Madrid Demonstrator

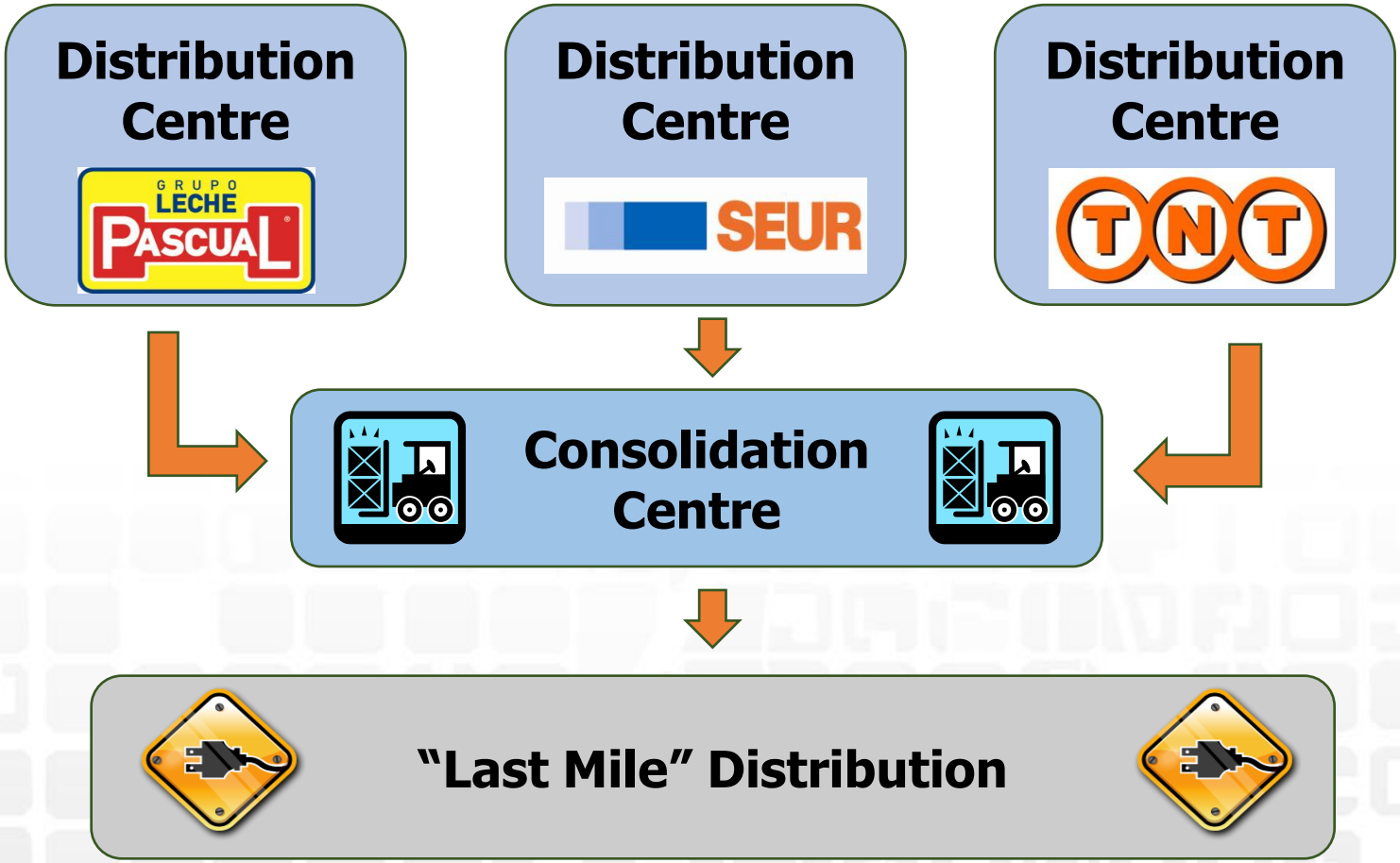
Stockholm transnational meeting

March 25th – 26th ,2014

Co-financed by the
