

My Electric Avenue (I²EV)

Successful Delivery Reward Application

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The 'My Electric Avenue' Project is the public identity for the Low Carbon Networks Fund Tier 2 Project "I²EV." The formal title "I²EV" is used for contractual and Ofgem reporting purposes.

Project leads



Project partners



My Electric Avenue has received support from Ofgem through the Low Carbon Networks (LCN) Fund.

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Executive summary

This document constitutes the application by Southern Electric Power Distribution (SEPD) and EA Technology for a Successful Delivery Reward (SDR) for the My Electric Avenue Project. The Project was submitted to Ofgem's Low Carbon Networks (LCN) Fund as I²EV (Innovation Squared: Managing unconstrained EV connections). It was conceived, developed and delivered by EA Technology in partnership with Southern Electric Power Distribution (SEPD).

The My Electric Avenue Project consisted of two strands of innovation: a novel commercial arrangement that enabled EA Technology, a SME, to deliver the Project¹ on behalf of SEPD; and a technical trial that tested the ability of a new technology 'Esprit,' developed by EA Technology, to manage excess LV network load resulting from Electric Vehicles (EVs). Owing to the unique manner in which the Project was structured, the 10% DNO Compulsory Contribution was split on a 7.5%:2.5% basis between SEPD and EA Technology.

The My Electric Avenue Project was delivered within budget, with all Successful Delivery Reward Criteria (SDRCs) and project learning achieved on or ahead of schedule with additional learning generated beyond the original scope. Additional Project requirements introduced via the Project Direction required delivery of a greater scope than originally planned.

Best practice project management methods were employed to deliver the Project through an extensive and diverse consortium of companies combining Project Partners² and suppliers with a disparate range of expertise.

The first component of the Project, the novel commercial arrangement, had three areas of learning to be achieved and disseminated; these were detailed in SDRCs 9.1, 9.2 and 9.3. A principal output of the Project's commercial elements was a contractual template for use by DNOs and third party companies to readily replicate the delivery approach implemented by the My Electric Avenue Project. This contractual template and associated learning are expected to be used as the starting point for the commercial agreements for WPD's Proteus (to be delivered by Ricardo) and OpenLV (to be delivered by EA Technology) NIC projects, if the bid submissions are successful in the 2016 competition.

The second component of the Project, the technical trials, related to the capability of LV networks to withstand increasing penetrations of EVs, the potential for Esprit to manage this increasing load and the acceptability of Esprit to customers. The learning associated with these areas of the Project was published in SDRCs 9.6, 9.7 and 9.8. Achieving these trials required minimum recruitment of customers to participate in the Project; confirmation of meeting these targets was published in SDRC 9.5.

Finally, in recognition that EA Technology developed Esprit and was managing the project intended to test it, it was determined that a third party was to be engaged to conduct regular independent reviews of the Project. The reports detailing the findings and recommendations at six monthly intervals were published in SDRC 9.4. The independent reviewing company, Ricardo, gave the Project an overall rating of 'Excellent' determining that both the commercial and technical areas of innovation have added value to the industry and that the complex project was managed successfully and professionally.

Ricardo also noted the value of additional learning delivered by the Project, beyond that anticipated during the bid development phase, for future DSR projects. The extensive dataset gathered by the Project is also anticipated to provide valuable input to many future academic and innovative research projects in the UK and beyond.

This report provides evidence that we have achieved the Successful Delivery Reward Criteria and evidence of exceptional project management and change control. In consideration of this, EA Technology and SEPD are seeking to be awarded 100% of the SDR (£474,943.00).

¹ "The Project" refers to the My Electric Avenue Project rather than another project that may be discussed in general terms.

² Project Partners is used to refer to companies participating within the Project that provided an in-kind contribution to the Project.

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1. Evidence for Successful Delivery Reward Criteria

The My Electric Avenue (I²EV) Project was awarded by Ofgem in November 2012 and commenced in January 2013 for a three year programme of works.

In December 2015, the European Union committed to legally binding targets for the reduction of carbon emissions across its Member States. Whilst decarbonisation of the UK has been underway for some years, this agreement has confirmed the extent of this required reduction, and the timescales in which it must be achieved. The decarbonisation of the UK will affect electricity, heat and transportation in the years to come.

In recent years as technology has improved, furthering the viability of all-electric vehicles, the number on UK roads has increased significantly, rising from approximately 2,500 at the time of the Project being formulated to over 53,000 at the time of completion.

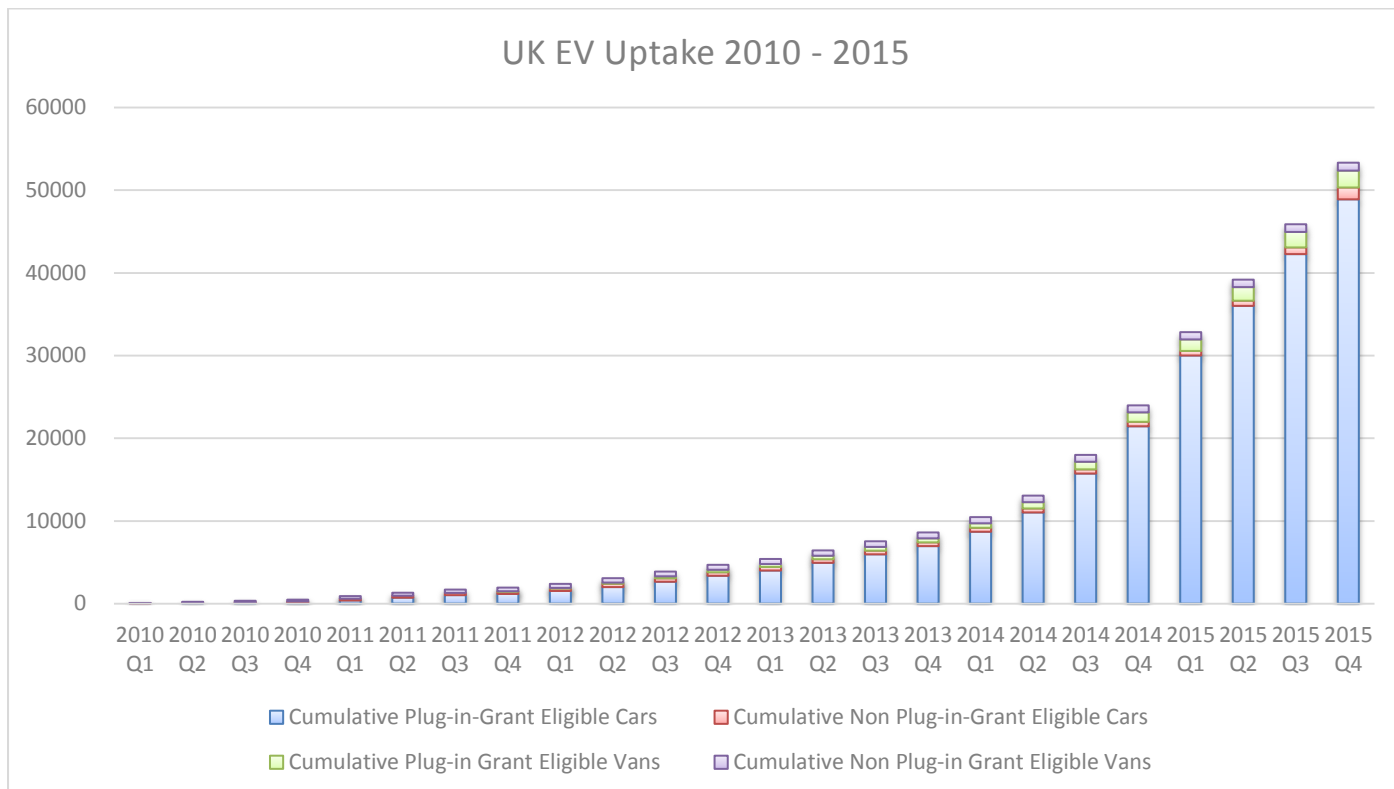


Figure 1 EV Uptake 2010 – 2015

The My Electric Avenue Project considered the anticipated high uptake of electric vehicles (EVs) overloading low voltage (LV) networks during times of high electricity demand and sought to test a mitigating solution. The latest anticipated uptake figures published by the Department of Energy and Climate Change (DECC) forecast between three and ten million EVs to be registered on UK roads by 2030, increasing to a potential 24 million by 2040. UK Government have signalled that they are aiming for 100% of new cars and vans being Ultra Low Emission Vehicle by 2040. DECC’s uptake scenarios for EVs are shown in Appendix I.

Distribution Network Operators must operate networks within their current carrying capacity and ensure voltages are kept within statutory limits. It was expected that one or both of these requirements risked being broken as EVs become more widespread. As such, the My Electric Avenue Project set out to answer the following questions.

1. Can LV networks withstand the unconstrained connection of EVs as they become more widely adopted?
2. In the event that LV networks risk becoming compromised by the uptake of EVs, can Esprit, a technology developed by EA Technology, effectively manage the load of EVs for the purposes of network protection?
3. If Esprit were to be deployed, is it acceptable to consumers, the users of the EVs?
4. Is Esprit a cost effective alternative to the current Business-As-Usual (BAU) approach to network reinforcement?

The Project Direction contained a number of specific deliverable requirements to be met as part of Project delivery, these took the form of both reports to be published, detailing learning realised through delivery of the Project, and achievement of specific milestones related to recruitment of customers and deployment of equipment. In all instances, SDRCs were time limited, linked to either the start of the Project or Ofgem’s approval of the Customer Engagement Plan (CEP).

These SDRCs ensured the Project would:

- With respect the technical trials³:
 - Recruit three clusters of at least ten participants connected to the same LV feeder by September 2013.
 - Have recruited five clusters of at least ten participants connected to the same LV feeder by December 2013.
 - Have recruited at least one hundred participants, across ten clusters of participants connected to the same feeder, with at least seven of those clusters containing at least ten participants, by March 2014.
- With respect the social trials⁴, recruit at least one hundred participants by August 2014.
- Have allocated all funding for the implementation of technical trial clusters by August 2014.
- Undertake an Independent Review by a third party company contracted especially for the purpose on six occasions, at six month intervals throughout the Project.
- Publish reports detailing specific learning outcomes throughout the Project by specifically defined deadlines. The first report was due in February 2013, month two of the Project and the last in December 2015, month 36.

Each of these SDRC requirements were achieved on or ahead of schedule (Appendix II) with the report containing the learning, or confirmation of recruitment achievement being submitted to Ofgem. Each of these reports are also available on the Project Website⁵ but links to the individual files are included below (Appendix III) for clarity and ease of use.

The majority of reports and documentation issued by the My Electric Avenue Project was produced directly by EA Technology. All outputs produced by EA Technology conformed to the ISO 9001 accreditation standard and were internally reviewed for technical and commercial accuracy prior to submission to SEPD. Further reviews were undertaken by SEPD with comments being returned for implementation by EA Technology before re-issue, and onward submission to Ofgem. Where reports were authored (either partially or entirely) by a Project Partner (e.g. SDRC 9.6), internal review was expected prior to delivery to EA Technology, at which point the document was reviewed in the same manner as all others produced for the Project.

The Independent Review of the My Electric Avenue undertaken by Ricardo⁶, a global engineering consultancy specialising in Transport and Energy, considered the entirety of the Project, spanning Governance arrangements to technical verification of equipment installation.

Ricardo's comments on the SDRC deliverables, providing an independent verification of delivery for each criterion, are provided below as evidence of the quality. The only reports not subjected to this independent review were those issued to the Project by Ricardo, detailing the independent views of Project delivery. Ricardo's overall review of the Project is summarised in section 3.1.

Ricardo utilised a RAG indicator process (Red / Amber / Green) throughout the independent review; the independent evaluation of each SDRC and associated comments are included below. All documents referenced throughout this report, including the 6 independent reviews undertaken by Ricardo are linked in Appendix III. A more thorough explanation of the RAG considerations is detailed for reference in Appendix IV.

³ The technical trials consisted of clusters of participants connected to the same LV feeder, signing up to lease an EV but would grant the Project the ability to remotely control their ability to charge the EV within their cluster.

⁴ The social trials consistent of participants leasing a non-subsidised Nissan LEAF for the purposes of providing the Project with non-curtailed usage data.

⁵ www.myelectricavenue.info

⁶ www.ricardo.com

Table 1 Ricardo’s Summary RAG Table

RAG Indicator	Explanation
Green	<ul style="list-style-type: none"> • The project is delivering to plan (time, quality, budget) • There are no major issues • All the objectives have been met • The deliverables are of high quality
Amber	<ul style="list-style-type: none"> • The project is at risk of not delivering to plan (time, quality, budget) • There are issues / risks that will impact the project if not fixed • The objectives have been partially met • The deliverables are of adequate quality
Red	<ul style="list-style-type: none"> • The project is not delivering to plan (time, quality, budget) • There are issues / risks that are impacting the project right now • The objectives have not been met • The deliverables are of poor quality

The timeliness of individual SDRCs are detailed below, with Ricardo’s independent assessment of the outputs’ quality, raised by Ricardo in the independent reviews, being quoted and referenced where appropriate.

