THE LATEST DEVELOPMENTS AND INITIATIVES OF EVS IN SPAIN

EV/PHEV TOWN SYMPOSIUM

Goto, Japan

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IDAE



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ENERGY DEPENDENCE IN SPAIN. **ROLE OF THE TRANSPORT SECTOR**

Energy dependence : Spain vs UE 27



- Energy costs amount to 4,5% of the GDP
- Oil products economic balance: 45.000M€, at the end of 2011

Electrical Non-renewable balance wastes 0.1% Hydro Natural gas 2.0% 22.4% Nuclear 11.6% Renewable Energy Biomass, 11.6% biogas and USW 4.2% Biofuel 1.3% Coal 9.6%

Primary energy consumption in Spain, 2011



Spanish electricity generation mix, 2011

- Transport sector accounts for 37,4% of total final energy consumption and 29,5% of total CO₂ equivalent emissions in Spain
- Electricity generation in Spain: 49,4% free of CO₂ and 50% energy performance: for Evs oriented to urban areas, it could be achieved C02 savings of close to 60% and primary energy savings of close to 30%



EVs/PHEVs: INDUSTRIAL OPORTUNITY

2012 CAR MANUFACTURING IN SPAIN

- •2nd European manufacturer in cars
- Ist European manufacturer in vans and commercials





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PROPOSAL OF THE EUROPEAN COMMISSION

ANNEX II

Proposal (COM (2013) 18/2) for a **DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the deployment of alternative fuels infrastructure:**

- •Establishes a common framework of measures for the deployment of alternative fuels infrastructure in the Union
- •Sets out minimum requirements on alternative fuels infrastructure build-up and common technical specifications, including recharging points for EVs and refuelling points for natural gas and hydrogen.
- •Members shall ensure a minimum number of recharging points (attached table), By 31 Dec. 2020. At least, 10% shall be publicly accessible.

Minimum	number (of electric	vehicle	recharging	points in	each Membe	r State

Member State	Number of recharging points (in thousands)	Number of publicly accessible recharging points (in thousands)
BE	207	21
BG	69	7
CZ	129	13
DK	54	5
DE	1503	150
EE	12	1
IE	22	2
EL	128	13
ES	824	82
FR	969	97
IT	1255	125
СҮ	20	2
LV	17	2
LT	41	4
LU	14	1
HU	68	7
MT	10	1
NL	321	32
AT	116	12
PL	460	46
РТ	123	12
RO	101	10
SI	26	3
SK	36	4
FI	71	7
SE	145	14
UK	1221	122
HR	38	4

EUROPEAN COMMISSION COM (2013) 18 /2

Proposal for a **DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the deployment of** alternative fuels infrastructure:

INTEROPERABILITY

- •AC slow recharging points (< 22kW) shall be equipped with connectors Type 2, as described in standard EN 62196-2:2012
- •AC fast recharging points (>22kW) shall be equipped with connectors Type 2, as described in standard EN 62196-2:2012
- •DC fast recharging points (>22kW) shall be equipped with connectors Type 2
- •"Combo 2", as described in the relevant EN standard, to be adopted by 2014

EXPECTED RESULTS

•Build up a minimum alternative fuel infrastructure and the implementation of common technical standards EU-wide

•Keeping the leadership of EU vehicle and vessel industry; contribute the economic growth and jobs in Europe

•Breaking dependence of transport of oil

•Contribute to the achievement of the 60% reduction of GHG emissions from transport by 2050







SPANISH STRATEGY FOR ENERGY EFFICIENCY AND SAVINGS 2008-2012 (E4)



COMMITMENT 2020 (triple 20)

MODAL CHANGE TO MORE
EFFICIENT TRANSPORT MODES

IMPROVE ENERGY EFFICIENCY OF EACH TRANSPORT MODE MORE EFFICIENT USE OF TRANSPORT MODES

European policies:

- Technology development (new technologies and alternative fuels)
- Market tools (taxes, incentives,...)
- Actions to optimise the use of transport modes and infrastructures to promote changes int th behaviour of cityzens and companies.

