaluation indicates a premium from triple helix collaborations, as opposed to other non-collaborative innovation supports. This is indicative of the benefits of academic input to project activity, drawing on the considerable and extensive research strengths across Scotland. Supported IC clients access university academics who extend well beyond IC host universities, with ICs working with a range of institutions with expertise in relevant fields to them. Where there is strong IC support for a link to a university or college then innovation outcomes and impacts increase (see section 2.4.8).

A strong market failure is evident amongst industry knowing how and where to access academic support and so there is evidence that ICs are helping to address this. Translating academic expertise into commercial products has been a long-standing challenge. The review indicates stronger innovation outcomes for clients where market failures have been significantly reduced (see section 2.4.9).

IC engagement with colleges is much lower than with universities and, despite some ICs increasing their activity levels with colleges recently, more could be done by ICs to engage with the college sector **(see recommendation 3).** The picture is variable across ICs, and some are growing their activity in this area, including co-design of course content.

The IC programme has provided substantial skills development support in the form of support to students, with a particular focus on those studying for master's degrees, and the ICs' support is typically well regarded in this respect. Students play a positive role in knowledge development and engagement with industry. There is good evidence that the placement/work readiness element of MSc programmes is a useful recruitment tool for industry, retaining skills in Scotland (see section 2.3.10). ICs should be supported to continue this activity **(see recommendation 4)**. Whilst few students attribute their employment wholly to IC support, many go on to enter employment in fields associated with their area of study, especially in the private sector.

Where ICs have mobilised finance for clients (securing new equity, new debt finance, or new public sector investment), there is a strong positive link with increased innovation outcomes. It is recognised that brokering external finance has not been an explicit role of ICs. Findings suggest significant challenges in accessing wider investment linked to commercialisation and a positive role has been played by ICs in encouraging links to investors. There would be advantages in further developing this role (see sections 2.3.4 and 2.4.11) **(see recommendation 5)**. While the success of ICs

in mobilising other public sector sources of support for innovation should be acknowledged, ICs could still play a greater role in the leverage of private sector finance beyond that secured to deliver collaborative projects themselves **(see recommendation 6).**

3. Performance against targets and objectives.

Some 76% of the IC targets examined are exceeded or on track (75%+ achieved), although this is not evenly distributed across ICs. ICs have increased their engagement and collaborative project activities in Phase 2 compared to Phase 1, despite slightly reduced levels of core funding, with more varied events and increased business and academic collaboration. This is testament to the ICs growing in stature and capability, following Phase 1 which included their establishment and set up.

Targets for Phase 2 have been reached in most instances with the remainder of the funding period still to be completed. The exception is skills development activities that have been negatively impacted by the Covid-19 pandemic reducing placement possibilities and by Brexit reducing external funding and international students.

Overall, the ICs responded positively to the challenges presented by the Covid-19 pandemic, with some ICs leading national responses for the Scottish Government (see IC appendices). ICs continued, and in many cases increased, levels of support activity, pivoting to remote support and delivery, including major online conference engagement.

Not all Phase 2 targets have been stretching and monitoring against indicators is not consistent across the ICs, nor is target setting, with many adopting additional indicators and others not clearly reporting against core MEF indicators. There is sometimes a disconnect between the MEF and logic models and there is considerable merit in developing the MEF, for ICs and funders, increasing consistency of definitions and extending indicators, notably in relation to measuring wider benefits **(see recommendation 7)**.

ICs are meeting high level objectives for GVA and employment impacts. Against funder inputs of £97 million (Phase 1 & 2 to nearest reporting period, excluding DHI and PMS-IC inputs and employment)[1], the estimated net additional peak employment of 1,856 represents a cost of £52.2k per net additional job and funder input to net additional GVA is a benefit to cost ratio of 1.8:1. Although these impacts to date are positive, they are not significant. This may be due to timing, as a high proportion of business have still to translate their innovation activity to successful commercialisation. Whilst the estimates do assume some wider benefits in the economy via the application of economic multipliers, the cost per net additional job (2021 peak employment year) is similar to the average annual GVA output per employee (taking a 5-year, 2016-2020 average).

The net economic impacts for the supported population of business clients were estimated by grossing up impacts from survey respondents to the population. The Consultants did not have sufficiently detailed data on the characteristics of the total population of IC clients to compare with survey respondents in order to fully assess potential non-response bias and how representative the sample was of the population. In addition, due to the smaller number of respondents at the individual IC levels, confidence intervals for individual IC results were wider than for the overall programme. This means that grossed up impacts, particularly at the individual IC level, should be treated with a degree of caution as they are based on feedback from a relatively small sample of IC clients and have a larger margin of error. There is, however, little other evidence regarding actual or net economic impacts, and the findings represent the best evidence available on which to estimate the net economic impact of the ICs. The evaluation makes it clear that such impact data should be considered alongside other evidence of benefits in the report rather than in isolation.

[1] DHI and PMS-IC excluded from GVA impact calculations- see section 2.3.6.

4. How effectively ICs engage in the ecosystem.

There is strong evidence that ICs are engaging with and indeed building innovation ecosystems. ICs have supported *at least* 1,268 events across Phases 1 and 2, with extensive signposting from collaborative projects to other funding bodies (there is scope for more consistent feedback mechanisms from events) (**see recommendation 7**). IC clients indicate they have been significantly supported in establishing links with a wide range of ecosystem bodies, notably with universities, colleges, and private industry.

There has been progress in increasing the density of ecosystem networks. The number of different types of support accessed (e.g., collaborative projects, networking, training etc.) is also associated with better innovation outcomes and impacts (2.3.9). However, there is still scope to further promote connections in many cases as part of sustained, long-term relationship building **(see recommendation 1).**

Networking intensity suggests a positive relationship with innovation outcomes and impacts. This applies across the innovation outcomes and impacts examined. This finding supports the value of networking activity alongside collaborative projects, where the density of the relationships, as one might expect, appears important (see section 2.4.7).

It is clear from the evaluation that ICs are building ecosystems that go far beyond any narrow definition of IC activities. The IC appendices provide an assessment of how effective each IC has been in building engagement in its own ecosystem across several dimensions, with IC's providing leadership, influence, partnership building and system strengthening and building system resources in term of visibility, knowledge and entrepreneurship. Although some ICs have been active in building the ecosystem beyond Scotland more can be done to build international links and presence **(see recommendation 8**.

IC clients clearly value the role of the ICs in building the innovation ecosystem, reporting a range of innovation system-related benefits that relate to IC expertise, increased visibility and development of trust between organisations. ICs act as a source of sector or technology expertise for their clients, improve the visibility of the sector or technology area and support the diffusion of knowledge and good practices between academia and businesses, as well as the public and third sectors.

5. Wider impacts.

As well as building and strengthening the innovation ecosystems described above, ICs are contributing to wider societal goals, most notably in relation to human health and wellbeing and IC contributions to net zero. For some ICs, addressing the net zero agenda is explicitly articulated in their approach.

Survey evidence illustrates the breadth of wider impacts from IC support for clients, which include public and Third Sector organisations. Almost three in four clients report significant contributions to sustainable development goals because of working with the IC, most frequently in the adoption of new medium-high, and high technologies, ensuring healthy lives, promoting wellbeing, COVID response, promoting lifelong learning and access to education and conservation and sustainable use of marine resources. Stakeholders cited IC impacts in relation to good health and wellbeing and climate action.

There are challenges in measuring wider benefits, with a need for stronger monitoring and evaluation plans and relevant MEF frameworks established as part of IC business cases (**see recommendation 7**). This is particularly necessary for ICs where wider benefits form a larger share of overall impact (such as DHI and PMS-IC). Such wider benefits may take longer to be realised and relate more closely to public sector agendas and efficiencies, rather than commercial outcomes. Other ICs also

make a significant contribution to wider societal issues which may have dual commercial and public benefit impacts.

6. Degree to which ICs benefit all parts of Scotland.

Universities across Scotland are engaged with the ICs and collaborative projects between academics and IC clients are brought forward across a wide range of industrial sector interests. More than one in seven IC clients, for example, have engaged with universities in the North East of Scotland and almost one in 10 engaged with the University of the Highlands and Islands, principally SAIC clients.

The broad geographic spread of IC client activity also translates to innovation outcomes that are distributed across Scotland. The introduction of new or significantly improved goods, services, or processes since working with ICs and attributed to ICs, by client location, is slightly more concentrated in the central belt, however all parts of Scotland demonstrate these innovation outcomes. Knowledge benefits attributed to ICs are also distributed across Scotland with no clear geographic pattern.

There are pockets of Scotland where networking benefits are lower, typically although not always further away from the central belt, which shows the value of a local presence, especially in Highlands and Islands and the South of Scotland (**see recommendations 9a and 9b)**. Outreach and an 'on-the-ground' presence is effective in spreading the reach of IC activity and impact.

Employment additionality impacts are also evident across Scotland, again with no clear geographic pattern. Rather, employment impacts are greatest in certain local authority areas where high employment impact projects have been supported.

7. Lessons learned.

The delivery of the IC programme over Phase 1 and to date in Phase 2 has become more refined, with lessons learned from Phase 1. ICs are supporting increased levels of activity, with less core funding resource, in part though the leverage of public and private resources.

There remain some issues that frustrate ICs when being hosted by Universities, most typically in relation to administrative process linked to HR and finance, where ICs are bound by host University procedures. This includes the ability to recruit in a timely manner, offering competitive market rates and career progression. The ICs' academic institutional status can also inhibit funding applications in some circumstances. Generally, however, there are many mutual benefits of the IC-host University approach and good practice which can be replicated and built upon (building on SFC 'Good Practice Governance Guide for Innovation Centre's Boards[2]') (**see recommendation 10**).

There are lessons learned from the implementation of the MEF, where there has been inconsistency of application and some confusion as to what information is captured and when. There have been additional issues with respect to data protection and the release of information to allow timely and effective evaluation. The MEF and data collection protocols should be reviewed and refreshed (**see recommendation 7)**.

As an extension of lessons related to data collection via the MEF, there is emerging good practice in relation to using CRM systems to better guide IC activity and impact. The evidence from this review is that longer-term, multiple intervention relationships work best in terms of innovation, GVA and job outcomes and impact, and CRM systems can be used effectively to monitor and nurture these interactions (**see recommendation 1)**.

There is emerging good practice in moving to a more programme, mission-based approach where ICs support groups or clusters of projects under prioritised themes, rather than a more project-based approach. BE-ST is perhaps most advanced in this approach, although others (e.g., The Data Lab) are developing their approaches to more strategic and transformational interventions. ICs should not lose sight of the clear benefits of collaborative project activity. However, this can be part of a wide programme-based philosophy (**see recommendation 11)**.

[2] https://www.sfc.ac.uk/innovation/innovation-centres/innovation-centres-key-documents.aspx

The use of independent advisory panels can be effective in raising the quality of supported projects. Several ICs have advisory boards, and these have slightly different remits and responsibilities, although SAIC's independent scientific panel appears to be a good model in bringing independence to project approval (**see recommendation 12)**.

Recommendations.

The following recommendations arise from evaluation of the IC programme level. There are some additional, IC-specific recommendations contained in the IC appendices, although only where these are not covered by the overall recommendations below.

Recommendation 1: A more developed, sustained, relationship approach with IC clients, underpinned by sound CRM systems. Sustained relationships with multiple interventions deliver greater impact. This requires the specification of a minimum set of data fields needed for IC's CRM systems, and a wider systematic resourcing (of staffing and resources) for account management/ business managers to **promote sustained relationships** with clients (see also recommendations 2, 6 and 10). **Owner:** ICs. **Timescale:** 6-12 months.

Recommendation 2: Maintaining a mixed portfolio of clients and reinforced SME engagement. ICs should continue to engage SMEs and increase SME reach, balanced with recognition that some of the bigger economic gains are likely to be derived from larger players, and that these are also necessary ecosystem members. **Owner:** ICs. **Timescale:** ongoing.

Recommendation 3: To support the drive for further college involvement from a low base. The review shows relatively limited engagement with colleges although some ICs are working with colleges more extensively than others. There are a variety of ways in which ICs can engage with colleges, from collaborative R&D to course co-design, to skills development support and placements, to event and engagement activities. **Owner:** ICs. **Timescale:** ongoing.

Recommendation 4: Continue skills programme work/employer readiness support. The review evidence points to the value of skills development support to industry as well as students, including business recruitment. Some ICs have very strong employer readiness support programmes and these should be continued and where relevant replicated in other ICs. Industry placements are particularly effective. **Owner**: Funders/ICs. **Timescale:** ongoing.

Recommendation 5: Supporting a greater role for ICs in encouraging links to investors and strengthening their position in ecosystems. The findings suggest that there are significant challenges in accessing wider investment linked to commercialisation. Part of this relates to next stage, post-feasibility finance and weaknesses in the investment support landscape (e.g., for early-stage manufacturing). Whilst ICs have played a positive role in this regard, they cannot overcome these barriers alone, and ICs could play a greater role in linking clients to potential investors. Consideration should be given to how ICs can be supported/encouraged to make these links. **Owners**: Funders/ ICs. **Timescale**: 6-12 months.

Recommendation 6: To support the drive for increased private and public sector leverage. Greater private sector leverage increases the return and value for money from core funder investment and generates economic benefits for Scotland. There have been considerable increases in private sector leverage in Phase 2 and this drive should continue. There have also been substantial additional public sector monies leveraged by ICs and this is further encouraged for building IC ecosystems (particularly where it results in a more favourable distribution of UK wide innovation funding to Scotland). **Owner:** ICs. **Timescale:** ongoing.

Recommendation 7: Improve and develop the Monitoring and Evaluation Framework (MEF). The programme would benefit from an updated and revised monitoring and reporting framework (MEF) to assist in consistently tracking and reporting existing indicators as well as incorporating additional indicators and methods for capturing wider benefits, and equity (particularly representation of HIE

and South of Scotland enterprises). As a minimum, this should include the following (and a working group should be established to guide/oversee):

a) Improved jobs and turnover tracking (ICs).

b) Common guidance for defining logic models, results chains, and 'logframes'[3], linked to a more robust/comprehensive suite of indicators; a MEF handbook with indicator definitions, and roles and responsibilities for data collection, and timing of collection (Funders).

c) Common guidance on event monitoring and feedback (light touch) (ICs).

d) A process to address challenges in measuring wider benefits (e.g., health economics/carbon savings measurement) through the mapping of intended project results chains (i.e., the intended inputs, activities, outputs, outcomes, and impacts), and an associated set of qualitative and quantitative indicators (Funders/ICs).

Owner: programme partners, ICs. **Timescale**: 6-12 months

Recommendation 8: To support ICs to act internationally and to strengthen their links to SDI. ICs are an asset for Scotland with extensive reach and links to academic expertise and industry insight. ICs have the ability to have greater influence internationally. Whilst some ICs have developed some rest of UK and international links, this could occur on a much greater scale for the benefit of Scotland. ICs should demonstrate how they are going to grow their international presence. **Owner:** Funders/ ICs. **Timescale:** 6-12 months.

Recommendation 9a: Ensuring access to ICs by clients in the South of Scotland. Outcomes and impacts from the IC programme are being derived by those clients in the South of Scotland that engage with the programme, although the numbers engaged could be higher. There should be a more systematic approach from ICs to increasing access to ICs by South of Scotland clients, recognising the specific profile and needs of the South of Scotland business base. **Owners:** Funders/ ICs. **Timescale:** 6-12 months.

Recommendation 9b: Ensuring access to ICs by clients in the Highlands and Islands. Again, there is evidence that outcomes and impacts from the IC programme are being derived by those clients in the Highlands and Islands that engage with the programme. Engagement is greatest where ICs have a physical staff presence in the region and/or a dedicated resource. ICs should continue (and be supported to continue) outreach work and specific project activity in the region. **Owners:** Funders/ ICs. **Timescale:** 6-12 months/

Recommendation 10: Develop and implement refreshed national guidance for host universities. There is good practice amongst host universities in how best to support ICs to be as effective as possible. Some of this relates to clear processes and procedures (which typically exist), but also where flexibilities can and have been introduced to allow ICs to act as autonomously and independently as possible. In the past there has been a dedicated group looking at administration issues. Whilst there is no need for a formal group, guidance on good practice for host universities in relation to staffing (recruitment, progression) and financial processes would be beneficial. **Owner:** SFC. **Timescale**: 6 months.

Recommendation 11: Developing a more programme / mission-based approach. Impacts are greater when projects are not supported in isolation and there is merit is coalescing project activity around programmes of activity or around IC missions. BE-ST have developed this approach to good effect. This should also include the move to more strategic and transformational projects linked to

[3] A logframe is a "systematic ,visual approach to designing, executing and assessing projects which encourages users to consider the relationships between available resources, planned activities and desired changes or results". https://www.betterevaluation.org/methods-approaches/methods/logframe

further growing ICs' ability to lever additional project and private investment, again a move some ICs are already undertaking (see also recommendation 6). **Owner:** programme partners, ICs. **Timescale:** 6-12 months.

Recommendation 12: Greater role of independent panels to support project approval, including scientific panels. Some ICs are already using such panels to good effect (e.g., SAICs SISP) which supports project and programme review and approvals and offering independent opinion. Others may wish to adopt a similar model. **Owner:** ICs. **Timescale:** 6-12 months.

1 Introduction.

1.1 Purpose of evaluation.

This report sets out the findings from an evaluation of the Innovation Centres (IC) Programme led by Additional Research on behalf of Scottish Enterprise (SE), Scottish Funding Council (SFC) and Highlands and Islands Enterprise (HIE). The seven centres within scope of the evaluation were:

- BE-ST (Built Environment - Smarter Transformation), formerly Construction Scotland Innovation Centre (CSIC).
- CENSIS (Centre for Sensing, Imaging and Internet of Things (IoT) technologies), formerly Centre for Sensors & Imaging Systems.
- DHI (Digital Health & Care Innovation Centre).
- IBioIC (Industrial Biotechnology Innovation Centre).
- PMS-IC (Precision Medicine Scotland Innovation Centre), formerly Stratified Medicine Scotland Innovation Centre (SMS-IC).
- SAIC (Sustainable Aquaculture Innovation Centre), formerly Scottish Aquaculture Innovation Centre.
- TDL (The DataLab).

1.2 Context.

1.2.1 Programme background.

In April 2012 the SFC issued the 'Innovation Centre Call for Proposals.' It requested proposals from Scottish higher education institutions (HEIs) and potential business partners to establish ICs in support of the Scottish Government's Economic Strategy (GES)[4]. The GES and associated frameworks for Innovation and Science for Scotland[5] articulated the need to support innovation to drive business competitiveness and economic growth. The call highlighted that ICs provided an important opportunity for HEIs to define and strengthen their role as partners with industry in delivering against business demand, and outlined the following vision:

> *"Using the Scottish university infrastructure, human resources and research excellence as a platform for collaborations across the whole of Scotland, Innovation Centres will create sustainable and internationally ambitious open-communities of university staff, research institutes, businesses and others to deliver economic growth and wider benefits for Scotland".*[6]

Following submission of proposals, some eight ICs were established with investment from SFC. The Centres did not all commence activity at the same time, so the Phase 1 start dates differ.

The ICs were invited to put forward Business Plans for Phase 2 funding. Whilst Phase 1 was fully funded by SFC, Phase 2 was financially supported by SFC, SE and HIE (DHI was also financially supported by the Scottish Government). Business Planning guidance issued by the funding partners updated the vision for the programme as follows:

> *"Innovation Centres bring the expertise and capabilities of Scotland's universities, research institutes, colleges and businesses, to address industry demand led opportunities that support growth of the Scottish economy. Innovation Centres should support transformational opportunities*

[4] As referenced in Innovation Centres: call for proposals (2012), Scottish Funding Council
[5] As referenced in Innovation Centres: call for proposals (2012), Scottish Funding Council
[6] Innovation Centre: call for proposals (2012), Scottish Funding Council

for industry and work collaboratively to develop Scotland as a world-leading entrepreneurial and innovative nation".[7]

The Business Planning guidance also provided updated aims and objectives, with the main aim being to "*deliver routes to economic benefits through increased levels of collaboration between business and academia which target business or sectoral growth and/or improved delivery of public services in Scotland".*'[8]

The appraisal of Phase 2 business plans followed the HM Treasury Green Book approach[9]. ICs were asked to follow a three-stage process with the first stage focussing on the strategic case setting out the transformational opportunity which each individual IC sought to address. The guidance required ICs to split out centre costs and project costs in recognition of the need for *"stable longer-term investment towards centre costs"* balanced with a *"much greater emphasis on the programme's original objective of ICs securing investment in demand-led projects primarily from industry, and competitively won funding from a range of UK and wider sources"*.

ICs each submitted a business plan. The appraisal process was delivered by the three funding partners and included the commission of a due diligence review of each IC's performance in Phase 1[10]. Following the multi-partner appraisal process seven ICs were awarded Phase 2 contracts. The Oil and Gas Innovation Centre (OGIC) did not receive Phase 2 funding and aspects of it, particularly engagement with academic base, were supported through a 3-year project at the Oil and Gas Technology Centre.

A staggered approach to Phase 2 was adopted reflecting that Centres had different Phase 1 start dates. This independent evaluation took place in 2022-3 with the end of Phase 2 approaching.

1.2.2 Programme objectives

The Phase 2 Business Planning guidance stated that each IC would need to contribute to the main aim of '*delivering routes to economic benefits through increased levels of collaboration between business and academia which target business or sectoral growth and/or improved delivery of public services in Scotland'* through focussing on some or all of eight objectives.

For the purposes of the evaluation the authors extended the Phase 2 objectives and as detailed in the appendices, sought to determine the extent to which each IC has delivered on them.

1. Work collaboratively with partners across the business innovation landscape to **direct businesses to the right support.**
2. Work with partners to **build and promote innovation support ecosystems and industry sectors**.
3. **Engage industry and academics in collaborative projects that drive business growth** delivering mutual benefits to all partners and inspiring further collaborations.
4. Help businesses **secure competitive, external innovation funding** aligned to industry challenges and requirements.
5. **Exploit academic research to solve industry-defined problems.**
6. Demonstrate leadership and **support the sector to address major Government policy priorities** covering economic, social and environmental objectives.

[7] Innovation Centres – Business Planning and appraisal guidance (2017), Scottish Funding Council Scottish Enterprise and Highlands & Island Enterprise
[8] Innovation Centres – Business Planning and appraisal guidance (2017), Scottish Funding Council Scottish Enterprise and Highlands & Island Enterprise
[9] Green Book (2022), HM Treasury
[10] Due Diligence Reports (2017 to 2019), Various authors commissioned by Scottish Funding Council

7. Help **secure inward investments** through promoting Scotland's strengths in academia-business collaboration.
8. Deliver collaborative projects to **enhance public services delivery** delivering mutual benefits to all partners and inspiring further collaborations.
9. Support **the development of skills** addressing industry needs.
10. Grow an environment that **develops the next generation of business innovators, academics and entrepreneurs**.

The objectives developed by the authors were created in an attempt to better reflect the scope of all seven ICs. For example, the development of skills that address industry needs (authors' objective 9) was not explicitly mentioned in the Phase 2 objectives (although this report acknowledges that objective 10 relates to skills). Nor was the authors' objective 6 which calls for ICs to demonstrate leadership and support the sector to address major Government policy priorities covering economic, social and environmental objectives. Finally, the role for ICs to work with partners to build and promote innovation support ecosystems and industry sectors (authors' objective 2) isn't contained within the Phase 2 objectives.

1.2.3 Business context.

1.2.3.1 A key role for SMEs.

At the outset of the programme, the Small Business Survey (2012)[11] highlighted that as of March 2012 there were an estimated 341,360 private sector enterprises operating in Scotland. Approximately 339,100 were small and medium sized enterprises (SMEs), comprising 99.3% of all businesses. These businesses are central to the Scottish economy, accounting for 55% of private sector employment and 38% of turnover.

The latest available Small Business Survey (2020)[12] reveals that some 36% of SME employers had introduced new or improved goods, services or processes in 2020 compared to 35% of UK SMEs. This is a rise of 3 percentage points compared to the 2012 Survey and suggests that despite the economic challenges outlined below, the overall trajectory for innovation over the programme period has been positive.

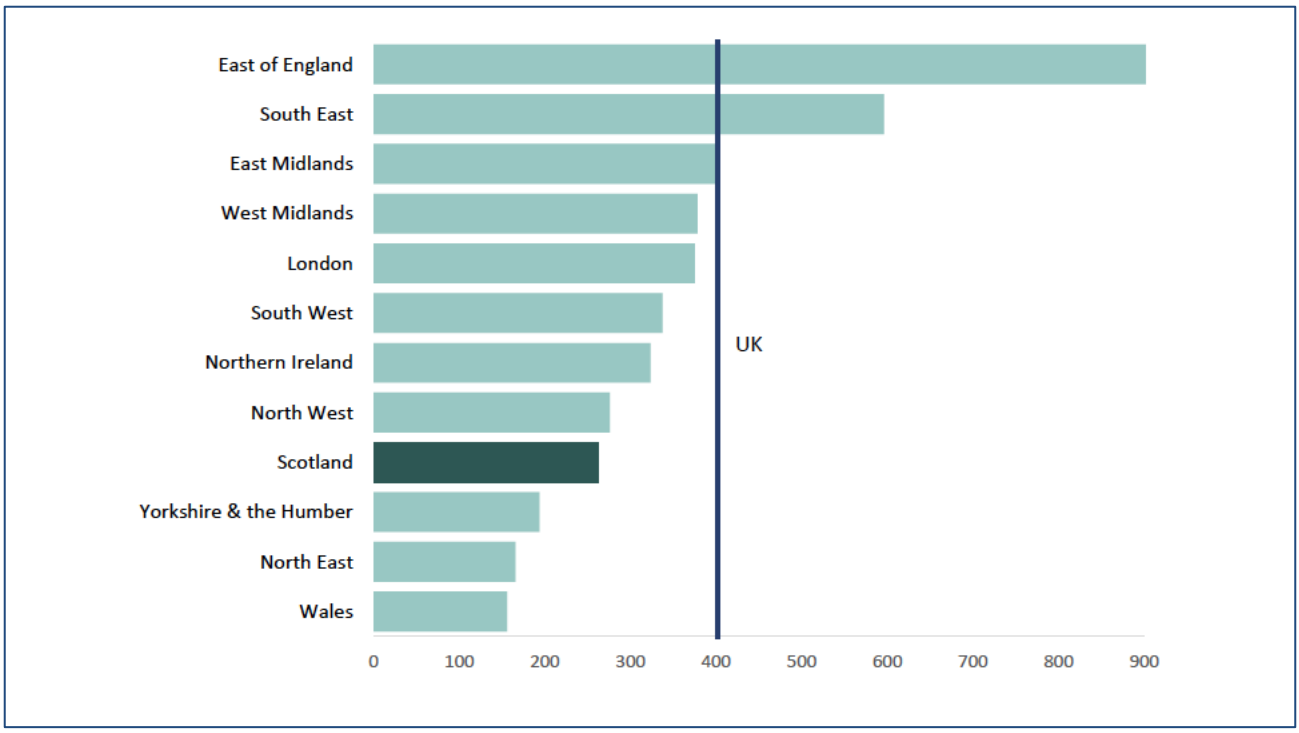
1.2.3.2 Improving business R&D.

Scotland has relatively low levels of business R&D spend. Data from Eurostat and the Organisation for Economic Co-operation and Development (OECD)[13] examines Gross Domestic Expenditure on Research & Development (GERD) relative to GDP. Latest available data on Scotland's GERD (2019) as a percentage of GDP was 1.66% (unchanged from 2018). Sweden, with a similar SME base (of 177,983 in 2022) has GERD relative to GDP of 3.49% which is over double the rate achieved in Scotland.

Business enterprise research and development (BERD) in Scotland (2020)[14] highlights that Scotland ranked eighth out of the twelve UK regions for BERD expenditure as a share of GDP in 2020 as shown below (see Figure 1.1).

[11] Small Business Survey (2012), UK Government (Link)
[12] Small Business Survey (2020), UK Government (Link)
[13] Scotland GERD cited on Eurostat.
https://ec.europa.eu/eurostat/statistics-explained/index.php?oldid=469808#Gross_domestic_expenditure_on_R.26D
[14] Scottish Government (2022) Business enterprise research and development: 2020, Scottish Government: Edinburgh.
https://www.gov.scot/publications/business-enterprise-research-and-development-2020/

Figure 1.1 BERD expenditure per head of population (£).



Source: Scottish Government (2022) Business enterprise research and development: 2020, Scottish Government: Edinburgh, p13.

Overall, this evaluation concluded that around a third of Scottish SMEs typically introduce new or improved goods, services or processes and this is in line with the UK average. However, BERD in Scotland as a share of GDP is considerably below the UK average and suggests that effort is needed to increase the scale of innovation undertaken by Scotland's businesses[15].

1.2.3.3 Wider political and economic context.

There has been considerable disruption and turbulence in the economic context in which the IC programme has been delivered to date, relevant to the later stages of Phase 1 and Phase 2:

- **COVID-19 pandemic** - the outbreak of COVID-19 and the subsequent lockdown had major, wide-ranging impacts on businesses across Scotland and the ICs as set out later in this evaluation report.

- **Brexit** - in 2021 the chairman of the Office for Budget Responsibility (OBR) said recent data showed the impact of Brexit was *"broadly consistent"* with the OBR's assumption that leaving the EU would *"reduce our long run GDP by around 4%"*. Challenges witnessed include: falling business confidence; supply chain challenges; and recruitment challenges. These challenges are relevant to IC activity as businesses that lack confidence are less likely to invest in R&D.

1.3 Market failure

Addressing market failure is a key rationale for government intervention. Public programmes typically seek to address market failures that fall within the following categories: equity; efficiency; and environment. There are also frequently valid wider drivers of public sector investment. This section of the report provides a brief outline of the market failures that individual ICs address. More granular analysis is provided in the reports on each Centre in the Appendices.

[15] BERD data released at the time of writing, indicates the gap with the rest of the UK has reduced somewhat.

1.3.1 Equity considerations

The key question here is whether the proposed programme area (in this case Scotland) performs well or poorly in relation to comparator areas (in this case in relation to innovation).

There is considerable variation in BERD expenditure by sector, business size and geography in Scotland. Firstly, in relation to **sector**, BERD expenditure in the 'Professional, scientific and technical activities' sector (£460 million) accounted for almost a third (32.0%) of the Scottish total with 'Manufacturing' accounting for almost a quarter of the Scottish total (24.9%). BERD is therefore dominated by a small number of sectors and there is a rationale to focus support on sectors with low levels of innovation expenditure.

In relation to **business size**, businesses with over 400 employees accounted for over half of BERD expenditure in Scotland, with businesses with between 100 and 399 employees accounting for an additional quarter of total BERD expenditure. This confirms that there is an on-going need to support micro, small and medium-sized enterprises to innovate. Furthermore, over half of R&D expenditure in Scotland was from foreign-owned firms confirming a need to promote innovation amongst indigenous firms.

Finally in relation to **geography**, businesses located in the City of Edinburgh accounted for almost a third of all Scottish BERD spending. Businesses in Glasgow City and West Lothian accounted for a further 14.2% and 12.6% respectively. An alternative way of comparing BERD spending across local authority areas is to calculate BERD spend per person. In 2020, businesses in West Lothian spent more per person than any other local authority area (£981) and the City of Edinburgh was a close second (£838).

The appendices contain analysis of the extent to which IC addresses equity considerations.

1.3.2 Efficiency considerations

This requires a consideration of whether there are imperfections or faults in the market that can only be resolved with public sector intervention. The two following efficiency considerations appear to be a major focus for individual Innovation Centres:

- **Externalities** - this market failure considers whether there are likely to be wider costs and benefits not considered in the decision-making process of beneficiaries. The completion of successful research and development leading to the development of new products, services and processes delivers wider economic, environmental and societal benefits that are not exclusively received by the businesses and organisations that innovate. This is a major legitimate driver for the IC programme and is explicitly referenced in the Phase 2 Business Planning guidance.
- **Information failures –** exists when some, or all, of the participants in an economic exchange do not have perfect knowledge. It also exists when one participant in an economic exchange knows more than the other, a situation referred to as the problem of asymmetric, or unbalanced, information.

1.3.3 Environmental considerations

The third potential rationale for Government intervention relates to environmental considerations. Key questions include whether there is scope for the intervention to lead to positive environmental impact or reduce the harmful impacts in line with the priorities of Scottish Government.

1.3.4 Wider drivers

Finally, there are several wider drivers for potential intervention:

- **Institutional failure:** the traditional role of academia lies in teaching and research, yet universities and colleges represent a significant innovation asset. The IC programme seeks to

bring academia, industry and government together to foster economic and social development.

- **Co-ordination failure**: the programme acknowledges that the innovation support ecosystem is complex, and the Phase 1 Call for Proposals contained an objective to *"simplify the innovation landscape in Scotland through creating conduits to the university knowledge and expertise for all businesses in Scotland complementing to existing initiatives"*. The IC programme seeks to increase the number and scale, of collaborative R&D projects taking place in Scotland and recognises that establishing collaborative innovation partnerships is complex and time consuming.
- **Opportunity:** fostering innovation has the potential to deliver significant opportunity and contribute to several of the desired national outcomes. The potential to improve public services and assist in the transition to net zero are areas where there is a particularly strong justification for public investment in the programme.

1.4 Previous performance.

Professor Graeme Reid was appointed to conduct an independent review of the delivery of the original vision, aims and objectives of the IC Programme[16]. The terms of reference for this commission set out that the review would look at "*progress and likely success of individual ICs while recognising that the review comes relatively early in the term of the programme"*. Professor Reid was supported by an Advisory Committee and the consultancy firm Ekos who produced an economic impact analysis.

The review was published in September 2016 and Professor Graeme Reid acknowledged that "*it is rather early in the life of the Innovation Centres to assess their long-term impact, but it is a good time to help the partners understand whether the Centres remain on trajectories towards achieving the vision"*. He highlighted research showing that in 2012 Scotland's total R&D spend was 1.59% of Gross Domestic Product (GDP) compared to 3.55% in Finland and 2.08% which is the average spend across the 27 member states of the European Union.

The review's key findings included:

1. Agreement amongst review contributors that the IC programme vision was current and correct, and many commented that the vision must continue to allow the ICs to be flexible and agile in order to respond to industry needs and priorities.
2. Acknowledgement of the diversity of individual ICs within the programme in relation to their priorities, successes and maturity. Centres differ significantly in the extent to which public sector organisations are key "beneficiaries" with some ICs delivering societal as well as economic benefits.
3. There were some differing views amongst contributors on how effective the ICs were at engaging businesses across the whole of Scotland. There were some concerns that businesses would not travel extra distances unless for "*outstanding expertise*".
4. There were also differing views about how effective ICs were at engaging with universities. Contributors had mixed views about governance arrangements with some suggesting ICs could be stand-alone entities, rather than being hosted by a university.
5. There was a desire to see bigger scale, open innovation projects in the future as the ICs matured. Contributors consistently asked that a *"clear, detailed commitment of long running public support is given to the programme to allow it the space to continue to mature and to fully realise opportunities"*.

[16] Independent Review of the Innovation Centres Programme (2016), Scottish Funding Council (Link)

The Reid review summarised its conclusion as follows: "*the evidence shows that the Innovation Centre programme is on the right track and Centres are now entering a more mature operational phase. It will take time for a wider range of businesses to build trust in the Innovation Centre programme*".

The Review's key recommendations included:

1. SFC and partners to assess whether to continue financial support for each IC 10 years after its creation and at 10-yearly intervals thereafter.
2. The Monitoring & Evaluation Framework (MEF) should be reviewed to "*reduce its administrative burden and strike an explicit balance between incentives for Innovation Centres to generate income and the incentives for them to deliver impact for the Scottish economy*".
3. Each IC should make *"renewed efforts to involve as much of Scotland's excellent research base as possible with the programme"*.
4. Each IC should work with the funders to *"create and promote a centralised body of data and case studies about individual businesses that have benefitted from working with universities and colleges"*.

An evaluation of the Centres was conducted by Ekos to support Professor Graeme Reid's work. Findings from this evaluation not covered above include:

1. Feedback from businesses engaging with ICs was positive, and there was strong praise for the expertise and professionalism of staff at the Centres.
2. The innovation support landscape remained complex, and the ICs could do more to ensure effective communications and referrals across the system.
3. 75% of firms supported were small and medium-sized enterprises (SMEs). Collaborative projects were perhaps smaller (average scale of £94K) and shorter (average length of 9 months) than originally envisaged. The majority of projects were between Technology Readiness Levels (TRLs) of 4 (small scale prototyping) and 7 (system demonstration).
4. There is evidence of benefits and impacts for participating companies particularly in relation to networking and knowledge gains. The commercialisation of new/improved products, processes, and services were reported by relatively few businesses due to the early stage of many projects.
5. More consistent application of the MEF is required. The IC programme was deemed to be not yet *"delivering economic impacts on a scale that might be expected of innovation support programmes. However, the ICs are young and are still developing their support models and approach"*.

The Reid Review was completed six years prior to this evaluation, at a point where it was too early to gauge impact. This evaluation occurs at a point where early impacts have started to become visible and seeks to determine if the scale of impact matches the scale of public investment in Innovation Centres in addition to the other evaluation objectives set.

1.5 Evaluation scope and approach.

The evaluation brief for the current exercise highlighted that "*with the Innovation Centre Programme now approaching 10 years of delivery, it is important to understand the outcomes and impacts achieved to date, how the ICs have delivered against all their objectives, how they have evolved alongside industry and the academic ecosystem, and value for money received for public sector investment*".

The brief provided seven lines of enquiry for the evaluation to pursue as follows:

1. Assess how well the main objective of delivering routes to economic benefits through increased levels of collaboration between industry and academia has been achieved, both in terms of outputs and outcomes.
2. Assess the role each IC has played in supporting the wider range of colleges and universities to maximise their value to Scotland.

3. Examine performance against targets and achievement of objectives.
4. Identify outputs and outcomes achieved (and likely to be achieved) with a view to understanding how effective each IC is in building engagement in its own ecosystem.
5. Identify and assess wider impacts.
6. Assess the degree to which these achievements and impacts have reached all parts of Scotland.
7. Collate Lessons Learned from the ICs operations in delivering their services.

The evaluation was completed by Additional Research in partnership with Context Economics, ADD Specialists, Open Cities, and IBP Strategy & Research. The following approach was undertaken:

1. Desk review of key documents and management information.
2. Completion of 70 one-to-one stakeholder interviews.
3. One-to-one beneficiary interviews leading to the production of case studies.
4. Design and delivery of a survey to direct clients which received 465 responses.
5. Design and delivery of a survey to students which received 201 responses.
6. Design and delivery of a survey to wider stakeholders which received 15 responses.

The evaluation commenced with an inception meeting in Edinburgh in August 2022. Challenges involved in securing permission to obtain the contact details of beneficiaries necessitated the evaluation period being extended to March 2023.

Further information on the approach is included in Appendix A.

1.6 Report structure.

The reminder of the document is structured as follows:

- Chapter 2: Findings.
- Chapter 3: Conclusions and recommendations.
- Appendices including findings for individual ICs.

2 Findings.

This section presents the main findings of the evaluation, setting out an assessment of project inputs (costs), the immediate activities and outputs of the programme, the longer-term benefits of the intervention in terms of outcomes, and the ultimate impacts in terms of employment, economic wealth generated, and wider benefits. The emphasis in the main body of the report is on the achievements of the programme as a whole. More detailed reporting on individual ICs is appended.

2.1 Funder inputs.

This section sets out the main inputs to the IC programme, the main activities and outputs as reported in the MEF, as well as insights on activities and outputs available from the beneficiary surveys.

An £84 million award by SFC for Phase 1 was followed by a further £78 million award for Phase 2 with contributions from additional funding partners, SE, HIE, and Scottish Government departments (a total of £162 million in current prices) (see Table 2.1). The total spend by the core funders on the IC Programme amounted to £137 million to March 2023, of which £84 million related to Phase 1 and

£53 million to Phase 2 (in scope ICs)[17]. SFC has provided the majority of this contribution (91%), with SE, HIE and Scottish Government departments contributing lesser amounts. Some £28.4m remains to be spent during Phase 2. These figures relate to the core funders only and do not reflect any leveraged funding from other sources (discussed elsewhere).

It is noted some 45% of those responding to the Stakeholder Survey agreed or strongly agreed that 'the level of funding for the programme is appropriate given the aims and objectives' and 36% agreed or strongly agreed that 'the mix of funding sources for the programme is appropriate.'

Table 2.1 Funder Inputs to March 2023.

	BE-ST	CENSIS †	DHI	IBioIC†	PMS-IC	SAIC	TDL	All ICs
Phase 1								
Phase 1 SFC Spend	£9.2m	£11.3m	£15.7m	£11.8m	£12.0m	£12.8m	£11.2m	**£84.0m**
Phase 1 SE Spend	-	-	-	-	-	-	-	-
Phase 1 HIE Spend	-	-	-	-	-	-	-	-
Total	**£9.2m**	**£11.3m**	**£15.7m**	**£11.8m**	**£12.0m**	**£12.8m**	**£11.2m**	**£84.0m**
Phase 2								
Phase 2 SFC Award	*£8.0m*	*£8.6m*	*£7.5m*	*£9.1m*	*£7.5m*	*£7.5m*	*£9.5m*	***£57.6m***
Phase 2 SE Award	*£2.5m*	*£2.0m*	-	*£3.4m*	*£2.0m*	*£0.5m*	*£2.5m*	***£12.9m***
Phase 2 HIE Award	*£0.5m*	*£0.3m*	-	*£0.6m*	-	*£2.0m*	*£0.5m*	***£3.9m***
Phase 2 SG Award	-	-	*£2.5m**	-	-	-	*£1.0m***	***£3.5m***
Total	***£11.0m***	***£10.9m***	***£10.0m***	***£13.1m***	***£9.5m***	***£10.0m***	***£13.5m***	***£78m***
Phase 2 SFC Spend to Date	£5.8m	£6.3m	£5.5m	£7.0m	£2.4m	£5.7m	£7.4m	**£40.1m**
Phase 2 SE Spend to Date	£1.6m	£1.5m	-	£2.2m	£0.4m	£0.3m	£1.3m	**£7.3m**
Phase 2 HIE Spend to Date	£0.3m	£0.2m	-	£0.4m	-	£1.2m	£0.25m	**£2.35m**
Phase 2 SG Spend to Date	-	-	£2.5m	-	-	-	£1.0m	**£3.5m**
Total	**£7.7m**	**£7.9m**	**£8.0m**	**£9.6m**	**£2.9m**	**£7.2m**	**£9.95m**	**53.25m**
Total Phase 1 & 2								
Total SFC Spend to Date	£15.1m	£17.6m	£21.2m	£18.8m	£14.4m	£18.5m	£18.6m	**£124.1m**
Total SE Spend to Date	£1.6m	£1.5m	-	£2.2m	£0.4m	£0.3m	£1.3m	**£7.0m**
Total HIE Spend to Date	£0.3m	£0.2m	-	£0.4m	-	£1.2m	£0.25m	**£2.4m**
Total SG Spend to Date	-	-	£2.5m	-	-	-	£1.0m	**£3.5m**
Total Spend to Date	**£17.0m**	**£19.3m**	**£23.7m**	**£21.4m**	**£14.9m‡**	**£20.0m**	**£21.15**	**£137.2m**

*Source: SFC, SE, HIE correspondence ('Summary funders awards and drawdowns to date', excel spreadsheet, Feb 2023); * SG Health and Social Care Directorate; ** SG Digital Directorate. † Including Phase 2 extension amount. ‡ 14.9 due to rounding.*

2.2 Activities and outputs.

This section sets out the main activities and outputs as reported in the MEF, as well as insights on activities and outputs available from the beneficiary surveys. **There are differences in the way Innovation Centres collect, interpret and report upon indicators through the MEF and so caution should be applied with respect to the aggregated totals and any comparison between ICs. The individual Innovation Centre appendices provide additional commentary on activity and outputs.**

The MEF returns indicate that the Innovation Centres have achieved the following results across the following activity measures:

[17] Total SFC Phase 1 spend amounted to £96.7m, including £14.2m of capital equipment, and including the Oil and Gas Innovation Centre (OGIC). Phase 1 spend amounted to £84.0m excluding the OGIC.

- **Events**: Over Phases 1 and 2 of the Innovation Centre Programme to date, *at least* 2,167 engagement events have been hosted by the Innovation Centres. Due to some inconsistency in the completion of the standard MEF, it is not possible to present the exact breakdown of the figure by size of event. Nonetheless, for those Innovation Centres that have provided disaggregated data in the MEF, the data indicates that the focus has primarily been on events of medium scale (i.e., 10-100 Attendees). The MEF does not record the total number of attendees, but a broad estimate puts this number in the order of 61,000 (see Table 2.2). Further detail on the nature of events hosted by the ICs and their aims are included in the individual Appendices[18].

