



NPP construction the trigger to the development of the innovative society

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- 1. EDF Group company profile**
2. Impact of NPP projects on local, regional and national economy
3. Potential Cooperation in R&D
4. Key messages

EDF GROUP AT GLANCE

WORLD'S NO. 1 ELECTRICITY COMPANY

- Well established in Europe, especially France, the United Kingdom, Italy and Belgium.
- Diversified low-carbon energy mix founded on nuclear power capacity.

EDF COVERS ALL ELECTRICITY- RELATED ACTIVITIES

- Generation
- Transmission, distribution
- Trading, supply
- Energy services

LEADER IN LOW-CARBON POWER GENERATION

- No. 1 in the world for nuclear power generation.
- No. 1 in Europe for renewable energy generation.
- No. 3 in Europe for energy services.



an efficient, responsible electricity company that champions low-carbon growth

EDF GROUP AT GLANCE

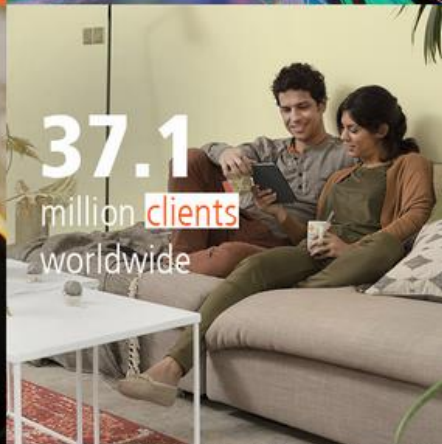
Efficient & responsible
electricity company, champion
of the low-carbon growth

71.2
billion euros
in **annual revenue**

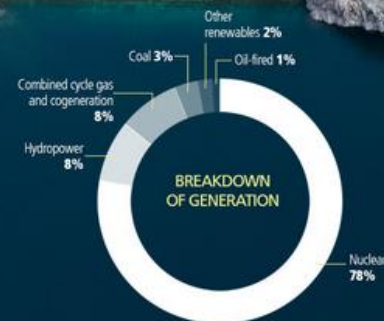


154,845
employees worldwide

37.1
million **clients**
worldwide



584.7 TWh
EDF Group's
electricity generation



662
million euros
in **R&D budget**



88%
of electricity **CO₂ free***

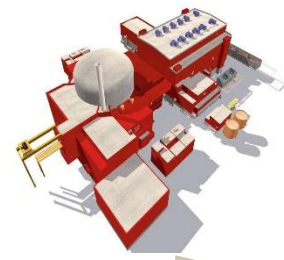


**EDF produces around 22% of the European Union's electricity,
primarily from nuclear power**

As of December 2016

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WORLD NPP: POTENTIAL SCOPE OF EQUIPMENT LOCALIZATION

Degree of investment and complexity

Easiest, less demanding for special qualification

- Earthworks & Foundations
- Concrete and rebar supply
- Intake and outfall construction
- Auxiliary buildings
- Substations
- Transmission lines
- Cranes
- Piping QC3
- Fire Fighting Equipment
- Cable trays

Minimum investment or time needed to qualify

- Pumps (non-primary)
- Valves
- Filters
- Vessels
- HVAC
- Pipe fabrication
- Motors
- Transformers
- MV & LV Switchgears
- Heat Exchanger
- Power Cable

Significant investment needed

- Fuel fabrication
- Spent fuel reprocessing
- High level waste storage
- Heavy forgings
- Reactor Pressure Vessel
- Steam Generator
- Polar Crane
- Safety & Operational I&C
- Main auxiliaries pumps
- Main Control Room
- Diesel Generators



Localisation is a key point of Nuclear New Build in order to maximize the economic benefit for Czech Republic, in respect of industrial skills

FRANCE: LOCAL SUPPORT DURING NPP CONSTRUCTION IN FLAMANVILLE 3

- Accommodation strategy for the coming workers (housing, gymnasium, schools, ...)
- Support for the infrastructures constructions (public equipment)
- Promote local employment and industries
- Manage the construction termination (employment transition)
- EDF knowhow is based on communication with local communities, analysis and diagnostic of the situation, and involvement of all parties, including the government
- Pathway from education, through training, to employment



