

**For discussion on
27 June 2019**

Paper FC 7/2019

Family Council

Key Findings of Manpower Projection to 2027

PURPOSE

The Government has been conducting, at the macro level, periodic Manpower Projection exercises with a view to assessing the broad trends of Hong Kong's future manpower supply and requirements for the medium term. We briefed the Legislative Council Panel on Manpower in May 2019 on the key findings of Manpower Projection to 2027, and the relevant paper is at [Annex](#). Members are invited to note the paper.

**Labour and Welfare Bureau
June 2019**

For information
21 May 2019

Legislative Council Panel on Manpower
Key Findings of Manpower Projection to 2027

Introduction

This paper informs Members of the key findings of Manpower Projection to 2027 (MP2027).

2. The Government has been conducting, at the macro level, periodic Manpower Projection (MP) exercises with a view to assessing the broad trends of Hong Kong's future manpower supply and requirements for the medium term. Adopting 2017 as the base year and covering a 10-year projection period, MP2027 projects the manpower situation up to 2027 on the basis of the latest available manpower statistics. A brief summary on the framework and methodology of MP2027 is at **Annex A**.

Key Findings of MP2027

Manpower Supply Projection

3. The local manpower supply (equivalent to the labour force excluding foreign domestic helpers) is projected to increase from 3.64 million in 2017 to reach a plateau in 2019 to 2022 at 3.67 million to 3.68 million, and then decrease to 3.57 million in 2027 (as illustrated in Chart 1 of **Annex B** on manpower projection analyses). In other words, the local manpower supply is projected to increase at an average annual rate of 0.2% for 2017 to 2022, and to decrease at an average annual rate of 0.6% for 2022 to 2027. It represents an average annual decreasing rate of 0.2% during 2017 to 2027.

4. The actual and projected local manpower supply for 2017 and 2027 analysed by age group, sex and education level are set out at Tables 1 to 3 of **Annex B** respectively. In particular, the local manpower supply will be ageing along with the greying of our population. The local manpower supply at age 55 or above is projected to constitute about 24.4% of the overall local manpower supply in 2027, as against 21.3% in 2017. Along with the rapid ageing of our population, the overall labour force participation rate is expected to fall from 59.1% in 2017 to 54.9% in 2027¹. The local male manpower supply is expected to decrease at an average annual rate of 0.6% from 1.99 million in 2017 to 1.88 million in 2027, whilst the local female manpower supply is projected to grow slightly at an average annual rate of 0.2% from 1.65 million in 2017 to 1.69 million in 2027.

5. The general education profile of our workforce is anticipated to improve further in the next decade. The manpower supply with qualifications of *sub-degree*, *first degree* and *postgraduate* is projected to grow at an average annual rate in the range of 1.6% to 2.9% during the period from 2017 to 2027, owing to the abundant pathways available to our youth in pursuing higher education. On the other hand, the manpower supply at the levels of *upper secondary* and *lower secondary and below* is expected to decline, mainly due to the anticipated retirement of many workers with these qualifications, who belong to the post-war baby boomer generation, during the projection period. It is broadly estimated that some 150 000 workers with qualifications of *upper secondary* and some 300 000 workers with qualifications of *lower secondary and below* will retire during this period.

Manpower Requirement Projection

6. The total manpower requirements (excluding foreign domestic helpers) are projected to increase by 127 000 from 3.61 million in 2017 to

¹ While the age-specific labour force participation rate (LFPR) for persons aged between 25 and 64 will rise during 2017 to 2027, the number of elders aged 65 or over in the population will increase remarkably (by 676 700) during the same period. The much expanded elderly population will thus water down the overall LFPR.

3.74 million in 2027, corresponding to an average annual growth rate of 0.3% for the overall economy during the projection period.

