



Barrow-in-Furness

Demographic Analysis and Forecasts

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For the attention of:

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Acknowledgements

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Introduction

Context & Requirements

- 1.1 Barrow-in-Furness' Strategic Housing Market Assessment (SHMA) was published in August 2016 and included an assessment of housing growth over the 2012–2031 plan period¹. In the same year, Barrow Borough Council published its Draft Local Plan² which incorporated the analysis presented in the SHMA and outlined the Objectively Assessed Housing Need (OAN) for the borough over the defined plan period. In both the SHMA and Draft Local Plan, population and housing growth was estimated using the 2012-based population and household projections from the Office for National Statistics (ONS) and Department for Communities and Local Government (DCLG).
- 1.2 In advance of its new Local Plan which is due for adoption later this year, Barrow Borough Council is seeking to consider the most up-to-date demographic and housing growth evidence to better inform its Objectively Assessed Housing Need (OAN).
- 1.3 Edge Analytics has been commissioned to provide a range of scenarios based on the most up-to-date evidence including; the latest 2014-based Sub-National Population Projection (SNPP) from the ONS, 2014-based household projection model from the DCLG, latest Mid-year Population Estimates (MYEs) and economic assumptions from the Office for Budget Responsibility's (OBR) labour market analysis.
- 1.4 A number of trend scenarios based on variant migration histories are considered and presented alongside the official 2014-based population and household projection. Employment forecasts from Experian are also considered, along with a range of sensitivity scenarios to evaluate the

¹<https://data.barrowbc.gov.uk/dataset/33db3778-bb79-44a0-b901-f6778cfdad3/resource/116d5c31-359d-4950-ab8b-9e2915612ab9/download/sregenerationplanning-policymasterplans-and-evidence-base-studiesshma-update-2016barrow-shma-upd.pdf>

²<https://data.barrowbc.gov.uk/dataset/barrow-borough-council-local-plan-publication-draft-2016/resource/a5f64cd1-07a4-4a5d-be50-ce4507aa0f2c>

impact of alternative commuting and economic activity rate assumptions on the relationship between economic and population growth in Barrow-in-Furness.

Approach

Official Guidelines

- 1.5 The development and presentation of demographic evidence to support local housing plans is subject to an increasing degree of public scrutiny. The National Policy Planning Framework (NPPF) and Planning Practice Guidance (PPG) provide guidance on the appropriate approach to the objective assessment of housing need. Guidance is also provided by the Planning Advisory Service (PAS)³, with practical advice on assessing the housing needs and establishing housing targets for an area.
- 1.6 In the objective assessment of need, demographic evidence is a key input. The PPG states that the DCLG household projections should provide the *“starting point estimate of overall housing need”* (PPG paragraph 2a-015). Local circumstances, alternative assumptions and the most recent demographic evidence, including Office for National Statistics (ONS) population estimates, should also be considered (PPG paragraph 2a-017). Evidence that links demographic change to forecasts of economic growth should also be assessed (PPG paragraph 2a-018).
- 1.7 The choice of assumptions used for demographic forecasting has an important impact on scenario outcomes. This is particularly the case when trend projections are considered alongside employment forecasts. The scrutiny of demographic assumptions is now a critical component of the public inspection process, providing much of the debate around the appropriateness of a particular OAN.

Edge Analytics' Approach

- 1.8 In accordance with the PPG, Edge Analytics has used POPGROUP (v.4) technology to develop a range of growth scenarios. In each of the scenarios, historical data is included for the 2001–2015 period, with scenario results presented for Barrow-in-Furness' designated 2014–2031 plan period.

³ <http://www.local.gov.uk/sites/default/files/documents/objectively-assessed-need-9fb.pdf>

- 1.9 The scenario analysis is prefaced with a ‘demographic profile’ of Barrow-in-Furness, illustrating its geographical context, its ‘components’ of population change (births, deaths, and migration) and its historical commuting and migration patterns ([Section 2](#)).
- 1.10 The starting point of the scenario analysis is the 2014-based sub-national population projection (SNPP) and sub-national household projection for Barrow-in-Furness ([Section 3](#)). A number of alternative trend scenarios, using varying migration assumptions, have been developed and are compared to the 2014-based benchmark scenario in [Section 4](#). Household and dwelling growth have been estimated using assumptions from the 2014-based DCLG household projection model for Barrow-in-Furness, with sensitivities which consider the implications of adjustments to headship rates in the younger age groups.
- 1.11 In [Section 5](#), the effect of the changing population age structure on Barrow-in-Furness’ labour force is considered, linking the demographic scenarios to an estimated employment growth requirement using assumptions on economic activity, unemployment and commuting. These are compared to independently-generated Experian employment forecasts for Barrow-in-Furness. Sensitivity testing has also been included to consider alternative economic assumptions that link population growth to the jobs growth implied by the Experian employment forecasts.
- 1.12 [Section 6](#) summarises the scenario evidence, with the Appendices to this document providing a summary of the POPGROUP methodology and further detail on key data and assumptions used in the development of the forecasts.

2 Area Profile

Geography

2.1 Barrow-in-Furness is a coastal district located in Cumbria, bordering Morecambe Bay and the district of South Lakeland. With a total area of 78km², the district is one of the smallest boroughs in England with a population density of approximately 865/km².

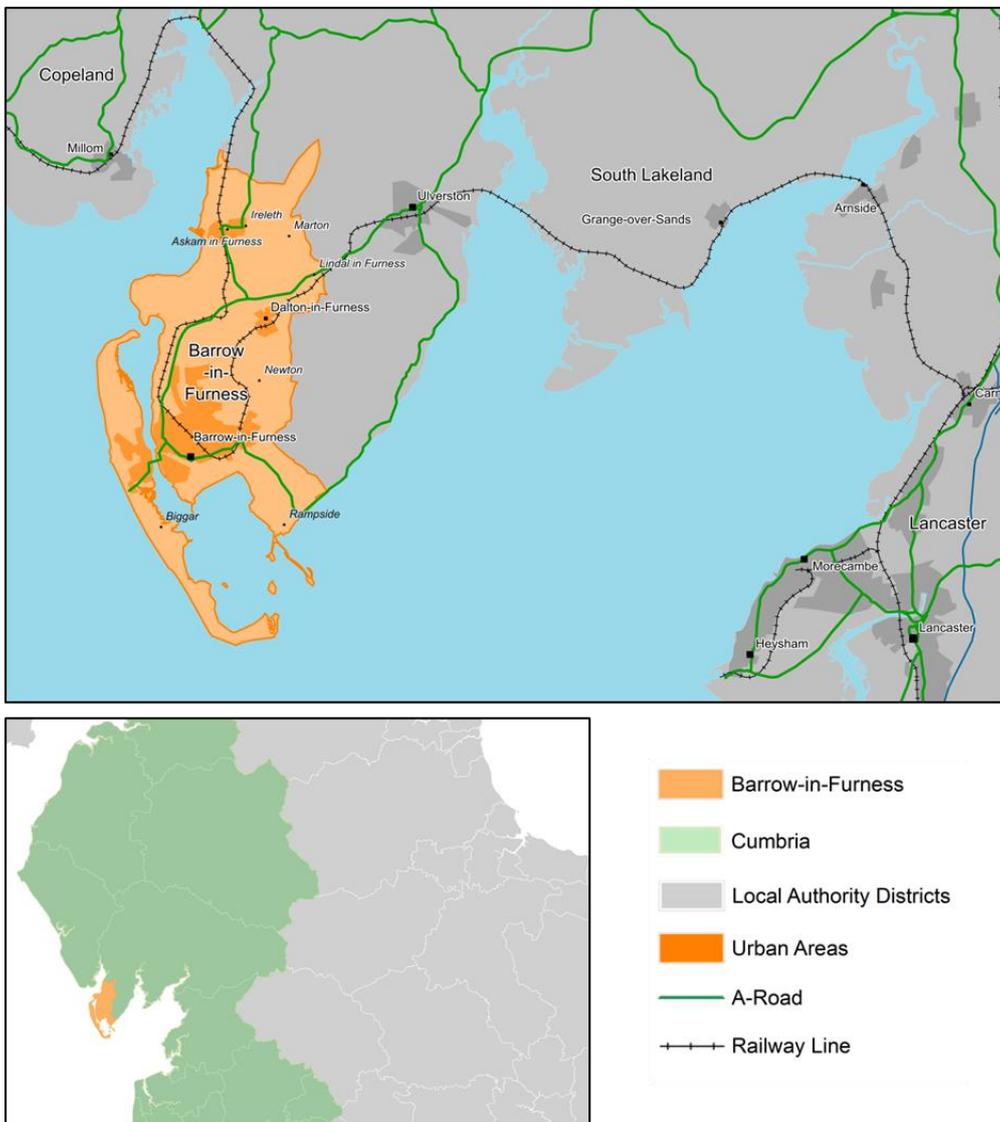


Figure 1: Barrow-in-Furness

Population Growth Profile

- 2.2 The 2015 MYE for Barrow-in-Furness suggests a population of 67,515, a 6.2% decline since 2001. This population decline contrasts to the positive rate of population growth in both Cumbria and the North West (2.1% and 5.9% respectively), and is substantially below the England average growth rate of 10.8%.

Table 1: Barrow-in-Furness population change comparison (Source: ONS)

| Area | Population Change 2001–2015 | | | |
|-------------------|-----------------------------|------------|-----------|----------|
| | 2001 | 2015 | Change | % Change |
| Barrow-in-Furness | 71,960 | 67,515 | -4,445 | -6.2% |
| Cumbria | 487,795 | 497,996 | 10,201 | 2.1% |
| North West | 6,772,985 | 7,173,835 | 400,850 | 5.9% |
| England | 49,449,746 | 54,786,327 | 5,336,581 | 10.8% |

- 2.3 Between Censuses, MYEs are derived by applying ‘components of change’ (i.e. counts of births and deaths and estimates of internal and international migration) to the previous year’s MYE. Following the 2011 Census, the MYEs from 2002–2010 were ‘rebased’, ensuring the correct transition of the age profile of the population over the 2001–2011 decade. At the 2011 Census, Barrow-in-Furness’ resident population was 69,087, a 4.0% reduction from 2001. The 2011 Census population count proved to be *lower* than that suggested by the trajectory of growth from the previous MYEs. As a result, the revised, final MYEs are *lower* than the original pre-Census MYEs (Figure 2).

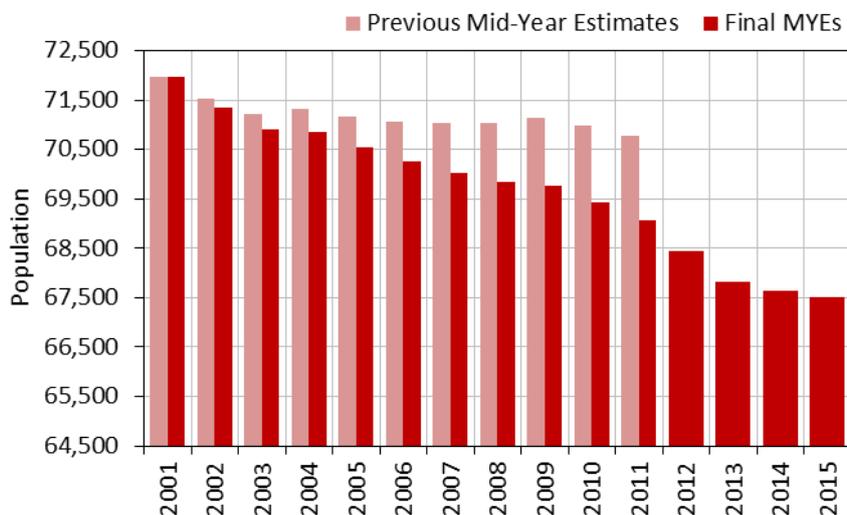


Figure 2: Barrow-in-Furness mid-year population estimates, 2001–2015

- 2.4 The rebasing of the MYEs involved the recalibration of the components of change for 2001/02–2010/11. After methodological changes and errors in the components were accounted for, the remaining difference between the expected 2011 mid-year estimate and the 2011 Census-based mid-year estimate is referred to as ‘unattributable population change’ (UPC). The ONS has not attributed UPC to any one component-of-change, however, suggesting that it may be due to the Census estimates themselves, international migration estimation or internal migration counts.
- 2.5 In Barrow-in-Furness’ case, the impact of the UPC component was a reduction to each inter-Census MYE, averaging -167 per year to 2011 (Figure 3).

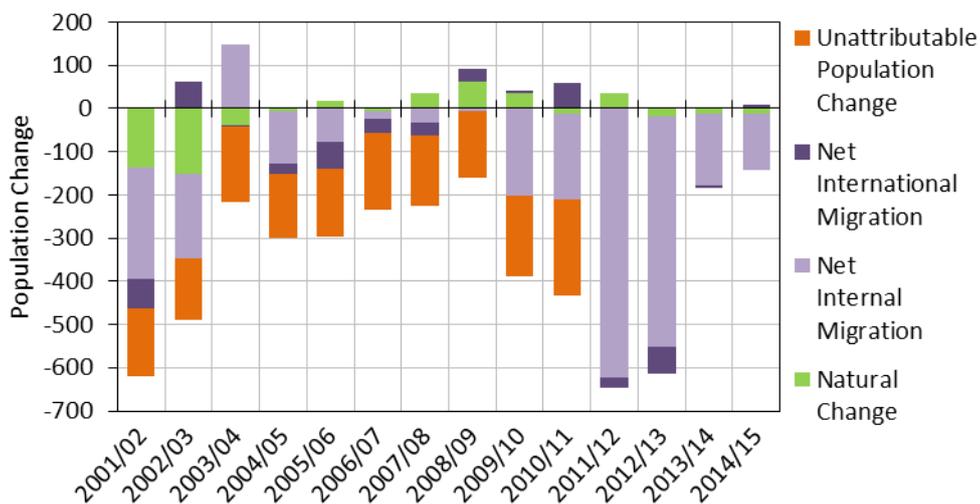


Figure 3: Mid-Year Population Estimates (Source: ONS)

- 2.6 Between Censuses, births and deaths are accurately recorded in vital statistics registers and provide a robust measure of 'natural change' (the difference between births and deaths) in a geographical area. Given that births and deaths are robustly recorded, and assuming that the 2001 Census provided a robust population count, the 'error' in the historical MYEs is most likely due to the difficulties associated with the estimation of migration.
- 2.7 Internal migration (i.e. migration flows to and from other areas in the UK) is adequately measured using data from the Patient Register (PR), the National Health Service Central Register (NHSCR) and Higher Education Statistics Agency (HESA), although data robustness may be lower where there is under-registration in certain age-groups (young males in particular).
- 2.8 It is most likely that the UPC component is associated with the mis-estimation of international migration, i.e. the balance between immigration and emigration flows to and from Barrow-in-

Furness. Based on this assumption, a fourteen-year profile of the 'components of change' is presented for Barrow-in-Furness (Figure 4).

