NSW Resources
Resources Regulator

Report to Mining and Petroleum Competence Board on practising certificates 2023–2025 and projections to 2030

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Amendment schedule		
Date	Version	Amendment
2025	0.1	New document as previous reports split into separate ones for practising certificates and certificate of competence exam results

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Introduction

The Resources Regulator reports annually to the NSW Mining and Petroleum Competence Board on:

- the number of practising certificates held for each statutory function since 2023
- certificate of competence exam pass/fail rates since 2018 and certificates issued.

After 2025 the Regulator will prepare separate reports for each of the above.

This combined report now also includes projected numbers of certificate holders to 2030, based on certificates issued and renewed between 2017 to June 2025.

Scope

The data for this report was obtained from the Regulator's Activity Compliance and Enforcement System (ACES) and information developed from this data by NSW Resources, with oversight by the NSW Mining and Petroleum Competence Board.

Observations

The following observations were made for the practising certificate numbers and statistics:

1. Numbers for most functions have declined between 2023 to 2025, with a few notable exceptions.
2. Declining numbers are mainly attributable to either:
    a. holders not renewing their practicing certificates
    b. low certificate of competence exam pass rates.
3. Increased numbers are mainly attributable to mutual recognition of interstate certificates.
4. Estimates of the number of holders required for functions at the 4 different classes of mines show that there are adequate numbers to satisfy these functions at present. However, these estimates do not account for potential reductions in supply for mines that are more remote.
5. The projection of certificate holders for different functions reveals declining numbers after a larger-than-average initial number was recorded between 2017 and 2019. Although some practising certificate holders have not renewed, there remains sufficient holders until the next period renewal period of 2028–2029.
6. Projections for individual functions generally align with the practising certificate number trends from 2023 to 2025.

An executive summary for the projection of practising certificates is also provided.

Recommendations

1. That the Board consider this report and how they may support the ongoing maintenance of a sufficient number of practising certificate holders, with reference to the 'Recommendations

for the NSW mining industry for certificate of competence exams results and practising certificates numbers'[1].

[1] Recommendations for the NSW mining industry from observations of the report for certificate of competence exams 2018–2013 and practising certificates (https://www.resources.nsw.gov.au/resources-regulator/our-role/other-functions/mining-and-petroleum-competence-board/board)

Practising certificates issued

Figures below are provided for 2023–2025. The total number of practising certificates held is 3,092. This is a 15.8% decrease from 2023 (3,674).

These figures show the maintenance of competence hours for the highest function listed on a certificate only. It is assumed holders will predominantly practise at their highest function, acknowledging they may relieve in others. For example: a practising certificate for mining engineering manager for underground coal mines will be included in total numbers for this function, but not in totals for any other functions listed on their certificate (such as ventilation officer and undermanager).

The electrical engineer and mechanical engineer functions can also be filled by individuals from the Engineers Australia National Engineering Register (NER)

Table 1. Number of practising certificates issued by class of mine and function

Class of mine (number) and functions	28 March 2023	27 January 2024	23 June 2025	% change 2023–25	Observations
Underground coal mines	27	27	25		
Mining engineering manager	178	140	131	–27	16 expired certificates not renewed in last 18 months
Undermanager	346	301	281	–18.8	40 expired certificates not renewed 5 passed exams in last 18 months
Deputy of an ug coal mine	1064	1068	920	–13.5	217 expired certificates not renewed 45 passed exam in last 18 months
Electrical engineering manager	107	89	87	–18.7	3 candidates passed exams in 2024–25
Mechanical engineering manager	93	74	72	–22.6	Nil oral exam passes in the past 18 months
Ventilation auditor	8	3	1	–87.5	10 holders have ventilation auditor as a lower-level function on certificate

Class of mine (number) and functions	28 March 2023	27 January 2024	23 June 2025	% change 2023–25	Observations
Ventilation officer	99	68	43	−56.6%	71 holders have ventilation officer as a lower function on certificate
Dust control measures auditor	6	2	3	−50%	
Total	**1901**	**1745**	**1538**	**−19.1**	
Open cut coal mines	35	36	23		Number adjusted to 23 for 2025 as mines requiring statutory function nominations
Mining engineering manager	146	129	130	−11	
Open cut examiner	508	480	442	−13	79 expired certificates not renewed in the last 18 months
Electrical engineer	48	43	40	−8.3	3 candidates passed exams in 2024–2025. Also from NER
Mechanical engineer	43	37	29	−32.6	8 expired certificates not renewed and only 3 candidates passed in last 18 months. Also from NER
Total	**745**	**689**	**641**	**−14**	
Underground mines other than coal (25)	26	25	33		
Mining engineering manager	112	109	115	2.7	
Underground mine supervisor	343	323	297	−13.4	58 expired certificates not renewed. 22 passed oral exams in past 18 months

Class of mine (number) and functions	28 March 2023	27 January 2024	23 June 2025	% change 2023–25	Observations
Total	**455**	**432**	**412**	**–9.5**	
Mines other than ug or coal mines that require a PC (314)	346 tiers 1–2	340 tiers 1–2	314 tiers 1–2		
Quarry manager • tier 1 for 28 quarries (can also practise at tier 2 and 3)	90	88	109	21	8 expired certificates not renewed in the last 18 months. 8 out of 10 candidates passed in the 2024–2025 exams. WA mutual recognitions were 21. 8 expired certificates not renewed
Quarry manager of specific non-coal mine(s)					
• tier 2 (all and specific) for 286 tier 2 quarries	483	478	401	–17	168 expired certificates not renewed in past 18 months, possibly as no longer required for tier 3 quarries. 122 new all tier 2 quarry certificates issued. 83 certificates upgraded from site specific to all tier 2.
- any tier 2 quarry			205		Expect this number to match approximately the number of tier 2 quarries eventually.
- specific sites only			196		Will reduce to 0 within 5 years as qualifications obtained
• tier 3 for 1,630 quarries	Not applicable	Not applicable	Not applicable		

Class of mine (number) and functions	28 March 2023	27 January 2024	23 June 2025	% change 2023–25	Observations
Total	573	566	510	–11	
Total (all above) certificates issued	3,674	3,432	3,092	–15.8	

Practising certificates granted via mutual recognition

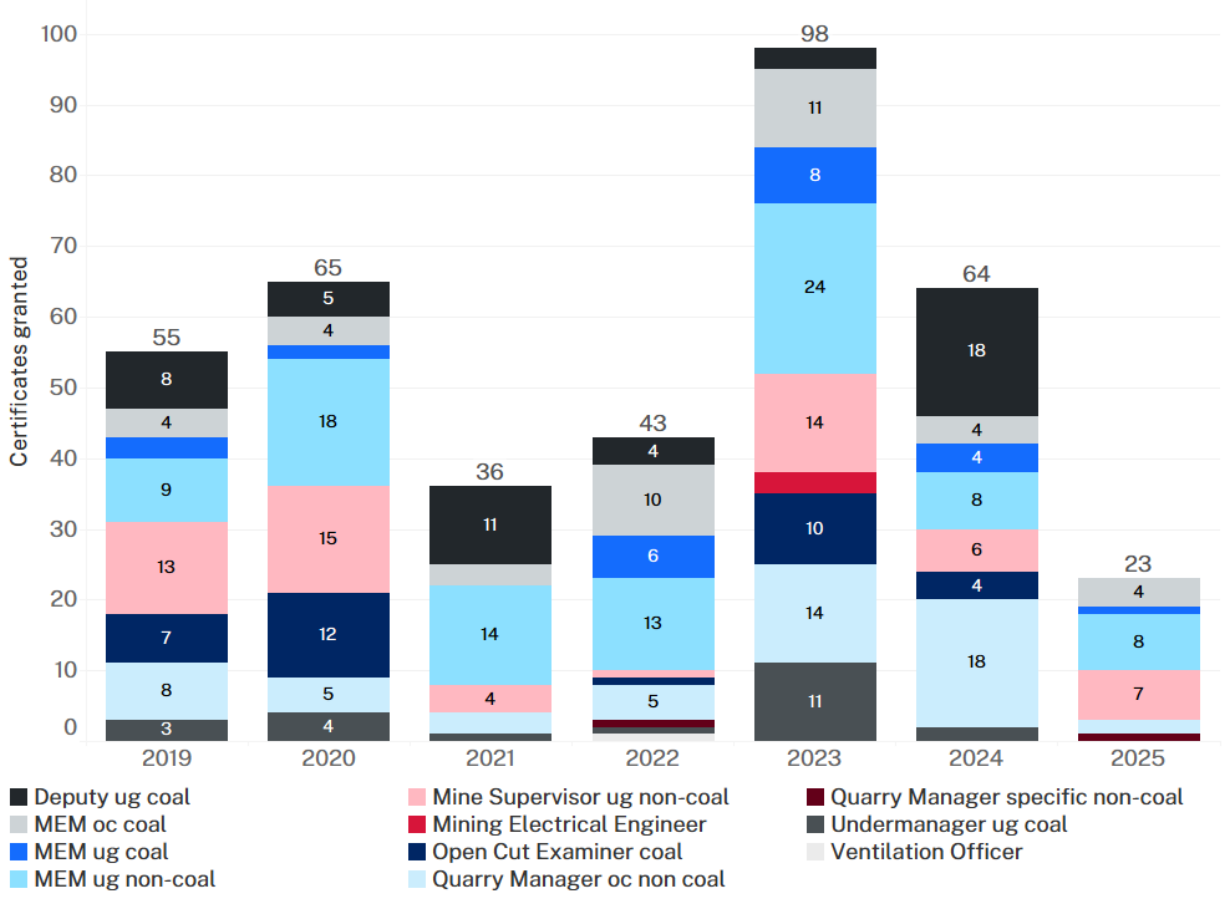
The number of practising certificates granted via mutual recognition decreased in 2020–2022, increased in 2023, and reduced again in 2024 and 2025 (January to June).

