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The Impact of Demographic Change on the Chemical Industry in Europe

100 ml

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The Impact of Demographic Change on the Chemical Industry in Europe

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www.demographicsinchemistry.eu

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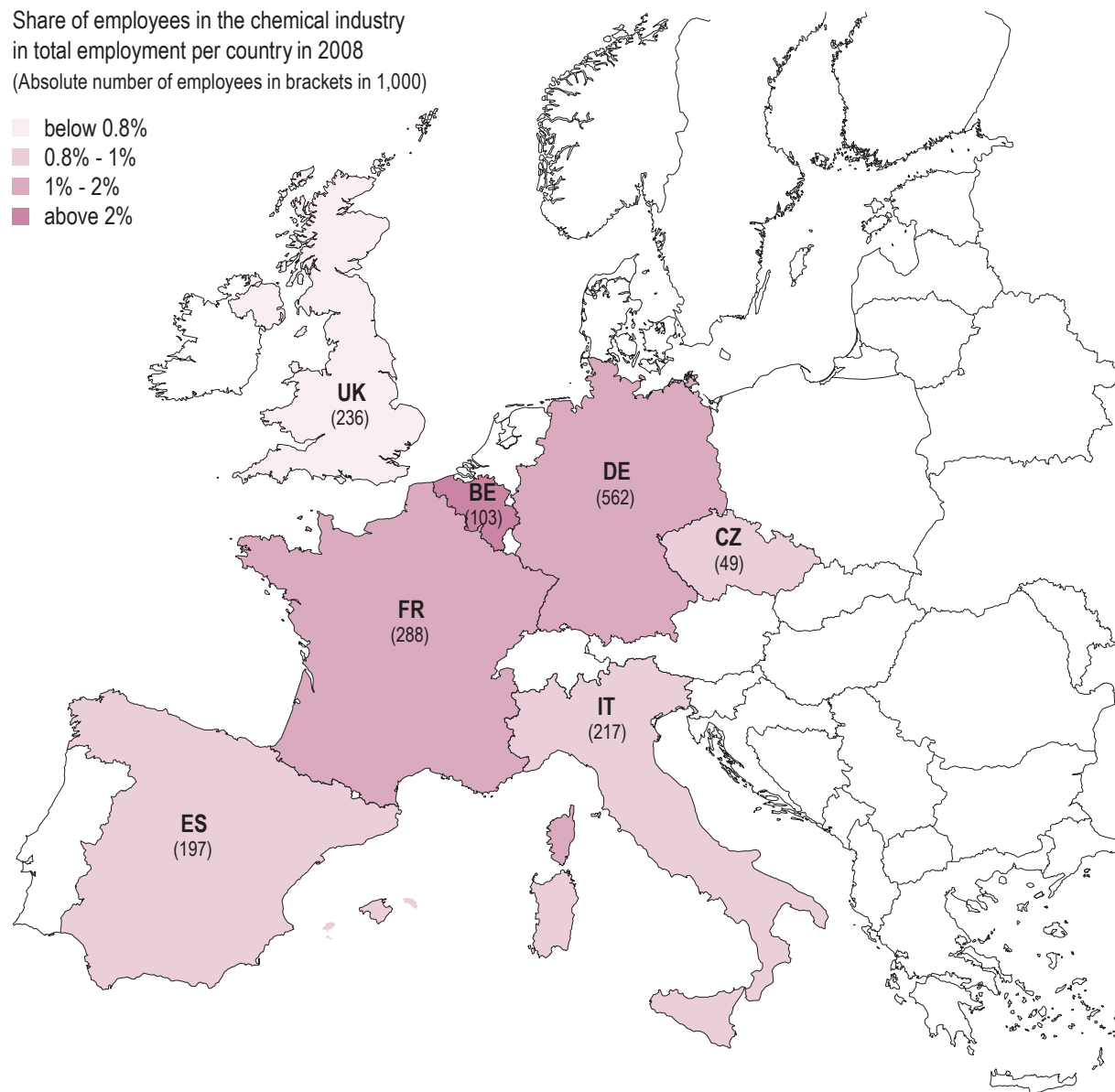
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Introduction

Share of employees in the chemical industry in total employment per country in 2008
(Absolute number of employees in brackets in 1,000)

- below 0.8%
- 0.8% - 1%
- 1% - 2%
- above 2%



Data Source: LFS 2008; own calculation and presentation

The impact of demographic change on the chemical industry in Europe is studied for seven countries: Belgium, the Czech Republic, Germany, Spain, France, Italy and the United Kingdom. The presentation begins with a demographic overview. The national and regional demographic development in each of the countries are then briefly analysed. Finally the national labour supply for the Chemical Industry is investigated and projected onto the demographic structure in 2030.

The chemical sector in the EU27 employed more than 2.2 million people in 2008. Countries with large population size also accounted for more chemical industry workers. One quarter of the EU27 employees lived in Germany, 12% in France. However, the national share of chemical employees in total employment was highest in Belgium. Altogether, the seven countries represented nearly 72% of all employees in this sector (LFS 2008).

General Indicators

2008	Area (km ²)	Pop. (Mio.)	Density (Inh./km ²)	Ø Age (Years)
BE Belgium	30 528	10.6	349	40.7
CZ Czech Republic	78 867	10.3	131	40.4
DE Germany	357 108	82.2	230	42.9
ES Spain	505 987	45.3	89	40.7
FR France	543 965	61.9	114	39.9
IT Italy	301 336	59.5	198	43.0
UK United Kingdom	243 069	61.3	252	39.7

Data Source: Eurostat; own calculation and presentation

Demographic Change: Ageing and Growth (2008–2030)

	Population Ageing in Years			Population Growth in %			Active Share in %			
	Total	Working-Age		Total	Working-Age		2008		2030	
		15–64	15–74		15–64	15–74	15–64	15–74	15–64	15–74
(BE) Belgium	2.5	0.4	1.7	10.2	1.5	7.4	66	75	61	73
(CZ) Czech Republic	5.1	2.1	3.2	0.7	- 9.0	- 4.1	71	79	64	75
(DE) Germany	4.1	1.6	2.6	- 2.5	- 12.0	- 7.1	66	78	60	74
(ES) Spain	4.1	2.5	3.5	16.3	9.1	14.8	69	77	64	76
(FR) France	2.8	0.1	1.6	9.9	0.2	6.1	65	73	59	71
(IT) Italy	4.0	1.8	2.5	3.9	- 2.8	1.4	66	76	62	74
(UK) United Kingdom	1.9	0.4	1.3	13.0	5.3	9.3	66	75	62	72

Data Source: Eurostat; own calculation and presentation

Data Source: Eurostat; own calculation and presentation

Data Source: Eurostat; own calculation and presentation

Demographic change means population ageing with the perspective of shrinking. Ageing is measured as an increase in mean age between two periods. Shrinking occurs if the percentage rate of change in the number of inhabitants is negative over a period of time. While ageing is global, shrinking of the total population is still a local phenomenon.

Future ageing will be most pronounced in the Czech Republic, followed by Spain, Germany, and Italy, the latter two being estimated to reach a mean age of nearly 47 years by 2030. The nations with the lowest current mean age will continue to have the youngest population; the average age will be less than 42 years for the UK and 42.8 years in France in 2030. Ageing in labour-related age groups is much slower.

The number of inhabitants is projected to increase further in all countries but Germany. Spain, the UK and Belgium will even witness growth among the working-age population (15-64), who will be shrinking in Germany, the Czech Republic, and Italy. Germans are likely to lose 6.5 million, and the Czechs and Italians between 0.7 and 1.1 million of their 15-64 year-olds between 2008 and 2030.

Most striking are the projections for Germany and Spain. Germany's workforce is expected to decrease by 12% to 47.9 million people in 2030, while Spain's potentially active population will, in contrast, grow by 2.8 million (9.1%) reaching 34 million in 2030. The difference is due to projected net migration. Fertility rates are low in both countries.

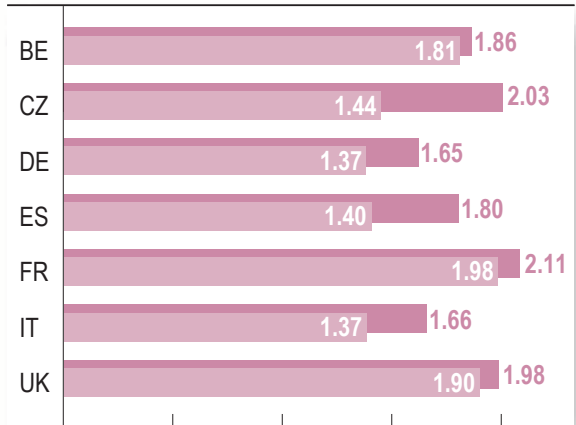
The active share is the proportion of persons aged 15-64 (or 15-74) in the total population. A higher share implies that there exists the opportunity to absorb and productively employ more workers from the national labour market.

In 2008, the Czech Republic had the largest active share at 71%. By 2030, however, it will have dropped to 64%, sharing ranks with Spain. The active share is expected to be lowest in France, demonstrating that demographic change may manifest quite differently in the total and in the working-age population. A comparison of Italy and the UK is also instructive; their active shares show equal values in 2008, as well as in 2030. Demographic development, however, differs heavily in the two countries.

Demographic Change: Fertility

Fertility Rates

Children per Woman TFR (2008) CFR (1960)



Data Source: Eurostat, Sobotka et al. (2004); own presentation

Fertility is the most important determinant of the future labour supply. Children not being born today will be missing on the labour market 15-25 years ahead. A fertility rate of around 1.4 children per woman means that the next cohort is roughly one third smaller in numbers than the previous one. Total fertility rates (TFR) are the average number of children a woman would have if she were to experience the current age-specific fertility rates, while cohort fertility rates (CFR) show the number of children actually born to women that have concluded their fertile phase. For different reasons, cohort fertility rates are and may continue to be higher than total fertility rates.

Total fertility rates are highest in France, the UK and

Belgium, and particularly low in Germany and Italy, closely followed by Spain and the Czech Republic. Cohort fertility rates for women born in 1960 show a somewhat different ranking for the seven countries. They are still lowest for Germany and Italy, but now followed by Spain and Belgium, with highest rates observed in France, the Czech Republic and the UK (in this order). The huge discrepancy in projected and completed fertility rates in the Czech Republic is due to political developments in the early 1990s.

The number of children born to a woman differs by the level of education a woman has. In general, the number is negatively correlated with the educational level. Differences are particularly pronounced in France and the UK and weakest in the Czech Republic and Germany, thus far. However, according to the fertility rates of women born around 1951-1962, a highly educated French woman still had considerably more children on average than a German woman with low education. At the same time, in 2007 the employment rate of women with two children was over 70% in France, but only 58% in Germany and 53% in Italy and the Czech Republic (UNECE 2009).

Fertility Rates (CFR) by Education Level of the Mother

Cohorts: 1951-1962



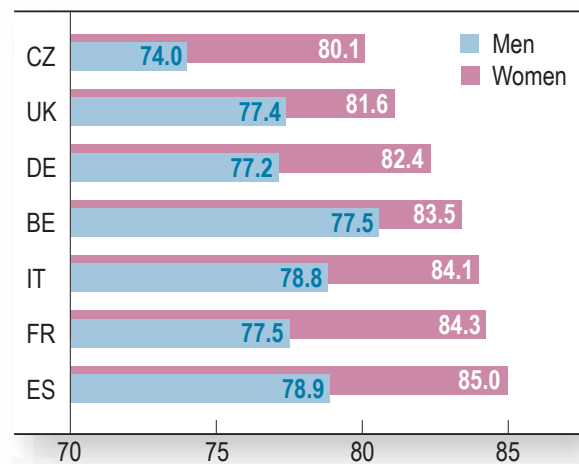
Data Source: UNECE (2000), Ratcliff/Smith (2006), Toulemon et al. (2008), STBA (2009); own presentation

The phenomenon of differential fertility is for various reasons important for the future labour supply. Firstly, employment as well as its projected scarcity is highest among the higher educated. Secondly, the educational level and future performance of the offspring are related positively to the educational level of the parents in many countries. Increasing the compatibility of parenthood and labour participation, particularly for the higher educated, may hence prove beneficial.

Demographic Change: Mortality and Migration

Life Expectancy at Birth

2008, in Years

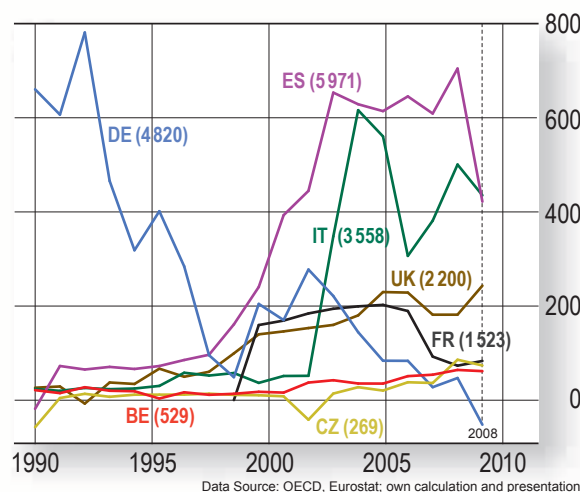


Life expectancy indicates the probable number of years a person will live. Over the last century, life expectancy at birth has advanced strongly in most of the developed countries. The major contribution is attributed to improvements in medical care that led to a decrease in fatal illnesses. However, opinions on the future continuation of this trend differ.

Women often have a higher life expectancy than men. In 2008, gender difference for the seven countries lay between 4.2 years for the UK and 6.8 years for France. The lowest life expectancy for both men and women among the analysed countries was found in the Czech Republic with 74 years for men and 80.1 years for women. Spanish men and women lived the longest, having a life expectancy of nearly 79 and 85 years.

Net Migration, 1990–2008

(With Cumulative Net Migration, in Thousand) Thousand

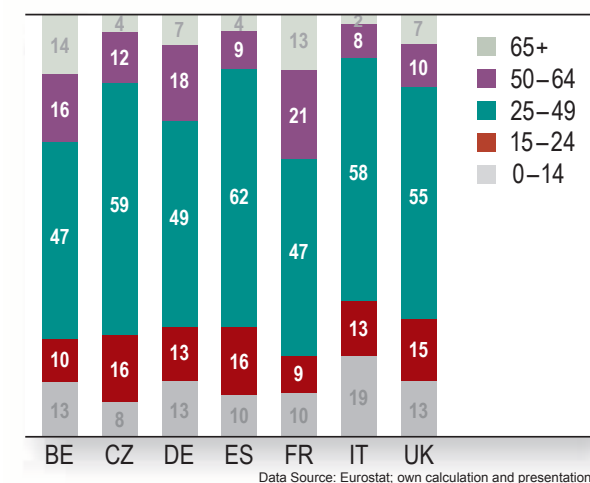


Net migration is the balance between immigration and emigration. It shows huge fluctuations, making it difficult to forecast the total population development. Germany's migration balance has become negative from 2008 onwards, while Italy and Spain have developed a high surplus. Immigration is the driving force behind population growth in both countries.

In 2007, the share of foreigners in the total population amounted to 12% in Spain, 8% in Germany, and nearly 6% in Italy and France. Migration may considerably change the labour force supply and its age structure. However, many immigrants moving to Italy and Spain from the South are poorly qualified. Data on the available workforce should therefore be interpreted with caution.

Foreigners: Age Composition

2008, by Age Groups in Percent



Migrants belong in general to younger working-age groups and have higher fertility rates than natives. If society and migrants themselves succeed in their integration efforts, migrants and their descendants may provide a valuable labour force potential.

The share of 0-24 year-olds among foreigners in the considered countries lies between 19% in France and 32% in Italy. The corresponding shares among natives range from 24% in Italy to 31% in France and the UK. The share of 25-49 year-olds among foreigners is at 47% the lowest in Belgium and France, and at 62% the highest in Spain. Finally, the share of foreigners older than 50 is particularly high in France (34%) and Belgium (30%), and very low in Italy (10%) and Spain (13%), reflecting the patterns of migration.

Country Profiles: Executive Summary

1. Demographic change is defined as population ageing with the perspective of population shrinking. The process is normally accompanied by an increase in diversity. All seven countries and 12 regions considered here as locations of the European chemical industry are experiencing demographic change, although with great variance in degree and characteristics.

2. Ageing is a global phenomenon. It is primarily measured as an increase in mean age. The total population is likely to age in all countries and regions considered here between 2008 and 2030. National averages range from +1.9 in the United Kingdom to +5.1 years in the Czech Republic. On the regional level, ageing is likely to be weakest in Île de France (+1.7 years) and strongest in Severozápad (+5.3 years).

3. Shrinking is still a local phenomenon. It is defined as a negative rate of population growth. On the national level, only the German population is projected to shrink, while Belgium, France, Spain and the United Kingdom will experience (near to) double-digit population growth. On the regional level, a population decline is expected in Dusseldorf and Severozápad. All other regions apart from Cologne are likely to see strong population growth.

4. Demographic change strongly differs in the total and in the working-age population (15-64 years). The latter shows more shrinking, but less ageing than the former. The reason is that population ageing is lately and in future mainly resulting from an increase in life expectancy at ages older than 65 years. At the same time, age groups younger than 40-50 years often show a considerable decline due to low fertility since the 1970s.

5. Between 2008 and 2030, shrinkage of the working-age population is expected for the Czech Republic, Germany and Italy on the national level. Among the regions considered, shrinkage is projected for Antwerp, Cheshire, Cologne, Dusseldorf, Lazio and Severozápad, that is, for half of the 12 regions. Shrinking of the working-age population may hence occur even while the total population is still increasing.

6. Growth rates are age specific and show large variance between countries and regions. Age group 15-24, for example, is of particular importance as junior staff for companies. However, its number is declining in the Czech Republic, in Germany, Italy and the United Kingdom, but not in Belgium, Spain and France. On the regional level, shrinking is most pronounced in German regions, and growth in the Spanish regions. The second youngest age group (25-34) is still increasing in Belgium, France and the United Kingdom.

7. The 35-44 year-olds are the most preferred age group for companies, as they combine still fresh formal knowledge with an already rich experience, and show high labour participation rates. Unfortunately, their number is decreasing in all countries but the UK and in all but two regions (Île de France and Berkshire, Buckinghamshire and Oxfordshire), at rates varying on the national level between -21% in Italy and -2.5% in the Czech Republic. The demographic development is thus economically unfavourable.

8. The number of 55-64 year-olds is, to the contrary, increasing all over, except in Severozápad, at national rates lying between +0.2% in the Czech Republic and

+62% in Spain. This increase fully compensates the decrease in younger age groups (15-34 years) in five countries but not in Germany and the Czech Republic. The same is true for all regions considered, with the exception of Dusseldorf and Severozápad, of course.

9. There is a large unused potential among women and the elderly that could serve to compensate the shrinking of the labour force under demographic change. However, labour participation rates differ greatly among countries and regions and show large variance by age, gender and parity. Employment rates of the elderly (55-64 years) are particularly low in Belgium, Italy and France, being at 61-67% (for males) roughly twice as high in the other four countries. The most pronounced gender differences in employment rates is present in Italy, amounting to 23 percentage points. Employment is generally lower, the higher the number of children (the parity), especially in Germany and the Czech Republic.

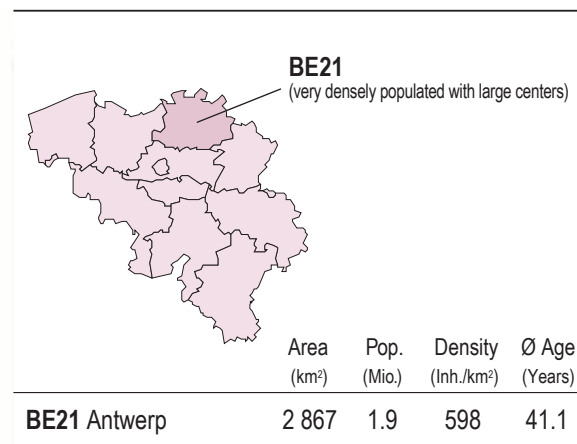
10. High unused potential is also present among part-time working females, particularly in Belgium, Germany and the United Kingdom and among mothers. However, activating this potential demands creating child-care opportunities and working conditions ensuring compatibility of work and parenthood.

11. A large part of the projected increase in the highly educated workforce comes from women, as the educational level of women increases and female employment rates tend to correlate positively with the educational level. The largest employment rate for highly educated women was found in Germany (82.6% in 2008), the lowest in Italy (73.8%).

Country Profile: Belgium

General Indicators

2008, by Regions



Data-Source: Eurostat; own calculation and presentation

Age-Specific Growth Rates

2008–2030

	Belgium	EU 27
0–14	6.1	-2.6
15–24	2.5	-9.7
25–34	1.8	-14.3
35–44	-3.8	-9.9
45–54	-6.1	0.0
55–64	16.3	20.3
65–74	52.9	37.3
75–79	31.5	38.6
80+	52.0	65.0

Data-Source: Eurostat; own calculation and presentation

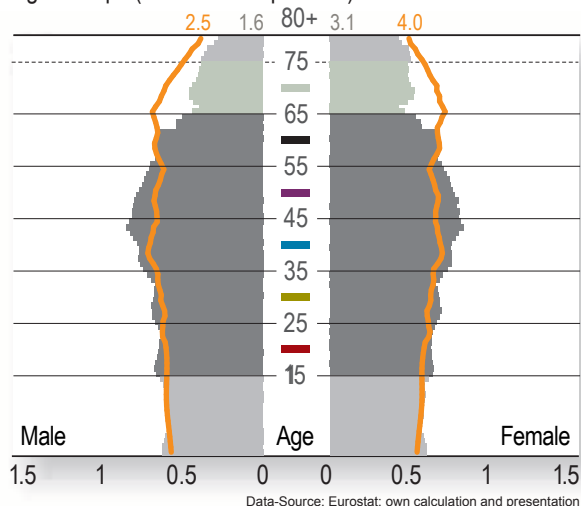
The chemical industry in Belgium is, in terms of employment, mainly present in the regions of Antwerp, Hainaut and East-Flanders. The number of employees in the chemical sector amounts to approximately 30 000 in the first area, and to somewhat over 10 000 persons in the other two regions.

The age pyramids for 2008 and 2030 show decreasing shares for most age groups younger than 62, and increasing ones for the older ages. The share of the oldest (80+ years) is thus projected to grow from 4.7% to 6.5%. Although the share of age group 0-14 is not likely to change much, the group is projected to rise in numbers by 6.1% to nearly 2 million by 2030.

Natural population growth as well as net inflows are positive over the whole period and ensure a future population growth of projected 10.2% to 11.7 million people in 2030. Altogether, future ageing will be moderate and slightly lower than over the period of 1990-2008. Mean age will be 43.2 years in 2030, which is more than one year less than the EU27 average.

Age Structure

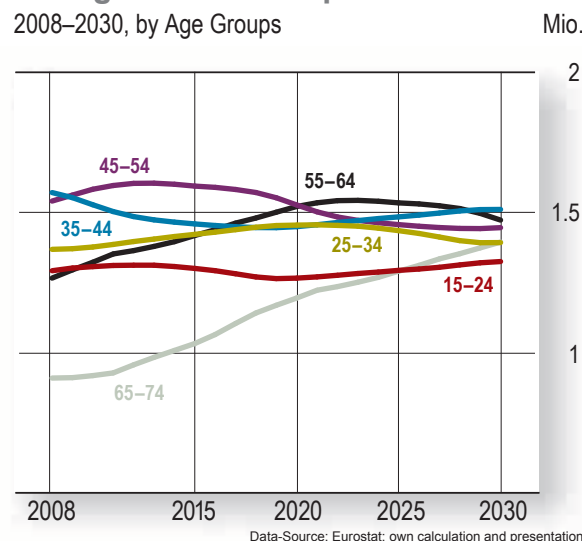
Age Groups (% of Total Population) 2008 and 2030



Data-Source: Eurostat; own calculation and presentation

Change in Active Population

2008–2030, by Age Groups



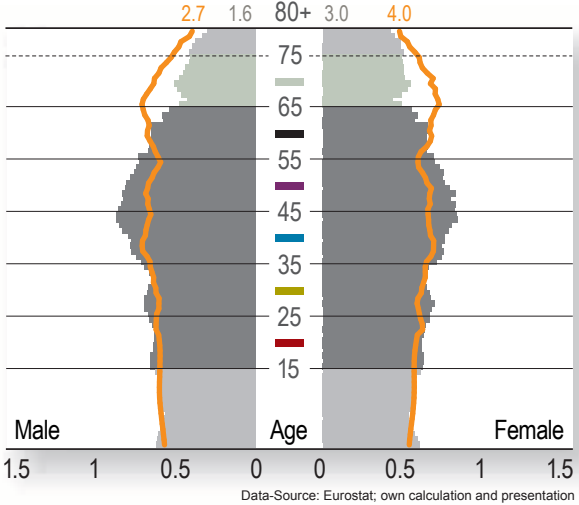
Data-Source: Eurostat; own calculation and presentation

The active population (15-64 years) will experience a decline from 2023 onwards, but is still likely to display overall growth of 1.5% over the period 2008-2030. While the numbers of 35-44 and 45-54 year-olds will decline by 60 000 (3.8%) and 94 000 (6.1%) over the period, all other active age groups are expecting growth. The 55-64 and 65-74 year-olds are projected to increase by 206 000 (16.3%) and 483 000 (+52.9%) to nearly 1.5 million and 1.4 million, respectively. However, the active share of the 15-64 year-olds may at 61% be relatively low in 2030.

Regional Profile: Antwerp (BE21)

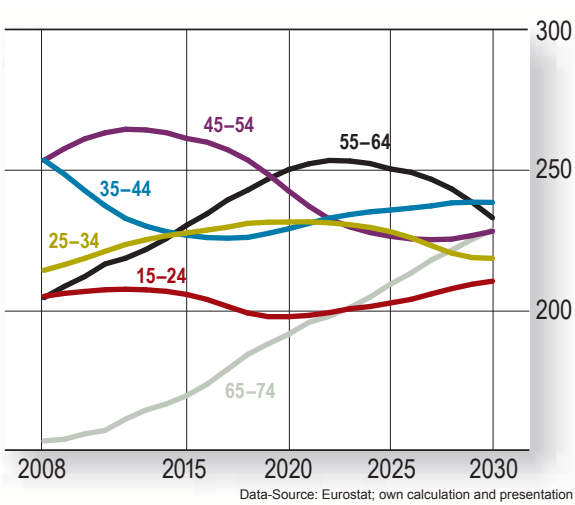
Age Structure

Age Groups (% of Total Population) 2008 and 2030



Change in Active Population

2008–2030, by Age Groups Thousand

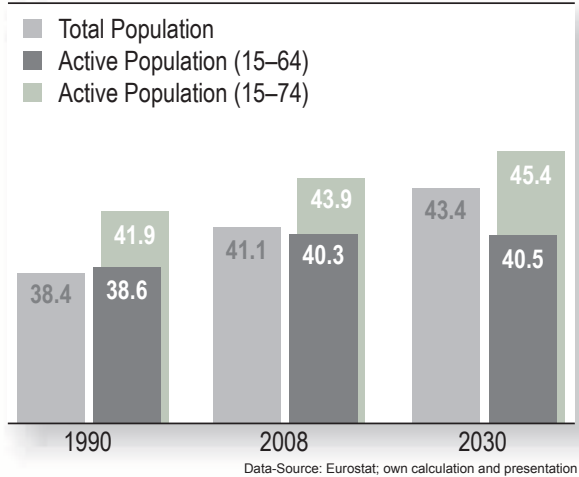


The age pyramids picture a relatively balanced structure compared to most EU regions. While the shares in total population will decrease for most age groups younger than 58, they will likely increase for the older groups. Yet, ageing of the total population is slowing down compared to the EU27: mean age in 2008 is slightly above the EU27 average; in 2030 it will be more than one year below the average.

Natural population growth will remain positive throughout the considered time period. The migration balance is strongly positive, as Antwerp expects relatively large net inflows from abroad, which will compensate for the internal outflows to other Belgian regions. Altogether, total population development is positive: the population is expected to increase by 161 000 persons (9.4%) to nearly 1.9 million inhabitants.

Mean Age

in Years



Population Size and Active Share

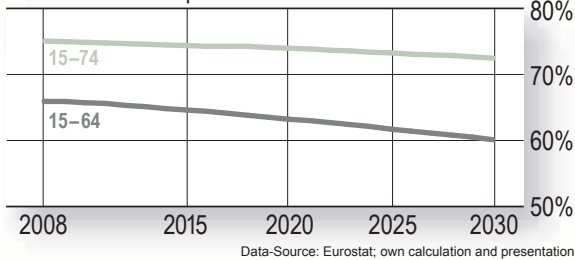
1990–2030, in Thousand and Percentage Change

	Total	15-64	15-74			
1990	1 597	+ 7.3	1 080	+ 4.8	1 210	+ 6.3
2008	1 714	+ 3.9	1 132	+ 1.8	1 285	+ 2.9
2015	1 781	+ 5.3	1 152	- 2.0	1 322	+ 2.7
2030	1 875		1 129		1 358	

The inactive population is expected to grow strongly in Antwerp. The 75-79 and 80+ year-olds will increase by 28.3% and 58.5% to 86 000 and 127 000. However, the number of the youngest (age group 0-14) is estimated to grow as well, by 8% to 304 000 in 2030.

The working-age population (15-64) is projected to nearly keep its size of 1.1 million, while the number of 15-74 year-olds will increase by 5.7% to roughly 1.4 million. Among them, the 55-64 and the 65-74 year-olds are expected to grow by almost 14% and 49% to 233 000 and 229 000 persons, while the 35-44 and 45-54 year-olds are likely to shrink by nearly 6% and 10% to 239 000 and 228 000, respectively. The share of the potentially active subgroup 15-64 may thus fall from 66% in 2008 to 60.2% in 2030.

Share of Active Population



Country Profile: Germany

DEA1

(very densely populated with large centers)

CHEMPARK Krefeld-Uerdingen
HENKEL AG & Co. KGaA
Solvay Rheinberg Industrial Park

DEA2

(very densely populated with large centers)

CHEMPARK Leverkusen
CHEMPARK Dormagen
Chemical Park Knapsack
Industriepark Oberbruch

DEB3

(very densely populated with large centers)

BASF SE

DE71

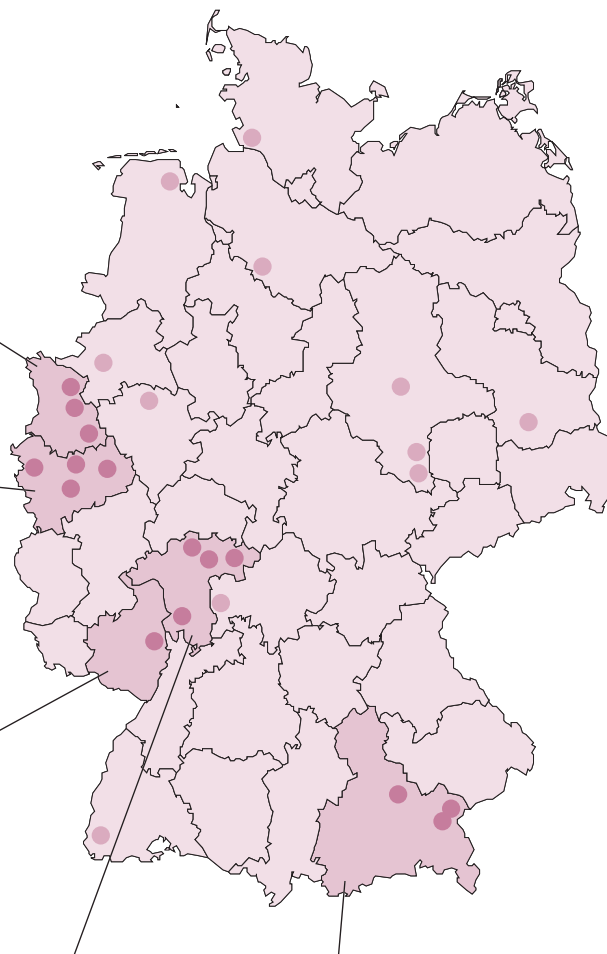
(very densely populated with large centers)

Industrial Park Griesheim
BASF Lampertheim GmbH
Industriepark Höchst, Infracorv Höchst
Industriepark Wolfgang

DE21

(very densely populated with large centers)

Chemiepark Trostberg
Industriepark Werk Gendorf
Industriepark Gersthofen



General Indicators

2008, by Regions	Area (km ²)	Pop. (Mio.)	Density (Inh./km ²)	Ø Age (Years)
21 Upper Bavaria	17 531	4.3	246	41.8
71 Darmstadt	7 445	3.8	508	42.5
A1 Dusseldorf	5 290	5.2	984	43.3
A2 Cologne	7 365	4.4	596	42.1
B3 Rheinhessen-Pfalz	6 851	2.0	295	42.8

Data-Source: Eurostat; own calculation and presentation

Germany's chemical industry is concentrated mainly in the South and West. The largest centre is in North Rhine-Westphalia. Over 150 000 people are employed here, which is about one quarter of the German chemical work-force. Other agglomerations are found in Bavaria, Baden-Wurttemberg, Hesse and Rhineland-Palatinate; each region having between 55 000 and 61 000 employees in this sector.

The table above lists German regions (NUTS 2) with high numbers of chemical employees. It comes as no surprise that they are all densely populated with large centres. This is particularly true for the districts of Cologne and Dusseldorf, which are and remain among the most densely populated areas in Germany. Both have high labour potentials, despite the expected decrease in the working-age population. Furthermore, both offer proximity of raw-material suppliers and of large research and development infrastructures. This proves beneficial for the chemical industry which is energy-intensive and which relies heavily on innovations.

Data-Source: VCI 2010; own presentation

Country Profile: Germany

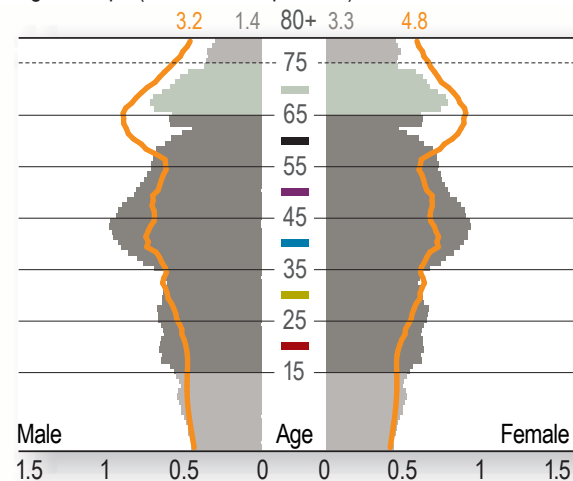
Age-Specific Growth Rates

2008–2030		Germany	EU 27
0–14		-10.1	-2.6
15–24		-23.3	-9.7
25–34		-8.2	-14.3
35–44		-22.2	-9.9
45–54		-20.9	0.0
55–64		21.2	20.3
65–74		20.9	37.3
75–79		37.7	38.6
80+		64.4	65.0

Data-Source: Eurostat; own calculation and presentation

Age Structure

Age Groups (% of Total Population) 2008 and 2030



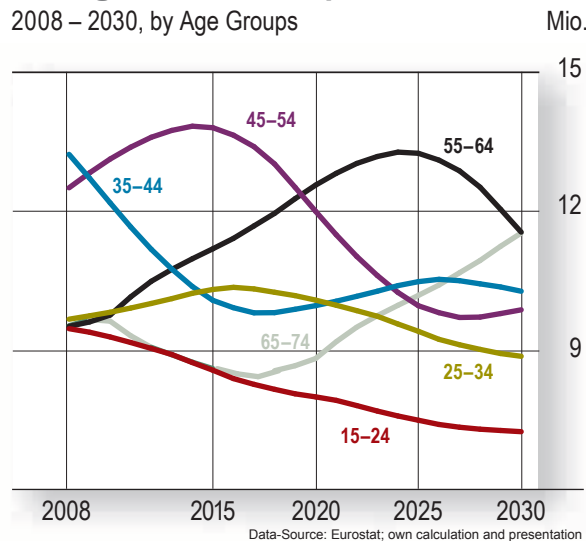
Data-Source: Eurostat; own calculation and presentation

The age pyramids for 2008 and 2030 show increasing shares of age groups older than 57 years, while the other age groups are almost all likely to decline. Mean age of Germany's total population over the period 1990-2030 rests at least two years above the EU27 average. The active population (15-64) was only slightly younger than the total population in 1990, but the gap is likely to widen to nearly 5 years until 2030.

The size of the total population, which still increased by almost 4% between 1990 and 2008, is expected to shrink by 2.5% to a population of 80.2 million through 2030. Natural population growth thereby remains negative over the whole period, but losses will not be compensated by net immigration any more.

Change in Active Population

2008 – 2030, by Age Groups



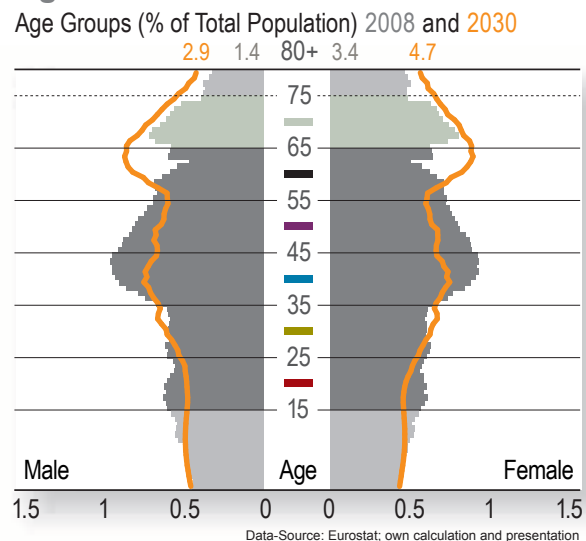
Data-Source: Eurostat; own calculation and presentation

The share and number of elderly persons will nevertheless register an enormous increase, opening up opportunities for new products and services. Over the period 2008-2030, the inactive age groups 75-79 and 80+ will increase by roughly 38% and 64%, from 3.0 million to 4.2 million and from 3.9 million to 6.4 million persons, respectively. The opposite development is expected for the other inactive age group, the 0-14 year-olds; their number is projected to decrease by some 10% to 10.1 million over the same period, pointing to the likeliness of continued shrinking after 2030.