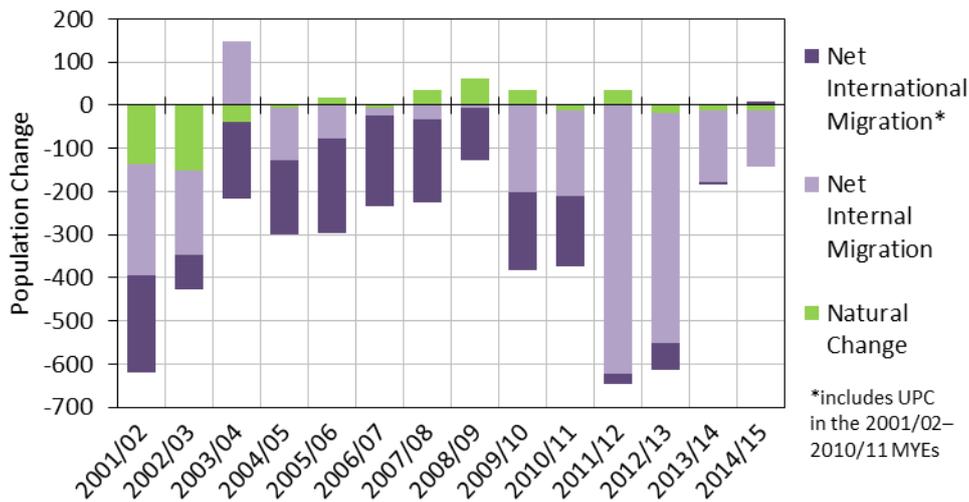


Figure 4: Barrow-in-Furness components of population change 2001/02 to 2014/15 including UPC in the 2001/02 to 2010/11 international migration component (source: ONS)

- 2.9 Barrow-in-Furness's population change since 2001/02 has been driven by a combination of natural change, internal and international migration. Natural change has historically had a varied impact on population change, contributing to a population decline in the earlier and latter part of the historical period (i.e. an excess of deaths over births).
- 2.10 Internal migration (i.e. the exchange of migrants between Barrow-in-Furness and other parts of the UK) has had the most significant impact on population decline, with a significant peak in net outflows during 2011/12 and 2012/13. In all years since 2001, only 2003/04 has seen a positive growth due to a net inflow to Barrow-in-Furness. With the inclusion of the UPC component, international migration is estimated to have had a negative impact on Barrow-in-Furness' population change throughout the 2001/02–2010/11 historical period, with little impact upon population change thereafter.

Age-Structure

- 2.11 When considering future housing needs and the size and shape of the resident labour force, the age structure of Barrow-in-Furness' population is a key factor. Figure 5 compares Barrow-in-Furness' age profile to its region and England in total, using the 2014 base year of the latest ONS sub-national projections.

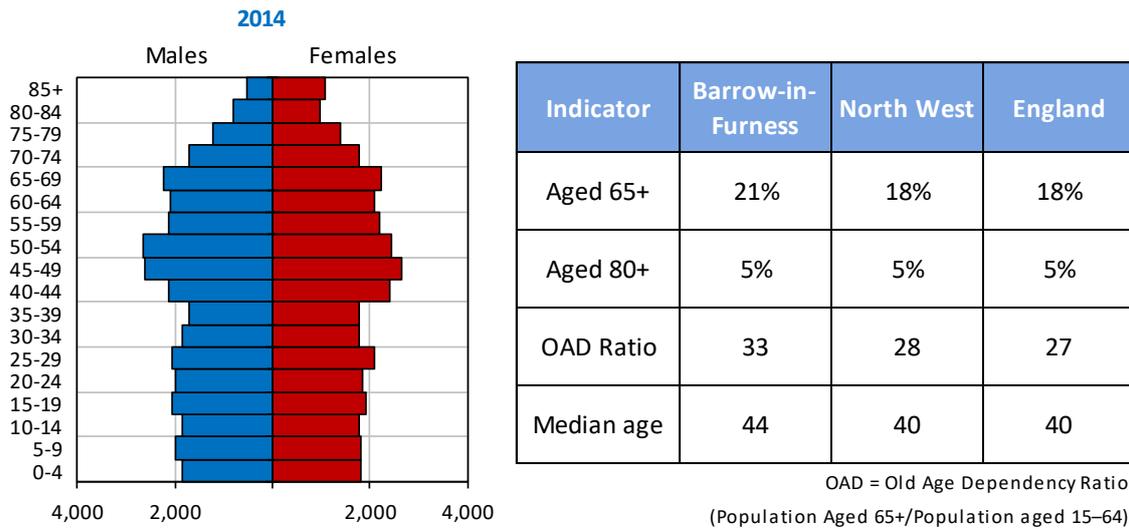


Figure 5: Barrow-in-Furness population age structure (source: ONS)

2.12 Barrow-in-Furness has an older age profile than the North West region and England, with 21% of the population in the 65+ age-range, and a median age of 44. Barrow-in-Furness has an Old Age Dependency ratio of 33, compared to a national average for England of 27. This means that the 65+ population of Barrow-in-Furness is equivalent to 33% of the 15–64 age-group population, compared to just 27% across England in aggregate.

Internal Migration

2.13 Internal migration statistics measure the in-flows and out-flows of population to and from Barrow-in-Furness, from and to elsewhere in the UK. The average annual decline of Barrow’s population as a result of internal migration exchanges has averaged -173 per year since 2001/02 (Figure 6). This illustration reflects the ‘components-of-change’ profile but also presents the separate in-migration and out-migration flows that make up the net total. During the 2001/02–2014/15 historical period, internal in-migration averaged 1,708 per year, with internal out-migration averaging 1,881 people per year. Whilst both in-migration and out-migration has remained relatively stable during the last fifteen years, it was a sharp fall in the level of in-migration in combination with a rise in out-migration in 2011/12 that led to the decline in net migration. In more recent years, internal in- migration flows have increased relative to outflows.

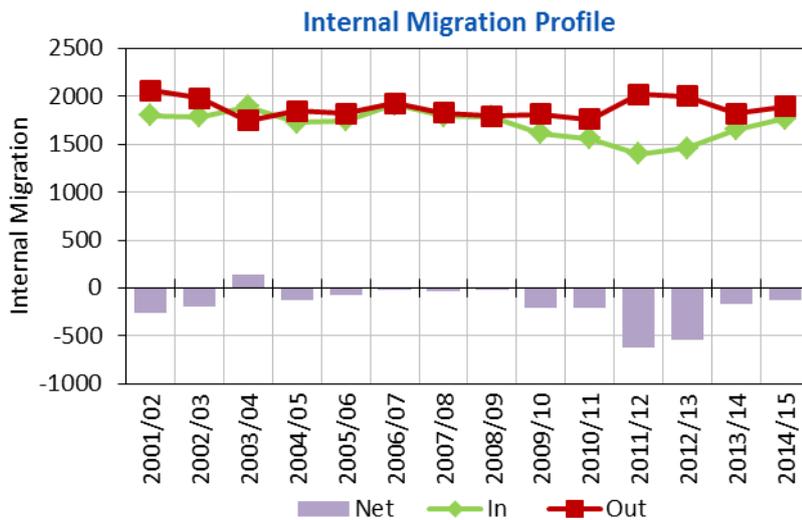


Figure 6: Barrow-in-Furness internal migration profile, 2001/02–2014/15 (source: ONS)

2.14 In terms of migration linkages between Barrow-in-Furness and surrounding areas, the largest *positive* net exchanges (i.e. a higher inflow than outflow) have been with Oldham and Bradford local authority districts, although these are small numbers (Figure 7). For the net *outflow* exchange, the dominant flow has been between South Lakeland and Lancaster (Figure 7).

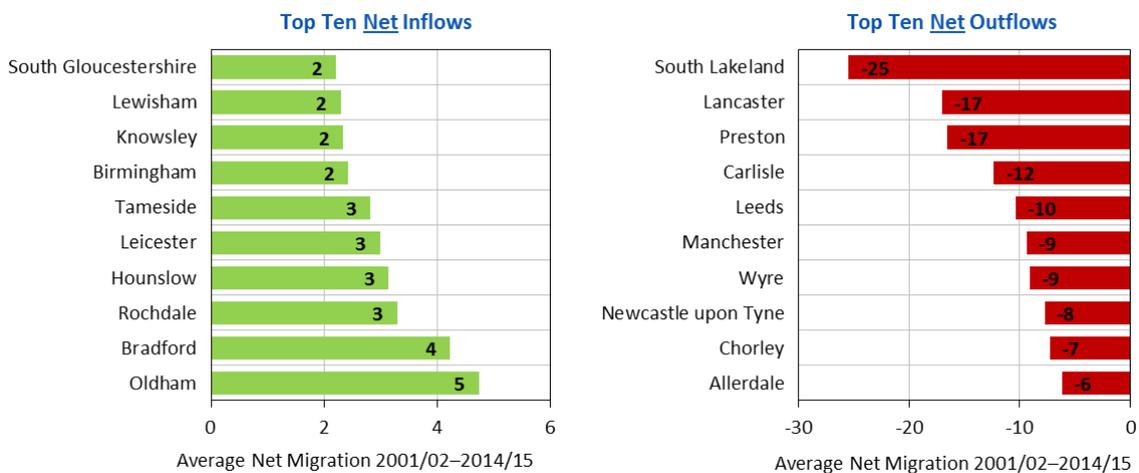


Figure 7: Top-10 internal migration net inflows & outflows, average 2001/02–2014/15 (source: ONS)

2.15 The age profile of migration reveals that Barrow-in-Furness has experienced a significant net outflow in the 15-19 and 75+ age groups (Figure 8). The large net outflow at age 15–19 will be associated with student moves to higher education; with a smaller return flow in the 20–24 age group.

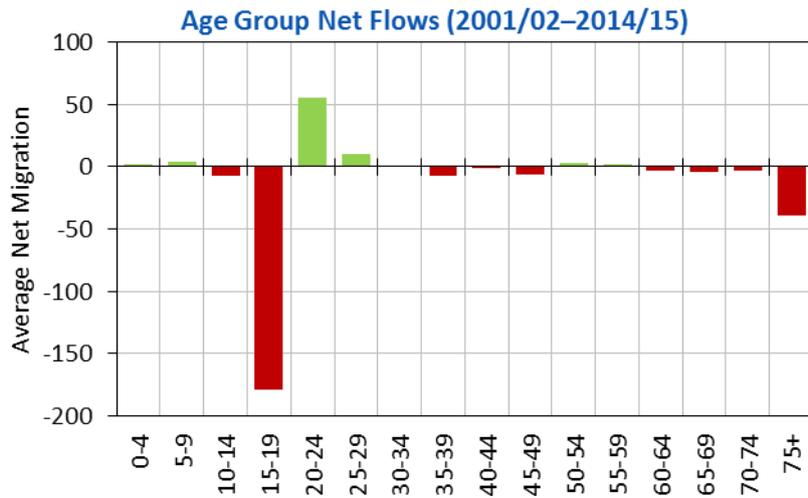


Figure 8: Barrow-in-Furness internal migration age profile, 2001/02–2014/15 (source: ONS)

International Migration

2.16 National Insurance Number (NINo) registrations provide an indication of the number of foreign nationals that have registered to work in Barrow-in-Furness since 2002 (Figure 9).

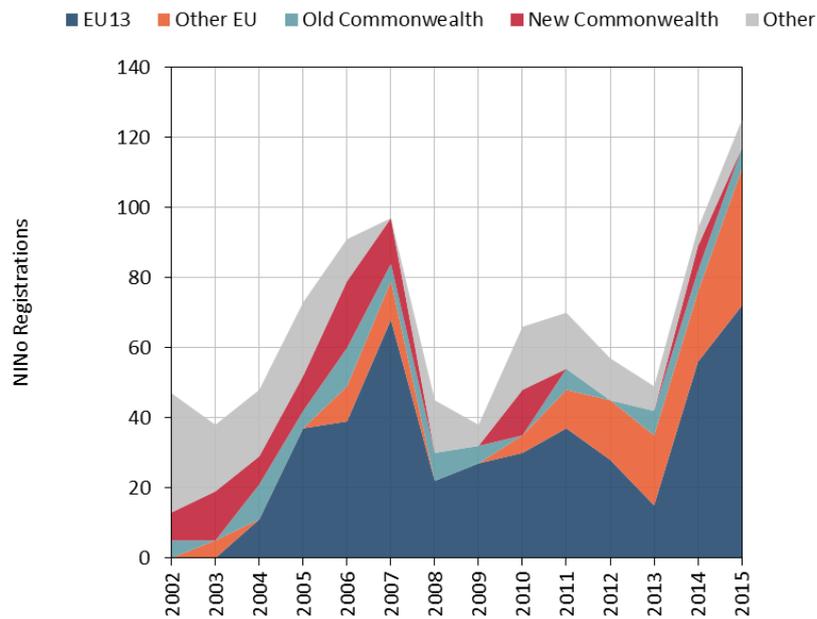


Figure 9: NINo Registrations in Barrow-in-Furness, 2002–2015 (Source: DWP)

2.17 These data do not align especially well with ONS components of change as they are a record of immigration only (there are no associated de-registration statistics); they only include those registering for work (excluding dependents) and do not provide any evidence on the 'length-of-

stay' of each migrant. However, they do provide a useful picture of the likely trend in immigration and an indication of the country-of-origin of migrants locating themselves in Barrow-in-Furness.

- 2.18 The large majority of Barrow-in-Furness' NINO-registrations have been associated with European migrants, particularly from the countries that have joined the EU since 2004. 2013 was a low-point for registrations, but numbers have increased since, with a higher proportion of migrants from Bulgaria and Romania since 2014.

Commuting Flows

- 2.19 With regards to travel-to-work patterns, the 2011 Census recorded 31,344 workers aged 16+ living within Barrow-in-Furness (Table 2) and 31,478 workers aged 16+ working within Barrow-in-Furness (Table 3).

Table 2: Barrow-in-Furness 2011 Census commuting flows: workers (ages 16+)

| Where do people who live in Barrow-in-Furness work? | | Source: ONS | |
|---|-------------------|---------------|---------------|
| Live | Work | Number | % |
| Barrow-in-Furness | Barrow-in-Furness | 26,292 | 83.9% |
| | Other | 5,052 | 16.1% |
| Workers | | 31,344 | 100.0% |

Table 3: Barrow-in-Furness 2011 Census commuting flows: employment (ages 16+)

| Where do people who work in Barrow-in-Furness live? | | Source: ONS | |
|---|-------------------|---------------|---------------|
| Live | Work | Number | % |
| Barrow-in-Furness | Barrow-in-Furness | 26,292 | 83.5% |
| Other | | 5,186 | 16.5% |
| Jobs | | 31,478 | 100.0% |

- 2.20 Approximately 83.9% of Barrow-in-Furness' labour force both live and work within the borough, with the remaining 16.1% commuting elsewhere (Table 2). In terms of employment, the majority of Barrow-in-Furness' jobs are taken up by the local workforce (83.5%), with 16.5% of workers commuting from elsewhere (Table 3).
- 2.21 The balance between the number of workers and jobs in Barrow-in-Furness changed marginally over the 2001–2011 Census decade; with a smaller increase in the number of resident workers (+2,511) compared to jobs (+2,887) (Table 4). In 2011, Barrow-in-Furness had a balanced

commuting ratio of 1.00 (i.e. a relatively balanced number of workers and jobs), compared to a small net outward commuting ratio of 1.01 in 2001.

Table 4: Barrow-in-Furness Census travel-to-work commuting ratios, ages 16+ (source: ONS)

| Barrow-in-Furness | | 2001 Census | 2011 Census |
|------------------------|------------|-------------|-------------|
| Workers | <i>a</i> | 28,793 | 31,344 |
| Jobs | <i>b</i> | 28,591 | 31,478 |
| Commuting Ratio | <i>a/b</i> | 1.01 | 1.00 |

Note: 2001 data from Census Table *T101 – UK Travel Flows* ; 2011 data from Census Table *WU02UK - Location of usual residence and place of work by age* .

3 Official Projections

- 3.1 In this section, the latest population and household projections from the ONS and the DCLG are considered. Together with Section 2, this section presents the context for the development of a range of alternative growth scenarios, detailed in Section 4.

Official Statistics

- 3.2 In the absence of a population register, the UK continues to rely on the ten-yearly Census for a definitive count of population within its constituent local authority areas. Between Censuses, MYEs are calculated, using data on births, deaths, internal and international migration to quantify annual growth (Figure 10).

