

# **Nuclear Energy, Climate Change and IAEA Assistance to Interested Member States**

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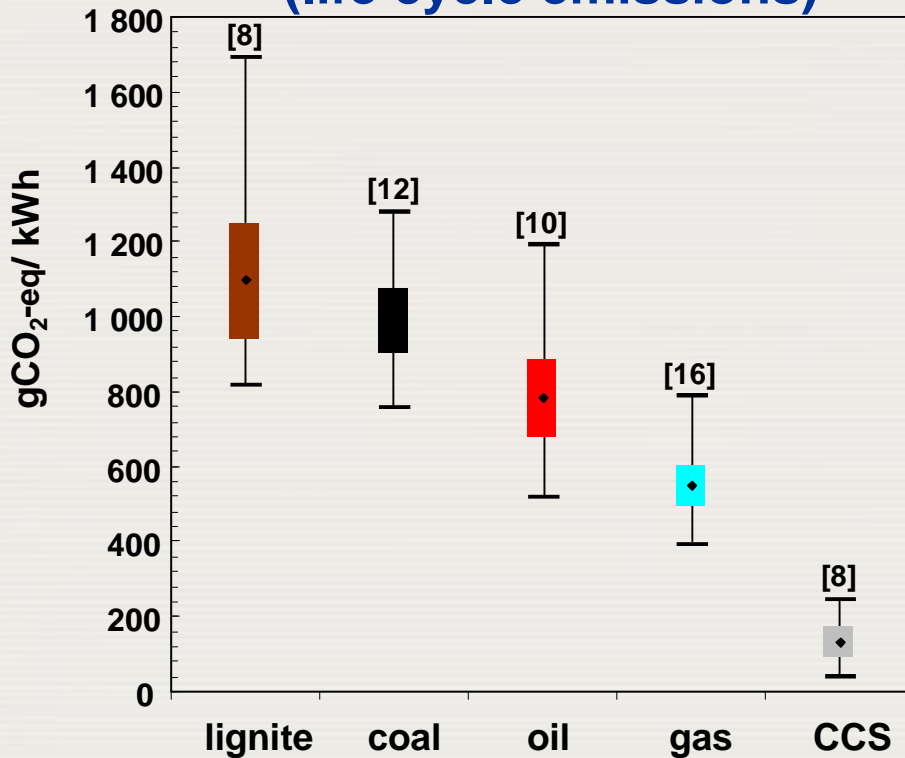
International Atomic Energy Agency

# Three take-away messages

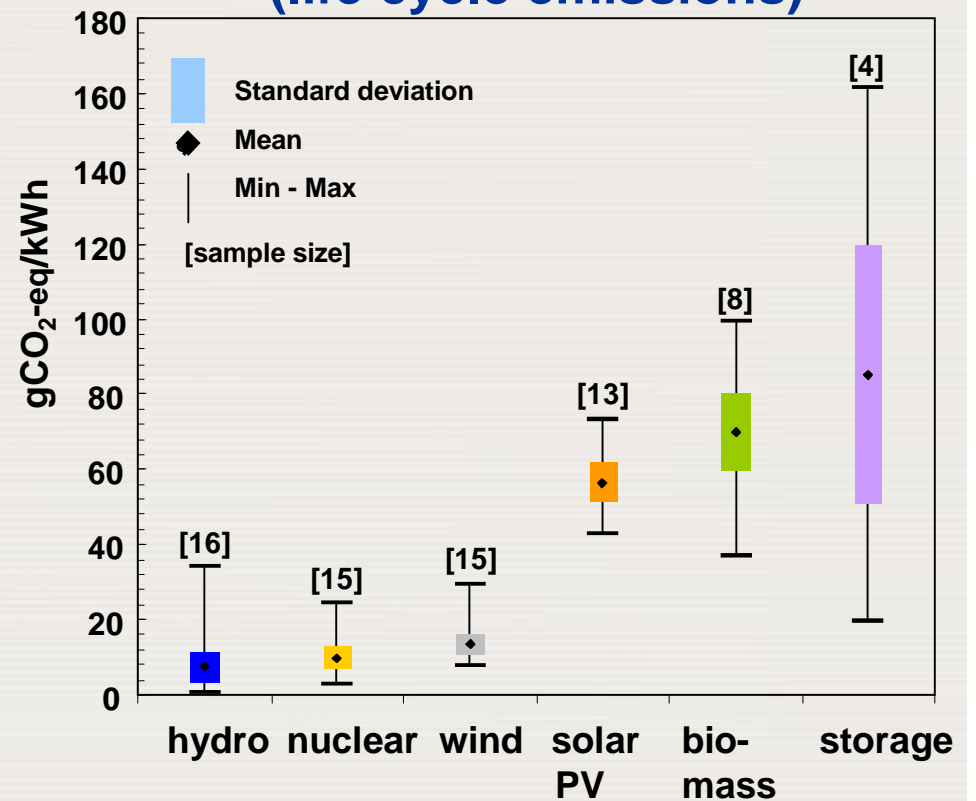
- ∅ Nuclear power is good for the climate
- ∅ Nuclear power is not a quick-fix mitigation option
- ∅ Nuclear power can make a substantial mitigation contribution in any serious long-term mitigation strategy

