

3rd Electric Road Systems Conference 2019
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A Unique ERS Technology for Urban Use – Conduit Current Collection

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Summary

Algret Innovations is bringing forward a unique technology in the emerging industry of electric road systems (ERS). Currently there are a handful of different technologies that are covered in the ERS research being undertaken around the world, however being a more recent development, Algret Innovations wants to present this technology to raise awareness. By April 2019 a short feasibility study will be completed, looking at the application of the technology for charging public transport vehicles in cities and we would like to disseminate the findings. The technology is based on ‘conduit current collection’ employing an enclosed channel protecting the electrical contacts.

1 Research Questions

- Is this a viable technology that should be considered an option on the highways?
- Is this a viable technology that could be an ideal option for urban use?
- What are other use cases for ERS?
 - Industrial applications
 - Automated stationary charging
 - Roadside charging (major problem in the UK due to lack of driveways/garages)
- Is charging taxis as they queue in ranks viable technically and as a business?
- What are the main challenges for charging taxis (both technical and socioeconomic)?
- Can UK funding support this technology to TRL5-6 and beyond? What is the UK planning regarding ERS? Are other countries willing to fund its development as part of more serious ERS programmes?

2 Methodology

- We have progressed the technology readiness level (TRL) by building a physical prototype on a lab-scale. Currently are close to reaching TRL4 and will do by May.
- We are now making preparations for a full demonstrator system (off-highways test facility). We may have this ready in time for the conference in May
- We then plan to take this into a more representative user trial, which the feasibility study is aimed to prepare us for as part of its two-phase funding competition
- Part of the feasibility study was to install telematics devices onto taxis to assess how often they stop in a taxi rank and therefore to what extent they can maintain the state-of-charge of their batteries by charging while queuing.
- We also looking at the business case
 - Profitability
 - Stakeholders
 - Government subsidy requirements
 - Collaboration with OEMs/Vehicle manufacturers
- We also assessing the technical feasibility
 - Power requirements and system cost
 - Vehicle integration
 - Safety considerations



Figure 1: A typical taxi rank in London

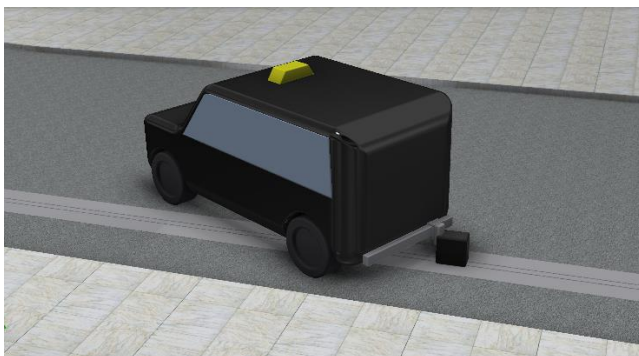


Figure 2: An illustration of the conduit current collection technology employed in this use case

3 Results

We are still working on the feasibility study and will be completing and submitting it at the end of March 2019. So far we are gaining a good insight into the charge rates required for the usage application, the user requirements, obstacles to overcome and the costing of the system.

We hope to share the outputs for this study that may be interesting for the conference who may be considering how ERS will scale to urban/inner-city use, which represents a large portion of GHG emissions and harmful air pollution, which must be addressed.

At the conference we would like to present:

- An overview of our technology option
- The unique advantages and challenges of the technology
- How we have progressed with its development
- The key outputs of our feasibility study and what we have learned
- The benefits of deploying our technology for charging taxis and other public transport vehicles

We would also like to raise awareness of the technology as it is progressing. Presenting at the poster session at the 2nd conference was a great success for us and we would like to keep everyone updated on our developments. We are looking for public bodies, research institutions or private organisation that may be able to support us on our develop pathway and reach the required stage of development for procurement into international ERS deployment programmes.

Acknowledgments

Our feasibility study is part of the ‘**Wireless electric vehicle charging for commercial users: feasibility studies**’ competition, funded by the Office for Low Emission Vehicles (OLEV) in partnership with Innovate UK. As a first phase of an innovation funding programme worth c. £40m, 27 feasibility studies will analyse the application and impact of innovative technologies for EV charging.

9 feasibility studies will focus on the application of Wireless EV charging (**or cable-free conductive technology**) for commercial users, reducing business disruptions from vehicle charging and therefore increasing the attractiveness of the EV proposition. In a subsequent phase of the funding round, the best projects will be competing for funding for implementation of real-world demonstrators.

The partners collaborating on the study are:

- Algret Innovations LTD (lead)
- The University of Birmingham
- Southend-on-Sea Borough Council
- EB Charging LTD

Author



Yannick Algret studied General Engineering at Durham University before leaving to file a patent for an ERS technology which he conceived and developed. He founded Algret Innovations LTD to take the technology forward as a business which has been awarded multiple grants funded by UK government and via the EU to advance the technology.