KTI
Knowledge Transfer Ireland
Where Research & Business Connect

Review of the outcomes reported in the KTI AKTS 2016

Contents

Executive Summary

Knowledge Transfer Ireland (KTI), in conjunction with the HEA, publishes the Annual Knowledge Transfer Survey (AKTS). The AKTS is the review of business engagement and commercialisation (knowledge transfer) by the Research Performing Organisations[1] (RPOs) within Ireland. KTI commissioned a study, undertaken by IP Pragmatics[2], into the outcomes reported in the Annual Knowledge Transfer Survey 2016[3] (AKTS2016).

The main objectives of the study were to: collect in-depth information on the new products and services launched to market in 2016 based on RPO licences; collect information on those spin-out companies that were reported as "active" at year end 2016 (see Appendix A. Definitions); investigate the status of the products and services that were listed as launching to market in the previous AKTS studies (2013-15) and; investigate the progress of those companies that were reported as Active Spin-outs in the AKTS2016 that were also listed as active in the AKTS2013. This report summarises those findings.

In 2016, 24 products and services which derived from licences from RPOs were brought to market by 18 different companies. The dominant sector this year was Manufacturing and Materials at 30%. Of the 93 products and services that were launched from 2013-2015, 67 (72%) were still available on the market as of the end of 2016.

At the end of the year there were 109 Active Spin-outs (active for at least three years) that had brought in investment funding or recorded turnover and had at least one full time employee. The majority of Active Spin-outs were in the ICT sector (35%) and Health & Medical Technologies (28%). The survival rate for Active Spin-outs is encouraging, with 83% of the 78 Active Spin-outs from 2013 either still independently active or successfully acquired or merged with another company.

The commercialisation activities of the RPOs show strong support for the local economy, with 89% of the licensee companies and 99% of the Active Spin-outs reported in 2016 as having an Irish base. In the sample sets studied, the Active Spin-outs support at least 980 jobs in Ireland, and the licensee companies support many more. The most commonly licensed intellectual property (IP) underpinning both product and services was patented IP.

The proportion of these outcomes that arise from the Institutes of Technology and from the Specialist and State Research Institutions has been steadily increasing over the past four years which aligns with the investment in and development of the technology transfer capability within the RPO sector since the introduction of the Enterprise Ireland Technology Transfer Strengthening Initiative (TTSI).

State funding played a key role in supporting development of technology and IP that led to products and services launched to market and in the creation of spin-outs which achieved "active" status. Both types of outcome have particularly benefitted from awards under Enterprise Ireland's: Commercialisation Fund; Innovation Partnerships and; High Potential Start Up programme. This does not take into account the other investments made by the State that underpinned the research and infrastructure within the RPOs from which these commercialisation outcomes stem.

1 Irish Higher Education Institutions and State research organisations

2 www.ip-pragmatics.com

3 http://www.knowledgetransferireland.com/About_KTI/Reports-Publications/KTI-Annual-Review-and-Annual-Knowledge-Transfer-Survey-2016.pdf

2014-2016 **Highlights**

24

Validated new products and services launched to market by 18 companies based on RPO licences in 2016

109

Validated active Spin-outs based on RPO intellectual property as of the 31st December 2016

67

products and services that are still on the market after being launched in the three years prior to 2016

980

The 109 Active Spin-outs are estimated to support at least 980 jobs

89%

of the companies bringing RPO-related products and services to market in 2016 are based in Ireland

99%

of Active Spin-out companies are based in Ireland

83%

of the Active Spin-outs from 2013 are either still active or have been successfully acquired or merged with another company

Funding

Enterprise Ireland Commercialisation Fund and HPSU funding plays a key role in supporting the opportunities that result in products and services launched to market and in the creation of companies that mature into Active Spin-outs

1
Introduction

The Annual Knowledge Transfer Survey (AKTS) provides data and case studies to convey the range of activities, outcomes and benefits to enterprise that come from knowledge transfer and commercialisation with the Irish research base. Knowledge Transfer brings many benefits, including a closer understanding of industry challenges within academia, new entrepreneurial activity, higher business activity, more jobs, more investment into Ireland and the application of academic research for the wider benefit of society. The AKTS covers a range of topics from invention disclosures, IP activity and licensing to collaborative research with enterprise and the formation of new spin-out companies. The survey measures these activities over a calendar year (January to December).

The data for the AKTS are provided primarily by the Technology Transfer Offices (TTOs) of the RPOs.

The 26 state-funded RPOs submitting data are:

- Seven universities
- 14 institutes of technology
- Three specialist research institutes: The Royal College of Surgeons; the National College of Art & Design and; the National College of Ireland
- Two state research bodies: The Marine Institute and Teagasc (the national Agriculture and Food Development Authority)

In this Outcomes Study, IP Pragmatics was commissioned to take a deeper look at two of the indicators which are reported in the AKTS survey for 2016:

1. the number of products and services which were brought to market during 2016, and
2. the number of spin-out companies from RPOs that are deemed to be "active" at least three years post formation as of 31 December 2016.

The study also looked back to the Active Spin-outs which were reported in 2013 (the first year of the AKTS survey) and revisited all the products and services launched since 2013, to track their progress and to understand the impacts that the transferred technologies have had in that time.

2

Products and services launched on the market based on licences from RPOs

The AKTS 2016 reported 26 new products and services launched on the market in that year as the result of a licence from an RPO. This is likely to be an underestimate of the actual number launched, due to the challenges of obtaining data in all situations as information may be viewed as commercially sensitive by the licensee. In some cases, the RPO may only be informed about the new product if and when royalties become due, rather than at the time of launch. The survey period of January-December 2016 relates to the product or service launch date, rather than the date of the licence, which may have been signed earlier.

After validation by the study team, two of the products reported in the AKTS2016 were excluded. The 24 validated new products and services flowed from licences executed by 11 RPOs. Ten of these new products and services were generated in Universities, nine from Institutes of Technology (IoT) and five from specialist institutes or state research bodies. The majority of these were products. Ten were services or included a service element.

The TTOs were actively involved, often from the initial research stages, supporting identification of industry partners and application to suitable funding schemes. They then worked with the Principal Investigators (PIs) at the RPO to identify tangible and intangible intellectual property arising from the research and to put appropriate protection mechanisms in place. The TTO routinely led the negotiation of the licence agreements.

2.1 Pathways to licensing

The study team examined the relationships that led to the licences that underpinned product and services launches. They found that half (12) of licences were issued to an RPO spin-out. Many of the other licences arose from collaborative research projects with industry, either funded exclusively by the partner company, or through grant-funding, most often from Enterprise Ireland and in one case from SFI and in two cases from the European Union. One product/service launch was the result of a licence of a student-led start-up.