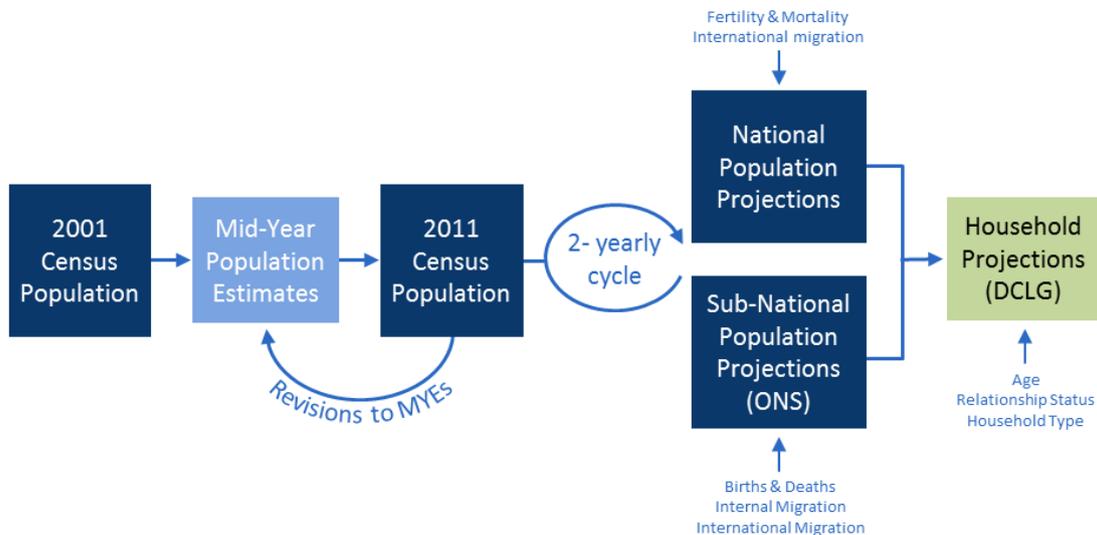


Figure 10: Official Statistics – population and households

- 3.3 Every two years ONS publishes its national population projections, setting key assumptions on the long-term effects of fertility, mortality and international migration to estimate population growth outcomes for England, Wales, Scotland and Northern Ireland. The 2014-based *national* projection was released in October 2015⁴.

⁴ <http://www.ons.gov.uk/ons/rel/npp/national-population-projections/2014-based-projections/index.html>

- 3.4 The national projection informs the sub-national population projections (SNPPs) for English local authorities, also published on a bi-yearly cycle. The latest, 2014-based SNPPs use a combination of national and local assumptions on births, deaths and migration to formulate a 25-year projection for each local authority area.
- 3.5 The SNPPs provide the key demographic input to the DCLG household projections. The latest 2014-based household projection model provides a 25-year projection of household growth in each of the English local authorities.
- 3.6 The PPG states that the DCLG household projections should provide the “*starting point estimate of overall housing need*” (PPG paragraph 2a-015). The remainder of this section considers the 2014-based SNPP and the 2014-based DCLG household projection for Barrow-in-Furness, providing the context for complementary scenario analysis in Section 4.

ONS Sub-national Population Projection

- 3.7 In the development and analysis of population forecasts, it is important to benchmark any growth alternatives against the latest ‘official’ population projection. The most recent official subnational population projection is the ONS 2014-based SNPP, released in July 2016. These projections use demographic assumptions derived from a pre-2014, 5–6 year historical period in combination with national assumptions on fertility, mortality and international migration⁵.
- 3.8 Figure 11 presents the ONS population projections series for Barrow-in-Furness. Under the latest, 2014-based SNPP, the population of Barrow-in-Furness is expected to decrease by 6,599 over the 25-year projection period (2014–2039), a decline of 9.8%. Under the previous 2012-based SNPP, the population was expected to decrease by 3,213, a fall of 4.7% over the 2012–2037 25-year projection period.
- 3.9 The rate of population decline under the 2014-based SNPP is notably *higher* than that estimated by each of the previous projections. The earlier 2012-based outcomes projected a lower rate of decline, whereas projections between 2006 and 2010 projected a small but positive rate of growth.

⁵<http://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/subnationalpopulationprojectionsforengland/2014basedprojections>

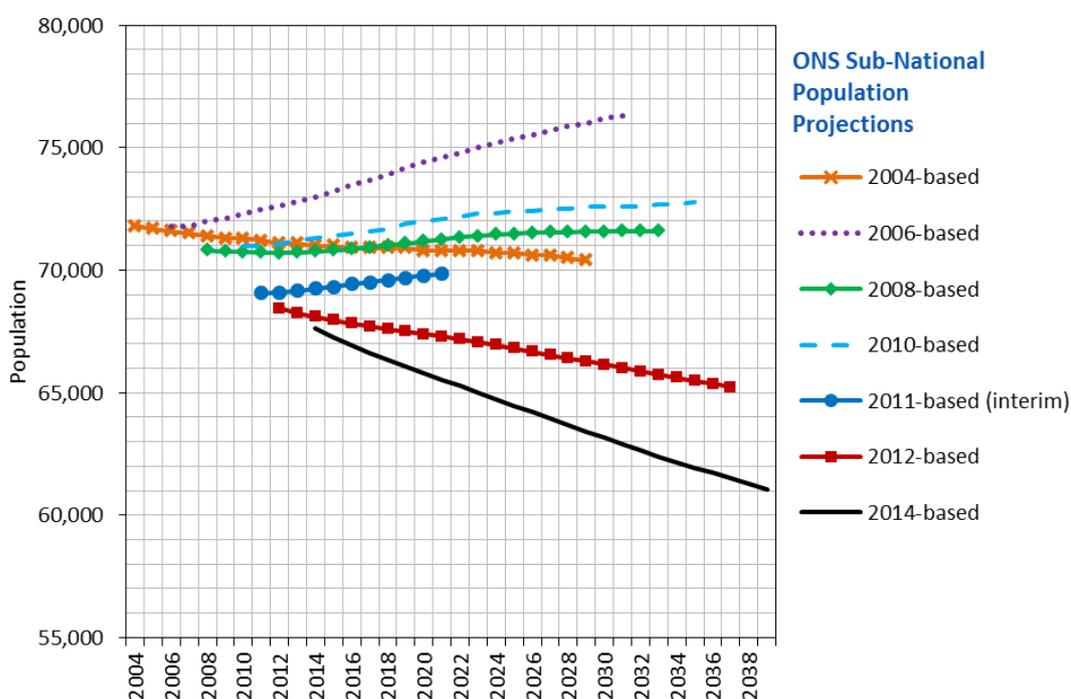


Figure 11: Official Projections for Barrow-in-Furness (Source: ONS)

3.10 The rate of population change implied by the 2014-based SNPP for Barrow-in-Furness is also significantly lower than that estimated for both the North West region and England in total (8.2% and 16.5% respectively) (Table 5).

Table 5: SNPP-2014 growth comparisons (Source: ONS)

| Areas | Population | | | |
|-------------------|------------|------------|-----------|----------|
| | 2014 | 2039 | Change | Change % |
| Barrow-in-Furness | 67,648 | 61,049 | -6,599 | -9.8% |
| North West | 7,132,991 | 7,719,677 | 586,686 | 8.2% |
| England | 54,316,618 | 63,281,522 | 8,964,904 | 16.5% |

3.11 The components of population change that underpin the 2014-based projection for Barrow-in-Furness are presented in Figure 12, with the historical components of change for 2001/02 to 2013/14 included for comparison. The net outflow through internal migration is projected to continue over the 2014–2039 projection period, with international migration having little impact upon growth. As the population ages, and with a net outflow in younger age-groups, natural change is projected to have an increasingly negative impact on population change throughout the 2014–2039 projection period.

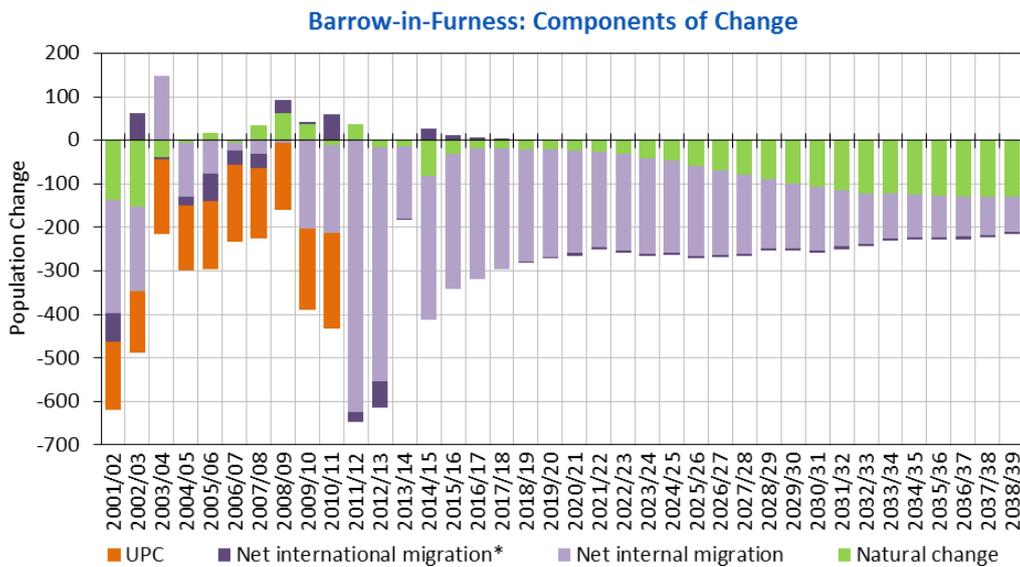


Figure 12: Historical and 2014-based SNPP components of change (Source: ONS)

3.12 To illustrate how the ONS assumptions on demographic change in Barrow-in-Furness compare with the historical evidence, the average annual natural change, net internal and international migration change for the 2014-based projection are compared to 6-year and 13-year historical averages (Table 6).

Table 6: Barrow-in-Furness 2014-based SNPP components comparison (Source: ONS)

| Component of Change | Historical | | Projected |
|------------------------------------|-------------------------------------|--------------------------------------|---|
| | 6-year average (2008/09–2013/14) | 13-year average (2001/02–2013/14) | 2014-based SNPP average (2014/15–2038/39) |
| Natural Change | 15 | -15 | -75 |
| Net Internal Migration | -289 | -176 | -187 |
| Net International Migration (+UPC) | -92 | -140 | -3 |
| Net International Migration (-UPC) | 2 | -12 | |

*UPC is only applicable to the years 2001/02–2010/11

3.13 The negative influence of natural change upon population growth is reflected in an SNPP average annual assumption of -75 per year, which is significantly greater than both the short-term 6-year average (+15 per year) and longer-term 13-year average (-15 per year). The projected effect of internal migration (-187 per year) in the 2014-based SNPP is estimated at a level that is more closely aligned with the 13-year average (-176 per year) and reflects a reduced level of net out-

migration than the 6-year average (-289). International migration is projected to result in a very small net emigration over the 25-year period (-3 per year), which with the *exclusion* of UPC, is more consistent with the 13-year average trend.

DCLG Household Projection

- 3.14 In the evaluation of housing need, the PPG states that the DCLG household projections “*should provide the starting point estimate of overall housing need*” (PPG paragraph 2a-015). The 2014-based household projection model, which is underpinned by the 2014-based SNPP, was released by the DCLG in July 2016, superseding the 2012-based household projection model.
- 3.15 The methodological basis of the new 2014-based model is consistent with that employed in the previous 2008-based and 2012-based household projections. A ‘two-stage’ methodology has been used by DCLG. ‘Stage One’ produces the national and local projections for the total number of households by age-group and relationship status group over the projection period. ‘Stage Two’ provides the detailed household type breakdown by age.
- 3.16 The 2014-based household headship rates (also referred to as household representative rates) have changed little from the 2012-based model, with only small adjustments made to account for new evidence arising from the latest Labour Force Survey (LFS) extracts. As a result, the 2014-based household projections differ from the 2012-based versions primarily on the basis of a different underpinning population projection
- 3.17 The 2014-based DCLG household projection model for Barrow-in-Furness, underpinned by the 2014-based SNPP, estimates that the number of households will decrease by 1,890 over the 2014–2039 projection period, equivalent to -76 households per year. This compares to a positive annual growth in households (+8 per year) assumed under the 2012-based model (Figure 13).

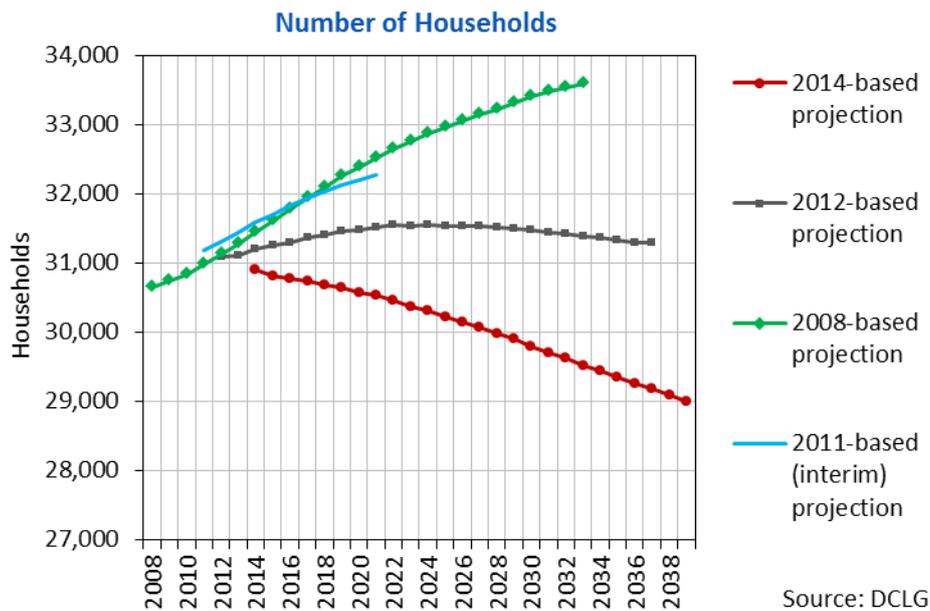


Figure 13: Household growth 2014 based DCLG household projections for Barrow-in-Furness

- 3.18 A significantly larger population growth expectation in the 2008-based household projection, coupled with household formation rates that suggest a more rapid reduction in average household size, resulted in an average annual household growth estimate of +118 per year under the 2008-based model alternative.

Starting Point Estimate

- 3.19 The DCLG household projection, underpinned by the latest ONS population projection, provides the 'starting point' in the assessment of housing need (PPG paragraph 2a-015). For the 2014–2031 plan period, the 2014-based household projection model suggests a decrease of 1,187 households, approximately 70 per year. Over the same time period, the 2014-based SNPP projects a 7% decrease in the population, equivalent to a decline of 4,750 (Table 7).

Table 7: Barrow-in-Furness 'starting point' estimates (source: ONS and DCLG)

| | Variable | 2014 | 2031 | Change | % Change | Average (per year) |
|-----------------------|------------------------|--------|--------|--------|----------|--------------------|
| 2014-based SNPP | Population | 67,648 | 62,898 | -4,750 | -7.0% | -279 |
| 2014-based DCLG Model | Households | 30,896 | 29,709 | -1,187 | -3.8% | -70 |
| | Household Population | 66,953 | 61,986 | -4,967 | -7.4% | -292 |
| | Average Household Size | 2.17 | 2.09 | -0.08 | -3.7% | -0.005 |

3.20 As outlined in the PPG, it is appropriate to consider “*alternative assumptions in relation to the underlying demographic projections and household formation rates*” of the local area (PPG Paragraph 2a-017). In the following sections, these ‘official’ projections are compared to a range of alternative growth scenarios, considering both demographic and economic evidence.