European Commission

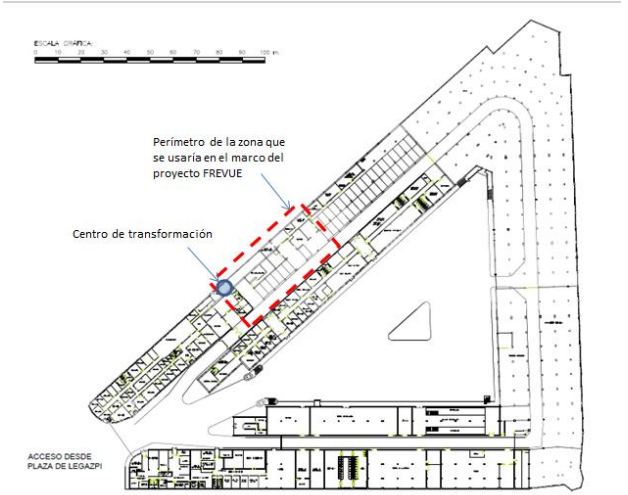
SEVENTH FRAMEWORK
PROGRAMME

Logistic Solution



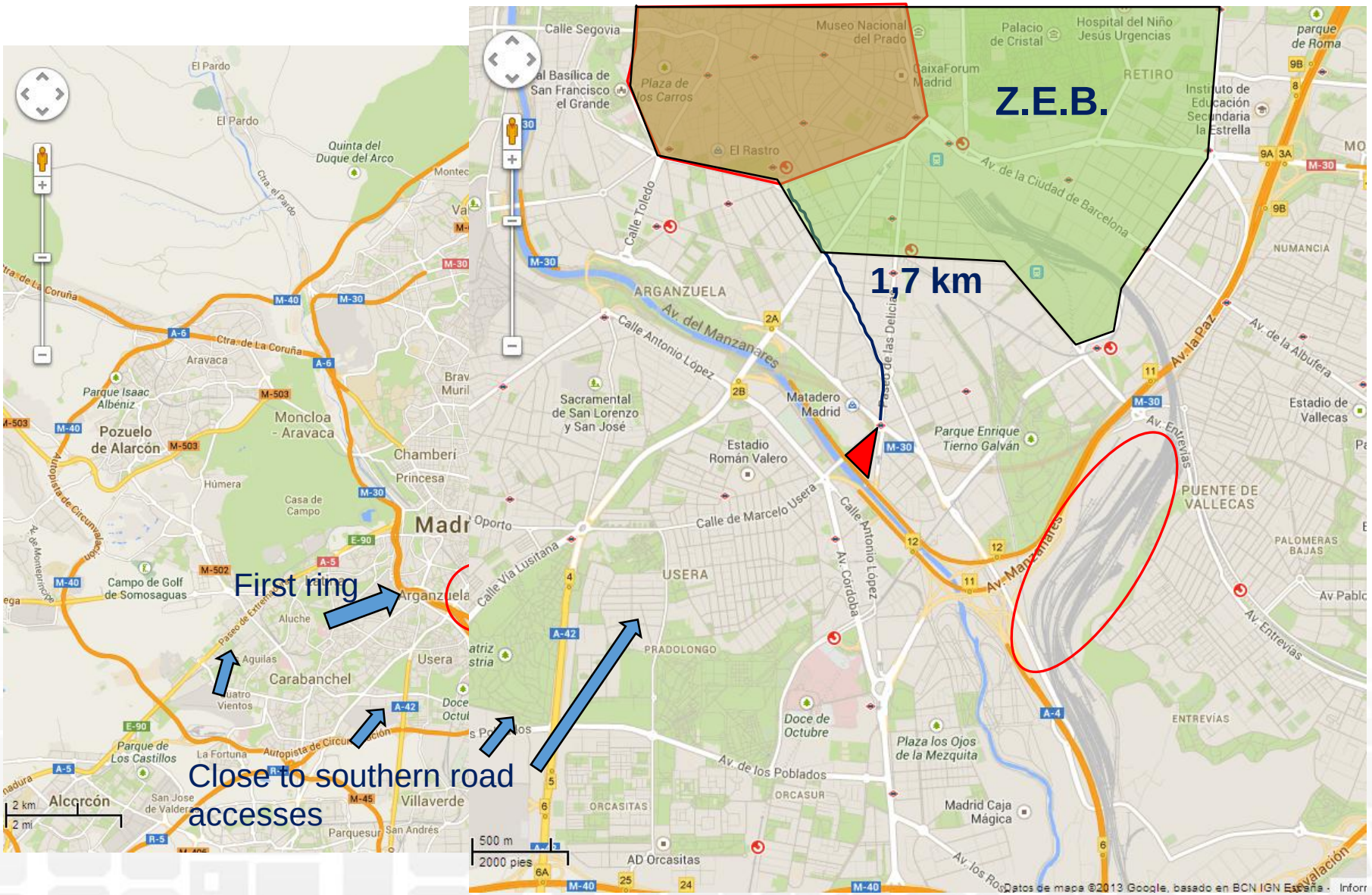
Consolidation Centre

LEGAZPI MARKET



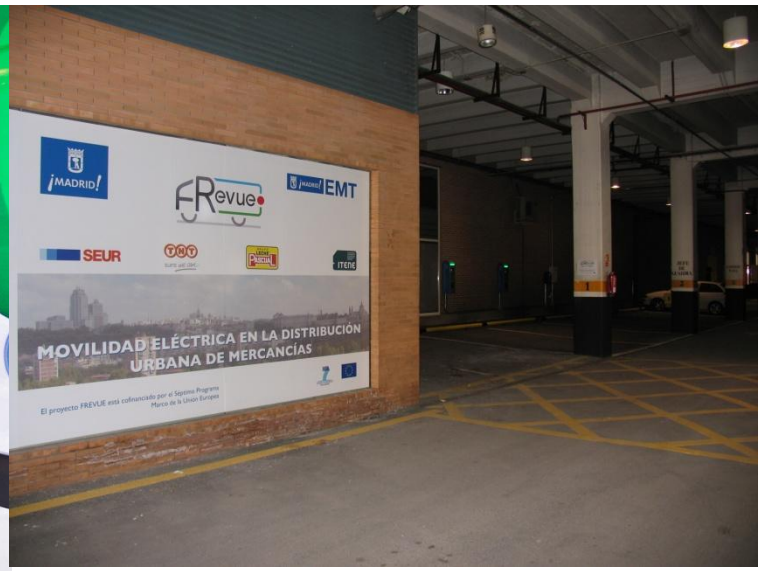
Why Legazpi Market?

