The National Skills Academy
POWER

RIIO-ED1 WORKFORCE REQUIREMENTS

A report to Ofgem on the workforce requirements of DNOs during RIIO-ED1 and RIIO-ED2

Phase 3 – Final Report

May 2013

Led by:

ABB | Alstom | Balfour Beatty | Carillion Utility Services | Energy & Utility Skills | Enterprise Power Services | E.ON UK | Freedom Group | G4S | Mainstream Renewable Power | Morrison Utility Services | National Grid | Northern Powergrid | SSE | Scottish Power | Siemens | UK Power Networks |

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1 EXECUTIVE SUMMARY

This report presents the final analysis of the workforce renewal requirements of Great Britain's electricity distribution network. This work was carried out in collaboration with, and on behalf of, all six Distribution Network Operators (DNOs) and their principal "Tier 1" contractors in order to support their resource planning activities for RIIO-ED1 and beyond (through to the end of RIIO-ED2). The research has been collated by utilising both the EU Skills' Workforce Planning Model and a series of collective and individual 1-2-1 DNO meetings.

Background

All DNOs have worked in collaboration with Energy and Utility Skills (EU Skills) to build a formative industry-wide Workforce Planning Model. This model allows each company to build scenarios around their principal technical, engineering and specialist roles to aid their workforce renewal strategies.

This model has been used as the basis for workforce planning across the industry since 2007, informing industry thinking and action. It has been used to quantify resource requirements and to inform activity relating to sector attractiveness, training design, capacity and capability and resource mobilisation including regulatory price control discussion.

The model now forms the basis for this updated analysis of the Electricity Distribution (ED) skills landscape over the next 18 years. Data and key assumptions from all electricity DNOs have been aggregated to form this unique industry-wide picture.

The National Skills Academy for Power believes this to be the first time that such a comprehensive exercise has ever been carried out within Great Britain and, as such, represents the most comprehensive and accurate forecast of the demand for skills ever produced for the electricity distribution industry.

Overview

Across both DNOs and contractors there are 20,536 people currently employed in technical, engineering and specialist roles – 14,292 in the six DNOs (an increase of 2,626 employees since the 2007 DPCR5 Ofgem submission) and we have received workforce data on 6,244 of their contractor workforce.

DNOs face a significant challenge to meet the workforce requirements over the next two decades. By the end of RIIO-ED1 DNOs and their contractors are expected to lose 9,708 employees, equivalent to 47% of the current workforce.

The age distribution of the DNO workforce is significantly different to that of the contractors. Within the DNO workforce 26% of the workforce is aged 53 years or more, while in the contractor workforce it is half of this proportion (13%).

The number of retirements will continue to increase year-on-year until 2026, when 700 employees will retire – the age profile of the workforce will therefore continue to be an issue for DNOs until well into RIIO-ED2.

This increase in the number of retirements through RIIO-ED1 into RIIO-ED2 will impact upon the industry at the same time as the full impact of new technology deployment will be felt. This will present a number of significant challenges to the industry in terms of obtaining the required workforce numbers and skills.

To maintain current workforce levels, 15,192 new appointees will be needed by the end of ED1 – equivalent to 74% of current workforce levels. During ED1, this could cost the DNOs in the region of £292.4million and the contractors around £75.6million.

36% of vacancies are predicted to be filled by recruiting trainees (up from 21% in 2007).

The availability of trainees and skilled craftsman is likely to be a significant hurdle for the industry to overcome. During ED1 we predict that the DNOs will be looking to recruit and train 1,930 Apprentices at QCF level 2 and 1,096 at level 3. Being able to attract this quantity of appropriate candidates is likely to the one of the biggest hurdles that the industry will face in terms of workforce renewal.

Current graduate trainee schemes for selected level 4 and 5 posts remain at a modest level. Therefore, the development of training programmes to meet demand for higher level skills (levels 4 and above), notably the Foundation Degree, are critical for the delivery of this workforce renewal programme. It is likely that significant increases in training provider capacity will be required to support higher skills delivery. This is high on the agenda of both EU Skills and the Skills Academy.

Pressure will be felt by the DNOs over course of RIIO-ED1 and ED2 as staff will be targeted for roles in the fast-growing renewables industry, nuclear, the oil and gas industry and those working to upgrade and electrify the nation's railways.

The renewables industry is planning, as a short-term resourcing strategy, to attract nearly-competent people from the power and associated industries who can quickly transition into renewables functions and roles. This may create a significant drain on the current workforce and potential talent pool for the DNOs.

2 Introduction, scope and coverage

2.1 Introduction

This report the presents a comprehensive analysis of workforce requirements of GB's electricity distribution network through the periods of RIIO-ED1 and ED". It has been carried out in collaboration with, and on behalf of, all six DNOs and their principal "Tier 1" contractors in Great Britain in order to support their resource planning activities.

We have achieved this by utilising EU Skills' Workforce Planning Model. This tool, which focusses on the principal technical, engineering and specialist occupations that are employed within the regulated workforce of each DNO and their contractors, establishes a profile of vacancies over the coming years (in what job roles, when and where) and allows each network to develop an appropriate recruitment plan in order to achieve the necessary fully-competent workforce (using a number of different "routes to competency").

This report contains analysis of:

- The vacancy profile and recruitment plan of all six DNOs through to 2030 (the end of RIIO-ED2).
- An estimate of the vacancy profile and recruitment plans of each DNO's "Tier 1" contractor supply chain. Current workforce data has been supplied in the vast majority of cases (c85% of all such contractors) and assumptions, similar to those of the appropriate DNO, have been applied to their data.
- Actual costs of recruiting and training new appointees have been supplied by each DNO and to their recruitment plans and those of their contractors.
- An illustrative scenario of 5% workforce growth throughout ED1 and ED2, across both DNOs and contractors, is also presented for illustrative purposes.

It was hoped that all DNOs would, by now, be able to provide detailed workforce growth scenarios based on the requirements of (i) the smart meter roll-out by 2019; (ii) the deployment of a number of new technologies including electric vehicles; and (iii) a standard workforce growth scenario based on business as usual. However, this has not been the case. Therefore, to provide an idea of the scale of the potential impact of workforce growth on recruitment plans and associated costs, an illustrative workforce growth scenario of 5% during ED1 and ED2 is provided.

Individual DNOs will provide their detailed workforce growth scenarios direct to Ofgem via the usual business planning negotiations/discussions.

Each DNO has worked with EU Skills and the Skills Academy to model their workforce requirements based on a number of assumptions:

- Lead times to competence for each role (i.e. how long a new appointee into a role would take to become fully competent and operational).
- Drop-out rates for each entry route (including those failing to reach the levels of competency required).
- Levels of productivity during initial training and development[1].
- Average retirement age (as defined by each DNO separately).
- Natural wastage levels (as defined by each DNO separately).
- Each DNO's assumptions around retirement age, natural wastage, recruitment strategies and costs have also been applied to their contractor workforce in the same manner.

In response to the forecast vacancy profile, each DNO (and contractor) has developed a recruitment strategy which will deliver the required fully-competent workforce at the right time.

Finally, the cost of gaining the necessary fully-competent workforce has been applied to each DNO's recruitment plan. Full cost data has been received from five out of the six DNO companies and in order to mitigate against the missing cost data, the average costs were calculated based on the data that was received and applied to the missing DNO's recruitment plan. The costs received from the five DNOs are based on the likely actual cost of recruiting and training less-than-competent new appointees (i.e. new recruits as well an internal promotions).

These network-level outputs have then been aggregated to form a unique industry-wide picture. It is this aggregate that this report is based on.

We believe that this is the first time that such an exercise has ever been carried out within Great Britain and, as such, represents the most comprehensive and accurate forecast of the demand for skills ever produced for the electricity distribution industry.

2.2 Scope and coverage

The six DNOs and their principal contractors in Great Britain have utilised the model for each of the 14 DNO regions separately over the period of 2012 to 2030; therefore covering:

- The remaining years of DPCR5
- RIIO-ED1
- RIIO-ED2

It is important to note that this report is based on the **aggregate** outputs of each DNO region's workforce modelling exercise and, therefore, contains no data about individual DNO or contractor workforces. Furthermore, the analysis contained within this report does not highlight the, often, very specific challenges faced by individual DNOs or the idiosyncrasies of each DNO's approach to managing their workforce renewal programmes.

Each DNO has received the full results from the model for their respective regions and contractor workforce as well as the complete aggregate data.

[1] These productivity levels can vary by DNO, although the *range* of productivities is narrow. Some DNOs do report gaining some levels of productivity from trainees, including Apprentices, during the second half of their time in training.

3 Headline numbers

- Across both DNOs and contractors there are 20,536 people currently employed in technical, engineering and specialist roles – 14,134 in the DNOs (an increase of 2,626 employees since the 2007 DPCR5 Ofgem submission) and we have received workforce data on 6,244 in their Tier 1 contractor workforce.
- In that 2007 submission we estimated that the total workforce in 2012 would be 12,713. This shows that all the DNOs have acted upon the findings of the 2007 exercise and have increased their workforce levels beyond what was previously predicted as necessary.
- However, DNOs still face a significant challenge to meet the workforce requirements of the coming two decades. By the end of RIIO-ED1 DNOs and their contractors are expected to lose 9,708 employees, equivalent to 47% of the current workforce. This is made up of 4,321 retirements (21% of the current workforce) and 5,390 leavers through natural wastage.
- Despite recent recruitment activity, the number of employees retiring in 2022 (the final year of RII-ED1) will be more than double the number expected to retire in 2013 – 584 in 2022 compared to 285 in 2013.
- The number of retirements will continue to increase year-on-year until 2026, when 700 employees will retire. Meaning that the age profile of the workforce will continue to be an issue for DNOs until well into RIIO-ED2.
- The high age profile of the workforce affects all skill levels, but it does have a proportionately greater impact on the higher skills levels. In 2022 alone, 201 employees at level 4+ are forecast to retire compared to 69 in 2013 – an increase of 291%. This compares to a 177% increase in those employed in level 3 or below occupations (383 in 2022, up from 216 in 2013).
- Consequently, the proportion of planned appointees at level 4+ increases from 23% (292 of 1,255) in 2013 to 27% (472 of 1,763) by the end of RIIO-ED1.
- In addition to the 9,708 leavers through retirement and natural wastage, an additional 5,009 vacancies could be created to replace existing employees that have been promoted to fill vacancies in higher job roles. Each promotion will leave a vacancy behind them which will need to be filled. This number, however, is highly dependent upon each employer's recruitment strategy (i.e. the extent to which they use upskilling as a method of developing their existing employees to fill vacancies).
- Therefore, just to maintain current workforce levels (and taking into account trainee drop-out rates during training), an estimated 15,192 new appointees will be needed by the end of ED1 – equivalent to 74% of current workforce levels.
- These new appointees by the end of ED1 will be gained through a combination of different "routes to competency" as below:
    - Trainees (Apprentices and Graduates) – 5,482 people
    - Marketplace recruitment (fully competent) – 4,333 "
    - Marketplace recruitment (semi-competent) – 323 "
    - Upskillers (promotions) – 4,522 "
    - Cross-skillers (e.g. multi-skilling but remaining at the same level) – 532 "
- The total cost of recruiting and training these new appointees is £442,001,000 up to the end of RIIO-ED1 (including the remaining two years of DPCR5).
- By 2030/31 (the end of RIIO-ED2) the DNOs and their contractors will have needed to appoint 30,094 people (DNOs = 22,689; Contractors = 7,405) – almost one-and-a-half times (147%) current workforce levels just to maintain their headcount numbers.

- If workforce requirements were to increase by a standard 5% across the DNOs and their contractors during ED1, the additional extra new appointees would be 1,772.
- Recruiting these 1,772 additional employees would cost an extra £50,947,000 to recruit and train.
- It is an important point worth highlighting that this potential growth requirement during ED1 is dwarfed by the need to replace retirees (3,698 employees) and leavers through natural wastage (4,320).

4 Workforce Requirements

4.1 Key assumptions

In terms of determining the number of leavers from the workforce over the period of the model, each DNO applied their own assumptions on a number of factors could determine future workforce demand. These are summarised in table 1 below.

Table 1: Workforce requirement assumptions

Workforce Requirements				
Level	**Retirement Age**	**Natural Wastage – Range**	**Natural Wastage – Average %**	**Efficiency Savings**
1	61-65	2.0% - 9.2%	4.5%	0%
2	61-65	1.2% - 3.2%	2.2%	0%
3	61-65	0.8% - 3.2%	2.1%	0%
4	61-65	0.6% - 3.5%	2.1%	0%
5	61-65	1.4% - 3.5%	2.3%	0%
6-8	61-65	2.0% - 3.7%	2.8%	0%

Retirement age assumptions range from 61-65 years. With the recent abolition of the statutory retirement age, it is currently very difficult for employers to predict what affect this may have on their workforce dynamics. Given (i) increasing life expectancy and (ii) historically low pension returns, it is likely that the workforce of the future will be driven to work for longer. However, given the often physical nature of the work undertaken by this workforce, it is not envisaged that future retirement ages will extend much beyond their current levels.

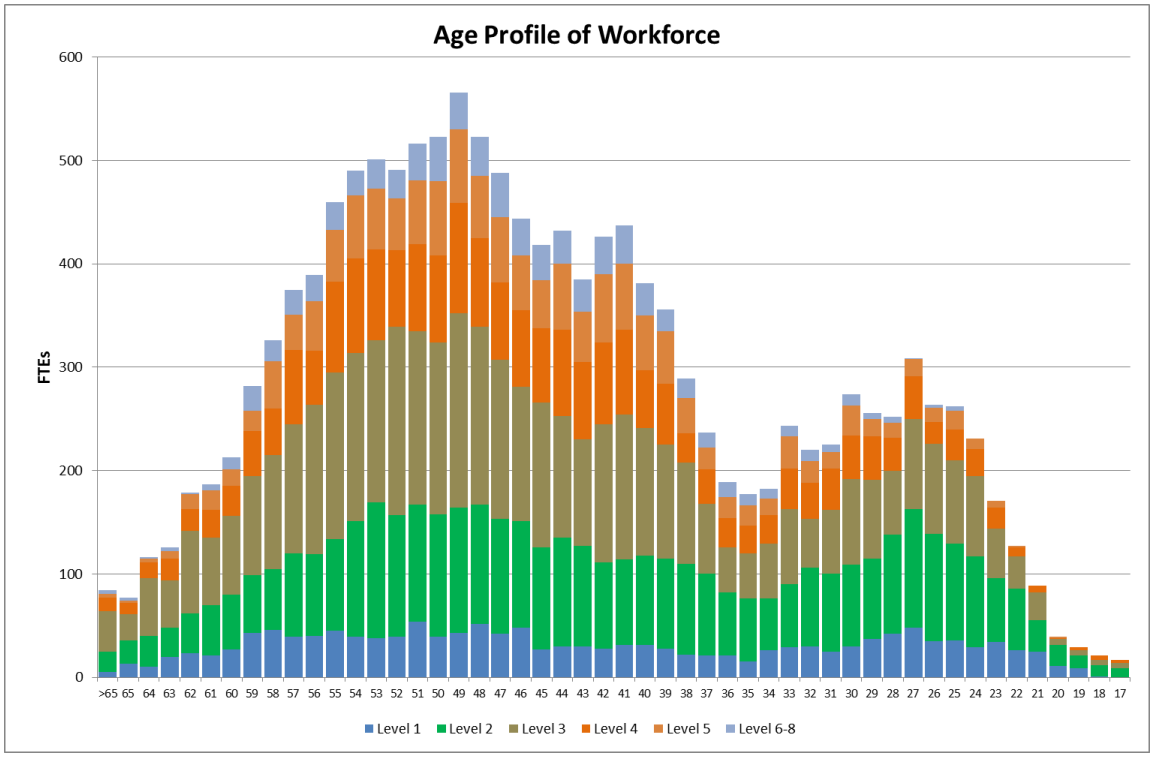
Although natural wastage levels vary quite considerably across companies (particularly at level 1), the average is low compared to other sectors of the economy, which typically see wastage rates of c10% per annum.

4.2 Age profile and retirements

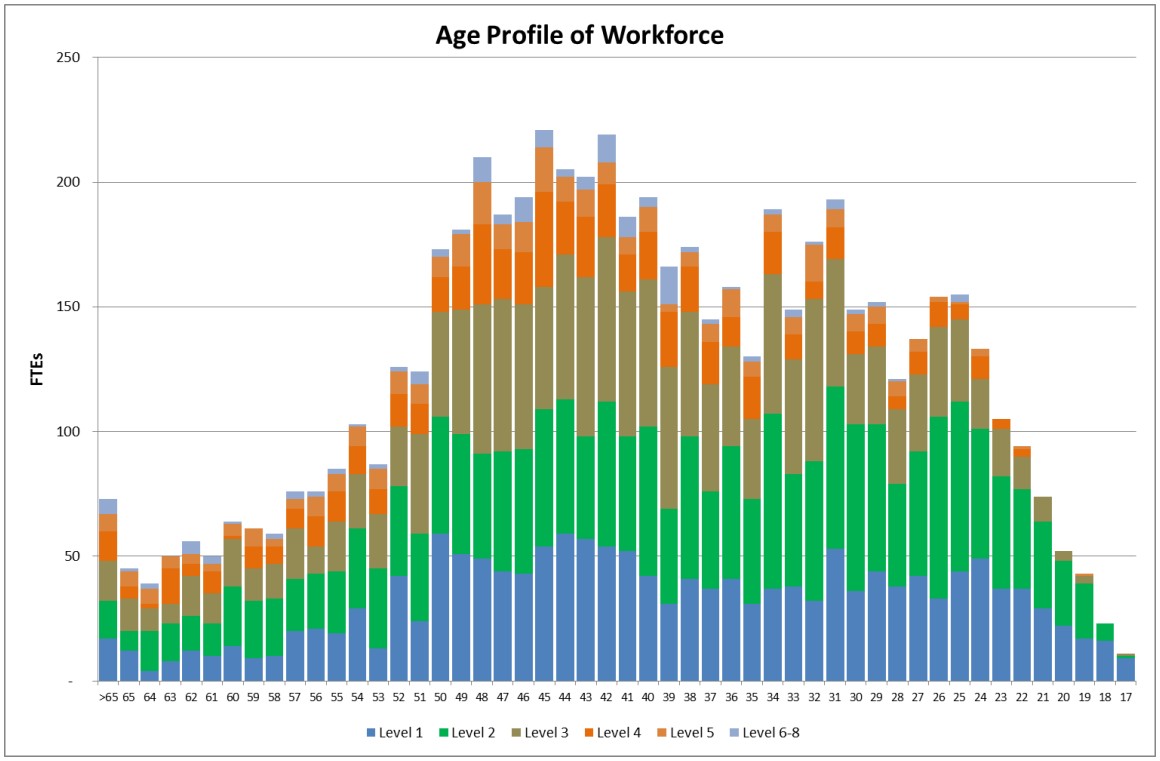
The age profile of the DNO, contractor and combined workforces are shown below in the following figures.

Figure 1: Age profile of the workforce

DNOs



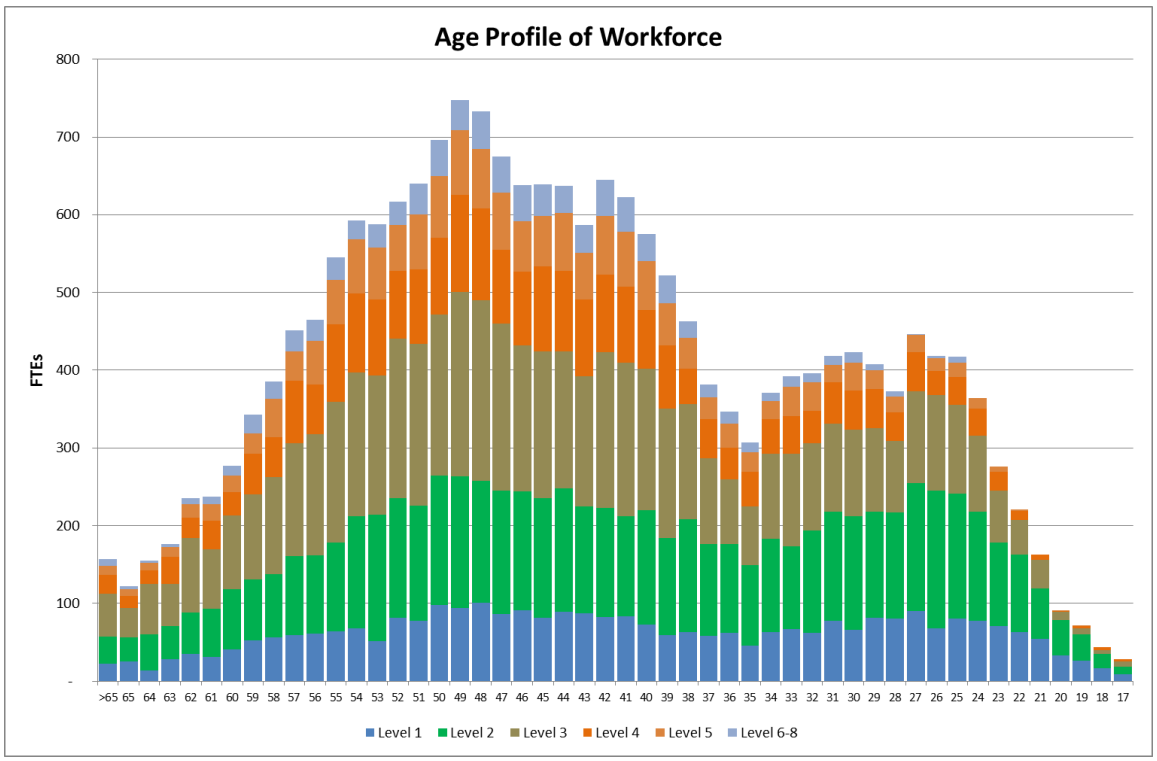
Contractors



As can clearly be seen in the above charts, the age distribution of the DNO workforce is significantly different to that of the contractors. Within the DNO workforce 27% of the workforce is aged 53 years or more, while in the contractor workforce it is around half of this proportion (15%).

Figure 3 below shows the age profile of the combined DNO and contractor workforce, with 23% being aged 53 years or more.

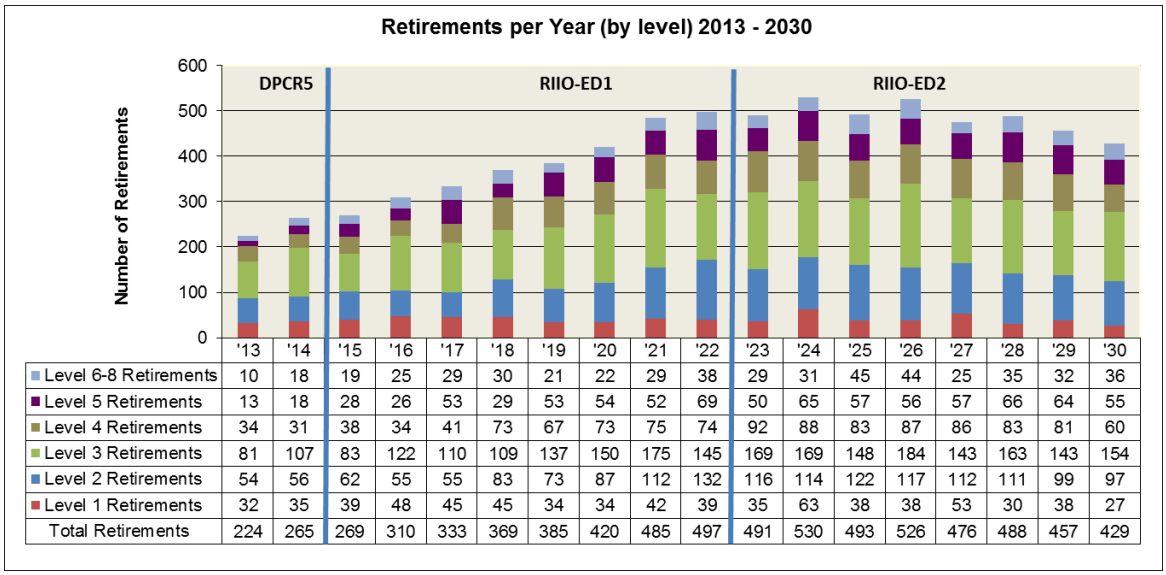
DNOs and Contractors combined



Given these age distributions, figure 2 below shows the expected number of retirements broken down by QCF level.

