

Forfás / EGFSN Study:  
Addressing the Demand for High-Level ICT Skills  
across all Sectors of the Economy in Ireland

November 2013

# Background

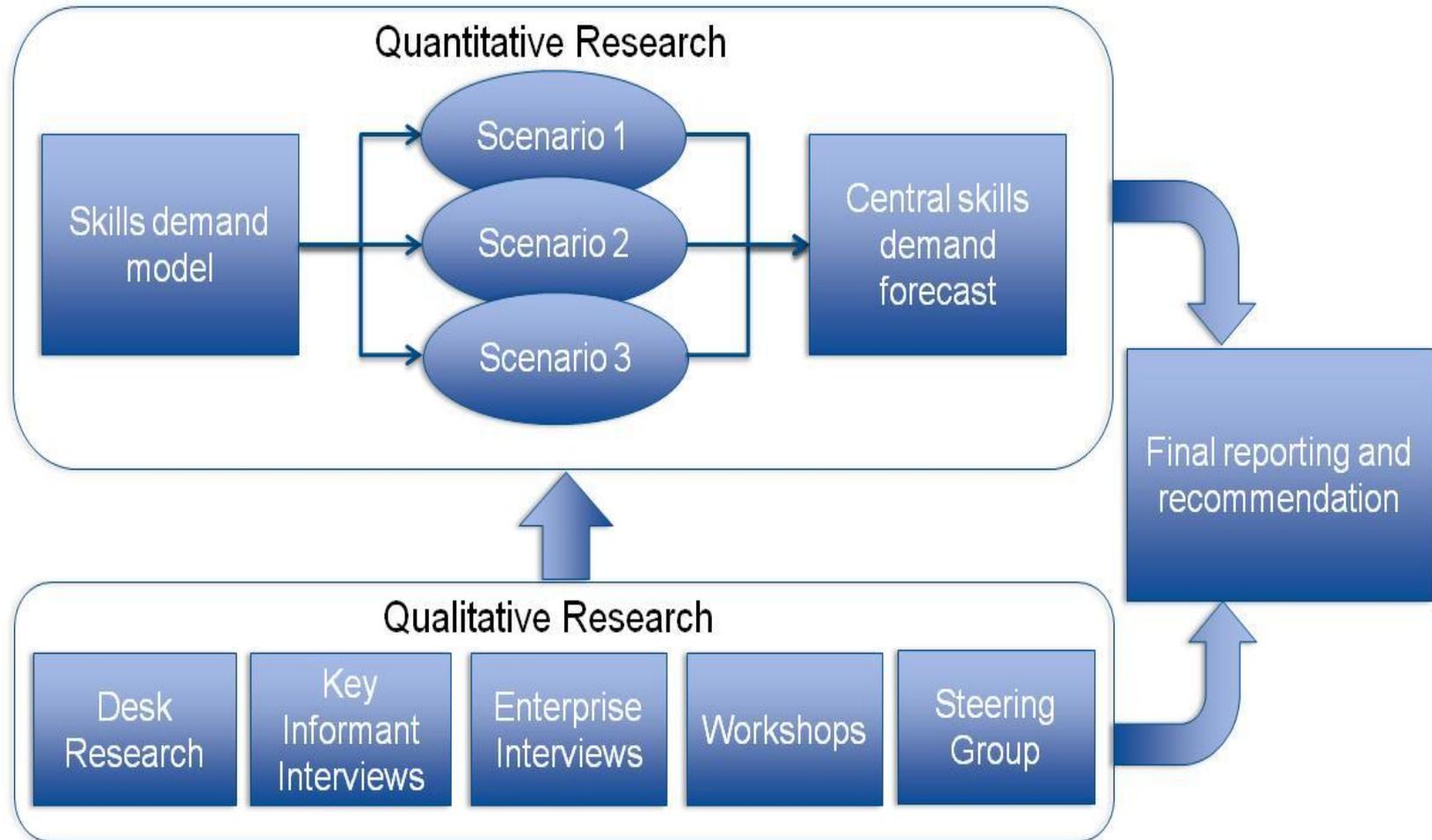


- Aim of the Study undertaken by Forfás / EGFSN, is to assess the demand for high-level ICT skills across all sectors of the economy over the period 2013 – 2018. The study also integrates updated high-level ICT supply forecasts by the Higher Education Authority.
- The study will directly feed into the planned update of the Government's ICT Action Plan. It is included as an action within Action Plan for Jobs 2013.
- Focus is on computing and electronic / electrical professionals at NFQ Level 8/9/10 and progression levels NFQ Levels 6/7 (including those of the above requiring a combination of technical, and business /analytic/foreign language skills).
- There were 68,280 ICT professionals in employment in 2012, of which:
  - ICT Computing Professionals - 52,170
  - Electronic and Electrical Engineering Professionals - 16,110
- In 2012, it is estimated that 43,280 ICT professionals were employed in the broadly defined ICT Sector while 25,000 were employed across other sectors of the economy.

# Forecasting ICT Skills Demand



- Assessing the demand for high-level ICT skills in a small open economy such as Ireland is complex – given that a large proportion of the skills needed being dependant on export markets are not just reliant upon demand created in the domestic market.
- Demand is also strongly dependant on market conditions and demand patterns in the global ICT market, as well as the relative competitive proposition for FDI.