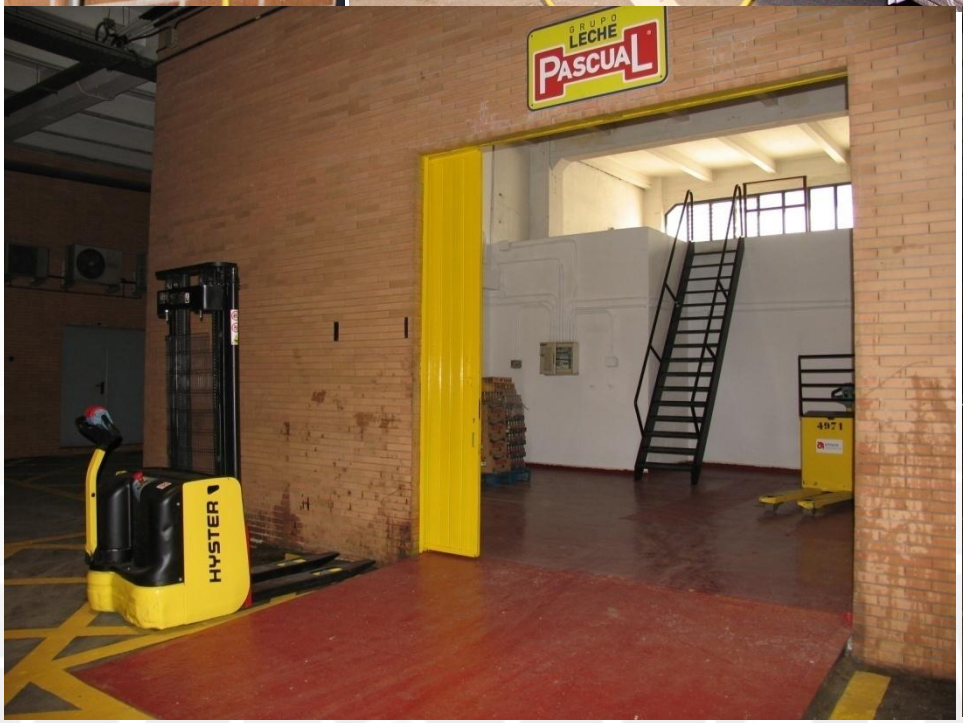
- Municipally owned (Madrid City Council contribution to the project)
- Landmark and representative (one of the very first concrete buildings in Spain, dating back from 1910).
- Gets back its original use
- Complies with the requirements in terms of surface area, clearance, enough space for vehicles manoeuvring, cargo warehouses, toilets, 24 hours surveillance, etc.)
- Excellent accessibility by road (first ring of the city, area with minimal interference with bus stops, traffic roundabout, etc.)


Z.E.B.
1,7 km
First ring
Close to southern road accesses
Calle Segovia
Museo Nacional del Prado
Palacio de Cristal
Hospital del Niño Jesús Urgencias
parque de Roma
Basílica de San Francisco el Grande
Plaza de los Carros
CaixaForum Madrid
RETIRO
Instituto de Educación Secundaria la Estrella
El Rastro
Av. de la Ciudad de Barcelona
Calle Toledo
ARGANZUELA
Av. del Manzanares
Calle Antonio López
Sacramental de San Lorenzo y San José
Matadero Madrid
Paseo de las Delicias
Parque Enrique Tierno Galván
Estadio Román Valero
Av. de la Albufera
Estadio de Vallecas
Av. Entrevías
PUENTE DE VALLECAS
PALOMERAS BAJAS
NUMANCIA
Calle de Marcelo Usera
Calle Vía Lusitana
Calle Antonio López
Av. Manzanares
USERA
PRADOLONGO
Doce de Octubre
Plaza los Ojos de la Mezquita
Av. de los Poblados
ORCASITAS
ORCASUR
Madrid Caja Mágica
AD Orcasitas
ENTREVÍAS
Av. la Paz
Av. Córdoba
Av. los Rosales
El Pardo
Quinta del Duque del Arco
Ctra. de La Coruña
Aravaca
Parque Isaac Albéniz
Pozuelo de Alarcón
Moncloa - Aravaca
Chamberí
Princesa
Húmera
Casa de Campo
Campo de Golf de Somosaguas
Aluche
Aguilas
Carabanchel
Cuatro Vientos
Parque de Los Castillos
La Fortuna
Usera
Alcorcón
San Jose de Valderas
Villaverde
Parquesur
San Andrés
Autopista de Circunvalación
Paseo de Extremadura
2 km
2 mi
500 m
2000 pies
Datos de mapa ©2013 Google, basado en BCN IGN España


Punto de recarga
de vehículo eléctrico
IBIL


IBIL
Mercedes-Benz
El proyecto FREVUE está cofinanciado por el Séptimo Programa Marco de la Unión Europea


¡MADRID!
FRevue
¡MADRID! EMT
SEUR
TNT
MOVILIDAD ELÉCTRICA EN LA DISTRIBUCIÓN URBANA DE MERCANCÍAS


GRUPO LECHE PASCUAL
HYSTER

Vehicles

GRUPO LECHE PASCUAL

SEUR

TNT

IVECO

Mercedes-Benz

RENAULT

+ 2014…?