2.2 Types of intellectual property underpinning products and services launched in 2016

Products and services brought to market may build on multiple types of IP. Not all of which may emanate from an RPO. Of RPO-derived IP, in 2016, a total of 29 different types of IP were transferred to generate the 24 products and services. As in previous years, about a third of the licences are based on patents originally filed by the RPO. A slightly smaller number of the licences are based on software code and algorithms.

Figure 1: Source of products and services brought to the market in 2016 by type of institution (n=24)

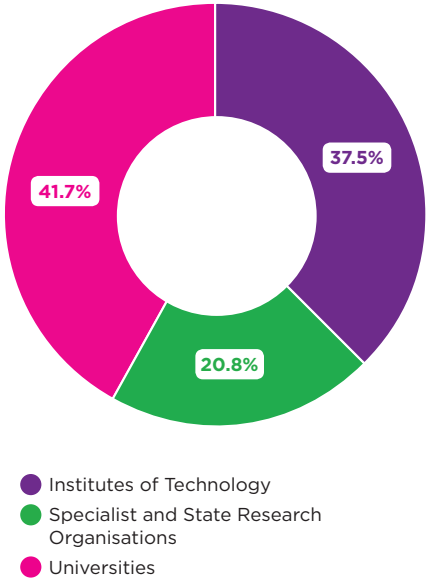
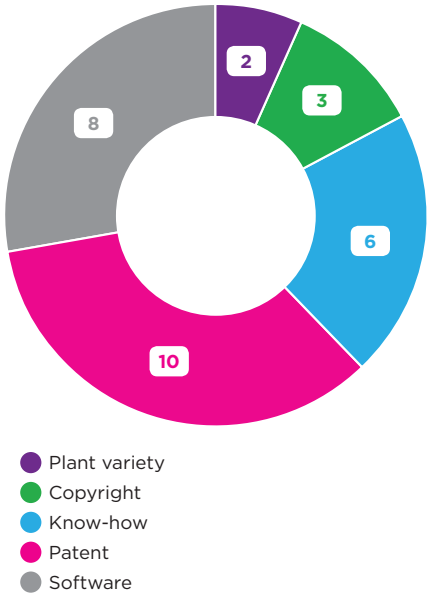


Figure 2: Types of IP rights licensed from RPOs that led to products and services launched in 2016 (n=29)



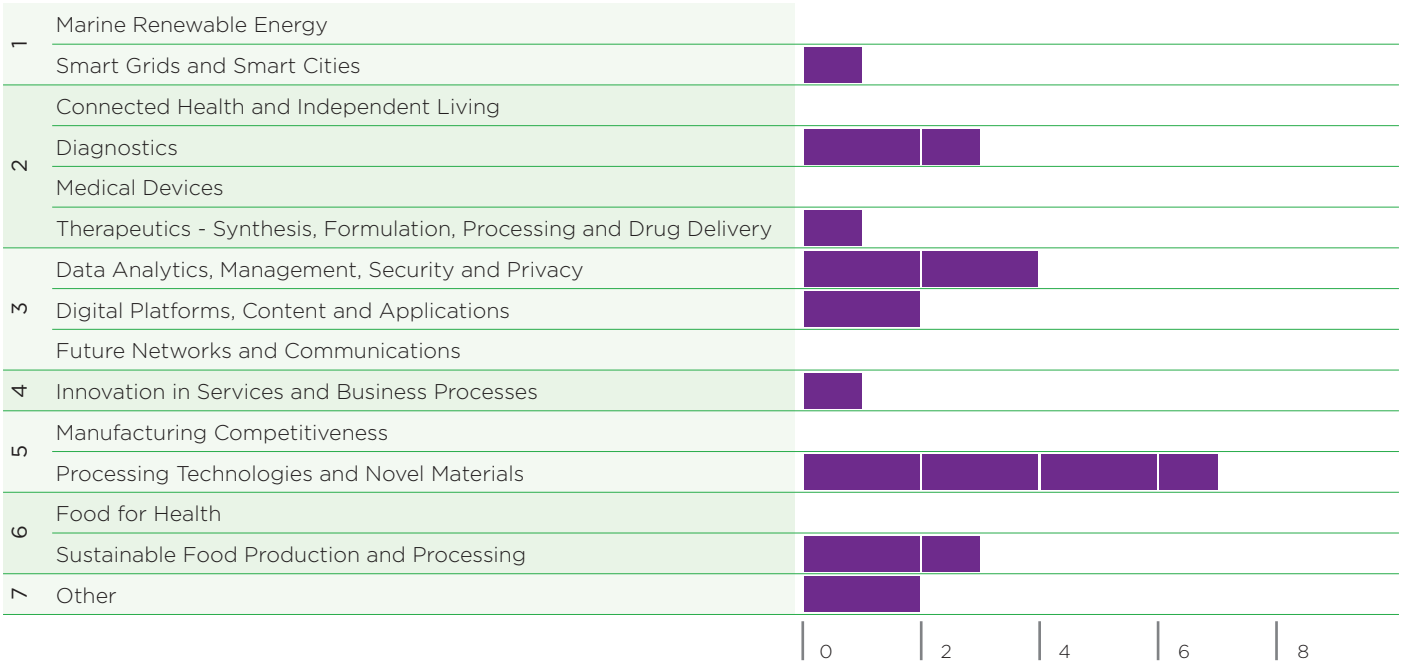
2.3 Research Prioritisation Areas

The TTOs classified the product and service launches against the 14 national Research Prioritisation Areas and six high level Research Prioritisation Themes[4]. Where the interdisciplinary nature of a licensed technology could have allowed multiple categories, the most relevant area was selected.

The majority (29%, 7 launches) were categorised in the field of Manufacturing and Materials (last year the most prevalent area was ICT at 42%) followed by ICT (25%, 6 launches). Again this year, 8% fell outside of the Research Prioritisation areas and are classified as "Other".

The graph below drills down into the themes to categorise the products and services into the individual research prioritisation areas:

Figure 3: Licensed technologies launched in 2016, mapped against research themes and priority areas (n=24)



Research Priority Themes:

1 Energy
2 Health & Medical Technologies
3 ICT
4 Innovation in Services and Business Processes
5 Manufacturing & Materials
6 Sustainable Food
7 Other

2.4 Characteristics of licensee companies

The study team looked into the licensee companies launching RPO-based products and services. In some cases, the same company brought more than one to market, with a total of 18 different companies launching the 24 products or services in 2016. These companies range from small start-ups to multinational corporations. Seven (39%) of the licensee companies were spin-outs from the RPO. Of the licensee companies that were not spin-outs, three were larger companies (>50 employees), 46% (11) of the companies had less than 10 employees.