The top 3 functions of certificates granted were in the metalliferous and extractive sectors, in order:

1. Mining engineering manager of underground mines other than coal (97)
2. Underground mine supervisor (61)
3. Quarry manager (tier 1 – 56)
4. Deputy (51)

The first 3 functions were mainly due to recognition of WA certificates of competence. Deputy recognitions were predominately for Queensland certificates.

Figure 1. Practising certificates granted by certificate type with mutual recognition



Estimates for NSW classes of mines needs for practising certificate holders

Practising certificates estimates

Background

The Resources Regulator estimated the number of certificate holders needed to practise in the statutory functions.

Calculations for estimates of individuals required for classes of mines

Number of mines that are either open or intermittent in operation (not closed or under rehabilitation)

from ACES on 23 June 2025

Assumptions made for estimates

General (all mines)

- certificate holders are required for the extraction of minerals or other materials (mining activities)
- for other mining operations, there are enough certificate holders to support mining activities by including both:
    - the practising of statutory functions
    - other functions commonly required by mine operators to hold a practicing certificate because these functions provide instruction to statutory function holders (for example: longwall co-ordinator, production superintendent).
- Seven-day roster shiftwork (except Mines – quarries)

Underground coal:

- Undermanager: 5 required with 2 to relieve (7)
- Deputy: assume 5 panels being developed with one deputy per panel, with 2 to relieve (7)

Coal mines (surface):

- Open cut examiner: 5 on shift and 5 to relieve (10)
- For mechanical and electrical engineer statutory functions, assume they qualify to practise in the function by:
    a) 90% being practising certificate holders
    b) 10% being on the Engineers Australia National Engineers Register, as per schedule 10 of the Work Health and Safety (Mines and Petroleum Sites) Regulation 2022

Underground metalliferous and other minerals mines

- Underground supervisor – 4 for shifts, with 4 to relieve (8)
- Electrical engineer – 60% from NER, 40% from practising certificate holders

Surface and underground metalliferous and extractive mines

- Electrical engineer for mines with greater than 1 KW or if high voltage is recognised – assume applies to tier 1 and 2 mines (quarries), with approximately 70% from NER – 30% from PC holders

Estimates

The Resources Regulator estimated the number of practising certificate holders needed in 2025.

Table 2. Estimates of practising certificate holders required for mine classes in 2025

Practising certificate	Mining activities (including relief)	Support staff (stat and related roles)	Total for mine	No. of mines 2025	Total required 2025	No. at June 2025
Coal						
Underground						
Mining engineering manager	1	1	2	25	50	131
Electrical engineering manager		1	1	25	25	87
Mechanical engineering manager		1	1	25	25	72
Undermanager	7	3	10	25	250	281
Deputy	28	3	31	25	775	920
Ventilation officer		1	1	25	25	43
Ventilation auditor (contracted)		0.10	0.10	25	3	1
Dust explosion control measures auditor (contracted)		0.10	0.10	25	3	3
Sub total					1,156	1,538

Practising certificate	Mining activities (including relief)	Support staff (stat and related roles)	Total for mine	No. of mines 2025	Total required 2025	No. at June 2025
Surface (open cut)						
Mining engineering manager	1	1	2	23	46	130
Electrical engineer		1	1	23	23	40 or NER
Mechanical engineer		1	1	23	23	29 or NER
Open cut examiner	10	5	15	23	345	442
Sub total					646	641
Metalliferous/other minerals						
Underground						
Mining engineering manager	1	1	2	33	66	115
Electrical engineer		1	1	33	33	60% from NER, 40% PC – refer coal figures
Underground supervisor (small & large mines)	7	2	9	33	297	297
Sub total					396	412
Mines other than ug or coal (quarries)						
Quarry manager (tier 1) certificate of competence required	1	1	2	28	56	109
Electrical engineer (tier 1)		0.2	1	28	6	70% NER, 30% PC –

Practising certificate	Mining activities (including relief)	Support staff (stat and related roles)	Total for mine	No. of mines 2025	Total required 2025	No. at June 2025
						refer coal figures.
Quarry manager (tier 2) all sites OR specific sites	1	0	1	286	286	401
Electrical engineer (tier 2 – part time)		0.10	0.10	286	29	70% NER, 30% PC – refer coal figures
Sub total					377	510
Total estimated holders required					**2,575**	**3,092 available overall**

Practising certificates – forecast number projections

Practising certificates – projections and analysis process

Background

The Resources Regulator has analysed and aggregated the number of in-force practising certificates and projected a timeline to forecast if the numbers exhibited a decline over time when compared to historical renewal data. The underpinning rationale for the analysis came from previous annual reports to the Mining and Petroleum Competence Board on practising certificate numbers and certificate of competence exam results.

The Resources Regulator developed a projection model based on new candidate and certificate renewal historical data. This document will not replicate any of the analytical techniques, testing or development that underpin this projection but is referenced where relevant.

This document will briefly describe the projections for practising certificate quantities over the next 5 years to 2030, assuming renewal and new candidate certificate of competence exam performance results continue on the same trajectory as previous data.

Executive summary

This projection analysis incorporated several levels of analysis, including visual distribution (histograms) on factors of certificate types by age of holders and renewal performance. Chi-squared[2] tests were used to determine if those factors were interdependant and to forecast a time series of projected figures based on this analysis.

The period 2017–2019 saw a substantial number of certificates granted, which provided enough data to analyse renewal percentages. Practicing certificates require renewal every 5 years, so the period 2022–2024 was used to estimate how many 'new' certificates[3] were issued per month. The Resources Regulator does not expect the larger-than-average intake of 2017 to be repeated.

A drop in numbers in the 2023–2024 reporting period was the impetus for the request for analysis. This drop is entirely due to the renewal period for the large intake of granted certificates in 2017–2019 following the introduction of legislative requirements for practising certificates. Because practising certificates have a 5 year term before they require renewal, we expect another (but lesser) drop in numbers during 2028–2029 and a steady decline over each 5 year cycle.

Analysis of the distribution of expiries (non-renewal) and granting of new certificates shows that these distributions have remained similar over time. Expiry percentages diverge from those under 55 and over 55 upon granting a certificate (those over 55 at the time of granting a certificate are less likely to renew in 5 years). This was used in estimates of new certificates and their distribution as well as forecast expiry rates – by certificate type.

[2] For a simplified understanding of chi-square analysis refer to the Australian Bureau of Statistics article: https://www.abs.gov.au/Ausstats/abs@.nsf/7d12b0f6763c78caca257061001cc588/711ecfa53732d329ca2577f9000f21b5!OpenDocument

[3] Where the certificate granted wasn't a direct renewal of a previous certificate for the same person.

The projection has been forecast to 2030, and has been built 'programatically' so that it may be dynamically and systematically replicated when required.

The table below summarises what can be found in the 'Results' section as to whether each practising certificate type has forecast numbers stable out until 2030 or are forecast to decline without intervention or securing more people from industry to be certificated into those functions.

Table 3. Forecast practising certificate numbers until 2030, based on 2022 onward 'new' certificate averages.

Certificate type	Forecast
PC – Mining Mechanical Engineer	Decline
PC – Mining Engineering Manager of an ug coal mine	Decline
PC – Undermanager of an underground coal mine	Decline
PC – Ventilation Officer	Decline
PC – Mining Electrical Engineer	Slight decline
PC – Quarry Manager of specific non-coal mine(s)	Slight decline
PC – Deputy of an ug coal mine	Stable
PC – Mining Engineering Manager of an ug mine other than a coal mine	Stable
PC – Mining Engineering Manager of a coal mine other than an ug coal mine	Stable
PC – Open Cut Examiner of a coal mine other than an ug coal mine	Stable
PC – Underground mine supervisor of underground mines other than coal mines	Stable
PC – Quarry Manager of a mine other than a coal mine or ug mine	Increase
PC – Dust Auditor	*Not forecast*
PC – Mining Engineering Manager of specific non-coal mine(s)	*Not forecast*
PC – Ventilation Auditor	*Not forecast*

Note: Mining mechanical engineer and mining electrical engineer certificate types include both surface engineer and underground manager types. They are grouped together in the Resource Regulator system data. Future projections are planned to separate them.

Analysis and results

Age-based analysis

Age-based expiry trends were visualised using histograms, which showed the percentage of expired vs renewed practicing certificates for each certificate type granted between 2017 and 2019 (a certificate can be renewed by being granted on the back of an expiry date). Data was then coded into age-based categories to identify any patterns in the performance of a specific age group. No actual sets of data will display the same distribution, but visual analysis of the individual histograms showed that groups below age 55 consistently had a significantly lower expiry percentage when compared to those above 55. This observation allowed the forecasting of age-based expiries based on a split between ages above and below 55. Hence at each renewal forecast point the percentage for the age bracket and distinct certificate type was used. See Appendix C for the histogram charts.

Age-based distribution was also conducted at the certificate type level based on grant dates. As an aggregate, the above/below 55 proportion from the initial intake period (2017–2019) was

approximately the same when compared to new candidate certificates granted in 2023–24 (see Table 2, red squares show similar percentage distribution). Chi-square analysis[4] indicated a relationship existed between the age of the holder and the certificate type. This means that not all certificate types share uniform intake proportions of above/below 55. Forecasts of new certificates were formulated using the observations above, and those projections will renew 5 years later at the renewal proportion per type and age group.

