# NWL –PR24 DD support – NHH demand PCL DD analysis

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## 1　Introduction

In the PR24 draft determination (DD) for Northumbrian Water Limited (NWL), the Ofwat model used for your business demand performance commitment level (PCL) means that the median of historic growth pre-Covid has been used to set a glide path for business demand to 2029/30. On the face of it, this approach seems difficult to justify. In particular, this means that Ofwat has disregarded the NHH forecast presented by you for Northumbrian Water (NNE) and Essex and Suffolk Water (ESK). In addition, Ofwat has adjusted the NHH demand value in the starting year of AMP8, without considering how this value relates to the reported values presented by you.

In order to consider the impact of these issues in more detail and build evidence for your consultation response, this analysis will:

- Look at each decision made in Ofwat's analysis and assess its credibility and impact.
- Consider the analysis, model variables and reasoning from the WRMP24 NHH forecast.
- Look at what actuals show since the forecast, including 2023/24.
- Make recommendations for alternatives to Ofwat's proposal.

Section 2 provides a summary of our findings, and section 3 provides detailed analysis of each of the steps taken by Ofwat to present its recommended PCL.

## 2　Summary of findings

For their PR24 business plan, NWL proposed a business demand profile for:

- NNE of **148.5** Ml/d in 2024-25, increasing to **187.1** Ml/d in 2029-30.
- ESK of **78.3** Ml/d in 2024-25, increasing to **86.4** Ml/d in 2029-30.

Ofwat's PCL modelling process for the DDs resulted in business demand values for:

- NNE of **132.6** Ml/d in 2024-25 (a reduction of **15.9** Ml/d), and **117.5** Ml/d in 2029-30 (a reduction of **69.6** Ml/d to that proposed by NWL).

- ESK of **72.4** Ml/d in 2024-25 (a reduction of **5.9** Ml/d), and **59.0** Ml/d in 2029-30 (a reduction of **27.4** Ml/d to that proposed by NWL).

For NNE this results in a 3-year rolling average PCL for 2029-30 of **120.6** Ml/d, which is a **15.8%** reduction in NHH demand from the 2019-20 3-year rolling average baseline.

For ESK this results in a 3-year rolling average PCL for 2029-30 of **61.6** Ml/d, which is a **17.5%** reduction in NHH demand from the 2019-20 3-year rolling average baseline.

For context, Defra's target is a **15%** reduction by 2050, with an interim target of a **9%** reduction by March 2038.

The make-up of the Ofwat DD proposed business demand figure for 2029-30 for **NNE** is based on:

a) A reduction in baseline for 2024-25 of **15.9** Ml/d (based on zero growth from 2022-23 outturn to 2024-25).

b) A NHH water efficiency saving by 2029-30 of **4.81** Ml/d (from Ofwat's validated enhancement analysis).

c) A reduction in the baseline for 2029-30 of **69.6** Ml/d (based on an annual growth rate of **-1.15** Ml/d/year from Ofwat's 2024-25 baseline, which is derived from the median growth rate between 2012 and 2019).

The make-up of the Ofwat DD proposed business demand figure for 2029-30 for **ESK** is based on:

a) A reduction in baseline for 2024-25 of **5.9** Ml/d (based on zero growth from 2022-23 outturn to 2024-25).

b) A NHH water efficiency saving by 2029-30 of **2.29** Ml/d (from Ofwat's validated enhancement analysis).

c) A reduction in the baseline for 2029-30 of **27.4** Ml/d (based on an annual growth rate of **-1.15** Ml/d/year from Ofwat's 2024-25 baseline, which is derived from the median growth rate between 2012 and 2019).

The logic for having two different growth rates for the period 2022-23 to 2024-25 and 2024-25 to 2029-30 is difficult to comprehend. Both rely on a prediction of future growth based on a median historic value of year-on-year growth, which goes directly against the best practice approaches for predicting future demand.

Best practice[1,2] recommends the use of econometric and population factors for forecasting NHH demand. For NWL, the NHH demand forecasts for the NNE and ESK areas were developed by segmenting the properties into agriculture, non-service, service population driven, and service economy driven sectors. The forecast models used population, gross added value (GVA), employment and population density as factors. They also considered the impact of Covid-19 and included consultations with Local Authorities (relating to growth

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[1] Forecasting water demand components – Best practice manual. UKWIR, 97/WR/07/01. 1997.
[2] Demand forecasting methodology. UKWIR, 95/WR/01/1

from existing and new business properties) and discussions with large users (>20,000 m³/year). Analysis of new users included their consumption during construction and business as usual on completion of construction.

