# PORTUGUESE ELECTRIC MOBILITY PROGRAM

SEOUL MARCH 17, 2010

PRESENTATION FOR UN FORUM ON CLIMATE CHANGE MITIGATION, FUEL EFFIENCY AND SUSTAINABLE URBAN TRANSPORT

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# THE STARTING POINT
## THE NEED FOR A NEW PARADIGM

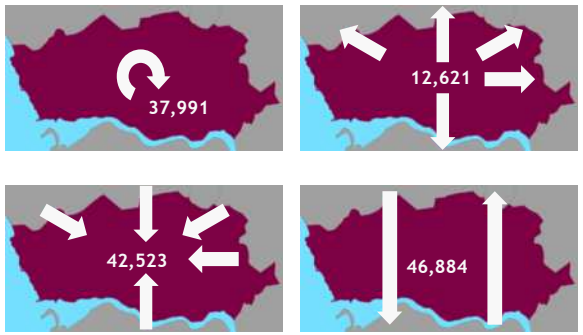
### The starting point

- 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

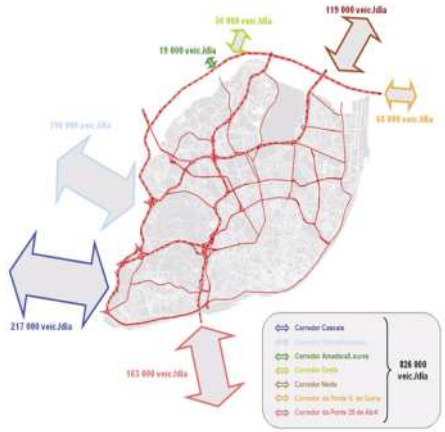




Between 7:30 a.m. and 9:30 a.m.

Source: CMPorto

→ **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)



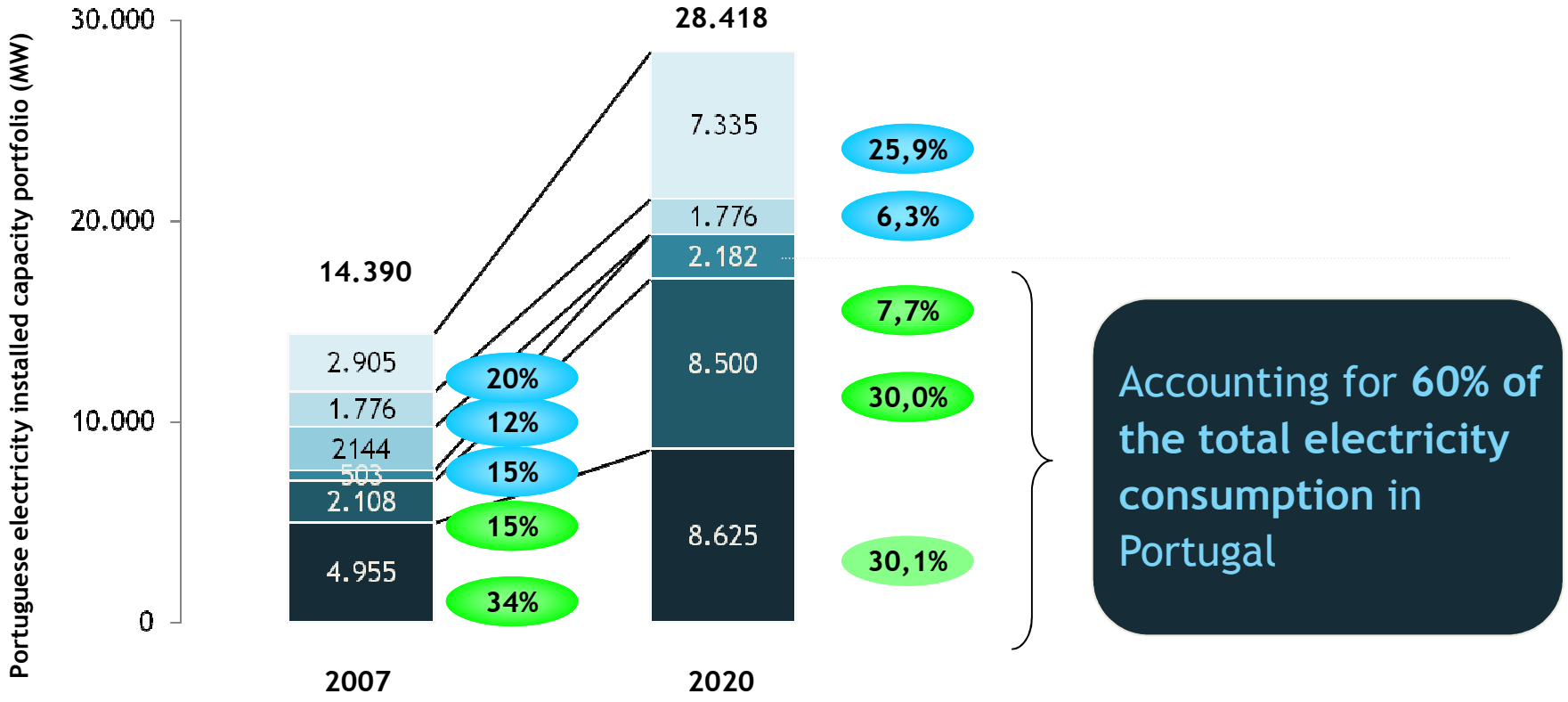
Source: Lisboa, O Desafio da Mobilidade (CM Lisboa)

