LCNF Report_ENW – ETA ISP_v06

Electricity North West - Creating Efficient Distribution Networks (eta)

Project No. 379526

Submitted to:
Ofgem

Submitted by:
British Power International
7 Phoenix Square
Wyncolls Road
Colchester
Essex
CO4 9AS
United Kingdom

DATE: 25 October 2013

Document Status

Title:	LCNF Report_ENW – ETA ISP_v06
Project Name:	Electricity North West - Creating Efficient Distribution Networks (eta)
Issue:	Final 06
Date:	25 October 2013
Electronic Doc Ref:	http://sharepoint/Networks/ElecDistrib/Elec_Distrib_Lib/LCN Fund/Technical_consultants/yr4_2013/addendum reports/LCNF Report_ENW - ETA ISP_v06.docx

Authorisation

Name	Position	Signed	Date
P Glendinning	Managing Director		
J Cunningham	Project Manager		

History

Issue	Date	Originator	Checker	Description
03	20 September 2013	J Cunningham	G Chapman	Draft
04	11 October 2013	J Cunningham	R Lane	Draft 2nd Bilateral
05	22 October 2013	J Cunningham	R Lane	Resubmission Draft
06	25 October 2013	J Cunningham	R Lane	Final

Table of Contents

Explanatory Note

This report, including the "traffic light" indicators that reflect the salient points and material issues of concern identified during the evaluation process, (other than Section 9) is based on:-

- the original full submissions received from the DNOs in August 2013;
- subsequent question responses through the formal written question process;
- discussions held at the initial bilateral meetings between the DNO and the Expert Panel on 28 August 2013;
- discussions held at the Consultant-DNO meeting on 5 September 2013;
- discussions held at the second bilateral meeting between DNO and the Expert Panel on 27 September 2013; and
- subsequent clarifications by the DNO.

In October 2013 the DNOs were given an opportunity to submit revised proposals. The traffic light indicators and the metrics shown in Sections 1 to 8 do not reflect any changes made by the DNOs in these revised submissions.

Section 9 of this report contain an addendum, which summarises the main changes made between the original and revised submissions, and the impact this has on the evaluation of the project against the criteria. Any significant changes to figures/metrics noted in this addendum.

Project Summary

Full name:	eta: creating efficient distribution networks
DNO Group:	Electricity North West Limited
The Problem(s):	Managing HV and LV networks efficiently in the future with high levels of embedded generation from PV panels and wind coupled with increased demand from heat pumps and electric vehicles. These increased levels generation and demand will create thermal, harmonic and voltage issues
The Method(s):	Control of network voltage. Co-ordinated voltage control, using on-load tap changing transformers and capacitors, across EHV, HV and LV networks. Interconnection traditionally radial HV and LV circuits and assuming control of these networks within the Control Room. Real-time co-ordinated configuration and voltage optimisation of HV and LV networks.
The Trial(s):	The use of co-ordinated capacitors and on-load tap changers on HV and LV networks to optimise the voltage profile. A subset trial of either on-load tap changers on distribution transformers or capacitors on the substation LV bars or combinations of both. Trials will include; dense urban, urban and rural networks, involving 5 Primary s/stns, 10 HV circuits, 40 Secondary s/stns serving 45,000 customers. Trial locations: Manchester, Wigan and Wigton. Particularly identifying social landlords. Monitoring network performace data; monthly consumption at supply point substations; weather data and economic data.
The Solution(s):	Replace 'J' type fuses with controllable and configurable retrofit vacuum switching devices allowing for remote control and dynamic reconfiguration. Capacitors will be based on voltage set-points rather than power factor control. Combination of tap changer control at 33kV and some newly fitted 11kV transformers coupled with remotely controlled network capacitors. Conservation of Voltage Reduction (CVR).
Key strengths and weaknesses against the criteria	

Strengths:	This project has a very strong learning opportunity for all DNOs. The application of the equipment to the DNO low voltage system will provide substantial benefits for voltage control and capacity sharing. It should also provide for fewer customer interruptions and speed the process of fault detection and isolation.
Weaknesses:	Increased street furniture to house capacitors, leading to vulnerability to vandalism and accidental vehicle damage. The project appears to be heavily dependent on one supplier (Kelvatek) and to a lesser extent Siemens. The project is likely to be a major opportunity for Kelvatek and there may be a risk of over commitment. Balancing the potential commercial opportunities this project provides Kelvatek, their size and the likelihood of alternative devices in the marketplace, Kelvatek's contribution towards the project may be considered appropriate.

1. Summary of Assessment against Evaluation Criteria

Criteria	Overall Assessment	
(a) Low Carbon and Benefits		The eta method provides clear benefit compared with traditional reinforcement where there is a clustered take up of LCTs, and a high penetration of EVs, PVs, and HPs. In growth scenarios due to generation from PV, eta modelling shows clear benefits. In the scenario of rapid demand growth due to HP and EV, the savings are not so clear above a penetration rate of 60%. If HP and EV growth is significant, then the eta method needs to be approached more cautiously. However, a benefit of eta is the high initial carbon saving and the flexibility to apply multiple phases of investment to optimise the longer term benefits as uncertainty over LCT take up is reduced. Clearly there are a number of assumptions and extrapolations made in the initial calculations, and it may be that the solution is not suitable for application to the proportion of network claimed. Nevertheless, the project has the potential to unlock significant network capacity and is proposed to be developed in a way that affords portability across other GB DNOs.
(b) Value for Money		Benefits are targeted towards network customers and the distribution network principally by: • DUOS savings due to deferred or avoiding expensive traditional network reinforcement. • Reduced cost and reduced timescales for the connection of LCT and renewable generation. • Energy efficiency resulting in reduced consumption from CVR and hence electricity consumption. • In addition, the application of CVR will enable customers to maximise the export of PV generation. Learning benefits are well targeted towards the distribution network and its customers as well as wider GB DNO benefits to replicate the eta method outside the ENW region. The proposal describes how through the procurement process for equipment and services ENWL has driven value for money. Contractual incentives for programme and cost betterment appear to have been investigated [Section 3, P.18]. Major project cost items appear reasonable although they lack some detailed justification. The contingency budget of £1 million (8.7%) will need to be carefully monitored.
(c) Generates New		Key knowledge for sharing includes the following:-