Most of the difference between Ofwat's proposed NHH demand in 2029-30 and NWL's proposed values in each of their regions (from their rWRMP) are due to Ofwat's assumption that a median year-on-year growth factor derived from a period pre 2017 is a better predictor of future NHH demand than the more sophisticated forecasts developed by NWL.

The period between 2107 and 2023 has seen unprecedented change in the NHH demand sector. The market has opened to competition, societal norms have been impacted by the Covid-19 pandemic, the UK has exited the EU, there has been a cost-of-living crisis, and GVA is growing faster post-covid than pre-covid[3], and proposed new developments within NWL's regions. This challenges the assumption by Ofwat that their prediction of future NHH demand is more appropriate than the approach taken by NWL in developing their best value water resources plan.

Furthermore, NWL's best value WRMP aims to ensure that there is sufficient water available for new industry and business growth in its regions. It cannot be correct to alter the final plan profiles for NHH demand based on a fundamentally flawed assumption of future growth, because this would then result in a plan which is not best value.

One way forward would be for Ofwat to accept the baseline NHH demand forecast to 2029-30 included in NWL's WRMP best value plan, and then apply Ofwat's validated enhancement reduction to the NWL baseline in 2024-25 to 2029-30 to derive the target. This would result in the following 2029-30 values and 3-year average PCLs for each area:

For NNE:

- A 2029-30 target NHH demand of 182.3 Ml/d
- A 3-year rolling average target of 175.6 Ml/d

For ESK:

- A 2029-30 target NHH demand of 86.4 Ml/d
- A 3-year rolling average target of 83.0 Ml/d

However, these would need a discussion relating to how these figures contribute to Defra's business demand reduction targets.

# 3 Non household consumption analysis

## 3.1 Analysis of the business demand PCL model

Based on analysis of Ofwat's PCL model:

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[3] https://www.ons.gov.uk/economy/grossvalueaddedgva/timeseries/abml/qna

This model describes how Ofwat have set the PCL for business demand using the following steps:

**Step 1 – Establish a NYAA baseline NHH consumption for 2029-30**

Ofwat have converted the baseline planning scenario dry year annual average forecast to a normal year annual average equivalent. This was calculated using the ratio of NYAA/DYAA forecast business demand from companies revised draft WRMP 24 to calculate a NYAA Baseline scenario for business demand (demand levels if the company were to not intervene through metering, water efficiency, etc).

For NNE Ofwat have calculated the DYAA:NYAA ratio to be 1.000.

For ESK Ofwat have calculated the DYAA:NYAA ratio to be 1.071.

*This results in the calculated NYAA baseline for 2029-30 as:*

- **192.5** Ml/d for NNE
- **86.4** Ml/d for ESK

**Step 2 – Determine the historic business demand growth**

Ofwat attempt to ensure the credibility of companies forecast growth rates. To do this Ofwat compare forecast growth rates to median historic growth outturn. The period analysed is pre COVID-19 to exclude the impacts of COVID-19 on business demand. The calculation of the median uses annual growth rates from 2012-13 to 2018-19. This excludes 2011-12 which is excluded due to Widespread decrease >5%. Suggesting outlier year/impact of reporting change. 2019-20 is excluded due to the potential impact of COVID-19 on business demand during Jan-March 2020.

*For NNE the median year-on-year growth rate from 2012-13 to 2018-19 is **-1.15%.***

Figure 1 shows the range of year-on-year rate changes for NNE, and Figure 2 shows the historic NHH growth trend for NNE.