- An ICT skills demand model (used also by EU Commission) was utilised to forecast demand. This takes into account expert analysis of global ICT expenditure and is adapted to ensure that the impact of global ICT market demand is captured, as well as the local consumption of ICT technology and services spending.
- Throughout the project, there has been a continuous loop of adjustments of the key variables as data gathering, key informant feedback etc. is evaluated and used to inform the forecasting and the final three scenarios are established- the central one being the one most anticipated to occur.





- The central growth scenario forecast is for ICT professionals demand to increase from 68,280 in 2012 to 91,000 in 2018 – @ 5 % compound annual growth rate.
- An estimated 44,500 Job openings will arise over the period to 2018 arising from both expansion demand and replacement demand. Enterprises are recruiting both new graduates and experienced staff.
- There are real challenges to be faced in realising this potential in terms of gaining ground in new technology markets and sustaining improved competitiveness with other countries.
- Background of global shortages of high-level ICT skills and talent- other countries are actively competing for such skills – estimated potential gap of 864,000 in Europe by 2015.



- Mobility and Consumerisation – leveraging mobile solutions in the business environment.
- Cloud Computing
- Big Data
- Social Media Technologies
- IT Security
- “Internet of Things”- embedded connecting devices and appliances sensors and tags
- Micro-and nano technologies as Key Enabling Technologies