European Parliament Resolution, 11 de marzo de 2008

SPAIN: E4 (2004-2012) and PAE 2011-2020



EVs/PHEVs: NATIONAL TARGETS

Iniciatives	Vehicles Target	At the end of	
Short term: MOVELE ⁽¹⁾	2.000	2010	
Medium term: SSIEV (2)	250.000	2014	
Long term: RES Directive ⁽³⁾	2.500.000	2020	1 aerogenerador (3 MW) 700 coches/año (rol UNA Instal de recerirá de 20 000 kinvario) (rol UNA Instal de recerirá de 20 000 kinvario)

- (1) Pilot Demonstration Project managed by IDAE
- (2) Spanish Strategy to Impulse Electric Vehicle (2010-2014)
- (3) 2009/28/CE Directive; Art. 3.4. 2020 Target: 10% RES for transport energy consumption Spanish Legislation: PANER (2011-2020): 342 ktep/y in 2020



INTEGRAL PLAN TO IMPULSE EV/PHEV 2010-2014

ACTION PLAN 2010-2012 (PLAN MOVELE)

- •Dedicated budget 590 M€.
- •15 Key measures.

PROMOTION OF THE DEMANDAction 1 : Public support to acquisition of EVsRD 648/2011Action 2 : Trasposition of Directive 2009/33Action 3 : Identification and promotion of demandfor urban fleets (Fleet study)Action 4 : Promotional actions for EVs in cities:urban advantages (Guide and Certification for cities)	RECHARGING INFRASTRUCTURE AND MANAGEMENT OF ENERGY DEMAND Action 8 : Agreement with utility companies Action 9 : New super valley tariff Action 10 : Smart meters (hourly discrimination) Action 11 : Legal framework for recharging services (Supporting plan for infrastructure development) TRANSVERSAL MEASURES	
INDUSTRIALIZATION AND R&D Action 5 : Supporting plan for industrialization of EVs and components	TRANSVERSAL MEASURES Action 12 : Development of strategical marketing (Fleet promotion, Feria Genera, Website, Vuelta ciclista, MOVELE communication tool)	
Action 6 : Plans to support TICs linked to EVs	Action13 : Standardisation of recharging elements	

Action 7 : Stablishment of prioritary guidelines for R&D programmes related EVs and recharging infrastructure

Action13 : Standardisation of recharging elements Action14 : Homologation of vehicle and components Action 15 : Training programmes for professionals and academies/universities





OBJECTIVES OF THE STRATEGY: VEHICLES



Based on study markets made in 2009

85% of EVs penetration is aimed to fleets!!



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TWO MAIN BARRIERS TO MEET THE PLANNED OBJECTIVES

1."SLIDING" OF THE SUPPLY: Today it's difficult to sell Evs, but it is more difficult to buy them!! DELAYED ENTRANCE IN THE MARKET: Car manufacturers failed in the announced date of commercialisation (Highly desviation in months registered)

•54% of VE models expected for 2011/2012 have been delayed with an average of 4 months•10 models has been delayed and other 4 models remove dates and don't show now any expectations

REDUCED NUMBER OF UNITS:

Initial market supply expected for 2011:Final market supply

13.561 (units of cars and vans)



INCENTIVE PROGRAMMES FOR EVs/PHEVs ACQUISITION

Supporting Programs (at national scale)	HEV <110gCO₂/km in 2011 (Full)	HEV <110gCO₂/km en 2011 (Mild)	(PHEV/EREV)	BEV and Fuel cell	Supporting level
IDAE-Regional Administrations Agreements (E4)	Up to 2.300€	Up to 2.000€	Up to 7.000€	Up to 7.000€	15% of market prices
Strategic Projects (leasing/renting) (E4)	Up to 2.000€	Up to 1.800€	Up to 7.000€	Up to 7.000€	15% of market prices
Pilot Demonstration Project MOVELE (E4)	N. A.	N. A.	Up to 5.000-7.000€ (1)	Up to 5.000- 7.000€	15-20 % of prices before taxes (according technical characteristics of batteries)
Plan Movele 2010-2012 (RD 648/2011) (RD 417/2012)	N. A.	N. A.	15km<=R<=40km: Up 40km < R<=90km: U 90km <=R: L	to 2.000€ o to 4.000€ p to 6.000€	(2) 25% of prices before taxes (with battery)35% of prices before taxes (without battery)

(*) PHEV, EREV+BEV not applied in 2011.

