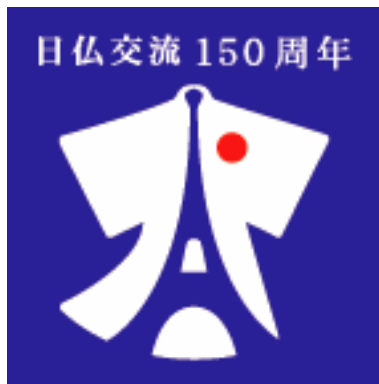

AESJ
Foreign Professional Societies Coordinating Committee
July 15, 2008

***France's Nuclear Energy :
Status and Prospects***



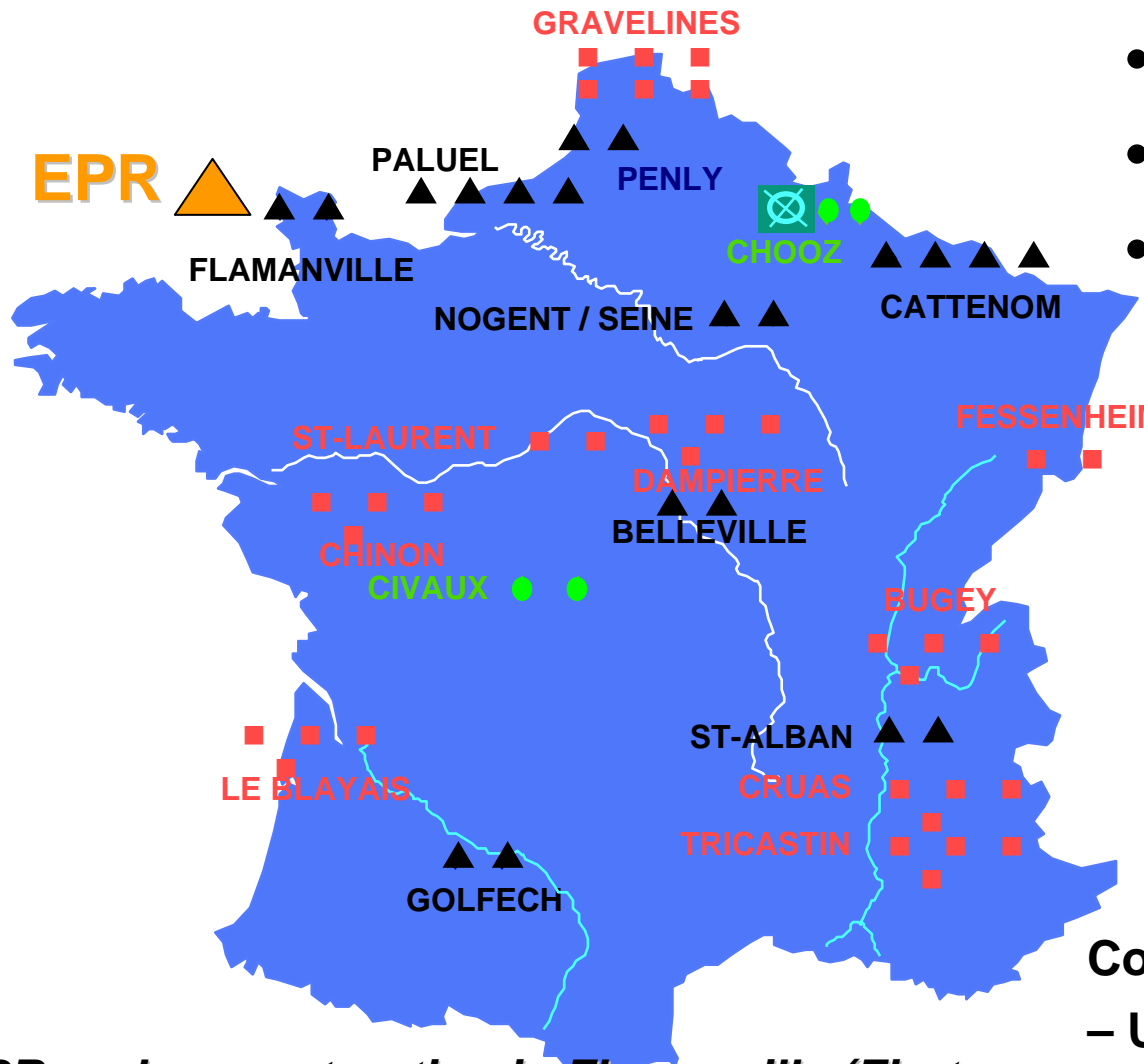
Pierre-Yves CORDIER

Nuclear Counsellor
Embassy of France in Japan

Outline

- Nuclear Energy in France :
 - The existing fleet.
 - Who does what ?
- Regulatory framework :
 - The 2006 law on transparency and security in the nuclear field
 - The 2006 law on Waste management
 - First session of the HCTSIN.
- The future of nuclear energy in France :
 - The EPR, GB II, JHR : building up the future.
 - R&D strategy for next generation nuclear systems.
 - A few words about Europe...
- French energy policy at home and abroad
- Cooperation between France and Japan
 - 35 years of friendship, and moving forward...

The current nuclear power fleet in France



- 34 900 MWe units ■
- 20 1300 MWe units ▲
- 4 1500 MWe units ●

58 PWR units
63184 MWe installed

428.7 TWh produced in 2007

energy independence rate :

50.5 % in 2007

Connection to the grid :

- Unit 1 (Fessenheim 1) : April 1977
- Unit 58 (Civaux 2) : December 1999

EPR under construction in Flamanville (First concrete in december 2007)

Actors involved in the nuclear program in France

- **Definition of the French energy policy :**
 - Government : Prime Minister, Ministry in charge of ecology, energy, sustainable development and regional planning (MEEDDAT), DGEC
 - Parliament Assessment Office of Scientific and Technological Choices (OPECST) : assesses the technological decisions, the Parliament votes the laws
- **Independent Safety Authority : ASN**, reinforced by the June 2006 law
- **R & D : CEA**, public research organization
- **Utilities : EDF**
- **Companies : AREVA (NP and NC), Alstom**, but also SME, ..
- **Waste management agency : ANDRA**
- **Expertise and R&D for safety : IRSN**
- ... **Public opinion** ...: The National Commission of Public Debate (CNDP) organizes public debates at the national and local levels about building big industrial facilities.



Update regulatory framework (1)



Law on nuclear waste, 2006 June 28th

- A step by step programme for HLLL waste, with 3 complementary solutions, R&D programme with time schedule and financing taken into account.