Table 4 – Certificates granted

2017–2019 Certifcates granted					Weighted %	
Age bracket	#	% total	% expiry (in age bracket)	Expiry #	Total	Expiry %
23–27	32	1.1%	66%	21		
28–31	191	6.2%	43%	83		
32–36	393	12.6%	31%	121		
37–40	356	11.4%	31%	109		
41–45	456	14.3%	32%	148		
46–49	405	12.9%	36%	144		
50–54	448	14.3%	38%	170	72.7%	34.9%
55–58	398	12.6%	60%	240		
59–63	315	10.0%	72%	226		
64–67	97	3.0%	80%	78		
68–72	35	1.3%	66%	23		
73–76	5	0.3%	100%	5		
77–100	2	0.1%	100%	2	27.3%	67.4%
Total	3133					

2023–2024 Certificates granted					Weighted %
Age bracket	#	% total	% expiry (in age bracket)	Expiry #	Total
23–27	14	0.6%	66%	9	
28–31	43	1.9%	43%	19	
32–36	198	8.7%	31%	61	
37–40	311	13.7%	31%	95	
41–45	400	17.6%	32%	130	
46–49	294	12.9%	36%	104	
50–54	362	15.9%	38%	137	71.4%
55–58	260	11.4%	60%	157	
59–63	249	11.0%	72%	179	

64–67	91	4.0%	80%	73	
68–72	35	1.5%	66%	23	
73–76	13	0.6%	100%	13	
77–100	1	0.0%	100%	1	28.6%
Total	2271				

Analysis assumptions – actual performance

The forecast analysis has been written so that it can be dynamically re-run at any time. For example, if this analysis is re-run in 6 months' time any new information will be incorporated into the model. For this initial analysis, the reference date is end of January 2025, and the actual performance portion of the analysis will incorporate and sum (by month) all active certificates to that time. Each month calculates the number of certificates with a 'grant date' less than the current month and 'expiry date' greater than that date. This assumes all forward dated expiries will make their expiry date, and with few 'when cancelled' dates used this is a safe assumption.

Analysis assumptions – projection estimates

The projection estimate analysis is similar to 'actual performance', but ensures the records analysed have an 'expiry date' that is future dated and no new 'grant date' afterward. Each record is then given a new 'grant date' 5 years into the future and calculated with a renewal percentage based on certificate type and age (at initial 'grant date') as per 'Age-based analysis'. These records are then aggregated at certificate-type level and added to 'actual performance' per month.

Analysis assumptions – new certificate estimates

This forecast estimates 'new certificates', which for the purpose of this modelling means a certificate type (linked to a holder) that is not a direct renewal from the same certificate type and holder within one day of a previous records' (type and candidate) expiry date. All records of this nature, with 'grant dates' from 2022 onward, are used to get an average number granted per calendar month of certificate type and age group (over and under 55). The average number per calendar month is then used to extrapolate 'new' certificates granted, projecting out another 5 years. As an illustration below Figure 2 shows the numbers in December for each of the years after 2019. Taking the average (in this example, 8 over the 5 years = 1.4), we then extrapolate that December in the next 5 years will have the same number granted.

Figure 2 – Illustration of numbers for an age group over a period with an average extrapolated for next 5 years

		Actual						Forecast				
Certificate	Age band	Dec 2020	Dec 2021	Dec 2022	Dec 2023	Dec 2024		Dec 2025	Dec 2026	Dec 2027	Dec 2028	Dec 2029
Type 1	Age 1	1	1	1	4	0		1.4	1.4	1.4	1.4	1.4

The expiry date is 5 years from the 'grant date' and these numbers are aggregated as part or the inforce total numbers up until the calculated 'expiry date'.

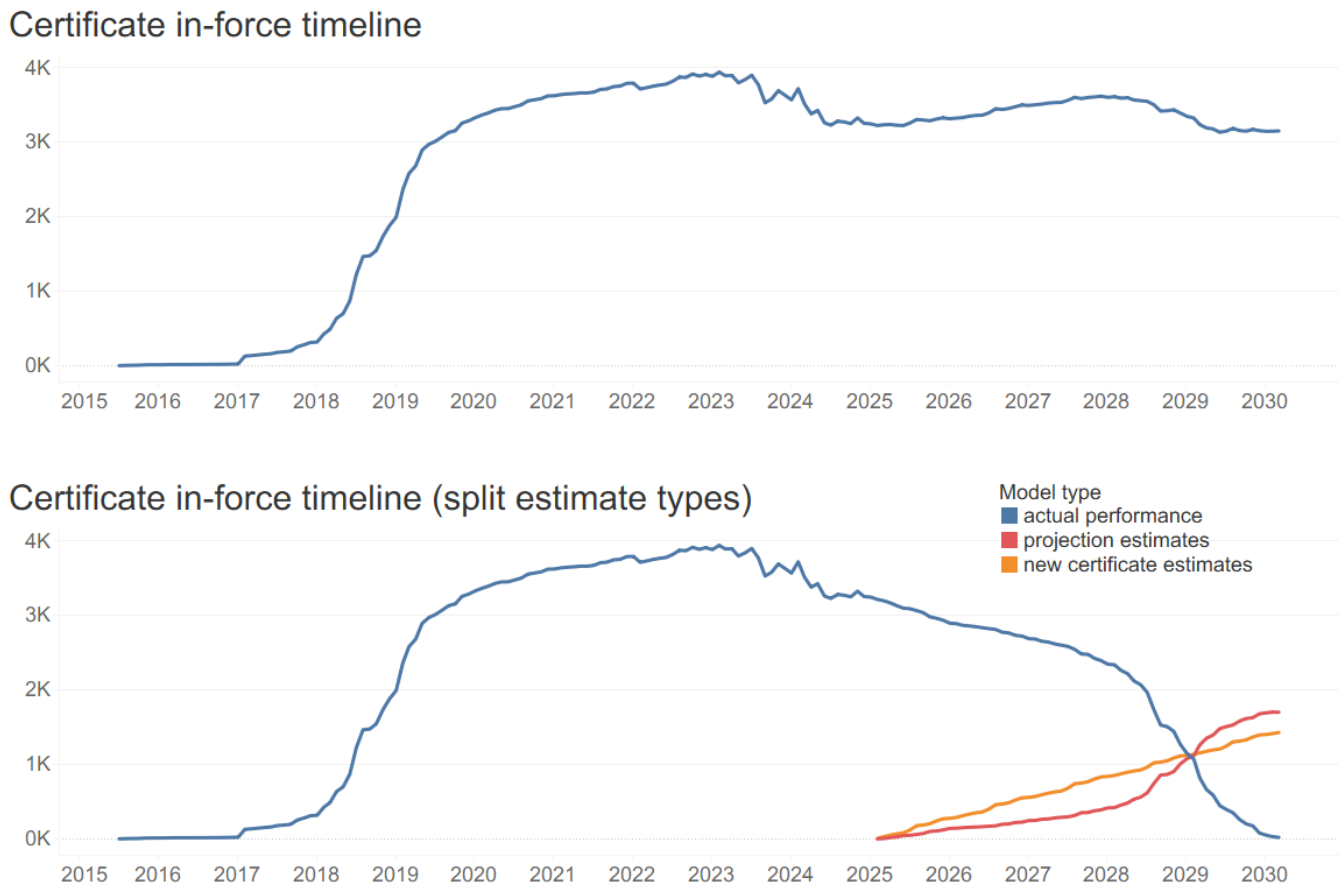
After discussion with the MCT a decision was made to forecast monthly averages based on the period 2022–2024. Although for most of the certificate types the entire period was stable (see Appendix D for individual certificate type charts), it is a reasonable period to assess averages over time without introducing bias due to a small period of intake that may not be replicated. Furthermore to make this modelling dynamic and reproducable over time the modelling is written to take averages from the 3 preceeding 12 month periods at point of extraction (which is January 2022 for this initial analysis).

The initial large intake period 2017–2019 was removed due to the expectation that this has a very low chance of being replicated in the future. This is because it is likley that the implementation of the legislative requirements promoted a surge in PC's being created. If we used these years than the average would be increased and inflate a false positive inflation in forecast numbers.

Analysis assumptions – combining the estimates

The three aggregated datasets are now combined and aggreated at month-year level by certificate type, age band and projection type that allows for monthly sums of active certificates. Figure 3 shows a projection chart for all certificate types (top), and the breakdown of how the three separate analysis points look before being combined (bottom). The blue line on the bottom chart is the future performance if we had no more new candidates or renewed certificates from now, and is illustrating that based on recent new candidate performance the certificate numbers should remain stable.

