
AREVA

# *AREVA Group development strategy in post-Fukushima environment*

**Benjamin Fremaux, Senior Executive Vice President, Strategy, M&A**
**Secretary to the Executive Board, AREVA**

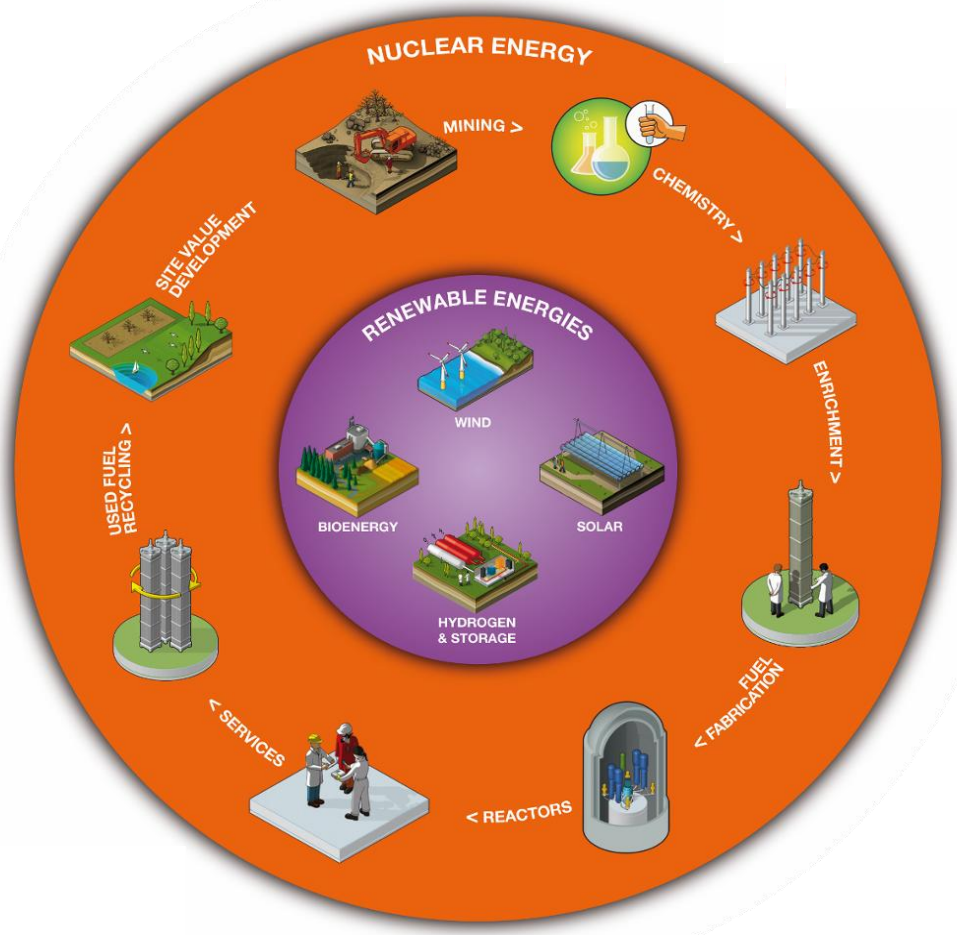
**Moscow, June 5th 2012**

# Agenda

- **AREVA overview**
- **Nuclear power perspectives after Fukushima**
- **AREVA's strategic vision**

[ A TRADUIRE ]

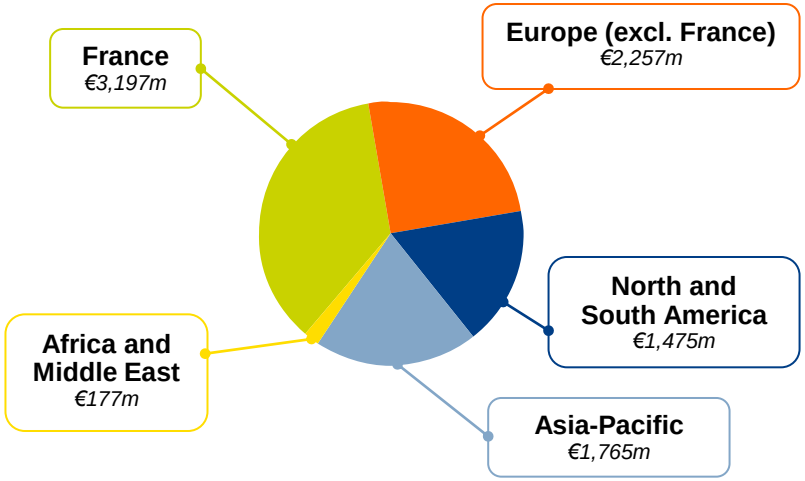
# AREVA is a global leader in solutions for power generation with less carbon




