



EDF and Smart Cities

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VP International and Partnerships



Cities : Our future

- **50% of people live in cities- 70% by 2050**
- **Massive challenge to accommodate billions of newcomers with limited resources**
 - A challenge for energy and CO2 emissions
- **The Smart City concept: part of the solution for a sustainable economic growth**



EDF at a glance :

37,7 millions

of customers WW

156 200

of partnerships WW

65,3 bn€

628,2 TWh

of generation WW

99.6* g

CO2 / kWh produced

- Electricity : all businesses from production, to transport & distribution and supply
- Strong presence in Europe : France, United Kingdom, Italy, Belgium and others
- Industrial player in Asia and in the United States

Key figures

Turnover 2011

in %

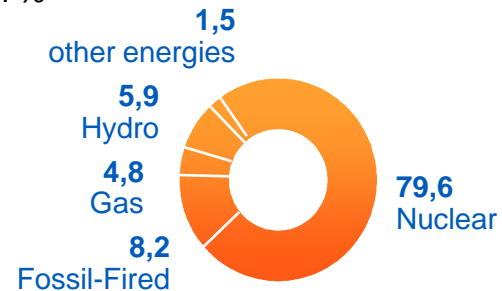
43.1
outside France



56.9
France

Production Mix 2011 (Group)

in %

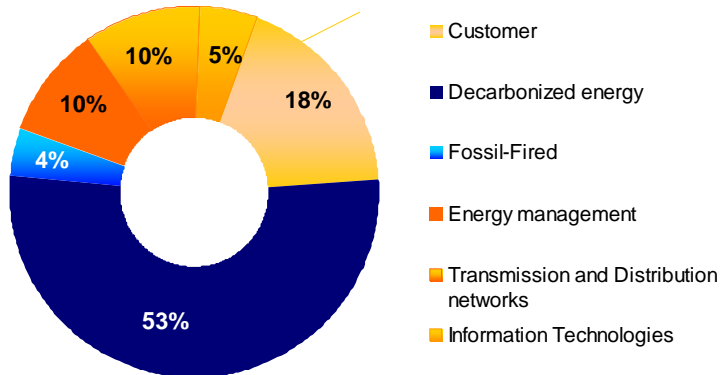


Total : 628,2 TWh

EDF R&D : key figures 2011

Main activities

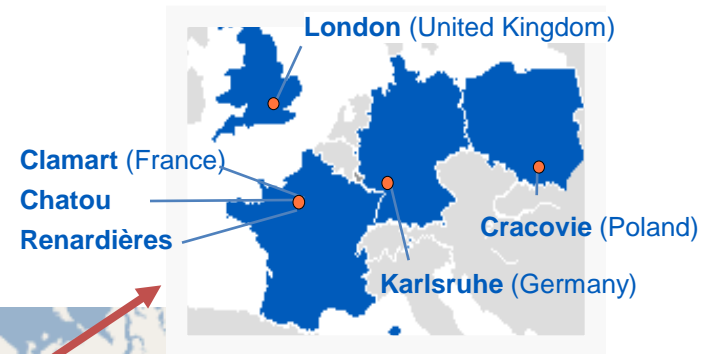
Driven to identify the next growth drivers, for the different Group's businesses all over the World



