IEA 5TH FORUM ON THE CLIMATE-ENERGY SECURITY NEXUS

POLICIES AND PRACTICES TO ENHANCE ENERGY SECTOR RESILIENCE

SESSION 5 - BUSINESS AND INVESTMENT PLAYERS' PRACTICES TO IMPROVE CLIMATE CHANGE RESILIENCE OF THEIR ASSETS, OPERATIONS, AND INVESTMENTS

WHAT IS AT STAKE FOR THE POWER SECTOR ? EDF GROUP EXPERIENCE

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Outline

1. **A story line at EDF : how meteorology and climate have been dealt with ?**

2. **Building a strategy to cope with climate change related hazards**

3. **Lessons learned by EDF Group : balance between resistance and resilience,…..**

4. **…… and lessons learned from cooperation with other utilities**

Storyline

- From 1980 to 1990 an activity dealing with meteorological data but two topics emerged clearly :
  - complex statistical studies for studying relationship between meteorological data and supply/demand issues
  - mesoscale modelling studies for dispersion of effluents in complex terrains
- 1989/90 – a breakthrough year ! The Scientific Advisory Board of EDF recommends EDF is paying attention to the climate change issue
- 1990 to 2000 – involvement of R&D team on climate modelling studies in relationship with French, EU and international scientific community
- Starting end of 1999 and follow up years : a suite of meteorological/climate events impacting strongly our Group (Storms, heatwave, flooding, etc.…)

- **Response** :

  - **a climate hazard plan, then**

  - a climate change adaptation strategy

Towards a global strategy for coping with « climatic (and climate change related) hazards »

Lothar and Martin, two storms in **1999** → Actions → Follow-up

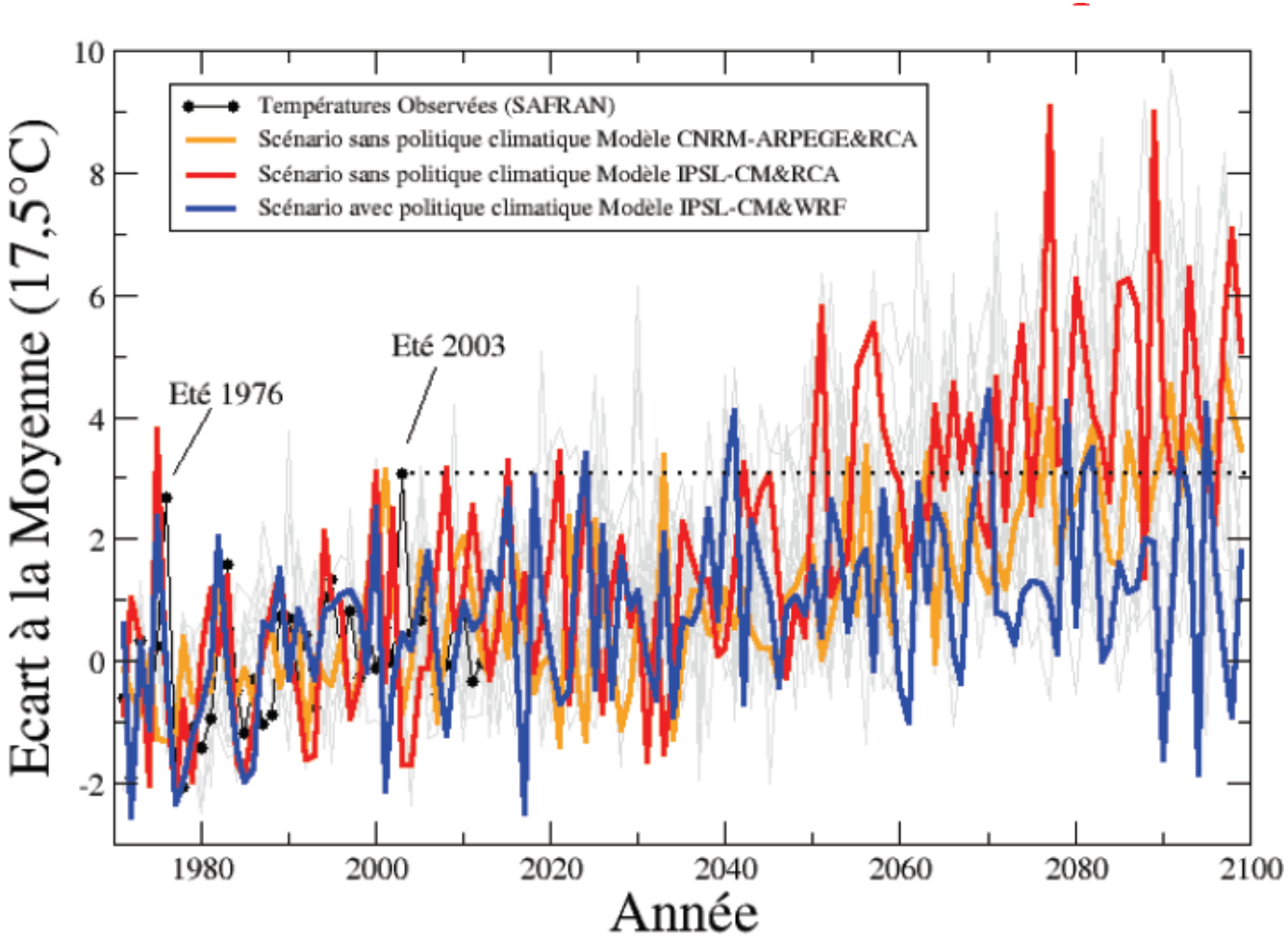
Floodings in summer **2002** → Actions → Follow-up