→ **826,000** vehicles enter or cross Lisbon daily

Average daily distance travelled by car in **Lisbon :**

**28 km** (one way)

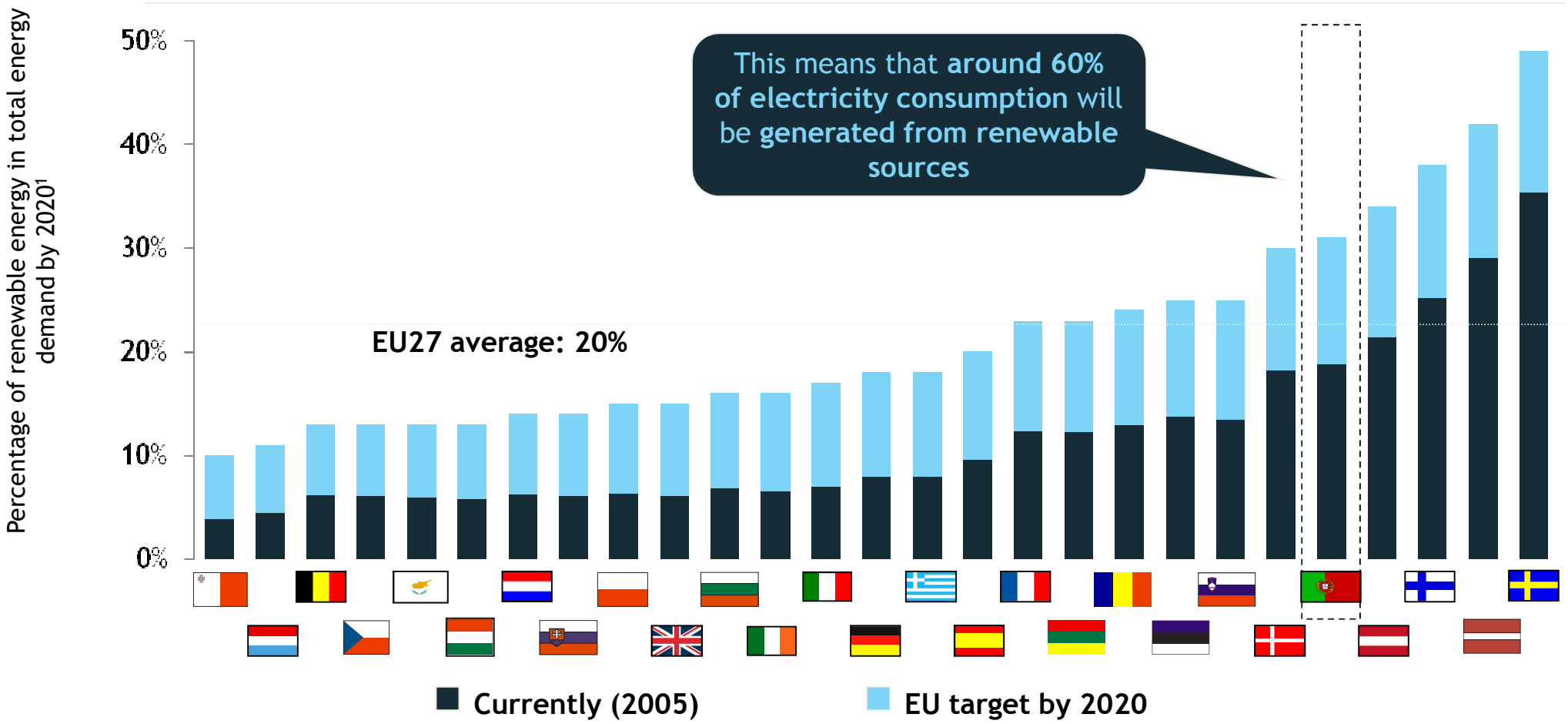
# ENERGY STRATEGY
## 2007-2020 OBJECTIVE : TO INCREASE INSTALLED CAPACITY BY 100%




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)