Entrants to Education and Training (s): Over Phases 1 and 2 of the Innovation Centre Programme to date, at least 114,803 individuals have been supported to enter education. The majority of these have been entered into Continuing Professional Development (CPD) courses through BE-ST (i.e., through the online BIM Awareness course or the Low Carbon Learning Programme) and DHI and in particular through The Data Lab, including via their joint MOOCs (The Power of Data in Health and Social Care). A significant number of individuals have been supported more intensively to enter university education at the PhD and MSc levels, amounting to at least 190 and 1,794 individuals across all Innovation Centres, respectively. [19] IBioIC accounts for the largest number of PhD entrants (122), whilst The Data Lab on the other hand accounts for the greatest number of MSc entrants (940), a major skills development support programme. Only DHI and IBioIC have supported entrants at the HND/HNC level, accounting for 87 individuals together (see

- Table *2.3*). Further detail on the nature of courses offered by the ICs and their aims are included in the individual Appendices.
- **Collaborative Projects**: Unsystematic collection of MEF data during the Phase 1 Innovation Centre Programme, as well as well as some double counting in MEF form at the outset of Phase 2 (with respect to the *New*, *Continuing*, and *Completed* projects), and incomplete MEF entries in some cases - makes it difficult to estimate the total number of Collaborative Projects supported across both phases. Nonetheless, *at least* 494 projects have been supported across Phase 1, and 675 new projects have been supported across Phase 2 (1,169 in total). The MEF indicates that the focus has primarily been on academic-to-business collaborations that have involved Scottish firms, with *at least* 709 having been established over the period. Likewise, academic-to-public sector collaborations have also been frequent, with *at least* 298 of such projects having been established over the period, many also involving Scottish businesses (see Table 2.4). Some 8.2% of collaborative projects are business to business projects and have not involved an academic partner or IC. Further detail

[18] The Funders may consider requesting that the ICs collect a light touch minimum consistent set of event feedback in order to improve decision-making and assessment.
[19] Note that SFC only provides funding for Taught Postgraduate (TPG) places.

on the nature of collaborative projects and their aims are included in the individual Appendices.

Table 2.2 Events (Phase 1 & Phase 2).

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs
> 100 Attendees	41	16	43	21	0	56	N/A	**177**
10-100 Attendees	260	168	95	134	10	153	N/A	**820**
< 10 Attendees	14	0	0	0	0	0	N/A	**14**
Total	**315**	**184**	**138**	**155**	**10**	**209**	**1,156**	**2,167**

Source: MEF.

Table 2.3 Entrants to Education & Training (Phase 1 & Phase 2).

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs
PhD/EngD	3	14	5	122	0	9	37	**190**
MSc	127	46	94	201	245	141	940	**1,794**
HND/HNC	0	0	4	83	0	0	0	**87**
Other	3,646	0	4,862	45	2	0	104,177	**112,732**
Total	**3,776**	**60**	**4,965**	**451**	**247**	**150**	**105,154**	**114,803**

Source: MEF.

Table 2.4 Collaborative Projects (Phase 1 & Phase 2).

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs
Phase 1								
Academic/IC to business (involving at least 1 business in Scotland)	60	112	-	64	-	30	73	**339**
Academic/IC to business (involving no businesses in Scotland)	4	1	-	12	-	0	0	**17**
Academic / IC to Academic	10	-	-	-	-	-	0	**10**
Business to business (involving at least 1 business in Scotland)	5	3	-	0	-	0	0	**8**
Academic/IC to public sector (involving no businesses in Scotland)	33	11	-	8	-	0	13	**65**
Academic/IC to public sector to business (involving at least 1 business in Scotland)	4	11	-	1	8	7	7	**38**
Total	**116**	**138**	**17**	**85**	**8**	**37**	**93**	**494**
Phase 2								
Continuing Projects								
Academic/IC to business (involving at least 1 business in Scotland)	14	-	-	-	-	18	12	44
Academic/IC to business (involving no businesses in Scotland)	1	-	-	-	-	-	-	1
Academic / IC to Academic	5	-	-	-	-	-	-	5
Business to business (involving at least 1 business in Scotland)	0	-	-	-	-	-	-	0
Academic/IC to public sector (involving no businesses in Scotland)	4	-	-	-	4	-	4	12
Academic/IC to public sector to business (involving at least 1 business in Scotland)	3	-	-	-	5	23	1	31
Total	**27**	**0**	**0**	**0**	**8**	**41**	**17**	**93**
Completed Projects								
Academic/IC to business (involving at least 1 business in Scotland)	14	75	5	60	-	2	30	**186**
Academic/IC to business (involving no businesses in Scotland)	1	13	3	15	-	-	-	**32**
Academic / IC to Academic	3	-	-	-	-	-	-	**3**
Business to business (involving at least 1 business in Scotland)	3	8	-	-	-	-	38	**49**
Academic/IC to public sector (involving no businesses in Scotland)	2	13	9	7	1	-	4	**36**
Academic/IC to public sector to business (involving at least 1 business in Scotland)	40	20	7	2	1	3	1	**74**
Total	**63**	**129**	**24**	**84**	**2**	**5**	**73**	**380**
New Projects (continuing and completed projects)								
Academic/IC to business (involving at least 1 business in Scotland)	95	113	3	97	-	20	42	**370**
Academic/IC to business (involving no businesses in Scotland)	13	15	1	15	-	-	-	**44**
Academic / IC to Academic	16	-	-	-	-	-	-	**16**
Business to business (involving at least 1 business in Scotland)	4	8	-	-	-	-	38	**50**
Academic/IC to public sector (involving no businesses in Scotland)	19	20	12	12	3	-	8	**74**
Academic/IC to public sector to business (involving at least 1 business in Scotland)	48	25	9	6	5	26	2	**121**
Total	**195**	**181**	**25**	**130**	**8**	**46**	**90**	**675**

Source: MEF. Note: Continuing and Completed do not necessarily sum to New Projects, due to incomplete MEF entries in many cases.

The MEF returns indicate that the Innovation Centres have achieved the following results across the following output measures, again with the caveat that different Innovation Centres collect and report data in different ways:

- **Follow-On** (see Table 2.5): Over Phase 1 and Phase 2 of the Innovation Centre Programme to date, the Innovation Centres have engaged in a great deal of signposting to other innovation ecosystem partners, with *at least* 301 of the 543 known and reported follow-on Collaborative Projects having been signposted to other forms of support. It is noted that this does not capture additional follow-on that occurs outside of Collaborative Projects, as this was not required of ICs by the funders at the outset of the programme. This signposting has often been to other public funding or support bodies, rather than SE and HIE themselves, suggesting that the funders' initial investment can be helpful in unlocking viability for funding from other sources. Indeed, other public funding or support bodies accounted for 113 instances of follow-on support, whilst SE and HIE together accounted for 114 instances. The Innovation Centres themselves are also a major source of follow-on, accounting for 101 instances of follow-on support. Often the private sector directly followed on from Collaborative Projects, providing evidence of leverage of public funds. In 120 instances, the businesses that have engaged with the Innovation Centres have been able to take their innovation directly to market without further support.
- **Commercial Launches & Other Applications** (see Table 2.6): Over Phase 1 and Phase 2 of the Innovation Centre Programme to date, Innovation Centre activity has led to *at least* 2,120 commercial launches (of products and services) and other applications of innovation (processes, business models, public service delivery) via Collaborative Projects (it is noted BE-ST accounts for 59 percent of this activity and The Data Lab 29%, largely reflecting method of reporting). Most commercial launches were new or improved products (c. 679), or applications via new or improved processes (c. 556), or new or improved services (c. 413), with relatively fewer leading to improvements in business models (c. 269). Some 205 of these commercial applications resulted in new or improved delivery of a public service in Scotland.
- **Qualifications** (see Table 2.7). Over Phases 1 and 2 of the Programme to date, the Innovation Centres have supported 15,258 individuals to receive qualifications in their respective fields. The preponderance of these have been achieved through certification within the context of the aforementioned CPD courses, amounting to 13,559 individuals. Nonetheless, *at least* 1,549 individuals had received an MSc, and further 101 had received a PhD. Likewise, *at least 49* individuals have received qualifications at HND/HNC levels to date via DHI and IBioIC support.

Table 2.5 Follow-On (Phase 1 & Phase 2).

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs
Signposted to SE	21	56	9	N/A	N/A	0	3	**89***
Signposted to HIE	10	6	6	N/A	N/A	1	2	**25***
Signposted to other public funding/support body	38	27	33	N/A	N/A	9	6	**113***
Signposted to private sector	35	12	4	N/A	4	10	9	**74***
IC supported follow-on project planned or underway	46	31	9	N/A	6	9	N/A	**101***
Direct to market (by a business in Scotland)	52	55	8	N/A	2	3	N/A	**120***
Projects not taken forward	5	8	4	N/A	-	4	N/A	**21***
Total	**207**	**195**	**73**	**N/A**	**12**	**36**	**20**	**543***

*Source: MEF. * Figures do not include IBioIC for Phase 1/2;; and The Data Lab for Phase 1 not available in the MEF at time of writing.*

Table 2.6 Commercial Launches & Other Applications (Phase 1 & Phase 2).

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs
New or improved products developed (with/for a business in Scotland)	381	159	14	N/A	3	10	1112	**679***
New or improved processes (with/for a business in Scotland)	278	21	6	N/A	-	15	236	**556***
New or improved services developed (with/for a business in Scotland)	226	43	4	N/A	-	7	131	**413***
New or improved business models (with/for business in Scotland)	162	19	6	N/A	-	7	75	**269***
New or improved delivery of a public service in Scotland	117	18	12	N/A	**1**	3	54	**205***
Total	**1,164**	**260**	**42**	**N/A**	**4**	**42**	**608**	**2,120***

*Source: MEF. * Figures do not include IBioIC for Phase 1/2; PMS-IC for Phase 1.*

Table 2.7 Qualifications (Phase 1 & Phase 2).

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs
PhD/EngD	3	5	4	80	0	0	9	**101***
MSc	127	46	80	196	105	130	865	**1,549***
HNC/HND	0	0	4	45	0	0	0	**49***
Other	478	0	5,889	15	0	0	7177	**13,559***
Total	**608**	**47**	**5,977**	**336**	**105**	**130**	**8.051**	**15,258***

*Source: MEF. * Figures do not include PMS-IC for Phase 1.*

We note that other population level data is variable by IC and, where available, discussed in individual IC appendices.

2.2.1 Additional findings from survey of beneficiaries.

2.2.1.1 IC clients

As discussed in Appendix A, due to small sample sizes, findings at IC level are indicative.

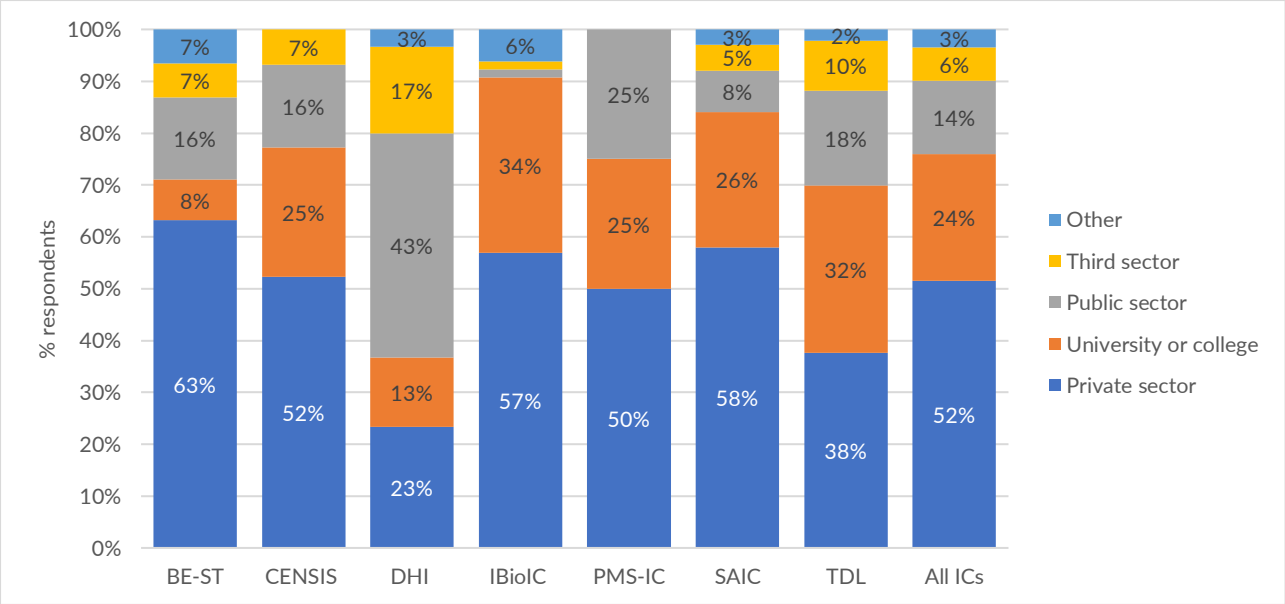
It is noted that the survey of client beneficiaries had good representation across the main cohorts of IC clients, including public sector organisations (see Figure 2.1):

- 238 (52%) were private sector businesses.
- 113 (24%) university or college.
- 65 (14%) public sector organisations.
- 30 (6%) third sector (non-profit).
- 16 (3%) other.

There was also a good spread across industry sectors, which largely follows the IC sector focus, with the main sectors as follows (see Figure 2.2):

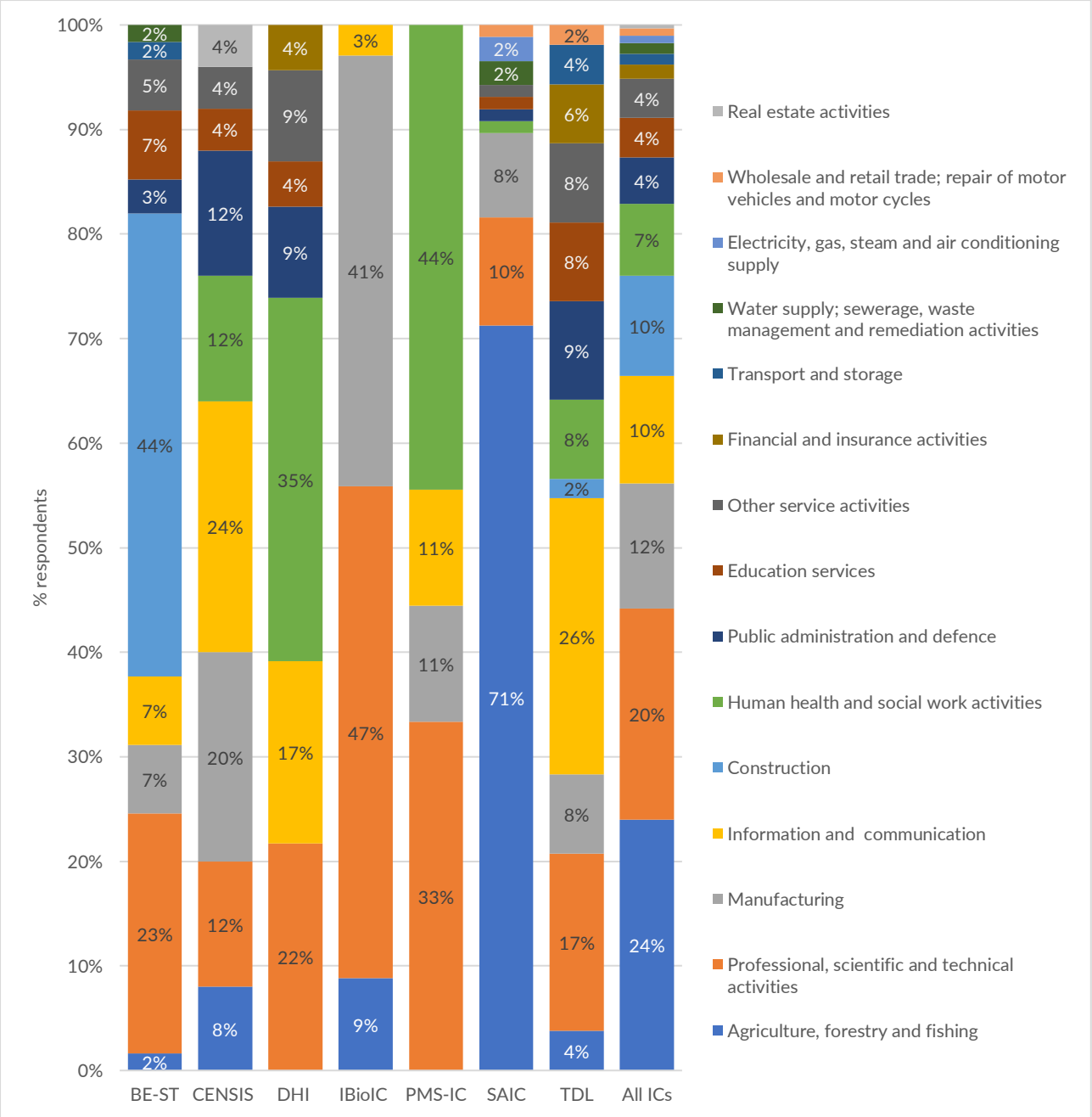
- Agriculture, forestry & fishing (24%).
- Professional, scientific, technical (20%).
- Manufacturing (12%).
- Information and Communication (10%).
- Construction (10%).
- Human health and social work activities (7%).
- Public administration and defence (4%).

Figure 2.1 What type of organisation do you work for?



Source: IC client survey , Q1. Notes: Data labels of 1 or less no shown. n= all ICs (462), BE-ST (76), CENSIS (44), DHI (30), IBioIC (65), PMS-IC (16), SAIC (138) TDL (93). Margin of error at programme level +/- 3.95% at 95% confidence level.

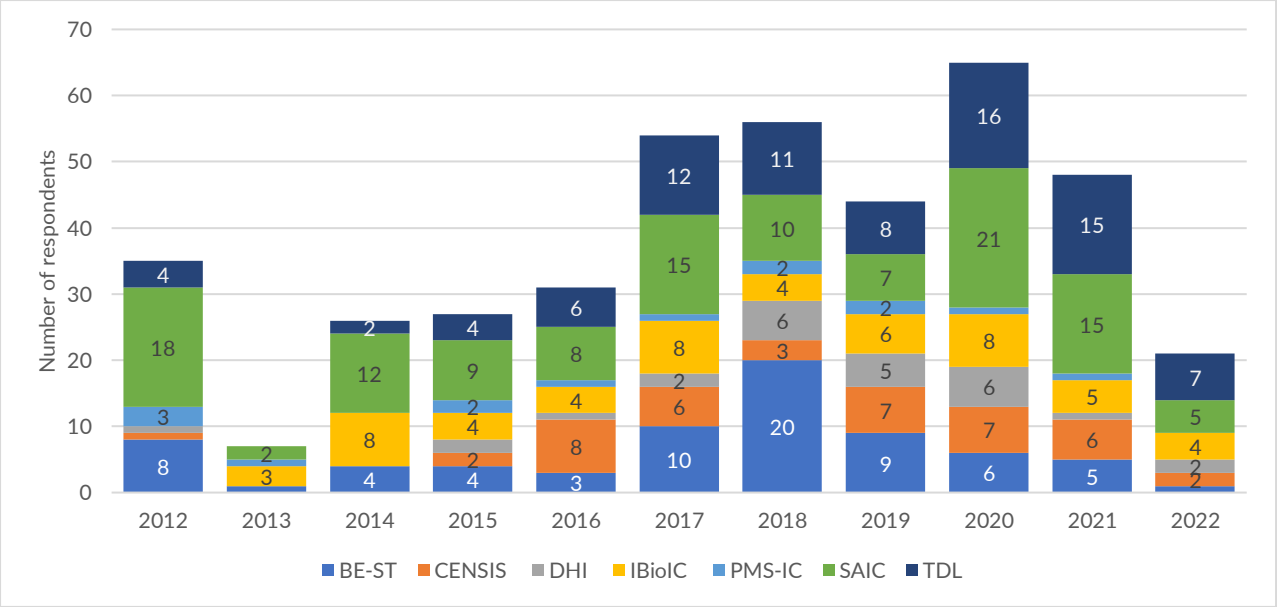
Figure 2.2 What does your establishment mainly make or do?



Source: IC client survey , Q2, Notes: Data labels of 1 or less no shown. n= all ICs (292), BE-ST (61), CENSIS (25), DHI (23), IBioIC (34), PMS-IC (9), SAIC (87) TDL (53). Margin of error at programme level +/- 5.27 % at 95% confidence level.

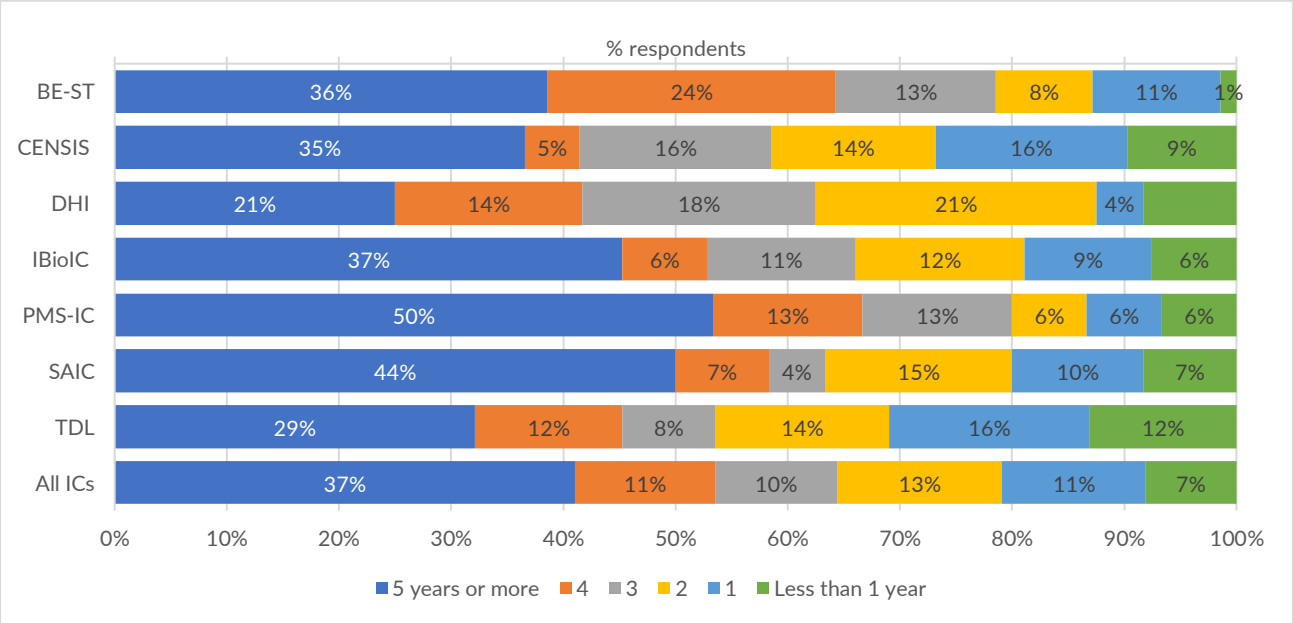
In terms of engagement with ICs, over one half of respondents (57%) first interacted with the IC in or before 2018 (broadly consistent with phase one) (see Figure 2.3). Almost nine in 10 clients (89%) were still involved with their IC, and, for all ICs, well over a third have been involved with an IC for five years or more (see Figure 2.4). It is noted that several respondents indicate engagement with an IC prior to establishment of the IC, highlighting the limitations of respondent recall for activities dating back over an extended period of years.

Figure 2.3 In what year did your establishment first engage with the Innovation Centre, for any reason?



Source: IC client survey Q6. Notes: Excluding Don't Knows. Data labels of 1 or less no shown. n= all ICs (414), BE-ST (71), CENSIS (42), DHI (26), IBioIC (54), PMS-IC (14), SAIC (122) TDL (85). Margin of error at programme level +/- 4.25% at 95% confidence level.

Figure 2.4 Duration of relationship with IC.



Source: IC client survey Q7. Notes: Excluding don't know, n= all ICs (456), BE-ST (77), CENSIS (43), DHI (26), IBioIC (58), PMS-IC (17), SAIC (144) TDL (91). Margin of error at programme level +/- 3.99% at 95% confidence level.

There are good levels of collaborative project involvement activity with clients. For all ICs, some 46% of respondents were involved in a collaborative project between more than one partner. It is noted 39% were in collaboration projects between themselves and one partner. In addition, 16% were Involved in consultancy projects (see Table 2.8).

It is noted that 25% of respondents had taken postgraduate internships/ placements/secondments (as high as 61% for The Data Lab). Many clients have also accessed lower intensity support e.g., 28% for advice and signposting, 51% conferences and events, 27% training and development support.

Overall, relatively few (8%) had accessed lab, test or demonstration facilities. However, not all ICs operate lab, test or demonstration facilities, including, for example, SAIC.

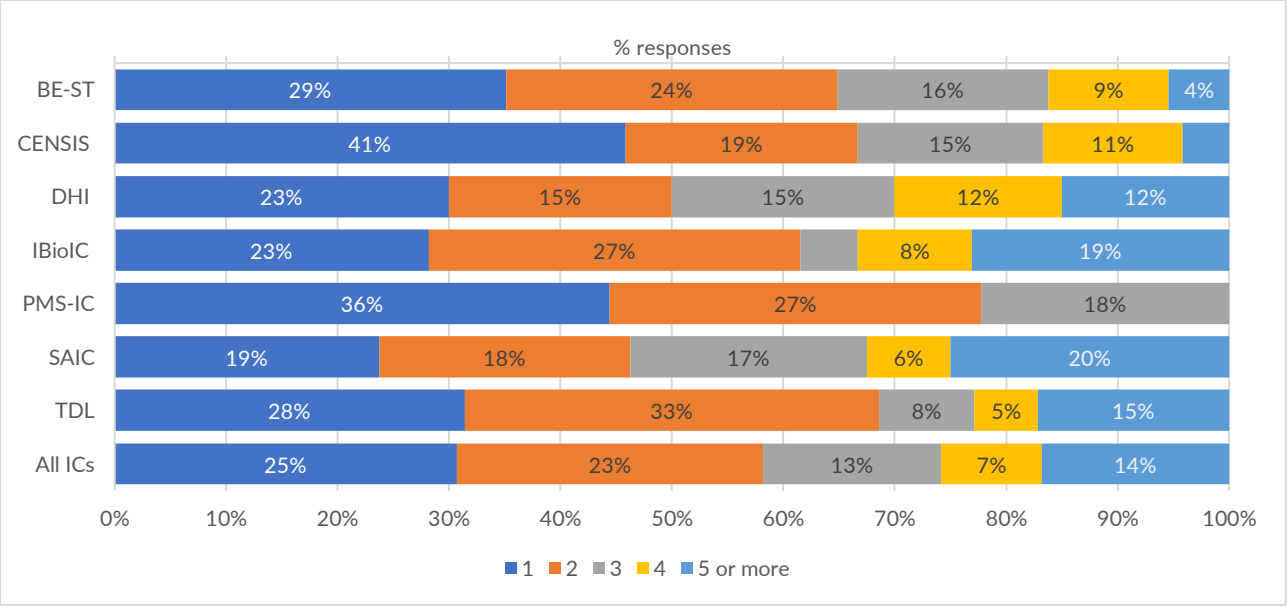
Table 2.8 In which of the following ways has your establishment engaged with the Innovation Centre? (% respondents)

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs
Attended conferences or events provided by, or supported by, an Innovation Centre (including 'innovation clusters')	68	55	47	64	25	53	30	**51**
A collaborative project(s) between your establishment and more than one partner from industry, the public sector or a university or college (in collaboration with, or supported by, an Innovation Centre)	46	43	63	44	56	58	24	**46**
A collaborative project(s) between your establishment and one partner from a university or college (in collaboration with, or supported by, an Innovation Centre)	33	30	60	53	31	42	28	**39**
Other advice or signposting provided by an Innovation Centre for any purpose (including accessing third-party funding)	32	30	27	30	6	32	18	**28**
Training or other skills development activities (e.g., seminars or workshops) provided by, or supported by, an Innovation Centre	34	9	23	26	6	25	39	**27**
Postgraduate internships/ placements/secondments supported by an Innovation Centre (MSc. or PhD.)	4	2	3	42	13	18	61	**25**
Joined the membership of an Innovation Centre (whether paid for or free)	13	7	7	56	0	30	11	**22**
Consultancy support provided by an Innovation Centre	14	52	30	14	6	9	9	**16**
To support a consultation process on strategy in your sector or technology area	20	16	23	11	6	14	3	**13**
Business development support (e.g., business accelerators)	1	16	17	5	0	15	11	**10**
Other	12	14	3	6	19	9	3	**8**
Making use of Innovation Centre laboratory, test or demonstration facilities	13	14	13	17	13	1	2	**8**
None of the above	0	0	0	0	0	1	1	**0**

Source:. IC client survey Q9. Notes:. n= all ICs (465), BE-ST (76), CENSIS (44), DHI (30), IBioIC (66), PMS-IC (16), SAIC (139) TDL (94).

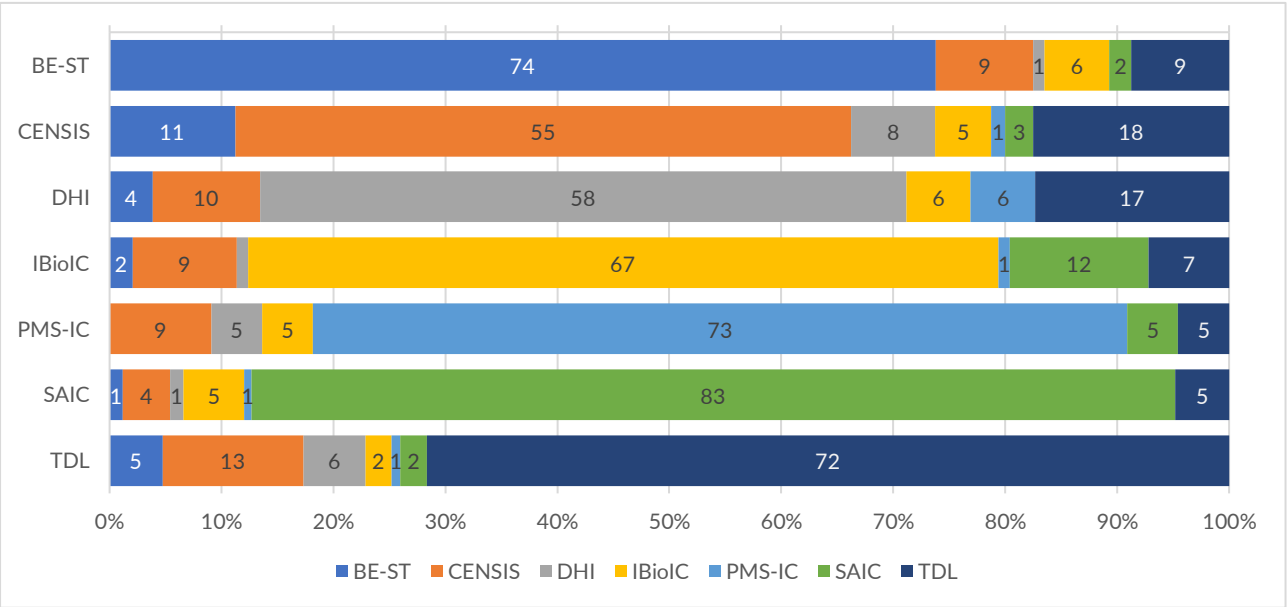
For collaborative project support, around one in five (21%) had accessed four or more rounds of IC funding. More typically clients accessed one or two rounds of IC support (48%) (see Figure 2.5). It is also the case that survey beneficiaries have often engaged with other ICs, particularly The Data Lab, CENSIS, IBioIC, DHI (see Figure 2.6).The individual IC appendices note a number of collaborative projects involving more than one IC, as part of effort to encourage useful synergies. However, anecdotally, some establishments also sought out distinct collaborative opportunities via multiple ICs.

Figure 2.5 How many collaborative projects has your establishment worked on with the Innovation Centre?



Source: IC client survey Q10. Notes: Data labels of 1 or less no shown. option n= all ICs (296), BE-ST (45), CENSIS (27), DHI (26), IBioIC (48), PMS-IC (11), SAIC (99) TDL (40). Margin of error at programme level +/- 5.23% at 95% confidence level.

Figure 2.6 Which of the following Innovation Centres has your establishment worked with? (%responses)



Source: IC client survey Q4. Notes:. n= all ICs (457), BE-ST (76), CENSIS (44), DHI (30), IBioIC (65), PMS-IC (16), SAIC (137) TDL (91). Margin of error at programme level +/- 3.98% at 95% confidence level.

The client survey demonstrates engagement with a wide range of universities, for the programme as a whole, as well as for individual ICs. Clients tend to engage most often with the host institution of the IC they mainly work with but not exclusively so (see Table 2.9). Engagement is relatively concentrated, with three institutions accounting for over half of the institutions worked with (that is, the Universities of Edinburgh, Stirling and Glasgow). This is likely partly a reflection of subject expertise within those institutions, but also reflective of the geographical location of establishments (close to ICs) as well as close relations with host universities, with the implication that there may be scope to further broaden academic utilisation across a wider pool of academic expertise.

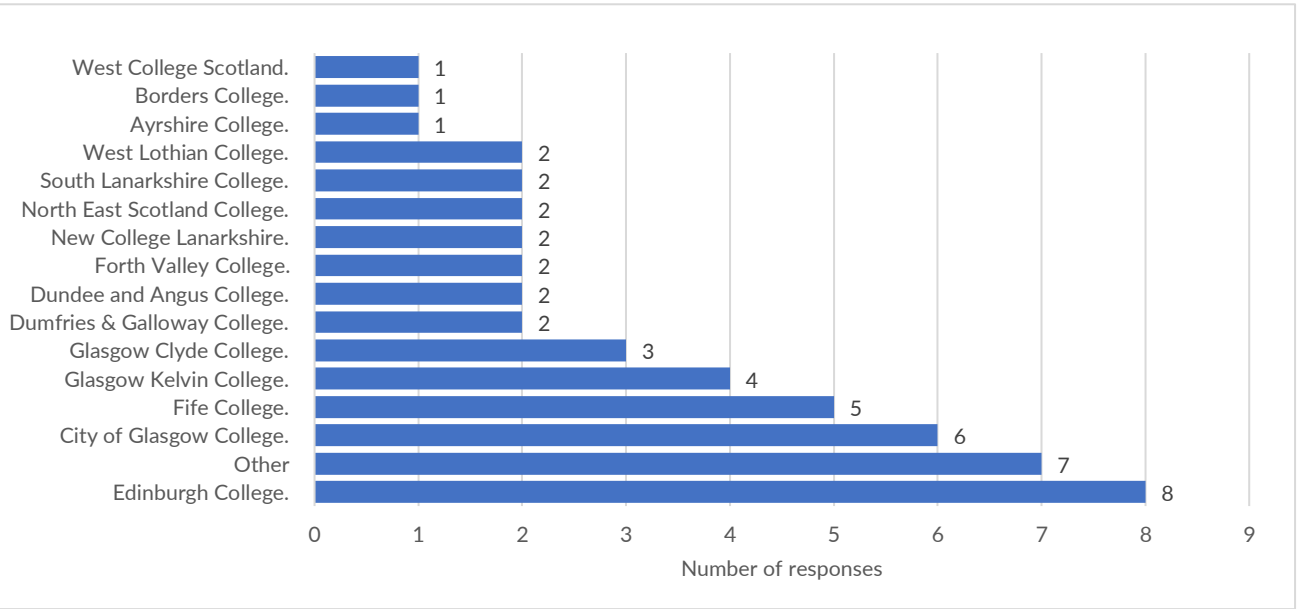
Engagement with colleges is on a smaller scale, with 300 respondents indicating they did not work with a college. Of the 50 respondents who did work with a college, there is a diversity of engagement across a range of institutions. The most common was with Edinburgh College followed by City of Glasgow College (see Figure 2.7).

Table 2.9 Which universities has your establishment worked with through the Innovation Centre? (% respondents).

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs
Did not work with a university or research institute.	28	41	23	21	6	18	14	**21**
University of Edinburgh.	12	9	3	29	50	18	34	**21**
University of Stirling.	3	2	3	5	0	44	10	**17**
University of Glasgow.	5	27	10	11	63	15	12	**15**
University of Aberdeen.	3	2	3	3	31	20	9	**10**
University of the West of Scotland.	3	2	3	3	31	20	9	**10**
Heriot-Watt University.	13	5	0	18	0	6	9	**9**
University of the Highlands & Islands.	1	2	0	5	0	24	2	**9**
Edinburgh Napier University.	25	7	7	5	0	1	5	**7**
University of Dundee.	5	0	0	5	44	8	4	**6**
Other	5	0	0	5	44	8	4	**6**
Robert Gordon University.	8	2	3	11	0	1	7	**5**
University of St Andrews.	0	0	3	5	0	7	3	**4**
Abertay University.	1	2	3	12	0	2	1	**3**
University of Strathclyde.	1	2	3	12	0	2	1	**3**
Glasgow Caledonian University.	7	5	0	2	0	1	6	**3**
Scotland's Rural College.	0	2	0	3	0	16	2	**6**
Glasgow School of Art.	7	0	17	0	0	0	1	**2**
Open University in Scotland.	0	0	0	0	0	1	0	**0**
Queen Margaret University Edinburgh.	0	0	0	2	0	0	0	**0**
Royal Conservatoire of Scotland.	0	0	0	0	0	0	0	**0**

Source:. IC client survey Q13. Notes:. n= all ICs (465), BE-ST (76), CENSIS (44), DHI (30), IBioIC (66), PMS-IC (16), SAIC (139) TDL (94).

Figure 2.7 Which colleges has your establishment worked with through the Innovation Centre?



Source: IC client survey Q15. Notes: Data labels of 1 or less no shown. n= all ICs (465), BE-ST (76), CENSIS (44), DHI (30), IBioIC (66), PMS-IC (16), SAIC (139) TDL (94).

2.2.1.2 Students

As the Innovation Centre Programme has matured, the Innovation Centres' programmatic scope has broadened to include student support in addition to typical one-to-one Collaborative Projects. The

number of students indicating that they started their research qualification during Phase 2 (63%) is accordingly greater than the number indicating that they started in Phase 1 (25%) (see Figure 2.8).[20]

The majority of those responding to the Student Survey are studying or have studied for an MSc (83%), with a smaller majority studying for a PhD level (14%), which is broadly consistent with the information in the MEF presented above (see Figure 2.10). Some 2 percent of respondents indicated that they studied towards a degree of a different type. Those that have undertaken broader CPD courses were excluded from the Student Survey, but the associated number is significant, especially for BE-ST and DHI.

As reflected in the MEF, most students have already been awarded their research qualification (Figure 2.9). The rate of respondents with completed qualifications stood at 76 percent, with 22 percent still working towards their qualification. Only 2 percent of respondents had left prior to completing their qualification. Those that have received their qualifications tended to do so in Phase 2, again reflecting the increased attention placed on the skills agenda by the Innovation Centres during this phase.[21]

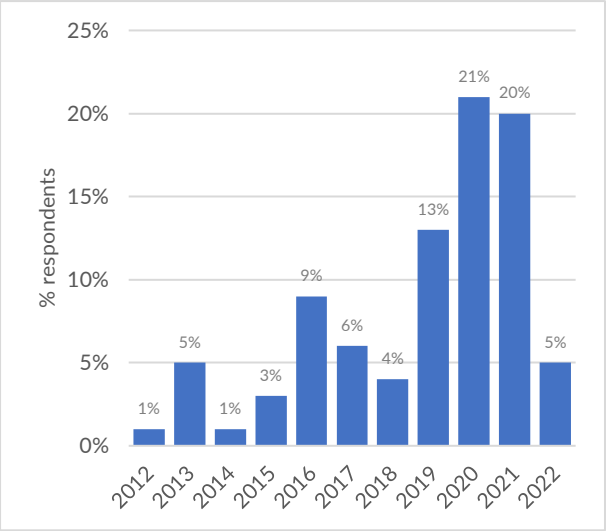
Every respondent to the Student Survey who indicated that they were undertaking a research qualification did so at a university or other research institute, all of which were based in Scotland. Only a handful of respondents indicated that they studied at the University of the Highlands & Islands, and these were reasonably well distributed between UHI Inverness (43%), UHI Outer Hebrides (29%), and SAMS UHI (29%) (Figure 2.12).

The most frequent subject areas studied by students were 'Artificial Intelligence & Data Science' (25%), 'Aquaculture' (20%), and 'Computer and Information Science' (17%), though this largely reflects a bias in the sample towards respondents from The Data Lab (62%) and SAIC (26%) (see Figure 2.13 and Figure 2.14). Students' research addressed a broad range of issues, though most often respondents indicated that they "addressed a fundamental problem" (31%). Often students' research was also aimed at improving methodologies (26%) or processes (23%) or developing business-oriented solutions (22%) (see Figure 2.15).

Often students were partnered with private or public sector entities as part of their research qualification. Some 44 percent of students were associated with a private sector business during their studies, whilst 15 percent were associated with a public sector organisation. This has likely helped to ensure that students' research was relevant to their fields, whilst also increasing the direct benefit of such support to the Scottish economy. Some 30 percent of students were not associated with a private, public, or third-sector organization during their studies, suggesting there is room to improve alignment to industry needs in the future (see Figure 2.16).

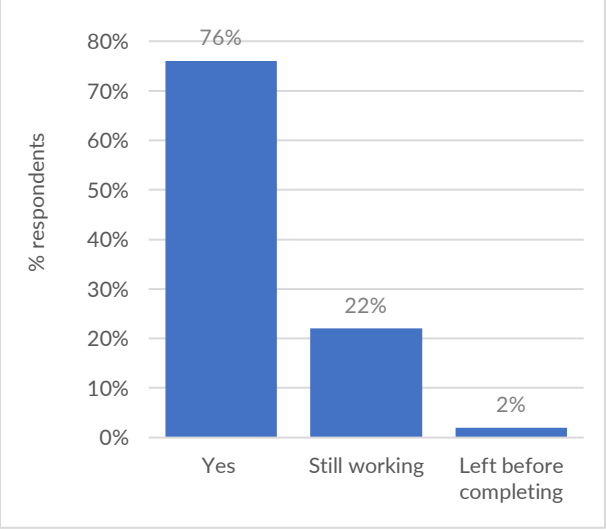
[20] This may also reflect a recency bias in the Student Survey's sample.
[21] Again, this may also reflect a recency bias in the Student Survey's sample.

Figure 2.8 In what year did you start your research qualification?



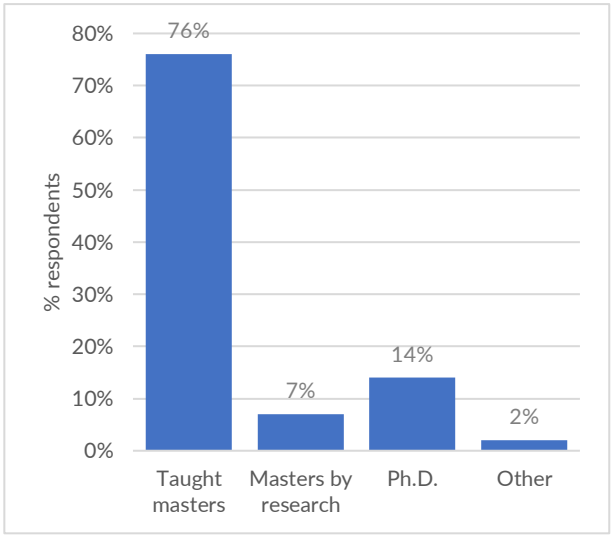
Source: Student survey Q1.1 n=201. Margin of error +/- 6.52% at 95% confidence level.

Figure 2.9 Have you been awarded your research qualification?



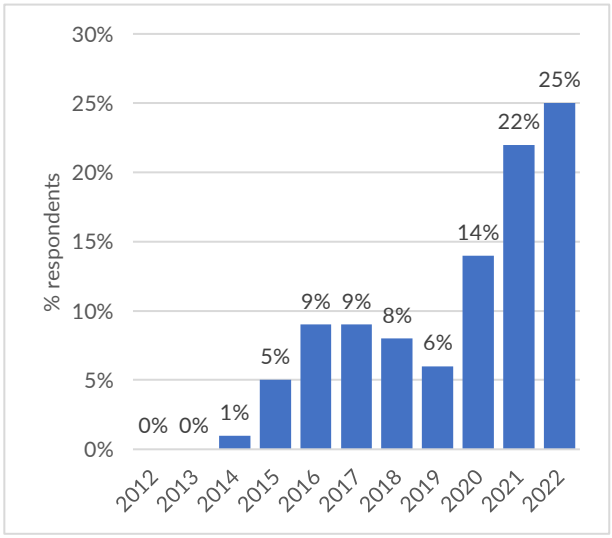
Source: Student survey Q1.2, n=182. Margin of error +/- 6.89% at 95% confidence level.

Figure 2.10 Thinking about your research qualification supported by an Innovation Centre, what type of research qualification are you / did you study for?



