

## AREVA Business & Strategy overview

August, 2010



Notice

#### Forward-looking statements

This document contains forward-looking statements information. and These statements include financial forecasts and estimates as well as the assumptions on which they are based, statements related to projects, objectives and expectations concerning future operations, products and services or future performance. Although AREVA's management believes that these forward-looking statements are reasonable, AREVA's investors and investment certificate holders are hereby advised that these forward-looking statements are subject to numerous risks and uncertainties that are difficult to foresee and generally beyond AREVA's control, which my mean that the expected results and developments differ significantly from those expressed, induced or forecast in the forward-looking statements and information. These risks include those developed or identified in the public documents filed by AREVA with the AMF, including those listed in the "Risk Factors" section of the Reference Document registered with the AMF on March 29, 2010 (which may be read online on AREVA's website, www.areva.com). AREVA makes no commitment to update the forward-looking statements and information, except as required by applicable laws and regulations.



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- Developments at AREVA
- Performances and objectives by BG
- AREVA latest financial results
- Appendices



## An energy world in revolution 3 major challenges





AREVA

# AREVA's positioning aligned with world energy challenges

#### **Global energy mix**

Billions of metric tons of oil equivalent / year



Source: World Energy Outlook 2008 stabilization 450 ppm" scenario, AREVA

# AREVA is a global leader in solutions for carbon-free power generation



#### 2009 Key figures

€43.3Bn backlog

€8,529M sales

**€647M op. performance** excluding OL3 provision \*

€97M EBIT including OL3 provision

48,190 people

\* EBIT Excluding OL3 provision of €550M recorded in H1.

## Installed nuclear capacity expected to nearly double by 2030

Forecasts issued by

AREVA's development forecasts for installed nuclear capacity (in GW)

From 2008 to 2030



<sup>1</sup> World Energy Outlook <sup>2</sup> World Nuclear Association <sup>3</sup> US Department of Energy <sup>4</sup> Energy Information Administration

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# AREVA is targeting 1/3 of the accessible market\*

#### Segmentation of the accessible nuclear new build market

Expected new nuclear capacities - Accessible Market\* (To be commissioned 2016-2030)





# Strong growth is expected on most renewable energy segments



Capacity installed for renewable energies

Source : WEO 2008, ETP, EIA (2008) \* Except hydro

## AREVA is the only fully integrated player on the nuclear power value chain...



# ... And plans to become a leading reference in the field of renewable energy





Already #1 in Bio-energy

Off-shore wind turbine of the highest power rating (5MW) currently in operation





Introduction to AREVA



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AREVA Overview – August 2010

## **Developments at AREVA**





### **Current status of the reactor projects**



- Concrete seal of the dome complete
- Main civil works complete
- Engineering work nearing completion
- Reactor vessel installed
- Architecture of the I&C system accepted
- Startup of nuclear operations for late 2012



- Unit 1: installation of 3<sup>rd</sup> reactor liner ring
- ► Unit 2: 1<sup>st</sup> concrete poured
- ► Engineering work nearly 52% complete
- ► 75% of procurement orders placed (in €)
- The main primary components are being manufactured
- Concrete work completed
- Rebar is being installed concrete comes next
- The reactor's containment liner has been installed





- ▶ 90% of procurement orders placed (in €)
- Engineering work nearly 80% complete
- Heavy component manufacturing continues: the reactor vessel will be available late 2010
- Installation of first equipment (AREVA's scope)





## **Engineering for EPR reactors:** the value of lessons learned

### Progress indicator for EPR reactor engineering work (nuclear steam supply systems - NSSS)

**Engineering hours** (June 2010 - rebased 100 - compared with OL3)



## Industrial developments at AREVA Mining – Front End

#### Mine site development

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Priority given to organic growth

**Cigar Lake** 

Imouraren

- Katco
   Somaïr
   Trekkopje
- Enrichment Georges Besse II - France
- Spinup of the first cascade achieved in 2009
- First production scheduled for late 2010
- Production at full capacity in 2016

#### Uranium conversion: Transition Comurhex I → Comurhex II

- Replacing and modernizing production capacity
- Investing in 15,000 metric tons of capacity/year
- Civil works have started

**Enrichment - Eagle Rock -** *United States* **Securing financing** 

- \$2 billion loan guarantee received from DOE
- Evaluation criteria: reliability of the proposed technology, innovation and financial strength
- Construction will begin in 2011 subject to licensing and the necessary diplomatic agreements





## Industrial developments at AREVA Renewables

#### AREVA Wind

- Acquisition of the remaining shares (49%) of Multibrid
- High-tech blade manufacturer (PN Rotor) acquired end 2009

#### AREVA Solar

- Acquisition of Ausra (renamed AREVA Solar) finalized in March 2010
- Concentrated solar thermal power
- Steam production and management: AREVA's core expertise
- Booming solar technologies:
  - Selected applications



Assembling wind turbine nacelle

Blade manufacturing





Solar power plant

"Booster": thermal solar extension to conventional thermal plants

Steam for industrial processes

Developments at AREVA



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Development plan approved June 30, 2009





Developments at AREVA

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# Strengthening AREVA's financial resources: pending actions

Announcements made on July 27, 2010

- Before the end of 2010: open up capital to the value of 15%, to strategic and financial investors with whom the Group already started negotiations
- Under consideration: EDF could take a stake in AREVA's capital





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## **AREVA Business Groups**



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**Front-End Business Group** 

AREVA: a leading player worldwide in the overall Front-End

2009 Sales: €3,471 M (41% of AREVA Sales) • H1 2010 Sales: €1,593 M



14,400 employees



N<sup>°</sup>1 producer of Uranium in 2009

• 8,626 tU produced by AREVA





# AREVA invests to maintain its leadership in Mines and Enrichment

#### Sales – 2009 split



#### A leading player in the overall Front-End

- Mining: explores, extracts and processes uranium ore, from which nuclear fuel is made. The BU then reclaims mining sites once production is finished
- Chemistry: converts natural uranium (U3O8) into uranium hexafluoride (UF6) required for enrichment
- Enrichment: Increasing the proportion of U235 found in natural uranium from 0.7% to 3%-5% in order to manufacture fuel for nuclear reactors
- Fuel: designs, manufactures and sells nuclear fuel assemblies for pressurized water reactors (PWR), boiling water reactors (BWR) and research reactors

In millions of euros	2009	H1 2009	H1 2010	Change 10/09		
ORDER BOOK	27,715	27,055	28,590	+5,7 %		
SALES REVENUES	3,471	1,556	1,593	+ 2,4 %		
OPERATING INCOME*	659	348	(133)	-		
% Sales	19,0 %	22,4 %	-8,3 %	nm		
OP. FCF BEFORE TAX	(315)	(179)	(210)	-18 %		
*Incl. €191m in H1 2009: new minority partners in GBII and €300m of impairment on Mining assets in H1 2						