## 2011 Key figures

**€45.6bn backlog**

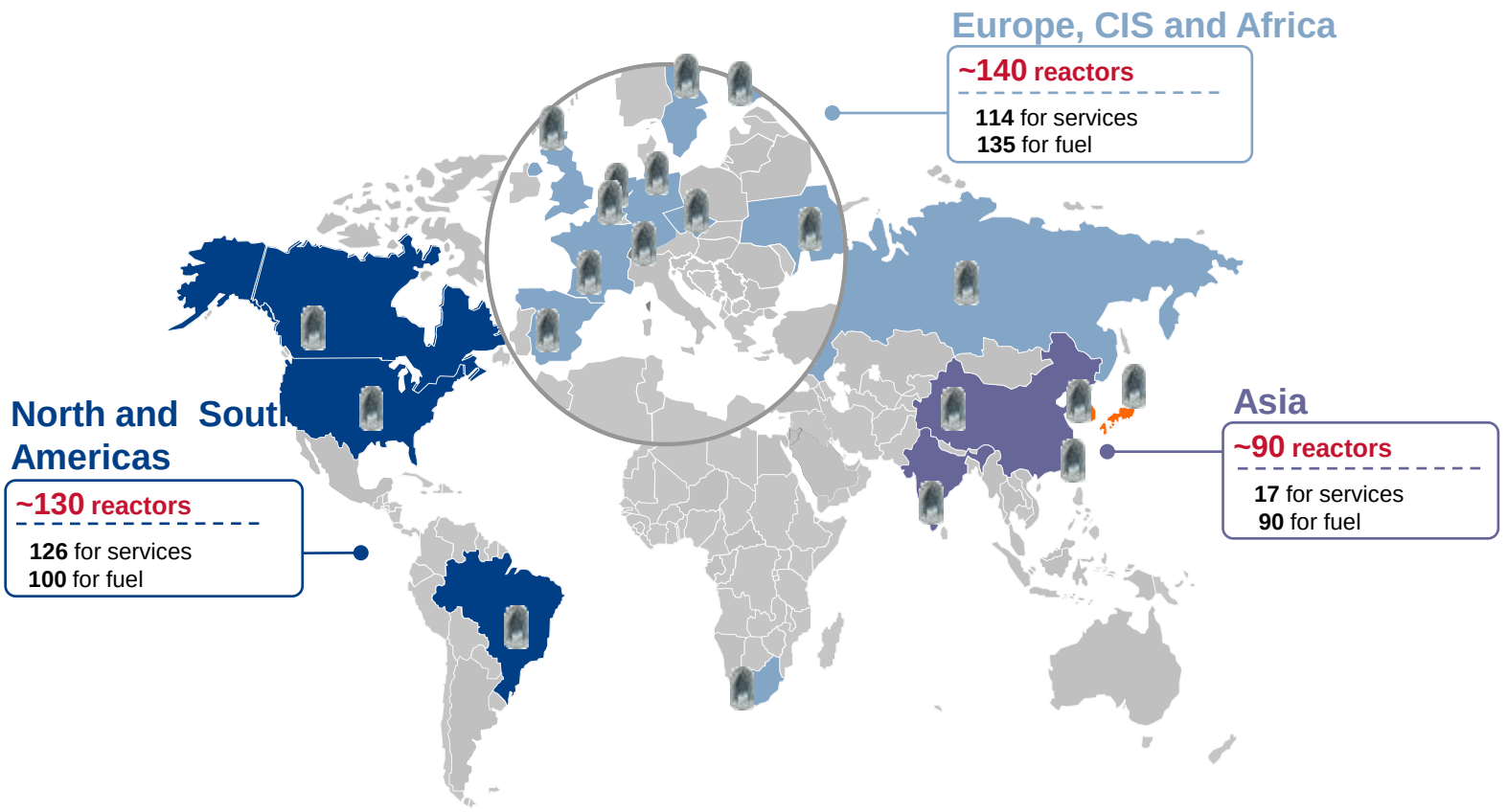
**€8,872m revenue**




**-€1,923m EBIT**

**47,541 people**

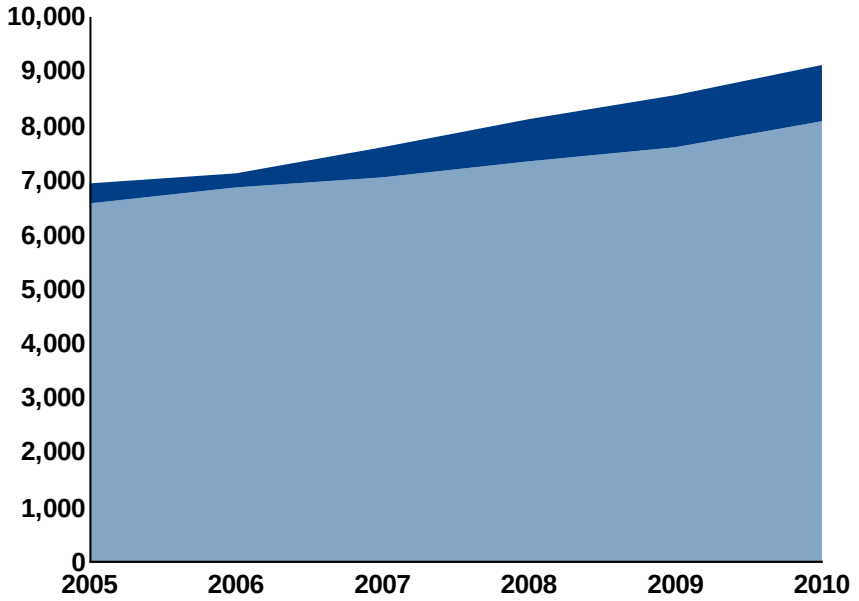
# 95% of all nuclear utilities are AREVA customers




**AREVA provides services to 360 reactors worldwide**

# Recurring operations: a robust foundation

## Revenue from Recurring operations vs. New builds (€m)




**Over 80% of AREVA's revenues stem from recurring operations generated by existing reactors**

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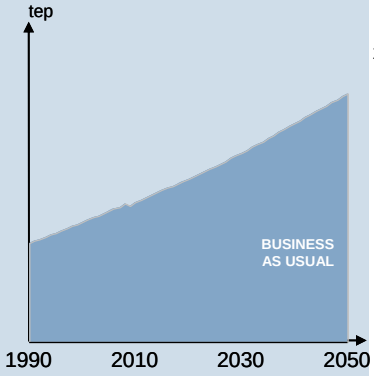
- Nuclear power perspectives after Fukushima
- AREVA's strategic vision
- Conclusion

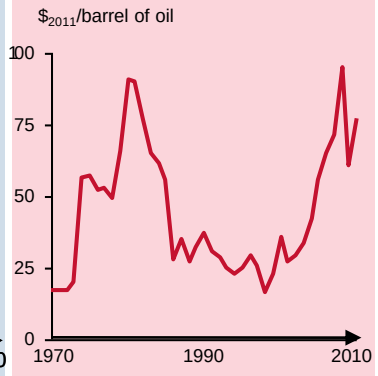
# Energy market: continued growth announced