4 Demographic Scenarios

Introduction

- 4.1 There is no single definitive view on the likely level of growth expected in Barrow-in-Furness. Ultimately, a mix of economic, demographic and national/local policy issues will determine the speed and scale of change. Whilst the official 2014-based ONS population and DCLG household projections form the ‘starting point’ of the assessment of housing need, the PPG states that it is appropriate to consider *“alternative assumptions in relation to the underlying demographic projections and household formation rates”* of the local area (PPG Paragraph 2a-017).
- 4.2 In line with the PPG, Edge Analytics has developed a range of alternative demographic scenarios for Barrow-in-Furness, using POPGROUP technology. The 2014-based population projection from ONS is presented as the official ‘benchmark’ scenario, with household growth estimated using household headship rate assumptions from the 2014-based DCLG household projection model. For comparison with this official benchmark, a number of ‘alternative trend’ scenarios have been developed, in which variant migration assumptions have been applied. In each of the alternative trend scenarios, the same 2014-based DCLG household growth assumptions have been applied.
- 4.3 The PPG states that the likely change in the number of jobs in an area should be considered, as should the size and structure of the labour force (PPG paragraph 2a-018). Section 5 compares the labour force and job growth implications of the trend scenarios with economic forecasts from Experian employment forecasts, considering key assumptions on Barrow-in-Furness’s future economic activity rates, level of unemployment and balance of commuting between resident workers and local jobs.

Demographic Scenario Definition

- 4.4 The **SNPP-2014** scenario replicates the 2014-based population projection from ONS. With the application of the household growth assumptions from the 2014-based DCLG household projection model, this provides the 'starting point estimate' for Barrow-in-Furness' housing growth analysis.
- 4.5 The PPG recommends, as part of the assessment of housing need, that the most recent demographic statistics from ONS and alternative demographic projections should be considered (PPG Paragraph 2a-017). The 2014-based SNPP from ONS is a trend-based projection that uses demographic assumptions based on up to six years historical evidence preceding 2014⁶. Given the unprecedented economic changes that have occurred since 2008, and the differences between the projected 2014-based SNPP data and the historical evidence on population change in Barrow-in-Furness (see paragraph 3.13), it is appropriate to consider alternative time periods in the derivation of migration assumptions.
- 4.6 Alternative trend scenarios have been developed which make more explicit use of historical evidence from a period prior to the latest (2015) mid-year population estimates. A **PG 5yr**⁷ scenario derives its internal migration rates and international migration flow assumptions from the historical period 2010/11–2014/15 (i.e. 5 years). A **PG 10yr** scenario derives its internal migration rates and international migration flow assumptions from a 10-year period, 2005/06 to 2014/15. A **PG Long Term** scenario derives its internal migration rates and international migration flow assumptions from a longer 14-year period (2001/02–2014/15). In the **PG 5yr**, **PG 10yr** and **PG Long Term** scenarios, the UPC components is included in international migration assumptions.
- 4.7 International migration is the most difficult component of population change to estimate. Evaluating its future impact upon Barrow-in-Furness' population change is complicated by the historical presence of UPC in the mid-year population estimates. As the **PG 5yr**, **PG 10yr** and **PG Long Term** alternative trend scenarios include UPC in their international migration assumptions, it is important to consider alternative outcomes that moderate the future impact of long term net immigration upon Barrow-in-Furness' population change.

⁶ <https://www.ons.gov.uk/populationandmigration/populationprojections/methodologies/>

⁷ Note that PG refers to POPGROUP, the demographic forecasting software used to develop the scenario forecasts.

- 4.8 A further scenario has been developed as a variant on the **PG Long-Term** scenario. The **PG Long Term-X** scenario is based on the last 14-years (2001/02–2014/15) of historical evidence, with UPC *excluded* from international migration estimation. Internal migration assumptions are consistent with the **PG Long Term** scenario.
- 4.9 A **Net Nil** scenario is also presented, in which internal and international migration flows are maintained from 2015/16, but the net change is set at zero. This scenario provides an indication of the degree to which population change is driven by natural change (the balance between births and deaths) and migration to Barrow-in-Furness.

Demographic Scenario Results

- 4.10 Each of the scenarios has been run using historical MYEs for the 2001–2015 period, with the exception of the **SNPP-2014**, which has a base year of 2014. Scenario results are displayed for Barrow-in-Furness' designated plan period 2014–2031 (Figure 14 and Table 8). The plan period includes one year of historical data (2014/15) in the **PG** scenarios.
- 4.11 Under the **SNPP-2014** scenario, Barrow-in-Furness' population is projected to decrease by 7.0% between 2014 and 2031, resulting in an average annual dwelling change of -74 per year.
- 4.12 Under the **PG 5yr** scenario, population decline of 6.8% is similar to that expected under the **SNPP-2014** scenario, resulting in an estimated average annual dwelling change of -61 per year (2014–2031). The **PG 10yr** scenario results in smaller decline of -4.8%, driven by lower levels of net out-migration over the historical ten year period. This level of population change results in an estimated dwelling change of -6 per year over the 2014–2031 plan period.
- 4.13 With a longer historical period considered, the **PG Long Term** scenario results in a smaller population decline at -3.3% (2014–2031), resulting in an average annual dwelling growth of +21 per year. The *exclusion* of UPC in the international migration assumptions of the **PG Long Term-X** scenario, reduces the negative annual impact of international migration on Barrow-in-Furness's population growth profile, resulting in a population change of -1.0% over the plan period. This expected level of population change produces an average annual dwelling requirement of +42 per year. This level of population and dwelling growth is closely aligned to that estimated under

the **Net Nil** scenario, which results in the smallest population reduction over the 2014–2031 plan period of -0.7%, producing a dwelling growth of +38 per year.

Barrow-in-Furness: Scenario Outcomes

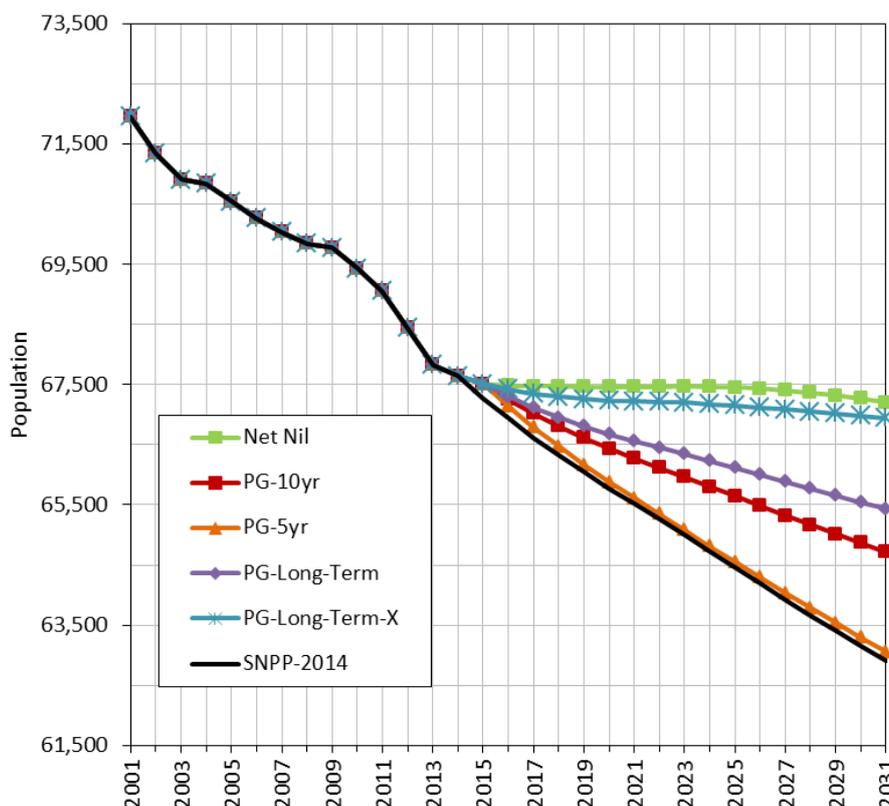


Figure 14: Barrow-in-Furness demographic scenario outcomes: population change 2001–2031

Table 8: Barrow-in-Furness demographic scenario outcomes 2014–2031

| Scenario | Change 2014–2031 | | | | Average per year | |
|----------------|-------------------|---------------------|-------------------|---------------------|------------------|-----------|
| | Population Change | Population Change % | Households Change | Households Change % | Net Migration | Dwellings |
| Net Nil | -442 | -0.7% | 612 | 2.0% | -7 | 38 |
| PG-Long-Term-X | -706 | -1.0% | 680 | 2.2% | -6 | 42 |
| PG-Long-Term | -2,215 | -3.3% | 338 | 1.1% | -92 | 21 |
| PG-10yr | -2,930 | -4.3% | -89 | -0.3% | -138 | -6 |
| PG-5yr | -4,589 | -6.8% | -980 | -3.2% | -219 | -61 |
| SNPP-2014 | -4,750 | -7.0% | -1,191 | -3.9% | -228 | -74 |

Note: Household and dwelling growth assessed using assumptions from the 2014-based household projection model. A 2011 Census dwelling vacancy rate of 5.4% has been applied.

Age Profile

- 4.14 The changing age structure of Barrow-in-Furness' population is important when considering future housing needs, and the progression of its labour force. The change in the age profile depends on the history of population change, particularly the relative size of successive birth cohorts, and continued improvements in life expectancy. The large birth cohorts of the 1940s, 1950s and 1960s are set to have a substantial effect upon local population profiles and this is reflected in the Barrow-in-Furness data. The term 'ageing population' generally refers to an increase over time in the share of the population in the older age-groups, specifically 65+.
- 4.15 Using a 2014 base year for comparison, Barrow-in-Furness' projected age profile change under the **SNPP-2014** scenario has been calculated for the plan period 2014–2031 (Figure 15). The red bars indicate where the population at the end of each-time period is *lower* than the 2014 base year. The blue bars indicate where the population is *higher* than the base year.

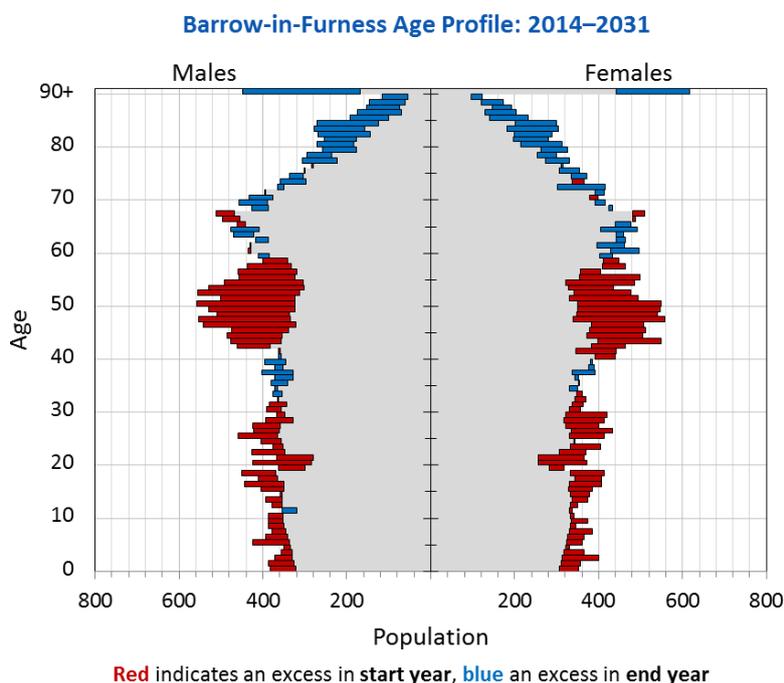


Figure 15: Barrow-in-Furness population age profile, 2014–2031 (Source: ONS, POPGROUP)

- 4.16 By 2031, it is estimated that there will have been a shift in the shape of the age profile, with those born in the 1940s, 1950s and 1960s moving into the oldest age groups, creating an increased imbalance between those aged 65+ and those in the younger age-groups. This is

reflected in the Old Age Dependency (OAD) ratio, which is projected to increase from 33 in 2014 to 47.5 by 2031. This means that the 65+ population will be equivalent to 47.5% of those aged 16–64 by 2031, compared to 33% at the start of the plan period.

Headship Rate Sensitivity

- 4.1 In POPGROUP, the headship rates are applied to the population projections to determine the implied level of household growth. In each of the demographic scenarios presented above, the latest 2014-based DCLG headship rate assumptions have been applied, in line with the PPG.
- 4.2 For males in the 15-44 age groups, the 2014-based headship rates for Barrow-in-Furness decrease over time, mirroring the trend seen nationally. In contrast, among female 15-44 age groups headship rates suggest slight increase. It is these younger age groups that have been more adversely affected by housing undersupply and affordability issues, which in some areas may have led to 'supressed' rates of household formation. Therefore, in line with the PPF recommendation that [“alternative assumptions in relation to ... household formation rates”](#) be considered (PPG Paragraph 2a-017), each scenario has been run with an alternative set of headship rates, for comparison with the 2014-based outcomes. This sensitivity examines the dwelling growth outcomes associated with an 'improvement' or 'recovery' in the headship rates of the younger age groups.
- 4.3 An alternative set of headship rates have been generated for Barrow-in-Furness. In the 2014-based headship rate return sensitivity, headship rates in the male younger age groups (15-44) return to their 2001 values by 2024, continuing the original rate of growth thereafter (refer to Appendix A for detail on headship rates).
- 4.4 With the application of the 2014-based variant headship rates, the dwelling growth outcomes of the demographic scenarios for Barrow-in-Furness are higher than the 2014-based outcomes (Table 9). These adjusted headship rates result in an annual requirement that is approximately 20 dwellings higher per year than that produced using the unaltered DCLG headship rates.

Table 9: Barrow-in-Furness headship rate sensitivity scenario outcomes 2014–2031

| Scenario | Population Change | Average Annual Dwelling Change 2014–2031 | |
|----------------|-------------------|--|-------------------|
| | | 2014-based | 2014-based Return |
| PG Long Term-X | -1.0% | 42 | 63 |
| Net Nil | -0.7% | 38 | 60 |
| PG Long Term | -3.3% | 21 | 41 |
| PG 10yr | -4.3% | -6 | 15 |
| PG 5yr | -6.8% | -61 | -42 |
| SNPP-2014 | -7.0% | -74 | -55 |

Scenario ranked in order of dwelling growth under 2014-based headship rates

5 Labour Force & Jobs Growth

Introduction

- 5.1 In the assessment of housing need, the PPG states that *“plan makers should make an assessment of the likely change in job numbers based on past trends and/or economic forecasts as appropriate and also having regard to the growth of the working age population in the housing market area”* (PPG paragraph 2a-018).
- 5.2 In POPGROUP, it is possible to derive the size and structure of the labour force and the level of employment that an implied level of population growth could support, through the application of: (1) economic activity rates; (2) unemployment rates; (3) a commuting ratio.
- 5.3 In this section, the labour force and employment growth implications of the demographic scenarios are presented and then compared to Experian employment projections. Sensitivity analysis considers the impact of alternative economic assumptions that link population growth to the employment growth implied by the Experian projections.

Core Economic Assumptions

Economic Activity Rates

- 5.4 The **Economic Activity Rates** determine the proportion of the working-age population (aged 16–75+) that are economically active (i.e. the labour force). The labour force includes those who are in work (i.e. ‘workers’) and those who are unemployed. Between the 2001 and 2011 Censuses, economic activity rates in Barrow-in-Furness increased in all but the youngest age group (16–19), and most notably in the older age groups (Figure 16). The increase in the economic activity rates has been more pronounced for females than for males.
- 5.5 In the face of unprecedented demographic change due to population ageing, changes to

economic activity rates are critical in maintaining an adequately sized local labour force and for maintaining the overall rate of employment. This is particularly the case in Barrow-in-Furness where the population is projected to age considerably over the next 25 years, with a larger proportion of the population in the older age-groups compared to the younger, labour-force ages.