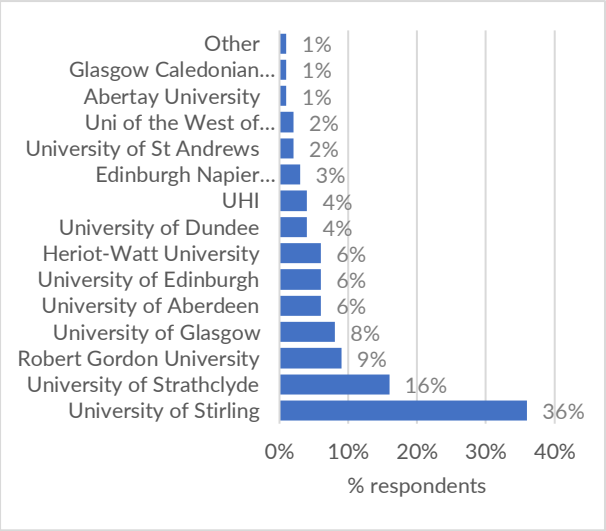
Source: Student survey Q1.3, n=182, no reply 1%. Margin of error +/- 6.89% at 95% confidence level.

Figure 2.11 In what year was your research qualification awarded?



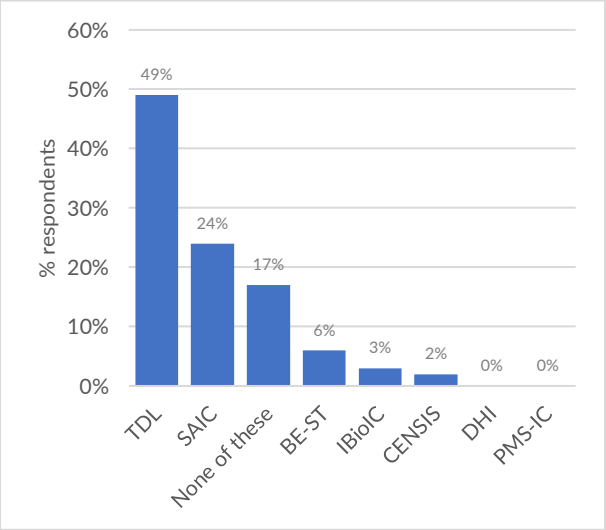
Source: Student survey Q1.4, n=139. Margin of error +/- 7.99% at 95% confidence level.

Figure 2.12 In which university are you undertaking / did you undertake your qualification?



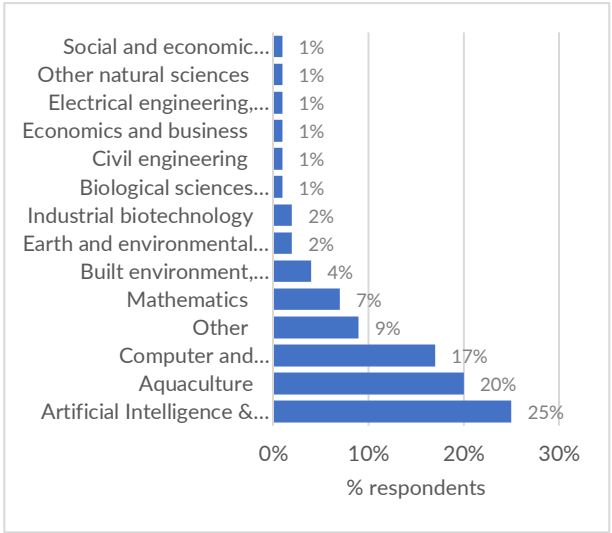
Source: Student survey Q2.2, n=179. Margin of error +/- 6.95% at 95% confidence level.

Figure 2.13 Which of the following Innovation Centres have you worked with?



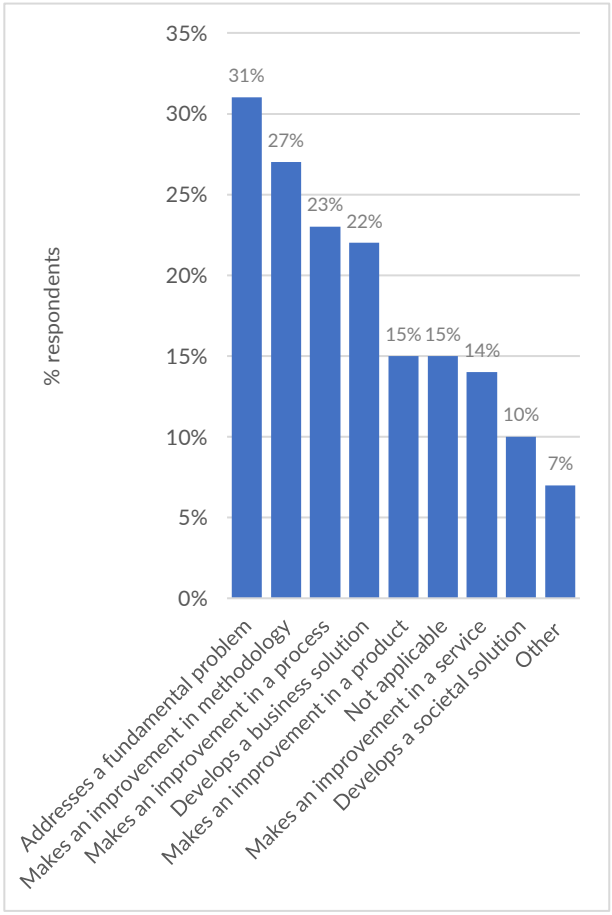
Source: Student survey Q2.4, n=201. Margin of error +/- 6.52% at 95% confidence level.

Figure 2.14 Please choose the field that corresponds best to your research qualification.



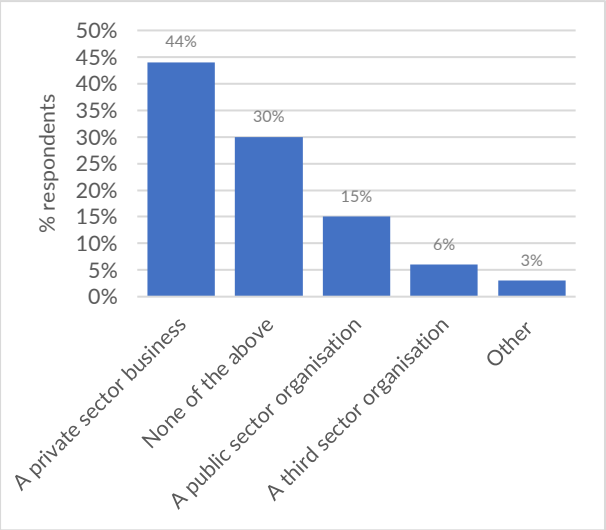
Source: Student survey Q2.5, n=201, no reply 2%. Margin of error +/- 6.52% at 95% confidence level.

Figure 2.15 In which categories would you place the primary research component of your qualification work / thesis / dissertation?



Source: Student survey Q2.6,1 n=201, no reply 2%. Margin of error +/- 6.52% at 95% confidence level.

Figure 2.16 Which of the following types of organisation did you work with as part of your research qualification?



Source: Student survey Q3.1 n=201, no reply 3%. Margin of error +/- 6.52% at 95% confidence level.

2.3 Outcomes and impacts.

This section turns to consider a number of higher-level outcomes and impacts of the IC programme. This draws on both the MEF and beneficiary survey results, as well as stakeholder comment. In turn the section reviews the wider influence of ICs on the innovation ecosystem. Lastly, feedback from supported students is reported.

2.3.1 Networking.

IC clients indicate they have been significantly supported in establishing links with a wide range of ecosystem bodies; with universities, colleges, and private sector industry being top of that list. IC supported networking activity, has, in particular, boosted business and academic contacts for a large proportion of IC clients. These findings suggest significant progress in increasing the density of ecosystem networks, in line with broad programme objectives, but also that there is still much scope to further promote connections in many cases.

Some 63% of respondents indicate some form of networking benefit resulting from improved number of business academic or third sector contacts, attributed to IC support (see Table 2.10). In terms of influence on relationships, ICs have played a significant role in developing client relationships with a wide range of bodies relevant to the innovation ecosystem (see Table 2.11). 35% of respondents indicate ICs have significantly supported clients to develop better relationships with universities or colleges, and 29% of respondents indicate ICs have significantly supported relationships with private sector clients/customers (although it is noted that these figures include responses from clients in academia, business and other sectors). A range of other networking benefits were cited (where the IC played a significant role) (see Table 2.12), with 42% of clients identifying new business contacts, and new academic contacts for 37%. A further 28% also cited a joint venture with business, 22% a joint venture with academic institution.

Table 2.10 Significantly improved aspects of networking benefits (number of business, academic, public or third sector contacts) attributed to IC.

	BE-ST		CENSIS		DHI		IBioIC		PMS-IC		SAIC		TDL		All ICs	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
%	43%	57%	33%	68%	35%	65%	30%	70%	43%	57%	33%	67%	46%	54%	37%	63%
Base	28	37	13	27	9	17	18	42	6	8	41	85	36	43	151	259

Source: IC client survey Q23. Margin of error for programme +/- 4.28% at 95% confidence level.

Table 2.11 Of the following bodies, which, if any, has the Innovation Centre played a significant role in supporting your establishment's relationship with them? (% respondents)

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs
Universities or colleges.	25	18	33	36	25	46	34	**35**
Clients or customers from the private sector.	25	30	30	30	31	42	10	**29**
Conferences, trade fairs or exhibitions.	12	11	20	29	0	27	12	**19**
Government or public research institutes.	8	20	30	6	25	22	15	**17**
Suppliers of equipment, materials, services, or software.	13	34	30	12	0	16	4	**15**
Professional and industry associations.	11	2	17	21	19	24	5	**15**
Other clients or customers from the public sector.	7	32	40	15	19	6	7	**13**
Other public sector innovation funding programme	7	14	17	15	13	13	3	**11**
Consultants, commercial laboratories or private Research and Development institutes.	9	9	10	14	6	16	3	**11**
Other units within your own business, enterprise or organisation group.	5	11	20	6	13	13	9	**10**
Technical, industry or service standards.	13	5	17	9	0	14	4	**10**
Competitors or other businesses in your industry.	9	9	7	6	6	19	1	**10**
Scientific journals and trade / technical publications.	3	0	3	2	13	9	1	**4**
Social web-based networks or crowd-sourcing.	3	0	3	9	0	4	1	**3**
Other	3	0	0	0	0	3	2	**2**
Other public sector general business funding programme	1	0	3	2	0	1	1	**1**
None of the above	30	16	17	21	31	14	24	**21**

Source: IC client survey Q16. . n= all ICs (465), BE-ST (76), CENSIS (44), DHI (30), IBioIC (66), PMS-IC (16), SAIC (139) TDL (94).

Table 2.12 Thinking about the following networking benefits, has your establishment received a significant level of benefit as a result of working with the Innovation Centre? (% respondents).

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs
Number of business contacts.	38	48	33	56	31	50	26	**42**
Number of academic contacts.	28	32	23	50	38	45	29	**37**
Developed project or joint venture with a business.	25	23	33	38	25	33	16	**28**
Developed project or joint venture with academic institution.	24	14	20	24	19	37	13	**24**
Number of public sector contacts.	16	36	33	21	13	22	20	**22**
Developed project or joint venture with public sector body.	11	14	20	6	19	11	10	**11**
Number of third sector contacts.	9	11	20	6	0	6	5	**8**
Developed project or joint venture with third sector organisation.	7	0	7	2	6	2	3	**3**
Other	5	0	3	2	0	1	2	**2**
None of the above	28	23	17	11	25	17	28	**21**

Source: IC client survey Q23. n= all ICs (465), BE-ST (76), CENSIS (44), DHI (30), IBioIC (66), PMS-IC (16), SAIC (139) TDL (94).

2.3.2 Knowledge benefits.

A range of broad knowledge benefits stemming from IC support are identified by IC clients. ICs have been most influential in stimulating technical knowledge. In addition, improved cross-industry collaboration, and awareness of academic capabilities are noted by clients (which correspond with the networking benefits identified above). The level of knowledge benefits is moderate for IC clients as a whole, which, as for networking, demonstrates the scope for further engagement of the client base around the specific knowledge related topics listed.

While the responses reflect a range of engagement and client types (academic, business, public sector, other), with connecting academia and business at the core of the programme (for most ICs), the levels reported are somewhat lower than may be anticipated at this stage.

Some 47% of respondents indicate significantly improved aspects of knowledge benefits including improved awareness of academic capabilities, or awareness of other public or private sector support (see Table 2.13)**.** Some 39% of ICs cited 'Improved technical understanding of priority technology areas in my sector' (see Table 2.14). A further 31% cited both 'improved awareness of academic capabilities' and 'improved cross-industry collaboration'.

Table 2.13 Do clients feel ICs have played a significant role in delivering knowledge benefits (with a focus on improved awareness of academic capabilities, public or private sector support)? (% respondents)

	BE-ST		CENSIS		DHI		IBioIC		PMS-IC		SAIC		TDL		All ICs	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	**No**	**Yes**
%	57%	43%	58%	42%	54%	46%	59%	41%	57%	43%	42%	58%	61%	39%	**53%**	**47%**
Base	37	28	22	16	14	12	35	24	8	6	53	73	48	31	**217**	**190**

Source: IC client survey Q24. (excluding no answer) Margin of error at programme level +/- 4.30% at 95% confidence level.

Table 2.14 Do clients feel ICs have played a significant role in delivering knowledge benefits, detailed results (% respondents).

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs
Improved technical understanding of priority technology areas in my sector.	33	59	47	48	6	45	24	**39**
Improved cross-industry collaboration.	34	14	37	33	13	45	17	**31**
Improved awareness of academic capabilities.	26	23	27	32	19	42	27	**31**
Improved market understanding of priority technology areas in my sector.	25	41	33	32	19	32	20	**29**
Improved industry or technology foresighting.	22	18	40	21	13	19	11	**19**
Improved employee skills and ways of working.	17	25	23	23	0	14	22	**19**
Improved awareness of other public sector support.	18	18	23	17	13	19	13	**17**
Improved awareness of wider societal goals (e.g., Net Zero, Sustainable Development Goals, Cyber Security)	22	20	10	24	0	9	10	**14**
Improved awareness of private sector support.	13	11	17	14	19	17	7	**13**
Improved understanding of growing the business (if applicable).	4	11	10	12	0	10	1	**7**
Other	0	0	7	2	0	2	0	**1**
None of the above	22	9	0	12	31	14	18	**15**

Source: IC client survey Q24. Notes: Data labels of 1 or less no shown. n= all ICs (465), BE-ST (76), CENSIS (44), DHI (30), IBioIC (66), PMS-IC (16), SAIC (139) TDL (94).

2.3.3 TRL progression for collaborative projects

Clients expect TRLs to have advanced significantly in the course of IC support, often to TRL 7-8 within the near future[22]. ICs are also credited by clients with playing a significant role in supporting this progress. However, while positive overall, the findings prompt IC consideration of project selection criteria, and whether more projects at a higher TRL would contribute to quicker realisation of innovation, economic and wider benefits.

Some 52% of respondents indicate ICs have made a very or extremely important contribution to advancing the project TRL (main project supported, see Table 2.15**).** Those clients involved in collaborative projects through ICs have typically started at the lower end of the TRL scale (it is noted this may include project work before IC involvement). Some 75% of projects were at TRL 1-3 at the start (see Figure 2.17). Interestingly, when clients look forward to the next three years, those at TRL 7-8 are expected to account for 60% of the total (see Figure 2.18). In all, some 61% of clients thought ICs were very or extremely important in advancing their project TRL (see Figure 2.19). The data also demonstrates the time it takes to fully move to TRL 7-8 (i.e., 3 years +).

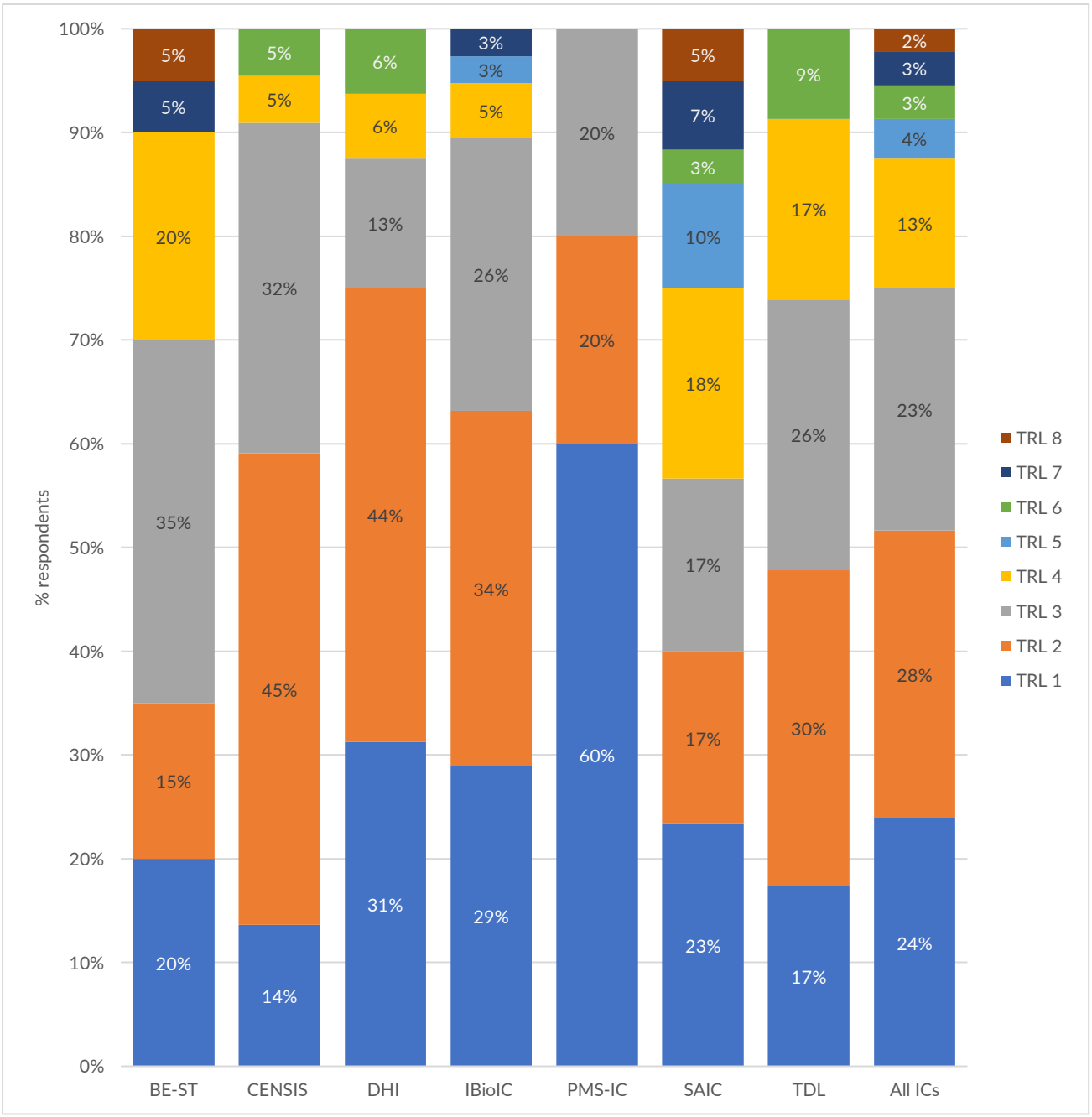
[22] TRL 1 - Basic principles observed. Can describe the need(s) but have no evidence.
TRL 2 - Technology concept formulated. Concept and application has been formulated.
TRL 3 - Experimental proof of concept. Needs validation through prototyping.
TRL 4 - Small scale prototype. Technology validated in laboratory environment.
TRL 5 - Large scale prototype. Technology validated in industrially relevant environment.
TRL 6 - Prototype system. Technology demonstrated in industrially relevant environment.
TRL 7 - Demonstration system. System prototype demonstration in operational environment. Operating at pre-commercial scale.
TRL 8 - Commercially ready. System complete and qualified. All technical process and systems to support commercial activity in ready state.

Table 2.15 Do clients feel ICs have been very or extremely important in advancing TRL? (% respondents)

	BE-ST		CENSIS		DHI		IBioIC		PMS-IC		SAIC		TDL		All ICs	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
%	58%	42%	36%	64%	43%	57%	47%	53%	44%	56%	48%	52%	53%	47%	48%	52%
Base	21	15	9	16	10	13	20	23	4	5	41	44	18	16	123	132

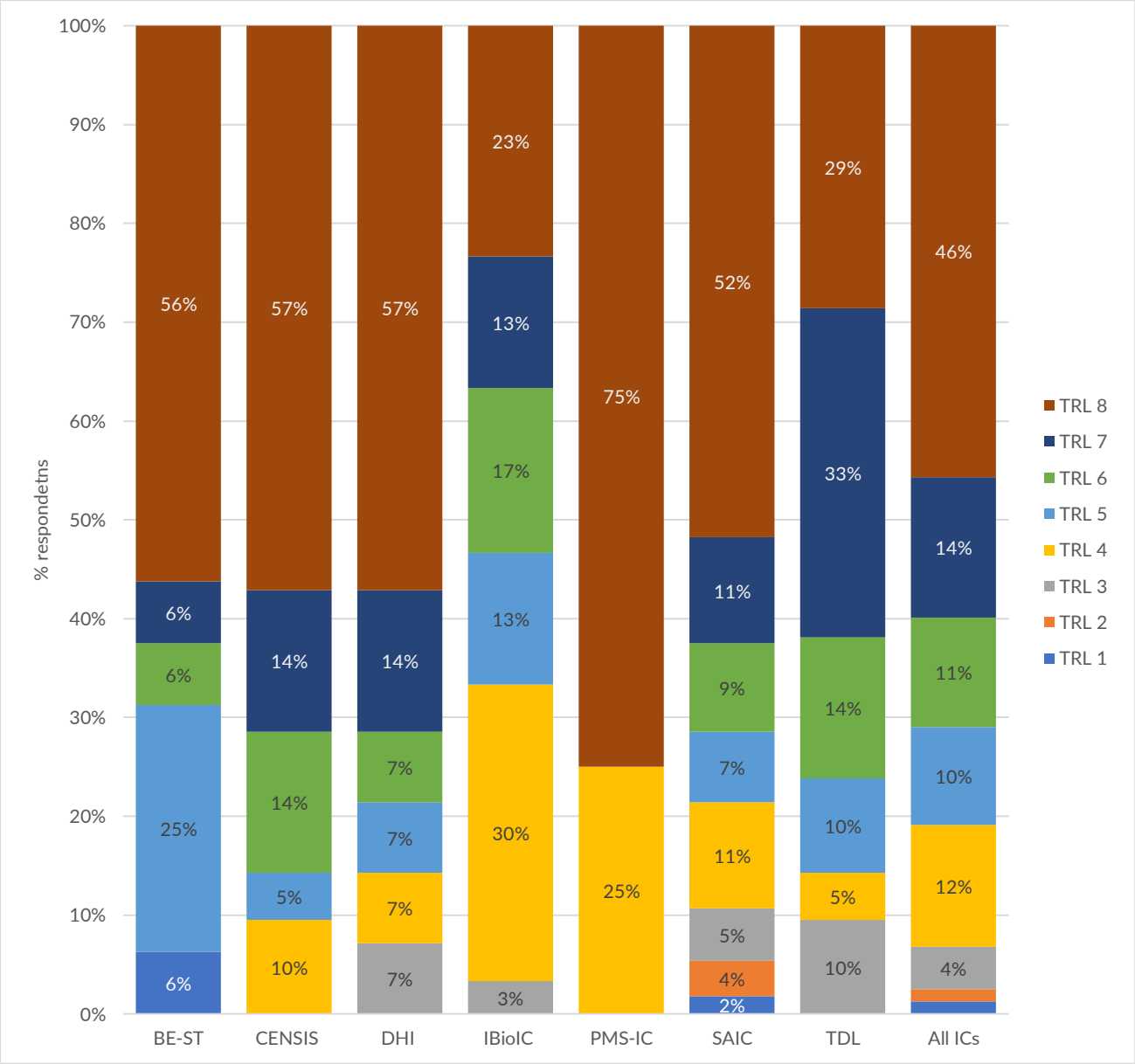
Source: IC client survey Q29. Margin of error at programme level +/- 5.70% at 95% confidence level.

Figure 2.17 TRL at the start of the project, most significant project. (% respondents)



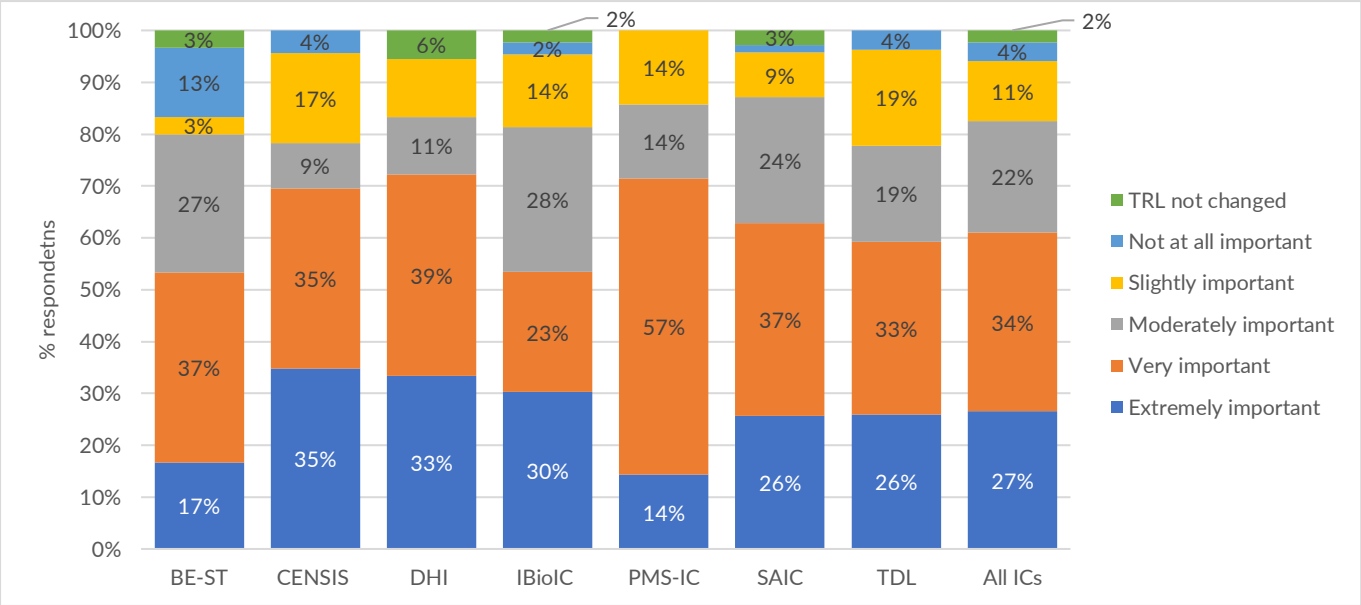
Source: IC client survey Q28 (start). Notes: Data labels of 1 or less no shown. n= all ICs (184), BE-ST (20), CENSIS (22), DHI (16), IBioIC (38), PMS-IC (5), SAIC (60) TDL (23). Margin of error at programme level +/- 6.86% at 95% confidence level.

Figure 2.18 TRL within the next three years, most significant project (% respondents).



Source: IC client survey Q28 (next three years). Notes: Data labels of 1 or less no shown. n= all ICs (162), BE-ST (16), CENSIS (21), DHI (14), IBioIC (30), PMS-IC (4), SAIC (56) TDL (21). Margin of error at programme level +/- 7.36% at 95% confidence level.

Figure 2.19 Thinking about your establishment's most significant project work with the Innovation Centre, how important has the Innovation Centre been in advancing the technology readiness level (TRL)?



Source: IC client survey Q29. Notes: Data labels of 1 or less no shown. n= all ICs (218), BE-ST (30), CENSIS (23), DHI (18), IBioIC (43), PMS-IC (7), SAIC (70) TDL (27). Margin of error at programme level +/- 6.24% at 95% confidence level.

2.3.4 Finance and sales benefits

A quarter (25%) of respondents cite access to finance as a barrier to innovation (see Table 2.16) Overall, 17% thought the IC was important in helping overcome this barrier. In addition, 25% of IC clients (from a low response base) stating a finance benefit from working with an IC, reported the IC making a significant contribution to securing new equity investment, new debt finance or new public sector investment (Table **2.17** and Table 2.18).

The findings suggest significant challenges in accessing wider investment linked to commercialisation, and a positive role for ICs in encouraging links to investors. It is recognised that brokering external finance has not been an explicit role of ICs (e.g., equity or debt finance), but this may be something ICs could support more explicitly.

Similarly, low sales benefits because of working with IC likely reflect: the pre-commercial stage of many collaborative projects, that such downstream sales activity is not easily attributed to earlier project, networking or skills work that was supported by ICs, or in some cases, that projects have not led to commercially successful outcomes.

However, 38% of IC clients reported some form of sales benefits (see Table 2.19). Excluding not applicable, therefore, more than half of the IC supported clients report a sales benefit. The largest proportion (17% of all respondents) had entered or grown Scottish markets, 7% other UK markets and 8% International markets.

Table 2.16 Which, if any, of the following were significant in constraining your establishment's innovation activities before working with the Innovation Centre? (% respondents).

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All
Lack of qualified personnel or specialist project / programme support	22%	41%	30%	17%	38%	19%	36%	26%
Availability of finance, including awareness of funding opportunities	18%	14%	20%	29%	13%	32%	29%	25%
Direct innovation costs too high	24%	20%	13%	36%	13%	19%	19%	22%
Lack of access to academic expertise or other partnership opportunities	12%	16%	10%	17%	13%	22%	16%	17%
Lack of information on technology	12%	27%	17%	11%	6%	6%	9%	11%
Cost of finance	8%	11%	-	8%	6%	15%	9%	10%
Excessive perceived economic risks	11%	2%	3%	11%	6%	12%	7%	9%
Lack of information on markets	9%	18%	10%	14%	-	8%	6%	9%
Ability to work collaboratively with competitors on a shared challenge	12%	7%	17%	8%	19%	11%	3%	9%
Withdrawal of UK from European Union (Brexit)	5%	5%	-	6%	6%	11%	7%	7%
Perceived uncertain demand for innovative goods or services	9%	5%	7%	6%	6%	7%	2%	6%
Government regulations	5%	-	-	3%	-	10%	1%	5%
Procurement challenges	4%	7%	20%	2%	6%	3%	7%	5%
Issues related to COVID-19	3%	5%	-	5%	6%	8%	3%	5%
Other	4%	2%	3%	6%	-	7%	5%	5%
Effect of a market dominated by established businesses	4%	-	13%	5%	-	4%	1%	3%
None of the above	30%	23%	30%	18%	38%	27%	19%	25%
No reply	14%	7%	17%	9%	19%	6%	10%	10%

Source: Client survey Q17 n= all ICs (465), BE-ST (76), CENSIS (44), DHI (30), IBioIC (66), PMS-IC (16), SAIC (139) TDL (94).

Table 2.17 Do clients feel ICs have made significant contribution to securing new equity investment, new debt finance or new public sector investment? (% respondents)

	BE-ST		CENSIS		DHI		IBioIC		PMS-IC		SAIC		TDL		All ICs	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
%	85%	15%	60%	40%	67%	33%	80%	20%	60%	40%	68%	32%	84%	16%	75%	25%
Base	17	3	6	4	2	1	12	3	3	2	21	10	16	4	77	26

Source: IC client survey Q35.Note: excluding 'not applicable'. Margin of error at programme level +/- 9.39% at 95% confidence level.

Table 2.18 Do clients feel ICs have made significant contribution to securing new equity investment, new debt finance or new public sector investment? Detailed responses (% responses).

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs
Secured new debt finance (e.g., bank loans, trade credit)	0	0	0	0	0	1	0	0
Secured new equity investment (e.g., venture capital, angel investors)	2	0	0	6	0	2	5	3
Other	6	7	11	6	0	4	3	5
Secured new public sector investment	4	15	11	6	22	9	5	8
Improved investment readiness (e.g., capacity to understand and meet the specific needs and expectations of investors)	13	11	11	9	11	10	8	10
Cost savings, or more efficient/effective processes	11	11	0	14	0	17	8	12
Not applicable	28	33	44	26	33	29	25	29
None of the above	36	22	22	34	33	27	48	32

Source: IC client survey Q35. n= all ICs (256), BE-ST (47), CENSIS (27), DHI (9), IBioIC (35), PMS-IC (9), SAIC (89) TDL (40). Margin of error at programme level +/- 5.69% at 95% confidence level.

Table 2.19 Do clients feel ICs have made significant contribution sales benefits? Detailed responses (% responses).

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs
Secured new sales from licensing	0	0	0	3	0	1	0	**1**
Other	4	0	9	6	0	6	3	**4**
Entered or grew in other UK market	2	13	9	6	10	10	3	**7**
Entered or grew in international markets	11	13	18	3	20	3	8	**8**
Entered or grew in Scottish market	17	30	27	6	10	20	10	**17**
None of the above	35	17	9	36	30	22	38	**28**
Not applicable	30	27	27	39	30	38	40	**35**

Source: IC client survey Q36. n= all ICs (258), BE-ST (46), CENSIS (30), DHI (11), IBioIC (33), PMS-IC (10), SAIC (88) TDL (40). Margin of error at programme level +/- 5.66% at 95% confidence level.

2.3.5 Innovation investment and activity.

IC clients (of all types) are engaged in a range of innovation investment (particularly internal R&D) and innovation activities (particularly introduction of new services, goods or process). ICs are also acknowledged by clients as playing a significant role in stimulating some of this investment and activity. However, the findings also highlight the scope for increasing innovation investment and activity and encouraging a wider group of clients to invest in, and undertake, innovation.

Some 52% of respondents indicate they have introduced new or significantly improved goods, services or processes since working with an IC and 30% that an IC had a significant role in their introduction (see Table 2.20 and Table 2.21).

The role the ICs play in stimulating their client investment in innovation activity varies by type (see Table 2.22). Some 55% of respondents have invested in internal R&D since they engaged with an IC and just under a third of clients indicate that ICs played a significant role in this innovation investment. Just under a third of IC clients report investment in training for innovation activities and a fifth in recruitment for innovation activities. However, the proportion of IC clients attributing a significant role for ICs in stimulating this investment is low to moderate.

A quarter of IC clients have introduced new or significantly improved services since they started working with the IC (25%) and just under one in five (18%) new or improved goods. A further 15% had introduced new processes (see Table 2.23). Where these have occurred, the IC has typically played a significant role i.e., around two out of three of the IC clients.

Some 5% of clients had started a new business or spun-out a business, with the IC playing a significant role in under half of these instances. A smaller proportion had patents granted (3%), with the IC having a significant role in under half of these.

Table 2.20 Since working with IC, establishment introduced new or significant improved goods, services, or processes (% respondents)

	BE-ST		CENSIS		DHI		IBioIC		PMS-IC		SAIC		TDL		All ICs	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
%	47%	53%	51%	49%	52%	48%	53%	47%	46%	54%	57%	43%	50%	50%	48%	52%
Base	30	34	18	17	14	13	27	24	6	7	65	49	38	38	182	198

Source: IC client survey Q21. Margin of error at programme level +/- 4.49% at 95% confidence level.

Table 2.21 Since working with IC, establishment introduced new or significant improved goods, services, or processes (attributed to IC) (% respondents).

	BE-ST		CENSIS		DHI		IBioIC		PMS-IC		SAIC		TDL		All ICs	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
%	67%	33%	51%	49%	52%	48%	63%	37%	77%	23%	56%	44%	66%	34%	61%	39%
Base	43	21	18	17	14	13	32	19	10	3	64	50	50	26	231	149

Source: IC client survey Q22. Margin of error at programme level +/- 4.49% at 95% confidence level.

Table 2.22 Since your establishment first worked with the Innovation Centre, did your establishment invest in any of the following for the purposes of current or future innovation? and per cent saying IC played significant role (SR) in supporting. Detailed responses (% respondents),

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs	SR(%)
Internal Research & Development	38	66	47	64	50	60	56	**55**	**30**
Training or skills development for innovative activities	29	23	20	26	31	30	37	**29**	**12**
Recruitment for innovative activities	7	23	17	23	19	22	24	**20**	**6**
Any form of design activity, including participatory co-design	21	27	50	14	25	14	14	**19**	**8**
Acquisition of machinery and equipment, computer hardware and software for innovation	5	34	10	26	13	24	6	**17**	**4**
Market introductions of innovation	13	18	27	18	19	19	10	**16**	**8**
Acquisition of Research & Development	11	9	10	15	13	24	6	**14**	**7**
Prefer not to answer	11	9	10	15	13	24	6	**14**	**-**
Acquisition of existing knowledge	3	7	3	8	6	14	3	**7**	**2**
None of the above	25	7	10	17	13	17	12	**15**	**-**

Source: IC client survey Q19, Q20. Notes: Data labels of 1 or less no shown. n= all ICs (465), BE-ST (76), CENSIS (44), DHI (30), IBioIC (66), PMS-IC (16), SAIC (139) TDL (94).

Table 2.23 Since working with the Innovation Centre, did this establishment introduce any of the following? (% respondents), and number saying IC played significant role (SR).

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs	SR (%)
New or significantly improved services.	21	25	40	15	31	27	27	**25**	**17**
Any new or significantly improved goods.	16	20	20	20	0	23	14	**18**	**12**
New processes for producing or supplying goods or services.	12	14	17	18	19	19	11	**15**	**9**
Prefer not to answer	1	5	0	14	6	10	3	**6**	**-**
A new start-up or spin out business	1	2	0	6	19	9	1	**5**	**2**
New patent applications	1	2	0	3	13	5	3	**3**	**1**
New patents granted	1	0	0	2	6	5	2	**3**	**1**
Patents that have resulted in commercialised products or processes or have been licensed	0	2	0	2	6	1	1	**1**	**0**
None of the above.	45	36	43	36	44	33	39	**38**	

Source: IC client survey Q21, Q22.. n= all ICs (465), BE-ST (76), CENSIS (44), DHI (30), IBioIC (66), PMS-IC (16), SAIC (139) TDL (94).

2.3.6 Economic impacts.

This section discusses economic impacts of ICs in terms of employment and GVA, recognising that some ICs have a much greater focus on wider benefits, including health and wellbeing, that are less readily captured in these terms. It is emphasised that the reported results relate to relatively small samples of IC beneficiaries and that the grossed-up figures presented are indicative (see Appendix A). These wider benefits are discussed in subsequent sections and individual IC appendices.

The programme MEF reports at least 5,788 new jobs forecast by businesses in Scotland (to July 2022), with a further 7,331 jobs forecast to be safeguarded. New turnover forecast is recorded in the MEF as £2,164 million, with existing turnover safeguarded forecast as £1,113 million (forecast, gross jobs). Based on a more conservative model derived from survey results this report estimates net additional peak employment of 1,874 and a peak annual GVA of £65.7 million[23] (net additional GVA, constant prices, discounted) (£173.5 million cumulative over the ten years of the programme)[24].

The programme MEF records several outcomes and impacts measures for the ICs. These are indicated in Table 2.24 to Table 2.26. As discussed in the individual IC appendices, these entries generally do not consider additionality (i.e., an estimate of the counterfactual), are generally based on forecasts at project end, which may entail a significant level of optimism bias, and are assessed over varying or indeterminate time periods[25]. **The MEF employment and turnover figures, in many cases, are therefore likely substantially overstated.**

A reflection on the positive contribution the ICs make to the academic sector are the c72 posts created in Scottish HEIs (with a small number of college posts created). The MEF does not provide information on the means of academic job creation. However, this is often a combination of direct support and leveraged support for projects that employ staff. It would be helpful of the MEF to record the nature of positions (temporary / permanent, full time /part time) and per cent of post funded by IC.

Table 2.24 Anticipated Jobs Supported/ Created (Phase 1 & Phase 2).

	BE-ST	CENSIS	DHI*	IBioIC	PMS-IC	SAIC	TDL	All ICs
New jobs generated (by business in Scotland)	3,885	630	N/A	N/A	28	1,245	N/A	**5,788**
Existing jobs safeguarded (by business in Scotland)	6,474	372	N/A	N/A	21	464	N/A	**7,331**
Total	**10,359**	**1,002**	**N/A**	614	**49**	**1,709**	**1,449**	**15,182**

*Source: MEF. Note: * Figures do not include DHI for Phase 1/2.*

Table 2.25 Anticipated Turnover Supported/ Created (Phase 1 & Phase 2).

	BE-ST	CENSIS	DHI*	IBioIC	PMS-IC	SAIC	TDL*	All ICs
New turnover generated (by business in Scotland)	£1,643m	£239m	N/A	£16m	£3m	£279m	£105m	**£2,164m**
Existing turnover safeguarded (by business in Scotland)	£130m	£43m	N/A	£436m	-	£941m	-	**£1,113m**
Total	**£1,773m**	**£282m**	**N/A**	**£452m**	**£3m**	**£1,220m**	**£105m**	**£3,834m**

*Source: MEF. Note: * Figures do not include DHI for Phase 1/2, TDL for Phase 1*

[23] 2022.
[24] Achieved and not including any forecast.
[25] No further breakdown possible from MEF e.g., number of businesses.

Table 2.26 Posts Created in Scottish HEIs/ Colleges/ Public Sector (Phase 1 & Phase 2)

	BE-ST	CENSIS	DHI*	IBioIC*	PMS-IC	SAIC	TDL*	All ICs
New posts (in Scottish HEIs) created to support demand led academia-business projects	19	2	12	-	5	34	N/A	**72****
New posts (in Scottish colleges) created to support demand led academia-business projects.	1	-	0	-	-	-	N/A	**1****
New posts (in Scottish public sector) created to support demand led academia-business projects.	1	-	5	-	8	-	N/A	**14****
Total	**21**	**2**	**17**	**-**	**13**	**34**	**11**	**98****

*Source: MEF. Note: * Figures do not include DHI for Phase 1, IBioIC for Phase 1, and TDL for Phase 1 - not available in the MEF in agreement with funders. ** Figures do not include TDL for Phase 2 - not disaggregated in the MEF*

Analysis of client survey data identifies a peak net additional employment of 205 (1,874 grossed up to population) (2022). While the employment level of beneficiaries appears to have grown over the period under review, this is mainly a feature of having a higher frequency of respondents in more recent years (see Figure 2.20). Many respondents do not expect employment gains to be carried forward into 2025. This may be a function of a very challenging economic environment and associated moves to reduce headcount.

The net economic impacts for the supported population of business clients were estimated by grossing up impacts from survey respondents to the population. The Consultants did not have sufficiently detailed data on the characteristics of the total population of IC clients to compare with survey respondents in order to fully assess potential non-response bias and how representative the sample was of the population. In addition, due to the smaller number of respondents at the individual IC levels, confidence intervals for individual IC results were wider than for the overall programme. This means that grossed up impacts, particularly at the individual IC level, should be treated with a degree of caution as they are based on feedback from a relatively small sample of IC clients and have a larger margin of error. There is, however, little other evidence regarding actual or net economic impacts, and the findings represent the best evidence available on which to estimate the net economic impact of the ICs. The evaluation makes it clear that such impact data should be considered alongside other evidence of benefits in the report rather than in isolation.