7. It is projected that the faster growing economic sectors (i.e. those with the projected growth rate faster than that of the overall economy) in terms of manpower requirements during the period from 2017 to 2027 will be *Professional and business services* (at an average annual growth rate of 1.4%); *Information and communications* (1.2%); *Financial services* (1.1%); *Social and personal services* (0.9%); *Real estate* (0.8%); and *Construction* (0.5%). The sectors anticipated to have their manpower requirements diminished during the period from 2017 to 2027 are *Agriculture, fishing and quarrying* (at an average annual decreasing rate of 6.8%); *Manufacturing* (2.9%); *Import, export, wholesale and retail trades* (0.6%); and *Transportation, storage, postal and courier services* (0.2%). The manpower requirements in 2017 and the projections in 2027 by economic sector are set out in Table 4 of **Annex B**.

8. The manpower requirements of the pillar industries and the selected industries having good potential for further driving the development of our economy are listed respectively in Tables 5 and 6 of **Annex B**. Most of them are projected to grow at a rate faster than that of the whole economy during the projection period.

9. The projected changes in the occupation pattern and education level of manpower requirements (as presented respectively in Tables 7 and 8 of **Annex B**) are in line with Hong Kong's continued transformation to a knowledge-based and high value-added economy with focuses on innovation, professionalism and adoption of automation and technology in business processes. It is expected that the proportion of workers in high-skilled occupation groups viz. *Managers and administrators*; *Professionals*; and *Associate professionals* will increase (from 42.8% in 2017 to 46.4% in 2027), whereas the proportion of non-high-skilled occupation groups (such as *Clerical support workers*; *Craft and related workers*; and workers in the *Elementary occupations*) will decrease from 57.2% to 53.6% during the same period. Similarly, the manpower requirements for workers with higher education qualifications will increase and those with lower qualifications will shrink during the projection period.

Projected Manpower Resource Balance

10. The manpower resource balance, derived by comparing the projected manpower supply with the projected manpower requirements, provides a measure for assessing if the future manpower of the whole economy and at different education levels will be in balance, shortfall or surplus. In gist, the manpower requirements are expected to grow in tandem with economic growth whilst our labour force is expected to shrink due to ageing population and low fertility rate in the projection period, resulting in an overall manpower shortfall of 169 700 by 2027.

11. The projected manpower resource balances at different education levels in 2027 are given in Table 9 of **Annex B**. Basically, the shortfall will occur across all education levels. For the *lower secondary and below* level, while the projected manpower supply and requirements will both decrease, the decrease in projected supply will be far more apparent when compared with the decrease in projected requirements, leading to the largest shortfall by education level. On the other hand, for the *postgraduate* level, many workers with postgraduate qualifications are often employed for jobs offered to first degree holders. It would be more meaningful to pool together the projected shortfall at *first degree* level (50 900) and the surplus at *postgraduate* level (16 300) for analytical purpose.

Scenario Study

12. A broad-brush scenario study has been conducted at the macro level to take into account the impact of economic conditions on the overall manpower situation by 2027. With the manpower shortage in 2027 projected at 169 700 under the base-case scenario, the manpower shortfalls are estimated to be 254 200 and 86 800 under the high-case and low-case scenarios respectively.

Findings from Related Surveys

13. As reflected from the results of two MP-related statistical surveys (on job skills requirements, training needs and desire to work), our labour force are keen in pursuing courses to enhance their job skills, particularly on areas like Knowledge of products and services offered (by the workers), Teamwork and leadership, Ability to communicate in English/Putonghua, Customer service skills, and Creativity and problem-solving capability. About 20% of the total labour force (corresponding to some 752 800 economically active persons) had attended job-related training/retraining courses during the 12 months before enumeration, whilst about 36% of all persons engaged (corresponding to some 1.02 million persons engaged in various economic sectors) were considered by their employers as necessary to receive skill training.

14. Some 66 600 persons, including 50 100 female homemakers aged 30-59 and 16 500 early retirees aged 50-64 (corresponding to 10% and 5% of the respective population subgroups), indicated that they would be willing to work if they were offered “suitable” employment meeting their specific needs, with main considerations such as “Flexible/convenient working hours”, “High/reasonable salary”, “Work place near home”, and “Simple/ comfortable/safe job”. Most of them preferred part-time jobs and less than 10% (or some 6 300 persons) would prefer full-time jobs. This group of persons can probably be an alternative solution when employers faced difficulties in hiring full-time employees under the tight manpower situation.

