



# IRM Consultation - ENWL Smart Street

*Northern Powergrid's response to Ofgem's RIIO-ED1 Innovation Roll-out Mechanism consultation*

## KEY POINTS

- **We agree that better voltage management will support the government's carbon plan and wider environmental benefits.** We have no concerns over the gross benefits of this proposal either in magnitude or relevance to carbon targets. Nor do we have concerns over whether there should be an expectation to carry out the work anyway as part of business as usual.
- **While we commend the technical design of the Smart Street roll-out, it does not appear to offer clear value compared to a wider set of counterfactuals, and this needs to be properly understood if this IRM application is to be progressed.**
  - The submission specifically mentions “the thicker cables used within the counterfactual”. Thicker cables are a blunt and expensive method when it comes to traditional reinforcement. Network and load reconfiguration is likely to give a significantly lower traditional reinforcement cost. This approach may have been taken, but the submission as written suggests otherwise.
  - No consideration is made of alternative methods of voltage management, either by voltage reduction, which will address the current trend to higher voltages, or by a dynamic smart meter based voltage control system which should produce a marked improvement in our ability to cater for both high demand and high local generation situations.
- **Short-term benefits can be realised without significant investment and it is unclear whether this alternative has been considered.**
- Our own reduction of voltage based on our previous CLNR work that we are rolling out and reporting in our Environment and Innovation reports has a side benefit in reduction on energy bills in the region of £20 per customer per annum.
- Smart meter based dynamic voltage control offers the potential for reaping the longer-term benefits.
- Although the potential benefits per customer of these alternatives are lower than those proposed for Smart Street level, the roll-out we think that they should be compared for the value they offer to customers.

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## Responses to Ofgem's consultation questions

### *Eligibility*

#### ***Question 1: Do you consider that the proposed roll-out will facilitate the Government's Carbon Plan, or deliver wider environmental benefits?***

1. ENWL states that the Smart Street "trials demonstrated that controlling voltages provides a number of benefits to customers, including reducing customer energy bills, reducing carbon emissions, and facilitating the connection of LCTs to our network."
2. We accept this and agree that better voltage management will support the government's carbon plan and wider environmental benefits.
3. In particular the reduction in energy bills in this scenario is a direct consequence of reduction in energy use and therefore an environmental as well as financial benefit.

#### ***Question 2: Do you consider that the proposed roll-out will deliver long-term value for money for customers?***

4. Having reviewed ENWL's benefits analysis we are concerned that the benefit is being calculated against an erroneous base case without considering non-traditional alternatives.
5. Our own reduction of voltage based on our previous Customer-Led Network Revokution (CLNR) work that we are rolling out (and reporting as increased capacity for small scale generation connection via Environment and Innovation report and table E6), has a side benefit in reduction on energy bills in the region of £20 per customer per annum. The reduction is simply a reduction in the set point on the voltage control scheme at the EHV to HV substation. Although a lower level of benefit to customers this approach has been rolled out to over a third of our network (well over a million customers) with no significant cost to customers and the roll-out is continuing, as opposed to the 45,000 customers that the £15.1m (2012/2013 prices) Smart Street IRM targets.
6. However we accept that while this is highly effective at present it may become less so in the future.
7. With this in mind we have initiated a project (Boston Spa Efficient Energy Trial - BEET) considering the use of smart meter voltage data in real time to allow a dynamic set point for the voltage control scheme at the EHV to HV substation. This is a logical extrapolation of previous

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voltage control schemes such as GEN AVC1 or the GUS system trialled under CLNR. This will allow us to reduce the low voltage operating voltage further, and the dynamic nature will allow it to cater for generation rich clusters at low demand periods and EV charging and heat pumps during high demand periods.