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Performance and objectives by BG

AREVA





# AREVA, the world's number one producer of uranium in 2009

Production in tonnes of U<sup>1</sup>







# AREVA is leading the way in enrichment capacity renewal

#### Georges Besse II - FRANCE

- First rotation of first centrifuge cascade in December 2009
- ► €3 Bn project: one of the biggest industrial investments of the past decade in France
- Essential investment for global balance of the enrichment market with modular capacity to meet market requirements
  - First production scheduled for late 2010
  - Production at full capacity in 2016
- Best existing available technology (ETC TC12)



#### Eagle Rock Enrichment Facility - USA

- Construction to begin in 2011 subject to licensing and the necessary diplomatic agreements
- ► \$2 Bn loan guarantee received from DOE
- Evaluation criteria : reliability of the proposed technology, innovation and financial strength
- Proven ETC centrifuge technology, already licensed by the NRC



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## 131 reactors worldwide are fuelled by AREVA





Reactors & Services	
	<b>&gt;&gt;</b>
<ul> <li>Design and construction of nuclear reactors</li> <li>Maintenance and modernization of the nuclear power plants</li> </ul>	>>>

AREVA: a global key player in the **Reactors & Services** 



2009 Sales: €3,418 M (36% of AREVA Sales) • H1 2010 Sales: €1,543 M





### **Reactors & Services Business Group** Still mostly recurring, but new build is there

#### Sales – 2009 split



#### A global key player in the Reactors & Services

- Nuclear builds : participates in all stages of construction of the steam supply systems and nuclear islands and their commissioning, then provides support during the operating phase.
- ▶ Nuclear services: reactor optimization services.
- Equipment : design and manufacture of key components for nuclear power plants.
- Product & Technology: manages the AREVA reactors portfolio. It is responsible for safety and performance.
- Nuclear measurement: manufactures and markets key instruments and systems for detecting and measuring radioactivity.
- Propulsion and research reactor : uses its expertise to carry out high-tech projects. It is active in several sectors of the industry.

In millions of euros	2009	H1 2009	H1 2010	Change 10/09	
ORDER BOOK	8,910	8,269	7,964	+ 5,7 %	
SALES REVENUES	3,418	1,382	1,543	+ 11.6%	
OPERATING INCOME*	(76)	(552)	(391)	+ €162m	
% Sales	- 2,2 %	- 40,0%	- 25,3 %	nm	
OP. FCF BEFORE TAX	(736)	(565)	(420)	+ €145m	
* Incl. OI 3: €367 M in H1 2010 and €550 M in H1 2009					



Performance and objectives by BG

**A** AREVA



### **The EPR Reactor**

#### 1,650 MWe PWR



#### The Path to Greatest Certainty

- Generation III+ PWR
  - 4-Loop
  - 4 590 MWth
  - SG pressure 77bar at 100% power
  - 4x100% redundancy of active safeguard systems
  - Backup in case of total loss of safety function
- High power output (1,650 MWe)
- Evolutionary design (Konvoi/N4)
- Low global power generation costs
  - Reduce by up to 15% fuel consumption
  - 60 years of operation
  - Improved flexibility to reduce opex
- Outstanding safety level
- Maximized benefit from size effect
- Minimal environmental impact

**Construction in Finland, France & China** 

Licensing engaged in the USA & UK





## **The ATMEA1 Reactor**

1,100 MWe PWR



#### The mid-sized GenIII+ PWR

- Generation III+ PWR
  - 3-Loop
  - 2 860 3 150 MWth
  - SG pressure 71b at 100% power
  - 3x100% redundancy of active systems, passive safety systems and an additional backup cooling chain
  - Backup in case of total loss of safety function
- Medium power output (1,100 MWe)
- Evolutionary design based on the EPR and MHI's APWR
- Outstanding safety level
- Minimal environmental impact

Strong customer interest from GDF Suez





## **The KERENA Reactor**

1,250 MWe BWR



### The mid-sized GenIII+ BWR

- Generation III+ BWR
  - 🔶 3 370MWth
  - Steam pressure 75b at 100% power
  - Diversity of safety systems:
    - 2 qualified active safety systems
    - 4 qualified passive safety systems
- Medium power output (1,250 MWe)
- Design based on successful operation experience in the latest German BWRs
- Outstanding safety level
- Minimal environmental impact

Strong customer interest from E.ON





## AREVA EPR fleet is being deployed (2/2) EPR currently in exclusive negotiations





## **Back-End Business Group**



AREVA: the global leader in used nuclear fuel management



2009 Sales: €1,637 M (19% of AREVA Sales) • H1 2010 Sales: €897 M







### Back-End Business Group An unchallenged leadership

Sales – 2009 split

**Key financials** 



#### Nr 1 in used nuclear fuel management

- Recycling: a full service of fuel recycling, including Mixed Oxide fuel and Reprocessed Uranium fuel production
- Logistics: design and supply of casks for the transportation and storage of radioactive materials; also safe and secure transportation and logistics services
- Nuclear site value development: performance-based project management for Dismantling and Decommissioning programs; development of integrated and innovative solutions for both AREVA and external customers
- Cleanup: operation of dismantling and waste processing facilities, specialized nuclear maintenance
- Engineering: engineering services contributing to the design and construction of installations for global nuclear operators

In millions of euros	2009	H1 2009	H1 2010	Change 10/09
ORDER BOOK	6,685	7,327	6,268	- 14.5%
SALES REVENUES	1,637	843	897	+ 6.4%
OPERATING INCOME	235	150	167	+ €17m
% Sales	14 %	17.8 %	18.6 %	+0.8 pt
OP. FCF BEFORE TAX	288	60	102	+ €42m







AREVA Overview – August 2010




## **Worldwide recognition of AREVA's leadership in Back-End**

Japan





## Renewable Energies Business Group



Worldwide leader in Biomass

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Emerging player in the offshore wind and solar sectors



December 2009 Order Book: €1.1 Bn



2009 Sales: €168 M (2% of AREVA Sales)





## Renewable Energies Business Group A fast growing worldwide player

Sales – 2009 split



#### **Key financials**

#### A portfolio of solutions with different technologies

- Biomass: Engineering, procurement and construction (EPC) for Biomass power plants
- Wind: Design, manufacturing, assembly, and commissioning of the off-shore turbines, as well as Maintenance services.
- Concentrated Solar Power (CSP): Design, development, manufacturing and installation of solar steam generators, to build the most cost-effective CSP plants for utilities, independent power producers and industrial customers around the world
- Hydrogen: Development and qualification of innovative solutions for the fast growing hydrogen production market, as well as projects to demonstrate and deploy fuel-cell-basedsolutions