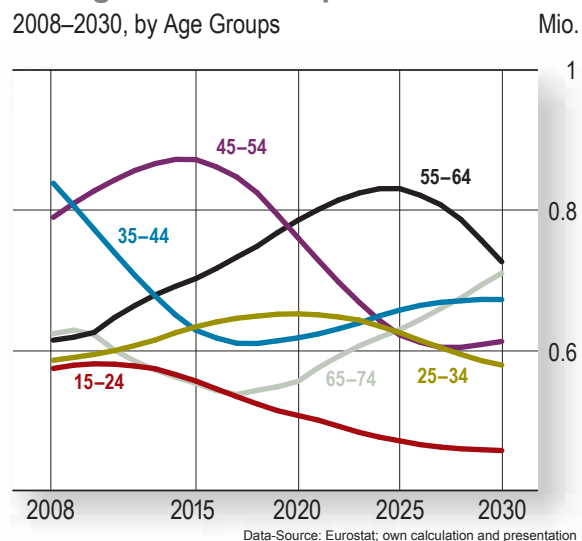
The potentially active subgroup of 15-74 year-olds grew by 5.3% in the past, but is projected to shrink from 64 million to 59 million (-7%) over the period of 2008-2030. The decline is even more pronounced when looking at the 15-64 year-olds; their number is likely to decrease by 6.5 million to roughly 48 million. However, the development is strongly age-specific. Age group 15-24 will steadily decline, ending up with a loss of 23%, which is 2.5 times as much as the average loss in the EU over the period. This implies severe restrictions on availability of trainees and young workers. At the same time, all other potentially active age groups are likely to experience at least temporary growth, yet resulting in a loss of around 0.8 million (-8%) for the 25-34 and of 3.0 million (-22%) for the 35-44 year-olds. The most striking difference to average EU development is projected for age group 45-54: a nearly 21% decrease (-2.6 million) in Germany, compared to constancy in the EU. The active share of those aged 15-64 is likely to decline from roughly 66% to 60% until 2030, leaving Germany with the second lowest active share among the seven countries.

Regional Profile: Dusseldorf (DEA1)

Age Structure



Change in Active Population

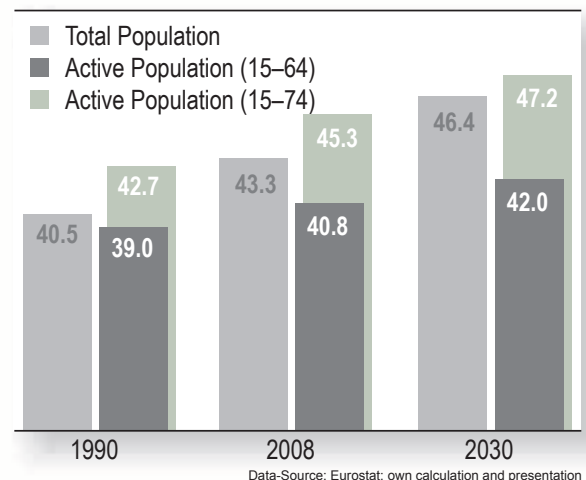


The age pyramids for 2008 and 2030 show the shift of 35-57 year-olds to older ages. All other age groups, with the exception of the 31-34 year olds, are likely to decrease. The total population was almost one year older than the working-age population (15-64 years) in 1990. This difference is likely to widen to 4.4 years by 2030. Altogether, the mean age of the total population will be at all times higher than the EU average over the considered period.

Natural population development will be negative and projected net inflows, although constantly positive from abroad, do not compensate. The total population, which experienced 0.7% of growth in the past, is therefore likely to shrink by 2.5% until 2030.

Mean Age

in Years



Population Size and Active Share

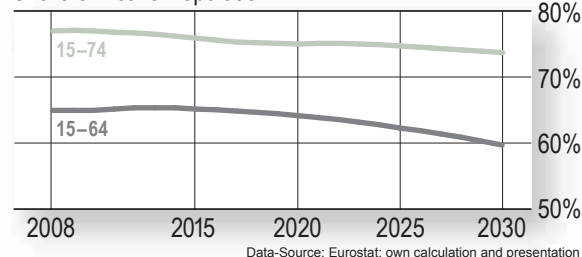
1990–2030, in Thousand and Percentage Change

	Total	15-64	15-74
1990	5 168	3 630	4 048
2008	5 206	3 405	4 030
2015	5 174	3 395	3 949
2030	5 074	3 051	3 762

Percentage Change (from 1990):
 Total: +0.7% (2008), -0.6% (2015), -1.9% (2030)
 15-64: -6.2% (2008), -0.3% (2015), -10.1% (2030)
 15-74: -0.5% (2008), -2.0% (2015), -4.7% (2030)

A strong increase is expected in the inactive population, as age groups 75-79 and 80+ are projected to grow by some 24% and 55% to roughly 254 000 and 390 000, respectively. Concurrently, the age group 0-14 is likely to shrink by 7.2% to 668 000.

Share of Active Population

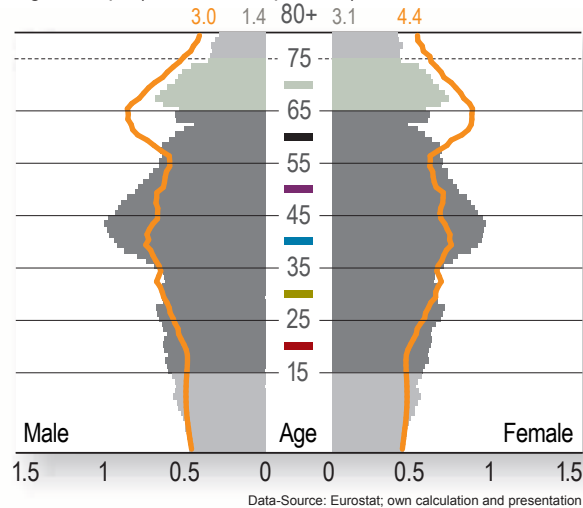


The potentially active subgroup (15-64) decreased by 6.2% to 3.4 million in the past and is likely to undergo a further shrinkage of 10.4% to 3.1 million by 2030. The decline applies to most of the active groups; severe decreases will amount to roughly 117 000 (-20.3%), 165 000 (-19.7%) and 176 000 (-22.3%) for age groups 15-24, 35-44 and 45-54, while the number of older persons aged 55-64 and 65-74 is likely to increase by 18.1% to 727 000 and by 13.8% to 710 000, respectively. The share of the active population (15-64) slightly rises to 65.8% between 2008 and 2014, but falls thereafter to 60.1% in 2030.

Regional Profile: Cologne (DEA2)

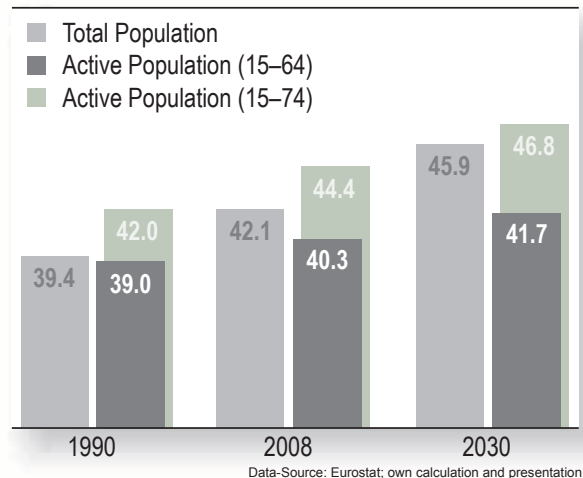
Age Structure

Age Groups (% of Total Population) 2008 and 2030



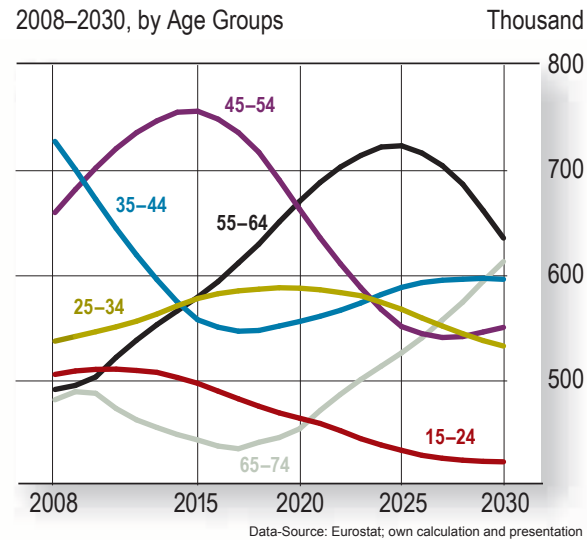
Mean Age

in Years



Change in Active Population

2008-2030, by Age Groups

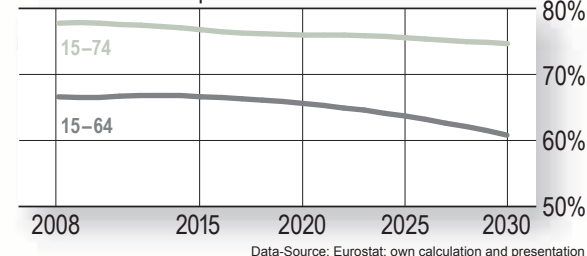


Population Size and Active Share

1990-2030, in Thousand and Percentage Change

	Total	15-64	15-74
1990	3 963 + 10.7	2 807 + 4.2	3 112 + 9.5
2008	4 389 + 1.4	2 926 + 1.6	3 408 + 0.2
2015	4 453 + 1.0	2 972 - 7.7	3 417 - 1.8
2030	4 499	2 742	3 356

Share of Active Population



Cologne's age pyramids for 2008 and 2030 show that most shares of persons younger than 57 years are projected to decrease in favour of the older age groups. The development of the mean age is similar to Düsseldorf's. The mean age of the total population is expected to increase by 3.8 years between 2008 and 2030, while the 15-64 year-olds are likely to age by only 1.4 years.

Natural population development is expected increasingly negative, but positive net migration flows from other German regions and from abroad are projected to compensate the loss until 2027. Cologne's total population grew with 10.7% rather strong in the past and will expand by an additional 2.5% through 2030.

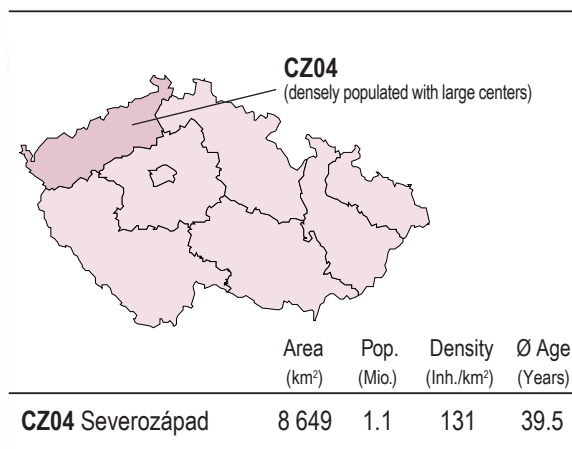
From 2008-2030, a shrinkage of 5.6% is expected for age group 0-14, leading to a size of 597 000 persons. In contrast, the other two inactive age groups 75-79 and 80+ are expected to increase by roughly 39% (214 000 persons) and 71% (332 000 persons), respectively.

The working-age population (15-64) evolves differently: after a growth of 4.2% between 1990 and 2008, a 6.3% decline is expected through 2030. The increase in age group 15-74 was much higher over the period 1990-2008 (9.5%), and subsequent shrinking will be much less pronounced (1.5% through 2030), reflecting the shift towards older ages. Age-specific rates of change are thereby highly diverse, amounting to roughly: -16% (15-24), -1% (25-34), -18% (35-44), -16.5% (45-54), +29% (55-64) and +27% (65-74). Altogether, the share in total population of the potentially active subgroup aged 15-64 (15-74) years falls from 66.7% (77.7%) to 60.9% (74.6%) between 2008 and 2030.

Country Profile: Czech Republic

General Indicators

2008, by Regions



Data-Source: Eurostat; own calculation and presentation

Age-Specific Growth Rates

2008–2030

Czech Republic EU 27

0–14	-9.7	-2.6
15–24	-17.3	-9.7
25–34	-39.8	-14.3
35–44	-2.5	-9.9
45–54	21.0	0.0
55–64	0.2	20.3
65–74	38.2	37.3
75–79	65.0	38.6
80+	98.2	65.0

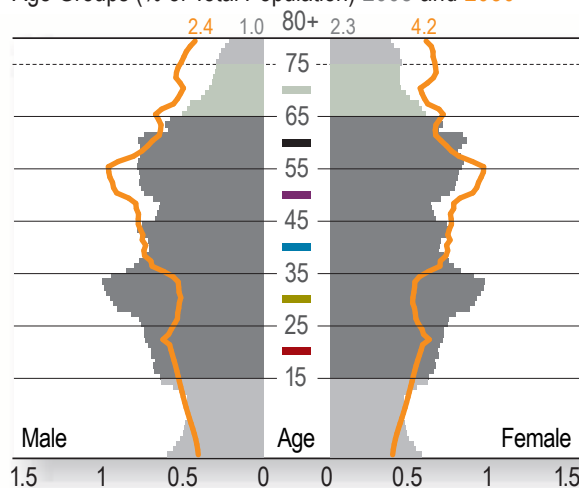
Data-Source: Eurostat; own calculation and presentation

Among the seven countries, the Czech Republic has the lowest number of employees in the chemical industry. About 10 000 persons, which is one quarter of all their chemical employees, are situated in the region of Severozápad. The second largest region in terms of employment in the chemical sector is Střední Čechy, which accounts for about 9 000 employees.

The age pyramids show decreasing shares of most age groups under 39 in favour of particularly the elderly. In 2030, the share of persons aged 80+ will be twice as high as in 2008, but still lower or comparable with the corresponding shares in the other countries considered. Their numbers will also nearly double, increasing to some 700 000 persons. While the 75-79 year-olds will grow by 200 000 (65%), the youngest are likely to shrink by 9.7% to 1.3 million through 2030.

Age Structure

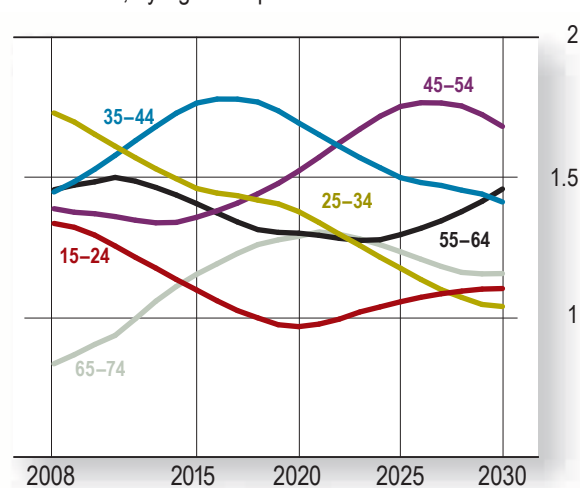
Age Groups (% of Total Population) 2008 and 2030



Data-Source: Eurostat; own calculation and presentation

Change in Active Population

2008–2030, by Age Groups



Data-Source: Eurostat; own calculation and presentation

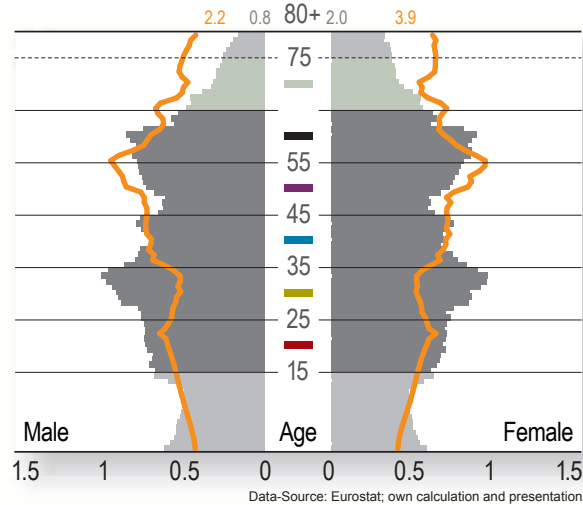
Natural population growth is expected to become increasingly negative after 2008, but net migration will compensate the deficit until 2020. Altogether, the Czech Republic is projected to expand its number of inhabitants by an additional 0.7% through 2030.

The potentially active age group of 15-64 year-olds is projected to shrink by 9% to 6.7 million over the period 2008-2030. Age group 45-54 will grow by about 300 000, while the 15-24 and 25-34 year-olds are likely to shrink by 200 000 and 700 000 persons. Even the rise in the oldest theoretically employable age group of 65-74 year-olds (+320 000), would not offset the decrease in the population aged 15-64. Still, the active share (15-64) is with 64.3% projected to be relatively high in 2030.

Regional Profile: Severozápad (CZ04)

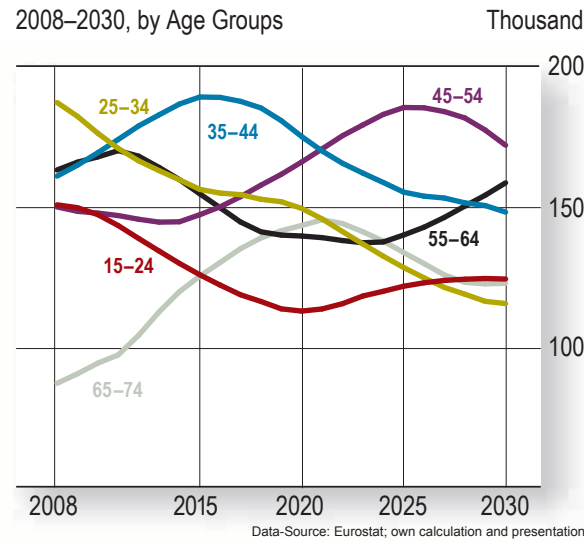
Age Structure

Age Groups (% of Total Population) 2008 and 2030



Change in Active Population

2008–2030, by Age Groups

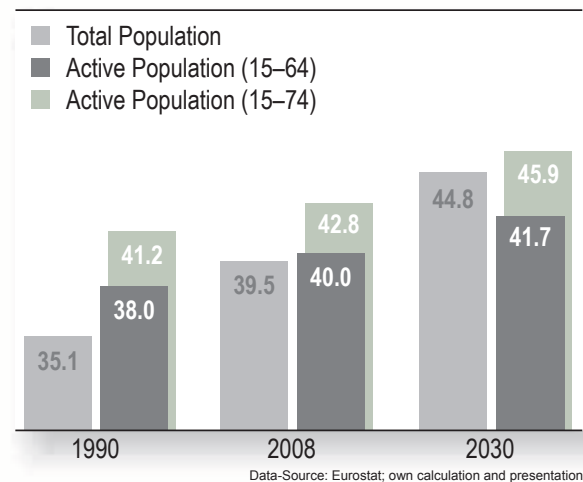


The age pyramid for 2008 is characterised by two large cohorts, roughly aged 27-37 and 50-61, and relatively low shares of persons aged over 67 years. By 2030, the shares of most age groups under 40 will have decreased, favouring in particular the elderly. The share of persons aged 80+ is likely to be more than twice as high as in 2008. The mean age of the total population in 1990 was over two years below the EU27 average, but is expected to be slightly above the average in 2030.

Natural population development is projected increasingly negative from 2010 on. Although net inflows from abroad will exceed the outflows to other Czech regions, the positive migration balance will only compensate the loss until 2017. Altogether, the number of inhabitants is expected to decline by 12 000 (-1.1%) until 2030.

Mean Age

in Years



Population Size and Active Share

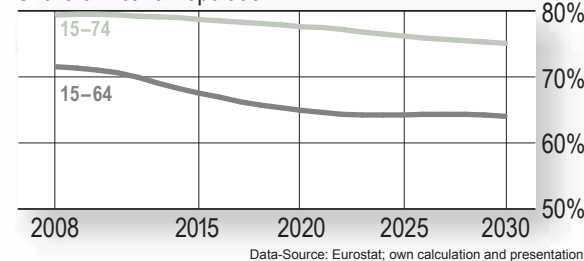
1990–2030, in Thousand and Percentage Change

	Total	15-64	15-74
1990	1 133	755	830
2008	1 135	813	901
2015	1 143	774	900
2030	1 122	720	843
	+ 0.1	+ 7.7	+ 8.5
	+ 0.7	- 4.8	- 0.1
	- 1.8	- 7.0	- 6.3

While the number of 0-14 year-olds will shrink by 12% to 151 000 until 2030, the two oldest inactive groups will experience extreme growth of 93.5% and 120.1% for age group 75-79 and 80+, reaching 59 000 and 69 000, respectively.

The working-age population (15-64) will continue to decline by 11.5% to about 720 000 between 2008 and 2030. Age-specific shrinkage over this period will amount to around 17% (15-24), 38% (25-34), 8% (35-44) and 3% (55-64), ranging from 4 500 (55-64) to 72 000 (25-34) persons less. At the same time, the 45-54 year-olds are likely to increase to 172 000, while the 65-74 year-olds will rise to 123 000. Altogether, the share of the working-age-subgroup 15-64 (15-74) in total population is projected to fall from considerable 72% (79%) in 2008 to 64% (75%) in 2030.

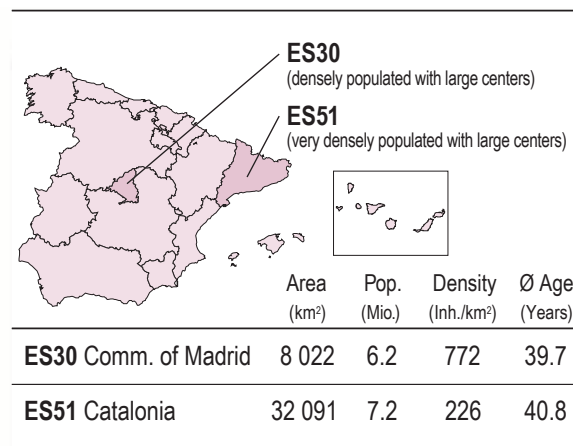
Share of Active Population



Country Profile: Spain

General Indicators

2008, by Regions



Data-Source: Eurostat; own calculation and presentation

Age-Specific Growth Rates

2008–2030

	Spain	EU 27
0–14	6.4	-2.6
15–24	16.7	-9.7
25–34	-25.1	-14.3
35–44	-15.3	-9.9
45–54	33.5	0.0
55–64	61.9	20.3
65–74	61.8	37.3
75–79	31.5	38.6
80+	61.3	65.0

Data-Source: Eurostat; own calculation and presentation

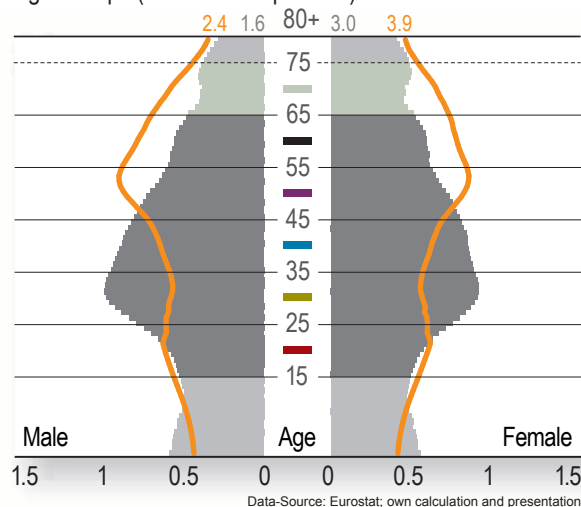
Spain's chemical industry is concentrated in the regions of Catalonia, the Community of Madrid and the Community of Valencia. The most important of them is Catalonia, employing over 60 000 chemical workers, with the other two regions employing some 20 000.

The age pyramid for 2008 is dominated by large shares of younger and middle aged working-age groups. As they shift to older ages, the shares of the older are likely to increase and those of persons aged 21-47 years to decrease severely through 2030. The 75-79 year-olds will grow to 2.2 million, while the number of oldest olds (80+) will experience an increase of 1.3 million.

The number of inhabitants increased by 16.6% between 1990 and 2008 and is likely to continue growing with about the same rate, reaching 52.7 million people by 2030. Natural population growth is negative from 2019 onwards, but high net migration from abroad will overcompensate the loss.

Age Structure

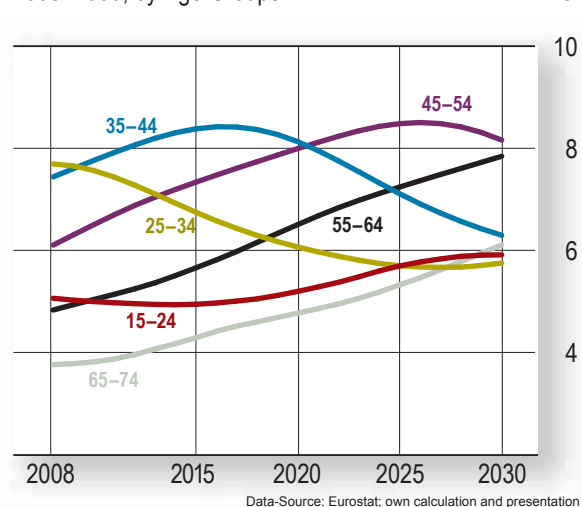
Age Groups (% of Total Population) 2008 and 2030



Data-Source: Eurostat; own calculation and presentation

Change in Active Population

2008–2030, by Age Groups



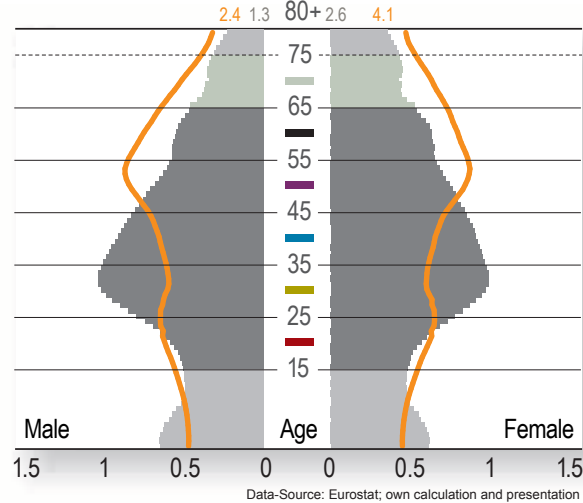
Data-Source: Eurostat; own calculation and presentation

Despite a decreasing share in total population, the number of people in the active subgroup is rising. Age groups 25-34 and 35-44 are shrinking by 1.9 million (-25%) and 1.1 million (-15%), but older potentially active age groups are likely to compensate. The number of 45-54 and 55-64 year-olds is projected to grow by 33.5% and 61.9%, increasing the working-age population by around two and three million, respectively. At the same time, the potentially active 65-74 year-olds are projected to grow by 62% to roughly 6 million. Furthermore, the group of the youngest (0-14 year-olds) will rise by 6.4% to more than 7 million over the same period, representing a positive perspective.

Regional Profile: Community of Madrid (ES30)

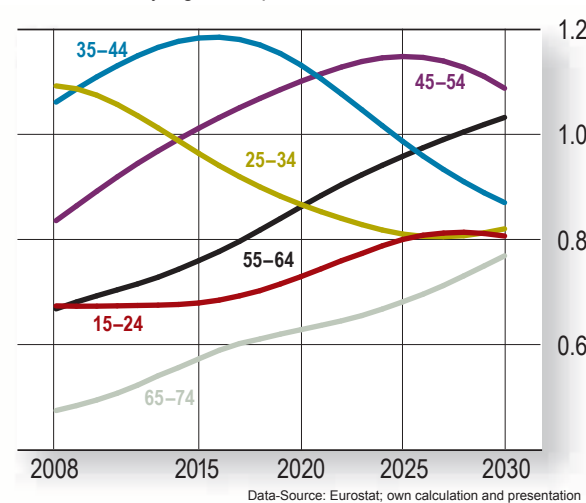
Age Structure

Age Groups (% of Total Population) 2008 and 2030



Change in Active Population

2008–2030, by Age Groups

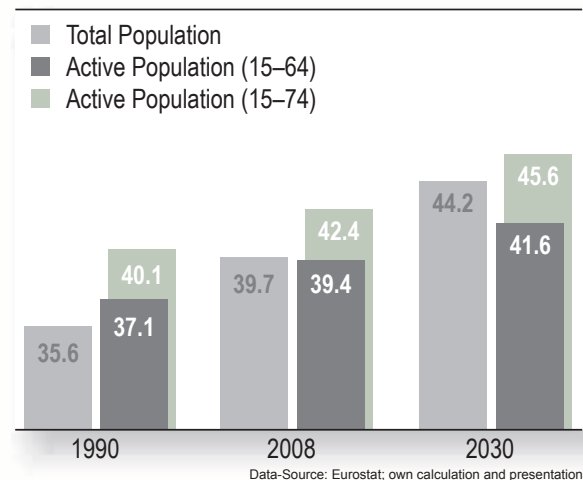


The age pyramid for 2008 shows large shares of the roughly 25-50 year-olds, which are likely to decrease through 2030. Similar to Catalonia, past and future fertility decline is expected to lead to a goblet-shaped age pyramid by 2030. The mean age of the total population was more than one year below the EU27 average in 2008, but is expected to move towards the EU27 average until 2030.

Natural population development is projected negative from 2028 on. The regional migration balance is expected negative, but net inflows from abroad may compensate the outflows until 2025. From 2027 on, total population development becomes negative, but average growth over the period of 2008-2030 remains at almost 15% very high. With 7 million it is the second largest region (after Île de France) here considered.

Mean Age

in Years



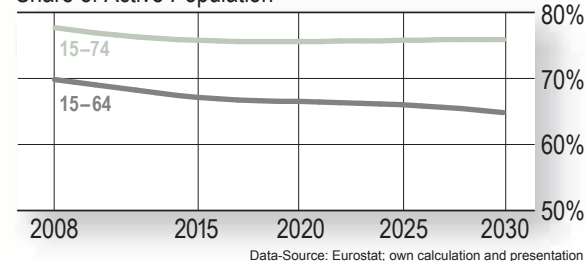
Population Size and Active Share

1990–2030, in Thousand and Percentage Change

	Total	15-64	15-74
1990	4 932	3 374	3 710
2008	6 189	4 331	4 808
2015	6 826	4 597	5 171
2030	7 097	4 616	5 385
	+ 25.5	+ 28.4	+ 29.6
	+ 10.3	+ 6.1	+ 7.6
	+ 4.0	+ 0.4	+ 4.1

All inactive groups will experience growth until 2030: While the number of 0-14 year-olds increases by only 2.1% to 971 000 until 2030, age groups 75-79 and 80+ years are likely to grow by 45% to 280 000 or almost double to 461 000 (+93.6%).

Share of Active Population

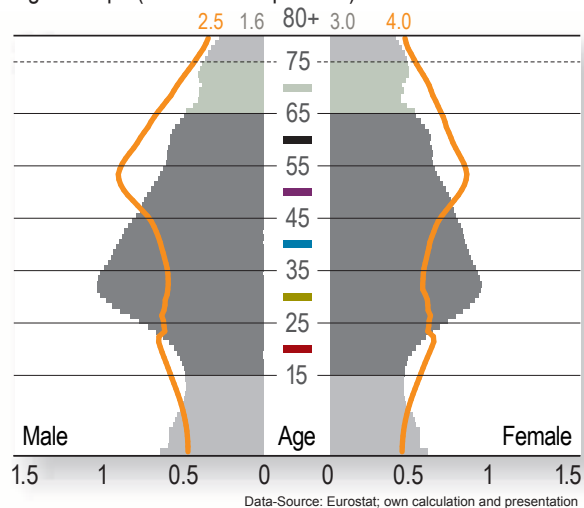


The working-age population (15-64) will continue growing, reaching 4.6 million in 2030 (+6.6% compared to 2008). Among them, age groups 25-34 and 35-44 are projected to shrink by nearly 25% and 18%. All other active age groups may see an increase, ranging from 20% (+132 000) for the 15-24 year-olds to 54% (+362 000) for the 55-64 year-olds. The potentially active age group of 65-74 year-olds will rise by 61% to 769 000 people. The active share of subgroup 15-64 falls from 70,0% in 2008 to 65,0% in 2030.

Regional Profile: Catalonia (ES51)

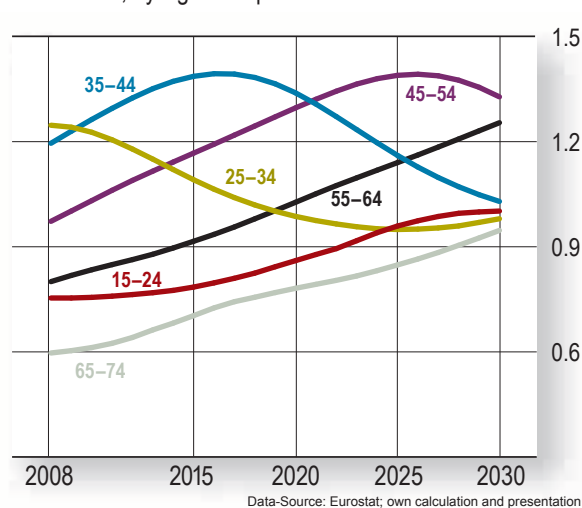
Age Structure

Age Groups (% of Total Population) 2008 and 2030



Change in Active Population

2008–2030, by Age Groups

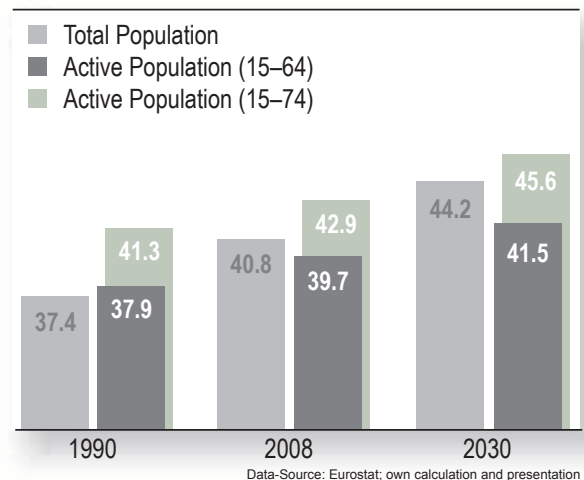


The age pyramid for 2008 shows relatively large shares of the working-age population. The expected shift to older ages leads to declining shares of the 23-46 year-olds, while shares of older age groups are likely to increase. Yet, ageing of the total population is expected to be slower than in the EU27, as the mean age of the region was above the EU27 average in 1990, while in 2008 and 2030 it is slightly below.

Net inflows from abroad are projected to be higher than internal outflows, ensuring overall population growth even after 2021, when natural population development becomes negative. Altogether, the number of inhabitants, which increased by 1.2 million (19.6%) in the past, is likely to grow further by 1.4 million reaching a population of about 8.7 million in 2030.

Mean Age

in Years



Population Size and Active Share

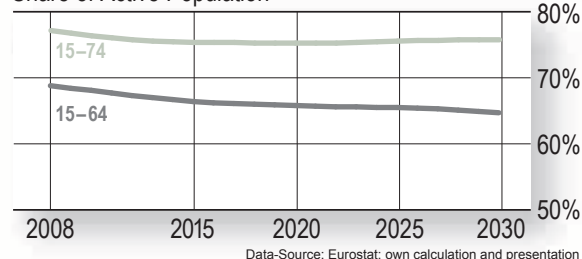
1990–2030, in Thousand and Percentage Change

	Total	15-64	15-74
1990	6 054	4 083	4 577
2008	7 238	4 970	5 569
2015	8 056	5 345	6 050
2030	8 657	5 591	6 538
	+ 19.6	+ 21.7	+ 21.7
	+ 11.3	+ 7.5	+ 8.6
	+ 7.5	+ 4.6	+ 8.1

The inactive population will experience a strong increase: The age groups 75-79 and 80+ years are projected to grow by 35.7% and 66.5% to 353 000 and 560 000, respectively. At the same time, age group 0-14 is likely to grow by 12.7% to 1.2 million.

The working-age population (15-64) is expected to grow by 12.5%, amounting to a working-age population of 5.6 million in 2030. The number of 45-54 and 55-64 year-olds is likely to expand by 350 000 (+36%) and 450 000 (+56%), while the number of 65-74 year-olds will grow by 350 000 (+58%). Age groups 25-34 and 35-44 are likely to shrink; the former by 266 000 (-21.3%), the latter by 165 000 (-13.8%). The share of the potentially active subgroup 15-64 (15-74) is projected to fall from roughly 69% (77%) in 2008 to 65% (75%) in 2030.

Share of Active Population

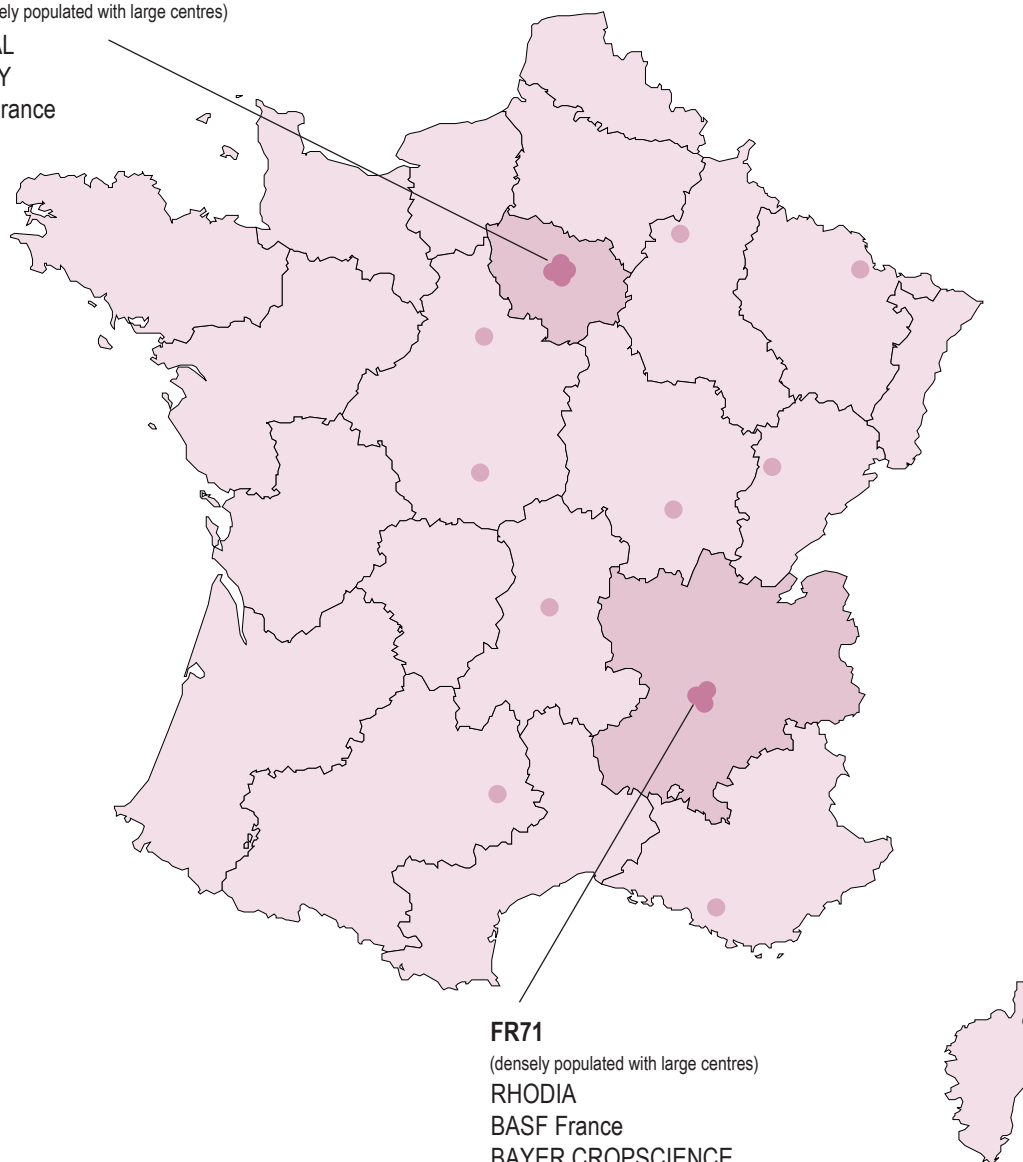


Country Profile: France

FR10

(very densely populated with large centres)

L'OREAL
SOLVAY
BASF France



FR71

(densely populated with large centres)

RHODIA
BASF France
BAYER CROPSCIENCE

General Indicators

2008, by Regions		Area	Pop.	Density	Ø Age
		(km ²)	(Mio.)	(Inh./km ²)	(Years)
10	Île de France	12 012	11.7	971	37.2
71	Rhône-Alpes	43 698	6.1	140	39.2

Data-Source: Eurostat; own calculation and presentation

France is the second largest employer in the chemical industry after Germany, with the UK coming in third. With a workforce of about 284 000 people, it represents roughly 15% of the European employees in the sector. Over 20% of them work in Île de France and 13% in the area of Rhône-Alpes. The majority of the remaining employees are located in the regions of Centre, Haute-Normandie, Nord - Pas-de-Calais, Provence-Alpes-Côte-d'Azur and Picardie; each representing 6% to 8% of the French employees in this sector.

