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Sustainable Energy Authority of Ireland

National Energy Research, Development & Demonstration Funding Programme

FINAL REPORT TEMPLATE

SECTION 1: PROJECT DETAILS – FOR PUBLICATION

Project Title	EC Charging EV Charge & Light
Lead Grantee (Organisation)	EC Charging
Lead Grantee (Name)	Theresa Keady
Final Report Prepared By	Theresa Keady
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	Name	**Organisation**
Project Partner(s)	Mary Hegarty	Dunlaoghaire Rathdown
Collaborators	Steve Large	Hubeleon

Project Summary (max 500 words)

Background & Context:

Vehicle Charging as a source of Grid Frequency Regulation:

Electric power girds require that power generation and loads are in balance in order to keep the grid frequency constant. When there is an imbalance between the generation and load, the grid frequency will change. Grid frequency regulation is usually a service performed by power plants that are controlled to vary their generation output up and down from a nominal value. Plug-in vehicles can provide a similar function by varying their charging rate based on locally-measure grid frequency. As plug-in vehicles reach large scale adoption, there is the potential for all frequency regulation to be provided through charging of plug-in vehicles. Ireland has set a target for savings estimates for Electric vehicle deployment (Ireland's second National Energy Efficiency Action Plan).

Charge & Light is a multifunction device that contains an EV Charger within a street light.

The Charge & Light system is housed within the street light providing power to the EV. The Type 2 Mode 3 socket is the EV industry standard and compatible with all EV's in Europe.

Dunlaoghaire Rathdown County Council have a number of Electric Vehicles and has expressed a desire to work with us to deliver EV charging solutions. EV charging is EC Charging's business with over 1,000 of our charge points now deployed in Ireland, UK, Norway, Germany and Dubai providing EV drivers with a network of EV Charging facilities. We are committed to expanding the use of EVs and being a proactive, innovative partner in delivering long-term, sustainable solutions.

Keywords (min 3 and max 10)	EC CHARGING EV CHARGE & LIGHT

NB – Both Section 1 and Section 2 of this Final Report will be made publicly available in a Final Technical Report uploaded online to the National Energy Research Database.

In the following Section, please provide a clear overview of your project, including details of the key findings, outcomes and recommendations. The section headings below are provided as a guide, please update or add to these as best suits your project.

By submitting this project report to SEAI, you confirm you are happy for Section 1 and Section 2 of this report to be made publicly available. If you wish to request edits to this section in advance of publication, please contact SEAI at EnergyResearch@seai.ie.

SECTION 2: FINAL TECHNICAL REPORT – FOR PUBLICATION (max 10 pages)

Executive Summary

EC Charging is Ireland's only electric vehicle (EV) charging station manufacturer specialising in the development of advance EV charging solutions. We produce a complete range of EV charging equipment which enables us to provide our customers with safe, reliable and convenient charging solutions that caters for all of today's electric car charging requirements.
The EC Charging team combines over twenty years experience in the automation, electronics and IT sector. Our innovative designs and cutting edge technology has enabled us to achieve our present position as the number 1 Irish market leader in the field of EV charging equipment.
EC Charging stations comply with all Irish and European Specification standards. Our embedded communication system is OCPP (Open Charge Point Protocol) enabled which allows it to connect to all OCPP compliant back office systems. Offering our customers choice and flexibility our services range from supply only to a complete turnkey solution including installation, commissioning and maintenance.
Our commitment to innovation and reliability has contributed in the development of strategic partnerships with energy providers, government agencies, local authorities and businesses. Working alongside the motor industry to aid the process of introducing new EV's to the market has granted EC Charging European recognition.

2.1 Introduction to Project

Electric power girds require that power generation and loads are in balance in order to keep the grid frequency constant. When there is an imbalance between the generation and load, the grid frequency will change. Grid frequency regulation is usually a service performed by power plants that are controlled to vary their generation output up and down from a nominal value. Plug-in vehicles can provide a similar function by varying their charging rate based on locally-measure grid frequency. As plug-in vehicles reach large scale adoption, there is the potential for all frequency regulation to be provided through charging of plug-in vehicles. Ireland has set a target for savings estimates for Electric vehicle deployment by 2030, (Ireland's National Energy Efficiency Action Plan). Market uptake of EV's and growth are challenged by endemic issues around infrastructure, chargepoint functionality and driver behaviour. A number of Cities have implemented EV Charging in streetlights. The EC Charging "Charge & Light system is an EV Charger housed within the street light providing power to the EV. The Type 2 Mode 3 socket is the EV industry standard and compatible with all EV's in Europe. EV Charging is EC Charging's business with over 1000 of our charge points now deployed in Ireland, UK and Dubai. We are committed to expanding the use of EVs and being a proactive, innovative partner in delivering long-term, sustainable solutions.