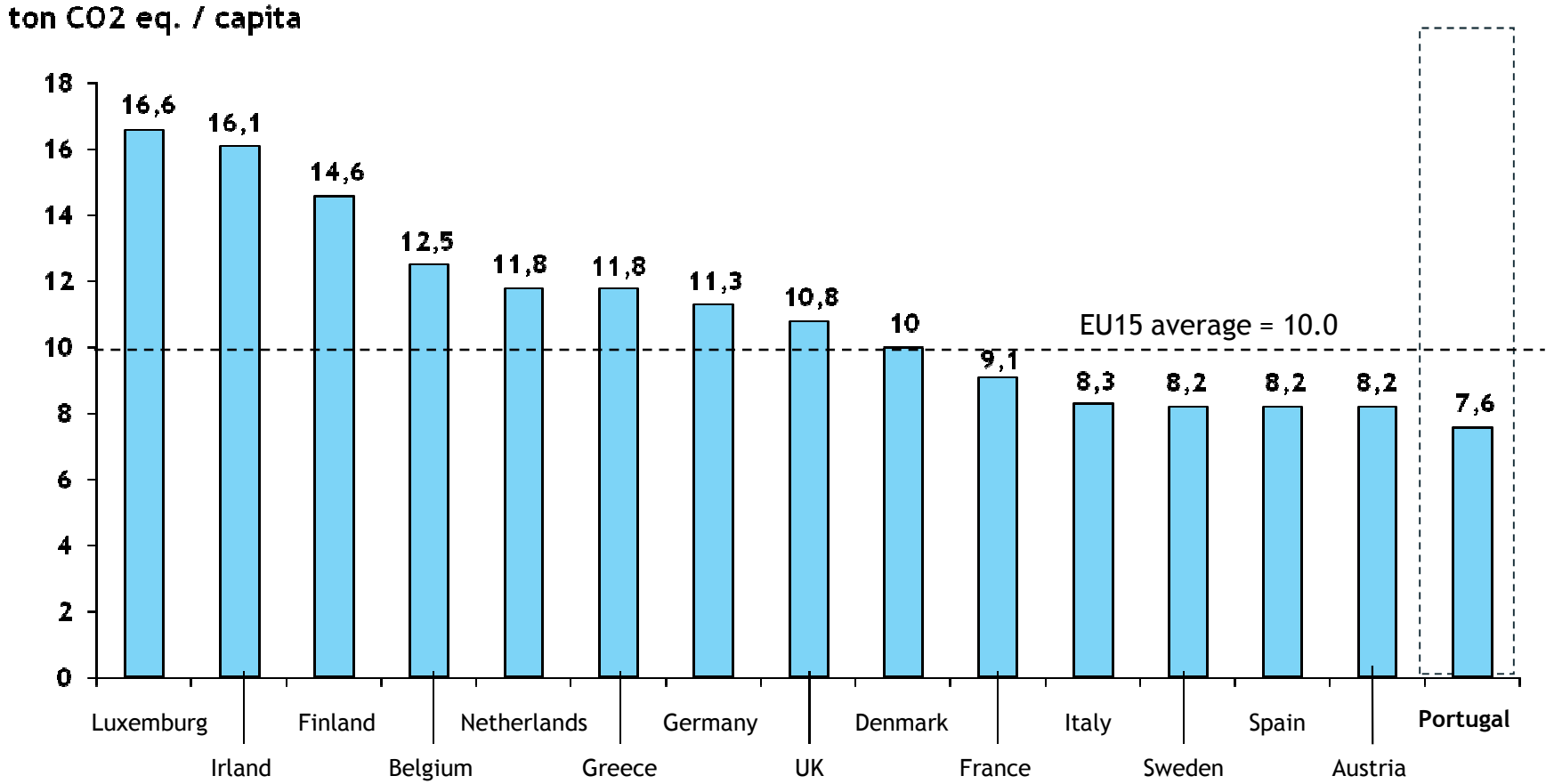



1. Including electricity consumption, fuel for transportation and different sources of primary energy used by industrial and household heating and cooling applications
Source: MEI

