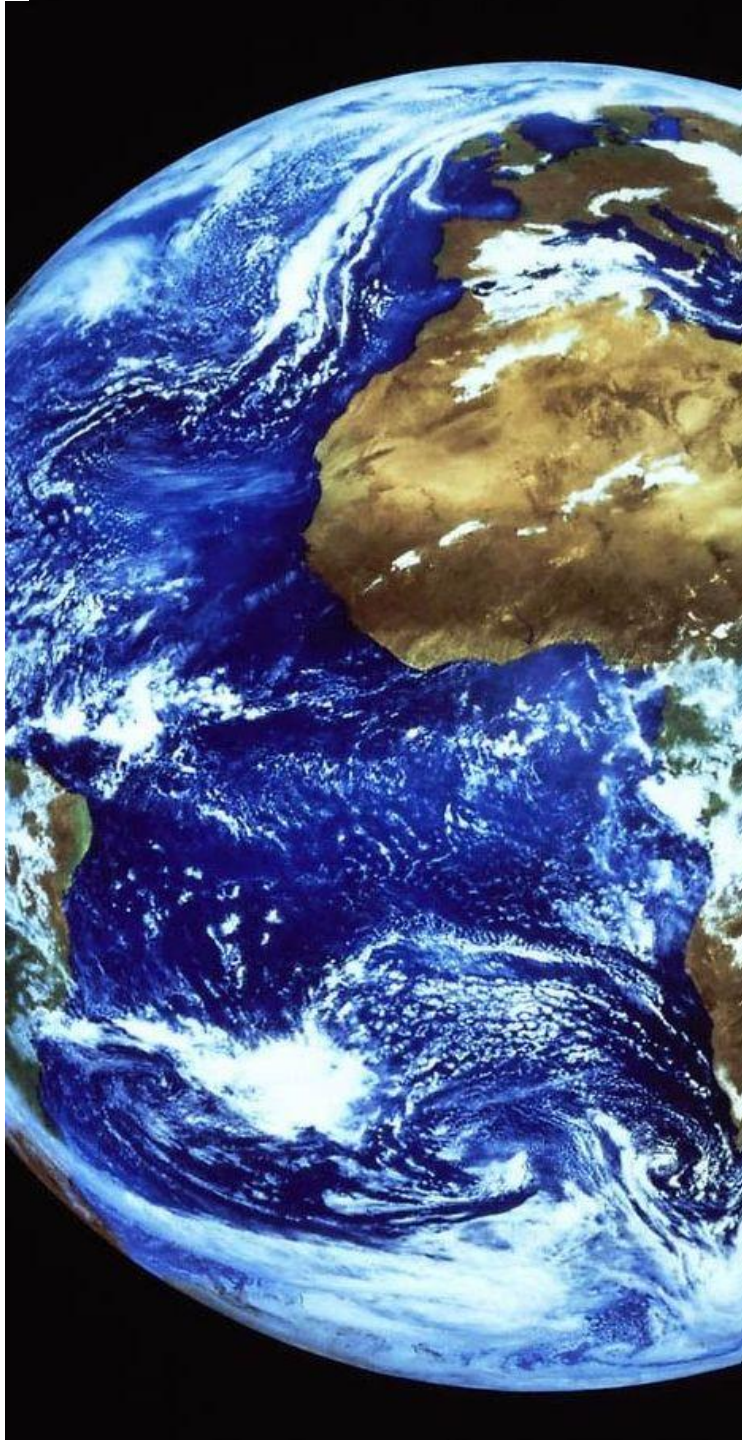
SECURITY CHALLENGES IN THE ELECTRICITY SECTOR RELATED TO CLIMATE CHANGE

IEA'S WORKSHOP
CLIMATE-ENERGY
SECURITY NEXUS



IMPACTS OF EVOLUTION OF THE CLIMATE ON ELECTRICITY

Production
- Cooling systems for thermal plants
- water
- Intermittency
- Resources
- Centralized/ Decentralized

Demand
- Evolution of needs
- Local/sectorial
- Buildings
- Industry / business / Residential

Average, repartition within day and year
Extreme events

Transport and distribution
- Network structure
- Smart grid

Society
- Behavior
- Heath
- Economy
- Resilience

Action plan for Adaptation

AN ACTION PLAN FOR ADAPTATION

- Crisis management
  - investment and organization to reduce the impact of extreme events on our facilities to be able to serve our customers and be part of the resilience of communities.
- Investment in existing facilities
  - to reduce their sensitivity to the estimate climate impacts
    - The very important point is how and when to invest in any transformation of our facilities
    - But it is also about organization and management.
- How to define the new requirements for our facilities
  - that will be built for at 50/60 even 100 years in the case of hydropower....and will have to face sea level rise, water scarcity, temperature rise ....
- R and D
  - we must support research on local climate impact, on extreme events alert management and develop softwares, models more related and dedicated to our needs.

