EDF at a glance

A global energy leader

- Electricity: covering the entire chain, from generation to transmission, distribution and supply.

- Solidly anchored in Europe: France, the UK, Italy, etc.

- Industrial operations in Asia and United States

- Natural gas: a major player

**Key figures**

- 37.9 million customers worldwide
- 169,139 employees worldwide
- €66.3 billion sales, of which 49% outside France
- 618.5 TWh of energy generated worldwide
- 117.1 g of CO₂ per kWh generated

**2009 sales**

- 49% Outside France
- 17% UK
- 11% Germany
- 7.5% Italy

**2009 EBITDA**

- 51% France
- 46% Outside France

**2009 generation mix**

- 75.4% Nuclear
- 11.2% Fossil-fired
- 8.1% Hydro
- 4.3% Gas
- 1.1% Other energies

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Electricity: covering the entire chain, from generation to transmission, distribution and supply.

Solidly anchored in Europe: France, the UK, Italy, etc.

Industrial operations in Asia and United States

Natural gas: a major player
EDF at a glance

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<th>Other European markets</th>
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<td><strong>France</strong></td>
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<tr>
<td>▪ EDF – RTE-EDF Transport, EDF 100%</td>
<td>▪ Austria</td>
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<tr>
<td>▪ ERDF, EDF 100%</td>
<td>▪ ESTAG Group, EDF 25%</td>
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<td>▪ PEI Group, EDF 100%</td>
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<tr>
<td><strong>UK</strong></td>
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<tr>
<td>▪ EDF Energy, EDF 100%</td>
<td>▪ Belgium</td>
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<tr>
<td><strong>Italy</strong></td>
<td>▪ EDF Belgium, EDF 100%</td>
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<tr>
<td>▪ Edison, EDF 48.96% owned and 50% voting rights</td>
<td>▪ SPE, EDF 51%</td>
</tr>
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<td>▪ Fenice, EDF 100%</td>
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<tr>
<td><strong>Switzerland</strong></td>
<td>▪ Spain</td>
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<tr>
<td>▪ Alpiq, EDF 26.06%</td>
<td>▪ Elcogas, EDF 31.39%</td>
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<tr>
<td><strong>Slovakia</strong></td>
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<tr>
<td>▪ SSE, EDF 49%</td>
<td>▪ Austria</td>
</tr>
<tr>
<td>▪ EC Wybrzeze, EDF 99.73%</td>
<td>▪ ESTAG Group, EDF 25%</td>
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<tr>
<td>▪ Elektrownia Rybnik SA, EDF 79.76% owned and 97.31% voting rights</td>
<td>▪ Belgium</td>
</tr>
<tr>
<td>▪ EC Krakow, EDF 94.31%</td>
<td>▪ EDF Belgium, EDF 100%</td>
</tr>
<tr>
<td>▪ Kogeneracja, EDF 40.58% owned and 50% voting rights</td>
<td>▪ SPE, EDF 51%</td>
</tr>
<tr>
<td>▪ Zielona Gora, EDF 39.93% owned and 98.40% voting rights</td>
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</tbody>
</table>
EDF at a glance

Other countries worldwide

United States
- Constellation Energy Nuclear Group, EDF 49.99%

Brazil
- Ute Norte Fluminense, EDF 90%

China
- Figlec and Synergie, EDF 100%
- Shandong Zhonghua Power Company Ltd., EDF 19.6%
- Datang Sanmenxia Power Generation Company Ltd., EDF 35%

Laos
- Nam Theun 2 Power Company, EDF 35%

Vietnam
- Mekong Energy Company Ltd., EDF 56.25%

Other activities

<table>
<thead>
<tr>
<th>EDF Énergies Nouvelles</th>
<th>TIRU</th>
<th>Électricité de Strasbourg</th>
<th>Dalkia</th>
<th>EDF Trading</th>
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<tr>
<td>EDF 50%</td>
<td>EDF 51%</td>
<td>EDF 89.07%</td>
<td>EDF 34%</td>
<td>EDF 100%</td>
</tr>
</tbody>
</table>
Nuclear

- **The world’s leading nuclear plant operator**
- *58* reactors in France,
  - 15 reactors in the UK,
  - 5 reactors in the United States (Constellation Energy Nuclear Group: EDF 50%)
- Generation 3 Nuclear with EPR Projects under construction in Flamanville (1 Unit), France and participation to Taishan (2 Units) in China. Further projects planned for UK and United States with prospects in Italy, Poland, Netherlands; considering South Africa.
- Unique expertise in the world as **Architect**, **Engineer**, and **Operator**
**Generation**

**EDF in the world**

**United States**
- JV with Constellation Energy Group
- First EPR to be commissioned late in 2018 (Calvert Cliffs)

**Great Britain**
- Target: 4 EPR units
- First EPR commissioned late in 2018 (Hinkley Point)

**Poland**
- Partnership agreement with PGE

**Italy**
- JV with ENEL
- 1 EPR under construction (Flamanville)
- Commissioning date 2014
- 1 EPR project (Penly)
- Commissioning date 2017

**China**
- 2 EPR units being built in Taishan with CGNPP
- First EPR commissioned late in 2013

**South Africa**
- Several units in project
The nuclear fleet in France

- An homogeneous fleet, the most important in Europe

- 58 units in operation
- Installed on 19 sites
- 63 GW, in 3 levels of power:
  - 900 MW (34 units)
  - 1.300 MW (20 units)
  - 1.500 MW (4 units)
- Flamanville 3 (EPR, 1650 MW) under construction
- Penly 3 (EPR, 1650M) under project
- 9 units in dismantling phase
Nuclear Operation Division:
- 20,000 people operate and maintain the units.
- 1,500 M€ spent for current maintenance in 2010.