520 M€ budget

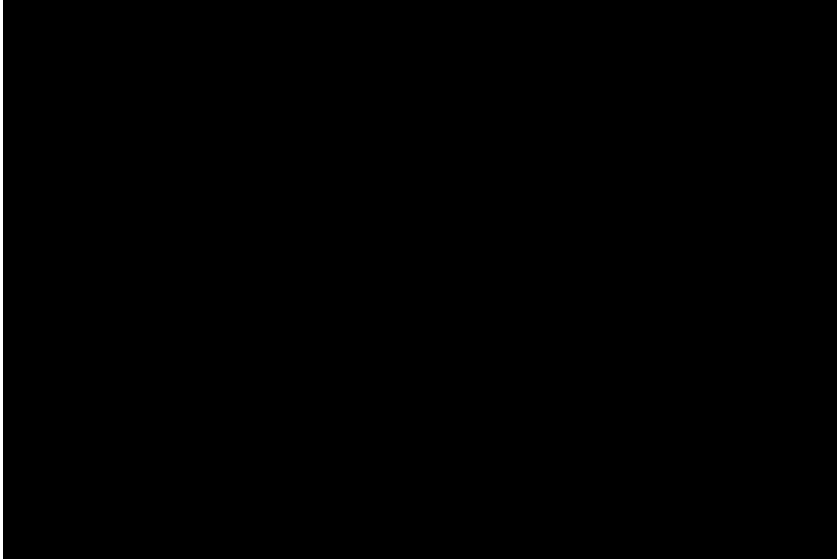
+ 2 000 people

8 R&D sites world wide

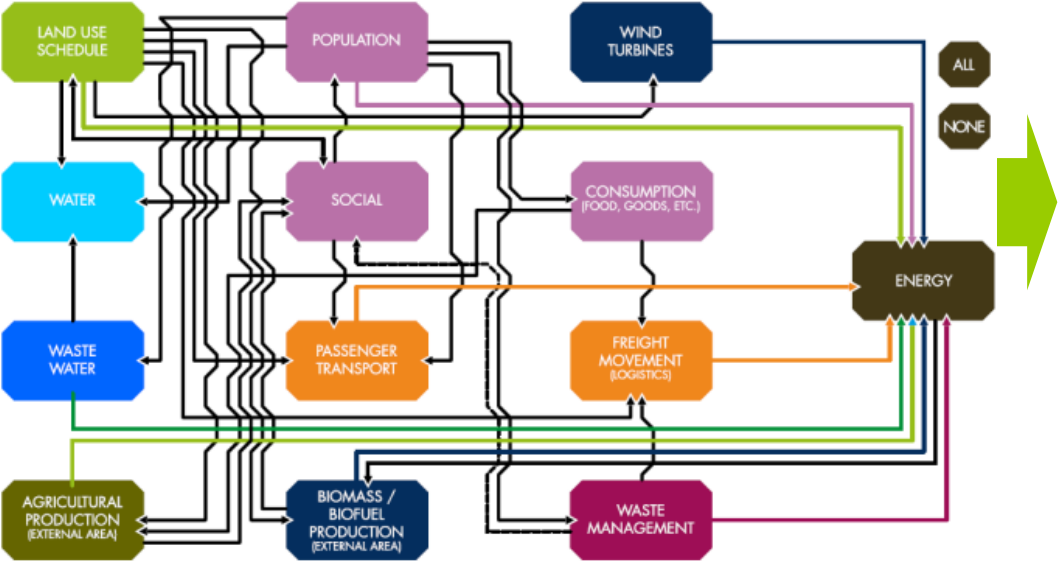


The Added Value of Smart Cities

- Long-term energy planning
 - local renewable potential,
 - Energy demand in building and for mobility
 - Electric Network planning
 - Taking into account Low CO2 targets and Energy Efficiency
- Solutions for low carbon and smart cities
 - Energy efficiency in buildings
 - Electric mobility
 - Smart grid to enable local renewable and demand response