In millions of euros	2009	H1 2009	H1 2010	Change 10/09
ORDER BOOK	1,086	136	1,135	+ €1bn
SALES REVENUES	168	49	47	- €2m
OPERATING INCOME	(60)	(58)	(59)	- €1m
% Sales	nm	nm	nm	nm
OP. FCF BEFORE TAX	(91)	(27)	(272)	- €245m





AREVA Overview – August 2010



## Building a portfolio of solutions since 2001



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## Major AREVA Renewables operational units aligned with market opportunities





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## **Financial highlights of the first half of 2010**

In millions of euros	H1 2009	H1 2010	Δ 10/09
Backlog	42,909	44,062	+ 2.7%
Revenue	3,908	4,158	+ 6.4%
<b>Operating income</b> excluding particular items % of revenue	145 3.7%	<b>213</b> 5.1%	+ €68m + <i>1.4 pt</i> s
Disposals / new partners - Mining/Front End assets* Project provisions**	247 (562)	19 (417)	
Reversible accounting adjustment on Mining assets value	-	(300)	
Operating income	(170)	(485)	€(315)m
<b>Net income Group share</b> Net earnings per share	<b>161</b> € <i>4.5</i> 5	<b>843</b> €23.82	+ €682m + <i>19.27</i> €
Operating cash flow before Capex	(336)	(99)	+ €237m
Free operating cash flow	(805)	(1,084)	€(279)m
	Dec 31, 2009	June 30, 2009	
Net debt	6,193	5,152	€(1.041)bn



Including 191 million euros for sales of minority interests in the GBII enrichment plant in 2009; Including 367 million euros of previsions in 2010 and 550 million euros in 2009 for the OL3 project in finland; \*\*

\*\*\* at constant consolidation scope and exchange rates





## Backlog: + 1.2 billion euros year-on-year

Backlog (in millions of euros)







**Revenue** (in millions of euros)



 $^*$  + 5.6% at constant consolidation scope, accounting methods and exchange rates Average exchange rate euro / dollar for AREVA: H1 2010: 1.325 vs. H1 2009: 1.384



## Increase in operating income excluding particular items

**Operating income excluding particular items** (in millions of euros)





# Reconciliation between operating income excluding particular items and operating income



## **Additional OL3 provision**

- Major civil works finalized Reactor vessel installed Piping ramp up well under way - Preparing for commissioning
- New schedule contemplating startup of nuclear operations at the end of 2012
- ► Additional provision recognized for €367 million to reflect the new schedule and conditions for the last phases of the project as notified to TVO (piping, testing and commissioning, instrumentation and control systems)
- Cumulated provisions recognized to date on the contract: 2.6 billion euros



## Reversible accounting adjustment on mining assets

- AREVA performs impairment tests on all mining assets as provided in IAS 36.
- The value of AREVA's mining assets taken as a whole was and is still largely greater than carrying costs at December 31, 2009, based on prospective uranium market data available as of that date
- Analysis of the new prospective uranium market data published in the second quarter of 2010, led to the recognition, in accordance with IFRS accounting principles, of a €300m impairment on the value of certain mining assets
- This accounting adjustment, representing around 6% of the book value of AREVA's mining assets, is non cash and subject to reversal



## Implementing AREVA's cost reduction plan 2010 objective: €400m...



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## Reducing operating working capital requirements in the Business Groups

**Operating WCR** (in millions of euros)

	H1 2009	H1 2010	$\Delta$ 10/09
Mining/Front End BG	1,629	1,578	€(51)m
Reactors & Services BG	(137)	(309)	€(172)m
Back End BG	(1,083)	(1,120)	€(36)m
Renewables BG	(18)	80	+€98m
TOTAL Operating WCR of the BGs	391	229	€(162)m

() = source; + = use of cash



### Optimization initiatives in all Business Groups

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## H1 2010 Capital expenditures in line with investment program...

Gross capex excluding external growth operations (in millions of euros)



## ... to strengthen AREVA's leadership



\* Acquisition of property, plants and equipment and intangible assets, Excluding T&D, before disposals

## Free operating cash flow before tax



In millions of euros

- ▶ Increase in EBITDA excluding particular: + €195m vs.H1 2009
- Lesser use of WCR in H1 2010 (- €291M vs. €413m in H 2009)
- Implementation of capex programs in Mining and Enrichment + acquisitions in Renewables

\* with an impact on operating income \*\* Including acquisitions (mainly €158m in Renewables)

AREVA latest financial results





## Mining / Front End BG

Kev figures			Orders received in H1 2010		
				► Uranium ► Conversion ► Enrichment	
In millions of euros	H1 2009	H1 2010	Δ 10/09	<b>FirstEnergy</b> Nucleares do Brasil US, African and European utilities	
Backlog	27,055	28,590	+ 5.7%		
Contribution to consolidated revenue	1,556	1,593	+ 2.4%	<ul> <li>AREVA's average uranium sales price continues to rise</li> <li>Volume increase in Mining</li> <li>Shift in fuel delivery schedule for EDF</li> </ul>	
Operating income	101	148	+ €47m		
excluding particular items				<ul> <li>Positive price and volume impact in Mining</li> <li>Reduction in mining production costs</li> </ul>	
% of revenue	6.5%	9.3%	+ 2.8 pts	<ul> <li>Shift in fuel delivery schedule for EDF</li> </ul>	
Disposals / new partners in assets*	247	19	-	Reversible non cash accounting adjustment on	
Reversible accounting adjustment on the value of certain mining assets	-	(300)	-	mining assets	
Contribution to operating income	348	(133)	€(481)m	<ul> <li>Inventory optimization (Enrichment)</li> <li>Capex increase, net of disposals: déploiement of capex programme</li> </ul>	
FCF before tax	(179)	(210)	€(32)m	(Mining and Enrichment)	

\*Incl. €191m in 2009: new minority partners in GBII





Operating performance in the 1<sup>st</sup> half of 2010

- Increase in production: 4,818 TU, + 39% vs. 1<sup>st</sup> half 2009
- Reduction in production costs: 13% vs. 1<sup>st</sup> half 2009
- Continued increase in average price of uranium sold by AREVA (+ 3.3%)