Figure 3 – Projection chart for practising certificates to 2030

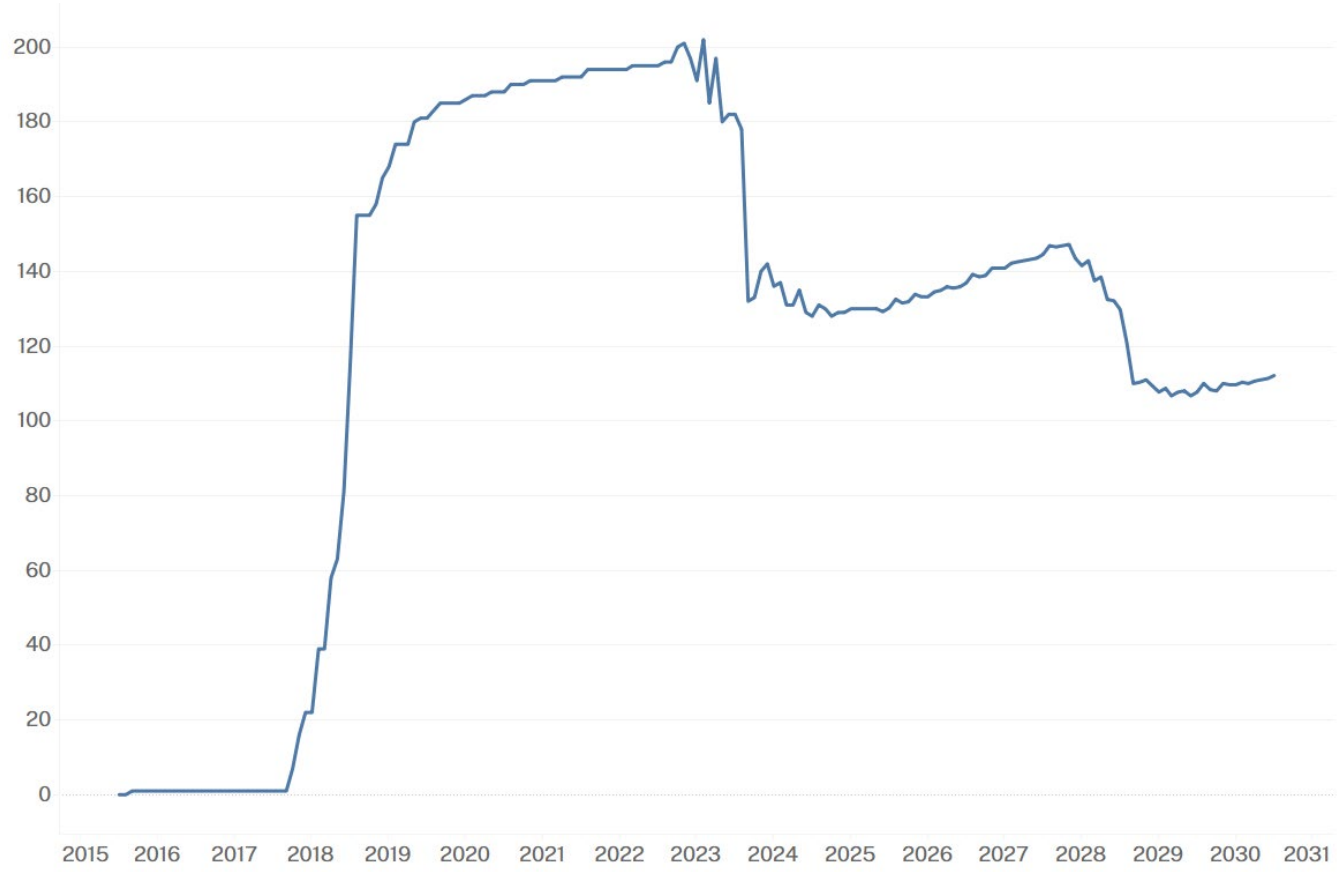


Results

Using the analysis described above the actual (completed) records were combined with projected expiry and new candidate performance at the certificate type level and are shown individually in timeline charts below (of actual and forecast point-in-time in-force certificate counts). Some certificate types represent stability in numbers through to 2030 and beyond, while some do start to drop or decline which stakeholder and industry may need to promote recruitment and new intakes to as renewals won't be enough to maintain stability. Noting that the 2023–2024 drop in numbers is based on the sharp intake (granting) of numbers for the 2017–2019 period, which is forecast to happen (at a relatively lesser degree) in 2029.

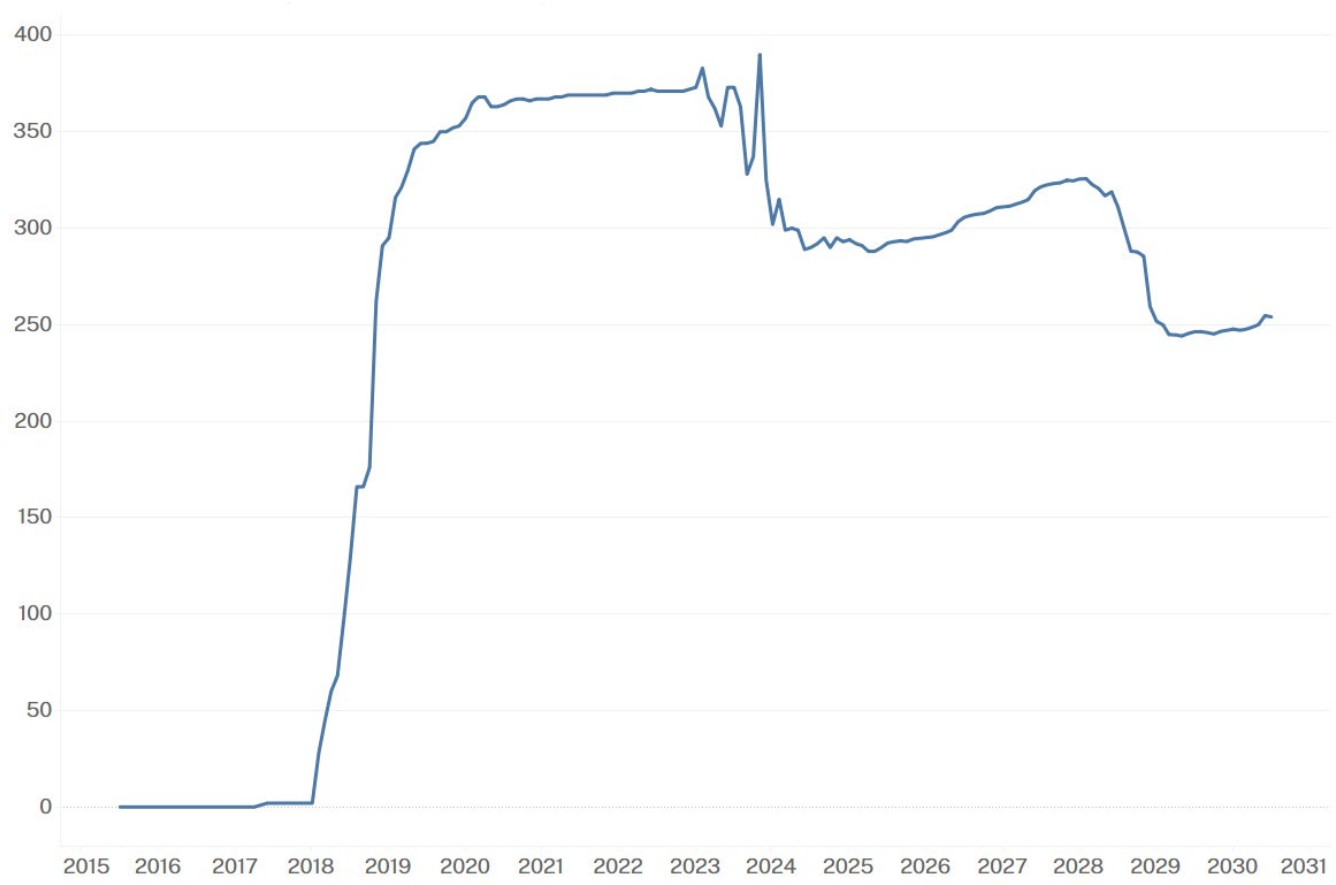
Underground coal mines

Figure 4. Practising certificate – mining engineering manager of an underground coal mine



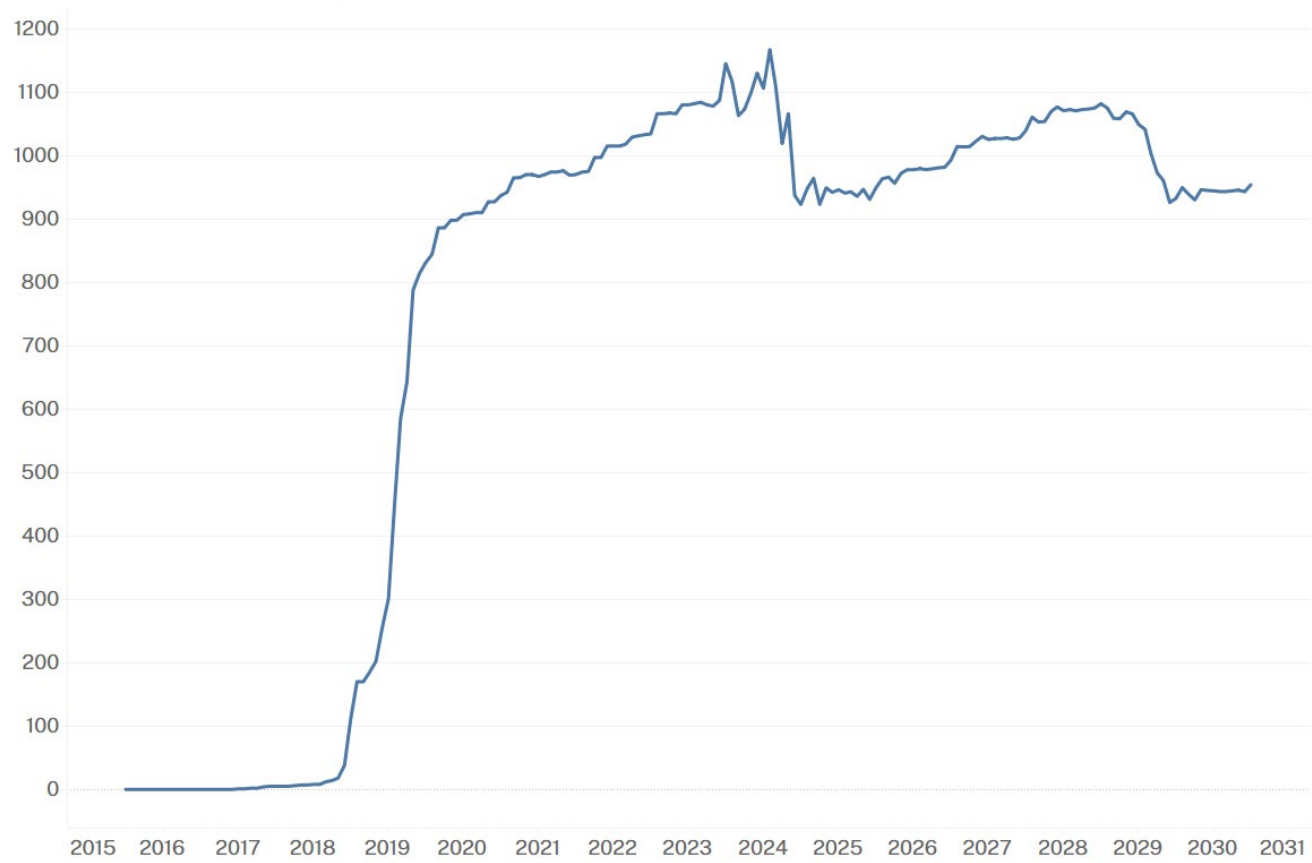
Relative lack of replenishment to expiries is projected to be ~55% of the 2017–2019 level. Regular new practising certificate holders propping up the expiry loss seems to be a problem with this certificate type.