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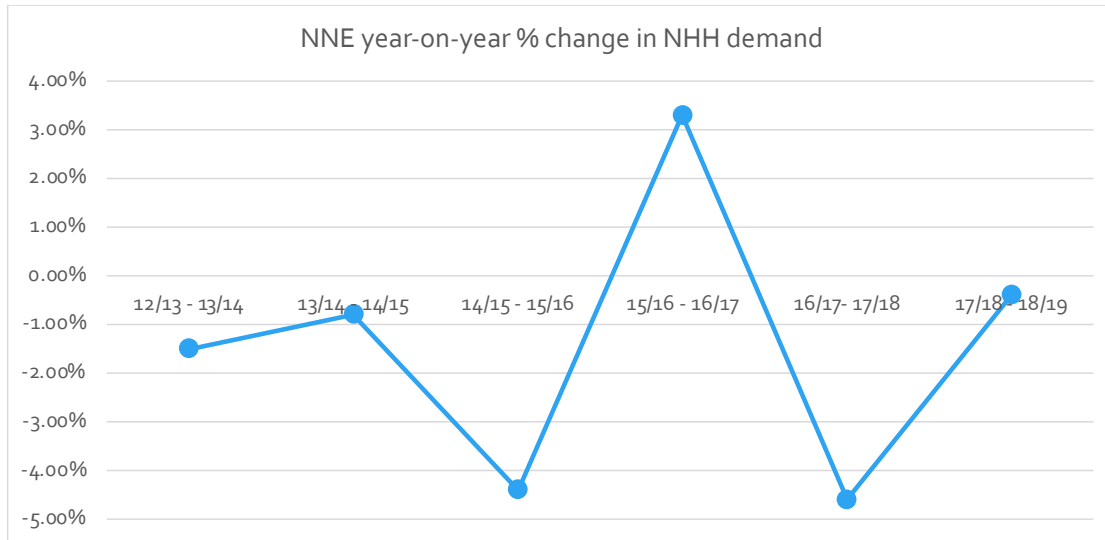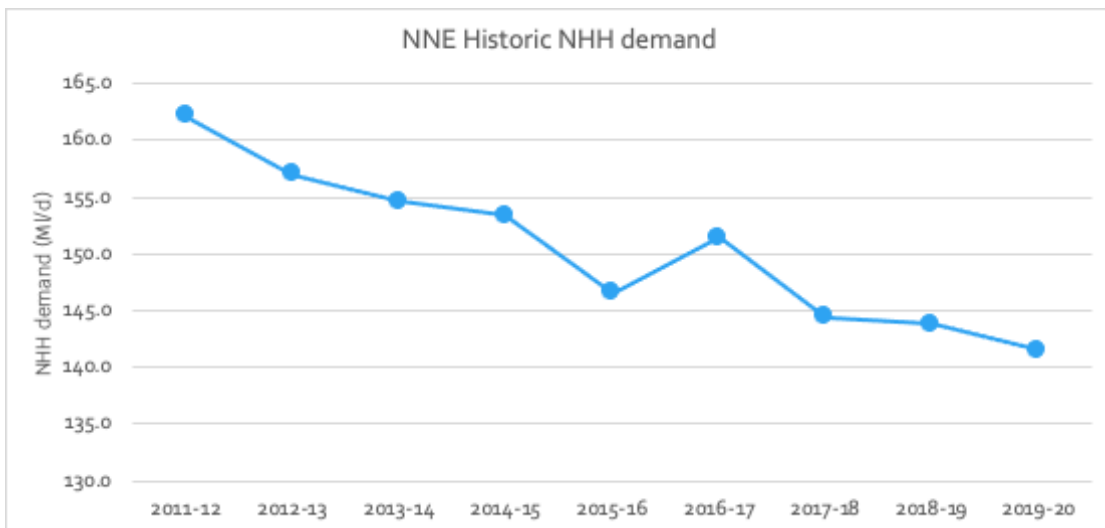**Figure 1 NNE year-on-year % change in NHH demand**



**Figure 2 NNE historic NHH demand**



*For ESK the median year-on-year growth rate from 2012-13 to 2018-19 is **-2.35%.***

Figure 3 shows the range of year-on-year rate changes for ESK, and Figure 4 shows the historic NHH growth trend for ESK.