\*Average price for  $U_3O_8$  sold including trading business



## **Reactors & Services BG**

#### Key figures

In millions of euros	H1 2009	H1 2010	Δ 10/09
Backlog	8,269	7,964	- 3.7%
Contribution to consolidated revenue	1,382	1,543	+ 11.6%
Operating income excl. particular items	10	26	+€16m
% of revenue	0.7%	1.7%	+ 1 pt
Project provisions*	(562)	(417)	-
Contribution to operating income	(552)	(391)	+ €162m
Free operating cash flow before tax	(565)	(420)	+ €145m

# Orders received in H1 2010 A service contract + three steam generators

- Progress in major reactor projects and buoyant recurring business in the United States and in France
- Services performance
   Reduction in overheads and marketing costs, stability in R&D costs
   Provisions incl. additional OL3 prov. (€367m)
- ↑ Increase in EBITDA (recurring business)
  - Slight decrease in Capex
  - Use of customer advances in line with progress at major reactor projects

\* Incl. OL3: €367 M in H1 2010 and €550 M in H1 2009

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## Back End BG

Key figures				Orders received in H1 2010		
In millions of ourse	H4 2000	H4 2040	A 10/00	Final waste processing, using the cold crucible process (European utilities)		
In minions of euros	H1 2009		Δ 10/09	MOX fuel (Japanese and European utilities)		
Backlog	7,327	6,268	- 14.5%	<ul> <li>MOX fuel rod production line (Sellafield - UK)</li> </ul>		
Contribution to consolidated revenue	843	897	+ 6.4%	<ul> <li>Strong production at La Hague in the 1<sup>st</sup> half of 2010</li> </ul>		
Contribution to operating	150	167	+ €17m			
% of revenue	17.8%	18.6%	+ 0.8 pt			
Free operating cash flow before tax	60	102	+ €42m	<ul> <li>Increase in EBITDA</li> <li>Customer downpayments postponed to the 2<sup>nd</sup> half of the year</li> </ul>		





Contracts and agreements signed with EDF:

- Implementing contract for 2008-2012 under the framework agreement concluded In December 2008 to set operating terms at La Hague and Melox through 2040
- Agreement on final payment to settle EDF's share of dismantling costs at La Hague
- International projects: two contracts signed for the Sellafield site in the United Kingdom
  - Design and installation of a new MOX fuel rod fabrication line for the SMP plant, using AREVA technology
  - Design for a high-level liquid effluent storage facility
- Industrial operations: production of the first batches of waste vitrified with the cold crucible technology
  - A unique technological innovation in the world
  - Vitrifying additional types of radioactive waste while increasing production







#### - al highlights

## **Renewables BG**

.. ......

Financial highlights				Orders received in H1 2010		
In millions of euros	H1 2009	H1 2010	∆ 10/09	Bioenergy contract - Brazil		
Backlog	136	1,135	+ €1bn	<ul> <li>Expansion in the offshore wind business</li> </ul>		
Contribution to consolidated revenue	49	47	€(2)m	<ul> <li>Decrease in biomass activity (customers experience difficulties in obtaining project financing)</li> </ul>		
Contribution to operating income % of revenue	<b>(58)</b> -	(59) -	€(1)m -	<ul> <li>Overheads increase as the Renewables BG expands its operations</li> <li>Changing gearboxes provided by a supplier for the Alpha Ventus offshore wind farm</li> </ul>		
Free operating cash flow before tax	(27)	(272)	€(245)m	<ul> <li>Ausra acquisition</li> <li>Buyout of minority holders in Multibrid</li> </ul>		



## Expanding Renewables BG activities

#### **AREVA** Wind

- Alpha Ventus wind farm inaugurated-Customer: DOTI\* (May 2010)
- Availability rate: 98% during a 90-day test phase (winter 2009-2010)
- ► The M5000 turbine design is validated
- ► Technical issue identified in gearboxes related to the use of non compliant materials
   → Gearboxes to be repaired this summer
- Potential customers identified for projects in Europe (North Sea)



#### AREVA Solar

- Selected by CS Energy for the Kogan Creek project (Australia)
  - Installation of a 44 MW concentrated thermal solar facility linked to a coal-fired plant → Expanding steam production at the coal plant without increasing total greenhouse gas emissions
  - Financing provided in part by the Australian government and the province of Queensland
- Pre-selected by the Australian government for the "Flagship" Project, in a consortium with Australian utility CS Energy
  - Building two concentrated solar units (total capacity: 250 MW)

\* Deutsche Offshore Testfeld und Infrastrukturgesellschaft shareholders include E.ON, Vattenfall and EWE.



## **Reduction in net debt**

#### In millions of euros

### Equity as of June 30, 2010: €8,672m Debt ratio\*: 59%

Dec. 31, 2009

June 30, 2010



\* Net debt / Equity

" Debt to Siemens at 2007 value, i.e. €2.049bn plus accrued interest

## Average debt maturity is more than 8 years\*

#### Maturity of main financial obligations (in millions of euros)\*\*



- Syndicated facility for Uramin acquisition was repaid in June 2010 (\$1.9 bn)
- Repayment of debt to Siemens in January 2012 at the latest (maturity date as per contract)
- No major debt maturing before 2016 (excluding debt to Siemens)
- S&P rating: BBB+/A2 with stable outlook

\*Excluding debt to Siemens \*\* Main medium/long term financial obligations\*\*\* Debt to Siemens at 2007 value, i.e. €2.049 bn plus accrued interest \*\*\*\* European Investment Bank

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## **Performance of AREVA IC** Outperformance of the IC vs. CAC 40 since AREVA creation

AREVA Investment Certificate vs. CAC 40 (Base 100 = 3/09/2001)



Since AREVA creation

04-Aug-2010

## AREVA current ownership structure



**Total French State: 92%** 

Note: Shareholding structure as at 29/10/2009

\*. CEA owns all of the voting rights certificates \*\* Employees' shareholding in AREVA



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### **Appendices**

#### Focus on AREVA Business Model

- ► Financials
- Nuclear: a critical part of the solution
- Mining business details
- Conversion/ Enrichment/ Fuel business details
- Reactors & Services business details
- Back-End business details
- Renewable Energies business details



#### AREVA Overview – August 2010

### **AREVA** integrated offers cover customer needs 2005-2009

Selected integrated offers - 2005-2009



## AREVA can rely on a resilient business model to expand

## Installed base business model ensuring strong cash-flow generation

Installed base revenue vs. new builds (millions of €)



- 80% of the nuclear business is recurrent
- Capex supported by the sale of the new facilities' future production
  - example: 90% of GB II production through 2020 is already in backlog

Source: AREVA strategic plan



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## The group benefits from a strong and successful culture of partnerships\*