Knowledge		•Installation Methodologies learning (Retrofitting) •Transforming LV radial networks (Interconnecting) •Real time Control & automation of LV network •Network Configuration & Voltage Optimisation •Customer Engagement: Learning The outputs appear to be of learning benefit to the industry from an operational and safety considerations as well as a project implementation perspective. The learning appears to be well suited to practical implementation by other DNOs as the output will develop the safe systems of work and associated policies and codes required to deploy the technology safely. Dissemination methods including Web based, conferences and workshops, academic papers, learning installations, press releases, as well as project reports etc. These appear to be standard and reasonable approaches. Quality assurance checks are also planned to ensure the dissemination methods are effective and can be revised to meet the stakeholder needs, which shows application of good practice.
(d) Partners and Funding		External funding amounts to £1.8m, or 15% of the total project cost. The collaborators including; Kelvatek (technology supplier), TNEI (software specialist), Seimens, Impact Research (Marketing and Customer Engagement Organisation), the University of Manchester, and the Queen's University Belfast, have all been considered for expertise and deliverables as well as prior experience. It is noted that Kelvatek is a SME and appears to have a relatively high commercial stake in this project, as that it is the owner and developer of key technology products essential to the success of the project, and that success of the project may open up the GB DNO market to Kelvatek. The approach to selection of delivery partners is reasonable. The submission builds on learning from previous funded projects, including C_2C and CLASS. Furthermore an international review of concepts of interconnecting LV networks has been undertaken by ENW to benchmark and fact find practices used elsewhere. (Ref, p33) It is evident that the ENW has made an effort to ensure the eta project does not replicate work and studies undertaken elsewhere.
(e) Relevance and		The project is highly relevant and aims to quickly address significant obstacles to releasing network capacity and voltage

Timing		headroom to facilitate the connection of Low Carbon Technologies, and at the same time operate a cost efficient, carbon and energy efficient distribution network. The key eta projects themes are:- • LV Network Management • Interconnection • HV & LV Voltage Control • Network Configuration • Voltage Optimisation These themes are universal DNO issues and provide additional capacity to facilitate connection of embedded renewable generation and LC loads without the need for reinforcement, and with voltage stabilisation and energy savings for customers. The technology used in the integrated approach mentioned above, together with remote controlled automation, has the potential for wide- spread application across UK DNO. The timing of this proposed project fits with incremental preliminary work under IFI and First Tier LCN Fund to produce the technologies that require field trialling in order establish wider GB deployment into business as usual.
(f) Methodology		The transition to a low carbon economy is likely to result in a significant increase in electricity demand from Low Carbon Technology (LCT) such as heat pumps and electric vehicles in the future, coupled with increased embedded generation from sources such as photovoltaic panels. Experience and forecasts suggest that these increases in loads and embedded generation are likely to be clustered, which will create problems on distribution networks. Both increased load and embedded generation require additional capacity, which has traditionally been addressed by network reinforcement, resulting in higher DUOS charges to customers. The eta project aims to help address this by optimising the use of the existing HV & LV networks by interconnecting networks using real time technology, with improved voltage regulation and lower energy consumption for customers through Conservation Voltage Reduction (CVR).
(g) SDRC		All 27 criteria comply with principle 4 in that they are SMART and also appear to meet the other three principles in that they are linked to generation of new knowledge and deliverable milestones. A detailed breakdown of each SDRC work stream evidence and

		criteria is covered on page 44 of the proposal.

Key to Traffic Light Colour Codes

The "traffic light" system used in the table above gives an indication of BPI's assessment of the information provided by the DNO in support of the project in its detail, alignment with the LCNF evaluation criteria, identification and management of project risk and other aspects for each of the criteria. This is not intended to suggest whether projects should be funded or not, but to point out those areas which BPI believes merit particular scrutiny or consideration. Thus:-

	• Seems to be generally in line with the objectives and requirements of the LCNF evaluation criteria; • Whilst there are some areas where additional information would be useful, that provided is generally comprehensive and provides no immediate cause for concern.
	• Some indication that the project is in line with the objectives and requirements of the LCNF evaluation criteria. However, further scrutiny is required to ensure to ensure this; • There are some gaps in the information provided; • Further assurance is needed to confirm that the project is viable and that risks are appropriately managed.
	• Significantly more assurance is required that the project is in line with the objectives and requirements of the LCNF evaluation criteria; • There are some major gaps in the information provided; • Considerable scrutiny is needed to confirm that the project is viable and that risks are appropriately managed; • Potential major risks to the viability of the project.

In the following evaluations against the criteria, if the project is addressing various problems and/or trialling several methods and solutions, separate analysis of metrics and sub-criteria will be provided, if appropriate, for relevant criteria.

2. Criterion (a) Low Carbon and Benefits

Criterion:	Accelerates the development of the low carbon energy sector and has the potential to deliver net financial benefits to existing and/or future customers.
Overall assessment:	The transition to a low carbon economy is likely to result in a significant increase in electricity demand from Low Carbon Technology (LCT) such as heat pumps and electric vehicles in the future, coupled with increased embedded generation from sources such as photovoltaic panels. Experience and forecasts suggest that these increases in loads and embedded generation are likely to be clustered, which will create problems on distribution networks. Both increased load and embedded generation require additional capacity, which has traditionally been addressed by network reinforcement, resulting in higher DUOS charges to customers. The eta project aims to help address this by optimising the use of the existing HV & LV networks by interconnecting networks using real time technology, with improved voltage regulation and lower energy consumption for customers through Conservation Voltage Reduction (CVR) , and benefits that are readily transferable to other GB DNOs. **Carbon Benefits Claimed:** ENW claims that this methodology will facilitate the connection for clusters of Low Carbon Technologies by releasing capacity up to four times faster and at 40% lower cost than traditional reinforcement, thus supporting achievement of DECC's carbon plan. ENW claims that the proposed methodology would be transferrable to 64% of the ENW network, and potentially transferrable to 72% of distribution networks across Great Britain. ENW claim that this would result in the release of 2985MW capacity within the ENW network area, or a potential release of up to 39630MW distribution capacity across Great Britain. This would avoid or defer the need for traditional network reinforcement. By optimising network utilisation and avoiding reinforcement, ENW claims that eta will result in significantly lower carbon emissions than traditional reinforcement, it will facilitate the connection of renewable generation and LCT, and will deliver reductions in network losses of 2%. The improved stabilised voltage regulation to customers resulting from CVR is claimed to provide an Energy Efficiency benefit on electrical appliances to customers of up to 3.5% per annum, which would also result in low carbon emissions. In addition, the application of CVR will enable customers to maximise the export of PV generation. Preliminary modelling carried out by the Tyndall Centre at University of Manchester suggests that eta may be up to 93.3% less carbon intensive

than traditional reinforcement activities for clustered generation, and up to 86.6% less carbon intensive than traditional demand reinforcement activity.

In terms of longer term operational carbon savings, the savings for generation clusters compared to traditional reinforcement appear to be positive throughout the period up to 2040. However, the overall carbon savings for demand clusters are less certain, and it would appear that over time the initial carbon savings from eta are outweighed by emission reductions in losses from conventional reinforcement.

ETA's claim that net carbon benefits could be as high as 2 million tCO2e for ENW and 26 million tCO2e for GB therefore require further investigation.