Modeling the city to understand long-term impact



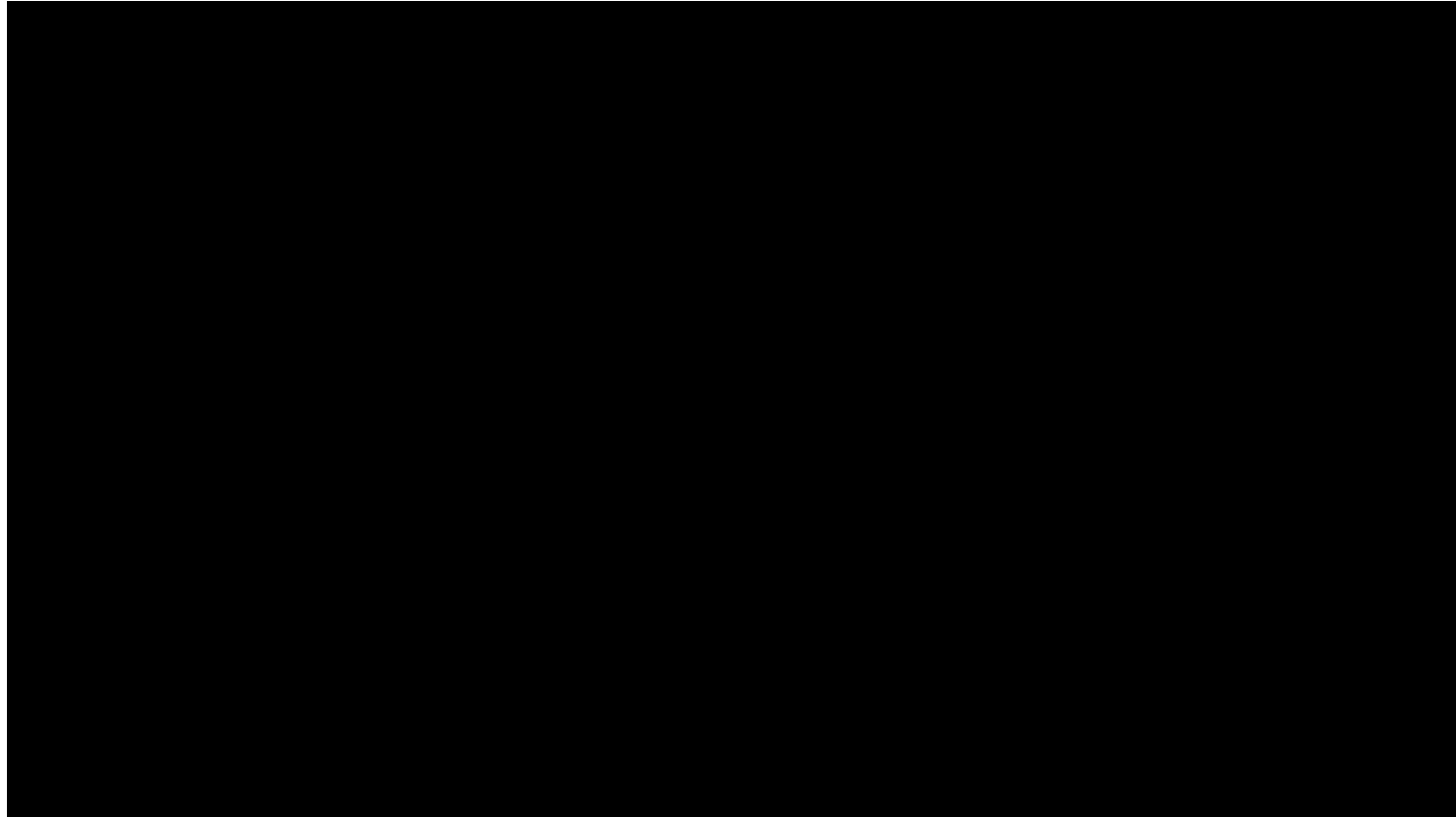
A project in partnership with  VEOLIA ENVIRONNEMENT

Reflecting complexity of cities using our worldwide expertise and systemic approach

Producing actionable results with 3D interactive tools

Building trust : Singapore

*A project in
partnership with*



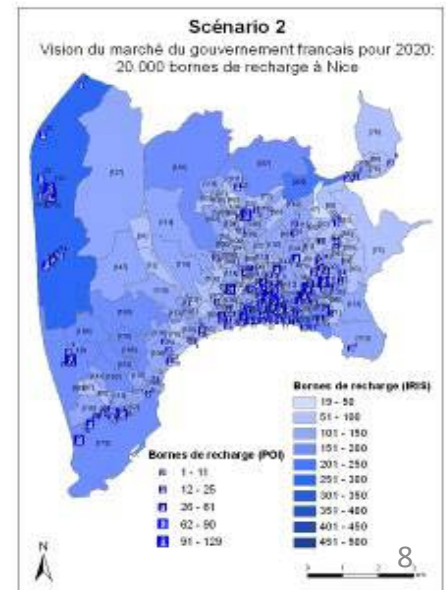
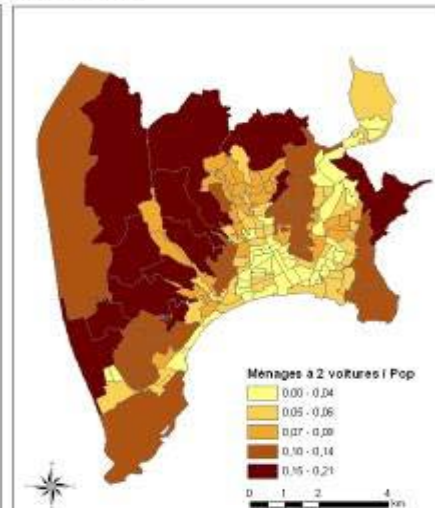
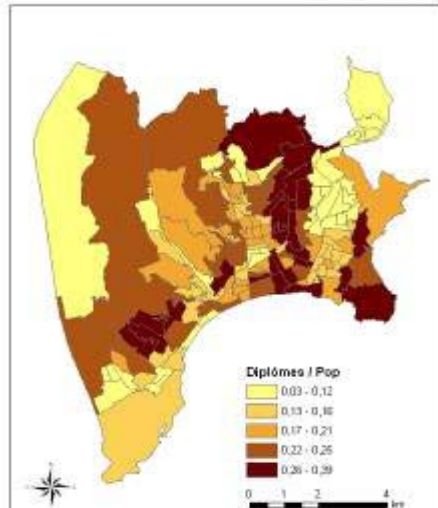
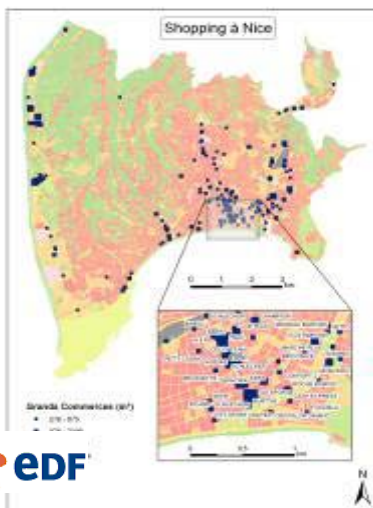
Singapore's challenges : quality of life and attractiveness of urban areas

