

# Nuclear energy- Between risks and benefits

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# Risk -types

- **Danger**- disease, whether, chemical product
- **Incident**-produce by danger, need protection for life or property
- **Terrorism**-unique type of danger=criminal act
- **Disaster**-earthquake, hurricanes, tsunami
- **Catastrophe**-incidents due to terrorist attack

# Vulnerabilities

- Cyber-vulnerabilities
- Bio-vulnerabilities
- Nuclear-vulnerabilities
- 
- 
- But financial circuits ?
- 
- .to....
- Maintaining the balance between specific security programs for electronic surveillance and human rights;

# After Fuku'

- **According to a nuclear safety aphorism, “An accident anywhere is an accident everywhere.”**
- As with the 1979 Three Mile Island **accident**, the 1986 Chernobyl accident, and the 2011 Fukushima-Daiichi accident, a future major nuclear power plant accidents could have a chilling effect on the growth of the industry or sustained operation of the current fleet of reactors;
- Similarly, a **terrorist attack** on any reactor could have a negative effect on continued use or potential growth of nuclear energy in many countries;
- However, even in nuclear-experienced countries, safety and security risks could increase if reactors are extended beyond their design life or if operators became complacent about providing for adequate security to account for terrorist attacks.
- Still, the greatest safety and security risks stem from countries that have little or no nuclear regulatory experience and nuclear educational programs. Without increased attention to **creating and strengthening nuclear safety and security cultures in all countries**, nuclear power programs in many countries could be held hostage to an accident involving inexperienced nuclear programs or different groups of interests;

# Stress tests

- For now we define a “stress test” as a targeted reassessment of the safety margins of nuclear power plants in the light of the events which occurred at Fukushima: extreme natural events challenging the plant safety functions and leading to a severe accident;
- the European Council of March 24th and 25th declared that “the safety of all EU nuclear plants should be *reviewed, on the basis of a comprehensive and transparent risk assessment (“stress tests”)*;
- *the European Nuclear Safety Regulatory Group (ENSREG) and the Commission are invited to develop as soon as possible the scope and modalities of these tests , making full use of available expertise (notably from the Western European Nuclear Regulators Association)*

# EU-Current measures-18.05.2011

- In the light of the Fukushima accident, comprehensive risk and safety assessments undertaken by the operators under the supervision of the national regulatory authorities of nuclear power plants will start at the latest by 1 June 2011;
- Will cover extraordinary triggering events like earthquakes and flooding, and the consequences of any other initiating events potentially leading to multiple loss of safety functions requiring severe accident management;
- Risks due to security threats and the prevention and response to incidents due to malevolent or terrorists acts (including aircraft crashes) involve different competent authorities, hence it is proposed that the Council establishes a specific working group composed of Member States and associating the European Commission;
- Human and organisational factors should be part of these assessments;

# Process to perform the “stress tests” and their dissemination

- The licensees have the prime responsibility for safety. Hence, it is up to the licensees to perform the reassessments, and to the regulatory bodies to independently review them.
- The timeframe is as follows:
- The national regulator will initiate the process at the latest on June 1 by sending requirements to the licensees.

|                 | Progress report | Final report |
|-----------------|-----------------|--------------|
| Licensee report | August 15       | October 31   |
| National report | September 15    | December 31  |

- The final national reports will be subjected to the peer review process described below.
- The European Commission, with the support of ENSREG, will present a progress report to the EU Council for the meeting scheduled on 9th December 2011 and a consolidated report to the to the EU Council for the meeting scheduled for June 2012.

# Still a option : Safer nuclear power

- Prosperity without security is unsustainable;
- Security is a state of mind , as much as it is a physical aspect of our environment;
- We must recognize that security means more than defense;
- After ending the 20th century we failed to recognize that dominance, like fossil fuel, is not a sustainable form of energy;
- We have a national security strategy , which sets core national interests, including protection of critical infrastructure, but that is a document written by specialists for specialists;
- **In order to be accepted and applied is necessary that more and more people to learn and understand the goals and practices;**
- A nation must be powered by the strength of its educational system, social policies, international development and diplomacy, and its commitment to **sustainable practices in energy and agriculture;**
- One of the biggest challenge is environmental damage from greenhouse gas emissions;
- This would act to level the economic playing field among **high-carbon emitters** such as traditional coal-fired plants and no- and **low-carbon emitters** such as highly efficient natural gas plants, nuclear plants, and wind- and solar-generated electricity;
- No single energy source is a technical **panacea** for combating global warming;
- **Nuclear power will remain part of this energy mix, for the foreseeable future.**

# Generation IV – Solution to minimize the risks

**ESNII: main goal is to develop Gen-IV demonstrators & prototypes to ensure that in 2040-2050 a new generation of more sustainable nuclear power plants will be commercially available**

Improved safety: robustness against severe damage in the core and passive systems