As this project has yet to run its trials and publish findings, the claims cannot be fully substantiated; however the project technologies appear to be transferable and can be retrofitted to other networks.

Potential for replication:

The key components that should technically be transferable to other networks are:-

- Voltage control – on load tap changing transformers & capacitors across EHV, HV & LV.
- Interconnecting of radial HV & LV Network
- Real time co-ordinated configuration

Conclusion:

The eta method provides clear benefit compared with traditional reinforcement where there is a clustered take up of LCTs, and a high penetration of EVs, PVs, and HPs.

In growth scenarios due to generation from PV, eta modelling shows clear benefits. In the scenario of rapid demand growth due to HP and EV, the savings are not so clear. If HP and EV growth is significant, then the eta method needs to be approached more cautiously.

However, a benefit of eta is the high initial carbon saving and the flexibility to apply multiple phases of investment to optimise the longer term benefits as uncertainty over LCT take up is reduced.

Clearly there are a number of assumptions and extrapolations made in the initial calculations, and it may be that the solution is not suitable for application to the proportion of network claimed.

However, the project has the potential to unlock significant network capacity and is proposed to be developed in a way that affords portability across other GB DNOs.

Metrics (as quoted by the project):

	Method 1 (Case	Comment

	study)	
Net financial benefit (£)[1]:	£732,688	(Eta method benefit over traditional network reinforcement) From eta full submission spread sheet (tab net benefits)
Network capacity release (kW)[2]:	9,160kW	
Base case time to release capacity (months)[3]:	44	
Method time to release capacity (months)[4]:	11.33	
Potential for replication[5]:	Yes	Estimated at 72% of GB

Sub-criteria	**Assessment**
Carbon claims (including quantitative, if provided)	By avoiding reinforcement, ENW claims that eta will result in significantly lower carbon emissions, facilitate the connection of renewable generation and LCT, and deliver reductions in network losses of 2%. The improved stabilised voltage regulation to customers from CVR is claimed to provide an Energy Efficiency benefit on electrical appliances to customers of up to 3.5% per annum, which would also result in lower carbon emissions. In addition, the application of CVR will enable customers to maximise the export of PV generation. The analysis work in appendix H (page 78) suggests potential savings of between 240,000 to 600,000 tCO2e for ENW and 3 to 8 million tCO2e for GB. However there are some uncertainties over the longer term benefits (25 year) where the scenarios for carbon savings are reduced and the benefits vary depending on LCT uptake scenarios. A field trial

[1] The financial benefit of each method (at the trial scale) compared to the most efficient existing method; **Net financial benefit = Base case costs** (the lowest cost of delivering the Solution (on the scale outlined as part of the project) which has been proven on the GB Distribution Systems) – **Method cost** (the cost of replicating the method at the trial scale once it has been proven successful)
[2] The network capacity released by each method (the additional headroom released on the distribution system following implementation of the Method)
[3] The time it would take in months to deliver the capacity shown in "Network capacity released" using the Base Case
[4] The time it would take in months to deliver the capacity shown in "Network capacity released" using the replicated Method
[5] The estimated number of sites or % of the GB Distribution System where the method could be rolled out, up to 2040

Sub-criteria	Assessment
	and further research appears to be the next logical progression.
Quantitative analysis	The Tyndall Centre for Climate Change Research at University of Manchester has carried out preliminary assessment of the carbon impact of the eta method under two scenarios; generation and demand clustering for Asset carbon impact and Operational carbon impact between eta and traditional methods (Ref: page 16):- Under asset carbon savings it indicates eta is up to 15 times less carbon intensive than traditional reinforcement to release the same network capacity. Under demand cluster scenario the conventional reinforcements provides greater emissions reduction (in losses) than the eta Method which over time outweighs the savings on the assets. However break even under both parameters is between 2025 and 2027. The analysis goes further to identify operational benefits specifically the LV control functionality which would be significant if transferred to GB DNOs, for quality of supply and capacity utilisation. There are also non quantified benefits in development of electrical industry knowledge of Conservation Voltage Regulation (CRV) and benefits which may inform future regulatory incentives. The analysis looks to present both benefits and drawbacks or uncertainties that warrant closer examination as part of the project.
Robustness of financial benefits	(Ref Appendix G1, Business Case Analysis) Net present value (NPV) CAPEX and OPEX benefits of eta over the 2015 to 2040 period have been compared with traditional reinforcement under different growth rates for generation (PV take up) and demand (HP and EV) led reinforcement. The LCT take up over the periods of 1, 10 and 25 years has been NPV modelled. During rapid growth of EV and HP alone, the benefit of traditional reinforcement is better than the eta method due to the reduction in losses being more significant from installation of a new secondary substation, instead of incremental reinforcements. This particular area requires further clarification and analysis.
Capacity released (and how quickly)	The project claims a potential capacity being released of 2985MW (ENW) and 39630MW (GB DNO). The project has a two year field trial period in which the technology is applied to the existing network and tested in ordered to quantify the carbon losses and energy savings. • Metrics in the project spread sheet provided show 9,160kW released in 11.33 months.
Replication	The project is claimed to be 64% transferrable to ENW and 72% to GB

Sub-criteria	Assessment
(applicability of technology, dependence on specific network characteristics)	DNO. The key components that should technically be transferable to other networks are:- • Voltage control – on load tap changing transformers & capacitors across EHV, HV & LV; • Interconnecting of radial HV & LV network; • Real time co-ordinated configuration; The Network Management System (NMS) will interface with the Optimisation software using standard control communications protocol as part of this project. The LV network configuration control is established by the use of WEEZAP (retrofit vacuum switching) and LYNX (LV fuse way) devices, which should not be network specific, although may not be suitable for retro-fitting in all instances. The geographic network areas targeted include City, Town and Country locations in order to understand application to representative GB DNO customers. In summary, the project technologies appear to be readily transferable and contain an element of ability to retrofit to other networks. There may be some software specific development required for other DNOs which should be established. Care needs to be taken that the software solution provider does not gain an unfair competitive advantage through this process. Operational technical standards, and safe systems of work should be assimilated into local DNO health safety & sustainability practices without major impact.

3. Criterion (b) Value for Money

Criterion:	Provides value for money to distribution customers
Overall assessment:	In summary the following observations are made on VFM to distribution customers. Benefits are targeted towards network customers and the distribution network principally by: • DUOS savings due to deferred or avoiding expensive traditional network reinforcement compared with the eta method. • Reduced cost and reduced timescales for the connection of LCT and renewable generation. • Energy efficiency resulting in reduced consumption from CVR and hence electricity consumption charges through billing. • In addition, the application of CVR will enable customers to maximise the export of PV generation. Learning benefits are well targeted towards the distribution network and its customers as well as wider GB DNO benefits to replicate the eta method outside the ENW region. The proposal appears less robust on demonstration of value for money and that the procurement process maximises early supply chain engagement and collaborative initiatives. Contractual incentives for programme and cost betterment do not appear to have been investigated. Major project cost items appear reasonable although they lack some detailed justification. The contingency budget of £1 million (8.7%) will need to be carefully monitored.
Metrics (where available):	
Size of benefits to distribution system[6]	The solution is claimed to be 64% transferable to ENW's networks. A DNO benefit of £22,860 [Ref: Spread sheet, Direct Benefits tab.] [Not removed as per DNO request in clarifications, as this is the Ofgem template format.]