1.1 Timeliness and Quality

The My Electric Avenue Project, in accordance with its Project Direction met the eight defined SDRCs (9.1–9.8), confirming this through a suite of reports confirming the relevant stage-gate had been achieved or detailing the learning associated with the SDRC in question.

Each SDRC defined within the Project Direction is covered below, detailing the timeliness of each submission in comparison to the required deadline. In all cases, these reports were submitted to Ofgem on or before the deadline in the Project Direction; a timeline detailing SDRC delivery is located in Appendix II. All reports related to the SDRCs are available on the Project website and are linked in Appendix III.

The quality of these reports was assured through the document approvals process outlined in section 2.5 and comments by Ricardo, provided as part of the independent review relating to each SDRC (with the exception of those reports relating to the independent review) relating to each SDRC are provided as supporting evidence of the quality and value of the Project outputs.

1.1.1 SDRC 9.1

“Document the learning from the experience of a third party leading a Tier 2 bid including suggestions for where the process could be more streamlined.

This will include: structure of the Project, interaction with the DNO, establishment of project partners, project costing, bid development commitment (costs and time), IPR positions, risk sharing principles and Ofgem Expert Panel / Consultant process.”

SDRC 9.1.1	Provide a report outlining key areas of learning in the areas identified above, with recommendations where applicable. The report will be published in the public domain for the audience of DNOs, Ofgem or third party companies who may wish to lead a LCN Fund project in collaboration with a DNO.	Achieved: ✓
Deadline:	February 2013	
Submitted:	February 2013	
Authoring Partner:	EA Technology	
Ricardo’s Comments:	This is a well-considered and professionally presented report documenting the bid process, issues encountered, and suggested improvements for the bid process in future. SDRC 9.4 Month 6 Independent Review, Page 16.	Good

1.1.2 SDRC 9.2

“Provide the blueprint of the contractual arrangements put in place with the DNO for a third party lead on a LCN Fund Tier 2 project.”

SDRC 9.2.1	Make available the initial contract template used between SEPD and EA Technology together with supporting guidance of the thinking behind key clauses. This will be made available for Ofgem and other DNOs to use as a starting point for future projects.	Achieved: ✓
Deadline:	April 2013	
Submitted:	April 2013	
Authoring Partner:	EA Technology	
Ricardo's Comments:	<p>SDRC 9.2.1: The Novel Commercial Arrangement is one of the key innovations of the project. This document, and associated Annexes, guides the reader through the process, documentation produced, and key learning from the process.</p> <p>Management & Delivery Document: A sensible, thorough and well-conceived 'quality' document that supports the Principal Contract between SEPD and EA Technology, and the Supporting Guidance document.</p> <p>Principal Contract Template: A robust initial template for the Principal Contract.</p> <p>Partner / Supplier Task Order Template: The document provides a suitable template for future Partner / Supplier Task Orders for similar projects. No review comments or areas for improvement noted.</p> <p>SDRC 9.4 Month 6 Independent Review, Page 16 – 17.</p>	Good
Further information:	<p>Meeting of this SDRC required multiple documents to be produced:</p> <ol style="list-style-type: none"> 1. SDRC 9.2.1 – Supporting Guidance for the Project Novel Commercial Arrangement 2. The Management & Delivery Document, created as part of the Novel Commercial Arrangement 3. The Principal Contract Template 4. This initial template was submitted to Ofgem as part of the SDRC 9.2.1 submission. The version linked below remains available for reference but is superseded by the updated contract template issued as part of SDRC 9.2.3. 5. The Partner / Supplier Task Order Template created as part of the Novel Commercial Arrangement 	
SDRC 9.2.2	Towards the end of the Project, review the contract put in place between SEPD and EA Technology. The review will focus on what worked well, what didn't work well, and what should be done differently in future projects set up in the manner of My Electric Avenue (I ² EV).	Achieved: ✓
Deadline:	October 2015	
Submitted:	October 2015	
Authoring Partner:	EA Technology	
Ricardo's Comments:	<p>SDRC 9.2 & 9.3 Report: A high quality, professional document capturing the learning from the novel commercial arrangement. This will be a useful, insightful and valuable document for Ofgem, DNOs and potential 3rd Party Lead Suppliers.</p> <p>SDRC 9.4 Month 36 Independent Review, Page 26.</p>	Excellent
Further information:	<p>This SDRC was achieved and delivered in conjunction with SDRCs 9.3.1, 9.3.2 and 9.3.3. The close interlinking of these SDRCs necessitated that a single deliverable be produced to avoid needless repetition of elements common to all four SDRC outputs. This full report, SDRC 9.2 – 9.3, was issued to Ofgem and is available for download on the Project Website.</p> <p>The section relevant to SDRC 9.2.2 begins on page 41 and benefits from an independent legal review of the contracts and supporting documentation.</p>	

SDRC 9.2.3	An updated contract template, taking into account learning from 9.2.2.	Achieved: ✓
Deadline:	December 2015	
Submitted:	October 2015	
Authoring Partner:	EA Technology	
Ricardo's Comments:	<p>It is good that a template for the Principal Contract has been included as one of the project deliverables. This template would benefit from another round of editing focused on making the document more consistent and user friendly. This, in turn, would make the template easier to adapt for future projects.</p> <p>SDRC 9.4 Month 36 Independent Review, Page 26.</p>	Adequate
Project Comment:	<p>Ricardo's comments have been noted and improvements to the contractual template are incorporated in the final, professionally published version of the template. These changes do not alter the fundamental content of the template, but make it easier to follow and understand.</p> <p>Furthermore, two NIC projects have been proposed to the 2016 submission process by Western Power Distribution (WPD). If successful, the first, 'Proteus'⁷ shall be delivered on behalf of WPD by Ricardo with the second, 'OpenLV'⁸ being delivered by EA Technology. In both instances, the updated contract template is expected to be utilised as a starting point for the commercial agreements.</p>	

1.1.3 SDRC 9.3

"An assessment, based on direct experience of how a third party can effectively manage delivery on innovative projects with a DNO and whether this allows DNOs to take on more innovation projects."

SDRC 9.3.1	<p>A report detailing processes established and utilised throughout the Project including templates of any forms and records of meetings / regular communications created as part of the process.</p> <p>This will include an evaluation of the collaboration between SEPD and Northern Powergrid with a 3rd party interface.</p>	Achieved: ✓
Deadline:	October 2015	
Submitted:	October 2015	
Authoring Partner:	EA Technology & SEPD	
Ricardo's Comments:	<p>SDRC 9.2 & 9.3 Report: A high quality, professional document capturing the learning from the novel commercial arrangement. This will be a useful, insightful and valuable document for Ofgem, DNOs and potential 3rd Party Lead Suppliers.</p> <p>SDRC 9.4 Month 36 Independent Review, Page 26.</p>	Excellent
Further information:	<p>This SDRC was achieved and delivered in conjunction with SDRCs 9.2.2, 9.3.2 and 9.3.3. The close interlinking of these SDRCs necessitated that a single deliverable be produced to avoid needless repetition of elements common to all four SDRC outputs. This full report, SDRC 9.2 – 9.3, was issued to Ofgem and is available for download on the Project Website.</p> <p>The section relevant to SDRC 9.3.1 begins on page 14.</p>	

⁷ https://www.ofgem.gov.uk/system/files/docs/2016/04/electricity_isp_proforma_nic_wpd_proteus_ricardo_-_2016.pdf

⁸ https://www.ofgem.gov.uk/system/files/docs/2016/04/electricity_isp_proforma_nic_wpd_openlv_pdf_0.pdf

SDRC 9.3.2	A framework to enable update suggestions to SSEPD policies and / or procedures, identified during the course of the Project will be provided.	Achieved: ✓
Deadline:	October 2015	
Submitted:	October 2015	
Authoring Partner:	EA Technology & SSEPD	
Ricardo's Comments:	SDRC 9.2 & 9.3 Report: A high quality, professional document capturing the learning from the novel commercial arrangement. This will be a useful, insightful and valuable document for Ofgem, DNOs and potential 3rd Party Lead Suppliers. SDRC 9.4 Month 36 Independent Review, Page 26.	Excellent
Further information:	This SDRC was achieved and delivered in conjunction with SDRCs 9.2.2, 9.3.1 and 9.3.3. The close interlinking of these SDRCs necessitated that a single deliverable be produced to avoid needless repetition of elements common to all four SDRC outputs. This full report, SDRC 9.2 – 9.3, was issued to Ofgem and is available for download on the Project Website. The section relevant to SDRC 9.3.2 begins on page 28.	

SDRC 9.3.3	An assessment by SSEPD of the level of effort expended on Project Management of the My Electric Avenue (I ² EV) Project by the staff involved in comparison to previous innovation projects.	Achieved: ✓
Deadline:	October 2015	
Submitted:	October 2015	
Authoring Partner:	EA Technology & SSEPD	
Ricardo's Comments:	SDRC 9.2 & 9.3 Report: A high quality, professional document capturing the learning from the novel commercial arrangement. This will be a useful, insightful and valuable document for Ofgem, DNOs and potential 3rd Party Lead Suppliers. SDRC 9.4 Month 36 Independent Review, Page 26.	Excellent
Further information:	This SDRC was achieved and delivered in conjunction with SDRCs 9.2.2, 9.3.1 and 9.3.2. The close interlinking of these SDRCs necessitated that a single deliverable be produced to avoid needless repetition of elements common to all four SDRC outputs. This full report, SDRC 9.2 – 9.3, was issued to Ofgem and is available for download on the Project Website. The section relevant to SDRC 9.3.3 begins on page 30 and details a comparison of effort required by SSEPD to support delivery of the My Electric Avenue Project in comparison to another SSEPD LCN Fund Tier 2 Project, New Thames Valley Vision (NTVV).	

1.1.4 SDRC 9.4

“An assessment of how the DNO and other interested parties can ensure independent validation of a third party’s Solution throughout a project and upon completion.”

SDRC 9.4.1	The provision of six independent reviews of the Project and technology with specific inclusion of improvements and adaptations to working practices incorporated by the Project Team ⁹ following the previous independent review(s). a) Produce six monthly report (highlighting strengths and improvement areas) to be tabled at steering group meetings). b) Produce response to 6 monthly report, detailing improvements planned by Project Steering Group as a result of the review.	Achieved: ✓
Deadline:	1. July 2013 2. January 2014 3. July 2014 4. January 2015 5. July 2015 6. December 2015	
Submitted:	1. July 2013 2. January 2014 3. July 2014 4. January 2015 5. July 2015 6. December 2015	
Authoring Partner:	Ricardo, EA Technology & SSEPD	
Ricardo’s Comments:	Not applicable due to conflict of interest.	
Project Comments:	EA Technology and SSEPD undertook the review of Ricardo’s independent evaluation, providing challenge where appropriate and implementing improvements to the Project processes and outputs where recommendations were made and value would be added to the Project. Where the potential value to be gained of a recommendation did not warrant implementation within the My Electric Avenue Project, it was acknowledged as an improvement to be considered in future projects.	
Further information:	Each six monthly report was reviewed by the Project Management Team in both SSEPD and EA Technology. EA Technology recommended where improvements should be implemented or considered as valuable learning for future projects. This was agreed with SSEPD and formed the basis of the Project’s response to each independent review. This response to each six monthly report, including the Executive Summary of the independent review, was submitted to Ofgem in accordance with the planned schedule. At completion of the Project, the full independent reviews and the Project Management Team’s responses were collated into three volumes, one for each year. These have been published on the Project website and are linked below. Examples of the Project’s response to recommendations made by Ricardo are provided in section 3.1.	

⁹ The Project Team refers to the core staff working on the Project across all companies involved in the delivery of My Electric Avenue.

1.1.5 SDRC 9.5

“Sign-up and secure involvement of sufficient customers in the trial to adequately test the Technology.”

SDRC 9.5.0	Customer engagement: submission of Customer Engagement Plan (CEP) and Data Protection Strategy (DPS) for Authority approval.	Achieved: ✓
Deadline:	February 2013	
Submitted:	February 2013	
Authoring Partner:	EA Technology	
Ricardo's Comments:	CEP: Describes a good, well-thought through plan for engaging with potential trial participants. DPS: Appears to be sensible and appropriate for this type of project.	Good
Further information:	The CEP and DPS were both revised during the course of the Project when necessary changes were identified. The CEP was changed in order to enable further recruitment of customers for the purposes of locating communication repeaters in their property, an approach that was not ultimately implemented. The DPS was changed to allow De Montfort University to utilise a specific customer survey and response analytics software that processed data on a remote server. The links below refer to the latest updates under which the Project was operating.	

