

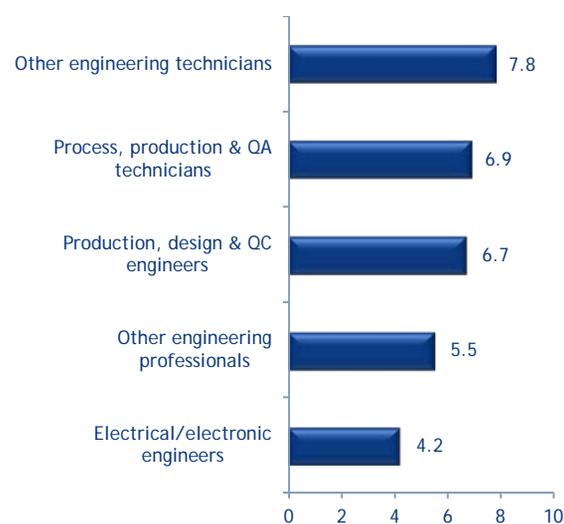
9.2 Engineering Occupations

- In 2016, there were approximately 31,000 persons employed in the selected engineering occupations, representing 1.5% of national employment (Figure 9.2.1)
- Over 70% of overall employment was concentrated in two sectors: 52% in manufacturing (mostly pharmaceuticals and machinery/equipment), with more than 21% in professional, scientific and technical activities (mostly architectural/engineering activities)
- Just over 52% of total employment was at professional level (i.e. engineers); the remainder was at technician level
- Between 2011 and 2016, employment growth in engineering occupations was the strongest recorded amongst the 17 broad occupational groups examined (8.2% on average annually); the strongest growth rates were observed for process, production and QA technicians (16% on average annually) and other engineering technicians (9%); in contrast, the weakest growth rates were observed for electrical/electronic engineers and production, design and QC engineers (3.5% and 5.6% respectively) (Figure 9.2.2)
- Over the same five-year period, in absolute terms, employment expanded by over 10,000; the largest increases were observed for process, production and QA technicians and other engineering technicians (by approximately 3,500 and 3,000 respectively); in contrast, employment levels of electrical/electronic engineers remained static
- Between 2015 and 2016, overall employment in engineering occupations expanded by 14% (compared with 2.9% nationally), or approximately 4,000; the

largest increases were observed for other engineering technicians

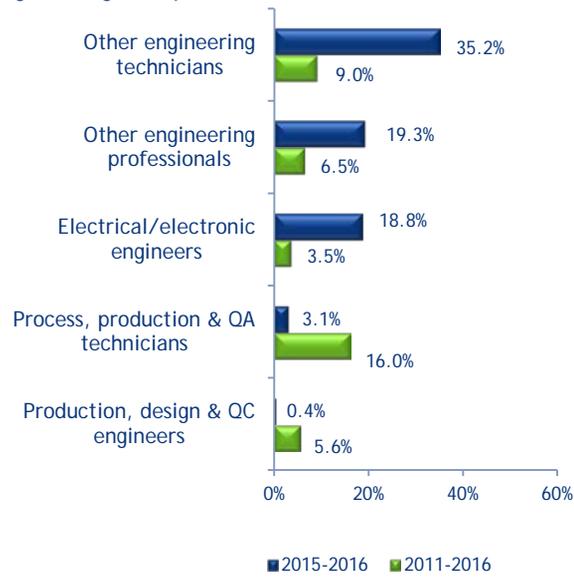
- With the exception of electrical/electronic engineers, over three quarters of persons employed in each occupation was aged 25-54 (Figure 9.2.3); almost a quarter of those employed as electrical/electronic engineers was aged 55 or older
- 93% of other engineering professionals and almost 90% of employed production, design and QC engineers were third level graduates; the lowest share was observed for engineering technicians (72%)(Figure 9.2.4)
- Over four fifths of those employed in engineering professional occupations were male; there were no female electrical/electronic engineers; two fifths of employed process, production and QA technicians were female - the highest share of females among the selected occupations
- The vast majority of employed engineering professionals and technicians worked full-time (96%) and were Irish-nationals (86%).

Figure 9.2.1 Numbers Employed (000s) in Selected Engineering Occupations, 2016



Source: SLMRU (SOLAS) analysis of CSO data

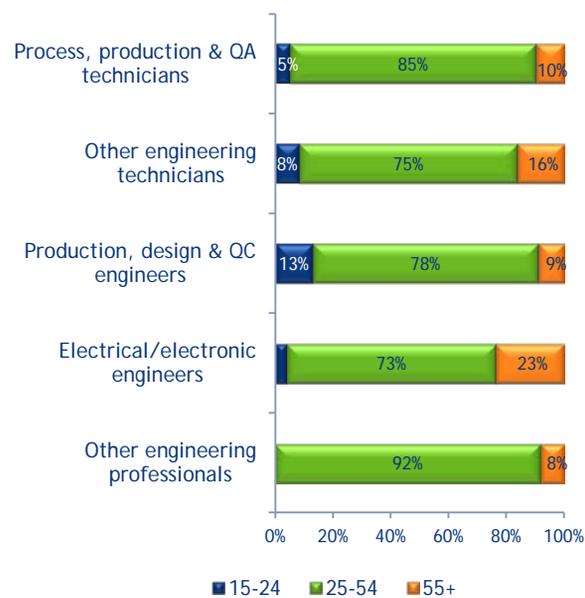
Figure 9.2.2 Average Annual Growth (%) in Selected Engineering Occupations



