

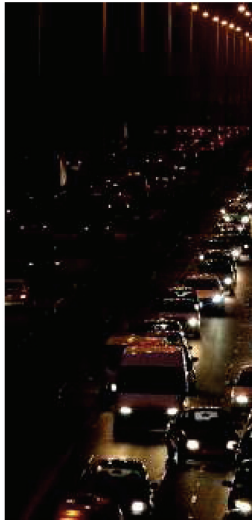
PORTUGUESE ELECTRIC MOBILITY PROGRAM

SEOUL MARCH 17, 2010
PRESENTATION FOR UN FORUM ON CLIMATE CHANGE MITIGATION, FUEL EFFICIENCY AND SUSTAINABLE URBAN TRANSPORT

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THE STARTING POINT THE NEED FOR A NEW PARADIGM



The starting point

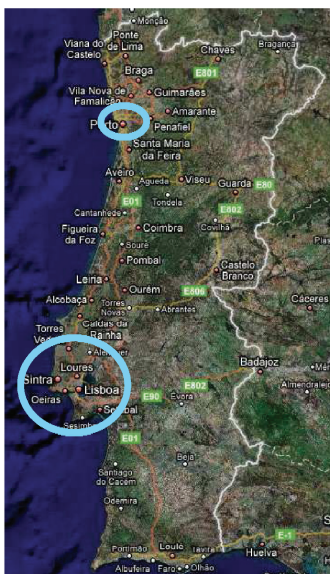
- ❑ **Energy:** oil-based economy; increasing oil prices
(transportation accounts for 38% of final energy consumption per sector)
- ❑ **Environment:** CO2 emissions
(more than 34 % of CO2 emissions in Europe come from transport sector)
- ❑ **Productivity and quality of life:** traffic congestion
(10% of roads are daily congested; annual cost amounts to almost 2% GDP)



The future

- ❑ New vision of mobility, new solutions and applications
- ❑ Integrated systems (users-transportation-infrastructure-territory)

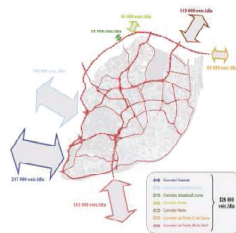
THE STARTING POINT MOBILITY PROFILE IN THE MAIN URBAN AREAS IN PORTUGAL



Between 7:30 a.m. and 9:30 a.m.
Sources: CM Porto

→ 130,000 daily courses with average 70% cars with single user and 23% driver + 1 passenger

Greater **Oporto** population travels daily an average distance of **12.5 km** (one way)



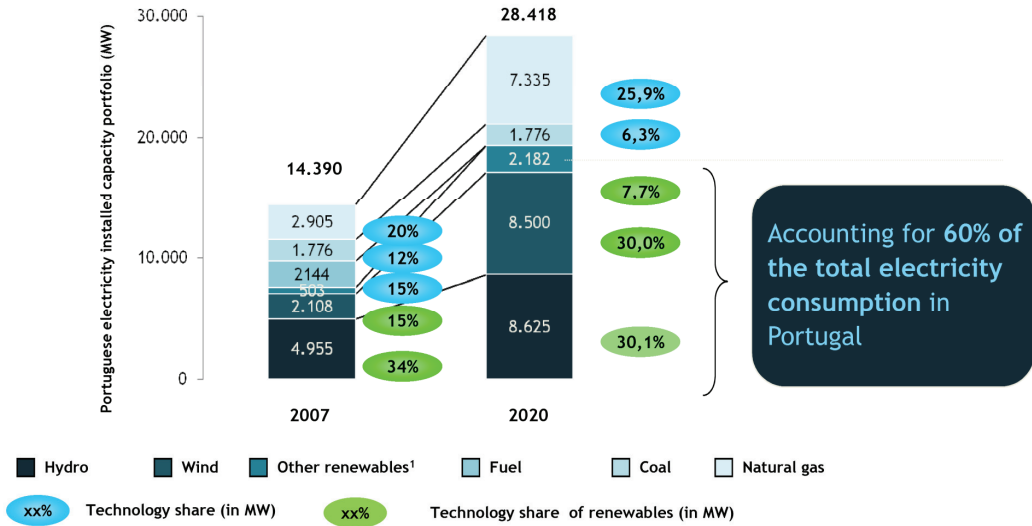
Source: Lisboa, O Desafio da Mobilidade (CM Lisboa)

→ 826,000 vehicles enter or cross Lisbon daily

Average daily distance travelled by car in **Lisbon** :
28 km (one way)