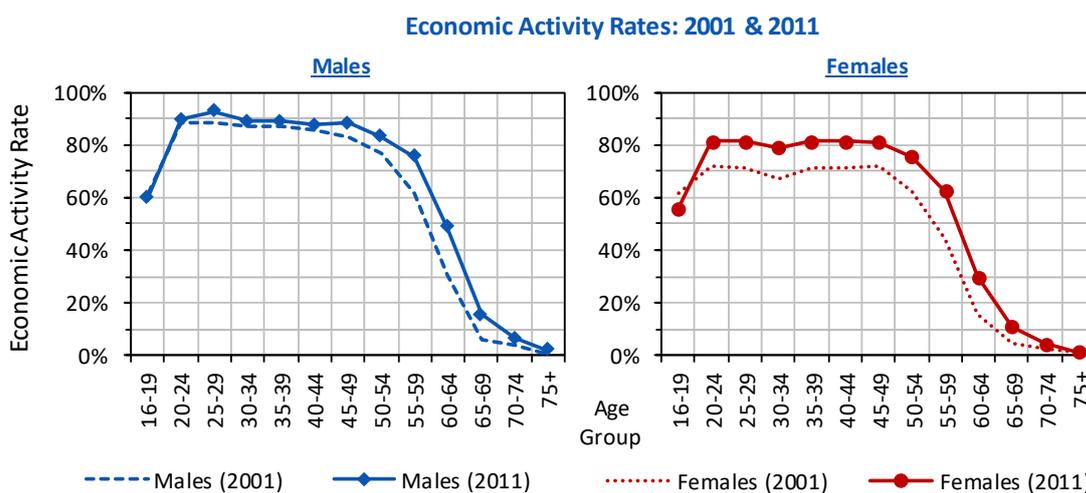


Figure 16: 2001 and 2011 Census economic activity rates for Barrow-in-Furness (source: ONS)

- 5.6 Whilst economic activity rates have increased historically, forecasting changes to future economic activity rates is challenging. In reality, it is highly unlikely that future rates of economic activity will remain static. The ageing of the population profile of most local authorities means that the older age-groups increasingly make up a larger proportion of the population. Furthermore, with increased life expectancies and changes to the State Pension Age (SPA), people are remaining in the labour force for longer, resulting in increased participation rates in the older age groups. To at least maintain the current level of *overall* economic activity requires higher economic activity rates generally, but most importantly in the older age-groups.
- 5.7 The Office for Budget Responsibility (OBR) has undertaken a new analysis of labour market trends in its 2017 Fiscal Sustainability Report⁸. Included within its analysis is a forecast of changing economic activity rates for males and females in the 16–75+ year-old age groups, extending to a long-term 2066 forecast horizon.
- 5.8 In the scenario analysis presented here, economic activity rates for Barrow-in-Furness's 60–75+ age groups have been adjusted in line with the OBR forecasts. Economic activity rates for the 16–

⁸ http://cdn.budgetresponsibility.org.uk/FSR_Jan17.pdf

59 age-range remain fixed at their 2011 Census values. The resulting age-specific economic activity rates applied to the Barrow-in-Furness scenarios are illustrated in Figure 17 and in Appendix C.

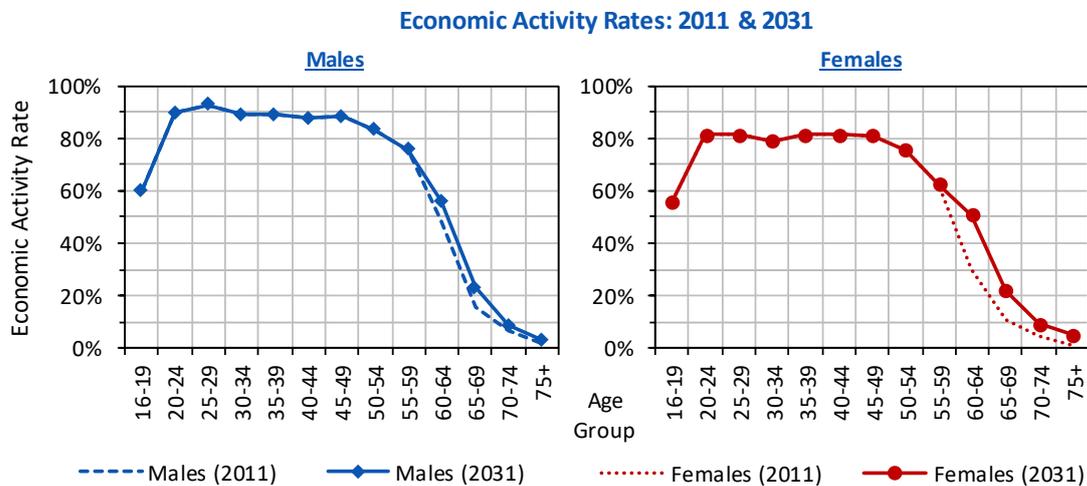


Figure 17: 2011 and 2031 OBR economic activity rates for Barrow-in-Furness (Source: OBR)

Unemployment Rate

- 5.9 The **Unemployment Rate** determines the proportion of the labour force that is unemployed (and as a result, the proportion that is employed). The historical unemployment rate profile for Barrow-in-Furness has been sourced from the ONS model-based estimates of unemployment. In the scenario modelling presented here, the unemployment rate tracks historical data to 2015, reducing to a 'pre-recession' (2004–2007) average of 5.6% by 2020 (fixed thereafter).

Commuting Ratio

- 5.10 The **Commuting Ratio** determines the balance between the resident number of 'workers' (i.e. the employed labour force) and the number of jobs in an area. A commuting ratio greater than 1.0 indicates a net *out*-commute (i.e. the number of resident workers in an area is greater than the number of jobs). A commuting ratio less than 1.0 indicates a net *in*-commute (i.e. the number of jobs is greater than the number of workers).
- 5.11 A fixed commuting ratio of 1.00 has been applied in the core scenarios presented here. This ratio is derived from the 2011 Census Travel to Work and indicates a balanced commuting ratio in Barrow-in-Furness. This demonstrates a slight change compared to 2001, when Barrow-in-

Furness had a commuting ratio of 1.01, indicating a slight net *out*-commute (see Table 4 on page 12).

Demographic Scenarios & Labour Force Change

5.12 For each of the Barrow-in-Furness demographic scenarios presented in Section 4, economic activity rate, unemployment rate and commuting ratio assumptions have been applied to derive an estimate of the changing size of the labour force that the population growth implies, and the level of employment growth that could be supported under these assumptions (Table 10).

Table 10: Labour Force and employment-growth outcomes 2014–2031

| Scenario | Change 2014–2031 | | | Average Annual Employment Growth |
|----------------|-----------------------|-----------------|-------------------|----------------------------------|
| | Labour Force (16–75+) | Employed People | Unemployed People | |
| Net Nil | -1,926 | -1,167 | -758 | -69 |
| PG Long Term-X | -1,998 | -1,236 | -763 | -73 |
| PG Long Term | -2,565 | -1,771 | -794 | -105 |
| PG 10yr | -2,949 | -2,133 | -816 | -126 |
| PG 5yr | -4,095 | -3,215 | -881 | -190 |
| SNPP-2014 | -4,212 | -3,325 | -887 | -196 |

5.13 The application of the economic assumptions to the **SNPP-2014** scenario estimates that the labour force size will be subject to a decline (-4,212) over the 2014–2031 period. Excluding the **Net Nil** scenario, the **PG Long-Term-X** scenario results in the smallest decline in the size of the labour force (-1,998) over the 2014–2031 plan period. Subsequently an estimated annual employment change of -73 per year is expected over the 2014–2031 period.

5.14 The estimated decline in the size of the labour force under each of the scenarios is reflective of the impact of the population growth trajectory in combination with an ageing population in Barrow-in-Furness, even with the higher economic activity rates implied by the OBR forecasts.

Experian Economic Forecasts

- 5.15 In the consideration of future employment growth in an area, the PPG states that ‘economic forecasts’ should be considered (PPG paragraph 2a-018). Whilst the employment growth estimates presented above are derived through the application of economic assumptions to scenarios of demographic change, economic forecasts of employment growth are derived using a different methodology.
- 5.16 Economic forecasts combine a national and regional economic outlook, with data on the sectoral mix of businesses, to produce a forecast of jobs growth for a local area. Economic forecasts typically incorporate population projection data but do not adjust the migration assumptions associated with this projection to account for higher or lower population growth to support a forecast level of jobs growth. Instead, economic forecasting models will typically balance jobs and population growth through changes to economic activity and unemployment rates and, in some instances, the commuting ratio.
- 5.17 Employment growth forecasts for Barrow-in-Furness have been provided from the Experian Full Time Equivalent (FTE) employment projections for the 2014–2031 *plan* period. As the start of the *forecast* period is 2015/16, two employment growth trajectories have been defined using the Experian forecasts (Figure 18);
- 1) The annual change in employment follows the trajectory of the Experian forecast from 2015/16 onwards;
 - 2) Average annual employment growth has been calculated over the 2014/15–2030/31 period from the Experian forecast and applied in each year of the 2015/16–2030/31 forecast period.

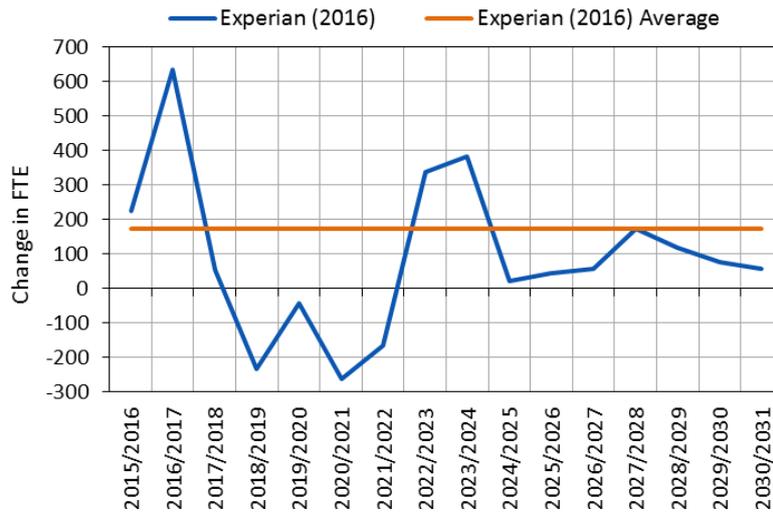


Figure 18: Barrow-in-Furness annual FTE employment growth trajectories (Source: Experian, 2016)

5.18 Over the 2014–2031 *plan* period (including one year of historical data), the jobs growth implied by the Experian (2016) employment forecasts can be compared to that resulting from the demographic scenarios (Figure 19). The expected annual employment growth over the plan period under both of the Experian trajectories is significantly higher than that estimated under the demographic scenarios.

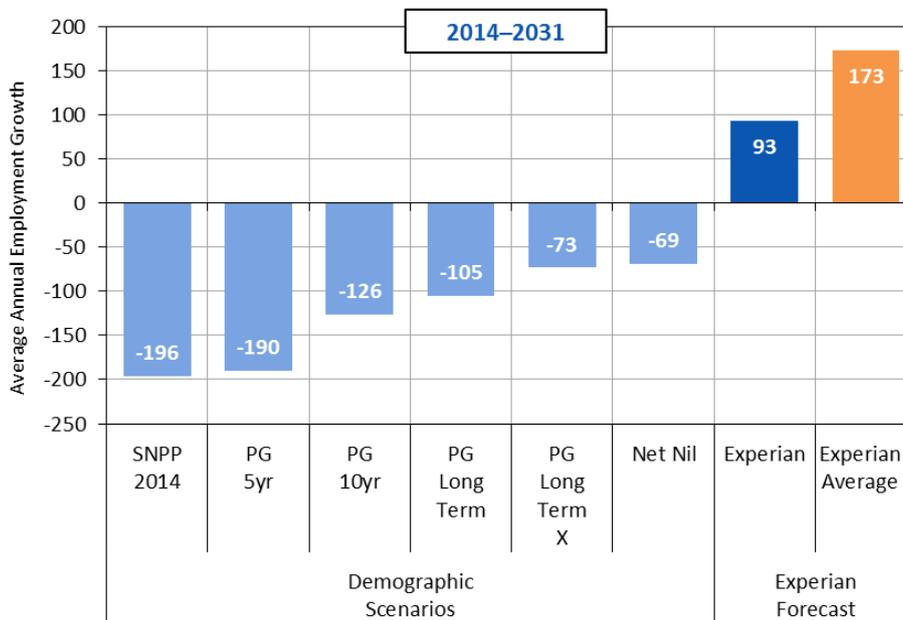


Figure 19: Comparison of average annual employment growth

- 5.19 With the assumptions that have been made in relation to economic activity, unemployment and commuting, the population growth required to support the level of employment growth implied by the Experian employment forecast, would be higher than that implied by each of the demographic scenarios.

Jobs-led Scenarios

- 5.20 The population, household and dwelling growth implications of the Experian employment forecasts can be evaluated using a 'jobs-led' configuration of the POPGROUP forecasting model. In a jobs-led scenario, population growth is linked directly to the change in employment within an area. POPGROUP evaluates the impact of a jobs growth trajectory by measuring the relationship between the number of jobs in an area, the size of the resident labour force and the size of the resident population.
- 5.21 Internal migration is used to balance the relationship between the size of the labour force and the forecast number of jobs. A higher level of net in-migration will occur if there is insufficient resident population and labour force to meet the forecast number of jobs. A higher level of net out-migration will occur if the population is too high relative to the number of jobs.
- 5.22 Key to determining the level of population growth required to meet a defined jobs growth trajectory are the three assumptions on economic activity, unemployment and commuting. With an ageing population (together with a fixed commuting ratio), higher levels of net in-migration would be needed to support the expected level of jobs growth under the Experian employment forecasts. However, if any of the key economic assumptions were to alter, for example, if the commuting ratio were to decrease or higher economic activity rates were assumed, the required level of population growth needed to support this level of jobs growth would be reduced.
- 5.23 Two jobs-led scenarios have been developed using the Experian employment forecast growth trajectories (previously referred to in Figure 18, p32):
- **Jobs-led Experian:** annual change in employment applied in each year of the 2015/16–2030/31 forecast period, as defined by the Experian employment forecast trajectory.
 - **Jobs-led Experian Average:** average employment growth calculated over the 2014–2031 period (as defined in the Experian forecast) and applied as an annual employment growth target over the 2015/16–2030/31 forecast period.

5.24 The population and dwelling growth outcomes of the **Jobs-led Experian** and **Jobs-led Experian Average** scenarios are compared to the demographic scenario outcomes in Table 11. To support the level of employment growth implied by the **Jobs-led Experian** and **Jobs-led Experian Average** scenarios, a higher level of net migration is estimated, at +276 and +406 per year respectively. This results in a population growth of 7.2% and 10.9% over the 2014–2031 period, with an associated average annual dwelling requirement of +177 under the **Jobs-led Experian** scenario, to +240 under the **Jobs-led Experian Average** scenario. Over the 2014–2031 plan period population change, and therefore household and dwelling growth, is significantly higher under the jobs-led scenarios than under the demographic scenarios.