(1)Example: Toyota PHEV 5.000€

(2)Supporting levels increases through multiple buying, not summited to absolut limits.

Note: in the frame of the IDAE-CCAA Collaboration Agreements, transformation of convenctional vehicles into EVs is also granted with 3.000€.



PLAN PIVE (Program of Incentives for Efficient Vehicles)



- •Objective: replacement of 75.000 vehicles (cars and vans), elder than 12 (M1)/10 (N1) years.
- •Public support of 1.000€/vehicle, conditioned to aditional discount of other 1.000€ realised by sale points.
- Beneficiaries: particulars, small and medium companies.
- Budget: 75 M€, from Action Plan 2008-2012 of the E4.
- Duration, 6 monsths- 31 March de 2013.

• Vehicles:

-HEVs, PHEVs, EREVs with A or B label (<u>www.idae.es</u>). (43% of total market of vehicles in Spain)

-BEVs (compatible with Plan Movele incentives) LPG and Natural Gas with CO2 emissions up to 160 g/km

2013: NEW INCENTIVE PROGRAMS HAS BEEN ANNOUNCED:

- Plan PIVE-2: 150M€ (150,000 cars and vans)
- Plan PIMA Aire: 50M€ (incentives of 1,000 and 2,000€/van acquisition; 30,000 vans)

COMPARATIVE CAR LABELLING

Eficiencia Energética PERIODO DE VALIDEZ: AÑO 2002 х Marca Y Modelc Gasolina Tipo Carburante Transmisión Manual Consumo de carburante 5,8 litros/100km (litros por cada 100 kilómetros) Equivalencia 17.2 km/litro (kilómetros por litro Emisión de CO2 139 g/km (gramos por kilómetro Comparativa de Consumo (con la media de los coches de su mismo tamaño a la venta en España Bajo consumo -15 -25% media +15 +25% F G >25% Alto consumo

* En todos los puntos de venta puede obtenerse gratuitamente una guía sobre el consumo de combustible y emisiones de CO2 en la que figuran los datos de todos los modelos de automóviles de tursmo nuevos.

*El consumo de combustible y las emisiones de CO2, no sólo dependen del rendimiento del vehículo; también influyen el comportamiento al volante y otros factores no técnicos. El CO2 es el principal gas de efecto invernadero responsable del calentamiento del paneta.



EVs/PHEVs VEHICLES ON ROAD IN SPAIN (at the end of 2012)

National Programmes of Incentives	EVs acquisitions per category				TOTAL	
(results at 10/12/2012)	Motorbike	Quadricycle	Car	Commercial	Bus	
Agreements IDAE-CCAA (2006-2010; E4)	23	22	20	6	6	77
Strategic projects IDAE (2008-2011; E4)	0	5	7	36	0	48
Piloto MOVELE (2009-2011; E4)	511	145	140	320	0	1.116
Plan MOVELE (RD 648/2011)	504	165	169	65	0	903
Plan MOVEL (RD 417/2012)	1.739	1.050	451	196	0	3.436
TOTAL /	2.777	1.387	787	623	6	5.580
						Completed
	(Acquired	in the frar	ne of Na	tional prog	rams of ir	centives)

Incentives for vehicle acquisition (RD 417/2012)								
Type of vehicle	Sale points	Nº aplications	Fleet Aplications	Public support	Average support	Nº Buyers		
M1: Cars	203	451 (13%)	242	2.787.234€(28%)	6.180€	254		
N1+N2: Commercials	65	196 (6%)	123	1.250.458€(13%)	6.380€	99		
M2+M3: Buses	0	0 (0%)	0	0€ (0%)	0€	0		
L3e+L5e: Motorbikes	68	1.739 (51%)	1.622	2.948.048€(29%)	1.695€	177		
L6e+L7e: Quadricycles	94	1.050 (31%)	565	3.013.758€(30%)	2.870€	593		
Total	430	3.436 (100%)	2552	9.999.498€ (100%)		1123		
			(74% of total)					

SPANISH NATIONAL BUDGET 2013: 8M€ Has just been approved for incentives to Evs acquisition.