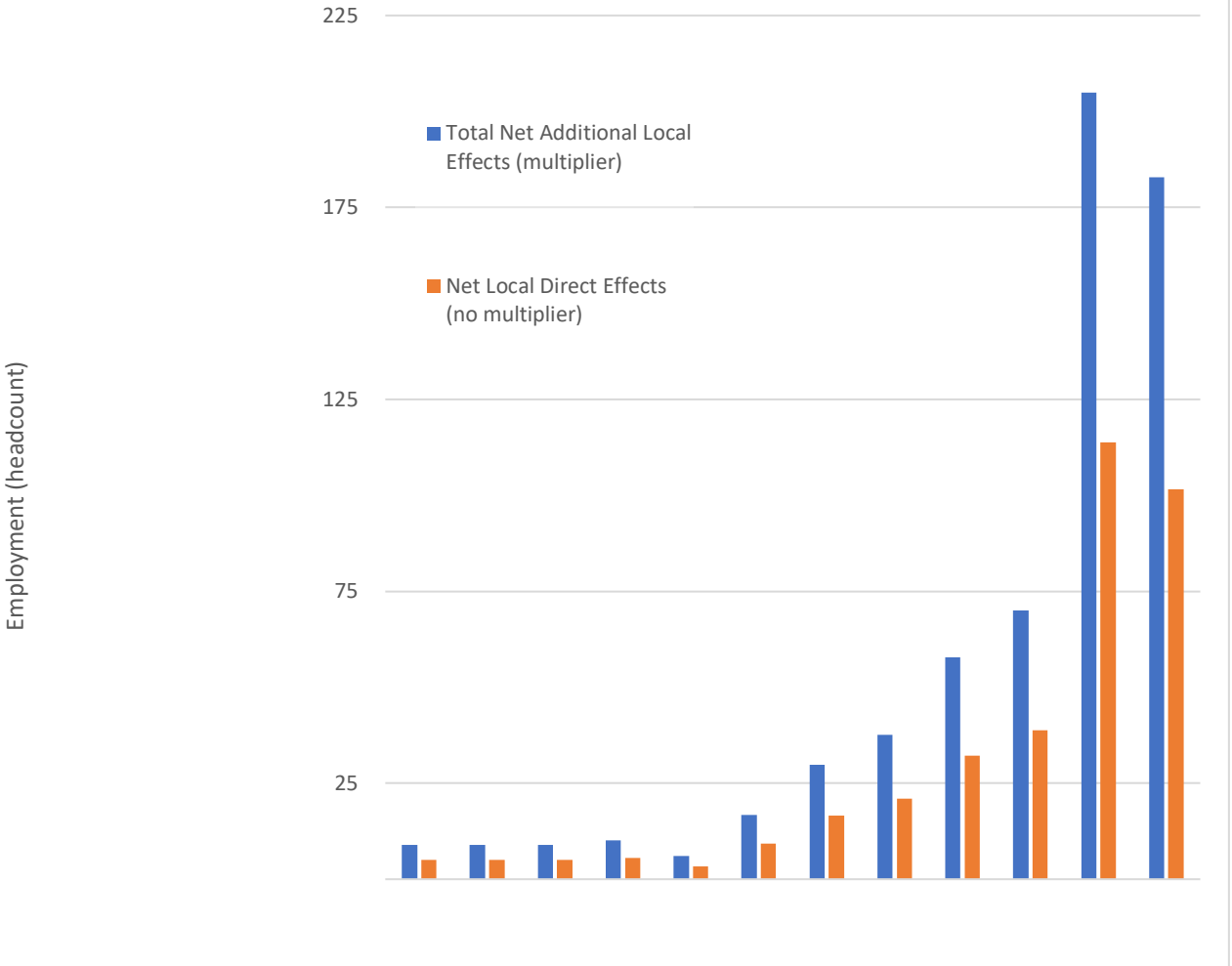
For those respondents involved in the IC programme before the later stages of phase one, few additional employment benefits are identified. This is possibly a reflection of both lower respondent numbers and the difficulty in retrospectively attributing benefits to the IC programme after a lengthy period of time.

For those beneficiaries engaging in the programme from between one and five years ago, there are higher levels of additional employment identified. This suggests two things. Firstly, employment benefits of participation are probably identified after a period of several years, as innovation is commercialised. Secondly, the nature of the interventions, involving relatively low-intensity interventions in some cases, or focused on projects that are often sometimes some distance from commercialisation, does not translate into easily attributable employment benefits (or within the timescale the evaluation is looking at).

The employment benefits identified are associated with increased economic benefits in terms of Gross Value Added. Cumulative net additional GVA of £173.5 million (grossed up to population) (at constant prices, discounted) for the period 2012- 2022 is estimated (see Table 2.27 to Table 2.30). GVA impacts for the programme at selected milestones are indicated in Table 2.31. Programme net additional GVA of £53.7 million is forecast for 2025 (net additional GVA, with multiplier, constant

prices, discounted). This is substantially lower than the equivalent figure for 2022 of £65.7 million and reflective of the forecast reduced headcount.

Figure 2.20 IC programme beneficiary employment (headcount) 2012-2022, 2025 (forecast), additional employment (not grossed up to population).



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2025
Total Net Additional Local Effects (multiplier)	9	9	9	10	6	17	30	38	58	70	205	183
Net Local Direct Effects (no multiplier)	5	5	5	6	3	9	17	21	32	39	114	102

Source: IC client survey. for 2012-2022 n= 186 (+/-6.82% at the 95% confidence level and based on a valid sample of 186), for 2025 n= 180 (+/-6.94% at the 95% confidence level and based on a valid sample of 180). 'Local' in this context denotes Scotland (see Appendix A)

Table 2.27 IC programme beneficiary employment (peak year) & cumulative Gross Value Added (GVA), 2012-22.

Impacts	Sample	Grossed up to Population	Lower range estimate	Upper range estimate
Employment (peak) (Total Net Additional Local Effects) (2022)	205	1,874	1,746	2,002
Employment (peak) (Net Local Direct Effects- no multiplier) (2022)	114	1,041	970	1,112
Cumulative Net Additional GVA, Current Prices	-	£221m	£206m	£ 236m
Cumulative Net Additional GVA (no multiplier), Current Prices	-	£123m	£114m	£131m
Cumulative Net Additional GVA, Constant Prices	-	£227m	£212m	£243m
Cumulative Net Additional GVA (no multiplier), Constant Prices	-	£126m	£118m	£135m
Cumulative Net Additional GVA, Constant Prices, Discounted	-	£174m	£162m	£185m
Cumulative Net Additional GVA (no multiplier), Constant Prices, Discounted	-	£96m	£90m	£103m

Notes: Margin of error +/-6.82% at the 95% confidence level and based on a valid sample of 186. Discounted values base year= 2012.

Table 2.28 Beneficiary employment by innovation centre, not grossed up to population (peak years[26]).

.	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL
Net Additional Employment (peak) (Total Net Additional Local Effects)	16	9	2	112	0	41	24
Net Additional Employment (peak) (Net Local Direct Effects- no multiplier)	9	5	1	62	0	23	13

Notes: The sum of IC employment by peak years does not equal programme employment by peak year as individual IC peak years vary from the programme peak year. n= BE-ST (33), CENSIS (28), DHI (11), IBioIC (32), PMS-IC (2), SAIC (48) TDL (33).

Table 2.29 Beneficiary employment by innovation centre, grossed up to population*[26].

.	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL
Net Additional Employment (peak) (Total Net Additional Local Effects)	187	56	18	858	0	400	357
Net Additional Employment (peak) (Net Local Direct Effects- no multiplier)	104	31	10	476	0	222	198

*Notes: The sum of IC employment by peak years does not equal programme employment by peak year as individual IC peak years vary from the programme peak year. n= BE-ST (33), CENSIS (28), DHI (11), IBioIC (32), PMS-IC (2), SAIC (48) TDL (33) *Figures are indicative and are associated with a significant margin of error.*

[26] Peak years for Gross Local Direct Effects: BE-ST (2021), CENSIS (2020), DHI (2022), IBioIC (2022), PMS-IC (2022), SAIC (2022), TDL (2022); Total Net Additional Local Effects: BE-ST (2022), CENSIS (2020), DHI (2022), IBioIC (2022), PMS-IC (-), SAIC (2022), TDL (2022); Net Local Direct Effects are as for Total Net Additional Local Effects.

Table 2.30 Beneficiary cumulative net additional GVA (2012-2022), by IC, grossed up to population*

.	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL
Cumulative Net Additional GVA , Constant Prices, Discounted	£24.6m	£7.5m	£1.5m	£38.8m	£-	£67.7m	£33.5m
Cumulative Net Additional GVA (no multiplier), Constant Prices, Discounted	£13.7m	£4.2m	£0.8m	£21.6m	£-	£37.6m	£18.6m

*Notes: *Figures are indicative and are associated with a significant margin of error.*

Table 2.31 Milestone Impacts for beneficiary GVA, Cumulative, IC programme, grossed up to population.

Impacts	Y1 (m)	Y3 (m)	Y5 (m)	Y10 (m)
Cumulative Net Additional GVA , Current Prices	£8.8	£18.4	£30.0	£220.1
Cumulative Net Additional GVA (no multiplier), Current Prices	£4.9	£10.2	£16.7	£122.6
Cumulative Net Additional GVA , Constant Prices	£10.4	£21.3	£34.2	£227.1
Cumulative Net Additional GVA (no multiplier), Constant Prices	£5.8	£11.8	£19.0	£126.2
Cumulative Net Additional GVA , Constant Prices, Discounted	£10.2	£20.2	£31.2	£173.5
Cumulative Net Additional GVA (no multiplier), Constant Prices, Discounted	£5.7	£11.2	£17.3	£96.4

Source: beneficiary survey. Note: margin of error +/-6.82% at the 95% confidence level and based on a valid sample of 186. Discounted values base year= 2012.

Several issues are noted in discussing the impact model presented.

Leakage: Some 14% (30) of respondent establishments in the economic model (216 in total) were non-Scottish-based (with variation between ICs). It is also noted that overall, 51 (11%) of 461 survey respondents were establishments based outside of Scotland, with 31 of these in the rest of the UK (7%), and the remainder overseas (4%).

This raises a question of whether all of the benefits of these projects are likely to accrue to Scotland. However, it is noted that many of the non-Scottish based respondents were reporting for organisations with a UK wide presence. It is also noted that just under half (24) of these non-Scottish based establishments were involved in a collaborative project, which will involve a benefit to academics based in Scotland or other partners based in Scotland. In addition, the involvement of non-Scottish establishments must be balanced with the desirable goal of widening and internationalising the ecosystem and engaging with key players from outside Scotland (including the promotion of inward investment). The level of leakage therefore does not seem disproportionate in that light.

Displacement: Many clients report that they are competing mainly in Scotland. Further benchmarking to establish the relative level of displacement would be helpful, but is beyond the scope of this exercise. However, the finding raises a question about how ICs appraise projects to maximise value to Scotland – e.g., if more could be done to identify companies in markets where Scottish companies are competing more with international competitors.

Distribution of impacts: The majority (70%) report no change to employment. This suggest that impacts to date, in terms of employment, appear to have come from a small subset of establishments. For the c30% who cite some kind of change in employment as a result of the ICs, most of them are reporting small numbers of jobs increases (1-10 employees) with a smaller number reporting larger impacts. These trends appear replicated in the forecast employment benefits attributed to the ICs.

The findings raise a question about how accurate or useful the MEF data on employment is. The survey findings would suggest that MEF data isn't particularly useful if it represents gross employment change that might be achieved anyway or are an overestimate (or both). This may be

hard to avoid where many projects are yet to be commercialised. However, it demonstrates that a fair level of attrition may be expected with projects that don't succeed versus ones that have a better return, and that a degree of optimism bias should be applied to MEF figures.

Large companies (based on the employment numbers they report) account for a disproportionate amount of the net employment impacts (50% in 2014/15, 95% in 2017 and falling to 60% by 2022). This raises a question for an equity focus on SMEs. The findings suggest there are more impacts for supporting larger companies, and that there is an argument for maintaining a balanced portfolio of clients by size: balancing equity and impact.

Outliers and other omissions: It is noted that a small number of outliers were removed, for example, an implausibly very high 2025 employment forecast of several thousand based on a current very small level of employment, or an employment level known to be substantially lower, or where there were inconsistent data entries by year for gross and additional jobs.

Reduced employment: A small number of respondents have reported that the ICs have resulted in fewer employees. In these cases, this may be because of misunderstanding the question or it genuinely means they think support has had a negative impact on employment, which in some circumstances is plausible (e.g., accelerating adoption of automation leading to reduced headcount).

2.3.7 General additionality.

Some 86% of respondents attribute full or partial additionality for innovation benefits to IC support (see Table 2.32).

The discussion of knowledge and networking benefits above note that IC clients attribute a proportion of any networking, knowledge or economic benefits to an IC. A further general question on additionality was included in the client survey (see Figure 2.21). The greatest percentage of respondents (31%) say they would have achieved a significantly smaller range of knowledge and networking or other benefits, at a reduced scale, and it would have taken longer to achieve them. A further 30% report more limited benefits.

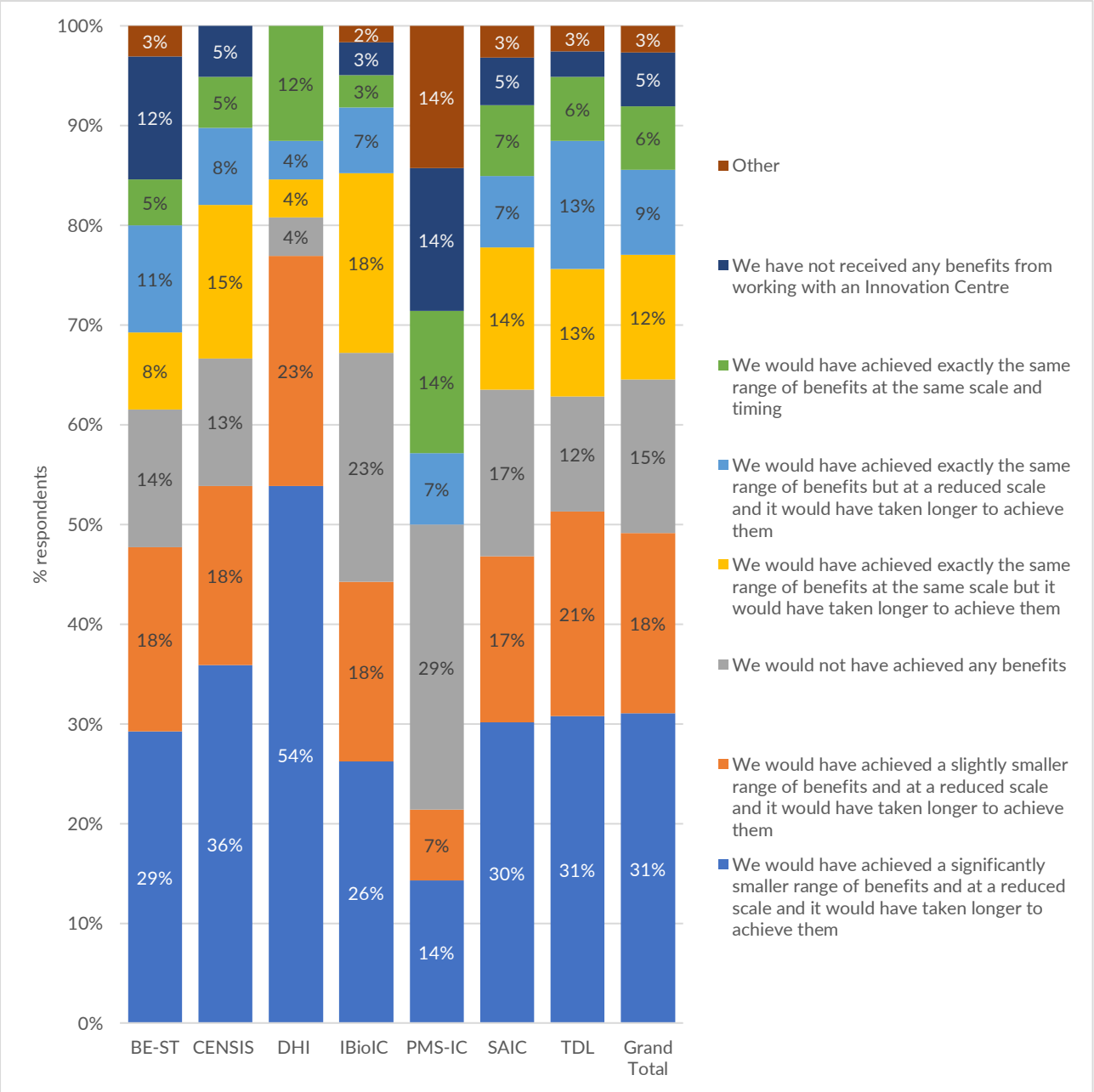
In all, 15% say they would not have achieved any of the knowledge and networking or other benefits without IC support (absolute additionality), whereas 6% say they would have achieved the same knowledge and networking benefits at the same time and scale without the IC support (zero additionality). However, the majority of additionality is through increasing the scale of knowledge and networking benefits or bringing forward the timing of benefits. These responses suggest generally high levels of additionality, but the per cent reporting no benefits or no additionality at 11% suggests there is room for improvement.

Table 2.32 Clients attribute full or partial additionality for innovation benefits to IC.(% respondents)

	BE-ST		CENSIS		DHI		IBioIC		PMS-IC		SAIC		TDL		All ICs	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
%	20%	80%	10%	90%	12%	88%	8%	92%	43%	57%	15%	85%	12%	88%	14%	86%
Base	13	52	4	35	3	23	5	55	6	8	19	107	9	69	59	349

Source: IC client survey Q25. Margin of error for programme +/- 4.29% at 95% confidence level.

Figure 2.21 If the Innovation Centre did not exist, which of the statements below most accurately reflects your view on the scale and timing of any benefits you have received from working with an Innovation Centre?



Source: IC client survey Q25. Notes: Data labels of 1 or less no shown n= all ICs (409), BE-ST (65), CENSIS (39), DHI (26), IBioIC (61), PMS-IC (14), SAIC (126) TDL (78). Margin of error for programme +/- 4.28% at 95% confidence level.

2.3.8 Wider impacts.

IC clients report significant contributions to sustainable development goals as a result of working with an IC. 72% of respondents indicate that IC support has contributed to one or more wider benefits (see Table 2.33).

A wide range of benefits are cited (see Table 2.34), particularly in relation to 'Industry, innovation and infrastructure (e.g., adoption of new medium-high, and high technologies)' (29%), 'Good health and wellbeing (e.g., ensuring healthy lives, promoting wellbeing, COVID response)' (18%), 'Quality education (e.g., promoting lifelong learning and access to education)' (17%),and 'life below water (e.g., conservation and sustainable use of marine resources)' (17%).

Stakeholders were also asked to identify whether they feel the Innovation Centre of which they have the greatest knowledge was contributing to the United Nations' Sustainable Development Goals (SDG). (Figure 2.22 and Table 2.34).

As shown below (Figure 2.22), stakeholders were most positive about the work of individual Innovation Centres in relation to the SDG of 'good health and well-being' with 43% citing a significant contribution and a further 14% a reasonable contribution.

Table 2.33 Do clients think IC has made a significant contribution to wider benefits? (% respondents)

	BE-ST		CENSIS		DHI		IBioIC		PMS-IC		SAIC		TDL		All ICs	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
%	32%	68%	36%	64%	23%	77%	31%	69%	42%	58%	23%	77%	29%	71%	28%	72%
Base	18	39	13	23	5	17	16	36	5	7	28	93	21	51	106	266

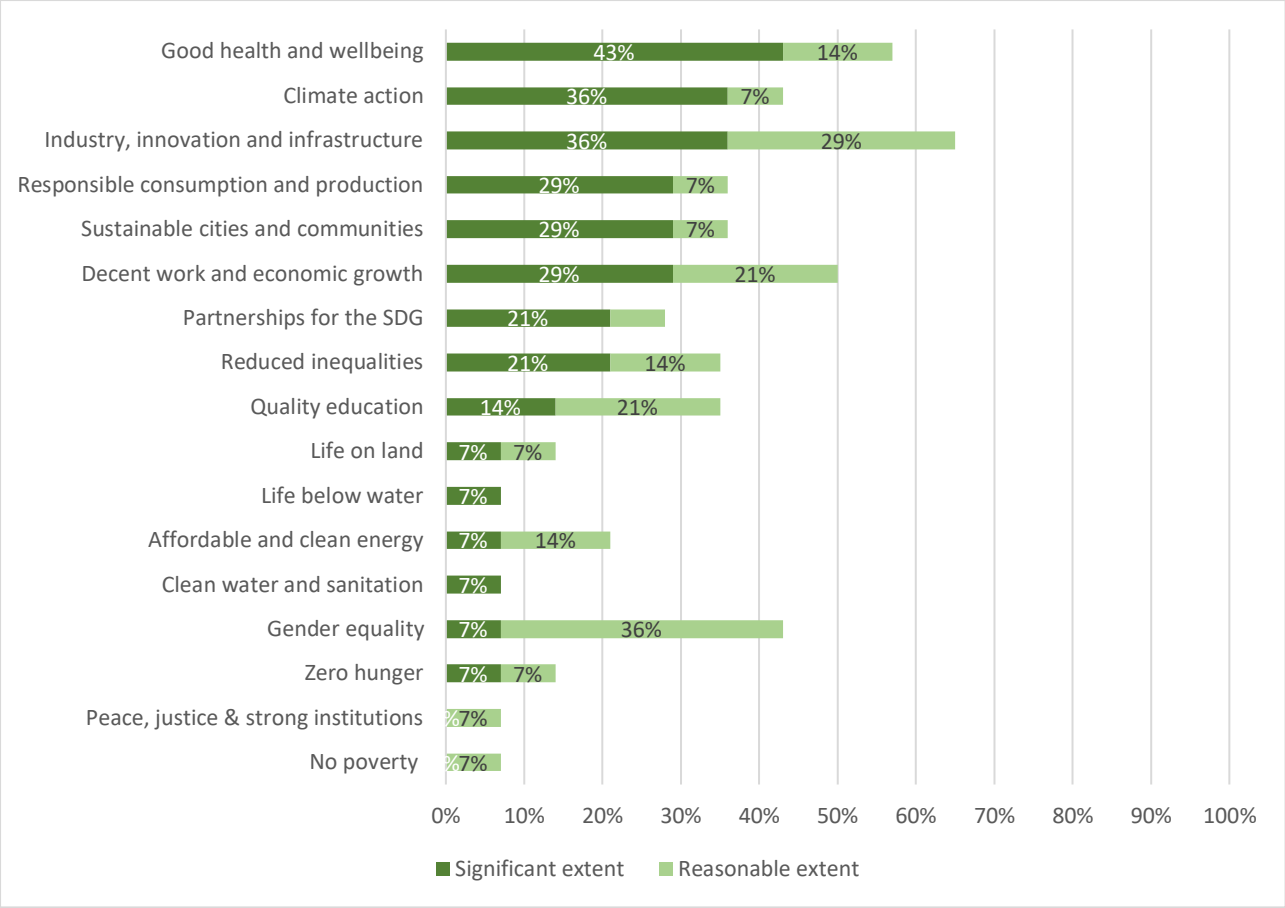
Source: IC client survey Q33. Margin of error for programme +/- 4.55% at 95% confidence level.

Table 2.34 Which, if any, of the following UN Sustainable Development Goals (SDGs) has your establishment made a significant contribution to, as a result of working with the Innovation Centre? (% respondents).

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs
Industry, innovation and infrastructure (e.g., adoption of new medium-high, and high technologies)	30	25	30	33	38	35	15	**29**
Good health and wellbeing (e.g., ensuring healthy lives, promoting wellbeing, COVID response)	16	14	40	23	25	16	12	**18**
Life below water (e.g., conservation and sustainable use of marine resources)	0	0	0	12	0	48	6	**17**
Quality education (e.g., promoting lifelong learning and access to education)	20	7	10	9	13	16	21	**15**
Decent work and economic growth (e.g., creating employment opportunities and improving productivity)	18	11	7	15	19	20	6	**15**
Climate action (e.g., reducing CO2 emissions)	28	18	3	18	6	13	12	**15**
Zero hunger (e.g., improved food security, nutrition and sustainable agriculture)	0	5	0	11	0	37	2	**13**
Responsible consumption and production (e.g., reducing waste, industrial pollution)	16	5	0	18	6	17	3	**12**
Gender equality (e.g., empowering women and girls)	12	0	3	8	0	19	11	**11**
Reduced inequalities (e.g., supporting disadvantaged groups or regions)	5	5	23	8	13	9	11	**9**
Sustainable cities and communities (e.g., improving transport, air quality, or waste management)	21	14	0	12	0	4	6	**9**
Affordable and clean energy (e.g., improving energy efficiency, development of renewables)	16	11	7	5	0	7	6	**8**
Life on land (e.g., promoting sustainable use of terrestrial ecosystems)	3	7	0	8	0	6	6	**5**
Partnerships for the Sustainable Development Goals (e.g., strengthening means for partnerships including internet access)	11	2	0	5	0	7	3	**5**
Other societal or environmental benefit (please specify below)	3	5	3	2	6	3	3	**3**
Clean water and sanitation (e.g., improving drinking water, sanitation and hygiene facilities)	0	9	0	5	0	6	0	**3**
No poverty (e.g., ending poverty in all its forms)	1	2	0	3	0	1	3	**2**
Peace, justice & strong institutions (e.g., promoting peaceful, inclusive societies)	1	0	3	2	0	0	1	**1**
None of the above	24	30	17	24	31	20	22	**23**

Source: IC client survey Q33. Notes:. n= all ICs (465), BE-ST (76), CENSIS (44), DHI (30), IBioIC (66), PMS-IC (16), SAIC (139) TDL (94).

Figure 2.22 Stakeholder views on wider benefits.



Source: stakeholder survey. Purposive sample.

2.3.9 Assessment of innovation ecosystem benefits.

The evaluation objectives included an assessment of how effective each IC has been in building engagement in its own ecosystem across a number of dimensions. The approach to assessing the role of ICs within the wider innovation ecosystem is set out in Appendix A. A detailed discussion for each IC is included in the relevant appendices. This section reports on the relevant findings from the IC client and stakeholder surveys that feed into the Appendix discussions.

IC clients surveyed report a range of innovation system-related benefits that relate to IC expertise, increased visibility and development of trust between organisations (see Table 2.35). ICs are viewed as a significant source of support for client establishments, for instance, identifying ICs as 'Acting as a source of sector or technology expertise' (44%), 'Supporting improved visibility within sector/ technology area' (40%), and 'supporting diffusion of knowledge and good practices' (37%).

There are also a range of ways in which ICs are considered to contribute to the development of the wider innovation ecosystem benefits (see Table 2.36). In particular, ICs are viewed as a significant source of support for the wider innovation ecosystem in their sector via 'Raising the profile of the sector/technology area within Scotland' (50%). 'Fostering synergies and networking within sector or technology area' (41%) and 'Acting as a strategy partner e.g., developing or sustaining new strategic or longer-term partnerships' (36%).

Stakeholders were also positive about the work of individual Innovation Centres in 'raising the sector (or technology) profile' with 71% of stakeholders citing a significant contribution. The other sources of Strategic Added Value that stakeholders were most positive about were 'fostering sector networks' and 'acting as a strategy partner' with 57% of stakeholders citing a significant contribution.

Finally, 50% of stakeholders identified a significant contribution to the work of Centres in relation to 'policy and strategic influence' and 'strategic sector leadership' (Figure 2.23).

Table 2.35 In which of the following ways, if any, has the Innovation Centre been a significant source of support for your establishment? (% respondents).

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs
Acting as a source of sector or technology expertise	43	64	53	50	25	42	36	**44**
Supporting improved visibility within sector/ technology area	36	27	57	50	25	50	24	**40**
Supporting diffusion of knowledge and good practices	37	20	53	42	19	41	32	**37**
Supporting the development of trust between your organisation and other organisations in your sector/technology area	36	27	53	33	31	49	20	**36**
Supporting the sharing of common resources	18	16	43	23	31	29	17	**24**
None of the above	17	16	10	15	25	9	16	**14**

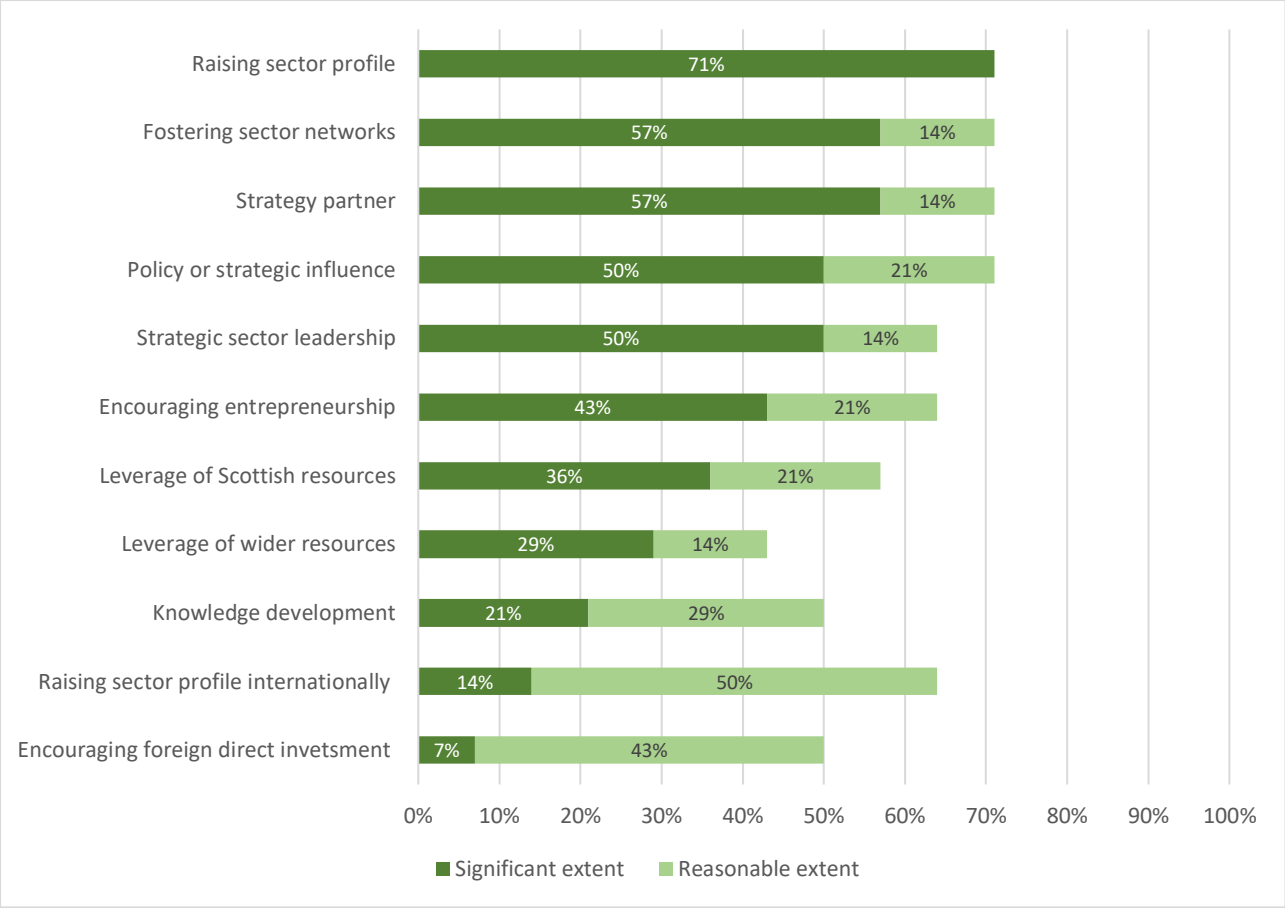
Source: IC client survey Q31. n= all ICs (465), BE-ST (76), CENSIS (44), DHI (30), IBioIC (66), PMS-IC (16), SAIC (139) TDL (94).

Table 2.36 In which of the following ways, if any, has the Innovation Centre been a significant source of support for the wider innovation 'ecosystem' in your sector or technology area? (% respondents).

	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL	All ICs
Raising the profile of the sector/technology area within Scotland	47	45	60	58	44	58	35	**50**
Fostering synergies and networking within sector or technology area	38	34	50	47	31	52	27	**41**
Acting as a strategic partner e.g., developing or sustaining new strategic or longer-term partnerships	37	30	60	33	31	44	23	**36**
Providing strategic leadership for the sector or technology area	33	20	47	38	25	38	18	**32**
Supporting knowledge development and dissemination (e.g., new courses, university or college networks, attraction of talent)	28	16	37	38	19	40	27	**32**
Encouraging experimentation and entrepreneurship in Scotland (e.g., start-ups, spin-outs, testing of new technologies, demonstrating new technology or processes)	28	23	40	36	25	35	15	**29**
Promoting investment and leverage of resources into the sector/ technology area from within Scotland	17	20	30	36	25	45	14	**29**
Raising the profile of the sector/technology area internationally	18	11	37	26	19	33	15	**24**
Effective policy or strategic influence	20	9	47	23	19	22	16	**21**
Promoting investment and leverage of resources into the sector/ technology area from outside Scotland	14	2	23	23	38	23	11	**18**
Encouraging foreign companies to establish in Scotland	3	2	7	15	6	12	2	**7**
None of the above	16	20	0	9	31	7	24	**14**

Source: IC client survey Q32. Notes: n= all ICs (465), BE-ST (76), CENSIS (44), DHI (30), IBioIC (66), PMS-IC (16), SAIC (139) TDL (94).

Figure 2.23 Stakeholder views on strategic added value.



Source: stakeholder survey. Purposive sample.

2.3.10 Students.

The evaluation also captured student feedback on the role of ICs.

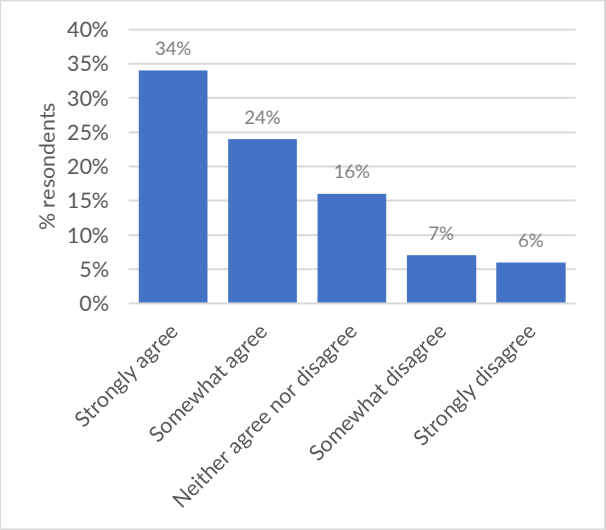
Positive employment benefits. Thinking about employment, 66 percent of respondents indicated that the ICs have helped, or will help them find, employment relevant to their studies, whilst 66 percent indicated that the Centres had opened up new career opportunities (see Figure 2.24 and Figure 2.25).

Most students indicated that they were in employment (63%) following their IC supported studies, though small minorities were either unemployed (10%) or inactive (9%). Few students proceeded to hold an academic position after completing their education (3%), suggesting that students have gained wider market-relevant skills for the most part. Turning to the nature of employment itself, most respondents are employees (96%, with 4% self-employed) in full-time (91%) and permanent positions (90%).

Of those that indicated they were in employment following their studies, the majority had gone on to find employment in the private sector (63%) (Figure 2.26). This statistic speaks volumes to the IC Programme's core ambition of connecting Scotland's academic base better to the private sector. Fewer students had gone on to find employment in the public sector (12%), third sector (7%), or education sector (7%).

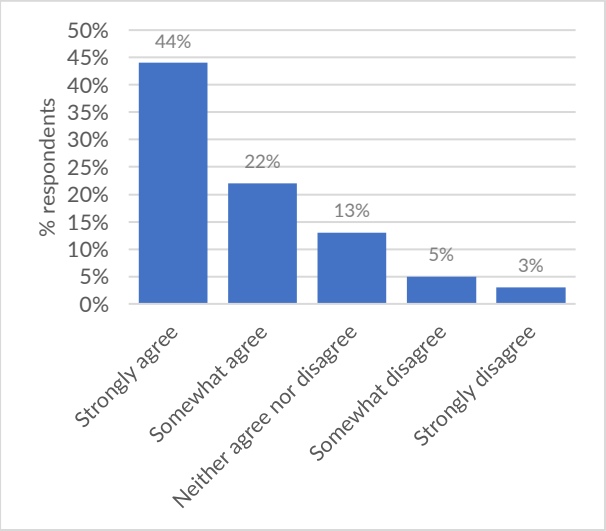
Of those in employment, the majority were employed in a business or an organisation other than the one that they were initially associated with during their studies (83%). This indicates scope to improve the sustained benefit to entities sponsoring students via the IC Programme. Over two thirds of students were employed in Scotland (see Figure 2.27).

Figure 2.24 The Innovation Centre helped me / will help me find employment relevant to my studies.



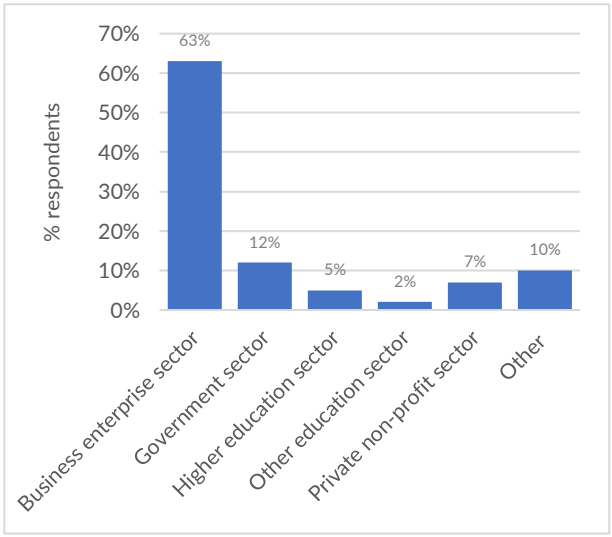
Source: Student survey Q.6a, n=201, no reply 12%. Margin of error +/- 6.52% at 95% confidence level.

Figure 2.25 The Innovation Centre has opened / will open new career opportunities.



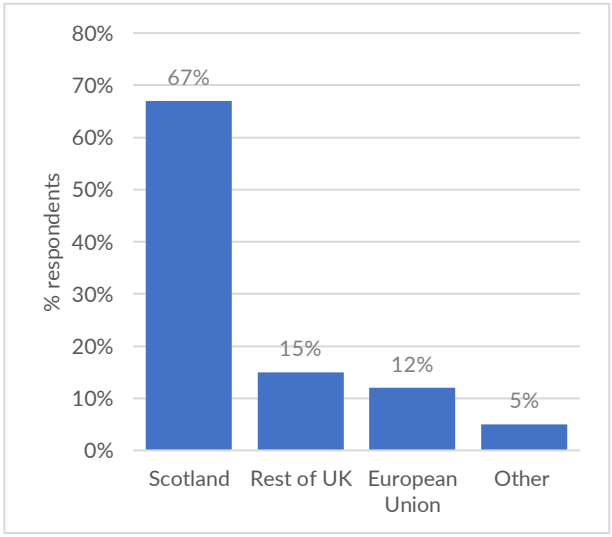
Source: Student survey Q.6c, n=201, no reply 12%. Margin of error +/- 6.52% at 95% confidence level.

Figure 2.26 What is your sector of employment?



Source: Student survey Q4.4, n=125, no reply 1%.. Margin of error +/- 8.46% at 95% confidence level.

Figure 2.27 Where is your place of employment?



Source: Student survey Q5.2 n=125, no reply 1%. Margin of error +/- 8.46% at 95% confidence level.

Research active employment for many. Most students who were employed following their IC supported studies indicated that they were in the 'Agriculture, Forestry, and Fishing' (23%), commensurate with the number of respondents associated with SAIC (Figure 2.28). Others were most frequently employed in 'Information and Communication' (14%), 'Finance and Insurance' (9%), or 'Professional, Scientific, and Technical' (7%), commensurate with the number of respondents associate with The Data Lab. Accordingly, just under half of respondents (49%) indicated that their job was in the same field as the research qualification, with about a further third indicating that it was partly related (38%). Only 12 percent of respondents have pursued a career outside of their field of study.

The majority of respondents had continued research and/or experimental work in their current role (62%), with 45 percent spending at least half of their time on such tasks.

Additionality. Although most respondents indicated that the Innovation Centres have helped or will help them find employment relevant to their studies, nearly a third of respondents also indicated that they would have found similar employment or a similar research position anyway without IC support (31%). Nonetheless, other respondents indicated that it would have taken longer to find employment or an academic position without such support (28%). Likewise, several respondents felt that they would be employed or in an academic position, but one with relatively less renumeration (31%). Only 25 percent of respondents felt that they would not be employed or in a research position at all or would not be in the field that they are currently in had they not received IC support.

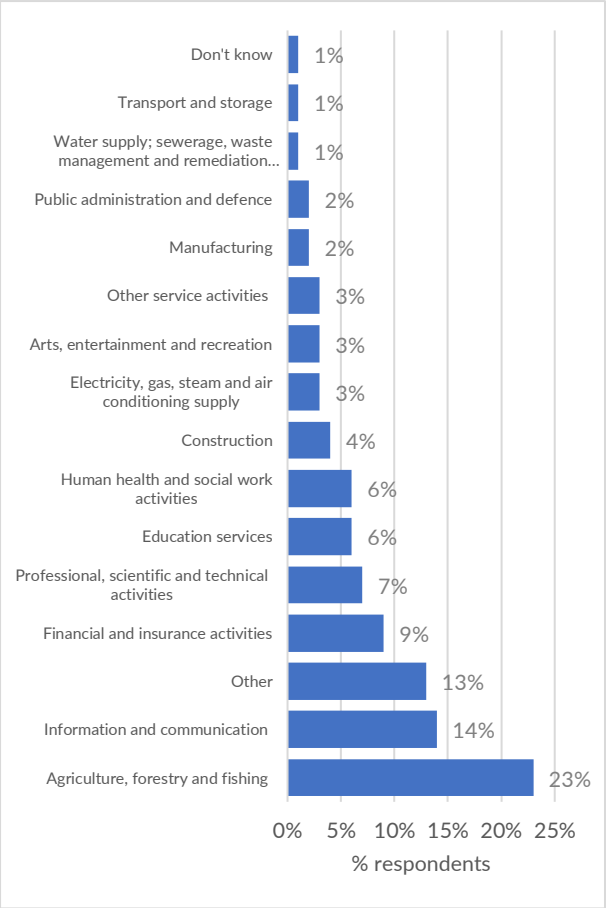
Salaries. The weighted average of the sample puts the yearly average earnings of students supported by the ICs at c. £42,449. Earnings for students supported via the IC Programme tend to fall within the £20,000-£29,000 (22%), £30,000-£39,000 (28%), and £40,000-£49,999 (24%) brackets, with the majority of them earning this amount in Scotland (67%) and the rest of the UK (15%) (Figure 2.30).

Immediate innovation outcomes. While not necessarily an immediate objective of research studies, it is of interest to consider the innovation outcomes associated with the student support, and as such these questions were included in the survey. Few students had directly supported patent development or the creation of Intellectual Property (IP) since finishing their studies. Some 48 percent of respondents indicated that they had not done so, whilst a further 29 percent were unsure. Of the few that have supported such processes, 4 percent had supported them once, 3 percent twice, and 2 percent three times.

Of those that have supported patent development or the creation of Intellectual Property (IP), most indicated that were unsure of the follow-on from such activities (59 percent). Some 10 percent felt that these had not gone on to be commercialized, whilst 8 percent felt that they had been commercialized at least once. Meanwhile, few students have been involved in broader commercialization activities since finishing their studies. Only 5 percent of respondents indicated as such, with 62 percent indicating that they had not (Figure 2.31).

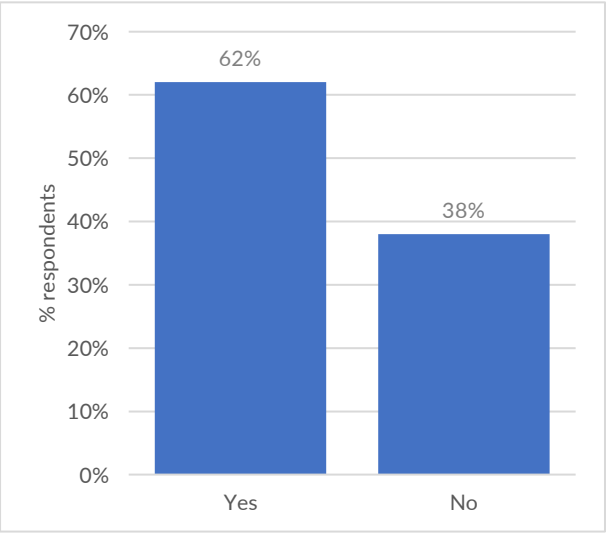
Only seven students responding to the student survey had started a business since participating in IC supported courses. Of these, none felt that the creation of the business was fully attributable to the IC, three felt that it was partially attributable, and a further four felt it was not at all attributable.

Figure 2.28 Which industrial sector does your main employer operate in?



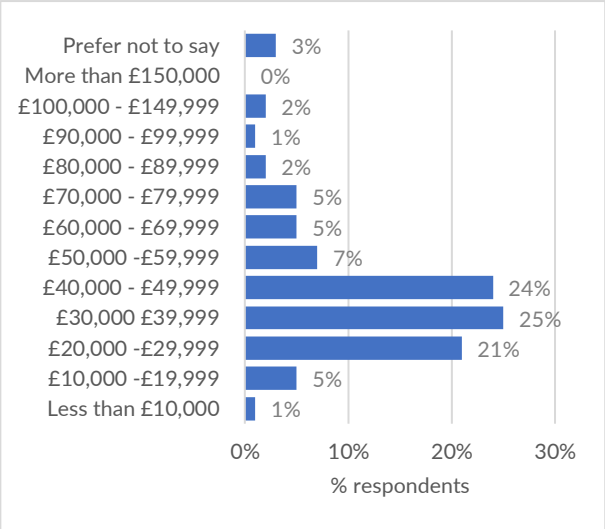
Source: Student survey Q4.6, n=125, no reply 1%. Margin of error +/- 8.46% at 95% confidence level.

Figure 2.29 In your current job(s), are you engaged in research and/or experimental development or entrepreneurial work?