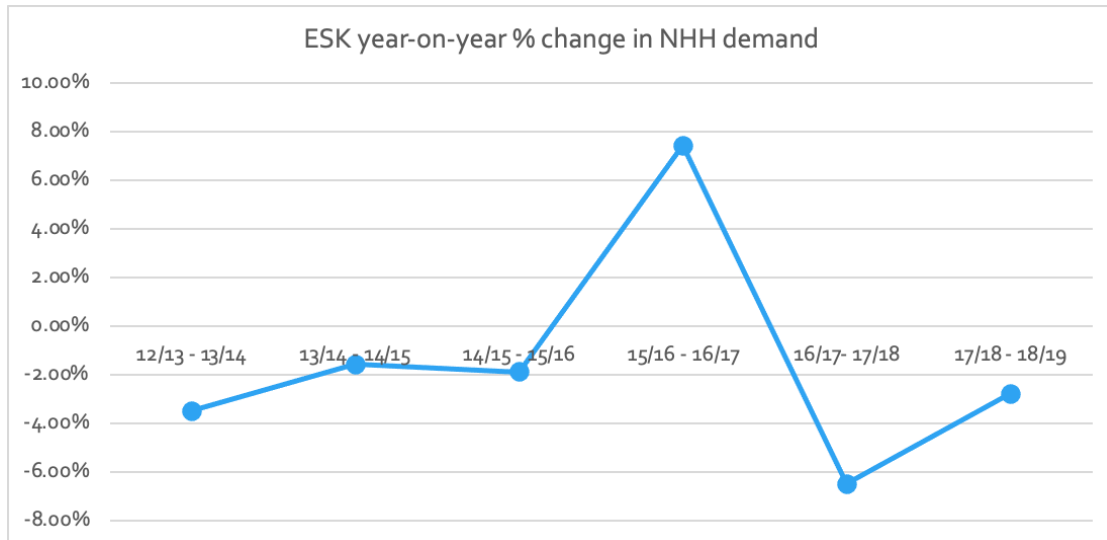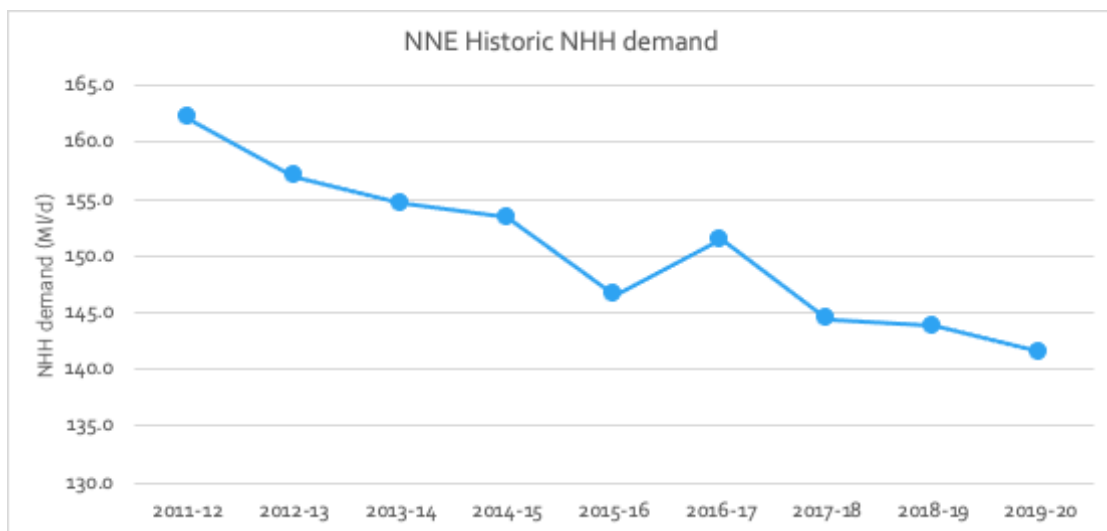**Figure 3 ESK year-on-year % change in NHH demand**



**Figure 4 ESK historic NHH demand**



Comments:

- Note between 2016-17 and 2017-18, meter reading and reporting changed from water company to retailers when the NHH market was opened to competition.
- The assumption from Ofwat is that future growth is better predicted by past growth, is directly opposed to the Best practice[5,6] which recommends the use of econometric and population factors in addition to trends for forecasting NHH demand.
- There were many factors impacting NHH water use between 2016 and 2023 and therefore, we question Ofwat's assumption that a median year-on-year growth

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[5] Forecasting water demand components – Best practice manual. UKWIR, 97/WR/07/01. 1997.
[6] Demand forecasting methodology. UKWIR, 95/WR/01/1

factor derived from the period 2012-13 to 2018-19 is a better predictor of future NHH demand than the more sophisticated forecasts developed for NWL[7,8].

**Step 3 – Determine the forecast NHH demand growth and derive the median value**

To determine companies forecast median baseline business demand growth for comparison to historical outturn, Ofwat used companies Dry-year annual average baseline planning scenarios from table 2d of the revised draft WRMP. This growth rate represents the expected increase in business demand if no mitigation actions were taken.