Sub-criteria	**Assessment**

[6] Size of benefits attributable or applicable to the Distribution System verses elsewhere

Sub-criteria	Assessment
Proportion of benefits attributable to distribution system (as opposed to elsewhere in the supply chain)	The project identifies ENW's stakeholder priorities as Reliability, Sustainability and Affordability, and claims all the benefits accrue wholly to distribution customers. Modelling of potential benefits is based on TNEI analysis on the Dunton Green substation customers and scaling up to estimate benefits for GB. The key customer benefits are: • Conservation Voltage Reduction techniques: saving customers money on their electricity bills through increased efficiency of customers' appliances, and the application of CVR to enable customers to maximise the export of PV generation. • DUOS savings: through deferred or avoided traditional network reinforcement investment. If eta is rolled out to GB DNO an estimated saving of £8.6 billion is quoted as possible (Reference, page 22). Throughout the eta project and potential wider implementation a commercial benefit will be achieved to the successful supplier of the WEEZAP and LYNX technologies and enabling software solution provider.
How learning relates to the distribution system	The key learning outcomes principally focus on the distribution system (Ref page 6) and can be summarised as follows: 1. Installation Methodologies learning (Retrofitting) 2. Network Management System Configuration 3. Transforming LV radial networks (Interconnecting) 4. Change proposals for design & operational standards 5. Safe working practices (network related) 6. HV & LV control 7. Network configuration & voltage optimisation 8. Customer engagement and feedback (essential to verify that customers do not experience any adverse impacts from the scheme before rolling out across the network) While the benefits are wider, the learning appears to be well focused to the distribution system.
Approach to ensuring best value for money in delivering projects	The project documentation states that both Open and Competitive procurement processes will continue to be used throughout the life of the project, and that EOI (expression of interest) was published on the ENA low carbon networks fund portal to offer suppliers opportunity to collaborate on the project. The project does confirm that a competitive process was used in the appointment of project partners and there is some evidence that prior experience was taken into consideration. The project appears to be heavily dependent on one supplier (Kelvatek) and to a lesser extent Siemens. The project would need to source other

Sub-criteria	Assessment
	products if Kelvatek's products were unavailable. There is some detail on the procurement methodology employed and planned for the next phase of the project. [Section 4d, P.25]. Although it appears competitive dialogue and negotiated bid was used, it is not explicit on how collaboration was achieved to gain the best value for money, or how this has been, or will be, factored into bid presentation and tender evaluation process and ethical / sustainable procurement considerations, or incentives for cost effective / efficient delivery.
Identify and review major cost items, examine justification for relevant costs, assess choice of discount rates	The project budget is made up of the following key elements: • £1m - Contingency (8.7%) • £1.2m – Project Management • £0.2m – Learning & Dissemination • £1.0m – Research • £0.5m – Customer Survey • £0.4m – Trials • £7.6m – Technology The proposal provides some justification for costs estimates. [Appendix A & B and Section 6.] Considering the pioneering nature of the project, the risk of interface management between programme partners and delays should not be underestimated. The contingency of below 10% suggests that the risks are well mitigated, although the mobilisation phase 1 risk log appears to be less convincing *"Review project plan and consider options to achieve milestones should the risk crystallise"*. The appendix C organogram does not identify interface management as a specific role in which case the contingency funding or plans may need re-examination. The major cost item for this project is the procurement and installation of the Kelvatek equipment and capacitors.

4. Criterion (c) Generates New Knowledge

Criterion:	Generates knowledge that can be shared amongst all DNOs
Overall assessment:	Key knowledge for sharing is summarised in the following categories:- •Installation Methodologies learning (Retrofitting) •Transforming LV radial networks (Interconnecting) •Real time Control & automation of LV network •Network Management System Interface •Network Configuration & Voltage Optimisation •Cost Benefit: Economic analysis and carbon impact •Customer Engagement: Learning The above outputs appear to be of learning benefit to the industry from operational and safety considerations as well as a project implementation perspective. This appears geared for other DNOs to learn from with a view to aiding practical implementation. The learning appears to be well suited to practical implementation by other DNOs as the output will develop the safe systems of work and associated policies and codes required to deploy the technology safely. Table 5.2 in the submission details audience and dissemination methods including Web based, Conferences and workshops, academic papers, learning installations, press releases as well as project reports etc. These appear to be standard and reasonable approaches. Quality assurance checks are also planned to ensure the dissemination methods are effective and can be revised to meet the stakeholder needs, which shows application of good practice.
Metrics (where available):	
Conforming to default IPR arrangements:	**YES** [Reference, P28]

Sub-criteria	**Assessment**
Potential for new/incremental learning to be generated by the project	The 8 key learning outcomes principally focus on the distribution system and customer engagement (Ref page 6) and appear highly transferable to other DNO's to implement with full integration or on an incremental approach. The project submission (Ref,p24) for eta demonstrates learning to be generated that is both incremental and new summarised as follows:- • **Installation Methodologies learning (Retrofitting):** Output - ready to use specifications to enable DNOs to purchase, install

Sub-criteria	Assessment
	and retrofit devices to the network to replicate eta. • **Transforming LV radial networks (Interconnecting):** Output – System operating procedures will enable how to transform radial LV feeders to interconnected networks cost effectively. • **Real time Control & automation of LV network:** Output – Planning, Design & Operational Standards, Health & Safety documentation, and operational training guides. • **Network Management System Interface:** Output – How to configure the Optimisation software & NMS system. • **Network Configuration & Voltage Optimisation:** Output – Definition of settings, configuration parameters and operating procedures for HV & LV circuit control through voltage controllers; on-load tap changing transformers and/or capacitors. • **Cost Benefit:** Output - Economic analysis and carbon impact, including value of network losses and energy reduction and investment deferral. • **Customer Engagement:** Output - Learning will be developed on how customers understand the initiative and perceived effects, as well as learning made available to wider stakeholders such as the academic partners and their institutions. The above outputs appear to be of learning benefit to the industry from operational and safety consideration as well as from a project implementation perspective. This appears geared for other DNOs to learn from with a view to aiding practical implementation. As the learning on optimum use and configuration of the technology which is available and can be retrofitted, it displays the ability to be applied in an incremental manner.
Applicability of learning to other DNOs	The learning appears to be well suited to practical implementation by other DNOs as the output will develop the safe systems of work and associated policies and codes required to deploy the technology safely. See above assessment for more information. *eta* aims to demonstrate that distribution networks can be operated differently from originally designed with the addition of smart technology to deliver financial savings to customers and stakeholders by mitigating the need for traditional reinforcement. The exposure gained in *eta* will further raise the profile of the Kelvatek business and its product range across the UK, EU and worldwide DNOs. But *eta* will also show that DNOs will need new technology to replicate the *eta* Method and the potential size of the market will attract Kelvatek's competitors to enter the market with alternative products.
Proposed IP management and any deviations from	The proposal does not appear to highlight the proposed IP management approach; however the un-checked tick box (Reference, p28) confirms