Heat wave in summer **2003** → Actions → Follow-up

2003 – climatic hazard strategy – permanent group

Cold spell in spring **2005** → Enrichment of actions

More heat waves to come if no climate policies in place ….



Ecarts à la moyenne (1971-2005) de la température moyenne de chaque été sur le Nord de la France, observés et simulés par plusieurs modèles climatiques et pour plusieurs scénarios économiques (Simulations des projets CMIP5 et EURO-CORDEX)

Institut Pierre Simon Laplace

METEO FRANCE
Toujours un temps d'avance

INERIS
maîtriser le risque pour un développement durable

EURO-CORDEX

HyMeX

EDF Group's Strategy of adaptation to climate change

Adapting existing assets to climate change, preparing new assets accordingly, emergency preparation and R&D on climate change impacts

- **Adapting existing facilities bound to stay in the landscape for a long time**
  Adapt our facilities, operating processes, in addition to the Climate Hazards Plan

- **Mainstreaming the expected consequences of climate change into our design of future assets and facilities**
  Changes in our energy mix from the onset of the design phase, the future climate is one of the design parameters for future power generation facilities

- **Boosting our resilience to extreme climate events - Direct application of our Climate Hazard Plan – Preparadeness for crisis management**
  Prevent an extreme climate event from having catastrophic impacts, and return to initial status as early as possible

- **Activating the right R&D to address the right topics**
  Deliver information on the latest breakthroughs about the predictable effects of climate change Provide support to define their impacts on our facilities and organisations Contribute to the construction of our future asset base

Two concepts

- Resistance :
  - capacity of our installations to resist to climate hazards –
    - based on statistical approach, on historical knowledge, on capacity to predict
- Resilience :
  - capacity of our operation teams to face extraodinary events allowing to
    - Guarantee the safety of our equipments
    - Guarantee the vital services to customers
    - Recover a normal situation on the shortest timeframe
- In which collaboration with Public Authorities is needed

Feedback after crisis

Resistance

- decision to transform aerial lines in underground lines;
- decision to invest in some power plants to elevate the dikes to increase the resistance to floods;
- decision to prepare existing assets on climate change consequences,

Collaboration with authorities is needed (Piketti commission, ASN, …)

Resilience

- Decison to create the FIRE (Intervention Force on electricity networks) (manpower and equipments)to face extraordinary event,

Relation with national local authorities is needed (organisation)

- Decision to build in Antilles islands wind farms which can be lied on the groud in case of cyclonic events,
- More recently decision to create FARN (Intervention Force on nuclear plants) to face extraordinary event.