Figure 2: Retirements per year (by level)

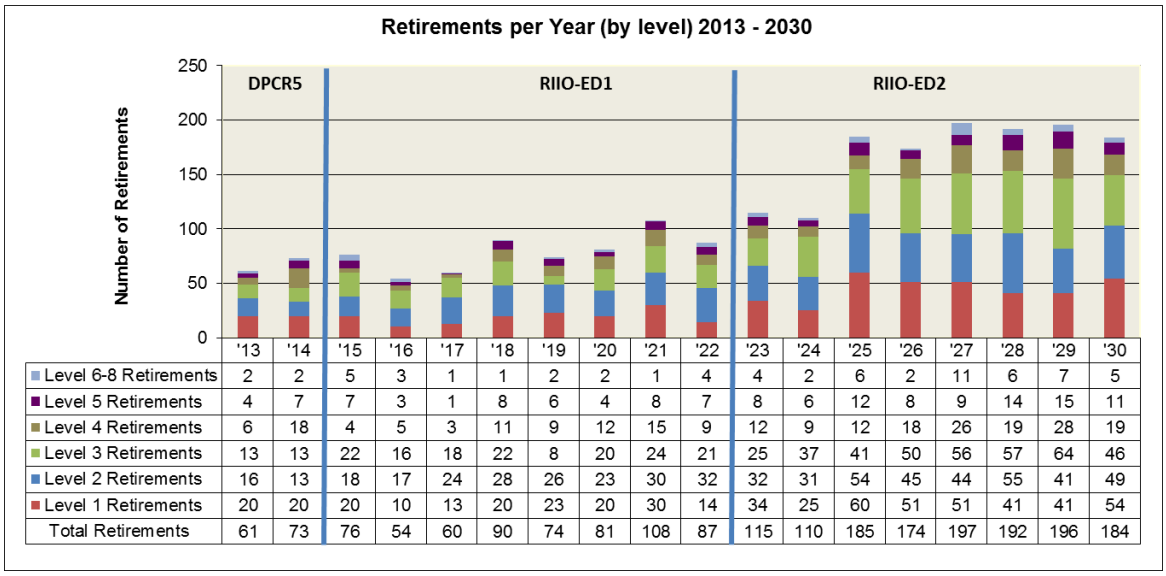
DNOs



	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Level 6-8 Retirements	10	18	19	25	29	30	21	22	29	38	29	31	45	44	25	35	32	36
Level 5 Retirements	13	18	28	26	53	29	53	54	52	69	50	65	57	56	57	66	64	55
Level 4 Retirements	34	31	38	34	41	73	67	73	75	74	92	88	83	87	86	83	81	60
Level 3 Retirements	81	107	83	122	110	109	137	150	175	145	169	169	148	184	143	163	143	154
Level 2 Retirements	54	56	62	55	55	83	73	87	112	132	116	114	122	117	112	111	99	97
Level 1 Retirements	32	35	39	48	45	45	34	34	42	39	35	63	38	38	53	30	38	27
Total Retirements	224	265	269	310	333	369	385	420	485	497	491	530	493	526	476	488	457	429

The number of retirements that are predicted to occur each year increases substantially throughout ED1 – increasing from 269 in 2015 to 497 in 2022. The peak year of retirements in the DNO workforce is 2024, when 530 are predicted to retire.

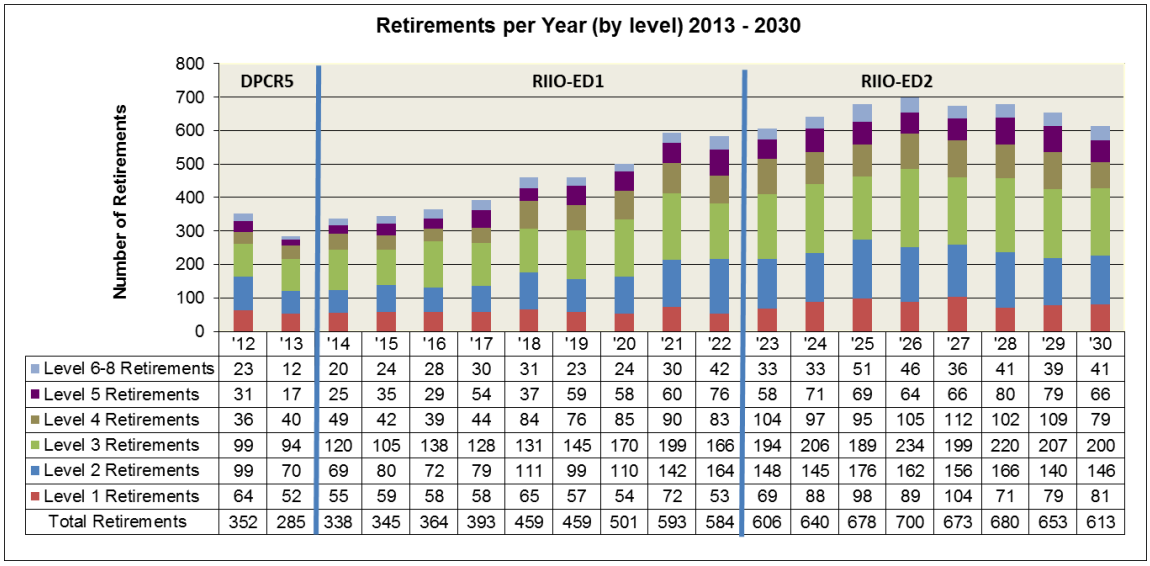
Contractors



	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Level 6-8 Retirements	2	2	5	3	1	1	2	2	1	4	4	2	6	2	11	6	7	5
Level 5 Retirements	4	7	7	3	1	8	6	4	8	7	8	6	12	8	9	14	15	11
Level 4 Retirements	6	18	4	5	3	11	9	12	15	9	12	9	12	18	26	19	28	19
Level 3 Retirements	13	13	22	16	18	22	8	20	24	21	25	37	41	50	56	57	64	46
Level 2 Retirements	16	13	18	17	24	28	26	23	30	32	32	31	54	45	44	55	41	49
Level 1 Retirements	20	20	20	10	13	20	23	20	30	14	34	25	60	51	51	41	41	54
Total Retirements	61	73	76	54	60	90	74	81	108	87	115	110	185	174	197	192	196	184

Within the contractor workforce there is a slight upward trend in the number of retirements during ED1. However, retirements really begin to have an effect on the contractor workforce during ED2 – more than doubling the expected number of retirements in ED1 (630 in ED1, increasing to 1,353 in ED2).

DNOs and Contractors combined



	'12	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Level 6-8 Retirements	23	12	20	24	28	30	31	23	24	30	42	33	33	51	46	36	41	39	41
Level 5 Retirements	31	17	25	35	29	54	37	59	58	60	76	58	71	69	64	66	80	79	66
Level 4 Retirements	36	40	49	42	39	44	84	76	85	90	83	104	97	95	105	112	102	109	79
Level 3 Retirements	99	94	120	105	138	128	131	145	170	199	166	194	206	189	234	199	220	207	200
Level 2 Retirements	99	70	69	80	72	79	111	99	110	142	164	148	145	176	162	156	166	140	146
Level 1 Retirements	64	52	55	59	58	58	65	57	54	72	53	69	88	98	89	104	71	79	81
Total Retirements	352	285	338	345	364	393	459	459	501	593	584	606	640	678	700	673	680	653	613

Overall, across the distribution workforce, 3,698 workers (18% of the current workforce) are predicted to retire during ED1, increasing to 5,243 in ED2 (a further 25% of the workforce) – reaching a peak in 2026 when 700 could retire in that year alone. This increase may be mitigated to a certain extent by the possibility of some workers, particularly those in higher skilled roles, not retiring until 65 or older.

The impact that the abolition of the statutory retirement age, combined with historically poor pension returns when compared to the cost of living, may mean that more people will work beyond what is currently considered to be the average/ likely retirement age.

As we will discuss in more detail later on, this increase in the number of retirements as we move through into RIIO-ED2 will impact upon the DNO and contractor workforce at the same time as the full impact of new technology deployment will be felt. This will present a number of significant challenges to the industry in terms of obtaining the required workforce numbers and skills.

The Skills Academy, working with all the DNOs and contractors, will continue to work in collaboration to ensure that the required entry routes and career pathways are in place to support the recruitment of the required workforce and skills.

4.3 Natural wastage

Natural wastage is leavers from the workforce through other reasons than retirement (e.g. redundancy, gaining a job with another company, etc.). It is unclear from the data gathered for this exercise where these workers go when they leave a company's employment. However, the most likely are:

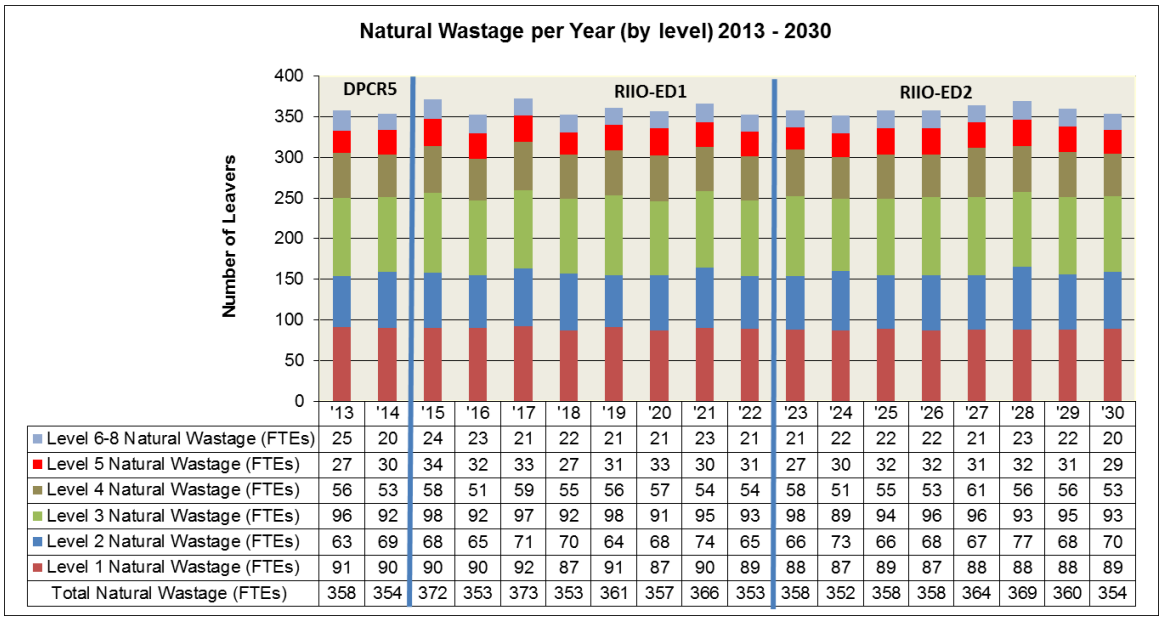
- They simply move to another company within electricity transmission and distribution industry. In this instance their skills are retained in the industry, accepting a small amount of assimilation/retraining/upskilling.
- They leave the industry completely, gaining employment in another industry such as construction, oil and gas, rail transport, etc.
- Finally, there will be a small proportion of leavers who move to electricity transmission and distribution companies overseas. Highly skilled electrical workers (as well as project managers) can attract significant rewards on the global labour market.
- Others reasons could include redundancy, dismissal and death in service.

Each DNO has applied their own rate of natural wastage, to their workforce modelling. It should be noted that these rates are applied as a constant throughout the period of the model. Because of this constant rate, the actual number of leavers through natural wastage each year varies only very slightly year-on-year[2].

Rates of natural wastage can and do vary significantly by QCF level.

Figure 3: Natural wastage per year (by level)

DNOs

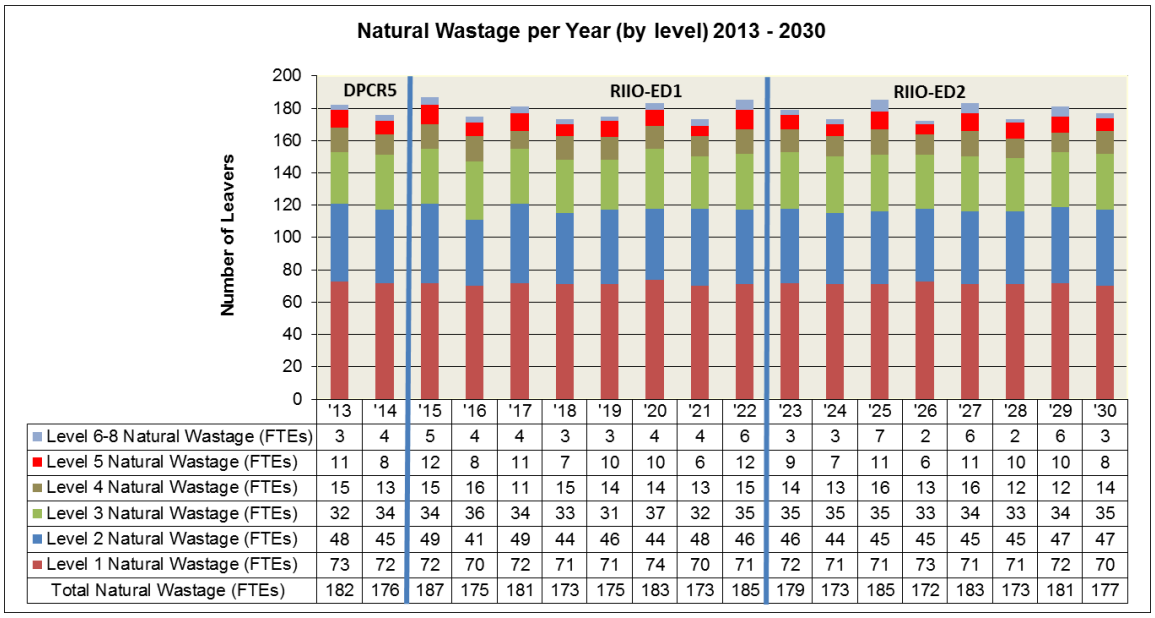


	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Level 6-8 Natural Wastage (FTEs)	25	20	24	23	21	22	21	21	23	21	21	22	22	22	21	23	22	20
Level 5 Natural Wastage (FTEs)	27	30	34	32	33	27	31	33	30	31	27	30	32	32	31	32	31	29
Level 4 Natural Wastage (FTEs)	56	53	58	51	59	55	56	57	54	54	58	51	55	53	61	56	56	53
Level 3 Natural Wastage (FTEs)	96	92	98	92	97	92	98	91	95	93	98	89	94	96	96	93	95	93
Level 2 Natural Wastage (FTEs)	63	69	68	65	71	70	64	68	74	65	66	73	66	68	67	77	68	70
Level 1 Natural Wastage (FTEs)	91	90	90	90	92	87	91	87	90	89	88	87	89	87	88	88	88	89
Total Natural Wastage (FTEs)	358	354	372	353	373	353	361	357	366	353	358	352	358	358	364	369	360	354

[2] Although some variation year-on-year does occur due to the cumulative effect rounding up/down fractions of FTEs within the calculations.

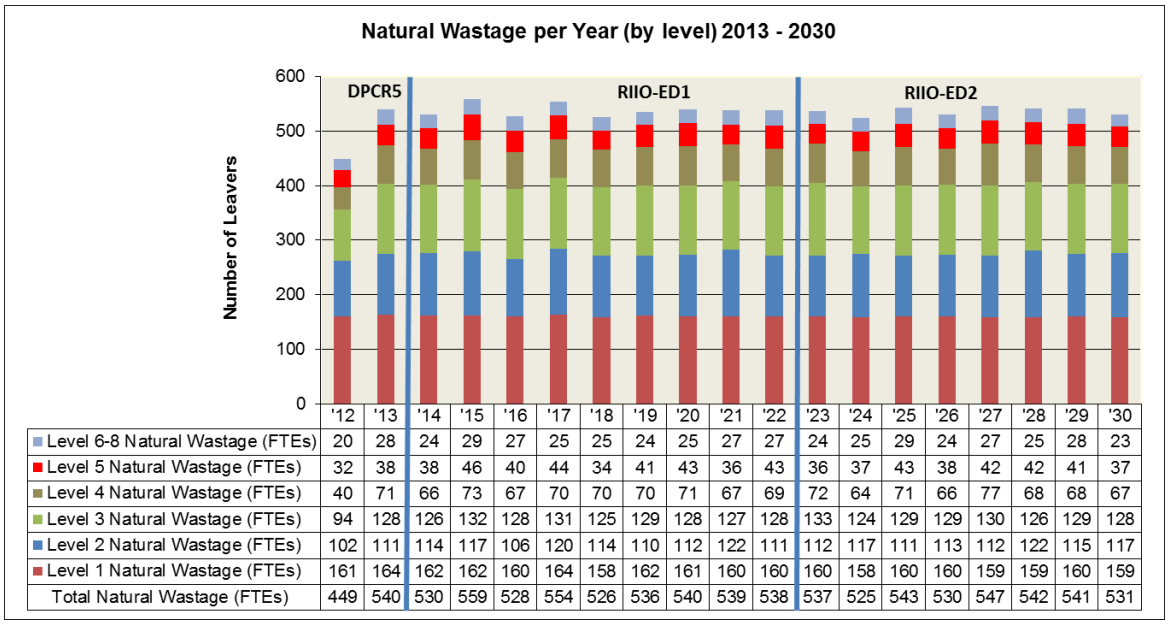
Contractors

For the purposes of this exercise we have applied the natural wastage rates of each DNO to their own contractor workforce. While this allows for a certain consistency of method, anecdotal evidence suggests that natural wastage rates in the contractor workforce can be substantially higher than those in the DNOs – occasionally more than twice as high in the lower level occupations. Therefore, these numbers should be seen as a conservative estimation rather than predicted figures.



	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Level 6-8 Natural Wastage (FTEs)	3	4	5	4	4	3	3	4	4	6	3	3	7	2	6	2	6	3
Level 5 Natural Wastage (FTEs)	11	8	12	8	11	7	10	10	6	12	9	7	11	6	11	10	10	8
Level 4 Natural Wastage (FTEs)	15	13	15	16	11	15	14	14	13	15	14	13	16	13	16	12	12	14
Level 3 Natural Wastage (FTEs)	32	34	34	36	34	33	31	37	32	35	35	35	35	33	34	33	34	35
Level 2 Natural Wastage (FTEs)	48	45	49	41	49	44	46	44	48	46	46	44	45	45	45	45	47	47
Level 1 Natural Wastage (FTEs)	73	72	72	70	72	71	71	74	70	71	72	71	71	73	71	71	72	70
Total Natural Wastage (FTEs)	182	176	187	175	181	173	175	183	173	185	179	173	185	172	183	173	181	177

DNOs and Contractors combined



	'12	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Level 6-8 Natural Wastage (FTEs)	20	28	24	29	27	25	25	24	25	27	27	24	25	29	24	27	25	28	23
Level 5 Natural Wastage (FTEs)	32	38	38	46	40	44	34	41	43	36	43	36	37	43	38	42	42	41	37
Level 4 Natural Wastage (FTEs)	40	71	66	73	67	70	70	70	71	67	69	72	64	71	66	77	68	68	67
Level 3 Natural Wastage (FTEs)	94	128	126	132	128	131	125	129	128	127	128	133	124	129	129	130	126	129	128
Level 2 Natural Wastage (FTEs)	102	111	114	117	106	120	114	110	112	122	111	112	117	111	113	112	122	115	117
Level 1 Natural Wastage (FTEs)	161	164	162	162	160	164	158	162	161	160	160	160	158	160	160	159	159	160	159
Total Natural Wastage (FTEs)	449	540	530	559	528	554	526	536	540	539	538	537	525	543	530	547	542	541	531

During ED1 the number of people predicted to leave the leave through natural wastage is equivalent to 21% of current workforce levels – and the same is predicted to happen in ED2. Including the remaining years of DPCR5, an estimated 9,686 employees will leave the workforce in this manner by the end of ED2.

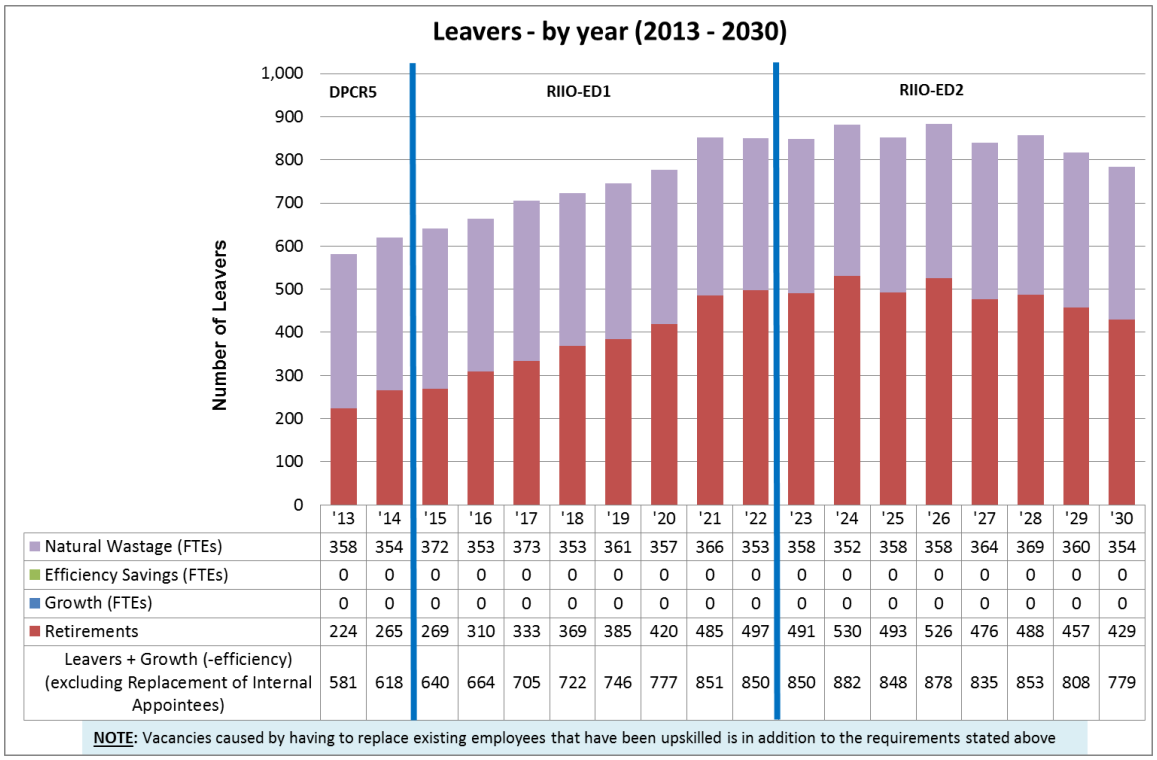
4.4 Total number of leavers

Taking into account expected levels of both retirements and natural wastage across both the DNOs and contractors, 9,708 of the current workforce are forecast to leave their jobs by the end of RIIO-ED1 (made up of 4,321 retirements and 5,390 leavers through natural wastage). This equates to 47% of the current workforce leaving their jobs by the end of ED1. This proportion is higher in the DNOs (50%) than in the contractors (41%) due the higher age profile in the DNO workforce resulting in a higher proportion of retirements over the period.

As we move into ED2, a further 9,509 workers are predicted to leave the workforce. This brings the estimated total number of leavers from the workforce between 2013 and 2030 to 19,217 – a number equivalent to 94% of the current workforce.