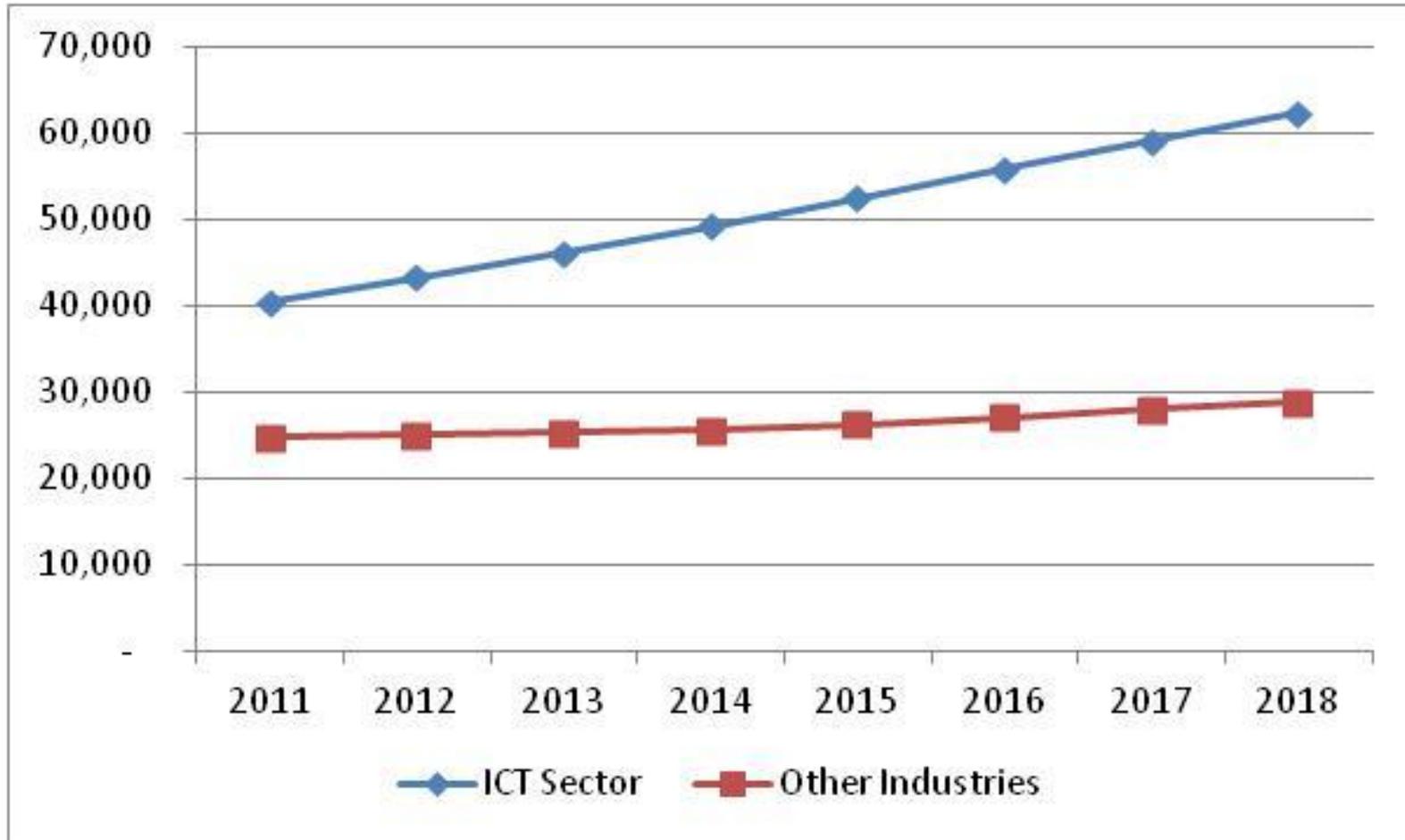


- These trends are raising the demand for new ICT skills. Some of these are core technology skills, but others, for example Big Data and social media require a combination of skills such as technology, statistics and business for Big Data; or technology and marketing for social media.
- Most computing skill sets will be around the technologies of cloud computing, mobile devices and technology, Big Data analytics, IT security, social technologies and the underlying enabling technologies.
- Rapid developments in micro and nanoelectronics, including semiconductors for PCs, mobile devices, medical devices, telecommunications, smart grid, energy efficiency is increasing skills demand for ICT electronic and electrical skills for R&D , testing and applications.