- JV in engineering in China

#### \*Non exhaustive list



#### Expanding knowledge in Renewables

- Partnership in biomass in India



**Development of the biomass** market in the United States



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**edf** 



Focus on AREVA Business Model

Financials

Nuclear: a critical part of the solution

Mining business details

Conversion/ Enrichment/ Fuel business details

Reactors & Services business details

Back-End business details

Renewable Energies business details



**AREVA Overview** – August 2010
## Non-operating items

In millions of euros	H1 2009	H1 2010	Δ 10/09
Operating income	(170)	(485)	€(315)m
Net financial income	230	(172)	€(402)m
Equity affiliates	(163)	46	+ €209m
Income tax	(34)	(242)	+ €276m
Net income from discontinued operations	s 144	1,240	+ €1,096m
Net income for the period	7	871	+ €864m
Including minority interests	(154)	29	+ €183m
Incl. net income group share	161	843	+ €682m
Net earnings per share (in euros)	€4.55	€23.82	+€19.27

### Net financial income

In millions of euros	H1 2009	H1 2010	∆ 10/09
End of life-cycle operations	29	(11)	€(40)m
including:			
Income from financial portfolio	47	61	+€14m
Income from receivables and discount reversal on earmarked			
assets	76	46	€(30)m
Discount reversal expenses	(95)	(118)	€(23)m
Net borrowing costs	(40)	(81)	€(41)m
Net gain on sales of securities	242	(1)	€(243)m
Discount reversal: pensions and other benefits	(40)	(38)	+ €2m
Other income and expenses	37	(41)	€(78)m
Net financial income	230	(172)	€(402)m



## Share in net income of associates

In millions of euros	H1 2009	H1 2010	Δ10/09
STMicroelectronics	(124)	18	+ 142
Eramet group	(39)	26	+ 65
Other	0	2	+ 2
Total	(163)	46	+ 209



## Change in net debt

In millions of euros	H1 2010
Net debt at beginning of period - 31.12.2009	(6,193)
EBITDA from operations (excl. end-of-life-cycle costs) % of revenue	215 5.2%
Income (loss) on sales of non-current operating assets	(23)
Change Operating WCR	(291)
Net operating Capex	(985)
Free operating cash flow before tax	(1,084)
End-of-life-cycle obligations	(6)
Dividends paid	(302)
Other (net financial investments, income tax, non operating WCR, etc.)	2,433
Change in net cash or (debt)	1,041
Net debt at the end of the period 30.06.2010	(5,152)



## Simplified Balance sheet at June 30, 2010

#### In billions of euros



#### Simplified assets = 23.2 = Simplified liabilities

\* Debt to Siemens at 2007 value, i.e. €2.049bn plus accrued interest

## **Consolidated Balance sheet** at June 30, 2010 – End-of-lifecycle operations

End-of-life-cycle operations at June 30, 2010 (in millions of euros)



- The law of June 28, 2006 on sustainable management of radioactive materials and waste requires that 100% of provisions for end-of-life-cycle operations be covered by earmarked assets effective June 28, 2011
- At June 30, 2010, AREVA's coverage of activities subject to the law of June 28, 2006 was 98%
- The ratio for all AREVA group activities was 96%



## **Consolidated income statement**

In millions of euros	June 30, 2010	June 30, 2009
Revenue	4,158	3,908
Other income from operations	12	38
Cost of sales	(3,780)	(3,706)
Gross margin	390	240
Research and development expenses	(162)	(163)
Marketing and sales expenses	(145)	(135)
General and administrative expenses	(284)	(304)
Other operating income and expenses	(284)	192
Operating income	(485)	(170)
Income from cash and cash equivalents	17	4
Gross borrowing costs	(98)	(45)
Net borrowing costs	(81)	(40)
Other financial income and expenses	(90)	271
Net financial income	(172)	230
Income tax	242	(34)
Net income of consolidated businesses	(415)	26
Share in net income of associates	46	(163)
Net income from continuing operations	(369)	(137)
Net income from discontinued operations	1,240	144
or operations held for sale		
Net income for the period	871	7
including minority interests	29	(154)
Net income attributable to owners of the parent	843	161



Appendices - Financials

## **Consolidated balance sheet (1/2)**

1

ASSETS (in millions of euros)	June 30, 2010	June 30, 2009
Non-current assets	23,829	21,875
Goodwill on consolidated companies	4,749	4,366
Intangible assets	3,586	3,282
Property, plant and equipment	5,955	5,294
End-of-life-cycle assets (third party share)	268	275
Assets earmarked to finance end-of-life-cycle operations	5,284	5,351
Investments in associates	1,844	1,635
Other non-current financial assets	1,113	860
Pension fund assets	1	0
Deferred tax assets	1,029	811
Current assets	9,662	14,175
Inventories and work-in-process	2,908	2,699
Trade accounts receivable and related accounts	2,789	2,161
Other operating receivables	2,063	1,838
Current tax assets	75	121
Other non-operating receivables	207	158
Cash and cash equivalents	1,413	1,409
Other current financial assets	207	139
Assets of operations held for sale	-	5,649
Total assets	33,492	36,050



Appendices - Financials

## **Consolidated balance sheet (2/2)**

LIABILITIES AND SHAREHOLDERS' EQUITY (in millions of euros)	June 30, 2010	June 30, 2009
Equity and minority interests	8,672	7,574
Share capital	1,347	1,347
Consolidated premiums and reserves	5,056	4,749
Deferred unrealized gains and losses on financial instruments	364	155
Currency translation reserves	218	(155)
Net income attributable to owners of the parent	843	552
Minority interests	844	926
Non-current liabilities	13,584	13,408
Employee benefits	1,118	1,121
Provisions for end-of-life-cycle operations	5,786	5,660
Other non-current provisions	105	94
Long-term borrowings	6,059	5,872
Deferred tax liabilities	516	661
Current liabilities	11,236	15,068
Current provisions	1,895	1,696
Short-term borrowings	713	1,869
Advances and prepayments received	3,933	3,893
Trade accounts payable and related accounts	1,732	1,567
Other operating liabilities	2,806	2,270
Current tax liabilities	65	35
Other non-operating liabilities	91	53
Liabilities of operations held for sale	-	3,685
Total liabilities and equity	33,492	36,050