FLAMANVILLE 3: EDF PROMOTES ECONOMIC LOCAL BENEFITS OF NPP CONSTRUCTION

4400 employees
on site
(not including
EDF)

55% of local
employment

700.000 hours of
training



748 local
recruitments after
training

123M€ invested in
outside
infrastructure
(35M€ EDF)

>75% of
employees
recover activity at
the end

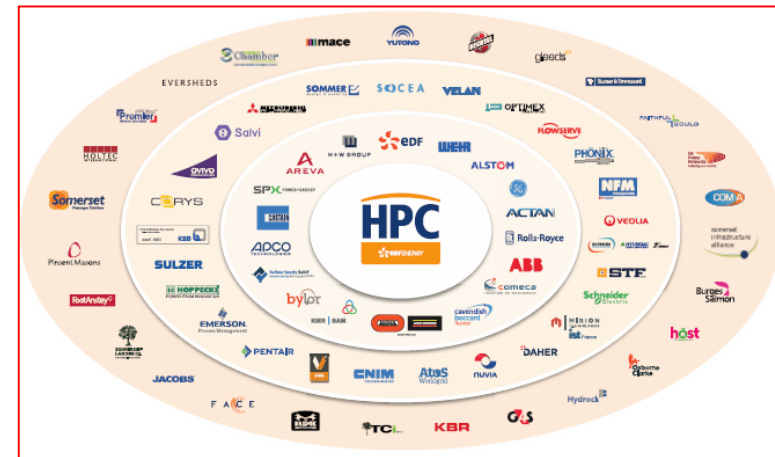
UK: ECONOMIC BENEFITS IN HINKLEY POINT

BOOSTING THE LOCAL ECONOMY

- Local employment (skilled workforces)
- Agreements with local companies, not only national companies
- Development of local offices

BUILDING THE LOCAL INDUSTRIAL BASE

- For HPC, UK based businesses are set to secure 64% of the total construction spend



International, National and Local partners working together to deliver HPC

HPC : BOOSTING THE LOCAL ECONOMY

- **HPC will contribute a total of £4bn into the regional economy**
 - c£1.5bn during construction and c£2.4bn during operations
- **HPC will create thousands of skilled job opportunities**
 - The project will create 25,000 job opportunities on site alone, for which c30% of workers are expected to come from the local area.
 - It will support 900 direct jobs during its 60 year lifetime.
 - and take on 1,000 apprentices.
- **A total of 1,500 high-quality jobs based in the Bristol area will be delivering the HPC project,**
 - a £120m annual investment into Bristol, worth over £1bn during the life of the project.
- **HPC is creating a new South West supply chain**

HPC: BUILDING THE LOCAL INDUSTRIAL BASE

How the UK's 64% of the construction value is shared

Civil Works	On Site Works	Equipment	Engineering and Project Management
40%	20%	20%	20%
<p>Around 40% of the value of contracts placed with UK companies will be in the field of civil engineering and building contract works.</p> <ul style="list-style-type: none"> Main Civils Contract with Bouygues Laing O'Rourke Marine Works contract (Costain) Kier/Bam earthworks; Bouygues UK for the ancillary buildings; 	<p>Around 20% of the UK content will be spent on mechanical and electrical site installation works with Balfour Beatty Bailey and Cavendish Boccard.</p> <ul style="list-style-type: none"> Doosan Babcock and M+W Group will engineer and install ventilation systems 	<p>A further 20% of the UK contracts will come from three categories:</p> <ul style="list-style-type: none"> Equipment directly sourced by EDF that will be produced in factories through the UK, mainly the Midlands, North East, Warrington and Scotland. Associated Development and Site Temporary Infrastructure to support the delivery of the HPC. . Over £650m of site services contracts. 	<p>The final 20% of UK content is made up of the spend with UK companies associated with Engineering and Project Management activities over the life of the HPC Project. This includes employees within EDF itself, spend with Engineering Consultants (like Atkins, Jacobs, etc) who are supporting both EDF SA's Engineering Team in Paris in addition to Engineering and Licensing activities in the UK, and on project management activities (Jacobs, KBR, Gleeds, F+G, Mace and Turner & Townsend.</p>