## Macroeconomics



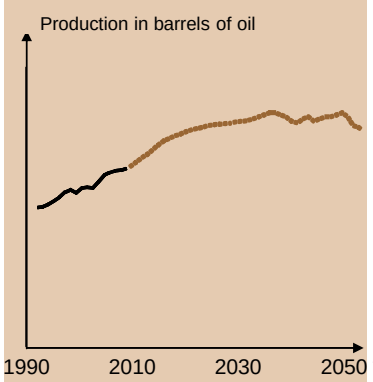

**Energy demand: x2 by 2050**

## Geopolitics



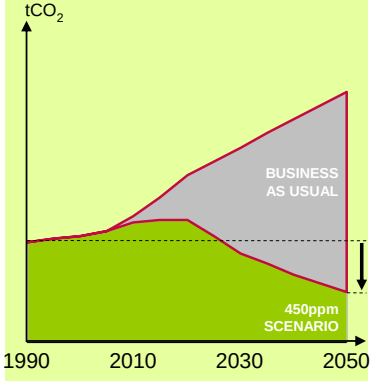

**Energy independance and security of supply**

## Resources



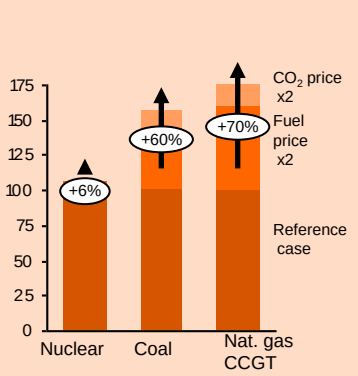

**Ineluctable decline of fossile resources + pressure on prices**

## Environment




**GHG emissions: goal= 50% reduction by 2050**

## Economics




**Energy cost, stability, predictability**

**2011 WEO**
**2009 – 2035**
**Scenario**

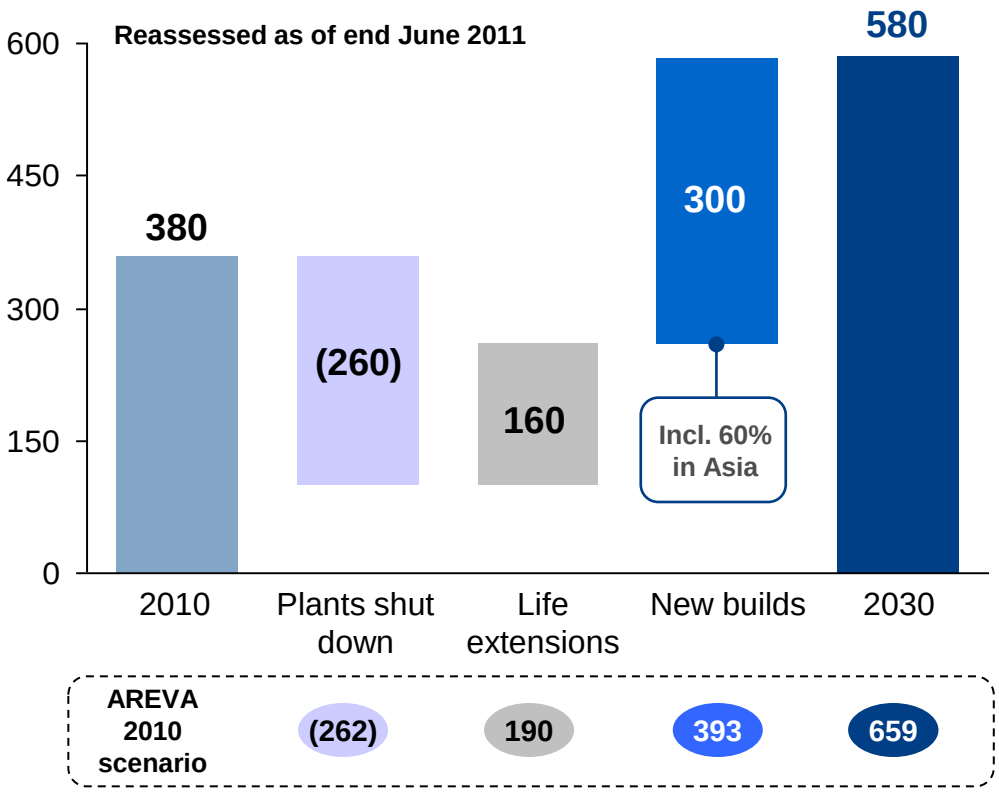
| | |
|---|---|
| **Global primary demand in energy*** | **+1.3% / year** |
| **Demand in nuclear energy*** | **+2.1% / year** |
| **Demand in renewable energies*** | **+2.5% / year** |