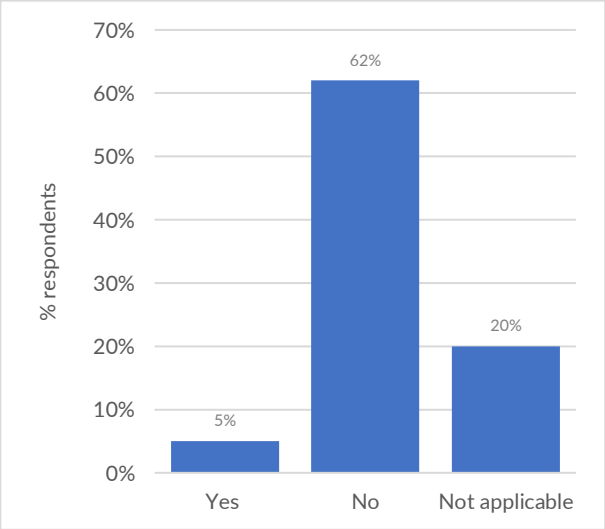
Source: Student survey Q5.4 n=125. Margin of error +/- 8.46% at 95% confidence level.

Figure 2.30 Counting all the jobs you currently hold, what are your gross annual earnings?



Source: Student survey Q5.1 n=125. Margin of error +/- 8.46% at 95% confidence level.

Figure 2.31 Have you been involved in any other commercialisation activities with your employer since participating in the Innovation Centre supported training (e.g., trademarks, copyrights, etc.)?



Source: Student survey Q6.3, n=201, no reply 12%. Margin of error +/- 6.52% at 95% confidence level.

2.4 Drivers of benefits.

A number of factors were examined for their influence on innovation outcomes and economic impact. In defining measures of innovation benefit, the report examined the following criteria:

Innovation benefits:

- Since working with an IC, has the client introduced new or significantly improved goods, services, or processes (Yes, No) .
- Introduction of new goods, services or process attributed to IC (Yes, No).
- Significantly improved aspects of networking benefits (number of business, academic, public or third sector contacts attributed to IC) (Yes, No).
- Significantly improved aspects of knowledge benefits (improved awareness of academic capabilities, and of public or private sector support attributed to IC) (Yes, No).
- Significance of IC in advancing TRL (very or extremely important) (Yes, No).

Impact and wider benefits:

- Net additional employment benefits (Yes, No).
- IC support significantly contributed to wider benefits (Yes, No).

General additionality:

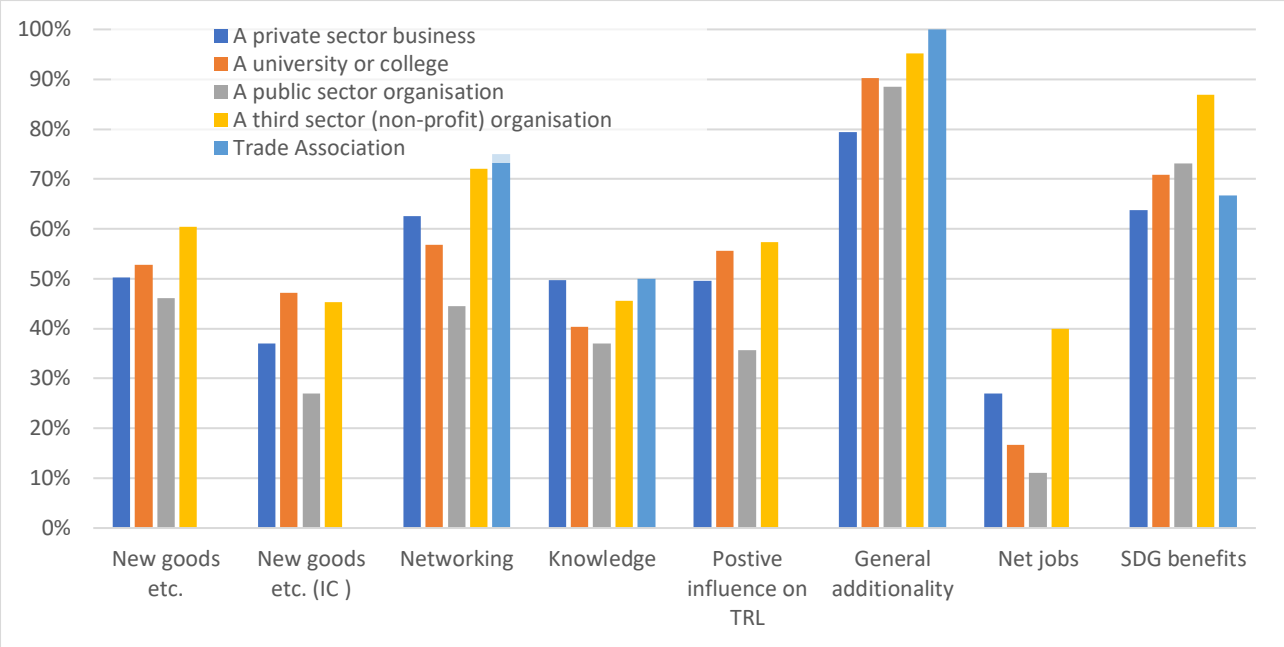
- Full or partial additionality (Yes, No).

In general, the sub-group analysis provides additional insights at the programme level. However, due to the small sample sizes at IC level, IC tables or charts are not included. Insights for individual ICs are noted in IC appendices where appropriate.

2.4.1 Client type.

All client types are deriving innovation benefits from IC engagement: businesses, academics, third sector, and public sector partners. This is very much in keeping with the triple helix model adopted by the ICs (and extended versions). Although the report does not canvas views from the wider public, most of the main client groups value engagement with the ICs: they are not just valued by industry and academics for example. Public sector and third sector clients are also deriving benefits across a range of innovation outcomes and impacts (see Figure 2.32). It is noted that the finding also shows that only a small per cent of clients reported net job impacts generally. Job impacts appear to be rarer in public sector, universities or colleges, and trade associations (although from a low base).

Figure 2.32 Per cent positive answers for innovation benefits by client type.

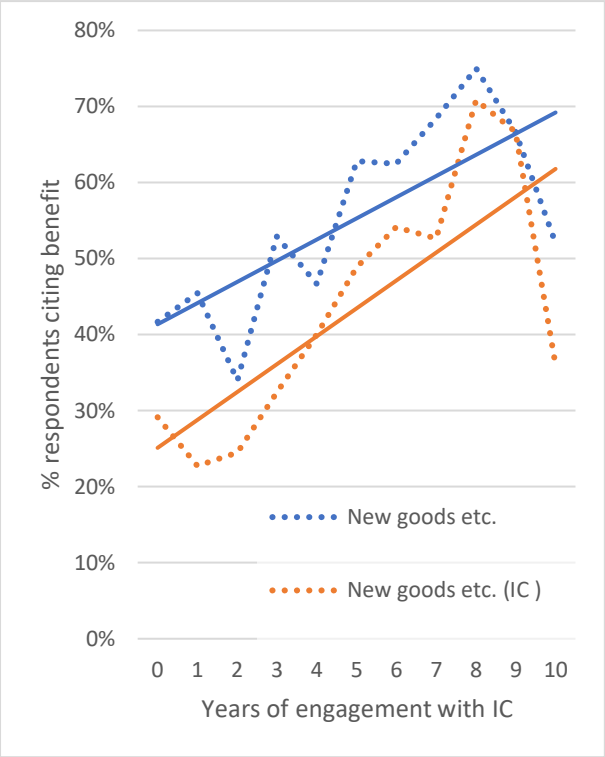


Source: IC client survey.

2.4.2 Duration of engagement.

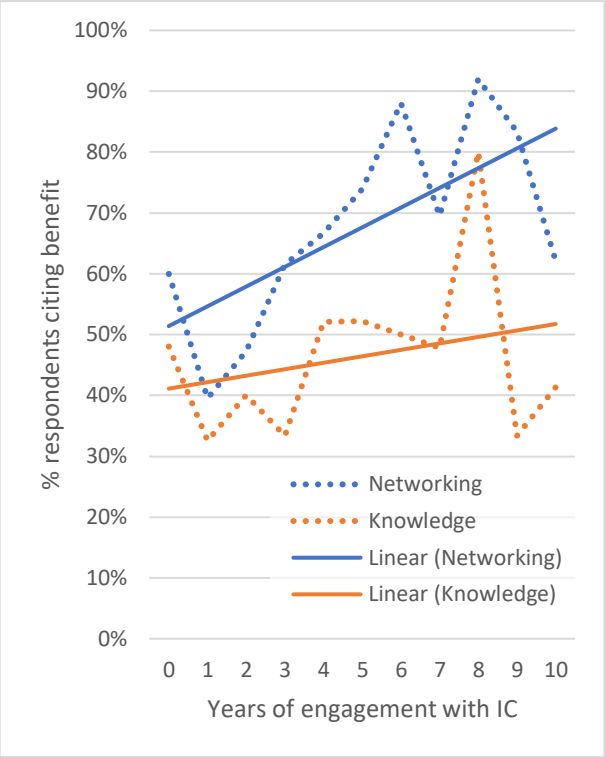
Duration of engagement with an IC plays an important role in the level of innovation benefits and indicates the medium to long term nature of bringing about positive change. Reported benefits are, on average, higher for those working with an IC for an extended period. This applies to introduction of new goods, services, or processes (whether the IC is identified as a significant support for this activity or not), networking benefits, knowledge benefits, net job creation, and the creation of wider SDG benefits. This also applies to the general level of additionality identified by clients (including both full and partial additionality). The significance of IC support for advancement of project TRL (completed projects only) did not appear to be highly influenced by duration of activity (reflecting that other factors are more important than duration of engagement, such as range of support types as noted below) (see Figure 2.33 to Figure 2.37).

Figure 2.33 Per cent positive answers for introduction of new goods, services or processes by duration of IC engagement.



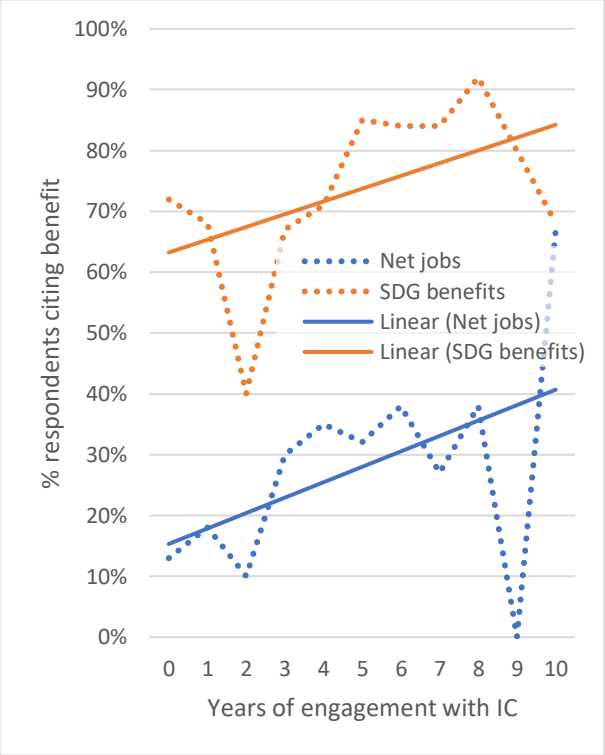
Source: IC client survey.

Figure 2.34 Per cent positive answers for networking and knowledge benefits by duration of IC engagement.



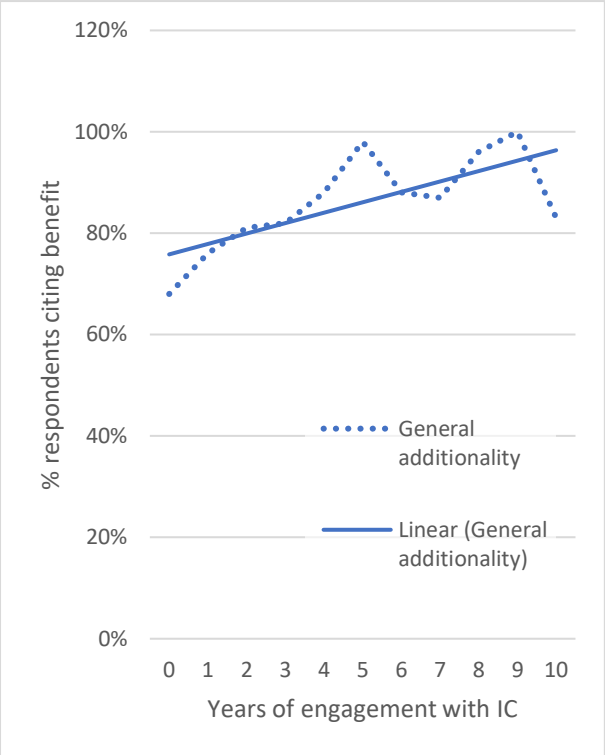
Source: IC client survey.

Figure 2.35 Per cent positive answers for net jobs and SDG benefits by duration of IC engagement.



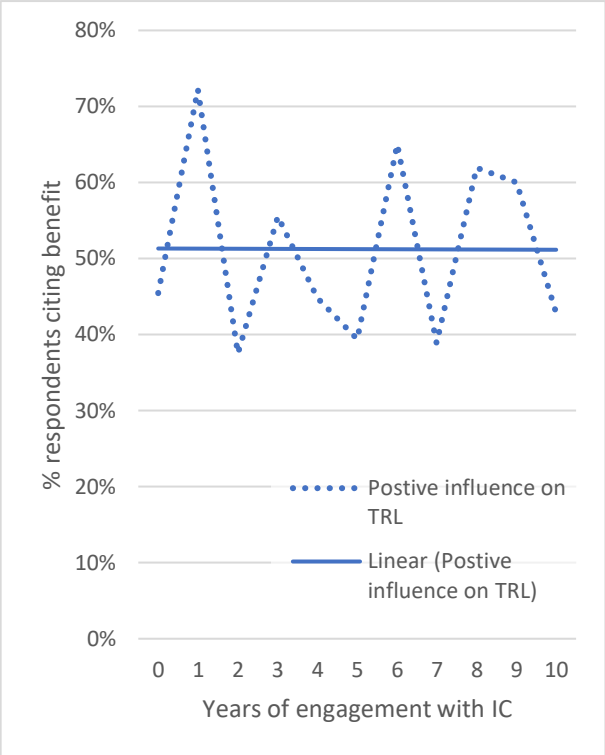
Source: IC client survey.

Figure 2.36 Per cent positive answers for general additionality by duration of IC engagement



Source: IC client survey.

Figure 2.37 Per cent positive answers for influence on TRL by duration of IC engagement



Source: IC client survey.

2.4.3 Number of support types.

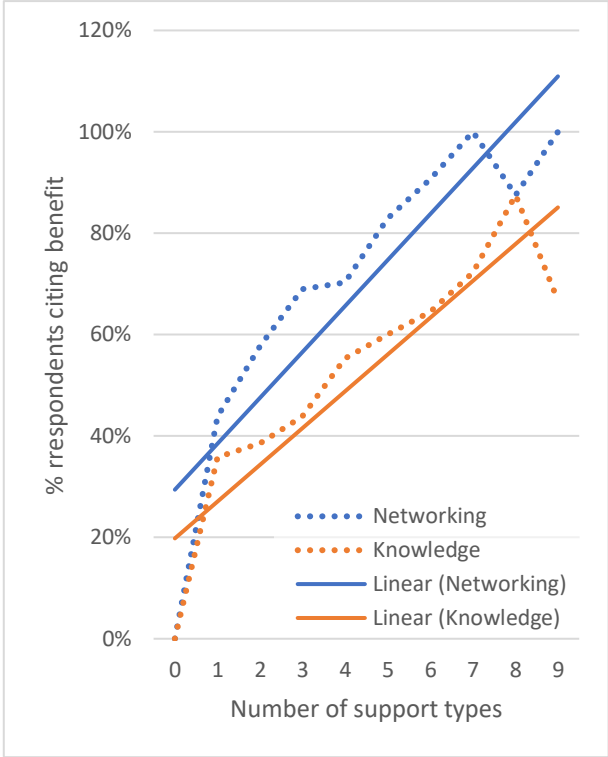
The number of different types of support accessed (e.g., collaborative projects, networking, training etc.) is also associated with better innovation outcomes and impacts. Reported benefits are notably higher for those accessing multiple types of support (see Figure 2.38 to Figure 2.42). This applies to introduction of new goods, services, or processes (whether the IC is identified as a significant support for this activity or not), networking benefits, knowledge benefits, and net job creation. This also applies to the level of general level of additionality identified by clients.

The significance of the range of IC support for advancement of project TRL (completed projects only) does appear to be important (in contrast to duration of support only), perhaps highlighting the complementary nature of supports, and the benefits of packaging these alongside collaborative projects. Influence on knowledge benefits is less discernible, with this outcome perhaps being governed more by specific support types (i.e., collaborative projects or training), than a package of supports per se.

Figure 2.38 Per cent positive answers for introduction of new goods, services or processes by number of support types.

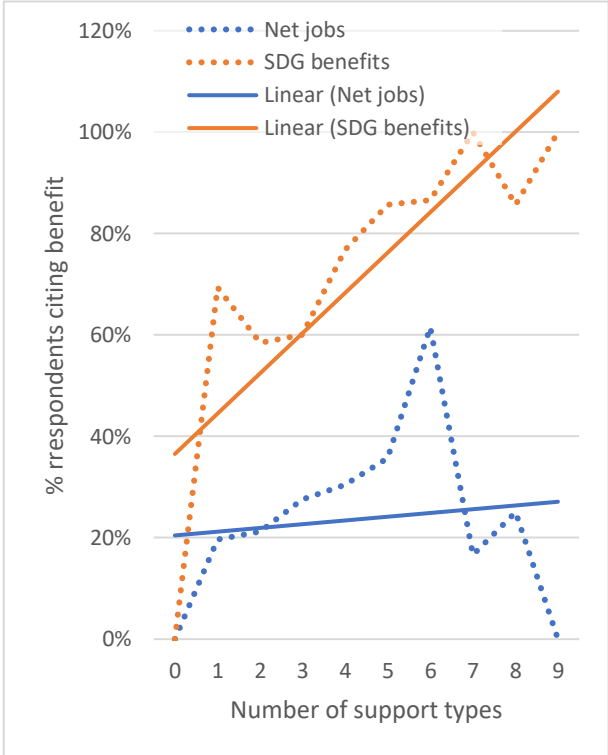
Source: IC client survey.

Figure 2.39 Per cent positive answers for networking and knowledge benefits by number of support types.



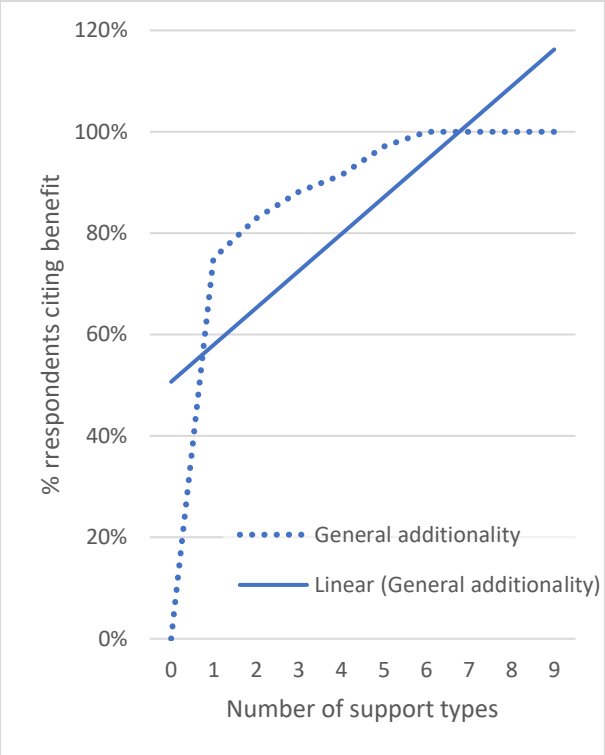
Source: IC client survey.

Figure 2.40 Per cent positive answers for net jobs and SDG benefits by number of support types.



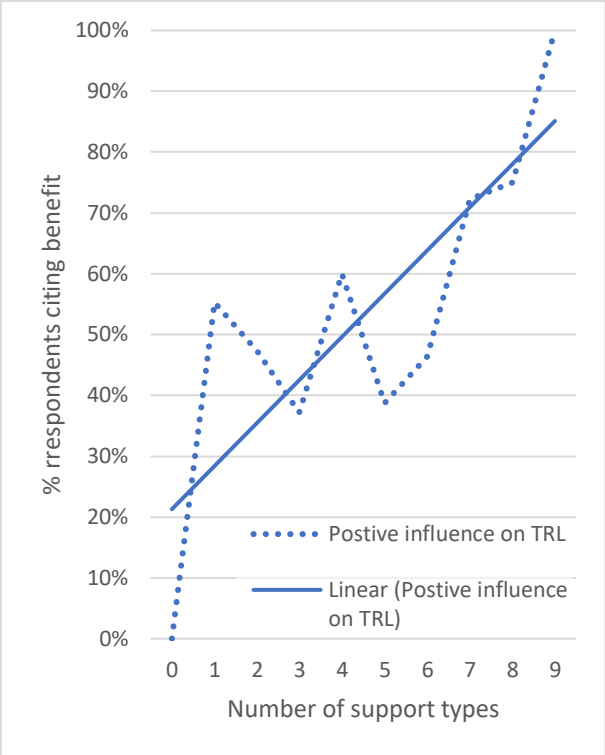
Source: IC client survey.

Figure 2.41 Per cent positive answers for general additionality by number of support types.



Source: IC client survey.

Figure 2.42 Per cent positive answers for influence on TRL by number of support types.

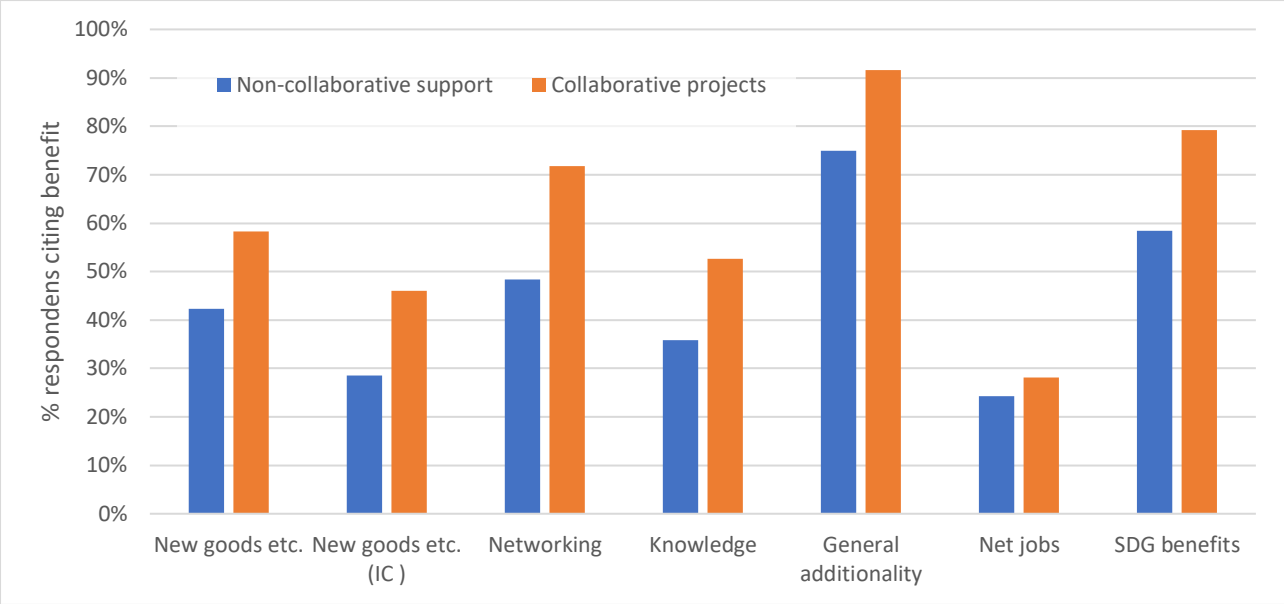


Source: IC client survey.

2.4.4 Collaborative projects.

Participation in collaborative projects, as opposed to other types of support only, appears associated with notably better innovation outcomes and impacts. This finding is perhaps reflective of the gain to be had from triple helix partnerships, over and above other forms of non-collaborative innovation support (Figure 2.43) A gain is seen across all innovation outcome and impact areas examined (on average +16% for collaborative projects across all dimensions examined). Other non-collaborative forms of support lead to benefits, but the order of benefits is generally better where a collaborative project is in place and the contributions of the partners, be they academics, industry, public sector, or third sector, are brought together.

Figure 2.43 Per cent positive answers for innovation benefits by engagement in collaborative project.

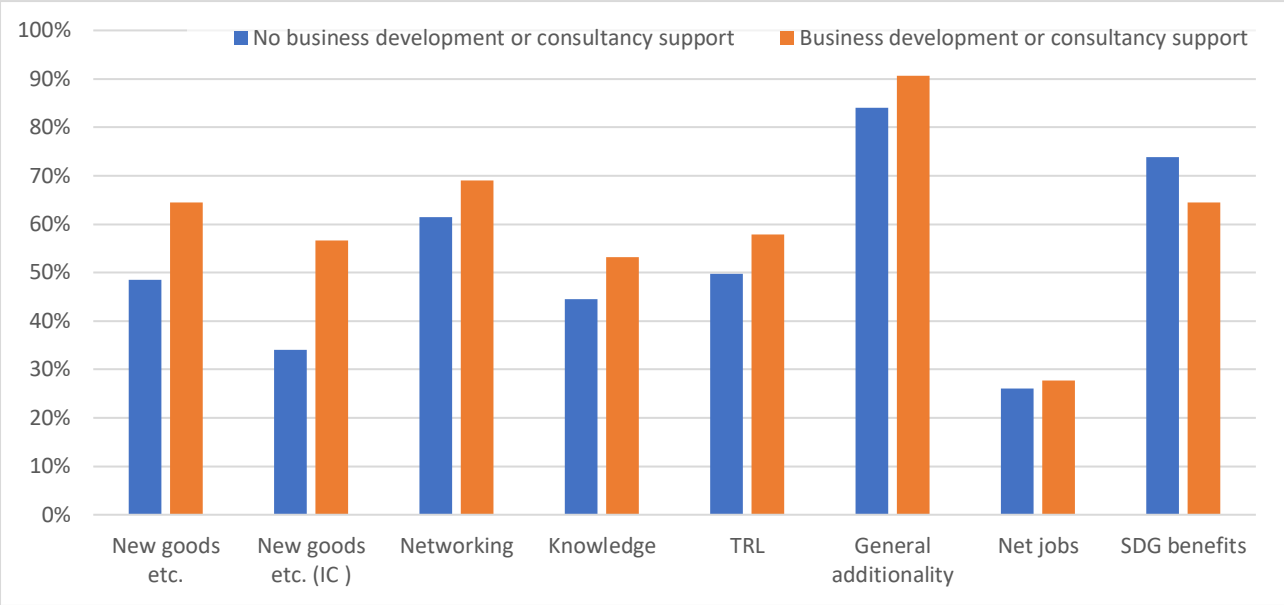


Source: IC client survey.

2.4.5 Business development or consultancy support.

The report was interested to examine whether access to business development or other consultancy support, delivered by the IC, was influential on innovation outcomes. This analysis is limited somewhat in that it does not take account of whether other non-IC business development or consultancy support was received by the client. Nonetheless, an innovation benefit is suggested for those clients accessing this type of support from an IC, especially for introduction or significant improvement of goods, services or processes (+8% on average across all dimensions examined). As such, this finding lends support to provision of these forms of help, or alternatively the potential gains to be derived from onward signposting to the enterprise agencies or other specialist support providers in the innovation ecosystem (e.g., legal, financial etc).

Figure 2.44 Per cent positive answers for innovation benefits by receipt of business development or consultancy support.



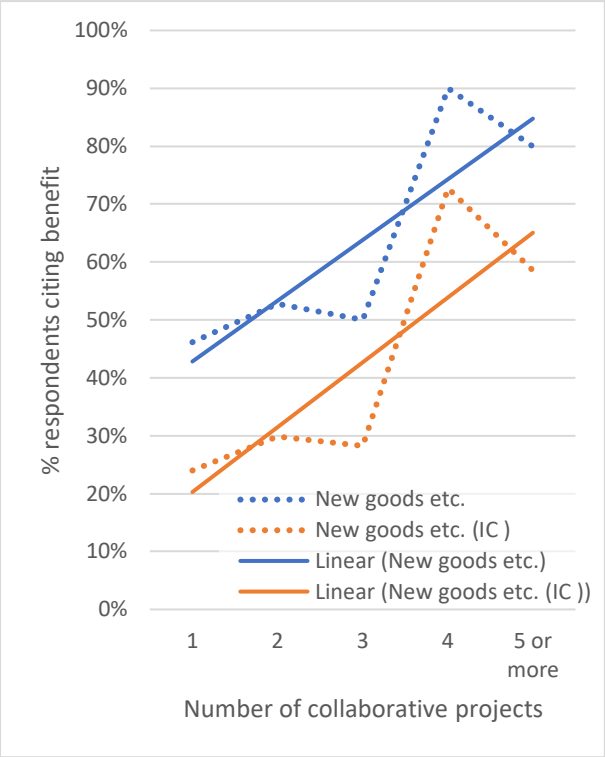
Source: IC client survey.

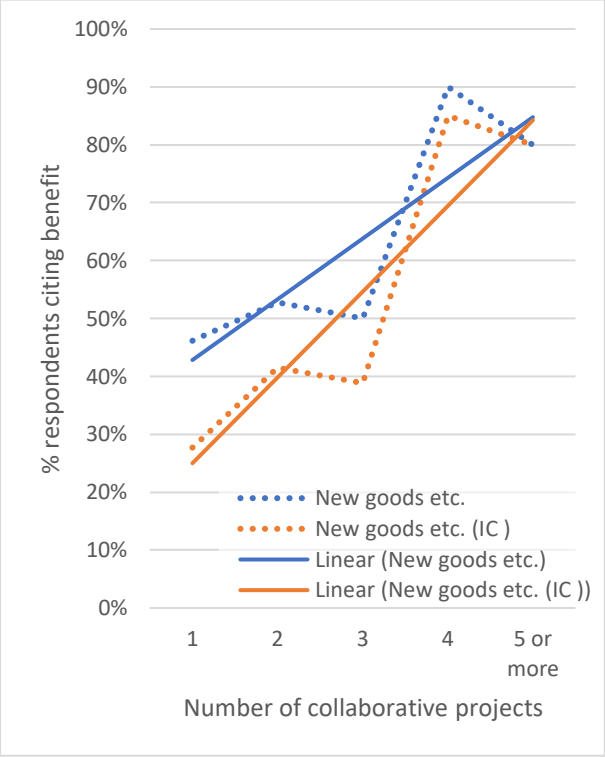
2.4.6 Number of collaborative projects.

Number of collaborative projects was also considered as a measure of intensity of engagement with ICs. As for range of supports and duration of engagement, number of collaborative projects also suggests a positive relationship with innovation outcomes (see Figure 2.45 to Figure 2.49). Multiple or repeat collaborations appear to lead to better outcomes across all the dimensions examined. This includes advancing TRL, which was not the case when looking at duration of IC engagement on its own (it is noted that respondents were asked to report on advancement in the most significant collaborative project).

The finding sheds light on the potential benefit from sustaining what are often iterative, multi-year, sequential, long term collaborative projects, which at the same must be balanced with sustaining a pipeline of new partners and projects to engage a broader pool of industry partners and new innovation topics.

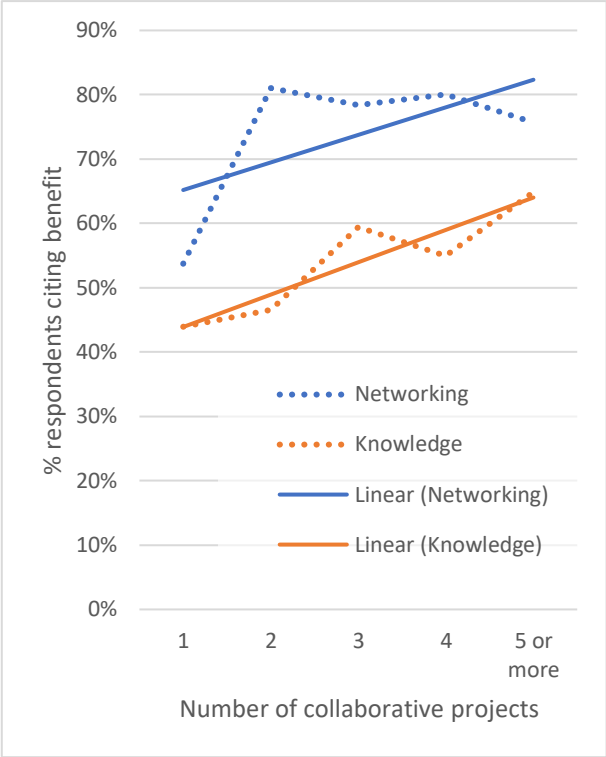
Figure 2.45 Per cent positive answers for introduction of new goods, services or processes by number of collaborative projects.





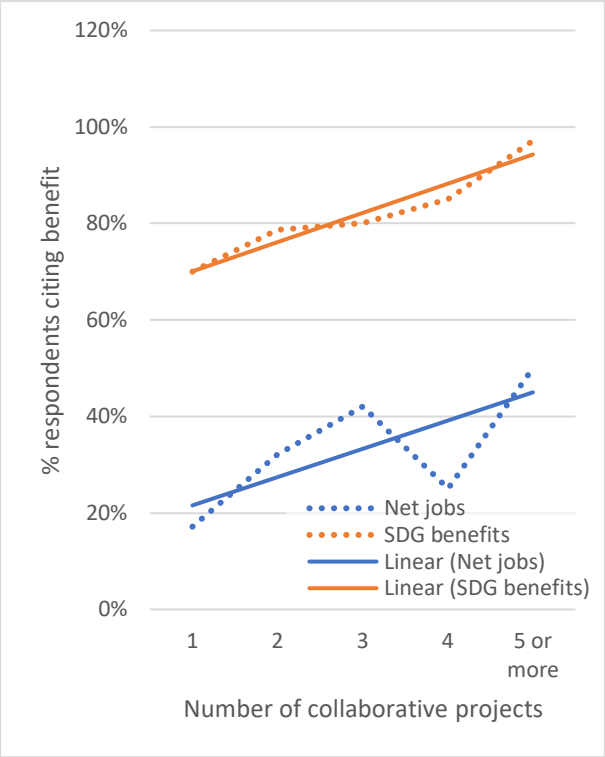
Source: IC client survey.

Figure 2.46 Per cent positive answers for networking and knowledge benefits by number of collaborative projects.



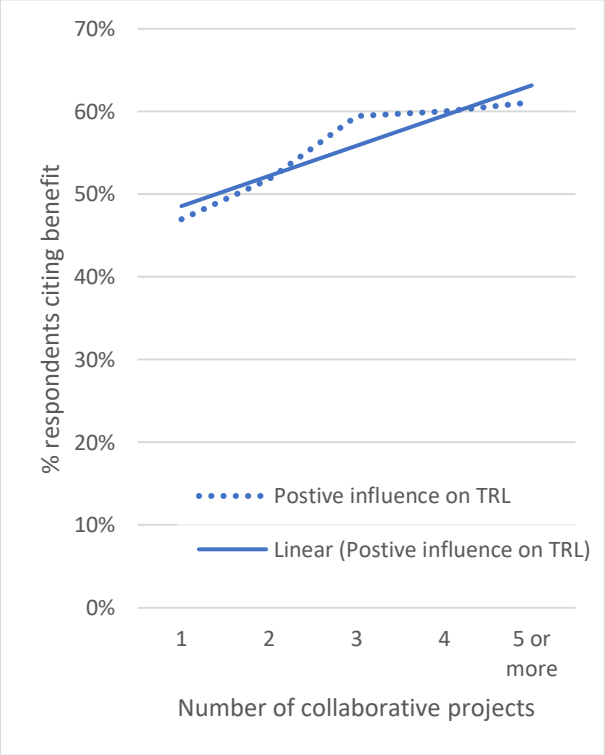
Source: IC client survey.

Figure 2.47 Per cent positive answers for net jobs and SDG benefits by number of collaborative projects.



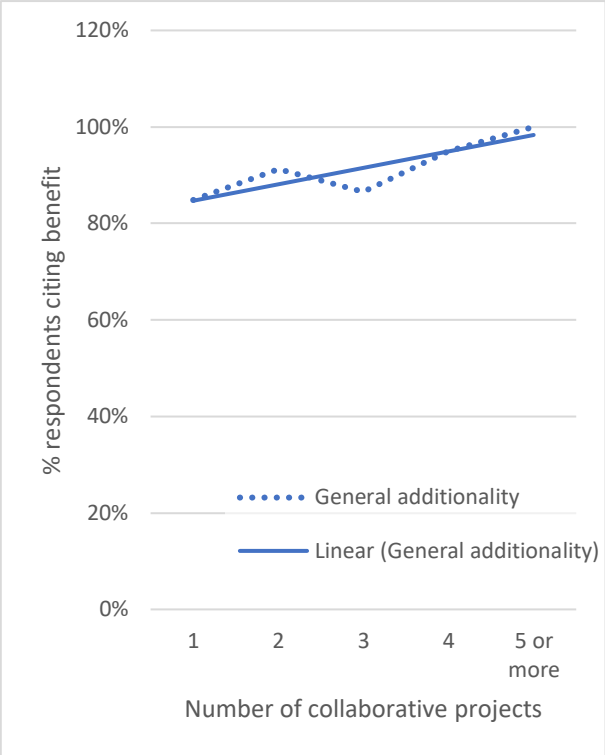
Source: IC client survey.

Figure 2.48 Per cent positive answers for influence on TRL by number of collaborative projects.



Source: IC client survey.

Figure 2.49 Per cent positive answers for general additionality by number of collaborative projects.



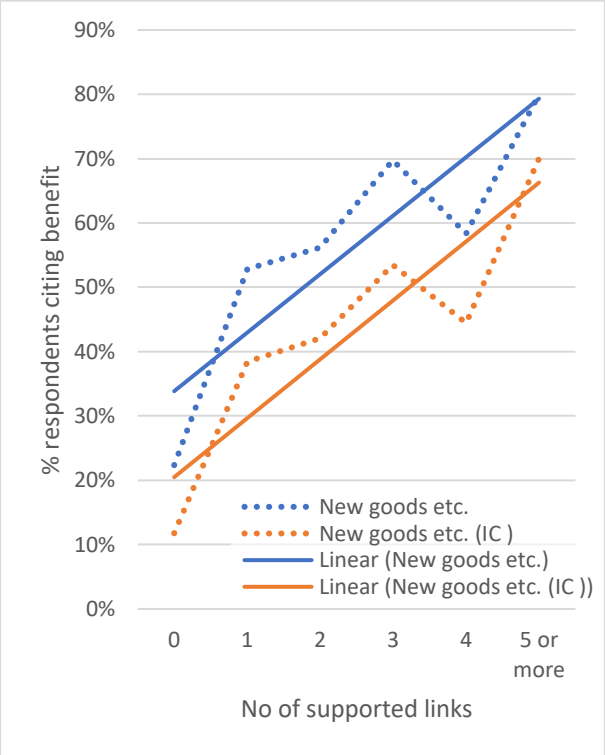
Source: IC client survey.

2.4.7 Networking

Networking is a core aspect of IC delivery and the report sought to examine how innovation outcomes vary by intensity of networking activity. In this regard, the number of significantly supported links to other ecosystem bodies was examined. Consequently, networking intensity also suggests a positive relationship with innovation outcomes and impacts. This applies across the innovation outcomes and impacts examined.

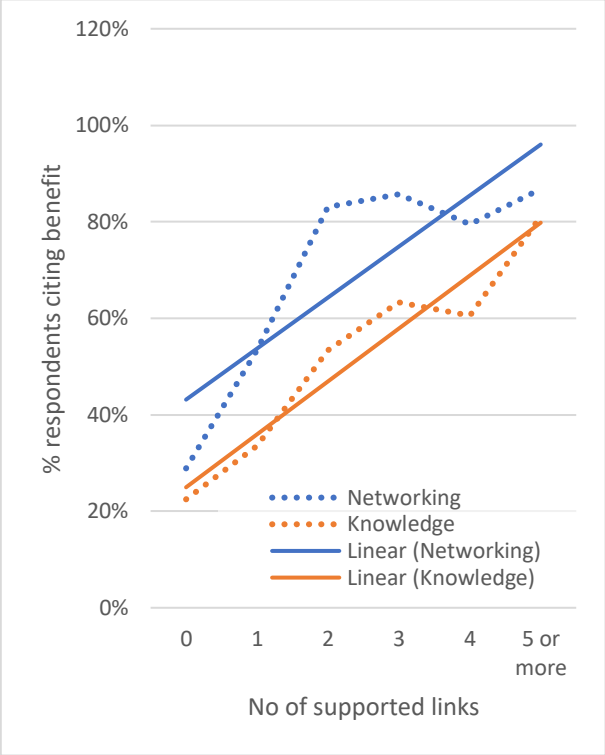
The finding supports the value of networking activity alongside collaborative projects, where the density of the relationships, as one might expect, appears important. Further network analysis of relationships and their links to innovation outcomes would be beneficial, but was beyond the scope of this study (e.g., identifying key members of network, gatekeepers, density of networks by client type etc).

Figure 2.50 Per cent positive answers for introduction of new goods, services or processes by number of supported links.



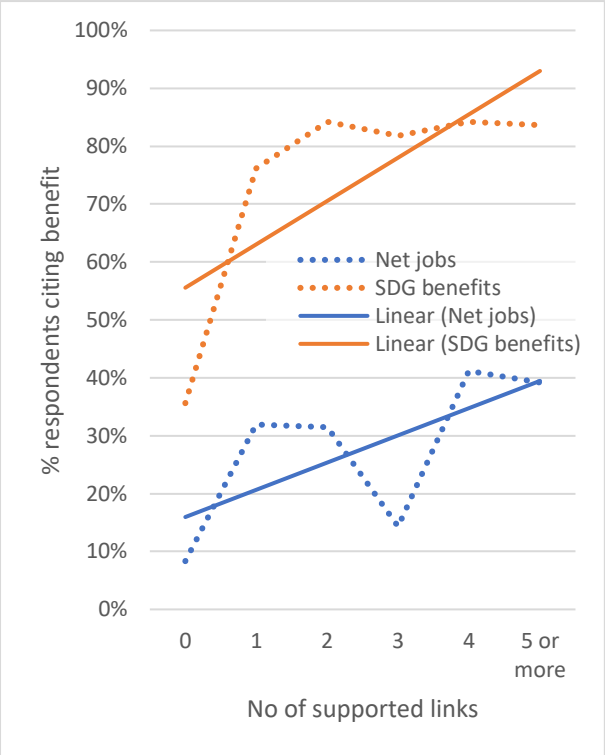
Source: IC client survey.

Figure 2.51 Per cent positive answers for networking and knowledge benefits by number of supported links.



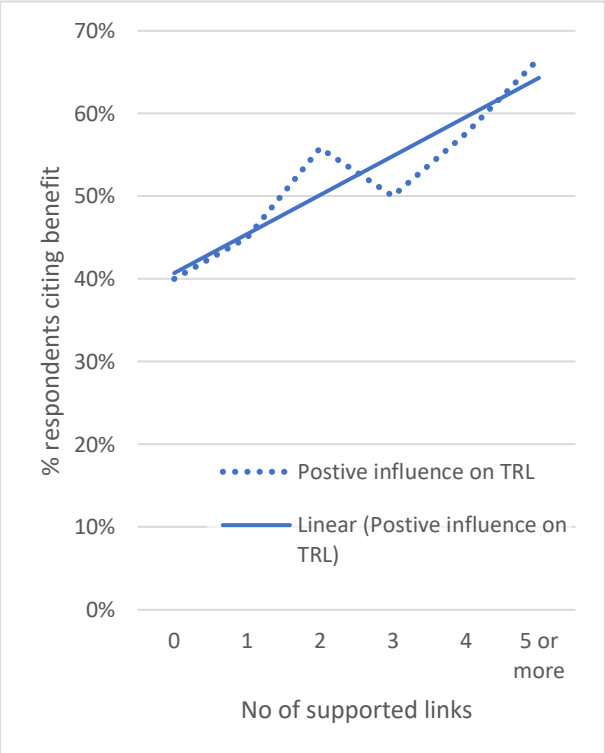
Source: IC client survey.

Figure 2.52 Per cent positive answers for net jobs and SDG benefits by number of supported links.