NISSAN

FRevue

Charging Infrastructure

IBIL: installs and manages electric charging stations

- **1 three-phase charging station of 32 A for the IVECO**
- **1 three-phase charging station of 16 A for the Mercedes Vito**
- **2 single-phase charging stations of 16 A for the Renault Kangoo**

ICT Development

- **Development of Electric Fleet Management tool.**

  - Monitoring of CAN Bus data and GPS position of the vehicle:

  - Real-time monitoring of:

    - ✓ GPS Position
    - ✓ Speed
    - ✓ Electricity consumption
    - ✓ Battery level
    - ✓ Vehicle range
    - ✓ Driving hours
    - ✓ Starts and stops

ICT Development

CAN Bus data logger

Data from operators activity

Electric Fleet Management Tool

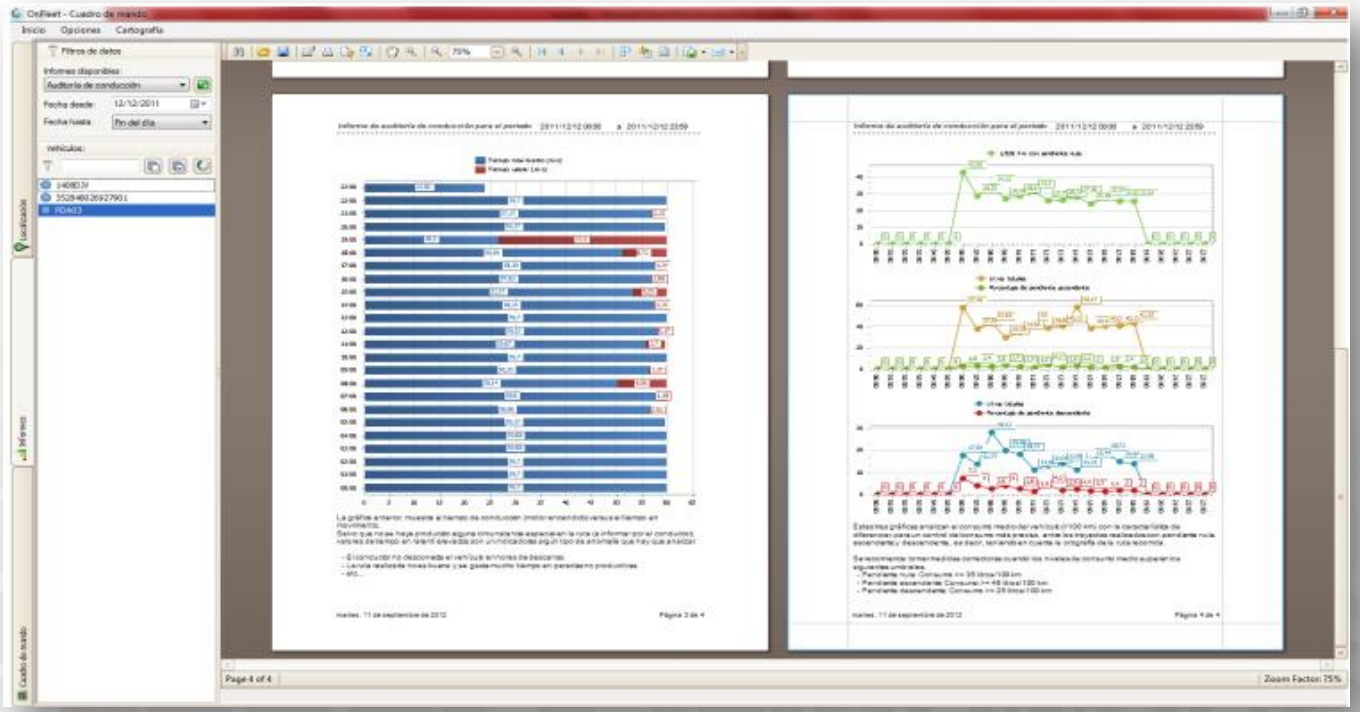
KPIs

ICT Development

KPI	Formula	Unit
PASCUAL		
Vehicle consumption	kWh/Kilometer	kWh/Km
Productivity of the service	Num. services / Km covered	Num./Km
Costs per service	Cost / num. of services	€/num.
Vehicle autonomy	Km. covered / num. Battery recharges	Km
Average times per service	Start time/ End time / number of deliveries	00:00 / 00:00 / num.
Productivity of the service	Number of pieces transported per day	Num.
Productivity of the service	Number of trips	Num.
TNT		
Productivity of the service	Num. stops (deliveries & collections) per day	Num./day
Costs per service	Cost / num. of services	€/num.
Service speed	Total time / num. services	Min./num.
Productivity of the service	Number of pieces transported per day	Num.
Productivity of the service	Number of trips	Num.
SEUR		
Vehicle autonomy	Working hours	Hours
Vehicle autonomy	Kilometers covered	Km.
Vehicle autonomy	Number of recharges per day	Num.
Vehicle autonomy	Time recharging per day	Minutes
Vehicle consumption	kWh/Kilometer	kWh/Km
Service productivity	Number of deliveries & collections per day	Num.
Vehicle autonomy	Kg delivered per day	Kg
Productivity of the service	Number of pieces transported per day	Num.
Productivity of the service	Number of trips	Num.

ICT Development

- **Development of Electric Fleet Management tool.**
  - Vehicle activity reports:



Data available

Source	Parameter	Unit (for reporting)	Availability per vehicle (green available; red not available)			
