



# EDF IN NORTH AMERICA

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EDF Inc.

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# SUMMARY

1. EDF IN NORTH AMERICA
2. CHALLENGES OF THE U.S. ENERGY MARKET

# 1. EDF IN NORTH AMERICA

## Four business lines...



- Ownership of **1,327 MW** of wind, solar and biogas generation.
- More than 6,000 MW of power under contract.
- EDF Renewable Services is the **leading provider** of third-party operations and maintenance services in North America.



Trading / Optimization

- **Contractual management of 18,000 MW** of generation.
- 1.2 bcm gas storage capacity rights in 14 separate sites.
- 5,000 MW peak power retail load across 7 states.
- Trader of Renewable Energy Certificates (RECs), biogas, weather derivatives and emissions



- Ownership of about **2,000 MW** of nuclear (PJM and NY-ISO non-regulated markets) generating 31.5 TWh per year, through a JV with EXELON. CENG operating **5 nuclear reactors on 3 sites**.
- New Nuclear EPR design and operating license applications under review by NRC.



R&D / Innovation  
Smart cities

- Objective to provide the EDF group with new energy technologies, products and business opportunities, with a focus on **smart cities and energy efficiency**.
- **Partnerships** with the Electric Power Research Institute (EPRI), MIT, Texas A&M and IBM, among others.



- **Employees**  
3,600  
(20 expats)

