

# **NIA ENWL021**

## **Value of Lost Load (VoLL)2**

### **Progress report**

**31 July 2019**



## VERSION HISTORY

Version	Date	Author	Status	Comments
V0.1	31 May 2019	Tracey Kennelly Project Manager	Final	

## REVIEW

Name	Role	Date
Lucy Eyquem	Innovation PMO Manager	12.06.19
Paul Turner	Innovation Manager	26.07.19

## APPROVAL

Name	Role	Signature & date
Steve Cox	Engineering & Technical Director	29.07.19

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## GLOSSARY

Term	Description
DNO	Distribution network operator
ENWL	Electricity North West Limited
LCT	Low carbon technology
MWh	Megawatt-hour
Ofgem	Office of Gas and Electricity Markets
PSI	Planned supply interruption
RIIO-ED2	Electricity distribution price control 2023 to 2028
SME	Small to medium enterprise
VoLL	Value of Lost Load
WSC	Worst-served customers
WTA	Willingness to accept
WTP	Willingness to pay

# 1 PROJECT FUNDAMENTALS

Title	Value of Lost Load (VoLL) 2
Project reference	ENWL021
Funding licensee(s)	Electricity North West Limited
Project start date	November 2018
Project duration	18 months
Nominated project contact(s)	InnovationTeam@enwl.co.uk

## 2 PROJECT SCOPE

Qualitative and Quantitative research with a broad spectrum of DNO customers:

- Domestic (general, rural, urban, worst served customers, vulnerable customers, fuel poor, adopters of LCT, experienced a lengthy interruption).
- SME customers from a range of market sectors (including but not limited to those heavily reliant on electricity / early LCT adapters).

## 3 OBJECTIVES

### Phase A – strategy:

- Optimise the VoLL decision making tool by providing guidance on the appropriate combination of VoLL drivers and the requisite level of sophistication and aggregation.
- Identify, evaluate and incorporate appropriate forecasting features to future proof the model / demonstrate stability/variability over time.
- Deliver an understanding of the relative value of investment to prevent an event versus that of managing the consequence of the event.
- Undertake analytics to identify the appropriate network scale to which the differentiated VoLL value should be applied.
- Develop sample investment plans to understand options for implementation and potential impact on affordability and quality of outcomes for different customer segments.
- Engagement with key industry stakeholders to identify implications, formalise an appropriate VoLL decision making tool and establish a strategy for transition to national implementation, identifying regulatory mechanisms currently or potentially driven by a VoLL function.

### Phase B – customer:

- Determine the increased sense of equity and DNO service provision that can be achieved through implementation of a differentiated VoLL model.
- Quantify the impact of scale and duration of an outage on VoLL.
- Deliver an understanding of the societal value of investment to prevent an event versus that of managing the consequence of the event.
- Measure societal acceptance of a differentiated VoLL model, segmented by customer need.

- Substantiate which segments are perceived by society to have the greatest need.
- Quantify the likely effects of a differentiated VoLL investment model on society, now and in the future.

## 4 SUCCESS CRITERIA

The project's success criteria are:

### Phase A – strategy:

- Identification of key vectors influencing VoLL and the degree of sophistication requisite in a credible decision making tool using a differentiated model.
- A preferred network scale of implementation following assessment of potential outcomes and data requirements.
- Sample investment plans to understand options for implementation and how that could impact affordability and quality of outcomes for different groups of customers.
- An understanding of the relative value of preventing an event versus managing the consequence of the event.
- Consult key industry stakeholders to establish acceptability, regulatory and wider impacts.
- Establish required adjustments derived from learning in this project, that key stakeholders support, which can be implemented as a next step into our core processes.
- Establish implications for RIIO-ED2 and a strategy for national implementation.

### Phase B – customer:

- Evaluation of potential social impacts of implementation of a future differentiated VoLL model by key customer and stakeholder groups.
- Deliver an understanding of the societal value of investment to prevent an event vs that of managing the consequence of the event.
- A practical demonstration of how the VoLL model can help DNOs to more effectively plan investment levied in areas where the consequence of asset failure are much higher, in a manner which delivers greatest value to the DNO, and benefits those most impacted but which is fair to all.

## 5 PERFORMANCE COMPARED TO THE ORIGINAL PROJECT AIMS, OBJECTIVES AND SUCCESS CRITERIA

The project is on plan to meet its aims, objectives and criteria.

### 5.1 Phase A – strategy:

Having quantified the variables that influence VoLL, work has now commenced on the key focus of the strategic phase of the project, which is to establish how this translates practically into current regulatory mechanisms. We are currently securing the analytical support through a tendered procurement process.