## **Key Figures by Division (1/3)**

#### H1 2010

In millions of (excluding work)	of euros force)	Mining/ Front End	Reactors & Services	Back End	Renewables	Corporate	Total Group
	Contrib. to consolidated revenue	1,593	1,543	897	47	78	4,158
Income statement	Operating income	(133)	(391)	167	(59)	(69)	(485)
	% of contrib. to revenue	- 8.35%	- 25.3%	18.6%	- 127.0%	- 88.5%	- 11.7%
Cash No Cash Fi Cash	EBITDA (excl. end-of-life-cycle costs)	310	(199)	267	(44)	(118)	215
	% of contrib. to revenue	19.4%	- 12.9%	29.7%	- 93.3%	- 152.2%	5.2%
	Net Capex	(645)	(113)	(41)	(170)	(16)	(985)
	Change in operating WCR	146	(108)	(122)	(58)	(149)	(291)
	Free operating cash flow	(210)	(420)	102	(272)	(284)	(1,084)
Other	Employees	14,387	17,651	11,040	1,133	3,979	48,190

## **Key Figures by Division (2/3)**

#### H1 2009

In millions of (excluding workf	<b>f euros</b> orce)	Mining/ Front End	Reactors & Services	Back End	Renewables	Corporate	Total Group
	Contrib. to consolidated revenue	1,556	1,382	843	49	78	3,908
Income or in statement %	Operating income	348	(552)	150	(58)	(58)	(170)
	% of contrib. to revenue	22.4%	- 40.0%	17.8 %	- 119.4%	- 74.4%	- 4.4%
E e c	EBITDA (excl. end-of-life-cycle costs)	438	(292)	198	(50)	(46)	248
	% of contrib. to revenue	28.1%	- 21.1%	23.5%	- 102.4%	- 59.0%	6.3%
Cash	Net Capex	(235)	(151)	(50)	(9)	(24)	(469)
	Change in operating WCR	(212)	(121)	(88)	32	(24)	(413)
	Free operating cash flow	(179)	(565)	60	(27)	(94)	(805)
Other	Employees	14,688	17,178	10,731	897	3,619	47,113

## **Key Figures by Division (3/3)**

2009			Reactors and	Back		Activities currently being disposed	Tota
In millions of euros (except staff)		Front End	Services	End	Corporate	of (T&D)	Group
	Contribution to consolidated revenue	3,471	3,418	1,637	4		8,52
Income	Operating Income	659*	(626)	235	(171)		9
	% of contrib. to consolidated revenue	19.0%	- 18.3%	14.4%	-		1.19
	EBITDA (excl. end-of-life cycle expenses)	917	(538)	367	(162)		58
	% of contrib. to consolidated revenue	26.4%	- 15.7%	22.4%	-		6.99
Cash	Net capex.	(738)	(402)	(128)	(26)		(1,294
	Change in operating WCR	(185)	210	49	31		10
	Free operating cash flow	(315)	(736)	288	(157)		(919
Others	Staff	14,763	21,003	11,082	969	31,627	79,44





**Focus on AREVA Business Model** 

Financials

Nuclear: a critical part of the solution

- Mining business details
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## Key competing dimensions for electricity generation

	Stakeholders				
	Governments	Utilities	Consumers		
Economic	Low cost of e	lectricity & robus	t profitability		
		,	,		
Poliable	Ş	Security of supply	1		
Reliable	Safety & performance				
Sustainable	Low	environmental im	pact		
Oustainable		Recyclable			

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## Nuclear production cost is transparent and comprehensive



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## Nuclear, unlike competing technologies, has limited dependency on fuel and carbon prices

#### Typical breakdown of production costs

Commissioning in 2020 - baseload operations

## % 100 80 60 40 20



#### **Methodology**

- The production cost (also called Levelised Cost Of Electricity) includes all the expenses related to the power plant from its construction to the operation and final decommissioning. It is the minimum electricity price beyond which a project is profitable
- ▶ The production cost is a common standard in the power industry. It is a relavant indicator to compare the cost of electricity and attractiveness between different technologies with different lifetimes and cost structures

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Source: AREVA analysis Carbon value 30€/tCO₂



Competitiveness of baseload technologies depends on the evolution of key parameters that are difficult to forecast



# AREVA has developed four contrasting scenarios to capture probable future energy markets Each scenario details for the 2020 horizon

- a coherent combination of key parameters
  - Fuel prices (oil, coal, gas)
  - CO<sub>2</sub> prices
  - Power demand evolution
  - Renewable penetration
  - Carbon Capture and Sequestration costs
- 2020 is the relevant time horizon when looking at an investment in nuclear



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Source: Bloomberg (Gas Henry Hub, Coal CIF ARA)

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Appendices – Nuclear: a critical part of the solution



### **2020 Energy Scenarios Matrix** 4 contrasting visions of the future energy world



## Emerging economies driving global growth

Very high energy demand, high fuel prices, increase in energy efficiency and strong CO2-free technologies penetration



Green push

Concerted battle against climate change, commitment in pushing green technologies, low demand for fossil fuel



Traditional security of supply

Security of supply is the main concern, high energy prices, weak cooperation between countries limits fight against climate change



Slow down in global growth

Low pressure on energy supply, low fuel prices, governments pursue fight against climate change



For each scenario, the associated production costs and net present values of different baseload technologies are assessed





## Comparison of production costs in Western Europe

#### **Baseload operations – commissioning in 2020**





## Nuclear cost stability contributes to electricity prices stabilization

#### **Evolution of industrial electricity price in France and Italy**

Correlation with oil prices



Source: AREVA analysis

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## Primary uranium resources are well distributed and sufficient for Gen 3

Uranium resources are sufficient for Gen 3

Uranium resources are well distributed



2. No major coal reserve constraint. However potential CO<sub>2</sub> storage capacity constraints for some areas

Appendices – Nuclear: a critical part of the solution

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### **AREVA** reactors set the world standard in safety



Appendices – Nuclear: a critical part of the solution



## Nuclear power has a very low carbon footprint

#### Comparison of greenhouse gas emissions

Baseload technologies - emissions measured for the all lifecycle of the plant



Source: IAEA (Weisser 2006), Paul Scherrer Institute (Dones 2003)

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## Nuclear power has very low externalities

#### Comparison of quantifiable external costs 2009 Sites in Central Europe

Methodology

- External costs assessment is a monetary valuation of damages accounting for market and nonmarket costs of externalities (pollutants, noise, greenhouse gases, radiations, accidents...)
- Externalities of all stages of the production process are considered, including construction, dismantling, fuel cycle
- The external cost method relies on 3 steps: emission assessment, environmental impact assessment and monetary valuation



Source: Stuttgart university for the European Commission NEEDS project, 2009

Appendices – Nuclear: a critical part of the solution





An increasingly larger part of public favors nuclear energy

Share of US public favoring

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## Many recent favorable political actions towards nuclear energy



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January 2010: President Obama, "But to create more of these clean energy jobs...building a new generation of safe, clean nuclear power plants in this country"

**July 2009:** End of nuclear energy ban put in place in 1987

**February 2009:** Swedish government planning to end a three-decade ban on building new nuclear reactors

January 2008: UK government giving go-ahead for new generation of nuclear power stations to be built.