Table 11: Barrow-in-Furness scenario outcomes 2014–2031

| Scenario | Change 2014–2031 | | | | Average per year | | |
|----------------------------------|-------------------|---------------------|-------------------|---------------------|------------------|-----------|-------------------|
| | Population Change | Population Change % | Households Change | Households Change % | Net Migration | Dwellings | Employment Growth |
| Jobs-led Experian Average | 7,342 | 10.9% | 3,862 | 12.5% | 406 | 240 | 173 |
| Jobs-led Experian | 4,884 | 7.2% | 2,844 | 9.2% | 276 | 177 | 98 |
| Net Nil | -442 | -0.7% | 612 | 2.0% | -7 | 38 | -69 |
| PG Long Term-X | -706 | -1.0% | 680 | 2.2% | -6 | 42 | -73 |
| PG Long Term | -2,215 | -3.3% | 338 | 1.1% | -92 | 21 | -105 |
| PG 10yr | -2,930 | -4.3% | -89 | -0.3% | -138 | -6 | -126 |
| PG 5yr | -4,589 | -6.8% | -980 | -3.2% | -219 | -61 | -190 |
| SNPP-2014 | -4,750 | -7.0% | -1,191 | -3.9% | -228 | -74 | -196 |

Note: Jobs-led and PG scenarios include one year of historical data

Jobs-led Sensitivity Scenarios

5.25 In order to evaluate the impact of alternative economic activity rate and commuting ratio assumptions on population growth under the jobs-led scenarios, three sensitivities have been developed:

- **CR SENS:** Commuting ratio reduces from 2011 Census value of 1.00 in 2014 to 0.99 by 2031.
- **EA SENS:** The 2014 aggregate economic activity rate (16-75+) of 59.0% is maintained over the plan period.
- **CR EA SENS:** Adjustments made to both the commuting ratio and economic activity rate, as defined by the **CR SENS** and **EA SENS** scenarios above.

Table 12: **Jobs-led Experian** sensitivity scenario outcomes 2014–2031

| Jobs-led Experian Scenario | Change 2014–2031 | | | | Average per year | | |
|----------------------------|-------------------|---------------------|-------------------|---------------------|------------------|-----------|-------------------|
| | Population Change | Population Change % | Households Change | Households Change % | Net Migration | Dwellings | Employment Growth |
| CORE | 4,884 | 7.2% | 2,844 | 9.2% | 276 | 177 | 98 |
| CR SENS | 4,547 | 6.7% | 2,704 | 8.8% | 258 | 168 | 98 |
| EA SENS | 911 | 1.3% | 1,192 | 3.9% | 66 | 74 | 104 |
| CR EA SENS | 594 | 0.9% | 1,060 | 3.4% | 49 | 66 | 105 |

Table 13: **Jobs-led Experian Average** sensitivity scenario outcomes 2014–2031

| Jobs-led Experian Average Scenario | Change 2014–2031 | | | | Average per year | | |
|------------------------------------|-------------------|---------------------|-------------------|---------------------|------------------|-----------|-------------------|
| | Population Change | Population Change % | Households Change | Households Change % | Net Migration | Dwellings | Employment Growth |
| CORE | 7,342 | 10.9% | 3,862 | 12.5% | 406 | 240 | 173 |
| CR SENS | 6,991 | 10.3% | 3,717 | 12.0% | 388 | 231 | 173 |
| EA SENS | 3,211 | 4.7% | 2,148 | 7.0% | 187 | 134 | 180 |
| CR EA SENS | 2,882 | 4.3% | 2,011 | 6.5% | 170 | 125 | 180 |

5.26 The reductions in the commuting ratio under the **CR SENS** scenarios result in fewer people commuting out of Barrow-in-Furness to neighbouring local authorities, increasing residence based employment. This reduces the annual net migration, resulting in lower population growth of 6.7% and 10.3% under the **Jobs-led Experian CR SENS** and **Jobs-led Experian Average CR SENS** scenarios respectively. This estimated level of population growth results in an average annual dwelling requirement of +168 under the **Jobs-led Experian CR SENS** scenario and +231 under the **Jobs-led Experian Average SENS CR** scenario (2014–2031).

- 5.27 The level of employment growth can be influenced by adjustments to the economic activity rate which in turn alters the size of the labour force. A higher aggregate economic activity rate over the plan period (2014–2031) under the **EA SENS** sensitivity, results in a greater proportion of the resident population maintained in the labour force. Consequently, a lower level of internal migration is estimated to meet the annual change in the level of employment. Under the **Jobs-led Experian** scenario, the **EA SENS** sensitivity reduces average annual net migration and dwelling growth to +66 and +74 respectively. Similarly, average annual net migration and dwelling growth is reduced to +187 and +134 respectively under the **Jobs-led Experian Average EA SENS** scenario.
- 5.28 Under the **EA CR SENS** sensitivity, population and dwelling growth is lowest. The **Jobs-led Experian EA CR SENS** scenario suggests population growth of 0.9% and a resulting average annual dwelling requirement of +66 per year. The **Jobs-led Experian Average EA CR SENS** scenario suggests population growth of 4.3%, with an expected average annual dwelling requirement of +125 over the 2014–2031 plan period.

6 Summary

Approach

- 6.1 The objective of this report has been to provide a range of demographic evidence to support the development of Barrow-in-Furness' Local Plan. This evidence incorporates the latest statistical releases from ONS and DCLG and provides a range of alternative trend and jobs-led scenarios for Barrow-in-Furness. All scenario analysis has been produced using POPGROUP technology.
- 6.2 The starting point of the analysis is the 2014-based SNPP and the 2014-based DCLG household projection model for Barrow-in-Furness. A number of alternative trend scenarios have been developed which consider balanced migration flows alongside five-year, ten-year and fourteen-year historical trends and are compared to the 2014-based SNPP benchmark.
- 6.3 The analysis has considered the effect of the changing age structure on its labour force, linking the demographic scenarios to an estimated employment growth using assumptions of economic activity, unemployment and commuting. These have been compared to employment growth trajectories under the Experian forecasts. Sensitivity testing has also been carried out on the jobs-led scenarios, to evaluate the impact of alternative economic assumptions on estimated population change and dwelling growth.
- 6.4 Under all scenarios, household and dwelling growth have been estimated using assumptions from the 2014-based DCLG household projection model for Barrow-in-Furness. Dwelling growth under each of the demographic scenarios has also been assessed under the assumption that household growth in the younger age groups return to earlier trends.

Growth Outcomes

6.5 A summary of the population change and annual dwelling growth outcomes associated with each scenario for Barrow-in-Furness is provided in Figure 20. Dwelling growth is highest under the jobs-led scenarios, ranging from an average of +66 to +240 under the **Jobs-led Experian CR EA SENS** and **Jobs-led Experian Average** scenarios respectively. Lower population change under the demographic trend scenarios results in a lower dwelling growth average, ranging from -61 under the **PG 5yr** trend scenario to +42 under the **PG Long Term-X** scenario.

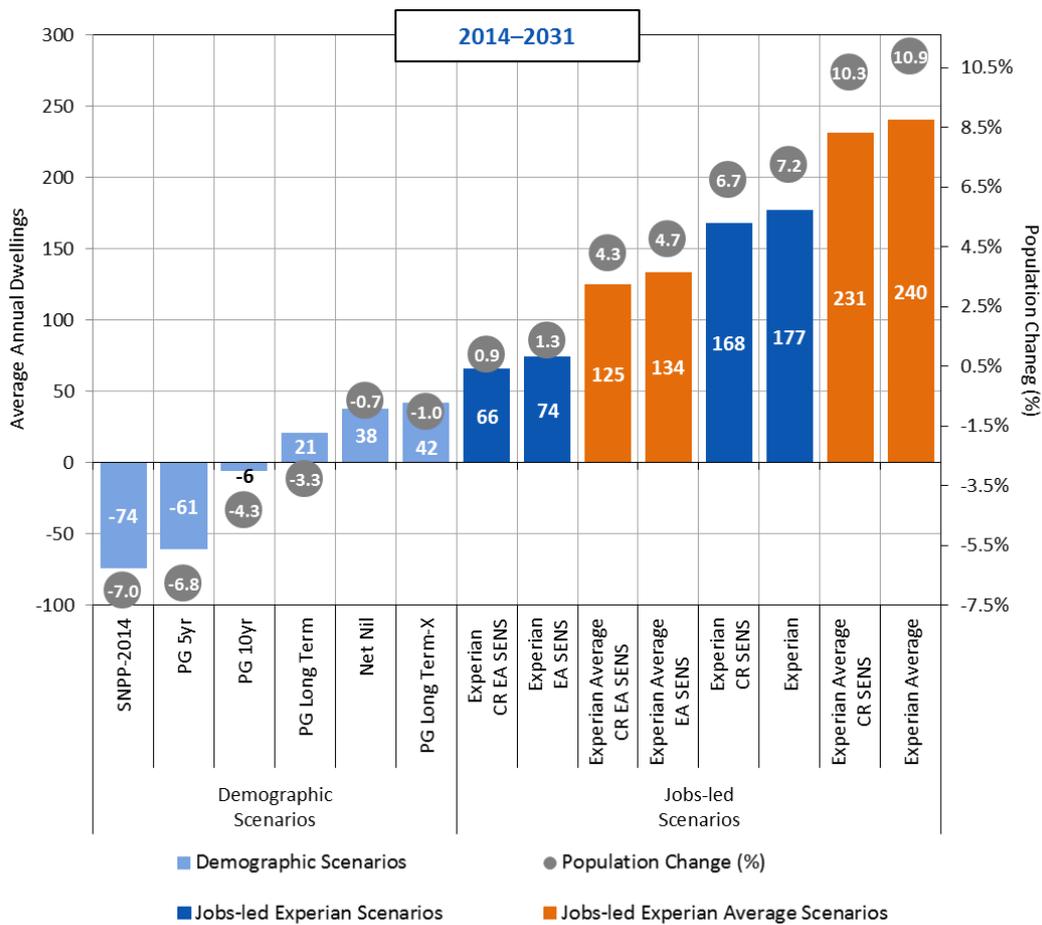


Figure 20: Population change and average annual dwelling growth outcomes for Barrow-in-Furness 2014–2031

Concluding Comments

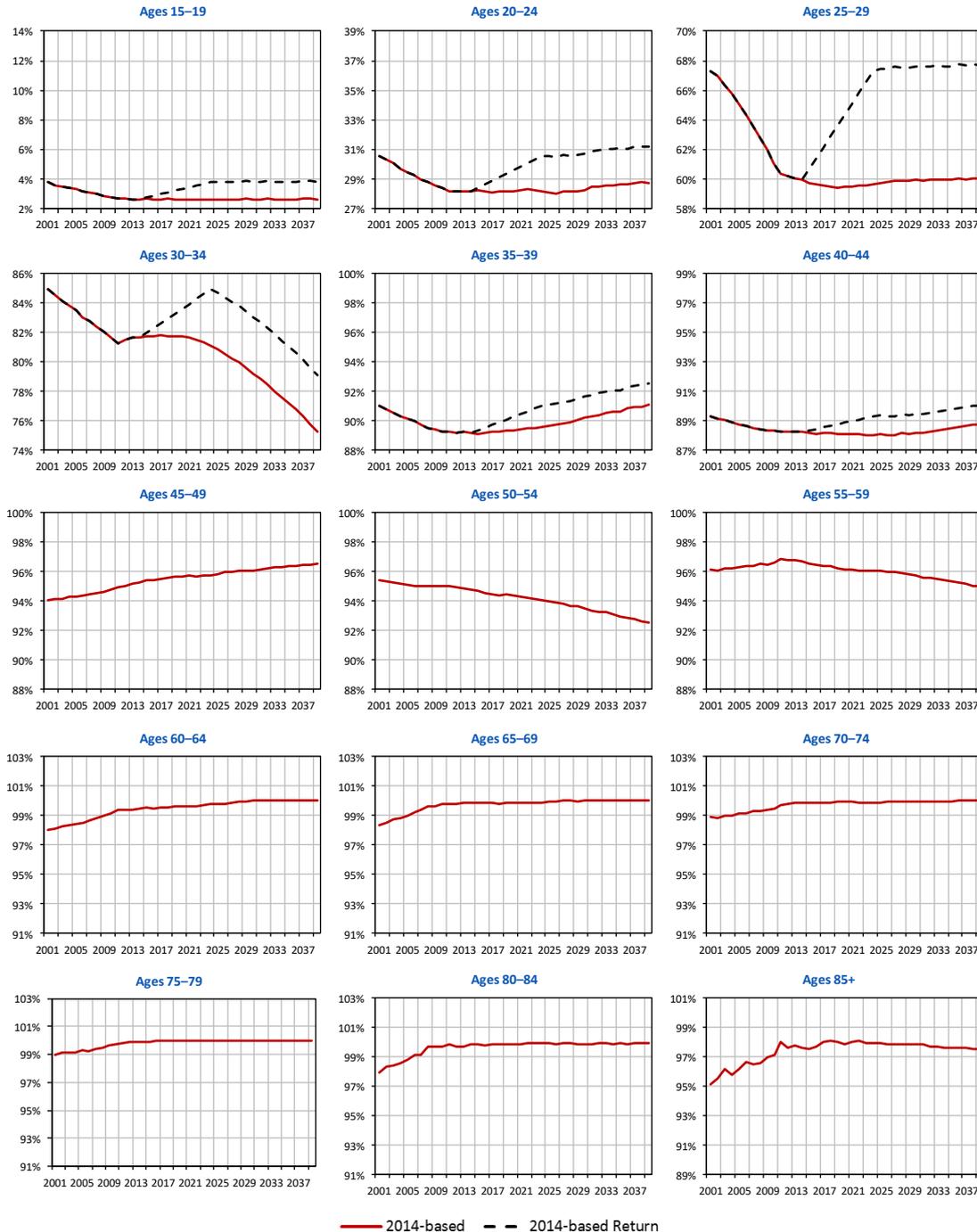
6.6 An updated range of evidence has been presented here for Barrow Borough Council to consider. The latest projections from the ONS and DCLG respectively suggest population decline for

Barrow-in-Furness between 2014 and 2031, resulting in an estimated dwelling change of -72 per year.