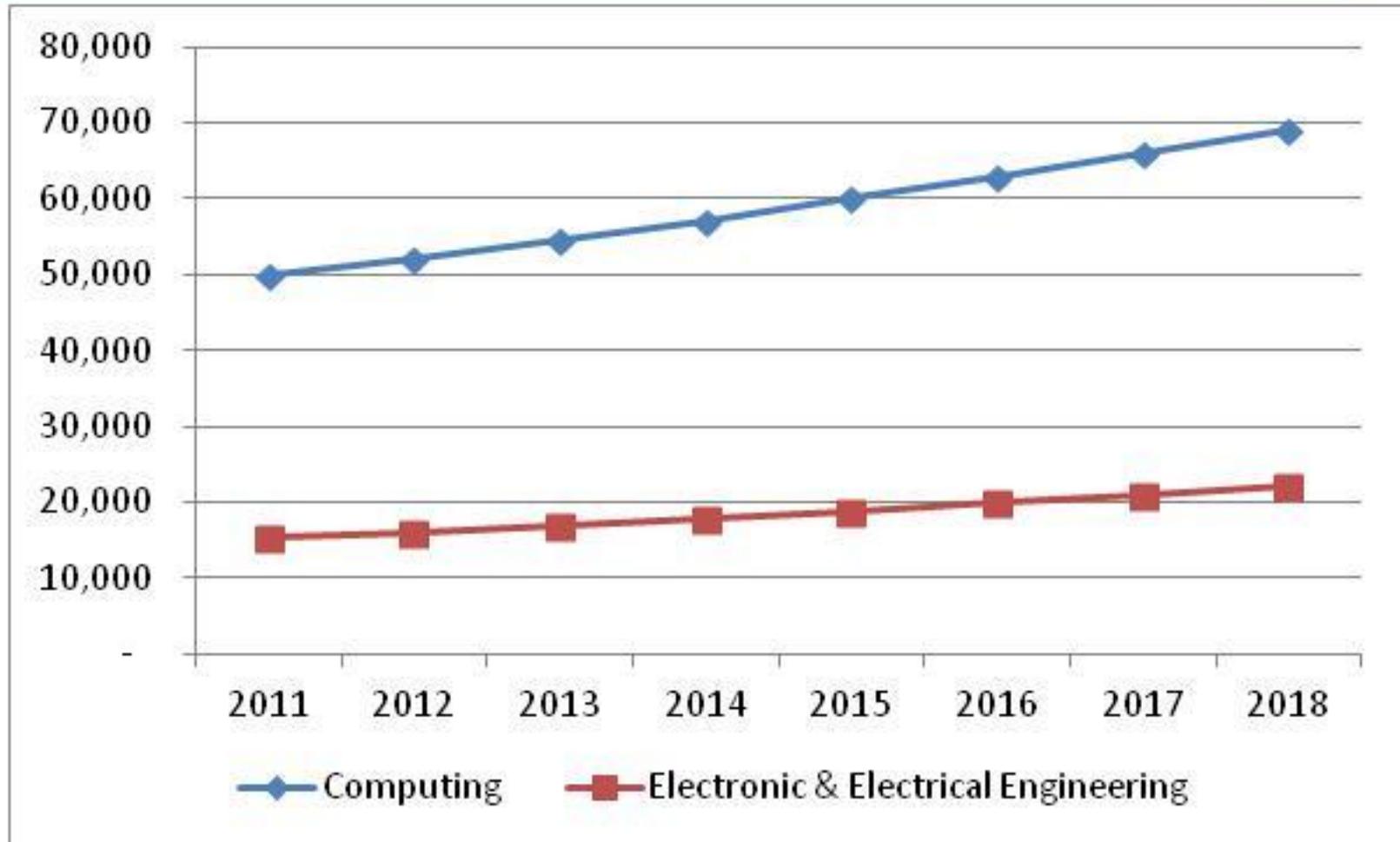


- Technologies are changing fast and therefore so is the demand for specific technology skills. A strong core technology education will form a good basis upon which future specific technology skills can be built.
- The development of “T” shaped skills which include core technology skills as well as business acumen, communication skills, teamworking and entrepreneurship are essential for innovation and the application of technology to changing business models.
- The ICT skills market will become increasingly complex and will demand more of the education and training system and from in-company training.