*For NNE the median year-on-year growth rate from 2023-24 to 2029-30 is* **+4.50%.**
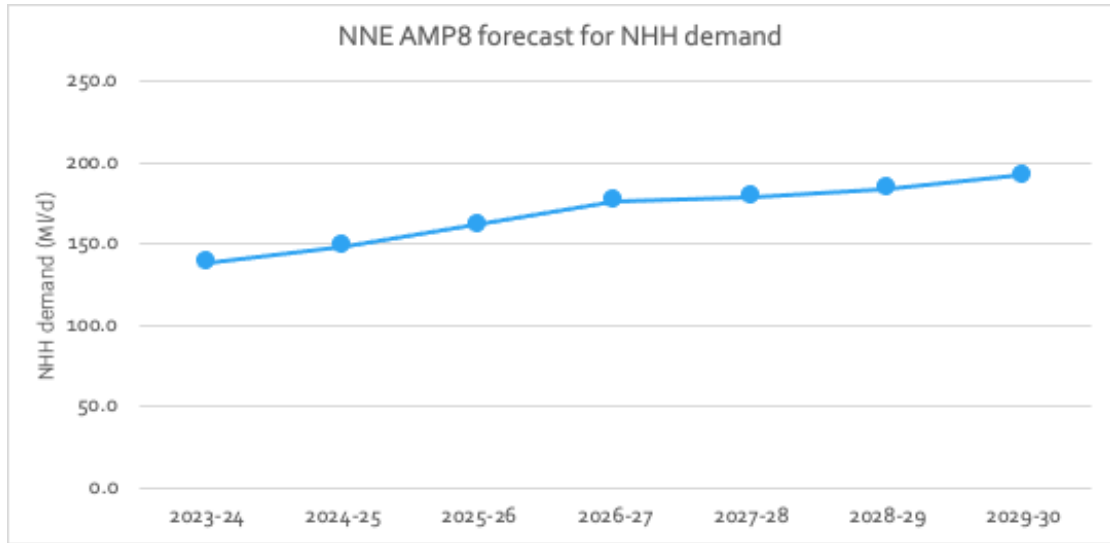
Figure 5 shows the range of year-on-year rate changes and Figure 6 shows the NHH demand forecast for AMP8.

**Figure 5 NNE future year-on-year % change in NHH demand**

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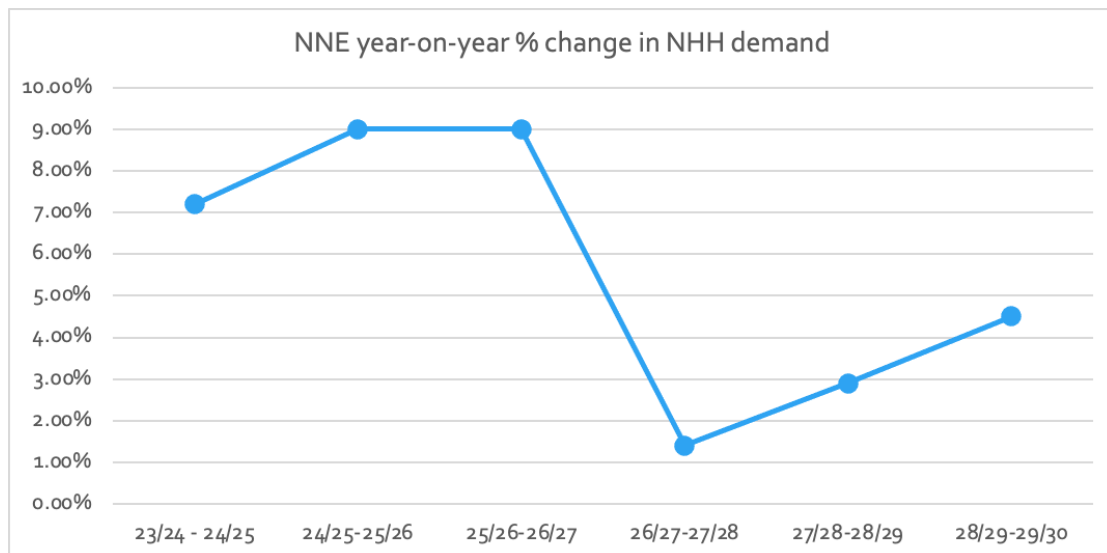
[7] NW_Demand Forecast WRMP24 Technical Report.
[8] ESW_Demand Forecast WRMP24 Technical Report.

**Figure 6 NNE AMP8 NHH demand**



*For ESK the median year-on-year growth rate from 2023-24 to 2029-30 is* **+1.50%.**

Figure 7 shows the range of year-on-year rate changes and Figure 8 shows the NHH demand forecast for AMP8.