# 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)

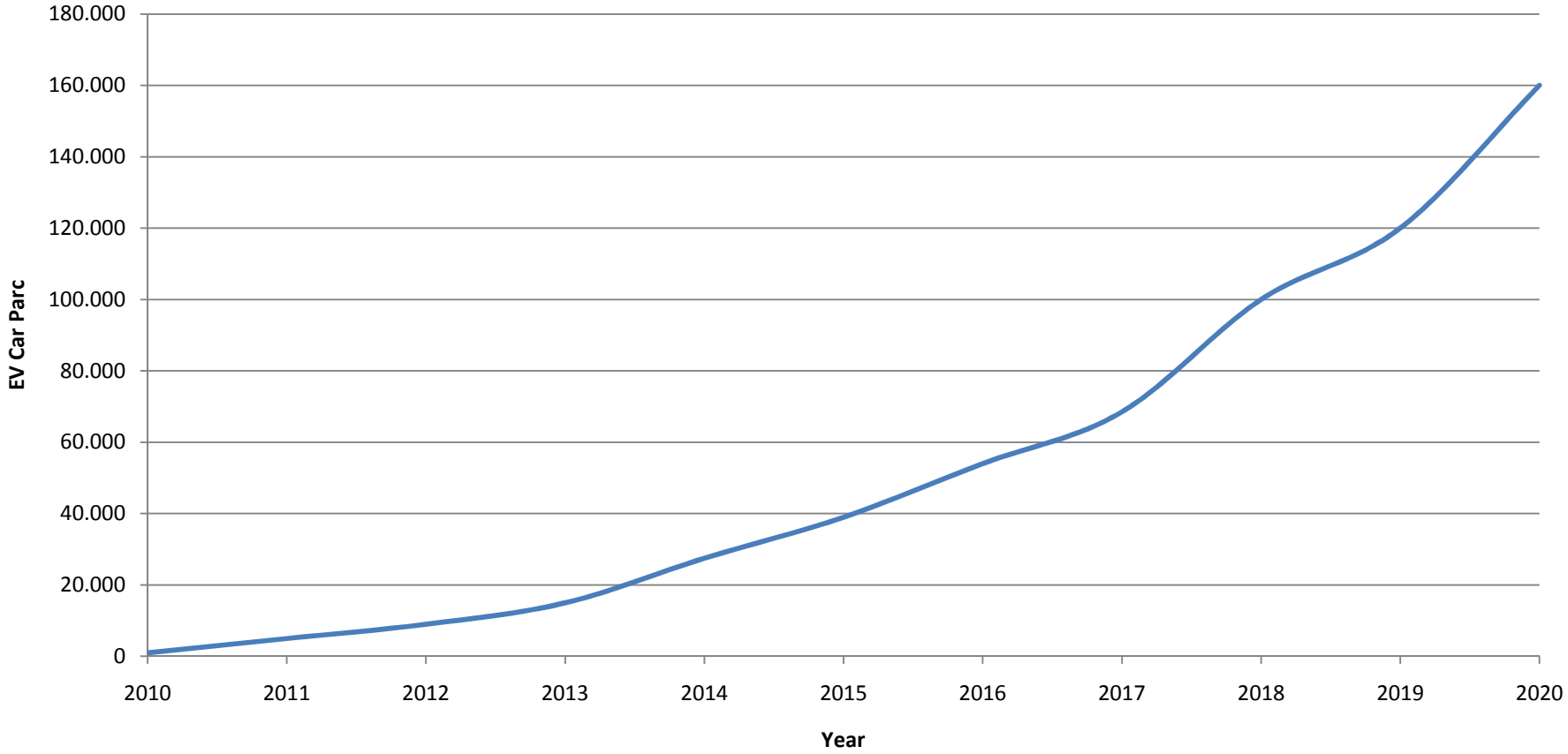



Source: European Commision; Eurostat

# 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

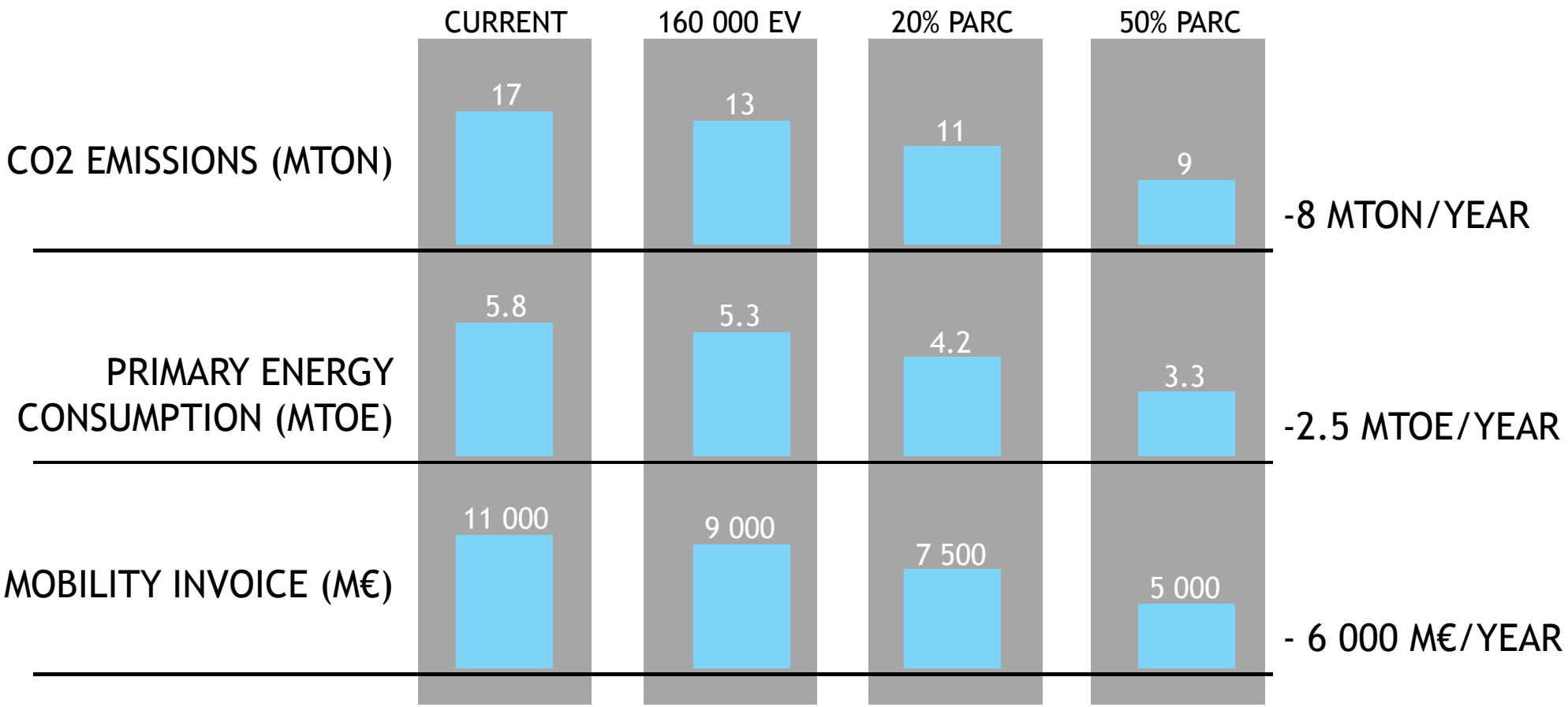
# INTEGRATED STRATEGY
## EV CAR PARK EVOLUTION FORECAST




| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EV | 1.000 | 5.000 | 9.000 | 15.000 | 27.500 | 39.000 | 54.000 | 68.500 | 100.000 | 120.000 | 200.000 |

Source: Inteli / Roland Berger Strategy Consultants

# INTEGRATED STRATEGY
## TOWARDS SUSTAINABLE MOBILITY




Source: Inteli

# INTEGRATED STRATEGY
## ECONOMIC IMPACT

- VEHICLES
- BATTERIES AND POWERTRAINS
- INFORMATION TECHNOLOGIES
- ENERGY SYSTEMS AND CHARGING NETOWRKS
- BUSINESS AND SERVICE MODEL