SDRC 9.5.1	Technology trials: Establishment of the cluster groups to trial the Solution.	Achieved: ✓
Deadline:	a) September 2013 – Sign-up of three cluster groups b) December 2013 – Sign-up of five cluster groups c) March 2014 – Sign-up of 100 customers, in at least seven cluster groups, with at least ten customers d) August 2014 – Sign-up of ten cluster groups	
Submitted:	a) September 2013 – Sign-up of three cluster groups b) October 2013 – Sign-up of five cluster groups c) March 2014 – Sign-up of 100 customers, in at least seven cluster groups, with at least ten customers d) March 2014 – Sign-up of ten cluster groups	
Authoring Partner:	EA Technology	
Ricardo's Comments:	Sign up of three cluster groups: Completed to schedule. Sign up of five cluster groups: Completed ahead of schedule. Sign up of 100 customers, in at least seven cluster groups, with at least ten customers: Completed to schedule. Sign up of ten cluster groups: Completed ahead of schedule.	Good

SDRC 9.5.2	All cluster funding allocated due to successful establishment of clusters.	Achieved: ✓
Deadline:	August 2014	
Submitted:	August 2014	
Authoring Partner:	EA Technology	
Ricardo's Comments:	Completed to schedule.	Good

SDRC 9.5.3	Minimum of 100 EV drivers signed up to have their driving habits recorded.	Achieved: ✓
Deadline:	August 2014	
Submitted:	August 2014	
Authoring Partner:	EA Technology	
Ricardo's Comments:	Completed to schedule.	Good

1.1.6 SDRC 9.6

“An assessment of the public acceptance (or otherwise) to Demand Side Response of EVs using this sort of technology.”

SDRC 9.6.1	A report documenting the finding from the socio-economic analysis on public reaction to the Technology.	Achieved: ✓
Deadline:	October 2015	
Submitted:	October 2015	
Authoring Partner:	De Montfort University	
Ricardo's Comments:	A professional, well-written scientific report on the social aspects of the MEA trials, prepared by De Montfort University with support from EA Technology. The “Summary of Findings” boxes are useful for quickly understanding the key results from the participant questionnaires and interviews.	Good

1.1.7 SDRC 9.7

“An assessment of the most appropriate integration of the Technology for different applications and suitable cycling times, or reasons why this is not possible if the trials are unsuccessful.”

SDRC 9.7.1	Documentation describing: <ul style="list-style-type: none"> a) Views of the OEM community of the impact, (if any), that cycling of EVs (or heat pumps) may have on their product(s) and end of life. b) Recommendations of suitable cycle times for EVs and heat pumps for demand-side response. c) Evidence of whether the Esprit solution would be feasible combining the learning available at the time from SDRCs 9.5 and 9.6. 	Achieved: ✓
Deadline:	June 2015	
Submitted:	June 2015	
Authoring Partner:	EA Technology	
Ricardo's Comments:	SDRC 9.7.1 has been completed to schedule. The learning captured in this report is highly relevant to the future development and commercial role out of Esprit or similar system. This makes it a key deliverable from the Project. Learning about the Esprit through the Technical Trial has been extensive. All aspects of the technology have been considered, from its design and installation to in-situ operation and functionality, with the exception of decommissioning. The Project Team has also thought through the various business models that could be applied for the commercial roll-out of the technology.	Good
Further information:	In support of the SDRC 9.7.1 document, two separate reports, referenced by the SDRC document were produced assessing: <ul style="list-style-type: none"> a) The impact of EVs on the voltage of LV networks. b) The impact of Esprit on heat pumps. c) The impact of Esprit on cable thermal ratings of LV networks. <p>This suite of reports combined feedback from the OEMs, with EA Technology’s expertise relating to the</p>	

LV network to evaluate the potential effectiveness of the Esprit technology.

1.1.8 SDRC 9.8

“An assessment of how much headroom this sort of technical solution would yield, considering different network topologies and load types.”

SDRC 9.8.1	<p>Modelling to understand additional headroom available / other network benefits from using the Technology.</p> <ul style="list-style-type: none"> a) The models will assess the % of thermal and voltage headroom and produce estimates of the potential benefits. b) Delivery of an updated Solution Template specific to the Technology and any update EV charging profiles for use in the GB Smart Grid Forum modelling tool. 	Achieved: ✓
<p>Deadline: November 2015</p>		
<p>Submitted: November 2015</p>		
<p>Authoring Partner: EA Technology, with extensive reference to a suite of five reports delivered by the University of Manchester</p>		
Ricardo's Comments:	<p>SDRC 9.8: A complete draft of this report was provided for the M36 Independent Review. This has the potential to be an excellent report.</p> <p><i>Note: these comments refer to the initial draft version of the SDRC 9.8 report due to timing conflict between submission of the 9.8 report and when the independent review needed to be undertaken to meet the deadline for SDRC 9.4.</i></p> <p>Modelling & Analysis Reports: The University of Manchester reports demonstrate a professional approach following a logical structure with clear wording and good learning/conclusions drawn. Overall, The University of Manchester provided excellent network modelling and analysis.¹⁰</p>	Good
<p>Project Comments: Some recommendations were made by Ricardo as part of the independent review of the initial draft version of the report however these had already been addressed as part of the Project's Quality Assurance process.</p>		
<p>Further information: In support of the SDRC 9.8.1 document, an additional report examining the effectiveness of the PLC communication system utilised in the My Electric Avenue Project was produced. This report, referenced in SDRC 9.8.1, examined the multitude of factors that affected the ability to reliably transmit and receive control signals along the LV feeders.</p> <p>The deliverables from the University of Manchester, relating to the modelling of LV networks, the impact of EVs and benefits of deploying Esprit were delivered in a suite of five reports, also referenced in the SDRC 9.8.1 document.</p> <p>All reports referenced by the primary SDRC document are linked below.</p>		

¹⁰ Note: Ricardo's comments relating to the University of Manchester deliverables are extracted from the six independent reviews and summarised to meet the appropriate context.

1.2 Cost effectiveness

1.2.1 Evaluation of expenditure

Due to the third party lead, the majority of the costs incurred by the My Electric Avenue Project, are within the Ofgem category 'Contractors'. Categories of Equipment, Payments to Users and Contingency experienced brief periods of isolated, focussed expenditure rather than regular outlay throughout the Project. The allowable expenditure for each Category is taken from the Change Request to the Project Direction approved by Ofgem in July 2015 (refer to section 2.4). The Project did not exceed 105% of allowable budget in any Ofgem Category with an overview of the expenditure provided below.

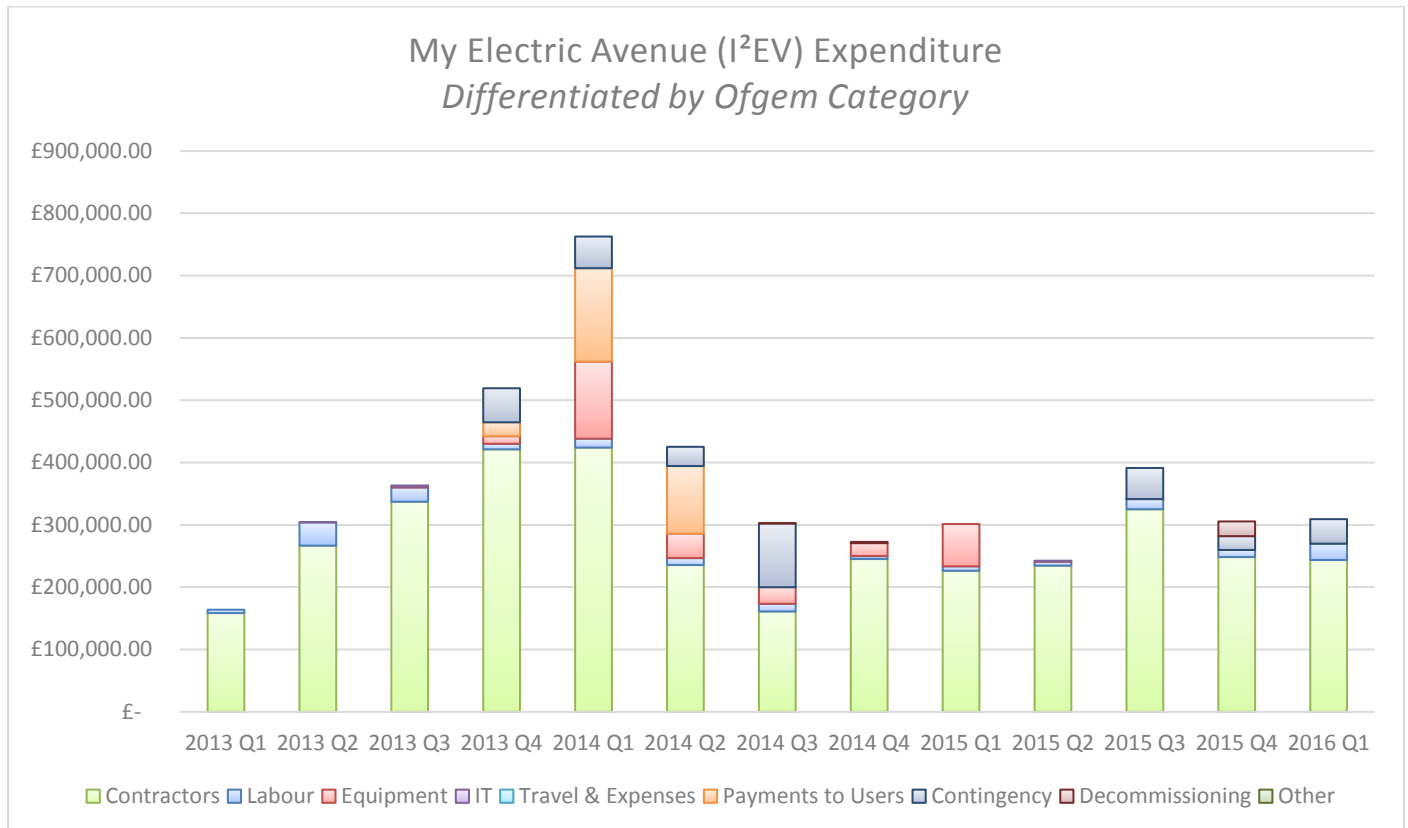


Figure 2 Expenditure Differentiated by Ofgem Category

Cost effectiveness was assured for the Project through the procurement process (detailed in section 1.2.5), whereby Project Partners provided fixed price quotations for evaluation by Ofgem's Expert Panel. Following the scope increase introduced to the Project via additional clauses in the Project Direction, it fell to the individual companies to derive further efficiencies where possible as further funding was not available from the LCN Fund. In-kind contributions were also required to enable the increased scope to be achieved, (refer to section 1.2.2) further increasing the value to customers.

Processes used to ensure efficient delivery of the Project are provided in sections 1.2.5 and 2.

Table 2 My Electric Avenue Project Expenditure and Variation by Ofgem Category

<i>Ofgem Category</i>	<i>Category Budget</i>	<i>Category Expenditure</i>	<i>% Expended</i>	<i>% Variance</i>
<i>Labour</i>	£222,250.00	£184,397.02	82.97%	-17.03%
	The level of effort required by SEPD to provide Project Assurance and Governance support was significantly reduced in the final year of the Project in comparison with expectations.			
<i>Equipment</i>	£278,630.00	£292,546.99	104.99%	+4.99%
	The cost of equipment was reduced by EA Technology as part of the additional in-kind contribution provided in support the Change Request. This significantly reduced the costs (c£206k) in comparison to those planned for during the bid submission; refer to section 1.2.2.			
<i>Contractors</i>	£3,532,150.00	£3,527,164.69	99.86%	-0.14%
	EA Technology accommodated the additional recruitment effort required as a consequence of the Project Direction by reducing day rates below that originally quoted in the bid submission. This allowed additional work to be undertaken within the available budget.			
	Fixed price contract arrangements were implemented with all Project Partners and Suppliers ensuring that unforeseeable cost changes could not adversely affect the Project. Additional in-kind contributions by EA Technology, Fleetdrive Electric and Nissan were also provided; for further details, refer to section 0.			
	Management of Project delivery by the multiple Project Partners is detailed in section 2.			
<i>IT</i>	£2,710.00	£2,813.66	103.83%	+3.83%
<i>Travel & Expenses</i>	£3,000.00	£0.00	0.00%	-100%
	SEPD's Travel & Expense costs were included within their staff overhead costs for the Project and so are included within the 'Labour' category rather than being separated into this category.			
<i>Payments to Users</i>	£276,630.00	£280,617.58	101.44%	+1.44%
	Expenditure against the Payments to Users category was utilised to fund the EV lease subsidy for technical trial participants. Due to the business-as-usual processes associated with vehicle leasing arrangements, there was potential for minor changes in overall leasing costs between each financial Quarter to be borne by the Project in order to maintain a fixed lease rate for all customers. Details of the in-kind contribution provided to the Project by Nissan via this mechanism can be found in the original bid submission documentation.			
<i>Contingency</i>	£400,400.00	£350,028.01	87.42%	-12.58%
	The process for requesting and authorising the use of contingency is detailed in section 1.2.3. The full budget allowed for was not required, resulting in a Category under spend of £50.37k.			
<i>Decommissioning</i>	£26,290.00	£25,757.11	97.97%	-2.03%
<i>Other</i>	£7,370.00	£0.00	0.00%	-100%
	No expenditure was made against this category. It had been intended to provide a budget for taxis or hire vehicles in the event the Esprit technology operated incorrectly and prevented participants from using their vehicle.			
<i>Total</i>	£4,749,430.00	£4,663,325.06	98.19%	-1.81%