•Oriented to public contractors

•Vehicles: M (1,2 and 3) y N (1,2 and 3)

•Consideration of emissions and energy consumption in the acquisition prices of vehicles

* 🕞 🏤 🗶 🚮

•Trasposed into Spanish legislation through Spanish Law for Sustainable Economy (articles 106, 107 and 6th additional disposition)

•It is the origin of: <u>www.cleanvehicle.eu</u>



OBJECTIVES OF THE STRATEGY: INFRASTRUCTURE





NATIONAL SUPPORTING PROGRAMMES FOR INFRASTRUCTURE

INCENTIVES in the frame of the Collaboration Agreements IDAE-Regional Governments (Action Plan 2008-2012, E4)

Subject of investment	Maximum elegible cost (€)	Financial support PAE+ (€)
Complete installation of a covered CHP < 40kW	4.000	Up to 40% (public use)/30% (companies) of elegible costs with a maximum of 1.600€/1.200€
Complete installation of a not covered CHP < 40kW	6.500	Up to 40% of elegible costs with a maximum of 2.000€
Complete installation of a CHP ≥ 40kW	50.000	Up to 40% (public use)/30% (companies) of elegible costs with a maximum of 20.000€/15.000€
Centralised control system	50.000	Up to 40% (public use)/30% (companies) of elegible costs with a maximum of 20.000€/15.000€
Communication campaign (recharging networks)	6.000	6.000€

Parking lots in "**living bloks**": financial support up to 40% of complete installation costs (smart meter not included), with a maximum of 200€ per CHP installed.



PUBLIC USE CHARGING POINTS OPERATIVE IN SPAIN

Recharging infraestructure					
Cities	89				
Stations	288				
Total CHP	771				
Type of charge					
CHP Single Phase	691				
CHP 3-phase	80				
Location					
CHP covered	355				
CHP not covered	416				
Supporting program					
MOVELE	223				
Others	548				

Updated at the end of 2012



www.movele.es



COLABORATION AGREEMENT IDAE-AEDIVE

COLABORATION AGREEMENT (17 May, 2012):

- AEDIVE (Spanish Association of recharging infrastructure).
- Elaboration of specialised guides, videos and other diffusion material for installators, living blocks managers, architects, town councils, ...
- Study of Observatory for EV's recharging.
- Creation of the Information Center for EV's recharging (CAR).
- Seminars and events







NORMATIVE FOR INFRASTRUCTURE

- National normative for technical conditions and basic warranties for electric installations for allowing recharging of EVs (ITC 52).
- It will estipulate a certain minimum electrical infrastructure for new buildings.
- It is expected to be approved in the next weeks.
- Regional initiatives linked to ITC 52 (Catalonia).

RD 647/2011 (23rd May, 2011):

- It regulates the functions of the new figure "Manager of charging" (initially defined in RDL 6/2010, in the frame of the Law for the Electric sector 54/1997): a new power market agent which is allowed to sell electricity for <u>EV charging energy services</u> and energy storage.
- Also it establishes the "supervalley tariff": an special access tariff defined for electricity supply with voltage lower than 1kV and maximum power between 10 and 15 Kw.



INTEROPERABILITY OF PUBLIC USE INFRASTRUCTURE I

Definition at national level of an "**Interes Group**" in order to carry out a communication plattform for interconnecting different recharging networks for Evs, with a consensus between members at national level, considering also other possible solutions or suggestions at international level:

FITSA: Coordinator

IDAE : Institutional support

AENOR and ODETTE (ANFAC): Standardization agents

MANAGERS OF RECHARGING: Installation and operation of recharging infrastructure.