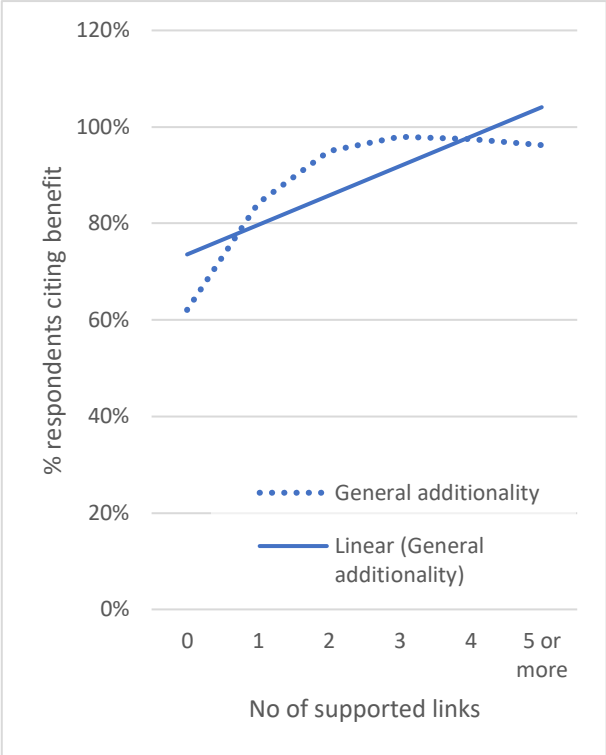
Source: IC client survey.

Figure 2.53 Per cent positive answers for influence on TRL by number of supported links.



Source: IC client survey.

Figure 2.54 Per cent positive answers for general additionality by number of supported links.

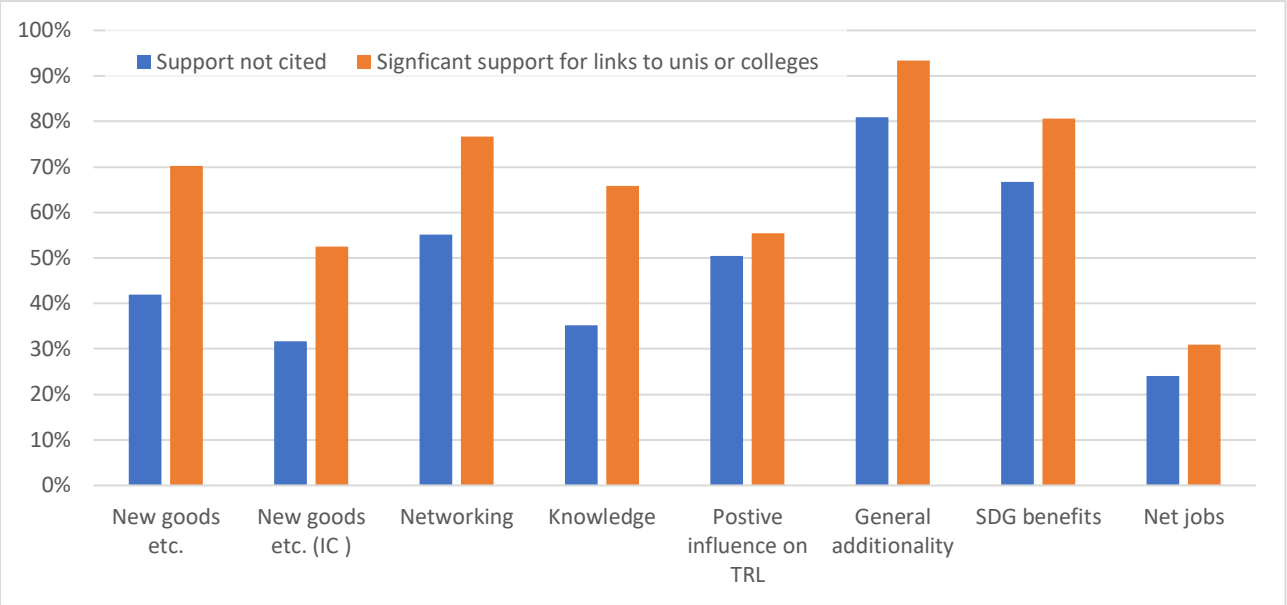


Source: IC client survey.

2.4.8 Links to universities or colleges.

While detailed network analysis was beyond the scope of this study, the evaluation wished to examine the difference made by establishing links to the key group represented by universities and colleges. With a pivotal role in the triple helix model, the success of ICs in fostering improved connections with academia by other stakeholders is crucial. In general terms, where the IC had significantly supported a link to a university or college it is suggested that there is a positive link to innovation outcomes and impacts. As for collaborative projects discussed above, the finding suggests a premium from collaborative relationships (average +17% across dimensions examined), and especially for introduction of new goods, services or processes (+28%), networking (+22%) and knowledge benefits (+31%) (see Figure 2.55). In other words, links to academia (via collaborative projects or other means) appear linked to better innovation outcomes and impacts.

Figure 2.55 Per cent positive answers for innovation benefits by IC supported links to universities or colleges.

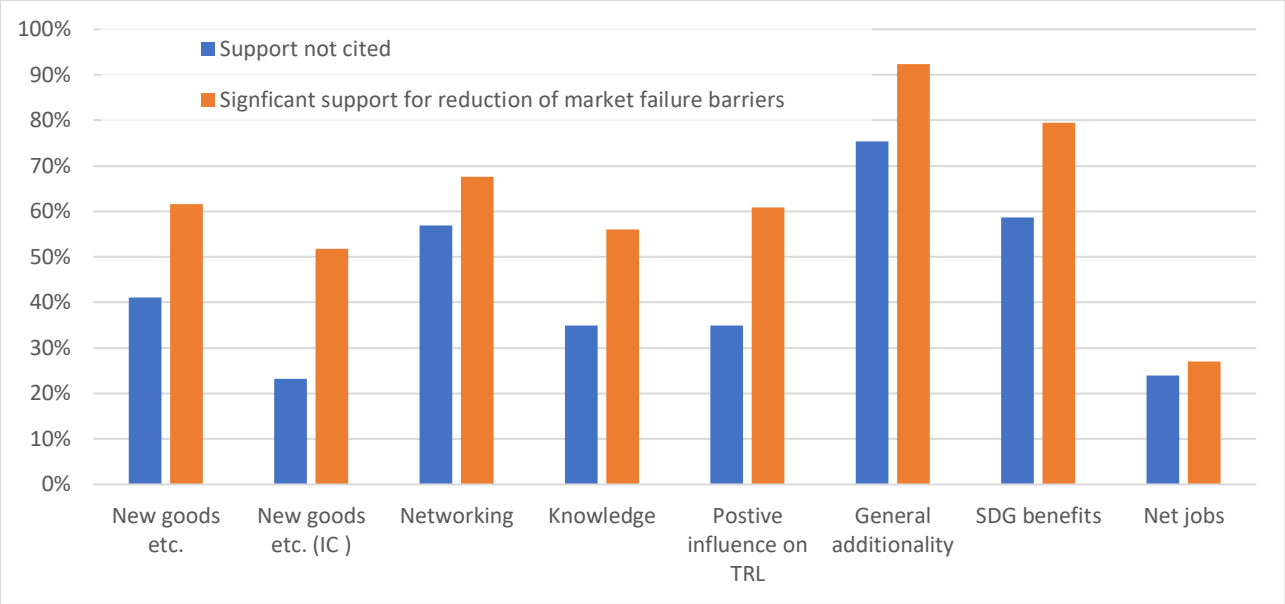


Source: IC client survey.

2.4.9 Reduction of market failure barriers.

As discussed in the evaluation introduction, one of the ways in which ICs work can be characterised is in their success in lowering the market failure barriers experienced by clients in their efforts to undertake innovation activities and develop their business or service. The evaluation wished to examine the extent that reduction of market failure barriers was indeed associated with better innovation performance. Figure 2.56 suggests that there is a positive relationship between reduction in market failure barriers and innovation outcomes and impacts; where ICs have been successful in lowering market failure barriers, this has generally linked with improved benefits for clients (+18% on average across all dimensions examined).

Figure 2.56 Per cent positive answers for innovation benefits by reduction in market failure barriers.

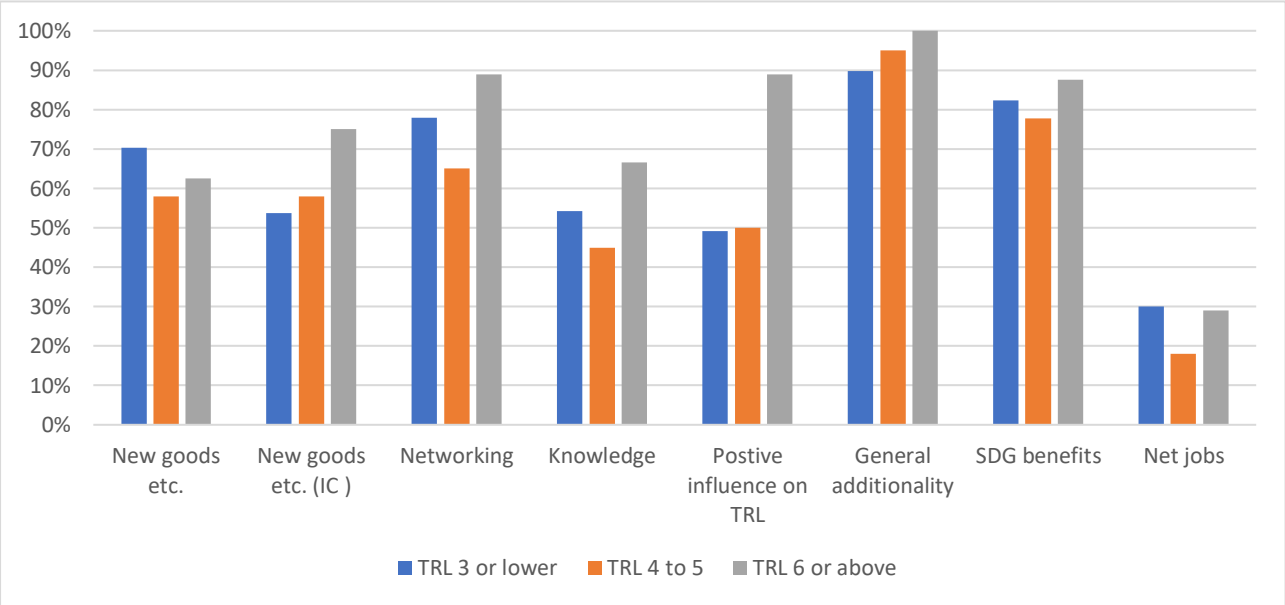


Source: IC client survey.

2.4.10 TRL at start of project.

The evaluation wished to examine whether having a lower or higher TRL at the start of a collaborative project was linked to innovation outcomes. As indicated in Figure 2.57, there is no clear pattern. However, it is noted that respondents were asked to provide answers in relation to their main collaborative project. Given that many IC clients have participated in multiple related collaborative projects over several years, as part of an ongoing journey, the findings may not reflect the full picture, and the funders would benefit from a more in-depth examination of the links between TRL and outcomes over the course of multi-stage collaborations.

Figure 2.57 Per cent positive answers for innovation benefits by TRL at start of project.

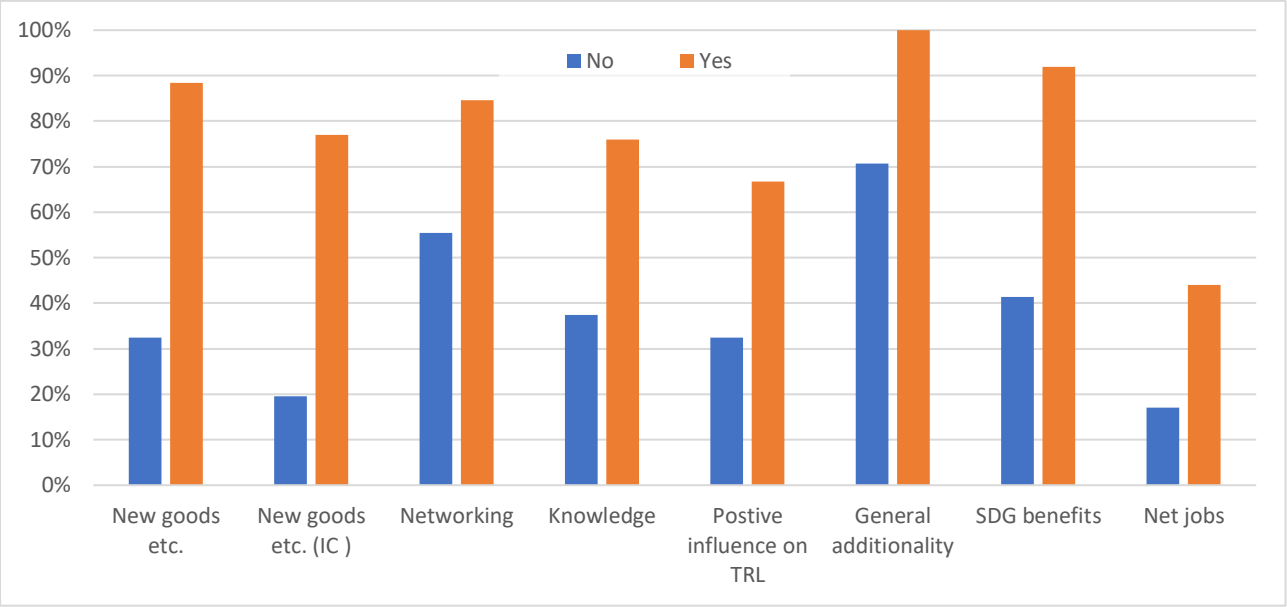


Source: IC client survey.

2.4.11 Finance benefits.

Respondents were asked whether significant IC support for securing finance benefits (securing new equity, new debt finance, or new public sector investment) was associated with improved innovation benefits. Figure 2.58 suggests there is a strongly positive link between IC support in this area and innovation outcomes and impacts (+40% on average, across dimensions examined, and as high as +57% for introduction of new or significantly improved goods, services or processes that was significantly supported by an IC). As may be anticipated, the ICs role in this regard, appears to make a marked difference on what innovation benefit has been achieved. That relatively few IC clients cited a finance benefit, highlights the potential gain from further IC action in this area with a greater role for ICs in encouraging links to investors and supporting clients to get financial benefits.

Figure 2.58 Per cent positive answers for innovation benefits by finance support accessed.



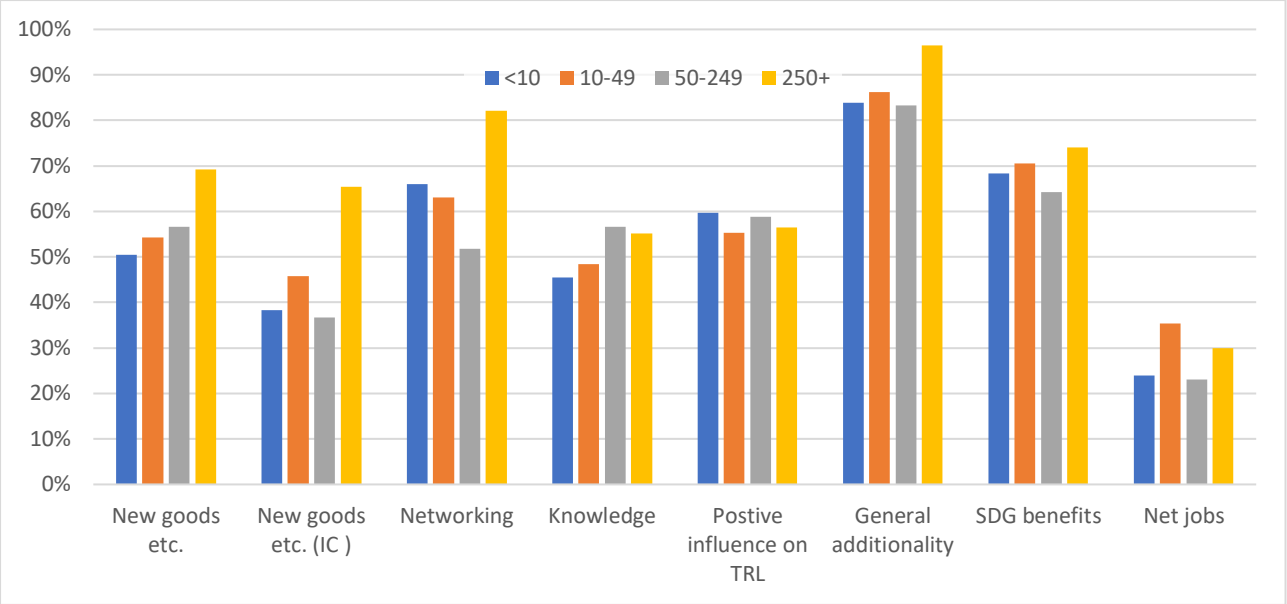
Source: IC client survey.

2.4.12 Employment size.

The evaluation considered innovation benefits by client employment size band (see Figure 2.59). In general, larger establishments appear to do better on many counts than smaller clients, although not by large margins (250+ employers on average +11% higher than <10 employers across all dimensions) (as discussed in relation to employment impacts above). Nonetheless, the greater challenges faced by smaller establishments in undertaking innovation projects should encourage measures to foster SME access to IC networks.

It is it worth noting that larger companies may report bigger employment gains and that the majority of employment impacts reported above came from large companies (that is, the scale of jobs increases overall). One large company may have an impact that's bigger than growth across many small companies.

Figure 2.59 Per cent positive answers for innovation benefits by employment size band.



Source: IC client survey.

2.5 Delivery and value for money.

This section considers the contribution of operational arrangements for the achievement of IC programme objectives across the IC phases, including monitoring and evaluation arrangements. A more detailed commentary is included in individual IC appendices.

2.5.1 Governance and operational arrangements.

Governance arrangements are mainly discussed within the context of individual IC appendices. In general, governance arrangements put in place for the ICs in Phase 1 were continued into Phase 2, with each IC hosted by a University and each with a Governance Board to oversee the direction of the IC. In general, the delivery of the IC programme over Phase 1 and to date in Phase 2 has become more refined, with lessons learned from Phase 1. As noted elsewhere, ICs are supporting increased levels of activity, with less core funding resource, in part though the leverage of public and private resources.

Governance Boards comprise a mix of experienced industry experts and leading academics, key public sector organisations (for selected ICs) and typically with representation from the host University on the Board. Industry experts include those drawn from outside Scotland and/or with international experience. Funders act as Observers on all Boards (governance challenges have a had a particular influence on the development and roll out of PMS-IC activities as discussed in greater detail in Appendix F).

The majority of ICs also have Advisory Groups to support project selection/appraisal and to provide scientific input. Others also have a Commercial Advisory Group to advise on the commercial viability of proposals and to provide external insights and perspectives. The use of independent advisory panels can also be effective in raising the quality of supported projects. Several ICs have advisory boards, and these have slightly different remits and responsibilities, although SAIC's independent scientific panel appears to be a good model in bringing independence to project approval.

Perhaps linked to this, there is emerging good practice in moving to a more programme, mission-based approach where ICs support groups or clusters of projects under prioritised themes, rather than a more project-based approach. BE-ST are perhaps most advanced in this approach, although

others (e.g., The Data Lab) are developing their approaches to more strategic and transformational interventions.

Each IC has a management or operations team, reporting to the Governance Board. These have appropriate functions within teams, such as heads of innovation/technical directors, business engagement or skills development. Teams have typically increased in terms of headcount between Phases 1 and 2, (some, such as BE-ST more than doubling headcount, albeit from a smaller than average base), partly in response to a recognised need to increase resources from Phase 1, but also to oversee in some cases considerable increases in business engagement and project collaboration activities.

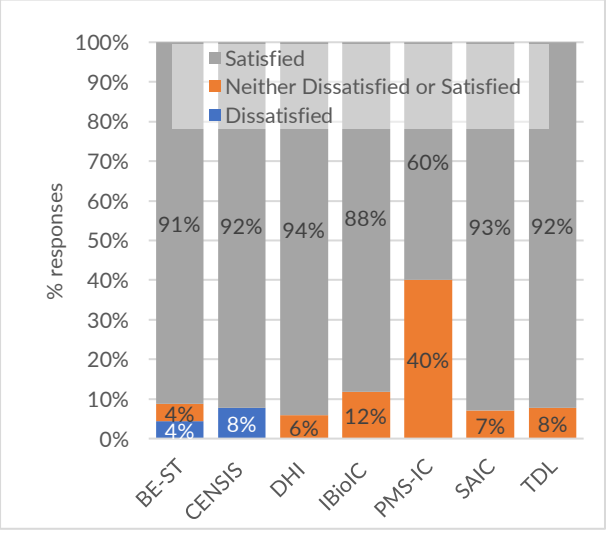
Host university relations are generally very good and regarded as positive by stakeholders, although there can be challenges for the IC in being part of the host university structures, notably in relation to recruitment and retention of staff, where ICs can find it difficult to offer competitive salaries (vis a vis the private sector) and where IC posts may be constrained by the shorter-term nature of funding arrangements for posts.

Indicative of good governance arrangements and strong IC Management teams, there are very high levels of client satisfaction with IC support across most aspects of support (see Figure 2.60 to Figure 2.69). Marginally lower levels of satisfaction (although still very high) are noted for:

- Lab, test or demonstration facilities (noted that not all ICs offer facilities e.g., SAIC).
- Consultancy support projects.
- Support for a consultation process.
- IC membership (paid or free).

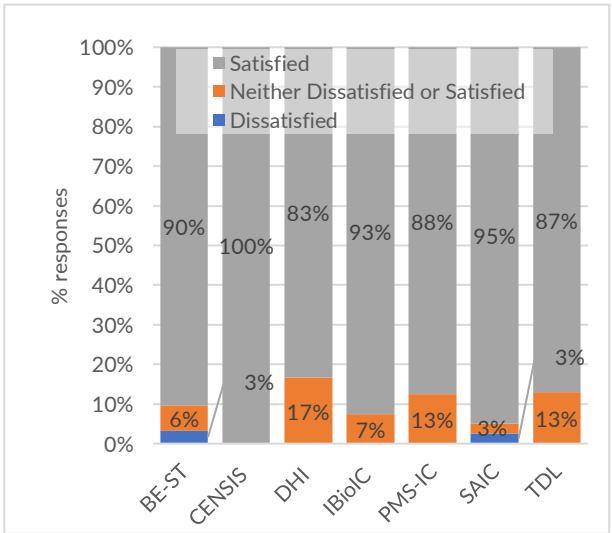
It is noted that too few responses were received to comment on business development support (the small number received for BE-ST, CENSIS, DHI, and IBioIC- were all positive). Responses for individual ICs are indicated below, although number of responses for individual ICs is low in some cases.

Figure 2.60 Collaborative project(s) between your establishment and one partner from a university or college.



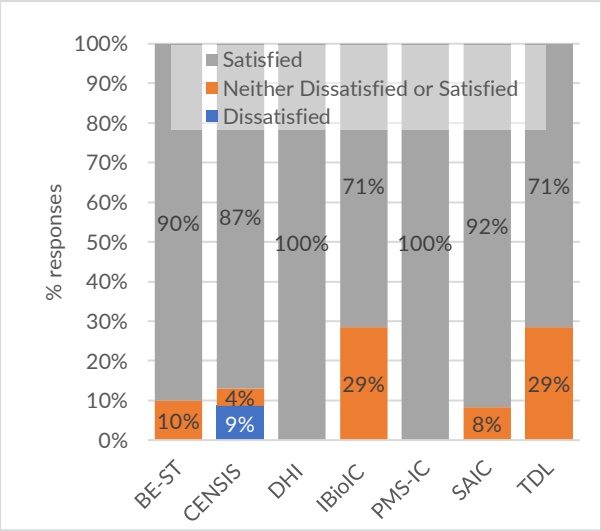
Source: IC client survey , Q11a, option n= all ICs (174), BE-ST (23), CENSIS (13), DHI (17), IBioIC (34), PMS-IC (5), SAIC (56) TDL (26). Margin of error for programme +/- 7.08% at 95% confidence level.

Figure 2.61 Collaborative project(s) between your establishment and more than one partner from industry, the public sector or a university or college.



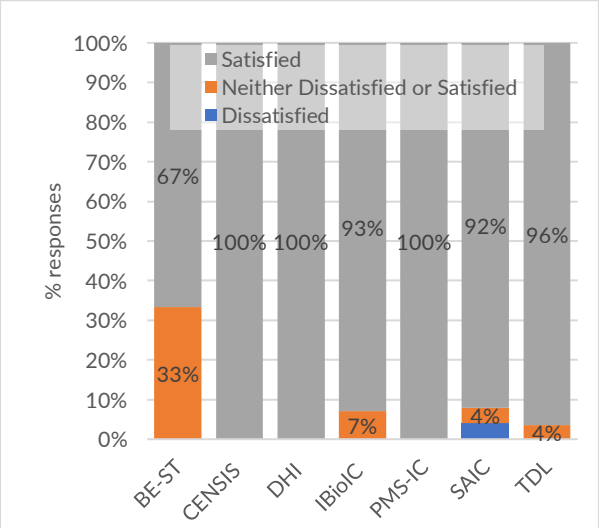
Source: IC client survey , Q11b, n= all ICs (204), BE-ST (31), CENSIS (18), DHI (18), IBioIC (27), PMS-IC (8), SAIC (79) TDL (23). Margin of error for programme +/- 6.48% at 95% confidence level.

Figure 2.62 Consultancy support provided by an Innovation Centre.



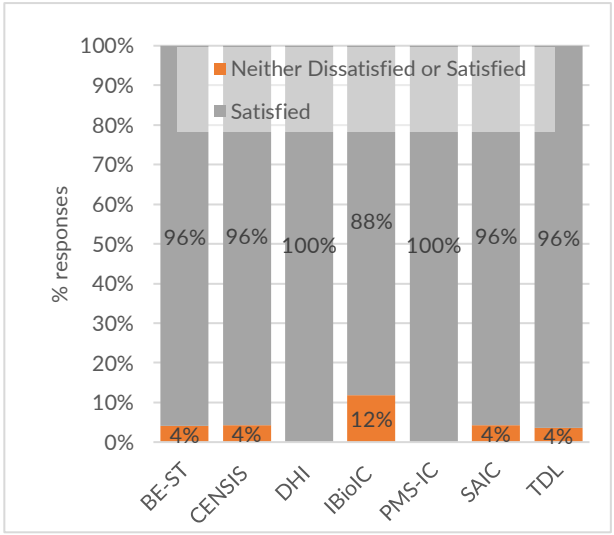
Source: IC client survey , Q11c, n= all ICs (68), BE-ST (10), CENSIS (23), DHI (8), IBioIC (7), PMS-IC (1), SAIC (12) TDL (7). Margin of error for programme +/- 11.67% at 95% confidence level.

Figure 2.63 Postgraduate internships/ placements/secondments supported by an Innovation Centre.



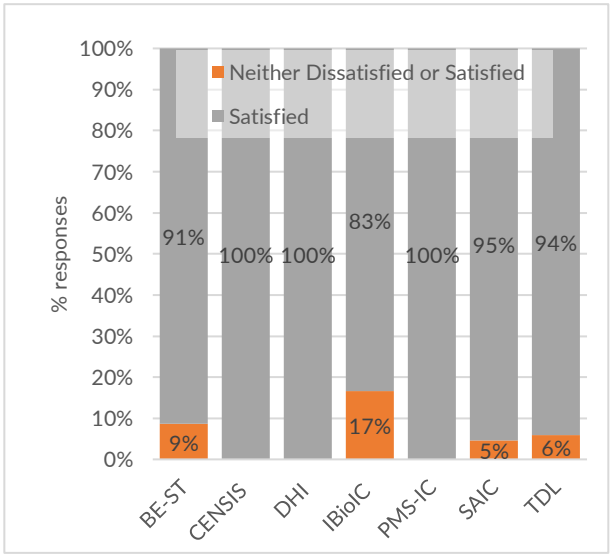
Source: IC client survey , Q11d, n= all ICs (117), BE-ST (3), CENSIS (1), DHI (1), IBioIC (28), PMS-IC (2), SAIC (25) TDL (57). Margin of error for programme +/- 8.77% at 95% confidence level.

Figure 2.64 Attended conferences or events provided by, or supported by, an Innovation Centre.



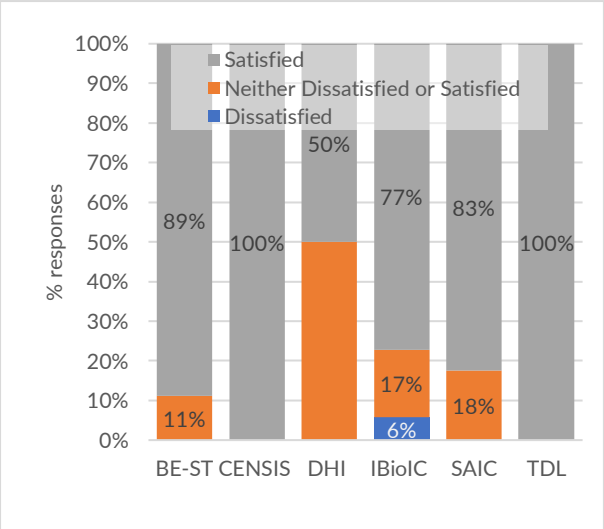
Source: IC client survey , Q11e, n= all ICs (228), BE-ST (49), CENSIS (23), DHI (14), IBioIC (42), PMS-IC (3), SAIC (69) TDL (28). Margin of error for programme +/- 6.08% at 95% confidence level.

Figure 2.65 Other advice or signposting provided by an Innovation Centre for any purpose.



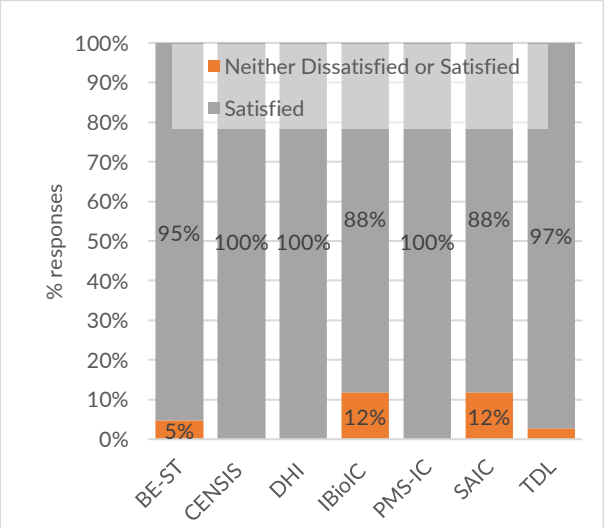
Source: IC client survey , Q11f, n= all ICs (121), BE-ST (23), CENSIS (11), DHI (8), IBioIC (18), PMS-IC (1), SAIC (43) TDL (17). Margin of error for programme +/- 8.62% at 95% confidence level.

Figure 2.66 Joined the membership of an Innovation Centre



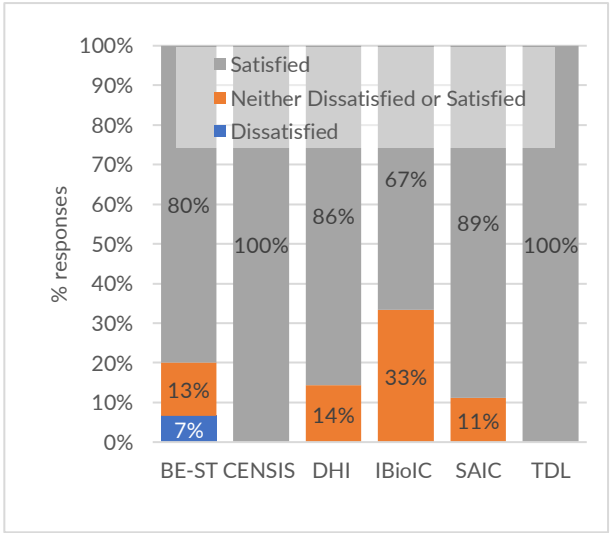
Source: IC client survey , Q11g, n= all ICs (98), BE-ST (9), CENSIS (2), DHI (2), IBioIC (35), PMS-IC (0), SAIC (40) TDL (10). Margin of error for programme +/- 9.64% at 95% confidence level.

Figure 2.67 Training or other skills development activities.



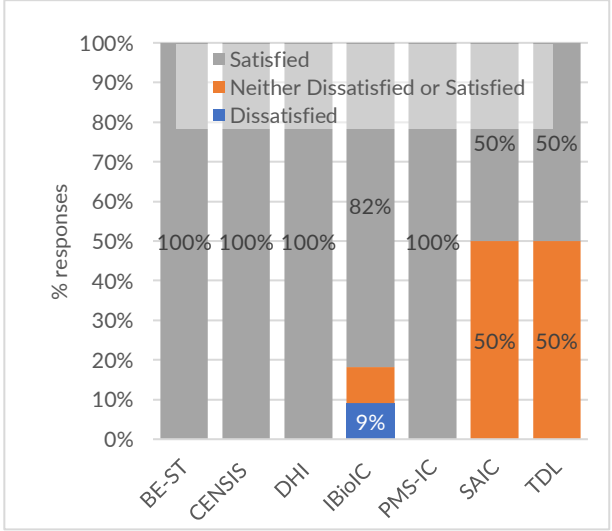
Source: IC client survey , Q11h, n= all ICs (119), BE-ST (21), CENSIS (4), DHI (6), IBioIC (17), PMS-IC (1), SAIC (34) TDL (36). Margin of error for programme +/- 8.69% at 95% confidence level.

Figure 2.68 To support a consultation process on strategy in your sector or technology area.



Source: IC client survey , Q11k, n= all ICs (54), BE-ST (15), CENSIS (5), DHI (7), IBioIC (6), PMS-IC (0), SAIC (18) TDL (3). Margin of error for programme +/- 13.14% at 95% confidence level.

Figure 2.69 Making use of Innovation Centre laboratory, test or demonstration facilities.



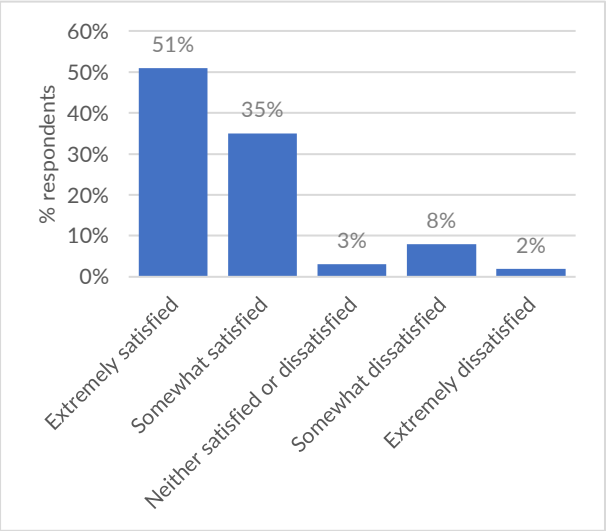
Source: IC client survey , Q11i, n= all ICs (35), BE-ST (10), CENSIS (5), DHI (3), IBioIC (11), PMS-IC (2), SAIC (2) TDL (2). Margin of error for programme +/- 16.41% at 95% confidence level. Not all ICs have facilities i.e. SAIC

Turning to consider students specifically, for those students who have been associated with a private sector business during their studies, the majority were satisfied with the support they received (Figure 2.70. Indeed, some 86 percent of respondents indicated that they were "somewhat satisfied" or more. The associated figure for those partnered with public and third sector organizations was 87 percent and 100 percent, respectively (Figure 2.71 and Figure 2.72). Dissatisfaction was highest amongst those partnering with a private sector organization, though at *only* 13 percent this can be considered a minority opinion.

Students were also highly satisfied with the support they received directly from the Scottish universities themselves. Indeed, 78 percent of respondents indicated that they were “somewhat satisfied” or more (see Figure 2.73). Likewise, students were also highly satisfied with the support they received from the Innovation Centres themselves, with 71 percent of respondents indicating that they were “somewhat satisfied” or more (

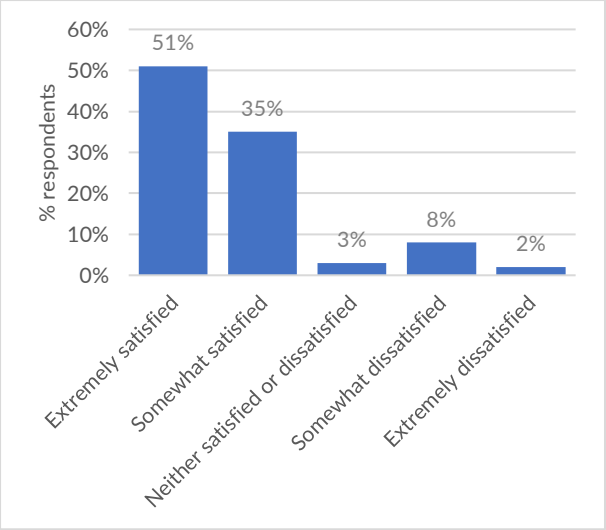
Figure 2.74). Students felt that the Innovation Centres had played an important role in connecting them to other students (68% 'Somewhat Agree' or higher) and supporting them more generally in their studies (68% 'Somewhat Agree' or higher).

Figure 2.70 Private sector business- satisfaction.



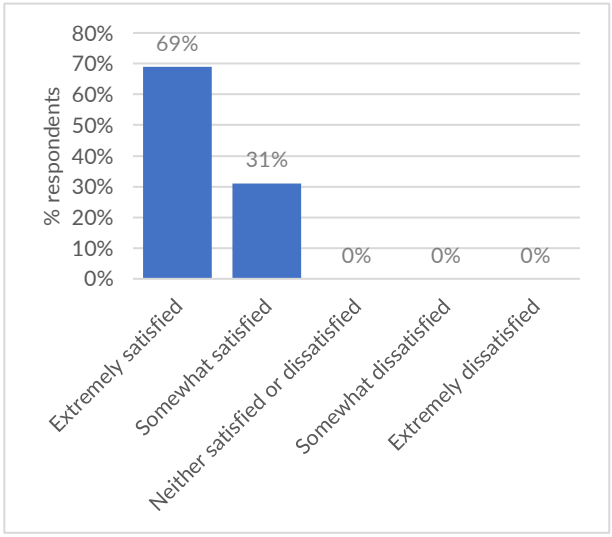
Source: Student survey Q3.2a n=88. Margin of error for programme +/- 1019% at 95% confidence level.

Figure 2.71 Public sector organisation- satisfaction.



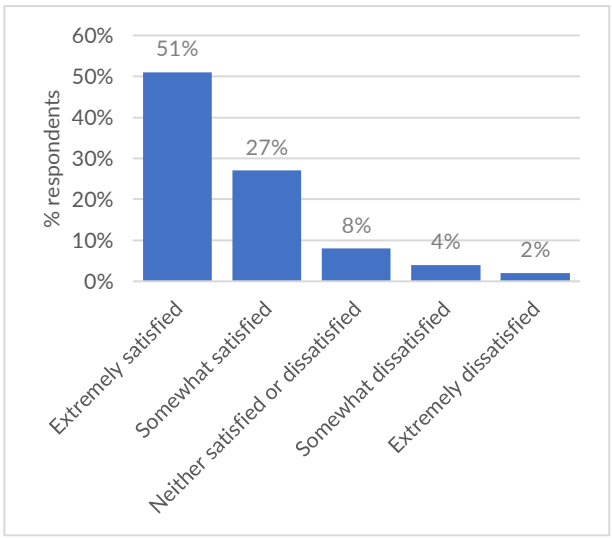
Source: Student survey Q3.2b, n=31. Margin of error for programme +/- 17.45% at 95% confidence level.

Figure 2.72 Third sector (non-profit) organisation- satisfaction.



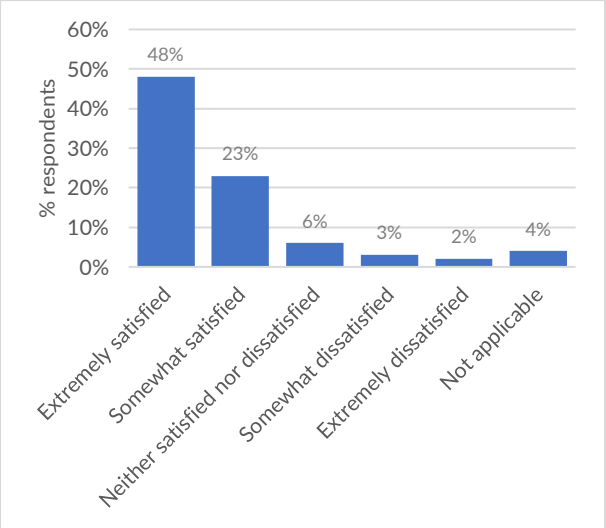
Source: Student survey Q3.2c, n=13. Margin of error for programme +/- 27.09% at 95% confidence level.

Figure 2.73 University or college- satisfaction.



Source: Student survey Q3.2d, n=201, no reply 7%. Margin of error for programme +/- 6.52% at 95% confidence level.

Figure 2.74 Thinking about the Innovation Centre you worked / are working with during the Innovation Centre supported research qualification, how satisfied are you with the support they provided you with?



Source: Student survey Q3.3, n=201, no reply 12%. Margin of error for programme +/- 6.52% at 95% confidence level.

2.5.2 Monitoring and evaluation arrangements.

ICs report against the MEF guidance set out by SFC, SE and HIE at the outset of Phase 2. However, several stakeholders consider that the MEF is not effective at conveying the true extent of ICs' impact. Reporting of these significant wider benefits is mainly qualitative in nature at this time and the programme MEF would benefit from revision to capture wider benefits through the identification of appropriate qualitative and quantitative indicators and appropriate targets.

It is noted that programme MEF data, including financial data, is not always transparent, or well detailed, and was not in some cases readily available for analysis (particularly inputs, commitments, expenditure, and mobilised finance information). Programme expenditure budget lines are not linked to MEF indicators, and some important outcome areas do not have corresponding MEF indicators (e.g., finance mobilised), therefore limited VfM efficiency assessment is possible (i.e., cost per main output or outcome area). A number of other issues with the MEF include:

1. There were uncertainties on the part of some ICs on the definitions for inputs, commitments, expenditure, and leveraged finance.
2. There were at times discrepancies between IC MEF output, and outcome entries and funder expectations.
3. The comparability/consistency of some of the MEF indicators was limited, including forecast gross employment or safeguarded employment/turnover estimates (mixed approaches regarding time period assessed, validation, accounting for optimism bias).

The programme would benefit from an updated and revised MEF to assist in tracking key existing indicators as well as incorporate new and additional indicators and methods for capturing wider benefits, and equity indicators.

2.5.3 GDPR restrictions.

Appendix A notes that differences in IC and host university approaches to GDPR introduced challenges for timely evaluation of the programme. It would be beneficial for the future evaluation for all ICs (and host institutions) to agree a common approach to GDPR as it applies to IC client and student contact information, and, for all IC clients and supported students to be notified that their

personal data may be used to contact them for evaluation purposes. ICs and host universities should also have suitable arrangements in place to share data with funding partners and appointed independent evaluators.

2.5.4 Population level data

As an extension of lessons related to data collection via the MEF, there is emerging good practice in relation to using CRM systems to better guide IC activity and impact (see IC appendices). The evidence from this review is that longer-term, multiple intervention relationships work best in terms of innovation, GVA and job outcomes and impact, and CRM systems can be used effectively to monitor and nurture these interactions. Available population level data varies by IC. Consistent with GDPR procedures noted above, it would be beneficial for future monitoring and evaluation for a common core set of client and student profile data to be maintained, for example:

- Clients
  1. Client Location (by Scottish local authority (derived from post code)/ other).
  2. Category of support received (collaborative projects, networking training etc).
  3. Category of client (public sector, industry, third sector, university or college by institution, other).
  4. Organisation size (employment).
  5. Location of establishment HQ.
  6. Contact information (email and telephone number).
  7. Project funding (by source body, location, value),
- Students
  1. Student home location (by Scottish local authority (derived from post code)/ other)
  2. Category of support received (MSc, PhD, intern, other)).
  3. Subject of study.
  4. Affiliated university or college.
  5. Contact information (email and telephone number).

2.5.5 Value for money.

2.5.5.1 Limitations.

The overall programme MEF provides a limited framework of quantitative metrics that can be used to assess VfM (see 2.5.2 above). A more detailed commentary is included in individual IC appendices. An indicative suite of indicators that could be considered on a quarterly basis going forward include[27]:

- Economy
  - Key information on programme cost drivers by main type e.g., capital expenditure, staffing by grade, travel, etc.
  - Costs saving measures including:
    - Procurement savings - quantified where possible, with narrative of cost saving measures.
    - Implementation savings - e.g., savings on project implementation available for re-allocation.
  - Management costs - expenditure as share of budget.
- Efficiency
  - Budget expenditure as % of total programme budget by main activity areas.
  - Budget committed as % of total programme budget by main activity areas.
  - Finance mobilised by public (noting source), and private funding.
  - Finance mobilised as share of relevant budget line or IC budget as appropriate.