			Kangoo TNT	Kangoo SEUR	Mercedes Vito (Pascual)	IVECO (Pascual)
DIRECT Data from the monitoring device	Position	GPS				
	Timestamp	0:00				
	Travelled distance (total accumulated)	m				
	Speed	km/h				
	Power consumption in kWh (accumulated)	kWh	Calibrated	Calibrated		
	% Battery	%				
	Brakes (Yes/No)	Yes/No				
	Throttle position (%)	%				
	Range (calculated remaining distance)	m	To be confirmed	To be confirmed		
INDIRECT data from the monitoring device (calculated based on the battery level)	Power consumption in kWh	kWh	Direct data	Direct data		
	Range (calculated remaining distance)	m	Direct data	Direct data		
Data provided by the operators (see templates attached)	Number of services per day	Num.				
	Payload: - Pieces transported per day (TNT, Pascual, SEUR) - Kilograms transported per day(only **SEUR**)	Num.				
	"Number of trips" (every time going by the Consolidation Center)	Num.				
	"Average load" (calculated based on data of Kg. And pieces transported per day)	Num.				
	Maintenance time (in hours)	Hours				
	Price paid per kWh	€/kWh				

Data available

Source	Parameter	Unit (for reporting)	Availability per vehicle (green available; red not available)			
			Kangoo TNT	Kangoo SEUR	Mercedes Vito (Pascual)	IVECO (Pascual)
Data from charging stations (IBIL) - Data available only for recharges carried out in Consolidation Center of Legazpi. - The Mercedes Vito and the IVECO from Pascual occasionally do recharges also in another location (Barajas) but these data are not monitored by IBIL. - The Renault Kangoo from SEUR do not recharge in Legazpi so data from recharges is not available	Charging post ID	Num.				
	Charging post location	GPS				
	Time – charging start	0:00:00				
	Time – charging end	0:00:00				
	Total energy charged	kWh				
	Malfunctions	Type				
	Maintenance	Type				
	Cost of installation of new charging points	€				
	Local Grid monitoring data	Load/volt/ freq				
	EV ID	Num.				
	Power rate from the post	Amp.				
	Charging voltage	Volts				
	Charging post occupancy	Si/No				
	Fuel mix for electricity generation	%				
	Tariff	€/KWh				
	Price paid	€				