Figure 4 categorises the licensee companies according to number of employees. These data are difficult to obtain accurately, and a variety of sources including the RPOs own information, licensee reported data, public websites and company LinkedIn profiles were used to estimate the information.

The majority of the licensee companies that launched a product or service in 2016 are Irish owned companies at 16 (89%). Two (11%) are internationally owned. 78% are based in solely Ireland or have locations both in Ireland and abroad (11%). Of the Irish based companies, the majority (42%, 10 licensees) are located in the Greater Dublin area.

Figure 4: Size of the licensee companies launching products and services during 2016 (n=18)

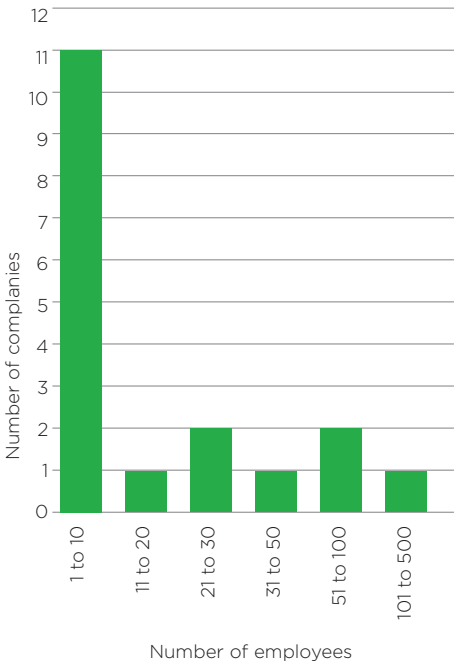
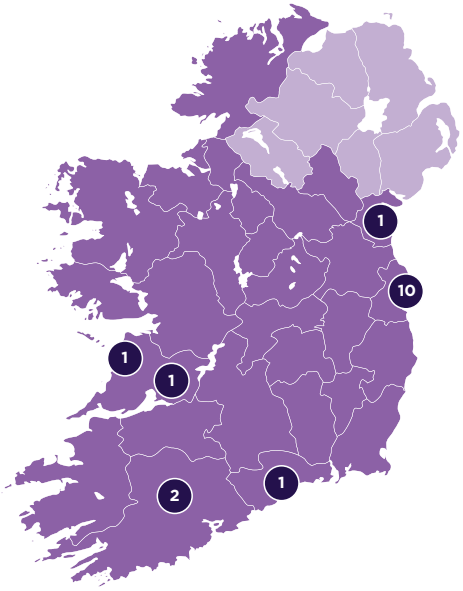


Figure 5: Location of the 16 Irish based companies launching products and services in 2016



CASE STUDY

Nova Leah products reach international customers

Nova Leah, a Dundalk Institute of Technology spin-out, has carved itself a niche in the supply of products to analyse the cybersecurity risk of connected medical devices. The founding technology, SelectEvidence®, developed by Dr. Anita Finnegan, is an automated platform solution for monitoring medical devices to protect them from cybersecurity threats.

The technology was licensed from DkIT and the first product reached the market in 2016. The first significant medical device customer for Nova Leah is a Fortune 500 company and two further multinational customers are expected to be secured by the end of 2017.

The establishment of Nova Leah was enabled by State funding initiatives that supported Dr Finnegan's career development, the Department of Education's Springboard programme being particularly pivotal. Funding from the Enterprise Ireland Commercialisation Fund programme helped drive the technology development in the Regulated Software Research Centre (RSRC) at DkIT to create SelectEvidence®. This was licensed to the spinout company that had been founded by Dr. Finnegan and RSRC Director, Dr. Fergal McCaffery. Nova Leah raised initial investment from a US VC fund and was accepted to Enterprise Ireland High Potential Start-Up (HPSU) programme in 2015. Having established an office in Boston in 2017 the company is now embarking on a second funding round from US investors targeting €2-5m.

Based out of Dundalk Institute of Technology's Incubation Centre, Nova Leah can benefit from ongoing quarterly reviews to aid business planning and take advantage of the IP clinics and marketing workshops among other supports.

Throughout the journey, from technology inception to spin-out creation and licensing, the TTO worked with the founding academics. The TTO supported the original funding application, implemented an IP strategy and facilitated IP management, provided licensing support and ultimately aided the formation of the company and securing of ongoing funding.

Added value from the RPO: Support to access commercialisation funding; intellectual property and strategy, licence, spin-out support, incubator facility

Research Prioritisation Area: Data Analytics, Management, Security and Privacy

3

Products and services – trends and progress since 2013

In the three years of the AKTS, there was a steady increase in the number of products and services launched onto the market each year. A slight decline was seen during 2016 in launches relating to the universities sector. In total, 116 new products and services have now been launched since 2013, emerging from 16 different RPOs. Over the four years to 2016, 63% of the products and services have originated in the Universities, 26% in the Institutes of Technology and 11% from the specialist and state research organisations. As the technology transfer system has developed, in large part with support from the Enterprise Ireland Technology Transfer Strengthening Initiative (TTSI) funding programme[5], the contribution of specialist and state research organisations and Institutes of Technology to new product and service launches by licensee companies has increased.

3.1 Types of IP underpinning product and services launches over time

The type of underpinning IP transferred in the RPO licences has remained relatively constant over the past four years. Software (38%) and patents (35%) are the most common form of IP and are often combined with additional know-how (27%) from the RPO. The plant variety category was introduced for the first time in 2015; before this plant varieties were included in the category of biological materials. A number of different IP rights may underpin a single product or service.

3.2 Research Prioritisation Areas

Categorising new product and service launches over the past four years against Research Prioritisation themes shows that ICT, Health & Medical Technologies and Manufacturing & Materials are the most prevalent areas of activity, with the majority (35%) in ICT. Within these individual themes, the most common Research Prioritisation Area to yield commercial products and services from RPO licences has been Digital Platforms, Content & Applications (14%), followed by Processing Technologies & Novel Materials (11%).