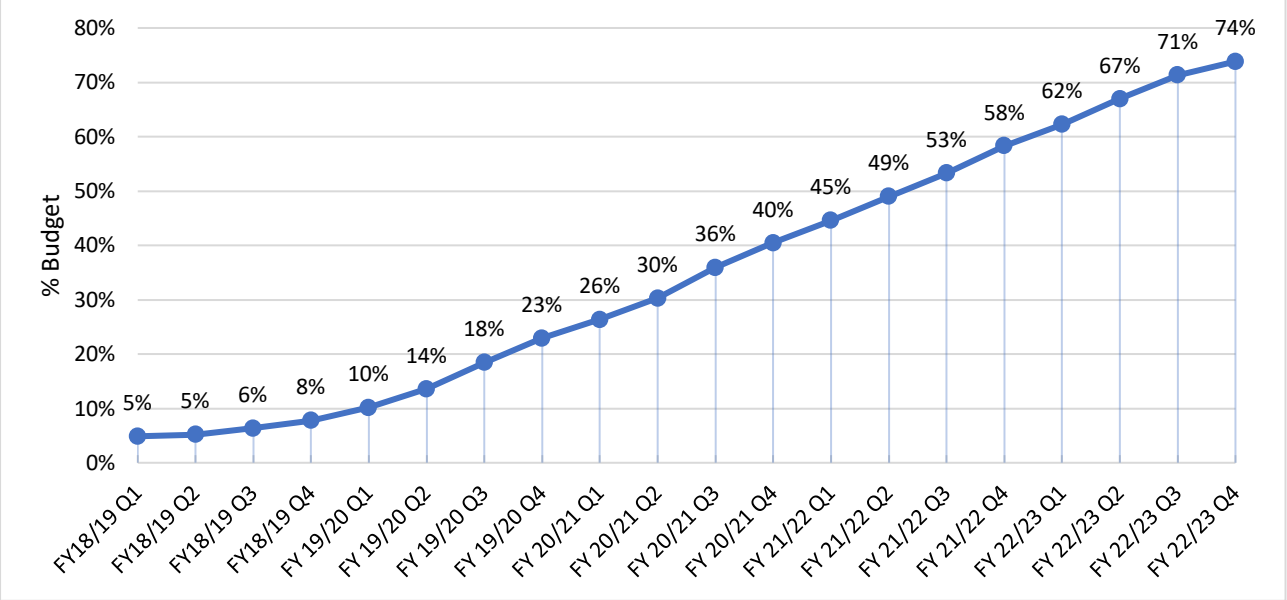
[27] Based around HM Treasury Green Book's 4 E's of Economy, Efficiency, Effectiveness and Equity.

- Leveraging ratio.
- Effectiveness
  - Cost per key output and impact area. Costs taken as relevant budget line for output area, or IC budget for impacts.
- Equity
  - Size (e.g., employment) and sector of beneficiaries.
  - Geographical distribution of beneficiaries by post code/ equivalent (location of establishment primarily working with IC if part of larger organisation).
  - Home location of parent beneficiary as appropriate.
  - Collaborative project spend (IC share) by geographical location of beneficiary.
  - Geographical location of networking event participants.
  - Gender and home location of supported students.

2.5.5.2 Budget execution.

Total Phase 1 spend was £84 million (excluding Oil and Gas Innovation Centre). Funder budget drawdown is used as a proxy for expenditure (it is noted quarterly drawdown is approximate). Accordingly, Phase 2 budget execution is noted in Table 2.37. Some 74% of the funder budget has been drawn down for the period up to March 2023 with IC spend on track for the remainder of Phase 2. Further information budget execution by IC is included in the report appendices.

Table 2.37 Programme budget execution, Phase 2.



*Source: SFC, SE, HIE correspondence ('Summary funders awards and drawdowns to date', excel spreadsheet, Feb 2023). * funders indicate awarded at outset of Phase 2.*

2.5.5.3 Finance mobilised.

Finance mobilised (public or private) is not recorded as a specific MEF indicator. Here, it is assessed as all recorded MEF commitments (project and centre combined), excluding all funder commitments. MEF commitments are presented as supplied by the IC.

On this basis, a very significant £222 million was mobilised over Phases 1 and 2. A substantial amount of this is from other public sources (£122 million or 56%). In addition, £93 million (42%) was industry finance. Comparing funder inputs (Dec 2022) to finance mobilised, this indicates an estimated leverage of £135 million to £222 million, or 1.6:1 (benefit to cost ratio). For industry finance mobilised this is 0.7:1 (see table below). Further information on finance mobilised by IC is

included in the report appendices. As for some other MEF data, there are inconsistencies in definition between ICs, which may overstate the level of public finance mobilised.

Table 2.38 Finance mobilised, to latest reporting period 2021/22.

	Phase 1	Phase 2	Total
Higher Education Institutes*	£7,669,237	£4,048,198	£11,717,435
Other Public**	£33,287,363	£76,599,543	£109,886,906
Industry	£52,376,882	£41,039,013	£93,415,894
Other	£5,449,216	£1,312,365	£6,761,581
Total	**£98,782,697**	**£122,999,119**	**£221,781,817**

*Source: MEF. *May overstate finance mobilised if HEI includes other SFC finance. **Some IC reporting incudes total amounts or multi-partner projects rather than IC element.*

2.5.5.4 Cost per impact measure.

It is important that value for money assessments consider programme effectiveness, that is, the relationship between the intended and actual results of public spending. In other words, what are the higher-level outcomes and impacts of the programme and at what cost. In this regard, two impact measures are examined: jobs and GVA. It is acknowledged that all ICs to a greater or lesser extent, have a focus on wider environmental, health, and social benefits, and therefore these impact measure do not capture all of the benefits of ICs. Therefore, this section omits these figures for DHI and PMS-IC. In addition, it is emphasised that the employment levels relate to a relatively small sample of IC beneficiaries in some cases and that the grossed-up figures presented are indicative.

Nonetheless, assuming costs as funder inputs of £97 million (note: this omits DHI and PMS-IC funder inputs and employment) to nearest reporting period, net additional peak programme employment of 1,856 equates to a cost of £52,230 per net additional job. Similarly, funder input to net additional GVA equates to a benefit to cost ratio of 1.8:1 (over 10 years) (see Table 2.39 and Table 2.40).

It is noted that average annual GVA output per employee in Scotland (5 year, 2016-20 average) is £49,500, suggesting the cost per job is positive. These estimates assume direct, indirect, and induced benefits in the economy via the application of economic multipliers. Corresponding figures for individual ICs are noted in appendices where applicable.

The net economic impacts for the supported population of business clients were estimated by grossing up impacts from survey respondents to the population. The Consultants did not have sufficiently detailed data on the characteristics of the total population of IC clients to compare with survey respondents in order to fully assess potential non-response bias and how representative the sample was of the population. In addition, due to the smaller number of respondents at the individual IC levels, confidence intervals for individual IC results were wider than for the overall programme. This means that grossed up impacts, particularly at the individual IC level, should be treated with a degree of caution as they are based on feedback from a relatively small sample of IC clients and have a larger margin of error. There is, however, little other evidence regarding actual or net economic impacts, and the findings represent the best evidence available on which to estimate the net economic impact of the ICs. The evaluation makes it clear that such impact data should be considered alongside other evidence of benefits in the report rather than in isolation.

Table 2.39 Cost per job (excluding DHI, PMS-IC)

	Employment	Cost per job
Net Additional Employment (peak)	1,856	£52,230
Net Additional Employment (peak) (no multiplier)	1,031	£94,024

Source: authors.

Table 2.40 GVA ratio (excluding DHI, PMS-IC)

	GVA	Benefit: cost Ratio
Cumulative Net Additional GVA , Constant Prices, Discounted	£172.0	1.8:1
Cumulative Net Additional GVA (no multiplier), Constant Prices, Discounted	£95.6	1.0:1

Source: authors.

2.5.5.5 Equity.

As discussed above, universities across Scotland are engaged with the ICs and collaborative projects between academics and IC clients are brought forward across a wide range of industrial sector interests. More than one in seven IC clients, for example have engaged with universities in the North-East of Scotland and almost one in 10 engaged with the University of the Highlands and Islands, principally SAIC clients (the distribution of UHI centres worked with is noted in Figure 2.75**).**

The broad geographic spread of IC client activity also translates to innovation outcomes that are distributed across Scotland. The geographical distribution of innovation outcomes and impacts is noted in Map 2.1 to Map 2.5 below. The introduction of new or significantly improved goods, services, or processes since working with IC (attributed to IC or not), by client location, does not show a clear geographic pattern, with all parts of Scotland demonstrating these innovation outcomes (Map 2.1 and Map 2.2).

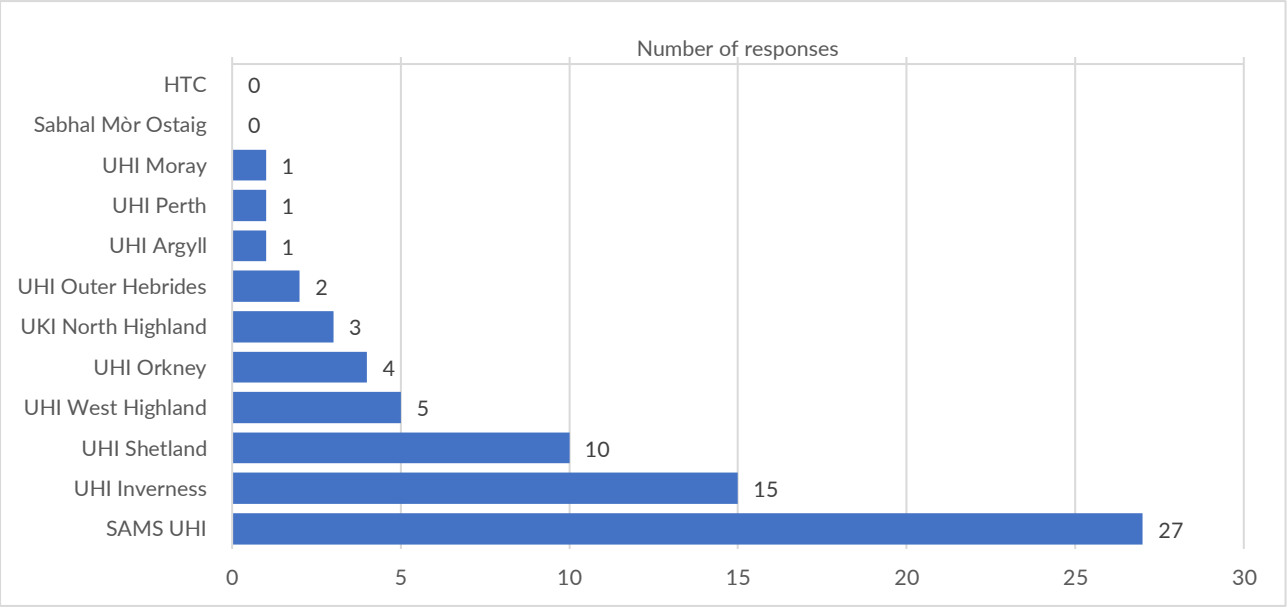
There are pockets of Scotland where networking benefits are lower, typically although not always further away from the central belt, which shows the value of a local presence, especially in Highlands and Islands and the South of Scotland (Map 2.3). Knowledge benefits attributed to ICs are also distributed across Scotland with no clear geographic pattern (Map 2.4).

Employment additionality impacts are also evident across Scotland, again with no clear geographic pattern. Rather, employment impacts are greatest in certain local authority areas where high employment impact projects have been supported (Map 2.5).

The client survey indicates a good geographic spread of client survey respondents, including proportionate responses from the Highlands and Islands. Overall, some 13% of respondents were based in the HIE area, this rises to 30% for SAIC. Edinburgh and Glasgow account for some 53% of establishment locations for all ICs. It is noted that a very low proportion of respondents (2%) were located in either Dumfries & Galloway or the Scottish Borders (see Figure 2.76). Some 51 (11%) of respondents were establishments based outside of Scotland, with 31 of these in the rest of the UK (7%), and the remainder overseas (4%) (see Table 2.41).

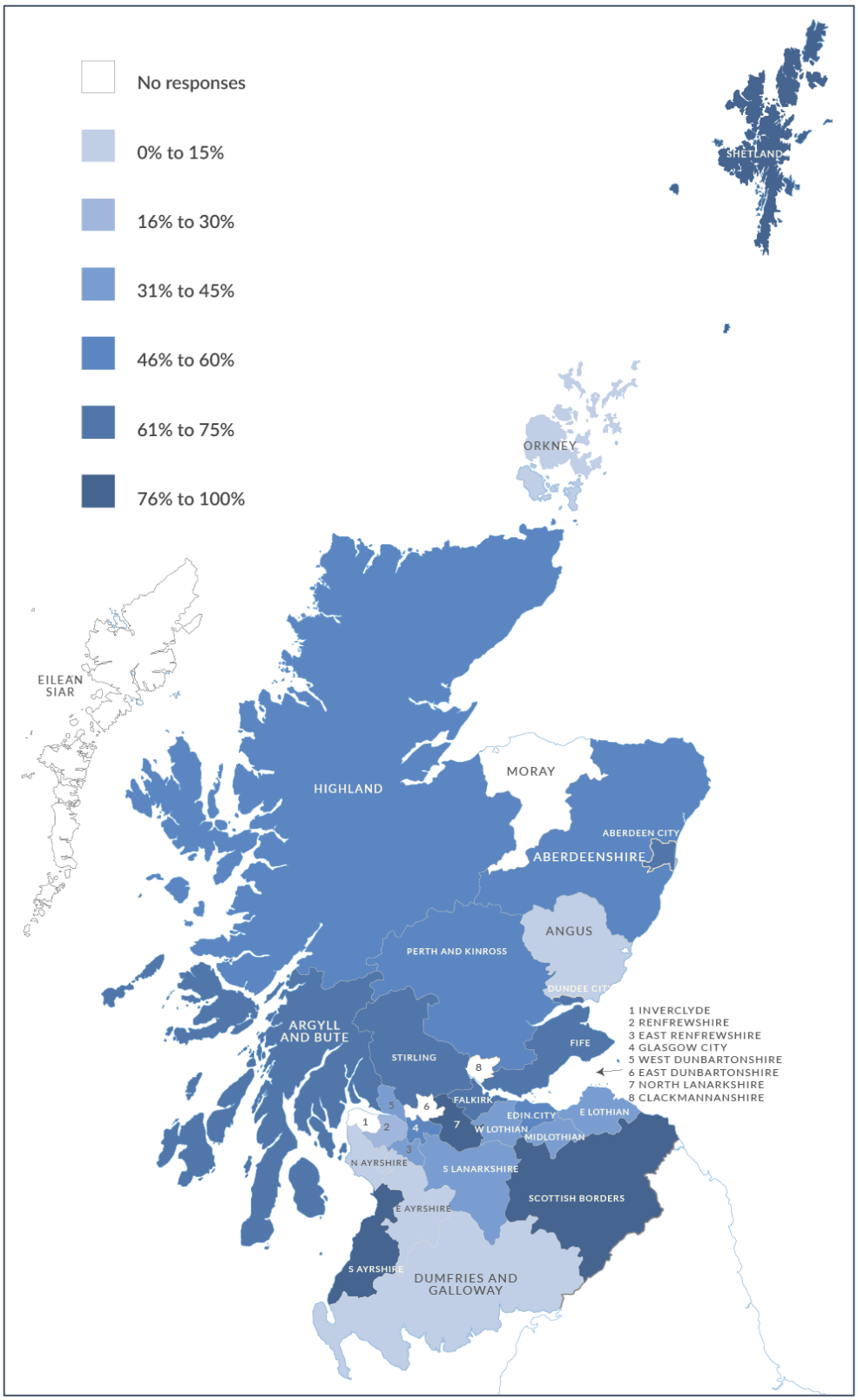
Reporting on number of supported beneficiaries at the HIE geography is limited by variable CRM records across the programme. A more detailed commentary is included in individual IC appendices.

Figure 2.75 You selected University of the Highlands & Islands. Please indicate which campus locations your establishment worked with.



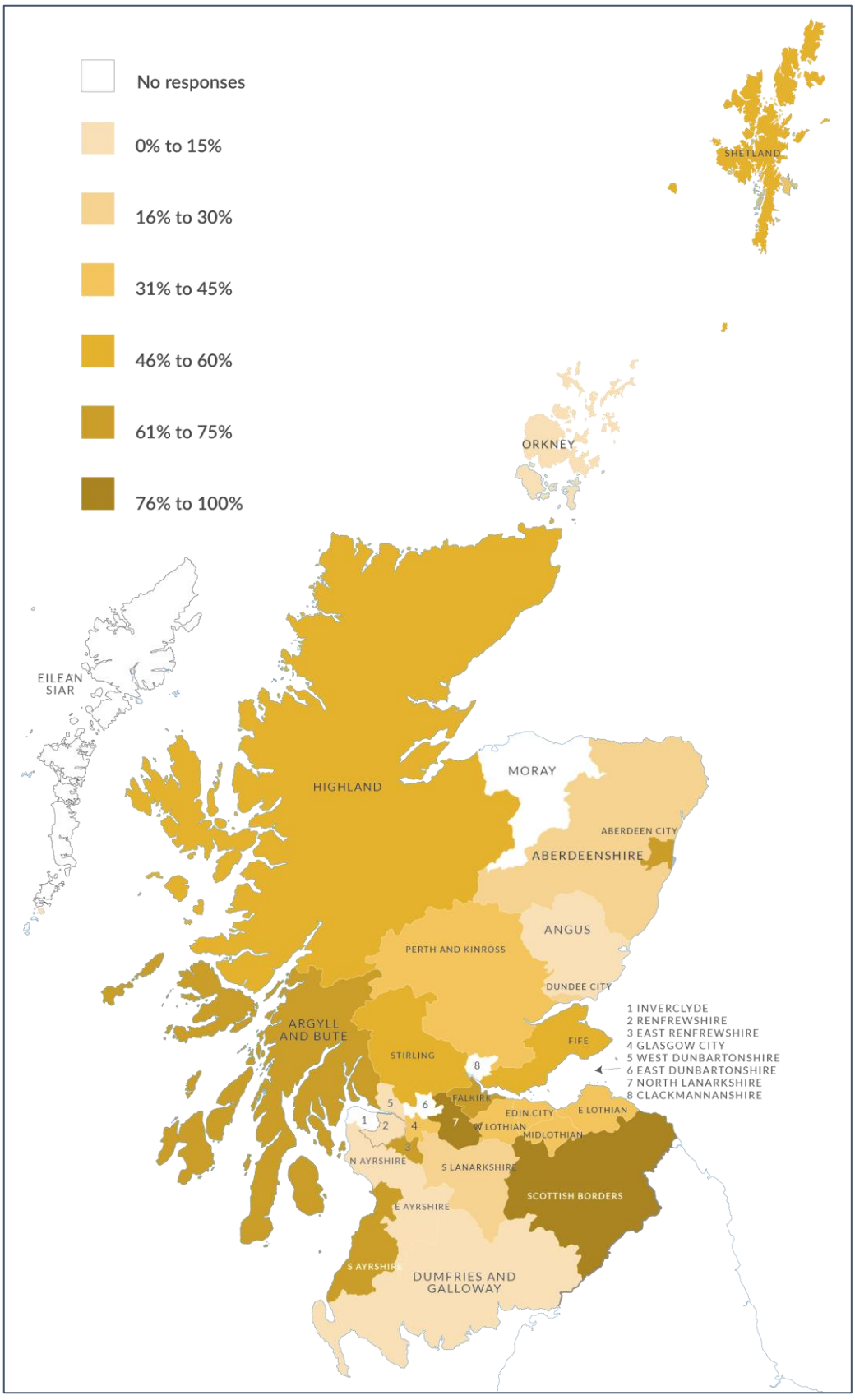
Source: IC client survey , Q14.

Map 2.1 Introduction of new or significantly improved goods, services, or processes since working with IC by location (% respondents from location answering positively).



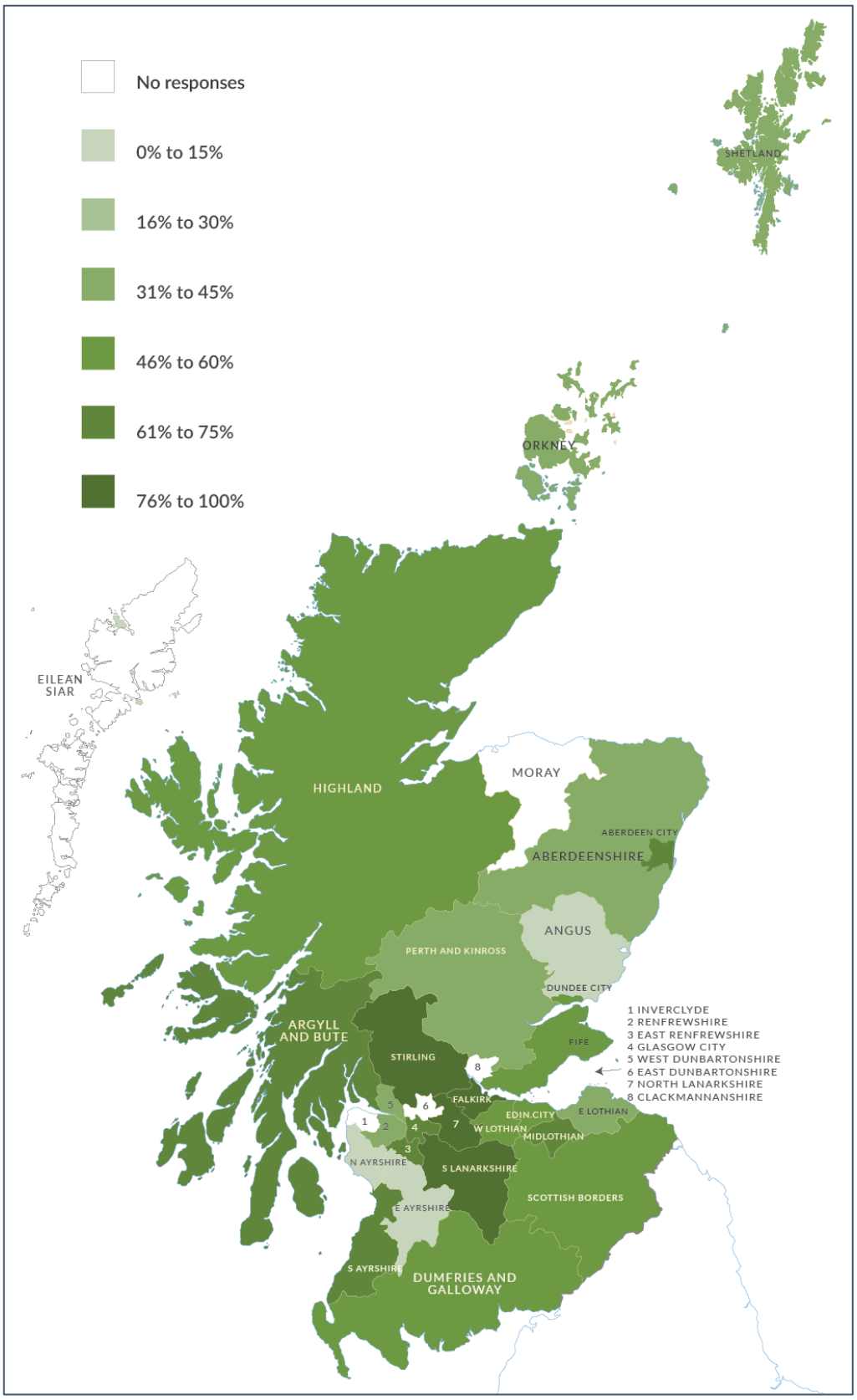
Source: IC client survey Q21.

Map 2.2 Introduction of new or significantly improved goods, services, or processes since working with IC and attributed to IC, by location (% respondents from location answering positively).



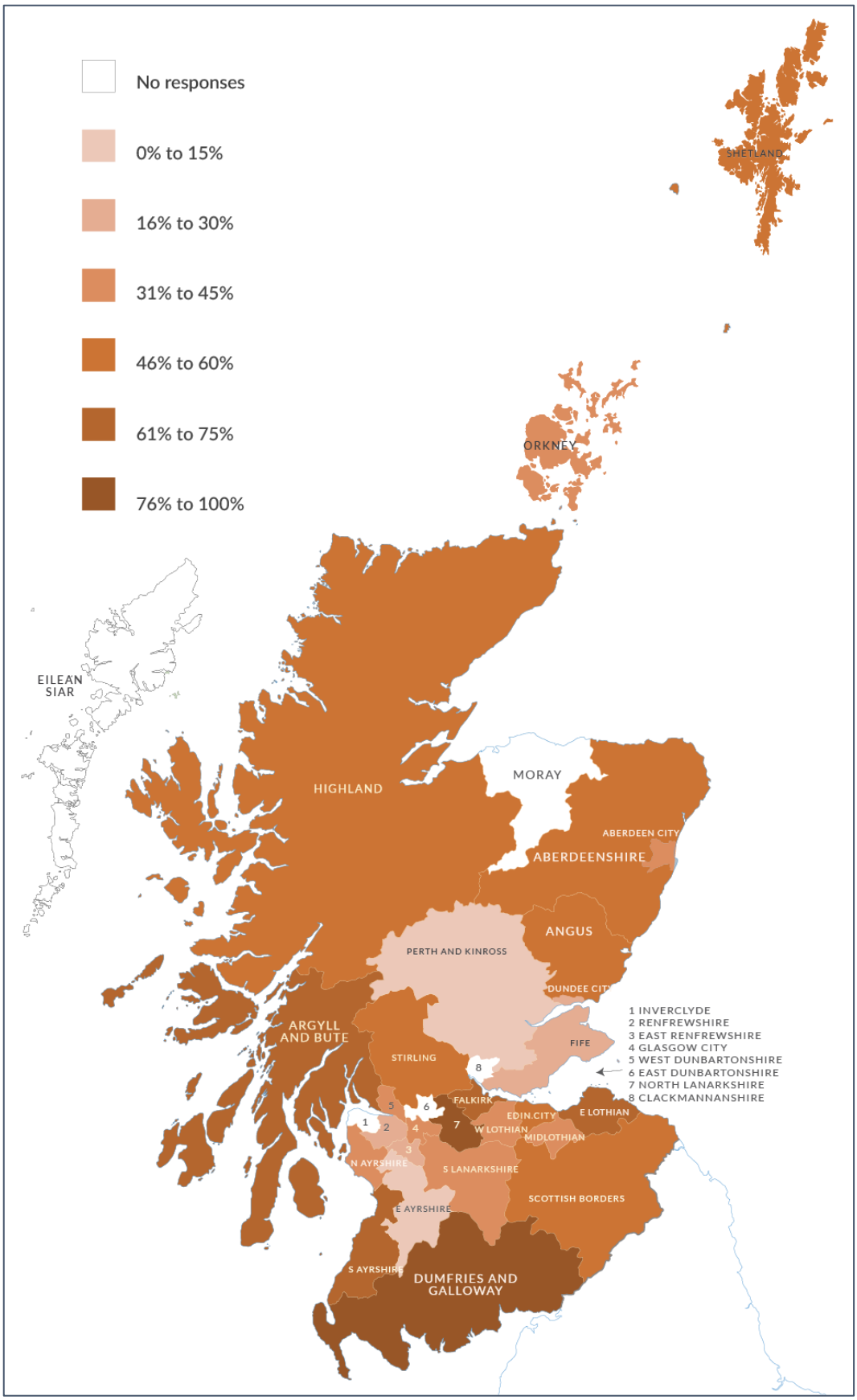
Source: IC client survey Q22.

Map 2.3 Networking benefits attributed to IC, by location (% respondents from location answering positively).



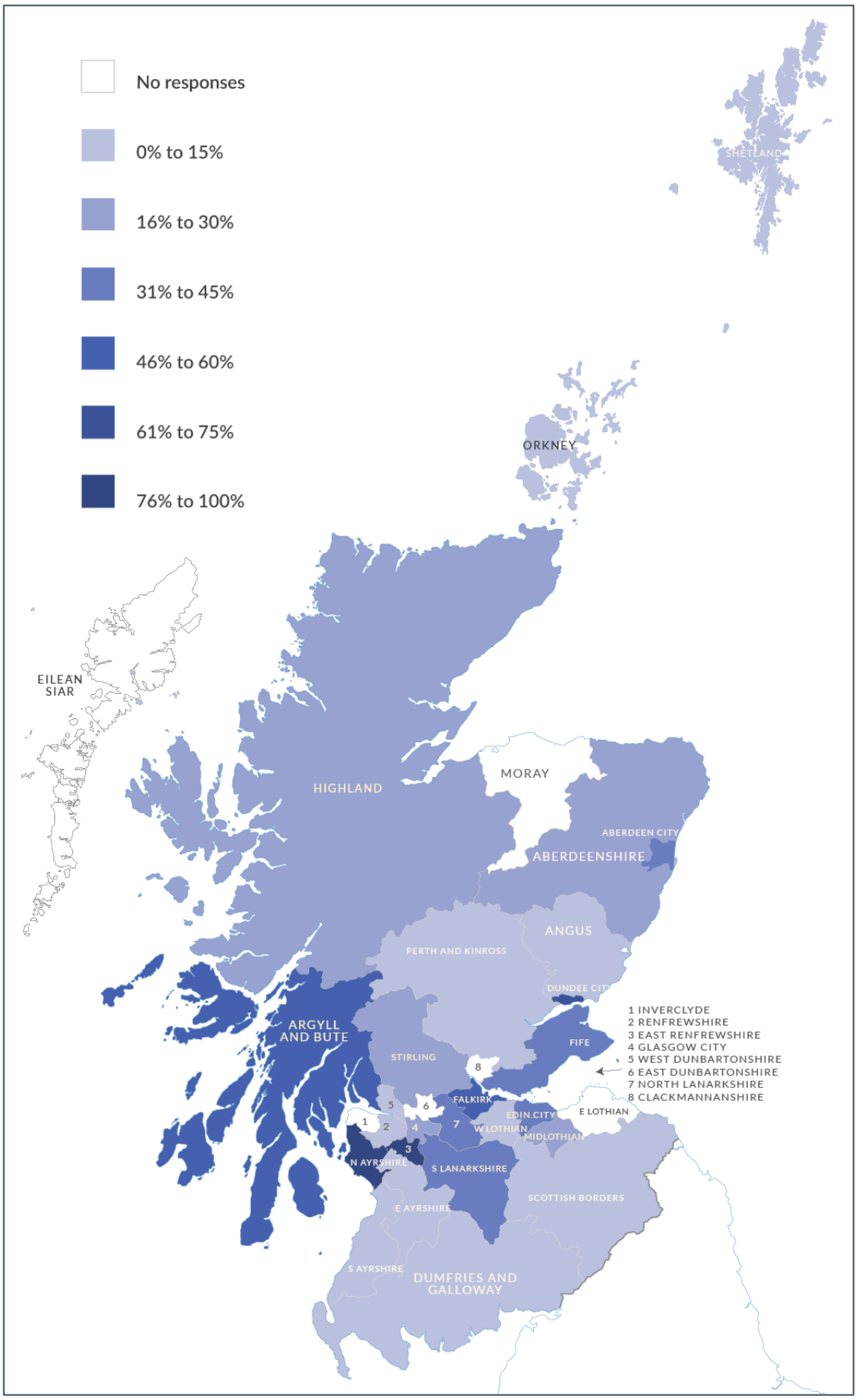
Source: IC client survey Q22.

Map 2.4 Knowledge benefits attributed to IC, by location (% respondents from location answering positively).



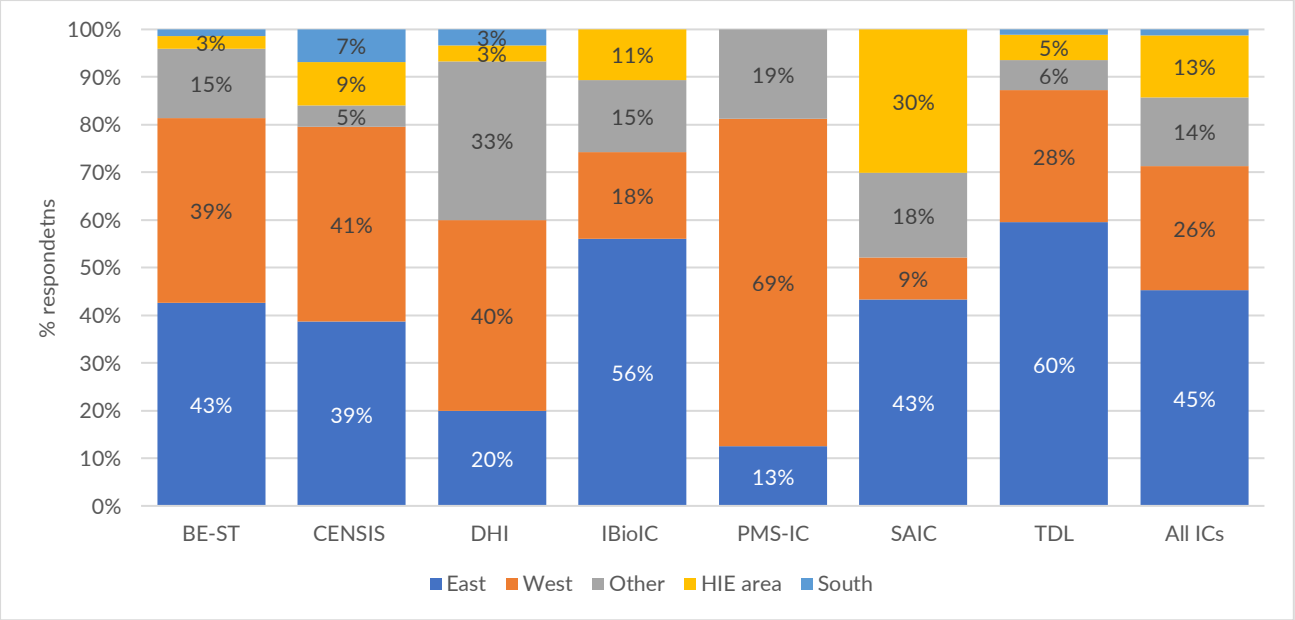
Source: IC client survey Q22.

Map 2.5 Employment additionality, by location (% respondents from location answering positively).



Source: IC client survey Q22.

Figure 2.76 In which council area is your establishment located? (grouped by broad area)



Source: IC client survey , Q3. Notes: Data labels of 1 or less no shown. n= all ICs (461), BE-ST (75), CENSIS (44), DHI (30), IBioIC (66), PMS-IC (16), SAIC (136) TDL (94). Margin of error for programme +/- 6.53% at 95% confidence level.

Table 2.41 Geographical location of respondents.

Location	Number
East Ayrshire	1
Angus	2
Dumfries and Galloway	3
East Lothian	3
East Renfrewshire	3
North Ayrshire	3
Orkney Islands	3
Scottish Borders	3
South Ayrshire	3
West Dunbartonshire	3
Falkirk	4
Renfrewshire	4
North Lanarkshire	5
Shetland Islands	5
West Lothian	6
Aberdeenshire	7
Perth and Kinross	7
South Lanarkshire	9
Dundee City	11
Fife	15
Argyll and Bute	19
Aberdeen City	22
Midlothian	25
Stirling	33
The Highlands	37
City of Edinburgh	76
Glasgow City	90
Pan-Scotland	9
Other UK	31
European Union	5
Other	14
Total	**461**

Source: Client survey

2.5.5.6 Overall value for money.

There are a number of limitations in the available data for informing VfM assessment as set out above. Nonetheless, a number of efficiency and effectiveness measures are presented, where budget execution, finance mobilised, estimated cost per impact, and equity are shown to be generally positive at the programme level (with variation at IC level discussed in individual appendices). It is also recognised that ICs contribute to a significant range of wider benefits that are not easily captured by these metrics (such as health and environmental benefits). There are also wider contributions of the ICs to the development of the innovation ecosystem (as discussed in more detail in the appendices). Taking into account these wider benefits, and within the limits of the available data, the evaluation concludes that the programme delivers good value for money.

2.6 Progress against targets and objectives.

2.6.1 Targets

76% of the IC targets examined are exceeded or on track (i.e., 75%+ achieved), although this is not evenly distributed across ICs. In general ICs are making good progress against their Phase 2 targets, particularly with regards business engagement and collaborative projects.

The exception is the entrants to education/training. Progress against skills development targets has been challenging in Phase 2, with all ICs with large skills support programmes (e.g., IBioIC, The Data Lab) reporting the negative impacts of both Brexit and the COVID-19 pandemic on recruitment, and

in the case of the latter, ability to provide placements. Nonetheless, there has been substantial skills support activity in both IBioIC and The Data Lab, and in other ICs taking forward skills support. Reporting against outcome indicators is patchier, although, as the survey evidence and review of MEF data shows, there are good jobs and turnover outcomes achieved in a number of ICs (e.g., BE-ST, CENSIS) including students gaining employment following skills support (e.g., The Data Lab).

More generally, in some activity areas, targets have been well exceeded, and it would be appropriate for ICs to agree more stretching targets with funders. It is acknowledged that some ICs have adopted 'stretching' targets and this good practice should be considered by all.

It is noted that target definition is not consistent across ICs and the individual appendices provide more detailed commentary on progress against individual IC targets within context. However, as a general indication of progress, achievement against targets is noted below:

- BE-ST: Of nine high level target areas:
  - 6 exceeded.
  - 3 on track (75%+).
  - Only off-track sub-target is business to business collaborative projects.
- CENSIS: Of 14 detailed targets.
  - 4 exceeded,
  - 1 on track (75%+).
  - 9 off track.
  - Off track areas, are mainly linked to follow-on from completed commercial projects, and skills development.
- DHI: Of 15 detailed target areas currently reported on,
  - 9 are exceeded,
  - 2 on track (75%+),
  - 4 off track.
  - Off track targets include challenge competitions hosted, academic grant awards, market research reports and work experience placements.
- IBio-IC: of 17 targets:
  - 9 exceeded.
  - 5 on track (75% +).
  - 3 off track.
  - Off track include master's and HND entrants (impacted by Covid-19 and Brexit), and industry membership.
- PMS-IC- see individual appendix.
- SAIC: Of 17 targets:
  - 15 exceeded.
  - 1 on track (75%+) (summer interns)
  - 1 off track (master's students).
- The Data Lab: Of 22 available targets:
  - 11 exceeded.
  - 5 on track (75%+).
  - 6 off-track.
  - Off track primarily include skills development, international projects (both impacted by Covid-19), and number of 'transformational' projects completed (with project definition still to be agreed).

2.6.2 Objectives

As highlighted in section 1.2.2, for the purposes of the evaluation the authors extended the Phase 2 objectives and, as detailed in the appendices, sought to determine the extent to which each IC has delivered on them. The table below uses a RAG rating to assess the extent to which each IC addresses the 10 rationalised objectives (Table 2.42). The assessment is based on the evaluation

team's analysis of documents supplied by the ICs; analysis of survey data from beneficiaries and stakeholders; and analysis of interviews completed with staff from the ICs and the funding organisations, IC Board members, academics, and wider stakeholders. The individual appendices provide more detailed commentary on progress against individual IC objectives within context. However, as an indication of general progress, achievement against objectives is noted below.

Table 2.42 Assessment of achievement by objective.

Objectives	BE-ST	CENSIS	DHI	IBioIC	PMS-IC	SAIC	TDL
O1: Direct businesses to support	High	High	Moderate	High	Low	High	High
O2: Build and promote ecosystems & sectors	High	High	High	High	Moderate	High	High
O3: Drive business growth	High	Moderate	Low	Moderate	Low	High	High
O4: Win external funding	High	Moderate	High	High	Moderate	High	High
O5: Solve industry problems	High	High	High	High	Low	High	High
O6: Address major policy priorities	High	High	High	High	High	High	High
O7: Secure inward investment	Moderate	Moderate	Low	High	Low	Moderate	Moderate
O8: Enhance public services	Moderate	High	High	Moderate	High	Moderate	Moderate
O9: Develop skills	High	Moderate	Moderate	High	High	High	High
O10: Develop next generation	High	Moderate	Moderate	High	Moderate	High	High

Source: authors

3 Conclusions and recommendations.

Innovation Centres (ICs) were established to bring the expertise and capabilities of Scotland's universities, research institutes, colleges and businesses, to address industry demand led opportunities that support growth of the Scottish economy. This evaluation provides strong evidence that ICs are supporting increased innovation activity, skills development and benefits for society more generally through supporting opportunities for industry and academia to work collaboratively. However, this has not yet translated into significant economic impacts. This may reflect the time needed to successfully commercialise innovation outputs.

ICs are part way through their second phase and, as such, they are continuing to develop and evolve. The evidence presented in this evaluation, and highlighted below, shows the ICs are playing a substantial role in building innovation ecosystems, delivering innovation outcomes and impacts for the private sector, and in many cases, Third Sector and public sector organisations. The conclusions below are structured around the seven main evaluation objectives. Recommendations, linked to the conclusions are also presented.

Findings against main evaluation objectives.

1. ICs delivery of routes to economic and wider benefit through increased levels of collaboration between industry and academia.

ICs are supporting a very considerable volume of collaborative project activity between academia and industry, and this is translating into economic and wider benefits for Scotland. At least 1,169 collaborative projects have been supported (actual), an underestimate given incomplete MEF data for Phase 1 in particular, which have generated *at least* 2,120 commercial launches and other applications of innovation. Some 520 of the 1,169 collaborative projects have led to follow-on activity, almost a quarter direct to market and a similar proportion signposted to further support from other public funding or support bodies.

The main message from the analysis is that intensity of engagement and triple helix collaboration matters. This is to an extent common sense and is what some IC stakeholders have commented on anecdotally. This evaluation supports such a view. Intensity of engagement in terms of duration of relationship with an IC, the range of supports, the number of repeat collaborative projects, the number of links supported to other ecosystem bodies (not only, but particularly, universities and colleges), all appear to have a positive effect on innovation outcomes and impacts. As does support for securing financial benefits via an IC (see section 2.3.9 on drivers of benefits).

Relationships of a shorter duration, isolated supports, fewer project engagements, fewer linkages established with other ecosystem bodies and, where finance benefits are not part of the package, appear to be associated with a lower frequency of benefits. In other words, building multifaceted relationships (including additional finance benefits) over an extended time period (several years) leads to better innovation outcomes and impacts.

An implication for IC's is that they need to be able to build and maintain client relationships (for example through membership and networking, having appropriate CRM (Customer Relationship Management) systems, and the staffing to maintain and cultivate relationships with a degree of continuity) **(see recommendation 1)**.

Through collaborative projects, ICs are supporting the progression through the Technology Readiness Levels (TRLs), moving projects from TRL1-3 and above to TRL7-8 in many cases. This is positive and indicative of movement from basic research and proof of concept, through prototyping to demonstration and commercial readiness.

These findings generally apply regardless of client type (private business, university or college, public body or third sector). Larger employers also tend to do better out of IC support (in terms of, for example, introducing new goods, services or processes as well as employment gains). While the difference with smaller organisations is not marked, it reinforces the need to offer continuing access and support to SMEs **(see recommendation 2).**

2. IC role in supporting colleges and universities to maximise their value to Scotland.

This evaluation indicates a premium from triple helix collaborations, as opposed to other non-collaborative innovation supports. This is indicative of the benefits of academic input to project activity, drawing on the considerable and extensive research strengths across Scotland. Supported IC clients access university academics that extend well beyond IC host universities, with ICs working with a range of institutions with expertise in fields relevant to them. Where there is strong IC support for a link to a university or college then innovation outcomes and impacts increase (see section 2.4.8).

A strong market failure is evident amongst industry knowing how and where to access academic support and so there is evidence that ICs are helping to address this. Translating academic expertise into commercial products has been a long-standing challenge. The review indicates stronger innovation outcomes for clients where market failures have been significantly reduced (see section 2.4.9).

IC engagement with colleges is much lower than with universities and, despite some ICs increasing their activity levels with colleges recently, more could be done by ICs to engage with the college sector **(see recommendation 3).** The picture is variable across ICs, and some are growing their activity in this area, including co-design of course content.

The IC programme has provided substantial skills development support in the form of support to students, with a particular focus on those studying for master's degrees, and the ICs' support is typically well regarded. Students play a positive role in knowledge development and engagement with industry. There is good evidence that the placement/work readiness element of MSc programmes is a useful recruitment tool for industry, retaining skills in Scotland (see section 2.3.10). ICs should be supported to continue this activity **(see recommendation 4)**. Whilst few students attribute their employment wholly to IC support, many go on to enter employment in fields associated with their area of study, especially in the private sector.

Where ICs have mobilised finance for clients (securing new equity, new debt finance, or new public sector investment), there is a strong positive link with increased innovation outcomes. It is recognised that brokering external finance has not been an explicit role of ICs. Findings suggest significant challenges in accessing wider investment linked to commercialisation and a positive role has been played by ICs in encouraging links to investors. There would be advantages in further developing this role (see sections 2.3.4 and 2.4.11) **(see recommendation 5)**. While the success of ICs in mobilising other public sector sources of support for innovation should be acknowledged, ICs could still play a greater role in the leverage of private sector finance beyond that secured to deliver collaborative projects themselves **(see recommendation 6).**

3. Performance against targets and objectives.

Some 76% of the IC targets examined are exceeded or on track (75%+ achieved), although this is not evenly distributed across ICs. ICs have increased their engagement and collaborative project activities in Phase 2 compared to Phase 1, despite slightly reduced levels of core funding, with more varied events and increased business and academic collaboration. This is testament to the ICs growing in stature and capability, following Phase 1 which included their establishment and set up.