The above table represents the two regions with the highest share of employees. Both show high population density and large centres. This is particularly true for the district of Île de France which is the most densely populated region in the country. It also ranks first in terms of population size among all EU-regions considered in this study. In addition to its high labour potential, Île de France also offers all infrastructure and prestige of the capital region, while Rhône-Alpes is France's main energy producing region; both are beneficial factors for the chemical sector.

Country Profile: France

Age-Specific Growth Rates

2008–2030	France	EU 27
0–14	4.0	-2.6
15–24	5.2	-9.7
25–34	1.0	-14.3
35–44	-7.5	-9.9
45–54	-6.6	0.0
55–64	11.1	20.3
65–74	54.2	37.3
75–79	47.1	38.6
80+	60.0	65.0

Data-Source: Eurostat; own calculation and presentation

The age structure in 2008 shows relatively large shares of 33-61 year-olds in total population as compared to the other age groups. Until 2030, the age structure becomes most equilibrated, with much higher shares of older age groups than in 2008. The share of the over 65 year-olds rises from almost 16% to 22%, that of oldest olds (80+) from 5.0% to 7.3%. However, the total population remains relatively young, with the mean age lying roughly 1-2 years under the EU27 average between 2008 and 2030.

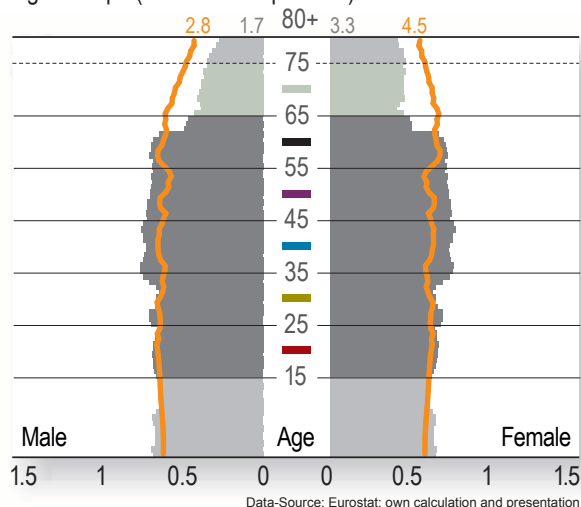
Natural population development is positive throughout the projection period. Positive net immigration from abroad adds to it, resulting in high population growth. The number of inhabitants grew by about 9% since 1990 and is likely to further increase by 10% until 2030.

Consistent with total population growth, the youngest age group is projected to grow by 4% to 11.8 million from 2008 to 2030. Over the same period, the oldest olds will experience a 60% increase (+1.9 million) to nearly 5.0 million people, which is the second highest increase in absolute numbers among all age groups. The 75-79 year-olds rank third with expected growth of 1.0 million (+47%). Altogether, even without considering the potentially active group of 65-74 year-olds, over 55% of the total population growth is attributed to the inactive population.

In contrast to the expected increase of the inactive population, the size of the active population shows only very slight overall changes. After a growth of 8.1% between 1990 and 2008, the active population (15-64) is projected to still grow, albeit by only 91 000 (+0.2%) until 2030. However, the development differs among age groups. The 15-24 and 55-64 year-olds are projected to grow by 407 000 (+5%) and 822 000 (+11%), while age groups 35-44 and 45-54 years are likely to decline by 658 000 (-7.5%) and 556 000 (-6.6%), respectively. The number of 25-34 year-olds increases slightly by some 77 000 persons (+1%). Compared to the development of the 15-64 year-olds, the growth of the potentially active population aged 15-74 years is at 6.1% much more pronounced. This comes as no surprise, as the highest increase among all age groups will be seen for the 65-74 year-olds, which are projected to grow by 2.7 million (+54%) to 7.5 million until 2030. From 2008 to 2030, the active share is likely to decrease from roughly 65% (73%) to 59% (70.5%) when calculated for the 15-64 (15-74) year-olds.

Age Structure

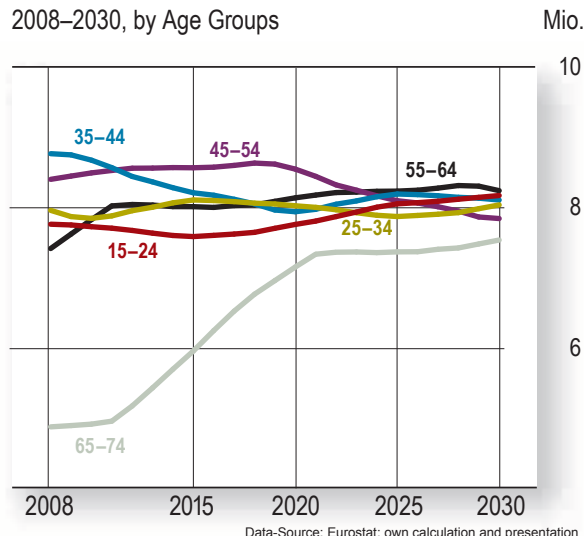
Age Groups (% of Total Population) 2008 and 2030



Data-Source: Eurostat; own calculation and presentation

Change in Active Population

2008–2030, by Age Groups

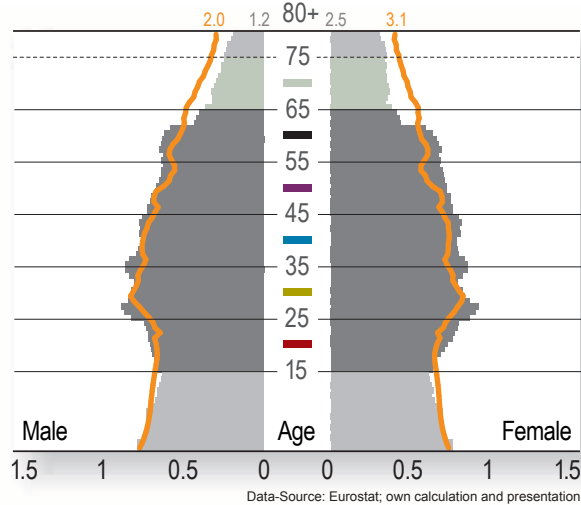


Data-Source: Eurostat; own calculation and presentation

Regional Profile: Île de France (FR10)

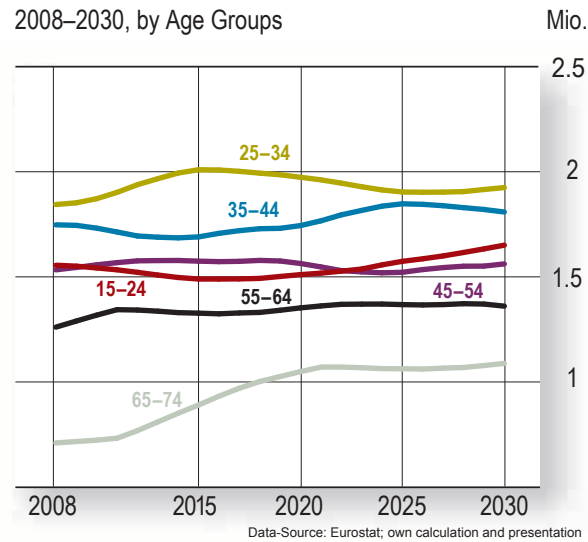
Age Structure

Age Groups (% of Total Population) 2008 and 2030



Change in Active Population

2008–2030, by Age Groups

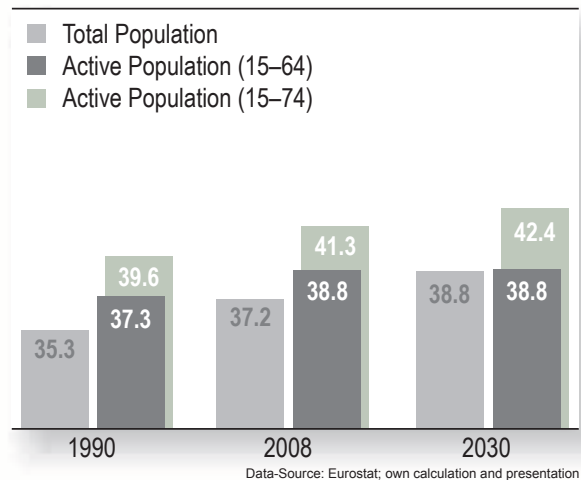


The age pyramids show similar shapes in 2008 and in 2030 up to age group 62. The age structure is characterised by large shares of middle aged groups, which are expected to slightly decrease in favour of the over 62 year-olds. The total population is ageing slower than the EU27 on average. At 35.3 years, the mean age was nearly two years lower than the EU27 average in 1990 and with 38.8 it is projected to be more than 5 years lower in 2030.

Projected births are more than twice as high as the number of deaths in Île de France. Total population growth will hence be positive over the whole period of 2008-2030, even though the migration balance is negative due to outflows to other French regions. Altogether, the number of inhabitants is expected to increase by 12.5% to almost 13.2 million until 2030.

Mean Age

in Years



Population Size and Active Share

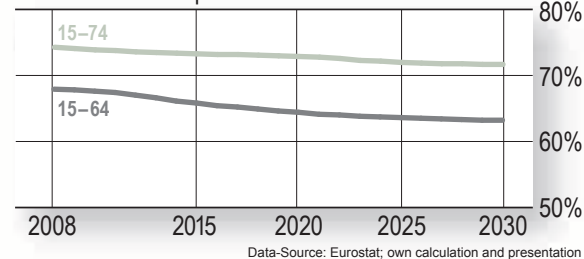
1990–2030, in Thousand and Percentage Change

	Total	15-64	15-74
1990	10 645	7 342	7 914
2008	11 658	7 944	8 660
2015	12 270	8 093	8 988
2030	13 112	8 307	9 399
	+ 9.5	+ 8.2	+ 9.4
	+ 5.3	+ 1.9	+ 3.8
	+ 6.9	+ 2.6	+ 4.6

All inactive groups are expected to grow: the 0-14 year-olds by almost 14% or 317 000 people, which is in absolute numbers the highest increase among the inactive; age group 75-79 by 47% (+142 000) and the oldest olds (80+) by 61% (+256 000).

Between 2008 and 2030 the working-age population (15-64) is projected to grow by 4.6% to about 8.3 million people. All age groups are likely to experience growth, ranging from 1.8% (+28 000) for those aged 45-54, to 7.9% (+99 000) for the 55-64 year-olds. The potentially active age group of 65-74 year-olds will show the highest increase: 52.6% or +376 000 people. As the population ages, the active share, that is subgroup 15-64 (15-74) years, is projected to fall from roughly 68% (74%) in 2008 to 63% (72%) in 2030.

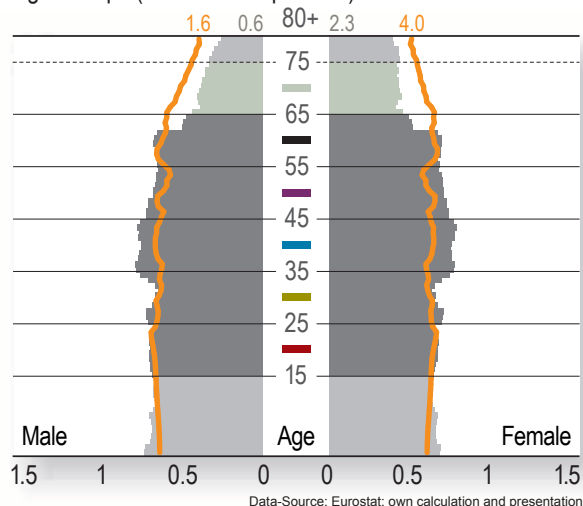
Share of Active Population



Regional Profile: Rhône-Alpes (FR71)

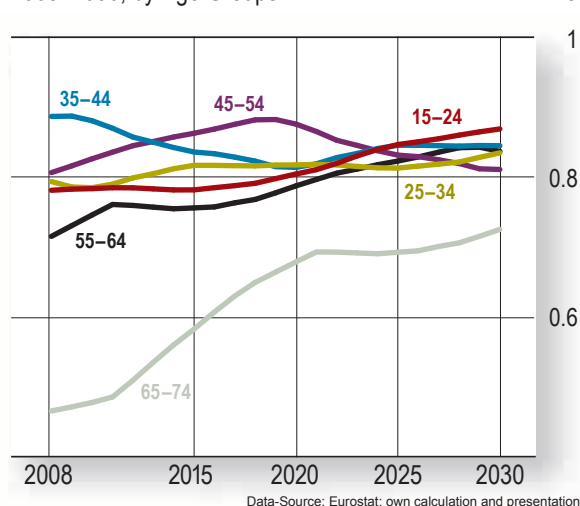
Age Structure

Age Groups (% of Total Population) 2008 and 2030



Change in Active Population

2008–2030, by Age Groups

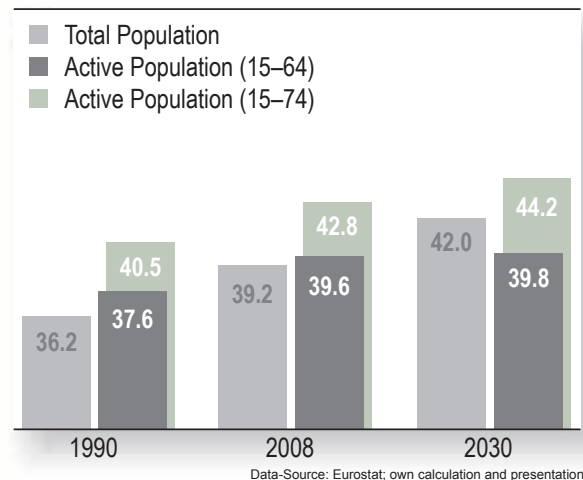


The age pyramids 2008 and 2030 for this region strongly resemble those for France. They display a cylindrical shape and increasing shares of the 61+ year olds in total population. The mean age of the total population remains at least one year below the EU27 average throughout the time span considered. The mean age of the active subgroup (15-65) was at 36.2 in 1990 1.4 years above the average of the total population, but will be 2.2 years below it in 2030.

Natural population development is strongly positive, being enhanced by inflows from abroad and from other French regions. Overall population growth is therefore projected positive; the number of inhabitants will grow by 14.3% between 2008 and 2030.

Mean Age

in Years



Population Size and Active Share

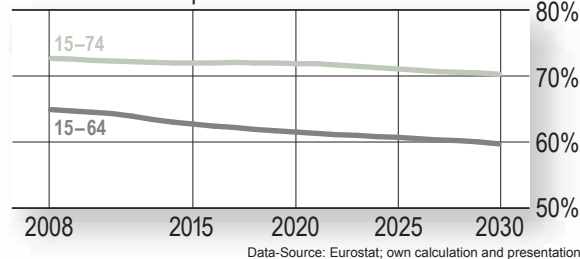
1990–2030, in Thousand and Percentage Change

	Total	15-64	15-74
1990	5 346 + 14.1	3 555 + 12.0	3 909 + 13.8
2008	6 070 + 5.3	3 982 + 1.7	4 450 + 4.2
2015	6 423 + 8.6	4 051 + 3.5	4 635 + 6.1
2030	6 975	4 193	4 919

The inactive age groups are all projected to rise until 2030; the youngest age group will increase by almost 8% to 1.3 million, while age groups 75-79 and 80+ are expected to grow by roughly 49% and 74% to about 300 000 and 500 000 people, respectively.

The working-age population (15-64) displayed a growth of 12% in the period 1990-2008 and is likely to increase further by 5.3% to 4.2 million by 2030. The only active age group expected to shrink are the 35-44 year-olds; their number may fall by some 42 000 people (-4.7%). The potentially active group 65-74 will experience the highest increase of 260 000 people (+55%), followed by the 55-64 year-olds with 120 000 people (+17%). The shares of the working-age groups 15-64 (15-74) in total population fall from some 65% (73%) in 2008 to 60% (70%) in 2030, being almost identical with the average development in France.

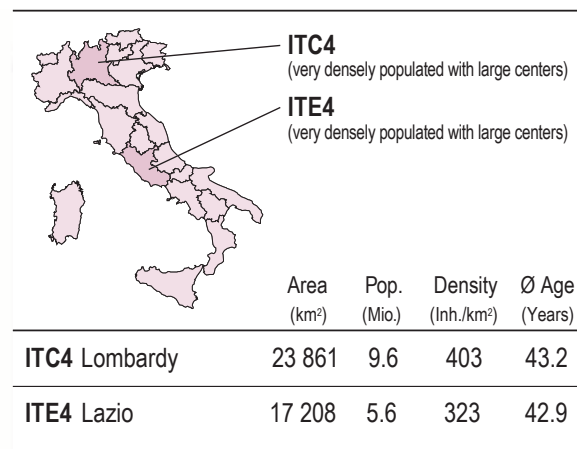
Share of Active Population



Country Profile: Italy

General Indicators

2008, by Regions



Data-Source: Eurostat; own calculation and presentation

Age-Specific Growth Rates

2008–2030

	Italy	EU 27
0–14	-9.3	-2.6
15–24	-0.8	-9.7
25–34	-16.5	-14.3
35–44	-23.9	-9.9
45–54	1.4	0.0
55–64	34.3	20.3
65–74	27.9	37.3
75–79	20.6	38.6
80+	60.8	65.0

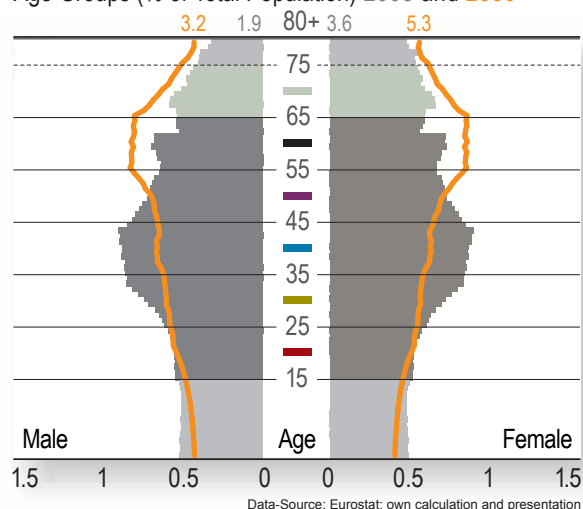
Data-Source: Eurostat; own calculation and presentation

The chemical industry is mostly concentrated in the North of Italy, accounting for more than 60% of chemical employment in 2008. With more than 80 000 persons, Lombardy is representing 36% of all employment in the sector. The second largest number of employees, some 25 000, are located in the region of Lazio.

The age pyramids for 2008 and 2030 show only small and still slightly decreasing shares for persons younger than 22 years; decreasing shares for the 23-50 year-olds and growing shares for all ages above 50 years. The Italian population is projected to remain, alongside with Germany, the oldest in the EU, expecting a mean age of 47 years in 2030. The most severe age shift is taking place among the elderly: Age group 80+ is expected to grow by 60.8% to 5.3 million people. In 2030, 8.5% of the population will be over 80 years old.

Age Structure

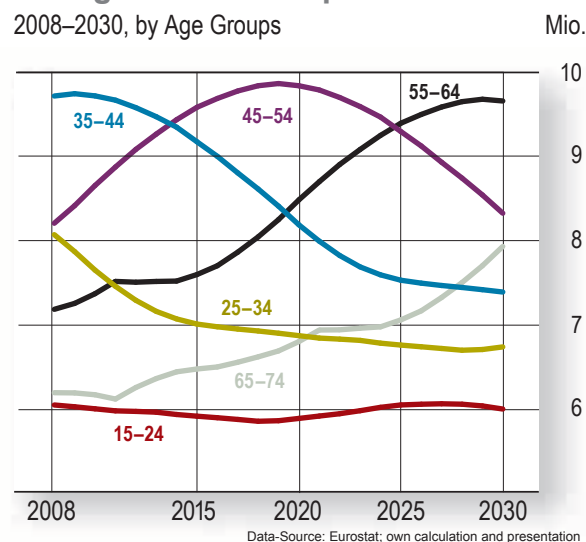
Age Groups (% of Total Population) 2008 and 2030



Data-Source: Eurostat; own calculation and presentation

Change in Active Population

2008–2030, by Age Groups



Data-Source: Eurostat; own calculation and presentation

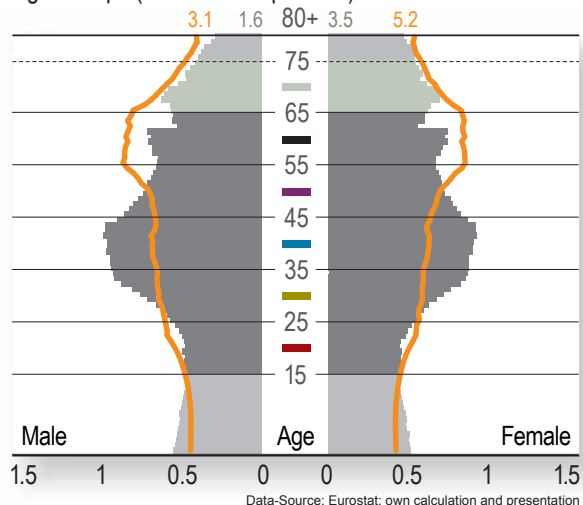
Natural population growth is negative over the whole period of 2008-2030, but high net inflows from abroad are projected to compensate for the loss. The number of inhabitants is thus projected to expand by 3.9% until 2030, entirely based on ageing and immigration.

The active population is projected to decrease over the period 2008-2030, at age-specific rates that are strongly differing. While the 15-24 and 45-54 year-olds show relatively little overall change, age groups 25-34 and 35-44 will shrink by about 16.5% and 24%. The oldest active group (55-64) is likely to increase by some 34% from 7.2 to 9.5 million. Overall, the active population (15-64) shrinks by 1.1 million to 38.1 million in 2030, its share falling from almost 66% to 61.6%.

Regional Profile: Lombardy (ITC4)

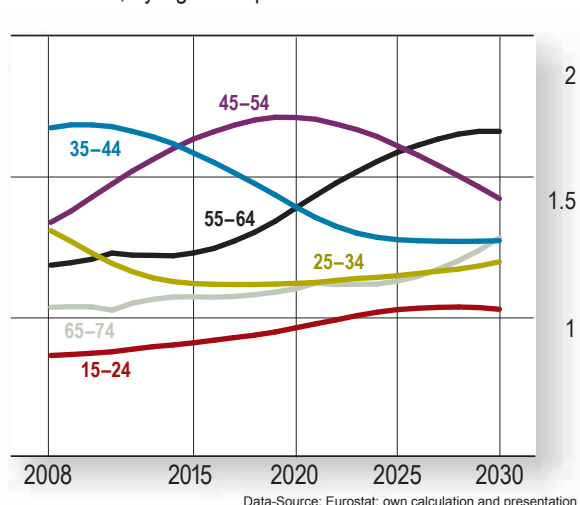
Age Structure

Age Groups (% of Total Population) 2008 and 2030



Change in Active Population

2008–2030, by Age Groups

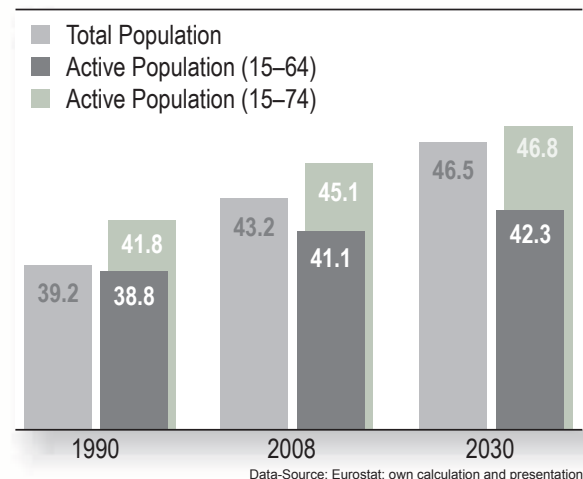


The age pyramids show small shares of those aged 25 and under, strongly decreasing shares of the 27-50 year-olds, and for the most part increasing shares of those older than 50. The share of the oldest-olds (80+), which is already (much) higher than in all other regions here considered, will continue to rise to 8.3%. Mean age of the total population and the active population were nearly the same in 1990, but will differ by 4.2 years in 2030; both groups are considerably older than the EU27 average throughout all periods.

Natural population development is projected positive until 2010, but net inflows from other Italian regions and particularly from abroad compensate the loss thereafter. The number of Lombardy's inhabitants increased by 8.9% in the past and may grow by 9.2% to 10.5 million through 2030.

Mean Age

in Years



Population Size and Active Share

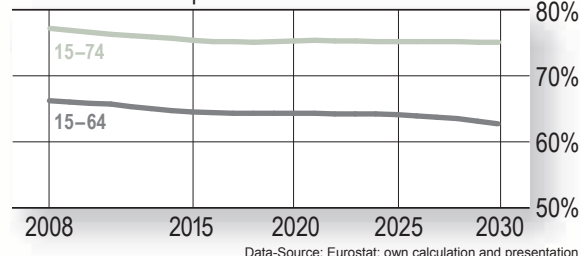
1990–2030, in Thousand and Percentage Change

	Total	15-64	15-74
1990	8 837	6 300	6 985
2008	9 628	6 377	7 415
2015	10 049	6 484	7 559
2030	10 515	6 589	7 873
	+ 8.9	+ 1.2	+ 6.2
	+ 4.4	+ 1.7	+ 1.9
	+ 4.6	+ 1.6	+ 4.2

Among the inactive population, the number of the 0-14 year-olds is likely to shrink by 3.2% from 2008 on, resulting in a size of 1.3 million in 2030. The other two inactive age groups are projected to increase by 23% (75-79) and 78% (80+) to 480 000 and 870 000 people.

The potentially active population is expected to grow by 3.3% to 6.6 million in 2030. The increase applies to all older active groups as well as the youngest: age groups 15-24 and 45-54 will grow by 18.9% and 6.3% to 1.0 million and 1.4 million; the 55-64 and 65-74 year-olds by 475 000 (+40%) and 246 000 (+23.7%). Concurrently, the number of 25-34 and 35-45 year-olds will decline by 111 000 (-8%) and 401 000 (-24%). The active share (15-64) in total population is likely to fall from 66% in 2008 to almost 63% in 2030.

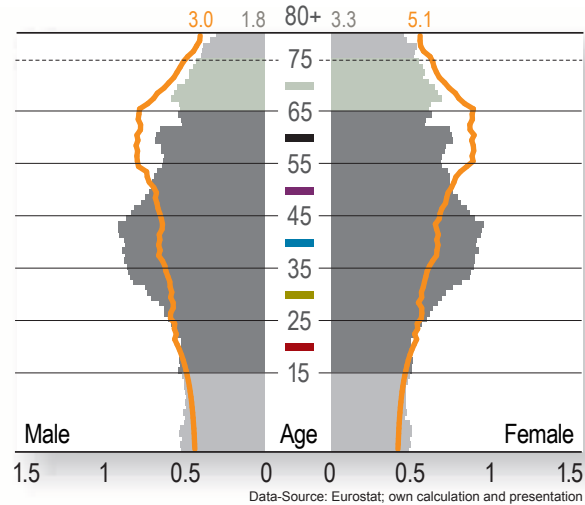
Share of Active Population



Regional Profile: Lazio (ITE4)

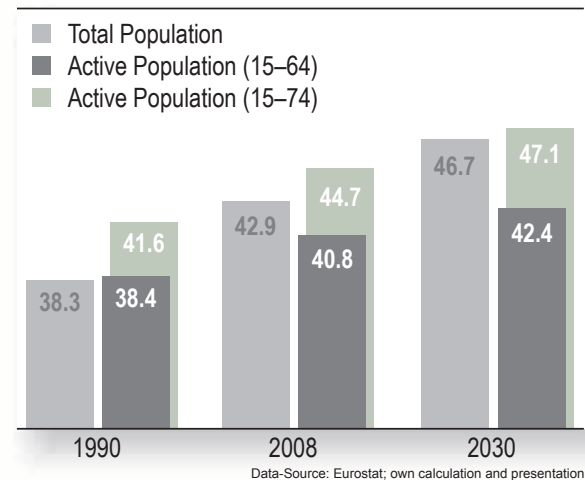
Age Structure

Age Groups (% of Total Population) 2008 and 2030



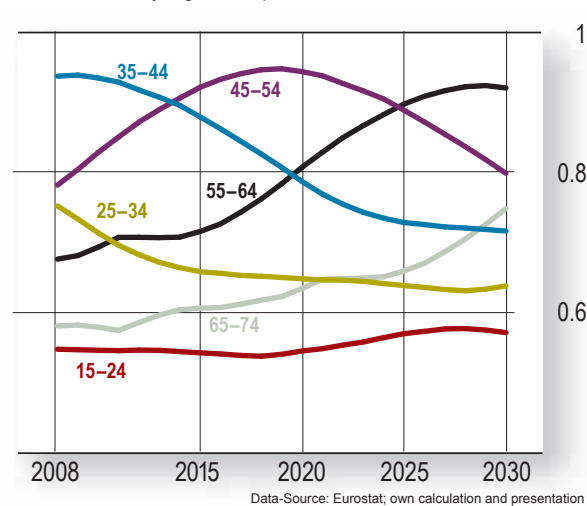
Mean Age

in Years



Change in Active Population

2008–2030, by Age Groups

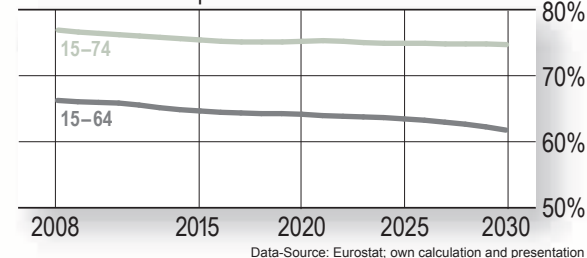


Population Size and Active Share

1990–2030, in Thousand and Percentage Change

	Total	15-64	15-74
1990	5 116	3 591	3 999
2008	5 552	3 692	4 273
2015	5 722	3 714	4 320
2030	5 873	3 642	4 390
	+ 8.5	+ 2.8	+ 6.9
	+ 3.1	+ 0.6	+ 1.1
	+ 2.6	- 1.9	+ 1.6

Share of Active Population



The age pyramid in 2008 shows a relatively old population with small shares of the young and high shares of persons aged roughly 28-47. By 2030, the shares of nearly all age groups under 51 will have decreased in favour of the older. Mean age of the total population and of the active subgroup (15-64) were close in 1990, but are expected to differ by more than four years in 2030. The total population aged faster than the EU27 average in the past, but is likely to age slower in the future; yet, the mean age remains higher than the EU27 average at all times considered.

Natural population growth is increasingly negative from 2009 on and net internal outflows add to this after 2019. However, strong immigration from abroad is expected to more than compensate for the loss through 2030. The number of inhabitants, which increased by 8.5% over the period 1990-2008, is projected to grow by 5.8% between 2008 and 2030.

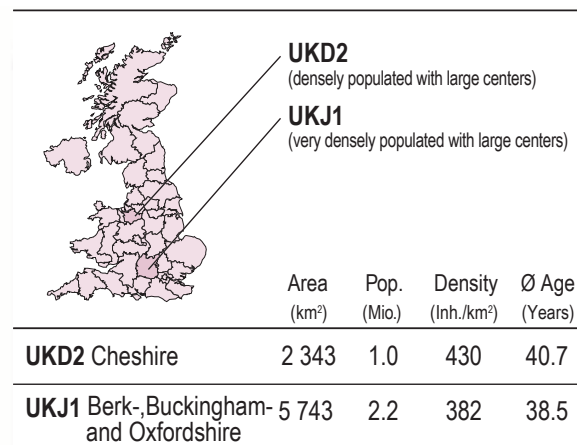
The development of the inactive population is split: The number of 0-14 year-olds will shrink by 5% to 730 000, while the 75-79 and 80+ year-olds will experience strong growth: the former may grow by some 23% to 280 000, the latter by 68% to nearly 480 000 in 2030.

The active population (15-64) is likely to decrease by 1.4% until 2030. The 25-34 and 35-44 year-olds are likely to diminish in numbers by 114 000 (-15.1%) and 220 000 (-23.5%). Although age group 55-64 will grow by 243 000 people (+36%), the deficit could not be compensated without the increase in age group 65-74, which amounts to 167 000 (+28.7%) people. The active share 15-64 falls from 66.6% to 62% in 2030.

Country Profile: United Kingdom

General Indicators

2008, by Regions



Data-Source: Eurostat; own calculation and presentation

Age-Specific Growth Rates

2008–2030

United Kingdom EU 27

Age Group	United Kingdom	EU 27
0–14	13.4	-2.6
15–24	-1.3	-9.7
25–34	9.9	-14.3
35–44	5.1	-9.9
45–54	0.1	0.0
55–64	13.7	20.3
65–74	41.2	37.3
75–79	34.4	38.6
80+	56.8	65.0

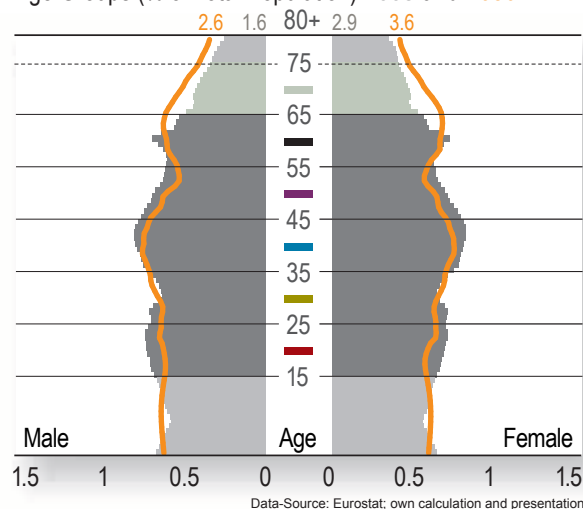
Data-Source: Eurostat; own calculation and presentation

The chemical industry in the UK provides employment to about 230 000 persons. The largest part of it is located in three NUTS2 regions: Bedfordshire, Hertfordshire; Berkshire, Buckinghamshire and Oxfordshire; and Cheshire, each registering some 15 000 employees.

The age pyramids for 2008 and 2030 show relatively small differences: The shares of age groups younger than 60 are, with a few exceptions, susceptible to some shrinking. By 2030, the share of the economically inactive age groups is expected to have increased by 59 %. Among them, age group 65-74 will experience the highest growth in shares (+41.2%) and in numbers (2.1 million), while the 0-14 and 80+ year-olds are projected to increase by 1.4 million and 1.6 million, respectively.

Age Structure

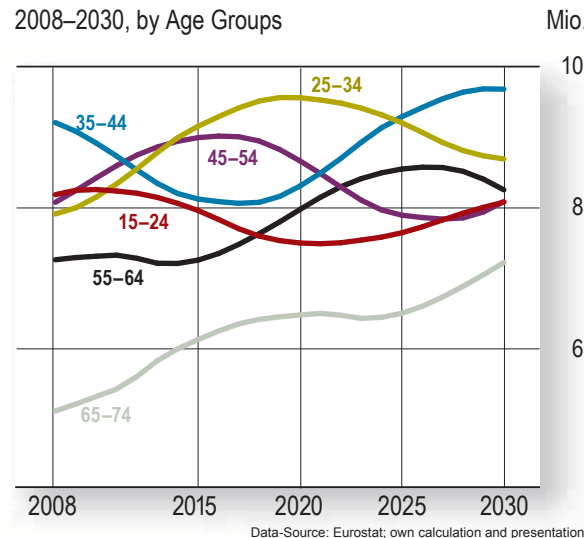
Age Groups (% of Total Population) 2008 and 2030



Data-Source: Eurostat; own calculation and presentation

Change in Active Population

2008–2030, by Age Groups



Data-Source: Eurostat; own calculation and presentation

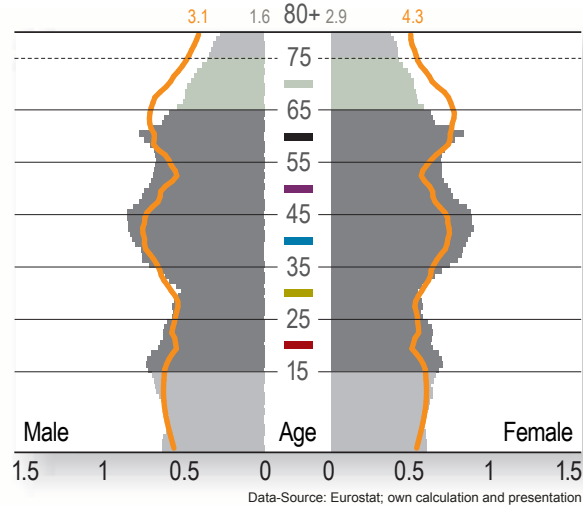
Natural population growth and the migration balance are likely to be both positive; the number of inhabitants will grow by about 13% over 2008-2030; past growth was 7.2%. Mean age of the total population is lower than the EU27 average over the whole period 2008-2030. In 2030, the UK will be the fourth youngest country among the EU27.