Related Information

15. MP2027, a technical exercise projecting the broad trends of our manpower situation up to 2027, could provide useful reference for the Government, business sector and training bodies to plan mid-term manpower strategies. Nonetheless, given the macro nature of this exercise, we are unable to make projections on the manpower supply of specific sectors and occupations, given that it is difficult, if not impossible, to ascertain which sector a person will work in after graduating from school or university. In addition, workers in an industry may change jobs and even move into another industry altogether over time. Relevant bureaux/departments and stakeholders may conduct further sector-specific

manpower planning/ studies, having regard to the future development and characteristics of the manpower supply and demand of the specific sectors concerned, the policy direction and other practical considerations.

16. We plan to upload the full report on MP2027 to the website of the Labour and Welfare Bureau in end-2019. Meanwhile, the Census and Statistics Department (C&SD) will publish the results of the related surveys through the C&SD's website.

Advice Sought

17. Members are invited to note the projection findings presented above.

Labour and Welfare Bureau
May 2019

Framework and Methodology of Manpower Projection to 2027 (MP2027)

MP2027 comprises three major components, namely manpower supply projection (MSP), manpower requirement projection (MRP), and projected manpower resource balance (MRB). While MSP is analysed by age group, sex and education level, MRP is analysed by economic sector, occupation group and education level. By comparing the findings of MSP with MRP, we would also attempt to derive MRB by education level, which is the only common analysis element in both MSP and MRP.

2. MP2027 adopts a six-level education classification, namely “Lower secondary and below”, “Upper secondary”, “Diploma” (including craft), “Sub-degree”, “First degree” and “Postgraduate”. These categories largely reflect the mainstream education structure of Hong Kong.

3. The classifications of economic sectors and occupation groups adopted in MP2027 for analysing the findings of MRP are primarily based on those of the Census and Statistics Department (C&SD) in relation to compilation of manpower statistics. MRP is analysed on the basis of 12 economic sectors¹ according to conventional classification (which together make up the whole economy) and nine occupation groups².

¹ These include “Agriculture, fishing and quarrying”, “Manufacturing”, “Electricity, gas, water and waste management”, “Construction”, “Import, export, wholesale and retail trades”, “Accommodation and food services”, “Transportation, storage, postal and courier services”, “Information and communications”, “Financial services”, “Real estate”, “Professional and business services” and “Social and personal services”.

² These include “Managers and administrators”, “Professionals”, “Associate professionals”, “Clerical support workers”, “Service and sales workers”, “Craft and related workers”, “Drivers, plant and machinery operators and assemblers”, “Elementary occupations” and “Other occupations” (including mainly farm workers, animal husbandry workers and fishermen).

4. Manpower supply in the context of MP2027 is virtually equivalent to the labour force comprising both the employed persons and unemployed persons of our economy but excluding foreign domestic helpers. The manpower supply projection in MP2027 draws on the C&SD's latest Population Projections and Labour Force Projections, which have reflected the future population and manpower trends. Various factors affecting the growth of the future manpower supply, in particular the demographic change in the next decade, have been taken into account in the projection model. In projecting the Hong Kong's future manpower supply with further breakdowns by age group, sex and education level, we have taken into consideration various factors sourced from the education statistics of the Education Bureau and information collected from a MP-related Household Survey conducted under the administration of the C&SD (in which 10 100 households were enumerated). Types of input data have covered education profiles of Hong Kong residents, students leaving Hong Kong for overseas studies (including the Mainland), students returning to Hong Kong upon graduation, and working people upgrading themselves by taking up continuing studies.