Non-proliferation: closed cycle; partitioning and recycling processes

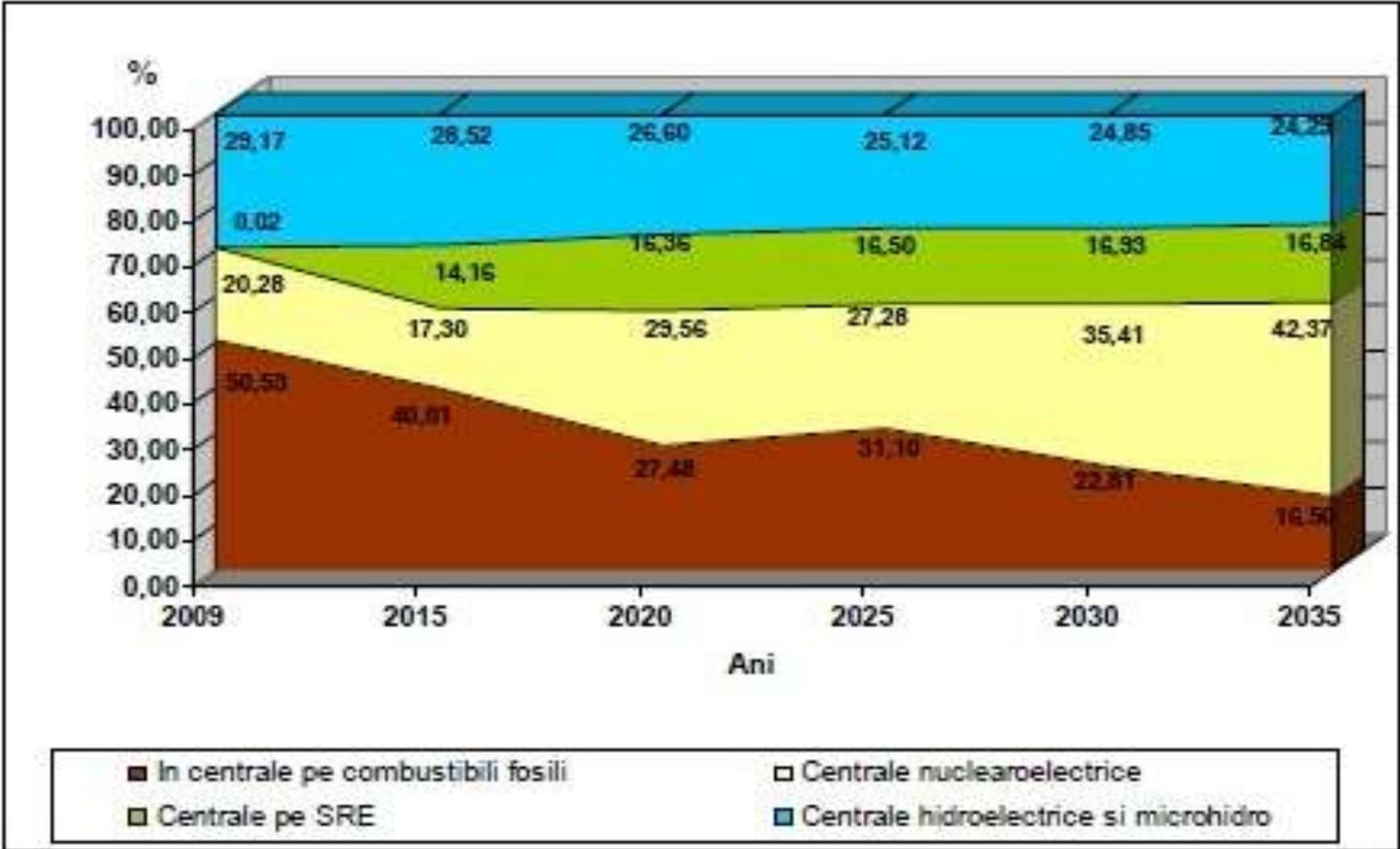
Reducing the radioactive waste risks: minimising the production of high level radioactive waste; minore actinite burning

Security of supply: an efficient use of uranium resources;

Three options in Europe: sodium (SFR), lead (LFR), gas(GFR).

Romanian option: LFR; availability to host ALFRED (lead demonstrators, 100 Mwe)

# Structure of Romanian electricity production during 2011-2035



# Conclusions

- Developing our ability to look *beyond risk and threat – to accept them as realities within a strategic ecology – and to focus on opportunities and converging interests* will determine our success in pursuing our national interests in a sustainable manner while maintaining our national values.
- The EU and NATO Members States should welcome such growth provided they can successfully **manage nuclear energy's risks**: safety, security, waste disposal and proliferation.
- Maintaining appropriate programs for risk management, the nuclear energy will sustain the national economic growth;
- For all types of critical infrastructures is mandatory to have specific **educational plans** in order to develop and upgrade the knowledge's in order to have a right answer to three major questions : What is critical? Is it vulnerable? What is mandatory to assure the domestic consumption? What can be done?;
- **In the Romanian energy- mix consumption the nuclear energy must provide 45% in the future;**
- Romania must continuous update the specific criteria and regulations based on international practice.

Thank You! ....Any Questions?