Figure 4: Leavers by type and by year

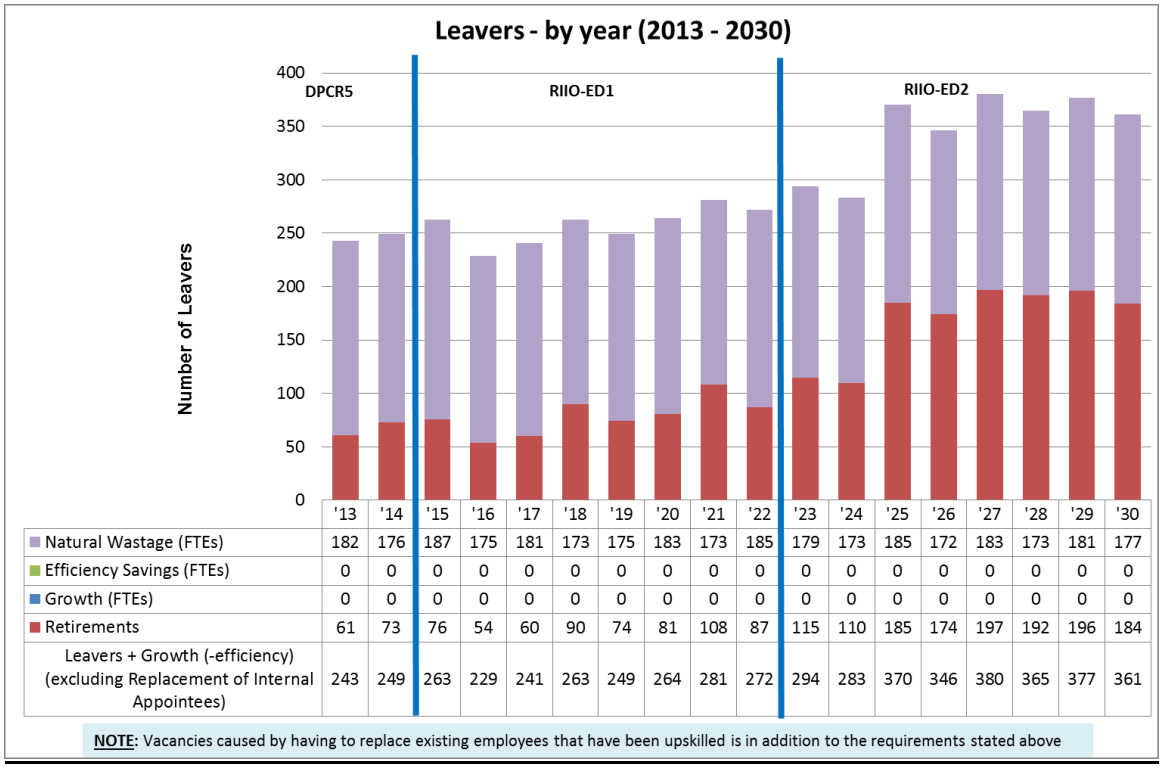
DNOs



	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Natural Wastage (FTEs)	358	354	372	353	373	353	361	357	366	353	358	352	358	358	364	369	360	354
Efficiency Savings (FTEs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Growth (FTEs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retirements	224	265	269	310	333	369	385	420	485	497	491	530	493	526	476	488	457	429
Leavers + Growth (-efficiency) (excluding Replacement of Internal Appointees)	581	618	640	664	705	722	746	777	851	850	850	882	848	878	835	853	808	779

NOTE: Vacancies caused by having to replace existing employees that have been upskilled is in addition to the requirements stated above

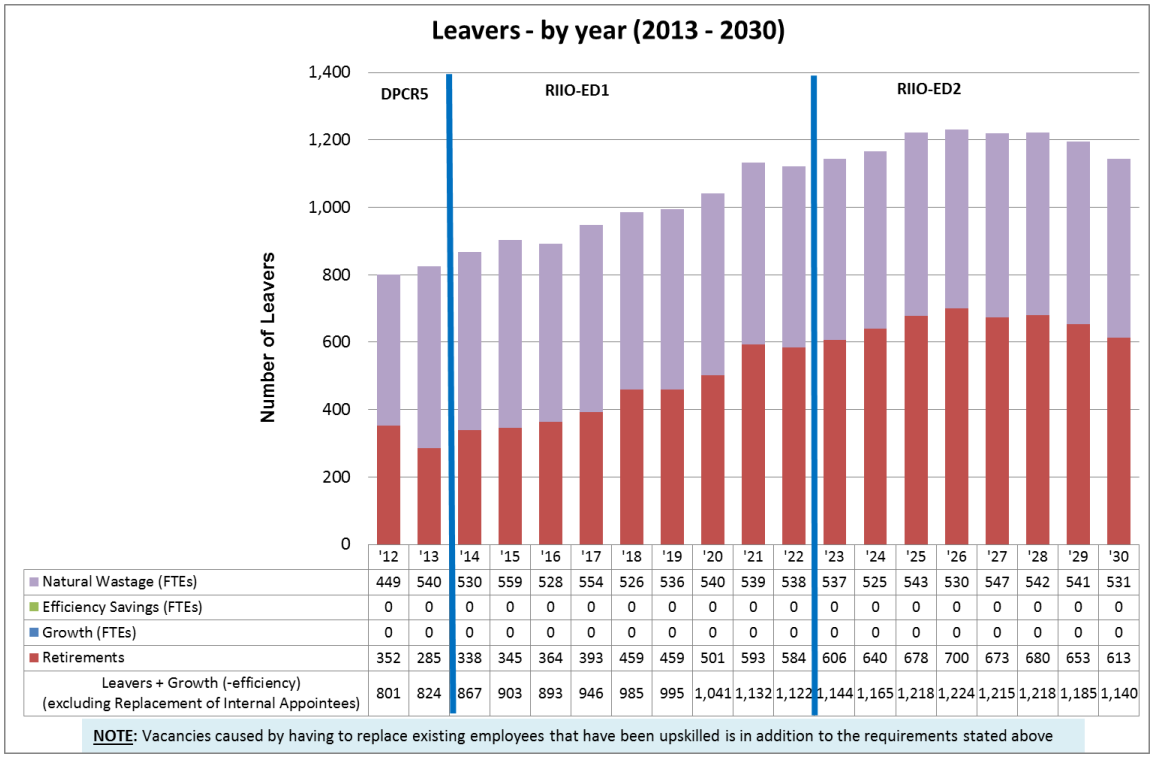
Contractors



	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Natural Wastage (FTEs)	182	176	187	175	181	173	175	183	173	185	179	173	185	172	183	173	181	177
Efficiency Savings (FTEs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Growth (FTEs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retirements	61	73	76	54	60	90	74	81	108	87	115	110	185	174	197	192	196	184
Leavers + Growth (-efficiency) (excluding Replacement of Internal Appointees)	243	249	263	229	241	263	249	264	281	272	294	283	370	346	380	365	377	361

NOTE: Vacancies caused by having to replace existing employees that have been upskilled is in addition to the requirements stated above

DNOs and Contractors combined



	'12	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Natural Wastage (FTEs)	449	540	530	559	528	554	526	536	540	539	538	537	525	543	530	547	542	541	531
Efficiency Savings (FTEs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Growth (FTEs)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retirements	352	285	338	345	364	393	459	459	501	593	584	606	640	678	700	673	680	653	613
Leavers + Growth (-efficiency) (excluding Replacement of Internal Appointees)	801	824	867	903	893	946	985	995	1,041	1,132	1,122	1,144	1,165	1,218	1,224	1,215	1,218	1,185	1,140

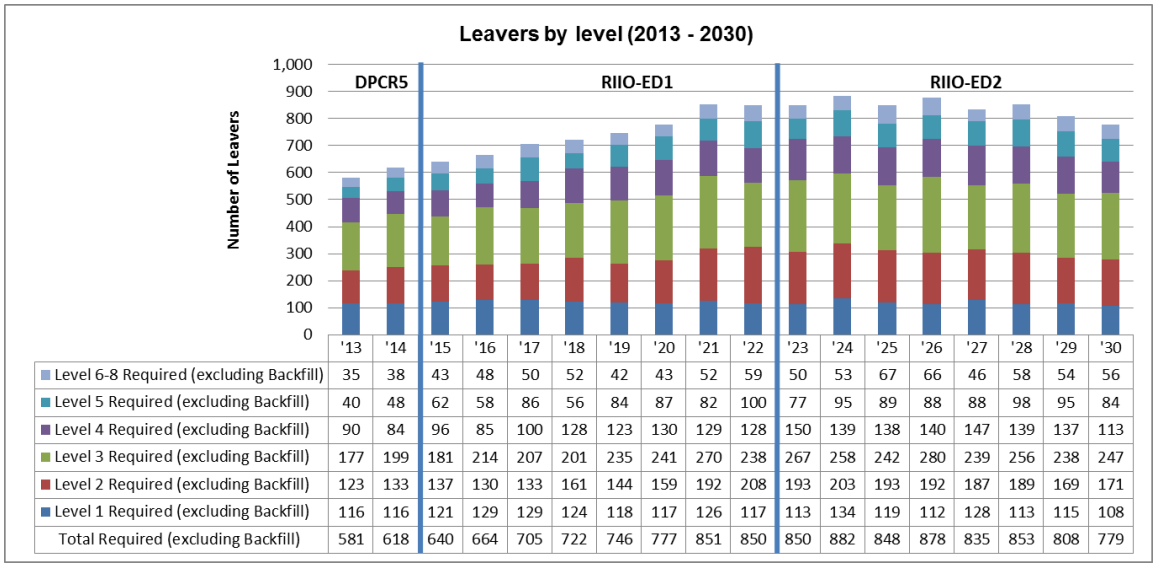
NOTE: Vacancies caused by having to replace existing employees that have been upskilled is in addition to the requirements stated above

The peak year for leavers from the DNO workforce is 2024, while within the contractor workforce, due to its relatively younger age profile, the peak year isn't until 2027. However, when both

workforces are combined, the overall peak year for leavers from the workforce is 2026, when 1,218 workers are expected to leave in that year alone.

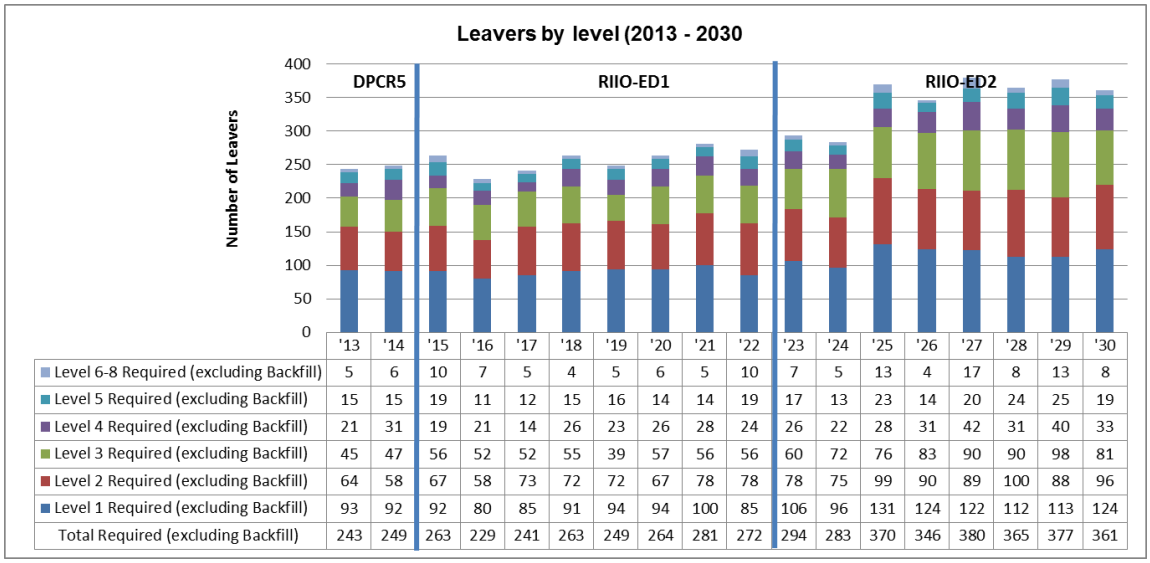
Figure 5: Leavers by QCF level and by year

DNOs



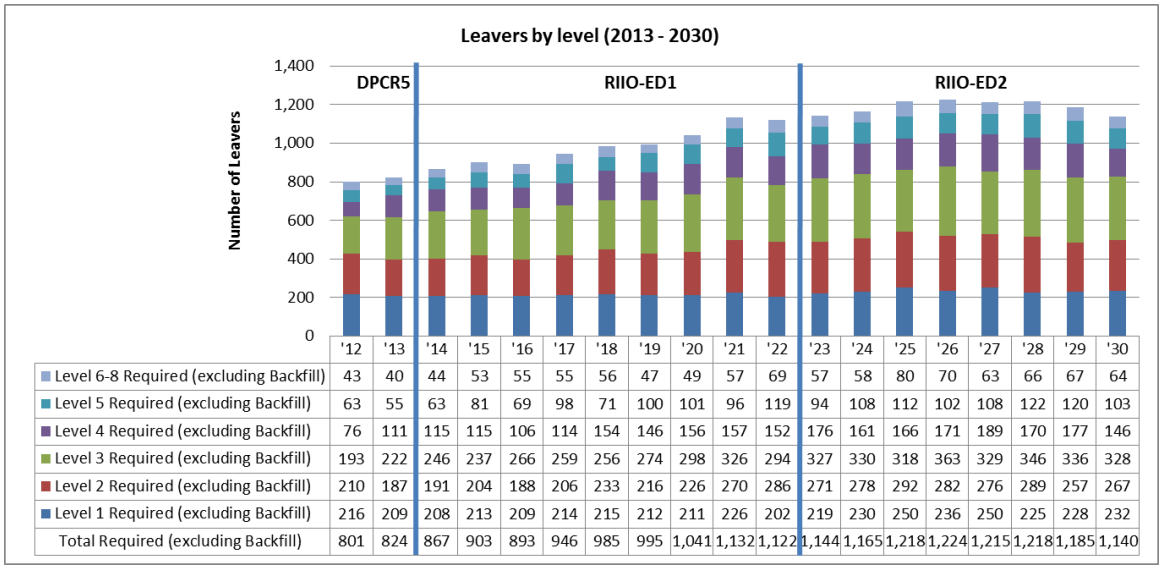
	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Level 6-8 Required (excluding Backfill)	35	38	43	48	50	52	42	43	52	59	50	53	67	66	46	58	54	56
Level 5 Required (excluding Backfill)	40	48	62	58	86	56	84	87	82	100	77	95	89	88	88	98	95	84
Level 4 Required (excluding Backfill)	90	84	96	85	100	128	123	130	129	128	150	139	138	140	147	139	137	113
Level 3 Required (excluding Backfill)	177	199	181	214	207	201	235	241	270	238	267	258	242	280	239	256	238	247
Level 2 Required (excluding Backfill)	123	133	137	130	133	161	144	159	192	208	193	203	193	192	187	189	169	171
Level 1 Required (excluding Backfill)	116	116	121	129	129	124	118	117	126	117	113	134	119	112	128	113	115	108
Total Required (excluding Backfill)	581	618	640	664	705	722	746	777	851	850	850	882	848	878	835	853	808	779

Contractors



	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Level 6-8 Required (excluding Backfill)	5	6	10	7	5	4	5	6	5	10	7	5	13	4	17	8	13	8
Level 5 Required (excluding Backfill)	15	15	19	11	12	15	16	14	14	19	17	13	23	14	20	24	25	19
Level 4 Required (excluding Backfill)	21	31	19	21	14	26	23	26	28	24	26	22	28	31	42	31	40	33
Level 3 Required (excluding Backfill)	45	47	56	52	52	55	39	57	56	56	60	72	76	83	90	90	98	81
Level 2 Required (excluding Backfill)	64	58	67	58	73	72	72	67	78	78	78	75	99	90	89	100	88	96
Level 1 Required (excluding Backfill)	93	92	92	80	85	91	94	94	100	85	106	96	131	124	122	112	113	124
Total Required (excluding Backfill)	243	249	263	229	241	263	249	264	281	272	294	283	370	346	380	365	377	361

DNOs and Contractors combined



	'12	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Level 6-8 Required (excluding Backfill)	43	40	44	53	55	55	56	47	49	57	69	57	58	80	70	63	66	67	64
Level 5 Required (excluding Backfill)	63	55	63	81	69	98	71	100	101	96	119	94	108	112	102	108	122	120	103
Level 4 Required (excluding Backfill)	76	111	115	115	106	114	154	146	156	157	152	176	161	166	171	189	170	177	146
Level 3 Required (excluding Backfill)	193	222	246	237	266	259	256	274	298	326	294	327	330	318	363	329	346	336	328
Level 2 Required (excluding Backfill)	210	187	191	204	188	206	233	216	226	270	286	271	278	292	282	276	289	257	267
Level 1 Required (excluding Backfill)	216	209	208	213	209	214	215	212	211	226	202	219	230	250	236	250	225	228	232
Total Required (excluding Backfill)	801	824	867	903	893	946	985	995	1,041	1,132	1,122	1,144	1,165	1,218	1,224	1,215	1,218	1,185	1,140

The number and proportion of leavers during ED1 varies considerably by QCF level:

- Level 1 roles (operatives) will see 1,702 leave their jobs (56% of the current L1 workforce)
- Level 2 roles will see 1,829 leave (31% of the L2 workforce)
- Level 3 roles (skilled technical) will lose 2,210 workers (36% of the L3 workforce)
- Levels 4-8 (higher level) roles will lose 2,276 workers (41% of the L4-8 workforce)

Across all QCF levels, the number of leavers during ED2 is higher than in ED1 alone.

4.5 The replacement of upskillers

As well as the 9,708 leavers expected through retirements and natural wastage, an additional cause of recruitment is the need to replace existing workers who are promoted – called backfill. This requirement is, of course, determined by the recruitment strategies employed by each employer and can be a cause of significant recruitment activity.

DNOs themselves will, given their anticipated recruitment strategy as applied to the model, need to recruit and additional 4,163 workers by the end of ED1 (including the remainder of DPCR5) to replace those that have been promoted. Within the contractor workforce this figure is 846. This gives a total additional recruitment demand of 5,009 across the combined workforce by the end of ED1 (and an additional 5,239 during ED2).

4.6 Total number of new appointees required

Given the expected number of retirees, (ii) leavers through natural wastage, (iii) the need to replace existing employees who are promoted, and (iv) the replacement of trainees who drop-out during training (assumed to be 5% of Apprentices per year) the total requirement to recruit across both DNOs and contractors is shown in table 2 below.

Table 2: Total predicted number of new appointees required

	DNOs	Contractors	Total New Appointees
DPCR5	1,877	685	2,562
RIIO-ED1	9,845	2,785	12,630
RIIO-ED2	10,967	3,935	14,902

5 Recruitment Plans

In response to this anticipated requirement to recruit, each DNO has provided a detailed recruitment plan in order to ensure that they will achieve their required fully competent workforce at all times over the next two RIIO periods. These same recruitment plans have also been applied to each DNO's contractor workforce to give a total picture an anticipated recruitment activity.

At various levels in the workforce there are different entry routes (called Routes to Competency) available. These are:

- **Apprentices** = new recruits starting on a recognised Apprenticeship framework.
- **Graduates** = new recruits onto a structured learning/development programme aimed at those recently graduated from university.
- **Semi-competent Marketplace** = includes (i) intra-company transfers from other parts of the company into this area of operations/workforce; and (ii) recruiting new entrants to the company that will require some training/ development.
- **Fully-competent Marketplace** = these new entrants to the workforce have all the required skills and only require familiarisation with company procedure to be fully operational.
- **Upskilling** = promoting an existing employee into a skillset at the next level up (e.g. from level 4 to level 5). We also work on the basis that people aren't promoted more than one level up.
- **Cross-skilling** = moving an existing employee from one skillset into another at the same level (e.g. from one level 4 skillset to another level 4 skillset).

Collectively these are termed "new appointees", recognising that upskillers and cross-skillers are not new recruits into the business, but rather newly appointed to another role.

Each DNO individually takes its own approach to meeting its current and future workforce demands; there is little consistency across the industry. The reasons for this include having to deal with the idiosyncrasies of regional and local labour markets and having to operate within the context (and limitations) imposed by parent companies. Table 3 below shows the overall "average" recruitment plan for each level during ED1.

Table 3: Average recruitment profile used within the model

Average Recruitment Profile					
Level	**Trainee**	**Semi-Competent Marketplace**	**Fully-Competent Marketplace**	**Upskill**	**Cross-Skill**
1	7.1%		92.9%		
2	70.6%		15.9%	13.5%	0.1%
3	35.6%	4.6%	9.0%	40.2%	10.6%
4	18.6%	4.4%	18.7%	56.6%	1.7%
5	27.4%	1.7%	13.2%	55.23%	2.5%
6-8			33.3%	66.7%	
Overall Average	**36.2%**	**2.1%**	**27.9%**	**30.3%**	**3.6%**

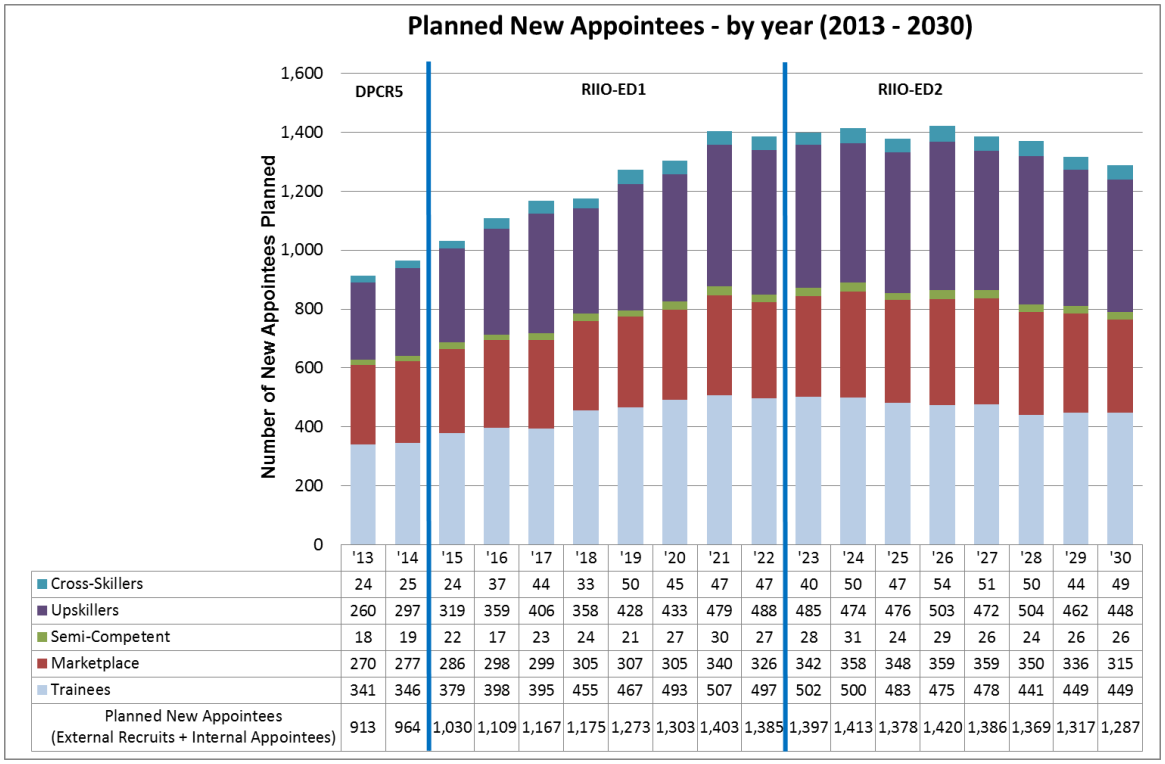
Points to note include:

- **Trainees** – Apprentices are a significant source of labour for the level 2 and 3 workforce. Graduates account for almost one-third of level 5 recruits and around one-in-five of level 4 recruits.
- **Semi-competent marketplace** – this is a minority entry route for levels 3 and 5, but could account for one-fifth of new recruits at level 4.
- **Fully competent marketplace** – this accounts for the vast majority of level 1 recruits and just over one-third of recruits at levels 6-8.
- **Upskilling** – this is a significant entry route for level 4, 5 and 6 job roles. Also, just over one-third of the level 3 workforce is predicted to be upskilled from existing level 2 employees.
- **Cross-skilling** – but is increasingly important at levels 2 and 3.