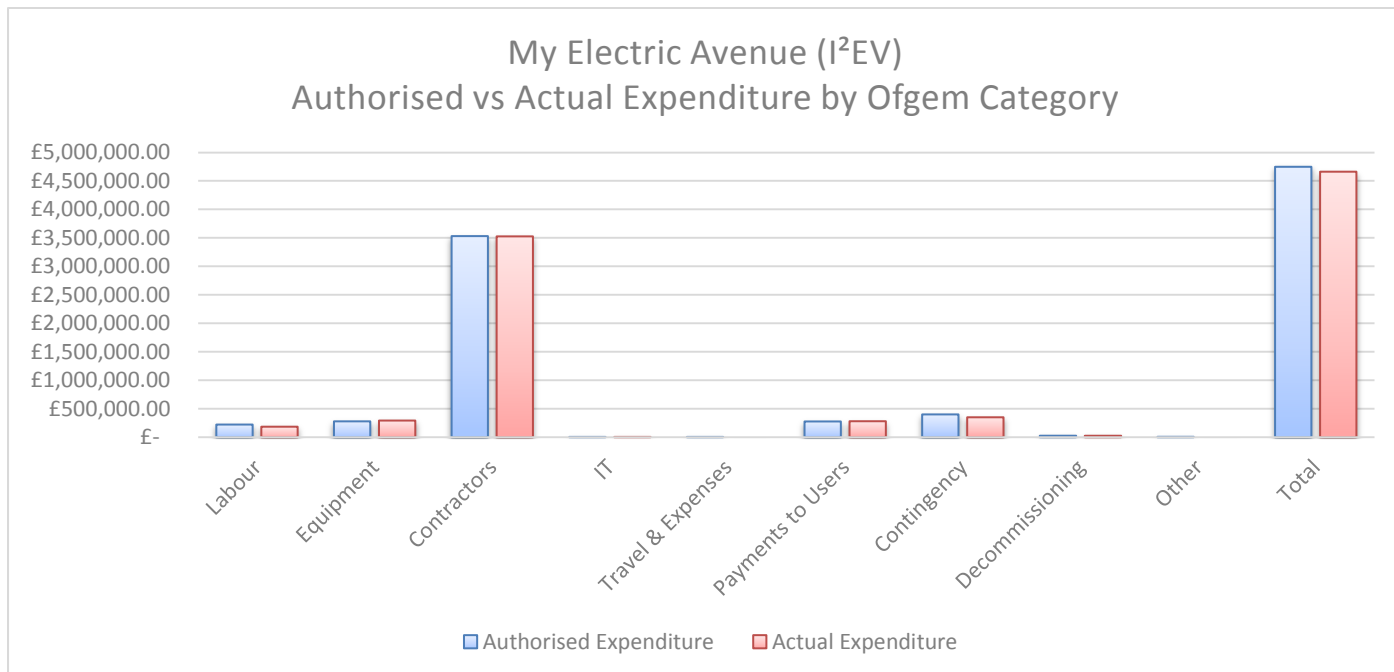


Figure 3 Actual vs Authorised Expenditure by Ofgem Category

1.2.2 In-kind contributions

Due to the change to the recruitment methodology, introduced to the Project as a consequence of additional clauses in the Project Direction, (refer to section 2.4 for details), it was necessary for further in-kind contributions to be provided to support the change in scope.

EA Technology reduced the staff rates quoted during the bid submission phase, allowing more resource effort to be provided over the course of the Project for the same cost. EA Technology also increased the subsidy on the Esprit equipment and associated support, providing in total approximately £1,000,000 in-kind contribution beyond the £600,000 planned during bid submission.

Similarly, Fleetdrive Electric increased their in-kind contribution by approximately £60,000 by incurring significant additional costs whilst successfully recruiting trial participants and not passing all of the costs on to the Project. This increased the in-kind contribution provided by Fleetdrive Electric to approximately £158,000.

At the end of the Project, Nissan elected to further increase their in-kind contribution to the Project by not invoicing for their element of staff support. This further in-kind contribution of £50,000 was provided in addition to the preferential lease rates of the Nissan LEAF provided to the Project.

At the point of bid submission, the total in-kind contribution for the Project was anticipated to be c£4,908,000; with the addition of the further in-kind contributions detailed in 2.4, this increased to c£5,620,000.

1.2.3 Use of contingency

During the bid submission, SEPD and EA Technology requested an explicit contingency budget to enable rapid response to changing situations within the Project, and it was stated as part of the request that any unused contingency would be returned to customers at the end of the Project.

As outlined above, the use of contingency funds required approval from the Project Steering Group. In total, 12 requests were submitted for the use of contingency: two were subsequently withdrawn, two were rejected and eight were approved. The fully approved use of contingency totalled £352,828 although ultimately, not all of this was required. Consequently, the expenditure of contingency totalled £350,028, leaving £50,372 of the Contingency budget unutilised.

The Project Contingency was managed by the Steering Group, with both EA Technology and SSEPD needed to authorise contingency expenditure. This required Steering Group representatives from each company to agree that the request was valid, and would add value to the Project. Each contingency request linked to relevant risks on the risk register and any company within the Project could request the use of contingency funds. Partners would submit a request to EA Technology’s Project Management team who would initially approve or reject the request. If the request was deemed valid, it was passed on to SSEPD for further discussion and approval or rejection. Where a contingency request originated with SSEPD, it would be passed to EA Technology for review and return or approval.

Not all contingency requests were approved, with some being rejected or requiring further clarification or justification. The Contingency Request Template form is provided in Appendix V and details of each submitted request are in Appendix VI.

Requests were required to detail the financial value of the request, the impact to the Project if the request were to be rejected and additional value to the Project if it were approved.

1.2.4 Return of funding

The My Electric Avenue Project was awarded a total expenditure allowance of £4,749,429, consisting of funding from the following sources:

1. LCN Fund Award - £4,174,958
2. DNO Compulsory Contribution - £474,943
3. Assumed achievable interest - £99,528

In reality, due to low interest base rates in the UK over the duration of the Project, the achieved interest in the bank account was only £13,949. The efficiencies achieved by the Project resulted in an effective under spend relative to the Project Budget of £86,105, but due to the reduced interest rate, only £567 remains in the bank account for return to customers.

1.2.5 Procurement process

At the time of project inception, the range of companies that could provide the necessary expertise to deliver the Project was limited; this was referred to in SDRC 9.1. The Nissan LEAF was the only pure electric vehicle available for deployment in sufficient numbers to meet the purpose of the Project and consequently, very few leasing companies were offering EVs in any form. Fleetdrive had recently established an EV focussed area of the business (Fleetdrive Electric) and were already working with Nissan to offer the LEAF to individual customers, not just to companies. Both Nissan and Fleetdrive Electric, realising the value of the proposed Project to the automotive industry as well as the energy sector, offered to become Project Partners¹¹, providing an in-kind contribution to the Project as part of their participation. Details of the in-kind contributions offered are available in the Project Bid Submission documentation on Ofgem's website, linked in Appendix III.

Government incentives relating to EV charging points had resulted in their availability around the UK, but the Project team recognised that specific expertise in the provision, installation and maintenance of charging points would be beneficial, falling outside the core business expertise of both EA Technology and SSEPD. Zero Carbon Futures (ZCF) (at the time of bid inception trading under the name Charge Your Car North Ltd), were initially approached for assistance following their previous work with Nissan, providing charging point expertise at Nissan's Sunderland manufacturing plant. ZCF subsequently joined the team of Project Partners during the bid process.

All companies participating in the My Electric Avenue Project, (Partners and Suppliers), named in the bid submission provided fixed price quotations for the work detailed in the bid. This secured value for money and reduced the Project risk by dispersing risk of delivery to the organisations best equipped to mitigate and manage any risks that may have occurred.

The effective day rates for each company, allowing for the in-kind contribution, fees to be invoiced and anticipated resource requirements were provided to Ofgem's Expert Panel as part of the bid submission process. These rates were deemed to provide sufficient value to the customer for the Project to be approved. The subsequent increase in Project scope, introduced through the Project Direction and necessitating further in-kind contribution to be provided to the Project (refer to section 1.2.2) further reduced this day rate and increased the end-value to the customer.

Post Project award, Ricardo and SSEC were awarded Supplier roles via competitive tender. Ricardo were contracted directly to the Project via EA Technology to provide the Independent Review whereas SSEC were contracted to ZCF to provide installation capabilities for the trial equipment.

In summary, where the Project required bespoke expertise or a particular product with limited supplier options, fixed price contract values were negotiated and discussed with Ofgem as part of the bid development process. Where expertise could be procured from multiple potential companies, a competitive tender approach was followed.

1.3 Summary

The My Electric Avenue Project has delivered the planned outcomes in a cost effective manner for the customer despite the increased scope introduced through additional clauses in the Project Direction. These clauses, inserted for the purpose of protecting customer money, increased the Project scope through specifying a more complex recruitment approach. Accordingly, this increased the cost to deliver the recruitment for the Project. This increase was mitigated, partially through re-

¹¹ The term 'Project Partners' is used to signify that the company referred to provided an in-kind contribution to the Project. Companies involved in the Project without providing an in-kind contribution are referred to as Project Suppliers.

planning later stages of the work but mostly through increases in the in-kind contribution by EA Technology, Fleetdrive Electric and Nissan. These additional contributions were further supplemented by SEPD requiring less effort to support Project Delivery than had been originally anticipated.

The additional in-kind contributions agreed as part of the Change Request, were determined to have raised the total value of the Project to approximately £10.12 million, an increase from £9.66 million, with no increase to the funding provided by the LCN Fund.

In total, the unused budget equates to £86,105, achieved in-spite of increased scope requirements being accomplished within the original budget and timescales.

The My Electric Avenue Project Team believe this demonstrates the Project was delivered cost effectively whilst providing greater value for the customer.

2. Evidence of Project Management

2.1 Project management principles, processes and practices

The My Electric Avenue Project utilised a Project Management approach that combined PRINCE2 and Agile methodologies. A PRINCE2 based approach was utilised for financial tracking, forecasting and reporting purposes but Agile was more appropriate for reacting to the quickly changing landscape of customer recruitment, ordering of vehicles and deployment of trial equipment.

Furthermore, due to the nature of the My Electric Avenue Project, specifically the commercial innovation being trialled, it was essential for EA Technology to provide SEPD with sufficient information to confirm that the Project was being delivered effectively and efficiently, without conflicting with any wider licensing requirements. This was necessary without placing an undue burden on the core Project Management team at EA Technology or supporting staff at SEPD. This overall approach enabled delivery of all Project requirements on or ahead of schedule for less cost than originally anticipated.

2.1.1 Project Governance arrangements

A significant element of the My Electric Avenue Project was to establish and trial a commercial and project delivery approach to enable a third party to deliver an innovation Project on behalf of a DNO. The approach implemented needed to facilitate Project Delivery whilst enabling the DNO to retain responsibility for licence critical elements. This necessitated an approach that provided the DNO with sufficient assurance that the Project was proceeding appropriately whilst giving the ability to step-in and take over if circumstances required it.

An overview of the established approach is below, and comprises:

A **Project Steering Group**, consisting of Directors from both SEPD and EA Technology, charged with providing oversight and strategic input to the Project. Furthermore, contingency could not be accessed without authorisation from a Steering Group member from each company. The Steering Group initially convened every quarter, but once the trial recruitment was complete and the trials were underway, reduced this to convening by exception. Company representatives from the Project Assurance Team provided regular briefings to the Steering Group, who were also included in the distribution of all monthly Project Management updates.

A **Project Assurance Team** consisting of designated staff from both SEPD and EA Technology provided the main interface between the two companies. The team convened via teleconference once a month to discuss the project's progress against plan, status of deliverables, expenditure and forecast costs, and issues, risks and mitigations. EA Technology issued a monthly Project Summary Report (PSR) that provided a 'one page overview' of the Project covering all of the above points that served as the basis for the meeting discussions; a template of this PSR is provided in Appendix VII and detailed further in SDRC 9.2 & 9.3.

The **Project Manager** within EA Technology was responsible for the Project's delivery on-time and on-budget.

Due to the disparate elements of work within the overall Project, each area was led by a separate individual within EA Technology to ensure consistency of approach and decisions with each area reporting to the Project Manager in matters of delivery, budget and risks.

These individuals provided single points of contact for the Project Partners working within each area of the Project. The organisational structure of the Project is provided in Appendix VIII, which details the Partner responsible for delivery of each area of work. Where extensive coordination and transference of high volumes of data were required, this is also shown.