Targets for Phase 2 have been reached in the majority of instances with the remainder of the funding period still to be completed. The exception is skills development activities that have been

negatively impacted by the Covid-19 pandemic reducing placement possibilities and by Brexit reducing external funding and international students.

Overall, the ICs responded positively to the challenges presented by the Covid-19 pandemic, with some ICs leading national responses for the Scottish Government (see IC appendices). ICs continued, and in many cases increased, levels of support activity, pivoting to remote support and delivery, including major online conference engagement.

Not all Phase 2 targets have been stretching and monitoring against indicators is not consistent across the ICs, nor is target setting, with many adopting additional indicators and others not clearly reporting against core Monitoring & Evaluation Framework (MEF) indicators. There is sometimes a disconnect between the MEF and logic models and there is considerable merit in developing the MEF, for ICs and funders, increasing consistency of definitions and extending indicators, notably in relation to measuring wider benefits **(see recommendation 7)**.

ICs are meeting high level objectives for GVA and employment impacts to some extent. Against funder inputs of £97 million (Phase 1 & 2 to nearest reporting period, excluding DHI and PMS-IC inputs and employment)[28], the estimated net additional peak employment of 1,856 represents a cost of £52.2k per net additional job and funder input to net additional GVA is a benefit to cost ratio of 1.8:1. These are positive findings, and whilst the estimates do assume some wider benefits in the economy via the application of economic multipliers, the cost per net additional job (2021 peak employment year) is similar to the average annual GVA output per employee (taking a 5-year, 2016-2020 average). However, although the impacts to date are positive, they are not significant. This may reflect timing as a high proportion of businesses have still to successfully commercialise their innovation activities.

The net economic impacts for the supported population of business clients were estimated by grossing up impacts from survey respondents to the population. The Consultants did not have sufficiently detailed data on the characteristics of the total population of IC clients to compare with survey respondents in order to fully assess potential non-response bias and how representative the sample was of the population. In addition, due to the smaller number of respondents at the individual IC levels, confidence intervals for individual IC results were wider than for the overall programme. This means that grossed up impacts, particularly at the individual IC level, should be treated with a degree of caution as they are based on feedback from a relatively small sample of IC clients and have a larger margin of error. There is, however, little other evidence regarding actual or net economic impacts, and the findings represent the best evidence available on which to estimate the net economic impact of the ICs. The evaluation makes it clear that such impact data should be considered alongside other evidence of benefits in the report rather than in isolation.

4. How effectively ICs engage in the ecosystem.

There is strong evidence that ICs are engaging with and indeed building innovation ecosystems. ICs have supported *at least* 1,268 events across Phases 1 and 2, with extensive signposting from collaborative projects to other funding bodies (there is scope for more consistent feedback mechanisms from events) (**see recommendation 7**). IC clients indicate they have been significantly supported in establishing links with a wide range of ecosystem bodies, notably with universities, colleges, and private sector industry.

There has been progress in increasing the density of ecosystem networks. The number of different types of support accessed (e.g., collaborative projects, networking, training etc.) is also associated with better innovation outcomes and impacts (2.3.9). However, there is still scope to further

[28] DHI and PMS-IC excluded from GVA impact calculations- see section 2.3.6.

promote connections, in many cases as part of sustained, long-term relationship building **(see recommendation 1).**

Networking intensity suggests a positive relationship with innovation outcomes and impacts. This applies across the innovation outcomes and impacts examined. This finding supports the value of networking activity alongside collaborative projects, where the density of the relationships, as one might expect, appears important (see section 2.4.7).

It is clear from the evaluation that ICs are building ecosystems that go far beyond any narrow definition of IC activities. The IC appendices provide an assessment of how effective each IC has been in building engagement in its own ecosystem across several dimensions, with IC's providing leadership, influence, partnership building and system strengthening and building system resources in term of visibility, knowledge and entrepreneurship. Although some ICs have been active in building the ecosystem beyond Scotland more can be done to build international links and presence **(see recommendation 8**.

IC clients clearly value the role of the ICs in building the innovation ecosystem, reporting a range of innovation system-related benefits that relate to IC expertise, increased visibility and development of trust between organisations. ICs act as a source of sector or technology expertise for their clients, improve the visibility of the sector or technology area and support the diffusion of knowledge and good practices between academia and businesses, as well as the public and third sectors.

5. Wider impacts.

As well as building and strengthening the innovation ecosystems described above, ICs are contributing to wider societal goals, most notably in relation to human health and wellbeing and IC contributions to net zero. For some ICs, addressing the net zero agenda is explicitly articulated in their approach.

Survey evidence illustrates the breadth of wider impacts from IC support for clients, which include public and Third Sector organisations. Almost three in four clients report significant contributions to sustainable development goals because of working with the ICs, most frequently in the adoption of new medium-high, and high technologies, ensuring healthy lives, promoting wellbeing, COVID response, promoting lifelong learning and access to education and conservation and sustainable use of marine resources. Stakeholders cited IC impacts in relation to good health and wellbeing and climate action.

There are challenges in measuring wider benefits, with a need for stronger monitoring and evaluation plans and relevant MEF frameworks established as part of IC business cases (**see recommendation 7**). This is particularly necessary for ICs where wider benefits form a larger share of overall impact (such as DHI and PMS-IC). Such wider benefits may take longer to be realised and relate more closely to public sector agendas and efficiencies, rather than commercial outcomes. Other ICs also make a significant contribution to wider societal issues which may have dual commercial and public benefit impacts.

6. Degree to which ICs benefit all parts of Scotland.

Universities across Scotland are engaged with the ICs and collaborative projects between academics and IC clients are brought forward across a wide range of industrial sector interests. More than one in seven IC clients, for example, have engaged with universities in the North East of Scotland and almost one in 10 engaged with the University of the Highlands and Islands, principally SAIC clients.

The broad geographic spread of IC client activity also translates to innovation outcomes that are distributed across Scotland. The introduction of new or significantly improved goods, services, or processes since working with ICs and attributed to ICs, by client location, is slightly more concentrated in the central belt. However, all parts of Scotland demonstrate these innovation

outcomes. Knowledge benefits attributed to ICs are also distributed across Scotland with no clear geographic pattern.

There are pockets of Scotland where networking benefits are lower, typically although not always further away from the central belt, which shows the value of a local presence, especially in Highlands and Islands and the South of Scotland (**see recommendations 9a and 9b)**. Outreach and an 'on-the-ground' presence is effective in spreading the reach of IC activity and impact.

Employment additionality impacts are also evident across Scotland, again with no clear geographic pattern. However, employment impacts are greatest in certain local authority areas where high employment impact projects have been supported.

7. Lessons learned.

The delivery of the IC programme over Phase 1 and to date in Phase 2 has become more refined, with lessons learned from Phase 1. ICs are supporting increased levels of activity, with less core funding resource, in part though the leverage of public and private resources.

There remain some issues that frustrate ICs when being hosted by Universities, most typically in relation to administrative process linked to HR and finance, where ICs are bound by host University procedures. This includes the ability to recruit in a timely manner, offering competitive market rates and career progression. The ICs' academic institutional status also inhibits funding applications in some circumstances. Overall, however, there are many mutual benefits of the IC-host University approach and good practice which can be replicated and built upon (building on SFC 'Good Practice Governance Guide for Innovation Centre's Boards[29]') (**see recommendation 10**).

There are lessons learned from the implementation of the MEF, where there has been inconsistency of application and some confusion as to what information is captured and when. There have been additional issues with respect to data protection and the release of information to allow timely and effective evaluation. The MEF and data collection protocols should be reviewed and refreshed (**see recommendation 7)**.

As an extension of lessons related to data collection via the MEF, there is emerging good practice in relation to using CRM systems to better guide IC activity and impact. The evidence from this review is that longer-term, multiple intervention relationships work best in terms of innovation, GVA and job outcomes and impact, and CRM systems can be used effectively to monitor and nurture these interactions (**see recommendation 1)**.

There is emerging good practice in moving to a more programme, mission-based approach where ICs support groups or clusters of projects under prioritised themes, rather than a more project-based approach. BE-ST is perhaps most advanced in this approach, although others (e.g. The Data Lab) are developing their approaches to more strategic and transformational interventions. ICs should not lose sight of the clear benefits of collaborative project activity; however, this can be part of a wide programme-based philosophy (**see recommendation 11)**.

The use of independent advisory panels can also be effective in raising the quality of supported projects. Several ICs have advisory boards, and these have slightly different remits and responsibilities, although SAIC's independent scientific panel appears to be a good model in bringing independence to project approval (**see recommendation 12)**.

Recommendations.

The following recommendations arise from evaluation of the IC programme level. There are some additional, IC-specific recommendations contained in the IC appendices, although only where these are not covered by the overall recommendations below.

[29] https://www.sfc.ac.uk/innovation/innovation-centres/innovation-centres-key-documents.aspx

Recommendation 1: A more developed, sustained, relationship approach with IC clients, underpinned by sound CRM systems. Sustained relationships with multiple interventions deliver greater impact. This requires the specification of a minimum set of data fields needed for IC's CRM systems, and a wider systematic resourcing (of staffing and resources) for account management/ business managers to **promote sustained relationships** with clients (see also recommendations 2, 6 and 10). **Owner:** ICs. **Timescale:** 6-12 months.

Recommendation 2: Maintaining a mixed portfolio of clients and reinforced SME engagement. ICs should continue to engage SMEs and increase SME reach, balanced with recognition that some of the bigger economic gains are likely to be derived from larger players, and that these are also necessary ecosystem members. **Owner:** ICs. **Timescale:** ongoing.

Recommendation 3: To support the drive for further college involvement from a low base. The review shows relatively limited engagement with colleges although some ICs are working with colleges more extensively than others. There are a variety of ways in which ICs can engage with colleges, from collaborative R&D to course co-design, to skills development support and placements, to event and engagement activities. **Owner:** ICs. **Timescale:** ongoing.

Recommendation 4: Continue skills programme work/employer readiness support. The review evidence points to the value of skills development support to industry as well as students, including business recruitment. Some ICs have very strong employer readiness support programmes, and these should be continued and where relevant replicated in other ICs. Industry placements are particularly effective. **Owner**: Funders/ICs. **Timescale:** ongoing.

Recommendation 5: Supporting a greater role for ICs in encouraging links to investors and strengthening their position in ecosystems. The findings suggest that there are significant challenges in accessing wider investment linked to commercialisation. Part of this relates to next stage, post-feasibility finance and weaknesses in the investment support landscape (e.g., for early-stage manufacturing). Whilst ICs have played a positive role in this regard, they cannot overcome these barriers alone, and ICs could play a greater role in linking clients to potential investors. Consideration should be given to how ICs can be supported/encouraged to make these links. **Owners**: Funders/ ICs. **Timescale**: 6-12 months.

Recommendation 6: To support the drive for increased private and public sector leverage. Greater private sector leverage increases the return and value for money from core funder investment and generates economic benefits for Scotland. There have been considerable increases in private sector leverage in Phase 2 and this drive should continue. There have also been substantial additional public sector monies leveraged by ICs and this is further encouragement for building IC ecosystems (particularly where it results in a more favourable distribution of UK wide innovation funding to Scotland). **Owner:** ICs. **Timescale:** ongoing.

Recommendation 7: Improve and develop the monitoring and evaluation framework (MEF). The programme would benefit from an updated and revised monitoring and reporting framework (MEF) to assist in consistently tracking and reporting existing indicators as well as incorporating additional indicators and methods for capturing wider benefits, and equity (particularly representation of HIE and South of Scotland enterprises). As a minimum, this should include the following (and a working group should be established to guide/oversee):

a) Improved jobs and turnover tracking (ICs).

b) Common guidance for defining logic models, results chains, and 'logframes'[30], linked to a more robust/comprehensive suite of indicators; a MEF handbook with indicator definitions, and roles and responsibilities for data collection, and timing of collection (Funders).

[30] A logframe is a "systematic ,visual approach to designing, executing and assessing projects which encourages users to consider the relationships between available resources, planned activities and desired changes or results".

c) Common guidance on event monitoring and feedback (light touch) (ICs).

d) A process to address challenges in measuring wider benefits (e.g., health economics/carbon savings measurement) through the mapping of intended project results chains (i.e., the intended inputs, activities, outputs, outcomes, and impacts), and an associated set of qualitative and quantitative indicators (Funders/ICs).

Owner: programme partners, ICs. **Timescale**: 6-12 months

Recommendation 8: To support ICs to act internationally and to strengthen their links to SDI. ICs are an asset for Scotland with extensive reach and links to academic expertise and industry insight. ICs have the ability to have greater influence internationally. Whilst some ICs have developed some rest of UK and international links, this could occur on a much greater scale for the benefit of Scotland. ICs should demonstrate how they are going to grow their international presence. **Owner:** Funders/ ICs. **Timescale:** 6-12 months.

Recommendation 9a: Ensuring access to ICs by clients in the South of Scotland. Outcomes and impacts from the IC programme are being derived by those clients in the South of Scotland that engage with the programme, although the numbers engaged could be higher. There should be a more systematic approach from ICs to increasing access to ICs by South of Scotland clients, recognising the specific profile and needs of the South of Scotland business base. **Owners:** Funders/ ICs. **Timescale:** 6-12 months.

Recommendation 9b: Ensuring access to ICs by clients in the Highlands and Islands. Again, there is evidence that outcomes and impacts from the IC programme are being derived by those clients in the Highlands and Islands that engage with the programme. Engagement is greatest where ICs have a physical staff presence in the region and/or a dedicated resource. ICs should continue (and be supported to continue) outreach work and specific project activity in the region. **Owners:** Funders/ ICs. **Timescale:** 6-12 months/

Recommendation 10: Develop and implement refreshed national guidance for host universities. There is good practice amongst host universities in how best to support ICs to be as effective as possible. Some of this relates to clear processes and procedures (which typically exist), but also where flexibilities can and have been introduced to allow ICs to act as autonomously and independently as possible. In the past there has been a dedicated group looking at administration issues. Whilst there is no need for a formal group, guidance on good practice for host universities in relation to staffing (recruitment, progression) and financial processes would be beneficial. **Owner:** SFC. **Timescale**: 6 months.

Recommendation 11: Developing a more programme / mission- based approach. Impacts are greater when projects are not supported in isolation and there is merit is coalescing project activity around programmes of activity or around IC missions. BE-ST have developed this approach to good effect. This should also include the move to more strategic and transformational projects linked to further growing ICs' ability to lever additional project and private investment, again a move some ICs are already undertaking (see also recommendation 6). **Owner:** programme partners, ICs. **Timescale:** 6-12 months.

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https://www.betterevaluation.org/methods-approaches/methods/logframe

Recommendation 12: Greater role of independent panels to support project approval, including scientific panels. Some ICs are already using such panels to good effect (e.g., SAICs SISP) which supports project and programme review and approvals and offers independent opinion. Others may wish to adopt a similar model. **Owner:** ICs. **Timescale:** 6-12 months.

Appendix A. Methods.

A.1 Detailed evaluation objectives.

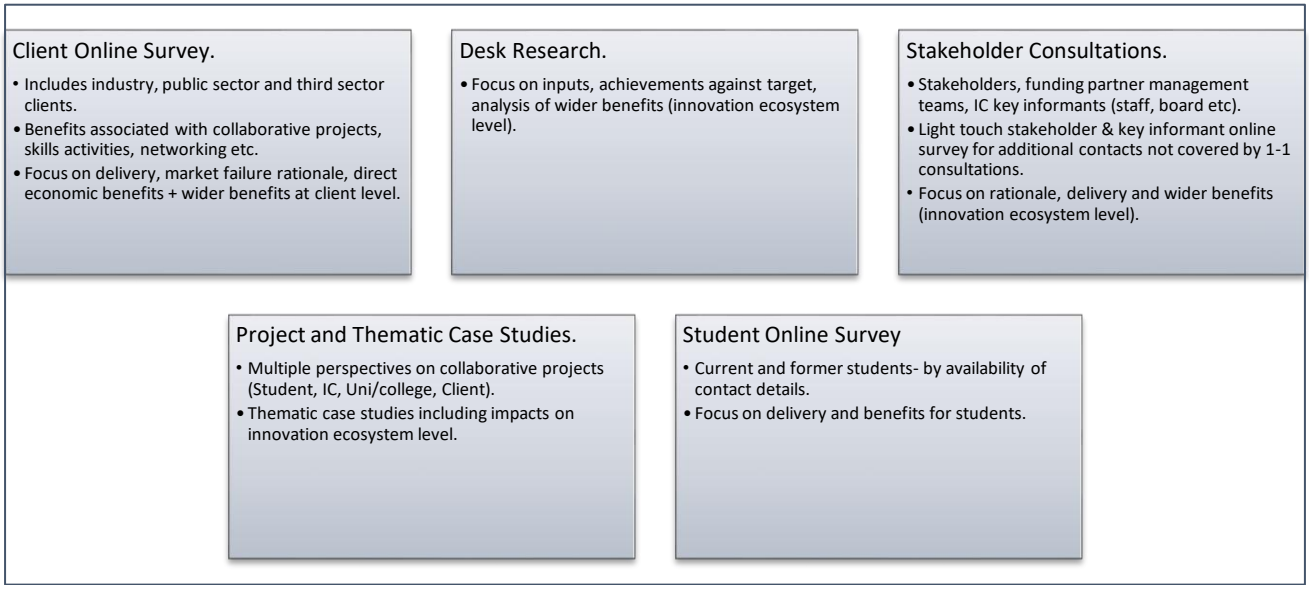
The high-level aims, and objectives of the evaluation are noted in the report introduction. The detailed evaluation objectives were as follows:

1. Assess how well the main objective of delivering routes to economic benefits through increased levels of collaboration between industry and academia has been achieved, both in terms of outputs and outcomes.
    a. Taking account of additionality (the counterfactual) and the difference ICs have made to stakeholders.
2. The role each IC has played in supporting the wider range colleges and universities to maximise their value to Scotland.
3. Examine performance against targets and achievement of objectives.
    a. Including phases 1 and 2.
    b. With reference to employment and net Gross Value Added (GVA).
    c. Understand intermediate benefits and routes to impact (e.g., access funding, develop new products or services, improve productivity, cost savings, investment in equipment, training or innovation, as well as the bottom-line impacts on sales, and exports).
    d. Considering the role of exemplar projects.
    e. Including an assessment of forecast benefits and implications for ongoing public sector support.
4. Identify outputs and outcomes achieved (and likely to be achieved) with a view to understanding how effective each IC is in building engagement in its own ecosystem.
    a. Considering an appropriate range of wider actors (e.g., NHS, investors, professional intermediaries, business organisations, corporate players at home and abroad).
5. Identify and assess wider impacts.
    a. Including a qualitative assessment of benefits (for example, understanding the journey of a project in terms of technology readiness levels, a method for estimating the maturity of technologies on scale from basic research though to operational testing).
    b. Including wider societal benefits, and environmental benefits, e.g.
        i. Contributions to health improvements, wellbeing, and prevention;
        ii. Contributions to place making (e.g., regeneration and urban development through location and quality of IC infrastructure);
        iii. Contributions to carbon emission savings.
        iv. Contributions to inclusion and equity (e.g., the geographical distribution of delivery and stakeholder diversity- for instance SMEs assisted, gender of students).
6. Assess the degree to which these achievements and impacts have reached all parts of Scotland.
    a. Taking account of the geographical distribution of activity, with particular reference to the HIE area.
    b. Making use of visual aids where (e.g., maps, heat maps) for key delivery areas, and main benefits in terms of employment and GVA.
7. Collate lessons learned from the ICs operations in delivering their service.

A.2 Main steps

The main steps included in the evaluation are summarised in the figure below (Figure A. 1).

Figure A. 1 Main evaluation elements.



Source: authors.

Desk review of management information and previous knowledge.

A detailed review was made of background documentation relating to the programme including previous monitoring and evaluation evidence; and relevant wider strategy/policy documentation. The following data was made available for all Innovation Centres:

1. Phase 1 business /delivery plans.
2. The Reid Report and additional EKOS report.
3. Due diligence prepared by the funding partners prior to Phase 2 approval being given.
4. Programme Phase 2 governance arrangements.
5. Each IC's Phase 2 business plan and delivery plan.
6. Phase 1 Summary reports.
7. Phase 2 Quarterly MEF reports.
8. Any other phase IC-level evaluation reports.
9. Selected additional project level and IC management information.

Stakeholder consultations.

Consultations were held with stakeholder representatives to assess the evaluation questions and areas for consideration. The consultations were conducted by semi-structured telephone or MS Teams interview. Topic guides to support the consultations were developed in advance of fieldwork and submitted to SE for review and comment. These guides were informed by the evaluation objectives and considerations outlined above. A copy of the topic guide is available for download here.

https://acrobat.adobe.com/link/track?uri=urn:aaid:scds:US:10fdf709-80db-34e9-bf4c-5f02ccdcd0a6

Full copies of the topic guide and questionnaires are included in Appendix J.

For anonymity we have not included a full list of consultees at the funder's request. Consultations were undertaken with:

- 13 funders;

- 70 IC stakeholders (including a number of sessions with multiple stakeholders, including board members, operational staff, host university representatives, other academic representatives, public sector representatives, and industry and third sector representatives.

Please note, the names of individual consultees are not used in the main body of the report.

A number of additional stakeholders were included in an online stakeholder survey (additional names provided by the client over and above the number allocated for one-to-one interview).

A copy of the stakeholder survey questionnaire is available for download here:

https://acrobat.adobe.com/link/track?uri=urn:aaid:scds:US:e5edaad6-583f-319d-aa52-b83ade53ee86

Beneficiary surveys.

Two questionnaire surveys were conducted aimed at gathering a range of quantitative and qualitative feedback from the selected beneficiaries relevant to the evaluation questions and considerations. The two surveys included:

1. IC client survey. A copy of the client survey questionnaire is available for download here:

   https://acrobat.adobe.com/link/track?uri=urn:aaid:scds:US:1387b98b-d5d5-3962-b13b-c3d535c48a14

2. IC student survey. A copy of the student survey questionnaire is available for download here:

   https://acrobat.adobe.com/link/track?uri=urn:aaid:scds:US:8dd30dd0-9526-3ba5-b1c2-f809f5211cdf

The sampling frames comprised lists of relevant recipients with the necessary information to contact the respondents (that is, e-mail in the first instance). This data was supplied by SE. The surveys were conducted using an online survey tool. Draft questionnaires were developed in advance and submitted to SE for review and comment. The timing of the survey administration was agreed with the Funding Partners, and the survey administration took place over four weeks. All relevant beneficiaries were approached to participate in the survey.

Relevant beneficiaries included those deemed to have had sufficient level of support from the IC to merit follow up, such as those in receipt of support from the ICs to develop projects, but beneficiaries receiving light touch support (event attendees, recipients of newsletters, etc) were excluded on the basis that the evaluation questions and details of impacts achieved would be disproportionate to the level of support.

The sampling approach for the client survey was as follows:

- **Method**: In the first instance, a census of all beneficiaries was targeted (i.e., all beneficiaries were approached to participate). In practice, it was not possible to ensure complete coverage – response rates did not allow this – however, the approach gave every beneficiary (for whom email details were held) an opportunity to participate in the evaluation.
- **Population**: The population for this sample was all beneficiaries supported by the programme (excluding one-to-many interventions e.g., newsletters, open online courses) (that is, c1,863 companies across the Centres, and c1,809 students (at PH.D. and MSc. levels (other qualification levels were not included in the survey).
- **Sampling Frame:** This comprised a list of relevant recipients with the necessary information to contact the respondents (i.e., e-mail). This data was supplied by SE or directly by ICs in some cases.
- **Sampling Strategy:** As noted, a census of all beneficiaries was conducted, rather than a random sample. Given the likely small population sizes (per Centre), a high proportion of all beneficiaries would in any case be required to generate a representative sample for each Centre (before considering response rate).

- **Administration:** The survey was conducted via email distribution using SNAP online survey software. Draft questionnaires were developed in advance and submitted to SE for review and comment.
- **Response Rates:** The study sought to maximise the response rates (through careful questionnaire design, administration, and email and phone reminders). Use was made of email reminders and dedicated support was available for additional telephone reminders, and interviews.

Results of the client and student surveys are noted below (Table A. 1) In total some 465 responses were achieved for the client survey. This provided a response rate of 25% of the estimated in scope population, with a margin of error of 4% (at the 95% confidence level), which represents a robust programme sample. Response rates at the IC level are generally indicative and caution is advised when generalising from the individual IC client survey findings.

While the overall programme level sample for students is moderate (11% response rate with 6.5% margin of error (at 95% confidence level), this primarily relates to the three ICs of BE-ST, SAIC and The Data Lab. Again, caution is advised when generalising from the individual IC student survey findings.

A small online stakeholder survey was conducted in addition to one-to-one interviews to accommodate additional feedback. This was a purposive survey.

Table A. 1 Survey administration details.

Target group	Estimated in scope population	Bounces	Complete	Response Rate (%)	Margin of Error (%)*
Client BE-ST	386	59	78	20	+/-10
Client CENSIS	169 (76†)	0	43	25 (57)	+/-13 (+/-10)
Client DHI	79	7	27	34	+/-15
Client IBioIC	244	3	59	24	+/-11
Client PMS	30	0	17	57	+/-16
Client SAIC	466	34	147	32	+/-7
Client TDL	489	41	94	19	+/-9
Total Client	**1,863** (1,770†)	**144**	**465**	**25** (26)	**+/-4** (+/-4)
Student BE-ST	127 (65†)	11	15	12 (23)	+/-12(+/-22)
Student CENSIS	60 (3†)	0	2	3 (67)	‡
Student DHI	99 (4†)	0	1	2 (25)	‡
Student IBioIC	184 (20†)	0	6	3 (30)	‡
Student PMS-IC	245 (0†)	-	0	0	‡
Student SAIC	177 (91†)	2	53	30 (58)	+/-11 (+/-9)
Student TDL	917 (736†)	172	124	12 (17)	+/-8 (8)
Total Student (PhD & MSc)	1,809 (919†)	**185**	**201**	11 (22)	+/-6 (+/-6)
Stakeholder	22	0	15	68	Purposive sample

*Source: authors. Notes: * at 95% confidence level. † number of contacts provided (sampling frame in brackets).‡ representative sample not available. Number of responses to individual questions may vary.*

It is noted that clients' survey responses were answered on the basis of the main IC they had worked with. This was not necessarily the same as the IC contact list from which they were sampled if a client worked with more than one IC. However, the difference was small (see Table A. 2). Figures and tables in this report refer to the main IC worked with (column B).

Table A. 2 Number of respondents identifying main IC worked with versus number of respondents replying to IC contact lists.

IC	A. Number of responses to IC contact list	B. Number of responses identifying IC as main IC worked with
BE-ST	78	76
CENSIS	43	44
DHI	27	30
IBioIC	59	66
PMS-IC	17	16
SAIC	147	139
TDL	94	94
Total	**465**	**465**

Source: authors

GDPR issues.

A number of data fields were requested from ICs in order to facilitate the surveys, including name, position, organisation name, email address, contact number (and nature of engagement if available). Only SAIC was able to provide a comprehensive set of contact information. In particular, only SAIC was able to provide comprehensive telephone contacts for clients, limiting the possibility of conducting telephone interviews to supplement online surveys.

In general, the availability of up-to-date student contact data was limited for all but BE-ST, SAIC and The Data Lab, and no ICs were able to provide student telephone contacts. A high proportion of some IC student emails were no longer in use (i.e., BE-ST and The Data Lab).

The evaluation notes that there were limitations in the ability of some ICs to share stakeholder contact information for the surveys due to GDPR data protection issues. Time taken to agree data protection protocols between the client and the ICs caused significant delay in the administration of the survey. Further, some ICs were required to seek additional consent for client participation in the surveys, which in one case, significantly reduced the available sampling frame.

It would be beneficial for future evaluation for all ICs (and host institutions) to agree a common approach to GDPR as it applies to IC client and student contact information, and, for all IC clients and supported students to be requested to opt in to be contacted for the purposes of evaluation at a future date.

Case study research.

A further phase of the evaluation research was to undertake up to 21 impact case studies (3 per centre). These case studies are used to gain an in-depth understanding of selected projects. Cases were selected based on discussion with funding partners: selected by type, to provide a broadly representative range of projects, and a broad geographic spread. Case studies were selected by consultants and checked by the Innovation Centres and Scottish Enterprise to ensure there was an appropriate mix of projects.

In terms of case data collection and process, a consistent set of information on the cases was identified and collected (including that derived from project documents, reports, and interviews with project leader / staff), seeking where possible to identify process issues as well as quantitative and qualitative evidence on project outcomes and sustainability.

Economic impact method note.

This note sets out the approach to impact assessment (the gross and net impact of in scope programme interventions). The approach adopted is consistent with (2014) Scottish Enterprise Economic Impact Guidance, and HM Treasury Green Book guidance.

Economic Benefits Assessed.

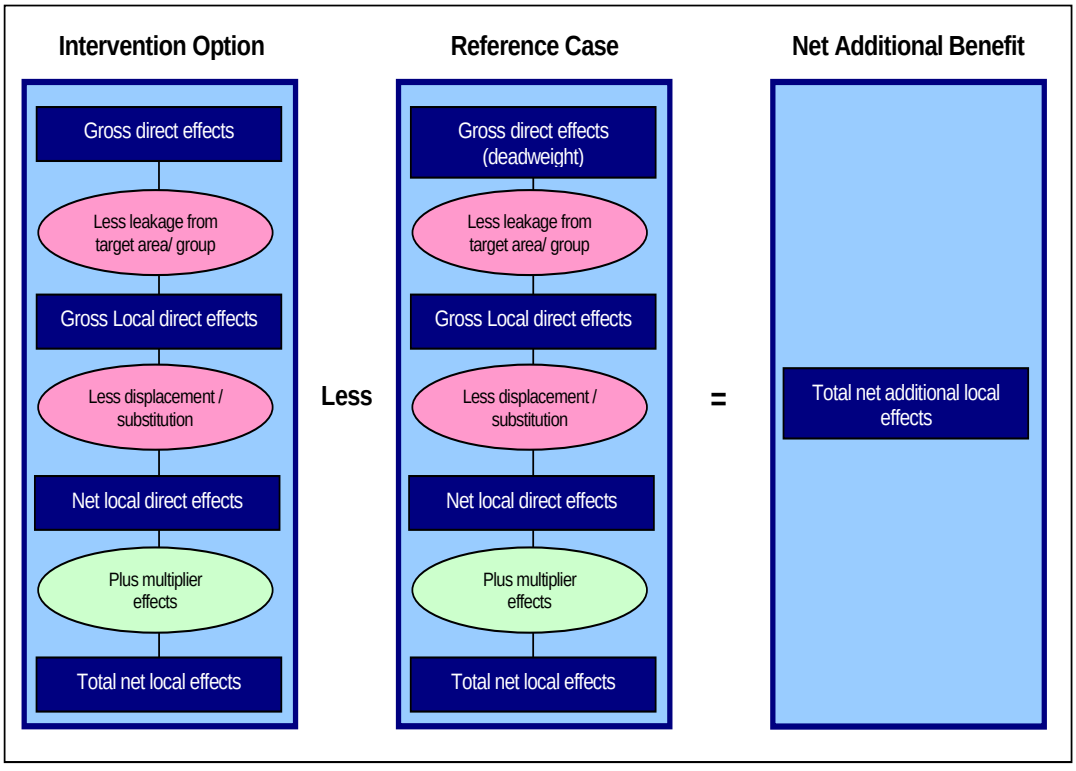
The evaluation examines two main measures of economic benefit. This includes business **employment**. The second, **Gross Value Added**, is estimated based on reported employment. For each of these benefits the evaluation assesses both the Gross Direct benefit and the Net Additional benefit. The latter considers not just the benefit to the individual firms, but also the wider interaction with the Scottish economy.

It is noted that respondents provided details of the total headcount employed (all employment categories). Therefore, no estimate of Full-time Equivalents was made.

Approach to Assessing Additionality.

The approach to assessing additionality is set out in the figure below and is consistent with HM Treasury 'Green Book' and Scottish Enterprise guidance. In summary, the Gross Direct benefits are compared against a counterfactual (also referred to as the reference case, or deadweight), both cases being adjusted for secondary indirect factors which reflect the interaction of the intervention with the Scottish economy. These are: displacement, leakage, and economic multipliers **but not** substitution (discussed further below). The counterfactual was established by the beneficiary, guided by a series of questions that formed a core part of the beneficiary survey questionnaire.

Figure A. 2 Additionality Approach



These factors set out above were combined, **for each individual respondent**, in the standard additionality model represented by the formula (substitution is not assessed):

$$AI = [GI \times (1-L) \times (1-Dp) \times (1-S) \times M] - [GI^* \times (1-L^*) \times (1-Dp^*) \times (1-S^*) \times M^*]$$

Where: AI= Net additional impact; GI= Gross Impact; L= Leakage; Dp= Displacement; S= Substitution; M= Multipliers.

Sources of Data.

As noted, the data used to estimate Gross Direct and Net Additional benefits, GVA, and value for money, are derived from the survey of beneficiaries and secondary data sources as summarised in

the table below (Table A. 3) (based on scale and timing of employment benefits). A number of new variables were created from the survey data to permit impact calculations.

Gross Value Added (GVA) is often regarded as the best measure of the sum of economic activity within an area. GVA is an indicator of wealth creation and measures the contribution to the economy of each individual firm (or industry sector). GVA is one of the Government Economic Strategy National Performance Framework Purpose Targets.

GVA estimates are based on GVA per head data for best-fit selected industry groups drawn from Scottish Government statistical source (Scottish Government (2022) Scottish Annual Business Statistics 2020, Scottish Government: Edinburgh).

Table A. 3 Data Sources

Factor	Source
Gross Direct Employment	Beneficiary survey
Employment Counterfactual (Deadweight)	Beneficiary survey
Gross Value Added	GVA per head data for best-fit selected industry groups drawn from Scottish Government statistical source (Scottish Government (2022) Scottish Annual Business Statistics 2020, Scottish Government: Edinburgh).
Employment, and GVA Multipliers	Scottish Government Input-Output tables
Displacement	Beneficiary survey
Substitution	Not applicable
Leakage	Beneficiary survey

Source: authors

Dealing with Data Gaps.

If a company answered 'don't know' to the displacement question the average displacement figure for those where a value was provided was applied.

If a company answered 'don't know' to market conditions question their response was altered and set at the midpoint ("stayed the same") to allow a displacement figure to be calculated.

Employment impact figures are presented on an annual basis and according to the peak year of impact.

Area of Benefit.

The analysis adopts Scotland as the area of benefit. Net Additional impacts at the regional or UK level may vary.

Period of Benefit.

Gross direct employment is examined for the years 2013 to 2022 (where applicable).

Deadweight.

Deadweight is assessed for employment benefits on an annual basis (derived from beneficiary survey).

Displacement.

The definition of displacement, consistent with HM Treasury Green Book supplementary guidance, addresses the question: 'Will the intervention reduce existing activity from within the target group or area? If yes, by how much? A factor is introduced into the evaluation framework to account for these issues. The factor accounts for product market displacement.

A weighted displacement figure has been applied using the responses obtained to the client survey question on Competition and on Market Conditions (see tables below) The proxy displacement values derived are combined with the responses to the market conditions question. This is based on the principle that displacement will be higher in a declining market and lower in an improving market.

The proxy data for displacement are applied to employment additionality estimates.

Table A. 4 Product Market Displacement- Competition.

Thinking about competition in your main area of business, which of the following statements best describes your business?	Proxy Displacement Value
All the businesses I compete with are based in Scotland	0.00
The majority of businesses I compete with are based in Scotland	0.25
Around half of the businesses I compete with are based in Scotland	0.50
A minority of businesses I compete with are based in Scotland	0.75
None of the businesses I compete with are based in Scotland	1.00

Table A. 5 Product Market Displacement- Market Conditions.

Thinking about the market conditions over the period you have been account managed, would you say that market conditions have...?	Displacement Weighting Factor
Declined strongly	0.50
Declined moderately	0.75
Are about the same	1.00
Improved moderately	1.25
Improved strongly	1.50

Substitution.

The survey does not directly explore levels of substitution amongst respondents. No direct evidence of substitution is available, and it has therefore been assumed as zero.

Leakage.

Leakage is a measure of the extent to which benefits are received by the target group or area, rather than an unintended group or area. This factor is considered relevant to estimation of Net Additional turnover benefits as not all beneficiaries may be Scottish-based establishments.

Employment leakage assesses the extent to which benefits have accrued to workers resident outside of Scotland. This is assessed by the survey, and employment based outside of Scotland is not included in the employment of GVA impacts recorded.

Economic Multipliers.

HM Treasury Green Book supplementary guidance makes the argument that economic multipliers should be used with caution, if at all, at the national level: 'multiplier or 'second round' effects should normally be excluded on the grounds that the alternative uses to which the resources would otherwise be put would also generate multiplier effects; and differences in such effects are often difficult to distinguish with confidence or without disproportionate effort'.

However, for the purposes of comparison with earlier evaluation and benchmarking with other initiatives, the evaluation includes results with multiplier effects. **Type II Employment multipliers** are applied using the standard values contained in the most recent available Scottish Government Input - Output tables (5-year averages).

Gross Value Added.

Gross Value Added (GVA) is a measure of the contribution to the economy of each individual producer, industry or sector. It can be thought of in general terms as a measure of the total output

from a business less the costs of raw materials and other inputs used in production. GVA is generally regarded as the best measure of the sum of economic activity within an area.

A number of methods are available to estimate the GVA impact. Two main choices are between a calculation based on detailed company financial information and a second approach based on estimates of average GVA return per unit of turnover for industry sectors. This choice represents a trade-off between accuracy and ease of collection. As such, GVA estimates are based on survey employment data, and secondary data on GVA averages available from the Scottish Government (Scottish Annual Business Statistics- latest available figures -5-year averages). It is noted very few survey respondents were able or willing to provide turnover data.

Prices.

Where stated in the body text, all historic GVA data is converted to a consistent 2022 price basis using latest available GDP deflators for each year.

Optimism Bias.

No adjustment is made for optimism bias in considering forecast GVA on the basis that there are no robust evidence sources available on which base assumptions on suitable optimism bias. A range of scenarios would be possible and something the funders may wish to consider as an after action.

Discounting.

Discounting has been undertaken for GVA impacts at 3.5% discount rate with a base year of 2012.

Grossing.

The net economic impacts for the supported population of business clients were estimated by grossing up impacts from survey respondents to the population. The Consultants did not have sufficiently detailed data on the characteristics of the total population of IC clients to compare with survey respondents in order to fully assess potential non-response bias and how representative the sample was of the population. In addition, due to the smaller number of respondents at the individual IC levels, confidence intervals for individual IC results were wider than for the overall programme. This means that grossed up impacts, particularly at the individual IC level, should be treated with a degree of caution as they are based on feedback from a relatively small sample of IC clients and have a larger margin of error. There is, however, little other evidence regarding actual or net economic impacts, and the findings represent the best evidence available on which to estimate the net economic impact of the ICs. The evaluation makes it clear that such impact data should be considered alongside other evidence of benefits in the report rather than in isolation.

Assessing innovation ecosystem benefits.

An analytical framework was developed to systematically assess IC benefits for the innovation ecosystem. The framework was informed by the following three approaches:

1. Wise, E., Eklund, M. Smith, M., Wilson, J. (2022) A participatory approach to tracking system transformation in clusters and innovation ecosystems—Evolving practice in Sweden's Vinnväxt programme, Research Evaluation, 31(2), 2022, 271–287. This article presents an evolving approach for tracking system transformation in clusters and collaborative innovation initiatives.
2. Department for Business, Energy and Industrial Strategy, (2017) Industrial Clusters in England, BEIS Research paper No.4, BEIS: London, pp 94-95. Research identifying 'Characteristics of Successful Clusters'.
3. Department of Trade and Industry (2006) Evaluating the impact of England's Regional Development Agencies, Developing a methodology and evaluation framework, DTI

Occasional Paper No.2, DTI: London, pp19- 21. This is a 'Strategic Added Value' (SAV) framework. The concept of Strategic Added Value was developed as part of an impact evaluation framework used to evaluate the former regional development agencies in England.

- Several criteria were developed based on the authors' synthesis of the above work (see
- Table A. 6). Each of these criteria are assessed following the author's development of a broad scoring framework for each criteria taking account of:
- Activity scope.
- Activity scale/frequency.
- Geographic reach of activity.

These criteria are used to assign each IC to one of 4 zones as outlined in Table A. 7. The zones are not intended to be a means of comparing performance of ICs, rather to evaluate IC performance relative to individual context and objectives.

The scoring approach is based on:

- Consultant's judgement scores based on satisfaction of scoring criteria following programme of stakeholder consultations, and analysis of documentary evidence (e.g., Annual Reports).
- Judgment scores also informed by % of client respondents identifying IC as significant source of support for wider innovation 'ecosystem' in their sector or technology area.
- Judgments scores also informed by relevant inputs/outputs reported in KPIs where applicable (e.g., leverage).

Table A. 6 Innovation ecosystem measurement framework

Criteria	Examples	Code
Innovation Centres- System Leadership		
1. Leadership.	Providing strategic leadership and acting as a catalyst via development of a sector/ technology area strategy, including: 1. Articulating and communicating development needs. 2. Identifying opportunities and solutions to partners and stakeholders (in particular, new opportunities for innovation and business development for local firms). 3. Providing industrial leadership (e.g., leading to greater investment, strengthened infrastructure or skills upgrading).	LED/CAT
2. Influence.	Informing and influencing strategy and actions related to thematic area, including: 1. Carrying out or stimulating activity that defines the distinctive roles of partners. 2. Gets partners to commit to shared strategic objectives. 3. Influences partners to allocate their funds accordingly.	POL/ST
3. Partnerships	Acting as a trusted Strategic Partner, e.g., 1. New strategic partnerships. 2. New longer-term partnerships. 3. Facilitates the sharing of confidential information and benchmarking (leading to the identification of collaborative opportunities and the diffusion of good industry practices).	SP
4. System Strengthening	Creating synergies and facilitating academic -industry networking. 1. Development of collaborative culture, especially academic-industry e.g., a) New cross-sectoral connections. b) Improved structures. c) Improved working practices among innovation support actors. d) Using existing academic expertise to solve industry problems. 2. Using academic knowledge and expertise to a) improve information exchange and knowledge transfer and coordination. b) Improve integration of the design and delivery of interventions between partners. 3. Facilitating the identification of new business opportunities and linking academic expertise to business. 4. Setting up the mechanisms and incentives for more effective and deliberative engagement of stakeholders in the design and delivery of local priorities and projects.	ISS
Innovation Centres- System Resources		
5. Visibility (market)	(Primarily in relation to sector markets and investors) 1. Acting as 'voice of sector 'sub-nationally. 2. Acting as the 'voice of the sector' nationally. 3. Development of national, position or visibility.	POS-N
	4. Actions to increase visibility of Scotland internationally, leading to strengthened flows of inward investments into Scotland and support for the internationalisation of local firms. 5. Engagement in international RDI projects.	POS-I
6. Resources	1. Development of physical research and innovation infrastructure and environments (that do not duplicate existing effort) e.g., a. Test/demo facilities,	RES

	b. accelerators. 2. Improved organisational capacities or ways of working (innovation processes)	
7. Leverage.	1. Identifying opportunities and engaging across UK and beyond 2. Engaging and bringing business and academia together in partnership to apply for funding (even if unsuccessful) (e.g., providing letters of support). 3. Provides financial and other incentives to mobilise domestic partner and stakeholder resources: a) Equipment. b) People. c) Funding, including expansionary investment.	INV-N
	4. Provides financial and other incentives to mobilise international partner and stakeholder resources: a) Equipment. b) People. c) Funding e.g., new international investment e.g., FDI/ purchase of companies in Scotland.	INV-I
8. Knowledge	Affecting how knowledge is created and spread between actors and combined/applied in the system. 1. New university courses. 2. New research networks. 3. Programmes or institutional establishments/expansions within the thematic area. 4. Attraction of talent and supporting skills/talent development. 5. Sharing 6. Linking industry demand to academic via MSC/PhD support	KD
9. Commercialisation	Supporting activities leading to commercial or public sector exploitation: 1. Fostering test of new technologies, applications, or markets. 2. New company establishments. 3. Experimentation within existing companies. 4. New companies or spin-outs.	EE-N
	5. Foreign companies establishing in Scotland.	EE-I

Source: authors

Table A. 7 Judgement scoring.

Judgement Scoring			
Zone 1.	Zone 2.	Zone 3.	Zone 4.
a) Scope. Minority of examples. b) Frequency. Small number of examples. c) Reach. Mostly regional /sub-national.	a) Scope. Preponderance of examples. b) Frequency. Multiple examples. c) Reach. Mostly national.	a) Scope. Comprehensive examples. b) Frequency. Multiple examples. c) Reach. Mostly national level; some RoUK/ International engagement (with tangible Scottish benefits).	a) Scope Comprehensive examples. b) Frequency. Multiple examples. c) Reach. National level; Extensive RoUK/ International engagement (with tangible Scottish benefits).

Source: authors