 - **Partitioning & Transmutation :**
 - 2012: Assessment of Gen IV fast Reactors / ADS
 - 2020: Fast reactor Prototype
 - **Retrievable Geological Repository**
 - 2015: Authorization decree
 - 2025: Beginning of operation
 - **Interim storage :**
 - Creation of new facilities in 2015.
- More than 3000 sites pre-selected for the LALL (low activity long life) storage facility.
- Transparent process for the selection, respecting local democracy.

Reversibility is a key issue, guaranteed for at least 100 years :
future generation will be able to make their choices, should new technologies allow more satisfying solution

Updated regulatory framework (2)

Law on Transparency and security in nuclear field, 2006 June 14th



Enhancing the independent control of the nuclear activities in France, ensuring accurate and timely information.

- Transformation of the existing DGSNR into an independent Authority for Nuclear Safety (ASN), in order to strengthen the independence of the supervising body (5 commissioners).
- Creation of the High Committee for transparency and information on nuclear safety, with representatives from the government, the nuclear operators, the citizens, and experts from fields relevant to nuclear energy.
- Local Information Committees (CLI) created around nuclear facilities, and headed by a local elected official, are strengthened. The CLI can ask any relevant information about nuclear safety to the operator, and has the power to initiate independent measurement surveys and health studies around the nuclear facilities.

Updated regulatory framework (3)

High Committee on transparency and information on nuclear safety

- Composition :
 - 4 MPs (National Assembly and Senate).
 - 5 presidents of CLI (Local Information Committee).
 - 5 people from associations in the field of ecology, environment, protection against harmful effect of radioactivity...
 - 5 people from nuclear operators (AREVA, EDF, CEA, hospitals...)
 - 5 people from national unions
 - 3 experts on science, information, society.
 - 5 people for ASN, IRSN, central administration, risk prevention...
- First meeting on June 18th, 2008 :
 - Transportation of Pu.
 - Structure and rules of the committee to be fixed.
 - Conclusion of the meeting by M. JL Borloo, Minister of MEEDDAT.