Figure 6 below shows the overall breakdown of planned recruitment by entry route.

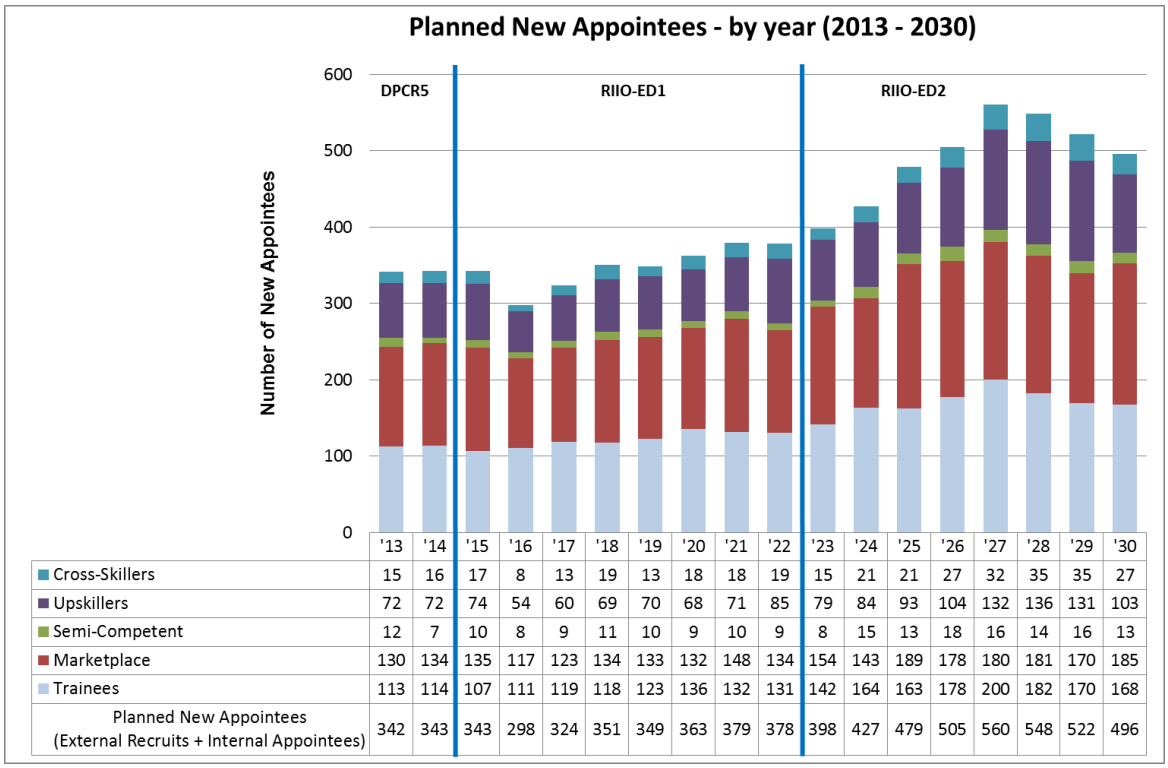
Figure 6: Planned appointees per year (by type)

DNOs



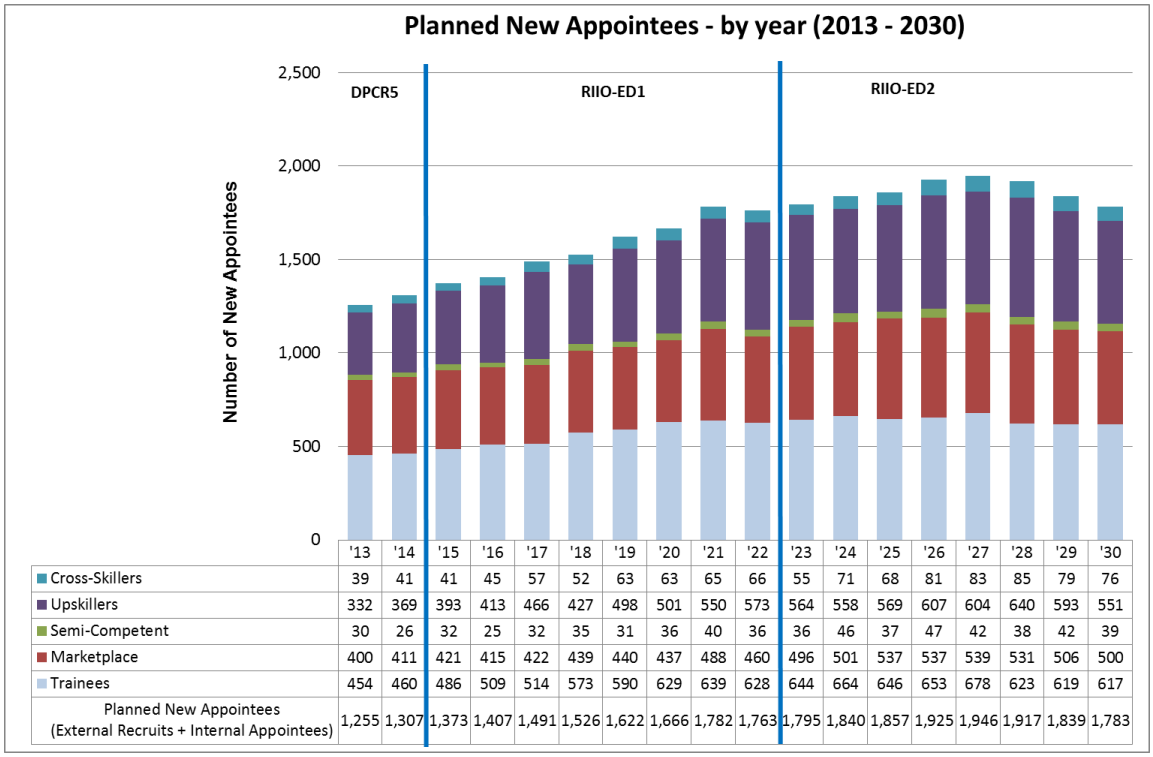
	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Cross-Skillers	24	25	24	37	44	33	50	45	47	47	40	50	47	54	51	50	44	49
Upskillers	260	297	319	359	406	358	428	433	479	488	485	474	476	503	472	504	462	448
Semi-Competent	18	19	22	17	23	24	21	27	30	27	28	31	24	29	26	24	26	26
Marketplace	270	277	286	298	299	305	307	305	340	326	342	358	348	359	359	350	336	315
Trainees	341	346	379	398	395	455	467	493	507	497	502	500	483	475	478	441	449	449
Planned New Appointees (External Recruits + Internal Appointees)	913	964	1,030	1,109	1,167	1,175	1,273	1,303	1,403	1,385	1,397	1,413	1,378	1,420	1,386	1,369	1,317	1,287

Contractors



	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Cross-Skillers	15	16	17	8	13	19	13	18	18	19	15	21	21	27	32	35	35	27
Upskillers	72	72	74	54	60	69	70	68	71	85	79	84	93	104	132	136	131	103
Semi-Competent	12	7	10	8	9	11	10	9	10	9	8	15	13	18	16	14	16	13
Marketplace	130	134	135	117	123	134	133	132	148	134	154	143	189	178	180	181	170	185
Trainees	113	114	107	111	119	118	123	136	132	131	142	164	163	178	200	182	170	168
Planned New Appointees (External Recruits + Internal Appointees)	342	343	343	298	324	351	349	363	379	378	398	427	479	505	560	548	522	496

DNOs and Contractors combined



	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Cross-Skillers	39	41	41	45	57	52	63	63	65	66	55	71	68	81	83	85	79	76
Upskillers	332	369	393	413	466	427	498	501	550	573	564	558	569	607	604	640	593	551
Semi-Competent	30	26	32	25	32	35	31	36	40	36	36	46	37	47	42	38	42	39
Marketplace	400	411	421	415	422	439	440	437	488	460	496	501	537	537	539	531	506	500
Trainees	454	460	486	509	514	573	590	629	639	628	644	664	646	653	678	623	619	617
Planned New Appointees (External Recruits + Internal Appointees)	1,255	1,307	1,373	1,407	1,491	1,526	1,622	1,666	1,782	1,763	1,795	1,840	1,857	1,925	1,946	1,917	1,839	1,783

The number of planned appointees to be sought by all DNOs and their contractors by the end of ED1 (15,192) is equivalent to 74% of the current workforce. Within the DNOs this figure is equivalent to 82% of current workforce levels, while in the contractors it is equivalent to 56% - this reflects the higher age profile within the DNO workforce.

The largest entry route is "trainees", which comprises both Apprenticeship and Graduate in-takes. By the end of ED1 some 5,482 trainees are expected to have been recruited by both DNOs and their contractors (this is in addition to those that are currently in training) – more than half of these (54%) will be at level 2, with 29% being at level 3. The absolute number of trainees being recruited in 2022 (the final year of ED1) is expected to be around 38% higher than the number recruited in 2013 – 628 compared to 454.

During ED1 the average number of level 2 trainees required to start training is 310 per year. In ED2 this rises to 359 per year. For level 3 the requirement is for 166 to start training each year in ED1 and 171 each year in ED2.

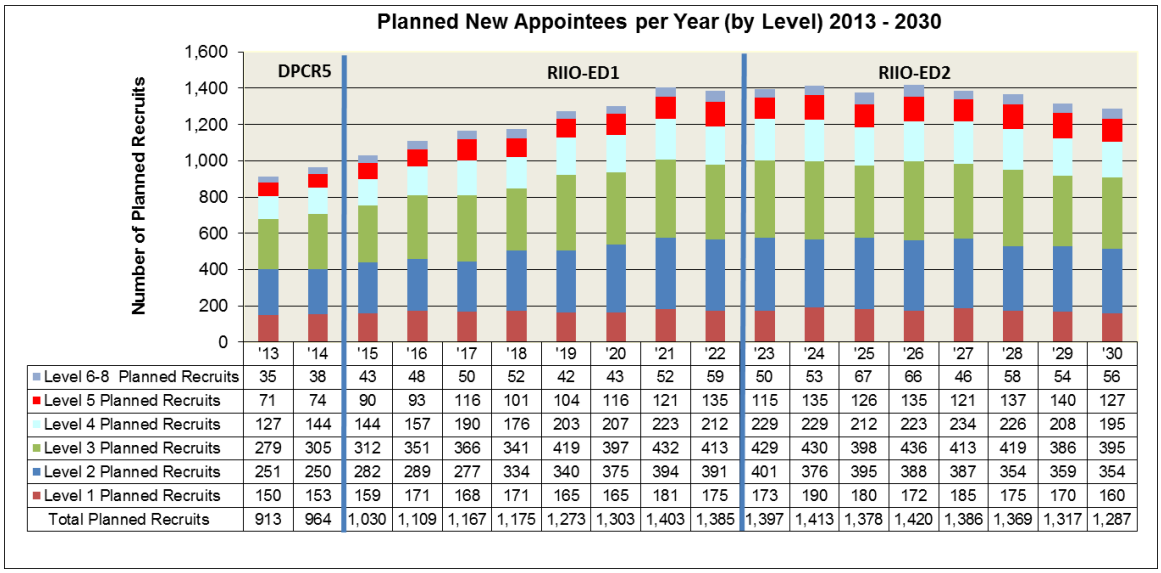
Graduate in-take requirements are somewhat lower at an average of 25 to start training each year in ED1; rising to 29 each year in ED2.

A similar pattern can be seen in the increase in upskillers and cross-skillers over the same period. However, the increase in absolute numbers of marketplace recruits by 2022 is only 12%.

In 2007, 21% of vacancies were forecast to be filled by using trainees; this has now increased to 36%. The reverse is true for marketplace recruitment. In 2007 50% of vacancies were to be filled by this entry route, in 2013 this has fallen to 30%. The proportion of vacancies to be filled by upskilling existing employees has remained constant.

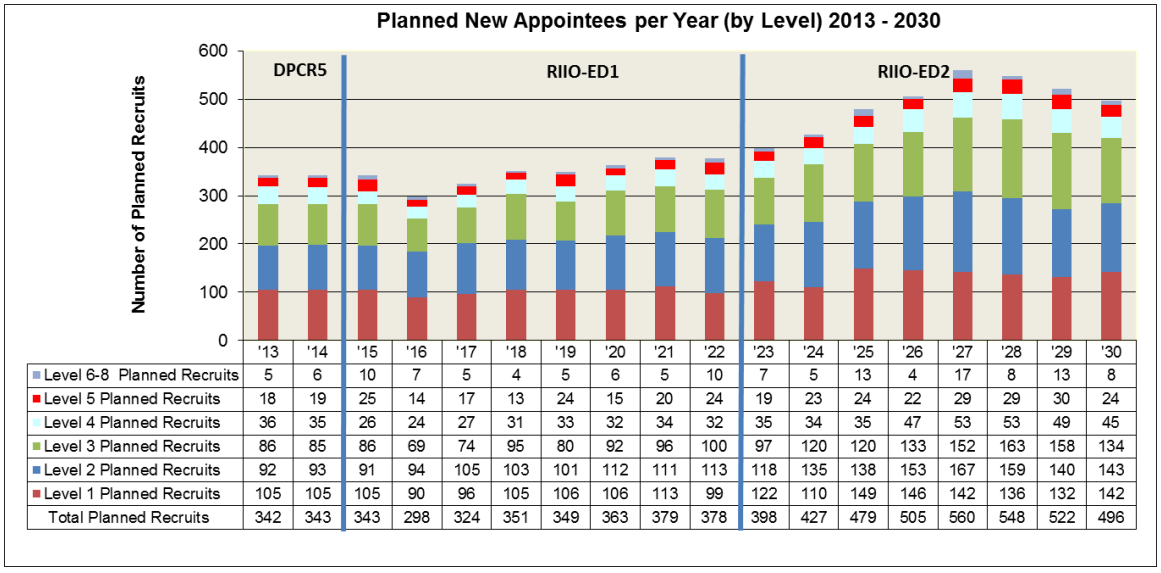
Figure 7: Planned new appointees per year (by level)

DNOs



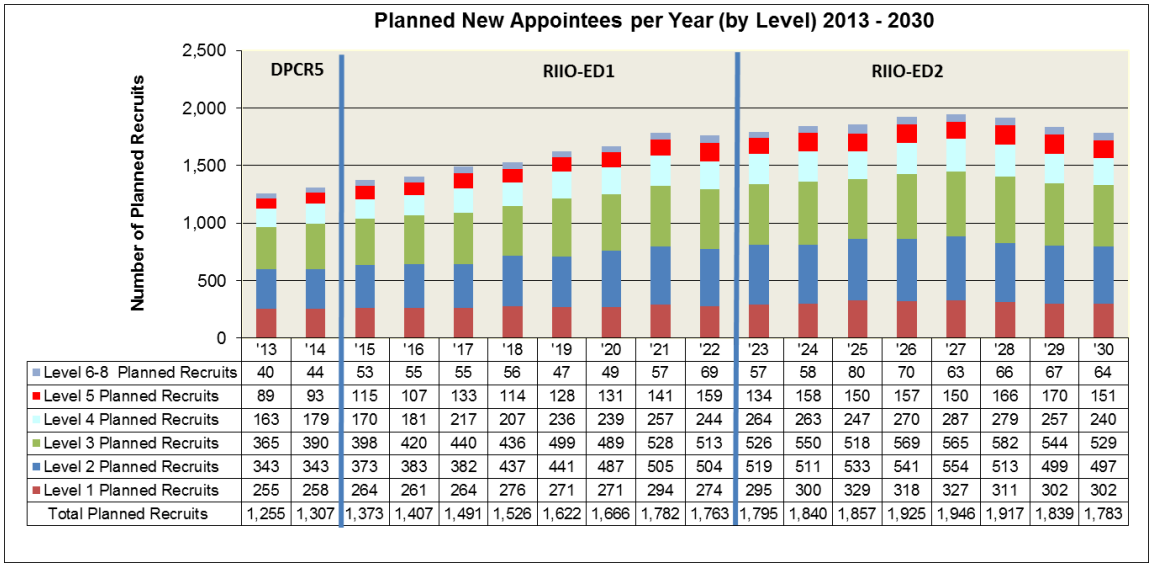
	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Level 6-8 Planned Recruits	35	38	43	48	50	52	42	43	52	59	50	53	67	66	46	58	54	56
Level 5 Planned Recruits	71	74	90	93	116	101	104	116	121	135	115	135	126	135	121	137	140	127
Level 4 Planned Recruits	127	144	144	157	190	176	203	207	223	212	229	229	212	223	234	226	208	195
Level 3 Planned Recruits	279	305	312	351	366	341	419	397	432	413	429	430	398	436	413	419	386	395
Level 2 Planned Recruits	251	250	282	289	277	334	340	375	394	391	401	376	395	388	387	354	359	354
Level 1 Planned Recruits	150	153	159	171	168	171	165	165	181	175	173	190	180	172	185	175	170	160
Total Planned Recruits	913	964	1,030	1,109	1,167	1,175	1,273	1,303	1,403	1,385	1,397	1,413	1,378	1,420	1,386	1,369	1,317	1,287

Contractors



	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Level 6-8 Planned Recruits	5	6	10	7	5	4	5	6	5	10	7	5	13	4	17	8	13	8
Level 5 Planned Recruits	18	19	25	14	17	13	24	15	20	24	19	23	24	22	29	29	30	24
Level 4 Planned Recruits	36	35	26	24	27	31	33	32	34	32	35	34	35	47	53	53	49	45
Level 3 Planned Recruits	86	85	86	69	74	95	80	92	96	100	97	120	120	133	152	163	158	134
Level 2 Planned Recruits	92	93	91	94	105	103	101	112	111	113	118	135	138	153	167	159	140	143
Level 1 Planned Recruits	105	105	105	90	96	105	106	106	113	99	122	110	149	146	142	136	132	142
Total Planned Recruits	342	343	343	298	324	351	349	363	379	378	398	427	479	505	560	548	522	496

DNOs and Contractors combined



	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Level 6-8 Planned Recruits	40	44	53	55	55	56	47	49	57	69	57	58	80	70	63	66	67	64
Level 5 Planned Recruits	89	93	115	107	133	114	128	131	141	159	134	158	150	157	150	166	170	151
Level 4 Planned Recruits	163	179	170	181	217	207	236	239	257	244	264	263	247	270	287	279	257	240
Level 3 Planned Recruits	365	390	398	420	440	436	499	489	528	513	526	550	518	569	565	582	544	529
Level 2 Planned Recruits	343	343	373	383	382	437	441	487	505	504	519	511	533	541	554	513	499	497
Level 1 Planned Recruits	255	258	264	261	264	276	271	271	294	274	295	300	329	318	327	311	302	302
Total Planned Recruits	1,255	1,307	1,373	1,407	1,491	1,526	1,622	1,666	1,782	1,763	1,795	1,840	1,857	1,925	1,946	1,917	1,839	1,783

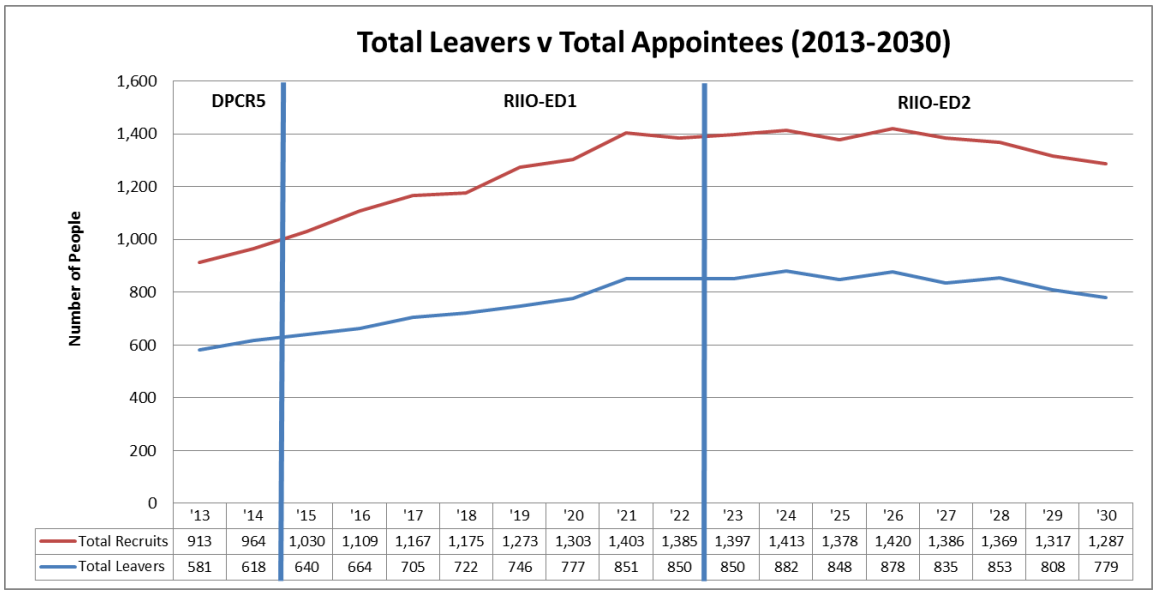
As can be seen from figure 8 below, for every person that leaves the workforce, the industry must make, on average, nearly 1.6 new appointments (including internal promotions and taking into account drop-out rates amongst trainees).

A crucial aspect to the deliverability of these recruitment plans will the availability of trainees and skilled craftworkers. During ED1 we are predicting that the DNOs will be looking to recruit and train 1,930 Apprentice at QCF level 2 and 1,096 at level 3 – these two entry routes alone account for nearly one-third of the predicted recruitment activities of the whole industry during ED1. Being able to attract this quantity of appropriate candidates is likely to the one of the biggest hurdles that the industry will face in terms of workforce renewal.

As charts below show, the ratio of leavers to new appointees increases as we move through ED1 into ED2. This is a result of a greater emphasis on upskilling the current workforce.