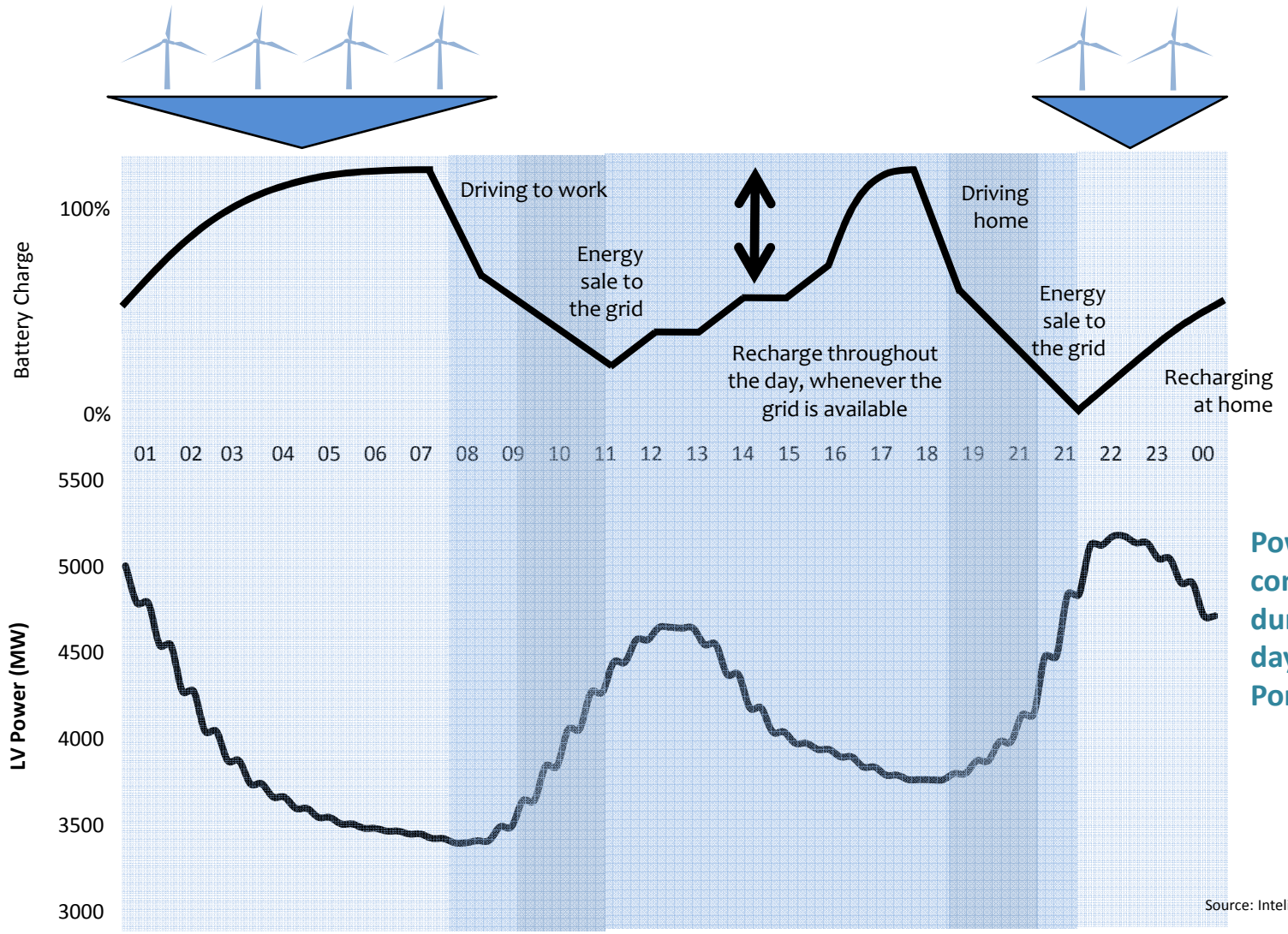
- R&D / ENGINEERING
- TECHNOLOGICAL DEVELOPMENT AND INNOVATION
- STRUCTURAL CONDITIONS
- INVESTMENT ATTRACTION

**Target 2020**

- QUALIFIED EMPLOYMENT
  **3000 NEW JOBS**
- VALUE
  **500 M€ GVA**
- ECONOMIC ACTIVITY
  **1000 M€ BV**
- TECHNOLOGY AND INNOVATION
  **50 M€ RD&I**