Relation with safety authority needed

Lessons on the organization side

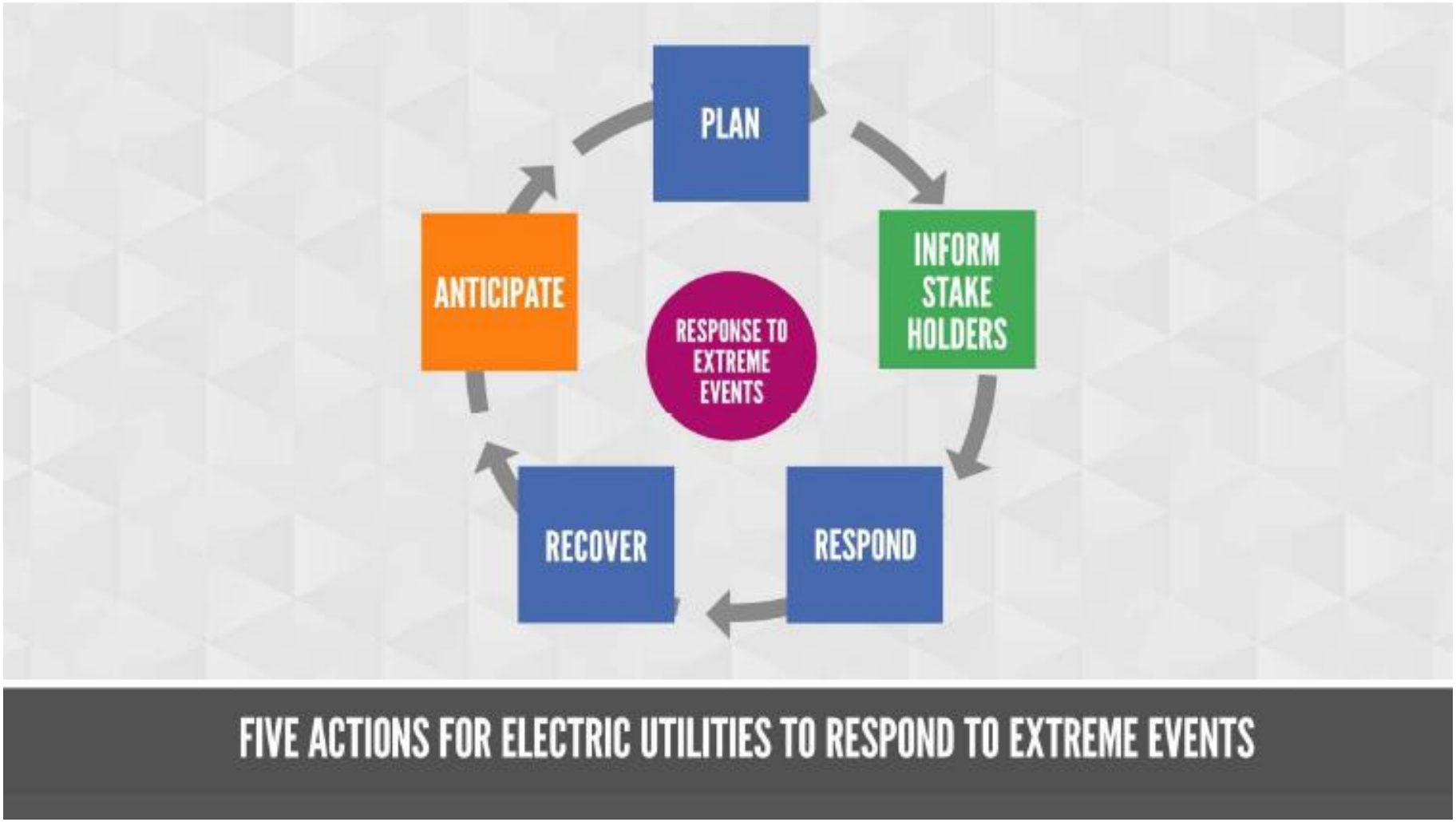
Public Private collaboration in the adaptation and resilience business

- **Key success factors :**
  - Anticipation
  - Clear organisation between authorities and industrials (to manage crisis but not only)
  - Mutual knowledge and mutual recognition of skills between public and private actors

- **To morrow, what are the key issues ?**
  - Find right balance between resistance and resilience ?
  - What appropriate regulations ?

Building resilience into the power sector
WBCSD electric utilities (report 2014)

Five actions for power sector utilities to respond to extreme events (from WBCSD)



Recommendations for public-private collaboration (from WBCSD electric utilities report)

- Cross-sector collaboration for long-term infrastructure planning
- Organize mutual aid for crisis response
- Develop local forecasts over time periods relevant to business decision-making
- Organize effective pooling of technical expertise to:
  - Assess risk
  - Understanding socio economic costs
  - Develop new business models to price and manage risk.
- Share information, especially on a local scale, to improve community resilience.

BUILD SYNERGIES TO BUILD RESILIENT SOCIETIES

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WBCSD electric utilities report can be found:

http://www.wbcsd.org/resilience.aspx