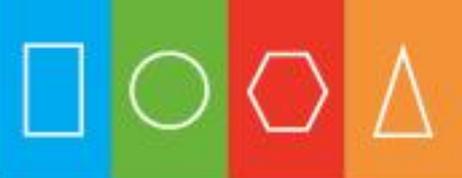
# Central Growth Scenario Forecast - Demand for High-level ICT Skills by Sector, 2011-2018



# Central Growth Scenario Forecast - Demand for High-level ICT Skills by Type, 2011-2018



# Central Growth Scenario Total Potential Job Openings for ICT Professionals 2012-2018

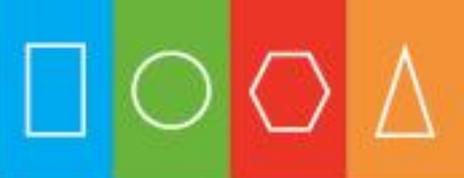


|  | 2012         | 2013         | 2014         | 2015         | 2016         | 2017         | 2018         | Total Job Openings 2012-2018 |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------------------------|
| <b>Computing</b>                               |              |              |              |              |              |              |              |                              |
| Level 6/7                                      | 499          | 505          | 509          | 533          | 528          | 522          | 506          | 3,602                        |
| Level 8+                                       | 3,963        | 4,275        | 4,501        | 5,017        | 5,302        | 5,468        | 5,564        | 34,090                       |
| <b>Total</b>                                   | <b>4,462</b> | <b>4,780</b> | <b>5,010</b> | <b>5,550</b> | <b>5,830</b> | <b>5,990</b> | <b>6,070</b> | <b>37,692</b>                |
| <b>Electronic &amp; Electrical Engineering</b> |              |              |              |              |              |              |              |                              |
| Level 6/7                                      | 288          | 297          | 312          | 335          | 351          | 354          | 350          | 2,287                        |
| Level 8+                                       | 1,189        | 1,273        | 1,348        | 1,495        | 1,589        | 1,646        | 1,720        | 10,260                       |
| <b>Total</b>                                   | <b>1,477</b> | <b>1,570</b> | <b>1,660</b> | <b>1,830</b> | <b>1,940</b> | <b>2,000</b> | <b>2,070</b> | <b>12,547</b>                |
| <b>Total Job Openings</b>                      | <b>5,939</b> | <b>6,350</b> | <b>6,670</b> | <b>7,380</b> | <b>7,770</b> | <b>7,990</b> | <b>8,140</b> | <b>50,239</b>                |