Source: SLMRU (SOLAS) analysis of CSO data

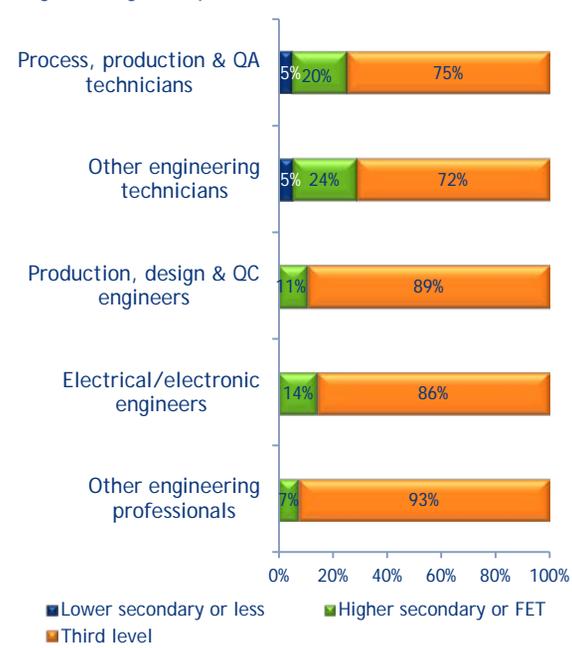
*Note: Growth rates associated with occupations where employment is comparatively small are less reliable due to a greater risk of sampling error.

Figure 9.2.3 Age Profile of Selected Engineering Occupations, Quarter 4 2016



Source: SLMRU (SOLAS) analysis of CSO data

Figure 9.2.4 Education Profile of Selected Engineering Occupations, Quarter 4 2016



Source: SLMRU (SOLAS) analysis of CSO data

Shortage Indicators

Employment has been growing strongly in the selected engineering occupations in recent years. Over a half of those were working in the manufacturing sector, where employment growth in high-tech and medium high-tech manufacturing has been particularly strongly over the most recent five-year period. Job announcements in the media in 2016 were most frequent in industry, primarily in the manufacture of medical devices, biotech, pharmaceutical, food/beverages and machinery/equipment with engineering roles announced including in R&D design, quality control and process engineers along with engineering technicians involved in testing.

Replacement demand in these occupations tends to be low, primarily due to a younger age cohort than the national average; turnover, however, is above average, particularly in relation to electrical and quality control engineers along with quality assurance technicians. Expansion demand,

combined with a high level of movement between employers, is accounting for frequent vacancy notifications primarily for process, quality and project engineers. There were approximately 2,100 recent new hires in 2016 for professional engineers and a further 2,300 for technicians (two thirds of all engineering new hires held a third level honours degree or higher).

Employers are competing internationally for some niche engineering roles (primarily process and equipment engineers but also automation, project and mechanical engineers) with 434 new employment permits issued in 2016 for professionals in both industry and the ICT sector.

The number of third level engineering graduates is estimated at 5,000, more than half of which were at NFQ level 8 or higher; graduate output has been increasing in recent years (up by more than a half since 2010). There are also two new NFQ level 7 apprenticeships in industrial electrical engineering and polymer processing technology. In addition, in April 2017, there were over 600 engineers (over half of whom held at least a degree-level (NFQ 7) qualification) and almost 700 engineering technicians (a third of whom held at least a degree-level (NFQ 7) qualification) who were job ready job seekers.

The demand for engineers, typically for roles in pharmaceutical and medical devices manufacturing, relates largely to those with significant experience (at least five years) in industry specific settings. Shortages include

- process and design (including R&D)
- quality control/quality assurance (including standards, compliance and

regulatory affairs, mostly EHS⁴¹ compliance)

- automation (including lean processes)
- validation/computer validation system (CVS), CQE (certified quality engineer) certification
- chemical engineers
- electrical engineers (safety, tech. specification, mechatronics - development and integration of mechanical, electrical and software systems; power generation and transmission)
- mechanical engineers: with skills and experience in polymer engineering and injection moulding
- technicians: quality assurance/control, process (e.g. injection moulding/polymer engineering), extrusion and maintenance.

There also appears to be an issue with geographical mobility and the ability to attract candidates to certain locations.

⁴¹ Environmental Health and Safety