The active population (15-64) will grow by 5.3% to 4.3 million over the period of 2008-2030. While the age groups 15-24 and 45-54 change little in numbers, the 55-64 and 65-74 year-olds are likely to increase by nearly one million (+14%) and 2.1 million (+41%), while the 25-34 and 35-44 year-olds are projected to grow by about 0.8 million (+10%) and 0.5 million (+5%) until 2030. The share of the active population 15-64 (15-74) is shrinking slowly to roughly 62% (72%) in 2030.

Regional Profile: Cheshire (UKD2)

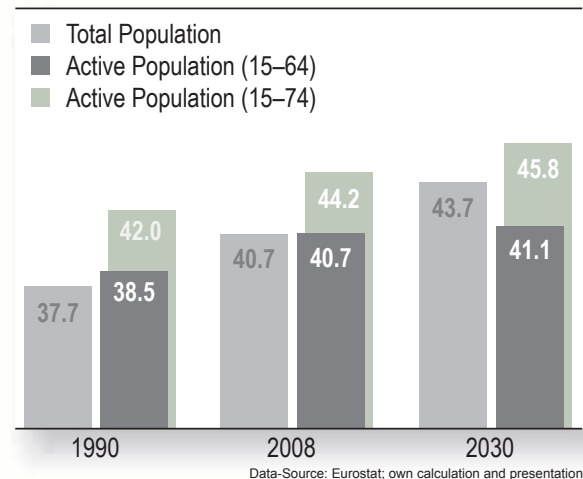
Age Structure

Age Groups (% of Total Population) 2008 and 2030



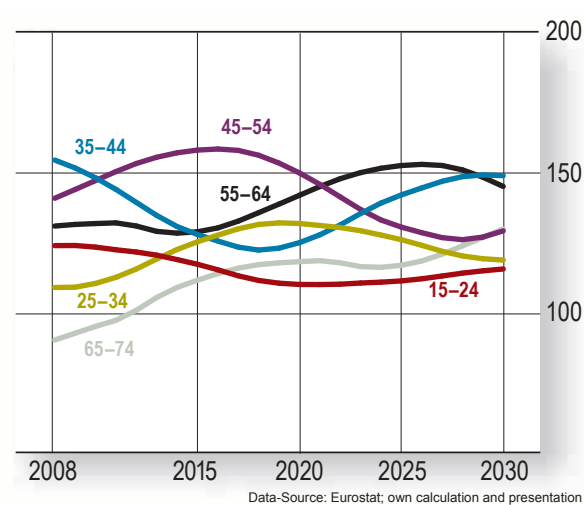
Mean Age

in Years



Change in Active Population

2008-2030, by Age Groups

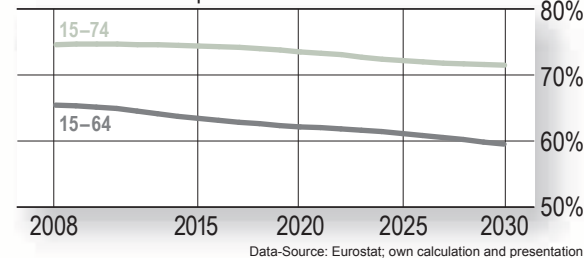


Population Size and Active Share

1990-2030, in Thousand and Percentage Change

	Total	15-64	15-74
1990	957	631	712
2008	1 006	660	751
2015	1 035	659	771
2030	1 104	659	789
	+ 5.1	+ 4.6	+ 5.5
	+ 2.9	- 0.3	+ 2.6
	+ 6.6	+ 0.0	+ 2.4

Share of Active Population



The age pyramids show a decline in most age groups younger than 62. In particular, the shares of the 35-57 year-olds will shrink in favour of the older. Mean age will be slightly below the EU27 average over the whole period of 2008-2030, but it will be more than two years higher than the UK average in 2030.

Natural population growth in Cheshire is projected positive until 2026. Positive net inflows, particularly from other British regions, are likely to compensate the loss. Cheshire's inhabitants increased by 5.1% between 1990 and 2008 and will continue to grow by an additional 9.7% to 1.1 million until 2030.

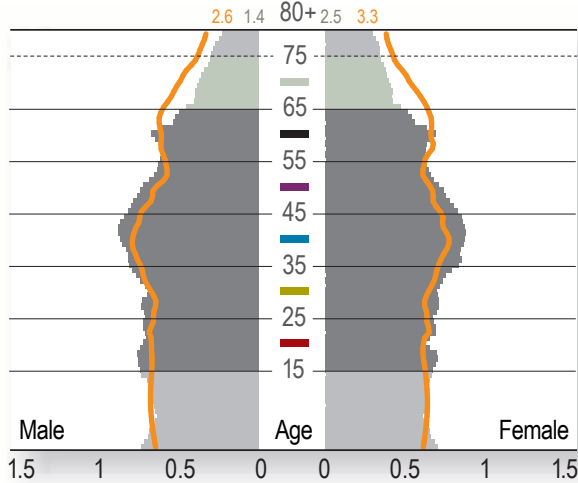
Among the inactive population, the number of the 0-14 year-olds is likely to grow by 4.6% from 2008 on, leading to a size of 184 000 in 2030. Furthermore, the other two inactive age groups are projected to increase by 46.3% (75-79) and 78.8% (80+) to 49 000 and 82 000 persons, respectively.

The potentially active population (15-64) is expected to only slightly decline (-0.2%) until 2030, their number remaining nearly constant at 659 000. However, age groups 15-24, 35-44 and 45-54 years are projected to shrink by 6.7%, 3.6% and 8.2% to 116 000, 149 000, and 129 000 (in this order). The compensating development comes from the 25-34 and 55-64 year-olds which are likely to grow by roughly 9% and 11% to 119 000 and 145 000. The highest projected increase is expected for the 65-74 year-olds, which may grow by 44% to 130 000 people. As a result, the active share of 15-64 (15-74) year-olds in total population falls from nearly 66% (75%) in 2008 to 60% (71%) in 2030.

Regional Profile: Berkshire, Buckinghamshire and Oxfordshire (UKJ1)

Age Structure

Age Groups (% of Total Population) 2008 and 2030

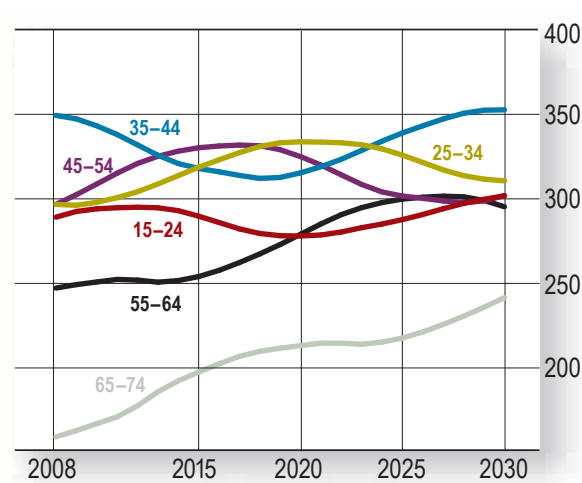


Data-Source: Eurostat; own calculation and presentation

Change in Active Population

2008–2030, by Age Groups

Thousand



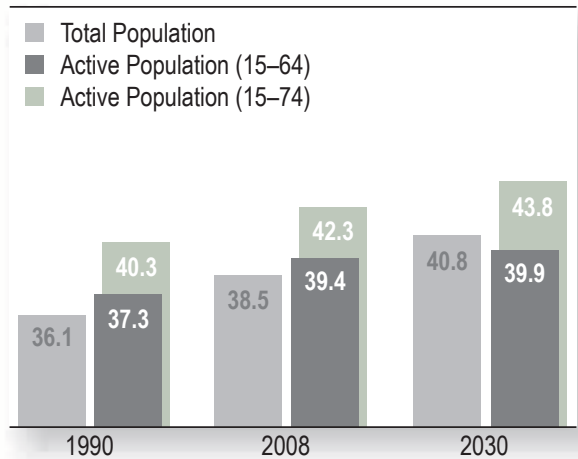
Data-Source: Eurostat; own calculation and presentation

The age pyramids show decreasing shares for most age groups 60 and under, while the shares of the older are projected to increase through 2030. In contrast to Cheshire, the middle aged (33-48) will continue to have the largest shares in total population. Ageing among the total population is remarkably slow, keeping mean age increasingly lower than the EU27 average (by two years in 2008 and by more than three years in 2030).

Natural population development and the migration balance are both expected positive. The inflows from abroad are projected to compensate the outflows to other British regions. The region will thus see growth of 13.6%, amounting to an increase from 2.2 million in 2008 to nearly 2.5 million inhabitants in 2030.

Mean Age

in Years



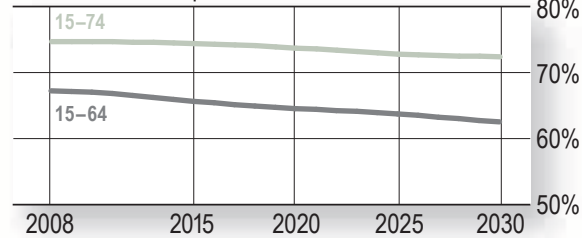
Data-Source: Eurostat; own calculation and presentation

Population Size and Active Share

1990–2030, in Thousand and Percentage Change

	Total	15-64	15-74
1990	1 946	1 317	1 455
2008	2 194	1 479	1 639
2015	2 296	1 511	1 708
2030	2 492	1 562	1 804
	+ 12.8	+ 12.3	+ 12.6
	+ 4.6	+ 2.1	+ 4.3
	+ 8.6	+ 3.4	+ 5.6

Share of Active Population



Data-Source: Eurostat; own calculation and presentation

All inactive age groups are likely to increase. The number of the 0-14 year-olds is estimated to increase by 11% between 2008 and 2030, resulting in 454 000 people in 2030. The other two age groups, 75-79 and 80+, will increase by 44.5% and 70.2% to 88 000 and 147 000, respectively.

The working-age population (15-64) will grow by 5.6% to 1.6 million until 2030. The increase applies to all active age groups: the number of 15-24 and 25-34 year-olds is projected to grow by 4.4% and 4.7% to 302 000 and 311 000, while that of age groups 35-44 and 45-54 will stay nearly constant at 353 000 and 302 000. Concurrently, age groups 55-64 and 65-74 will register the highest increase among the potentially active of 19.4% and 51.7% to 295 000 and 242 000 people. The active share of the 15-64 (15-74) year-olds falls from 67.4% (74.7%) in 2008 to 62.7% (72.4%) in 2030.

The Potential of Women and the Elderly: Employment

Employment

15 to 64 years
2008, in Percent

	Male	Female	Total
BE Belgium	68.6	56.2	62.4
CZ Czech Republic	75.4	57.6	66.6
DE Germany	75.9	65.4	70.7
ES Spain	73.5	54.9	64.3
FR France	69.6	60.4	64.9
IT Italy	70.3	47.2	58.7
UK United Kingdom	77.3	65.8	71.5

Data-Source: Eurostat; own presentation

Female Employment by Parity

Females Aged 25 to 49 years, Children Aged under 17
2008, in Percent

	0	1	2	3+
BE Belgium	78.4	78.4	78.0	59.1
CZ Czech Republic	89.4	70.0	61.9	38.2
DE Germany	83.0	72.0	63.0	42.0
ES Spain	73.6	65.9	60.3	50.8
FR France*	75.6	76.5	71.2	49.8
IT Italy	66.8	60.6	53.1	39.8
UK United Kingdom	85.3	75.9	70.7	48.9

* Values from 2005

Data-Source: UNECE; own presentation

Total employment rates in 2008 ranged between 58.7% in Italy and 71.5% in the UK, with the Italian value being explained by a particularly low female employment rate of 47.2%. In general, the rate of employment was lower for females than for males in all countries considered, with the UK having the highest employment rate for both sexes, followed by Germany. The lowest rate for male employment was found in Belgium at 8.7 percentage points lower than the highest rate.

In most countries female labour participation tends to be the lower, the more children a woman has. The largest gap in Employment by Parity was found in the Czech Republic, where it ranges from 89.4% for childless women (the highest rate among the seven countries) to 38.2% in case of 3+ children (the lowest rate among the seven countries). Belgium, in contrast, showed nearly constant rates for women with no child, one child, or two children in 2008.

Female Employment by Education

15 to 64 years
2008, in Percent

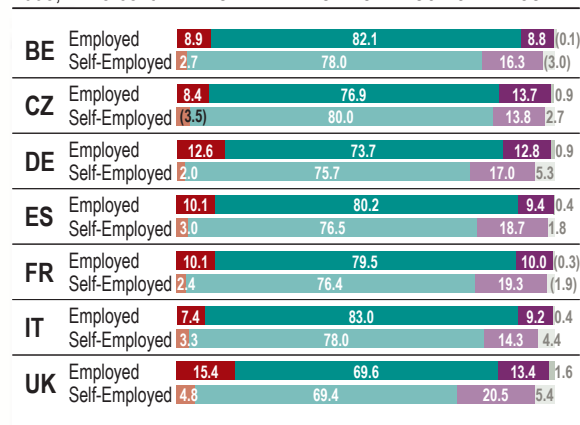
	Low	Medium	High
BE Belgium	31.0	59.0	80.1
CZ Czech Republic	24.2	63.3	75.7
DE Germany	41.0	70.2	82.6
ES Spain	41.5	59.6	77.4
FR France	41.2	64.3	78.7
IT Italy	29.6	58.6	73.8
UK United Kingdom	48.6	69.6	82.1

Data-Source: Eurostat; own presentation

Employed vs. Self-Employed

By Age Groups

2008, in Percent



Values in Brackets are not reliable.

Data-Source: Eurostat; own calculation and presentation

A higher educational level tends to correlate with higher employment rates. The highest employment rate for highly educated women was found in Germany at 82.6%, the lowest in Italy at 73.8%. As far as women with low education is concerned, in the Czech Republic, in Belgium and in Italy, only less than one third (24.2% - 29.6%) of them worked in 2008, while it was nearly half (48.6%) in the United Kingdom.

For all countries, the share of employed and self-employed persons was highest in age group 25-49. Furthermore, self-employment rates were lower than employment rates among the 15-24 year-olds; the opposite was true for those aged 50-64 years and above.

The Potential of Women and the Elderly: Unemployment and Inactivity

Retirement

2002–2007, in Years male / female	Labour force exit age		Official age of retirement	
BE Belgium	59.6	58.3	65	62
CZ Czech Republic	62.2	58.5	62	59
DE Germany	62.1	61.0	65	65
ES Spain	61.4	63.1	65	65
FR France	58.7	59.5	60	60
IT Italy	60.8	60.8	65	60
UK United Kingdom	63.2	61.9	65	60

Data-Source: OECD (2009); own presentation

Unemployment

2008, in Percent male / female / total	Unemployment rates (15 to 64 years)		
BE Belgium	6.5	7.6	7.0
CZ Czech Republic	3.5	5.7	4.4
DE Germany	7.5	7.6	7.5
ES Spain	10.1	13.1	11.4
FR France	6.9	7.9	7.4
IT Italy	5.6	8.6	6.8
UK United Kingdom	6.3	5.2	5.8

Data-Source: Eurostat; own presentation

Germany, Spain and France had the same official retirement age for males and females in 2008, while it was lower for females than for males in all other countries here considered. The labour force exit age was higher for women than for men in Spain and France, and on average the same in Italy. In the other four countries, women retired earlier than men. The highest average labour force exit age for males was found in the UK at 63.2 years and for females in Spain at 63.1 years, while the lowest values were registered for males in France at 58.7 years and for females in Belgium at 58.3 years.

The lowest total unemployment rate in 2008 was found in the Czech Republic at 4.4%, while Spain exhibited the highest unemployment rate at 11.4%. The largest difference between the rates of male and female unemployment was at 3 percentage points found in Italy (5.6% for males, 8.6% for females), and in Spain (10.1% for males, 13.1% for females).

Reasons for Inactivity of 50–64 Year-Olds

2008, in Percent male / female	BE		CZ		DE		ES		FR		IT		UK	
Think no work is available	9.5	16.4	0.6	0.8	2.1	3.7	2.5	4.8	0.0	1.1	5.0	7.9	0.9	0.0
Looking after children or incapacitated adults	0.0	2.0	0.4	0.9	0.0	2.9	1.0	6.7	0.0	0.0	0.5	6.7	5.0	8.9
Other family or personal responsibilities	2.2	24.5	0.0	0.3	0.0	12.8	3.9	45.9	0.0	0.8	1.1	10.7	0.0	6.1
Own illness or disability	17.0	11.6	6.4	4.8	17.4	11.4	44.0	21.9	1.0	1.6	12.0	7.9	49.4	24.8
Retired	38.5	29.3	91.0	91.8	75.4	52.2	35.5	6.1	96.6	93.4	65.2	23.8	36.1	51.6
Other reasons	32.2	15.9	1.4	1.3	4.2	16.7	13.0	14.5	1.5	2.7	16.1	43.1	7.8	7.9

Data-Source: Eurostat; own presentation

The most important reason for inactivity of the elderly (50-64 year-olds) in 2008 was retirement, except for Spain and the UK, which listed illness or disability as the most common reason. For all other countries this was the second or third most important reason for inactivity. Normally, such differences are due to differences in early retirement legislation. The strongest difference by gender was found regarding “other family or personal responsibilities”, with a gap of over 40 percentage points between male and female responses in Spain. The least important of all reasons for inactivity considered in the survey was “looking after children or incapacitated adults”.

The Chemical Industry: Executive Summary

1. The age structure in the chemical industry differs from the age structure of the working-age population in each of the seven countries. The basic difference is that age groups 15-24 and 55-64 are less and middle age groups are more represented in the chemical industry than in the working-age population. One reason is simply that the employment rates of the younger and older are lower than for the middle age groups. Another reason is differences in the gender structure. Together they imply that demographic change may have a negative impact on the chemical industry even if the working-age population is not shrinking.

2. The share of women is lower in the chemical industry than in the working-age population in each of the seven countries. While roughly 50% of the working-age population are women, their share is only 30-44% in the chemical industry. The lowest values were found in Italy (30%) and Belgium (31%), the highest in the Czech Republic (44%) and France (43%). The value for Italy mirrors the low employment rate of Italian women.

3. The characteristics of the age and gender distribution in the chemical industry may pose labour availability problems due to demographic change, even if they are not expected from a national perspective. For example, while the working-age population is expected to remain almost constant in France until 2030, a decline of 2.4% is possible in the chemical industry under the Status Quo Scenario. The implications for Italy are more severe: While the working-age population is projected to shrink by 3% until 2030, a decline of almost 10% could occur in labour availability for the chemical industry under the same scenario.

4. We have explored two strategies for ensuring future labour availability for the chemical industry under the conditions of demographic change. The better strategy is to keep chemical workers until the official retirement age. The only exception was found for the Czech Republic, where in 2008 the share of older age groups was higher in the chemical sector than in the working-age population and where the official retirement age is still quite low. Under these conditions it is more advantageous to keep age-specific employment rates constant.

5. If the chemical industry aimed at maintaining its current number of employees, British and Spanish companies would not need to react to demographic change. However, in Belgium and France, the number of workers would decrease through 2030 without reaction to the demographic development. But, drawing back on currently unemployed (and possibly less qualified) persons would be a fully compensating strategy for companies in these countries. In Italy, Germany and the Czech Republic full compensation under the Status Quo Scenario is not possible, even if the full Active Potential was used.

6. To offset the decline in the number of Italian and German chemical employees, Italian companies would have to keep their current employees until the official retirement age (which corresponds to the Trend Scenario), while Germany would additionally have to draw back on the national labour market to find new workers among the unemployed. All these measures would still not lead to compensation of demographic change effects on the Czech chemical industry in the Czech Republic.

7. Countries like Germany, which are projected to experience a strong decline in the availability of labour in the chemical industry, will also experience shrinkage in all chemical professions under the Status Quo Scenario. Effects are strongly gender-specific in five out of the seven countries (exceptions being the Czech Republic and the United Kingdom): The expected growth rates are often lower for women than for men. The major reason is that fewer women than men of age 50-64 years – a demographically increasing age group – are currently employed in the chemical industry.

8. Generally, the current professional structure is not likely to be sustainable under demographic change. Growth in professions with a large share of older people, e.g. scientific and higher management positions, is often more positive than average. This is particularly true for higher management positions in Italy.

9. A positive result is that negative demographic development is not automatically accompanied by a reduction in the number and share of academically trained workers. Even under the Status Quo Scenario the share of academics could generally remain close to its 2008 value, although the number of academics would increase only in France and the United Kingdom.

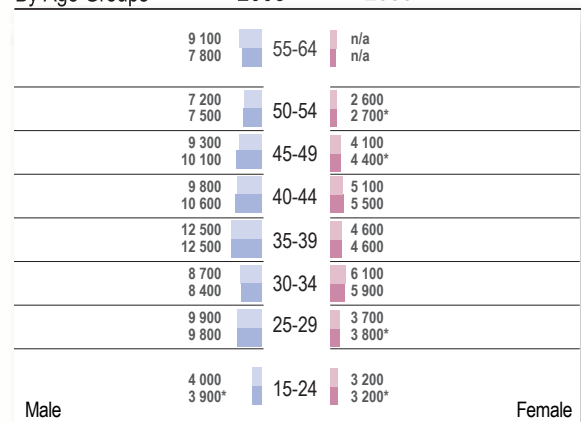
10. The number of highly-trained workers as well as their share in employment could increase considerably, if the two conditions of the Trend Scenario are applied. First, an increase through 2030 of age-specific rates of academics to the highest level found in 2008 (which was Belgium's) and second, continual employment of the current employees until the official retirement age.

The Chemical Industry: Employment Projection for Belgium

Age and Gender - Status Quo Scenario

Belgium

By Age Groups ■ 2008 ■ 2030

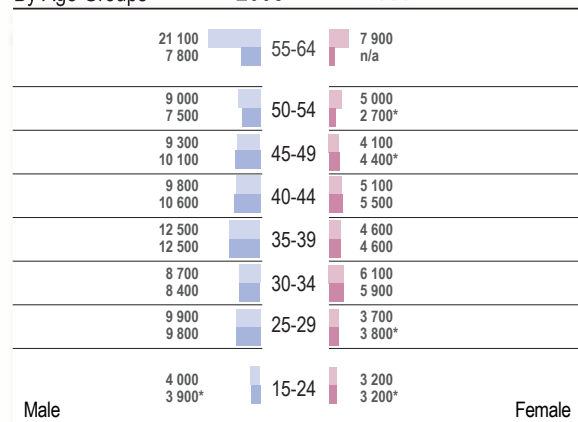


2008: 70 500; 2030: -0.3 % 15-64 2008: 32 200; 2030: -1.1 %
Data-Source: Eurostat, LFS; own calculation and presentation

Age and Gender - Trend Scenario

Belgium

By Age Groups ■ 2008 ■ 2030



2008: 70 500; 2030: 19.3 % 15-64 2008: 32 200; 2030: 20.4 %
Data-Source: Eurostat, LFS; own calculation and presentation

Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

The Belgian chemical industry employed nearly 103 000 workers in 2008. Two thirds of them were men, particularly of age 35-49, the rest being quite equally distributed among the other age groups - remarkably up to 64 years. The only exception were the 15-24 year-olds, which accounted for only 5.5% of all male employees. Women were somewhat younger, with the 30-49 year-olds being the largest group. At the same time, the 15-24 year-old female employees were more numerous than those of age 55-64; their share was 45% while that of the 55-64 female year-olds was only 21% of all employees in the corresponding age groups. All in all, the chemical industry appears to be attractive for young women. This can be considered as an advantage, under the conditions of demographic change.

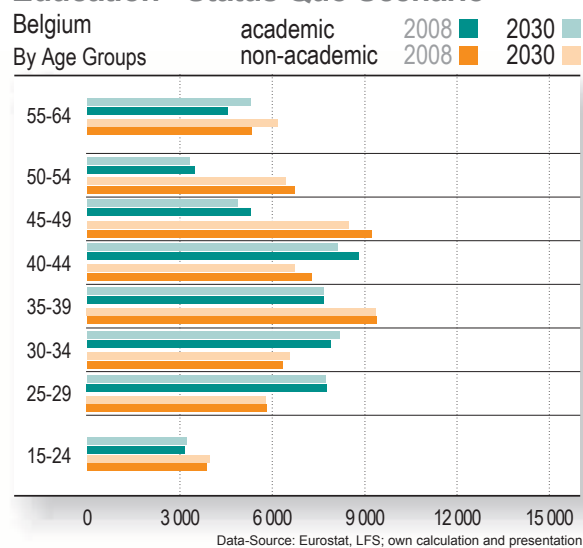
However, employment of those younger than 50 years old is currently higher than the employment of those older than 50. The industry would therefore lose some of its employees (-0.5%), if it were to decide to keep its age-specific shares of population constant through 2030 (Status Quo Scenario). Additionally, the age structure of its workforce would change under this Scenario. The number of 55-64 year olds would increase by 17%, that of 30-34 and 15-24 year-olds by roughly 3%. In contrast, the number of middle age groups (40-49) would decrease by approximately 8%.

If the chemical industry in Belgium decided instead to keep its current workers until the official retirement age, and to employ the younger in the present age-specific proportions (Trend Scenario), it might experience a

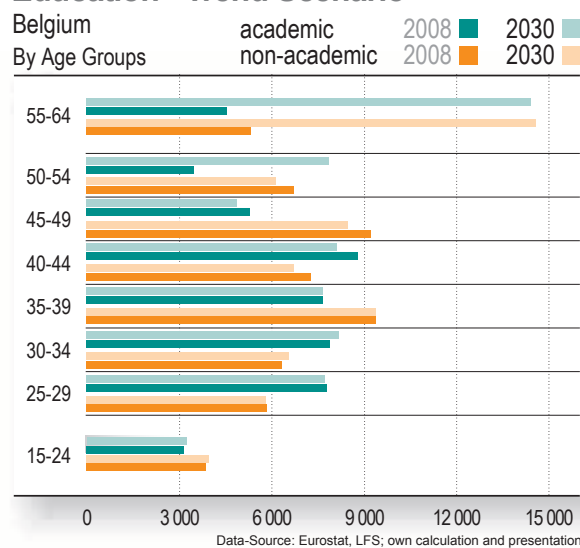
strong increase in its workforce (+ 20%). This is due to the relatively large number of middle age workers in 2008 compared to the smaller number of employees aged 50 and older. The strongest increase until 2030 would therefore be expected for the 50-64 year-olds. While the number of men aged 50-64 in the chemical industry could nearly double, the female numbers could rise by more than 160% until 2030. However, without knowing the reason behind why the current share of older workers (50-64) was relatively small in 2008, the more realistic growth rate is predicted to lie in between the results of the two scenarios. The large range found between the two scenarios (-0.5% to +20%) reflects the complex relationship between demographic change, educational preferences, and the employment policy of industries.

The Chemical Industry: Employment Projection for Belgium

Education - Status Quo Scenario



Education - Trend Scenario



Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Professions - Status Quo Scenario

Belgium By Employees	Share 2008		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	3.8%	0.8%	-0.5%	-7.6%
Clerks	6.4%	9.5%	-2.6%	-1.2%
Plant and Machine Operators, Assemblers	18.1%	4.5%	-0.1%	-1.8%
Technicians and Associate Professionals	21.0%	8.5%	-0.4%	-0.2%
Professionals	9.2%	4.3%	1.6%	-1.2%
Legislators, Senior Officials, Managers	8.2%	2.4%	0.6%	-6.3%
Other	3.3%	0.0%	-3.6%	n/a

Data-Source: Eurostat, LFS; own calculation and presentation

The share of highly educated workers in the chemical sector was at 47% in 2008 quite large in Belgium. It was particularly high among women: 59% as opposed to 42% among men, and it was exceptionally high for young women: Over 70% of female 15-29 year-olds were highly educated. This reflects a rising demand for academics in the chemical industry. Their share (irrespective of gender) was 57% among the 25-29 year-olds, 55% in age group 30-34, but only 34% for the 50-54 year-olds. However, among the even older, it was again 46%, which might indicate that it is rather the highly educated, which are able and willing to work longer.

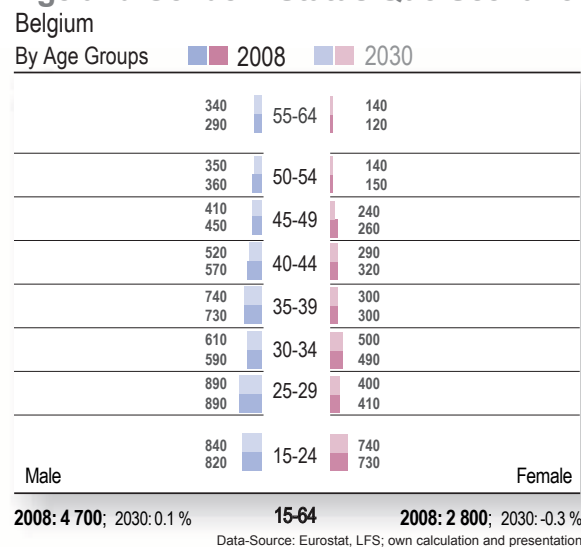
The number of academics is projected to stay almost constant (-0.4%) under the Status Quo Scenario, and

to increase by nearly 28% under the Trend Scenario. As the highly educated young and middle-aged employees are assumed to remain in the sector in the Trend Scenario, the share of academics in all employees is expected to grow to 50% in 2030.

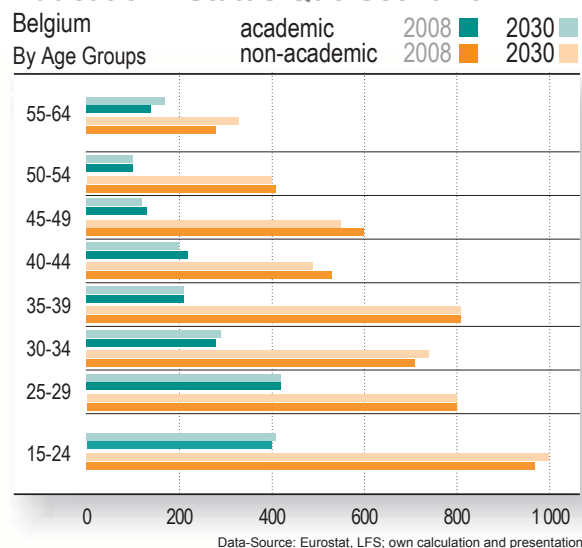
A relatively large share of older male employees worked as professionals and in higher management positions in 2008. Under the assumptions of the Status Quo Scenario, an increase in the number and share of males in these two professions is expected. However, as 80% of the employees were less than 50 years old in 2008, all other professions would be less represented by 2030. This should only be understood as a crude hint towards profession-specific aspects of demographic change.

The Chemical Industry: Unemployment Projection for Belgium

Age and Gender - Status Quo Scenario



Education - Status Quo Scenario



Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Professions - Status Quo Scenario

Belgium By Potential Employees	Share 2030		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	13.1%	1.5%	-0.8%	-1.9%
Clerks	4.8%	10.4%	0.1%	-1.4%
Plant and Machine Operators, Assemblers	25.6%	14.2%	-1.5%	-0.8%
Technicians and Associate Professionals	8.9%	5.7%	-0.2%	1.3%
Professionals	3.4%	2.7%	-0.3%	-1.1%
Legislators, Senior Officials, Managers	2.9%	2.3%	-3.1%	-5.3%
Other	4.5%	0.0%	-0.6%	n/a

Data-Source: Eurostat, LFS; own calculation and presentation

Similar to the working-age population, the number of unemployed persons will not change much between 2008 and 2030 under the Status Quo Scenario (-0.1%). The Unemployed Potential for the chemical industry is projected to encompass roughly 7 500 persons by 2030. Among them, 37% are expected to be female and over 50% are likely to be under the age of 35.

In 2008 some 26% of male unemployed and 46% of female unemployment were academics. The age group 25-29 will thereby remain the most educated group among the unemployed; 34% of them are projected to be highly educated in 2030.

At roughly 11%, a relatively large share of 2008 unemployed men and women was formerly working in

elementary occupations; among unemployed women, the share of former clerks was at around 10% also very high. The low projected share of females in elementary occupations, however, is due to the fact that only very few Belgian women in the chemical sector were working in this job category in 2008. The share of plant and machine operators and assemblers, in contrast, was large among both the employed and the unemployed in the chemical industry, resulting in high shares of these professions among the Unemployed Potential in 2030.

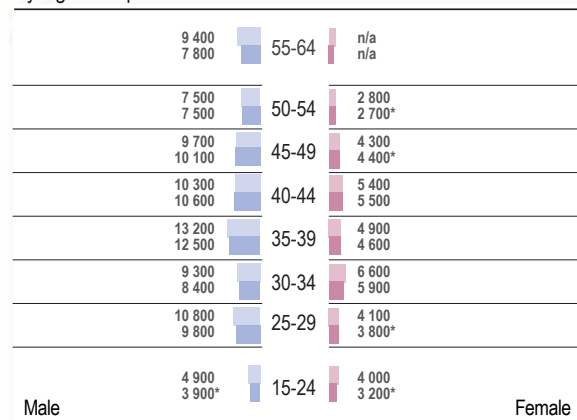
Although not considered in the model, part-time work can also be seen as an unused potential. On average, only 72% of all women in the sector were working full-time in 2008. This was the lowest share among the countries here considered.

The Chemical Industry: Active Potential Projection for Belgium

Age and Gender - Status Quo Scenario

Belgium

By Age Groups ■ 2008 ■ 2030



2008: 70 500; 2030: 6.4 % 15-64 2008: 32 200; 2030: 7.4 %

Data-Source: Eurostat, LFS; own calculation and presentation

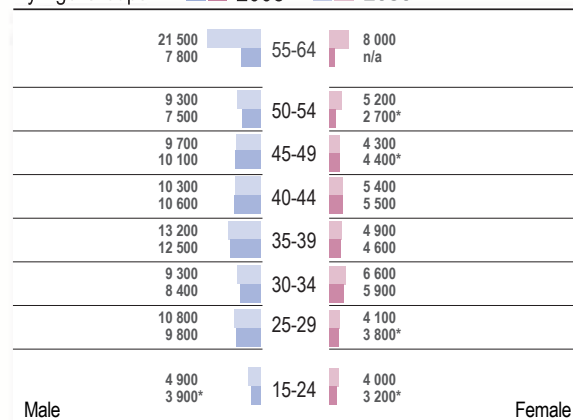
Projected Chemical Workers + Projected Unemployed Potential = Projected Active Potential

The Active Potential calculated for 2030 consists of the projected amount of chemical workers plus the projected number of unemployed persons; the latter were weighted by the share of chemical employees in all employees of the country to reflect their availability for the chemical sector. Thus, with 2.3% of all Belgian employees working in this sector, the estimated Unemployed Potential is also relatively high, as this was the largest share among the seven countries. Overall, drawing back on the potential of the unemployed could significantly influence the projected number of employees in 2030.

Age and Gender - Trend Scenario

Belgium

By Age Groups ■ 2008 ■ 2030



2008: 70 500; 2030: 26.0 % 15-64 2008: 32 200; 2030: 31.9 %

Data-Source: Eurostat, LFS; own calculation and presentation

If the full potential were to be used in 2030, the average growth rate of employees between 2008 and 2030 could reach 6.7% according to the Status Quo Scenario. The number of male workers would therefore increase by less than the average (6.4%), while the number of female workers more than the average (7.4%), implying a change in the gender structure of the workforce. The highest increase under this Scenario (+25%) would be seen in the youngest age group (15-24). The second highest increase (+22%) would be found among the oldest (55-64 years).

Under the Trend Scenario, the overall number of employees is projected to grow up to 28% (26% for men and nearly 32% for women). The largest growth could be found to occur in age group 55-64: 176% for

Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

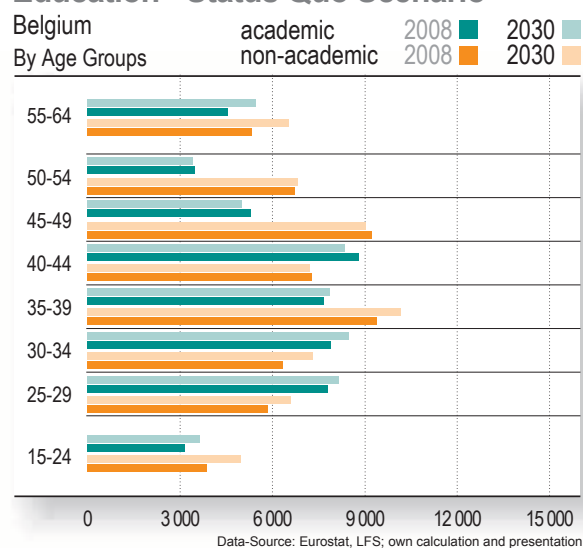
Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

male and 282% for female employees. The age structure would than show a pronounced shift towards older ages. By 2030, almost one-third of all employees would belong to age group 50-64 under the Trend Scenario, compared to 20% under the Status Quo Scenario. However, not all age groups are expected to grow; shrinkage by about 3% and 4% is still expected for age groups 40-44 and 45-49 in both Scenarios.

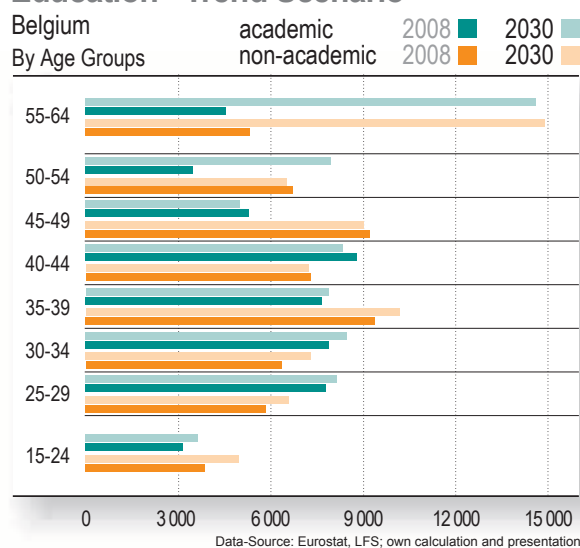
The share of the Unemployed Potential in all Belgian unemployed is the highest one among the seven countries studied. In 2008, the Unemployed Potential represented 2.3% of all unemployed persons in Belgium. Activating them could easily compensate the projected loss of employees until 2030.

The Chemical Industry: Active Potential Projection for Belgium

Education - Status Quo Scenario



Education - Trend Scenario



Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Professions - Status Quo Scenario

Belgium By Active Potential	Share 2030		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	4.4%	0.8%	22.3%	5.0%
Clerks	6.2%	9.5%	2.3%	6.0%
Plant and Machine Operators, Assemblers	18.7%	5.1%	9.2%	18.9%
Technicians and Associate Professionals	20.3%	8.4%	2.3%	4.2%
Professionals	9.0%	4.2%	4.1%	3.0%
Legislators, Senior Officials, Managers	8.0%	2.2%	2.9%	0.1%
Other	3.2%	0.0%	5.5%	n/a

Data-Source: Eurostat, LFS; own calculation and presentation

According to the Status Quo Scenario, the share of academics in all employees would decrease by one percentage point to 46% until 2030, if the whole potential were to be used. This is because the number of non-academics is likely to increase faster (+8.6%) among the Active Potential than the number of academics (+3.5%). Even though the overall number of employees would increase most strongly for the youngest age group, the highest increase of academics is likely to occur among the 55-64 year-olds; their number is estimated to grow by nearly 20%. Growth in the number of academics aged 15-24 years could, however, show second highest growth (+15.5%) until 2030.