Sub-criteria	Assessment
default IP principles	the project conforms with default IPR principles. It is noted that Kelvatek is a SME and appears to have a relatively high commercial stake in this project, as that it is the owner and developer of key technology products essential to the success of the project. The success of the project may open up the GB DNO market to Kelvatek. However, at the meeting 5 September 2013 with the DNO and partners it became clear that although the vacuum bottle used in the Kelvatek equipment do have patents and IPR, there is nothing stopping other companies using solid state switches to achieve the same functionality. The main area where IPR may be relevant is the software and programming characteristics learned during the trials. For the development of the implementation plan (shown in the Full Submission) Electricity North West has agreed with Kelvatek the quantities and delivery timings for the equipment and services required to undertake the *eta* Project. In addition for the *eta* bid Electricity North West has negotiated Kelvatek's financial and in kind support (ie a discount to the products and services required for *eta*), if *eta* is successful in receiving LCN Funds. *eta* will follow the default IPR conditions when delivering the *eta* Project. There will be no product based Foreground IPR created within *eta* in relation to the WEEZAP, LYNX or Siemens Spectrum optimisation. Through our collaboration with Kelvatek we expect the *eta* Project will create the following Foreground IPR: ○ Proven and deployable adaptive protection settings for a low voltage controllable circuit breaker (or equivalent) on the range of LV feeders detailed in the *eta* Trial; and ○ New LV network design and operating rules, including optimum capacitor bank location and interconnecting rules, together with mounting arrangements, protection settings and autonomous operating regime settings. Both will be shared with the GB DNOs to facilitate their replication of the *eta* Method.
Credibility of proposed methodology for capturing learning from the trial and plans for disseminating	The proposal details approach to dissemination of knowledge generated through the project and how this will be shared with the project group and recognises the need to tailor to the audience. The 8 key learning outcomes captured through the project implementation and knowledge outcomes (as above) appear to be methodically thorough. Table 5.2 in the submission details audience and dissemination methods including Web based, conferences and workshops, academic papers, learning installations, press releases as well as project reports, etc. These appear to be standard and reasonable approaches. The potential installation at the Museum of Science & Industry at Manchester may be a more original approach if it proceeds.

Sub-criteria	Assessment
	The quality and effectiveness of the dissemination activities is planned to ensure continuous improvement. This is achieved through engagement feedback such as Web polls, focus groups and surveys in order to assess potential barriers to dissemination.

5. Criterion (d) Partners and Funding

Criterion:	Involvement of other partners and external funding.
Overall assessment:	Total Project cost of £12m comprises of funding of: • £1.8m of funding contribution from Project Partners • £1m ENW contribution and • £8.9m LCN Fund. (Ref Fig 3.4 page 17) The collaborators including; Kelvatek (technology supplier), TNEI (software specialist), Seimens, Impact Research (Marketing and Customer Engagement Organisation), The University of Manchester and the Queen's University Belfast, have all been considered for expertise and deliverables as well as prior experience. It is noted that Kelvatek is a SME and appears to have a relatively high commercial stake in this project, as that it is the owner and developer of key technology products essential to the success of the project, and that success of the project may open up the GB DNO market to Kelvatek. The project is likely to be a key account for Kelvatek and there may be a risk of over-commitment of both physical and financial resource for the project to succeed. This governance risk of contractor failure does not appear to be clearly identified in the risk log (Ref: Appendix E,p59) The approach to selection of delivery partners is reasonable. The submission builds on learning from previous funded projects, including C_2C and CLASS. Furthermore an international review of concepts of interconnecting LV networks has been undertaken by ENW to benchmark and fact find practices used elsewhere. (Ref, p33) It is evident that the ENW has made an effort to ensure the eta project does not replicate work and studies undertaken elsewhere.

Metrics (where available):			
Total cost of project (£):	£11,944,000	Number of consortium members:	Total = 11 3- Project Partners 7- Project Supporters + ENW
Cost met by DNO (£):	£1,011,904	Cost met by DNO (% of total cost):	8.5%
LCNF support (£):	£8,933,000	LCNF support (% of total cost):	74.8%

Cost met by others (£):	£1,825,900	Cost met by others (% of total cost):	15%

Sub-criteria	**Assessment**
Appropriateness of collaborators (including experience, expertise and robustness of commitments)	Partners have been selected based on three key areas 1- Prior experience in scope of work and reliability to deliver; 2- Involvement represents value for money for eta; and 3- Commitment to ENW, eta, and its success and the dissemination of learning gained. Kelvatek has the relevant history in LV Switching and Fault Management with VCB (Vacuum Circuit Breaker) technology automation and reclosing on LV networks. They have successfully utilised similar technology on railway electrification and/or signalling systems, and have developed the WEEZAP LV VCB specifically for the eta project, demonstrating a high level of commitment to the project and hence its success. TNEI licenses the modelling software that GB DNOs use for network design. Other collaborators include Seimens; Impact Research (Marketing and Customer Engagement Organisation); The University of Manchester; and the Queen's University Belfast. All have all been considered for expertise and deliverables as well as prior experience. Table 5.1 (Page 31) in the proposal sets clear milestones and deliverables against responsible collaborators. It is noted that Kelvatek is a SME and appears to have a relatively high commercial stake in this project, owing that it is the developer of the technology and the success of the project may help open out the GB DNO market. The project is likely to be a key account for Kelvatek and there may be a risk of over commitment of both physical and financial resource on obligation for the project to succeed. This governance risk of contractor failure does not appear to be clearly identified in the risk log (Ref: Appendix E,p59) Kelvatek will provide financial and in kind support amounting to £1 516 300 to the *eta* Project in the following three ways: 1. A financial contribution to the purchase of the WEEZAP devices, amounting to £1 035 650, against the total purchase cost of £2 159 090; 2. A financial contribution to the purchase of the LYNX devices, amounting to £443 850, against the total purchase cost of £918 152; and 3. The provision of training and support for the installation and operation of the WEEZAP and LYNX devices, including the