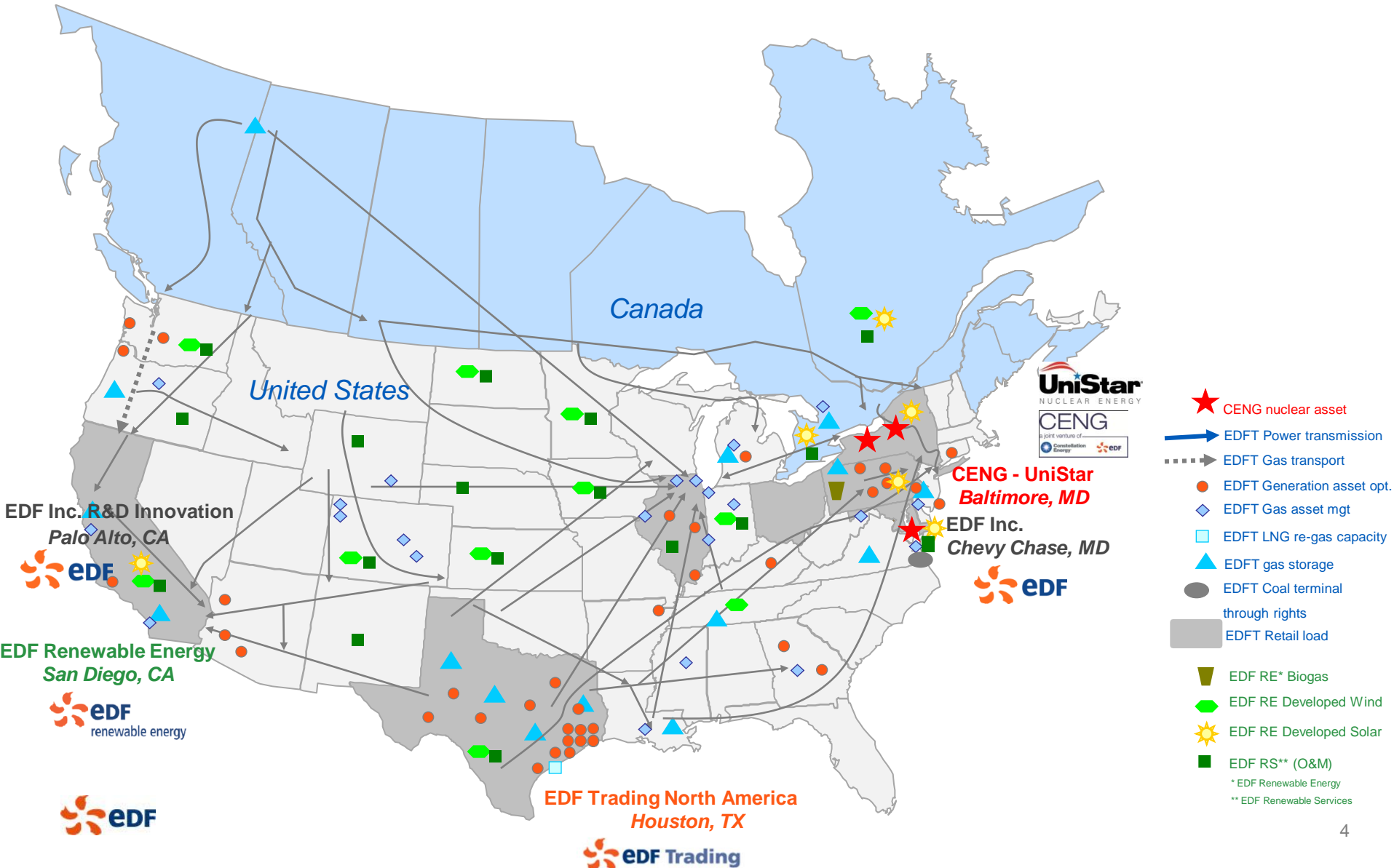
- **Ebitda**  
\$550m in '11

- **CAPEX**  
\$1b in '11

- **Assets**  
\$8b

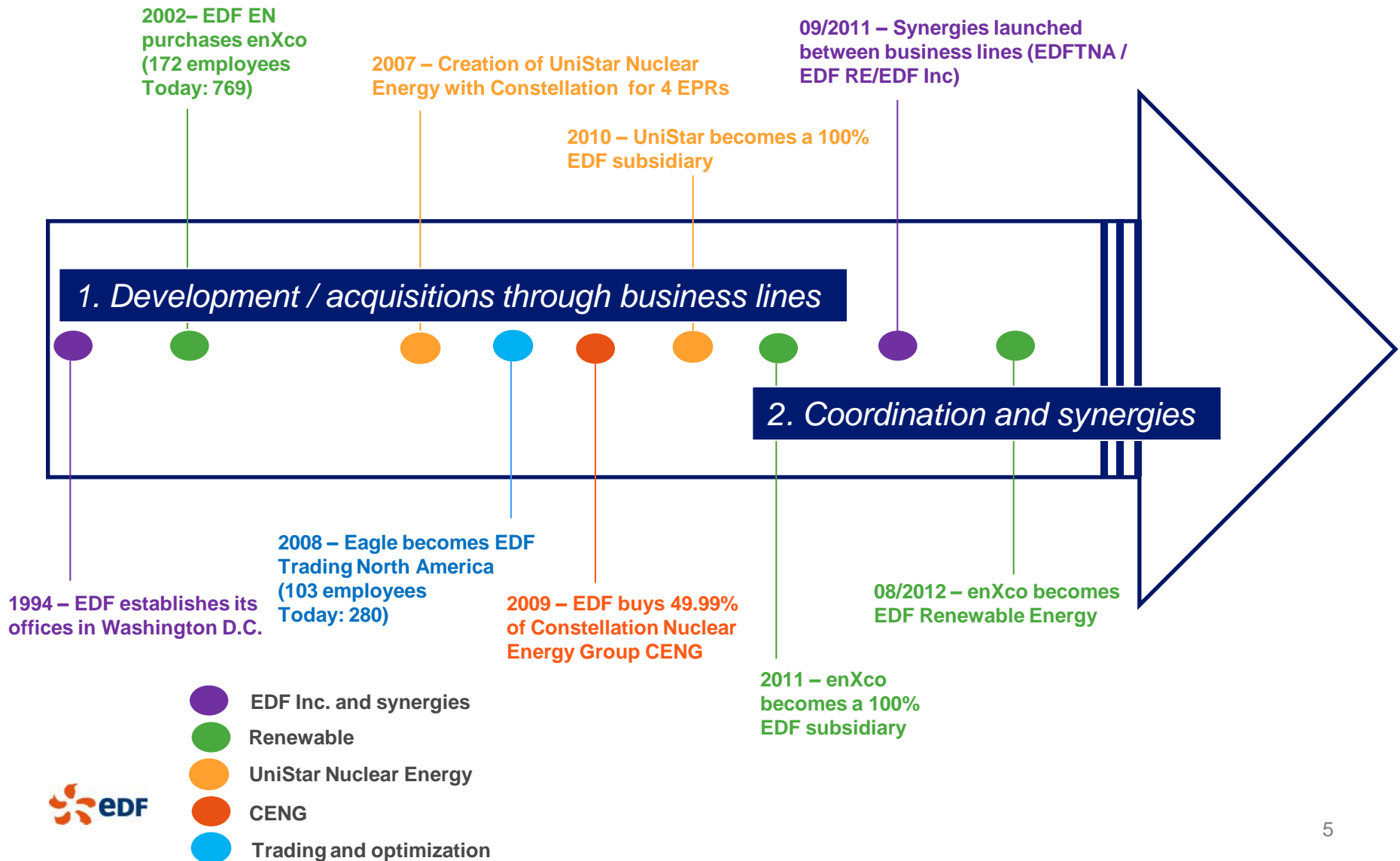
# 1. EDF IN NORTH AMERICA

## Map of operations



# 1. EDF IN NORTH AMERICA

## Evolution of EDF presence, and success stories



# 1. EDF IN NORTH AMERICA

## Strategy for business lines

Develop, optimize and diversify our asset portfolio on natural gas, renewable and new services.

Leave the nuclear option open.

Strengthen synergies between NA entities.

### New nuclear

- New nuclear development is **currently** uneconomic on a merchant basis.
- But a conviction that **safe nuclear should remain a key part of the US energy mix.**

### Existing nuclear

- **Protect** CENG's independence.