Figure 6: Source of products and services brought to the market 2013-2016 by type of institution

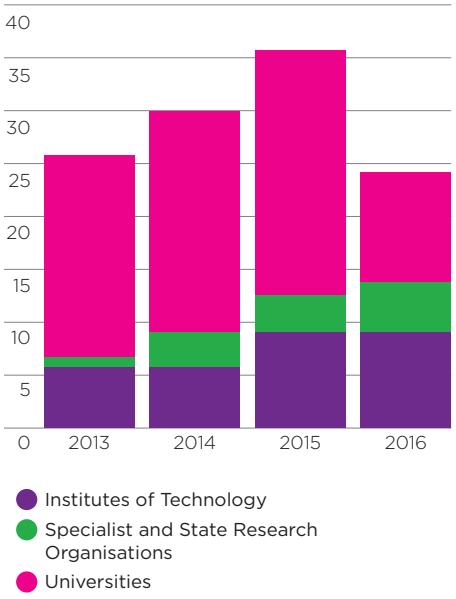
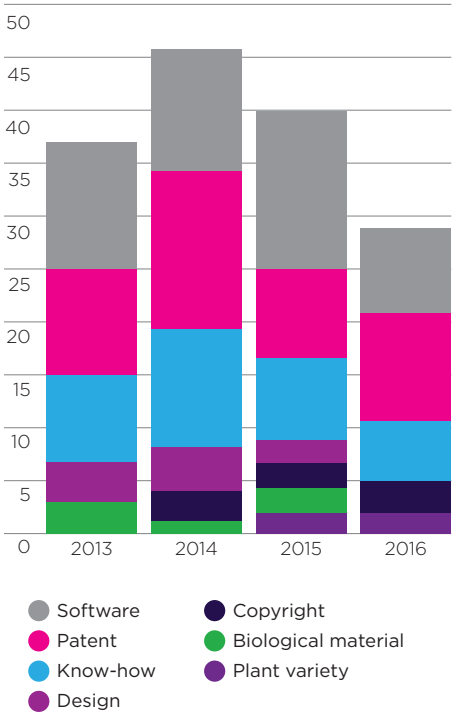
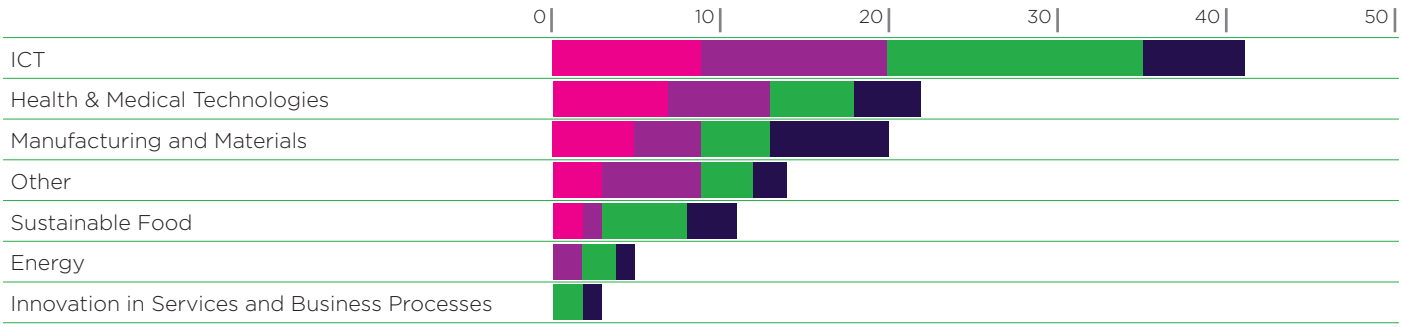


Figure 7: Types of IP rights that led to products and services launched 2013- 2016



5 http://www.knowledgetransferireland.com/News/Minister-Halligan-announces-%E2%82%AC34-5M-in-funding-for-the-Technology-Transfer-Strengthening-Initiative.html

Figure 8: **Licensed technologies launched 2013-2016, mapped against research priority areas (n=116)**



Research Priority Themes:

1 Energy
2 Health & Medical Technologies
3 ICT
4 Innovation in Services and Business Processes
5 Manufacturing & Materials
6 Sustainable Food
7 Other

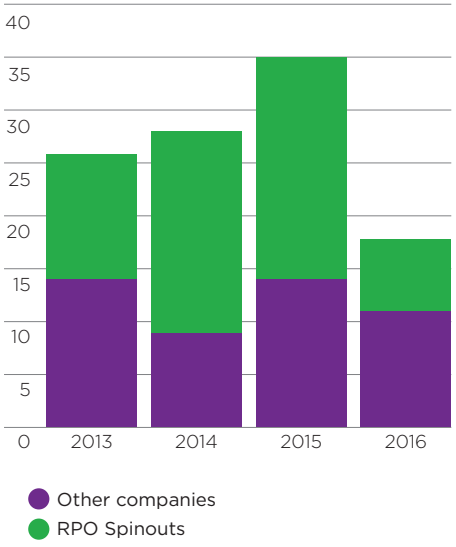
Over the years, products and services falling into the "Other" category have included: Online training; Animal health; Research tools (including instrumentation and reagents); Consumer products; LED; Product security; Financial risk management.

3.3 Characteristics of licensee companies

A significant proportion of the licensee companies launching products and services based on RPO IP over the last four years have been spin-outs from the RPO. This has varied between 39-68%.

The proportion of licensee companies that are based in Ireland has remained constant, at an average of 85%.

Figure 9: **Type of licensee company launching products and services 2013-2016 (n=107)**

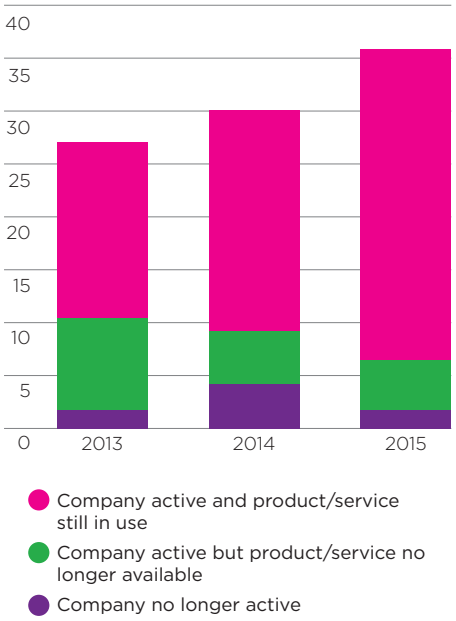


3.4 Products and services that are still in use

This year's study investigated all the products and services that had been launched onto the market between 2013 and 2015 based on IP licensed from the Irish RPOs to establish whether these products and service are still in use and, if not, whether this is because the licensee company is no longer active or because the technology is no longer being used. The study team used a combination of public data and information reported by the licensee to the TTO. A total of 67 products and services were found to be still on the market. This is likely to be an underestimate, as the team was unable to establish the definitive status for some of the products and services through the available information.