Source: IEA ETP: reference scenario 2010 - UNFCC, CERA 2009

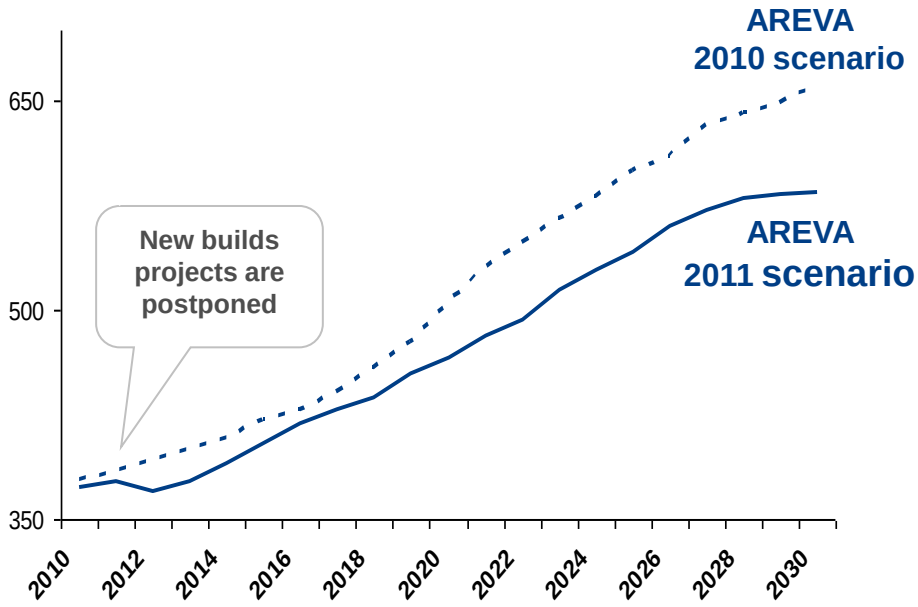
* Billions of toe

# Nuclear scenario: installed capacity growth will be delayed

## AREVA 2011 scenario (GWe)




## Change in global installed base (GWe)




**Growth in installed capacity:**
**+2.2% per year on average until 2030**

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# Action 2016

## Safety Security Transparency

- Commercial priority given to value creation
- Selectivity in capital spending
- Debt management

**Improving our performance**

# Action 2016

**Safety Security Transparency**

**Commercial priority given to value creation**

**Selective capital expenditure**

**Debt management**

**Improving our performance**

# Installed base: doubling profitability by 2016

**Fuel offering**

- Expanding integrated offerings in the front end cycle

**Post-Fukushima safety**

- Capturing 35% of the accessible market of post-Fukushima safety works (estimated at €3.5bn over 10 years)

AREVA Safety Alliance

**Reactor modernization/ life extension**

- Replacing primary components
- Installing digital I&C systems

**Recycling: promoting safer management approaches for used fuel**

- Reducing the volume of used fuel in the pools (recycling or dry storage)
- Improving pool safety



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# New nuclear plants: becoming the reference technology (EPR / ATMEA)

## Ongoing negotiations (bilateral)

CGNPC — Taishan 3-4

NPCIL — Jaitapur 1-2

EDF — Hinkley Point C-D

EDF — Penly 3

EDF, PPL, Duke Energy — Calvert Cliff 3, Bell Bend, Piketon

## Ongoing bids

Horizon Nuclear Power — Wylfa 3-4

Fennovoima — Pyhäjoki

CEZ — Temelin 3-4

JAEC

## Bids to come (in 3-5 years)

ESKOM

TVO

GDF Suez – Iberdrola

Delta

PGE

Vattenfall

New Brunswick Power

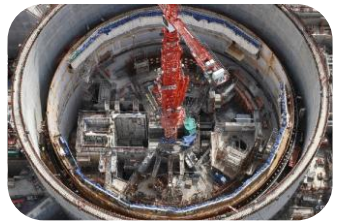
Ameren

Saoudi Arabia

# Global leadership for the construction of Gen III+ reactors (EPR)

**Percentage of completion in %**
**(AREVA scope)**

| | |
|---|---|
| Olkiluoto 3 | 82% complete (Supply of a turnkey power plant) |
| Flamanville 3 | 56% complete (Supply of a Nuclear Steam Supply System) |
| Taishan 1 & 2 | 63% complete (Supply of 2 nuclear islands) |



# EPR: unique lessons learned on projects

| | | Evolution between OL3 and Taishan |
|---|---|---|
| Engineering | Number of engineering hours on the Nuclear Steam Supply System scope | -60% |
| Construction | Duration of construction (from 1st concrete to dome installation) | -50% |
| Procurement | Average procurement time (reliability of procurement planning) | -65% |
| Total | Total construction time (from 1st concrete to 1st divergence) | -40% |