Under the Trend Scenario, the share of academics could even increase to 49%, as the number of

academics would increase by roughly 32%, while that of non-academics by only 24%. Two thirds of all female employees would then be academics by 2030. However, even the inclusion of the Unemployed Potential into employment could not stop the ageing process of the workforce. The strongest increase in the number of academics until 2030 is projected for the older: 128% for age group 50-54 and 220% for age group 55-64.

All professions are likely to increase in numbers. The shares of most male professions, however, could shrink slightly compared to 2008; only the shares of plant and machine operators and assemblers and of men in elementary occupations are projected to increase until 2030.

The Chemical Industry: Conclusions for Belgium

Age and Gender: The Employed Potential

- Under the Status Quo Scenario, almost no change in employment (-0.5%) is expected in 2030 compared to 2008. In the Trend Scenario substantial employment growth would be possible (+20%).
- In 2008, 20% of all employees in the chemical sector were aged 50-64 in Belgium. This share could increase to 21% (35%) until 2030 under the Status Quo Scenario (Trend Scenario).
- The average female share in the chemical industry was and remains around 31% under both Scenarios
- Highest female share was found in age group 15-24 (44.8%) in 2008; in 2030, the highest share will be 44.5% and is found in the same age group.

Age and Gender: The Unemployed Potential

- Only the Status Quo Scenario was calculated. The Unemployed Potential would remain nearly constant until 2030 in this case.
- In 2008, the share of 50-64 year-olds in the Unemployed Potential was 12%. Only a slight increase to 13% is expected until 2030.
- At 37%, the overall female share is projected to remain nearly the same in 2008 and 2030.

Age and Gender: The Active Potential in 2030

- In the Status Quo Scenario (Trend Scenario), the Active Potential is projected to increase by 6.7% (28%) until 2030.
- The share of 50-64 year-olds in the Active Potential is likely to be 20% (33.5%) in 2030.
- At the same time, the average female share is projected to remain almost constant under both scenarios at around 32%.

Higher Education: The Employed Potential

- In the Status Quo Scenario, the number and share of academics is likely to stay constant, the latter at around 47%. In the Trend Scenario their numbers could grow by 28% and their share increase to 50% until 2030.
- Among the 50-64 year-olds, the academic share was only 40% in 2008. Under the Status Quo Scenario (the Trend Scenario), it will be 41% (52%) in 2030.
- The majority of women (59%) were academics in 2008; the situation is expected unchanged under the Status Quo Scenario. According to the Trend Scenario, 2/3 of women would be academics in 2030.

Higher Education: The Unemployed Potential

- The number of unemployed academics remains almost constant in 2008 and 2030.
- The average share of academics in the Unemployed Potential is estimated to lie at around 27% in 2030. The share of academics among the 50-64 year-olds nearly corresponds to this average.
- The share of academics among the female Unemployed Potential lies at 39% in 2008, a value hardly expected to change in 2030.

Higher Education: The Active Potential for 2030

- The number of academics in the Active Potential is estimated to grow by 3.5% (31.6%) until 2030. Their share in all employees will then amount to 46% (49%).
- At the same time, their share among the 50-64 year-olds is expected to be at 40% (51%).
- The average academic share among females in the Active Potential is at 57%, expected much higher than the average in 2030. The same is true under the Trend Scenario with a female academic share of 65%.

Professions: The Employed Potential

- Under its assumptions in 2030 more male employees would work as professionals and in higher management positions than in 2008.
- The lowest growth rate is projected for women in elementary occupations, as they were primarily present in the shrinking age group of 40-49 year-olds.

Professions: Unemployed and Active Potential

- The 2030 share of plant and machine operators and assemblers is estimated relatively high in the Unused Potential. The same applies to female clerks and men working in elementary occupations.
- If the Unemployed Potential were fully used by 2030, no profession would have to incur losses, while their shares will shift slightly towards the shares of the formerly unemployed.

GENERAL CONCLUSIONS

Demographic change is projected to have only a small impact on the future number of employees in the Belgian chemical industry. Even if the current age structure was kept constant, projected shrinkage could be easily compensated by the labour market.

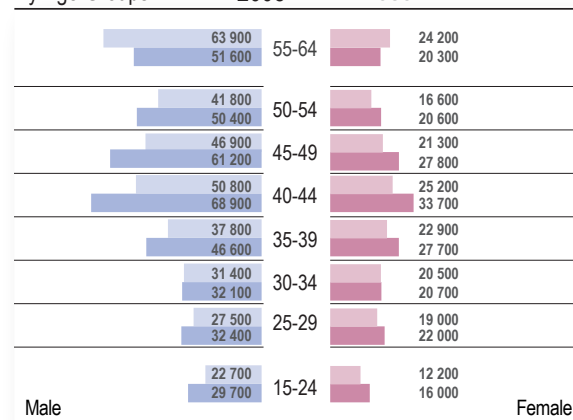
Belgium had the second lowest share of women working in the chemical industry. 72% of them were working full-time in 2008; this was the lowest share among the seven countries studied. But women in the chemical industry are on average highly educated: 59% of them were academics compared to 40% of all male employees in 2008. Given the trend to higher education, it could be beneficial for Belgian firms to attract more female workers to this industry.

The Chemical Industry: Employment Projection for Germany

Age and Gender - Status Quo Scenario

Germany

By Age Groups ■ 2008 ■ 2030



2008: 372 900; 2030: -13.4 % ■ 15-64 ■ 2008: 188 700; 2030: -14.2 %
 Data-Source: Eurostat, LFS; own calculation and presentation

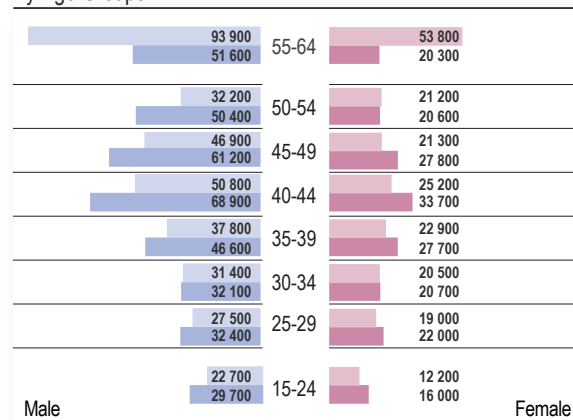
The German chemical industry employed about 562 000 people aged 15-64 in the chemical industry in 2008. The lowest number of employees was found among the 15-24 year-olds (8% of all employees), the highest in age groups 40-44 and 45-49 (representing 18% and 16% of all employees). The older age groups (50-64) made up for 27% of all male and 22% of all female employees.

The average female share in the chemical industry was 33% in 2008, with higher values for younger and lower values for older age groups. Age group 25-29 had at 40% the highest share of females in an age group, while lower than average shares of women were found among the 50-54 (29%) and the 55-64 year-olds (28%).

Age and Gender - Trend Scenario

Germany

By Age Groups ■ 2008 ■ 2030



2008: 372 900; 2030: -8.0 % ■ 15-64 ■ 2008: 188 700; 2030: +4.0 %
 Data-Source: Eurostat, LFS; own calculation and presentation

Under the Status Quo Scenario, higher shrinkage is expected in the number of employees in the chemical sector (-14%) than in the working-age population of Germany (-12%). This is because the only active age group that is likely to increase in Germany (the 55-64 years), is weakly represented in the chemical industry at present. All other working-age groups are projected to decrease between 2008 and 2030.

Under the assumptions of the Status Quo Scenario, the share of women in the chemical industry will at 33% in 2030 remain close to its value of 2008. The share will be slightly higher than in 2008 for age groups 50+, while the share of females in the age groups younger than 50 is projected to be below their values of 2008

Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

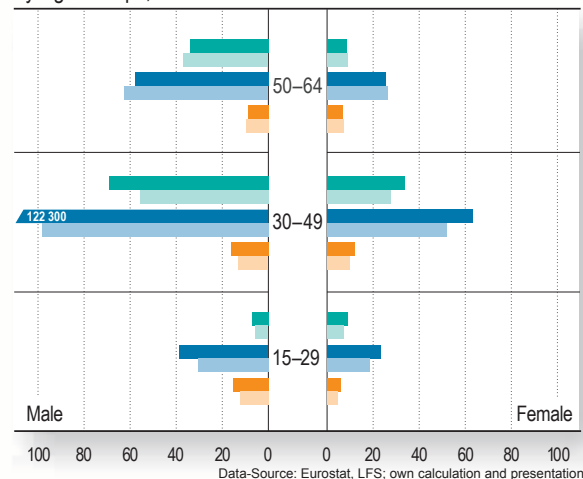
A decline of 4% in the number of employees is expected through 2030 under the Trend Scenario. If the current young and middle-aged employees are kept until retirement, the number of older workers (55-64) would double, without compensating for the shrinkage of all younger age groups. On average, the number of men is likely to shrink by 8% and that of women to increase by 4%, as women in older ages are currently underrepresented. However, among the 55-64 year-olds the number of men will increase by 82% and that of women by 165%.

As the number of women will increase more strongly than the number of men under the assumptions of the Trend Scenario, women would represent a third (36%) of the chemical industry's labour force by 2030.

The Chemical Industry: Employment Projection for Germany

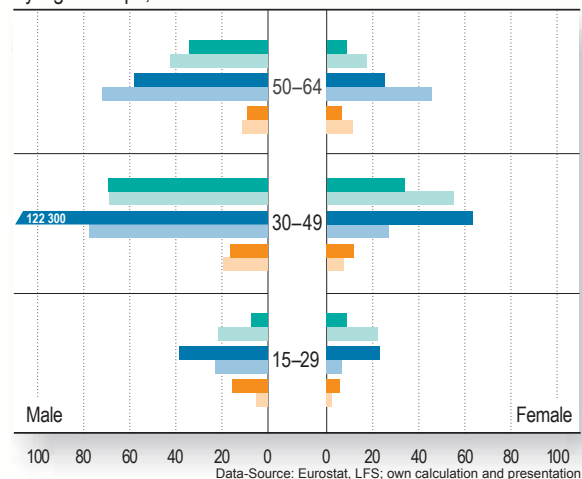
Education – Status Quo Scenario

Germany
By Age Groups, in 1000



Education – Trend Scenario

Germany
By Age Groups, in 1000



Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-olds of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Professions - Status Quo Scenario

Germany By Employees	Share 2008		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	3.9%	3.4%	-13.9%	-16.0%
Clerks	5.7%	8.0%	-14.6%	-14.3%
Plant and Machine Operators, Assemblers	20.2%	4.5%	-14.2%	-13.7%
Technicians and Associate Professionals	12.5%	10.4%	-12.7%	-14.1%
Professionals	10.1%	4.8%	-12.5%	-13.4%
Legislators, Senior Officials, Managers	6.0%	1.6%	-12.1%	-13.1%
Other	8.3%	0.6%	-13.8%	-19.1%

Data-Source: Eurostat, LFS; own calculation and presentation

The average share of academics among all employees in the German chemical industry was 29% in 2008. Among female employees it was 27%, whereby women represented 31% of all academics in the sector. These are intermediate values compared to the other six countries studied. At 39% and 33%, high shares of academics were found in age groups 30-34 and 35-39. In age group 50-64 the share of academics was at 30% one percentage point above the average in 2008, while it was low among the 15-24 year-olds (below 5%). Over 50% of young academics (15-29) were female.

The number of highly educated employees is expected to shrink by 13%, if age specific shares of employees in total population were to remain constant through 2030 (Status Quo Scenario). However, neither the share of

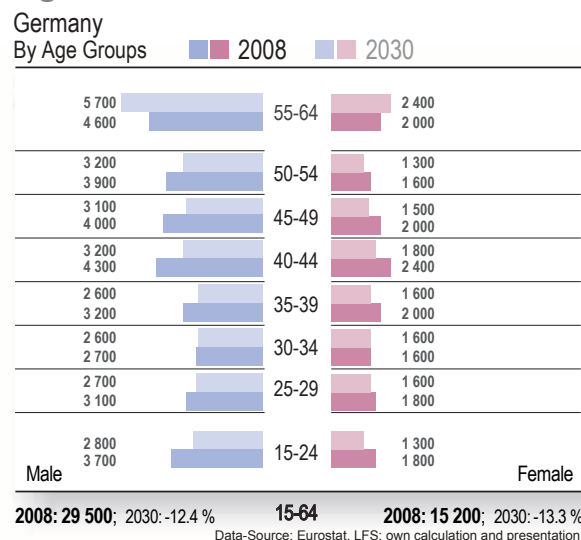
academics in all employees nor that of academics among older employees and among females would change much under this scenario.

Under the Trend Scenario, the overall number of academics could increase by 42% between 2008 and 2030. The share of academics in all employees would then increase from 29% to 43% and the academic share in female employees from 27% to 49%.

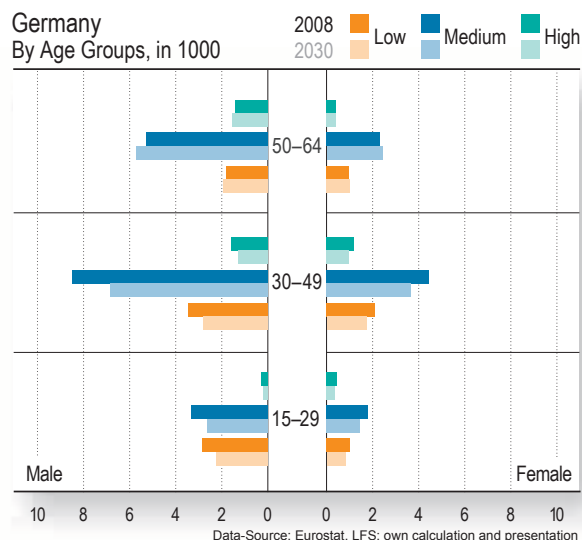
Compared to the other six countries, a large share of male employees worked as craft and related trades workers (subsumed under Other), and as plant and machine operators and assemblers in 2008. As nearly all age groups shrink, all professions are likely to decline as well.

The Chemical Industry: Unemployment Projection for Germany

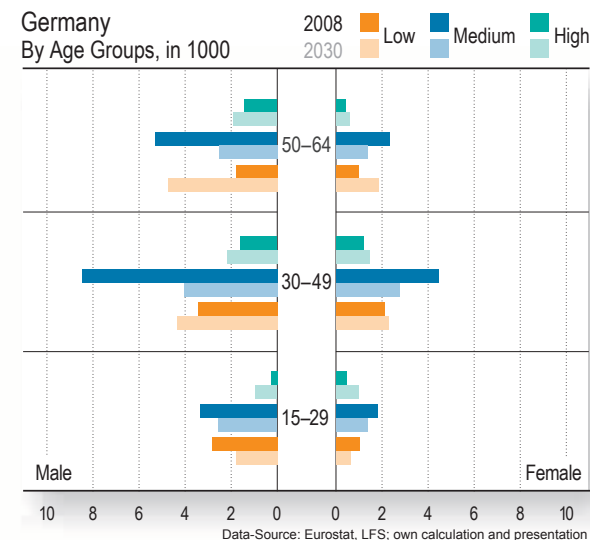
Age and Gender - Status Quo Scenario



Education – Status Quo Scenario



Education – Trend Scenario



Professions - Status Quo Scenario

Germany By Potential Employees	Share 2030		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	9.8%	7.3%	-12.6%	-12.5%
Clerks	5.8%	7.6%	-13.0%	-12.7%
Plant and Machine Operators, Assemblers	27.3%	7.6%	-12.1%	-13.4%
Technicians and Associate Professionals	6.7%	6.2%	-10.5%	-11.6%
Professionals	3.2%	2.0%	-8.3%	-11.0%
Legislators, Senior Officials, Managers	3.4%	1.3%	-4.8%	-9.5%
Other	10.9%	0.9%	-13.4%	-14.1%

Data-Source: Eurostat, LFS; own calculation and presentation

For an estimation of the Unemployed Potential for the chemical industry, only the Status Quo Scenario was considered. This potential is expected to shrink by nearly 13% in numbers between 2008 and 2030, amounting to 39 000 in 2030. The share of 50-64 year-olds among them was 27% in 2008, and thus higher than among employees in the chemical industry. Through 2030, it is expected to grow to 32%. At the same time, the overall female share is projected to remain at roughly 34%.

For an estimation of the educational composition of the Unemployed Potential, both the Status Quo and the Trend Scenario were considered. The number of academics among the potential is expected to shrink by 9.5% under the Status Quo Scenario. The academic

share in the Unemployed Potential would then amount to 13% in 2030, with values slightly higher for age group 50-64 (15%), and for women (14%).

Under the Trend Scenario, the number of academics could increase by 50%. The academic share in the potential would then amount to 21%. Age group 50-64 would show the average value in the sector in 2030, and women an above average share of academics (23%).

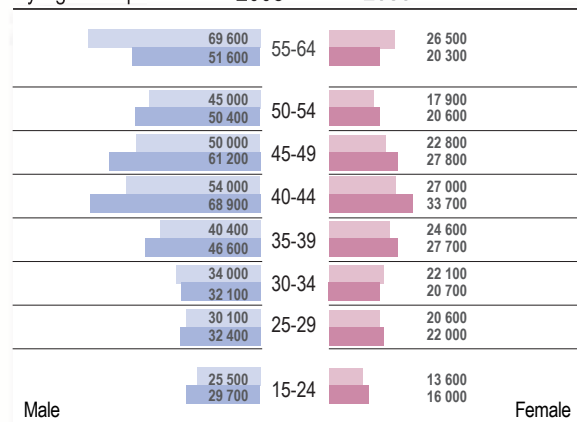
Under the Status Quo Scenario, the available number of skilled labour will decrease for all professions. The strongest decrease will be found for craft and related trades workers ("Other" in the table). Male plant and machine operators and assemblers are likely to represent 27.3% of all Unemployed Potential in 2030.

The Chemical Industry: Active Potential Projection for Germany

Age and Gender - Status Quo Scenario

Germany

By Age Groups ■ 2008 ■ 2030

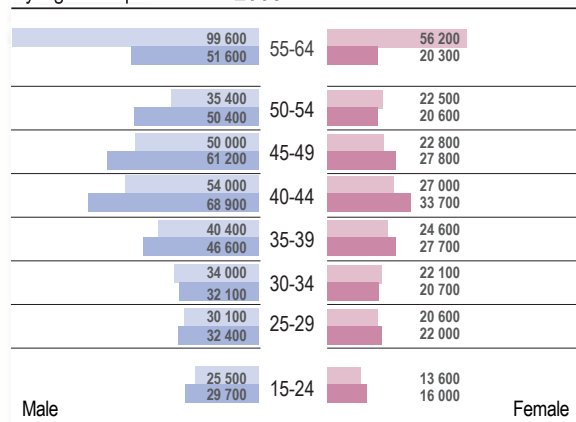


2008: 372 900; 2030: -6.5 % **15-64** 2008: 188 700; 2030: -7.2 %
Data-Source: Eurostat, LFS; own calculation and presentation

Age and Gender - Trend Scenario

Germany

By Age Groups ■ 2008 ■ 2030



2008: 372 900; 2030: -1.0 % **15-64** 2008: 188 700; 2030: 11.0 %
Data-Source: Eurostat, LFS; own calculation and presentation

Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

$$\begin{aligned} &\text{Projected Chemical Workers} \\ + &\text{Projected Unemployed Potential} \\ = &\text{Projected Active Potential} \end{aligned}$$

With about 1.5% of all German employees working in the chemical industry, the estimated size of the Unemployed Potential for this sector is also relatively high, compared with the situation in the other countries studied. Overall, drawing back on the potential of the unemployed is not likely to completely compensate the projected loss of employees under the Status Quo Scenario between 2008 and 2030. Only if the current young and middle-aged employees, particularly females, were kept in the chemical sector until the official retirement age, the chemical sector could be stopped from shrinking.

If the full potential were to be used in 2030, shrinkage in the chemical sector would be reduced to its half under the Status Quo Scenario. The decline in the number of males (-6.5%) is weaker than for females (-7.2%), as males were next to other reasons also more present in the age group with the strongest growth (age group 55-64). Looking at particular age groups, the formerly expected decrease in the number of female employees aged 30-34 years may be fully compensated by resorting to the Unemployed Potential. At the same time, the number of 55-64 year-olds is projected to increase by 39% until 2030, as opposed to 22% without the full use of the Unemployed Potential.

Under the Trend Scenario, the number of employees

could even increase (by +3%), if the full Active Potential were to be used by 2030. This is entirely due to the increase in female employees (+11%), as the number of males is likely to shrink by 1%. Age group 55-64 is projected to have the largest growth rate: at 117%, it will be nearly three times as high as in the Status Quo Scenario.

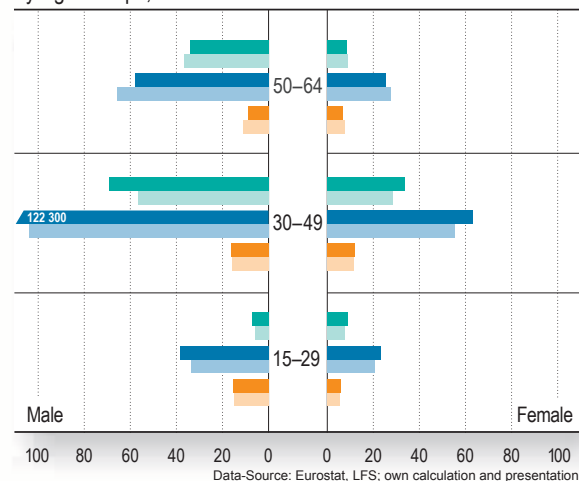
Nevertheless, in both scenarios the share of 50-64 year-olds, as well as the average female share in all employees in 2030 will remain quite similar to the values found without the use of the Unemployed Potential. The highest age-specific female share in the Active Potential of year 2030 would still be found in age group 25-29, although on the higher level of nearly 41%.

The Chemical Industry: Active Potential Projection for Germany

Education – Status Quo Scenario

Germany
By Age Groups, in 1000

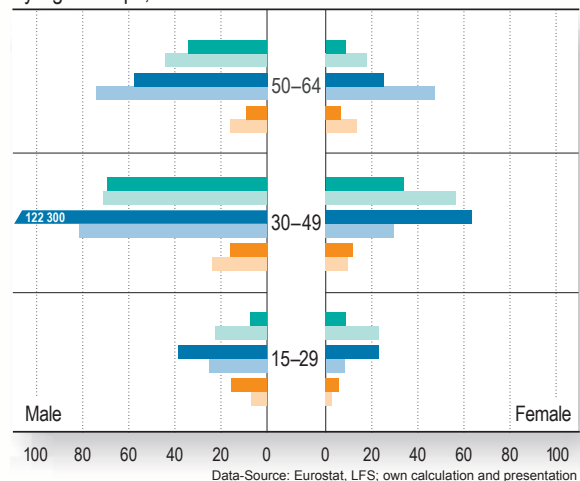
2008 2030
Low Medium High



Education – Trend Scenario

Germany
By Age Groups, in 1000

2008 2030
Low Medium High



Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Professions - Status Quo Scenario

Germany By Active Potential	Share 2030		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	4.3%	3.6%	4.4%	-0.6%
Clerks	5.7%	7.9%	-7.4%	-7.4%
Plant and Machine Operators, Assemblers	20.7%	4.7%	-4.4%	-1.5%
Technicians and Associate Professionals	12.1%	10.1%	-8.9%	-9.8%
Professionals	9.7%	4.6%	-10.2%	-10.4%
Legislators, Senior Officials, Managers	5.9%	1.6%	-7.9%	-7.3%
Other	8.5%	0.6%	-4.3%	-8.3%

Data-Source: Eurostat, LFS; own calculation and presentation

With the Unemployed Potential in the Status Quo Scenario, the number of highly educated employees is likely to shrink by approximately 10% until 2030, which is 12% for females and almost 10% for males in academia. The shrinkage will thus be three percentage points lower than without the use of the Unemployed.

In contrast to the decrease in the Status Quo Scenario, the number of academics in the Trend Scenario increases by 47% until 2030. The increase steams exclusively from highly educated women, as the number of highly educated men is projected to remain nearly constant (-1%) until 2030 in this scenario.

Employing the unemployed would exert a uniform influence on the German chemical industry's labour

force in 2030: The shares of academics in all employees as well as their shares in all females would fall roughly one percentage point below their respective shares in the employment projection under both scenarios. The same development is expected for the share of highly educated 50-64 year-olds.

The Unemployed Potential may compensate the decrease in the number of males in elementary occupations. The available workforce for all other professions is projected to decline in the Status Quo Scenario. This will, however, not severely affect the number of female employees in elementary occupations and plant and machine operators and assemblers, as their absolute numbers are likely to decrease by only 0.6% and 1.5%, respectively.

The Chemical Industry: Conclusions for Germany

Age and Gender: The Employed Potential

- An employment decline of 14% (4%) is projected between 2008 and 2030 for the Status Quo Scenario (Trend Scenario).
- Concurrently, the share of employees aged 50-64 is expected to grow from 25% to 30% (37%) by 2030.
- In the Status Quo Scenario, the average female share in the chemical industry will remain at 33% nearly the same as in 2008; it could also grow to 36% if the Trend Scenario were to prevail.
- The highest female share was found in age group 25-29 at 40% in 2008; in 2030, the highest share is found in the same age group at 41%.

Age and Gender: The Unemployed Potential

- The Unemployed Potential will shrink by nearly 13% from 2008 to 2030 in the Status Quo Scenario.
- The share of 50-64 year-olds in the whole Unemployed Potential was 27% in 2008 and is expected at 32% by 2030.
- At nearly 34%, the overall female share is projected to remain nearly the same in 2008 and 2030.

Age and Gender: The Active Potential in 2030

- If the full potential is used in 2030, the chemical sector is in terms of employment likely to change between -7% in the Status Quo Scenario to +3% under the Trend Scenario over the period 2008-2030.
- The share of 50-64 year-olds and the average female share in all employees are not expected to change much compared to the Employed Potential projection under both scenarios.
- The highest age-specific female share is still found in age group 25-29 at nearly 41% in 2030.

Higher Education: The Employed Potential

- The number of academics will change by -13% (+42%) until 2030 in the Status Quo Scenario (Trend Scenario).
- Their share in all employees was and remains at 29% in 2030 in the Status Quo Scenario, while it could increase to 43% under the Trend Scenario.
- The academic share in age group 50-64 was 30% in 2008 and is likely to remain at/grow to 30% (33%).
- 27% of all females were academics in 2008; this share is not likely to change in the Status Quo Scenario, but could increase to 48% under the Trend Scenario.

Higher Education: The Unemployed Potential

- The number of academics is expected to change by -9.5% (+50%) between 2008 and 2030 in the Status Quo Scenario (Trend Scenario).
- The academic share in the Unemployed Potential is expected to be 13% (21%) in 2030.
- At the same time, the academic share in age group 50-64 is projected to be 15% (21%).
- High educational levels were found in 14% of the unemployed female potential in 2008; this share is expected to grow up to 23% by 2030 (Trend Scenario).

Higher Education: The Active Potential in 2030

- The number of highly educated employees is expected to change by -10% (+47%) in the Status Quo Scenario (Trend Scenario) between 2008 and 2030.
- The academic share in all employees is estimated to be 28% (42%) in 2030.
- At the same time, the academic share among age group 50-64 is estimated to be 29% (33%).
- An average of 26% (47%) of all female employees is projected to work in academic professions in 2030.

Professions: The Employed Potential

- A decline in numbers is projected for all occupations, as only the group of 55-64 year-olds is likely to increase.
- The highest shrinkage in numbers is expected for plant and machine operators and assemblers.

Professions: Unemployed and Active Potential

- Under the assumptions of the Status Quo Scenario, a large share of the Unemployed Potential would consist of plant and machine operators and assemblers in 2030.
- Even if the Unemployed Potential was fully used by 2030, only male elementary occupations could be stopped from shrinking. However, the decline among plant and machine operators and assemblers could be reduced to less than half.

GENERAL CONCLUSIONS

Demographic change is projected to have a strong impact on future labour availability for the chemical industry in Germany. Only in the most optimistic case (Trend Scenario), where there is a strong increase in the number of 55-64 year-old female employees, could the chemical sector be stopped from shrinking.

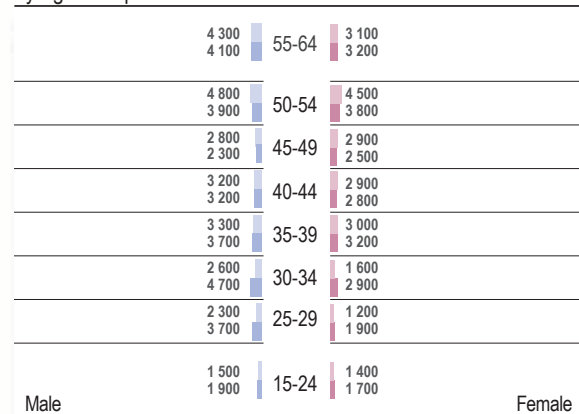
An increase in the share of full-time employed women could create an additional employment potential. The share was 73% in 2008, which is relatively low compared to the other six countries. All in all, female employees play an important role in keeping the number of employees in the chemical industry from shrinking. It could therefore be beneficial for German firms to make it more attractive for female workers to join and stay with the chemical industry.

The Chemical Industry: Employment Projection for the Czech Republic

Age and Gender - Status Quo Scenario

Czech Republic

By Age Groups ■ 2008 ■ 2030

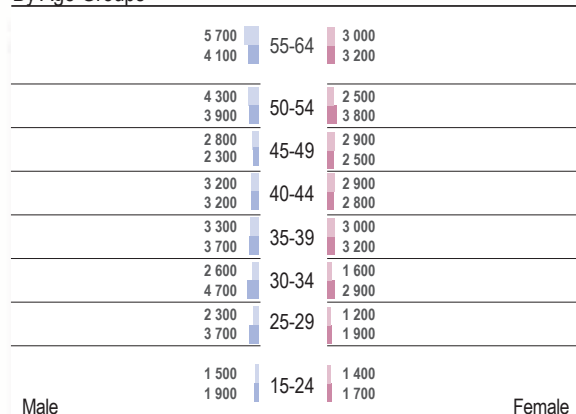


2008: 27 400; 2030: -9.2 % 15-64 2008: 22 000; 2030: -5.8 %
 Data-Source: Eurostat, LFS; own calculation and presentation

Age and Gender - Trend Scenario

Czech Republic

By Age Groups ■ 2008 ■ 2030



2008: 27 400; 2030: -6.1 % 15-64 2008: 22 000; 2030: -15.6 %
 Data-Source: Eurostat, LFS; own calculation and presentation

Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

The Czech chemical industry employed roughly 49 000 persons in 2008. Among them, the 55-64 year-old employees were more numerous than those of age 15-24; nearly 30% of all employees were between 50-64 years old (29% of all male and 32% of all female employees), while age group 15-24 represented only 7.3% of all workers in the sector.

The average female share in the sector was 44%, which is the highest value among the seven countries in 2008. At 51%, the largest age-specific share of females was found in age group 45-49. The female share among the 50-64 year-olds was with 47% also above the sectoral average in 2008. At the same time, the lowest share of females was at 34% found for age group 25-29.

According to Eurostat, numbers in age group 15-64 are expected to decrease by 9.0% until 2030, while the number of chemical employees is projected to shrink by 7.7% (Status Quo Scenario) in the Czech Republic. The difference is due to a higher share of older age groups in the chemical sector than in the working-age population, as all male and most female age groups older than 39 years are expected to increase between 2008 and 2030.

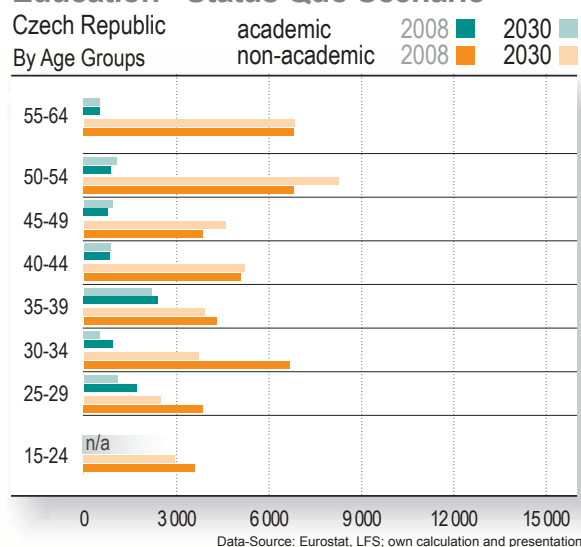
The average female share is likely to increase by one percentage point to 45% in 2030 in the Status Quo Scenario. The female age-specific shares for all age groups under 50 will increase slightly, while the shares of women aged 50+ years are expected to equal the average female share in 2030.

For the Trend Scenario, compared to the Status Quo Scenario, an even higher decrease of 10% is expected over the period 2008 - 2030, because the number of middle-aged women was relatively low compared to the number of older female employees in 2008. Thus, a particularly strong decrease is expected for women (-16%), while the number of men is projected to shrink by 6%. For the older ages (50-64), the number of males could increase by one quarter, while the number of females is projected to shrink by 22% until 2030.

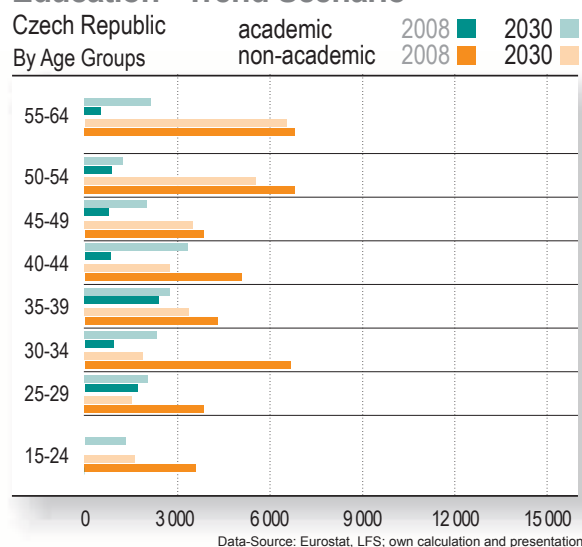
The average female share would decrease to 42% under the Trend Scenario until 2030, with the age-specific decrease being particularly strong for age group 50-64 years (from 47% to 35%).

The Chemical Industry: Employment Projection for the Czech Republic

Education - Status Quo Scenario



Education - Trend Scenario



Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-olds of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Professions - Status Quo Scenario

Czech Republic By Employees	Share 2008		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	2.2%	1.1%	-16.0%	-0.6%
Clerks	2.2%	5.0%	-6.2%	-2.0%
Plant and Machine Operators, Assemblers	13.7%	15.6%	-11.1%	-2.8%
Technicians and Associate Professionals	17.0%	15.6%	-11.8%	-8.9%
Professionals	5.8%	4.7%	-23.5%	-10.1%
Legislators, Senior Officials, Managers	5.7%	1.7%	6.2%	-0.9%
Other	8.9%	0.9%	-1.4%	-15.5%

Data-Source: Eurostat, LFS; own calculation and presentation

The Czech chemical industry had the lowest shares of highly educated men and women among the seven countries in 2008, amounting to roughly 16% each. At 31% and 36% the share of academics was high in age groups 25-29 and 35-39, while the share of academics among the 50-64 year-olds was at 9% very low, particularly among women (6.5%).

The chemical industry would lose about 11% of their highly educated employees, if it decided to keep its age-specific shares of population constant through 2030 (Status Quo Scenario). The share of academics in all employees would, however, remain nearly the same. As there will be a stronger decrease in the number of men than of women in academia, the female share in academic professions would grow from 45% to 46%.

If the educational level of the Czech Republic would equal that of Belgium's by 2030 and all of its employees were kept until the official retirement age (Trend Scenario), the overall number of academics in the chemical industry could more than double (+113%). The share of academics in all employees could then be expected to increase from 16% to 39%, with 54% of them estimated to be female.

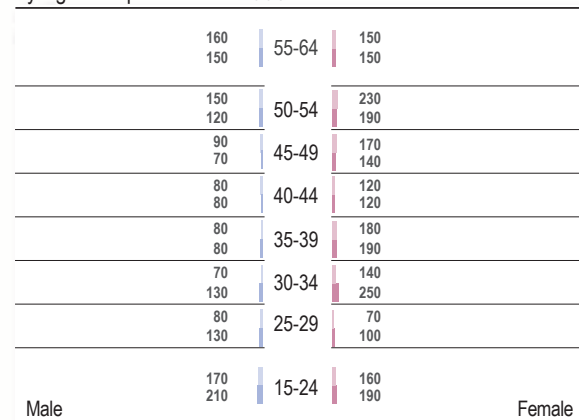
Compared to the other six countries, a large share of female employees worked as plant and machine operators and as technicians and associate professionals in 2008. If labour demand and supply remained the same, growth could only be expected in higher management positions, as only age groups 40 and older will increase in numbers.