2.1.2 Contractual arrangements

The contractual arrangements implemented by the My Electric Avenue Project were detailed in the 'Management and Delivery Document' available on the Project website¹², issued in support of the principal and sub-contracts. It detailed:

- The contractual hierarchy of the Project Partners and contractual documents
- The roles and responsibilities of each company
- Intended learning outcomes of the Project
- Reporting requirements
- Document approval process.

The contractual arrangement enabled effective, efficient delivery of the Project, evidenced by the delivery of a larger Project scope, for less than the allowed budget (refer to section 1.2.1) with all milestones being achieved on or ahead of schedule (section 1.1). SEPD's evaluation of the effectiveness of the commercial arrangement is detailed in SDRC 9.3.3, (section 1.1.3).

This approach allowed each Partner to manage delivery of their element of the Project, working within their specific area of expertise, with overall coordination by EA Technology. This in turn, reduced the involvement required by SEPD to ensure delivery further than had been originally anticipated at bid development. The approach utilised in the Novel Commercial arrangement was praised by Ricardo in the final Independent Review as effective and adding value to the industry (refer to section 0).

2.2 Responding to change and uncertainty

The frequent teleconferences between the Project Partners enabled a coordinated response to changing circumstances or identified risks. When a need to change approach or plans was identified, by any member of the Project Team, recommendations were made, discussed and agreed with actions taken by whichever company was the most appropriate.

ZCF and Fleetdrive Electric had responsibility for liaising with Project participants, primarily due to having built relationships during the recruitment phase, and retaining responsibility for the installed charging points and leased vehicles.

As expected in any Innovation Project, issues arose that required the Project to change approach and plans. Examples of key situations where this occurred and was reported are summarised below with reference to the evidential documentation.

- Customer recruitment changes introduced via additional clauses in the Project Direction. The impact of this was raised during the Project Direction negotiations (pre-Project commencement) and it is referred to in each Project Progress Report (PPR) issued by the Project.
- Issues identified with the manufacture and installation of ICBs were resolved; referred to in June 2014 PPR.
- Varying levels of effectiveness of the PLC medium were experienced throughout the Project with the Project responding to each occurrence as required. These were reported in PPRs issued in December 2013, December 2014 and June 2015.
- The need to continually liaise with cluster participants, and in some instances restart the recruitment process due to participant withdrawal before funding was released to commence equipment deployment. This provided a high level of risk and uncertainty to the Project. This was raised in the June 2013 PPR and also in multiple teleconferences with Ofgem over the same period.
- The Project planned to install devices to strengthen the PLC signal in one of the Northern clusters but was forced to reschedule the planned works, and change the installation approach due to strong objections being raised by residents (PPR June 2014).

2.3 Processes for risk management

2.3.1 Risk register

Risks affecting the Project were managed by the delivery team starting during the bid submission stage. The risk register created during bid development and submitted to Ofgem as part of that process was used as a 'live' document, transitioning through 33 iterations between official project commencement in January 2013 and completion in December 2015.

This register tracked all identified risks and issues throughout the course of the Project, detailing the potential financial impact to the Project, mitigation actions in place to reduce the probability of the risk occurring or reduce the impact and the party responsible for managing it. In total, 124 separate risks were identified, tracked and managed throughout the Project, varying in complexity and potential impact to the Project, with all risks being closed by Project completion.

¹² <http://myelectricavenue.info/sites/default/files/Annex%201%20-%2012EV%20%28My%20Electric%20Avenue%29%20Management%20and%20Delivery%20Document%20-%20Issue%201.0.pdf>

Regular teleconferences were held between all Project Partners, varying in frequency dependent on the scale and importance of work underway at any particular time. For example, during the period of intensive customer recruitment, conference calls were held weekly to raise new risks and opportunities to be considered, whereas during the monitoring phase, these calls were scaled back to a regular monthly call. Throughout the project however, urgent issues or opportunities were escalated immediately upon identification.

Identified risks were considered for the potential impact on the Project delivery (schedule and cost), the probability of occurrence and the cost of mitigation. Mitigation measures were only enacted if the cost to implement was worth the expenditure when compared to the cost and probability of occurrence of the risk.

The risk register was reviewed on a regular basis throughout the Project, with key risks raised to the Project Steering Group as part of the monthly reporting procedure.

No issues occurred that prevented the Project from achieving the required Project outcomes relating to recruitment targets, or gathering sufficient data to generate the necessary learning. The risk that introduced the greatest significant potential impact to the Project remained the lack of available funding for equipment deployment resulting in participants withdrawing from the trials. This was identified by the Project Team during the Project Direction negotiations but avoidance was outside the control of the Project team. All key risks and details of how the Project mitigated those risks can be found in the 6 monthly Project Progress Reports (see Appendix III for hyperlinks).

2.3.2 Project progress reports

Key risks and issues that occurred within each reporting period were detailed within the Project Progress Reports, issued to Ofgem at six month intervals. These reports detailed risks and issues that had the reasonable potential to impact the Project's delivery schedule, budget or learning outcomes.

Early in the Project, the primary risks related to customer recruitment, with specific emphasis on the delays that would be experienced by participants signing up early for the Project and then being required to wait for up to 12 months before the trials commenced. The first two Project Progress Reports (June and December 2013) focussed heavily on this matter. Mitigation of this risk was managed through extensive communication with Project participants and, where necessary, recruiting additional participants when customers withdrew from the trials due to delays in trial instigation.

The 'recruitment risk' escalated towards the end of the first year of the Project (December 2013 Project Progress Report) with fluctuation in clusters occurring as participants that had previously committed to participate in the trial withdrew due to the need to purchase or lease a new car; they were unable to wait for the Project to complete recruitment of all ten clusters.

During the latter stage of the Project, as part of routine maintenance activities, several RCBOs (Residual Current circuit Breaker with Overcurrent protection) within participant's EV charging points were found to have failed in an unsafe manner. The Project instigated a programme of replacing all RCBOs with a third party equivalent device to protect against future issues. This was detailed in the December 2015 Project Progress Report.

2.3.3 Issues and opportunities

An ongoing risk throughout the technical trials related to the effectiveness of PLC communications within the Esprit equipment networks. This was identified during the bid stage and specifically related to the potential for unreliable PLC communications. Mitigation measures were implemented during the period of cluster selection and establishment, with PLC surveys undertaken prior to confirming establishment of a cluster. Further measures were deployed on a case by case basis including installation of repeater units to boost the signals, and adaptation of software to improve system reliability. This was detailed in the Project Progress Reports between December 2014 and the final report in December 2015.

Ultimately, the actual system effectiveness proved to be less capable than the survey had predicted but was still capable of generating more data than was necessary to test the Esprit system and acceptability. Additionally, the problems experienced with the PLC capability enabled extensive analysis of the PLC system capabilities and generated further learning to inform future projects considering use of this communication medium. Furthermore, the additional learning gained through managing this was disseminated in the form of the PLC Communication Reliability report, issued in support of SDRC 9.8 (Appendix III). This output was outside of the scope of the Project but the Project Partners recognised its importance to the industry.

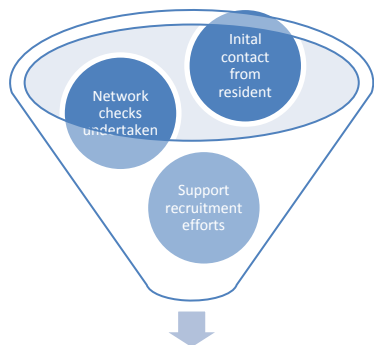
2.4 Change proposals

The bid submission team had not envisaged the possibility that the Project would only be awarded funding with a proviso that any expenditure related to deployment of trial equipment would be deemed 'disallowed' until the recruitment targets for the

technical trials were achieved¹³. The Project had planned a route of sequential recruitment and deployment, enabling recruitment effort to be focussed in a small geographic area. Following recruitment of a cluster, equipment would have been deployed and cars issued as soon as practicable.

This approach was intended to maximise data gathered, enabling any problems identified with the equipment installed or data capture processes to be corrected before further clusters were established and equipment deployed. Furthermore, the bid team hoped to capitalise on media interest for the first ‘electric vehicle streets’ and use the resulting publicity boost to more quickly recruit further clusters.

With the need to meet all recruitment targets before release of funding for the deployment of vehicles and equipment, a fundamental change in strategy was required. Recruiting multiple clusters in parallel enabled the use of generic marketing campaigns but required significant effort to coordinate cluster suitability checks and test drive events.



First ten clusters successfully recruited

It was necessary to verify the suitability of LV networks proposed for inclusion to the Project by volunteering residents. During creation of the bid submission, it was expected that the Project would need to liaise with between 30 and 50 potential clusters in a sequential manner to identify and establish ten suitable clusters for the trials. As a consequence of the parallel recruitment requirements, over 370 clusters were liaised with to support cluster champions in the recruitment of their neighbours.

This change in strategy required significantly more effort and associated expenditure than had originally been planned for customer recruitment, necessitating a ‘Request to Change the Project Direction’ to reallocate budget.

It was not possible to undertake the Project without implementing the measures outlined in the Change Request due to the fundamental changes to the planned approach required by the Project Direction. The need for a Change Request was identified and raised by the Project as part of the Project Direction negotiation process and the initial request was submitted once the Project was underway, however it was withdrawn in December 2013 to give full attention to complete the customer recruitment challenge outlined above. A second Change Request submitted in summer 2014, requesting the transfer of funds to accommodate customer recruitment was approved in July 2015 and consequently, the expenditure analysis in section 1.2.1, refers to these approved values.

The revised approach made additional funding available to the customer recruitment through the provision of additional in-kind contributions by EA Technology and Fleetdrive Electric (refer to section 1.2.2). This allowed the customer recruitment to be achieved in accordance with the SDRC requirements, despite the significant increase in cluster liaison required.

Primarily, the Project sought to re-distribute funds from the Equipment and Travel & Expenses Categories to make additional funds available for recruitment of trial participants. In order to make this financially achievable however, it was necessary for EA Technology and Fleetdrive Electric to increase their in-kind contributions (refer to section 1.2.2). In combination, these changes made sufficient funds available to achieve the customer recruitment targets detailed in the Project Direction.

The change to the customer recruitment process necessitated a change to the equipment deployment approach; specifically, deploying and commissioning all trial equipment in a short space of time rather than staggered over a period of several months.

No other changes were required to the Project approach planned during the bid submission.

2.5 Process for quality assurance

All documentation relating to Project deliverables required authorisation by both EA Technology and SEPD prior to issue. This requirement was in addition to each company’s internal quality assurance processes. All documentation was required to be checked and approved at each stage, with the option to return the report to the original author with comments and required changes clearly marked. This process ensured that all SDRCs and associated reports, whether produced by EA Technology, SEPD or other Project Partners, adhered to the same quality standards.

¹³ At least 100 participants, across at least ten clusters of participants connected to the same LV feeder, with at least seven of those clusters containing at least 10 participants.

3. Additional evidence

3.1 High level overview of learning outputs

Customer Acceptance

A key finding of the Project is that automated demand-side response of EV charging is accepted by domestic customers. There was no statistically significant difference in the opinions of domestic participants at the end of the trials between those who experienced significant active curtailment of their charging, and those who experienced little to no curtailment. This supports the view that active demand side management systems can be implemented in domestic situations, where such control can benefit the network without significant, or noticeable, effect on the end user.

At the completion of the trials, approximately 60% of the trial participants intended purchasing or leasing another EV, based on their experiences of using their Nissan LEAF for the duration of the Project. This decision does not appear to be adversely affected by any of the charging curtailment implemented throughout the Project.

Impact of EVs

The My Electric Avenue Project determined that, based on the charging profiles of more than 200 EV drivers, more than 300,000 LV networks in the UK (approximately 30%), will require intervention to support the anticipated uptake of EVs at varying penetration levels (refer to SDRC 9.8, linked in Appendix III). This demonstrates a real need for active management of EVs for the protection of LV networks, with EA Technology's Transform Model[®] identifying that Esprit, or an equivalent technology, has the potential to save the industry £2.2billion through deployment in preference to BAU reinforcement techniques.

Power Line Carrier Communications

Significant analysis was undertaken on the effectiveness of the power line carrier (PLC) communications employed by the Esprit technology, resulting in additional learning relating to factors affecting PLC. This may lead to further improvements and an increase in the effectiveness of PLC for use on electricity distribution networks.

These high level learning points were covered in the Project's suite of published reports, comprising all agreed Successful Delivery Reward Criteria Reports, plus supporting learning outputs where necessary. Each of these reports were delivered on or ahead of schedule by the Project team, providing the planned for learning and more.

3.2 Extensive dissemination of the Project learning

The My Electric Avenue Project has undertaken extensive dissemination activities across national and international arenas and targeted both the utility and automotive sectors. The wide range of companies reached through this approach has directly translated to a high level of interest and involvement in the automotive – utilities collaborative working group currently in the process of being established (refer to section 3.3). Furthermore, benefitting from the successful dissemination of the Project, My Electric Avenue was shortlisted for three awards, winning the Northern Automotive Alliance Innovation Award, sponsored by Jaguar Land Rover in 2015¹⁴.