ENERGY STRATEGY

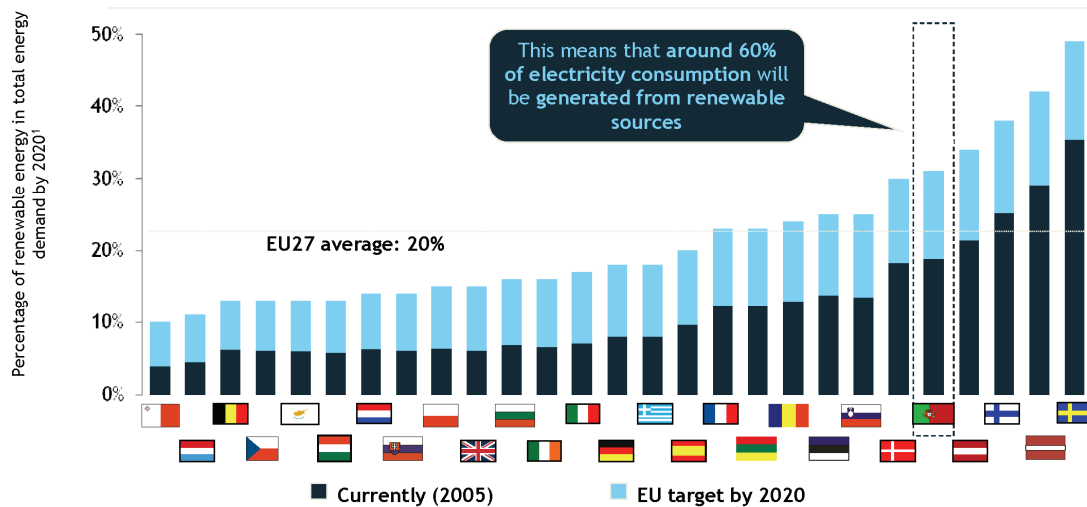
2007-2020 OBJECTIVE : TO INCREASE INSTALLED CAPACITY BY 100%



1. Biomass, solar, wave, biogas e microgeneration
Source: MEI; DGEG; REN

ENERGY STRATEGY

2007-2020 OBJECTIVE : TO LEVEL WITH THE MOST AMBITIOUS RENEWABLES TARGET IN THE EU27 (55% ABOVE EU27 AVERAGE)

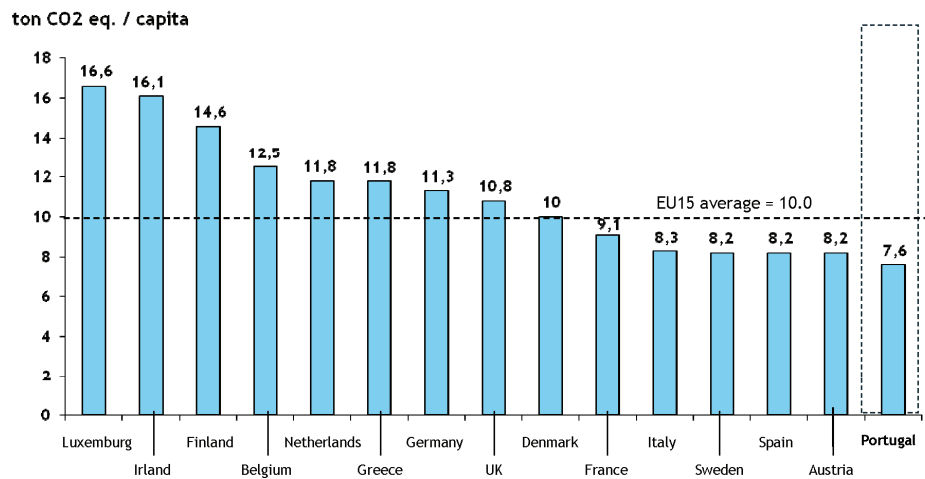


1. Including electricity consumption, fuel for transportation and different sources of primary energy used by industrial and household heating and cooling applications
Source: MEI

ENERGY STRATEGY

2007-2020 OBJECTIVE : TO LEVEL WITH THE MOST AMBITIOUS CO₂ TARGET PER CAPITA IN THE EU
(24% BELOW EU15 AVERAGE)

CO₂ emissions targets per capita in EU (2010)