5. The projected manpower requirements up to 2027 were compiled through a two-step statistical process. First, the preliminary estimates of the projected manpower requirements (including vacancies) of various economic sectors and industries up to 2027 were derived from statistical projection models drawing on the historical statistics. Second, an inter-departmental task group, with members from relevant bureaux/departments and statutory training bodies, would review and finetune the preliminary projection results by making reference to a wide range of relevant statistics and information. Sources of information included the findings of an extensive consultation exercise to gather views from over 100 businesses, trade associations and public organisations on the outlook of the future manpower requirements in various industries; and employers' views on their current and future manpower needs based on a MP-related Establishment Survey involving 5 900 establishments of various economic sectors. A list of the social and economic factors that may affect the outlook for future manpower needs, such as population ageing, the use of automation and artificial intelligence, the new business opportunities arising from the Belt and Road Initiative and the Guangdong-Hong Kong-Macao Greater Bay Areas, etc. were listed in the survey questionnaire and

consultation documents to facilitate respondents' responses on their envisaged future manpower requirements.

6. A broad-brush scenario study³ was conducted in collaboration with the Office of the Government Economist to take into account the impact of economic cycles and fluctuations on the projected overall manpower supply and requirements, as well as the manpower resource balance by 2027 at a macro level. The scenario study assumed the projected manpower supply to remain constant under different economic scenarios, as manpower supply in the medium to long term is to a large extent demographically-driven. On the requirement side, the manpower requirements under different scenarios were estimated by making reference to the past statistical relationship between manpower requirement and overall economic growth. In particular, with the main results of MP2027 taken as the base-case scenario, the high-case and low-case scenarios are constructed by assuming a ± 1 percentage point range for the trend real Gross Domestic Product (GDP) growth over the projection period⁴.

³ Given the broad-brush nature of the scenario study, potential structural changes in the future, such as those brought about by technological advancement and efficiency enhancement, have not been taken into account. Furthermore, this study only intends to capture the effect of different economic growth scenarios on the overall manpower projection at the macro level but not at the sectoral level. Also, the results are not meant to capture the potential year-to-year fluctuations in manpower resource balance.

⁴ Given that MP2027 covers a 10-year projection period, reference has been drawn to the historical 10-year trend growth rates of real GDP. As the trend growth rates hovered in a range of 2 percentage points in the past 20 years since 1998, a ± 1 percentage point range for the real GDP trend growth over the projection period has been adopted for the scenario study. In particular, the MP2027 exercise did not explicitly feature an assumed trend growth rate in real GDP over the 10-year projection period. As reference, the latest official medium-term real GDP trend growth forecast, covering a four-year period from 2020-2023 as announced in the 2019-20 Budget was 3% per annum, same as that put out in the past three rounds of Budget.