- **Provide** CENG with EDF's significant nuclear experience.
- **Strengthen** the relationship with Exelon post-merger.

### Renewable

- **Grow** as a developer, owner and operator of renewable in North America through acquisitions.
- **Reinforce** synergies between EDF Renewable Energy and EDF Trading North America.

### Trading/Opt

- **Set up a vertical development strategy**, with a focus on downstream and upstream activities.
- **Continue** the development in environmental and derivative products.

### Innovation

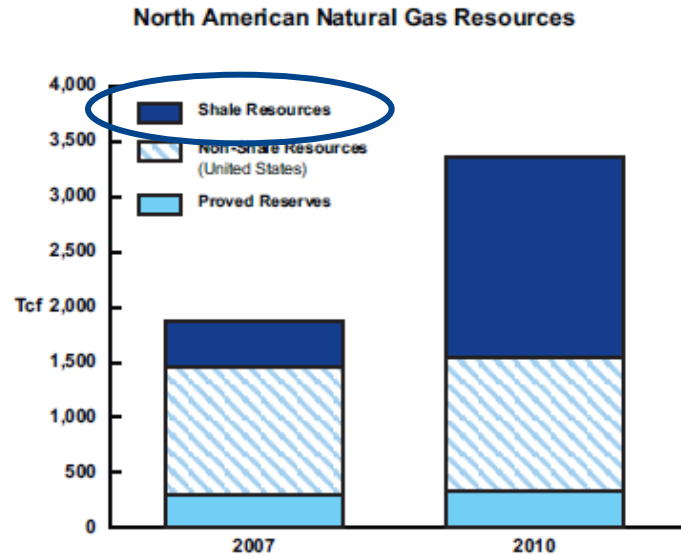
- **Find and acquire** new energy technologies, products and business opportunities.
- **Develop** new opportunities in smart cities and energy efficiency