**Figure 7 ESK future year-on-year % change in NHH demand**
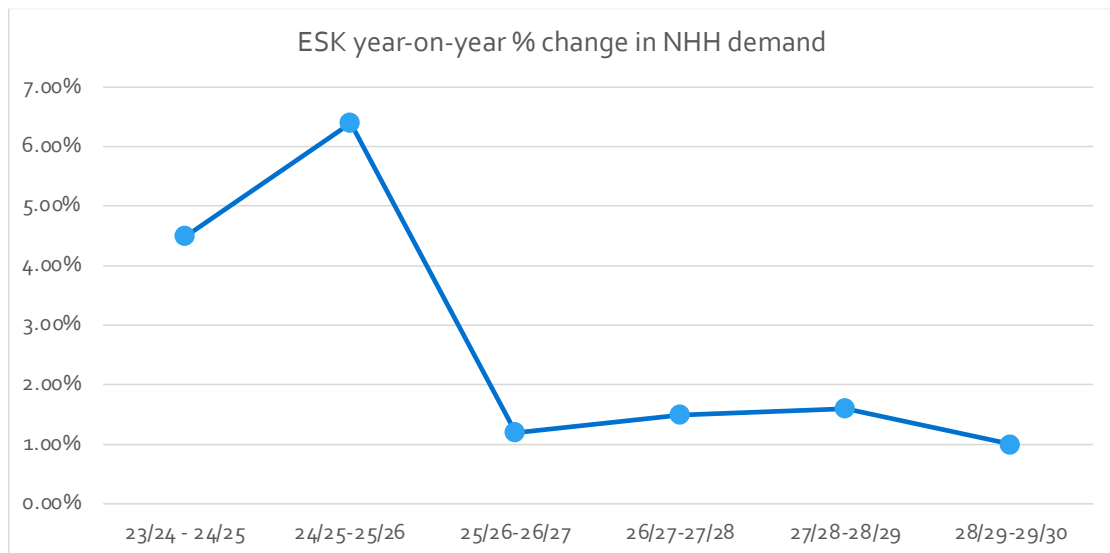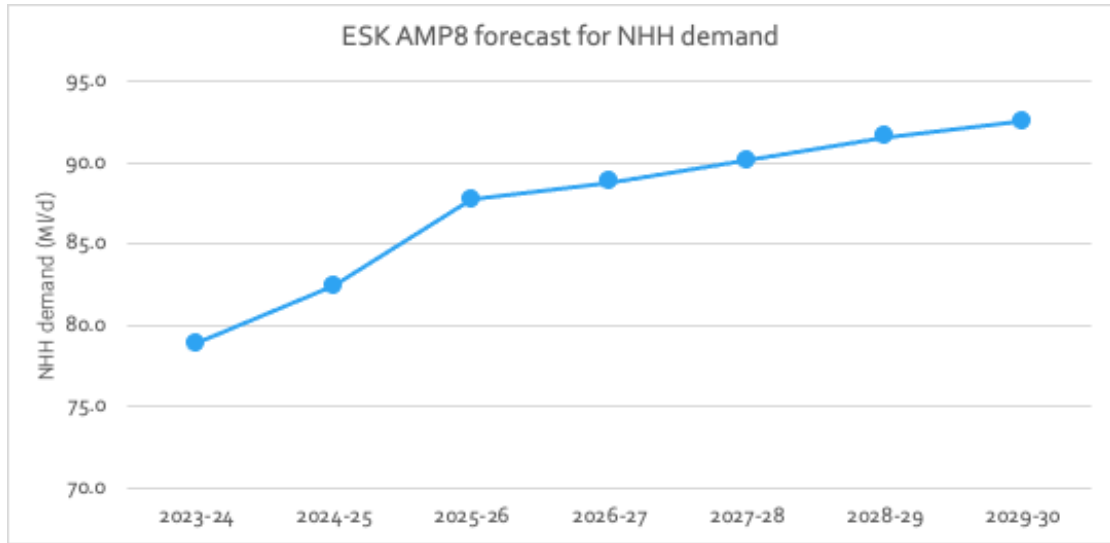
**Figure 8 ESK AMP8 NHH demand**



The historic and future NHH demand used to derive the median year on year trend values are shown in X and Y for NNE and ESK.