Source: European Commission; Eurostat

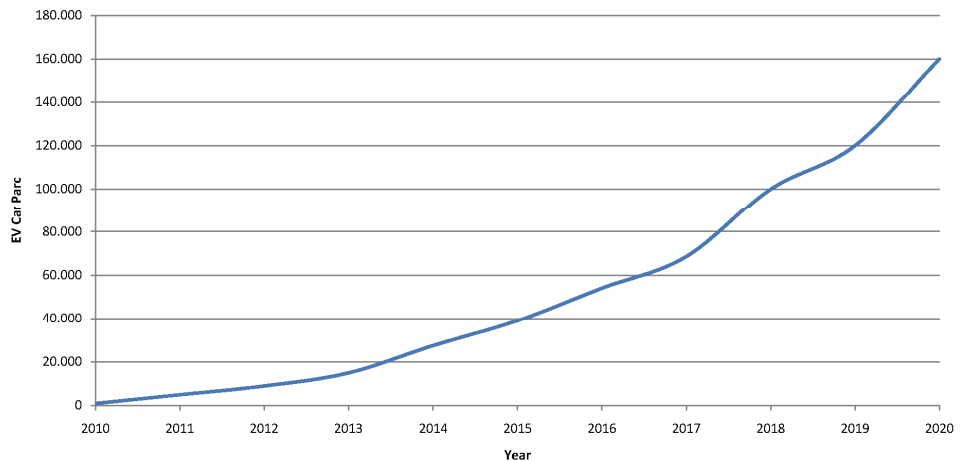
INTEGRATED STRATEGY

RENEWABLES AND ELECTRIC CARS ARE COMPLEMENTARY MODELS

- With a modern electrical distribution infrastructure the main challenge lies in vehicle and grid interface
- EVs widespread use will enable better dimensioning of the electricity generation system and better accommodation of renewables production
- Focus on night-charging as well as on distributed generation based on wind and PV solar power

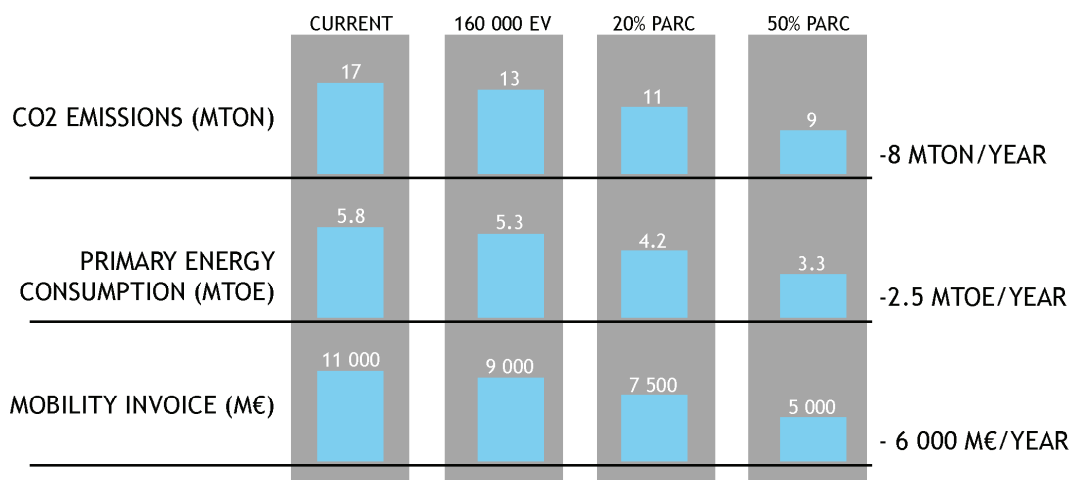


INTEGRATED STRATEGY EV CAR PARK EVOLUTION FORECAST



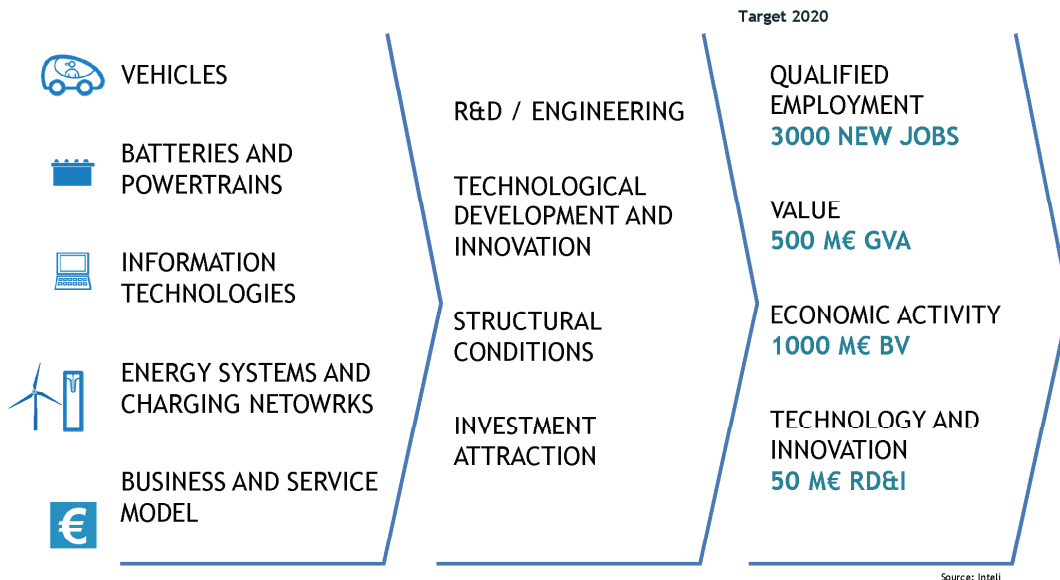
Source: Inteli / Roland Berger Strategy Consultants

