Replicate Final conference

Donostia/San Sebastián

26th March 2021



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RENAISSANCE OF PLACES WITH INNOVATIVE CITIZENSHIP AND TECHNOLOGY



BRISTOL PILOT Results and Impacts

Sarah Lee, Bristol City Council

BLOCK I: SUCCESFUL CITY MODELS FOR TRANSFORMATION OF DISTRICTS



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Aligning our vision for the city of leaving no one behind, putting citizens at the heart and working in partnership with:

- Bristol's One City Plan;
- Connecting Bristol Smart City strategy;
- Climate emergency ambitions; and
- **City Leap** (our) programme to a more sustainable and carbon zero plan and

The REPLICATE Project in Bristol aims to improve quality of life

in Ashley, Easton & Lawrence Hill

> by working with people

to explore how technology could help to tackle certain issues in the area

and create a clean energy system of the future.



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RESULTS





- 151 Building retrofit (160 measures)
- Installation of district heating pipe connecting 2 energy centres
- Smart Grid and EDMS Demand Side Response Trial
- 151 Smart Homes
- 484 PV panels installed on bus depot with 130kWh array



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RESULTS

Stage	New Boilers	Loft Insulation	Solar PV	Total
Enquired	229	237	285	751
Technical Survey	142	196	(Desktop Survey) 122	460
Quotation	126	115	161 (including reQuotations)	402
Accepted	65	65	36	166
Installed	65	65	30	160









Energy Demand Management System





This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement Nº 691735



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RESULTS











Lawrence Hill Bus Depot, 130.68kWp, 126,760 kWh/yr, £105,721



Roof shot showing the intended solar array on the bus station



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RESULTS





- Corporate e-bike scheme (12 e-bikes)
- 11 Electric car club vehicles (Co Wheels)
- On demand EV taxi bus WeGo
- 10 on-street and 24 off-street charging points installed and back office provider
- EV charging optimisation study
- Multimodal TravelWest Journey Planner
- Park Us parking app



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RESULTS









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RESULTS



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Time A							В	
Cost	30p/kWh 33	38	38	33	28	28	31	

Charge point is 7kW, EV needs 21 kWh; it plugs in at A, and is expected to plug out at B



Standard				
Charging				

Simply charge from plug-in until battery is full



Charging

Work out how many slots needed, then choose the optimal set of slots from those available



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RESULTS







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RESULTS







Integration of NetOs SDN

Proof of concept of Smart City Platform

- Citizen sensor deployment
- Citizen Engagement and recruitment activity



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RESULTS











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RESULTS





RESULTS









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IMPACTS



Innovation	Engagement activities using the Bristol Approach mapped the project area
	Energy infrastructure integration testing in a UK environment with ICT EDMS and Smart City Platform
	Multimodal travel options including Bristol specific options using the TWJP
	EV charging ecosystem to ensure car club EVs are able to operate in Bristol including an intelligent back-end system linking with the CP operator and understanding user preferences for future optimisation
	E-bike monitoring device to collect data and transfer wirelessly using LoRaWan for user analysis
	Smart City Platform proof of concept to integrate with other interventions for dynamic decision making

Engagement Mobile Future home pulled by electric trike lead by community engagement and needs



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IMPACTS



Environmental	On-street and off-street charge points are supplying 73,506.5 kWh electricity (31,978.5kWh to REPLICATE vehicles), based on a typical mileage rate of 20kWh/100km this equates to 9,000miles per year per vehicle. The number of charges total 7436 between all the 34 bays since their deployment.					
	Co-Wheels EV Car saved 38,021Kg/CO ₂ compared to an 'average' car					
	<i>Co-Wheels Electric Bikes</i> a total distance of 4520.7km resulting in an estimated 394Kg of savings in CO₂ emissions. Replacing some journeys by conventionally-fuelled vehicles.					
	Smart Homes expected savings from changing to more efficient machines was 6,940kg/CO ₂ equating to around 30,426 kWh/year					
Total estimated 600.143 t/CO2 saved	Installed <i>retrofitted</i> measures in homes estimated an overall CO ₂ reduction of 69,015kg/year and a kWh/m ² /year savings of 432,496					
The energy savings by project funded are .58 Gwh/year per million €	<i>Community PV</i> at Lawrence Hill Bus Depot is producing 111,341kWh per annum which saves around 32,447T/CO _{2.}					
	ParkUs parking app during the 207 usage events and saved around 19kg of CO2 savings					
	WeGo has saved 150kg/CO2 from a total 928.1km travelled compared with traditional taxi (<u>Traditional taxi</u> emissions 233 /km) and replacing some journeys by conventionally-fuelled vehicles.					



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IMPACTS





Better comfort levels in homes from retrofitted homes helping to tackle the fuel poverty in Bristol (UWE)

More affordable, sustainable and social transport options available through WeGo and TWJP

Tackling social isolation and loneliness using the WeGo service



Citizens more informed about the availability of better air quality information and data sensor deployment

Improved health through availability of sustainable and clean energy mobility options CoWheels services

Engagement was targeted at most in need and hardest to reach resulting in 27% social housing, 32% BAME in the Smart Homes project

Engaged Community Champions through Smart Homes rollout and encouraged upskilling

Around 3000 citizens engaged in total through the project on interventions being rolled out using the Bristol Approach methodology

"I like the idea of citizen sensing because it puts the power in the hands of the people." (pilot participant)





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Partners









University of BRISTOL





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