Sub-criteria	Assessment
	communications hub, Gateway, amounting to £36 800. The financial support for *eta* amounts to 46% of Kelvatek's total costs for the project, equalling £3 289 135. Kelvatek's costs and contribution are shown in the the tab named 'Project Cost Summary' in the *eta* Full Submission spreadsheet; whilst the breakdown of the individual elements are shown in the tabs named '2014-15' and '2015-16'. The table in the answer to question 18 contains the breakdown of the Kelvatek's costs and contribution.
Level of external funding (presented on a comparable basis with other projects)	The level of external funding is perhaps on the low side of what might be expected. However, since capital equipment and installation is a major cost of this trial it is inevitable that external funding and discounts are limited. The table below shows the costs and contributions for the equipment and services to be purchased from Kelvatek for undertaking the *eta* Project across the four years *eta* is live. **Description** / **Total Cost** Purchase Link Box Switch — £474,302 Purchase of Gateway — £162,698 Purchase of WEEZAP — £1,123,440 Kelvatek Link Box Switch Contribution — £443,850 Kelvatek WEEZAP Contribution — £1,035,650 WEEZAP Installation Support Contribution — £24,000 WEEZAP Training Contribution — £12,800 Purchase LV Board — £12,396 Total — £3,289,135 Kelvatek's costs and contribution are shown in the the tab named 'Project Cost Summary' in the *eta* Full Submission spreadsheet; whilst the breakdown of the individual elements are shown in the tabs named '2014-15' and '2015-16'.
Effectiveness of process for seeking and identifying new project partners and ideas	The process is summarised as follows:- • Identification via Expression of interest (EOI) using ENA LCN Fund Portal. • ENW held further Request For more Information (RFI) sessions to seek partners, specialist skills and understand associated cost and contributions. • The above approach EOI and RFI was trialled again in 2013 to gain wider awareness and greater competition. • Selection was made of partners and suppliers dependant on; experience, skills, cost, and ability to commit resources to deliver both the project and a transferable solution to other GB DNOs • Selection decision governance was taken by ENW Future

Sub-criteria	Assessment
	Network Steering Group. The above process is reasonable. The submission builds on learning from previous funded projects, including C_2C and CLASS. Furthermore an international review of concepts of interconnecting LV networks has been undertaken by ENW to benchmark and fact find practices used elsewhere. (Ref, p33) During Phase II of the *eta* Project (see Appendix F on page 64) the Project team will undertake site selection, network design and equipment tendering. The *eta* Project team will conduct a competitive tender for the purchase and installation of the equipment. The equipment installation tender submissions will be evaluated with the aim of delivering the lowest overall installation costs at the required quality and deliverable within the time constraints of the project. Each tender will be compared against the programme and costs for installation by direct labour in order to ascertain the most cost effective installation solution.

6. Criterion (e) Relevance and Timing

Criterion:	Relevance and timing.
Overall assessment:	The project aims to quickly address highly significant current obstacles to releasing network capacity and voltage headroom to facilitate the connection of Low Carbon Technologies, and at the same time operate a cost efficient, carbon and energy efficient distribution network. The key eta projects themes of:- • LV Network Management • Interconnection, • HV & LV Voltage Control • Network Configuration • Voltage Optimisation These themes are both universal DNO issues but also interlinked to optimise and facilitate the clustering of LCT connections. The technology used in the integrated approach mentioned above, together with remote controlled automation, has the potential for wide-spread application across UK DNO, that would be costly and take years of sustained investment to achieve under the traditional reinforcement approach used on the network. The learning from this project and benefits span not only LCT facilitation, but also go well towards immediate and long term DNO network management issues. Specifically some examples include the following:- • Dynamic real time visibility and use of LV Network • Potential reduction on network down time during faults (CMLs) • Deferment or avoidance of network reinforcement • Safety benefits of reduced direct contact with the LV network • Future regulation and price control considerations • Knowledge and technology advancement The timing of this proposed project fits with incremental preliminary work under IFI and First Tier LCN Fund to produce the technologies that require field trialling in order establish wider GB deployment into business as usual.

Metrics (where available):			
Start date:	1st January 2014	Elapsed time of project:	31st December 2017 (4 years)

Sub-criteria	Assessment
Significance in the project in: (a) overcoming current obstacles to a low carbon future	The project aims to quickly address highly significant obstacles of releasing network capacity and voltage headroom to facilitate the connection of Low Carbon Technologies, and at the same time operate a cost efficient, carbon and energy efficient distribution network. The key eta projects themes of:- • LV Network Management • Interconnection, • HV & LV Voltage Control • Network Configuration • Voltage Optimisation These themes are universal DNO issues and provide additional capacity to facilitate connection of embedded renewable generation and LC loads without the need for reinforcement, and with voltage stabilisation and energy savings for customers. The technology used in the integrated approach mentioned above, together with remote controlled automation, has the potential for wide-spread application across UK DNO.
(b) trialling new technologies that could have a major low carbon impact	The eta project trials new vacuum switching devices called WEEZAP and LYNX technologies, which can be inserted into LV fuse ways on LV distribution boards and link boxes respectively. The technology used in the integrated approach mentioned above, together with remote controlled automation, has potential for wide spread application across UK DNO, that would be costly and take years of sustained investment to achieve under traditional approach to that used on the HV network. The project claim of the first demonstration in the UK of a centralised LV network management and automation system would be supported should the eta project deliver its planned success criteria.
(c) demonstrating new system approaches that could have widespread application	This is a novel and practical method of interconnecting and controlling HV & LV networks to release capacity without the need for costly traditional reinforcement, and could be utilised in many parts of the distribution network. The project is claimed to be 64% transferrable to ENW and 72% to GB DNO, based on a (business case) study conducted by TNEI. This is based on estimates of relative proportions of ENW and GB feeders that the eta method would be applicable to. The technology used in this integrated approach together with remote controlled automation has potential for wide spread application across UK DNO.
Applicability of the	The learning from this project and benefits span not only LCT

Sub-criteria	Assessment
project to future business plans, regardless of uptake of Low Carbon Technologies (LCTs)	facilitation, but also go well towards immediate and long term DNO network management issues. The proposed project fits in with incremental preliminary work under IFI and First Tier LCN Fund to produce the technologies that require field trialling in order establish wider GB deployment into business as usual. With successful completion of the project, there is no reason to believe that this method could not be incorporated into future business plans as a real alternative to traditional network reinforcement, regardless of uptake of LCTs.