INTEGRATED STRATEGY TOWARDS SUSTAINABLE MOBILITY

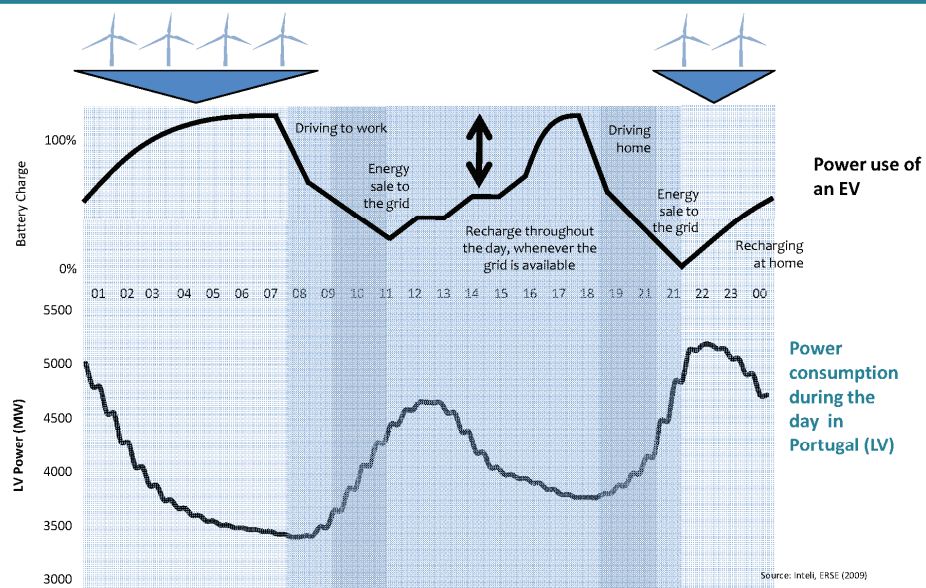


Source: Inteli

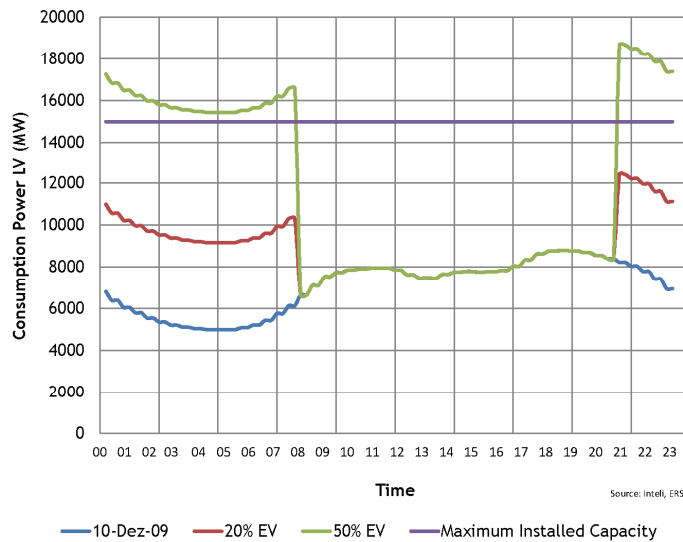
INTEGRATED STRATEGY ECONOMIC IMPACT



INTEGRATED STRATEGY IMPACT ON THE ELECTRIC GRID

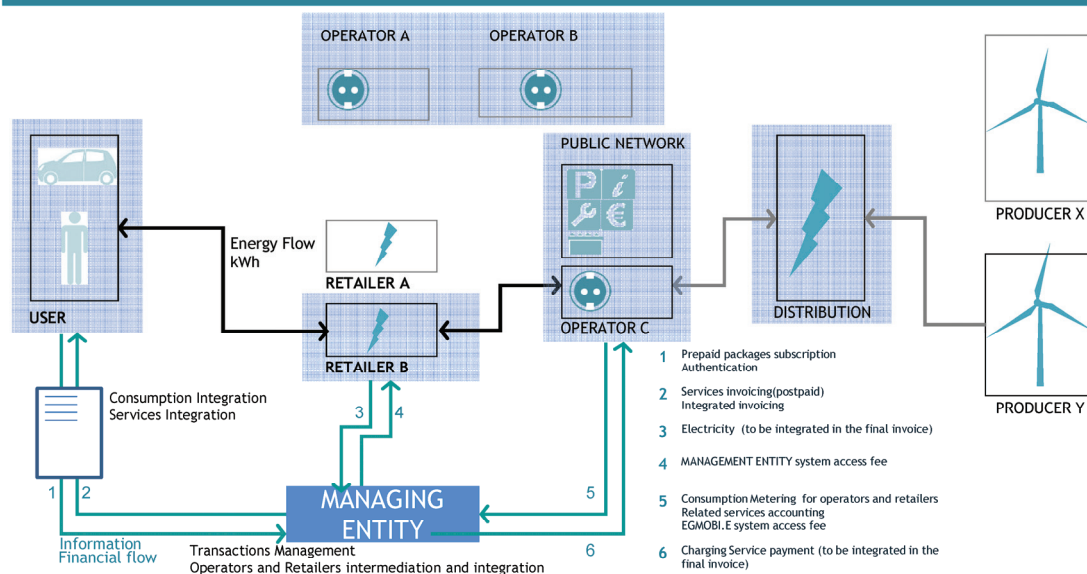


INTEGRATED STRATEGY IMPACT ON THE ELECTRIC GRID OF A GROWING EV PARK



- Extreme scenario: the EV park only charges simultaneously during the night
- Renewables capacity targets are sufficient to accommodate EV introduction from an early stage
- Need for development of smart charging and smart grids together with Vehicle-to-Grid (V2G) for optimal grid loading

ELECTRIC MOBILITY PROGRAM THE MANAGING ENTITY: INTEGRATION BETWEEN MULTIPLE STAKEHOLDERS

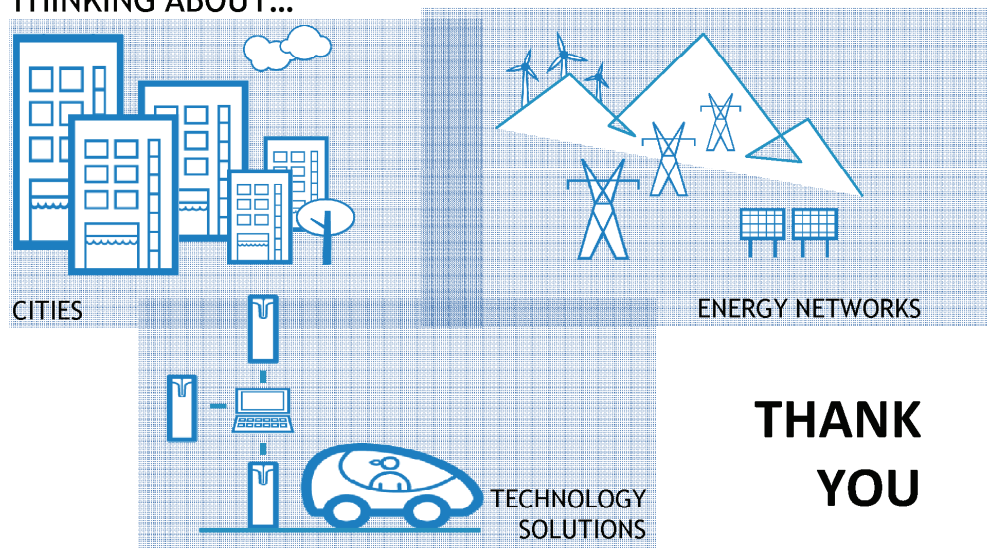


FINAL MESSAGE MAIN CONCLUSIONS

- ❑ This model framework ensures a **unique, open and universal user centered charging network**, which induces synergetic relations between the different market agents
- ❑ Electric Mobility will be a complementary added value to a wide range of companies' core businesses, for example : Electricity retail, Vehicle retail , Energy services, Parking, Financial services
- ❑ Major effort lies in the mobilization of upstream and downstream companies across the value chain for the joint optimization of resources:
 - ❑ 1 - Business agents (retail and operation) developing **innovative business solutions**, which can be both profitable and achieve international recognition
 - ❑ 2 - Companies and R&D Institutions through the development, design and production of **innovative technological solutions** of high export potential

CHALLENGES

THINKING ABOUT...



**THANK
YOU**