# SUMMARY

1. EDF IN NORTH AMERICA
2. **CHALLENGES IN THE U.S. ENERGY MARKET**

## 2. CHALLENGES IN THE U.S. ENERGY MARKET

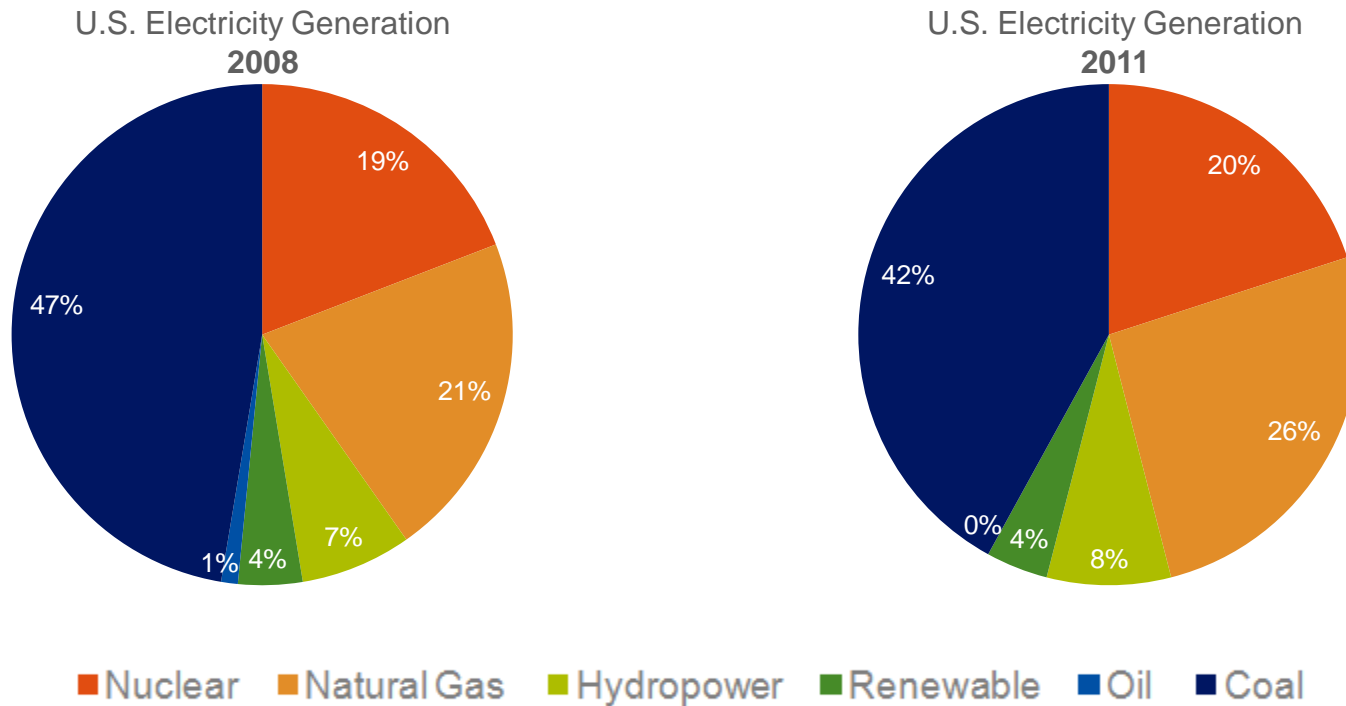
### New natural gas resources ...



Source: US Energy Information Administration, Potential Gas Committee, IHS CERA, 20702-1

- From 2007 to 2010, **North American natural gas resources doubled**, mainly due to shale gas.
- In the meantime, with the election of President Obama, the Environmental Protection Agency (EPA) put in place **constraining environmental rules**, favorable to low-carbon energies.

