Innovation at IBERDROLA
IBERDROLA Today

- **GENERATION**
- **DISTRIBUTION**
- **RENEWABLES**
IBERDROLA Today

**United States:**
- 2nd largest wind energy producer
- 3rd company in gas storage
- Electricity and gas distribution companies in New York and Maine

**United Kingdom:**
- 1st wind energy producer
- 3rd largest distribution company

**Mexico:**
- 1st IPP
- 2nd largest producer

**Brazil:**
- 1st distribution company

**Eurozone:**
- Largest energy company in the Iberian Peninsula
Iberdrola offers a mature product, which is electricity...

KWh is a commodity

The difference is not in the product

Values → Sustainability, Greenness........

Business Model → Renewable company, Mix of production..

Vertical Integration → Our own engineering...

Added Services → Quality, maintenance, ...

Innovation drives Efficiency

Environment is a key competitive factor

We earn more if we are able to produce/distribute/sell more at a lower cost
Best in Class: R&D management

- Maintaining leadership in Innovation Management
- Consolidation of the international organisation and management model (open and decentralized)

Iberdrola to achieve a top level position for energy technologies

- Creating value across business units through the development of R&D&i projects in key technology areas
- Consolidation of PERSEO - Corporate venture capital programme
- Establishment of a technology center in Qatar

Annual investment of 130-150MM€ - 450 MM€ in the period 2012-2014

Funding from the European Investment Bank (200MM€)
电气网络的未来

- 智能电网
  - 智能分布网络
  - 智能集成
  - 智能能源管理
  - 智能客户
- 服务质量
- 新材料和设备
- 保护
- 波浪质量与电力电子
- 电动交通
- 能源存储

尊重环境
信息和通信技术
安全与保安

IBERDROLA R&D
IBERDROLA R&D

**Generation and retail**

- **O&M Excellence**
  - Materials
  - Operation and maintenance
  - Security and safety

- **Low emission & environmental technologies**
  - Emissions control
  - Respect for the environment

- **Retail & Energy Management**
  - Energy Management
  - Energy selling process
  - Energy Efficiency

- **Electric Mobility**
**IBERDROLA R&D**

## Renewable energy sources

**O&M Excellence**
- Grid integration
- Energy generation forecast
- O/M efficiency improvement

**New renewable technologies**
- Offshore Wind energy
- Solar energy
- Marine energy
- Biomass and other sources

**Energy Storage**

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### IBERDROLA R&D

- **Respect for the environment**
- **Information and comm tech.**
- **Safety and security**
To make the most of the experience and know-how gained

International Benchmark

ACQUIRE Internationalisation Competitiveness Innovation

To generate, maintain and share knowledge

Technological Development

To provide value to the Group through our experience

Service to the Iberdrola Group

IBERDROLA benefits from our international activity and our customers have available the experience and technology of a leading utility
The scope of our activities includes from the execution of basic studies to the construction of turnkey projects.
# IBERDROLA Engineering & Construction

<table>
<thead>
<tr>
<th></th>
<th>THERMAL</th>
<th>HYDRO</th>
<th>WIND</th>
<th>SOLAR</th>
<th>NUCLEAR</th>
<th>T&amp;D</th>
</tr>
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<tbody>
<tr>
<td>Iberdrola</td>
<td>11,808</td>
<td>11,596</td>
<td>3,372</td>
<td>54</td>
<td>6 NPP</td>
<td>Full Support</td>
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<tr>
<td>Third Parties</td>
<td>5,285</td>
<td>469</td>
<td>1,789</td>
<td>97 (PV)</td>
<td>18 NPP</td>
<td>+27 Projects</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>17,222 MW</strong></td>
<td><strong>12,065 MW</strong></td>
<td><strong>5,160 MW</strong></td>
<td><strong>151 MW</strong></td>
<td><strong>24 NPP</strong></td>
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- **Combined Cycles**
- **Biomass**
- **District Heating**
- **Cogeneration**
- **Wind Farms**
- **Hydro Power Plants**
- **Photovoltaic**
- **CSP Solar Projects**
- **Nuclear Power Plants**
- **Offshore Wind**
- **Substations**
- **Monitoring Centres**
- **Transmission Lines**
- **Telecommunication Infrastructures**
Committed to the technological challenges of the future

Current and future networks
- Smart grids
- HVDC

Renewable energy technologies
- Offshore
- Marine energy
- Solar

Clean energy generation
- Energy efficiency
- Emission control
- Biomass

Long-term R&D
- Energy storage
- Fusion
- Electric mobility

Investments of 12.5 million euros en R&D&i in 2013
IBERDROLA Engineering & Construction
R&D

Committed to Group’s technological challenges...

Electrical Networks
- Smart Grids
- Networks and substations optimization
- HVDC

Renewable Generation
- Offshore
- Marine Energy
- Biomass
- Solar

Non renewable Sustainable Generation
- Energetic Efficiency
- Emissions Control
- Fission (Production support)

Other
- Electrical mobility
- Storage
- Fusion

...while watching over the competitiveness and efficiency of our business

Methodologies, process and tools innovation

Ongoing training for a better service to the Group

Long term business exploration
Strategic areas are classified in action lines depending on their time horizon

Immediate
- Efficiency Improvement Projects
  - Aimed to operational costs reduction by the development of tools and methodologies for resources optimization

Short term
- Technological Innovation Projects
  - Technological skills development in business areas

Medium term
- Disruptive Innovation Projects
  - New skills development to anticipate the requirements for future business sustainability

Long term

Technological Development
- Diversification

Actions in each area will be materialized in projects

Internal: financed by own funds with expected ROI

Financed: by funds from R&D&i supporting programmes
Innovation at IBERDROLA

Thank you for your attention!!!