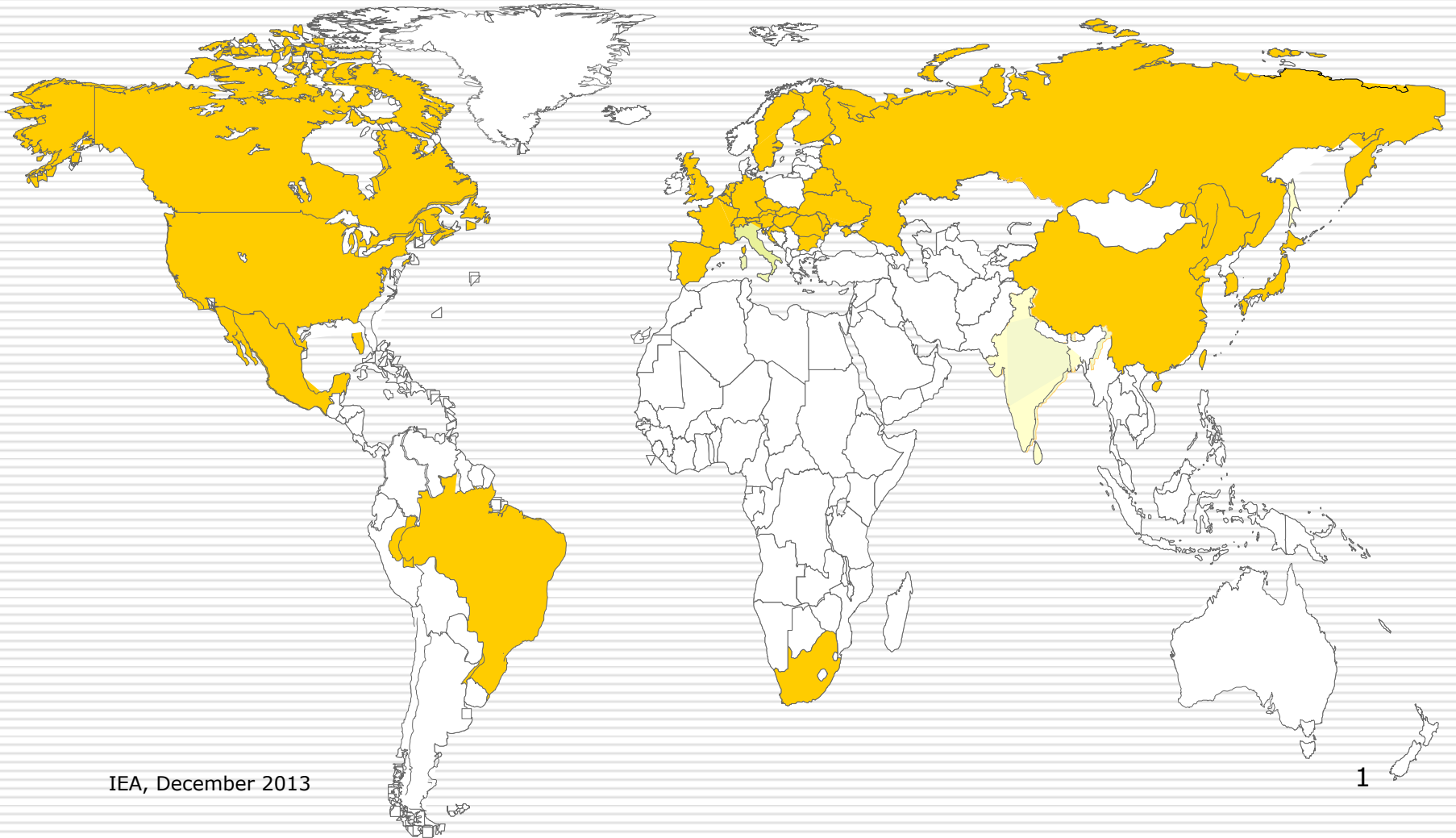


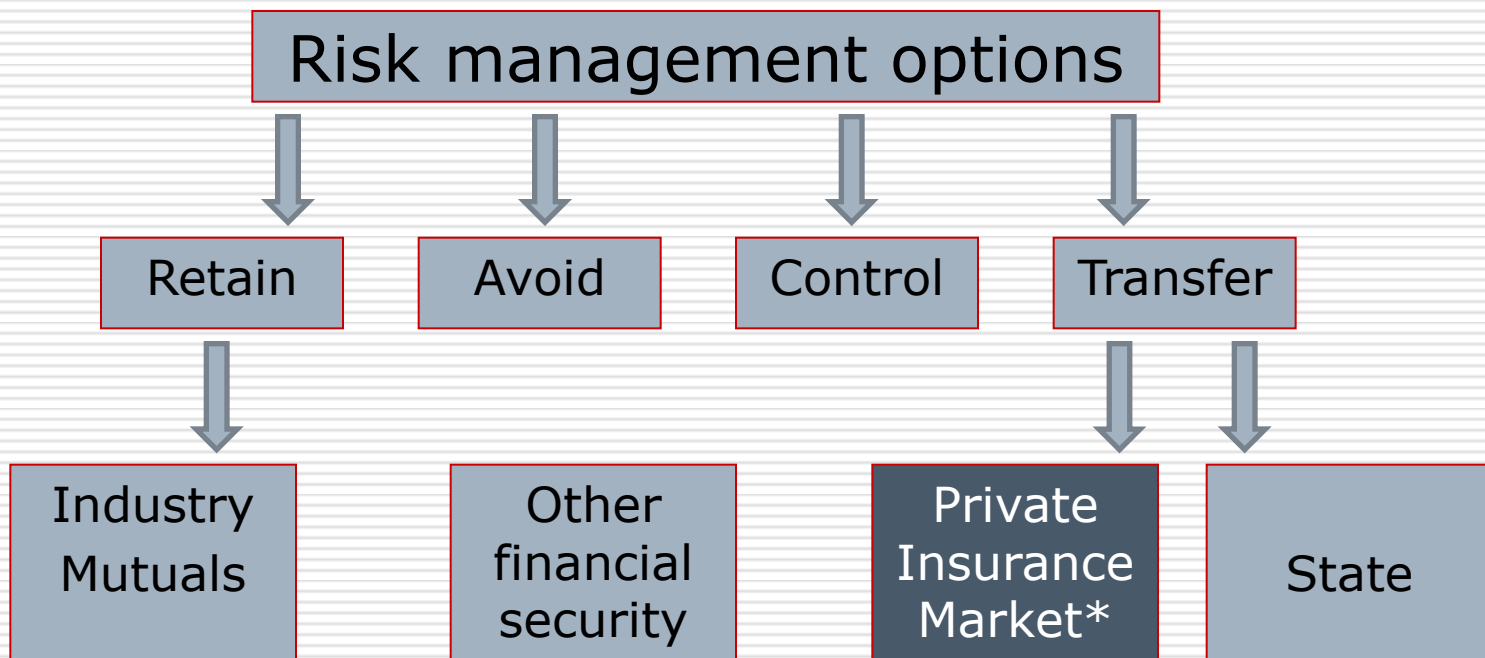
# ***Insurance of Nuclear Risks***

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# ***Risk Management***

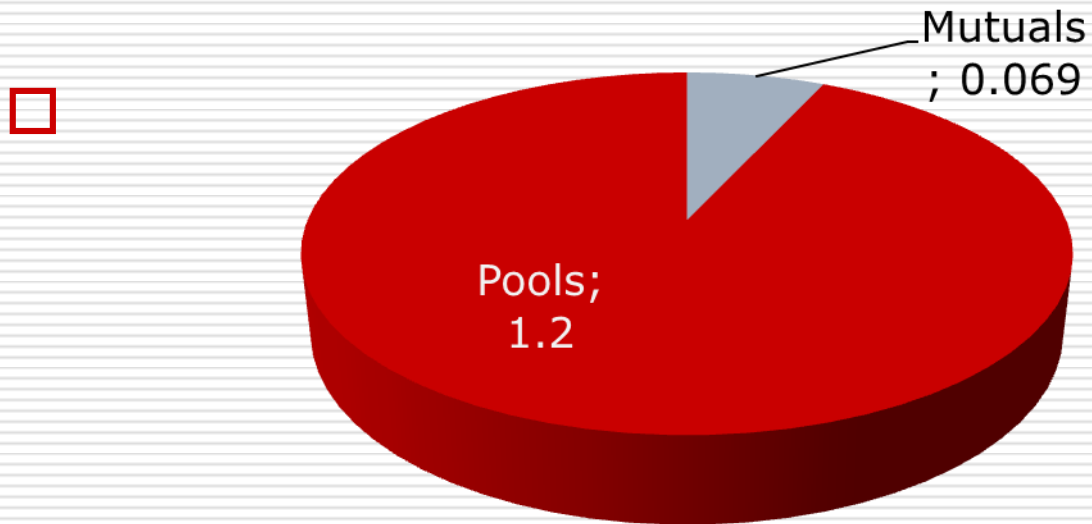
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\*A financial safeguard against the economic consequences of unknown loss events

# Private Market Capacity TPL (in € bio)

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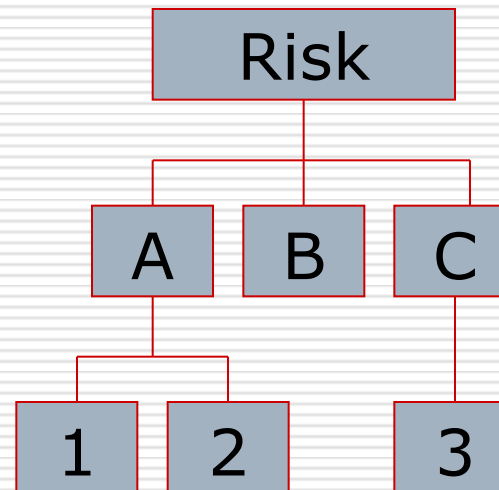
□ Mutuels: expansion in future?

