

KEY METHODOLOGY ASSUMPTIONS: GENERAL

Modelling Assumption	Limitation of this Approach	Recommended Further Work
Six primary substations are modelled as selected by UKPN.	<ul style="list-style-type: none"> The six selected substations may not be representative of EE potential to defer network reinforcement across UKPN's licence areas 	<ul style="list-style-type: none"> Detailed EE evaluation study across a larger sample of UKPN substations
EE potential is modelled on a standalone basis.	<ul style="list-style-type: none"> EE does not typically defer network reinforcement on its own. It is more effective when combined with DER, voltage control, etc. 	<ul style="list-style-type: none"> Broader assessment including interactions/synergies with other NWAs
Capacity threshold for each substation is assumed to be the load forecast in the scheduled year of upgrade	<ul style="list-style-type: none"> A reasonable proxy for the threshold for substation reinforcement Dependent on assumptions implicit within the load forecasts 	<ul style="list-style-type: none"> Consider revisiting load forecast assumptions
The analysis uses historic hourly loads and the load forecast to project future hourly energy saving needs	<ul style="list-style-type: none"> This assumes that future loads will follow the same shapes of historic loads on each substation and does not account for long-term shifts in the overall shape of the substation load 	<ul style="list-style-type: none"> This is a standard assumption for all load forecasting and doesn't necessarily require rework unless the team has reason to believe that the load shape will shift in the future

KEY METHODOLOGY ASSUMPTIONS: LOAD PROFILE ANALYSIS

Modelling Assumption	Limitation of this Approach	Recommended Further Work
<p>EE savings potential is only modelled for residential and small I&C customer segments. The database of EE measures in our model is assumed not to be applicable to large I&C customers (i.e. Profile Class 0), which typically require bespoke, custom measures.</p>	<ul style="list-style-type: none"> EE savings potential from the large I&C segment may be sizeable. It may also be accessible through a relatively small number of customers with block loads. 	<ul style="list-style-type: none"> Detailed study of the large I&C segment to assess EE savings potential Engagement with large I&C customers to identify their specific electricity end uses and understand the custom measures required
<p>Substation load is disaggregated into different customer segments using average annual load per Elexon profile class.</p>	<ul style="list-style-type: none"> Elexon's average customer profiles may not be representative of customers in UKPN's licence areas. 	<ul style="list-style-type: none"> Further research into UKPN's customer segmentation

KEY METHODOLOGY ASSUMPTIONS: EE MEASURES

Modelling Assumption	Limitation of this Approach	Recommended Further Work
<p>Database of EE measures is selected based on climate-matching between London and Washington state, US. This is a pragmatic simplification as it does not require extensive UK customer or building stock data and it does not require a mature energy efficiency evaluation ecosystem for measure characterisation in the UK.</p>	<ul style="list-style-type: none"> • Some EE measures may not be directly applicable to the UK context • Less certainty on the implementation details, such as adoption rates and deployment costs of measures in the UK 	<ul style="list-style-type: none"> • Detailed assessment of EE measures and customer behaviour in the UK • Detailed assessment of differences between UK regions • Seek partnerships with EE programme implementers currently operating in the UK to leverage their data and experience
<p>Savings potential of each EE measure is scaled according to the customer base at each UKPN substation. Scaling is adjusted for the customer classes (e.g. residential, commercial) specific to each substation.</p>	<ul style="list-style-type: none"> • Some EE measures may not be directly applicable to UKPN's service area • Less certainty on the implementation details, such as adoption rates and deployment costs of measures in UKPN's service area 	<ul style="list-style-type: none"> • Detailed assessment of EE measures and customer behaviour in UKPN's service area
<p>Lighting measures are excluded from the modelling because UKPN's load forecasts already assume a high degree of lighting efficiency.</p>	<ul style="list-style-type: none"> • Lighting measures represent valuable savings as they are typically low-cost, high impact, and relatively quick to implement. • Given the urgent deferral timeframes of the 6 substations we examined, there is limited opportunity to defer network reinforcement without lighting savings. 	<ul style="list-style-type: none"> • Detailed assessment of EE measures in UKPN's service area to confirm the prevalence of efficient lighting • Consider re-assessing the load forecast assumptions based on lighting baseline study