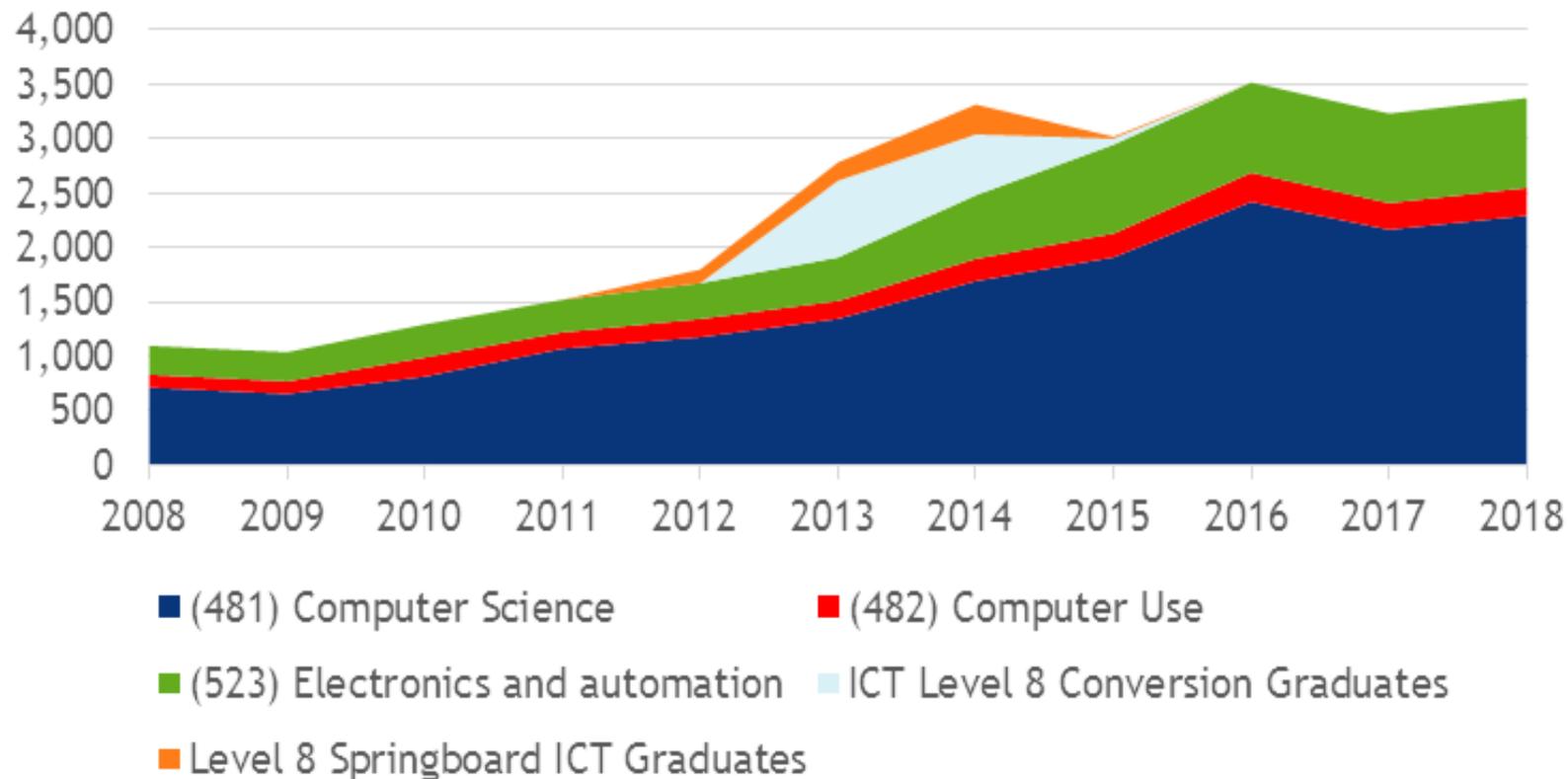
Source: IDC, 2013



- The joint Government - Industry ICT Action Plan was published in January 2012.
- The output of computer graduates in Ireland has increased by 25% over the last two years. Since early 2012, almost 1,500 places have been provided on intensive NFQ level 8 ICT graduate skills conversion programmes.
- A doubling of graduate output is now expected to be achieved by 2015 – three years ahead of the ICT Action Plan 2012 target of 2018.
- There has been an @ 60% increase in honours level math take up at Leaving Cert Level over the last three years.
- As a result of measures taken under the ICT Action Plan 2012, it is projected that the supply of high-level ICT graduates from the education system (mainstream and through conversion and reskilling) will meet 63% of industry demand in the year 2014.
- Projected ICT domestic graduate output at NFQ Level 8 and NFQ level 9+ respectively are presented in the following two tables.