From the available data, as might be expected, fewer of the earlier launches remain in use today. In part this reflects the progress of innovation, with older products superseded as new technology is introduced. There seems to be no particular attrition trends in terms of type of IP transferred, research themes and priority areas, or ownership of the licensee company. There is, however, a slight difference in terms of the type of licensee. Proportionally more of the products and services which are still available on the market were licensed to RPO spin-out companies (62%).

Figure 10: Current status of products and services by year of original launch (n=93)



CASE STUDY

Sales and company growth at Ceramix based on a product licence from TCD

A licence to technology from Trinity College Dublin (TCD) to Ceramicx, an Irish manufacturer of infrared radiation (IR) heating elements, enabled company sales growth of 23% in 2016 compared to 2015.

The Herschel is a robot arm IR sensor technology that was developed in a research collaboration between Professor Tony Robinson's group from the School of Engineering at TCD and Ceramicx. The project was funded by Enterprise Ireland's Innovation Partnership scheme and the Herschel was subsequently licensed to Ceramicx in 2014.

Ceramicx is well established in Ireland with manufacturing facilities in Co. Cork. Ceramix serves the aerospace, automotive and packaging industries, supplying industrial IR heating technologies to support their manufacturing processes for drying, bonding and annealing of component parts. The Herschel instrument supports the company's growing product portfolio, increasing product efficiency and facilitating bespoke client work and enabling the company's expansion of IR heating solutions to US and Asia industry. Its unique capability has raised Ceramicx profile in infrared R&D, industrial process heating and exotic materials processing in a wide variety of market sectors.

The growth of the company has facilitated an increase in the number of employees from 42 to 63 since it started working with TCD in 2012. The relationship with TCD is enduring and the company is working on two further collaborative research projects with other teams in the university.

The TTO team at TCD has supported many aspects of the commercialisation journey including project scoping, IP management and license negotiation.

Added value from the RPO: Collaborative research partnership; intellectual property, licence negotiation

Research Prioritisation Area: Processing Technologies and Novel Materials

4

Active Spin-outs

This study investigated those spin-outs with an "active" status at the time of census, i.e. on 31st December 2016. There were 119 Active Spin-outs reported in the AKTS2016 but on further investigation, as part of this report, this number was reduced to 109. Nine companies had ceased to trade during 2016.

Trinity College Dublin and University College Dublin have generated 41% of all the reported Active Spin-outs, which is likely to be due to the maturity of the technology transfer system in those universities – the oldest recorded Active Spin-out goes back to 1983 (UCD). These are followed by NUIG (11) and Dublin City University and Dublin Institute of Technology at 10 Active Spin-outs each. University College Cork had eight Active Spin-outs at the end of 2016 and one significant UCC Spin-out was acquired during the year.

4.1 Pathways to achieving Active Spin-outs

Whilst the journey for a new spin-out is unique, the role that the TTO plays in this process is consistent and may include advising the researchers on potential commercial opportunities, helping to build the business model and supporting applications for funding. A number of RPOs also run mentoring programs or accelerators to stimulate new entrepreneurial activity. The TTO may also help the academics to find suitable CEOs and mentors to drive the business forward and can support fundraising activities and make introductions to potential investors. The TTO will routinely lead the negotiation of the licence agreements and the foundation documents for the spin-out company.

Frequently cited supports are the Enterprise Ireland Commercialisation Fund which helps to prove the commercial value of the technology and the Enterprise Ireland High Potential Start Up (HPSU) programme[6], which gives access to advice and grants to help with developing the proposition, getting investor ready, or starting to internationalise.

4.2 Types of intellectual property underpinning Active Spin-outs

Patent-related IP accounts for 35% of the reported intellectual property licensed from the RPOs to the Active Spin-outs. A further 32% of IP is related to Know-how and 26% to Software. More than one type of IP may be used by a company.

4.3 Research Prioritisation Areas

The TTOs classify Active Spin-outs according to the national Research Prioritisation Themes and Research Priority Areas. Where a company could fit into more than one category, it is assigned to the one which most closely fits their commercial focus. The two dominant research themes in 2016 continue to be ICT (35%) and Health and Medical Technologies (28%). The Manufacturing and Materials theme is the next most prevalent at 17%.

Figure 11: Origin of the Active Spin-out by type of institution, 2016 (n=109)

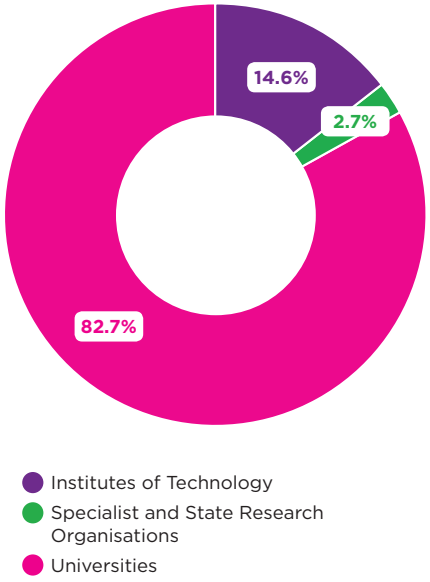
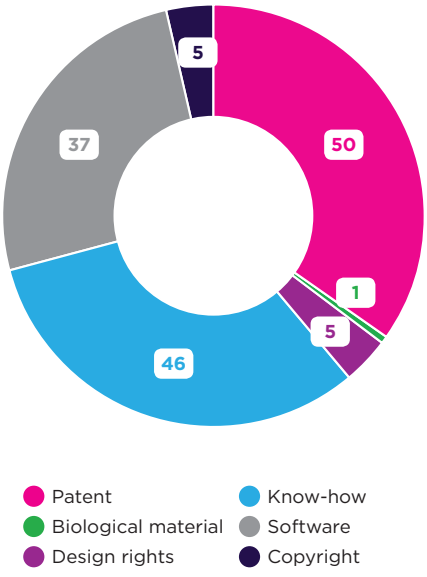
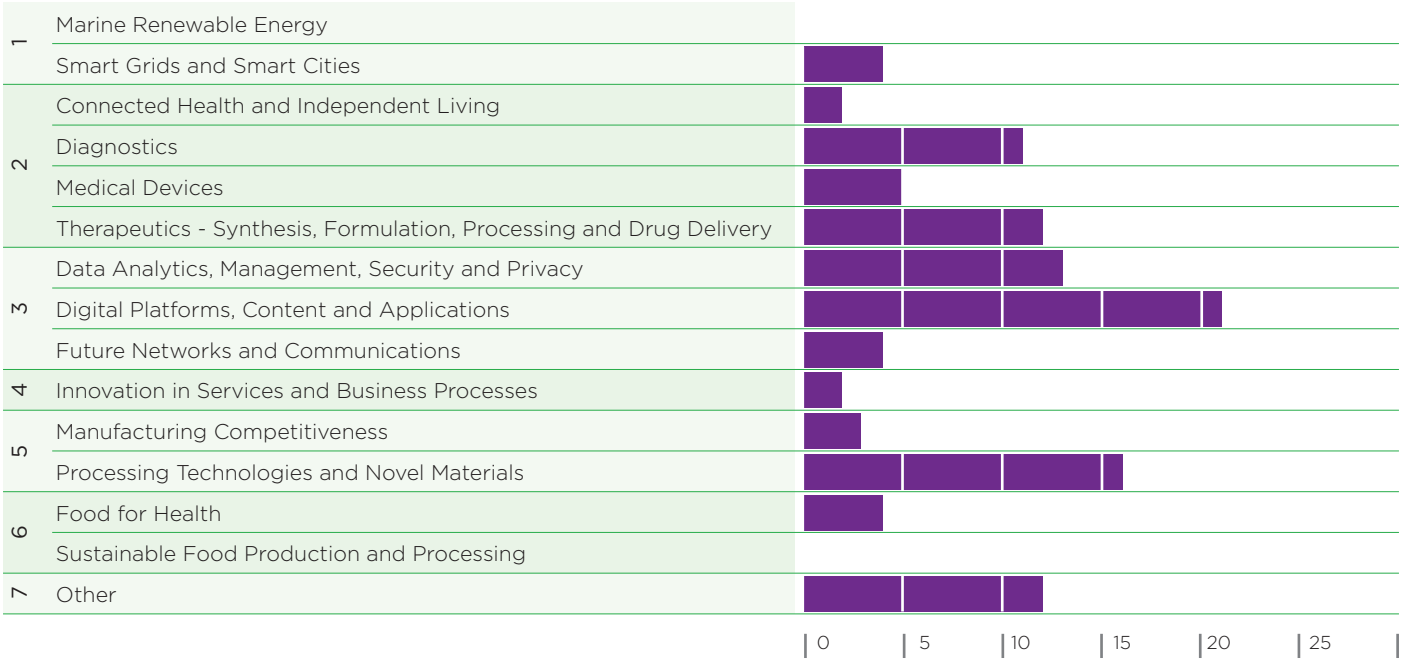