Source: Inteli

# INTEGRATED STRATEGY
## IMPACT ON THE ELECTRIC GRID

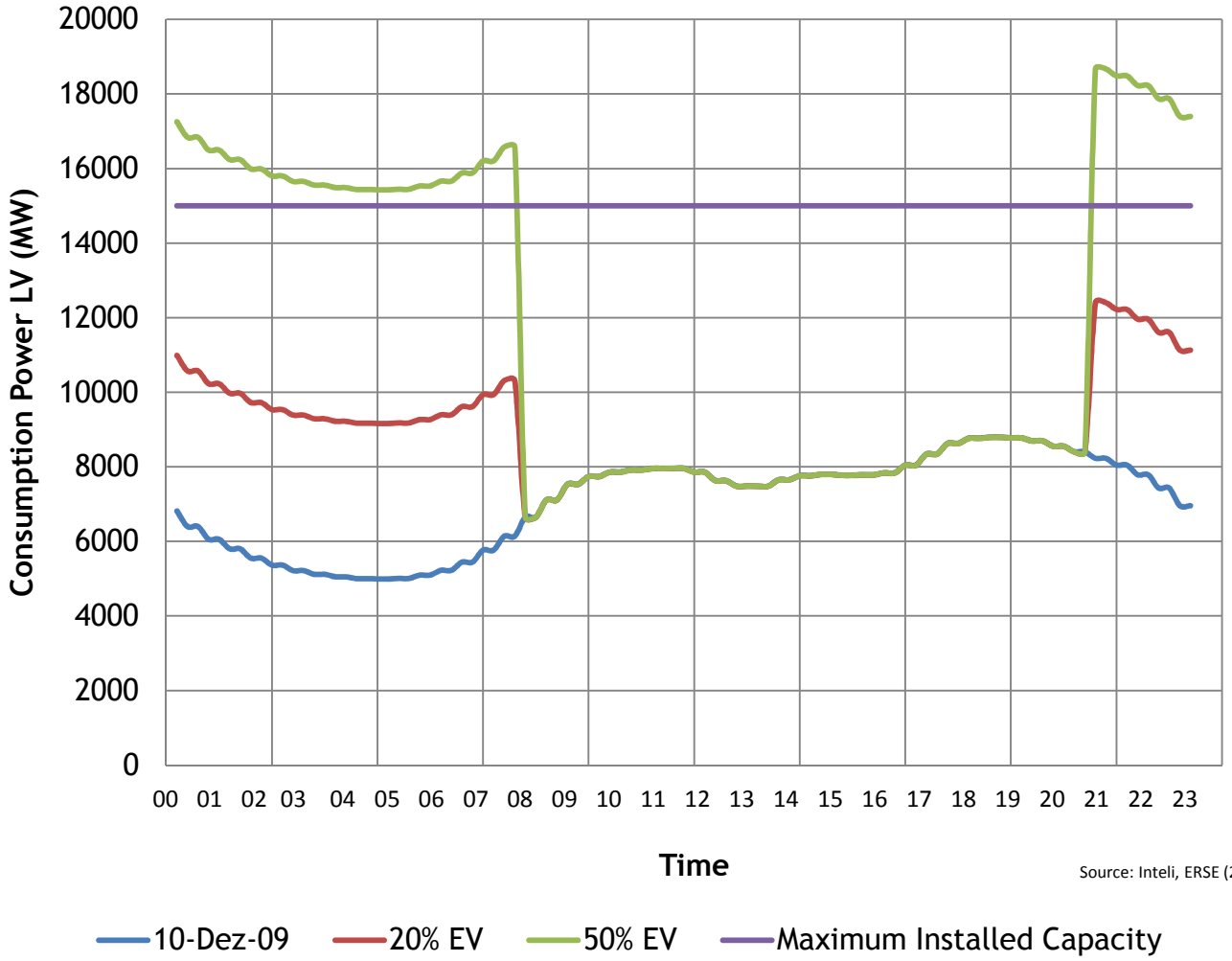



**Power use of an EV**

**Power consumption during the day in Portugal (LV)**

Source: Inteli, ERSE (2009)