- Advisory and decision-making tool to support Singapore's authority
- Increasing energy efficiency in buildings, integrating PV to buildings, sensitizing the population and forecasting impact on energy system and CO2

Transport and mobility in Cities

- **1/3 of energy consumption & CO2 emissions in Europe**
 - Transport infrastructure is a key factor for urban development
 - Individual cars
 - Public Transport network
- **challenges for energy and for EDF :**
 - Develop innovative technologies (batteries, systems and infrastructure...)
 - Integration in the electric network of electric mobility
 - Advising local authorities in their electric transportation projects

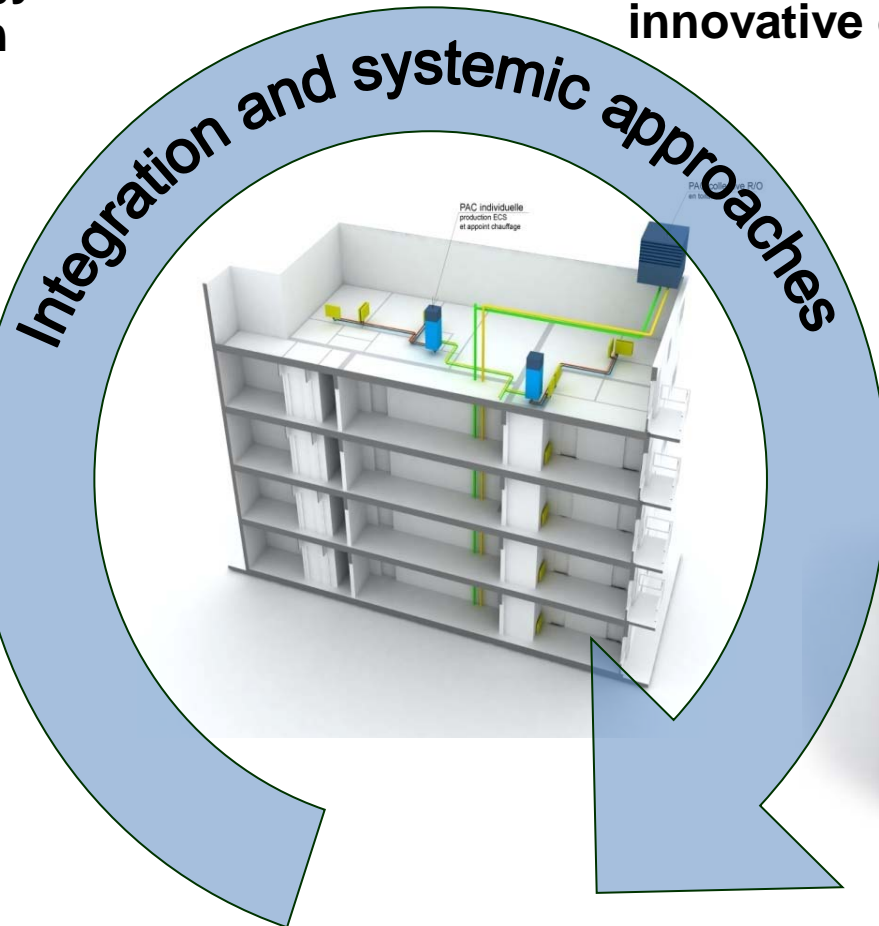
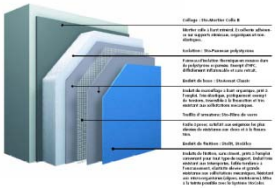
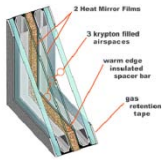
Facteurs influençant la distribution des véhicules électriques dans les ménages à Nice