Project Partners have also published numerous academic papers (or are awaiting acceptance) related to further learning generated by the My Electric Avenue Project. These are detailed and linked in Appendix III.

3.3 Post-My Electric Avenue

The revised contractual template (SDRC 9.2.3) is available for use or adaptation to future innovation projects within the industry. EA Technology are proposing its use in several future Projects currently under development, and other companies have signalled their intention to make use of it without the involvement of either EA Technology or SSEPD.

The My Electric Avenue Project has provided a highly positive impact on the utility and EV sectors through identifying, verifying and publicising the potential for EVs to adversely impact the GB distribution system and bring together companies capable of mitigating these issues. Both the utility and automotive sectors, as a result of the My Electric Avenue Project, recognised the need to collaborate and find solutions to facilitate uptake of EVs on GB electricity networks. As a consequence of this recognition, the EV Network Group, an automotive-utilities collaborative working group is in the process of being established to directly strengthen the communication links established by My Electric Avenue. Involvement has been secured by companies across multiple affected sectors; Government, utilities, automotive manufacture, charging point manufacturers, research and development and trade organisations. Further details relating to this group will become available in the near future.

¹⁴ The outcome of the two other awards via Energy Innovation Centre and Utility Week is unknown at time of writing.

3.4 Independent Review

The My Electric Avenue Project commissioned Ricardo, via competitive tender, to undertake an independent review of the Project as it progressed. The Invitation to Tender specifically stated the review was required to be an ‘independent evaluation of the project in its entirety’ and was to cover both the commercial and technical elements.

Ricardo provided six reports at six monthly intervals throughout the Project, highlighting Project strengths and made recommendations for improvements, either within the My Electric Avenue Project or for consideration in future innovation projects.

3.4.1 Extract from the final independent review

Ricardo’s final report, issued in December 2015 provided the below overall evaluation of the Project.

Table 3 Ricardo's Overall Assessment of the My Electric Avenue Project

<i>What is the Reviewers’ overall assessment of the project so far?</i>	Excellent
<i>Have the key objectives for the period been achieved?</i>	Yes
<i>Has the project made satisfactory progress towards meeting the overall project objectives?</i>	Yes
<i>Has each Task made satisfactory progress against the Plan of Works?</i>	Yes
<i>Has the project management been performed as required?</i>	Yes
<i>Has the collaboration between project partners and sub-contractors been effective?</i>	Yes
<i>Is there evidence of underperforming project partners or sub-contracts, lack of commitment or change in interest?</i>	No
<i>Have the project partners adequately publicised the project to raise awareness of the project with the general public?</i>	Yes
<i>Have the project partners adequately disseminated results and learning from the project?</i>	Yes

“The My Electric Avenue project has been very successful. Both the commercial and technical innovations have been demonstrated and shown to add value. The project has been delivered using a novel commercial arrangement, with SEPD as the lead DNO and EA Technology as the Third Party Lead Supplier. The Esprit technology has proven the concept of demand side response (DSR) control of EV charging to protect LV networks.

EA Technology have continued to work professionally and diligently in their role as project coordinator, successfully managing a complex arrangement of project partners and subcontractors. Teamwork within the project consortium has been excellent, with enthusiasm and morale remaining high throughout the project.

The My Electric Avenue team responded well to the various challenges encountered during the project. The changes imposed by Ofgem led to innovations in the recruitment approach, which yielded very high levels of public interest in the project. The agility and flexibility of the focused project team enabled them to respond quickly to the various issues encountered with the Esprit technology.

The My Electric Avenue project has collected a wealth of technical and social data regarding EV charging and user behaviour. This unique data set includes technical data from the electric vehicles, technical data from the monitoring of the low voltage systems and Esprit technology, and the social data concerning the experience of the Technical and Social Trial participants. Much learning has already been gleaned from this data, which has been reported in the Successful Delivery Reward Criteria reports.

The project has also delivered additional learning, such as the report on PLC communication and the Top 10 Tips series. Learning from My Electric Avenue will help to inform future projects seeking to develop demand side response (DSR) tools. It is likely that the MEA data set will be valuable input for many future academic and research projects in the UK and beyond.”

3.4.2 Independent review of Project Management

The use of specialist Project Partners, recruited for their individual areas of expertise provided significant benefits to the My Electric Avenue Project, enabling highly efficient and effective delivery. The range of companies involved, covering academia, international manufacturer, SMEs and multiple DNOs required exceptional Project Management expertise.

Ricardo highlighted EA Technology's effective Project Management of the Project in all of their independent reports throughout the Project, with specific comments extracted below.

Table 4 Extracts of Ricardo's review of the Project Management

Independent Review Reference	Extracted comment
Month 6 Independent Review, Page 18	"The project appears to be well managed by EA Technology, with good engagement from all project partners and subcontractors."
Month 12 Independent Review, Page 27	"The project continues to be well managed by EA Technology, with good participation from project partners and subcontractors."
Month 12 Independent Review, Page 28	"EA Technology has continued to cement good project management practices during this report period, introducing a monthly reporting process for project partners and continuing the monthly project partner audio meetings."
Month 18 Independent Review, Page 4	"EA Technology, the Third Party Lead Supplier, have continued to work professionally and diligently in their role as project coordinator. A good structure of Task management and progress meetings has been established to ensure good communication among the various project partner and task teams. EA Technology has continued to encourage various team building activities, such as the organisation of a press event for the first Technical Trial cluster and a face-to-face project partner meeting."
Month 18 Independent Review, Page 27	"The project continues to be well managed by EA Technology, with good participation from project partners and subcontractors. A good face-to-face project partner meeting was held in Chester on 30 April 2014 to mark the successful achievement of SDRC 9.5.1.3, enabling the Ofgem funding restrictions to be lifted and the project to proceed."
Month 24 Independent Review, Page 24	"Project management by EA Technology, as the Third Party Lead Supplier, continues to be strong. They have evidently tracked and monitored progress regarding the establishment of the Technical Trials and roll-out of the Esprit technology. They have quickly responded to the various issues encountered with the Esprit system, many of which were identified from checking the initial data."
Month 24 Independent Review, Page 36	<p>"As reported in previous Independent Reviews, the project is managed well by EA Technology. There is good participation from all project partners and subcontractors as witnessed by the Independent Reviewers at the face-to-face project partner meeting held in Chester on 3 December 2014.</p> <p>EA Technology hold monthly project partner audio meetings with all relevant project partners. Meeting minutes from these monthly partner meetings have been included "for information" in this review.</p> <p>Each project partner and subcontract completes Monthly Progress reports in Excel spreadsheet format.</p> <p>EA Technology also completes a monthly report for SSEPD and holds and associated monthly "Project Assurance" meeting."</p>
Month 30 Independent Review, Page 4	"Good teamwork and management of customer relationships continue to be key strengths of the My Electric Avenue team. Preparation for decommissioning is at an advanced stage. The plans show the project team is applying learning from the previous customer engagement activities."
Month 30 Independent Review, Page 21	"Project management and teamwork continues to be strong across the consortium. EA Technology, SSEPD, Northern Powergrid, Zero Carbon Futures, Fleetdrive Electric, De Montfort University, University of Manchester, and Automotive Comms continue to show strong commitment to the success of the project, as demonstrated during the recent Project Partner

Independent Review Reference	Extracted comment
	Meeting held on Tuesday 30 June 2015.”
Month 30 Independent Review, Page 30	“EA Technology continue to manage the project well, with good participation from all project partners and subcontractors.”
Month 36 Independent Review, Page 4	“Highlighted Strengths: Strong leadership by the Third Party Leader Supplier, EA Technology.”
Month 36 Independent Review, Page 28	“EA Technology continue to manage the project well, with good participation from all project partners and subcontractors.”
Month 36 Independent Review, Page 32	“EA Technology, as Third Party Leader Supplier for the My Electric Avenue project, has consistently shown strong leadership and good project management. Although an innovation project of this size would be considered small by a DNO, it was significant to EA Technology, who were able to give it the high priority it required to succeed. This is one of the benefits of the novel commercial arrangement trialled during this project.”

Recommendations were made by Ricardo for improving the Project, most of which were implemented during the course of the subsequent reporting period. Some recommendations, whilst valid, would have introduced additional costs to the project without providing sufficient benefit to justify such expenditure. In these instances, the recommendations were noted for future reference and will be considered in future projects.

3.4.3 Recommendations from the independent review

Specific recommendations were made by the independent reviewers to improve the quality of the Project on an ongoing basis. The majority were incorporated into the Project but some, whilst appropriate were deemed to be unlikely to provide sufficient benefit in the time remaining on the project relative to the costs required for implementation and were acknowledged but not implemented. All recommendations made by Ricardo can be found in the various SDRC 9.4 reports available on the Project website (links in Appendix III) but a selection of key recommendations are below.

Implemented recommendations

- Improve the format of the risk register to include additional information to aid in tracking and monitoring of the risks.
- Produce an internal Project Progress Report to inform the Steering Group and independent reviewers.
- Improve installation guidance documents relating to the Esprit equipment to minimise confusion by installers.
- Improve document control measures to include all project related documents; this recommendation was partially implemented, but was not expanded to include control of internal or informal documents as due to the increased administrative burden it was not considered to provide value for money.
- Utilise staff within EA Technology, not previously involved with the My Electric Avenue Project to provide a ‘peer review’ of the final reports prior to issue.

Acknowledged but not implemented recommendations

- Modify the Esprit system functionality to enable changing of settings remotely. This functionality was intentionally not included during the initial system design due to concerns over system security. Due to the product architecture it was not feasible to make such a change within the timescales of the Project.

Wider recommendations for the industry

- Acceleration of innovation projects could be realised through implementation of a similar commercial arrangement utilised in the My Electric Avenue Project.
- The energy networks sector should maintain a close technology watch and liaison with the automotive technology sector due to the anticipated development of EV technology and the potential for each sector to impact the other.

4. Summary of request for SDR

EA Technology and SEPD believe that the My Electric Avenue Project has delivered high quality outcomes and value significantly in excess of that envisaged in the bid submission. Furthermore, this was achieved within the timescales and for less than the budget allowed for in the Project Direction.

The inclusion of additional clauses via the Project Direction, for the purpose of protecting customer money, increased the Project scope through requiring a more complex recruitment approach. Accordingly, this increased the cost to deliver the recruitment, and the risk held by EA Technology, for this part of the Project. This increase was mitigated, partially through re-planning later stages of the work but mostly through increases in the in-kind contribution by EA Technology, Fleetdrive Electric and Nissan. These additional contributions were further supplemented by SEPD requiring less effort to support Project Delivery than had been originally anticipated.

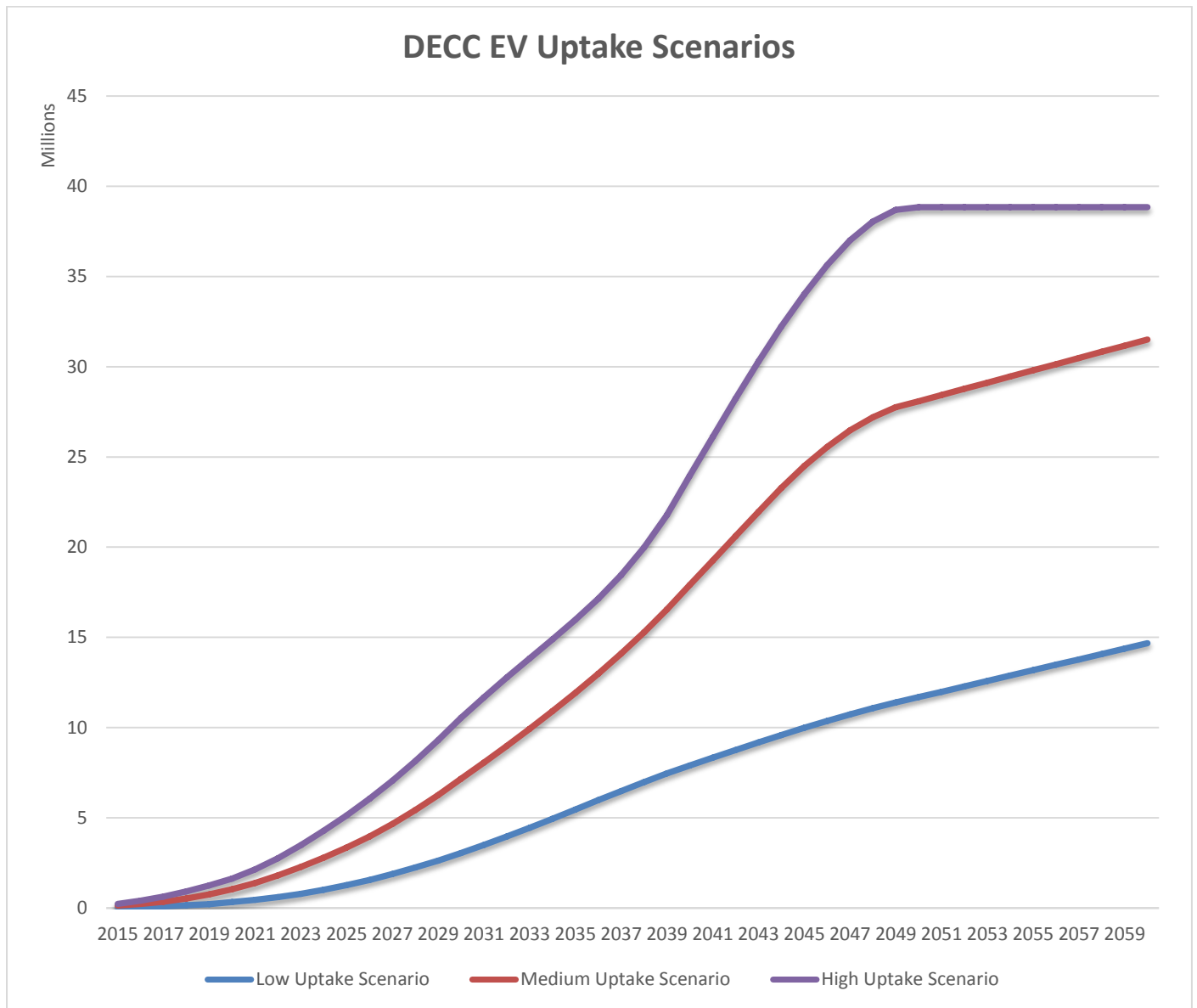
The additional in-kind contributions agreed as part of the Change Request, were determined to have raised the total value of the Project to approximately £10.12 million, an increase from £9.66 million, with no increase to the funding provided from the LCN Fund.