Prototype development of an EV Charge and Light system. *ECC Charge & Light is an innovative EV Street light solution offering a smart charging system enabling the use of RFID Card access and mobile phone payment.* The Charge & Light is a multifunction device that contains an EV Charger within a street light. The market potential and benefits of a street lighting system incorporating EV charging will remove barriers to EV adoption, by eliminating range anxiety.

2.2 Project Objectives

One of the recognised barriers to adoption of EVs by consumers is range anxiety: drivers worry that they will run out of charge before reaching a chargepoint (CP). This project is for the development and deployment of an EV Charging solution contained within a street light ("Charge & Light"). The The Charge & Light is a multifunction device that contains an EV Charger within a street light. Key components of the Charge & Light are sourced and the charge and light system prototype development is awaiting field test. The market potential and benefits of a street lighting system incorporating EV charging for county Councils is under analysis by ESB.
This project aims to:

1. Accelerate development and deployment of a competitive, sustainable system that will help achieve Ireland's NEEAP and NREAP targets by facilitating the adoption of EVs;
2. Remove barriers to growth by developing an EV Charge point integrated into existing and new street lights addressing the specific challenge of range anxiety.
3. Deliver a solution that will set a standard EV charging and processing for Ireland and internationally.

The objectives of the project were:

- Develop working Charge & Light prototype
- Define the market potential and benefits of a street lighting system incorporating EV charging for County Councils and Airports.
- Document the competitive landscape and critical success factors;
- Assess the technical feasibility of an EV Charge & Light solution.
- Define the key components of the "Charge & Light " (e.g. charge EV; manages power to the EV, payment facilities defined ie. subscriptions, cards, transactions, etc.
- Identify barriers to implementation including technical and cost barriers;
  Confirm market barriers and driver expectations/behaviours and define end-user (driver) requirements

2.3 Summary of Key Findings/Outcomes

Describe how your project has furthered the current state-of-the-art, current knowledge or current practice. Clearly highlight the degree of novelty and innovation demonstrated by your project.

Address each innovation in a bullet point below. Add as many bullet points as you need:

- *Innovation*

  ECC Charge & Light is an innovative EV Street light solution offering a smart charging system enabling the use of RFID Card access and mobile phone payment. To our knowledge and research the system is currently not available on the international market

2.4 Project Impact

Ireland has set a target for savings estimates for Electric vehicle deployment by 2030, (Ireland's National Energy Efficiency Action Plan). Market uptake of EV's and growth are challenged by endemic issues around infrastructure, chargepoint functionality and driver behaviour. A number of Cities have implemented EV Charging in streetlights. The EC Charging "Charge & Light system is an EV Charger housed within the street light providing power to the EV.*Clearly position the impact of your project with reference to the needs of the Irish Energy Sector, national and international policy objectives, and SEAI's remit.*

Key impacts include: Accelerate development and deployment of a competitive, sustainable system that will help achieve Ireland's NEEAP and NREAP targets by facilitating the adoption of EVs.

2.5 Recommendations

Using low-carbon electricity in the transport sector can decrease greenhouse gas emissions, encourage energy-efficiency gains through the greater efficiency of electric drive-trains, decrease the EU's oil dependence, improve the situation in cities with regard to air pollution and noise, and help to maintain Ireland's competitiveness by taking the lead in these new technological developments.
An increase in EVs will reduce import dependency on fossil fuels and contribute to a reduction in CO2 emissions.

2.5 Conclusions and Next Steps

Charge & Light is a multifunction device that contains an EV Charger within a street light.
The Charge & Light system is housed within the street light providing power to the EV. The Type 2 Mode 3 socket is the EV industry standard and compatible with all EV's in Europe. The Charge & Light is equipped with LCD lights and RFID rearders for access.
Charge & Light provides a smart solution which allows EV drivers to charge at street lights. It contains a single charging socket, RFID reader, energy meters, lcd and controller to manage the EV charging process

Market uptake and growth of EVs is challenged by endemic issues around infrastructure, charge point (CP) functionality and driver behaviour. The proposed "Charge & Light" solution is a customer-driven solution with benefits for drivers, CP hosts like Airports car parks and local authorities.

One of the recognised barriers to adoption of EVs by consumers is range anxiety: drivers worry that they will run out of charge before reaching a CP. The proposed Charge & Light Solution will enable drivers to charge at any street light. By addressing a key barrier to driver uptake (range anxiety), the Charge & Light solution will contribute to accelerated uptake and increased use of EVs.