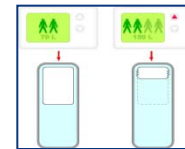
Low carbon buildings for low carbon cities

- Buildings: 40% of energy consumption & CO2 emissions in Europe. A main concern for energy efficiency and CO2 emissions targets

1. Decrease energy needs : insulation



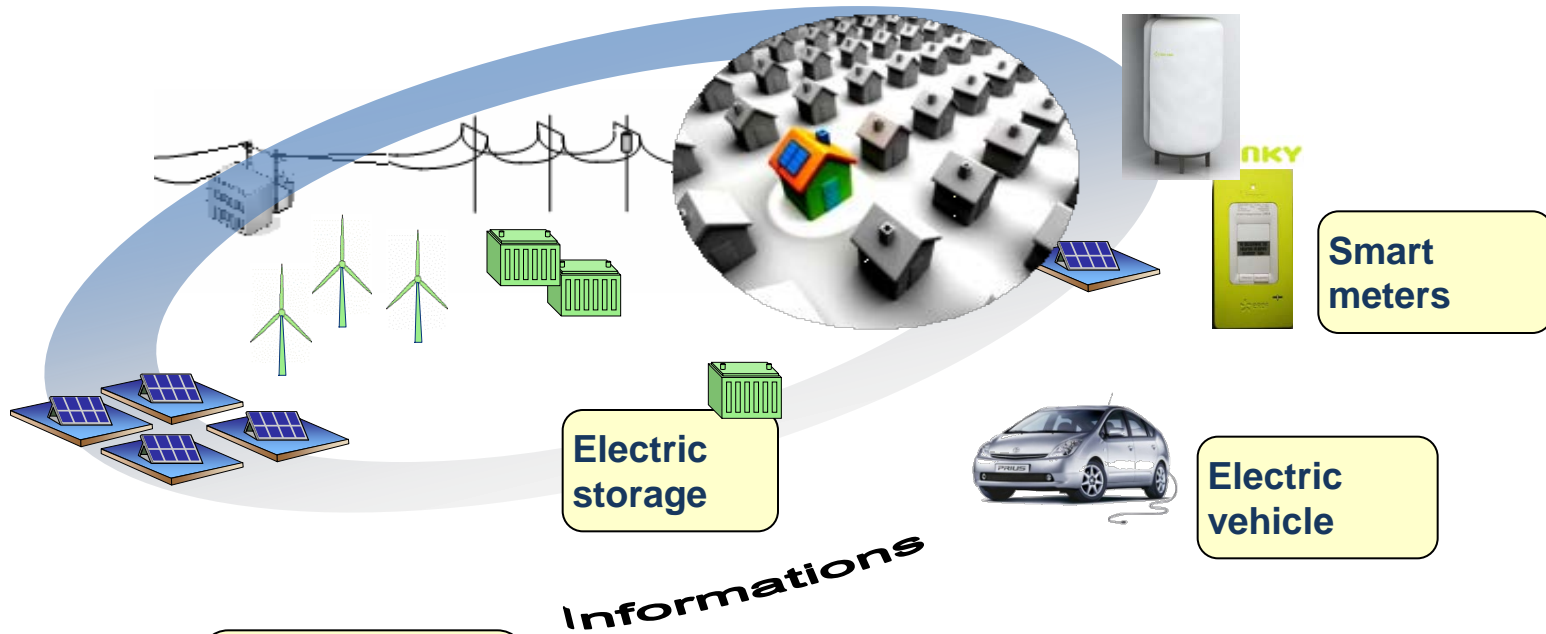
2. Efficient equipments and innovative energy management



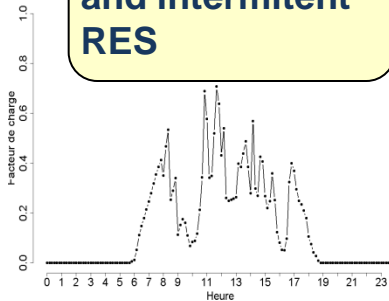
3. Develop RES : Heat Pumps, PV, biomass, solar



Smart grids : Operating electric system with local renewables, storage, demand side management, electric vehicles...