In total, the unused Project budget equates to £86,105, achieved despite increased scope requirements being accomplished within the original budget and timescales.

The My Electric Avenue Project Team believe this demonstrates the Project was delivered cost effectively whilst providing greater value for the customer. Finally, the opinion of Ricardo, the Project's independent reviewers is that the Project was effectively managed, delivering significant value to the industry through both the commercial and technical innovation areas.

- The Novel Commercial Arrangement, enabling a third party to deliver an innovation project on behalf of a DNO has been proved highly effective and makes it possible for future Innovation Projects to be delivered by a third party in the future.
 - Proposed projects submitted to the 2016 NIC process by WPD are expected to draw upon the novel commercial arrangement published by the My Electric Avenue Project.
- Modelling of UK networks, combined with data gathered by the Project has shown that over 30% of LV networks will experience problems at EV penetration levels exceeding 40%, and provides DNOs with the information required to more effectively identify 'at-risk' networks as the number of connected EVs increases.
- The Esprit technology has proved that DSR technology can be deployed by DNOs as an effective mitigation to LV network overloads whilst being acceptable to consumers.
- Significant datasets have been generated by the Project that will provide benefits to future LCN Fund projects, the wider electricity and automotive industries and academia.
- The closer working relationship between the electricity and automotive industries is a significant step towards the collaboration necessary to ensure uptake of EVs, and the resulting benefits to a low carbon future are not hindered by insufficient network capabilities.
- The Independent Review of the Project, provided by Ricardo, found it to be very successful, with an overall rating of "Excellent."

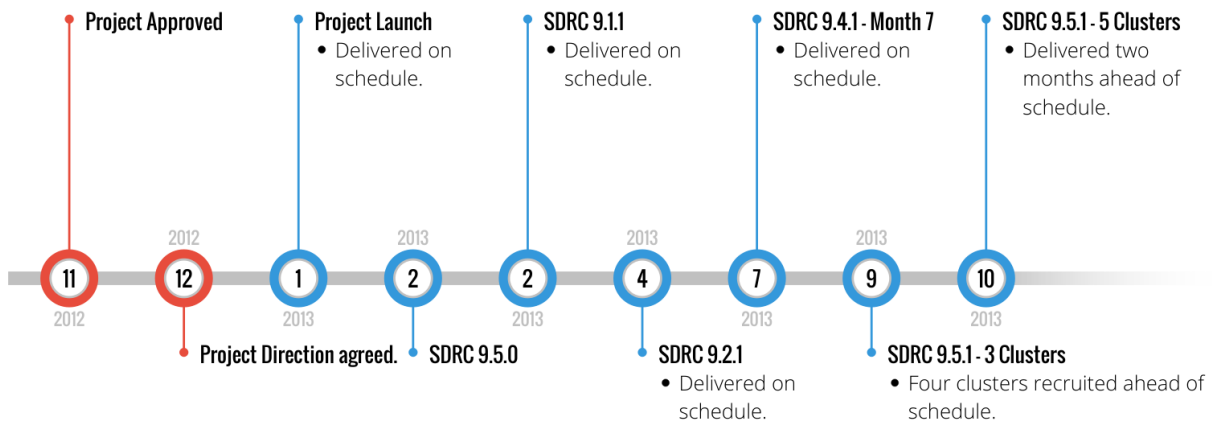
Appendix I DECC EV uptake scenarios



Appendix II Delivery milestones

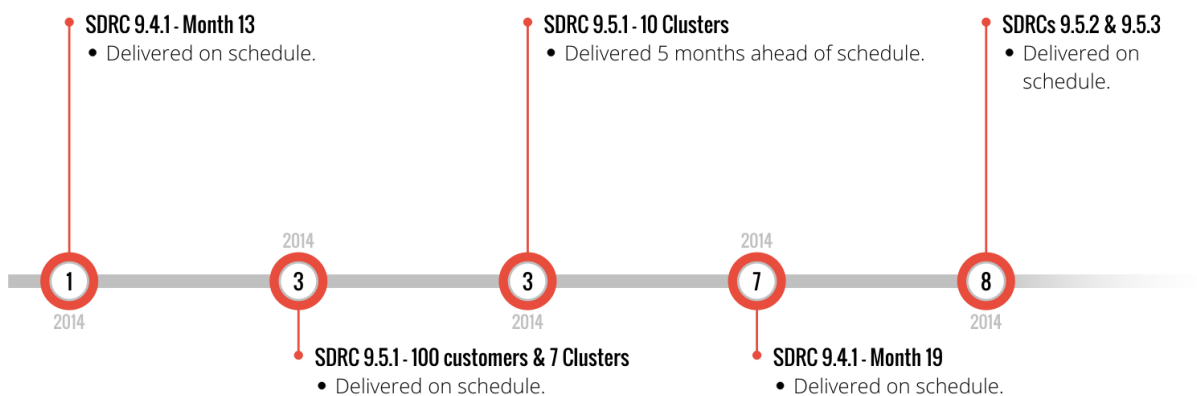
Year 1

Delivered SDRC Timeline - Year 1



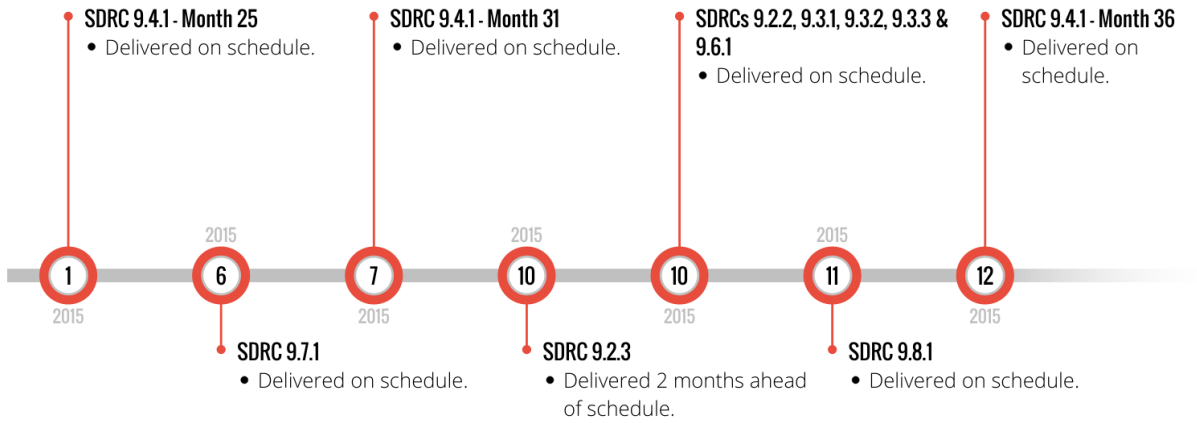
Year 2

Delivered SDRC Timeline - Year 2



Year 3

Delivered SDRC Timeline - Year 3



Appendix III Links to supporting documentation

Project Area	Website Link
SDRC 9.1	
SDRC 9.1.1	http://myelectricavenue.info/sites/default/files/My_Electric_Avenue_%28I2EV%29_-_SDRC_9_1_Learning_from_bid_process_v_1_For_Issue_0.pdf
SDRC 9.2 & 9.3	
SDRC 9.2.1	http://myelectricavenue.info/sites/default/files/SDRC%209.2.1.%20Supporting%20Guidance%20for%20the%20I2EV%20%28My%20Electric%20Avenue%29%20Novel%20Commercial%20Arrangement%20-%20Issue%201.0_0.pdf
Management & Delivery Document	http://myelectricavenue.info/sites/default/files/Annex%201%20-%20I2EV%20%28My%20Electric%20Avenue%29%20Management%20and%20Delivery%20Document%20-%20Issue%201.0.pdf
Initial Contractual Template	http://myelectricavenue.info/sites/default/files/Annex%202%20-%20I2EV%20%28My%20Electric%20Avenue%29%20-%20Principal%20Contract%20Template%20-%20Issue%201.1%20-%20Superseded.pdf
Partner / Supplier Task Order	http://myelectricavenue.info/sites/default/files/Annex%203%20-%20I2EV%20%28My%20Electric%20Avenue%29%20-%20Supporting%20Guidance%20-%20Task%20Order%20Template.pdf
SDRC 9.2.3	http://myelectricavenue.info/sites/default/files/My%20Electric%20Avenue%20%28I2EV%29%20SDRC%209.2.3%20-%20Principal%20Contract%20Template%20-%20Issue%202.1.pdf
SDRC 9.2 & 9.3	http://myelectricavenue.info/sites/default/files/My%20Electric%20Avenue%20%28I2EV%29%20SDRC%209.2%20%26%209.3%20Issue%20v2.3.pdf
SDRC 9.4	
Month 6 Independent Review	http://myelectricavenue.info/sites/default/files/RD13_280901_2%20-%20My%20Electric%20Avenue%20-%20M06%20Review%20Report.pdf
Response to Month 6 Independent Review	http://myelectricavenue.info/sites/default/files/SDRC%209%204%201%20I2EV%20%28My%20Electric%20Avenue%29%20Month%206%20Independent%20Review%20Issue%201.0_0.pdf
Month 12 Independent Review	http://myelectricavenue.info/sites/default/files/RD14_2101_5%20-%20My%20Electric%20Avenue%20-%20M12%20Review%20Report.pdf
Response to Month 12 Independent Review	http://myelectricavenue.info/sites/default/files/SDRC%209%204%201%20I2EV%20My%20Electric%20Avenue%20Month%2012%20Independent%20Review%20v1.3_0.pdf
Month 18 Independent Review	http://myelectricavenue.info/sites/default/files/RD14-000143-4%20My%20Electric%20Avenue%20-%20M18%20Review%20Report%20-%20EA%20Technology%20Copy.pdf
Response to Month 18 Independent Review	http://myelectricavenue.info/sites/default/files/SDRC%209%204%201%20I2EV%20My%20Electric%20Avenue%20Month%2018%20Independent%20Review%20v1.2.pdf
Month 24 Independent Review	http://myelectricavenue.info/sites/default/files/RD15-000001-4%20My%20Electric%20Avenue%20-%20M24%20Review%20Report%20-%20EA%20Technology%20Copy.pdf
Response to Month 24 Independent Review	http://myelectricavenue.info/sites/default/files/SDRC%209%204%201%20I2EV%20My%20Electric%20Avenue%20Month%2024%20Independent%20Review%20v1.1.pdf