A new reactor to launch the Gen III : The EPR

- *A mature concept, based on current PWRs' experience*
- *Significant improvements in safety and economy*

→ *Under construction in Finland at Olkiluoto (TVO) in operation by 2011*



- **July 05:** French Energy Policy Act → *A Gen III plant by 2012*
- **Oct 05 – Feb 06:** Public debate to build an EPR in Flamanville
- **December, 07:** First concrete poured



Fuel cycle in France: Georges Besse II Plant

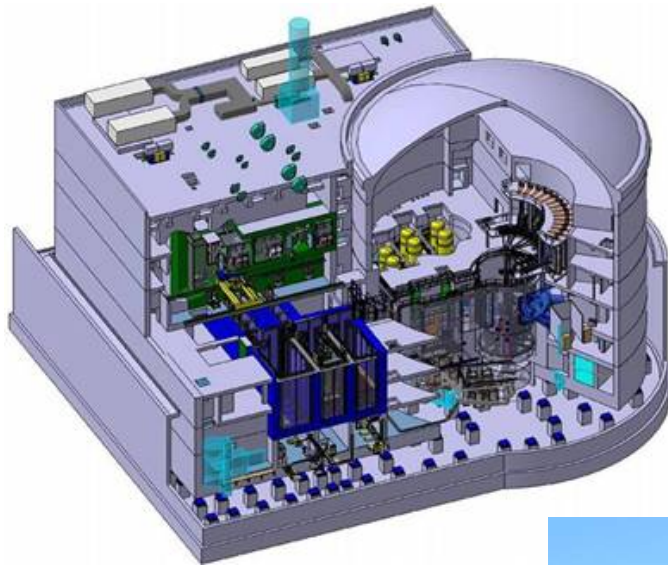


- Late 2006** **Beginning of the GBII construction site (South Unit)**
- August 2007** **Civil engineering works has been completed for the 1st module**

- Middle 2009** **1st cascade South Unit on line**
Construction works begins on the North Unit (vs 2012)

- Late 2016** **Full capacity (7.5MSWU) is reached (vs 2018)**

Jules Horowitz Reactor (JHR) : a new MTR by 2014 in Cadarache



➤ International partnership

- CEA, EDF, AREVA
- EU, Belgium, Czech Republic, Finland, Spain, India, Japan, Sweden ...



➤ Design of experimental devices in progress

- Public inquiry
(Nov. – Dec. 2006)
- Safety review
(March 2007)
- Building start
(September 2007)

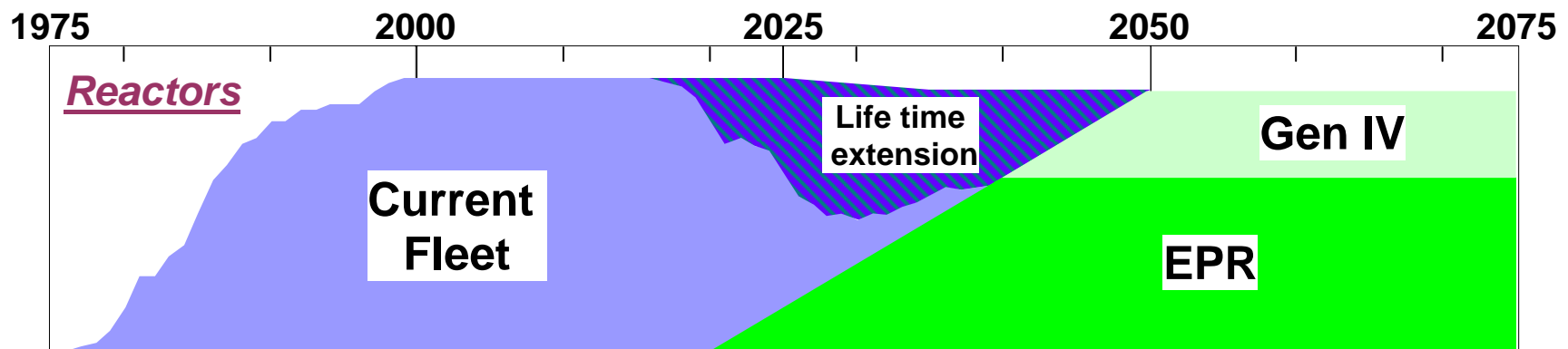


- High level neutronic flux
- Increasing instrumentation
- Capability to simulate different environments