Figure 5. Practising certificate – undermanager of an underground coal mine



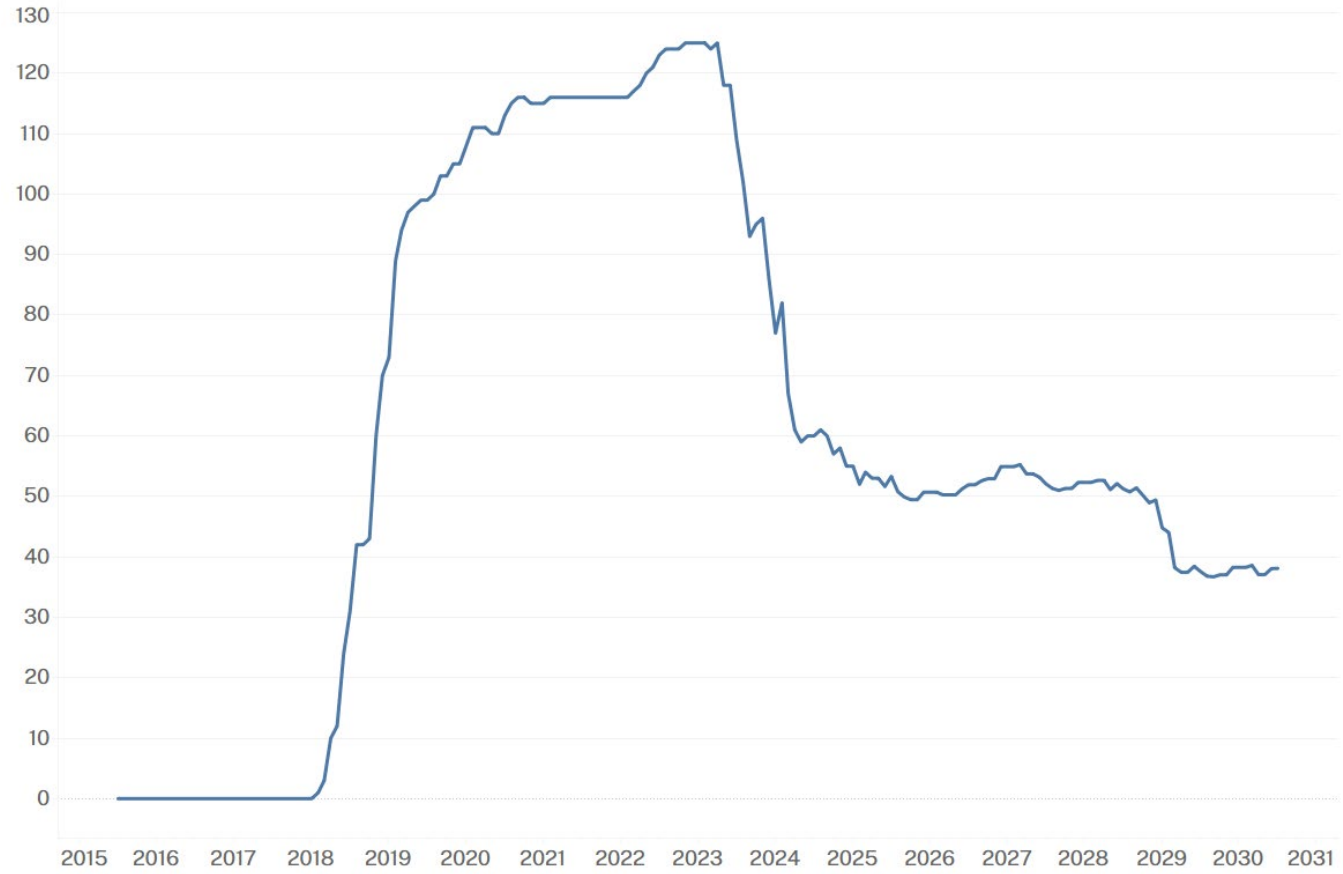
Numbers projected to be slightly declining by 2030, at ~65% of the maximum in 2024. Noting that 'new' certificate holders have been negligible since 2019, so the trend is driven from non-renewals.

Figure 6. Practising certificate – deputy of an underground mine



If new candidates and renewals continue at past rates, the level will not significantly drop below the original intake of the 2017–2019 period.

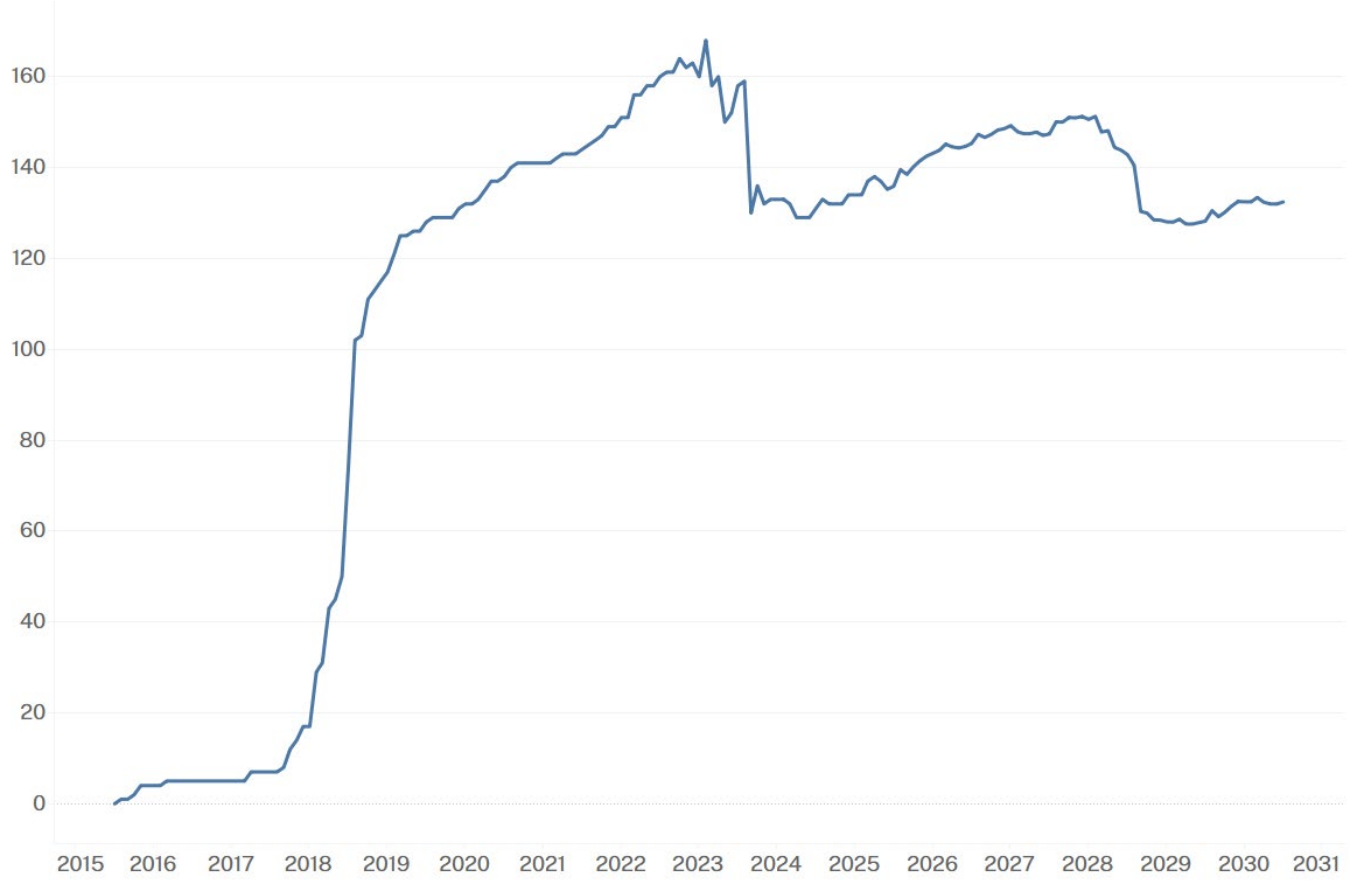
Figure 7. Practising certificate – ventilation officer



Apart from 10 new certificates for this function at its height in 2023, the projection can only be based on renewal versus expiry. This shows that without replenishment this certificate type will have aggregate reductions every 5 years from 2024.