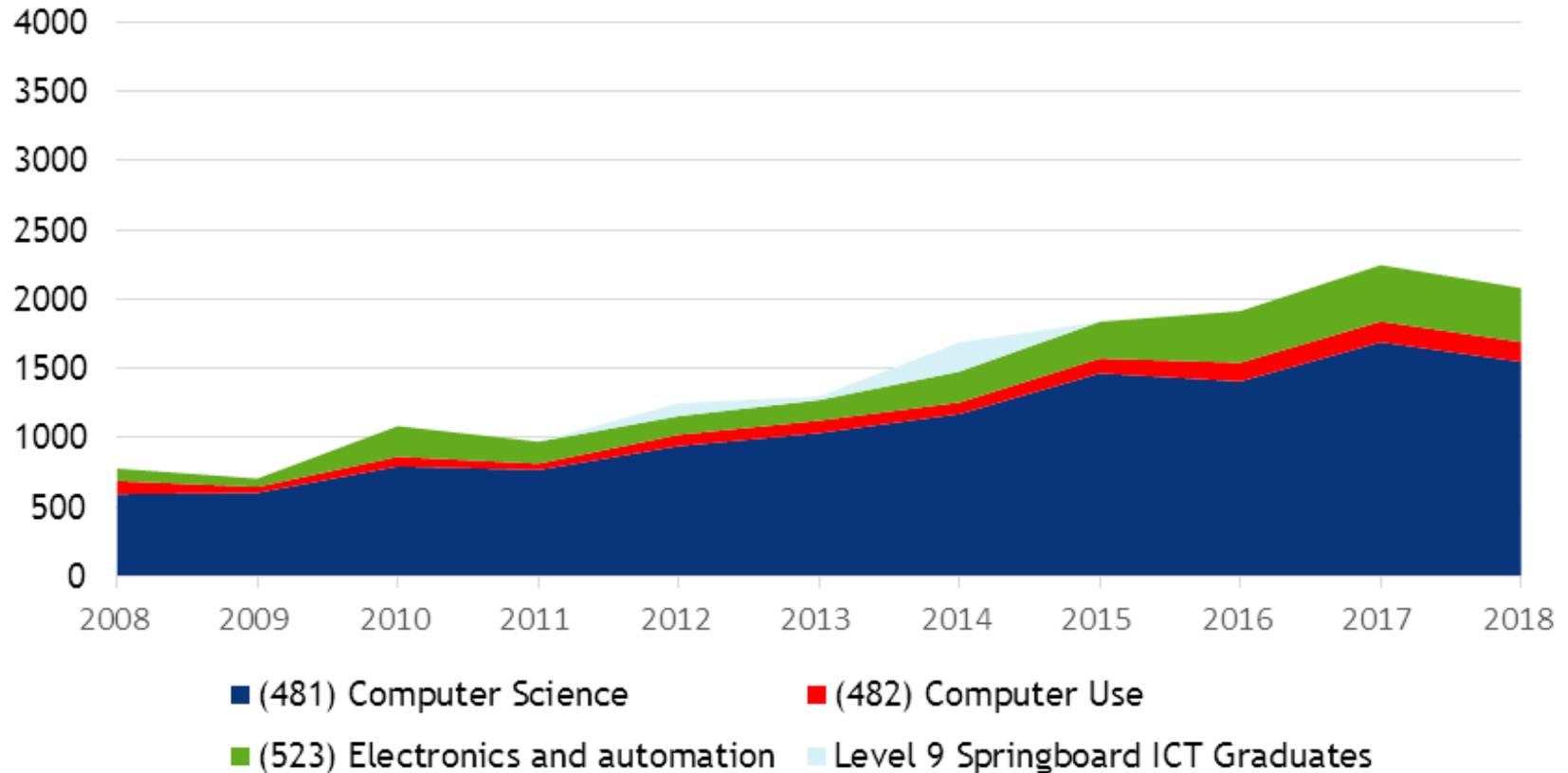
## ICT NFQ Level 8 Graduates by Field of Study 2008 to 2018



Source : HEA 2013



## ICT NFQ Level 9 Graduates by Field of Study 2008 to 2018



Source : HEA 2013

# Conclusions



The supply of ICT talent is a key part of Ireland's proposition to drive ICT business performance and inward investment. To achieve the forecast jobs potential over the next six years, all potential policy levers to improve supply will need to continue to be utilised, including:

- (a) Continuing to boost the domestic education ICT talent supply pipeline, both in terms of quantity and quality.
- (b) Investing further in targeted reskilling and skills conversion programmes for suitable jobseekers with relevant experience and the right aptitude.
- (c) Companies enhancing the talent development and retention of their ICT professionals including measures which create a talent flow to support the skills development of experienced employees and support the career path and training of new graduates.
- (d) Continuing to attract experienced international ICT talent, including expatriate talent (the Employment Permit system has been streamlined and improved to help achieve this).