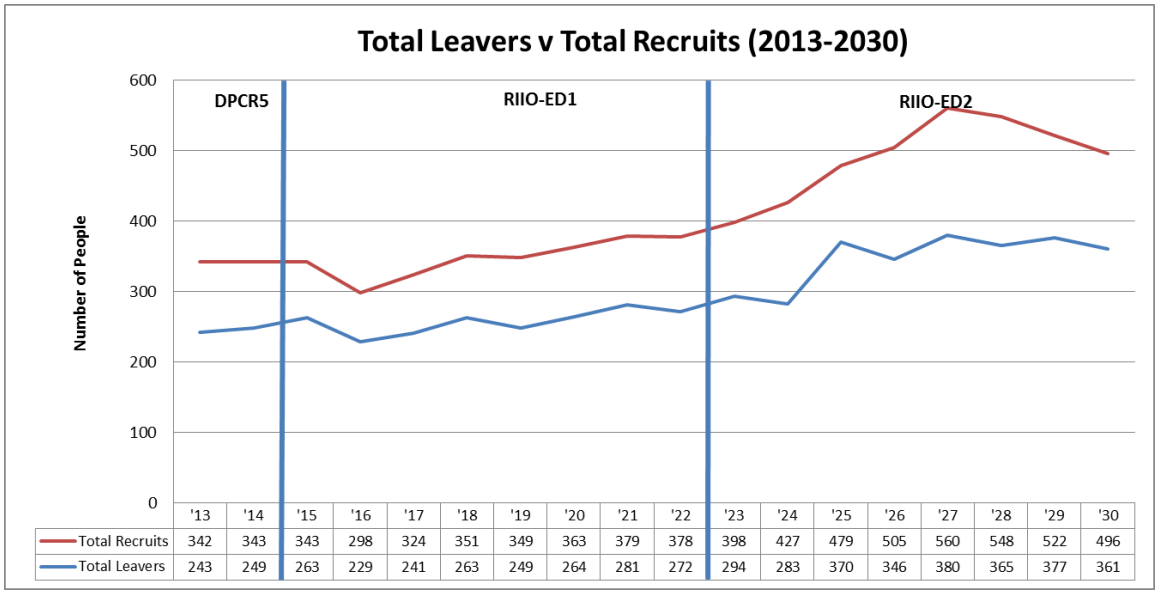
Figure 8: Total number of leavers v Total number of planned new appointees

DNOs



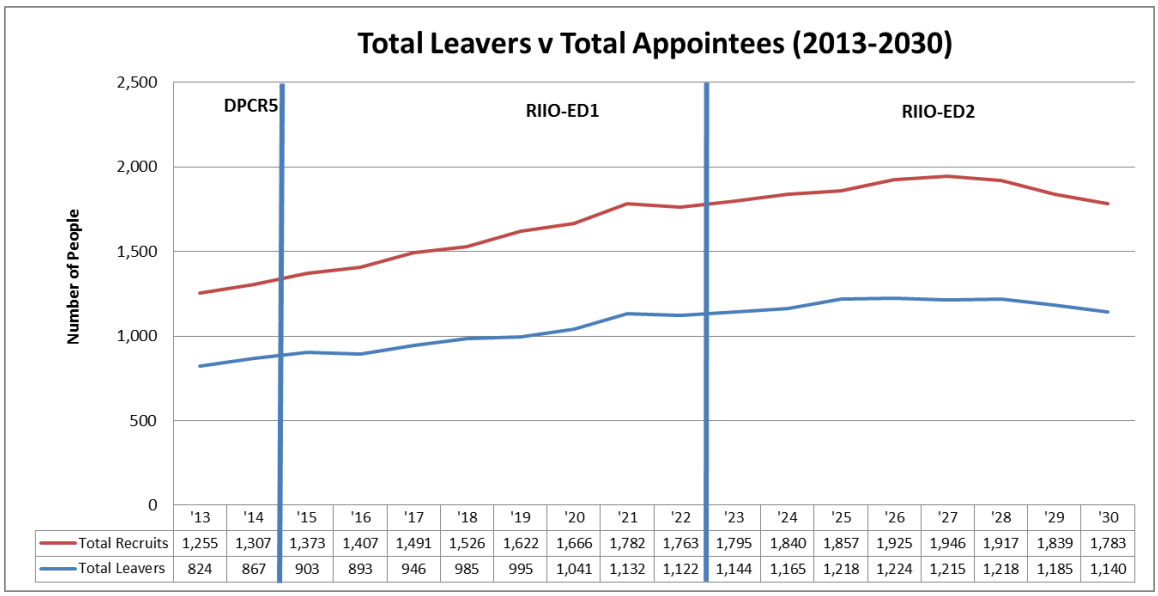
	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Total Recruits	913	964	1,030	1,109	1,167	1,175	1,273	1,303	1,403	1,385	1,397	1,413	1,378	1,420	1,386	1,369	1,317	1,287
Total Leavers	581	618	640	664	705	722	746	777	851	850	850	882	848	878	835	853	808	779

Contractors



	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Total Recruits	342	343	343	298	324	351	349	363	379	378	398	427	479	505	560	548	522	496
Total Leavers	243	249	263	229	241	263	249	264	281	272	294	283	370	346	380	365	377	361

DNOs and Contractors combined



	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Total Recruits	1,255	1,307	1,373	1,407	1,491	1,526	1,622	1,666	1,782	1,763	1,795	1,840	1,857	1,925	1,946	1,917	1,839	1,783
Total Leavers	824	867	903	893	946	985	995	1,041	1,132	1,122	1,144	1,165	1,218	1,224	1,215	1,218	1,185	1,140

The effect that upskilling has on the overall productivity of the workforce is a major issue for employers. When an employee is promoted they will not be immediately 100% competent and productive; they will require a certain amount training and development. At the same time their replacement will also be less than 100% competent and productive. There will also be a sizeable effect on the costs associated with that recruitment and training strategy.

6 The costs of recruitment and training

As part of the modelling exercise, each DNO was asked to provide detailed estimated costs for:

- **Recruitment** – a one-off cost of making a new appointee
- **Salaries** – salary levels while working towards full productivity (only a proportion of the salary, equivalent to their level of unproductivity, is applied as a cost in the model
- **Employment overheads** – pension, NI contributions, etc. (only applied to the unproductive proportion of the salary)
- **Training** – full cost of training in each year of training
- **Other costs** – travel and accommodation, PPE, etc. (applied in each year of training)

Full cost data was received from five out of the six DNO companies and in order to mitigate against the missing cost data, the average costs were calculated based on the data that was received and applied to the missing DNO's recruitment plan.

The costs received from the five DNOs are based on the likely actual cost of recruiting and training less-than-competent new appointees (i.e. new recruits as well an internal promotions).

The average costs provided by the DNOs for each of the above as shown in table 4 below.

Table 4: Average costs applied in the model, by type, level and entry route

Level	Entry Route	Recruitment	Salary[3]	Training	Other Costs
Level 1	**Apprentice**	£500	£14,000[4]	£9,000	
	Fully-Competent Marketplace	£937	£15,923	£6,500	
Level 2	**Apprentice**	£4,159	£12,828	£6,489	
	Fully-Competent Marketplace	£1,896	£23,980	£1,500	
	Upskiller	£150	£23,288	£2,544	

[3] This is the arithmetic mean of the salaries during their training and development prior to reaching full-competence. It is not the salary for a fully-competent, experienced employee.

[4] By taking the arithmetic mean of the values used in the model, it does give the impression that level 1 Apprentices earn more than level 2 and 3 Apprentices – this is caused by the method of calculation used to arrive at this figure and is not, in this instance, an accurate representation of reality.

Level	Entry Route	Recruitment	Salary[3]	Training	Other Costs
Level 3	**Apprentice**	£2,417	£13,000	£6,518	£700
	Fully-Competent Marketplace	£2,959	£28,655	£1,500	
	Fully-Competent Marketplace	£1,449	£25,546	£3,000	
	Upskiller	£150	£27,033	£2,188	
	Cross-skiller	£150	£27,480	£3,000	
Level 4	**Graduate**	£4,966	£26,667	£5,328	£3,374
	Fully-Competent Marketplace	£2,924	£40,424	£3,000	
	Semi-Competent Marketplace	£1,574	£32,162	£5,000	
	Upskiller	£150	£33,725	£3,525	
	Cross-skiller	£150	£38,853	£5,000	
Level 5	**Graduate**	£3,628	£31,500	£5,842	£863
	Fully-Competent Marketplace	£3,408	£46,184	£5,000	
	Semi-Competent Marketplace	£2,049	£38,853	£5,000	
	Upskiller	£150	£37,852	£3,619	
	Cross-skiller	£150	£45,992	£5,000	
Level 6-8	**Fully-Competent Marketplace**	£3,875	£59,119	£3,000	
	Upskiller	£150	£54,490	£4,670	

The total cost of recruiting and training a fully competent and productive workforce given the recruitment strategy presented above in section are given below.

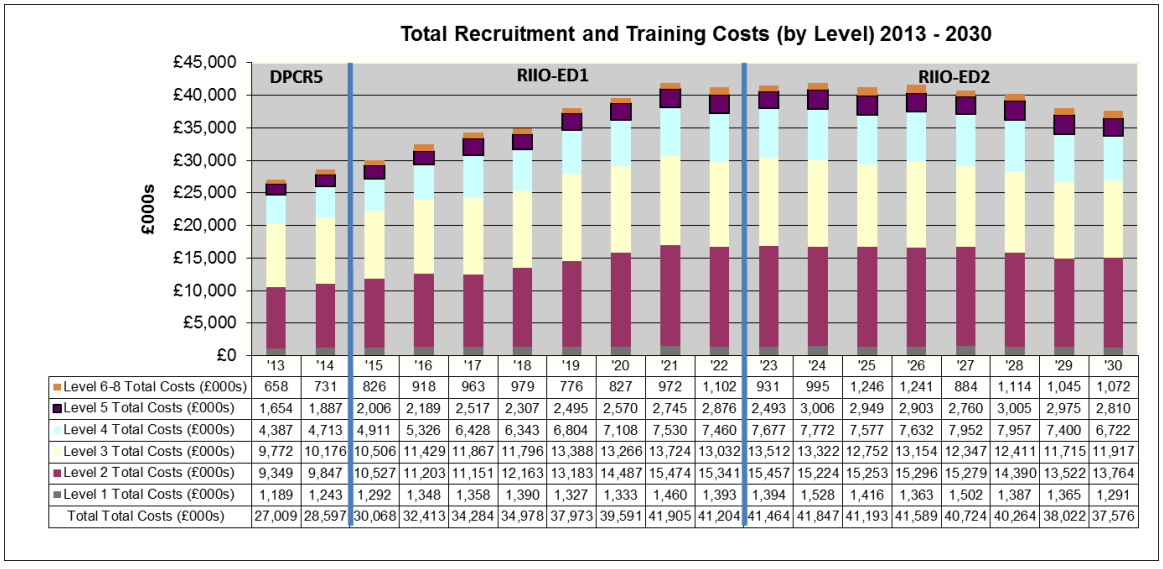
Table 5: Total recruitment and training costs

	DNOs	Contractor	Combined Costs
Remainder of DPCR5			
Recruitment	£3,548,000	£1,107,000	£4,655,000
Salary	£36,135,000	£11,535,000	£47,670,000
Training & Other	£15,929,000	£5,715,000	£21,644,000
Total Costs	**£55,606,000**	**£18,357,000**	**£73,963,000**
RIIO-ED1			
Recruitment	£17,193,000	£4,533,000	£21,726,000
Salary	£196,956,000	£47,494,000	£241,450,000
Training & Other	£81,290,000	£23,600,000	£104,890,000
Total Costs	**£292,416,000**	**£75,622,000**	**£368,038,000**
RIIO-ED2			
Recruitment	£19,609,000	£6,333,000	£25,942,000
Salary	£214,911,000	£67,846,000	£282,757,000
Training & Other	£88,156,000	£32,984,000	£121,140,000
Total Costs	**£322,679,000**	**£107,140,000**	**£429,819,000**

The following charts show a breakdown of these costs by each year through 2030 and by QCF level.

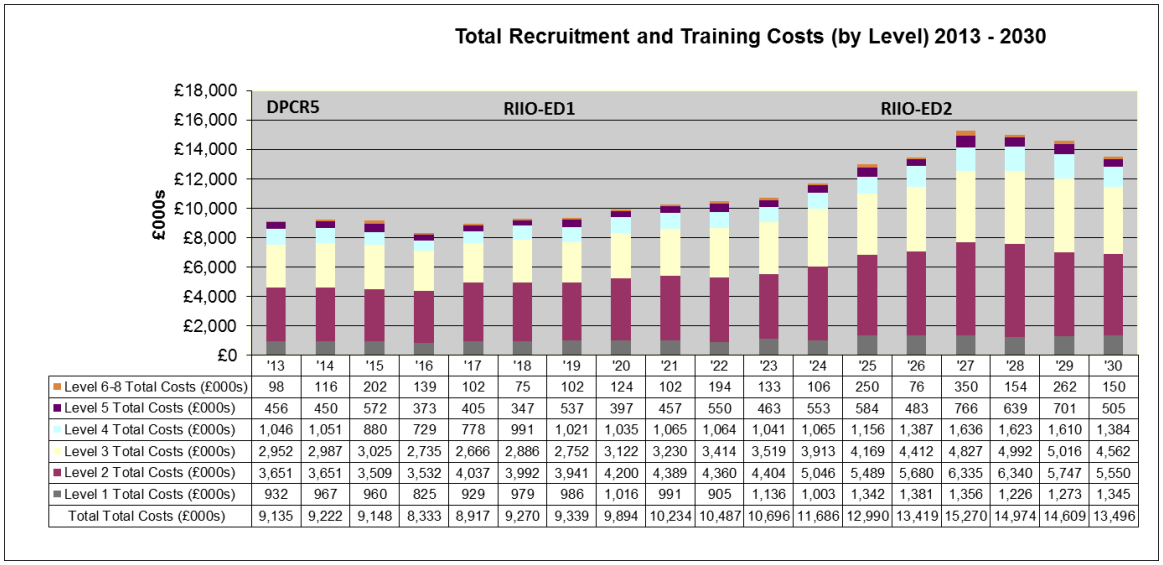
Figure 9: Total recruitment and training costs (by year)

DNOs



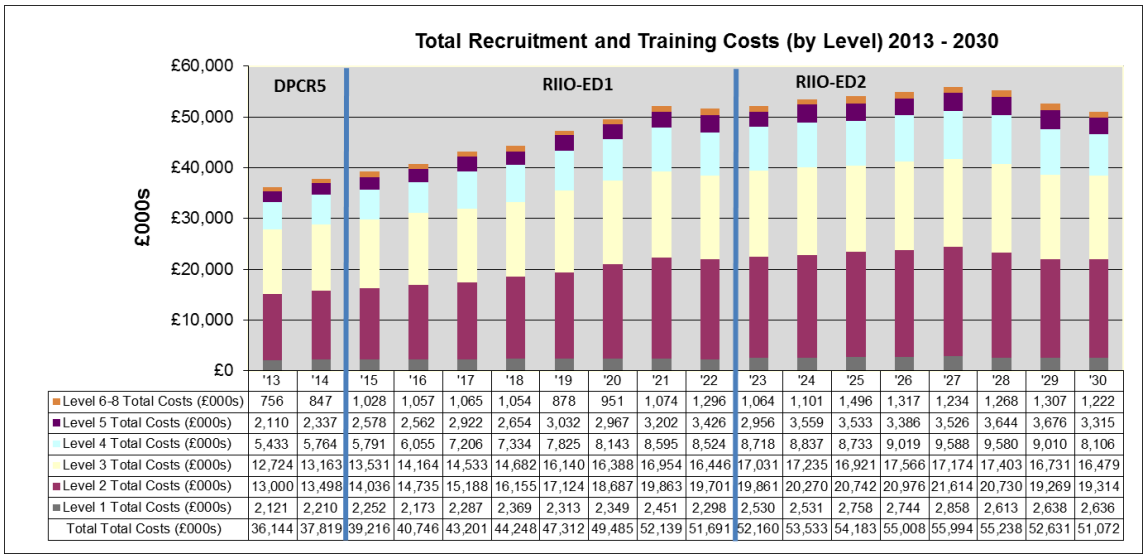
	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Level 6-8 Total Costs (£000s)	658	731	826	918	963	979	776	827	972	1,102	931	995	1,246	1,241	884	1,114	1,045	1,072
Level 5 Total Costs (£000s)	1,654	1,887	2,006	2,189	2,517	2,307	2,495	2,570	2,745	2,876	2,493	3,006	2,949	2,903	2,760	3,005	2,975	2,810
Level 4 Total Costs (£000s)	4,387	4,713	4,911	5,326	6,428	6,343	6,804	7,108	7,530	7,460	7,677	7,772	7,577	7,632	7,952	7,957	7,400	6,722
Level 3 Total Costs (£000s)	9,772	10,176	10,506	11,429	11,867	11,796	13,388	13,266	13,724	13,032	13,512	13,322	12,752	13,154	12,347	12,411	11,715	11,917
Level 2 Total Costs (£000s)	9,349	9,847	10,527	11,203	11,151	12,163	13,183	14,487	15,474	15,341	15,457	15,224	15,253	15,296	15,279	14,390	13,522	13,764
Level 1 Total Costs (£000s)	1,189	1,243	1,292	1,348	1,358	1,390	1,327	1,333	1,460	1,393	1,394	1,528	1,416	1,363	1,502	1,387	1,365	1,291
Total Total Costs (£000s)	27,009	28,597	30,068	32,413	34,284	34,978	37,973	39,591	41,905	41,204	41,464	41,847	41,193	41,589	40,724	40,264	38,022	37,576

Contractors



	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Level 6-8 Total Costs (£000s)	98	116	202	139	102	75	102	124	102	194	133	106	250	76	350	154	262	150
Level 5 Total Costs (£000s)	456	450	572	373	405	347	537	397	457	550	463	553	584	483	766	639	701	505
Level 4 Total Costs (£000s)	1,046	1,051	880	729	778	991	1,021	1,035	1,065	1,064	1,041	1,065	1,156	1,387	1,636	1,623	1,610	1,384
Level 3 Total Costs (£000s)	2,952	2,987	3,025	2,735	2,666	2,886	2,752	3,122	3,230	3,414	3,519	3,913	4,169	4,412	4,827	4,992	5,016	4,562
Level 2 Total Costs (£000s)	3,651	3,651	3,509	3,532	4,037	3,992	3,941	4,200	4,389	4,360	4,404	5,046	5,489	5,680	6,335	6,340	5,747	5,550
Level 1 Total Costs (£000s)	932	967	960	825	929	979	986	1,016	991	905	1,136	1,003	1,342	1,381	1,356	1,226	1,273	1,345
Total Total Costs (£000s)	9,135	9,222	9,148	8,333	8,917	9,270	9,339	9,894	10,234	10,487	10,696	11,686	12,990	13,419	15,270	14,974	14,609	13,496

DNOs and Contractors combined



	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Level 6-8 Total Costs (£000s)	756	847	1,028	1,057	1,065	1,054	878	951	1,074	1,296	1,064	1,101	1,496	1,317	1,234	1,268	1,307	1,222
Level 5 Total Costs (£000s)	2,110	2,337	2,578	2,562	2,922	2,654	3,032	2,967	3,202	3,426	2,956	3,559	3,533	3,386	3,526	3,644	3,676	3,315
Level 4 Total Costs (£000s)	5,433	5,764	5,791	6,055	7,206	7,334	7,825	8,143	8,595	8,524	8,718	8,837	8,733	9,019	9,588	9,580	9,010	8,106
Level 3 Total Costs (£000s)	12,724	13,163	13,531	14,164	14,533	14,682	16,140	16,388	16,954	16,446	17,031	17,235	16,921	17,566	17,174	17,403	16,731	16,479
Level 2 Total Costs (£000s)	13,000	13,498	14,036	14,735	15,188	16,155	17,124	18,687	19,863	19,701	19,861	20,270	20,742	20,976	21,614	20,730	19,269	19,314
Level 1 Total Costs (£000s)	2,121	2,210	2,252	2,173	2,287	2,369	2,313	2,349	2,451	2,298	2,530	2,531	2,758	2,744	2,858	2,613	2,638	2,636
Total Total Costs (£000s)	36,144	37,819	39,216	40,746	43,201	44,248	47,312	49,485	52,139	51,691	52,160	53,533	54,183	55,008	55,994	55,238	52,631	51,072

The costs of recruiting and training the estimated number of trainees will be required by the DNOs and contractors to maintain a fully productive workforce, including both Apprentices and Graduates, account for 66% of the total recruitment and training costs anticipated by DNOs and their contractors.

Predicted spend by the DNOs and their contractors on the recruitment and training of trainees is presented in table 6 below.

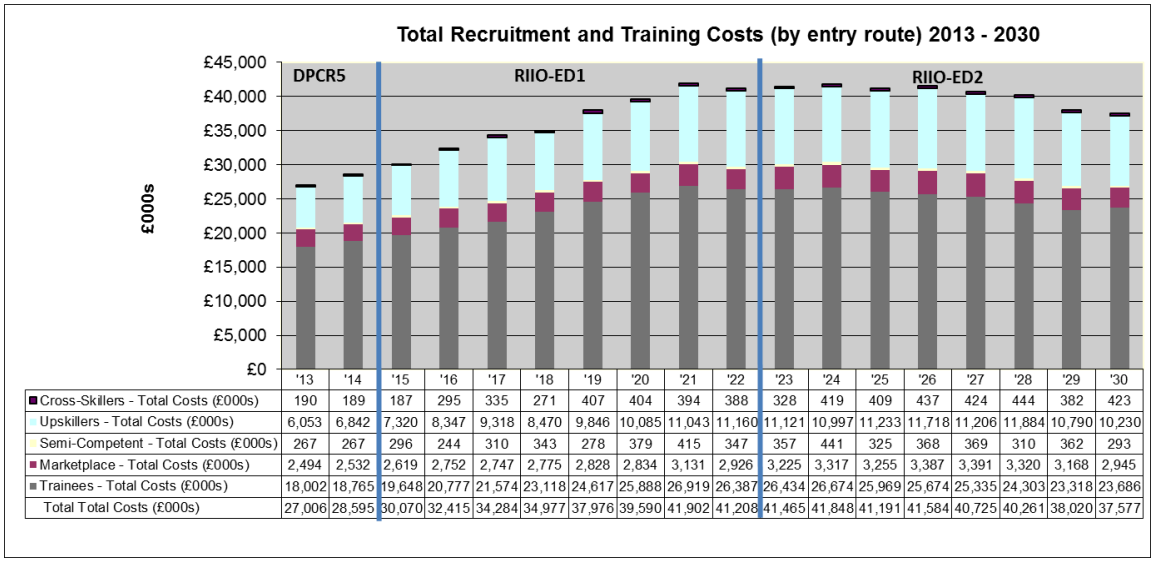
Table 6: Total recruitment and training costs

	DNOs	Contractor	Combined Costs
DPCR5			
Trainees	£36,767,000	£12,352,000	£49,199,000
Total Costs	**£55,606,000**	**£18,357,000**	**£73,963,000**
RIIO-ED1			
Trainees	£188,928,000	£52,423,000	£241,351,000
Total Costs	**£292,416,000**	**£75,622,000**	**£368,038,000**
RIIO-ED2			
Trainees	£201,393,000	£73,128,000	£274,521,000
Total Costs	**£322,679,000**	**£107,140,000**	**£429,819,000**

Figure 10 below shows the total costs by entry route.