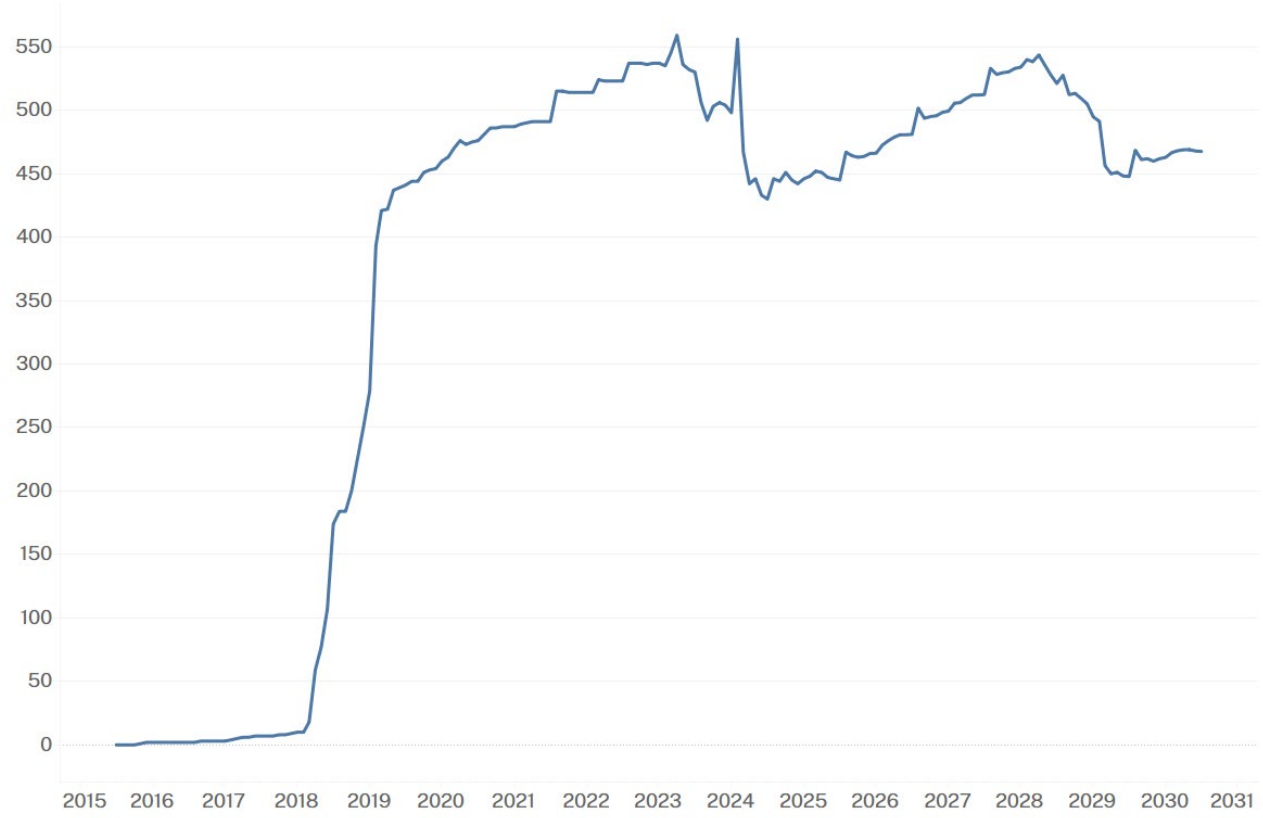
Coal mines

Figure 8. Practising certificate – mining engineering manager of a coal mine other than an underground mine



Similar pattern in projection, and 2030 is anticipated to see approximately the same in-force numbers as the 2017–2019 period.

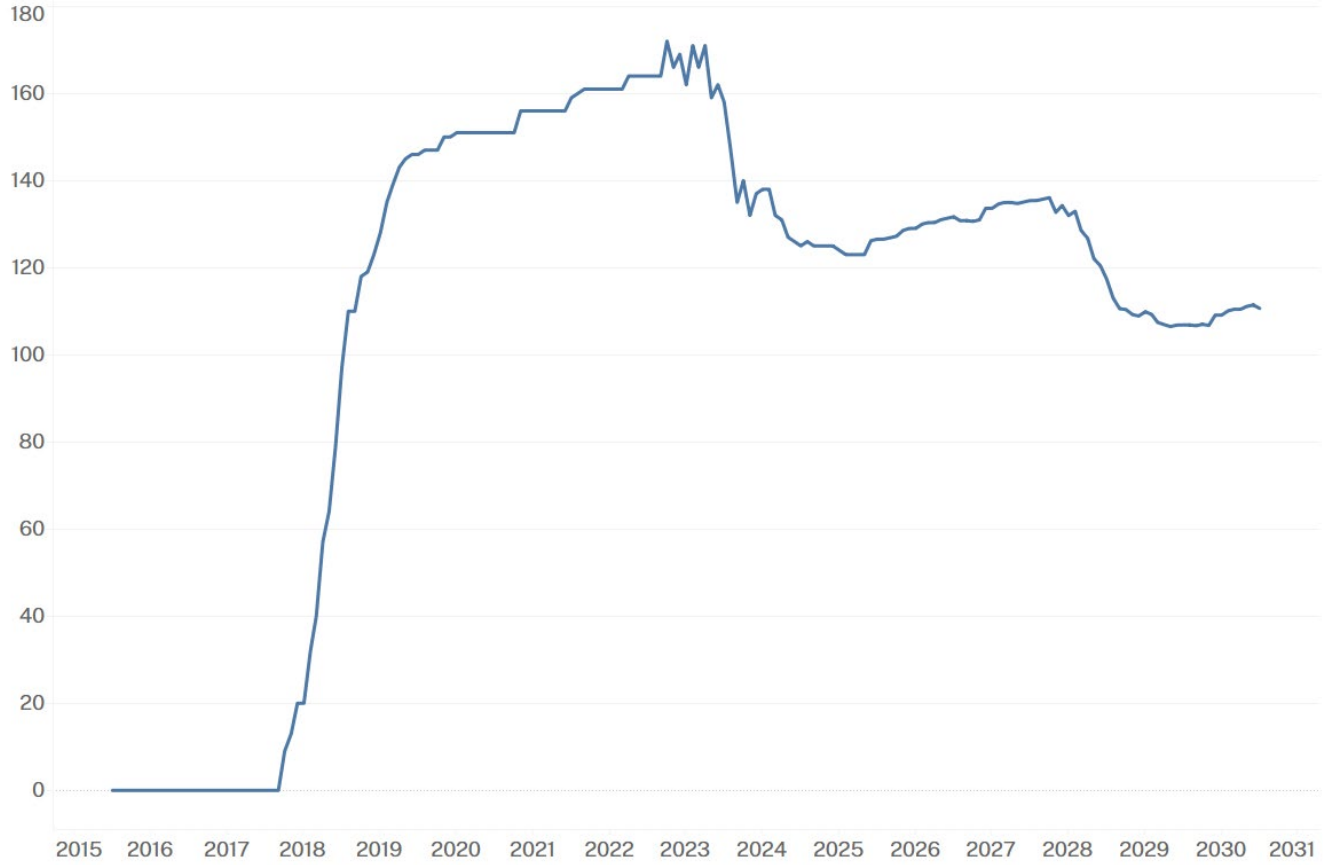
Figure 9. Practising certificate – open cut examiner of a coal mine other than an underground coal mine



Stable projections until 2030.