Engineering Division:
- 5,000 people, in charge of the new build (in France and abroad), of safety studies, modifications and heavy maintenance on the existing fleet, of dismantling the old units.
- 2,250 M€ spent in 2010
  - 600 M€ for new build
  - 1,400 M€ for modifications and heavy maintenance
  - 250 M€ for dismantling
Our future challenges

- Improving the availability of the units ➔ for outages shortening, we need more work in 2x10 or 3x8, … and increased workforce

- Facing the ageing of the equipments, ➔ we need changing major components (steam generators, alternators, diesel generators, HV transformers, heat exchangers,…)

- Extending the plants operating life from 40 years to 60 years, ➔ we intend updating their safety level, which will result in plant modifications

Globally, our yearly purchases will be multiplied threefold, between 2010 and 2015
A project structured in three levels

**Architect engineer**  
Level 1

**Detailed design**  
Level 2

**Suppliers**  
Level 3

- **Nuclear Steam Supply System**  
  - AREVA

- **Balance of Nuclear Island***  
  - SOFINEL  
    - 55% EDF  
    - 45% AREVA

- **Balance of plant**  
  - EDF  
    - Engineering subcontracts

- **Conventional island**  
  - ALSTOM (Flamanville 3)
  - X (Penly 3)
  - ...

- **Supply and erection contracts**

- **Design contract**  
- **Supply contract**

* BNI: Nuclear island, without nuclear steam supply system
- 1 : DETAILED DESIGN AND EQUIPMENT SUPPLY
- 2 : ERECTION WORKS
- 3 : SITE LOGISTICS
- 4 : SIDE ACTIVITIES
The allotment takes into account:

- The local legal framework (in Europe, the European Directive 2004/17 that imposes open and fair competition)
- The industrial capacities of the country and of the target local areas
- EDF’s current strategy:
  - giving responsibilities to its suppliers
  - reducing interface management
Approximately 150 contracts to award

For Flamanville EPR project, most of the contracts cover detailed design, supply and erection; that is not the case for the EPR projects in UK (erection is partially covered by specific contracts)

The 18 largest contracts account for 80% of the total price
2: ERECTION WORKS

18 large contracts:

- 5 in civil works (excavation work, main civil works, sub-water galeries, …)
- 8 in mechanics (heavy components, piping, HVAC…)
- 5 in power supply (wires and other electrical components, …)

Sub-suppliers are allowed

Local sub-supplying is seen as very positive but sub-supplying does not transfer the responsibility of the contract.
3 : SITE LOGISTICS

1- CIVIL WORKS :
Supplier storage and offices
Vehicle parks
Temporary fences
Topographic controls

2- POWER SUPPLY :
Temporary power supply

3 – MECHANICS :
Building site necessities: (pumping, various piping, provisory water supply,...)
Cranes and other utility vehicles

4 – SERVICES :
Security
Cleaning and other office maintenance
Handling and transportation on site
Overhead cranes operation
Building waste management
4 : SIDE ACTIVITIES

- Housing for workers

- Effects of the arrival of population on local trade

- Visits and industrial tourism (mainly VIPs during the construction phase)
Increase of the level of employment during both construction and operation

Involvement of local companies through direct contracts with the general contractor or through sub-contracts.

Nota: the number of workers depends on the place of the project in the series (the first of a kind needs more people, and there are today 3600 workers in Flamanville), and on the organization of the work in the concerned country (the UK projects will employ more workers).
EFFECT ON COUNTRY ECONOMY

For Flamanville 3:

- **Design**: around 50 companies involved in design, 100% from France
- **Manufacturing**: around 650 companies involved in the project with a survey of EDF (manufacturing components Important for Safety or for Availability). Among them, 60% from France
- **Erection**: around 250 companies involved, 75% of them from France

For a project out of France:

- **Design**: About 30 companies to be involved, about 40% to 60% of them in the concerned country
- **Manufacturing**: around 500 to 800 companies to be involved (depending of the organization of the sub-contracting); 25 to 60% of them in the concerned country
- **Erection**: around 200 to 300 companies involved, 60% to 90% in the concerned country
Qualification of the main contractors and acceptance of the sub-contractors are mandatory. That means that the project owner will check the applicant companies for:

- their financial results and forecasts
- their technical capacities
- their Quality Management System
- their training process
- their human safety organization
- …

Qualifications of some equipments (Important for Safety or for Availability) are mandatory. The Owner will order tests and/or studies to prove that the equipments are fit for purpose and meet all the specifications (seismic, serious accident, …). For Flamanville 3, some qualifications tests have been very long (>2 years) and very expensive.
EDF needs are growing in France ⇔ South Africa has new needs

South African industry includes many skilled companies but maybe lacking nuclear experience. Nuclear specifications may be different from usual industry standards.

EDF has already experienced suppliers in France, which know very well the nuclear context in France, but are not always able to face to day all the growing needs of EDF.

➤ Partnerships between experienced EDF suppliers and South African companies are welcome, in the interest of the French and South African industries … and of EDF.
Thank you for your attention