Our VoLL research to date, and planned next steps were presented to the Ofgem Reliability, Safety & Environment working group on 23 May 2019. This was received positively and Ofgem are keen to see regular updates brought back to the working group as the project progresses.

### 5.2 Phase B – customer:

## **Stage One - Desk research and stakeholder engagement**

A comprehensive literature review has been completed and a methodology statement developed. Both of these documents have been published on the [VoLL2 webpage](#).

The methodology outlines the proposed customer engagement plan and summarises how Electricity North West and its project partners will interact with, or impact upon, relevant customers where any form of engagement is undertaken as part of the project.

The proposed methodology will be subject to a peer review by Professor Iain Fraser, School of Economics, University of Kent and will be revised, as necessary on the basis of this feedback.

A Data Protection Impact Assessment has been developed for VoLL2 and will be published on the project webpage before any form of customer engagement takes place.

Depth interviews with key stakeholders have commenced - this phase of engagement is intended to challenge the research approach and highlight any wider implications or considerations which have not been included in the methodology. When this phase of the study is complete, feedback will be documented as an addendum to the method and the revised methodology, incorporating the critique, will be published on the project webpage.

## **6 REQUIRED MODIFICATIONS TO THE PLANNED APPROACH DURING THE COURSE OF THE PROJECT**

### **6.1 Supplementary surveys**

Academic peer review of the original VoLL study (ENWL010) identified a need for supplementary surveys to strengthen the results of the 'worst served customer' (WSC) and small to medium enterprise (SME) sample. The reasons for this are fully explained in the additional sample report, published on the [VoLL2 webpage](#) on 8 February 2019 and the closedown report for the main study which is available on the [VoLL webpage](#). The rationale and key findings are as follows:

For parity with previous studies, the main VoLL survey was designed to test both customers' willingness-to-accept (WTA) a payment for an outage and their WTP willingness-to-pay (WTP) to avoid an outage. Recommendations arising from an academic peer review of the original analytical model resulted in a project extension to demonstrate compatibility and continuity with the previous London Economics study conducted for Ofgem in 2013. This required further advanced analytics to validate the granular outputs and evaluate the range of certainty around these values.

This resulted in separation of the WTP/WTA analysis into two separate exercises (WTP only and WTA only), which effectively halved the number of observations on which the final modelling was based. This affected the stability of results for sub-groups with small sample sizes. To strengthen results in these areas further research was recommended and this involved an additional 500 customer surveys in under-represented groups. The main findings are summarised below:

- Domestic worst served customers

It was not possible in the main study to provide a definitive explanation for the directionally lower VoLL expressed by WSCs, because of the relatively small WTA sample size and the mix of 'objective' and 'self identified' definitions. The main VoLL study suggested that customers served by poorly performing networks have a lower reference state than those used to a higher level of service. Further research was

conducted to increase the sample size of 'objectively-defined' customers, ie those served by networks meeting the Ofgem classification of 'worst served'.

Analysis of the larger sample, which included 100 extra surveys, identified that the VoLL for objectively-defined WSCs (£13,736) is largely the same as VoLL for the average domestic customer served by Electricity North West's network (£14,080), as estimated in the main study. This figure is lower than the value of £17,481 MWh for all domestic customers, GB-wide.

- **Small to medium enterprises**

Given the diversity of the SME sample in relation to size, economic activity and consumption profile, additional WTA surveys were conducted to deliver more nuanced sub-group insights of VoLL assignments across a range of industry sectors.

Analysis of the overall SME VoLL, based on a larger WTA sample (1,003 versus 615), did not significantly change the average SME estimate of £47,560 MWh, as measured in the main study. However, the directional finding suggests that this value could be slightly higher than originally reported (with an average of £50,584 MWh based on the larger SME sample).

This additional research revealed some small differences in estimates of WTA reported in the new samples compared to the main study; however, a subsequent peer review concluded that there was not sufficient statistical evidence to claim any meaningful difference for either the WSC or SME samples. The details to emerge from the additional survey are documented in the VoLL additional sample report.

## **7 LESSONS LEARNT FOR FUTURE PROJECTS**

The project is in its early stages and at this point there are no lessons to share.

## **8 THE OUTCOME OF THE PROJECT**

Not applicable.

## **9 DATA ACCESS**

Electricity North West's [innovation data sharing policy](#) can be found on our website.

A Data Protection Impact Assessment has been developed for VoLL2 and will be made publically available, on the project webpage, before any form of customer engagement takes place.

## **10 FOREGROUND IPR**

There is no foreground IPR associated with this project.

## **11 PLANNED IMPLEMENTATION**

Not applicable.



# 12 OTHER COMMENTS

Not applicable.