Significant part of management, design and engineering scope is localized in UK

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R&D: KEY FIGURES



2000
employees

134
Ph.D. students



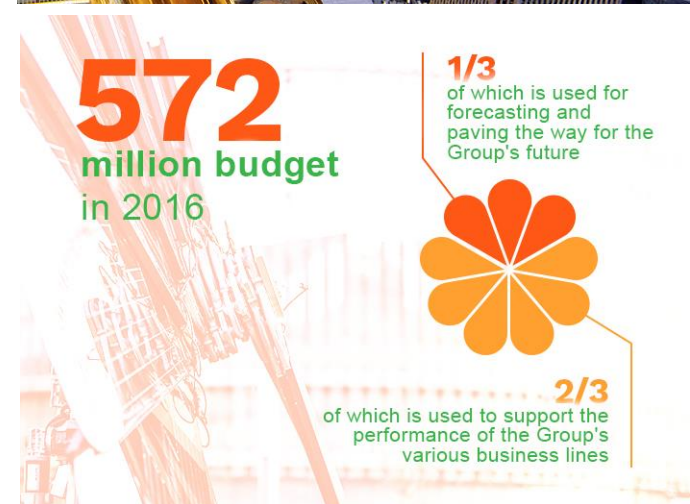
14
laboratoires
set up with our
partners



27 nationalities
represented




9 centres
in France and abroad



572
million budget
in 2016

1/3
of which is used for
forecasting and
paving the way for the
Group's future

2/3
of which is used to support
the performance of the Group's
various business lines