The Chemical Industry: Unemployment Projection for the Czech Republic

Age and Gender - Status Quo Scenario

Czech Republic

By Age Groups 2008 2030



2008: 970; 2030: -10.4% 15-64 2008: 1 300; 2030: -9.4%

Data-Source: Eurostat, LFS; own calculation and presentation

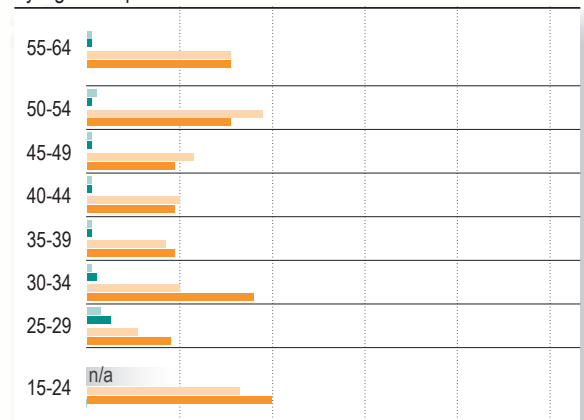
Education - Status Quo Scenario

Czech Republic

By Age Groups

academic
non-academic

2008 2030
2008 2030



0 200 400 600 800 1000

Data-Source: Eurostat, LFS; own calculation and presentation

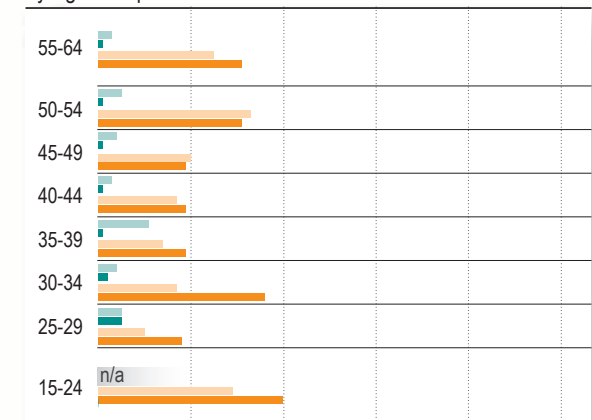
Education - Trend Scenario

Czech Republic

By Age Groups

academic
non-academic

2008 2030
2008 2030



0 200 400 600 800 1000

Data-Source: Eurostat, LFS; own calculation and presentation

Professions - Status Quo Scenario

Czech Republic

By Potential Employees

Share 2030

Growth 2008-2030

	Share 2030		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	8.6%	4.4%	-13.1%	-4.9%
Clerks	2.4%	5.3%	-23.1%	-12.3%
Plant and Machine Operators, Assemblers	12.0%	30.4%	-12.9%	-10.1%
Technicians and Associate Professionals	7.4%	10.8%	-6.7%	-10.8%
Professionals	2.0%	2.2%	-10.0%	-20.0%
Legislators, Senior Officials, Managers	1.2%	2.7%	1.6%	-18.9%
Other	8.8%	1.9%	-7.7%	-11.1%

Data-Source: Eurostat, LFS; own calculation and presentation

The Unemployed Potential amounted to about 2 300 unemployed persons in 2008 and is projected to decrease by 10% until 2030. Most age groups older than 39 will increase while younger age groups are estimated to shrink. The female share in 2030 will remain very close to its value in 2008, with the majority (58%) of all Unemployed Potential being female.

The number of academics among the Unemployed Potential is projected to shrink by 19% to about 100 people until 2030 (Status Quo Scenario), although their share will remain at 5% nearly the same as in 2008. If the Czech educational level in the sector equalled that of Belgium in 2030 (Trend Scenario), the number of academics would increase by nearly 200% until 2030. The academic share in the Unemployed

Potential would then amount to almost 18%, with 23.5% of women being highly educated in this scenario, as opposed to 5% in 2008.

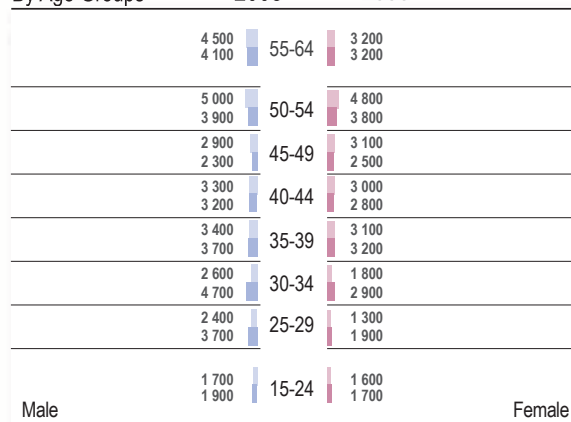
A large share of women in the Unemployed Potential consists of plant and machine operators and assemblers, because a high demand for these employees was estimated in the chemical industry. Furthermore, the number of female technicians and associate professionals was high among all unemployed, as well as within the chemical industry, resulting also in high shares of this profession as potential for the industry. Strongest shrinkage is estimated for male clerks and female professionals, as the majority of them were less than 40 years old and thus projected to shrink until 2030.

The Chemical Industry: Active Potential Projection for the Czech Republic

Age and Gender - Status Quo Scenario

Czech Republic

By Age Groups 2008 2030

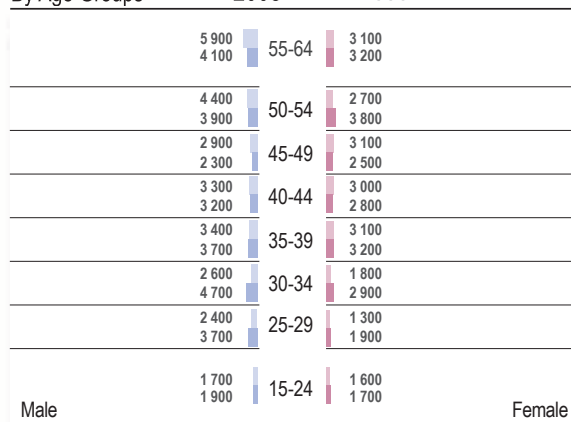


2008: 27 400; 2030: -6.0 % 15-64 2008: 22 000; 2030: -0.4 %
Data-Source: Eurostat, LFS; own calculation and presentation

Age and Gender - Trend Scenario

Czech Republic

By Age Groups 2008 2030



2008: 27 400; 2030: -2.9 % 15-64 2008: 22 000; 2030: -10.2 %
Data-Source: Eurostat, LFS; own calculation and presentation

Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Projected Chemical Workers + Projected Unemployed Potential = Projected Active Potential

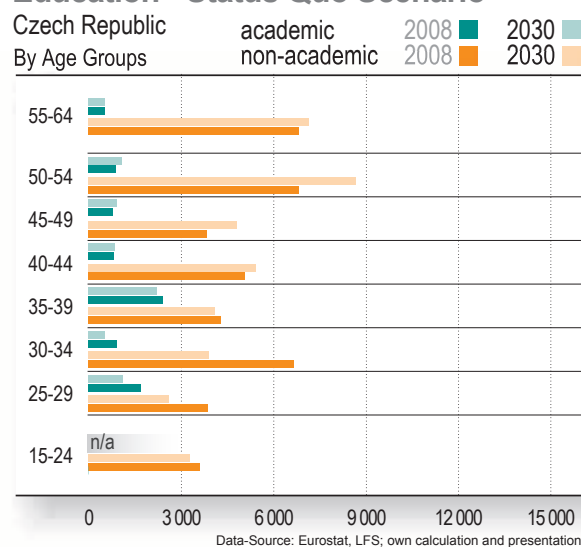
The projected number of chemical workers together with the Unemployed Potential make up the Active Potential, whereby the unemployed are weighted by the share of chemical employees in all Czech employees, in order to reflect their availability for the chemical sector. With less than 1% of all Czech employees working in this sector, the estimated number of the Unused Potential is relatively low compared to the other six countries. Overall, drawing back on the potential of the unemployed is not likely to compensate the projected loss of employees under the conditions of the demographic change.

If the full potential were to be used in 2030, the expected decrease of employees could be reduced to 3.5% according to the Status Quo Scenario. Shrinkage among males would then amount to 6% and the number of females would remain nearly constant (-0.4%). The average female share of the sector would therefore increase further to nearly 46%. The highest growth rate would again be found among the 50-54 year-olds (+27% until 2030). Recurring to the Unemployed Potential could fully compensate the expected decrease of female employees aged 55-64, and reduce shrinkage of the youngest age group (15-24) from 18% to 9%. At the same time, the share of 50-64 year-olds in all employees in 2030 will not be influenced much with the consideration of the Unemployed Potential.

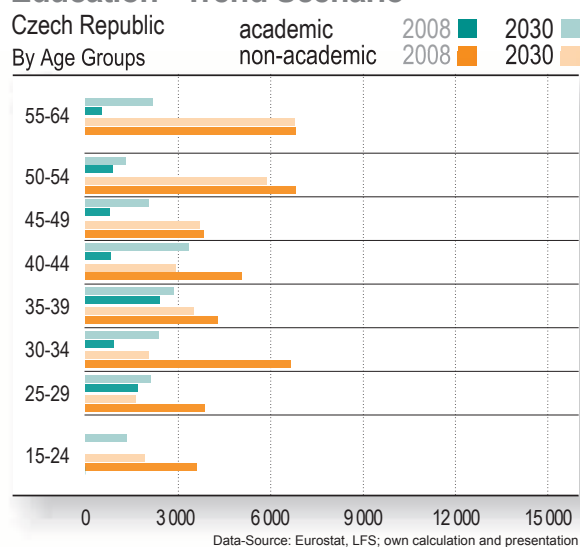
For the Trend Scenario, the number of employees is projected to shrink by 3% for men, 10% for women and about 6% in total. In contrast to the Status Quo Scenario, the Active Potential of the 50-54 year-olds is projected to shrink by nearly 7% until 2030, due to a 28% decline in the number of women. The number of women aged 55-64 years will also decrease (-2.9%), while the total number of persons in age group 55-64 is likely to grow by 22%. The average share of women in the industry would at 43% be slightly higher than without making use of the full Active Potential; the same would be true at 36% for the share of women in age group 50-64. At the same time, the share of employees aged between 50 and 64 is at 35% by 2030 not likely to change much under the influence of the Unemployed Potential.

The Chemical Industry: Active Potential Projection for the Czech Republic

Education - Status Quo Scenario



Education - Trend Scenario



Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-olds of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Professions - Status Quo Scenario

Czech Republic By Active Potential	Share 2030		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	2.3%	1.3%	-1.4%	14.3%
Clerks	2.2%	5.3%	-2.2%	2.0%
Plant and Machine Operators, Assemblers	13.1%	16.9%	-7.8%	4.4%
Technicians and Associate Professionals	15.9%	15.2%	-10.1%	-6.4%
Professionals	4.7%	4.5%	-22.3%	-8.3%
Legislators, Senior Officials, Managers	6.3%	1.8%	7.1%	5.1%
Other	9.5%	0.9%	2.2%	-7.9%

Data-Source: Eurostat, LFS; own calculation and presentation

Factoring in the Unemployed Potential in the Status Quo Scenario, the number of academics is likely to decrease by 9.5% compared to 11% without the use of the unemployed. At the same time, the shares of academics in all employees and in all females are slightly below the shares of the employment projection. Furthermore, the share of academics among the 50-64 year-olds remains at 9.3% close to its 2030 value without the Unemployed Potential.

If the educational level of the Active Potential equalled that of Belgium's by 2030 (Trend Scenario), the number of academics could more than double (+118%), with the highest increase found in age group 55-64 (+314%). The share of academics in all employees as well as in all female employees would then in

2030 be roughly one percentage point lower than without the consideration of the Unemployed Potential. Nearly half of the female employees could therefore be academics, with the average academic share in all employees amounting to 38% in 2030. The academic share of the 50-64 year-olds would at 21.5% also remain close to its former value for 2030.

In most professions of the chemical industry, the Unemployed Potential would not compensate for the decline in the number of males. The decreasing availability in several "female" professions could, however, be compensated, as the majority of the Unemployed Potential is projected to be female. This applies particularly to female plant and machine operators and assemblers.

The Chemical Industry: Conclusions for the Czech Republic

Age and Gender: The Employed Potential

- An employment decline of 8% (10%) is projected between 2008 and 2030 for the Status Quo Scenario (Trend Scenario).
- At the same time, the share of employees aged 50-64 is expected to grow from 31% to 37% (35.0%).
- In the Status Quo Scenario, the average female share in the chemical industry will rise by one percentage point to 45% in 2030; it could also shrink to 42% if the Trend Scenario were to prevail.
- The highest female share in 2008 was found in age group 45-49 at 52%; this is expected to remain true in 2030 as well, although with a slight projected decrease (51%).

Age and Gender: The Unemployed Potential

- The Unemployed Potential will shrink by almost 10% from 2008 to 2030 in the Status Quo Scenario.
- The share of 50-64 year-olds in the Unemployed Potential was 27% in 2008 and is expected to increase to 33% until 2030.
- At nearly 58%, the overall female share is projected to remain nearly the same between 2008 and 2030.

Age and Gender: The Active Potential in 2030

- The chemical sector is expected to shrink by 3.5% (6%) until 2030 if the full potential is used in the Status Quo Scenario (Trend Scenario).
- The share of 50-64 year-olds in the Active Potential is predicted to be 37% (35%) by 2030.
- At the same time, the average female share is expected to be 46% (43%).
- At 51-52%, the highest female share is likely to be found in age group 45-49.

Higher Education: The Employed Potential

- The number of academics shrinks by -11% until 2030 under the assumptions of the Status Quo Scenario, and increases by 113% under the Trend Scenario.
- Their share in all employees was nearly 17% in 2008 and is projected to be 16% (39%) in 2030.
- The academic share was 9% for age group 50-64 in 2008; it is estimated to be 9.6% (22%) in 2030.
- In 2008, only 16.5% of all women were academics; this share is expected to develop to nearly 16% (50%) until 2030.

Higher Education: Unemployed Potential

- The number of academics in this group is projected to grow by 19% (+199%) between 2008 and 2030 in the Status Quo Scenario (Trend Scenario).
- In 2030, the academic share in the Unemployed Potential is expected to be 5% (18%).
- Concurrently, the academic share in age group 50-64 is projected to be 3% (12%).
- A high educational level of 5.2% was found among the unemployed female potential in 2008; this share is expected to shrink (grow) to 5.0% (24%) by 2030.

Higher Education: The Active Potential for 2030

- The highly educated employees are expected to shrink (grow) by -10% (+118%) until 2030 under the Status Quo Scenario (Trend Scenario).
- Their share in all employees is estimated to be 16.5% (38%) in 2030.
- At the same time, the academic share in age group 50-64 is projected to be 9% (21.5%).
- An average of 15% (48%) of all women are likely to work in academic professions in 2030.

Professions: The Employed Potential

- As the age structure of professions was kept constant, growth would only be feasible in higher managerial positions, as the 40+ year-olds are the only increasing age group. Evidently, this is not a realistic perspective. Hence, job mobility of the elderly needs to augment.
- Women working as professionals were mostly present in the shrinking age group of 30-34 year-olds; this group is therefore expected to strongly decline (23.5%).

Professions: Unemployed and Active Potential

- Plant and machine operators, and the group of technicians could register the highest share in the Unemployed Potential in 2030.
- If the Unemployed Potential was fully used by 2030, labour shortage could be compensated for some "female occupations" like plant and machine operators.

GENERAL CONCLUSIONS

Demographic change is projected to have a strong impact on the future number of chemical employees: even in the most optimistic case, it would decrease by 3.5%. It is unlikely that the currently young and middle-aged employees will be able to compensate the relatively large number of retiring older employees.

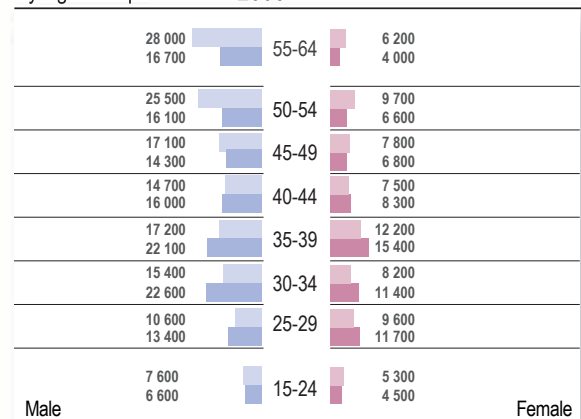
The share of females in the Czech chemical industry is the highest among the seven countries, with 94% working full-time. However, less than 17% of all female employees in the sector were highly educated in 2008. It therefore seems possible to increase the quality of labour, despite a decrease in quantity. In the optimistic case, the number of academics could more than double until 2030.

The Chemical Industry: Employment Projection for Spain

Age and Gender - Status Quo Scenario

Spain

By Age Groups ■ 2008 ■ 2030



2008: 127 700; 2030: 6.6% ■ 15-64 ■ 2008: 68 900; 2030: -3.2%

Data-Source: Eurostat, LFS; own calculation and presentation

197 000 persons, that is 1% of all Spanish employees, worked in the chemical industry in 2008. The highest age-specific shares were found among age groups 35-39 and 30-34 (19% and 17% of all employees). The 15-24 year-olds showed the lowest age-specific share (6% of all employees), followed by age group 55-64 (10.5% of all employees). Altogether, the 50-64 year-olds accounted for 22% of all employees in 2008.

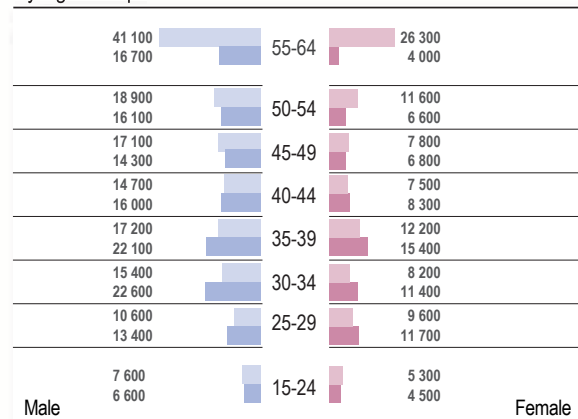
Almost one third of all employees (35%) were women in 2008, the highest age-specific female shares being 47% in age group 25-29 and 41% in age group 15-24 years. The lowest share of females was found among older employees: 24% for age group 50-64 years.

According to Eurostat, the working-age population

Age and Gender - Trend Scenario

Spain

By Age Groups ■ 2008 ■ 2030



2008: 127 700; 2030: 11.7% ■ 15-64 ■ 2008: 68 900; 2030: 28.6%

Data-Source: Eurostat, LFS; own calculation and presentation

(15-64) will grow by 9%, while the chemical industry is estimated to only grow by 3% under the Status Quo Scenario. The difference is due to the relatively low number of females in age groups 15-24 and 45+ in the chemical sector. As only these age groups are projected to increase, an overall shrinkage of 3% is expected for female chemical employees between 2008 and 2030.

The average female share is likely to decrease to 33% until 2030 under the Status Quo Scenario. Age-specific shares will then be slightly higher for the 15-39 year-olds and slightly lower than in 2008 for older age groups.

Under the assumptions of the Trend Scenario, an employment growth of nearly 18% is possible. The difference to the Status Quo Scenario is mainly

Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

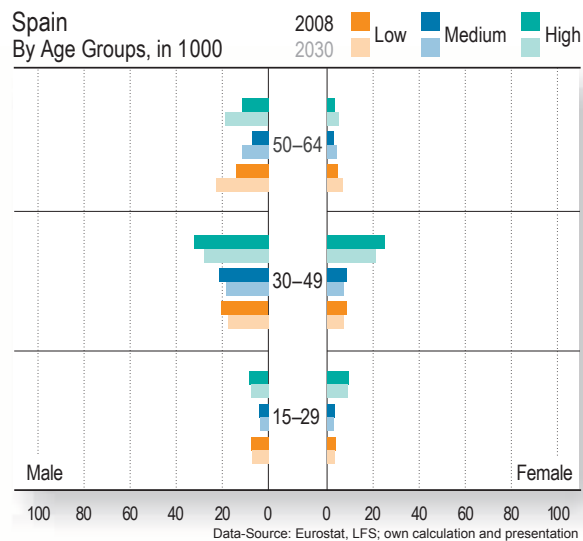
explained by the currently very low number of females in age group 55-64 (4000 as opposed to 16 700 men). Assuming that employees are kept until the official retirement age (Trend Scenario), the number of females in this age group could grow by over 560%, and that of men by nearly 150%, resulting in an overall threefold increase of this age group until 2030.

The average female share is expected to increase to 38% in 2030 under the Trend Scenario; the age-specific female share of 50-64 year-old employees is corresponding roughly to this average.

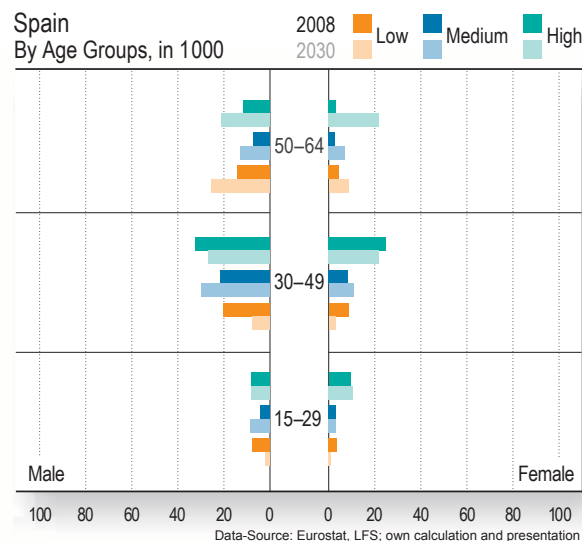
Future employment growth in the chemical industry in Spain will thus particularly depend on integration of women and the elderly into the workforce.

The Chemical Industry: Employment Projection for Spain

Education – Status Quo Scenario



Education – Trend Scenario



Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-olds of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Professions - Status Quo Scenario

Spain By Employees	Share 2008		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	6.7%	3.5%	0.8%	-3.4%
Clerks	3.9%	6.9%	7.1%	4.7%
Plant and Machine Operators, Assemblers	23.3%	6.5%	2.9%	3.3%
Technicians and Associate Professionals	15.6%	11.5%	10.7%	-9.7%
Professionals	4.9%	3.9%	-2.5%	-13.1%
Legislators, Senior Officials, Managers	4.3%	2.6%	21.1%	1.0%
Other	6.4%	0.0%	12.6%	n/a

Data-Source: Eurostat, LFS; own calculation and presentation

The share of highly educated women among female employees was 55% in 2008, while the average share of highly educated employees was 46% in the Spanish chemical industry. These values are comparable with those found for Belgium. At nearly 60%, high shares of academics were found among younger age groups (25-39 years), while they were low in the youngest age group 15-24 (25%) and among the 45-49 year-olds (23%). The share of academics among the 50-64 year-olds was at 34% below the average of 2008, and at 22% particularly low for women in this group.

Under the Status Quo Scenario, the number of academics could shrink by nearly 6%, while the academic share in all employees is estimated to decrease to 42% between 2008 and 2030. Over the

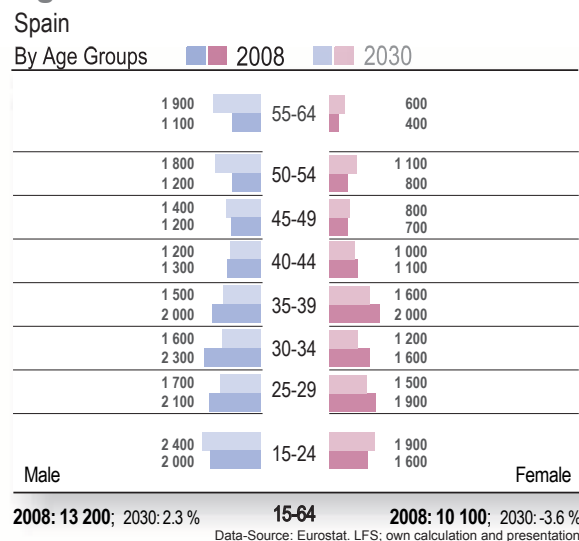
same time, the share of academics in women is likely to decrease by two percentage points to 53%.

In the Trend Scenario, the number of academic employees is projected to increase by about one third until 2030. The academic share in all employees could then increase to 52%, with about 62% of all females being academics.

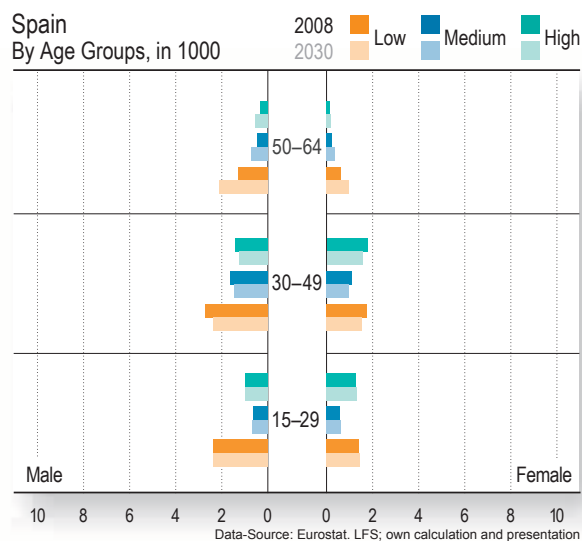
Without regard to gender, most occupations are expected to increase in numbers under the Status Quo Scenario (the only one considered). However, as the number of female employees is likely to shrink under this scenario, the availability of women is also projected to decrease in some occupations, particularly among professionals.

The Chemical Industry: Unemployment Projection for the Spain

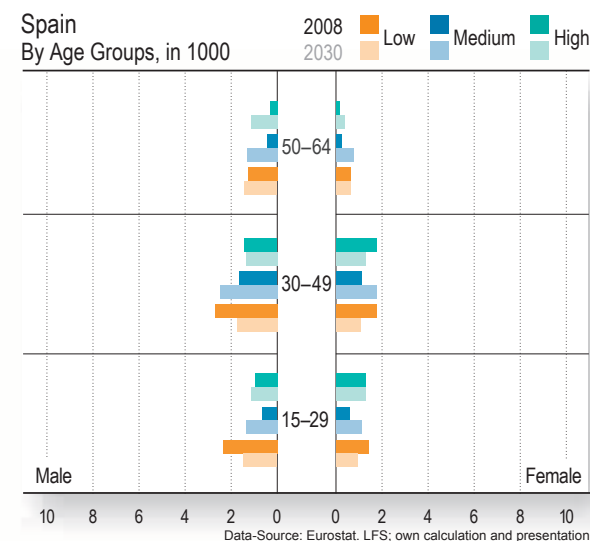
Age and Gender - Status Quo Scenario



Education – Status Quo Scenario



Education – Trend Scenario



Professions - Status Quo Scenario

Spain By Potential Employees	Share 2030		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	17.8%	8.5%	3.3%	1.6%
Clerks	2.1%	8.9%	-0.8%	-1.1%
Plant and Machine Operators, Assemblers	17.9%	16.3%	3.9%	2.6%
Technicians and Associate Professionals	7.2%	8.5%	1.0%	-3.0%
Professionals	1.1%	1.6%	-6.9%	-9.6%
Legislators, Senior Officials, Managers	0.7%	1.0%	5.4%	-2.9%
Other	8.6%	0.0%	3.5%	2.9%

Data-Source: Eurostat. LFS; own calculation and presentation

The Unemployed Potential is projected to remain nearly constant (-0.3%) at roughly 23 000 people in 2030. The share of females is then likely to amount to 42%, which is roughly nine percentage points higher than their expected share in all chemical employees in 2030 under the Status Quo Scenario. The 50-64 year-olds, at the same time, will be at 24 % fewer present in the Unemployed Potential compared to the chemical sector.

The number of academics in the Unemployed Potential is projected to shrink by about 11% from 2008 to 2030 (Status Quo Scenario) and will amount to 5000 people or about one quarter of all unemployed in 2030. Women are likely to have on average a better education than men: it is estimated that every third of

them will be highly educated in 2030.

In the Trend Scenario, the number of academics remains nearly constant (-0.8%) until 2030. Their share in the Unemployed Potential will at 27% be two percentage points above the respective share in the Status Quo Scenario. However, the academic share in all women is expected at 32% slightly lower than in the Status Quo Scenario.

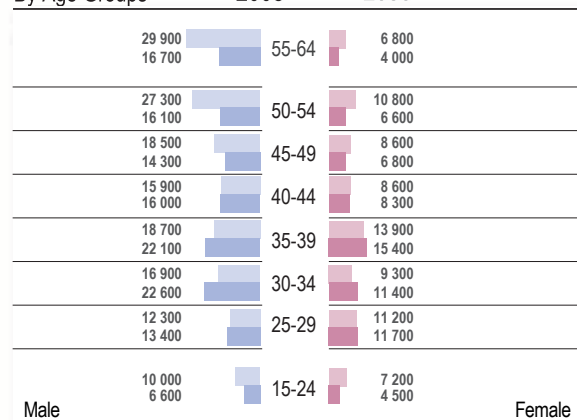
A large share of the Unemployed Potential has formerly worked as plant and machine operators and assemblers, or, as far as men are concerned, in elementary occupations. Their shares and numbers continue to increase, while some others, particularly the group of professionals, are expected to decrease.

The Chemical Industry: Active Potential Projection for Spain

Age and Gender - Status Quo Scenario

Spain

By Age Groups ■ 2008 ■ 2030

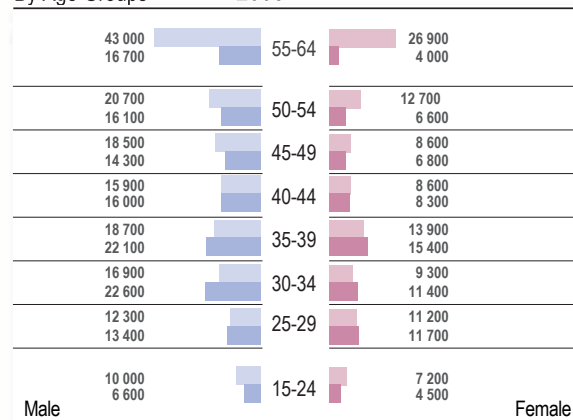


2008: 127 700; 2030: 17.1 % ■ 15-64 ■ 2008: 68 900; 2030: 10.9 %
 Data-Source: Eurostat, LFS; own calculation and presentation

Age and Gender - Trend Scenario

Spain

By Age Groups ■ 2008 ■ 2030



2008: 127 700; 2030: 22.2 % ■ 15-64 ■ 2008: 68 900; 2030: 42.8 %
 Data-Source: Eurostat, LFS; own calculation and presentation

Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Projected Chemical Workers + Projected Unemployed Potential = Projected Active Potential

Comparing the seven countries, the estimated size of the Unemployed Potential is moderate in relation to the number of all Spanish unemployed. This is not of great importance because in Spain the number of chemical employees is not likely to shrink under the impact of demographic change. The Unemployed Potential may yet be seen as an opportunity to increase the influence of the chemical industry in Spain in terms of employment.

Under the Status Quo Scenario, the chemical sector could grow by up to 15% if the full Active Potential

were to be used by 2030. The former shrinkage among the 40-44 year-old employees could be fully compensated, and shrinkage among those aged between 25 and 39 years could be reduced by at least ten percentage points for each age group. High growth rates could be expected for the youngest and the older age groups under the assumption of full capacity use; growth of almost +60% for the 15-24 year-olds, +64% for age group 50-54, and +72% for the 55-64 year-olds.

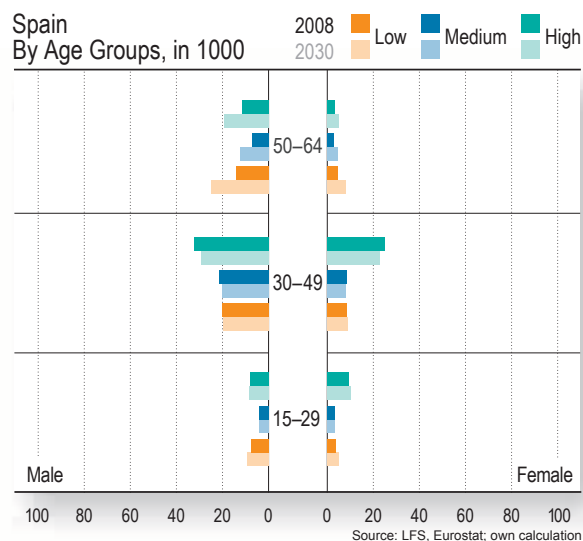
Under the assumptions of the Trend Scenario, the number of employees could grow by an average of 29% until 2030, which is nearly twice as much as in the Status Quo Scenario. Strong growth in terms of numbers is expected for women (+43%), due to the

huge projected increase in their shares in age groups 50-54 and 55-64 (by 91% and over 570%), the corresponding age-specific growth rates for men being two thirds lower. In terms of numbers, male and female employees could each grow by roughly 29 000 people until 2030.

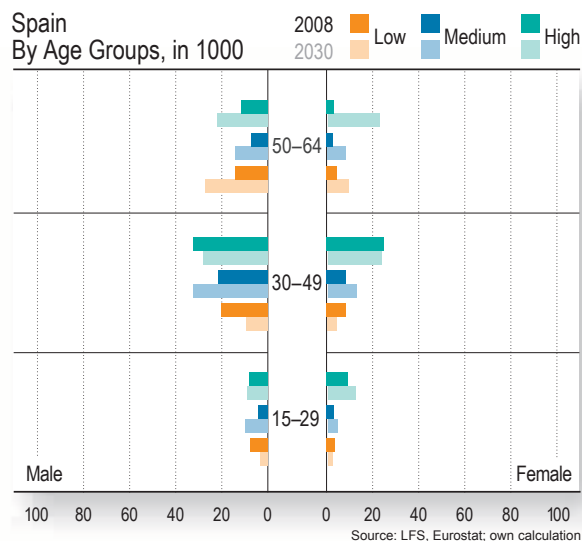
The share of females as well as of older people in 2030 is not likely to differ much from its shares without the use of the Unemployed Potential. Under both scenarios, the average share of women among the Active Potential is projected to be roughly one percentage point higher than in the employment projection. The share of employees aged 50 to 64, in contrast, is likely to be one percentage point lower for each scenario.

The Chemical Industry: Active Potential Projection for Spain

Education – Status Quo Scenario



Education – Trend Scenario



Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Professions - Status Quo Scenario

Spain By Active Potential	Share 2030		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	7.7%	3.8%	31.4%	24.1%
Clerks	3.8%	7.2%	13.2%	19.4%
Plant and Machine Operators, Assemblers	22.7%	7.5%	11.7%	32.3%
Technicians and Associate Professionals	15.8%	9.9%	16.0%	-1.2%
Professionals	4.3%	3.1%	0.1%	-8.3%
Legislators, Senior Officials, Managers	4.7%	2.4%	22.9%	5.5%
Other	7.1%	n/a	28.0%	n/a

Data-Source: Eurostat, LFS; own calculation and presentation

Including the Unemployed Potential in the Status Quo Scenario, the expected number of highly educated employees remains nearly the same in 2030 as it was in 2008. The shares of academics in all employees and in all females will be roughly two percentage points lower in the Active Potential than in the Employed Potential. The same decline applies to the share of highly educated people among the 50-64 year-olds in 2030.

The number of academics in the Active Potential could increase by 40% in the Trend Scenario, but their share in all employees, in females and in older people would decrease by 2-3 percentage points due to the influence of the unemployed. The average academic share in the chemical industry is thus likely to be 50%

instead of 52% in 2030. The academic share among age group 50-64 is expected at 55%, while the average share of academics in all female employees is projected to be 59% in 2030.

While the availability of male professionals could be stopped from shrinking by considering the Unemployed Potential in the Status Quo Scenario, the number of female plant and machine operators and assemblers, and the number of female technicians and associate professionals is still projected to shrink between 2008 and 2030, although the latter to an insignificant extent (less than 300 people). Altogether, the strongest increase in size is with 10 000 people expected for plant and machine operators and assemblers.

The Chemical Industry: Conclusions for Spain

Age and Gender: The Employed Potential

- An employment increase of 3% (18%) is projected between 2008 and 2030 for the Status Quo Scenario (Trend Scenario).
- The share of employees aged 50-64 is expected to grow from 22% in 2008 to 34% (42%) by 2030.
- In the Status Quo Scenario, the average female share in the chemical industry will shrink from 35% in 2008 to 33% in 2030; it could also grow to 38%, if the Trend Scenario were to prevail.
- Women were more present among younger age groups, with the highest female share in 2008 found at 47% in age group 25-29 years.

Age and Gender: The Unemployed Potential

- As only the Status Quo Scenario was considered, the Unemployed Potential will remain nearly constant between 2008 and 2030.
- The share of 50-64 year-olds in the Unemployed Potential was 15% in 2008; this share is expected to grow to 24% by 2030.
- The overall female share is projected to shrink from 43% to 42% between 2008 and 2030.

Age and Gender: The Active Potential in 2030

- The chemical sector can grow by up to 15% (29%) until 2030, if the full potential will be used in the Status Quo Scenario (Trend Scenario).
- The share of 50-64 year-olds in the Active Potential would be one percentage point below the share of the Employed Potential projection under both scenarios.
- The average female share in all employees will be one percentage point higher than the share of the Employed Potential projection under both scenarios.

Higher Education: The Employed Potential

- Until 2030, the number of academics are estimated to decrease by 6% in the Status Quo Scenario and to increase by +34% under the Trend Scenario.
- The academic share in all employees of the chemical sector was at 46% relatively high in 2008 and is likely to change to 42% (52%) through 2030.
- The academic share in age group 50-64 was 34% in 2008 and is likely to remain at/grow to 34% (57%).
- 55% of all females were academics in 2008; this share is likely to develop to 53% (62%).

Higher Education: The Unemployed Potential

- The number of academics is expected to shrink by 11% (1%) between 2008 and 2030 in the Status Quo Scenario (Trend Scenario).
- In 2030, the academic share in the Unemployed Potential is expected to be 25% (27%).
- At the same time, the academic share in age group 50-64 is projected to be 15% (28%).
- High educational levels were found in 36% of the unemployed female potential in 2008; the share will shrink by two (four) percentage points until 2030.

Higher Education: The Active Potential in 2030

- The number of academics in 2030 is expected to equal that of 2008 in the Status Quo Scenario, and could grow by 40% under the Trend Scenario.
- The share of academics in all employees would then amount to 40% (50%).
- At the same time, the academic share among age group 50-64 will be 33% (55%).
- An average of 50% (59%) of all female employees is projected to work in academic professions in 2030.

Professions: The Employed Potential

- The available number of male and female professionals as well as of females in elementary occupations is likely to decline under the Status Quo Scenario. The same is true for female technicians, while the number of male technicians may increase.
- A strong increase in positions in higher management, and for plant and machine operators (roughly 1 700 each) would be demographically feasible.

Professions: Unemployed and Active Potential

- Males in elementary occupations and female plant and machine operators are projected to have the largest shares in the Unemployed Potential in 2030.
- If the full Unemployed Potential will be used by 2030, the two occupations just mentioned will experience a strong increase. However, the shrinkage among female technicians cannot be fully compensated.

GENERAL CONCLUSIONS

Demographic change is projected to have a positive impact on the future number of chemical employees in Spain. Even if the current age structure is kept constant, labour supply should be sufficient to preserve the 2008 employment level.

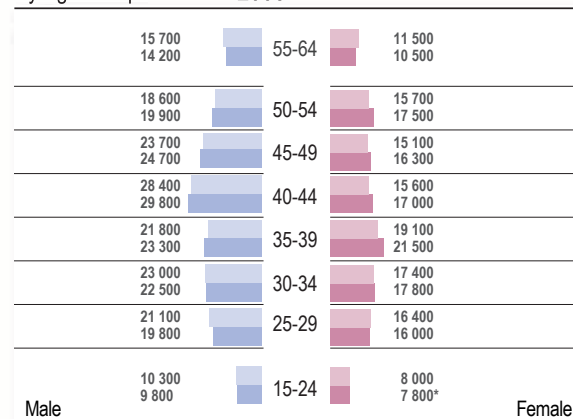
The chemical industry had a high share of academics among its employees in 2008, which was even more pronounced for women. This share, however, is likely to shrink, as most academics were found in the shrinking age groups between 25 and 44 years. If the chemical industry decided instead to keep most of its current employees, particularly women, at work until the official retirement age, this shrinkage could be compensated.