- There are interactions between the four topics and none of them can be play without the others
- Either can they only be driven by the company, it has to be built with communities, local authorities and research centers.

SEVERAL TIMEFRAMES

Crisis management

- Actions plans for crisis management : anticipation
  - Organization
    - Forecast and alert
    - Crisis organization with local authorities
      - The " FIRE" la force d'intervention rapide électricité"
      - Voluntary "Cut-off action plan"
      - Communication
      - Secured electricity access points
    - Coordination of power generation on a river and adapt nuclear plants maintenance planning
    - Commercial deals with consumers to reduce demand if needed
  - New tools
    - Forecast
  - Practicing, training, information and dialog
    - with local authorities

Adapting assets

- Hardening new and existing infrastructures
  - Identification of vulnerabilities
  - Assessment and simulation of impacts :
    - Wind, flooding, heat, drought, snow….
  - Integration of water scarcity
    - Reducing local exposure and sensitivity of plants' operation to temperature or drought
  - Hardening distribution and transmission lines (wind strength, snow) and cable (temperature vulnerability, flooding)
- Securing strategic points (flood, wind,..)
- Developing new technologies
  - Resilient wind turbines
  - Piano Key Weir
- Diversification of the energy mix

Tomorrow & the Long Term

Climate change as a risk is an additional stress on existing and future decision making processes

Evolution of needs and climate change

Take in account the evolution of generation

- Which role for decentralized generation and smart grid

Research on local climate forecast

FROM OAK TO REEDS : GIVING MORE FLEXIBILITY TO INFRASTRUCTURES TO BE MORE RESILIENT

The oak and the reed

The oak one day address'd the reed:--
"To you ungenerous indeed
Has nature been, my humble friend,
With weakness aye obliged to bend.
The smallest bird that flits in air
Is quite too much for you to bear;
The slightest wind that wreathes the lake
Your ever-trembling head doth shake.
The while, my towering form
Dares with the mountain top
The solar blaze to stop,
And wrestle with the storm.
What seems to you the blast of death,
To me is but a zephyr's breath.
Beneath my branches had you grown,
Less suffering would your life have known,
Unhappily you oftenest show
In open air your slender form,
Along the marshes wet and low,
That fringe the kingdom of the storm.
To you, declare I must,
Dame Nature seems unjust."
Then modestly replied the reed:
"Your pity, sir, is kind indeed,
But wholly needless for my sake.
The wildest wind that ever blew
Is safe to me compared with you.
I bend, indeed, but never break.
Thus far, I own, the hurricane
Has beat your sturdy back in vain;
But wait the end." Just at the word,
The tempest's hollow voice was heard.
The North sent forth her fiercest child,
Dark, jagged, pitiless, and wild.
The oak, erect, endured the blow;
The reed bow'd gracefully and low.
But, gathering up its strength once more,
In greater fury than before,
The savage blast
O'erthrew, at last,
That proud, old, sky-encircled head,
Whose feet entwined the empire of the dead!

Jean de la Fontaine

AN IMPORTANT SHIFT IN MINDSET :

- We are used to prepare to events by learning from the past
  - We harden infrastructure from that knowledge
  - We hope the climate modeling and forecasts will give us a new set of vision

WE HAVE NOT TO RESIST ANYTHING, WE MUST CHOOSE OUR VULNERABILITIES

WHAT TO EXPECT FROM POLICIES TO ENHANCE RESILIENCE ?

- Rethinking responsibilities
  - limits between resistance and resilience
  - insurance
- Enabling flexibility in infrastructures design
- Taking in account long term
- Supporting research on climate modeling at local level
- Enabling dialog and share practices between actors

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