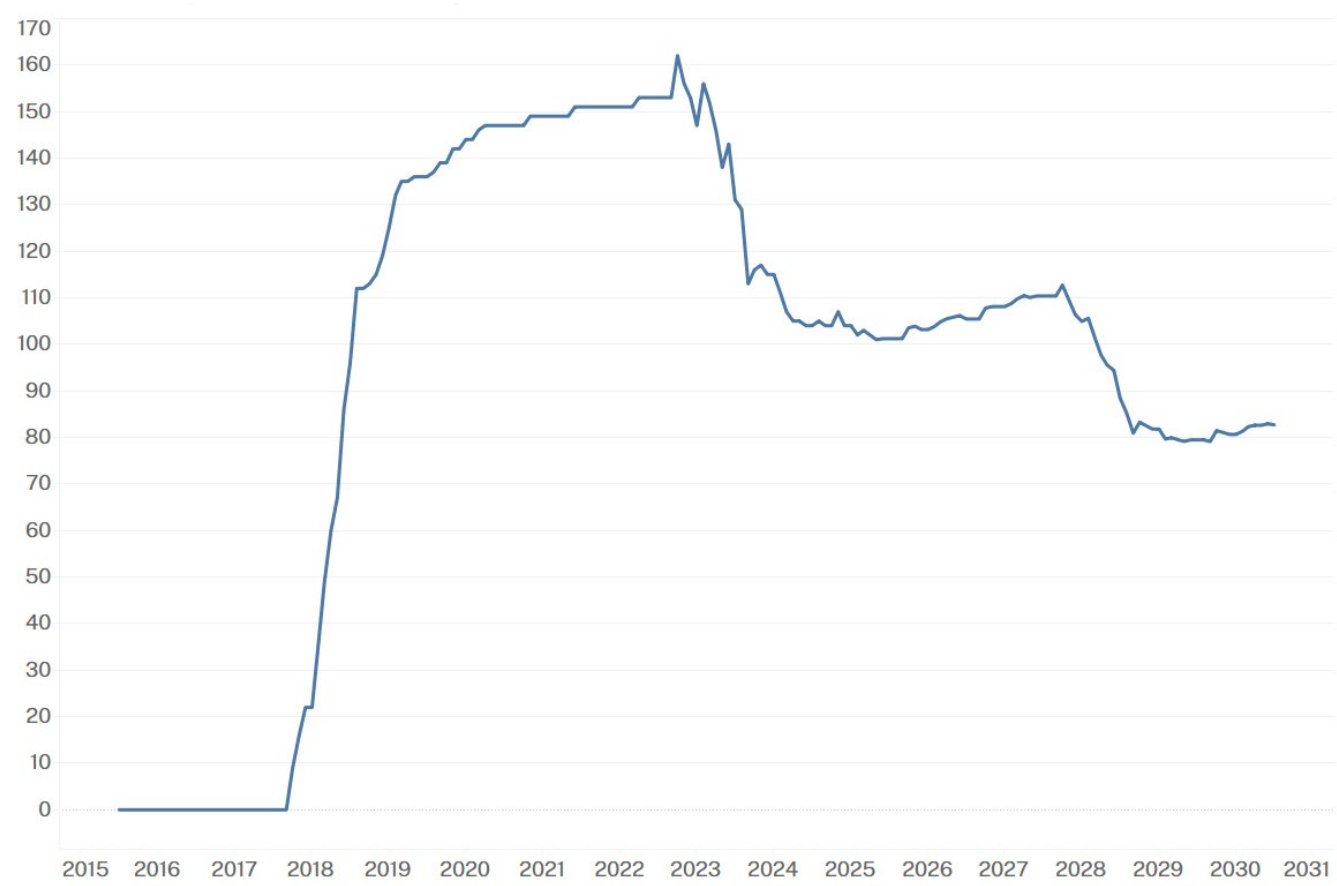
Underground and surface coal mines

Figure 10. Practising certificate – mining electrical electrical engineer (combined electrical engineer and electrical engineering manager)



Whilst numbers are lower (compared with other types), the period 2020–2024 shows marginally lower new intake numbers compared with the expiry drop-off. Projection is still relatively stable for 2030, but in-force numbers are at 75% of the 2017–2019 period and 65% of the peak in-force during 2023.

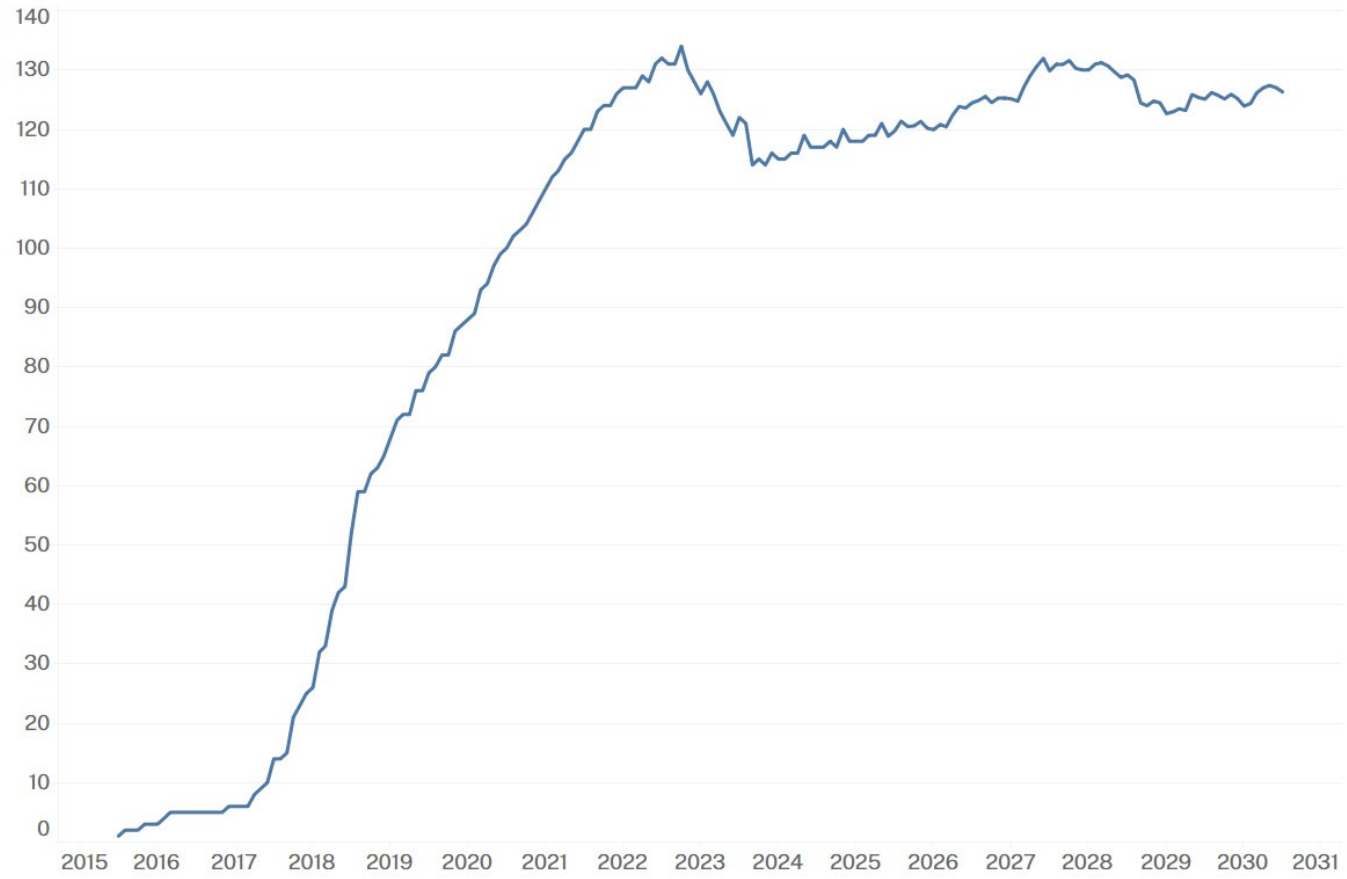
Figure 11. Pracisting certificate – mining mechanical engineer (combined mechanical engineer and mechanical engineering manager)



Relative lack of replenishment to expiries is projected to be ~57% of the 2017–2019 level. Regular new practising certificate holders propping up the expiry loss seems a challenge with this certificate type.

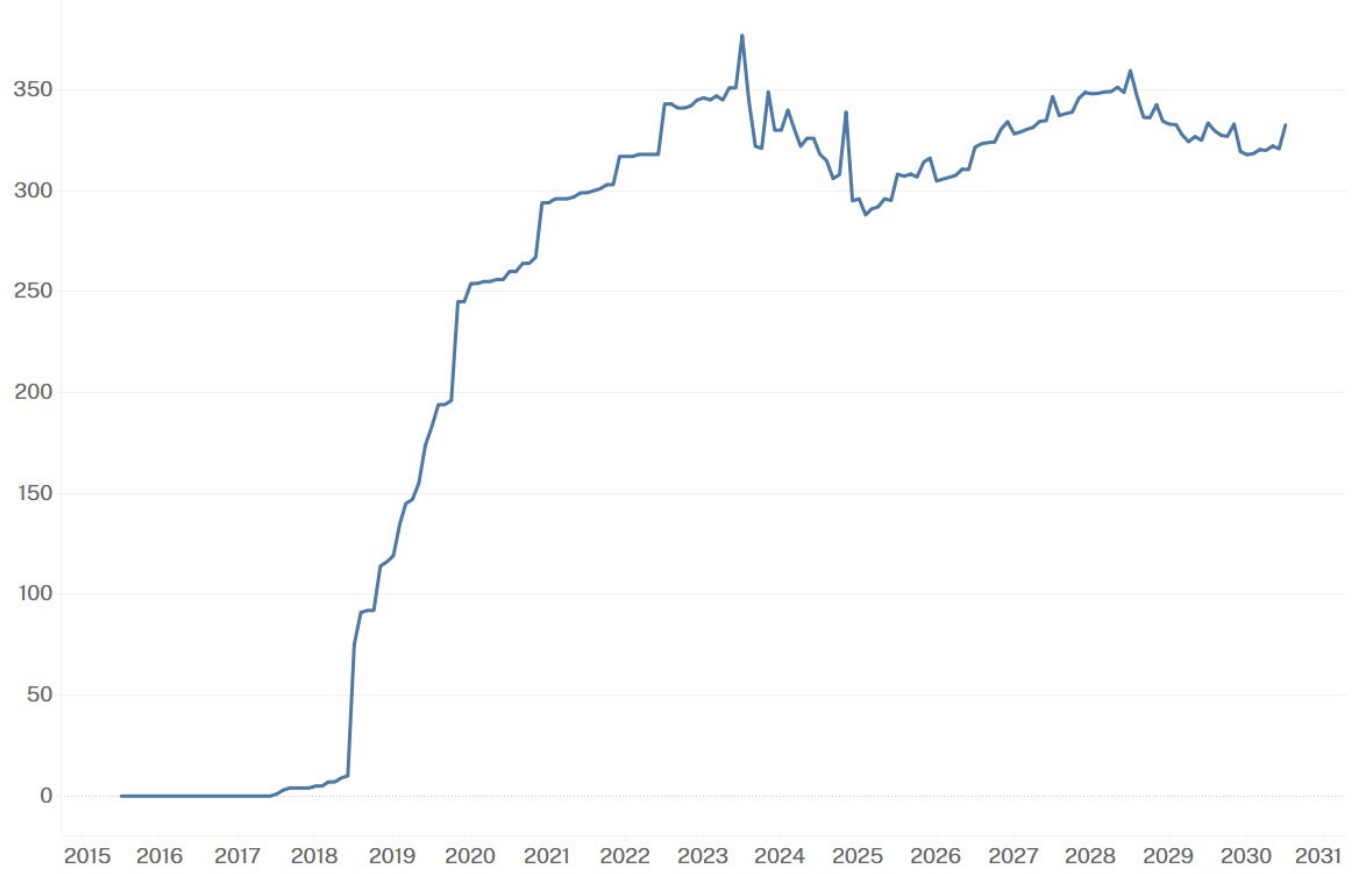
Underground mines other than coal

Figure 12. Practising certificate – mining engineering manager of an underground mine other than a coal mine



Stable projection until 2030, and, in fact, numbers in this certificate have grown past the original intake period. Refer to Table 1 for significant impact from mutual recognition of interstate certificates.