In contact with
4000
Start-ups



1678
patents

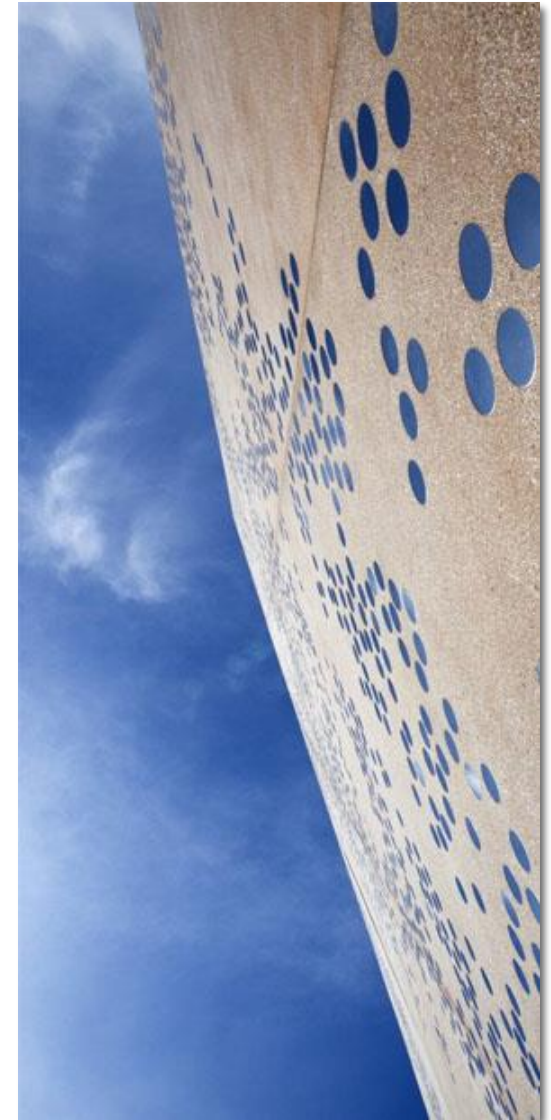
EDF R&D : 4 PRIORITIES

Priority 1: developing and testing new energy services for customers

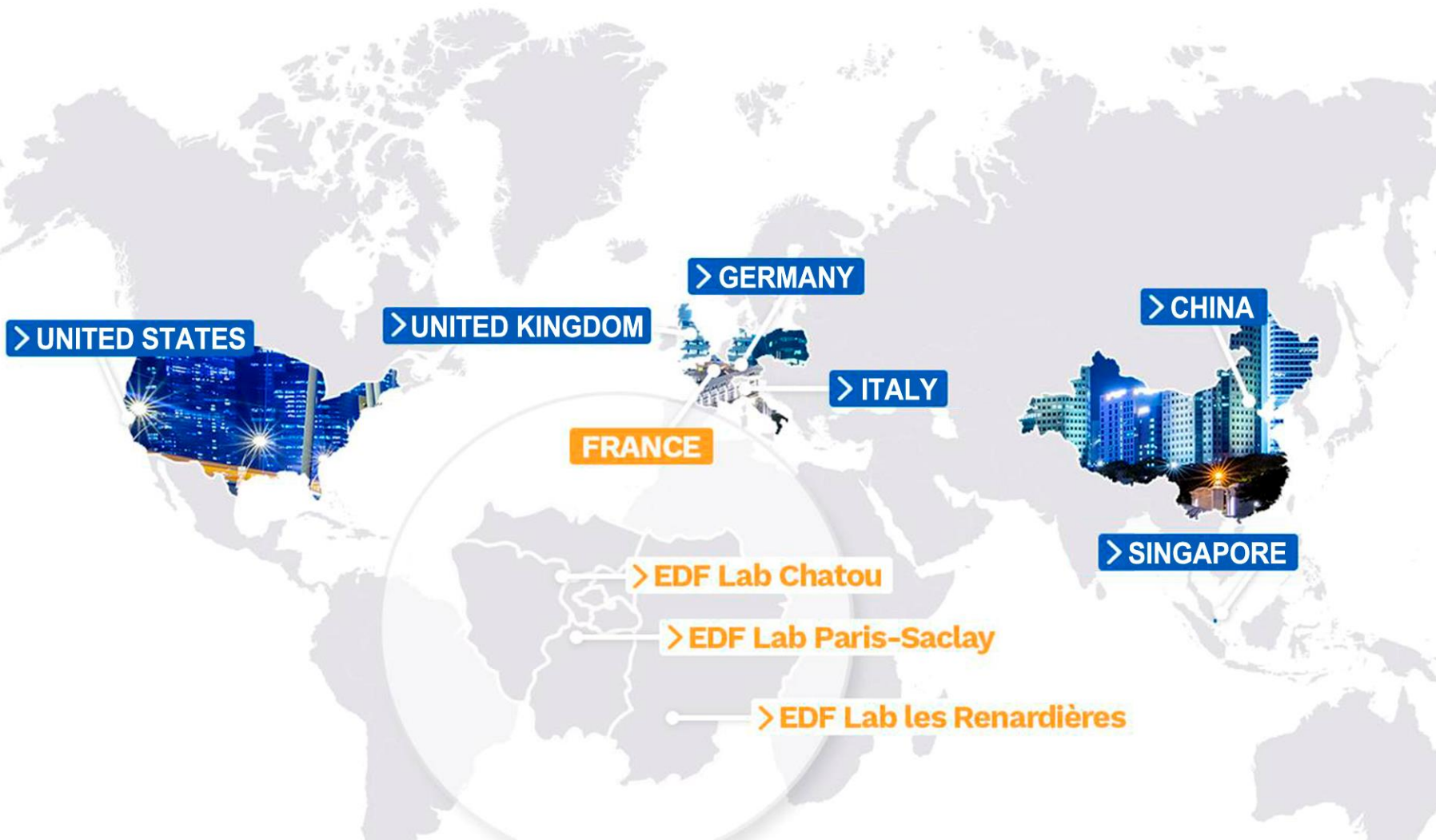
Priority 2: preparing the electrical systems and grids of tomorrow

Priority 3: consolidating and developing competitive, low-carbon energy generation mixes

Priority 4: Supporting EDF's Group international development



R&D INTERNATIONAL CENTERS AND CAMPUSES



With 3 centres in France and 6 abroad, EDF conducts research both nationally and at international level

INNOVATION

Missions and challenges of the Innovation network

- **Promoting experimentation and partnerships with the best start-ups**

Detecting start-ups, funding innovation, sponsoring innovation related contests, creating a network of innovators.

- **Promoting internal innovation**

Strengthening the « Intellectual Property » culture, integrating it into the business strategy, accelerating R&D internal innovation industrialisation.

- **Promoting and supporting development within the Group businesses**

Developing a promotional network (businesses / start-ups collaboration), backing start-ups development within the EDF Group.