**50% of the Taishan personnel had participated in OL3 or FA3 projects**

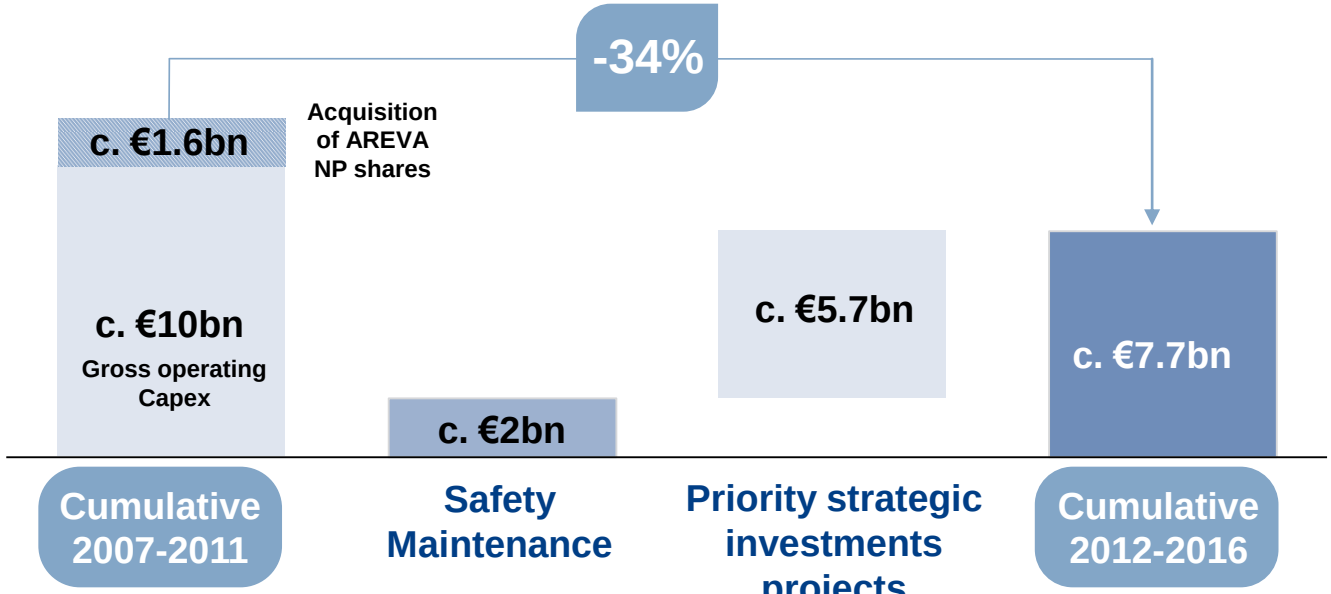
# Action 2016

**Safety Security Transparency**

- Commercial priority given to value creation
- **Selective capital expenditure**
- Debt management

Improving our performance

# Investment program consistent with new market conditions




Cigar Lake
Imouraren
Comurhex II (CXII)
Georges Besse II (GBII)
ATMEA
Renewables (c. €300m)

**Investments projects on hold given uncertainties**

Capacity extensions (GBII, CXII, Melox, La Hague)
Eagle Rock Enrichment Facility
Trekkopje, Bakouma, Ryst Kuil

# Action 2016

**Safety Security Transparency**

- Commercial priority given to value creation
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Improving our performance

# Financial structure objectives

**2012-2016:**

**Fully self-finance cumulative Capex***

**2012-2013:**

**Limited use of external financing**

**Maintain an appropriate level of short-term liquidity**

**Maintain a solid financial structure**

*vs 33% over 2007-2011 period

# A financing plan in line with the group's financial structure objectives

- **Plans for disposal / secondary offering of equity interests**
- **Plans for disposal of non-strategic operations**
- **Plans for disposal of minority interests / partnerships in strategic projects or operations**

**Cumulative objective 2012-2013**

**> €1.2bn**

- **Long-term bond issue program**

**Capex fully funded from operations as from 2014**

# Action 2016

**Safety Security Transparency**

- Commercial priority given to value creation
- Selective capital expenditure
- Debt management

**Improving our performance**



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# Performance improvement founded on 5 pillars

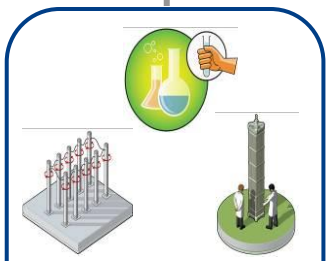
**Improving our performance**

| Safety Security | Customer Operations | Economic Competitiveness | Technology | Human Resources |
|---|---|---|---|---|
| ◆ *0 level 2 event*<br>◆ *0 occupational accident* | *Quality, cost, schedule* | *Gains expected by 2015*<br>*Operating costs: €1bn/year*<br>*WCR optimization: €500m* | *R&D creating value* | *Skilled and committed teams* |