The Chemical Industry: Employment Projection for France

Age and Gender - Status Quo Scenario

France

By Age Groups ■ 2008 ■ 2030



2008: 164 000; 2030: -0.9 % 15-64 2008: 124 400; 2030: -4.5 %

Data-Source: Eurostat, LFS; own calculation and presentation

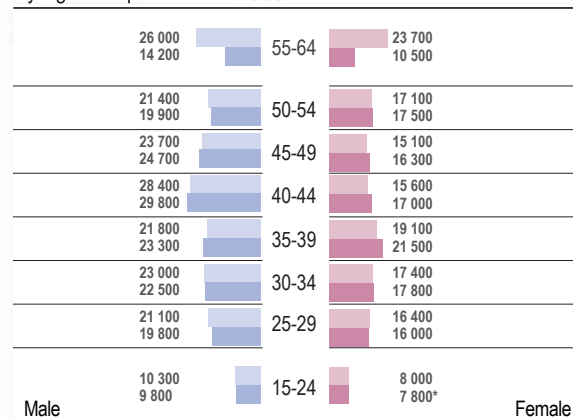
In 2008, 288 000 people aged 15-64 years worked in the French chemical industry. The lowest number of employees was found among the 15-24 year-olds, which made up for 6% of all employees. The highest number of employees was found in age groups 40-44 and 35-39, each representing 16% of all employees. Finally, 21% of all male and 23% of all female employees were aged between 50 and 64 years.

In 2008, the average female share in the French chemical industry was 43%, while the lowest share of women was found in age group 40-44 at 36%. At the same time, the highest age-specific female share amounted to 48% and was found among the 35-39 year-olds. High female shares were also present in age groups 50-54 (47%) and 55-64 (42%).

Age and Gender - Trend Scenario

France

By Age Groups ■ 2008 ■ 2030



2008: 164 000; 2030: 7.1 % 15-64 2008: 124 400; 2030: 6.4 %

Data-Source: Eurostat, LFS; own calculation and presentation

The working-age population of France is expected to remain nearly constant until 2030, while the number of employees in the chemical sector is likely to shrink by 2.4% under the corresponding Status Quo Scenario. This is mainly due to the projected increase in the number of 15-24 and 55-64 year-olds, which have higher shares in the working-age population than in the chemical sector. The decrease in the number of 35-54 year-olds will also affect the chemical sector relatively stronger than the French working-age population. Furthermore, stronger shrinkage is expected for females than for males in France and the chemical industry. The share of 50-64 year-olds is likely to remain at 22% through 2030.

Under the assumptions of the Trend Scenario, a

Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

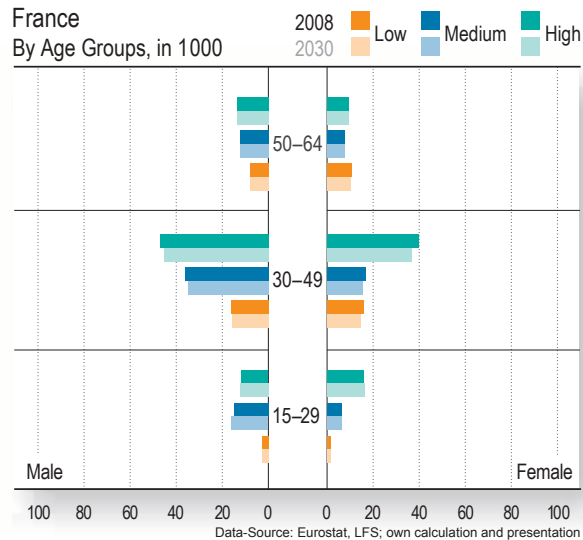
Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

growth by nearly 7% would be possible in the chemical industry, as the number of older workers (55-64) could double until 2030, with a higher expected increase for females (+126%) than for men (+83%). The number of males in age group 50-54 is not expected to shrink in this scenario (+7% growth), while the number of females will decrease by 2%. Overall, an increase in older age groups (50-64) will be able to compensate for the decline in younger age groups. The 50-64 year-olds would represent 29% of all employees in 2030.

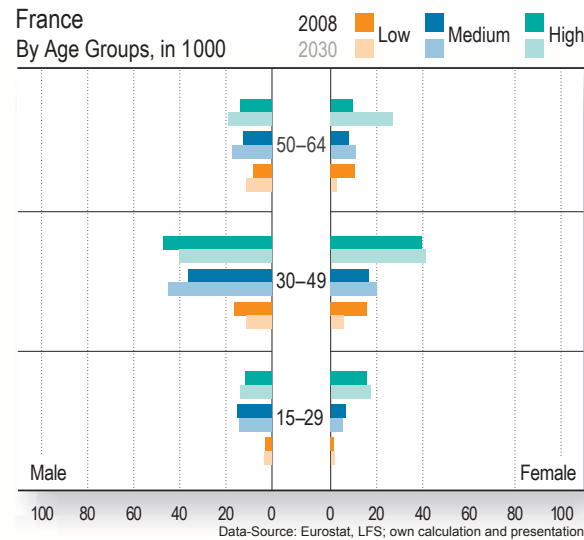
The female share is projected to remain unchanged at 43% between 2008 and 2030 under the Trend Scenario, while it is likely to shrink by one percentage point in the Status Quo Scenario.

The Chemical Industry: Employment Projection for France

Education – Status Quo Scenario



Education – Trend Scenario



Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-olds of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Professions - Status Quo Scenario

France By Employees	Share 2008		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	1.7%	0.8%	-3.1%	-10.2%
Clerks	2.3%	3.9%	-1.6%	-6.2%
Plant and Machine Operators, Assemblers	19.2%	7.4%	-0.3%	-5.6%
Technicians and Associate Professionals	12.5%	17.3%	-1.0%	-4.1%
Professionals	11.8%	6.3%	-2.1%	-2.5%
Legislators, Senior Officials, Managers	6.8%	4.9%	0.1%	-7.7%
Other	3.5%	1.6%	-0.1%	-0.7%

Data-Source: Eurostat, LFS; own calculation and presentation

In 2008, the average share of academics was 48% in all chemical employees and 53% in all female employees in the French chemical industry. The share of academics in age group 50-64 was thereby at 37% below the average in 2008, and at 24% the lowest among 50-54 year-olds.

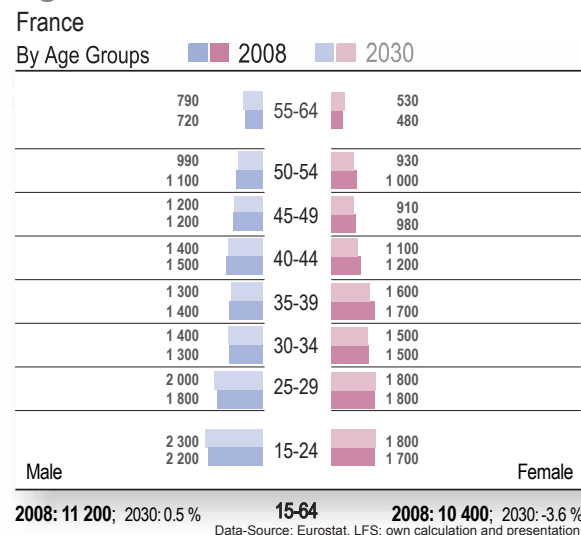
The number of highly educated employees is projected to shrink by 2% under the Status Quo Scenario. However, the share of academics in all employees would remain at 48% in 2030 unchanged compared to its 2008 value. Additionally, the share of academics among females is likely to change little under this scenario, while the academic share among the 50-64 year-olds is expected to increase from 37% to 39% between 2008 and 2030.

If the French educational level equalled Belgium's by 2030 and all employees were kept until the official retirement age (Trend Scenario), the overall number of academics would increase by 13%. The share of academics in all employees could then rise from 48% to 51%, and the academic share in female employees could increase to 65%.

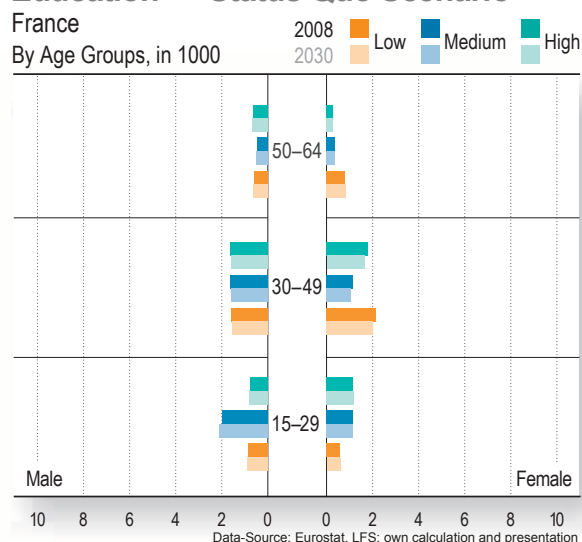
Compared to the other six countries, a relatively large share of male employees worked as technicians and as professionals in 2008. Through 2030, availability of nearly all occupations is expected to decrease in the chemical industry of France. Large differences are found in the number of higher management positions, which are projected to shrink strongly for females but remain constant for males.

The Chemical Industry: Unemployment Projection for the France

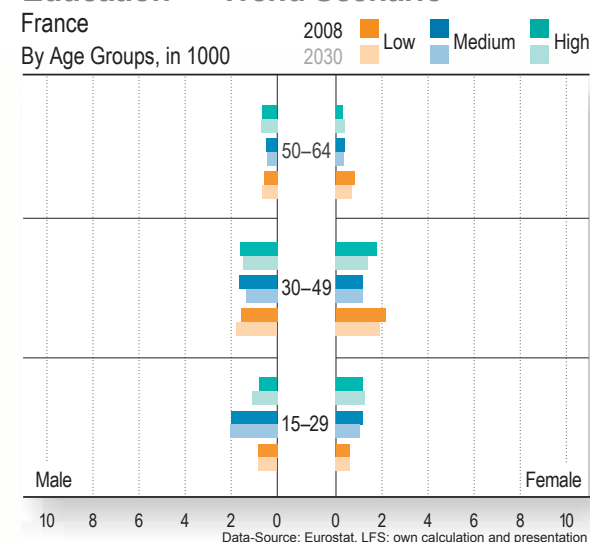
Age and Gender - Status Quo Scenario



Education – Status Quo Scenario



Education – Trend Scenario



Professions - Status Quo Scenario

France By Potential Employees	Share 2030		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	1.8%	0.9%	0,9%	-3,8%
Clerks	2.9%	3.9%	0,6%	-3,5%
Plant and Machine Operators, Assemblers	19.4%	8.6%	0,4%	-3,8%
Technicians and Associate Professionals	13.8%	18.7%	0,4%	-3,7%
Professionals	9.3%	7.2%	-0,1%	-4,2%
Legislators, Senior Officials, Managers	5.0%	4.3%	-0,3%	-4,4%
Other	2.7%	1.4%	1,1%	-2,8%

Data-Source: Eurostat, LFS; own calculation and presentation

The size of the Unemployed Potential is estimated at 21 300 persons in 2030, under the Status Quo Scenario. The share of 50-64 year-olds was and is projected to stay at 15%, being herewith lower than in the chemical industry's employment. The average female share in the Unemployment Potential will amount to 47%, which is above the female share in all the chemical employees in 2030.

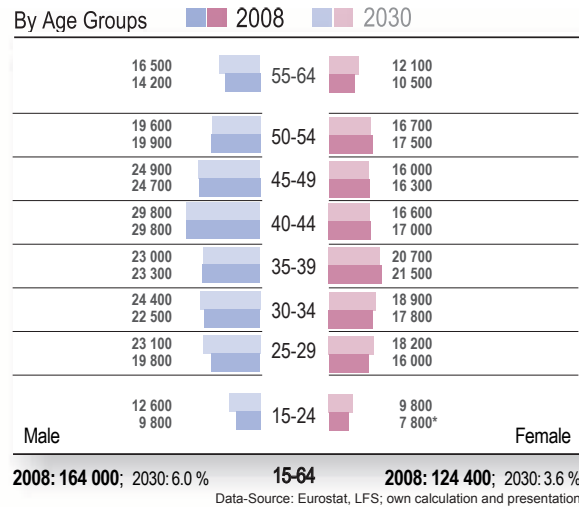
The number of academics is expected to shrink by 1.4% between 2008 and 2030 under the Status Quo Scenario and is projected to stay almost constant (+0.4%) under the Trend Scenario. As the average projected growth rates are not large, the share of academics in the Unemployed Potential is in both scenarios estimated to be close to its value in 2008

(32%). The same is true for the academic share in females at 34% in 2008 and 2030. The academic share in age group 50-64 is, however, likely to be at 34% in 2030 higher under the Trend Scenario, than under the Status Quo Scenario (29%).

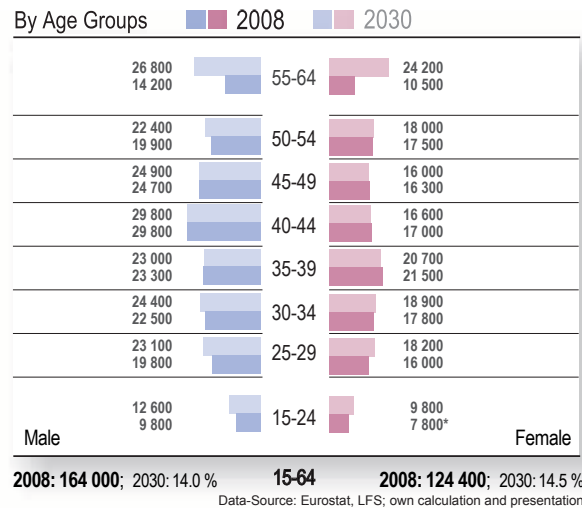
The number of females is estimated to decrease in all professions under the assumptions of the Status Quo Scenario. The number of of men however, is projected to change with rates between -0.3% and +0.9% quite little through 2030. As no data about former occupations of the unemployed were available for France, the occupational shares of the employed were used for the calculation of the Unemployed Potential. The result is the projection of relatively high shares of technicians and plant and machine operators in 2030.

The Chemical Industry: Active Potential Projection for France

Age and Gender - Status Quo Scenario France



Age and Gender - Trend Scenario France



Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Projected Chemical Workers + Projected Unemployed Potential = Projected Active Potential

About 1.1% of all French employees worked in the chemical sector in 2008. We assumed that the same share, 1.1%, of all unemployed workers would be available for the chemical industry in 2030. The size of the Unemployed Potential can then be judged as moderate compared to countries like Belgium or Germany. However, it would still easily suffice for compensating the projected loss of employees due to demographic change through 2030.

If the full Active Potential were to be used in 2030, the average growth rate of employees between 2008 and

2030 could reach 5.0% according to the Status Quo Scenario. The highest increase under this Scenario would be found in the youngest age group (15-24) at 27%. Resorting to the unemployed could stop the decrease in the number of 30-34 year old female employees. The same is true for the former decline in (nearly) all male age groups as well. Only shrinkage in the number of 35-54 years old women would still occur, although at a rate, which is five to seven percentage points lower than in the Employment Projection.

Under the Trend Scenario, the overall number of employees is projected to grow up to 14.2% until 2030. The largest growth could occur in age group 55-64: 88% for male and 131% for female employ-

ees, which is five percentage points higher than without the use of the Unemployed Potential. Shrinkage among the 50-54 year-old females could also be completely compensated, as growth by 3% is likely to be feasible for this age group under the Trend Scenario.

The Unemployed Potential is not likely to have a strong influence on the age and gender structure of the chemical industry in 2030 compared to 2008. Under both scenarios, the share of 50-64 year-olds in the full Active Potential is projected to be one percentage point lower than the equivalent share in the Employed Potential projection. The share of females in all employees is at 43% also expected to be close to its 2008 value under both scenarios.

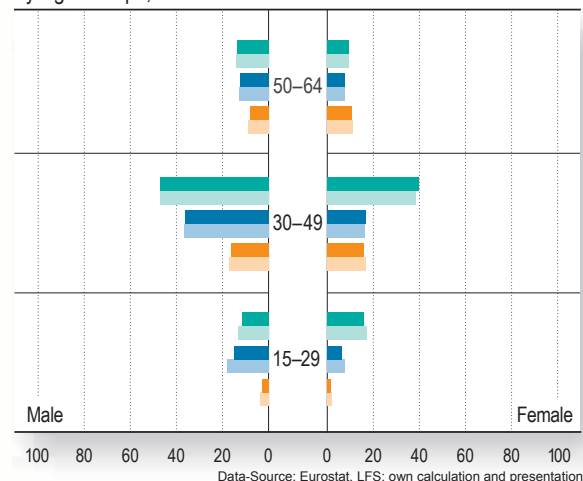
The Chemical Industry: Active Potential Projection for France

Education – Status Quo Scenario

France
By Age Groups, in 1000

2008 2030

Low Medium High



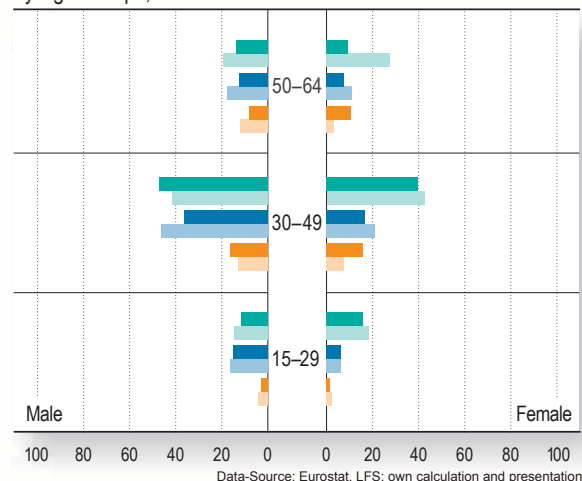
Data-Source: Eurostat, LFS; own calculation and presentation

Education – Trend Scenario

France
By Age Groups, in 1000

2008 2030

Low Medium High



Data-Source: Eurostat, LFS; own calculation and presentation

Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Professions - Status Quo Scenario

France By Active Potential	Share 2030		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	1,7%	0,7%	5,0%	-1,4%
Clerks	2,3%	3,7%	8,3%	1,7%
Plant and Machine Operators, Assemblers	19,7%	7,3%	7,6%	3,5%
Technicians and Associate Professionals	12,7%	17,1%	7,7%	4,4%
Professionals	11,7%	6,3%	4,0%	6,5%
Legislators, Senior Officials, Managers	6,9%	4,6%	5,8%	-0,7%
Other	3,5%	1,6%	6,1%	6,2%

Data-Source: Eurostat, LFS; own calculation and presentation

The number of highly educated employees in the Active Potential is likely to increase by approximately 2% between 2008 and 2030, if the labour participation rates for all age groups are kept constant (Status Quo Scenario). Thus, the formerly projected decline in the number of academics (-2%) could be stopped by activating the Unemployed Potential. Under the Trend Scenario, the number of academics would increase even stronger (+18%) than in the Employment Projection (+13%) until 2030.

The influence of the Unemployed Potential on the structure of the French chemical industry is consistent over the two scenarios: Under each scenario, the share of academics in the whole Active Potential is likely to be one percentage point lower than in the

Employment Projection in 2030. Equivalently, the academic share in the 50-64 year-olds is estimated to be half a percentage point lower in the Active Potential than among the employees of the chemical industry. The same is true for the share of academics in all females, which is projected to be two percentage points lower in the Active Potential.

The Unemployed Potential could fully compensate the decrease in numbers for nearly all occupations in the Status Quo Scenario. Only the number of females in elementary occupations and in higher management positions are still projected to decline, although only slightly. As the growth rates are relatively even, the occupational shares are also not likely to differ much from the ones of the chemical industry in 2008.

The Chemical Industry: Conclusions for France

Age and Gender: The Employed Potential

- An employment growth of -2% (+7%) is projected for the Status Quo Scenario (Trend Scenario).
- The share of employees aged 50-64 is expected to remain at/increase to 22% (29%) by 2030.
- In the Status Quo Scenario, the average female share in the chemical industry will shrink from 43% in 2008 to 42% in 2030; it could also remain constant, if the Trend Scenario prevailed.
- The highest female share in 2008 was found in age group 35-39 at 48%; this is expected to remain true in 2030 as well, although at one percentage point lower.

Age and Gender: The Unemployed Potential

- Only the Status Quo Scenario was considered. The Unemployed Potential is projected to decline only slightly (-1%) between 2008 and 2030 in this case.
- The share of 50-64 year-olds in the Unemployed Potential was 15% in 2008 and is expected to remain the same in 2030.
- The overall female share is projected to shrink from 48% to 47% between 2008 and 2030.

Age and Gender: The Active Potential in 2030

- The chemical sector could grow by 5% (14%) until 2030, if the full potential was used in the Status Quo Scenario (Trend Scenario).
- The share of 50-64 year-olds in the Active Potential would be one percentage point below the share of the Employed Potential projection under both scenarios.
- The female share in all employees would stay close to its value of 43% in 2008 under both scenarios.
- The highest age-specific female share is still found in age group 35-39 at 47%.

Higher Education: The Employed Potential

- The number of academics is projected to shrink by 2% (increase by 13%) in the Status Quo Scenario (Trend Scenario) until 2030.
- The average academic share was 48% in 2008 and is likely to remain constant (increase to 51%) until 2030.
- The academic share in age group 50-64 was only 37% in 2008 and is likely to grow to 39% (54%) in 2030.
- The share of academics among females was and is estimated to be 53% under the Status Quo Scenario, and could increase up to 65% under the Trend Scenario.

Higher Education: The Unemployed Potential

- The number of academics is expected to shrink by 1% between 2008 and 2030 in the Status Quo Scenario and to remain constant under the Trend Scenario.
- In 2030, the academic share in the Unemployed Potential is expected to be 32% for both scenarios.
- At the same time, the academic share in age group 50-64 is projected to be 29% (34% in the Trend Scenario).
- High educational levels were found in 34% of the unemployed female potential in 2008; the share is projected to remain constant for both scenarios.

Higher Education: The Active Potential in 2030

- The number of highly educated employees could increase by 2% (18%) until 2030.
- In 2030, 47% (50%) of all employees would then be academics.
- The academic share among age group 50-64 is likely to be below/above the average at 38% (54%).
- An average of 51% (63%) of all female employees is projected to be of high education in 2030.

Professions: The Employed Potential

- A relatively large share of male employees worked as technicians and as professionals in 2008.
- Through 2030, the number of employees is expected to decrease in most occupations under the Status Quo Scenario. This is particularly true for female employees.

Professions: Unemployed and Active Potential

- For the Unemployed Potential in 2030, a large male share is projected to consist of persons who formerly worked as technicians and as plant and machine operators and assemblers.
- The Unemployed Potential could fully compensate the decrease in numbers for nearly all occupations in the Status Quo Scenario. Only the numbers of females in elementary occupations and in higher management positions are still projected to slightly decline until 2030.

GENERAL CONCLUSIONS

Demographic change is weak in France, as well as its average impact on future employment. Even if labour participation at older ages remained low in the chemical industry of France, the projected shrinkage among its 15-64 year-old employees would be insignificant and could thus be easily compensated by the labour market.

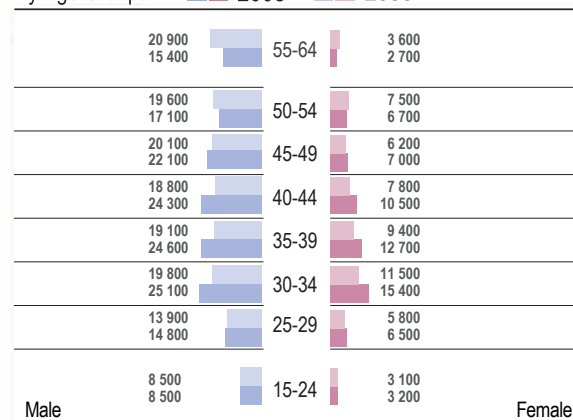
Activating the unemployed might, however, lead to a decrease in the share of academics in the chemical industry. This is the case, if the Status Quo Scenario applies; under the Trend Scenario, every second employee is expected to be highly educated in 2030.

The Chemical Industry: Employment Projection for Italy

Age and Gender - Status Quo Scenario

Italy

By Age Groups ■ 2008 ■ 2030



2008: 152 000; 2030: -7.4 % ■ 15-64 ■ 2008: 64 700; 2030: -14.9 %

Data-Source: Eurostat, LFS; own calculation and presentation

Italy's chemical industry employed about 217 000 people in 2008. Only 5% of them were aged 15-24, over 50% between 30 and 44, and 19% were 50-64 years old (that is, 21% of all male and 15% of all female employees belonged to the oldest age group).

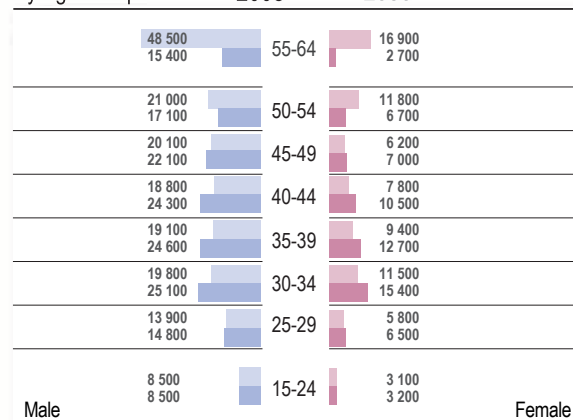
In 2008, the average female share in the chemical industry was 30%. It was at 15% the lowest in age group 55-64, and at 38% the highest in age group 30-34.

Under the Status Quo Scenario, a stronger decline is expected in the number of chemical employees (-10%) than in Italy's working-age population (-3%) until 2030. This is because the shares of chemical employees in the still increasing active age groups (50-54 and 55-64)

Age and Gender - Trend Scenario

Italy

By Age Groups ■ 2008 ■ 2030



2008: 152 000; 2030: 11.7 % ■ 15-64 ■ 2008: 64 700; 2030: 12.3 %

Data-Source: Eurostat, LFS; own calculation and presentation

are currently smaller than the corresponding shares in the Italian working-age population. However, the 50-64 year-olds are likely to represent 26% of all chemical employees in 2030.

Shrinkage among females (-15%) will be more pronounced than in men (-7%) in this scenario, as the number of females is projected to shrink more strongly for all age groups. The average share of females in the chemical sector is expected to decrease by two percentage points to 28% in 2030; only among the 50-64 year-olds is it likely to slightly increase, to 22%.

The development is projected totally different under the Trend Scenario: The number of employees could increase by nearly 12% until 2030. The explanation lies

Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

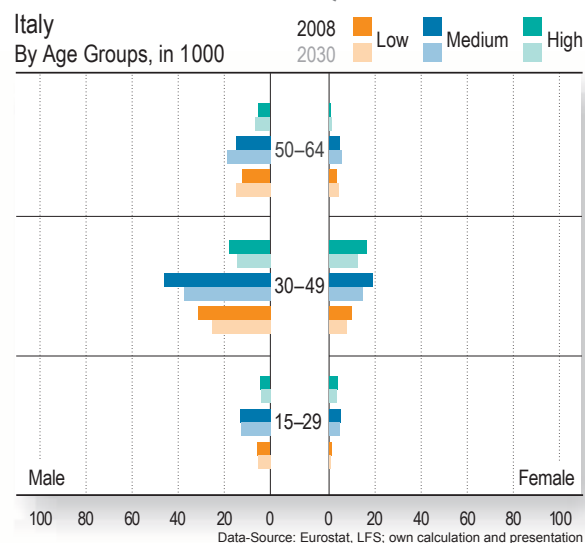
Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

in the 260% of growth in the number of 55-64 year-olds (+500% for females and +200% for males). The number of employees aged 50-54 could increase as well but at 38% to a much lesser extent. Overall, the increase in older age groups (50-64) could easily compensate the decline in younger age groups. However, more than 40% of all chemical employees would then be 50-64 years old in 2030. For Italy, the Status Quo Scenario is thus clearly one of heavy shrinkage, while the Trend Scenario is one of heavy ageing.

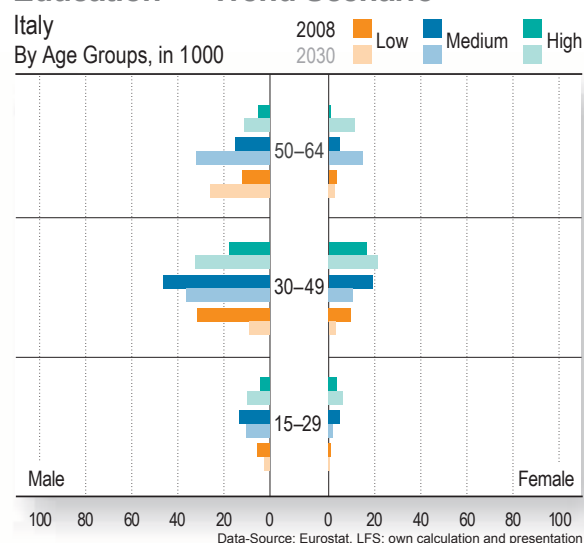
Under the Trend Scenario, the share of females in all employees is projected unchanged in 2030 compared to 2008 (30%). However, due to the strong increase in the number of women aged 50+, their share in age group 50-64 years would nearly double to 29% in 2030.

The Chemical Industry: Employment Projection for Italy

Education – Status Quo Scenario



Education – Trend Scenario



Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-olds of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Professions - Status Quo Scenario

Italy By Employees	Share 2008		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	3.8%	1.1%	-14.9%	-25.7%
Clerks	5.9%	5.1%	-7.5%	-13.7%
Plant and Machine Operators, Assemblers	22.8%	5.7%	-8.7%	-13.1%
Technicians and Associate Professionals	15.8%	10.2%	-7.9%	-16.3%
Professionals	12.5%	4.6%	-5.8%	-22.4%
Legislators, Senior Officials, Managers	3.4%	1.1%	12.7%	1.7%
Other	7.2%	0.8%	-10.4%	-25.5%

Data-Source: Eurostat, LFS; own calculation and presentation

In 2008, the share of academics in all chemical employees amounted to 23%. The lowest academic shares were found in age groups 15-24 (8%) and 50-64 (15%). High academic shares were found among the 25-39 year-olds (roughly 30%). However, the highest academic share was observed among women: 33% of all female employees were academics; this is ten percentage points above the average for all employees.

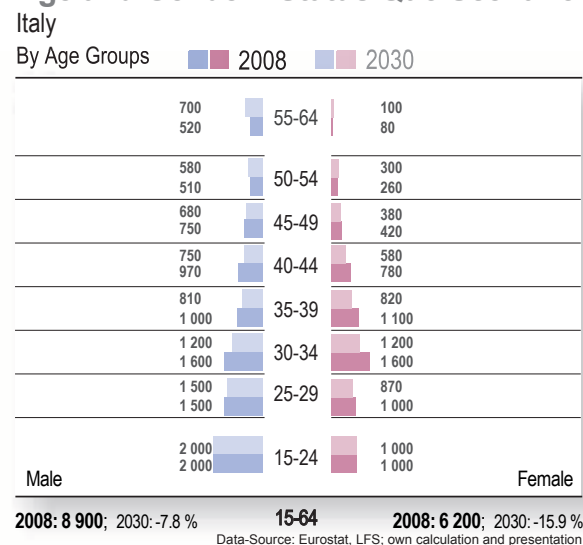
The number of highly educated employees is expected to shrink by 14% through 2030, if the age specific shares of chemical employees in the active population remain constant (Status Quo Scenario). The academic share in all employees will then slightly shrink to 22%, while it is likely to decrease to 31% among females. Among the 50-64 year-olds, it is projected unchanged.

If the Italian educational level equalled Belgium's by 2030, and all employees were kept until the official retirement age (Trend Scenario), the overall number of academics would double (+102%). The academic share would then increase to 41% in all employees, to 54% in all female employees, and to double to 30% in 2030 among the 50-64 year-olds.

A relatively large share of male employees worked as plant and machine operators and assemblers, as well as technicians in 2008. With unchanged professional preferences and opportunities, only the number of employees in higher management positions is expected to grow until 2030, while the number in all other occupations is likely to shrink. This is particularly true for female employees.

The Chemical Industry: Unemployment Projection for the Italy

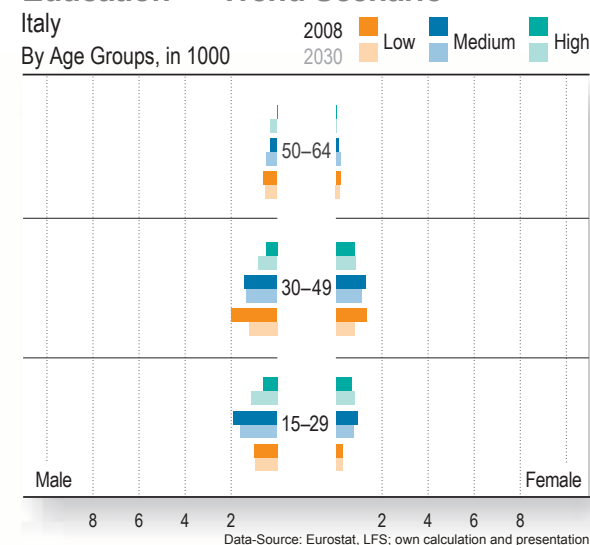
Age and Gender - Status Quo Scenario



Education – Status Quo Scenario



Education – Trend Scenario



Professions - Status Quo Scenario

Italy By Potential Employees	Share 2030		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	12.4%	3.2%	-6.3%	-12.8%
Clerks	7.3%	7.2%	-6.7%	-13.3%
Plant and Machine Operators, Assemblers	22.4%	13.1%	-6.6%	-16.0%
Technicians and Associate Professionals	7.9%	7.5%	-6.2%	-14.3%
Professionals	3.6%	3.6%	-9.9%	-17.5%
Legislators, Senior Officials, Managers	0.8%	0.5%	-4.5%	-13.1%
Other	8.8%	1.6%	-6.9%	-11.4%

Data-Source: Eurostat, LFS; own calculation and presentation

For an estimation of the Unemployed Potential, only the Status Quo Scenario was considered. The Unemployed Potential's size is projected to decrease by about 10% to roughly 13 000 people between 2008 and 2030. The female share in the Unemployed Potential is likely to be 41% in 2030. Furthermore, the Unemployed Potential is quite young: 57% of them are expected to be under the age of 35 and only 13% of age 50-64 years.

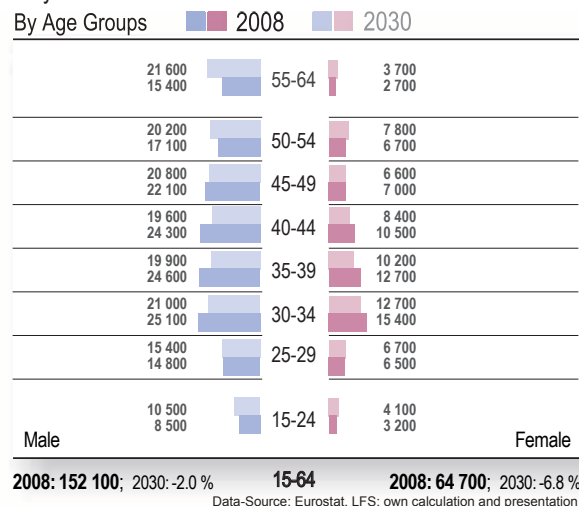
The educational composition of the Unemployed Potential was projected for both scenarios. Under the assumptions of the Status Quo Scenario, only about 18% of this potential is expected to be highly educated in 2030. The share of academics is likely to be at 26% higher among females and at 3% very low among all

50-64 year-olds. All these academic shares increase under the Trend Scenario: to 28% in the overall Unemployed Potential (compared to an average estimated share of 41% among chemical employees in 2030), to 34% in women, and to 18% for those aged between 50 and 64 years.

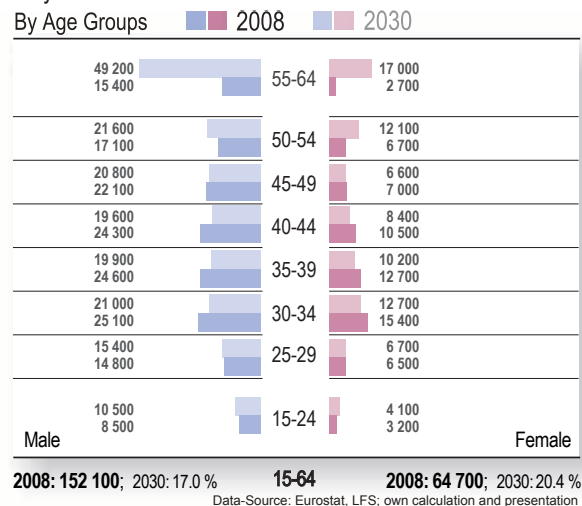
The availability of unemployed workers was also estimated by professions, but only for the Status Quo Scenario. Corresponding to the general decrease in the Unemployed Potential under this scenario, their number is likely to diminish in all occupations until 2030. The largest available groups would then be those of male and female plant and machine operators and assemblers, as well as males in elementary occupations.

The Chemical Industry: Active Potential Projection for Italy

Age and Gender - Status Quo Scenario Italy



Age and Gender - Trend Scenario Italy



Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-olds of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Projected Chemical Workers + Projected Unemployed Potential = Projected Active Potential

Comparing the situation in the seven countries studied, the estimated size of the Italian Unemployed Potential is moderate in relation to the number of all Italian unemployed. Additionally, the Unemployed Potential is shrinking at the same pace under the Status Quo Scenario. The projected decline can therefore be reduced, but not stopped by employing the unemployed. This applies particularly for females, as their number will shrink three times as strong as that of men. A reliable way of compensating labour shortage under the impact of demographic change would be to keep the current young and middle-aged employees until the

official retirement age. Immigration of the labour force is already included in the population projection.

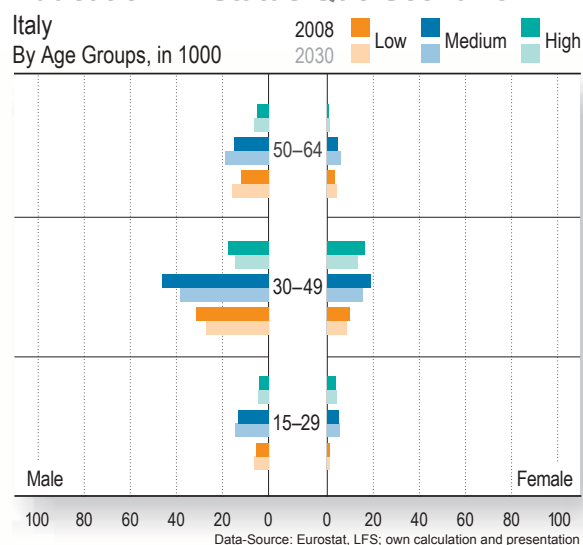
Overall, if the full Active Potential were to be used in 2030, shrinkage in the chemical sector would be reduced to one third under the Status Quo Scenario (-2% for male and -6.8% for female employees). Looking at particular age groups, the expected decrease in the number of male and female employees aged 15-24 and 25-29 years may be fully compensated by resorting to the unemployed. However, the strong decline in numbers of the 30-49 year-olds could be reduced by only three to six percentage points for each age group, while the number of 55-64 would increase by 40% until 2030, as opposed to 35% without the full use of the Unemployed Potential.