IBIL	GAS NATURAL FENOSA
IBERDROLA	ENDESA
EON	SOLARDILA
ACCIONA EFICIENCIA ENERGÉTICA, S.L.	



INTEROPERABILITY OF PUBLIC USE INFRASTRUCTURE II

MANAGERS OF CHARGING

- Definition of services and communication protocols (internet, security..)
- Definition of protocols for user autorization and for data interchange

URBAN MOBILITY OPERATORS

- Definition of services and communication protocols (internet, security..)
- Definition of protocols for information of state of use of the CHP and for reservation of CHP

STANDARDISATION ISSUES

- Use of defined standards
- Development of new normatives and follow up of their relevant standards

ACCESIBILITY TO CHARGING POINTS

 Agreements for standardisation of connectors and systems for user identification





SUPERVALLEY TARIFF

ITC/2585 (29th September, 2011):

P1	P2	P3
13 – 23 h.	0 – 1 h. 7 – 13 h. 23 – 24 h.	1 – 7 h.

Winter and Summer

ACCESS FEE: SUPERVALLEY TARIFF

2.0 DHS (Power contracted <10kW)

Power fee (TPA): 16,633 €/kW y año.

Active energy fee (TPA):

2.1 DHS (10kW<Power contracted <15kW)Power fee (TPA): 31,773 €/kW y año.Active energy fee (TPA):



ACCESS FEE: without hourly discrimination (< 10kW)

Power fee (TPA): 16,633 €/kW y año. Active energy fee (TPA): 0,0539 €/kWh



MARKETING AND COMMUNICATION PLAN FOR FLEETS

In previous studies (2010), it was detected a huge lack of knowledge about EVs and electromobility: existing market, costs, technological potential, etc.

Key matter: to develop **marketing and communication measures and tools oriented to car fleets**, in order to promote Evs demand and so, to reach implementation objectives for Evs considered in the Spanish Strategy.

Collaboration agreement IDAE-AEFGA

Duration: 1 year (July 2011 a July 2012) Budget IDAE: 233.000€

1.Elaboration of a «Guide for electromobility in fleets as reference publication for fleet s related EVs

www.aefga.com www.movele.es

2.Other Communication and diffusion activities:

Monographics on EVsNewsletters



MARKETING AND COMMUNICATION PLAN FOR FLEETS

3.Creation of the «Electric fleet Office»

- •Provide fleets updated information on Evs
- Specialised assessment
- •Support in managements related EVs.

4. Organization of events for fleet managers

«Day of the electric Fleet»:

- Valencia (Energy Simposium)
- Madrid (Circuit of Jarama)
- Barcelona (Smart City Expo)
- Moraleja de Enmedio (Madrid)
- Moraleja de Enmedio II public fleet- (Madrid)
- Valladolid (Alternative vehicles motorshow)

5.Program of audits for fleets (200 visits):

•Information and training on EV issues

- •Market information on EVs and Infrastructure
- •Assesment on their specific case: posibilities, advantages, procedures...









PROMOTIONAL ACTIONS FOR EVS IN CITIES: URBAN ADVANTAGES



MOVELE WEBSITE (www.movele.es)

Key tool which colletcs relevant info about EVs implementation in Spain (normatives, infrastructure deployment, catalogue of Vehicles, relevant news, fleets section...

GUIDE TO PROMOTE EVS IN CITIES

IDAE produced an specific guide for town councils. It includes a model for public regulations and call for proposals related to EVs.





EUROPEAN STRATEGIC ENERGY TECHNOLOGY PLAN

SET-Plan: technology pillar of the EU Energy and Climate policy.

Sets out a long-term energy research, demonstration and innovation agenda for Europe, including concrete strategic milestones to be achieved in the coming years.

EU will focus on implementing the technology priorities established in the European Strategic Energy Technology Plan.