Manpower Projection Analyses

(a) Manpower Supply Projection

Chart 1: Labour Force / Projected Labour Force, 2006 - 2066

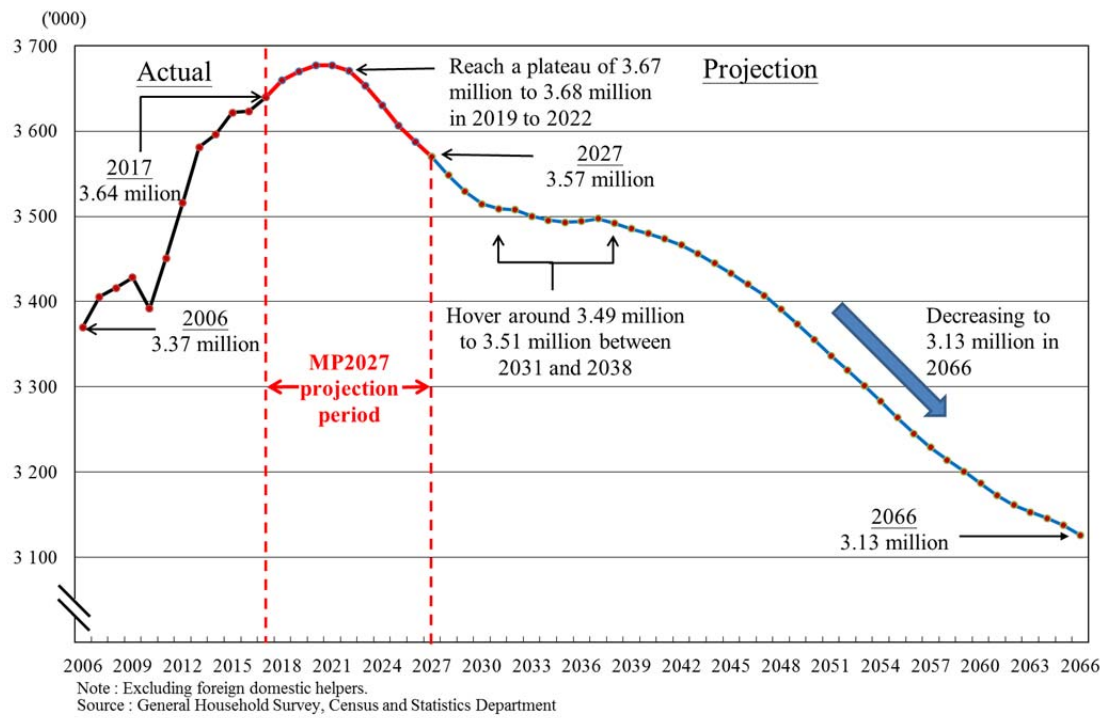


Table 1: Local Manpower Supply[@] and Labour Force Participation Rate[@] by Age Group in 2017 and 2027

Age group (years)	2017 (Actual)			2027 (Projected)			Projected change from 2017 to 2027	Projected average annual rate of change (2017-2027)
	Local manpower supply [@] (Number) (% share)		LFPR [#]	Local manpower supply [@] (Number) (% share)		LFPR [#]		
15 – 24	290 500	8.0	39.0%	232 400	6.5	34.4%	- 58 200	- 2.2%
25 – 34	829 400	22.8	86.9%	744 600	20.9	89.2%	- 84 900	- 1.1%
35 – 44	839 700	23.1	82.1%	885 600	24.8	85.3%	+ 45 900	+ 0.5%
45 – 54	905 000	24.9	79.0%	837 700	23.5	81.4%	- 67 300	- 0.8%
55 – 64	648 700	17.8	57.2%	672 500	18.8	60.5%	+ 23 800	+ 0.4%
65+	126 500	3.5	11.0%	197 300	5.5	10.9%	+ 70 800	+ 4.5%
15 – 54	2 864 600	78.7	74.0%	2 700 200	75.6	75.5%	- 164 400	- 0.6%
55+	775 200	21.3	33.9%	869 800	24.4	29.7%	+ 94 600	+ 1.2%
Total	3 639 800	100.0	59.1%	3 569 900	100.0	54.9%	- 69 800	- 0.2%*

@ Excluding foreign domestic helpers.

Labour force participation rate (LFPR) of the population in the respective age groups.

* The local manpower supply is projected to increase from 3.64 million in 2017 to reach a plateau in 2019 to 2022 at 3.67 million to 3.68 million (i.e. to increase at an average annual rate of 0.2% for 2017 to 2022), and then decrease to 3.57 million in 2027 (i.e. to decrease at an average annual rate of 0.6% for 2022 to 2027). It represents an average annual decreasing rate of 0.2% during the entire projection period from 2017 to 2027.

Note: Individual figures may not add up to the totals due to rounding.

Table 1A: Local Manpower Supply[@] and Labour Force Participation Rate[@] by Age Group in 2017 and 2022