R&D needed to support 3 power plants generations

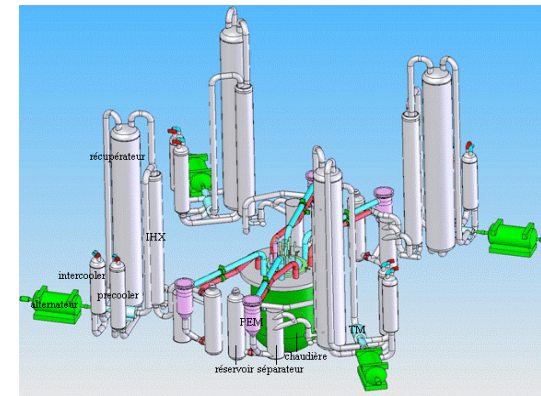
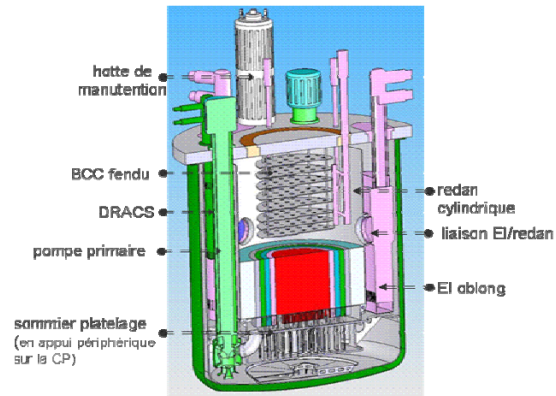
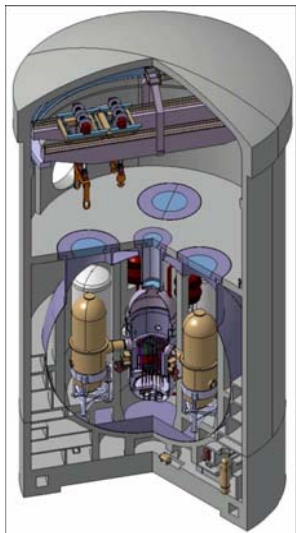
R&D needed on the long term to support industry and future systems for sustainability

- **Plant life time management & extension**
- **Gen 3 evolution, Fuel performance & safety,**
- **innovative fuel & material HTR & Gen 4**