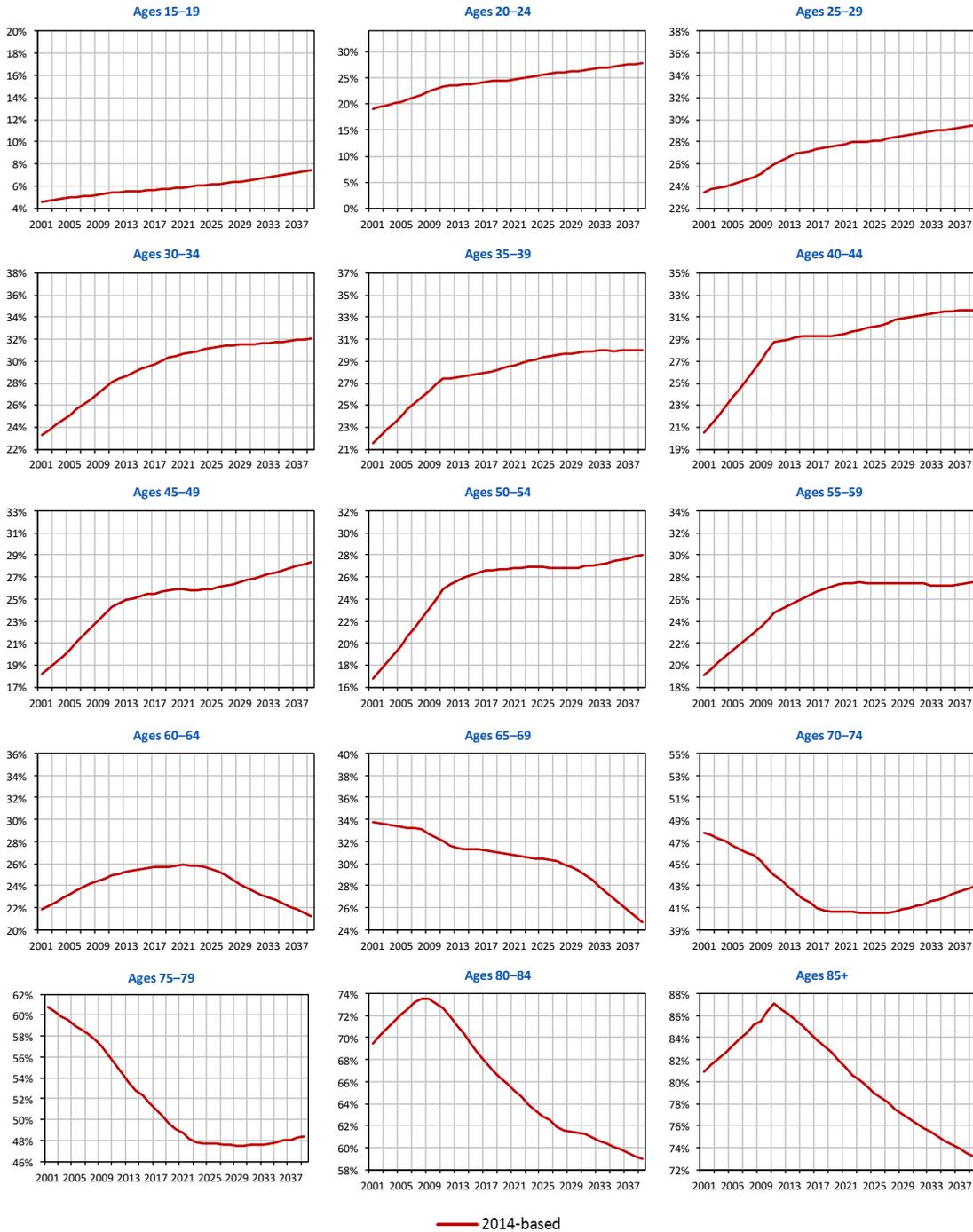
- 6.7 The exclusion of UPC and a reduction in net out-migration from Barrow-in-Furness under the **Long Term-X** scenario, results in the highest population growth under the demographic scenarios. This results in a higher average annual dwelling growth requirement (+42) than that expected under the **PG 5yr**, **PG 10yr** and **PG Long Term** trend based scenarios.
- 6.8 The **Net Nil** scenario illustrates the extent to which migration influences population change in Barrow-in-Furness. Under the **Net Nil** scenario, the population change of -0.7% over the 2014–2031 period, results in an average annual dwelling growth of +38 per year.
- 6.9 Quantifying the link between demographic and economic change is challenging. The scenario analysis presented here has illustrated how the employment growth forecasts in the **Jobs-led** scenarios (**Experian**, **Experian Average** and **SENS**) are estimated to require a higher level of population and dwelling growth under a range of variant economic assumptions and conditions.
- 6.10 The suite of sensitivity scenarios has examined how the estimated population and dwelling growth for Barrow-in-Furness might alter if the key conditions set for economic activity and commuting are altered. Maintaining a higher aggregate economic activity rate by the end of the plan period; operating in tandem with a change in the commuting patterns, has the most significant impact upon estimated population and dwelling growth required to support employment growth.

Appendix A Headship Rates

Males



Females



Appendix B

POPGROUP Methodology

Forecasting Methodology

- B.1** Evidence is often challenged on the basis of the appropriateness of the methodology that has been employed to develop growth forecasts. The use of a recognised forecasting product which incorporates an industry-standard methodology (a cohort component model) removes this obstacle and enables a focus on assumptions and output, rather than methods.
- B.2** Demographic forecasts have been developed using the POPGROUP suite of products. POPGROUP is a family of demographic models that enables forecasts to be derived for population, households and the labour force, for areas and social groups. The main POPGROUP model (Figure 21) is a cohort component model, which enables the development of population forecasts based on births, deaths and migration inputs and assumptions.
- B.3** The Derived Forecast (DF) model (Figure 22) sits alongside the population model, providing a headship rate model for household projections and an economic activity rate model for labour-force projections.
- B.4** For further information on POPGROUP, please refer to the Edge Analytics website (<http://www.edgeanalytics.co.uk/>).

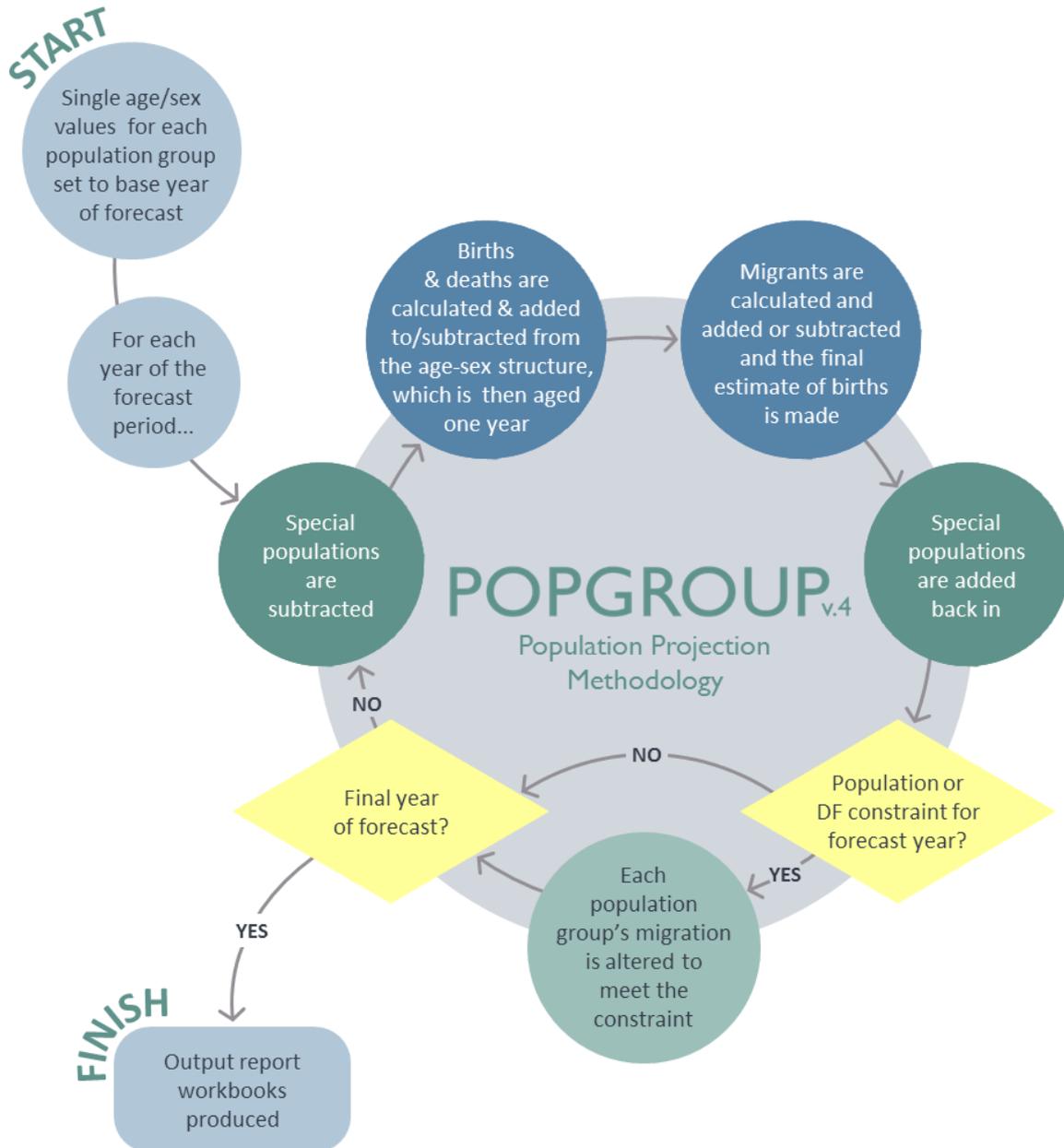
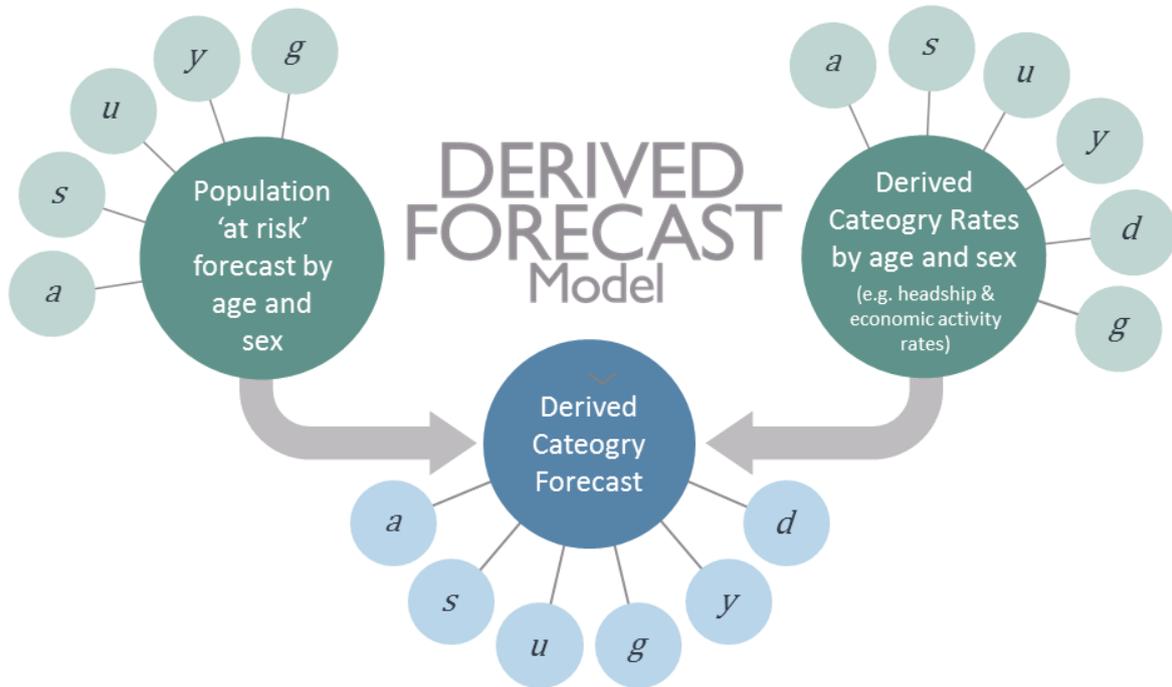


Figure 21: POPGROUP population projection methodology



$$D_{a,s,u,y,d,g} = \frac{P_{a,s,u,y,g} R_{a,s,u,y,d,g}}{100}$$

| | | | |
|----------|-------------------------------|----------|---|
| <i>D</i> | Derived Category Forecast | <i>y</i> | Year |
| <i>P</i> | Population 'at risk' Forecast | <i>d</i> | Derived category |
| <i>R</i> | Derived Category Rates | <i>g</i> | Group (usually an area, but can be an ethnic group or social group) |
| <i>a</i> | Age-group | | |
| <i>s</i> | Sex | | |
| <i>u</i> | Sub-population | | |

Figure 22: Derived Forecast (DF) methodology

Appendix C

Data Inputs & Assumptions

Introduction

- C.1 Edge Analytics has developed a suite of demographic scenarios for Barrow-in-Furness using POPGROUP v.4 and the Derived Forecast model. The POPGROUP suite of demographic models draw data from a number of sources, building an historical picture of population, households, fertility, mortality and migration on which to base its scenario forecasts. Using historical data evidence for 2001–2015, in conjunction with information from ONS sub-national population projections (SNPPs) and DCLG household projections, a series of assumptions have been derived which drive the scenario forecasts.
- C.2 The following scenarios have been produced:
- SNPP-2014
 - PG 5yr
 - PG 10yr
 - PG Long Term
 - PG Long Term-X
 - Net Nil
 - Jobs led Experian
 - Jobs-led Experian Average
- C.3 In addition to the above scenarios, the following **Jobs-led** sensitivity scenarios have been developed:
- Experian CR SENS
 - Experian EA SENS
 - Experian CR EA SENS
 - Experian Average CR SENS
 - Experian Average EA SENS
 - Experian Average CR EA SENS
- C.4 In the following sections, a narrative on the data inputs and assumptions underpinning the scenarios is presented.

Population, Births & Deaths

Population

- C.5 In each scenario, historical population statistics are provided by the mid-year population estimates (MYEs), with all data recorded by single-year of age and sex. These data include the revised MYEs for 2002–2010, which were released by the ONS in May 2013. The revised MYEs provide consistency in the measurement of the components of change (i.e. births, deaths, internal migration and international migration) between the 2001 and 2011 Censuses.
- C.6 In the **SNPP-2014** scenario, the historical MYEs are used up to 2014. From 2014, future population counts are provided by single-year of age and sex to ensure consistency with the trajectory of the ONS 2014-based SNPP.
- C.7 In the other scenarios, the historical MYEs are used up to 2015.

Births & Fertility

- C.8 In each scenario, historical mid-year to mid-year counts of births by sex have been sourced from the ONS MYEs.
- C.9 In the **SNPP-2014** scenario, historical births are used from 2001/02 to 2013/14. From 2014/15, future counts of births are specified, to ensure consistency with the 2014-based official projection.
- C.10 In all other scenarios, historical births are used from 2001/02 to 2014/15. From 2015/16, an area-specific age-specific rate (ASFR) schedule, derived from the ONS 2014-based SNPP, is included in the POPGROUP model assumptions. Long-term assumptions on changes in age-specific fertility rates are taken from the ONS 2014-based SNPP.
- C.11 In combination with the ‘population-at-risk’ (i.e. all women between the ages of 15–49), the area-specific ASFR and future fertility rate assumptions provide the basis for the calculation of births in each year of the forecast period (i.e. from 2015 onwards).

Deaths & Mortality

- C.12** In each scenario, historical mid-year to mid-year counts of deaths by 5-year age group and sex have been sourced from the ONS MYEs.
- C.13** In the **SNPP-2014** scenario, historical deaths are used from 2001/02 to 2013/14. From 2014/15, future counts of deaths are specified, to ensure consistency with the 2014-based official projection.
- C.14** In all other scenarios, historical deaths are used from 2001/02 to 2014/15. From 2015/16, an area-specific age-specific mortality rate (ASMR) schedule, derived from the ONS 2014-based SNPP, is included in the POPGROUP model assumptions. Long-term assumptions on changes in age-specific mortality rates are taken from the ONS 2014-based SNPP.
- C.15** In combination with the 'population-at-risk' (i.e. the whole population), the area-specific ASMR and future mortality rate assumptions provide the basis for the calculation of deaths in each year of the forecast period (i.e. from 2015 onwards).

Migration

Internal Migration

- C.16** In each scenario, historical mid-year to mid-year estimates of internal in- and out-migration by 5-year age group and sex have been sourced from the 'components of population change' files that underpin the ONS MYEs. These internal migration flows are estimated using data from the Patient Register (PR), the National Health Service Central Register (NHSCR) and the Higher Education Statistics Agency (HESA).
- C.17** In the **SNPP-2014** scenario, historical counts of internal in and out-migrants are used from 2001/02 to 2013/14. From 2014/15, future counts of migrants are specified, to ensure consistency with the 2014-based official projection.
- C.18** In the **Net Nil** scenario, historical counts of internal in and out-migrants are used from 2001/02 to 2014/15. From 2015/16, the internal in- and out-migration net flows are set to zero in each year in the forecast period (i.e. in- and out-migration still occur but the net balance is zero).