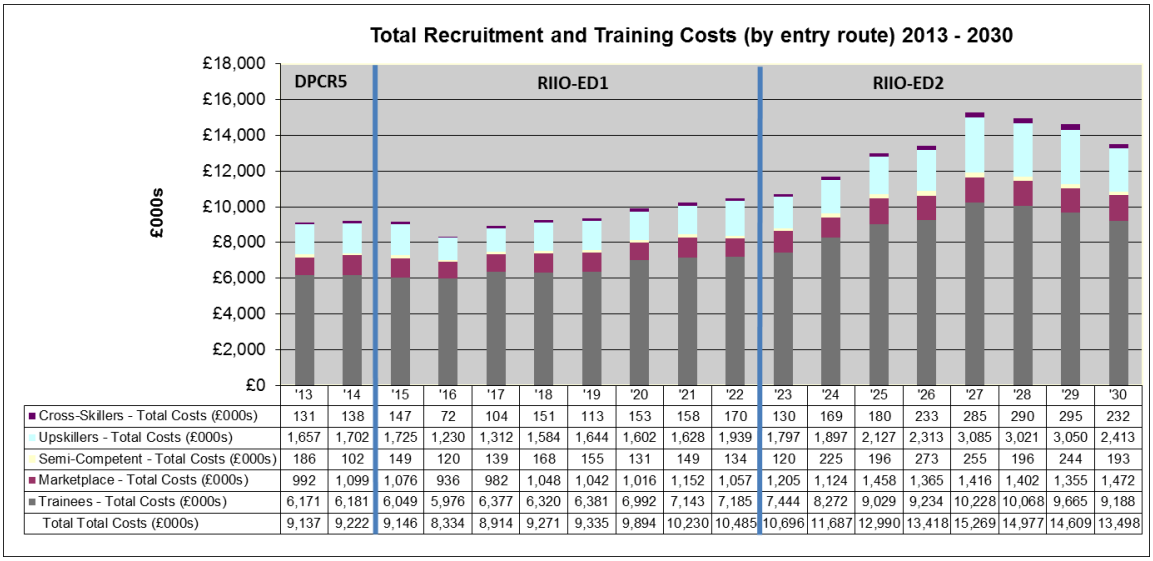
Figure 10: Total recruitment and training costs by entry route (by year)

DNOs



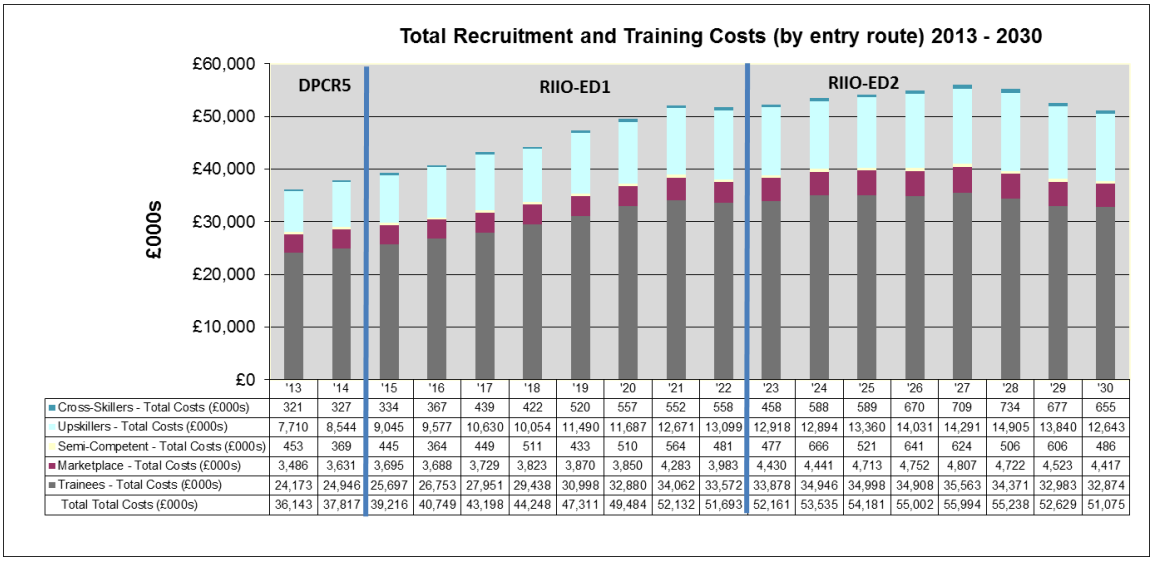
	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Cross-Skillers - Total Costs (£000s)	190	189	187	295	335	271	407	404	394	388	328	419	409	437	424	444	382	423
Upskillers - Total Costs (£000s)	6,053	6,842	7,320	8,347	9,318	8,470	9,846	10,085	11,043	11,160	11,121	10,997	11,233	11,718	11,206	11,884	10,790	10,230
Semi-Competent - Total Costs (£000s)	267	267	296	244	310	343	278	379	415	347	357	441	325	368	369	310	362	293
Marketplace - Total Costs (£000s)	2,494	2,532	2,619	2,752	2,747	2,775	2,828	2,834	3,131	2,926	3,225	3,317	3,255	3,387	3,391	3,320	3,168	2,945
Trainees - Total Costs (£000s)	18,002	18,765	19,648	20,777	21,574	23,118	24,617	25,888	26,919	26,387	26,434	26,674	25,969	25,674	25,335	24,303	23,318	23,686
Total Total Costs (£000s)	27,006	28,595	30,070	32,415	34,284	34,977	37,976	39,590	41,902	41,208	41,465	41,848	41,191	41,584	40,725	40,261	38,020	37,577

Contractors



	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Cross-Skillers - Total Costs (£000s)	131	138	147	72	104	151	113	153	158	170	130	169	180	233	285	290	295	232
Upskillers - Total Costs (£000s)	1,657	1,702	1,725	1,230	1,312	1,584	1,644	1,602	1,628	1,939	1,797	1,897	2,127	2,313	3,085	3,021	3,050	2,413
Semi-Competent - Total Costs (£000s)	186	102	149	120	139	168	155	131	149	134	120	225	196	273	255	196	244	193
Marketplace - Total Costs (£000s)	992	1,099	1,076	936	982	1,048	1,042	1,016	1,152	1,057	1,205	1,124	1,458	1,365	1,416	1,402	1,355	1,472
Trainees - Total Costs (£000s)	6,171	6,181	6,049	5,976	6,377	6,320	6,381	6,992	7,143	7,185	7,444	8,272	9,029	9,234	10,228	10,068	9,665	9,188
Total Total Costs (£000s)	9,137	9,222	9,146	8,334	8,914	9,271	9,335	9,894	10,230	10,485	10,696	11,687	12,990	13,418	15,269	14,977	14,609	13,498

DNOs and Contractors combined



	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29	'30
Cross-Skillers - Total Costs (£000s)	321	327	334	367	439	422	520	557	552	558	458	588	589	670	709	734	677	655
Upskillers - Total Costs (£000s)	7,710	8,544	9,045	9,577	10,630	10,054	11,490	11,687	12,671	13,099	12,918	12,894	13,360	14,031	14,291	14,905	13,840	12,643
Semi-Competent - Total Costs (£000s)	453	369	445	364	449	511	433	510	564	481	477	666	521	641	624	506	606	486
Marketplace - Total Costs (£000s)	3,486	3,631	3,695	3,688	3,729	3,823	3,870	3,850	4,283	3,983	4,430	4,441	4,713	4,752	4,807	4,722	4,523	4,417
Trainees - Total Costs (£000s)	24,173	24,946	25,697	26,753	27,951	29,438	30,998	32,880	34,062	33,572	33,878	34,946	34,998	34,908	35,563	34,371	32,983	32,874
Total Total Costs (£000s)	36,143	37,817	39,216	40,749	43,198	44,248	47,311	49,484	52,132	51,693	52,161	53,535	54,181	55,002	55,994	55,238	52,629	51,075

7 Recruitment and training challenges

As previously mentioned, the single largest obstacle to the industry recruiting the necessary skills it needs to deliver the capital investment programmes is the availability of suitable applicants for skilled craftsman roles and QCF level 2 and 3 trainee programmes.

Evidence from individual DNOs collected during this workforce planning exercise has revealed the extent to which it is an uphill task recruiting skilled workers, with one DNO essentially ruling out the recruitment of *competent* workers from the labour market; focussing instead on attracting semi-competent workers and upskilling/reskilling them – which of course takes time and financial resources to implement, particularly taking into account the hit on productivity levels that carrying partially-competent people within a team environment can have on overall productivity levels.

Issues around sector attractiveness in the power transmission and distribution industry are well documented in EU Skills and Skills Academy research, and both organisations, as well as individual employers, are undertaking numerous activities to try to remedy this situation. With the number of

16-19 year-olds that will enter the labour market over the next decade reducing (although picking up over the longer-term), this is likely to remain a critical issue for the industry.

At the higher skills level, a number of job roles within the electricity transmission and distribution industry are currently recognised by Government as being in shortage in the UK labour market and as such are included on the UK's Shortage Occupation List.

Table 6: Job titles on the UK's Shortage Occupation List

Job title		
Project Manager	Protection Engineer	Proposals Engineer
Site Manager	Design Engineer	Commissioning Engineer
Power System Engineer	Planning/ Development Engineer	Substation Electrical Engineer
Control Engineer	Quality, Health, Safety and Environment Engineer	Overhead Linesworker (high voltage only)
Project Engineer		

Overall, the challenge of recruiting already competent workers from the labour market is likely to prove significant – at all levels of the workforce.

The peak of marketplace recruits is predicted to be around 2027 – at this time the number of fully-competent marketplace recruits is approaching the same number of natural wastage leavers. Therefore, if a significant proportion of natural wastage leavers actually leave the industry completely (e.g. enter employment in another sector such as oil and gas, rail, etc.), there is likely to be an increase in reported skills shortages.

As previously mentioned, some networks are taking active measures to expand their recruitment and training of semi-competent people (i.e. intra-company transfers and re-skilling workers from other, similar sectors). Recent and on-going work by EU Skills and the Skills Academy to make the standards and qualifications for competent people more flexible and modular in delivery will allow this transition training to be more efficient and fast track people into roles.

Graduate trainee schemes for selected level 4 and 5 posts remain at a modest level. This could be due to the number of applicants for electronic and electrical engineering courses falling by one-quarter between 2001/02 and 2008/09, from 6,592 to 4,894. Within this, the number of UK-domiciled applicants fell by one-third (from 4,117 to 2,766); although there has been a recovery of sorts since the low point of 2006/07. Therefore, the development of training programmes to meet demand for higher level skills (QCF levels 4 and above), notably the Foundation Degree, are critical for the delivery of this workforce renewal programme. However, it is likely that significant increases in training provider capacity will be required to support higher skills delivery. This is high on the agenda of both EU Skills and the Skills Academy.

Up-skilling of existing employees, at all levels of the workforce, is becoming an increasingly important element individual DNO resource plans. Current employees have the advantage of having accumulated knowledge and skills specifically applied to the industry. However, up-skilling at this level does create a chain reaction as roles become vacant following a promotion and the additional headcounts that are required if trainees are recruited "ahead of time" (to take into account the length of the training programme). All networks currently have training and Apprenticeship schemes which they will need to expand to meet projected demand levels.

Pressure will be felt by the DNOs over course of RIIO-ED1 and ED2 as staff will be targeted for roles in the fast-growing renewables industry, nuclear, the oil and gas industry and those working to upgrade and electrify the nation's railways. In addition, and in direct competition, the renewables

industry is planning, as a short-term resourcing strategy, to attract nearly-competent people from the power and associated industries who can quickly transition into renewables functions and roles. This could create a significant drain on the current workforce and potential talent pool for the DNOs.

8 Workforce growth scenarios

8.1 Potential impact of smart meter roll-out on DNOs

Each DNO was asked for their forecasts of workforce growth during ED1 and ED2 and an assessment of the extent to which this growth would affect different job roles in the DNO and contractor workforces.

Three of the six DNOs provided this information – with the caveat that this data is more than likely to be updated as each organisation goes through the process of finalising their business plans.

Therefore, data is presented as an *indication* of the nature and extent of the growth requirements in the distribution workforce caused by the smart meter roll-out.

- The impact upon **Cable Jointers** (at QCF level 2) will be significant. The data provided suggests that the total number of people working in this job role (currently around 1,500) could increase by around 500 if we extrapolate the data we received to cover the missing DNO regions.

  This is in addition to the 875 new cable jointers at level 2 they will need to make to replace leavers from their current workforce.

- **Overhead Linesperson** (at QCF level 2) could see an increase of around 60 within the DNO workforce, on top of the 1,261 already predicted to be recruited to maintain headcount numbers.

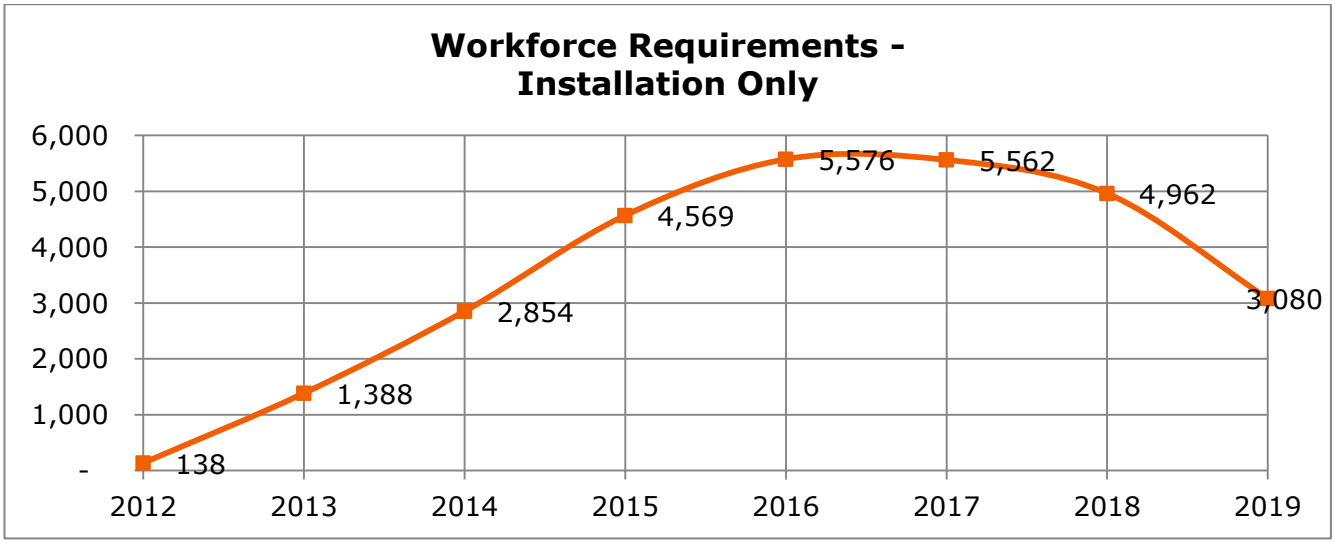
- There will also be increases of around 10-15% in job roles such as **Technical/Supervisory** (at QCF level 3), **Project Managers** (at QCF level 4), **Specialists** and **Managers** at QCF level 5 and **Specialist/ Engineers** at QCF level 6-8.

- Small numbers of expert data/communications engineers will be required to initiate activities such as demand response profiling, load management and enhanced fault indication. This will materialise during ED1 as the data communications company and communication service provider infrastructure is in place.

Prior to this workforce planning exercise (during the summer of 2012), the Skills Academy worked closely with representatives from both DNOs and GDNOs to produce a series of plausible resourcing scenarios for workforce deployment during the foundation phase and full smart metering rollout 2014-2019. This builds upon initial work carried out within the ENA Smart Meter Operations Group (SMOG). **This work is currently being updated based on revised DECC data and will be available in May 2013.**

Latest figures supplied by DECC indicate that 49.5million meters will require changing by 2019 – 27.5million electricity and 22million gas. Energy suppliers appear to be adopting a predominantly dual fuel installation strategy – which equates to over 9.8million meter installations per year during the height of the rollout. The chart below captures the latest rollout data provided by DECC and is based upon productivity scenarios of 4 dual fuel installations per day.

Figure 11: Workforce requirements of electricity and gas smart meter installations

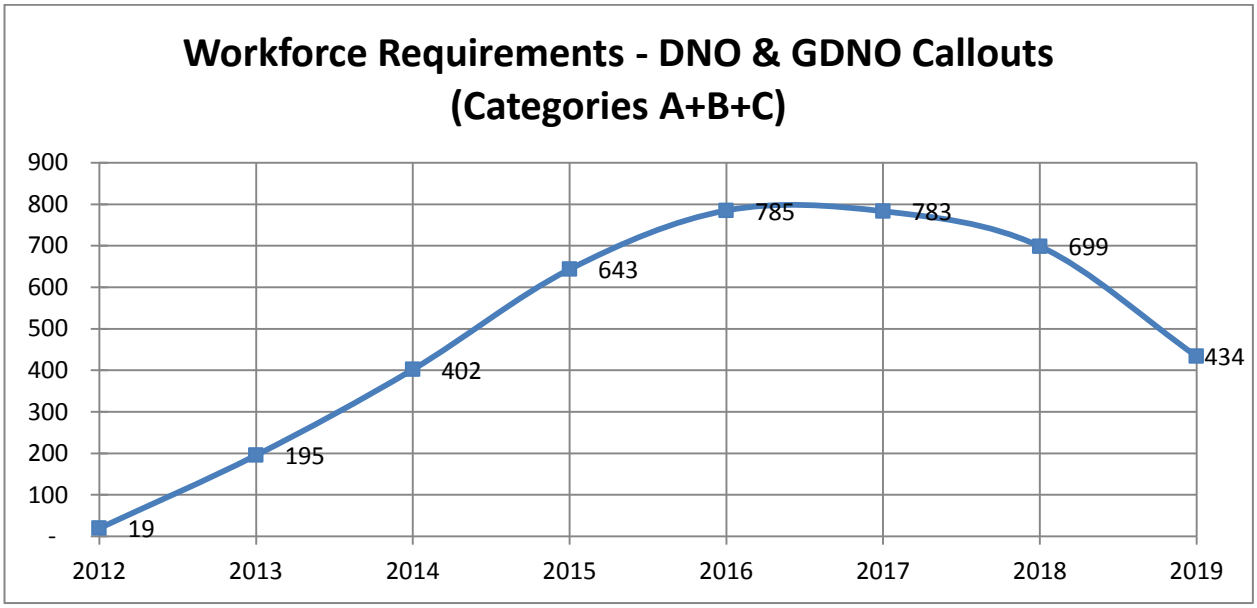


A total of 5,576 smart meter installers (3,111 for electricity and 2,465 for gas) are required during the peak rollout period of 2016 with 785 DNO/GDNO craft staff supporting the project by dealing with reported category A, B and C incidents.

The projections only accommodate operational installers and the DNO/GDNO operational craftspersons dealing with network incidents. The modelling currently does not include any wider network roles such as administrators and planners, design engineers, field supervisors or reinstatement teams. These roles could add significant additional resources to any network projections.

Subgroup representatives from both electricity and gas networks also produced a reportable incidents productivity analysis based upon the network job roles required to support the smart metering rollout. This analysis is an important factor when calculating additional resources required: for scheduling of existing resources to support both the priority category A emergency callouts and when forecasting the resource requirements when planning for category B and medium/longer term category C network issues.

Figure 12: Workforce requirements of callouts



8.2 New Skills for Future Networks & Technologies

DNO Futures engineers and their resourcing expert colleagues indicate that there are currently too many variables to accurately model the impact of new network technologies and their effect on the distribution network. Ground source heat pumps, photo voltaic, new forms of micro wind turbine may affect network characteristics, but could be contained by the introduction of demand-side energy storage technologies.

These technologies are not forecast to significantly expand until at least ED2/ED3. Electric vehicle charging may bring other network challenges as the anticipated medium and long-term low power charging facilities (available both at home, perhaps in office car parks and supermarkets) will gradually be faded out in favour of rapid charging facilities requiring significant power requirements of towards 60kW.

The unknown variables that could affect workforce modelling include the continuation of scientific and engineering research for such an electric vehicle infrastructure (with the automotive industry making significant progress on engine technologies and commercially viable, reliable modes of transport). Again, DNOs are indicating these variables make it currently implausible to forecast the impact on electricity network design – and the forecasting of skills implications for design/planning engineers and technicians.

Those DNOs who have attempted some specific analysis around response demand, generation and storage (one of the four key Smartgrid Workstream 3 product areas) are forecasting only modest increases in engineering skills during ED1 – highlighting a need for additional specialist communications/data engineers and technicians.

DNOs see a gradual move towards upskilling their engineers and craft staff as new network technologies are proved and become commercially acceptable for integration into new network design (as currently being instigated via the tier 1 & tier 2 Low Carbon Network Futures projects). Future skills for existing DNO staff may therefore be undertaken by short course, interactive interventions. DNOs employing major contractors with responsibilities for engineering design, planning and network installation will also require such interventions.

Areas that will see significant progress over the coming decades include:

An increasingly responsive and interactive grid

DECC Smartgrid Workstream III indicates an increase in distributed energy over the coming years – particularly over the ED2 price control period and beyond. Electrical sources of energy generated close to the point of consumption are more efficient, as there are reduced emissions and less wastage/loss during distribution. An increase in levels of smaller scale decentralised generation requires changes to the electricity network, as the network will be increasingly required to accept inputs from biomass plants, photovoltaic arrays, micro and small-scale wind turbines, alongside the anticipated requirement for an infrastructure of charging points for electric vehicles.

DECC's 2011 Carbon Plan states: "the grid will need to be larger, stronger and smarter to reflect the quantity, geography and intermittency of power generation. We will also need a more flexible energy system to cope with fluctuations in supply and demand." (DECC, 2011)

With the expected increase in distributed generation, energy will need to be inputted into the network as well as taken out of it. Being able to monitor this at a local level will be essential to avoid the issue of "disappearing capacity", where spinning reserve does not adequately cover demand, which is a risk of this trend towards more embedded generation. Two-way power flows, moreover, are more unpredictable and require a higher level of monitoring and management. Advances in voltage control will also be required to deal with reverse power flowing from distributed generation to the network.

Active management of the network will be vital in order to ensure adequate flexibility. It is expected that the power sector will become more intelligent and computer controlled to deal with these demands, with systems in place to allow distribution companies to raise the voltage of the networks, and maximise the use of existing capacity. DNOs will need to undertake active management of the network, closer to the customer. These changes will require greater development of low voltage connectivity systems, requiring increased investment in the network. To effectively manage this network, there will also be an increased need for power storage, alongside spinning reserve, in order to balance supply and demand.

Smart networks and meters will enable dynamic grid management

The changes required to the network to promote automated communication between the grid, on the one hand, and power consuming and generating technologies, systems and plant, on the other as power flows in both directions between the two, is often referred to as the development of a "smart grid".

Whilst the installation of smart meters, planned to be rolled out between 2014 and 2019, will not in itself create a "smart grid", it will be an essential component of its creation. It is hoped that consumers will use the information provided by smart meters to use energy more efficiently. Smart meters will also be able to collect the information required to monitor usage at a distance (and in real time) rather than via meter readings, which may allow for active management of the network to take place, responding to increased demand in certain locations. By 2030, a second round of smart meter installations may have taken place to upgrade the technology, and further aid management of the networks. Ability to reassure consumers that data protection and privacy concerns have been addressed, alongside logistical roll out capability of both energy suppliers and network operators, will determine the extent to which the smart grid can develop into a two way system, controlling as well as monitoring usage.

A radical transformation of the consumer interface

With the increased uptake of domestic energy producing technologies, such as solar photovoltaics and ground source heat pumps, it may be more efficient to change the way domestic networks work in the coming decades. Shifting from AC to low voltage DC networks, or hybrid AC/DC networks, might overcome issues relating to harmonics (causing loss of voltage) that often affect the input of power from distributed generation into the network. It is not unrealistic to envisage this happening by 2030.

To help balance the more intermittent supply of the future with unpredictable levels of demand from consumers, energy storage will play a key role. Current energy storage capacity in the UK is around 3GW. This needs to dramatically increase to help balance demand and supply in the future. The government has announced substantial investment in this area.

Should the uptake of electric vehicles progress at the levels some expect, emerging electric vehicle technologies may be utilised as back-up storage capacity when plugged in to the grid. It could be possible for charging to occur at times of low demand and, subject to owner consent, releasing energy back to the grid if demand is particularly high. The Plug-in Vehicle Infrastructure Strategy states that:

"In the longer term, it is also possible that the recharging patterns of plug-in vehicles could be moved to the point in the day that is best for the electricity system as a whole (known as 'dynamic demand response'). For example, if sufficient capability exists via a smart grid, plugin vehicle recharging could be matched to wind patterns or to available network capacity.

Further into the future, there may even be potential for plug-in vehicles to be used as a form of energy storage, with any remaining charge in the vehicle used to power the house when the vehicle is plugged in during peak periods, before fully recharging overnight (such 'vehicle to home' or 'vehicle to grid' concepts are at an early experimental stage)." (OLEV, 2011, p32)

With the advent of the smart grid, automated, intelligent and remote monitoring will be central to flagging up potential faults in the network before they escalate (or even highlight problems at risk at developing through methods such as sophisticated monitoring of weather conditions). Diagnostics and even some repair work may be carried out at a more centralised point or through automation, rather than at the site of the issue, particularly as information technology moves forwards.

In order to achieve increased uptake of dynamic demand technology, not only does the technology have to be available to consumers, but the customer demand needs to be there. Householders and businesses must be convinced that the benefits outweigh ceding some element of control over their appliance usage and, in conjunction with smart networks, allowing third party insight into their energy consumption patterns. Furthermore, software security will be an important confidence factor for users as householders and businesses alike will need to be assured that their data is secure and that adequate protection is in place from any attempts to hack into their energy accounts and to generally uphold network integrity. Public debate and concern around security, associations with 'big brother' and risks to privacy could hinder the development of this trend towards intelligent and interactive power networks.

Uptake barriers and enablers

Energy price increases, differentiated real time retail pricing, or even different tariff bands to reflect expected peaks and troughs in demand at different times of day, would be pivotal in terms of driving engagement with smart networks and demand from householders and businesses for technologies that communicate with the grid. These technologies will then become tools for domestic and non-domestic consumers alike to analyse their usage and manage their consumption to save money.