Data collection and reporting

Parameter	Unit (for reporting)	Collection Frequency	Collection Format	Frequency of reporting to the ICT Hub	Format of reporting to the ICT Hub
Position	GPS	Every 20 seconds	CANBUS Data logger	Weekly	.xml
Timestamp	0:00				
Travelled distance (total accumulated)	m				
Speed	km/h				
Power consumption in kWh (accumulated)	kWh				
% Battery	%				
Brakes (Yes/No)	Yes/No				
Throttle position (%)	%				
Range (calculated remaining distance)	m				
Power consumption in kWh	kWh	Every 20 sec.	(calculation)	Weekly	.xml
Range (calculated remaining distance)	m	Every 20 sec.			
Number of services per day	Num.	Daily data collected monthly	Excel	Weekly	.xml
Payload: - Pieces transported per day (TNT, Pascual, SEUR) - Kilograms transported per day(only **SEUR**)	Num.				
"Number of trips" (every time going by the Consolidation Center)	Num.				
"Average load" (calculated based on data of Kg. And pieces transported per day)	Num.				
Maintenance time (in hours)	Hours				
Price paid per kWh	€/kWh				

Data collection and reporting

Parameter	Unit (for reporting)	Collection Frequency	Collection Format	Frequency of reporting to the ICT Hub	Format of reporting to the ICT Hub
Charging post ID	Num.	Daily data collected monthly	Excel	Weekly	.xml
Charging post location	GPS				
Time – charging start	0:00:00				
Time – charging end	0:00:00				
Total energy charged	kWh				
Malfunctions	Type				
Maintenance	Type				
Cost of installation of new charging points	€				
Local Grid monitoring data	Load/volt/ freq				
EV ID	Num.				
Power rate from the post	Amp.				
Charging voltage	Volts				
Charging post occupancy	Si/No				
Fuel mix for electricity generation	%				
Tariff	€/KWh				
Price paid	€				

Templates

Fecha	Conductor	Nº servicios	Nº Bultos transportados	Nº de viajes (cada vez que pasan por el centro de consolidación)	Coste (€/kWh)	Tiempo de mantenimiento (en horas)	Kg. transportados (solo SEUR)	kWh o porcentaje de batería recargado (solo la IVECO para cargas fuera de Legazpi)
01/04/2014								
02/04/2014								
03/04/2014								
04/04/2014								
05/04/2014								
06/04/2014								
07/04/2014								
08/04/2014								
09/04/2014								
10/04/2014								
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23/04/2014								
24/04/2014								
25/04/2014								
26/04/2014								
27/04/2014								
28/04/2014								
29/04/2014								

Fecha de entrega:	
Empresa:	
Responsable:	
Vehículo (matrícula):	

Demonstrator progress

2013

- Vehicle acquisition
- Identification of data capture needs
- Arrangements with vehicle providers for the installation of the on-board devices
- KPIs for Logistic Service Providers defined
- Consolidation center established in Legazpi Market
- Installation of charging infrastructure in Legazpi Market and in LSPs facilities

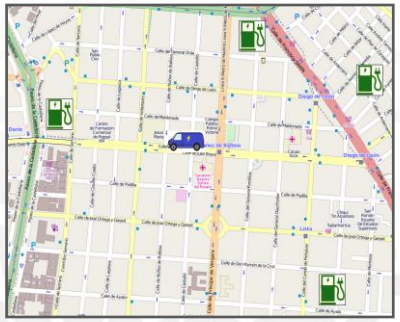
Demonstrator progress

2014

- Pilot Plan for SEUR, TNT and LECHE PASCUAL
- Vehicles operational
- Testing of the on-board device
- Identification of Data Available
- On-board devices installation
- Development of first version of the Electric fleet monitoring tool
- Agreement with ATOS in the protocol to send information to the ICT Hub