- **Watch and start-up detection network on 3 continents** America / Asia / Europe: 7 people more than 2000 start-ups identified from 2011
- **Transfer to businesses:** > 40 demonstrations.
- **Innovative objects:** 20
- **Investment in promising start ups:** 8

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KEY MESSAGES

- 1 ■ NPP construction contributes greatly to local, regional and national economy. The amount of contracts invested and the high level of technology concerned offers **huge opportunities for companies to develop innovation programs.**
- 2 ■ EDF group invests a lot in R&D activities, around 1.5M€ per day. In targeted countries, where it develops activity or operates assets, it often considers the creation of a R&D centre. As of today, **6 R&D centres have been opened out of France.**
- 3 ■ **EDF innovation network offers opportunities to local start ups.** It has already identified 2000 start ups and is investing in promising ones **through Electronova, its dedicated investment fund,..**
- 4 ■ France is building a long-term and equal economic partnership with RT, **with 500 locations employing nearly 100,000 people and generating an estimated turnover of EUR 13 billion**
- 5 ■ **French companies contribute already to the upscaling of the Czech economy,** as illustrated by Valeo's opening of an R & D center for more than 600 researchers in Prague last May

Thank you!

EDF GROUP

INVESTING IN LOCAL DEVELOPMENT GROWTH

EDF is committed to engaging with local companies and residents so they can benefit from employment, training and business opportunities that power plants generate throughout their lifespan

FLAMANVILLE 3

- **4,400 people** working on site and 55% hired locally
- Over **150 contracts** signed
- **700,000 hours** of training
- **123 M€** spent on outdoor infrastructure

HINKLEY POINT C

- **25,000 employment** opportunities to be created over the construction period
- 5600 People will be employed on site at peak
- **£85M** in orders placed with local companies
- Over 1,600 companies registered in Somerset's Chamber of Commerce database
- Investment in community wellbeing, education, employment and skills

ELECTRANOVA CAPITAL PORTFOLIO

ELECTRANOVA
CAPITAL

7 INVESTMENTS SINCE 2012



Offshore Wind

Designer of gravity based foundations for offshore wind turbines and substations

enlighted



Offshore Wind

Building Energy Management control solutions with first applications in lighting control



Energy Storage

Battery integrator. Conceive, develop and assemble batteries for portable devices, electric vehicles, and energy storage



Construction system

Designer and manufacturer of a proprietary industrial wood construction system



Smart Grid

Standard-based core infrastructure components and software that enable mass scale Internet of Things (M2M Infrastructure)



Fuel Cells Hydrogen

High temperature fuel cells for stationary applications (eg, microCHP) and electrolysers for Power-to-Gas and Power-to-Liquids applications



Wind measurement

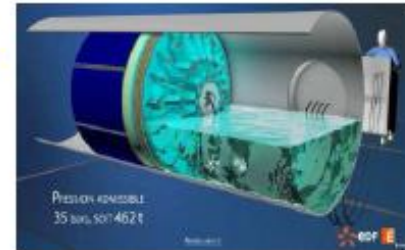
Developer of LIDARs for: Wind applications (site assessment and operation optimization), Airport traffic control



EXAMPLE: INNOVATIVE PIPE PLUG



High pressure resistant pipe plug initially dedicated to hydraulic tests in pipes on nuclear sites.



Two markets from EDF point of view:

- the internal market for its own nuclear stations and
- Other industrial markets: water networks, chemicals, etc.

TRL

8 (Pipe plugs are already deployed in some of EDF's nuclear plants)

2013

Prototype

Patent

2014

Prototype tested and validated for internal deployment

2015

Market study

IP transfert discussions



EXAMPLE: SPIN-IN EDF STORE & FORECAST

INNOVATION

In 2009, EDF R&D impuled R&D works on management method for storage connected to renewable generation, wind or solar.

In 2012, birth of PEGASE, the first operational solution on the market adressed mostly to island territories : 1 patent / 3 software registred /

VALUE CREATION

2014, Creation of **EDF Store & Forecast**, 1st Start-up 100% EDF located in an incubator in Paris

2015 EDF Store & Forecast is successful on some markets and earns money the first year of activity.