Appendices – Nuclear: a critical part of the solution



## Numerous countries have nuclear power plant projects





### 437 nuclear reactors in 2010 and more to come from the East





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## A long standing effort and global exploration portfolio is key...

Major deposits discovered by / with AREVA



# to reach a level of resources ensuring production sustainability and offering clients long term visibility

#### **AREVA resources**



Our Resources and Reserves level allow production sustainability for more than 20 years given our production targets

This long term visibility is a key commercial advantage as clients tend to anticipate their fuel supply

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Note:  ${}^{\scriptscriptstyle (1)}$  Accessible AREVA share,  ${}^{\scriptscriptstyle (2)}$  mine and plant yields included





## ... with a project launch sequence optimizing capital spending thanks to our diverse portfolio



More than 10 major production projects are on track



4 of them will come progressively online by 2012 to reach our objective of doubling production



The diversity of our projects portfolio allows us to optimize capital allocation and adapt to market conditions



## **Conventional fissile resources represent** more than 200 years of 2009 world demand

	CATEGORY of Uranium resources (million tons = wit)					
	Identified	d (deposits)	Undiscov	ered		
Cost of recovery \$/kgU	Reasonably Assured Resources	Inferred Resources	Prognosticated Resources 2	Speculative Resources 3	<ol> <li>Based on direct geological evidence</li> <li>Based on indirect geological</li> </ol>	
< 40	1.77	1.20			evidence	
40 to 80	0.83	0.65	1.95	4.80	Extrapolated values	
80 to 130	0.74	0.27	0.82			
> 130	-	-	?	2.97	Unconventional	
Subtotal	3.34	2.13	2.77	7.77	Onconventional	
General total	5.4	47	10.	54	15 to 25	
	General total of conventional resources: 16,009,100 t World demand in 2009*: less than 66,000 t <i>Resources:</i> > 200 times 2009 demand + With Gen IV Fast Breeder Reactor, resources are virtually unlimited					
VA estimate for 2009						

\*WN

Source: Nuclear Energy Agency "Uranium 2007: Resources, Production and Demand"





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## AREVA is renewing and extending its conversion capacities

#### **COMURHEX II -** *FRANCE*

- All conversion facilities worldwide are old
- AREVA is the first to invest in a brand new conversion facility
- Extendable Capacity: 15,000 tU per year, extendable to 21,000 tU only with market support
- Proven Comurhex process, but with technological innovations to be ahead of "power curve" for evolution of environmental and safety standards





- ► End 2012: Production start-up
- 2013 2014: Production ramp-up to reach 15,000 tU per year
- 2015 2018: Potential additional ramp-up to 21,000 tU per year if market conditions are met

## Comurhex II plant will come online at the right time to reap the benefits of nuclear expansion





### Two main enrichment processes; Centrifugation is the new state-of-the-art

#### **Gaseous Diffusion**

- Using gaseous diffusion technology, Georges Besse has been offering the best in terms of safety, security and flexibility for 30 years.
- No disruption of supply since production launch in 1979
- High flexibility with regard to levels of enrichment
- The current plant will serve as a bridge until new centrifuge plants are online

#### **Gaseous Centrifugation**



- Centrifuge technology is now considered by all players as the most efficient enrichment technology
- Used in Georges Besse II and EREF, the TC12 centrifuge has been a proven technology since 1992
- This design of centrifuge offers the best levels of cost efficiency, energy savings, technical reliability and environmental impact
- Modular conception that allows extension







p.42 Appendices – Conversion/ Enrichment/ Fuel business details


# AREVA supplies fuel assemblies and associated services and products

A fuel assembly is a bundle of zirconium rods containing the enriched uranium

### **Overview of AREVA Fuel activities**





# AREVA, a Major global fuel supplier





Source : Nuclear Assurance Corporation (Fuel Trac édition 10/2009); Average value over 2009 +/- 1 year



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# 50% of WW nuclear fleet is over 25 years 129 reactors out of 437 are over 30 years

Pyramid of ages – 437 nuclear plants – WW nuclear fleet (Data as of January 2010)



Source: IEAE International Status & Prospects of Nuclear Power (2010) – Data as of January 2010



# The new build business focuses on the "Nuclear island": 50~60% of the total EPR price



Note: Actual price of an EPR reactor and price proportions varies according to customer, country and project specificities

\* Steam turbine, power generator, cooling systems, grid interface

\*\* Civil works costs includes nuclear island, conventional island and balance of plant civil works costs







## **PWR steam generator**

Design

### Commissioning







#### FUNCTIONS

 to transfer heat and ensure leak-tightness between the primary (P) and secondary (S) circuits

#### DUTY

- mechanical effects of the circulating P and S flows
- chemical effects of the P and S fluids
- nominal and transient temperatures and pressures on P and S sides

#### MATERIALS

 nickel-based alloy (tubes), low internal alloy carbon steel (structures) with a stainless steel layer the water chamber (P side)

#### DIMENSIONS & WEIGHT:

- height: 20 to 22 meters
- diameter: 3.5 to 5 meters
- weight (empty): 300 to 420 metric tons





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# **Recycling offers key benefits**

### Natural resources savings

- Used fuel contains 96% of reusable materials
- Up to 25% natural uranium savings

### Improved ultimate waste management

- Volume of ultimate waste divided by 5
- Waste toxicity divided by 10
- Standard, durable, specifically designed waste forms and containers

### Reinforced economic interest of recycling

- Demonstrated competitiveness vs. once-through strategy
- Ability to control overall back-end costs based on proven 40-year industrial track record

### While ensuring Health, Safety and Environmental protection



Appendices – Back-End business details



Source: AREVA analysis

# Used fuel recycling is a competitive solution compared to direct disposal

### Methodology

- For both options (recycling and direct disposal), all costs at each stage of the production process are considered.
- Sales of recycled materials: a used fuel assembly contains 96% of recyclable materials. The plutonium and uranium recovered during recycling operations are used to manufacture recycled fuel. This fuel is then used in light water reactors and is thus comparable in value to fresh fuel. Therefore, recycled fuel creates value (i.e. credits) which offsets a significant part of the recycling costs.