Figure 12: RPO intellectual property (n=144), by type, used by Active Spin-outs, 2016



6 HPSU are ambitious new companies capable of creating 10 jobs in Ireland and realising €1 million in sales within three to four years of starting up

Figure 13: Active spin-outs at the end of 2016, mapped against research themes and priority areas (n=109)



Research Priority Themes:

1 Energy
2 Health & Medical Technologies
3 ICT
4 Innovation in Services and Business Processes
5 Manufacturing & Materials
6 Sustainable Food
7 Other

Twelve of the companies that did not fit naturally into a research priority area, and have been listed as "Other". These include: Engineering consultancy; Creative arts for social project; Electronic Circuit Design; On-line genealogy; Road-noise monitoring; Hand-wash monitor; Environmental Services; Policy consultancy; Animal health.

4.4 Company maturity

Examining the year of registration of each of the 109 Active Spin-outs shows that the majority of companies are less than 10 years old (78%), and 39% between 3 and 5 years old, with a similar proportion being 6-10 years old. 22% of Active Spin-outs companies are over 10 years old.

Figure 14: Age of the Active Spin-outs at December 2016 (n=109)

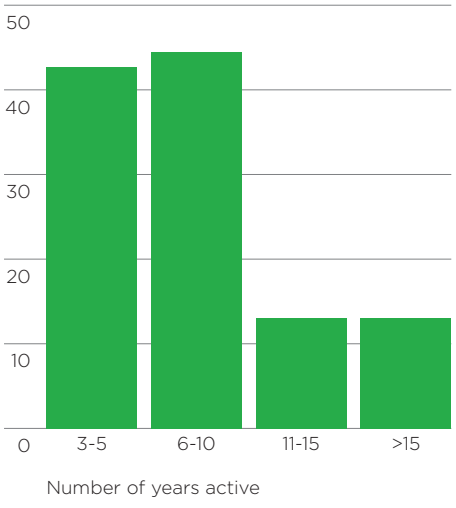
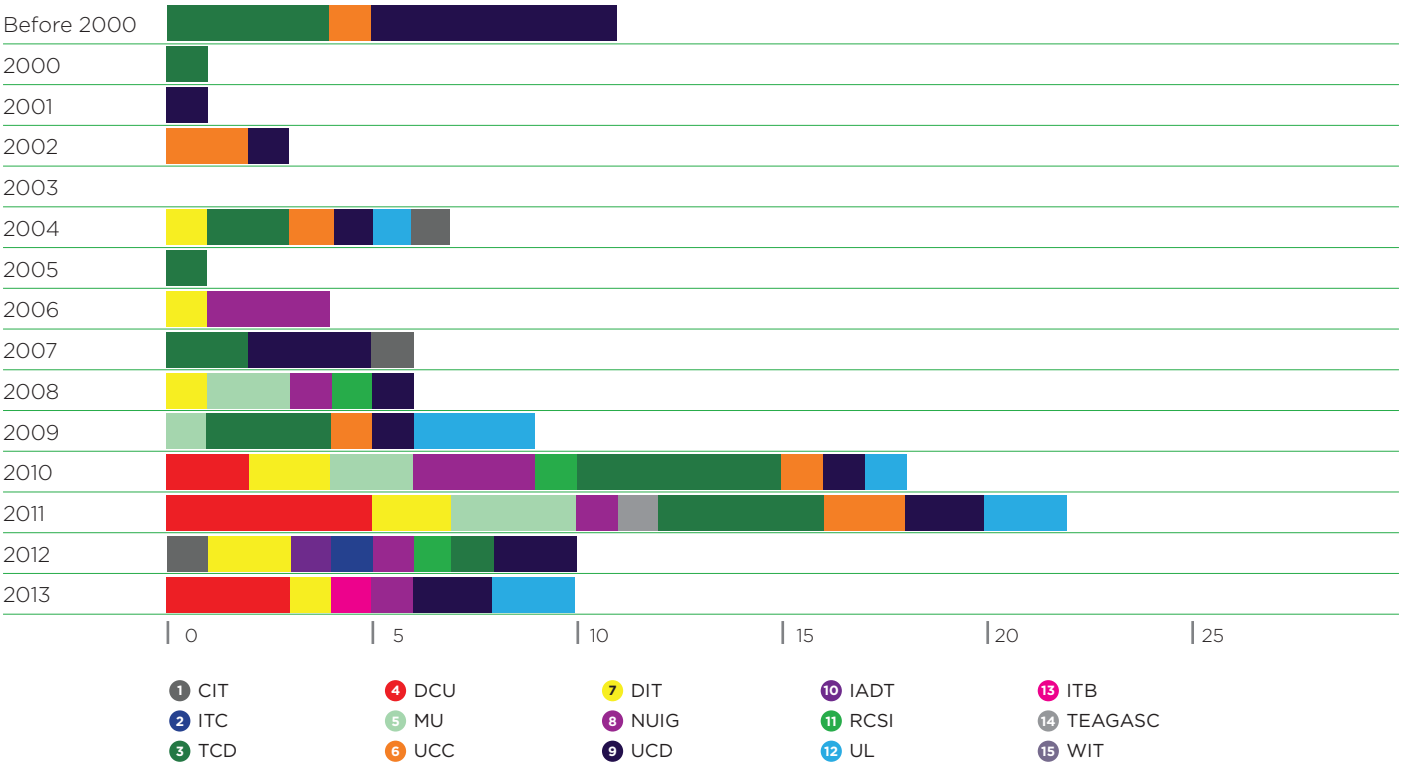