The impact of dynamic demand management technologies in balancing supply and demand in the context of a smart grid will be determined by energy pricing strategies, energy price trends and consequently, the attitudes of consumers as they trade off privacy, security and control against energy savings.

It will also be dependent on dynamic demand capability being integrated into appliances at the design stage, and on a sufficiently "smart" grid to be in place to optimise its effectiveness.

Skills implications

- Development of the new demand management technologies will require higher level STEM skills
- Skilled personnel will be required to integrate new technologies into existing systems
- Advances in ICT will allow for greater visibility and improved monitoring within the next few years. This will allow for more extensive mapping of sites and facilities and even 3D visualisation, reducing staff travelling time and enable the same amount of work to be done by less staff, from a central location
- ICT skills will also be vital to manage risk in terms of security breaches
- Increase in 'plug and play' technologies often leads to less technician/engineer specific training – more emphasis will be on manufacturer design and production skills and remote electronic fault diagnosis
- It may become commonplace to have new power electronics systems controlling an individual house. New forms of voltage control will be deployed to increase the charge required for electric vehicles and to decrease voltages for smart household appliances. This will require a re-configuration of existing electrotechnical skills
- There is likely to be an increasing requirement for customer- facing skills: To persuade customers of the benefits of demand management and address concerns. Monitoring and network management skills will also be impacted by this trend, depending on the extent to which consumers adopt and use these new technologies.

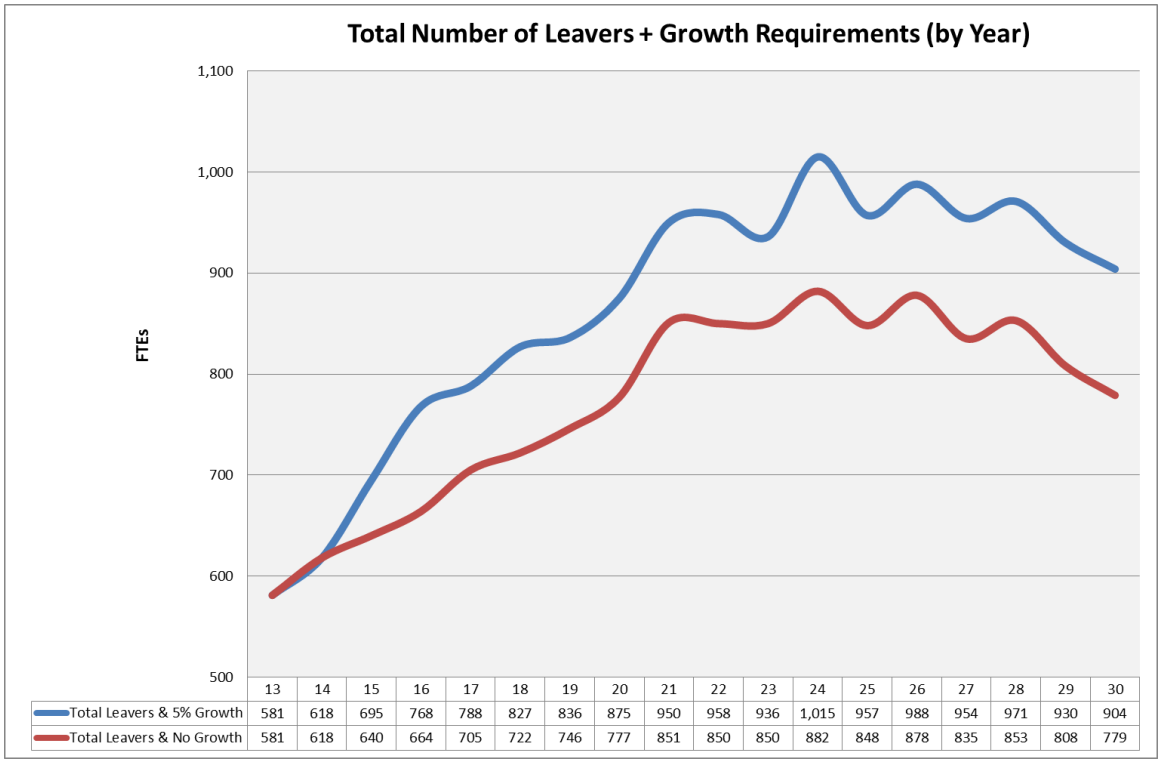
8.3 An illustrative 5% workforce growth scenario

To allow comparison with the "no growth" scenario presented in the above sections, we provide, for illustrative purposes only, analysis of the impact of a 5% increase in headcount numbers during both ED1 and ED2. (no growth has been assumed during the remainder of DPCR5).

The impact that this scenario has on the requirement to recruit can be seen in figure 13 below.

Figure 13: Total number of leavers plus growth

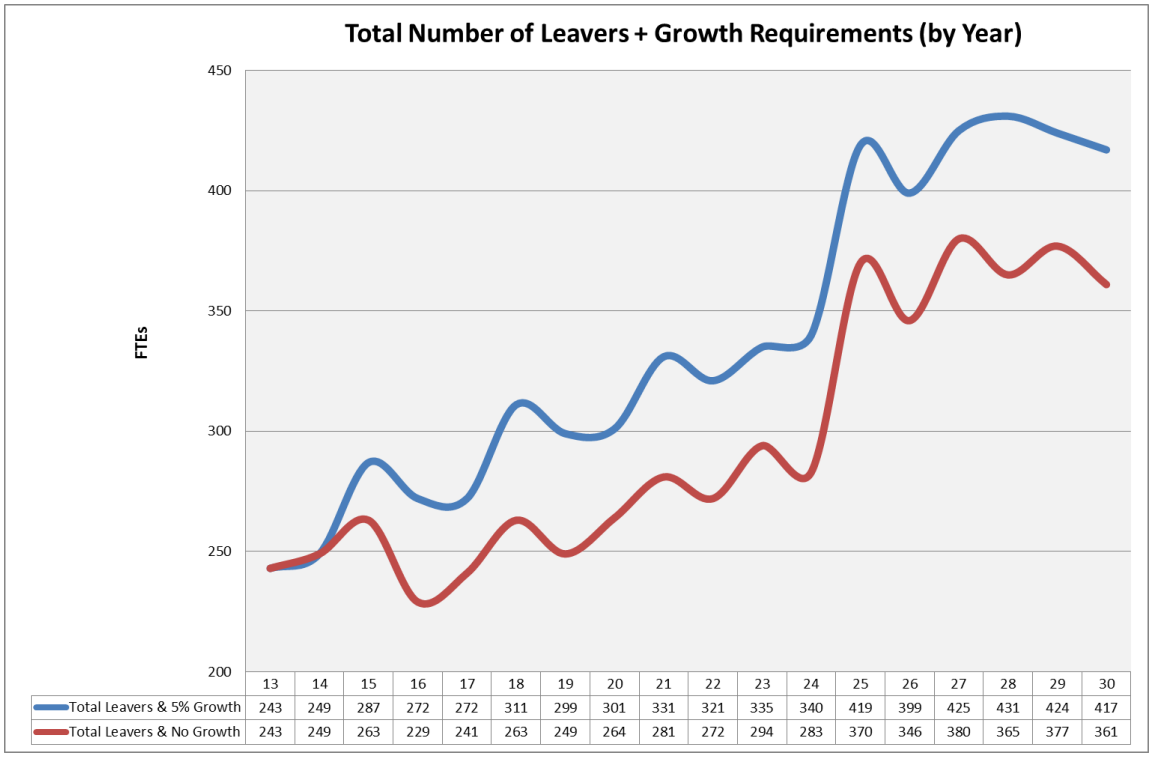
DNOs



	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Total Leavers & 5% Growth	581	618	695	768	788	827	836	875	950	958	936	1,015	957	988	954	971	930	904
Total Leavers & No Growth	581	618	640	664	705	722	746	777	851	850	850	882	848	878	835	853	808	779

A growth scenario of 5% over ED1 could require an additional 745 people to be recruited over the period and a further 799 in ED2. Each 1% of workforce growth creates an additional 18.6 jobs per year in the DNO workforce through ED1. During ED2 1% of growth adds 20.0 jobs per year.

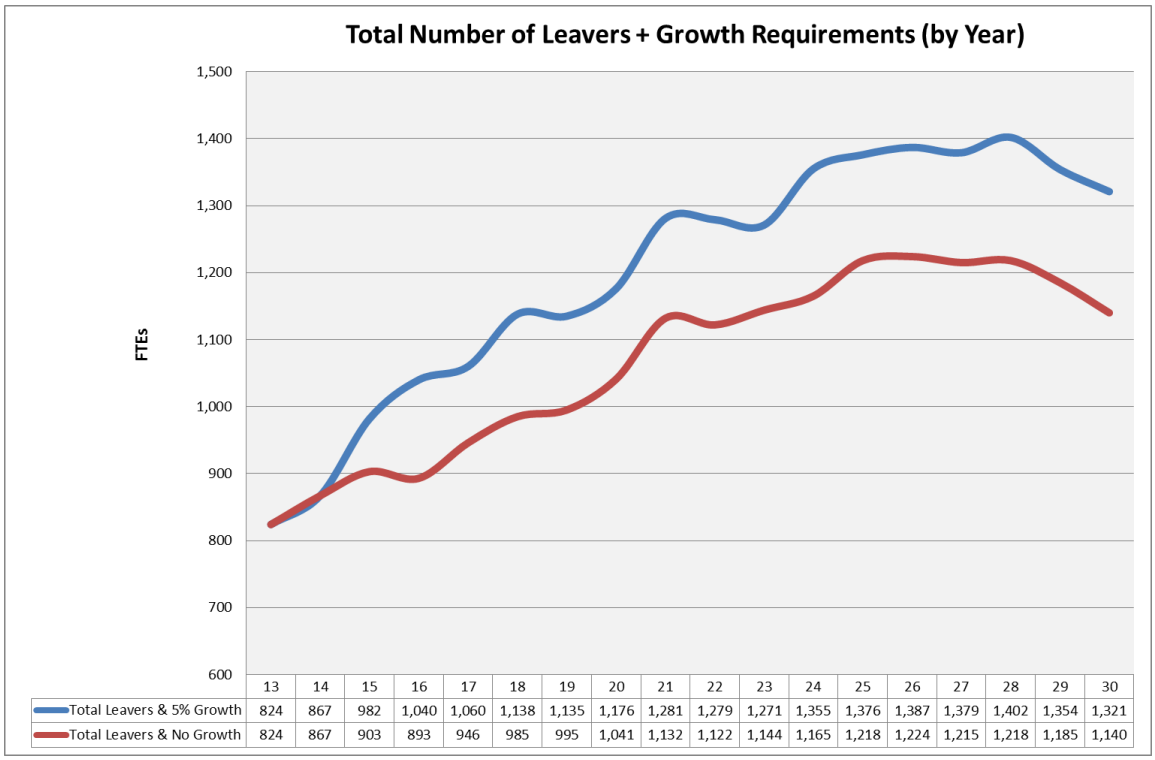
Contractors



	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Total Leavers & 5% Growth	243	249	287	272	272	311	299	301	331	321	335	340	419	399	425	431	424	417
Total Leavers & No Growth	243	249	263	229	241	263	249	264	281	272	294	283	370	346	380	365	377	361

A growth scenario of 5% over ED1 could require an additional 305 people to be recruited over the period and a further 318 in ED2. Each 1% of workforce growth creates an additional 7.6 jobs per year in the DNO workforce through ED1. During ED2 1% of growth adds 8 jobs per year.

DNOs and Contractors combined



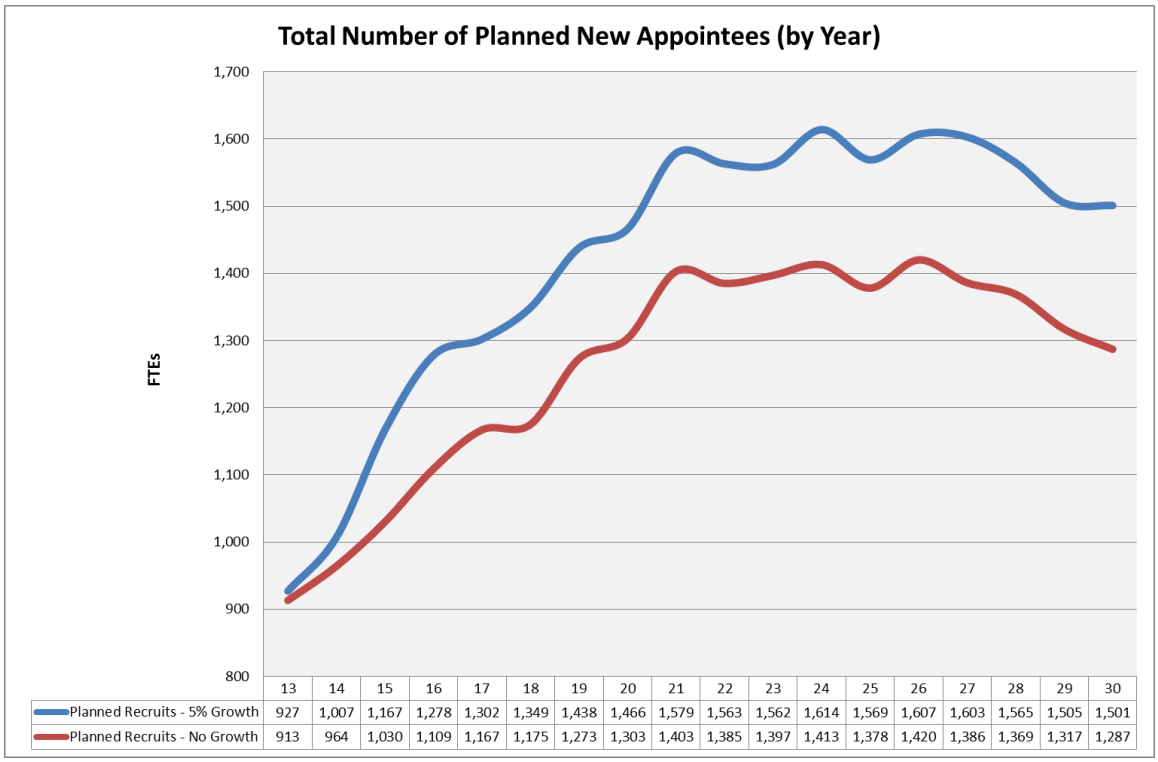
	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Total Leavers & 5% Growth	824	867	982	1,040	1,060	1,138	1,135	1,176	1,281	1,279	1,271	1,355	1,376	1,387	1,379	1,402	1,354	1,321
Total Leavers & No Growth	824	867	903	893	946	985	995	1,041	1,132	1,122	1,144	1,165	1,218	1,224	1,215	1,218	1,185	1,140

A growth scenario of 5% over ED1 could require an additional 1,050 people to be recruited over the period and a further 1,117 in ED2. Each 1% of workforce growth creates an additional 26.3 jobs per year in the DNO workforce through ED1. During ED2 1% of growth adds 27.9 jobs per year.

The impact that this additional headcount requirement has on the number of new appointees taken on by the DNOs and contractors is shown in figure 14.

Figure 14: Total number of planned new appointees (plus growth)

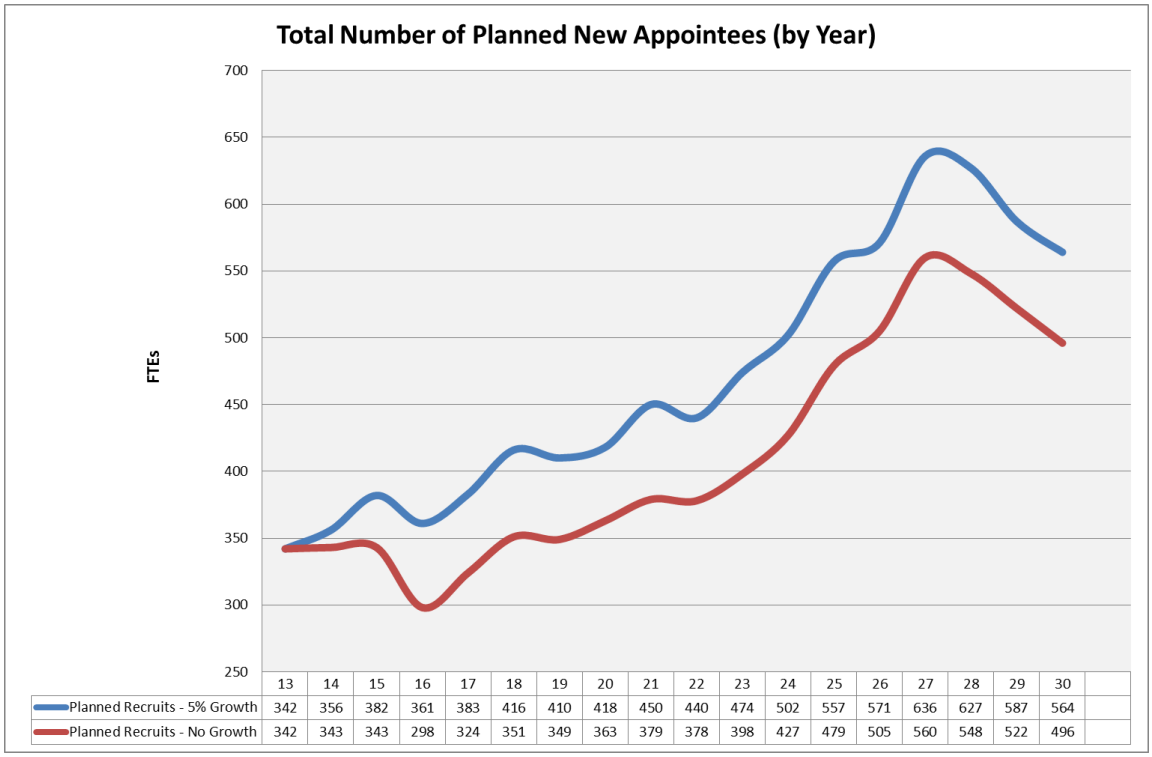
DNOs



	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Planned Recruits - 5% Growth	927	1,007	1,167	1,278	1,302	1,349	1,438	1,466	1,579	1,563	1,562	1,614	1,569	1,607	1,603	1,565	1,505	1,501
Planned Recruits - No Growth	913	964	1,030	1,109	1,167	1,175	1,273	1,303	1,403	1,385	1,397	1,413	1,378	1,420	1,386	1,369	1,317	1,287

Taking into account the predicted additional new jobs created and building the requirement to replace upskillers employees (as determined by each DNOs own recruitment strategy) and trainee drop-outs, and there could be the need to recruit and train an extra 1,354 appointees (i.e. new recruits and internal promotions) during ED1 and an extra 1,559 during ED2. This equates to an extra 33.9 new appointees per 1% of growth per year (39.0 in ED2).

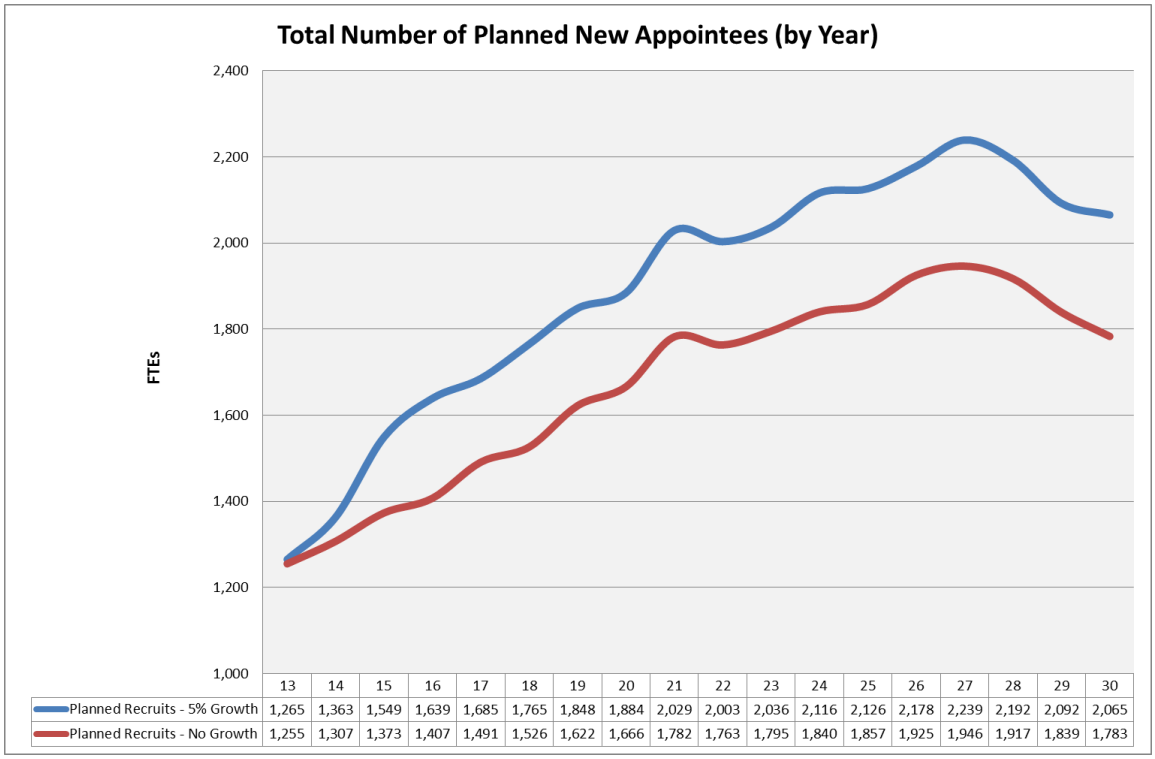
Contractors



	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Planned Recruits - 5% Growth	342	356	382	361	383	416	410	418	450	440	474	502	557	571	636	627	587	564
Planned Recruits - No Growth	342	343	343	298	324	351	349	363	379	378	398	427	479	505	560	548	522	496

Taking into account the predicted additional new jobs created and building the requirement to replace upskillers employees (as determined by each DNOs own recruitment strategy) and trainee drop-outs, and there could be the need to recruit and train an extra 488 appointees (i.e. new recruits and internal promotions) during ED1 and an extra 583 during ED2. This equates to an extra 12.2 new appointees per 1% of growth per year (14.6 in ED2).