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

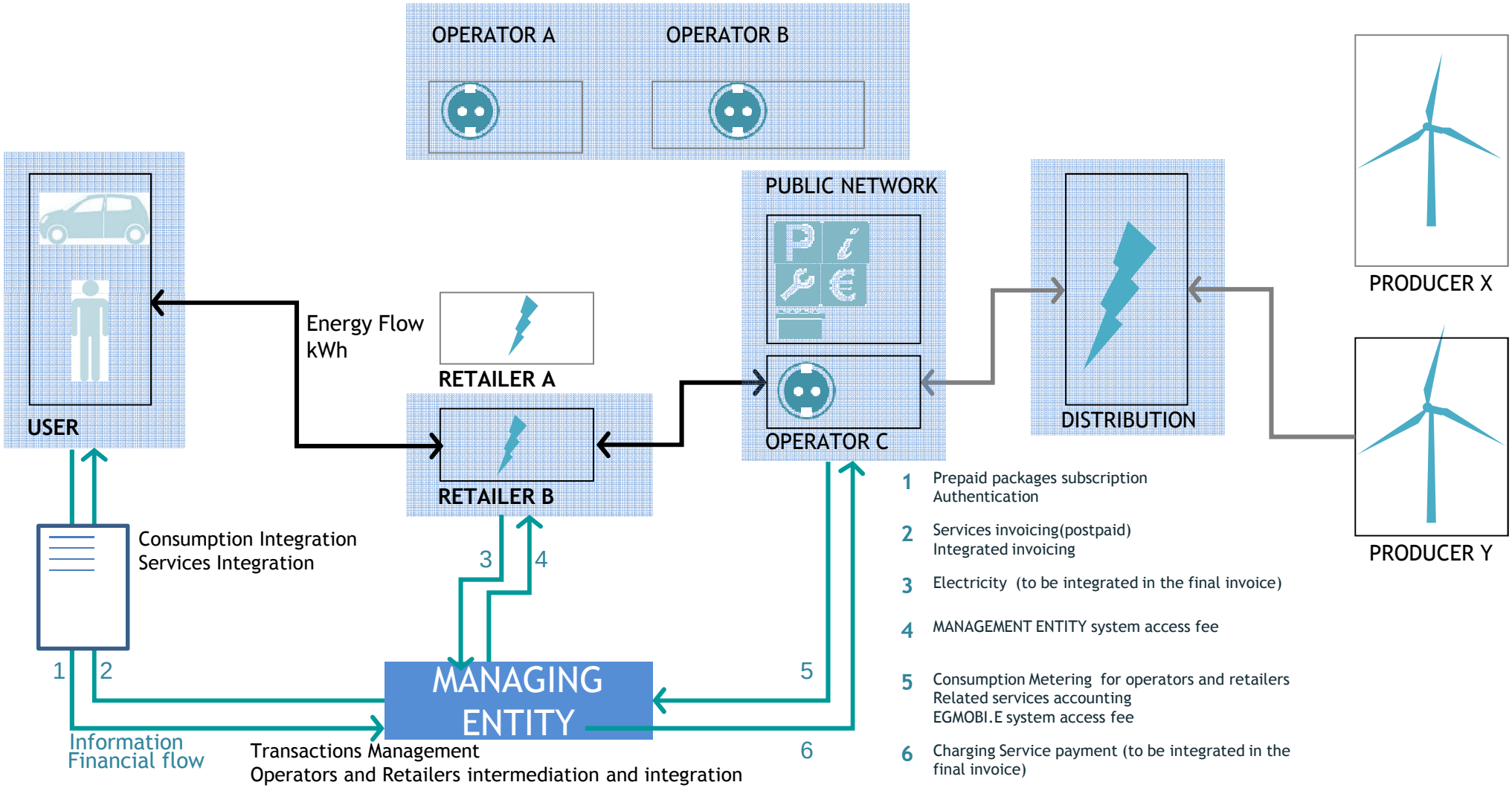



Source: Inteli, ERSE (2009)

- 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

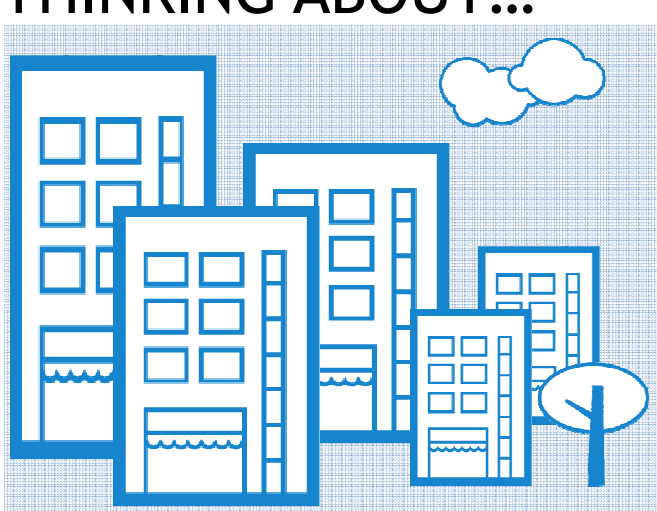
- This model framework ensures a **unique, open and universal user centered charging network**, which induces synergetic relations between the different market agents

- 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

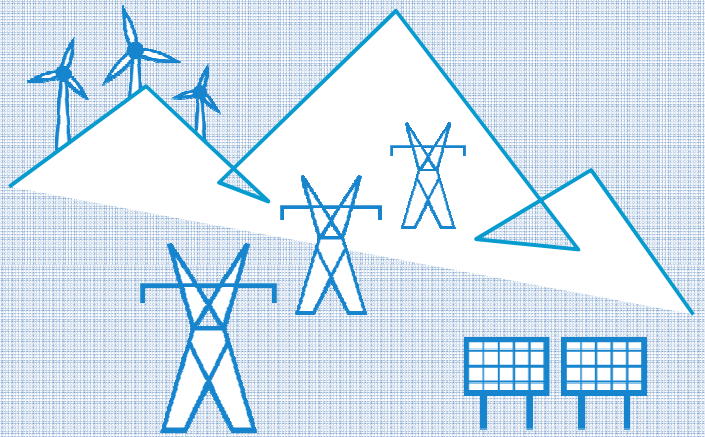
- Major effort lies in the mobilization of upstream and downstream companies across the value chain for the joint optimization of resources:
  - 1 - Business agents (retail and operation) developing **innovative business solutions**, which can be both profitable and achieve international recognition
  - 2 - Companies and R&D Institutions through the development, design and production of **innovative technological solutions** of high export potential

# CHALLENGES

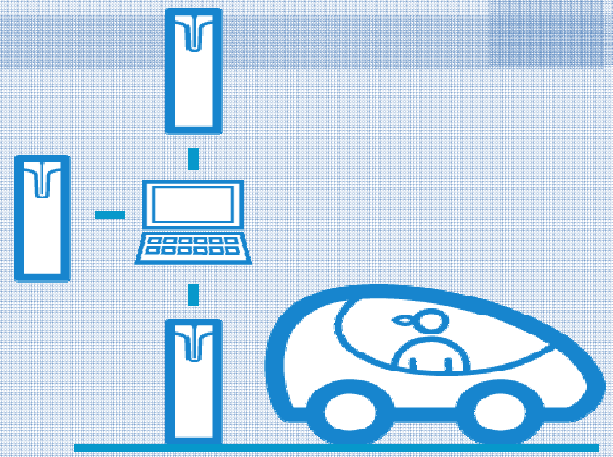
## THINKING ABOUT…



CITIES



ENERGY NETWORKS



TECHNOLOGY SOLUTIONS

**THANK YOU**