# Strategic objectives by Business Group

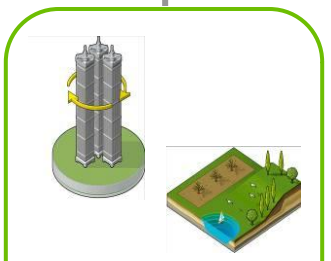
## Action 2016

**Mining**

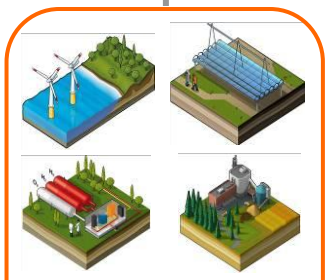


**Front End**

**Reactors & Services**



**Back End**



**Renewables**

# Strategic objectives: Mining and Front End Business Groups

## Mining BG

- Achieve the best profitability level
- Focus capital spending on most profitable assets
- Maintain resources and reserves for 20 years of production

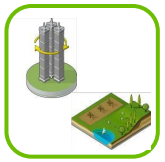
## Front End BG

- Achieve full production at the Georges Besse II and Comurhex II facilities
- Optimize our industrial footprint to improve competitiveness
- Manage the safety termination of operations at Eurodif
- Increase the commercial footprint in the fuel activity in Asia

# Strategic objectives: Reactors & Services and Back End Business Groups

## Reactors & Services BG

- Continue to improve the competitiveness of the EPR reactor and the qualification of the ATMEA reactor
- Contribute to improved reactor safety and reactor life expansion projects for existing reactors
- Participate in growth in Asia
- Prepare the technologies of the future (SMR and Generation IV)



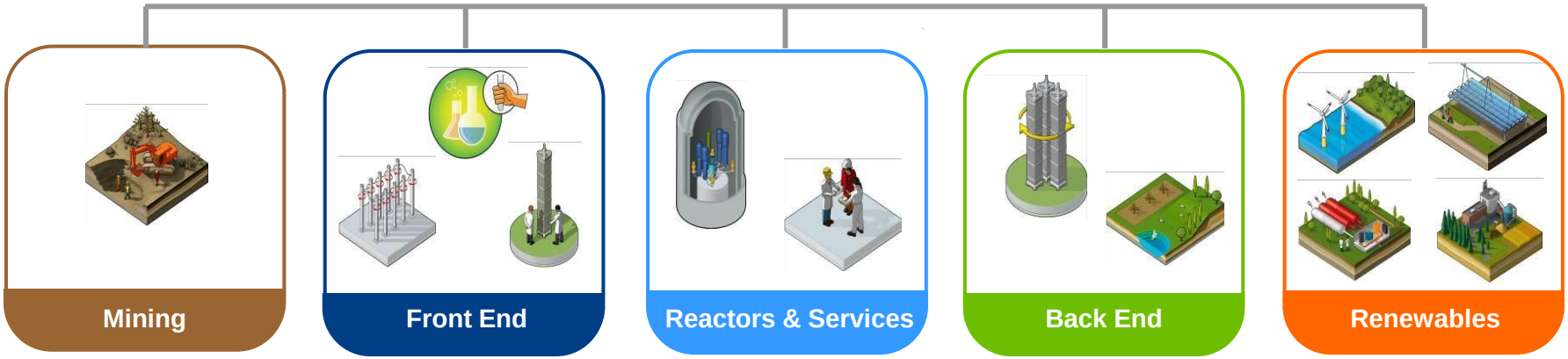
## Back End BG

- Ensure full usage production capacity at La Hague and Melox
- Participate in the development of the new regional recycling platforms (China, Japan, UK)
- Capitalize on our unique experience in fuel cycle facility and reactor dismantling
- Expand our leadership in storage and logistics services

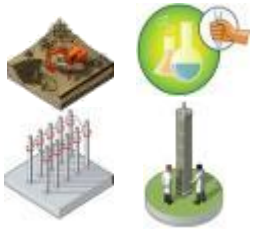
# Strategic objectives: Renewable Energies Business Group