# Nuclear power is good for the climate

## Fossil electricity generation (life cycle emissions)

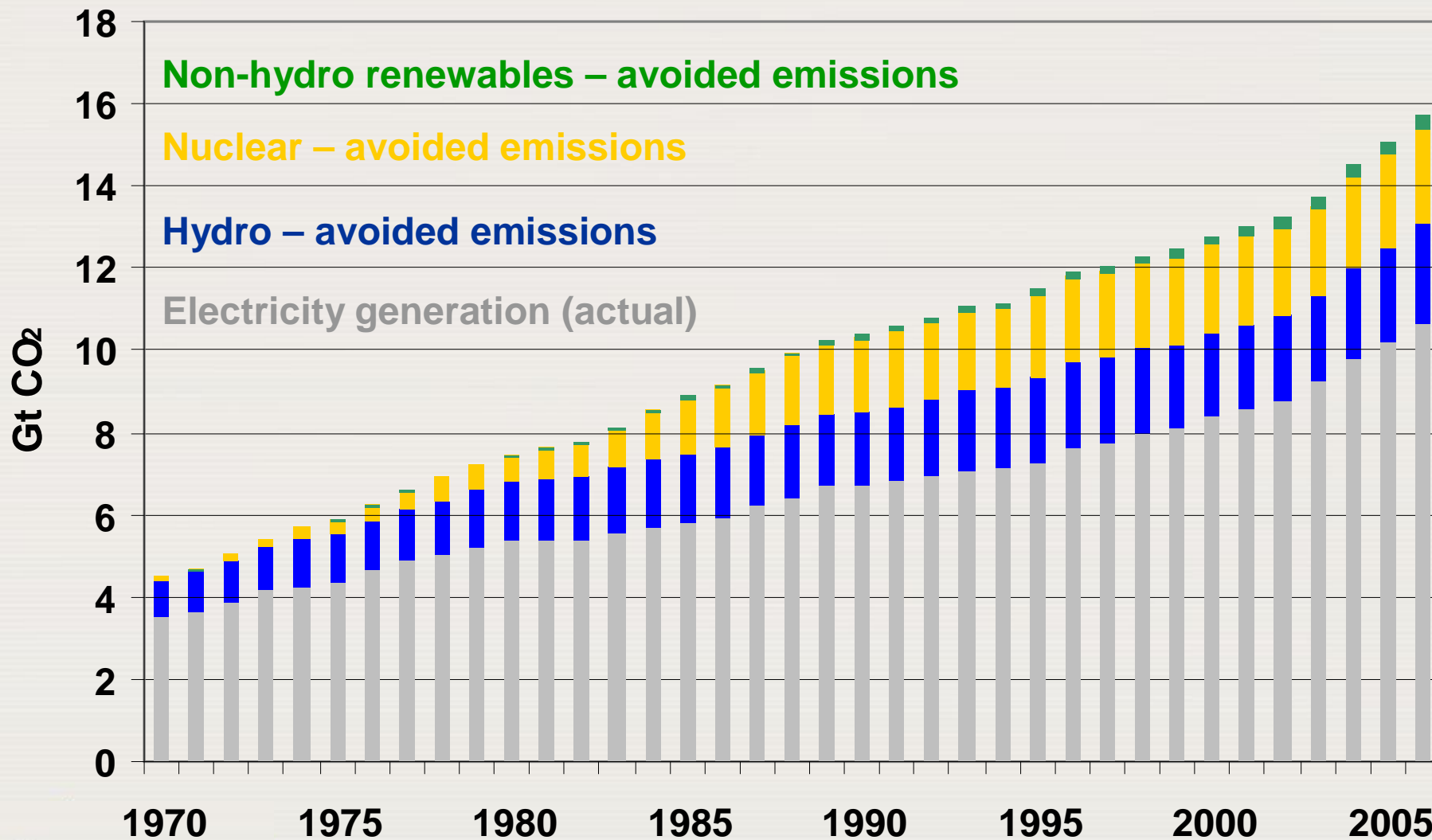


## Non-fossil electricity generation (life cycle emissions)

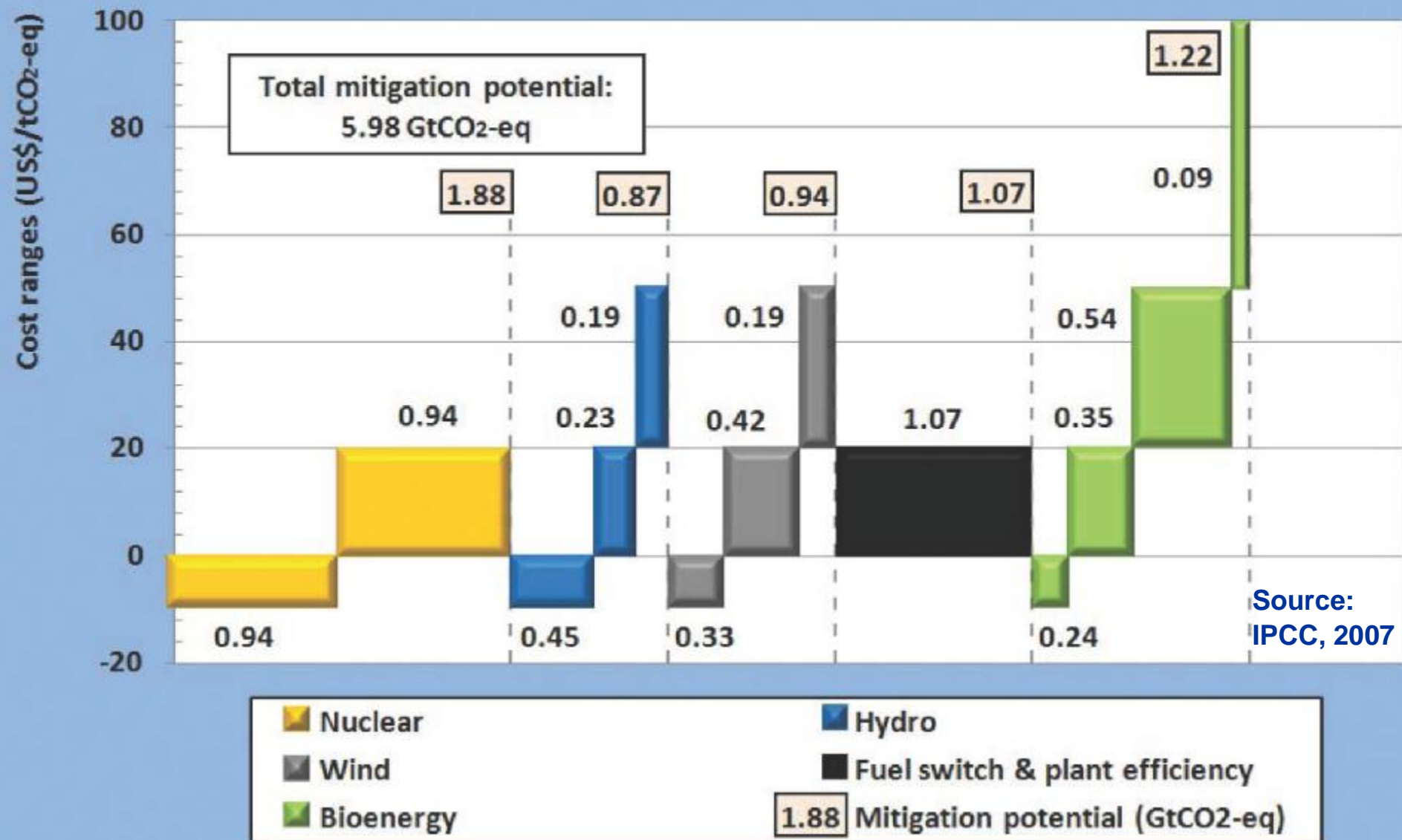


**Nuclear power: Very low lifecycle GHG emissions make the technology a potent climate change mitigation option**

# Global CO<sub>2</sub> emissions from electricity generation & emissions avoided by hydro, nuclear & renewables



# Mitigation potential of selected electricity generation technologies in different cost ranges



# One size does not fit all

- ∅ **Countries differ with respect to**
  - § energy demand growth
  - § alternatives
  - § financing options
  - § weighing/preferences
    - ∅ accident risks (nuclear, mining, oil spills, LNG...), cheap electricity, air pollution, jobs, import dependence, climate change
- ∅ **All countries use a mix. All are different.**
- ∅ **Nuclear power per se is not “the solution” to the world’s energy problems, climate change and energy security**
- ∅ **It surely can be an integral part of the solution!**