EII (European Industrial Initiative) \implies **EIP-SCC** "Smart Cities and Communities European Innovation Partnership", launched by EC on 10 July 2012



Budgetary envelope EIP Smart Cities FP7 (2007-2013) -SMARTCITIES-

Total Budget 209 million €: -95 million € from Theme 3 – Information and Communication Technologies (ICT) -114 million € from Theme 5 – Energy (90 ENER + 24 RTD)

2014-2020 HORIZON: New Framework Program for research, technology development and innovation

UE ROADMAP FOR SMART CITIES AND COMMUNITIES





EU STAKEHOLDERS PLATFORM ON SMART CITIES AND COMMUNITIES

(http://eu-smartcities.eu/)





- Last 10th July, it was launched by EC an initiative la CE on Smart Cities and **Communities European Innovation** Partnership (SCC), aimed to promote the development of "smart" technologies in cities.
- SCC will work on demonstration of • integrated urban and innovative solutions in the frame of Energy, **Transport and ICTs.**



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RECI (SPANISH NETWORK OF SMART CITIES)



- Málaga
- Murcia
- Palencia
- Pamplona
- Rivas-Vaciamadrid
- Sabadell
- Salamanca
- Santander
- Segovia
- Valencia
- Valladolid
- Vitoria-Gasteiz
- Zaragoza
- Nuevas: Alcobendas, Elche, Gijón, Móstoles, Oviedo, Sevilla y Tarragona

Workgroups:

- WG1. Social Innovation
- GT 2. Energy
- GT 3. Environment, Infrastructures
- GT 4. Urban mobility
- GT 5. Government, economy and bussines



SMART CITIES INITIATIVES IN SPAIN



Smart Santander, initiative FIRE (Future Internet Experimentation and Research) from 7PM.
Participation of 14 European partners and one from Australia. Trafic management, lighting and waste disposal.
Project OUTSMART: role of utilities in Smart cities.



Smart city Málaga. Financed by CDTI, Junta de Andalucía, Málaga town council and FEDER. This project is leadered by ENDESA and participe 10 companies as projec members and 15 R&D centres. Demonstration in real conditions of key concepts related smart energy to meet energy objectives by 2020. It deals with smart meters, energy transformation networks and public lighting



Vitoria Gasteiz. smart initiaatives in the individual public transport sector (CIVITAS program), automatic control of parks and gardens, **public lighting**, semaphoric regulated systems, energy consumption control in buildings "CONCERTO", photovoltaic installations in public buildings, lighting, water and disposal manag.



Projet "22@Urban Lab. Barcelona" A living lab was created in "22@Barcelona" district for innovative solutions in companies in the different frames (Mobility urbanism, etc.).



Pilot projects to remark: LED public lighting, on-line control of gas, light and water meters, sustainable mobility, recharging infrastructure for Evs, control cameras for

traffic management in the real time, optical fibre for buildings, semaphoric adaptations for blind people, etc. Awarded with SmartCity International Awards.



Smart City Valladolid and Palencia ("**Smart City VyP**"). To promote technology innovation. Initiatives related interurban mobility, urban mobility plans, initiatives related efficient buildings and efficient use of water



MALAGA: SMART CITY





MALAGA: SMART CITY II









GOBIERNO DE ESPAÑA YTURISMO IDAE 32

MALAGA: ZEM 2 ALL (towards Low Carbon Society)







Main Figures of the Project:

- •Japan- Spain innovation programme (4 years)
- •Bringing to Malaga **200 EVs** + 6 **V2G** Evs

•Installing navigation and localization systems all around the city with fleet and e-parking management systems

•220 standard recharging points and a further 16 quick charge points will be installed.



ZEM 2 ALL: Key technical objectives

- Development of a mobility management centre.
- Development of an integrated communications platform for electric vehicles and recharge points.
- Integration of renewable energies and energy storage systems.
- Development of technological solutions that facilitate the rapid charge and discharge of electric car lithium ion batteries to the vehicle-to-grid (V2G).
- Rollout of navigation, location and occupation solutions for recharge points.
- Development of consumption and supply management systems for recharging.



Barcelona, November 2013

•17-20 November: EVS-27 •20-22 November: Smart City Expo •EVI and IA-HEV meetings

Thanks for your attention

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