DELIVERABLE

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EXISTING INFRASTRUCTURE AND ENERGY SOURCES REPORT: **Bristol**

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Revision history and statement of originality

Revision	Date	Author	Organisation	Description
0.2	12.03.2012	P. Fryer	BRISTOL	Added Bristol Info
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Statement of originality:

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

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1 SUMMARY

1.1 Objective of document

The objective of this deliverable is to analyse the existing infrastructure in the cities, including a study on the energy sources that will be used to charge the electric vehicles

1.2 Content and structure of document

The document is structured in three parts, one by each Pilot action:

D1.1a: Pilot 1 - Bristol

D1.1b: Pilot 2 – Pamplona-Vitoria

D1.1c: Pilot 3 – Ljubljana-Maribor

1.3 Abbreviations and acronyms

Item	Description
EV	Electric Vehicle
RFID	Radio Frequency Identification
UID	User ID
GPRS	General Packet Radio Service
UMTS	Universal Mobile Telecommunications System

2 INTRODUCTION

At the moment of starting this project, there is already an existing infrastructure for recharging electric vehicles available in each of the participating cities. This infrastructure will be described in further detail in order to plan the adaptations needed in each case to provide each pilot with the necessary capabilities to perform satisfactorily roaming demonstrations.

As an additional part of this work package, a study of the different energy sources for each scenario will be performed.

3   ANALYSIS OF EXISTING INFRASTRUCTURE: PILOT 1 (BRISTOL)

3.1   Charging infrastructure of Bristol

In the Bristol pilot the main charging point operator is Bristol City Council, with a network of 40 intelligent charging bays spread over the city centre car parks and park and ride sites on the periphery of the city. These stations are all supplied by Chargemaster PLC. Several privately run car parks are also equipped with non intelligent charging stations. Some new private networks are currently expanding into the Bristol commute area; these include the 'Polar' network also operated by Chargemaster and Ecotricity at Motorway service stations and GoLow working with car clubs and pool car provision.

The UK model is a pluralistic one with different suppliers and network operators all providing charging stations. The challenge for the city is to coordinate this effort and provide a single software gateway into these networks.

3.1.1   Location of charging stations

Key	Car Park	Number of Charge Points
1	Portway Park and Ride	2 Twin wall mounted, 4 EV bays
2	Ashton Park and Ride	2 Twin floor mounted, 4 EV bays
3	Brislington Park and Ride	2 Twin floor mounted, 4 EV bays
4	College Street	2 Twin wall mounted, 4 EV bays
5	The Grove	1 Twin wall mounted, 2 EV bays
6	Templegate	2 Twin wall mounted, 4 EV bays
7	Chalks Road	2 Twin wall mounted, 4 EV bays
8	Trenchard	4 Twin wall mounted, 8 EV bays
9	West End	3 Twin wall mounted, 6 EV bays

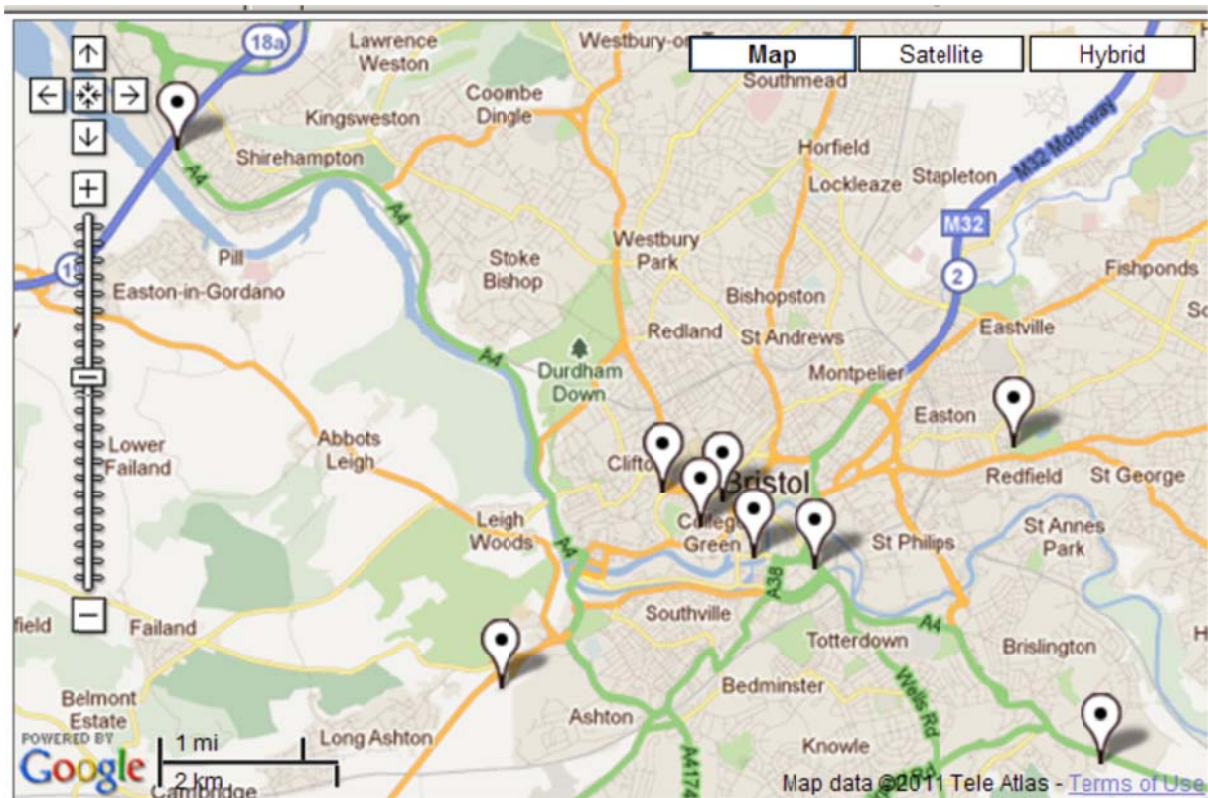Table 1: Locations of charging stations in Bristol area