# IAEA responds to Member State requests

Many developing countries lack the capacity for integrated resource planning, therefore:

## ∅ Energy planning and capacity building

§ Mitigation options throughout the energy system

§ CDM, JI and emission trading

## ∅ Infrastructure planning for starting nuclear power programmes

# Capacity building: Energy for Development

- ∅ Transfer planning models tailored to developing countries
- ∅ Transfer data on technologies, resources and economics
- ∅ Train local experts
- ∅ Jointly analyze national options
- ∅ Help establish continuing local expertise





# IAEA energy analysis models

∅ **Model for the Analysis of Energy Demand**



∅ **Model for Energy Supply System Alternatives and their General Environmental impacts**



∅ **Financial Analysis of Electric Sector Expansion Plans**



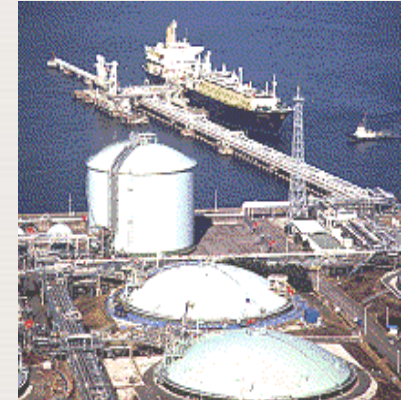
∅ **Simplified Approach for Estimating Impacts of Electricity Generation**



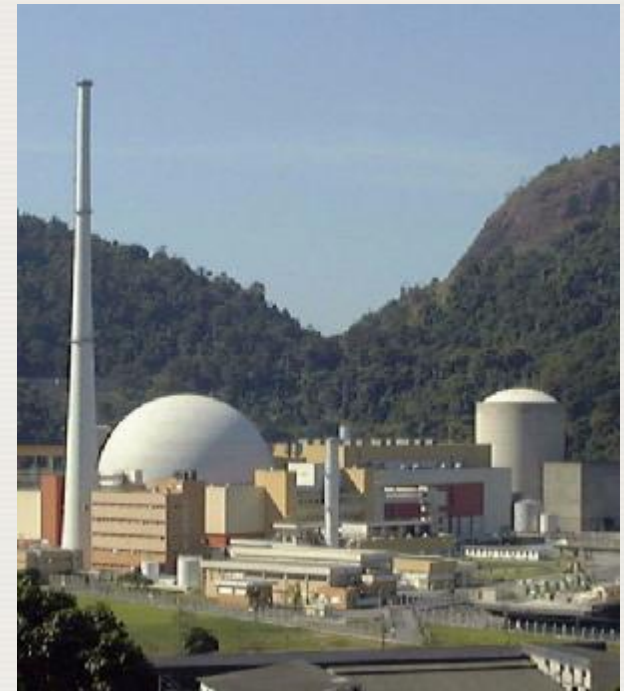
# Energy Planning

## *Outputs*

∅ A national plan towards sustainable energy development



∅ A tool for benchmarking status, defining strategies for, and monitoring progress towards, a sustainable energy future



# Energy planning and nuclear power

- ∅ If nuclear power is integral part of the optimal supply mix under several potential futures (scenarios), the next logic step concerns:

**Understanding the issues involved with the implementation of a nuclear power programme**

# Unlike many large industrial projects, nuclear power has certain unique characteristics

- § Risk of severe accidents and possible target of sabotage, i.e. concerns inherent with nuclear material and radiation
- § Public awareness of nuclear risks seems to outweigh its awareness of the benefits, e.g. climate change
- § Importance of public trust
- § Safety, security and proliferation issues
- § Start up phase is significant in length and effort, some 10-15 years before the shovel hits the ground
- § Requires a “100 year +” commitment
- § Long term waste issues