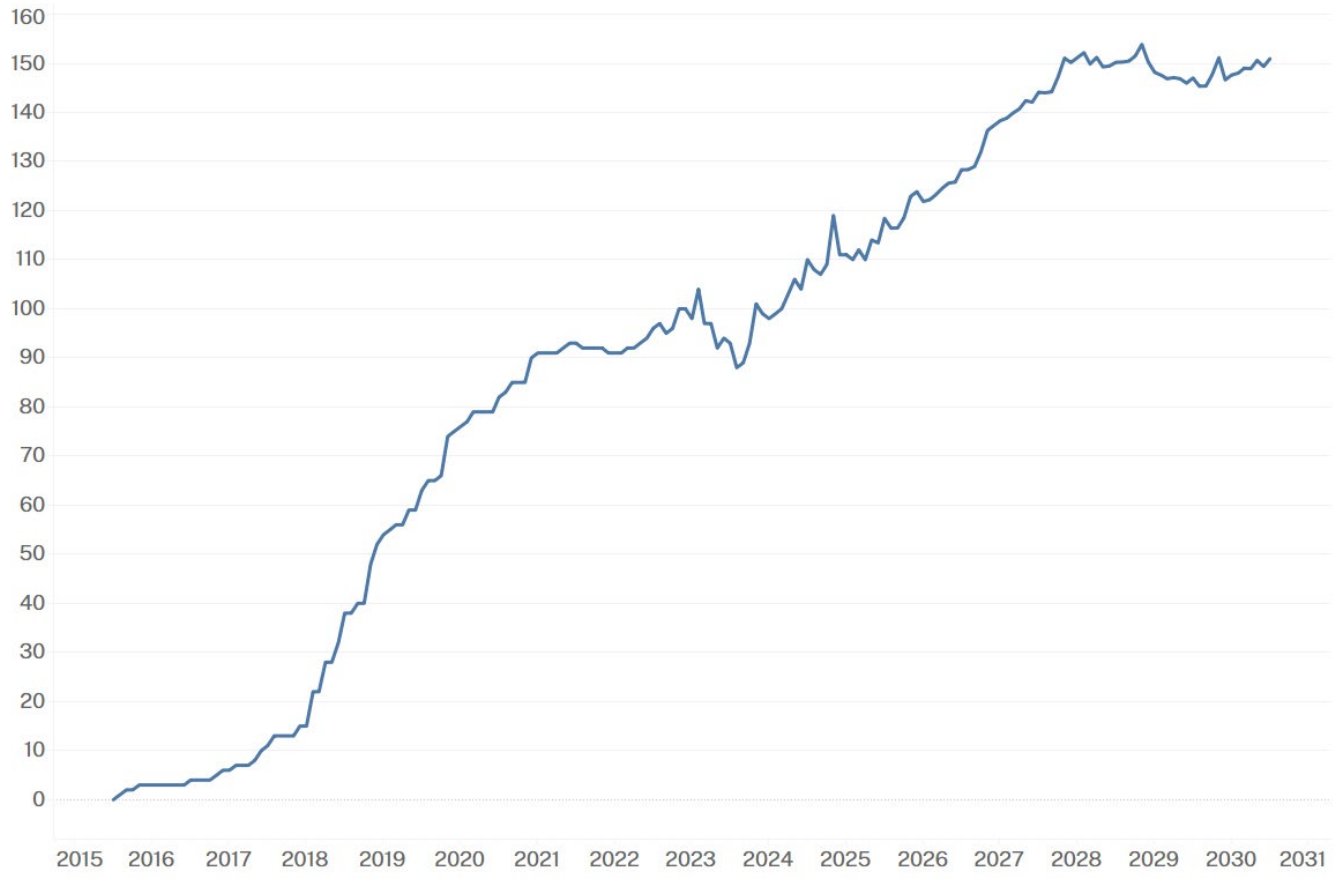
Figure 13. Practising certificate – underground mine supervisor of underground mines other than coal mines



Stable numbers projected with a slight increase from the 2017–2019 period.

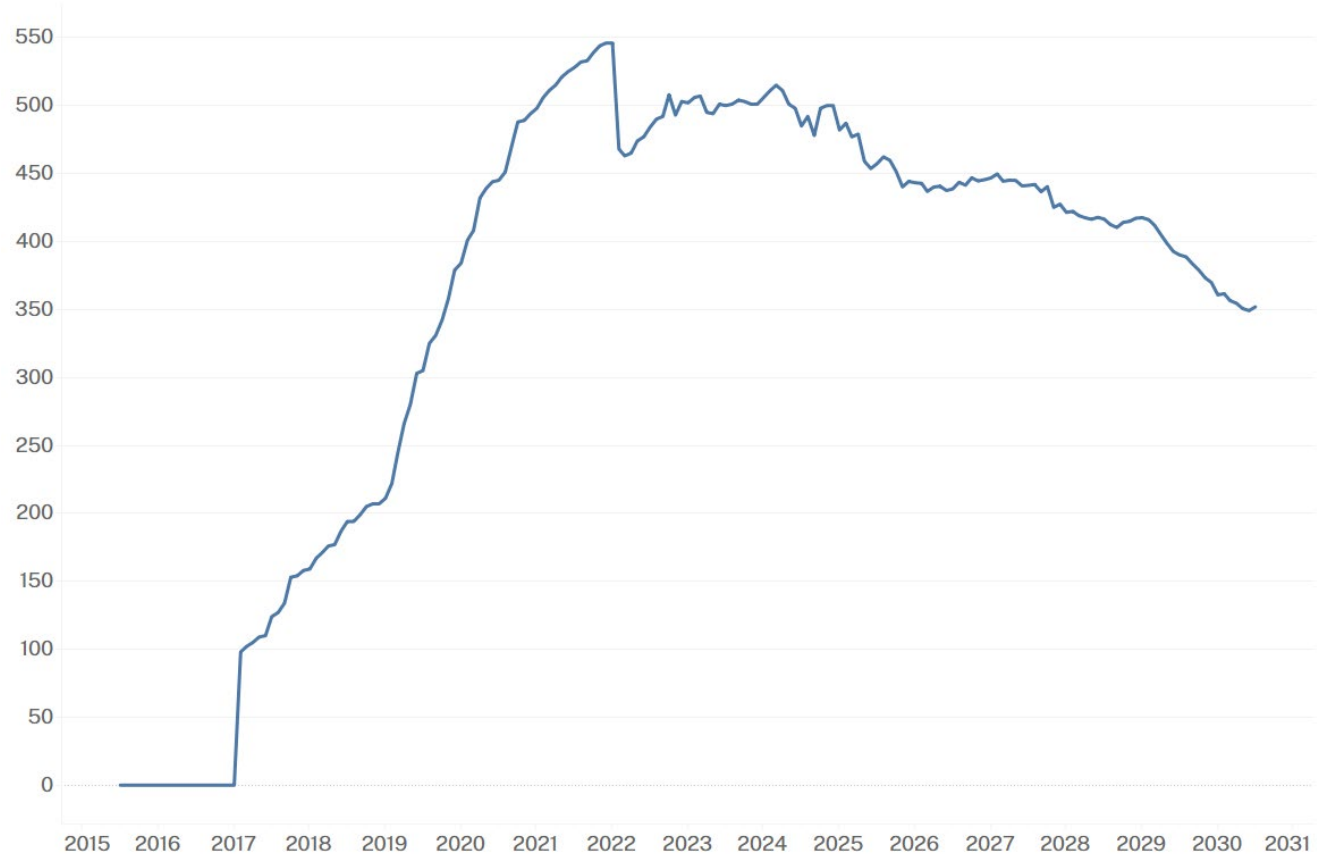
Mines other than underground or coal mines

Figure 14. Practising certificate – quarry manager of a mine other than a coal mine or underground mine (up to tier 1 quarries)



Numbers in this category are projected to be very stable and trending moderately upwardsuntil 2030.

Figure 15. Practising certificate – quarry manager of specific non-coal mine(s) (tier 2 quarries)



From the peak in 2021, projected to be at 78% of that number in 2030, showing a gradual decline from 2028.

Certificate types not forecast

The certificate types of ‘PC – ventilation auditor’, ‘PC – dust auditor’, ‘PC – mining engineering manager of specific non-coal mine(s)’ have no forecast parameters as the number of current certificates is zero (or close to it). This is an insufficient number to make a forecast.