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# Economic comparison of recycling and direct disposal options

€/kg used fuel





# Recycling strengthens non-proliferation

# Recycling restricted to a few regional centers under strict international safeguards

- Offering recycling services to a wide range of customers
- Avoiding the accumulation of used fuel in multiple storage sites worldwide
- Returning to customers final waste not subject to AIEA safeguards

### Plutonium recycled in MOX fuel

- Consumes roughly one third of the plutonium
- Significantly degrades the isotopic composition of the remaining plutonium and thus the potential attractiveness for non-peaceful usage

### Recycling facilities such as La Hague and Melox have a perfect track record with respect to fissile materials safeguards

### Recycling contributes to international non-proliferation initiatives

- Weapon-grade plutonium disposition (MFFF project)
- Securing « gap material » (DOE)



# Recycled fuels performance in reactors

MOX & Reprocessed Uranium fuels can accommodate all Light Water Reactors (80% of worldwide nuclear capacity)

### For utilities, recycled fuels have outstanding performance

- Excellent reliability track record
- Equal energy performance compared to natural uranium
- MOX in-core behavior similar to Uranium fuel under normal and accidental conditions

### EPR designed to accommodate up to 100% of its fuel as MOX





## AREVA: N<sup>a</sup> worldwide in treatment of nuclear fuel

# Treatment capacity for light water reactors fuel (tons/year)

Cumulative production, as of dec. 2009 (tons)



# As of today, AREVA treated ~75% of the fuel worldwide, i.e ~25 400 tons out of 33 200 tons

Source: AREVA, World Nuclear Association

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# AREVA: N<sup>9</sup> worldwide in MOX fuel fabrication

### MOX fuel production capacity (tons of MOX / year)



### Cumulative production, as of dec. 2009 (tons of MOX)



\*data of December 2008





# **AREVA logistics activities**

### **Casks supply**

- Design & licensing of dry storage and transport casks
- Manufacturing of casks

### **Transport and fleet management**

- Road transport of radioactive materials
- Operations of railway and maritime facilities
- Organization of transports incl. real-time monitoring
- Cask and safety vehicle maintenance on site
- Maintenance of safety vehicles
- Management of site supply chain
- Risk assessment and crisis management









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# Synergies between Nuclear and Renewable activities

### **Topline synergies**

- Established relationship with numerous utilities in many countries
- One-stop-shop for complementary low-CO<sub>2</sub> electricity generation solutions
- AREVA brand

### **Technical know-how and R&D capacity**

- EPC and project management
- Thermal transfer and steam management
- Corrosion, welding and nanotechnologies

### **Financial guarantees**

- AREVA financial strength
- Innovative project financing solutions (cofinancing...)





### Throughout the world, governments are supporting the development of renewable energies France



Targets by 2020:

> 20% of renewable energies in the energy mix by 2020

#### Incentives:

»Off shore: stimulation to favor national champions »Biomass: feed-in tariffs (~145€ in average)

#### **Targets:**

»Double US capacity to generate renewable energy over the next few vears

#### Incentives:

»Over \$60 billion in clean energy investments (American Recovery and Reinvestment Act) : loan guarantees, tax incentives and public investment)

#### Targets by 2020:

»E.U renewable energies = 20% energy total consumption

#### Incentives:

»Off Shore: stimulation policies (e.g. UK : in 2009 site pre- selection + subsidiaries for investment + tax exemption) »Biomass: feed-in-tariffs (~ 95€/MWh in

Germany)

### **USA**

### **Europe (excl. France)**

#### Targets:

»Renewable energy consumption =10 % of the total energy consumption by 2010 and 15% by 2020 (30GW of wind power & 30GW of Biomass)

#### Incentives:

- »Central government financial authority's renewable energy fund to support renewable energy development
- »Biomass: (e.g. for 2006 subsidy of 0.25 Yuan (US \$0.03) per kilowatt-hour for biomass

### China<sup>1</sup>

<sup>1</sup>Chinese targets and incentives set in the past years are being revised and increased. For instance Wind installed capacity is already 25GWe.

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Appendices – Renewable Energies business details





# Achieved critical milestones (1/2)

Off-shore Wind



### **Bio-energies**



### Market leadership

→ First 5MW WTG wind farm commissioned globally

Industrialization

→ 6X5MW WTGs installed & commissioned in Oct. '10

### Market leadership

→Bioenergy leader with an installed base higher than 2,500MW of high capacity biomass power plants

### Industrialization

→Critical technology advantage through new products development such as pyrolysis

Growth champion

→Order intake x2 since 2008 by bringing technical packaged customer solutions







Concentrated Solar Thermal



- Market leadership
- →Cutting hedge technology providing sustainable competitive advantage
- Industrialization
- $\rightarrow$ Bilateral agreements higher than ~\$300M of opportunities
- Booming market

→Leadership position in a fast growing market (c. 10% CAGR over '10 – '15 )

### Energy Vector and Storage



- Market leadership
- → Hydrogen storage demonstration coupled with solar PV on Myrte project

### Industrialization

→ Proof of concept for breakthroughs and industrialization for cost reduction



### Offshore Wind Power AREVA offers a unique Offshore value proposition

#### **Multibrid turbines M5000**



- The most powerful offshore turbine on the market (5 MW)
  - A leading edge position on a market favourable to high power turbines



A wind turbine designed specifically for harsh sea conditions

#### A light-weight structure, providing customer with

- A facilitated installation and maintenance
- The best weight / power ratio available on the market

#### Offshore wind activities covering

- Design, manufacturing, assembly, and commissioning of the off-shore turbines
- Maintenance services



Source: New Energy Finance 11/04/2008, Companies







### **CSP** installed capacity forecast



A market with important growth perspective

An installed capacity equivalent to 11 EPR in 2020



Source : WEO 2008, AIE (2008)

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### Principle of the CSP technology



The closest technology to AREVA's activities and expertise among all Renewable technologies

Appendices – Renewable Energies business details





### **Concentrated Solar Power** A promising market

- An emerging market with a >50% annual growth rate:
  - 400 MW sales for Solar CSP equipment in 2007
  - Over 1,000 MW in construction in 2009
  - 9,000 MW sales expected in 2012
- Current market in developed and sunny countries encouraged by public aid
  - California
  - Spain
    - E.g.: Tariffs of €270/MWh in Spain for 25 years
  - Middle East
    - E.g.: Masdar project in Abu Dhabi
- Further potential in..
  - .. Mediterranean countries through Mediterranean Solar Plan
  - .. Australia, Africa, India and China thanks to significant cost decrease

### Most appropriate areas for Solar thermal



#### Appropriate for solar thermal power plants:

- Excellent
  - lent (>2,300 kWh/m²/year)
  - Very good (between 1,900 and 2,300 kWh/m²/year )
  - Good (between 1,500 à 1,900 kWh/m²/year )
- Not appropriate (<1,500 kWh/m²/year)</li>