# Recommendations:



Recognising the need to implement actions that are already underway including the building up of the STEM skills supply pipeline within education system, the following set of additional actions are recommended that would have an impact on skills supply within the next 6 years.

## 1 Review the scope and governance of the ICT Action Plan

- As part of the planned review of the ICT Action Plan, review its scope to encompass all sources of ICT skills supply and ensure clarity of responsibilities for the overall coordination and implementation of actions.

## 2 Boost the Quantity and Quality of ICT Skills Output

- Ensure third level Computing and Electronic/Electrical Engineering programmes remain focussed on the development of the core technology skills that enterprises need, in line with internationally accepted curricula, allowing for sub-specialisation in years 3 and 4.
- Review and streamline where required existing Internship programmes each with differing requirements. Expand the volume of structured ICT internships opportunities in line with the planned increase in domestic supply, and explore ways to increase the absorptive capacity of enterprise, particularly indigenous companies.



- Run additional iterations of the NFQ Level 8 Conversion Programme starting in 2014 as a strategic response to meeting ICT skills demand. Change eligibility criteria for the retention of social welfare while on the programme back from 9 months in a 12 month period to 3 months. Jobseeker register data should be “mined” to identify and inform suitable candidates of conversion opportunities.

### **3 Inspire More Talent**

- Attract more talent, with the right aptitude, to careers in ICT, especially women. Strengthen advocacy and career advice provided to young people, especially girls at second level – and to their parents on the range of rewarding ICT career opportunities available. Establish and report on initiatives to raise female acceptances on ICT undergraduate programmes from 15% to 25% by 2018. Draw upon best international practice – EU Commission, Dell, Accenture, Intel, Microsoft, Coder Dojo.
- Organise one-day ICT skills event(s) and practical workshop(s), with ICT skills competitions for different ages to raise overall awareness and to attract talent of all ages to ICT careers including those pursuing non-formal entry to ICT careers.

# Recommendations:



## 4 Promote Ireland internationally as the centre for Global ICT Talent

- Establish a single website with public and corporate involvement to attract international ICT talent building on the best of existing websites and balancing the needs of both indigenous and FDI companies - drawing upon examples of the “ Make it in Germany” and “Contact Singapore“ portals. Utilise the European Placement system (EURES) more fully for the sourcing of experienced ICT professionals from within the EU/EEA area.
- Organise Career Fairs abroad to attract back expatriate ICT talent and talent in locations with a surplus of ICT skills. Focus around a group of companies with actual jobs to fill. The potential use of Irish embassies could be considered for such events.

## 5 Addressing the Skills Challenge

- Enterprises to move further towards being “skills producers“ of talent including the development of experienced employees and the career pathways of new graduate entrants. ICT talent management and retention systems should be advanced for attracting and retaining the best ICT talent, from both within Ireland and other countries.



- Build up ICT skills learning platforms by public and private bodies which provide for on-line training at various levels for ICT professionals at work, students and unemployed people, including for industry-based training and certification aimed at upskilling ICT practitioners and retraining career changers. This should provide modules and programmes at various levels up to Masters Degree.
  - Establish initiatives to develop e-leadership professional skills (persons with deep expertise in ICT with competence in leadership and management) to drive increased business value and innovation from the use of ICT within enterprises – developed in conjunction with universities and enterprise. Draw upon overseas learning (the Software Campus in Germany, IT-vest in Denmark and the UK Cranfield IT Leadership programme).
- 6 Maintain the ICT skills development capacity of Higher Education Institutions**
- Invest in maintaining the ICT skills development capacity of HEIs. This should include upgrading and maintaining the physical infrastructure to an up-to-date industrial standard. Create opportunities for existing ICT teaching staff to continually develop their knowledge of the latest technology trends through collaboration between institutions and enterprise, including short in-service courses.



The full report can be viewed at:

[http://www.skillsireland.ie/media/04112013-Addressing\\_ICT\\_Skills-Publication.pdf](http://www.skillsireland.ie/media/04112013-Addressing_ICT_Skills-Publication.pdf)