Results are again different under the Trend Scenario. The number of employees could grow by an average of 18% until 2030, which is an increase by roughly 26 000 male and 13 000 female employees. Strong growth in terms of numbers is expected for women (+20%), due to the huge projected increase in their shares in age groups 50-54 and 55-64 (by 82% and 521%), the corresponding age-specific growth rates for men being at 26% and 220% much weaker.

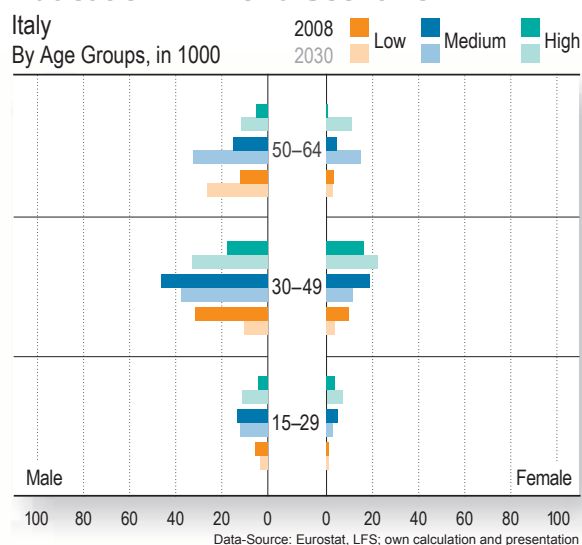
The share of females in 2030 is not likely to differ significantly from the value found without the use of the Unemployed Potential. At the same time, the share of employees aged 50 to 64 will be slightly lower under both scenarios, as the Unemployed Potential is estimated to be relatively young in 2030.

The Chemical Industry: Active Potential Projection for Italy

Education – Status Quo Scenario



Education – Trend Scenario



Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Professions - Status Quo Scenario

Italy By Active Potential	Share 2030		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	4.1%	1.0%	2.3%	-10.1%
Clerks	6.1%	5.0%	-0.9%	-6.2%
Plant and Machine Operators, Assemblers	23.0%	5.9%	-3.5%	-0.8%
Technicians and Associate Professionals	15.7%	9.4%	-5.2%	-12.3%
Professionals	12.5%	4.0%	-4.3%	-18.3%
Legislators, Senior Officials, Managers	4.1%	1.2%	14.0%	4.2%
Other	7.3%	0.7%	-3.9%	-14.9%

Data-Source: Eurostat, LFS; own calculation and presentation

Including the Unemployed Potential in the Status Quo Scenario, the expected number of highly educated employees is likely to decrease by 9%, as opposed to the 14% decline in the employment projection. The share of academics in all employees (21%) and in all females (31%) will remain nearly the same as without including the Unemployed Potential by 2030. The same applies to the share of highly educated people in the 50-64 year-olds (15%) in 2030.

The number of academics in the Active Potential could increase by 110% in the Trend Scenario, which is mostly attributed to the currently young and middle-aged chemical employees and less due to the Unemployed Potential. Compared to the Employment Projection, the academic share in all employees and

females would decrease by one percentage point in this scenario, while the share of academics in older people is not afflicted. In 2030, the average academic share in the chemical industry would thus amount to 40%, in women to 53% and among the elderly (age group 50-64) unchanged to 29%.

While the availability of males in elementary occupations could be stopped from shrinking by drawing back on the Unemployed Potential, the number of employees in all other occupations is, except for higher management positions, still expected to decrease until 2030. The projected decline is insignificant for male clerks and female plant and machine operators, but with 4 000 people more severe in the group of technicians and associate professionals.

The Chemical Industry: Conclusions for Italy

Age and Gender: The Employed Potential

- An employment change of -10% (+12%) is projected between 2008 and 2030 for the Status Quo Scenario (Trend Scenario).
- The share of employees aged 50-64 is expected to grow from 19% to 26% (41%) by 2030.
- In the Status Quo Scenario, the average female share in the chemical industry will shrink from 30% in 2008 to 28; it could also remain at 30% if the Trend Scenario were to prevail.
- The highest female share in 2008 was found in age group 30-34 at 38%; this is expected to remain true in 2030 as well, although with a slight decrease to 37%.

Age and Gender: The Unemployed Potential

- As only the Status Quo Scenario was considered to calculate the Unemployed Potential, it is projected to shrink by 11% until 2030.
- The share of 50-64 year-olds in the Unemployed Potential was 9% in 2008 and is expected to change to 13% through 2030.
- The overall female share is projected to shrink from 41% to 39% between 2008 and 2030.

Age and Gender: The Active Potential in 2030

- If the full potential will be used, shrinkage of -3% is expected in the Status Quo Scenario, and growth of 18% in the Trend Scenario.
- The share of the 50-64 year-olds in the Active Potential would be 26% (39%)
- The average female share in all employees is likely to be 29% (30%).
- The highest age-specific female share is still found in age group 30-34 with its value of 2008 (38%).

Higher Education: The Employed Potential

- The number of academics is estimated to shrink by 14% until 2030 in the Status Quo Scenario, while they could more double in the Trend Scenario.
- The academic share in all employees was 23% in 2008 and is likely to change to 22% (40%).
- The academic share in age group 50-64 was 15% in 2008 and is likely to remain constant in the Status Quo Scenario, while it could double in the Trend Scenario.
- 33% of all females were academics in 2008; this share is likely to develop to 31% (54%) until 2030.

Higher Education: The Unemployed Potential

- The number of academics is expected to shrink by 15% until 2030 in the Status Quo Scenario, in contrast to an increase by 36% under the Trend Scenario.
- In 2030, the academic share in the Unemployed Potential is expected to be 18% (28%).
- At the same time, the academic share in age group 50-64 is projected to be only 3% (18%).
- High educational levels were found in 26% of the female Unemployed Potential in 2008 and 2030 under the Status Quo Scenario; under the Trend Scenario it could be up to 34% in 2030.

Higher Education: The Active Potential in 2030

- The number of highly educated employees is still expected to shrink (9%) in the Status Quo Scenario, while it could grow by 110% under the Trend Scenario.
- The academic share would be 41% (42%) in 2030.
- At the same time, the academic share among age group 50-64 is expected only at 15% (29%).
- An average of 31% (53%) of all female employees is projected to be highly educated in 2030.

Professions: The Employed Potential

- Male plant and machine operators and assemblers, as well as male technicians made up for the largest shares in all chemical employees of 2008.
- Under the assumptions of the Status Quo Scenario, higher management positions would have to grow until 2030, while particularly the availability of technicians is likely to shrink by some 6000.

Professions: Unemployed and Active Potential

- Male and female plant and machine operators and assemblers, as well as males in elementary occupations are estimated to represent the largest groups of the Unemployed Potential in 2030.
- If the Unemployed Potential is fully used by 2030, only the group of males in elementary occupations can be stopped from shrinking. However, the decline in the number of male clerks and female plant and machine operators and assemblers can be strongly reduced.

GENERAL CONCLUSIONS

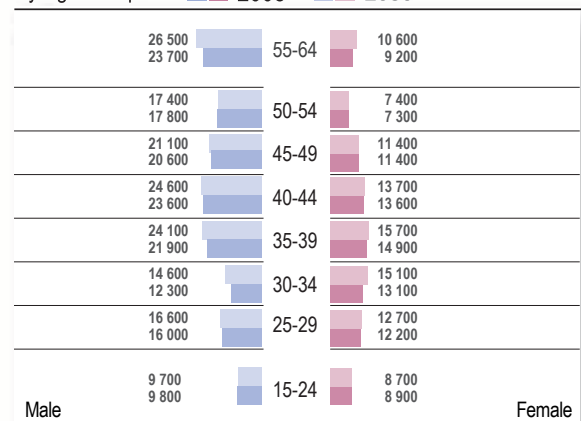
Demographic change is projected to have a strong negative impact on the Italian chemical industry in terms of employment. The decline will be even more pronounced among academics. Nevertheless, if the current employees are kept until the official retirement age (Trend Scenario), shrinking in the number of employees could be stopped and even turned into an increase, but at the price of heavy ageing of the chemical labour force. It is particularly the number of older female employees that would increase in this case. However, as women showed on average higher education as men, the strategy could be beneficial under educational aspects as well.

The Chemical Industry: Employment Projection for United Kingdom

Age and Gender - Status Quo Scenario

United Kingdom

By Age Groups ■ 2008 ■ 2030



2008: 145 600; 2030: 6.2% ■ 15-64 ■ 2008: 90 500; 2030: 5.4%

Data-Source: Eurostat, LFS; own calculation and presentation

In the United Kingdom, 236 000 people aged 15-64 worked in the chemical industry in 2008. The highest number of employees was found in age groups 35-39 and 40-44, each representing 16% of all chemical workers. Only 8% of all employees were aged 15-24, while 28% of all male and 18% of all female employees belonged to age groups older than 50 years.

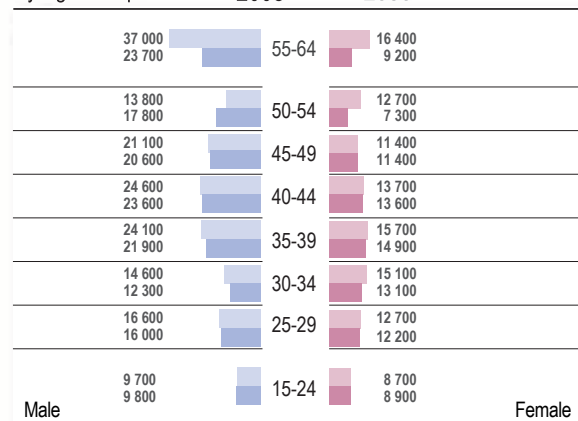
The average female share in the chemical industry was 38% in 2008. Higher age-specific female shares were found for the 25-39 year-olds, the highest in age group 30-34 at 51%. Particularly low female shares were found in age groups 50-54 (29%) and 55-64 (28%).

In the Status Quo Scenario, the working-age popula-

Age and Gender - Trend Scenario

United Kingdom

By Age Groups ■ 2008 ■ 2030



2008: 145 600; 2030: 10.9% ■ 15-64 ■ 2008: 90 500; 2030: 17.7%

Data-Source: Eurostat, LFS; own calculation and presentation

tion in the United Kingdom is expected to grow by 5.5% and the number of employees in the chemical sector by 5.9% until 2030. This means that the age structure in the chemical industry closely resembled that of the working-age population in 2008. The only difference was that the share of 15-24 year-olds - an age group that is expected to shrink through 2030 - was higher in the total population than in the chemical industry.

The average female share in 2030 will continue to be at 38% under the Status Quo Scenario, but it will be slightly below the overall average for age groups under 45, and slightly above it for the older.

Under the assumptions of the Trend Scenario, the

Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

number of available employees for the chemical industry could grow by nearly 14% until 2030. The expected increase in the number of employees is higher for females (+18%) than for men (+11%), since women were more underrepresented in the older age groups (50-64). Furthermore, as the currently young and middle-aged employees are kept until retirement, the overall number of older workers (55-64) increases by over 60%. The number of 50-54 year-olds however, is only expected to increase for female employees (+74%), while for males shrinkage is expected (-22%).

The average female share could increase to 40% until 2030, while the female share among age group 50-64 will at 36% however, remain under this average.

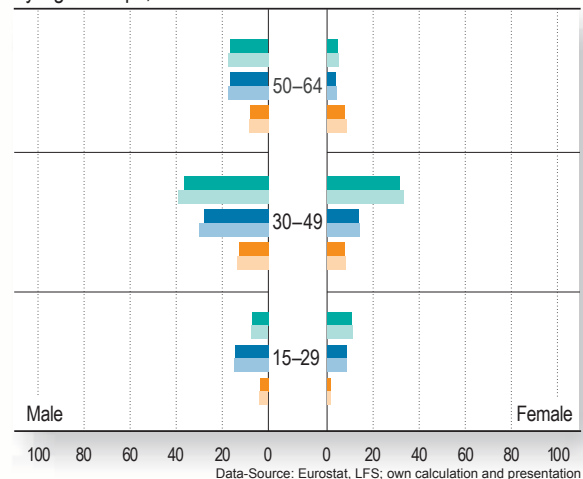
The Chemical Industry: Employment Projection for the United Kingdom

Education – Status Quo Scenario

United Kingdom
By Age Groups, in 1000

2008 2030

Low Medium High



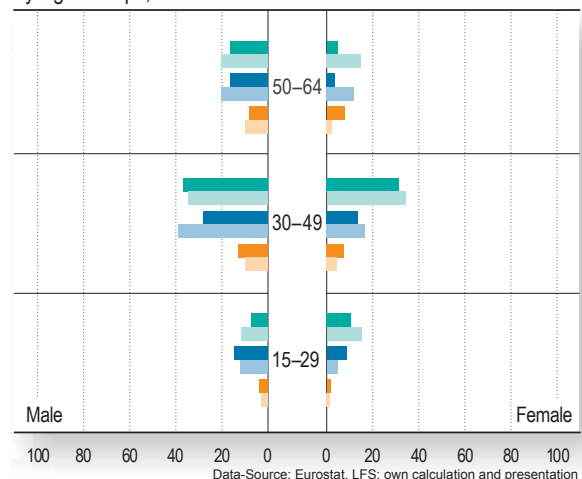
Data-Source: Eurostat, LFS; own calculation and presentation

Education – Trend Scenario

United Kingdom
By Age Groups, in 1000

2008 2030

Low Medium High



Data-Source: Eurostat, LFS; own calculation and presentation

Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-olds of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Professions – Status Quo Scenario

United Kingdom By Employees	Share 2008		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	5.8%	4.2%	4.9%	6.2%
Clerks	1.4%	9.1%	1.1%	4.4%
Plant and Machine Operators, Assemblers	15.0%	3.4%	6.3%	4.6%
Technicians and Associate Professionals	6.8%	6.2%	6.7%	5.2%
Professionals	13.1%	7.8%	6.9%	6.3%
Legislators, Senior Officials, Managers	15.9%	7.3%	6.2%	6.3%
Other	3.9%	0.0%	5.4%	n/a

Data-Source: Eurostat, LFS; own calculation and presentation

In 2008, the average share of academics in the British chemical industry was 46% for all employees and 52% for female employees. Age-specific academic shares were particularly high for the 30-34 (65%) and 35-39 (60%) year-olds, and at 37% significantly below the average for age group 50-64. The lowest age-specific share of academics was, as usual, found among the 15-24 year-olds, being however at 34% quite high (compared, for example, with Germany's 5%).

The number of highly educated employees will grow by 6% under the Status Quo Scenario. As this is close to average employment growth, the share of academics in all employees will continue to be at 46% in 2030. The shares of academics among older employees and among females would also change little in this scenario.

Projected growth in the number of academics is 27% under the Trend Scenario, resulting in an increase in the share of academics from 46% to 51% for all employees and from 52% to 61% in 2030 for female employees. The highest increase in the number of academics is likely to occur in age group 50-64. The academic share among the elderly could increase by 20 percentage points to 57% in 2030.

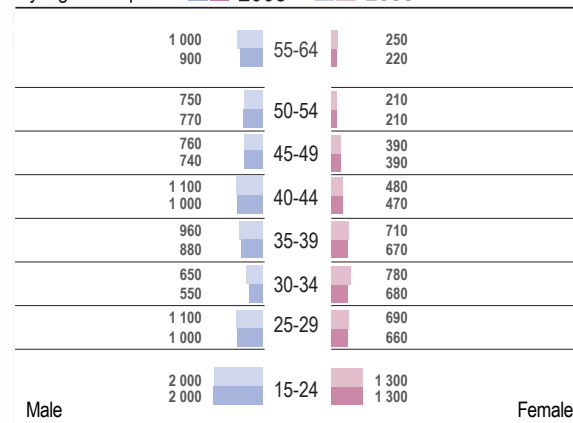
Compared to the other six countries, the UK had the largest shares of employees working as professionals and in higher management positions, and a low share of technicians. Under the assumption of unchanged age-specific professional choices, the availability of employees is likely to increase for all occupations, with the highest growth rate found among professionals.

The Chemical Industry: Unemployment Projection for the United Kingdom

Age and Gender – Status Quo Scenario

United Kingdom

By Age Groups ■ 2008 ■ 2030

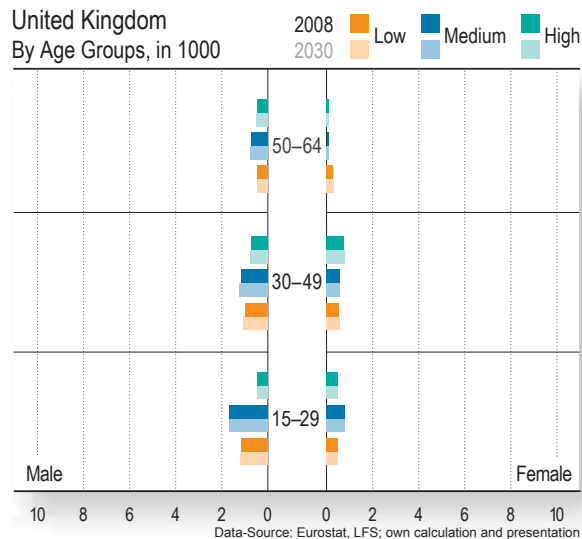


2008: 7 900; 2030: 4.6% **15-64** 2008: 4 600; 2030: 4.2%
Data-Source: Eurostat, LFS; own calculation and presentation

Education – Status Quo Scenario

United Kingdom

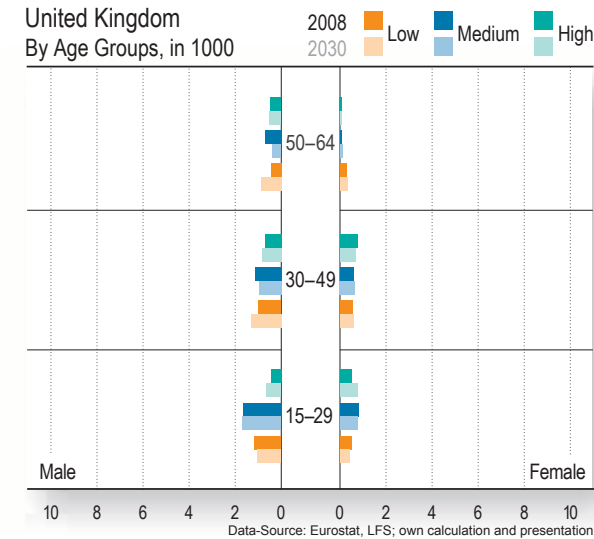
By Age Groups, in 1000



Education – Trend Scenario

United Kingdom

By Age Groups, in 1000



Professions - Status Quo Scenario

By Potential Employees	Share 2030		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	12.8%	8.5%	2.8%	2.3%
Clerks	3.0%	8.2%	3.2%	3.5%
Plant and Machine Operators, Assemblers	21.2%	7.1%	4.7%	1.8%
Technicians and Associate Professionals	5.8%	4.7%	4.3%	5.0%
Professionals	6.5%	3.5%	6.2%	5.1%
Legislators, Senior Officials, Managers	10.3%	4.8%	5.0%	5.4%
Other	3.5%	0.0%	2.9%	n/a

Data-Source: Eurostat, LFS; own calculation and presentation

The number of the Unemployed Potential is expected to grow by nearly 4.5% between 2008 and 2030 in the Status Quo Scenario (the only scenario here considered) and is estimated to encompass 13 000 persons in 2030. The share of 50-64 year-olds is then at 17% projected lower in the Unemployed Potential than in sectoral employment in 2030. At the same time, the share of females is at nearly 37% estimated to be only one percentage point lower among the unemployed as among the employed.

The number of unemployed academics is estimated for both scenarios. It is expected to grow by nearly 5% between 2008 and 2030 under the Status Quo Scenario, resulting in an average share of 24% in all unemployed in 2030, with higher values for age group

50-64 (26%) and for women (32%).

Under the Trend Scenario, the number of academics could increase by 24%, with the share of academics among all employees amounting to 28% in 2030. The academic share in age group 50-64 is at 25% in 2030 expected lower than in the Status Quo Scenario.

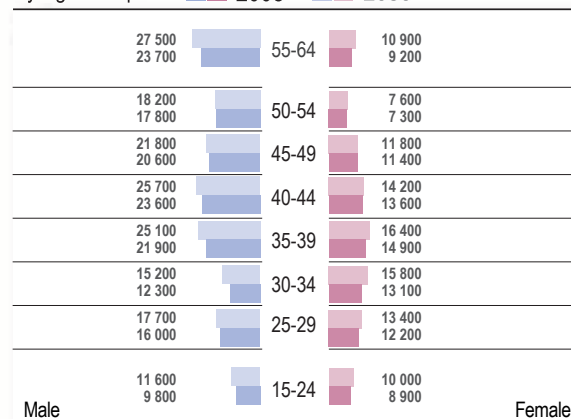
The availability of all professions will increase among the unemployed until 2030, the highest increase being projected in male professionals. The occupation with the largest share (21% in 2030) could then be plant and machine operators and assemblers. The shares of professionals and management positions are also projected to be the highest among the seven countries.

The Chemical Industry: Active Potential Projection for the United Kingdom

Age and Gender – Status Quo Scenario

United Kingdom

By Age Groups ■ 2008 ■ 2030

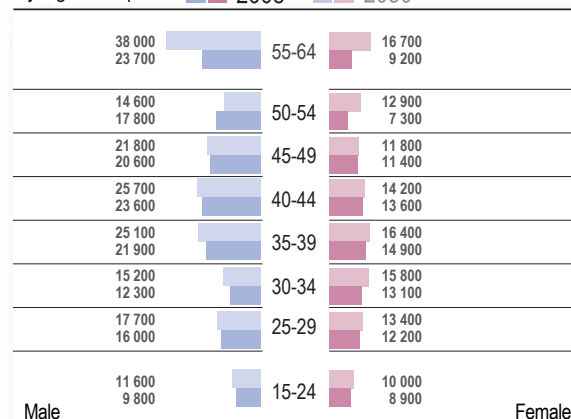


2008: 145 600; 2030: 11.9 % **15-64** 2008: 90 500; 2030: 10.7 %
Data-Source: Eurostat, LFS; own calculation and presentation

Age and Gender – Trend Scenario

United Kingdom

By Age Groups ■ 2008 ■ 2030



2008: 145 600; 2030: 16.6 % **15-64** 2008: 90 500; 2030: 23.0 %
Data-Source: Eurostat, LFS; own calculation and presentation

Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Projected Chemical Workers + Projected Unemployed Potential = Projected Active Potential

In 2008, about 0.8% of all British employees worked in the chemical sector. We assumed that the same share, 0.8%, of all unemployed workers will be available for the chemical industry in 2030. The estimated size of the Unemployed Potential for the chemical industry is thus relatively low in the UK compared to the other countries considered. However, drawing back on this potential is not necessary, as no shrinkage of the chemical workforce is expected until 2030. The Unemployed Potential may, however, still offer the possibility to further increase employment in the chemical sector, particularly as the

share of full-time workers in this sector was already very high in 2008.

Under the Status Quo Scenario the growth rate of employment could nearly double from 2008 to 2030, if the Unemployed Potential is fully used. The average growth rate would then amount to 11.4%, which is 11.9% for men and 10.7% for women. The formerly expected decrease in the number of 15-24 year-olds could be fully compensated by resorting to the unemployed; the same is true for the decline in numbers of 45-49 year-old women and 50-54 year-old men.

Under the assumptions of the Trend Scenario, the number of employees could increase by 19%, if the whole Active Potential were to be used by 2030. With

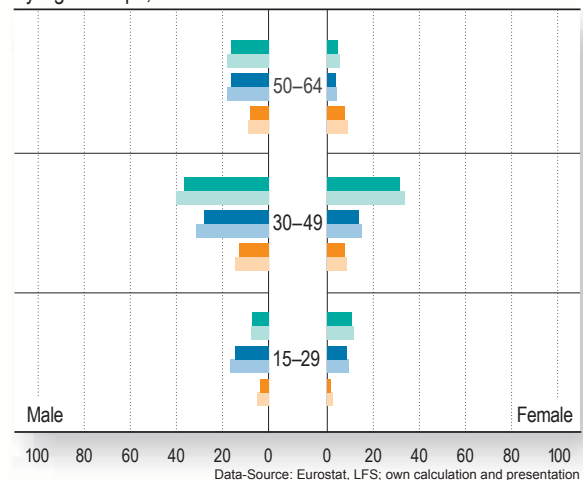
respect to gender, projected growth is stronger for females (+23%), than for men (+18%), as the former were less present in older age groups (50-64 years) in 2008 than the latter.

Full utilisation of the Unemployed Potential would neither have a strong impact on the age structure nor on the gender structure of the chemical sector. The average female share is still projected to be 38% in the Status Quo Scenario and 40% for the Trend Scenario. Furthermore, the highest female share would still be found among the 30-34 year-olds at 51% for both scenarios in 2030. The second highest female share, however, would be found in age group 50-54 at 47% (Trend Scenario) or in age group 15-24 years at 46% (Status Quo Scenario).

The Chemical Industry: Active Potential Projection for the United Kingdom

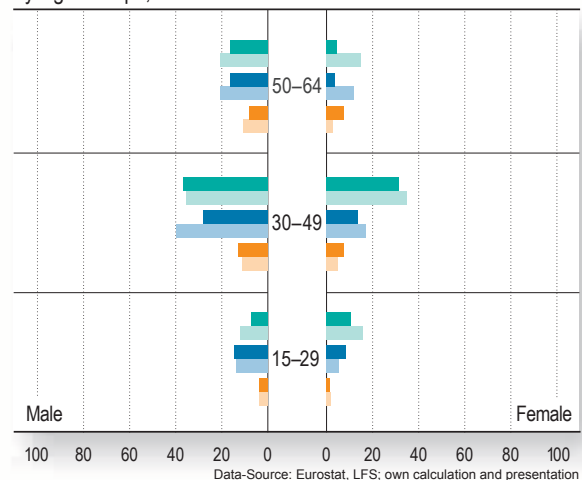
Education – Status Quo Scenario

United Kingdom
By Age Groups, 1000



Education – Trend Scenario

United Kingdom
By Age Groups, in 1000



Status Quo Scenario: To reflect the impact of general demographic change, age-specific labour participation rates are kept constant. The age-specific numbers of chemical employees are then developing according to Eurostat's total population projection.

Trend Scenario: The 28-42 year-old of 2008 are projected to be the 50-64 year-olds of 2030. For the younger than 50 year-olds in 2030, the assumptions of the Status Quo Scenario apply. Additionally, the educational level is projected to equal the Belgian level, which showed the highest academic share among younger employees in 2008. For the unemployed, only the latter assumption was used.

Note: Values marked by a star might be inaccurate due to a small sample size. Furthermore, unemployed persons are weighted numbers. See the methodological notes for additional information.

Professions - Status Quo Scenario

United Kingdom By Active Potential	Share 2030		Growth 2008-2030	
	Male	Female	Male	Female
Elementary Occupations	6.1%	4.4%	17.3%	17.6%
Clerks	1.4%	9.0%	12.9%	9.4%
Plant and Machine Operators, Assemblers	15.4%	3.6%	14.2%	16.1%
Technicians and Associate Professionals	6.8%	6.1%	11.5%	9.4%
Professionals	12.9%	7.6%	9.7%	8.8%
Legislators, Senior Officials, Managers	15.7%	7.2%	9.9%	9.9%
Other	3.9%	0.0%	10.5%	n/a

Data-Source: Eurostat, LFS; own calculation and presentation

With the inclusion of the Unemployed Potential in the Status Quo Scenario, the number of highly educated employees would increase by nearly 9% between 2008 and 2030. The shares of academics in all employees (45%) and in all females (51%) are, however, expected roughly one percentage point lower in the Active Potential compared to the Employed Potential projection. This is also the case for the share of highly educated people among the 50-64 year-olds in 2030.

The number of academics could increase by 30% in the Trend Scenario, if the full Active Potential were to be used in 2030. Similar to the other scenario, a decrease in the share of all academics by roughly one percentage point is expected, compared to the projec-

tion without the unemployed. The average academic share in 2030 is likely to amount to 50% in this case, with a share of 55.5% found among age group 50-64. At the same time, the average share of academics in all female employees is likely to be 60%.

As for occupations under the Status Quo Scenario, elementary occupations could at 17% show the highest growth rate, while the number of plant and machine operators and assemblers is projected to increase by some 5 000 workers through 2030. With unchanged professional choices and opportunities, the shares of professionals and occupations in higher management would continue to be large in 2030, while the share of technicians and associate professionals is estimated to be relatively low in 2030.

The Chemical Industry: Conclusions for the United Kingdom

Age and Gender: The Employed Potential

- An employment increase of 6% (14%) is projected between 2008 and 2030 under the Status Quo Scenario (Trend Scenario).
- The share of employees aged 50-64 is expected to remain at 25% under the Status Quo Scenario and could grow to 30% in 2030 under the Trend Scenario.
- In the Status Quo Scenario, the average female share in the chemical industry is likely to be at 38% in 2008 and 2030; it could also grow to 40% until 2030, if the Trend Scenario were to prevail.
- The highest female share in 2008 was found in age group 30-34 at 51% and will not change by much until 2030 under both scenarios.

Age and Gender: The Unemployed Potential

- The Unemployed Potential will grow by 5% until 2030 under the Status Quo Scenario (the only one considered).
- The share of 50-64 year-olds in the Unemployed Potential was 17% in 2008 and is expected unchanged in 2030.
- The average female share will be 37% in 2030.

Age and Gender: The Active Potential in 2030

- The chemical sector could grow by up to 11% (19%) until 2030, if the full potential is used in the Status Quo Scenario (Trend Scenario).
- The share of 50-64 year-olds in the Active Potential would then amount to 24% (29%).
- The average female share in the sector will be roughly 39% in both scenarios.
- The highest age-specific female share is still found in age group 30-34 at 51%.

Higher Education: The Employed Potential

- The number of academics is expected to grow by 6% (27%) in the Status Quo Scenario (Trend Scenario).
- The academic share in all employees is projected to remain constant at 46% in 2030 compared to 2008, while it could increase to 52% under the Trend Scenario.
- The academic share in age group 50-64 was 37% in 2008 and is likely to remain at/grow to 37% (61%).
- 52% of all females were and are projected to be academics; this share is likely to develop to 61% under the Trend Scenario.

Higher Education: The Unemployed Potential

- The number of academics is projected to grow by 5% (23%) between 2008 and 2030 in the Status Quo Scenario (Trend Scenario).
- In 2030, the academic share in the Unemployed Potential is expected to be 24% (28%).
- At the same time, the academic share in age group 50-64 is projected to be 26% (25%).
- High educational levels were found at 32% of the female Unemployed Potential in 2008; this share could increase by up to two percentage points until 2030 (Trend Scenario).

Higher Education: The Active Potential in 2030

- The number of highly educated employees in the Active Potential is likely to grow by 9% (30%) until 2030.
- In 2030, 45% (50%) of all employees would then be academics.
- At the same time, the academic share among age group 50-64 will amount to 36% (56%).
- An average of 51% (60%) of all female chemical employees is projected to be highly educated in 2030.

Professions: The Employed Potential

- The number of employees is estimated to increase in all occupations until 2030.
- In 2030, large shares of employees are projected to be working as professionals and in higher management positions and a relatively low share as technicians.

Professions: Unemployed and Active Potential

- Large shares of the Unemployed Potential are expected to consist of male plant and machine operators and assemblers as well as of persons in management positions and elementary occupations in 2030.
- If the Unemployed Potential will be fully used by 2030, strong growth is expected in the number of plant and machine operators and assemblers, as well as for employees working in elementary occupations.

GENERAL CONCLUSIONS

Demographic change is not pronounced in the United Kingdom. Ageing is slow and the average growth rate of the population is positive between 2008 and 2030. (Strong) growth is also projected for the working-age population. The chemical sector's workforce could therefore increase even in the case in which the low labour participation at older ages remains constant.

While the quantity of labour may be increased without severely changing the age structure in the sector, increasing the academic share would demand keeping the older employees longer in work as so far. But even without doing so, demographic change is not likely to have a negative influence on the number of academics.

Methodological Notes

Demographic data for 2008 and 2030, as well as information on the current structure of the chemical industry in the seven countries is taken from Eurostat. The demographic projection is based on the EUROPOP2008 convergence scenario, which is the only one readily available at present. It takes population on the 1st of January 2008 as a starting point and includes migration movements.¹

Data about the chemical industry was taken from the EU-Labour Force Survey (LFS), which is a sample survey of persons living in private households. The division of the population in employed, unemployed, active and inactive persons follows the International Labour Organisation (ILO) concept. Data obtained from the LFS may diverge from national data either because other definitions of (un)employment are used or because the data source is different. For example, the Federal Employment Agencies in Germany publish data for the 18/20-24 instead of for the 15-24 year-olds, and these data are based on company information. The great advantage of LFS data is its international comparability.

Two basic projections for the chemical industry in each of the seven countries² were performed: an Employment Projection and an Unemployment Projection. The two were then combined to an Active Potential Projection. Each projection consists of three variants: by age and gender, by education and by professions. Two scenarios could thereby be considered: the Status Quo Scenario and the Trend Scenario, but for some projection variants only the former was calculated.

Employment Projection

by Age and Gender:

Status Quo Scenario  and Trend Scenario 

by Education:

Status Quo Scenario  and Trend Scenario 

by Professions:

Status Quo Scenario 

Unemployment Projection


by Age and Gender:

Status Quo Scenario  

by Education:

Status Quo Scenario  and Trend Scenario 

by Professions:

Status Quo Scenario 

Active Potential Projection

by Age and Gender:

Status Quo Scenario  and Trend Scenario 

by Education:

Status Quo Scenario  and Trend Scenario 

by Professions:

Status Quo Scenario 

The Active Potential Projection by Age and Gender under the Trend Scenario is a combination of the corresponding Employment Projection, and the Unemployment Projection under the Status Quo Scenario. In what follows we first described the two scenarios and then the three projections with their variants.

Status Quo Scenario

Under the Status Quo Scenario it is assumed that age- and gender-specific rates of access of the chemical industry to the working-age population remain unchanged until 2030. In this case the chemical industry would experience the full impact of demographic change on the availability of labour. Its number of employees in an age group and in total would vary in accordance with the demographic development. Thus, if an age group in the population increases, the age group in the chemical industry will grow as well. The scenario implies that labour migration between sectors is taking place, particularly at older ages, as older age groups are strongly increasing in numbers under demographic change.

The age- and gender-specific rates of access of the chemical industry to the working-age population are calculated by dividing the number of chemical employees in an age group (taken from the LFS) by the population in this age group (taken from Eurostat). We call them “age-specific labour participation rates”. For example, a value of 2% for males aged 35-44 means that in 2008 2% of men aged 35-44 years worked in a country’s chemical sector. The assumption is now that in 2030 it will also be 2% of men then aged 35-44, which will work in this sector. Their number is calculated by applying the age-specific labour participation rate to the population aged 35-44 in 2030 (taken from the EUROPOP2008 projection).

¹ The former, 2004 projection, is no longer present on the Statistical Office’s homepage. For some regions, the 2004 and 2008 projections differ dramatically. ² Projections were only performed for countries, not for regions.

Trend Scenario

For the Trend Scenario, the 28-42 year-olds of 2008 are projected to be the 50-64 year-olds of 2030, whereby age- and gender-specific survival rates (taken from the EUROPOP2008 projection) are applied to the 2008 population. This could mean that from a specific age group set at 100%, only 96% will survive until 2030. Furthermore, it is assumed that workers aged 28-42 in 2008 and surviving until 2030 are kept in work and in the chemical sector until the official retirement age valid in 2008 for that very year in the country under consideration. For age groups younger than 50 years in 2030 we use the same assumptions as under the Status Quo Scenario.

The Trend Scenario implies that the number of employees in a country's chemical industry aged 50 and older in 2030 depends on the number of employees aged 28-42 in 2008.

When the Trend Scenario is considered for a Projection by Education, it is additionally assumed that the educational level of those aged 15-49 in 2030 will in all countries equal the educational level calculated for Belgium under the Status Quo Scenario. That is, we assume that all countries converge under the Trend Scenario towards the educational level prevailing in Belgium under the Status Quo Scenario.³ The reason for choosing Belgium as a reference was that it had the highest share of academics among younger age groups in 2008. We thereby ignore that some countries could overleap Belgium in terms of their academic share in age groups younger than 50 years.

Employment Projection

The Employment Projection is performed by Age and Gender and by Education for both Scenarios, and by Profession only for the Status Quo Scenario. By Age and Gender it follows the path described above. By Education it employs the classification into lower, middle and high education that follows the International Standard Classification of Education (ISCED 97). Due to data restrictions, the lower and middle levels of education had to be merged into one group ("non-academics") in the case of Belgium and the Czech Republic, and no differentiation by gender was possible for these two countries.

For the Employment Projection by Professions, the International Standard Classification of Occupations (ISCO-88) was used, with the group "Other" consisting of craft and related trades workers, but also of persons in agricultural and service professions. Since for some age groups the sample size in the LFS is too low, we could not publish age-specific results.

Unemployment Projection

With the Unemployment Projection we aim at estimating the share of a country's unemployed persons that could be used as a potential for compensating the effects of demographic change and maybe also for expanding employment in the chemical industry.

The Unemployment Projection by Age and Gender is performed only for the Status Quo Scenario. We do not consider the Trend Scenario as it is not said that

the currently unemployed persons aged 28-42 years will still be unemployed at the age of 50-64 years in 2030. We weighted the number of unemployed persons in 2008 by the national share of chemical employees in all employees, taken by age and gender.

For the Unemployment Projection by Education both Scenarios are considered. Regarding the Trend Scenario we proceeded as described above under the corresponding heading.

The Unemployment Projection by Professions follows the lines of the Employment Projection by Professions. The only difference is that in the case of France, information about the former occupation of the unemployed was not accessible. To compute the shares of occupations in all unemployed we therefore resorted to the occupational structure of the employed by age groups, as a rough estimator.

Active Potential Projection

Finally, the projected number of chemical employees and the estimated size of the Unemployed Potential for 2030 were combined to yield what we call the Active Potential for the year 2030. It can be seen as a "best case" result for the chemical industry. For the Active Potential Projection under the Trend Scenario results of the Employment Projection under the Trend Scenario were combined with results for the Unemployment Projection under the Status Quo Scenario.

³ This explains why only one Scenario by Education is calculated for Belgium: the assumptions for the Trend Scenario coincide with those for the Status Quo Scenario in this case.

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