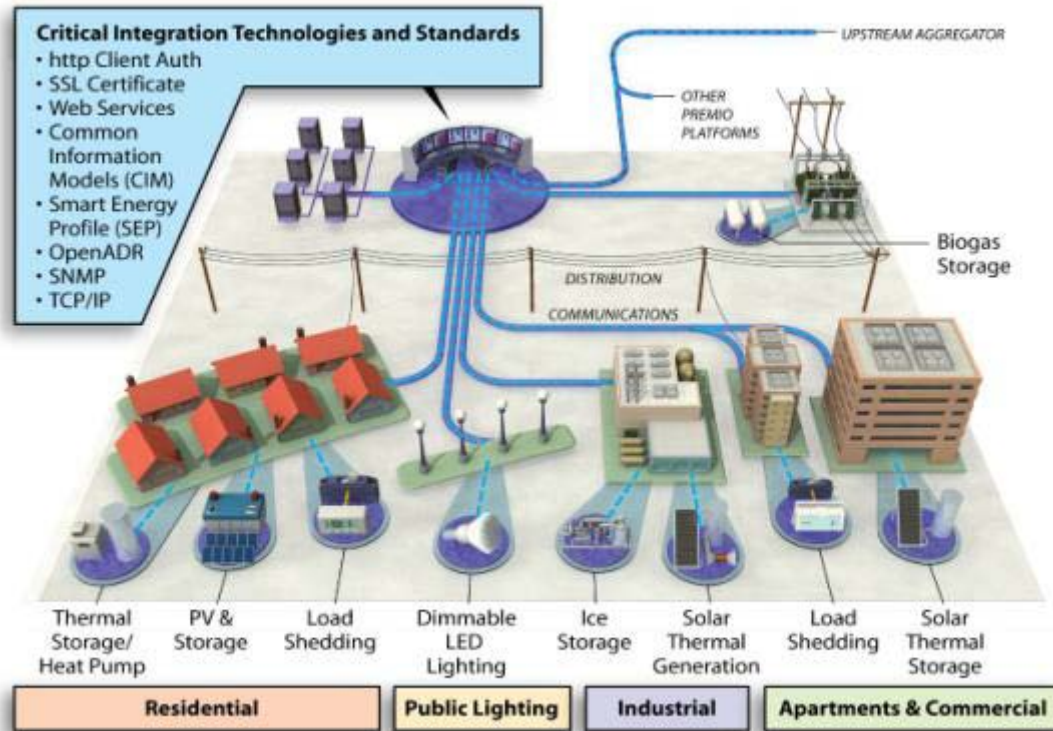


Decentralised and intermittent RES



A need for smart grids in cities

Example 1: Premio Project in France (part of EPRI Smart Grid Demo)



Sustainable cities : highlights

Danville : attractivity

Lyon : Ecocity

Mexico : Waste management

Singapore : Urban Planning



*A project in partnership
with*



A demonstration of our added value in US : Danville

- Project with City of Danville, VA



- Full audits of city energy and water infrastructure



- Developing a holistic view of the city to:

- Identify valuable synergies between sectors

- Increase city's attractiveness to companies



Conclusion : a systemic vision for cities' challenges

- **EDF has a large research capabilities dedicated to sustainable cities, with worldwide centers.**
- **EDF is working every day to better serve the public and to develop innovative solutions regarding smart cities' challenges**
 - Electric mobility, batteries, EV loading infrastructures,
 - energy efficiency in buildings and in industry,
 - Renewables,
 - smart grids and demand response thanks to smart meters.
- **EDF develops an holistic approach for cities**
 - Cities need to be plan looking at long term impact of decisions,
 - With a systemic approach taking into account the interaction between transport infrastructures, buildings, industrial development,
 - Placing the citizen in the center of the approach.
- **EDF helps cities to be more attractive, with a better quality of life for citizens and sustainable... a leading actor in Europe**



Thank you for your attention