CASE STUDY

Innovating for Clean Air

OPENING DOORS FOR UK INNOVATORS TO MAKE INROADS INTO THE INDIAN ELECTRIC VEHICLE MARKET

Increasing electric vehicle uptake and reducing air pollution are crucial, interrelated challenges for cities worldwide. Replacing petrol/diesel cars with electric vehicles (EVs) could have a hugely positive impact on air quality and health, as well as supporting climate goals.

To address these challenges, in 2019 three UK Catapults, with collaborative partners in India, launched the Innovating for Clean Air project. Led by Energy Systems Catapult, the project was a two-year initiative funded by UK Research and Innovation and focused on the Karnataka state capital city of Bengaluru.

The Challenge

An article in The Lancet published in December 2020 on "Health and economic impact of air pollution in the states of India: the Global Burden of Disease Study 2019," stated:

- 1.67 million deaths in India in 2019 were attributed to air pollution, 17.8% of all deaths in the country.

Reducing Internal Combustion Engine (ICE) vehicle usage could have a hugely positive impact on air quality in India, and across the world. Globally transport is thought to account for 23% of energy-related greenhouse gas (GHG) emissions, and a study in New Delhi found that the transport sector accounted for 19% of PM10, 39% of PM2.52 and 81% of NOx3 emissions in the city.

The Solution

Through engagement with Indian stakeholders in Bengaluru, the Catapults identified some of the key EV and air quality challenge areas for the city and key Indian innovators. Then launched an open call in the UK to find small and medium-sized enterprises (SMEs) who could deliver innovative solutions.

We aimed to deploy them in real-life urban testbeds, creating tangible collaboration opportunities for UK and Indian innovators.

These Clean Air Testbeds involved a cohort of 17 high potential UK and Indian SMEs developing innovative clean air and electric vehicle solutions.

Nine deployed solutions on Clean Air Street – a collaborative initiative with Connected Places and Energy Systems Catapults, the Directorate of Urban Land Transport (DULT), and the Indian Institute of Science. Eight carried out experiments in office buildings, residential areas, schools, and universities.

Satellite Applications Catapult also worked with SME Earthsense to develop a unique measurement system for air quality by integrating satellite, ground, and mobile sensor data to deliver a detailed localised map of the air quality to help support the integration of EVs within the city of Bengaluru.

The challenge was to increase the evidence base for policy that delivers cleaner air, while creating a replicable model which can be used elsewhere.

CATAPULT Energy Systems

ABOUT US

Energy Systems Catapult was set up to accelerate the transformation of the UK's energy system and ensure UK businesses and consumers capture the opportunities of clean growth.

The catapult is an independent, not-for-profit centre of excellence that bridges the gap between industry, government, academia, and research.

We take a whole system view of the energy sector, helping us to identify and address innovation priorities and market barriers to decarbonise the energy system at least cost.

"Access to charging infrastructure is one of the biggest barriers to the uptake of EVs, which directly links to clean air and carbon neutrality targets.

"Our partnership with Energy Systems Catapult provided a recipe for success to access a variety of organisations across India.

"It means that CityEV can play its part in India's crucial move towards its clean air targets and decarbonisation transition."

Doug Watson, COO – CityEV Ltd

The Innovators

CityEV – were established to design and manufacture the next generation of EV charge points that will address challenges faced by infrastructure providers.

Using the Clean Air Testbed, CityEV deployed their charge points into three pilot projects, working with government and private partners, including eee-taxi, an electric vehicle fleet with operations in Bengaluru.

Energeo – create unique data for towns and cities by digitally studying the built environment- using sources such as satellite imagery and LiDar – to identify the most beneficial locations to deploy low-carbon tech such as Solar PV, Heat Pumps and EV charge points.

Through the Clean Air Testbed, Energeo collaborated with DULT using geospatially focused, data driven techniques to identify demand and the optimal position for on-street and public EV charging infrastructure in areas of the Karnataka state capital,

EV Technology – aims to make the transition of vehicle fleets to electric as easy as possible. They support fleet providers by analysing and advising on everything from infrastructure requirements and installation to managing/monitoring vehicles and eco-driving training.

Through the Clean Air Testbed, EV Technology worked with eee-taxi to adapt their existing IoT platform to enable more efficient operation of their EV fleet.

GreenEnco – provides strategic and risk management consulting services for renewable energy including technical and financial services across the complete solar PV project lifecycle and energy storage projects.

Via the Clean Air Testbed, GreenEnco designed and installed an integrated solar PV solution with battery storage and EV charging infrastructure at the Indian Institute of Science campus.

Impact

A number of economic, environmental and capacity development impacts have occurred as a direct result of the project.

- The Clean Air Street initiative created a demonstration area where SME/start-up businesses could test and showcase their technology in a real world setting. The SME/start-ups who deployed in the Clean Air Street highlighted the positive impact the initiative had had on their business, with many sharing details of user feedback and how it will help their future business plans.
- The Clean Air Testbed supported a number of SME/start-up businesses in accessing the Indian market. The pilot projects enabled them to forge good partnerships for future research and demonstration, showcase their technologies and to explore commercial opportunities.
- The project has also achieved environmental impacts, for example by supporting innovators with environmentally friendly solutions to develop and test their solutions. Five air quality sensors have been installed in residential areas allowing families to monitor air quality in real time and undertake various activities to improve it, while four air quality sensors have been installed in a coworking space enabling the facilities team to understand the impact of indoor air quality on employee health and wellbeing.
- A number of project activities directly focused on capacity development. The types of impacts aimed for included raising citizen, stakeholder and policy maker awareness of issues and providing tools, data and processes to support evidence-based decision-making.

Get in touch

To find out how we can help you, get in touch via email: international@es.catapult.org.uk

For more information about our International team, click here.