Figure 1: Locations of charging stations in Bristol

- City: BRISTOL

- Number of charging points: 40 (Currently 10 private non intelligent stations in addition.

- Number of charging points Master: (with remote communications) 40

3.1.2 Technical characteristics of charging points

- Charging points operator: Bristol City Council

- Charging points manufacturer and models: 17 Chargemaster dual wall mounted units 3 Chargemaster dual pole mounted units

Figure 2: Chargemaster

- Charging points characteristics by model: both wall and pole mounted units have the same characteristics

  o Wall / Ground: 17 dual wall mounted, 3 dual pole mounted.

  o Single / Three phases: single phase

  o Maximum power: Legacy 3 pin 13 amp, Menecke type 2, 16 amp, max – 32 amp

  o Case connection A, B or C according IEC 61851

  o Number of socket outlets: two

  o Type of socket outlets: each dual unit has one socket of legacy and one of type 2. These are easily upgraded to two type 2.

  o   - Schuko CEE 7/4 type F: None

  o   - IEC 60309: NO

  o   - IEC 62916-2 type 2: YES

  o   - IEC 62916-2 Type 3A: NO

  o   - IEC 62916-2 Type 3C: NO

  o Number of simultaneous charging: 2

  o Charging modes according IEC 61851: 1, 2, 3 or 4 modes 1 and 2

- Electric protections: (MCB, RCD, surge protection…) yes RCD

- Power and energy meter: yes

- Battery (back up): yes

- Display: yes

- State indicator: (LEDs, lights… yes

- Interface with user: RFID..yes

- IK degree

- IP degree

- Charging points communications: RS-485, Ethernet, GPRS, 3G, etc..

- Communication protocol among charging spots:

- Local or remote validation at charging points: Describe which applies

- RFID card information: describe fields and data structure

The Scheme Partner shall ensure that the SmartCard Reader can read Data embedded in a Mifare Classic/4K ISO14443 Type A RFID Card that conforms to the following specifications:
- 13.56MHz frequency;

- ISO/IEC 14443-1:2000 Part 1: Physical characteristics;

- ISO/IEC 14443-2:2001 Part 2: Radio frequency power and signal interface;

- ISO/IEC 14443-3:2001 Part 3: Initialization and anti-collision; and

- ISO/IEC 14443-4:2001 Part 4: Transmission protocol.

Restrictions:
- Residents   only possible

- Employees   only possible

- Authorised Personnel   only possible

- Members   only possible

- Payment   No payment possible

- Cash   No

- Credit card   Not at present

- Bank/Debit Card   Not at present

- Electronic Purse   Not at present

- Electronic Toll Collection   Not at present

3.1.3   System description

User interaction with the infrastructure: Describe possible interaction of users with the charging infrastructure and by which means (RFID card, keypad, SMS, application for smart phone…)

- RFID

- Actions possible for the users: Start of charge, end of charge, reservation, cancel of reservation

- Not yet available

- User Database: Is there a user database available? Describe process for user registration and cancel

- Complete membership questionnaire, join Bristol Source, RFID issued. This gives access to the network.

- Use of white/black lists at the charging points: Yes

- Communication protocol between charging spot Master and infrastructure: Describe complete protocol stack and references to specific protocols Not available

- Registered data in every charging session Yes

- Communications latency with each charging station

- Billing: Per session? Flat fee? RFID pre-paid card? How is the whole transaction performed (e.g. how are the pre-paid RFID cards recharged?) Free for period of project, no recharge necessary cost of electricity included in parking charge.

- Security: How is logical security achieved in every level of information transfer: User and charging station, charging stations among themselves, charging station Master and control centre, encryption

- Members agree to data sharing, covered by data protection act registration

4 STUDY OF THE DIFFERENT ENERGY SOURCES

Key	Car Park	Number of Charge Points
1	Portway Park and Ride Zero renewable	2 Twin wall mounted, 4 EV bays
2	Ashton Park and Ride Zero renewable	2 Twin floor mounted, 4 EV bays
3	Brislington Park and Ride Zero renewable	2 Twin floor mounted, 4 EV bays
4	College Street Zero renewable	2 Twin wall mounted, 4 EV bays
5	The Grove Zero renewable	1 Twin wall mounted, 2 EV bays
6	Templegate Zero renewable	2 Twin wall mounted, 4 EV bays
7	Chalks Road Zero renewable	2 Twin wall mounted, 4 EV bays
8	Trenchard 100% renewable	4 Twin wall mounted, 8 EV bays
9	West End Zero renewable	3 Twin wall mounted, 6 EV bays

Table 2: Charge points in Bristol´s Car Parks