- C.19 In the **PG** scenarios, historical counts of internal in and out-migrants are used from 2001/02 to 2014/15. From 2015/16, future internal migration flows are based on the area-specific historical migration data. In the **PG-5yr** scenario, a *five* year internal migration history is used (2010/11 to 2014/15). In the **PG-10yr** scenario, a *ten* year history is used (2005/06 to 2014/15). In the **PG Long-Term** and **PG Long-Term X** scenario, a *fourteen* year history is used (2001/02 to 2014/15).
- C.20 In the alternative trend scenarios (i.e. **PG 5yr**, **PG 10yr**, **PG Long-Term** and **PG Long-Term X** scenarios) the relevant historical time period is used to derive the age-specific migration rate (ASMigR) schedules, which are then used to determine the future number of in- and out-migrants.
- C.21 In the case of internal in-migration, the ASMigR schedules are applied to an external ‘reference’ population (i.e. the population ‘at-risk’ of migrating into the area). This is different to the other components (i.e. births, deaths, internal out-migration), where the schedule of rates is applied to the area-specific population (i.e. the population ‘at-risk’ of migrating out of the area). The reference population is defined by considering the areas which have historically contributed the majority of migrants into the area. In the case of Barrow-in-Furness, it comprises all districts which cumulatively contributed 70% of migrants into the Cumbria LEP over the 2008/09–2014/15 period.
- C.22 In the **Jobs-led (Jobs-led Experian, Jobs-led Experian Average and SENS)** scenarios, historical counts of internal in and out-migrants are used from 2001/02 to 2014/15. From 2015/16, these scenarios then calculate their own internal migration assumptions to ensure an appropriate balance between the population and the targeted increase in the number of jobs that is defined in each year of the forecast period. A higher level of net internal migration will occur if there is insufficient population and resident labour force to meet the forecast number of jobs. In the **Jobs-led (Jobs-led Experian, Jobs-led Experian Average and SENS)** scenarios, the profile of internal migrants is defined by an ASMigR schedule, derived from the ONS 2014-based SNPP.

International Migration

- C.23 Historical mid-year to mid-year counts of immigration and emigration by 5-year age group and sex have been sourced from the ‘components of population change’ files that underpin the ONS MYEs. Any ‘adjustments’ made to the MYEs to account for asylum cases are included in the international migration balance.

- C.24 In all scenarios, future international migrant counts are specified.
- C.25 In the **SNPP-2014** scenario, historical counts of migrants are used from 2001/02 to 2013/14. From 2014/15, the international in- and out-migration counts are drawn directly from the 2014-based official projection.
- C.26 In the **Net Nil** scenario, historical counts of international in and out-migrants are used from 2001/02 to 2014/15. From 2015/16, the international in- and out-migration net counts are set to zero in each year in the forecast period (i.e. in- and out-migration still occur but the net balance is zero).
- C.27 In the **PG** scenarios, historical counts of international in and out-migrants are used from 2001/02 to 2014/15. From 2015/16, future international migration counts are based on the area-specific historical migration data. In the **PG 5yr** scenario, a five year international migration history is used (2010/11 to 2014/15). In the **PG 10yr** scenario, a ten year history is used (2005/06 to 2014/15). In the **PG Long-Term** and **PG Long-Term X** scenarios, a fourteen year history is used (2001/02 to 2014/15).
- C.28 Implied within the international migration component of change in the **PG-5yr**, **PG 10yr** and **PG Long-Term** scenarios is an 'unattributable population change' (UPC) figure, which ONS identified within its latest mid-year estimate revisions. The POPGROUP model has assigned the UPC to international migration as it is the component with the greatest uncertainty associated with its estimation.
- C.29 In the **PG Long-Term X** scenario, the UPC component has been *excluded* from international migration estimation.
- C.30 In the **Jobs-led (Jobs-led Experian, Jobs-led Experian Average and SENS)** scenarios, historical counts of international in and out-migrants are used from 2001/02 to 2014/15. From 2015/16, international migration counts are taken from the ONS 2014-based SNPP (i.e. counts are consistent with the **SNPP-2014** scenario). An ASMigR schedule of rates from the ONS 2014-based SNPP is used to distribute future counts by single year of age.

Households & Dwellings

C.31 The 2011 Census defines a household as:

“one person living alone, or a group of people (not necessarily related) living at the same address who share cooking facilities and share a living room or sitting room or dining area.”

C.32 In POPGROUP, a dwelling is defined as a unit of accommodation which can either be occupied by one household or vacant.

C.33 In all scenarios, the household and dwelling implications of the population growth trajectory have been evaluated through the application of headship rate statistics, communal population statistics and a dwelling vacancy rate. These data assumptions have been sourced from the 2001 and 2011 Censuses and the 2014-based household projection model from the DCLG. The 2014-based model was released by the DCLG in July 2016, and is underpinned by the 2014-based SNPP from ONS.

Household Headship Rates

C.34 A household headship rate (also known as household representative rate) is the *“probability of anyone in a particular demographic group being classified as being a household representative”*⁹.

C.35 The household headship rates used in the POPGROUP modelling have been taken from the latest DCLG 2014-based household projection model, which is underpinned by the ONS 2014-based SNPP. The DCLG household projections are derived through the application of projected headship rates to a projection of the private household population. The methodology used by DCLG in its household projection models consists of two distinct stages:

- **Stage One** produces the national and local authority projections for the total number of households by sex, age-group and relationship-status group over the projection period.
- **Stage Two** provides the detailed ‘household-type’ projection by age-group, controlled to the previous Stage One totals.

⁹ Household Projections 2012-based: Methodological Report. Department for Communities and Local Government (February 2015). <https://www.gov.uk/government/statistics/2012-based-household-projections-methodology>

- C.36 In POPGROUP, the Stage One headship rates have been applied by 5-year age group, sex and relationship status (Table 14).

Table 14: DCLG Stage One headship rate classification by relationship status

| DCLG Category | Description |
|--------------------|--|
| Single | Not in a couple: Marital status single |
| Couple | In a couple: whether married or cohabiting |
| Previously Married | Not in a couple: marital status previously married |

Communal Population Statistics

- C.37 Household projections in POPGROUP exclude the population ‘not-in-households’ (i.e. the communal/institutional population). These data are drawn from the DCLG 2014-based household projections, which use statistics from the 2011 Census. Examples of communal establishments include prisons, residential care homes and student halls of residence.
- C.38 For ages 0–74, the number of people in each age group not-in-households is fixed throughout the forecast period. For ages 75–85+, the proportion of the population not-in-households is recorded. Therefore, the population not-in-households for ages 75–85+ varies across the forecast period depending on the size of the population.

Vacancy Rate

- C.39 The relationship between households and dwellings is modelled using a ‘vacancy rate’, sourced from the 2011 Census¹⁰. The vacancy rate is calculated using statistics on households (occupied household spaces) and dwellings (shared and unshared).
- C.40 A vacancy rate of 5.4% for Barrow-in-Furness has been applied, fixed throughout the forecast period. Using the vacancy rate, the ‘dwelling requirement’ of each household growth trajectory has been evaluated.

¹⁰ Census Table KS401EW: Dwellings, household spaces and accommodation type

Labour Force & Jobs

- C.41 Apart from in the **Jobs-led (Jobs-led Experian, Jobs-led Experian Average and SENS)** scenarios, the labour force and jobs implications of the population growth trajectory are evaluated through the application of three key data items: economic activity rates, an unemployment rate and a commuting ratio.
- C.42 In the **Jobs-led (Jobs-led Experian, Jobs-led Experian Average and SENS)** scenarios, these assumptions are used to determine the level of population growth required by the defined jobs growth trajectory.

Economic Activity Rates

- C.43 The level of labour force participation is recorded in the economic activity rates. Economic activity rates by five year age group (ages 16-75+) and sex have been derived from Census statistics.
- C.44 Between the 2001 and 2011 Censuses, rates of economic activity increased, most notably for females and males in the older age groups (Figure 23).

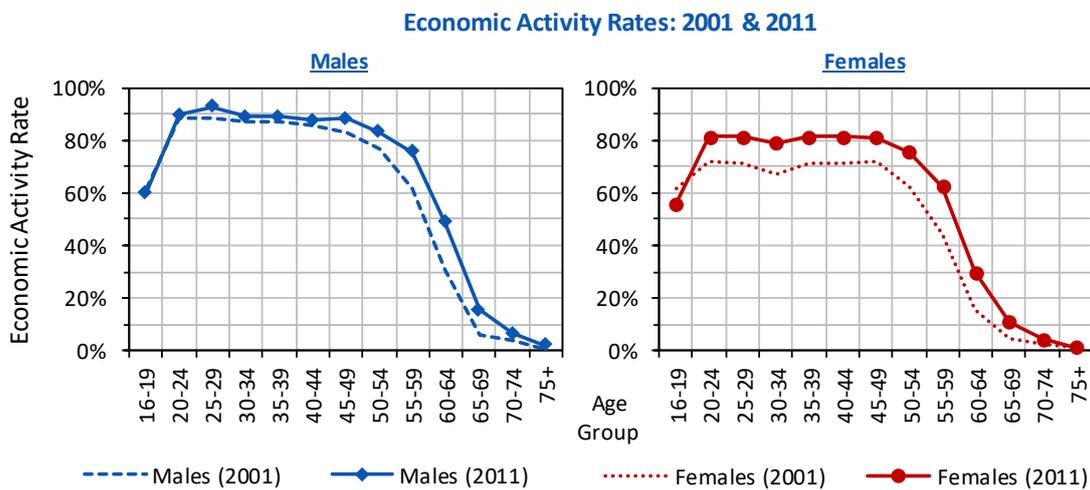


Figure 23: Barrow-in-Furness Economic activity rates: 2001 and 2011 Census comparison (source: ONS)

OBR Rates

- C.45 The Office for Budget Responsibility (OBR) has undertaken analysis of labour market trends in its 2015 Fiscal Sustainability Report¹¹. Included within its analysis is a forecast of changing economic activity rates for males and females, extending to a long-term 2066 forecast horizon. This forecast has been used to generate an alternative set of economic activity rates for Barrow-in-Furness.
- C.46 Adjustments have been made for the older age groups only (60–75+) (Table 15). The economic activity rate profiles are summarised in Figure 24.

Table 15: OBR Economic Activity Rate adjustments

| OBR Economic Activity Rates Change 2011–2031 | | | |
|---|-----|---------|------|
| Males | | Females | |
| 16–19 | 0% | 16–19 | 0% |
| 20–24 | 0% | 20–24 | 0% |
| 25–29 | 0% | 25–29 | 0% |
| 30–34 | 0% | 30–34 | 0% |
| 35–39 | 0% | 35–39 | 0% |
| 40–44 | 0% | 40–44 | 0% |
| 45–49 | 0% | 45–49 | 0% |
| 50–54 | 0% | 50–54 | 0% |
| 55–59 | 0% | 55–59 | 0% |
| 60–64 | 15% | 60–64 | 71% |
| 65–69 | 48% | 65–69 | 100% |
| 70–74 | 32% | 70–74 | 113% |
| 75+ | 57% | 75+ | 288% |

¹¹ http://budgetresponsibility.org.uk/docs/dlm_uploads/49753_OBR-Fiscal-Report-Web-Accessible.pdf

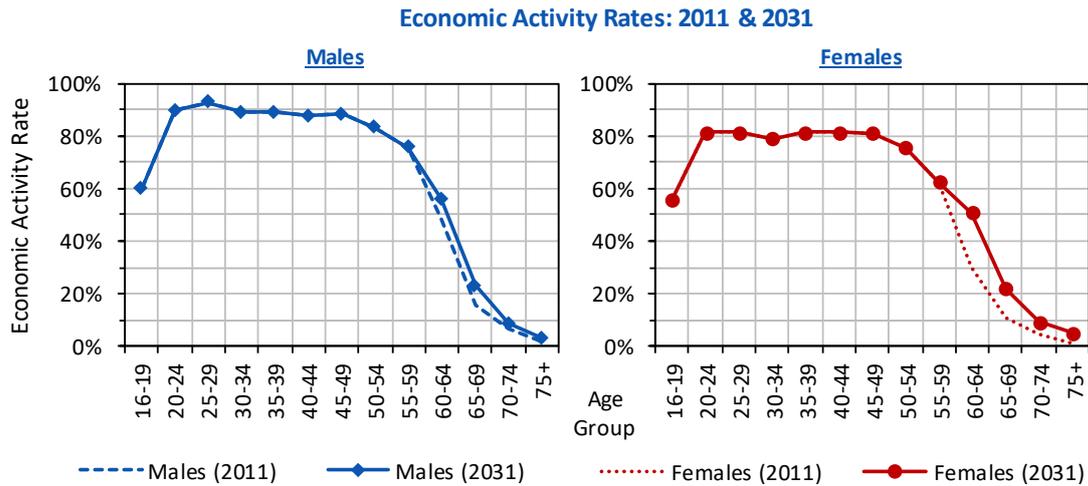


Figure 24: OBR economic activity rate profile for Barrow-in-Furness

C.47 These economic activity rate adjustments have been applied in all demographic and jobs-led scenarios except **Jobs-led EA SENS** and **Jobs-led CR EA SENS** scenarios. In the **Jobs-led EA SENS** and **Jobs-led CR EA SENS** scenarios, the aggregate 2014 economic activity rate (16–75+) of 59.0% is maintained over the forecast period.

Commuting Ratio

- C.48 The commuting ratio, together with the unemployment rate, controls the balance between the number of workers living in a district (i.e. the resident labour force) and the number of jobs available in the district.
- C.49 A commuting ratio greater than 1.00 indicates that the size of the resident workforce exceeds the number of jobs available in the district, resulting in a net out-commute. A commuting ratio less than 1.00 indicates that the number of jobs in the district exceeds the size of the labour force, resulting in a net in-commute.
- C.50 From the 2011 Census ‘Travel to Work’ statistics, published by ONS in July 2014, commuting ratios have been derived for Barrow-in-Furness. This is compared to the 2001 Census value in Table 16.

Table 16: Commuting Ratio Comparison

| Barrow-in-Furness | | 2001 Census | 2011 Census |
|-------------------|------------|-------------|-------------|
| Workers | <i>a</i> | 28,793 | 31,344 |
| Jobs | <i>b</i> | 28,591 | 31,478 |
| Commuting Ratio | <i>a/b</i> | 1.01 | 1.00 |

Note: 2001 data from Census Table T101 – UK Travel Flows; 2011 data from Census Table WU02UK - Location of usual residence and place of work by age.

- 6.11 In all except the **Jobs-led CR SENS** and **Jobs-led CR EA SENS** scenarios, the 2011 Census commuting ratio of 1.00 has been applied, fixed throughout the forecast period. In the **Jobs-led CR SENS** and **Jobs-led CR EA SENS** scenarios, a small net in-commuting ratio of 0.99 has been applied throughout the forecast period.

Unemployment Rate

- C.51 The unemployment rate, together with the commuting ratio, controls the balance between the size of the labour force and the number of jobs available within an area.
- C.52 In all scenarios, historical unemployment rates are defined up to 2015. From 2015, the unemployment rate reduces from 6.8% to a pre-recession average (2004–2007) of 5.6% by 2020, fixed thereafter (Table 17).

Table 17: Historical unemployment rates 2004–2015

| Area | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | Average Pre-Recession (2004-07) |
|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|---------------------------------|
| Barrow-in-Furness | 4.8 | 5.8 | 5.6 | 6.3 | 5.6 | 7.0 | 7.9 | 9.6 | 9.1 | 7.9 | 7.6 | 6.8 | 5.6 |

Source: ONS model-based estimates of unemployment, from NOMIS