8. There will be data systems integration costs for this, however given the smart meters are already energy system committed expenditure, as are the metering back office systems and SCADA systems, and we are already rolling out smart voltage control schemes (as ENWL did with CLASS), the costs for a full roll out are unlikely to be significant.
9. The likely benefit per customer of such a scheme will be slightly lower than the Smart Street approach, but the roll-out will address all customers as smart-meters become available and the costs will be insignificant for this by comparison with the 45,000 customers the Smart Street IRM targets.
10. Additionally BEET is intended to collect voltage and load data network equipment and to control local equipment such as regulators when they become required by clustering. Thus a hybrid BEET – Smart Street system could be envisaged providing the same performance to more customers than the simple system proposed by ENWL and at a far lower cost.
11. We accept that BEET is at the trial stage and not yet proven for mass roll-out. But such a solution is a valid counterfactual for comparison purposes.
12. In summary we believe the short to medium term benefits of Smart Street should be discounted in line with the £20 per customer per annum saving from simple voltage profile redesign, and the longer term saving considered in light of the likely savings from a smart meter based improved control system.

***Question 3: Do you consider that the roll-out will allow the licensee to receive commercial benefits within the price control period, e.g. will the roll-out lead to cost savings and/or incentive rewards, greater than the cost of the roll-out within the price control period?***

13. The benefits are likely to be generally to the customer in energy reduction in period, and will avoid reinforcement costs in subsequent periods.

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<sup>1</sup> <https://webarchive.nationalarchives.gov.uk/20100211000658/http://www.ensg.gov.uk/index.php?article=30>

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**Question 4: Do you consider that the technology that ENWL wishes to roll-out fall within the definitions of a Proven Innovation or Ordinary Business Arrangement as defined in the IRM licence condition?**

14. We view this as a Proven Innovation.

**Level of benefits**

**Question 5: What are your views on the merits of the proposed technology roll-out?**

**To what extent is the proposed roll-out relevant to current and future challenges in relation to the distribution network?**

15. We view the reduction in energy use and increase in connection of LCT loads as highly relevant to the challenges the distribution networks are expected to address.

**What improvements, if any, do you consider that the proposed technology roll-out offers compared to the current situation?**

16. On a technical basis the level of control of voltage at the local low voltage level, close to the majority of customers, will be greatly improved compared to the current situation. This will vary depending on the level of clustering, and we should note that once the transition to zero carbon is complete clustering may be much lower than during the transition period, so the benefit may reduce over time.

17. However the technology should be compared to other optimised alternatives and to techniques in development as well as the current traditional solutions. In this light it is less of an obvious investment case.

**Question 6: What are your views on the timing of the proposed roll-out?**

**What would happen if the proposed roll-out did not occur until the next distribution price control starting in 2023?**

18. This would allow for the proof of the value of smart meter based alternatives and would potentially save the customer significant cost.

19. It would of course mean that the roll out would start later should smart meter based alternatives be shown not to work.

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***Does the timing of the proposed roll-out have a significant effect on the expected level of benefits?***

20. The clearest effect is that customers would lose £2.7m of energy savings per annum; however a third of this might be mitigated by optimisation of existing voltage profiles.
21. The resultant lost benefits might be seen as £1.8m for delaying a £18.0m investment, which may prove to be unnecessary, by a year.

***Question 7: To what extent will the proposed roll-out facilitate the Carbon Plan?***

***Please explain what aspects of the Carbon Plan you consider the proposed roll-out will facilitate.***

22. ENWL state that the Smart Street benefits include “reducing customer energy bills, reducing carbon emissions, and facilitating the connection of LCTs to our network.”
23. This will contribute by directly reducing the energy requirement, and thereby greenhouse gas emissions, and by facilitating the transfer of energy used to non-greenhouse gas emitting sources.

***What is your view of the claims made by the licensee regarding the contribution the proposed roll-out will make to these aspects of the Carbon Plan?***

24. We agreed with ENWL’s view.

***Will the proposed roll-out deliver benefits more quickly than the business-as-usual methods used across Great Britain (GB)?***

25. We believe that the proposed roll-out delivers benefits more quickly than the business-as-usual methods, but there should also have been a consideration of non-traditional methods which are likely to be similarly paced.