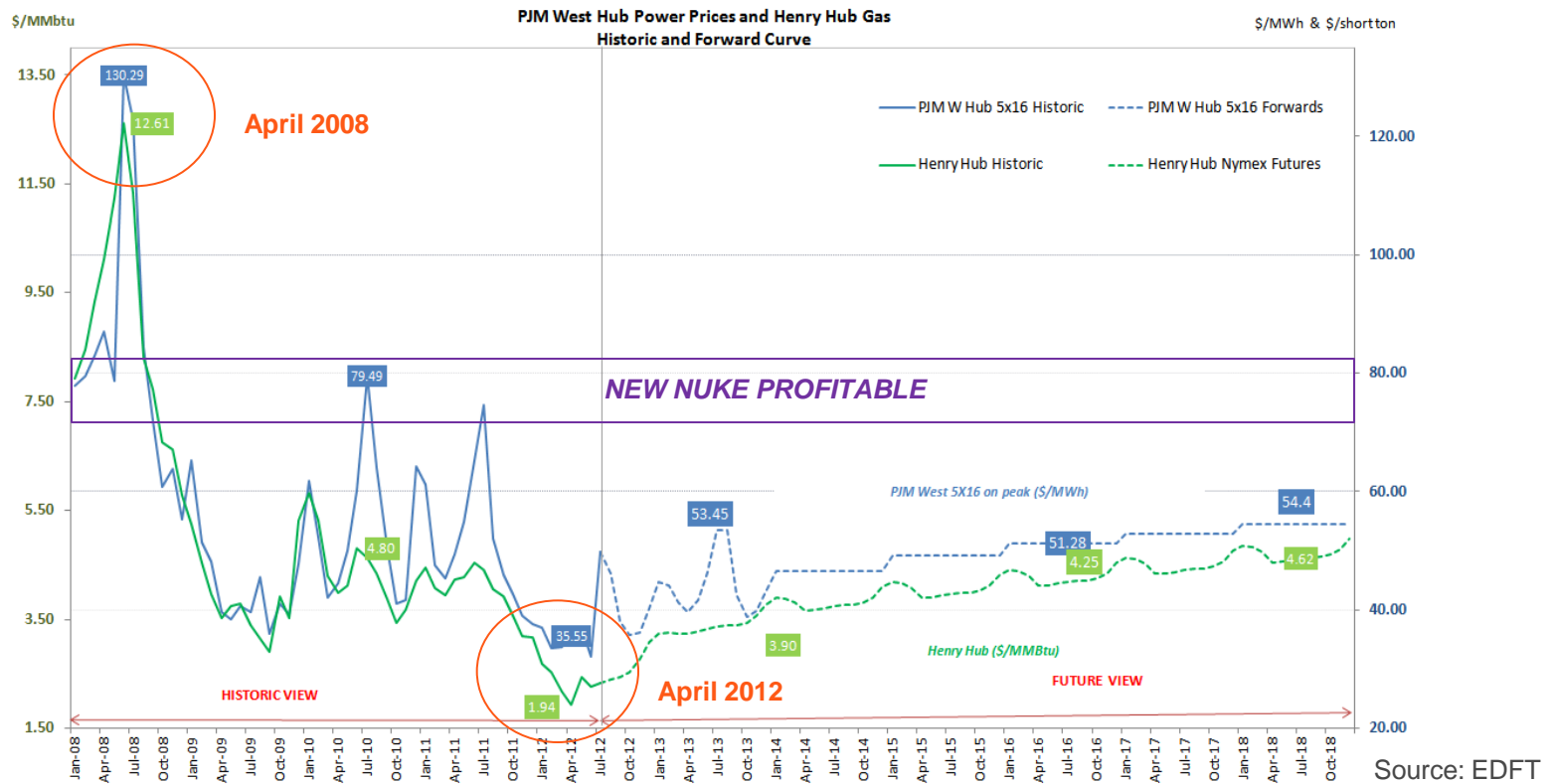
## 2. CHALLENGES IN THE U.S. ENERGY MARKET. ... lead to more electricity production from gas, and less from coal...



Source: EIA

-Starting in 2009, **historically low natural gas prices** lead to increased utilization of combined cycle plants at expense of coal units.

# 2. CHALLENGES IN THE U.S. ENERGY MARKET ... and lowering electricity prices.



- Electricity prices were at their lowest levels at \$35.55/MWh in April 2012 compared to \$80/MWh in April 2008.
- Electricity prices were lowered by natural gas prices and followed the same declining trend.

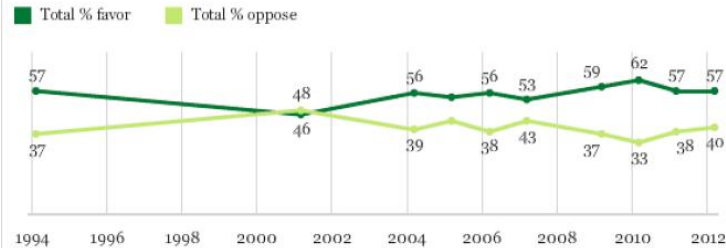
# 2. CHALLENGES IN THE U.S. ENERGY MARKET

## Nuclear energy in the U.S. in 2011: tough year

Operating reactors	Reactors under construction	Share of nuclear energy in the electricity mix in 2011	Strong performance of existing fleet
<b>104 (65 plants)</b> Largest nuclear fleet worldwide	<b>5</b>	<b>20%</b>	<b>89% capacity factor in 2011</b> 790 TWh generated



Overall, do you strongly favor, somewhat favor, somewhat oppose, or strongly oppose the use of nuclear energy as one of the ways to provide electricity for the U.S.?