Age group (years)	2017 (Actual)			2022 (Projected)			Projected change from 2017 to 2022	Projected average annual rate of change (2017-2022)
	Local manpower supply [@] (Number) (% share)		LFPR [#]	Local manpower supply [@] (Number) (% share)		LFPR [#]		
15 – 24	290 500	8.0	39.0%	227 900	6.2	38.1%	- 62 600	- 4.7%
25 – 34	829 400	22.8	86.9%	856 200	23.3	88.6%	+ 26 700	+ 0.6%
35 – 44	839 700	23.1	82.1%	855 400	23.3	83.6%	+ 15 700	+ 0.4%
45 – 54	905 000	24.9	79.0%	850 500	23.2	80.3%	- 54 400	- 1.2%
55 – 64	648 700	17.8	57.2%	719 900	19.6	60.1%	+ 71 200	+ 2.1%
65+	126 500	3.5	11.0%	160 800	4.4	11.1%	+ 34 300	+ 4.9%
15–54	2 864 600	78.7	74.0%	2 790 000	76.0	76.5%	- 74 600	- 0.5%
55+	775 200	21.3	33.9%	880 700	24.0	33.2%	+ 105 500	+ 2.6%
Total	3 639 800	100.0	59.1%	3 670 700	100.0	58.3%	+ 30 900	+ 0.2%

@ Excluding foreign domestic helpers.

Labour force participation rate (LFPR) of the population in the respective age groups.

Note: Individual figures may not add up to the totals due to rounding.

Table 1B: Local Manpower Supply[@] and Labour Force Participation Rate[@] by Age Group in 2022 and 2027

Age group (years)	2022 (Projected)			2027 (Projected)			Projected change from 2022 to 2027	Projected average annual rate of change (2022-2027)
	Local manpower supply [@] (Number) (% share)		LFPR [#]	Local manpower supply [@] (Number) (% share)		LFPR [#]		
15 – 24	227 900	6.2	38.1%	232 400	6.5	34.4%	+ 4 400	+ 0.4%
25 – 34	856 200	23.3	88.6%	744 600	20.9	89.2%	- 111 600	- 2.8%
35 – 44	855 400	23.3	83.6%	885 600	24.8	85.3%	+ 30 200	+ 0.7%
45 – 54	850 500	23.2	80.3%	837 700	23.5	81.4%	- 12 800	- 0.3%
55 – 64	719 900	19.6	60.1%	672 500	18.8	60.5%	- 47 400	- 1.4%
65+	160 800	4.4	11.1%	197 300	5.5	10.9%	+ 36 500	+ 4.2%
15–54	2 790 000	76.0	76.5%	2 700 200	75.6	75.5%	- 89 800	- 0.7%
55+	880 700	24.0	33.2%	869 800	24.4	29.7%	- 10 900	- 0.2%
Total	3 670 700	100.0	58.3%	3 569 900	100.0	54.9%	- 100 700	- 0.6%

@ Excluding foreign domestic helpers.

Labour force participation rate (LFPR) of the population in the respective age groups.

Note: Individual figures may not add up to the totals due to rounding.

Table 2: Local Manpower Supply[@] and Labour Force Participation Rate[@] by Sex in 2017 and 2027

Sex	2017 (Actual)			2027 (Projected)			Projected change from 2017 to 2027	Projected average annual rate of change (2017-2027)
	Local manpower supply [@] (Number) (% share)		LFPR [#]	Local manpower supply [@] (Number) (% share)		LFPR [#]		
Male	1 991 700	54.7	68.3%	1 884 500	52.8	62.6%	- 107 200	- 0.6%
Female	1 648 100	45.3	50.9%	1 685 400	47.2	48.3%	+ 37 300	+ 0.2%
Total	3 639 800	100.0	59.1%	3 569 900	100.0	54.9%	- 69 800	- 0.2%*

@ Excluding foreign domestic helpers.

Labour force participation rate (LFPR) of the population in the respective sex.

* The local manpower supply is projected to increase from 3.64 million in 2017 to reach a plateau in 2019 to 2022 at 3.67 million to 3.68 million (i.e. to increase at an average annual rate of 0.2% for 2017 to 2022), and then decrease to 3.57 million in 2027 (i.e. to decrease at an average annual rate of 0.6% for 2022 to 2027). It represents an average annual decreasing rate of 0.2% during the entire projection period from 2017 to 2027.

Note: Individual figures may not add up to the totals due to rounding.