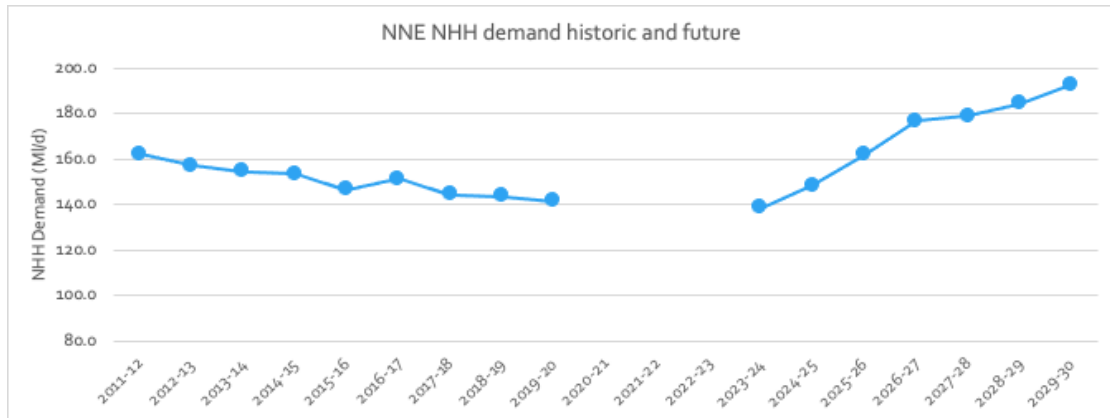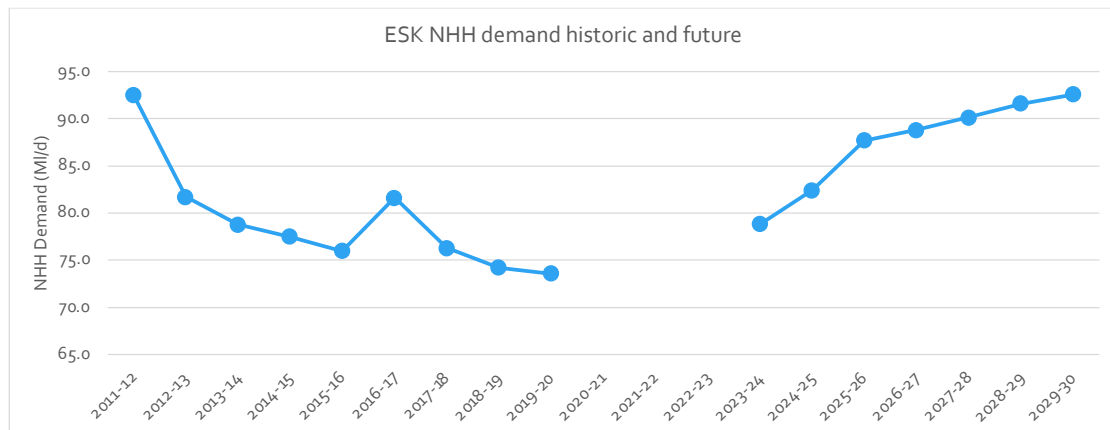**Figure 9 NNE historic NHH demand and predicted NHH demand**



**Figure 10 ESK historic NHH demand and predicted NHH demand**

**Step 4 – Initial test for forecast demand credibility**

Ofwat's initial test for forecast business demand credibility is the expected change in business demand from 2022-23 outturn to 2024-25.

Ofwat compared companies expected increase to their historical growth rate.  This growth rate was used to calculate a 'Maximum expected 2024-25 Business Demand', where if companies demand increased for two years at the historical median rate what level would it reach.

If companies forecast increases are above this level, Ofwat intervene and set their 2024-25 business demand equal to the 'Maximum expected 2024-25 Business Demand'.

Where a company's historic median growth rate is negative Ofwat set the growth rate equal to zero for this assessment. Negative growth will be considered in the 2029-30 analysis.

For NNE:

- 2022-23 outturn:                                132.6 Ml/d
- 2024-25 forecast                               148.5 Ml/d
- Median historic growth rate applied by Ofwat:  0%
- **Ofwat applied 20245-25 NHH demand        132.6 Ml/d**

For ESK:

- 2022-23 outturn:                                72.4 Ml/d
- 2024-25 forecast                               78.3 Ml/d
- Median historic growth rate applied by Ofwat:  0%
- **Ofwat applied 20245-25 NHH demand        72.4 Ml/d**

Comment: Ofwat do not allow future demand to grow above the historic median growth rate and have set the rate to zero as the median historic growth is negative.

**Step 5 – Second test for forecast demand credibility**

Ofwat's second test for forecast business demand credibility is the expected change in baseline business demand from 2022-23 outturn to 2029-30.

Ofwat compare companies forecast median baseline growth to their median historical growth rate. Where the forecast growth is greater than the historical rate, Ofwat intervene and set the growth rate equal to the historical level.

This is used to set the credible baseline business demand for companies as well as the 2029-30 forecast business demand. The baseline value will be used to calculate companies' reductions from enhancement.