GALLUP



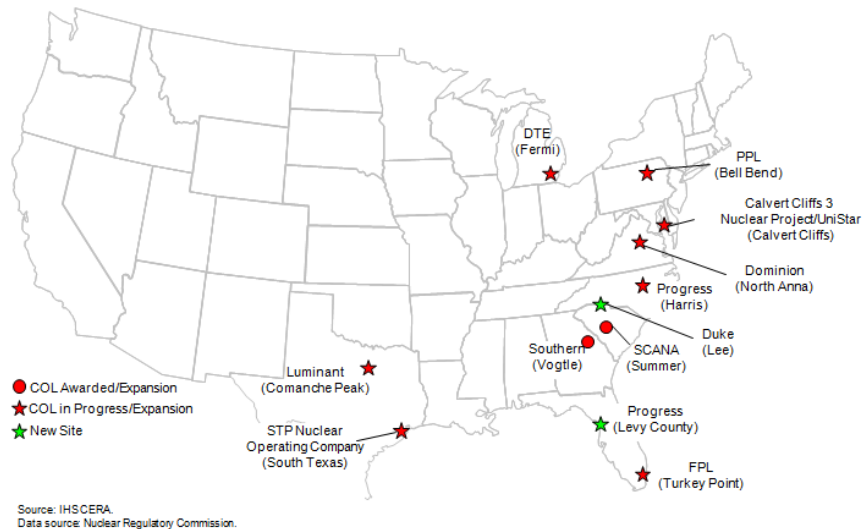
What is your opinion on the use of nuclear energy in France?

	July 2011	November 2011	March 2012
In Favor	32	33	37
Hesitant	37	40	36
Against	20	17	13

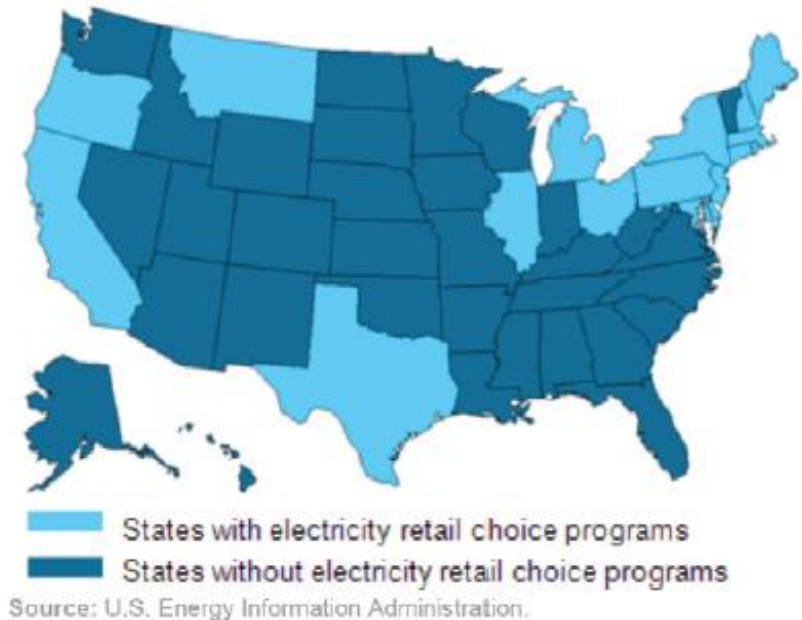
- 2011 was a tough year for the U.S. nuclear industry because of natural events (flooding, tornadoes, earthquakes) in the U.S. and Fukushima, in Japan.
- But, very strong response from US stakeholders enabled the public to keep confidence in nuclear.