Table 3: Local Manpower Supply[@] by Education Level in 2017 and 2027

Education level	Actual local manpower supply [@] in 2017		Projected local manpower supply [@] in 2027		Projected change from 2017 to 2027	Projected average annual rate of change (2017-2027)
	(Number)	(% share)	(Number)	(% share)		
Lower secondary and below	878 600	24.1	605 500	17.0	- 273 000	- 3.7%
Upper secondary	1 282 000	35.2	1 189 300	33.3	- 92 700	- 0.7%
Diploma	116 700	3.2	116 100	3.3	- 600	- 0.1%
Sub-degree	218 400	6.0	255 900	7.2	+ 37 500	+ 1.6%
First degree	888 600	24.4	1 063 200	29.8	+ 174 600	+ 1.8%
Postgraduate	255 600	7.0	339 900	9.5	+ 84 300	+ 2.9%
All levels	3 639 800	100.0	3 569 900	100.0	- 69 800	- 0.2%*

@ Excluding foreign domestic helpers.

* The local manpower supply is projected to increase from 3.64 million in 2017 to reach a plateau in 2019 to 2022 at 3.67 million to 3.68 million (i.e. to increase at an average annual rate of 0.2% for 2017 to 2022), and then decrease to 3.57 million in 2027 (i.e. to decrease at an average annual rate of 0.6% for 2022 to 2027). It represents an average annual decreasing rate of 0.2% during the entire projection period from 2017 to 2027.

Note: Individual figures may not add up to the totals due to rounding.

(b) **Manpower Requirement Projection**

Table 4: Manpower Requirements by Economic Sector in 2017 and 2027

Economic sector	Actual manpower requirements in 2017		Projected manpower requirements in 2027		Projected change from 2017 to 2027	Projected average annual rate of change (2017-2027)
	(Number)	(% share)	(Number)	(% share)		
Agriculture, fishing and quarrying	3 900	0.1	1 900	0.1	- 2 000	- 6.8%
Manufacturing	97 200	2.7	72 700	1.9	- 24 500	- 2.9%
Electricity, gas, water and waste management	16 100	0.4	16 500	0.4	+ 500	+ 0.3%
Construction	348 600	9.6	367 400	9.8	+ 18 800	+ 0.5%
Import, export, wholesale and retail trades	884 000	24.5	830 600	22.2	- 53 400	- 0.6%
Accommodation and food services	288 500	8.0	298 500	8.0	+ 10 000	+ 0.3%
Transportation, storage, postal and courier services	319 600	8.8	313 800	8.4	- 5 700	- 0.2%
Information and communications	115 800	3.2	130 700	3.5	+ 15 000	+ 1.2%
Financial services	264 000	7.3	294 600	7.9	+ 30 500	+ 1.1%
Real estate	140 000	3.9	152 200	4.1	+ 12 200	+ 0.8%
Professional and business services	402 700	11.1	460 900	12.3	+ 58 200	+ 1.4%
Social and personal services	732 200	20.3	799 700	21.4	+ 67 400	+ 0.9%
Total	3 612 600	100.0	3 739 600	100.0	+ 127 000	+ 0.3%

Note: Individual figures may not add up to the totals due to rounding.

Table 5: Manpower Requirements of the Pillar Industries in 2017 and 2027

Pillar industry	Actual manpower requirements in 2017 (Number)	Projected manpower requirements in 2027 (Number)	Projected change from 2017 to 2027	Projected average annual rate of change (2017-2027)
Financial services	264 000	294 600	+ 30 500	+ 1.1%
Trading and logistics	739 200	669 600	- 69 600	- 1.0%
Professional services and other producer services [@]	555 600	661 700	+ 106 100	+ 1.8%
Tourism	265 400	284 000	+ 18 700	+ 0.7%
Total	1 824 200	1 909 900	+ 85 700	+ 0.5%

- @ It covers a wide spectrum of business activities, including
- (i) Software publishing and information technology related services;
 - (ii) Legal services;
 - (iii) Accounting, auditing and bookkeeping services;
 - (iv) Business management and consultancy services and engineering and technical services not related to construction and real estate activities;
 - (v) Design, advertising and related services;
 - (vi) Architectural, surveying and engineering services related to real estate and construction; and
 - (vii) Other producer services.