Next steps

- **Vehicles monitoring: data collection & calibration**
- **Electric fleet monitoring tool: testing and final development**
- **Development of on-board application for vehicles to the positioning and booking of the charging points**



Dissemination

ABC

Prueba piloto de carga y descarga con coches eléctricos en el centro

▸ Los camiones llegan a Legazpi y de ahí los productos se reparten a las calles más estrechas

SARA MEDIALDEA
MADRID

Madrid tendrá, en una década, un sistema de carga y descarga con vehículos eléctricos de emisiones cero funcionando en el centro histórico de la capital. De momento, desde hace una semana el sistema se está probando como experiencia piloto, gracias a un proyecto coordinado y financiado desde Europa, y con la colaboración de las empresas TNT, Seur y Pascual. La base logística del ensayo se asienta en Legazpi, y desde ahí los coches eléctricos realizan el reparto final, el de la «última milla», entre los comercios de la zona.

La iniciativa fue adelantada ayer

ABC

Ana Botella

En este proyecto participan otras ciudades europeas: un consorcio internacional en el que se incluyen Oslo, Estocolmo, Lisboa, Milán, Amsterdam y Rotterdam, y donde Londres actúa como coordinadora.

La plataforma-base del programa piloto se ha instalado en Legazpi, concretamente en una parte del antiguo Mercado de Frutas y Verduras, que ha sido cedida temporalmente por el Ayuntamiento madrileño para este fin. La experiencia cuenta con un presupuesto de casi un millón de euros, del que la Unión Europea aporta más del 50 por ciento, y el resto llega de los socios españoles y el Ayuntamiento.

Recargar en la base

La plataforma logística de Legazpi ha sido adaptada en los últimos meses por la empresa española IBIL para que los vehículos puedan recargar allí energía eléctrica. Tiene además un almacén que actúa como depósito de carga. Se calcula que el proyecto piloto se

cel Centro Español de Logística

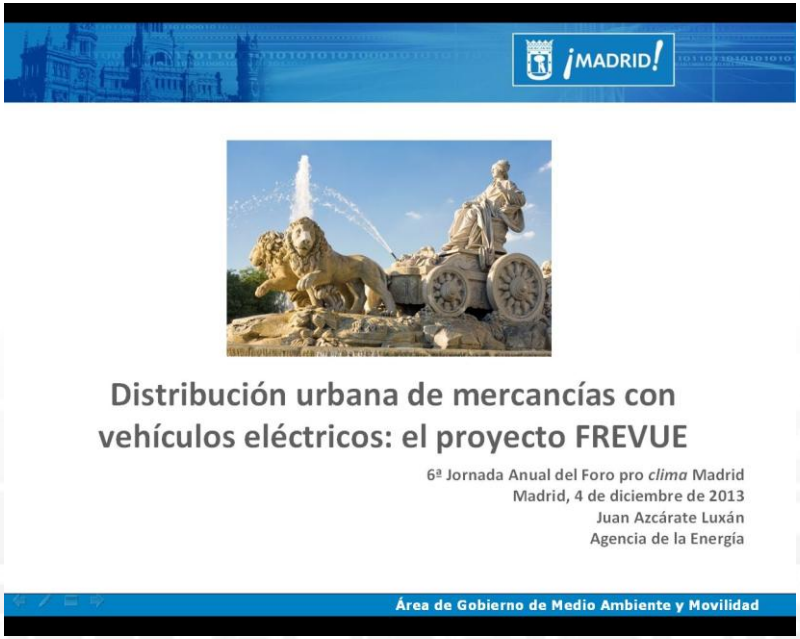
Universidad Carlos III de Madrid

UNO

CITET

SMART CITIES
DISTRIBUCIÓN URBANA INTELIGENTE
Universidad Carlos III de Madrid, Campus de Getafe, 11 de diciembre de 2013

Dissemination



Dissemination

Video Telemadrid