7. Criterion (f) Methodology

Criterion:	Demonstration of a robust methodology and that the project is ready to implement.
Overall assessment:	The *eta* site selection methodology (see Appendix B on page 52) describes the process Electricity North West will follow to select appropriate Trial circuits that allow the selection of representative samples of different circuit types and loading profiles. The methodology facilitates the deployment of the enabling technologies on circuits with differing characteristics and provides valuable learning on how *eta* can be adopted and the costs of adoption in a number of scenarios. The selection methodology ensures that the Trial circuits are reflective of the configuration of the GB system. The transition to a low carbon economy is likely to result in a significant increase in electricity demand from Low Carbon Technology (LCT) such as heat pumps and electric vehicles in the future, coupled with increased embedded generation from sources such as photovoltaic panels. Experience and forecasts suggest that these increases in loads and embedded generation are likely to be clustered, which will create problems on distribution networks. Both increased load and embedded generation require additional capacity, which has traditionally been addressed by network reinforcement, resulting in higher DUOS charges to customers. The eta project aims to help address this by optimising the use of the existing HV & LV networks by interconnecting networks using real time technology, with improved voltage regulation and lower energy consumption for customers through Conservation Voltage Reduction (CVR). Project Management & Governance approach is replicated from previously successfully delivered LCN projects. The project management structure looks fairly standard with work stream leads, a steering board and project manager and an overall project director. Key work stream deliverables are included in the plans (Ref Appendix C, p 56). Contract terms and conditions have been negotiated with project partners and necessary framework agreements are in place (Ref, Appendix D,p75) The project delivery proposals look credible and well developed to advance mobilisation when ready. **Risks:** There are 18 key risks listed against mobilisation phases and the work streams which is reasonable for a top down view of key risks. The mitigation against the highest risk (Phase 1 Mobilisation) states a contingency of *'Review Project Plan and consider options to achieve*

	milestones should the risk crystallise'. In isolation this mitigation measure lacks detail. Other contingency details are similar one or two line summaries. For a project of this magnitude the top ten risks contingency mitigation measures and owners should be better documented. There may be detail lacking here or some weakness in the proposal. **Value for Money:** The summary on value for money is that effort has been made towards competitively pricing products and services. **Project Plan:** The plan has identified key activities milestones and critical paths. It appears to demonstrate sufficient methodical delivery thought & planning. While it is likely that the project would have float built into the plan to accommodate a level of slippage this is not clearly identified.

Metrics (where available):

Requested level of protection against cost over runs (default 5%) (%):	0% (Reference,p33)	Requested level of protection against direct benefits (default 50%) (%):	0%

Sub-criteria	**Assessment**
Feasibility of project proposal	The eta project proposal builds on previous work of forerunner IFI and First Tier LCN Funded projects. The proposal shows that learning on previous projects on installation use and control of on load tap changing distribution transformers and capacitors in LV networks developed the approach to HV, which led to the development of WEEZAP. This shows credible learning to reach the stage to mobile a field trail of the technology. The project is split into five work streams, with responsibility shared between project partners namely: 1. Technology – 3 Project Partners 2. Trials – 3 Project Partners 3. Customer – 1 Project partner 4. Research – 5 Project Partners 5. Learning Dissemination – 5 Project Partners Project Management & Governance approach is replicated from previously successfully delivered LCN projects. The project management structure looks fairly standard with work stream leads, a steering board and project manager and an overall project director. Key work stream deliverables are included in the plans (Ref Appendix C, p 56). In addition the project has a mobilisation (Phase 1a and 1b) and

Sub-criteria	Assessment
	demobilisation (Phase II) sections. Dedicated internal (ENW) and external partner resourcing has been identified and a high level project plan (Fig 6.3,p37) and a more detailed MSP project plan is included in Appendix F of the proposal. Contract terms and conditions have been negotiated with project partners and necessary framework agreements are in place (Ref, Appendix D,p75) The project delivery proposals look credible and well developed to advance mobilisation when ready.
All risks, including customer impact, exceeding forecast costs and missing delivery date	Appendix E of the submission details risks and issues. • The Risk Scoring methodology uses the standard scoring against impact and probability. • Key project variables of time cost and scope/quality are used in the scoring matrix. There are 18 key risks listed against mobilisation phases and the work streams which is reasonable for a top down view of key risks. The highest ranking risk is Phase 1 mobilisation, which would be expected given the number of partner interfaces and uniqueness of the project proposal. The mitigation against the highest risk (Phase 1 Mobilisation) states a contingency of *'Review Project Plan and consider options to achieve milestones should the risk crystallise'*. In isolation this mitigation measure lacks detail. Other contingency details are similar one or two line summaries. For a project of this magnitude the top ten risks contingency mitigation measures and owners should be better documented. There may be detail lacking here or some weakness in the proposal.
Whether items within project budget provide value for money	See criteria (b) review of major cost items. The summary is that while there appears some efforts have been made towards competitively pricing, this area of the proposal appears to be less robust and lacks detail.
Project methodology (including depth and robustness of project management plan)	A detailed MSP project plan is included in Appendix F of the proposal, which contains 216 activities detailing a work breakdown. The plan has identified key activities milestones and critical paths. It appears to demonstrate sufficient methodical delivery thought & planning. While it is likely that the project would have float built into the plan to accommodate a level of slippage this is not clearly identified.

8. Successful Delivery Reward Criteria

Criterion:	Appropriateness of the SDRC definitions and timing and adequacy of links to key project milestones.
Overall assessment:	All 27 criteria comply with principle 4 in that they are SMART and also appear to meet the other three principles in that they are linked to generation of new knowledge and deliverable milestones. A detailed breakdown of each SDRC work stream evidence and criteria is covered on page 44 of the proposal.
Review:	The eta high level project plan (Figure 6.3, p37) details Successful Delivery Reward Criteria (SDRC) against each of the key work streams as well as the project mobilisation and demobilisation / close down. As detailed in Ofgem's LCNF governance document- version 6 (section 3.27, p50). The proposed Successful Delivery Reward Criteria is required to comply with the following principles in that they must me: 1. linked to meeting identified targets for the outputs that will be expected to be delivered through the Project, 2. linked to meeting identified Project milestones, on at least an annual basis, 3. linked to achieving the proposal it puts forward for generation of new knowledge to be amongst all network operators, and 4. SMART objectives – specific, measurable, achievable, relevant and time bound. (Reference, http://www.ofgem.gov.uk/ofgem-publications/45703/low-carbon-networks-fund-governance-document-version-6.pdf) There are a total of 27 SDRC criteria listed against the 6 work streams of the project.