- Turn first projects into landmark contracts
- Become a reference leader in offshore wind turbines in Europe (Germany, France, UK)
- Become a reference leader in concentrated solar power in Asia and the Middle East
- Refocus our business portfolio

# Action 2016



# Appendix



# Front end of the cycle: guaranteed security of supply

**Mining**

- More than 200,000 MTU delivered to date
- A diversified mining platform (geographic distribution, technologies, development stage)
- A dynamic exploration policy

**Conversion**

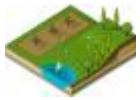
- More than 40 years of industrial experience and more than 360,000 MTU delivered to date
- Comurhex II: a new conversion facility

**Enrichment**

- End 2010: first production at the Georges Besse II enrichment plant
- Best centrifugation technology in the world (ETC)

**Fuel**

- More than 35 years of experience in boiling water reactors (BWR) and pressurized water reactors (PWR)
- More than 135 reactors worldwide use AREVA's fuel products



# Back End: offering a comprehensive range of solutions

## Recycling

- **Recycling**: **MOX** and **uranium**
- **Unique know-how and technologies deployed at an international scale** (Japan, United-States, United-Kingdom, China)
- **Undisputed leadership** (more than 75% of the global treatment market)

## Storage

- **Design and manufacturing of storage solutions**

## Logistics

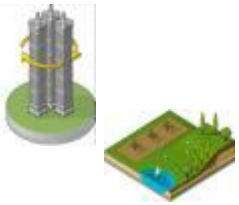
- **Design and manufacturing** of transport for nuclear materials: **31% market share**
- **Transport solutions and management: 7,000 transports completed**
- **Global footprint: transport license in 27 countries**

## Nuclear Site Value Development

- **1,500 specialists**
- **Dismantling of AREVA sites: 5 ongoing projects in France**
- Participation in several projects for customers in France and abroad

## Cleanup

- Services provided to **more than 90% of all French nuclear sites**



# Dismantling: broad expertise in managing customer projects

## Reactor vessel / internals: decontamination and dismantling (D&D)

| | |
|---|---|
| Stade, Würgassen, Obrigheim | ▶ Dismantling of the reactor vessel and internals<br>▶ Decontamination of primary and auxiliary circuits |
| Millstone, Rancho Seco, Yankee Rowe | ▶ Dismantling of the reactor vessel and internals |

## Used fuel, effluent / radioactive waste management

| | |
|---|---|
| Fukushima | ▶ Design and implementation of a full water treatment system |
| Dounreay | ▶ Special equipment to retrieve damaged fuel in research reactor |

## Assistance to the project owner / Design and engineering

| | |
|---|---|
| Creys-Superphénix | ▶ Support to the sodium retrieval and D&D preparation |

## M&O (maintenance and operations) for D&D projects

| | |
|---|---|
| Hanford | ▶ High level waste treatment (customer: DOE) |
| Savannah | ▶ Vitrification of high level waste (customer: DOE) |
| Marcoule | ▶ D&D of a large fuel treatment facility (customer: CEA) |
| Sellafield | ▶ Member of the site's M&O consortium |

**Creation of an expertise center for decommissioning and dismantling in Germany**

# Renewable energies: a targeted offering

| | A portfolio of technologies meeting customer needs | Expertise demonstrated in actual projects |
|---|---|---|
| **Offshore wind** | ▶ **Most powerful wind turbine** in operation (5MW)<br>▶ **Leader on the high-rated wind turbine market**<br>▶ Investor confidence<br>▶ Ramp-up of industrial production | ▶ **Alpha Ventus** (30 MW)<br>▶ **GT1** (400 MW)<br>▶ **Borkum West II** (200 MW)<br>▶ Exclusive ongoing negotiations for several projects |
| **Solar (CSP)** | ▶ **Fresnel technology** adapted to arid areas<br>▶ **10-15% lower electricity cost** than parabolic trough technology | ▶ **Kogan Creek** (44 MW expansion)<br>▶ **Liddell** (3 MWe)<br>▶ **Kimberlina** (5 MWe)<br>▶ **Solar Dawn** (250 MWe)* |
| **Bio-energies** | ▶ **100 plants** in service worldwide<br>▶ Installed base: almost 3 GW | ▶ **Coriance** (12 MWe)<br>▶ **Bertin** (380 MWe)<br>▶ **Bolognesi Participacoes** (modernization, 330 MWe) |

* Exclusive negotiations, not included in backlog as at the end of September 2011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