***Question 8: To what extent will the proposed roll-out deliver wider environmental benefits?***

***Please explain what, if any, environmental benefits you consider the proposed rollout will deliver.***

26. The roll out will reduce energy use and facilitating the transfer of energy used to non-greenhouse gas emitting sources.

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***What is your view of the claims made by the licensee regarding the environmental benefits their project will deliver?***

27. We agree with ENWL's view.

***Will the proposed roll-out deliver benefits more quickly than the business-as-usual methods used across GB?***

28. We believe that the proposed roll-out deliver benefits more quickly than the business-as-usual methods, but there should also have been a consideration of non-traditional methods which are likely to be similarly paced.

***Question 9: To what extent will the proposed roll-out deliver value for money for electricity consumers?***

***Please explain whether you consider the cost and scale of the proposed roll-out is justified in relation to the benefits it will deliver.***

29. The cost and scale of the proposed roll-out needs considering in light of the wider range of alternatives that we highlight in our response.

30. The majority of the short to medium term benefits of Smart Street should be achievable by methods not requiring capital investment.

31. The longer term benefits should be considered in light of the likely savings from a smart meter based improved control system, potentially integrated with a reduced Smart Street style capital investment.

32. In summary we believe the short to medium term benefits of Smart Street could be discounted in line with the £20 per customer per annum saving from simple voltage profile redesign, and the longer term saving considered in light of the likely savings from a smart meter based improved control system.

***What proportion of the potential benefits from the proposed roll-out do you consider will accrue to the network compared to other elements in the energy supply chain?***

33. The vast majority of the short term benefits will accrue directly to customers via lower energy use and thereby lower energy bills.

34. Longer term benefits associated with reduced reinforcement will be shared between customers and network companies, however as these are likely to be post-2023, the reduction might be

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expected to be factored into the RIIO-ED2 regulatory settlement, and again the customer should benefit via reduced DUoS charges associated with lower reinforcement allowances.

***Question 10: With reference to the IRM licence condition, do you have any significant concerns about funding the proposed roll-out under the IRM? For example, do you consider it is reasonable to expect the licensee to carry out the work anyway as part of business as usual?***

35. We agree that better voltage management will support the government's carbon plan and wider environmental benefits. We have no concerns over the gross benefits of this proposal either in magnitude or relevance to carbon targets. Nor do we have concerns over whether there should be an expectation to carry out the work anyway as part of business as usual.
36. We do, however, have questions with the counterfactual of conventional network reinforcement that the proposal is compared to.
- a. No consideration is made of alternative methods of voltage management, either by voltage reduction, which will address the current trend to higher voltages, or by a dynamic smart meter based voltage control system which should produce a marked improvement in our ability to cater for both high demand and high local generation situations..
  - b. The submission specifically mentions "the thicker cables used within the counterfactual". Thicker cables, while desirable for loss reduction, are a blunt and expensive method when it comes to traditional reinforcement. Network and load reconfiguration is likely to give a significantly lower traditional reinforcement cost. This approach may have been taken, but the submission as written suggests otherwise.
37. It is worth comparing the benefits of Smart Streets to other potential solutions offering similar benefits. Our own reduction of voltage based on our previous CLNR work that we are rolling out and reporting in our Environment and Innovation reports has a side benefit in reduction on energy bills in the region of £20 per customer per annum which competes with the short to medium term benefits of Smart Streets. Smart meter based dynamic voltage control offers another potential way of reaping the longer-term benefits.
38. These methods are likely to produce slightly lower benefits per customer, but to a far wider group of customers; over a million so far in terms of the voltage reduction.
39. A judgement needs to be made as to whether the higher localised benefit or greater overall benefit is preferable.