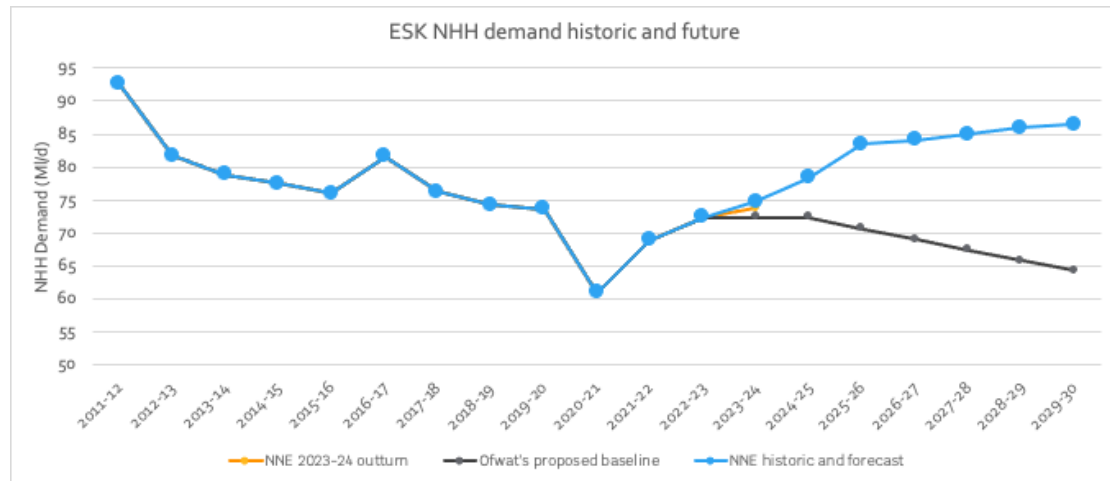Ofwat's 'credible' NHH demand baseline for NNE at 2029-30: **122.3 Ml/d.**

Ofwat's 'credible' NHH demand baseline for ESK at 2029-30: **61.3 Ml/d.**

This is plotted in Figure 11 and Figure 12 for NNE and ESK.

**Figure 11 NNE Historic and future NHH demand with Ofwat's calculated baseline**
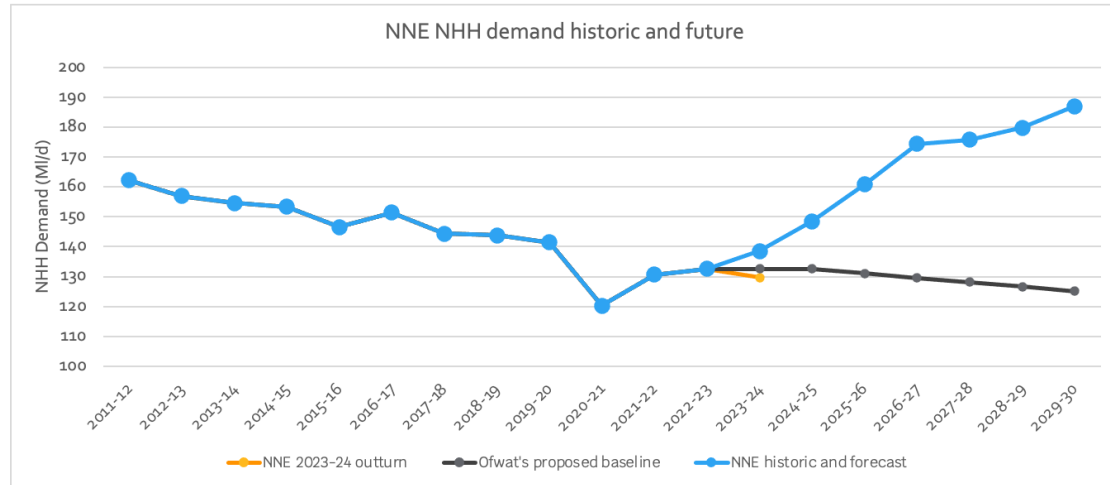


**Figure 12 ESK Historic and future NHH demand with Ofwat's calculated baseline**



**Step 6 – Validated benefits enhancement**

To ensure companies are delivering the benefits of enhancement activities Ofwat deduct the expected benefits of water efficiency activities and metering programmes from companies calculated baseline level. Where companies are delivering reductions less than Ofwat's view of validated enhancement reductions Ofwat intervene to set additional stretch.

Ofwat's estimate of validated enhancements (VE) for NNE: **4.8 Ml/d**

Ofwat's baseline for 2029-30 selected by VE for NNE: **117.5 Ml/d** (122.3 – 4.8).

Ofwat's estimate of validated enhancements (VE) for ESK: **2.3 Ml/d**

Ofwat's baseline for 2029-30 selected by VE for ESK: **59.0 Ml/d** (61.3 – 2.3).

**Step 7 – WRMP alignment**

Ofwat check companies' business plan forecast for 2029-30 against the NYAA business demand for 2029-30. Where the WRMP forecast is lower, Ofwat select the WRMP value.

For both NNE and ESK, there is no further adjustment to the baseline from this test.

**Step 8 – Select the level of stretch**

Ofwat select the lowest 2029-30 value from their various tests, which is the VE level of stretch at 76.8 Ml/d for NNE and ESK.

For NNE

- Ofwat's selected 2029-30:   117.5 Ml/d
- NNE original forecast:    187.1 Ml/d

For ESK

- Ofwat's selected 2029-30:   59.0 Ml/d
- ESK original forecast:    86.4 Ml/d