Project Area	Website Link
Month 30 Independent Review	http://myelectricavenue.info/sites/default/files/RD15-000890-4%20My%20Electric%20Avenue%20-%20M30%20Review%20Report.pdf
Response to Month 30 Independent Review	http://myelectricavenue.info/sites/default/files/SDRC%209%204%201%20I2EV%20My%20Electric%20Avenue%20Month%2030%20Independent%20Review%20Issue%201.pdf
Month 36 Independent Review	http://myelectricavenue.info/sites/default/files/RD15-002325-3%20My%20Electric%20Avenue%20-%20M36%20Review%20Report.pdf
Response to Month 36 Independent Review	http://myelectricavenue.info/sites/default/files/SDRC%209.4.1%20I2EV%20%28My%20Electric%20Avenue%29%20Month%2036%20Independent%20Review%20Response%20Issue%201.0.pdf
SDRC 9.5	
Customer Engagement Plan	http://myelectricavenue.info/sites/default/files/My%20Electric%20Avenue%20%28I2EV%29%20Customer%20Engagement%20Plan%20v%205_6_0.pdf
Data Protection Strategy	http://myelectricavenue.info/sites/default/files/My_Electric_Avenue_%28I2EV%29_-_Data_Protection_Strategy_v_4_2_0.pdf
SDRC 9.5.1 – 3 Clusters	http://myelectricavenue.info/sites/default/files/My%20Electric%20Avenue%20%28I2EV%29%20-%20SDRC%209%205%201%20Technology%20Trials_establishment%20of%20cluster%20groups_Sept%202013%20v%201.0%20Issue%201.pdf
SDRC 9.5.1 – 5 Clusters	http://myelectricavenue.info/sites/default/files/My%20Electric%20Avenue%20%28I2EV%29%20-%20SDRC%209%205%201%20Technology%20Trials_establishment%20of%205%20cluster%20groups_Dec%202013%20v%201.0%20Issue%201.pdf
SDRC 9.5.1 – 7 & 10 Clusters	http://myelectricavenue.info/sites/default/files/My%20Electric%20Avenue%20%28I2EV%29%20-%20SDRC%209.5.1%20Technology%20Trials_05%20March%202014_Issue%201.pdf
SDRC 9.5.2	http://myelectricavenue.info/sites/default/files/86002_11_SDR_C_9.5.2%20v1.0.pdf
SDRC 9.5.3	http://myelectricavenue.info/sites/default/files/I2EV%20%28My%20Electric%20Avenue%29%20SDRC%209.5.3%20Social%20Trials%20Issue%201.2.pdf
SDRC 9.6	
SDRC 9.6.1	http://myelectricavenue.info/sites/default/files/MEA%20SDRC%209%206%20Issue%202.pdf
SDRC 9.7	
SDRC 9.7.1	http://myelectricavenue.info/sites/default/files/86002_8_R_SDR_C%209.7%20Issue%202.pdf
Flicker Analysis Report	http://myelectricavenue.info/sites/default/files/86002_8_R_Flicker%20Analysis%20SDRC%209.7%20Issue%204.pdf
Heat Pumps Report	http://myelectricavenue.info/sites/default/files/86002_8_R_HeatPumpImpactEsprit_Issue%202%20non-confidential.pdf
Cable Thermal Rating Report	http://myelectricavenue.info/sites/default/files/86002_8_R_Cable%20Thermal%20Rating%20SDRC%209.7%20Issue%204.pdf
SDRC 9.8	
SDRC 9.8.1	http://myelectricavenue.info/sites/default/files/My%20Electric%20Avenue%20%28I2EV%29%20SDRC%209.8%20Issue%201.4.pdf
PLC Communication Learning	http://myelectricavenue.info/sites/default/files/PLC%20Communication%20Reliability%20Report.pdf

Project Area	Website Link
	20Report.pdf
Modelling & Analysis Reports	
WA1	http://myelectricavenue.info/sites/default/files/UoM-EA-Technology_MEA_Deliverable1.1-1.3v01.pdf
WA2	http://myelectricavenue.info/sites/default/files/UoM-EA-Technology_MEA_Deliverable2.1-2.3v03.pdf
WA3	http://myelectricavenue.info/sites/default/files/UoM-EA-Technology_MEA_Deliverable3.1-3.4v05.pdf
WA4	http://myelectricavenue.info/sites/default/files/UoM-EA-Technology_MEA_Deliverable4.1-4.2v03.pdf
WA5	http://myelectricavenue.info/sites/default/files/UoM-EA-Technology_MEA_Deliverable5.1-5.2v04.pdf
Project Progress Reports	
Month 6	http://myelectricavenue.info/sites/default/files/I2EV%20Project%20Progress%20Report%20June%202013%20%28public%20version%29.pdf
Month 12	http://myelectricavenue.info/sites/default/files/I2EV%20Project%20Progress%20Report%20December%202013%20Public%20Version%20Issue%201.2.pdf
Month 18	http://myelectricavenue.info/sites/default/files/I2EV%20Project%20Progress%20Report%20June%202014%20%28non-confidential%29_1.pdf
Month 24	http://myelectricavenue.info/sites/default/files/I2EV%20Project%20Progress%20Report%20December%202014_0.pdf
Month 30	http://myelectricavenue.info/sites/default/files/I2EV%20PPR%20June%202015%20v1.0%20-%20Complete%20%28non-confidential%29.pdf
Month 36	http://myelectricavenue.info/sites/default/files/I2EV%20Project%20Progress%20Report%20December%202015%20Issue%201.1%20redacted.pdf
Initial Project Direction	http://myelectricavenue.info/sites/default/files/I2EV_%28My_Electric_Avenue%29_Project_Direction_0.pdf
Change Request to the Project Direction	http://myelectricavenue.info/sites/default/files/I2EV%20Change%20request%20decision%20letter_July2015.pdf
Bid Submission Documents	https://www.ofgem.gov.uk/publications-and-updates/low-carbon-networks-fund-submission-scottish-and-southern-energy-i2ev
Published Papers	
Control of EV Charging Points for Thermal and Voltage Management of LV Networks	http://ieeexplore.ieee.org/xpl/articleDetails.jsp?reload=true&arnumber=7239654
A Statistical Analysis of EV Charging Behavior in the UK	http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=7381196&newsearch=true&queryText=A%20statistical%20analysis%20of%20EV%20charging%20behavior%20in%20the%20UK

Appendix IV Details of Ricardo’s RAG indicator process

Question	RAG Indicators		
What is the reviewers’ overall assessment of the project so far?	Excellent / Good	Adequate	Poor
Have the objectives for the period been achieved?	Yes	Partially	No
Has the project made satisfactory progress towards meeting the overall project objectives?	Yes	Partially	No
Has each Task made satisfactory progress against the Project Plan of Works?	Yes	Partially	No
Has the project implemented the recommendations from the previous Independent Review?	Yes	Partially	No
Have planned SRDCs been achieved for this reporting period?	Yes	Partially	No
Have planned milestones been achieved for this reporting period?	Yes	Partially	No
What is the reviewers’ opinion of the delivered SDRCs?	Excellent / Good	Adequate	Poor
Has the project management been performed as required?	Yes	Partially	No
Has the collaboration between project partners and sub-contractors been effective	Yes	Partially	No
Is there evidence of underperforming project partners or sub-contracts, lack of commitment or change in interest?	No	A little	Yes
Have the project partners adequately publicised the project to raise awareness of the project with the general public?	Yes	Partially	No
Have the project partners adequately disseminated results and learning from the project?	Yes	Partially	No

Appendix V Contingency request form template

My Electric Avenue (I²EV)

Request for the release of contingency funding



Contingency Request		Name	
Affected Task ID		Company	
Related Risk ID		Date Request Raised	
Date Decision Required		Telephone	
Value of Request		E-Mail	
Details of request			
Reason contingency is required			
Consequences to project if request is rejected			
Response to request for release of contingency funding			
EA Technology: Approved / Rejected		SSEP: Approved / Rejected	
Signed:		Signed:	
Reason for rejection of request (if applicable)			

Appendix VI Contingency requests

Contingency Request ID	Submitting company	Date of request	Summary of request	Value of request	Approved / Rejected
CR001	EA Technology	September 2013	It was raised during the Project Direction negotiations that the revised recruitment approach required by the Project Direction would involve greater effort and expenditure than originally planned. When it became apparent that the request to change the Project Direction would take longer than the funds allowed for customer recruitment would last, the contingency request was submitted to enable the Project to continue.	£163,000	Approved
CR002	Zero Carbon Futures	October 2013	It was identified that additional work would be required to install equipment in some participant properties. This request sought the funds necessary to cover this work. SSEPD confirmed that the costs should remain within the 'deployment' budget but could be identified as justification for a contingency request at a later date if required. The application was then withdrawn.	£9,042.00	Withdrawn
CR003	Fleetdrive Electric	May 2014	Fleetdrive Electric incurred significant additional costs relating to the recruitment of customers for the My Electric Avenue Project as a consequence of the additional clauses introduced via the Project Direction. Liaising with over 370 clusters required greater staffing requirements and more test drive events than planned, and a corresponding increase in management requirements. This contingency request was withdrawn then separated and refined into two discrete elements at the request of SSEPD, being resubmitted as CR004 and CR005.	£143,583.00	Withdrawn
CR004	Fleetdrive Electric	August 2014	Fleetdrive Electric incurred significant additional costs relating to the recruitment of customers for the My Electric Avenue Project as a consequence of the additional clauses introduced via the Project Direction. Liaising with over 370 clusters required greater staffing requirements and more test drive events than planned. Fleetdrive Electric demonstrated that the contingency request did not fully cover the additional costs incurred and consequently increased their in-kind contribution to the Project.	£83,583.00	Approved
CR005	Fleetdrive Electric	August 2015	Fleetdrive Electric incurred significant additional costs as a consequence of the additional clauses introduced via the Project Direction affecting the customer recruitment. Liaising with over 370 clusters required greater staffing requirements and more test drive events than planned with a corresponding increase in senior management requirements. Fleetdrive Electric demonstrated that the contingency request did not fully cover the additional costs incurred and consequently increased their in-kind contribution to the Project.	£42,500.00	Approved

Contingency Request ID	Submitting company	Date of request	Summary of request	Value of request	Approved / Rejected
CR006	EA Technology	June 2015	The potential for achieving additional learning from the data gathered was identified although insufficient budget remained to fully exploit it as part of the Project. A request was submitted to fund additional analysis by the University of Manchester and EA Technology, beyond the original scope of the Project.	£55,000.00	Rejected
CR007	EA Technology & University of Manchester	June 2015	The need for the University of Manchester to increase their analysis to account for the assumption of all vehicles having transitioned to EVs was identified. This required the re-running of their models and further analysis of the resulting data.	£2,800.00	Approved
CR008	EA Technology	July 2015	Equipment installed at one of the project clusters experienced partial failure, with phase currents being intermittently reported. Contingency funding was requested to purchase and install the replacement equipment.	£5,500.00	Approved
CR009	EA Technology	July 2015	The use of contingency was requested to fund an independent legal review of the Project's commercial documentation, including the principal and sub-contracts to support the commercial learning detailed in SDRCs 9.2 & 9.3.	£4,750.00	Rejected
CR010	Zero Carbon Futures & SSEC	October 2015	A failure of several RCBOs within charging points installed by the Project raised concerns by Zero Carbon Futures and SSEC. Contingency was requested to fund inspections of all charging points installed by the Project.	£1,100.00	Approved
CR011	Zero Carbon Futures	October 2015	Following the failure of multiple RCBOs within Project installed charging points, the use of contingency was requested to remove the 'at-risk' safety critical components and replace them with equivalent components from a different manufacturer.	£15,000.00	Approved
CR012	SSEPD	December 2015	SSEPD requested the use of contingency to enable a professional design of all reports published by the My Electric Avenue Project to maximise the effectiveness of disseminating learning.	£39,345.00	Approved

Appendix VII Monthly Project Summary Report (PSR) Template

My Electric Avenue (I²EV) - EA Technology Progress Report

1 I²EV (My Electric Avenue) Project	
Task Title: <input style="width: 90%;" type="text"/>	Task Reference: <input style="width: 90%;" type="text"/>
Contract Lead: <input style="width: 95%;" type="text"/>	Is the project on target? Objectives: <input style="width: 50%;" type="text"/> Budget: <input style="width: 50%;" type="text"/> Time: <input style="width: 50%;" type="text"/>
Client: <input style="width: 95%;" type="text"/>	
Director / Manager: <input style="width: 95%;" type="text"/>	
PO Reference: <input style="width: 90%;" type="text"/>	
Authorised Task Maximum: <input style="width: 50%;" type="text"/>	
Report for work done in the month of preceding the monthly assurance meeting: <input style="width: 90%;" type="text"/>	Project Month: <input style="width: 50%;" type="text"/>

2 Finance:													
<i>(Figures excluding VAT)</i>													
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
Annual Budget:													0.00
Cost Incurred:													0.00
Cost Forecast:													0.00
Cumulative Budget:	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Earned Revenue:	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Revenue as % of Budget:	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total spend to end of Previous Year: <input style="width: 50%;" type="text"/>		FY Spend: £ <input style="width: 50%;" type="text"/>		Remaining Financial Year Forecast: £ <input style="width: 50%;" type="text"/>		Following Year's Forecast: £ <input style="width: 50%;" type="text"/>							
				Remaining Future Years' Forecast: £ <input style="width: 50%;" type="text"/>		Total Cost of Task: £ <input style="width: 50%;" type="text"/>							

3 Work Progress:
Progress against project objectives and plan:
Activities & completions this month:
Risks, Issues, Recommendations / Resolutions
Learning points & IP
Profit and Loss Analysis

4 Sign:
Programme Director/Manager: <input style="width: 90%;" type="text"/>
Date Submitted: <input style="width: 50%;" type="text"/>

Appendix VIII Project organisational structure