Figure 15: Active spin-outs 2016 by RPO and year of registration (n=109)



The Technology Transfer Strengthening Initiative programme (TTSI) was introduced in 2007, and the effects of this funding can be seen in figure 15 in the significant increase in spin-outs registered after this date which still remain active in 2016. 28 of the 2016 Active Spin-outs were registered prior to 2007 and 81 registered in the seven years from 2007-2013.

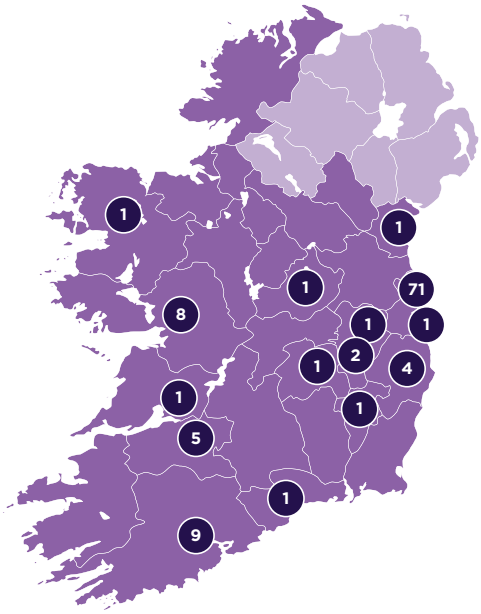
Two of the Active Spin-out companies have either ceased trading since the AKTS2016 data were collected, or were in the process of closing down but still met the definition of "active" at the end of 2016. Of the remaining 107 companies, the stage of development was established for all but seven companies. The majority (93%) are trading and bringing in income, 5% are in product development and 2% have been acquired.

4.5 Location

Mapping the location of each of the Active Spin-outs shows that only one of the Active Spin-outs is based outside Ireland (UK). Many of the Irish-based companies are operating globally. Of the 109 spin-out companies, 31 (28%) were identified which have established offices and/or appointed distribution agents in at least one overseas territory. Several of the other Active Spin-outs are trading abroad directly from their base in Ireland.

In common with other spin-outs across the world, many of the companies choose to establish themselves close to their founding institution. This allows them to retain close links and perhaps continue collaborative research with their RPO. Some may also be based in RPO-associated incubation facilities. 74% of Active Spin-outs remain located in the home town of the originating RPO. Over 65% of the spin-outs are based in Dublin, which mirrors the proportion of Active Spin-outs (63%) which originate from RPOs based in or around Dublin.

Figure 16: Current location of Active Spin-outs from each founding RPO (n=109)



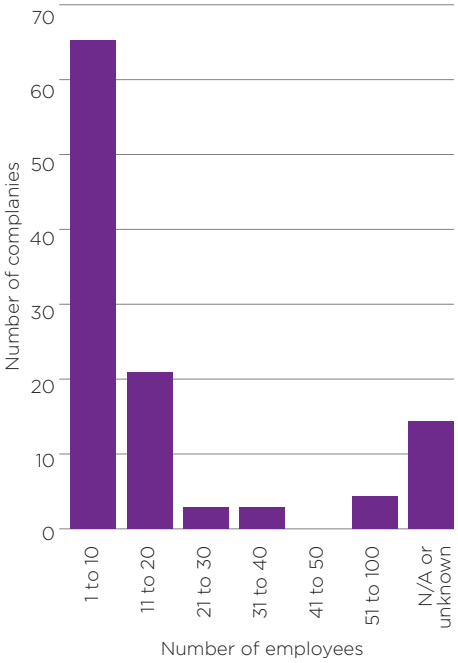
4.6 Employment

Accurate employment figures for the Active Spin-outs are challenging to obtain as this is not well reported to the RPOs and most of the companies are below the size where they have to include headcount data in their published annual returns. Figures can also be misleading, due to fluctuations in headcount, particularly within early stage companies which often use flexible placements according to their current needs. The study team used a variety of sources including data held by the RPOs, public websites and company LinkedIn profiles to estimate the number of employees on 31 December 2016.

The majority of the companies remain micro companies (39% have five or fewer employees, 22% have between six and 10). Some are growing and four companies now have over 50 employees.

As a group, the Active Spin-out companies currently provide employment for at least 960 people. This is a little lower than the number reported last year and is perhaps due to some of the larger companies being excluded from this year's analysis because they have been acquired or merged with another company and no longer fit the current definition of an Active Spin-out. If included, they would account for at least a further 148 jobs.

Figure 17: Size of the Active Spin-out companies as of 31 December 2016 (n=109)



CASE STUDY

Spin-out company on the way to delivering patient benefit

Surgacoll, a spin-out of the Royal College of Surgeons in Ireland, is a medical device company with a novel solution for implantable, collagen-based orthopaedic products. HydroxyColl, the company's first product, was CE approved in Europe in 2015 as a medical implant designed to regenerate a patient's bone tissue after trauma or cancer damage. HydroxyColl is manufactured for SurgaColl by Harmac Ltd, based in County Roscommon, a subsidiary of Harmac Inc.

HydroxyColl is used in MaxillioFacial reconstruction in Ireland and is going through a series of Clinical Trials in the UK. Meanwhile, ChondroColl, an innovative bioscaffold for the early intervention of knee cartilage damage, is in the late stages of Regulatory approval in Europe.