Source : EDF, ENC 2002

R&D Strategy of France for Future Nuclear Energy Systems

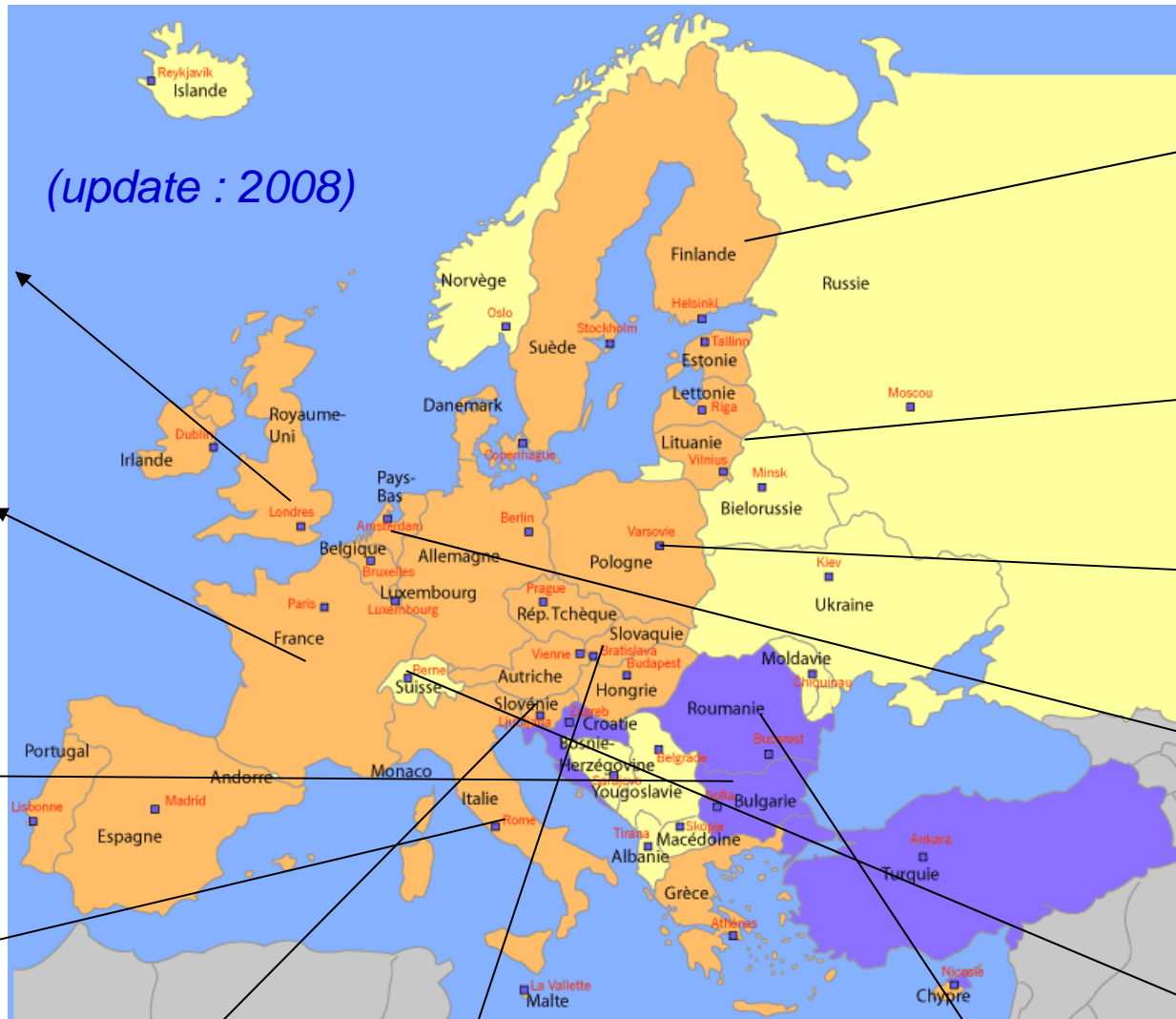


Development of Fast Reactors with closed fuel cycles, along 2 tracks:

- Sodium Fast Reactor (SFR)
- Gas Fast Reactor (GFR)
- New processes for spent fuel treatment and recycling

→ *Industrial deployment around 2040*

Nuclear renaissance in Europe, positive signs



(update : 2008)

United Kingdom :
 -Energy Review
 -Govt cleared the path for new nuclear investments

France :
 -EPR
 - 4th generation prototype (2020)

Bulgaria :
 2 VVER 1000 to be built at Belene.

Italy :
 -Agreement with EDF, access to EPR technology.
 - Decision to go back to nuclear

Slovenia :
 New project for Krško (decision foreseen 2008).

Slovakia :
 Completion of Mochovce 3 and 4.

Rumania :
 Cernavoda 3 and 4 to be completed 2014 and 2015

Finland :
 - EPR
 -n° 6 (decision foreseen spring 2010)
 - n° 7 under discussion

Baltic states Joint unit at Ignalina with Poland.

Poland Joint unit at Ignalina Domestic project (2021)

Holland :
 - Lifetime of the only power station extended until 2033

Swiss :
 2007 Political decision to replace units

2007 - 2008 : French Energy Policy, at home and abroad

Sept.24th, 2007, New-York: UN Climate Change Conference

«Le nucléaire civil, la France est disposée à aider tout pays qui le souhaiterait, à l'obtenir »



May 2008: Creation of the

« France Nucléaire International Agency » :

- An agency inside the CEA, with a Steering Committee involving all the state actors, in charge of coordinating the French competences.
- To advise the countries which want to get a nuclear industry during the pre- and feasibility studies, in the framework of bilateral agreements between these countries and France.

July 2008 : A second EPR will be built in France

- Site decision in 2009.
- First concrete in 2001.
- Operational around 2017.

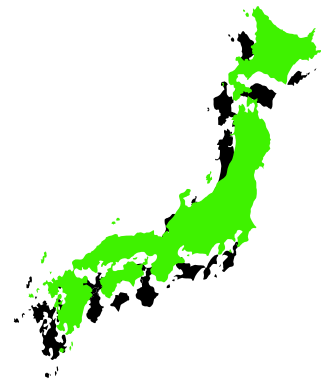
France and Japan : Celebrating a long collaboration, and going forward together

- **Declaration on nuclear energy (April 11th, 2008):**
 - Released after the meeting between Y. Fukuda, Prime Minister of Japan, and F. Fillon, Prime Minister of France.
 - Common strategy for energy policy.
 - Importance of nuclear energy for securing energy supply and fighting global warming.
- **Visit of M. Fillon to Rokkasho Mura (April 12th, 2008) :**
 - JNFL's Rokkasho Reprocessing Plant.
 - Site of the Broad Approach activities.



Together for Renaissance and Sustainability

Advanced french and japanese technologies
into service of energy
and meeting the climate change challenge



ご清聴ありがとうございました