9. Addendum: Changes made in Resubmission

9.1	**Summary of Changes**		Following meetings and discussions with the Expert Panel and the Consultants, and after responding to written questions, Electricity Northwest submitted a revised full submission in mid-October 2013. The resubmission now shows an overall reduction in the request for funding of £495k. The resubmission incorporates some significant changes from the original submission, including better value for money expenditure on customer survey frequency and additional funding from their partner Siemens of £100k. The graphs on page 18 now reflect the increased partner contribution. All the partners for the project are now involved in the dissemination of knowledge to other DNOs.
9.1.1	Trials and Survey		ENW has provided a more detailed explanation of the impact of the trials on customers within the trial areas: *"The OFF/ ON Trial design can be applied without customer intrusion and isolates the effect of the eta Method from customer behaviour. This will provide data that demonstrates the difference between energy consumption during application of the Method and energy consumption during normal operation. This information then enables a calculation of the aggregated consumption data to evaluate customers' energy savings."* An enhanced explanation of the customer survey is given as: *The design of the customer survey (see Section 8) takes into consideration the need to survey customers in order to prove Hypothesis 2; "Customers within the eta trial area will not perceive any changes in their electricity supply".* Taken together the enhanced information provides a better explanation of the OFF/ON table 2.1 on page 10 together with the data recorded and tracking.

9.1.2	System Operating Voltage		System operating voltages during periods of high and low demand/generation have been clarified on page 13 demonstrating the interaction between the levels of generation and demand and the proposed voltage level strategy. The re-submission now incorporates further information of the control of the low voltage system as follows: *"Application of the eta Method will involve flattening the voltage profile to deliver a consistent supply voltage to all customers wherever they are situated in relation to the substation. This will mean that some customers will receive lower voltages than they do currently. As appliances are designed and manufactured to operate across Europe where voltage is historically lower (220 volts), the application of lowering the voltage profile (ie Conservation Voltage Reduction) will have no adverse effect on appliance operation and is consistent with equipment specifications. Figure 8.1 is a stylized representation of the eta effect demonstrating that each customer within the Trial area will receive a supply voltage well within statutory limits."* and *"A flattened voltage profile is achieved through the installation of capacitors across HV and LV circuits. These commodity items are currently used worldwide by network operators, most notably in USA & Australia, to manage voltage and also by Industrial and Commercial customers in the UK (and worldwide) to improve poor power factors. In preparation for the eta bid, consultants TNEI, PB Power and S&C Europe worked independently of each other to research the various uses of capacitor. These consultants were unable to find any reasons for not using capacitors to control voltage in the UK context and are all supportive of the technological approach in the eta Project."*

9.2	**Impact on LCN Funding Application**		The two main areas of the resubmission that have any impact on the original submission are the improved level of partner contributions and changes to Workstream 3 to improve the customer experience areas. Appendix E removes a number of risks associated with Workstream 3 – Customer and this followings on from the changes to the customer engagement strategy.
9.2.1	Criterion (a) Low Carbon Benefits		The revised submission is not considered to impact on the evaluation against this criterion.
9.2.2	Criterion (b) Value for Money		The increased contribution from Siemens of £100k improves the value for money for this project. New graphs 3.8 to 3.11 give a clear indication of the work stream component parts and payments. Contingency costs have risen slightly.
9.2.3	Criterion (c) Generates Knowledge		The resubmission demonstrates more clearly how knowledge gained from the project will be disseminated via the Siemen's Crystal facilities. *"As a key learning and dissemination partner, Siemens will write an Optimisation Implementation Strategy setting out how DNOs with alternative NMS solutions can apply the Method and will provide additional support at learning events to further aid ease of roll out. Siemens is funding the provision of the Crystal as a venue for eta knowledge sharing events."*
9.2.4	Criterion (d) Partners and Funding		The additional funding of £100k from Siemens improves the funding position and also demonstrates the potential for future business in this area of low voltage system control and optimisation to cope with new demand and green energy. Table 4.1 now shows the University man-day contribution of 2,748 together with an increase of 70 man-days by partner Siemens. As part of the additional contribution by Siemens, they will provide the following: *"As a key learning and dissemination partner, Siemens will write an Optimisation Implementation Strategy setting out how DNOs with alternative NMS solutions can apply the Method and will provide additional support at learning events to further aid ease of roll out. Siemens is funding the provision of the Crystal as a venue for eta knowledge sharing events."* The key deliverables set out in table 5.1 have been increased by the addition of *"An Optimisation Implementation Strategy for adoption by DNOs utilising other NMS solutions."* and "*Customer experience report including details of customer engagement and survey feedback from customers within the Trial locations".*

9.2.5	Criterion (e) Relevance and Timing		The whole project is extremely relevant to the current state of affairs within many distribution networks and will provide information for planners on what remedies can be deployed to cope with the changing nature of equipment connected to the low voltage system. ENW has presented a table of prospective saving that could be achieved if the project was applied to all GB DNOs. *Table G5 below shows the expected future costs savings and associated assumptions for the technical equipment to apply the eta Method, when proven.*

Table G5 Future Cost Savings and Assumptions

Equipment	Cost saving %	Assumption
LV network equipment		
WEEZAPs and LYNX	25%	New entrants enter market and compete on price
On Load Tap Changing Distribution Transformers	15%	Second generation employ efficient manufacturing techniques to reduce price
Capacitors	15%	New UK demand stimulates supply chain
Joint monitoring	15%	Cheaper components and quicker installation techniques reduce costs
HV network equipment		
Capacitors	15%	New UK demand stimulates supply chain
Voltage controllers	50%	New uses stimulate demand and operational and installation methodologies reduce costs
NMS & interface	20%	Interface specs and methodologies reduce costs
Network configuration & voltage optimisation	40%	Operating regimes reduce configuration costs

9.2.6	Criterion (f) Methodology		ENW has identified a number of changes to the customer engagement process and customer experience, these improve the proposed methodology for assessing the impact of the project on customers. The changes are as follows: *"eta will seek feedback from customers from within the Trial areas to understand whether they notice a change in their electricity supply during the Trial period; this is crucial to answer Hypothesis 2, "Customers within the eta Trial area will not perceive any changes in their electricity supply when the eta Method is applied".* *"The technique used to engage with customers has been carefully considered based upon previous experience from other LCN Fund Projects; especially the CLASS Project where we will undertake quarterly customer surveys to understand the sensitivity of customers to changes in voltage. The level of voltage changes experienced by customers in the eta Trial will be very similar to that in the CLASS project. As such we intend to utilise the customer survey work already funded through CLASS and reduce the depth of the customer engagement work in eta."* *"In eta we will inform customers on the Trial networks of the project through a general awareness campaign early in the project; and then a) quantify the customer experience by recording and managing any customer queries and b) qualify the customer experience by holding a focus group in each of the Trial areas in later part of the second year of the Trial period. This will ensure we have sufficient information to prove Hypothesis 2 whilst reducing costs by leveraging earlier Tier 2 work."* "Surveys: *Prior to performing any survey interviews, Electricity North West will issue a data privacy statement summarising the compliance strategy which will ensure that eta complies with the Data Protection Act 1988."*
9.2.7	Successful Delivery Reward Criteria (SDRC)		Only minor modifications have been made to the SDRC to reflect the changes to the Workstream 3 –Customers and customer engagement strategy. Otherwise there is no material impact on the SDRC criteria.