The RSCI Office of Research and Innovation has provided ongoing support to the founding team, headed by Professor Fergal O'Brien who also chairs the Scientific Advisory Board for SurgaColl. The RSCI Innovation team has been instrumental in IP management, market due diligence and validation of the commercial opportunity, to supporting the inception of the company in 2012 and securing funding. This support has helped the company to raise more than €5.4million, through sources such as Enterprise Ireland, VC and angel investors.

The company appointed CEO, Dr William (Bill) Allan, to guide them through the ongoing round of venture funding and progress FDA regulatory approval for HydroxyColl to enter the US market.

Added value from the RPO: Commercial opportunity scoping; intellectual property, licence; spin-out support; fundraising

Research Prioritisation Area: Medical Devices

5

Active Spin-outs – trends and progress since 2013

The number of Active Spin-outs from RPOs in Ireland has been growing steadily since the AKTS began in 2013.

Over the course of the survey, there has been an increase in companies formed from the Institutes of Technology achieving Active Spin-out status, which reflects the development of technology transfer within the IoTs.

As would be hoped if the spin-outs were continuing to thrive, there has been steady progress towards older companies as a proportion of the total of Active Spin-outs reported each year, with a corresponding reduction in the percentage of companies under 5 years old.

5.1 The "Class of 2013" Active Spin-outs

This current study revisited the "Class of 2013" companies that were reported in the AKTS2013 to understand their progress since this time. Of the 78 Active Spin-out companies returned in 2013, 60 (83%) were reported as still active in 2016. In addition, five have been successfully acquired or merged with another company and 13 have been liquidated or are no longer trading. The five successful exits came in the ICT sector (3 companies) and in Health & Medical Technologies (2 companies).

Of the "Class of 2013" Active Spin-outs, 18% are more than 15 years post-formation whilst the majority have been active between 6-10 years since formation.

Most of these continuing companies were spun-out from universities (88%) and the remaining 12% arose from Institutes of Technology. This may reflect the fact that technology transfer has been established for far longer in the university sector.

Figure 18: Percentage of Active Spin-outs in each age band, as reported in 2013-2016

CASE STUDY

NVP Energy springs from Irish prototype to international customers

NVP Energy, a spinout from NUIG, was established around a core wastewater treatment technology that was licensed from NUIG and is designed to significantly reduce running costs, whilst generating a renewable energy by-product. The solution is based on a microbial treatment process developed by Professor Vincent O'Flaherty and his team at the School of Natural Sciences. The process allows for low temperature conditions, a first for an anaerobic wastewater treatment, whilst generating biogas as a by-product that is 100% available for use in heat & electricity production.

NVP Energy has seen great success in just a few years with customers in the Food & Drink and Municipal Wastewater treatment industries. This includes commissioning of a full-scale plant with ABP Food Group, at their meat processing plant in Lurgan, Co. Armagh, with Arrabawn Dairies in Galway and a project with a major global brewing brand on one of their UK sites. NVP Energy offers customers a compelling payback, averaging 3 years, whilst contributing to corporate social responsibility aims by delivering sustainable energy and process related energy-savings to site.

NVP Energy has won a host of sustainability accolades including the Shell Springboard Award, the SEAI Sustainable Energy Award and most recently an Irish Times Innovation Award for Energy & Environment.

The technology was developed by Professor O'Flaherty through an Environmental Protection Agency (EPA) grant and Enterprise Ireland funding. Throughout the development the TTO supported the IP filing strategy, the spin-out process and led the licensing negotiations with NVP Energy. Professor O'Flaherty continues to work closely with the company, collaborating with student placements and additional research grant projects for ongoing technology development.

Added value from the RPO: Support for commercialisation and prototyping funding; Entrepreneur in Residence scheme; intellectual property, licence; spin-out support; ongoing collaborative research

Research Prioritisation Area: Manufacturing Competitiveness

Appendix A

Abbreviations, acronyms and definitions

Acronym	*Description*
AKTS	Annual Knowledge Transfer Survey
EI	Enterprise Ireland
HEA	Higher Education Authority
HEI	Higher Education Institution
HPSU	Enterprise Ireland's High Potential Start Up support scheme
IP	Intellectual Property
KTI	Knowledge Transfer Ireland
SFI	Science Foundation Ireland
TTSI	Enterprise Ireland's Technology Transfer Strengthening Initiative programme

Abbreviations for HEIs included in this report:

CIT	Cork Institute of Technology
DCU	Dublin City University
DIT	Dublin Institute of Technology
DKIT	Dundalk Institute of Technology
IADT	Dun Laoghaire Institute of Art, Design and Technology
ITB	Institute of Technology Blanchardstown
ITC	Institute of Technology Carlow
MU	Maynooth University
NUIG	National University of Ireland, Galway
RCSI	Royal College of Surgeons in Ireland
TCD	Trinity College Dublin
UCC	University College Cork
UCD	University College Dublin
UL	University of Limerick
WIT	Waterford Institute of Technology

Relevant definitions used in the AKTS2016

RPO	Research Performing Organisations are Universities, Institutes of Technology and other research institutions funded primarily by public funds.
TTO	Technology Transfer Office is the team responsible for managing KT services, including intellectual property management, licensing, partnering with industry and the creation of new companies.
Spin-out	A spin-out company is an incorporated entity which at the time of formation was dependent on the exploitation of specific intellectual property rights of the RPO. The rights to the company can be linked to a specific researcher who was within the RPO at the time of company formation and who would be considered an academic founder. The RPO will hold equity in the spin-out and/or has issued the company with a licence to the IP.
Active Spin-out	An Active Spin-out is an RPO-created spin-out company that is at least three years post-formation (and three years since being reported as an RPO spin-out) and, as at the end of the reference year, has at least one paid employee and has raised equity and/or has booked sales revenue. It is an incorporated entity which at the time of formation was dependent on the exploitation of specific intellectual property rights of the RPO. The RPO will have executed a licence to the spin-out for the IPR and/or will hold equity in the spin-out.
Licence	A contract under which IP rights are transferred from one party to another for the purpose of commercialisation.

Appendix B
Methodology

The study and reporting was undertaken between April and November 2016. The methodology applied by IP Pragmatics to undertake this outcomes study combined the use of the previously collected information through the AKTS as well as data from previous outcomes studies and data held by KTI and Enterprise Ireland. Other sources of information researched included publicly available information such as websites, press releases, databases (IP, market, technical); existing case studies and overviews on companies and technologies and previous reports and documents on Impact from research in Irish RPOs. Desk-based research was undertaken to update and validate the information collected in previous years, combined with TTO interviews from the RPOs that reported relevant outcomes in AKTS2016. For the case studies, these interviews were followed up with discussions with representatives from the spin-out company or licensee.

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