# Issues: Expected preparedness and competency in key areas of

1. National position
2. Legislative framework
3. Nuclear safety
4. Regulatory framework
5. Human Resource Development
6. Safeguards
7. Security and physical protection
8. Management
9. Financing
10. Stakeholder involvement
11. Emergency planning
12. Radiation protection
13. Nuclear fuel cycle
14. Nuclear waste
15. Environmental protection
16. Site and supporting facilities
17. Industrial involvement
18. Procurement
19. Electric grid

<b>ISSUES</b>	<b>MILE- STONE 1</b>	<b>MILE- STONE 2</b>	<b>MILE- STONE 3</b>
1. National position			
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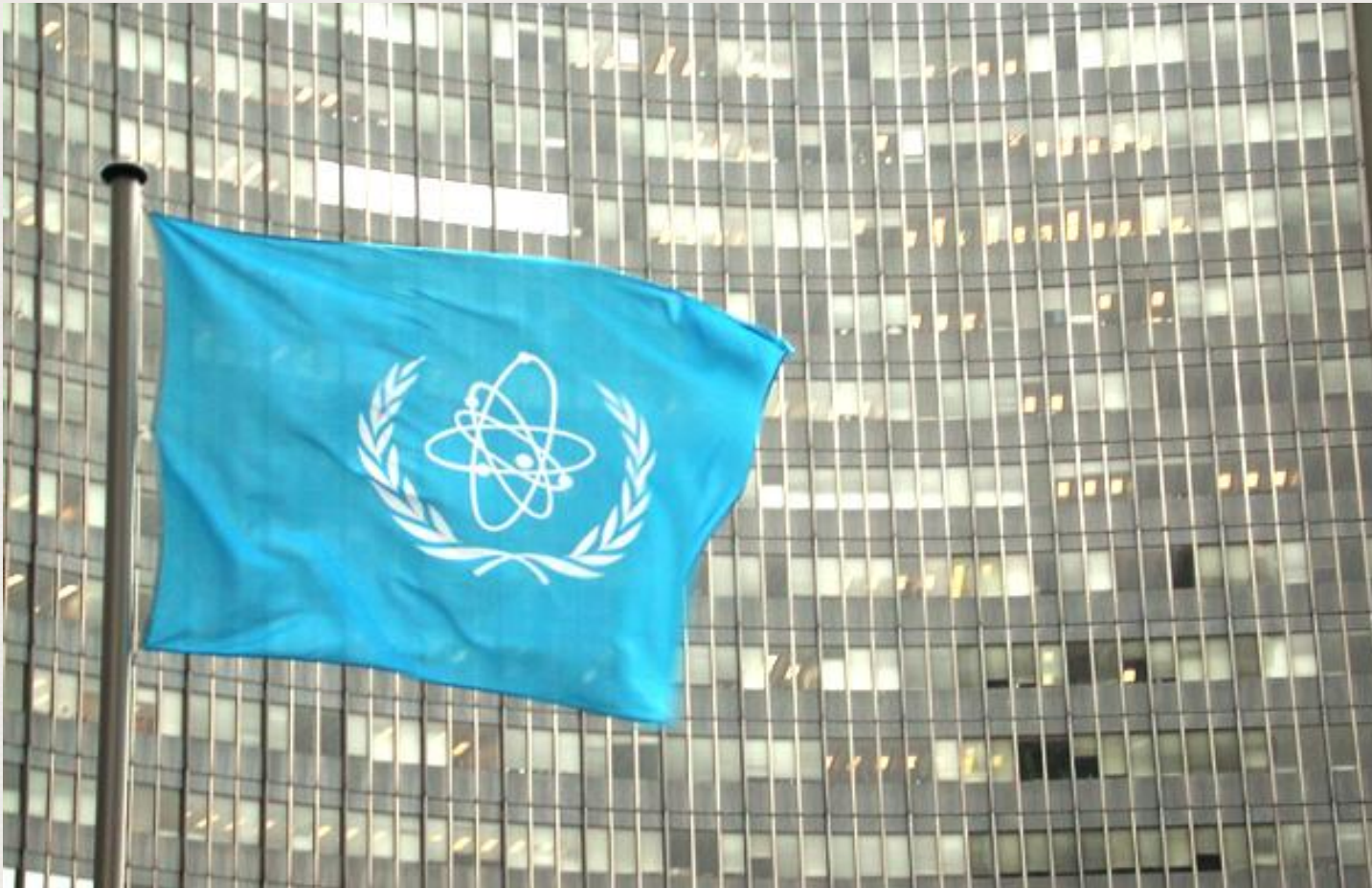
**ACTIONS**

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**ACTIONS**



# IAEA



*...atoms for peace.*