## 2. CHALLENGES IN THE U.S. ENERGY MARKET

### Future of nuclear in the U.S.: regulated markets, power uprates and SMRs



Source: IHS CERA – North American Natural Gas Roundtable – May 2012



- The share of nuclear energy in the electricity mix **remains steady at around 20%** since the late 1980s. The U.S. will continue **to pursue license renewals and uprates** (72 reactors already have 20-year license extensions - 382 MW of uprates in 2011, and 1,161 MW planned 2012 -2016).
- Drastic fall of natural gas prices questions **short and mid-term economics of nuclear** in the US (existing and new build), especially in **deregulated markets**.
- Nevertheless small modular reactors could become a way for a new US leadership in the nuclear industry

## 2. CHALLENGES IN THE U.S. ENERGY MARKET

### What is the impact of the next Presidential elections?

	Barack OBAMA	Mitt ROMNEY
Renewables	Favorable support through federal subsidies and environmental regulations.	Supports a “market based” approach.
Oil and Gas	Supports shale gas contingent on safety and environmental concerns.	Promotes development of shale gas industry and looser regulations.
Coal	Supports setting high standards on emissions of new units.	Wants to increase the U.S. production.
Nuclear	Supports funding research for new reactor designs (primarily SMRs)	Supports shorter NRC review of applications to 2 years
<b>Philosophy</b>	<b>“All of the above” strategy with renewable focus.</b>	<b>Favors oil, gas, and coal.</b>

- **Two different philosophies**; but for both candidates, energy is always linked to job creation and economic growth.

- **The impact of the election needs to be qualified:**

- Campaign-rhetoric vs. policies once in office.
- Capitol Hill majority unlikely.

# APPENDIX

# CONSTELLATION ENERGY NUCLEAR GROUP CENG

- A 49.99%/50.01% JV of EDF & Exelon
- Among the top nuclear owners and operators in the U.S.
  - 3 sites, 5 reactors, 4,055 MW of capacity, 2,647 employees.
  - Young fleet, with a 25-year average remaining on their operating licenses.
  - 20-year life extensions obtained for all 5 units (to 60 years\*).
- **Industrial performance**
  - Among the most efficient U.S. nuclear operators.
  - 89% capacity factor in 2011, 790 TWh generated.

\* 58 years for NMP2



*Calvert Cliffs (2 units, Maryland)*



*Nine Mile Point (2 units, NY state)*



*R.E. Ginna (1 unit, NY state)*

# UNISTAR NUCLEAR ENERGY UNE

- 100%-owned by EDF since November 2010
- Developing the U.S. EPR at Calvert Cliffs 3
  - **Licensing Process:** EPR Design Certification underway. Combined Construction and Operating Licence (COL) application submitted in 2008, now under review by NRC.



*The Calvert Cliffs 3 Nuclear Project, MD*

# EDF RENEWABLE ENERGY

- **EDF Renewable Energy is an EDF Energies Nouvelles Company**

- 738 employees in North America
- A leading **U.S. independent power producer** with more than 25 years of expertise in the renewable industry, covering all range of services from project development and management to operations and maintenance.

- **EDF Renewable Energy's portfolio**

- 1,327 MW of wind, solar and biogas generation
- More than 6,000 MW of wind and solar developed for own account and for third-party



# EDF TRADING NORTH AMERICA

- The leading player in the U.S. gas, power, coal and environmental products markets:

- **Gas:**

- Gas storage: 1.2 bcm storage capacity rights at 14 separate sites in the US.
    - Gas transmission: 8 bcm/yr. pipeline capacity rights across North America.

- **Electricity: 18,000 MW** of managed assets.

- **Wholesale load: 800 MW** in power load auctions.

- **Environmental commodities:** active trader of Renewable Energy Credits (RECs), biogas, weather derivatives and emissions.

- A unit of EDF Trading's global organization, which provides a multi-commodity wholesale energy trading hub to:

- Support asset optimization for the EDF Group in North America.
  - Support EDF Trading's existing global trading activities.

- Full service approach to energy management for major customers:

- Asset dispatch.
  - Hedging strategy planning.
  - Market conditions monitoring.

- Over 250 employees