Note: Individual figures may not add up to the totals due to rounding.

Table 6: Manpower Requirements of the Selected Industries in 2017 and 2027

Selected industry	Actual manpower requirements in 2017 (Number)	Projected manpower requirements in 2027 (Number)	Projected change from 2017 to 2027	Projected average annual rate of change (2017-2027)
Information technology and information services	72 300	90 000	+ 17 800	+ 2.2%
Innovation and technology industries	38 000	57 600	+ 19 600	+ 4.3%
Cultural and creative industries	217 800	238 000	+ 20 200	+ 0.9%
Environmental industries	45 200	51 500	+ 6 300	+ 1.3%
Testing and certification services	14 500	16 600	+ 2 100	+ 1.3%

Table 7: Manpower Requirements by Occupation Group in 2017 and 2027

Occupation group	Actual manpower requirements in 2017		Projected manpower requirements in 2027		Projected change from 2017 to 2027	Projected average annual rate of change (2017-2027)
	(Number)	(% share)	(Number)	(% share)		
Managers and administrators	480 500	13.3	539 100	14.4	+ 58 600	+ 1.2%
Professionals	274 700	7.6	302 500	8.1	+ 27 800	+ 1.0%
Associate professionals	790 900	21.9	891 900	23.8	+ 101 000	+ 1.2%
Clerical support workers	526 500	14.6	487 200	13.0	- 39 300	- 0.8%
Service and sales workers	619 100	17.1	633 700	16.9	+ 14 600	+ 0.2%
Craft and related workers	244 700	6.8	236 400	6.3	- 8 300	- 0.3%
Drivers, plant and machinery operators and assemblers	177 000	4.9	164 200	4.4	- 12 800	- 0.7%
Elementary occupations	495 500	13.7	482 500	12.9	- 13 000	- 0.3%
Other occupations [@]	3 600	0.1	2 100	0.1	- 1 500	- 5.2%
Total	3 612 600	100.0	3 739 600	100.0	+ 127 000	+ 0.3%

@ Including mainly farm workers, animal husbandry workers and fishermen.

Note: Individual figures may not add up to the totals due to rounding.

Table 8: Manpower Requirements by Education Level in 2017 and 2027

Education level	Actual manpower requirements in 2017		Projected manpower requirements in 2027		Projected change from 2017 to 2027	Projected average annual rate of change (2017-2027)
	(Number)	(% share)	(Number)	(% share)		
Lower secondary and below	879 100	24.3	682 100	18.2	- 197 000	- 2.5%
Upper secondary	1 280 200	35.4	1 231 900	32.9	- 48 300	- 0.4%
Diploma	114 700	3.2	122 500	3.3	+ 7 800	+ 0.7%
Sub-degree	210 900	5.8	265 400	7.1	+ 54 600	+ 2.3%
First degree	874 000	24.2	1 114 000	29.8	+ 240 000	+ 2.5%
Postgraduate	253 700	7.0	323 600	8.7	+ 69 900	+ 2.5%
All levels	3 612 600	100.0	3 739 600	100.0	+ 127 000	+ 0.3%

Note: Individual figures may not add up to the totals due to rounding.

(c) **Manpower Resource Balance**

Table 9: Projected Manpower Resource Balance by Education Level in 2027

Education level	(a) Projected manpower supply in 2027	(b) Projected manpower requirements in 2027	(c) = (a) – (b) Projected manpower resource balance in 2027 [Surplus (+) / shortfall (-)]
Lower secondary and below	605 500	682 100	- 76 500
Upper secondary	1 189 300	1 231 900	- 42 600
Diploma	116 100	122 500	- 6 400
Sub-degree	255 900	265 400	- 9 500
First degree	1 063 200	1 114 000	- 50 900
Postgraduate	339 900	323 600	+ 16 300
All levels	3 569 900	3 739 600	- 169 700

Note: Individual figures may not add up to the totals due to rounding.