DNOs and Contractors combined



	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Planned Recruits - 5% Growth	1,265	1,363	1,549	1,639	1,685	1,765	1,848	1,884	2,029	2,003	2,036	2,116	2,126	2,178	2,239	2,192	2,092	2,065
Planned Recruits - No Growth	1,255	1,307	1,373	1,407	1,491	1,526	1,622	1,666	1,782	1,763	1,795	1,840	1,857	1,925	1,946	1,917	1,839	1,783

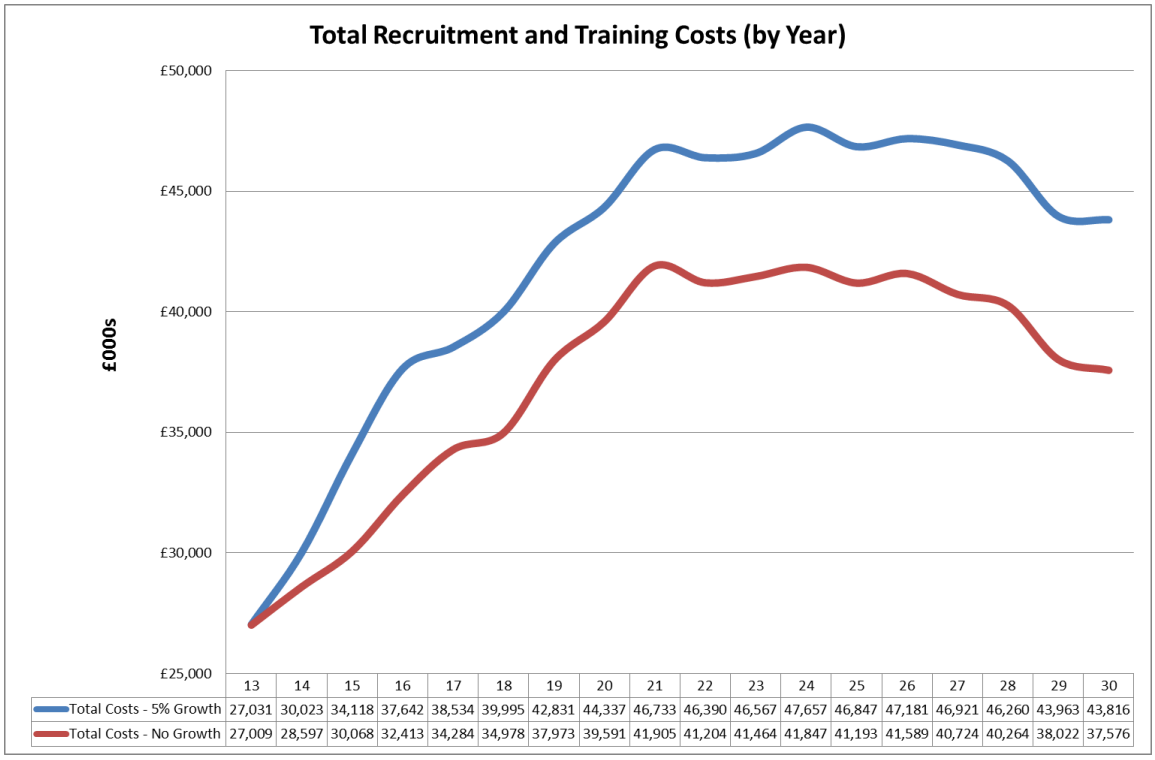
Taking into account the predicted additional new jobs created and building the requirement to replace upskillers employees (as determined by each DNOs own recruitment strategy) and trainee drop-outs, and there could be the need to recruit and train an extra 1,838 appointees (i.e. new recruits and internal promotions) during ED1 and an extra 2,142 during ED2. This equates to an extra 46.0 new appointees per 1% of growth per year (53.6 in ED2).

Figure 15 below shows the impact on the total cost of recruiting and training this larger workforce.

During ED1 total recruitment and training costs increase from £368,038,000 to £418,985,000 – an increase of £50,947,000.

Figure 15: Total recruitment and training costs

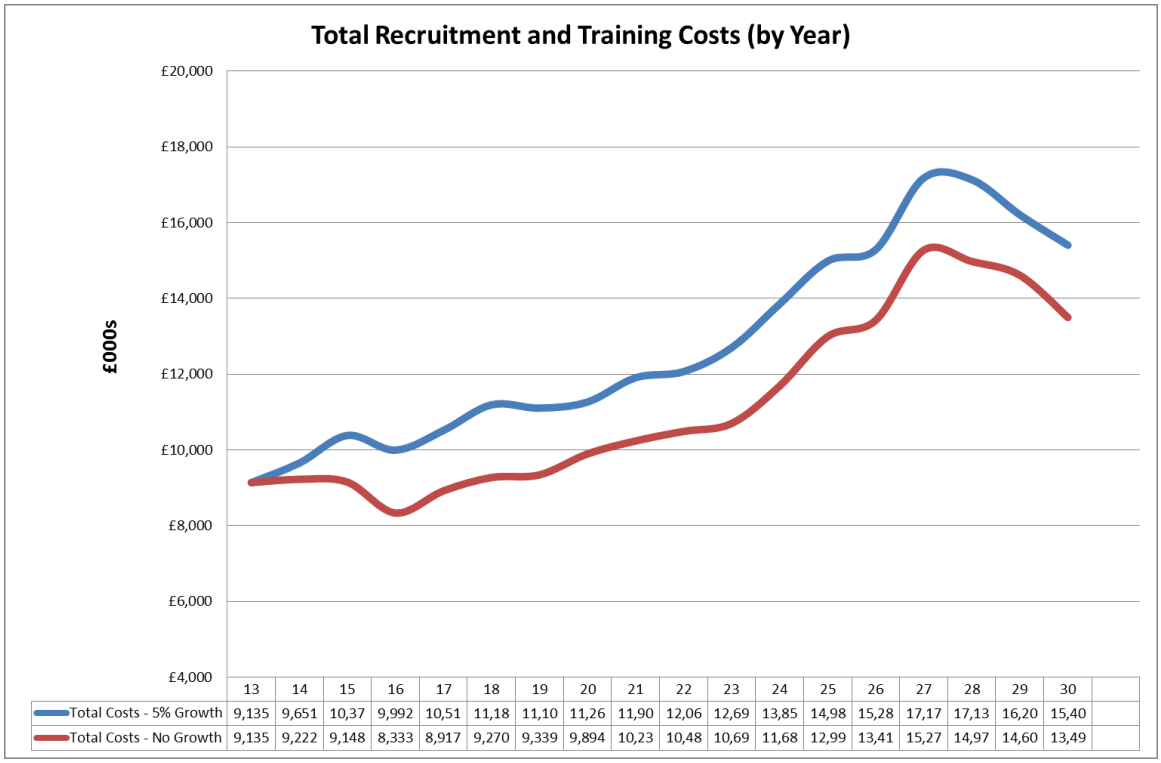
DNOs



	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Total Costs - 5% Growth	27,031	30,023	34,118	37,642	38,534	39,995	42,831	44,337	46,733	46,390	46,567	47,657	46,847	47,181	46,921	46,260	43,963	43,816
Total Costs - No Growth	27,009	28,597	30,068	32,413	34,284	34,978	37,973	39,591	41,905	41,204	41,464	41,847	41,193	41,589	40,724	40,264	38,022	37,576

Recruiting and training these additional workers could cost the DNOs in the region of £39,612,000 during ED1 – each 1% of workforce growth costing £990,300 per year. In ED2 the total costs increase by £46,533,000 - £1,163,325 per 1% of workforce growth per year.

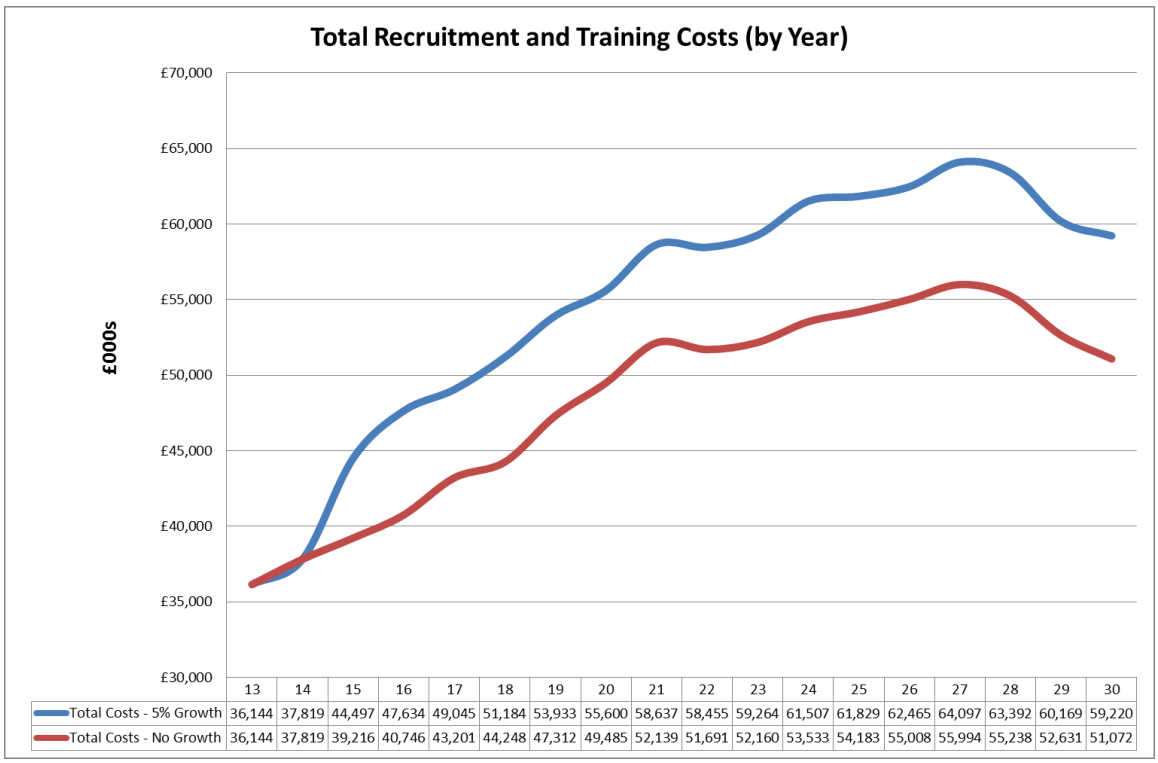
Contractors



	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Total Costs - 5% Growth	9,135	9,651	10,37	9,992	10,51	11,18	11,10	11,26	11,90	12,06	12,69	13,85	14,98	15,28	17,17	17,13	16,20	15,40
Total Costs - No Growth	9,135	9,222	9,148	8,333	8,917	9,270	9,339	9,894	10,23	10,48	10,69	11,68	12,99	13,41	15,27	14,97	14,60	13,49

Recruiting and training these additional workers could cost the contractors in the region of £13,147,000 during ED1 – each 1% of workforce growth costing £328,675 per year. In ED2 the total cost rises to £15,591,000 - £389,775 per 1% of workforce growth per year.

DNOs and Contractors combined



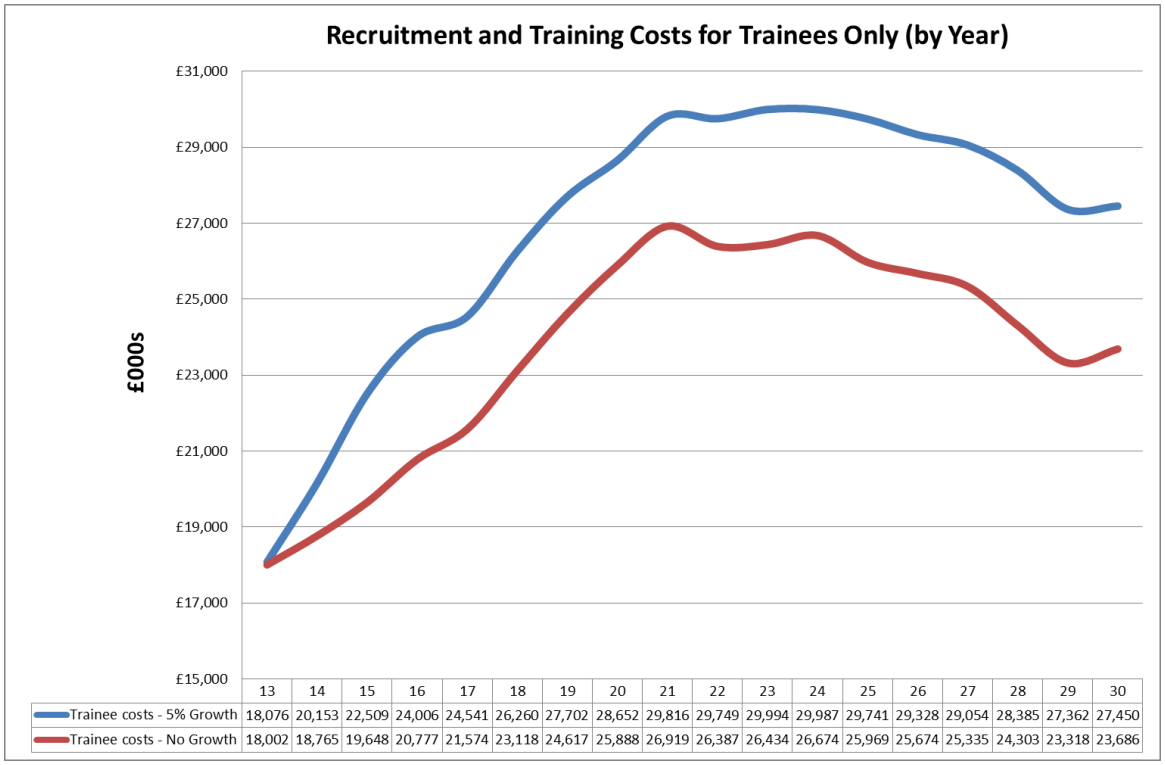
	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Total Costs - 5% Growth	36,144	37,819	44,497	47,634	49,045	51,184	53,933	55,600	58,637	58,455	59,264	61,507	61,829	62,465	64,097	63,392	60,169	59,220
Total Costs - No Growth	36,144	37,819	39,216	40,746	43,201	44,248	47,312	49,485	52,139	51,691	52,160	53,533	54,183	55,008	55,994	55,238	52,631	51,072

Recruiting and training these additional workers could cost the DNOs and contractors a combined total of £72,759,000 during ED1 – each 1% of workforce growth costing £1,818,975 per year. In ED2 the total cost rises to £62,124,000 - £1,553,100 per 1% of workforce growth per year.

The figures below present the recruitment and training costs for trainees in the no growth and 5% growth scenario.

Figure 16: Recruitment and training costs for trainees only

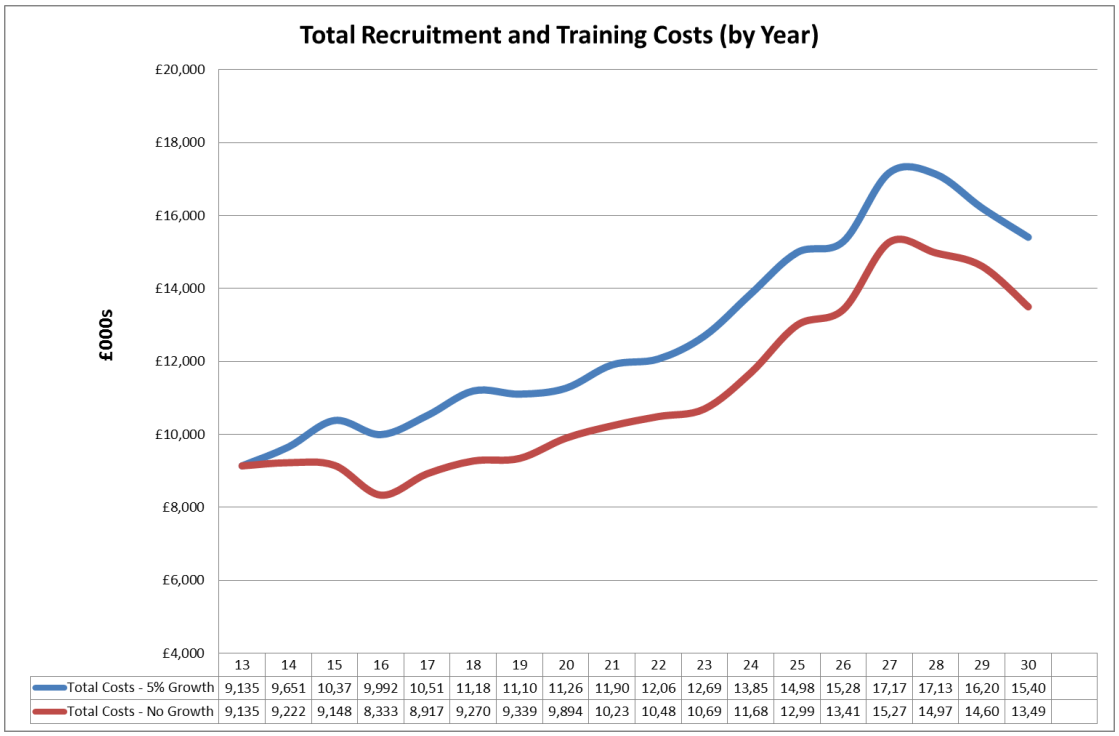
DNOs



	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Trainee costs - 5% Growth	18,076	20,153	22,509	24,006	24,541	26,260	27,702	28,652	29,816	29,749	29,994	29,987	29,741	29,328	29,054	28,385	27,362	27,450
Trainee costs - No Growth	18,002	18,765	19,648	20,777	21,574	23,118	24,617	25,888	26,919	26,387	26,434	26,674	25,969	25,674	25,335	24,303	23,318	23,686

Recruiting and training the additional trainees required could cost the DNOs in the region of £25,769,000 during ED1 – each 1% of workforce growth costing £644,225 per year. In ED2 the total cost rises to £29,908,000 - £747,700 per 1% of workforce growth per year.

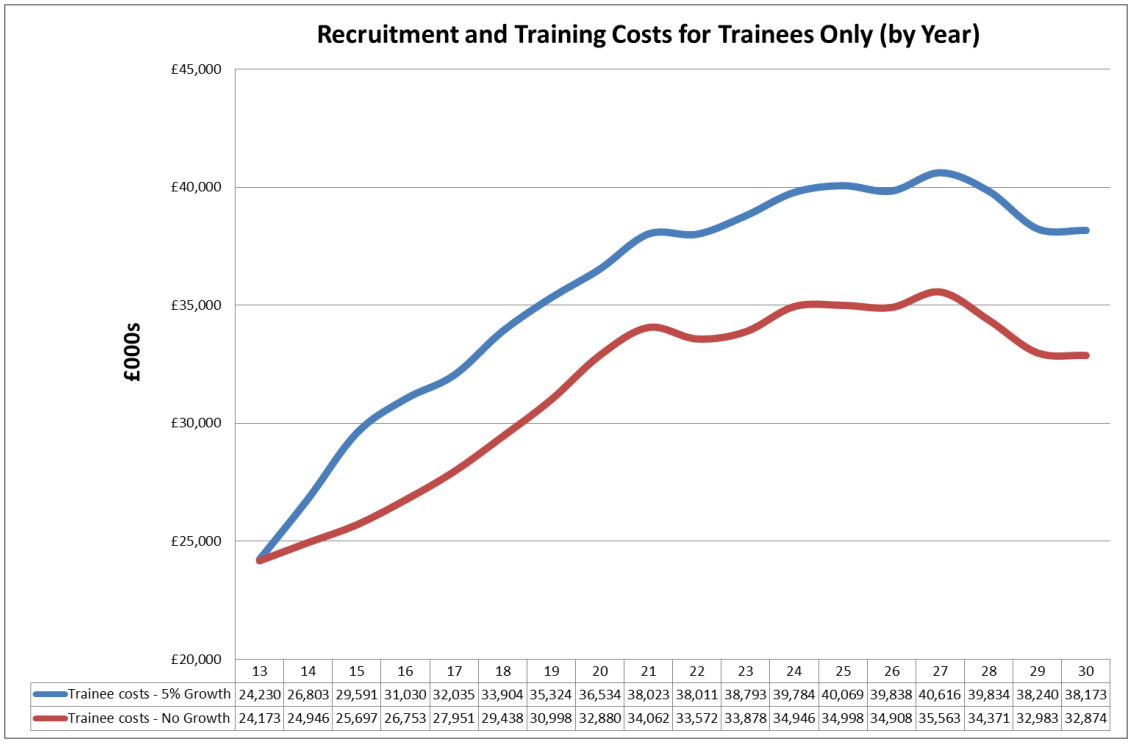
Contractors



	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Total Costs - 5% Growth	9,135	9,651	10,37	9,992	10,51	11,18	11,10	11,26	11,90	12,06	12,69	13,85	14,98	15,28	17,17	17,13	16,20	15,40
Total Costs - No Growth	9,135	9,222	9,148	8,333	8,917	9,270	9,339	9,894	10,23	10,48	10,69	11,68	12,99	13,41	15,27	14,97	14,60	13,49

Recruiting and training the additional trainees required could cost the contractors in the region of £9,263,000 during ED1 – each 1% of workforce growth costing £231,575 per year. In ED2 the total costs increase by £10,918,000 - £272,950 per 1% of workforce growth per year.

DNOs and Contractors combined



	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Trainee costs - 5% Growth	24,230	26,803	29,591	31,030	32,035	33,904	35,324	36,534	38,023	38,011	38,793	39,784	40,069	39,838	40,616	39,834	38,240	38,173
Trainee costs - No Growth	24,173	24,946	25,697	26,753	27,951	29,438	30,998	32,880	34,062	33,572	33,878	34,946	34,998	34,908	35,563	34,371	32,983	32,874

Recruiting and training the additional trainees required could cost the DNOs and contractors combined in the region of £35,015,000 during ED1 – each 1% of workforce growth costing £875,375 per year. In ED2 the total costs increase by £40,826,000 - £1,020,650 per 1% of workforce growth per year.

9 Next steps

EU Skills and the Skills Academy are currently working on a number of fronts to identify the nature and extent of the skills challenges facing the power sector over the coming years, including:

- Updating the analysis of the impact on DNOs of the smart meter roll-out based on updated data produced by DECC
- Working with smart meter companies to apply the Workforce Planning Model to their workforce; replicating the analysis contained within this report for the specific job roles needed to implement the smart meter roll-out
- Foresight intelligence looking at the skills implications of a range of factors that will impact upon the sector over the coming two decades. The first phase of this work has been completed, with phase 2 taking place during the summer of 2013.
- Using the data and intelligence gaining through this report and the activities listed above, to develop and implement a skills action plan as detailed in the DECC/ Ofgem Workstream 3 report.

Appendix 1 **Current employment levels by job role**

	Total Currently Employed			Total Leavers[5]		
	DNOs	Contractors	Combined	ED1	ED2	Total
General Technical Support Activities (Level 1)	1,465	1,624	**3,089**	1,702	1,870	**3,572**
General Technical Support Activities (Level 2)	520	1,081	**1,601**	430	565	**995**
Cable Jointers (Level 2)	1,322	208	**1,530**	496	636	**1,132**
Electrical Fitters (Level 2)	525	163	**688**	271	286	**557**
Overhead Linesperson (Level 2)	1,217	414	**1,631**	548	629	**1,177**
Telecomms Operative (Level 2)	3	1	**4**	1	2	**3**
Technical / Supervisory (Level 2)	126	89	**215**	83	94	**177**
Cable Jointers (Level 3)	1,192	125	**1,317**	472	589	**1,061**
Electrical Fitters (Level 3)	562	170	**732**	281	249	**530**
Overhead Linesperson (Level 3)	718	253	**971**	321	366	**687**
Specialist (Level 3 sp)	4	21	**25**	8	14	**22**
Multiskilled Craftsperson (Level 3)	826	225	**1,051**	360	463	**823**
Technical / Supervisory (Level 3)	1,240	813	**2,053**	768	996	**1,764**
Engineer (Level 4)	1,019	251	**1,271**	532	645	**1,177**
Specialist (Level 4)	170	39	**209**	61	91	**152**
Technical / Supervisory (Level 4)	35	13	**48**	21	19	**40**
Project Manager (Level 4)	630	149	**779**	277	338	**615**
Managerial (Level 4)	391	132	**523**	209	263	**472**
Engineer (Level 5)	462	218	**680**	291	324	**615**
Specialist (Level 5)	382	35	**417**	167	198	**365**
Technical / Supervisory (Level 5)	108	0	**108**	37	46	**83**
Project Manager (Level 5)	319	40	**359**	142	156	**298**
Managerial (Level 5)	243	35	**278**	98	145	**243**
Specialist / Engineer (Levels 6-8)	582	108	**690**	335	372	**707**
Managerial (Levels 6-8)	230	37	**267**	106	153	**259**
Total Target Workforce	**14,291**	**6,244**	**20,536**	**8,017**	**9,509**	**17,526**

[5] Total number of leavers through retirement and natural wastage during ED1 and ED2 (excluding the final years of DPCR5).

Appendix 2 **Energy & Utility Skills – Workforce Planning Model**

A focal point for planning and mobilising electricity DNOs workforce resourcing strategy.

The Workforce Planning Model is now an established tool within EU Skills' and the Skills Academy for Power's portfolio and is utilised across the power, renewables, gas, water and waste management industries. In addition to informing business plan development for regulated companies, the outputs of the model have been used by EU Skills and the Skills Academy as a catalyst to mobilise resources in relation to sector attractiveness, training design and to address sector-level capacity and capability issues (See Appendix 1). Discussions are also taking place to utilise the model within nuclear, financial services and rail sectors.

The schematic below illustrates how the EUS Workforce Planning Model has been developed as an enabler for all aspects of planning and delivering the skilled workforce required by the Electricity Networks.