# ***Risk Sharing***

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Insurer  
Co-insurers

Reinsurers



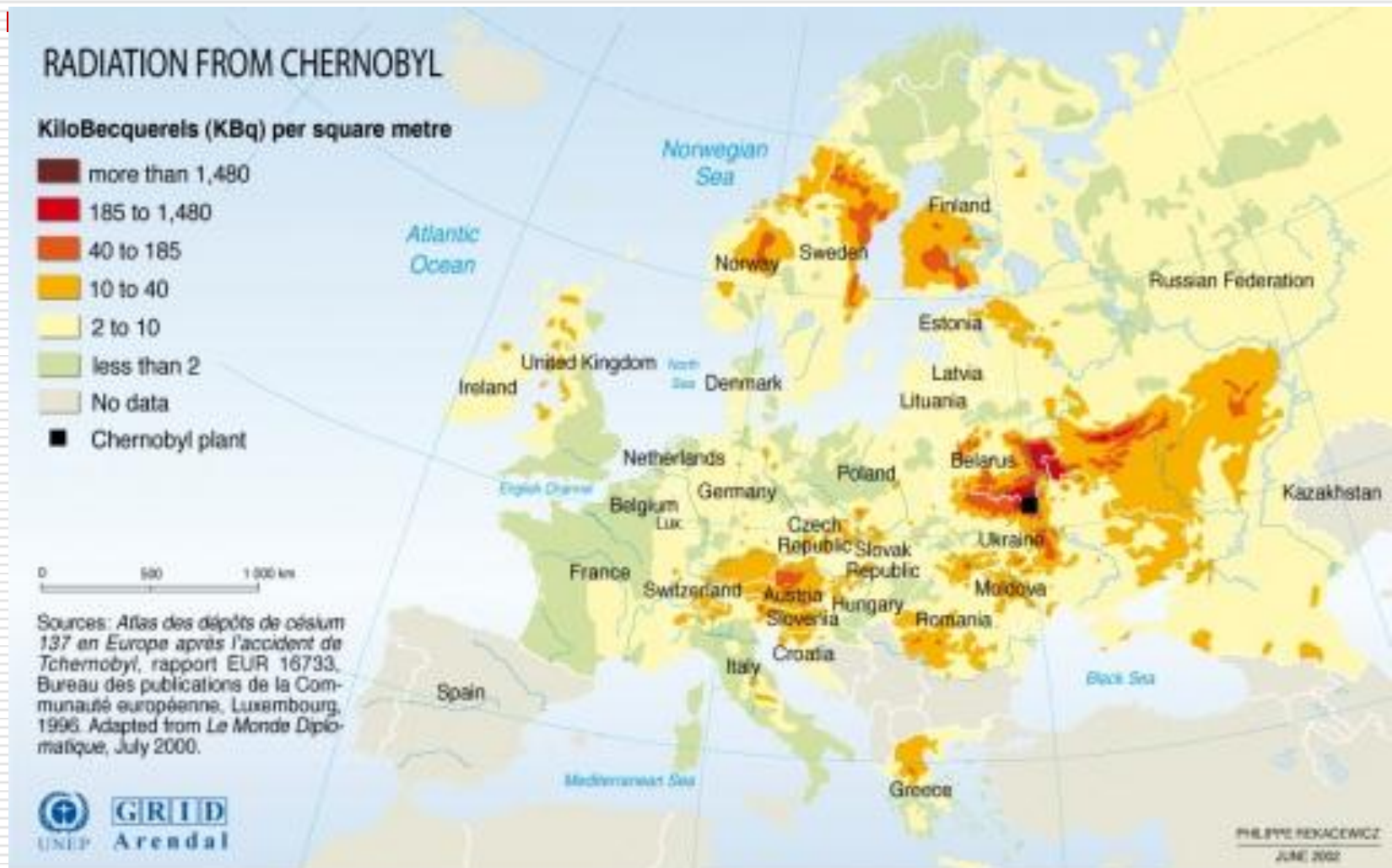
# ***Particularities of Nuclear Risk 1***

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## **Nuclear Electricity Production resulted in Insurance Problems:**

- Unknown, poorly perceived risk (nuclear bombs 1945)
- Low Frequency Outlook, but high catastrophe potential
- Few insured Installations
- Risk of claims accumulation from single event

# Particularities of Nuclear Risk 2

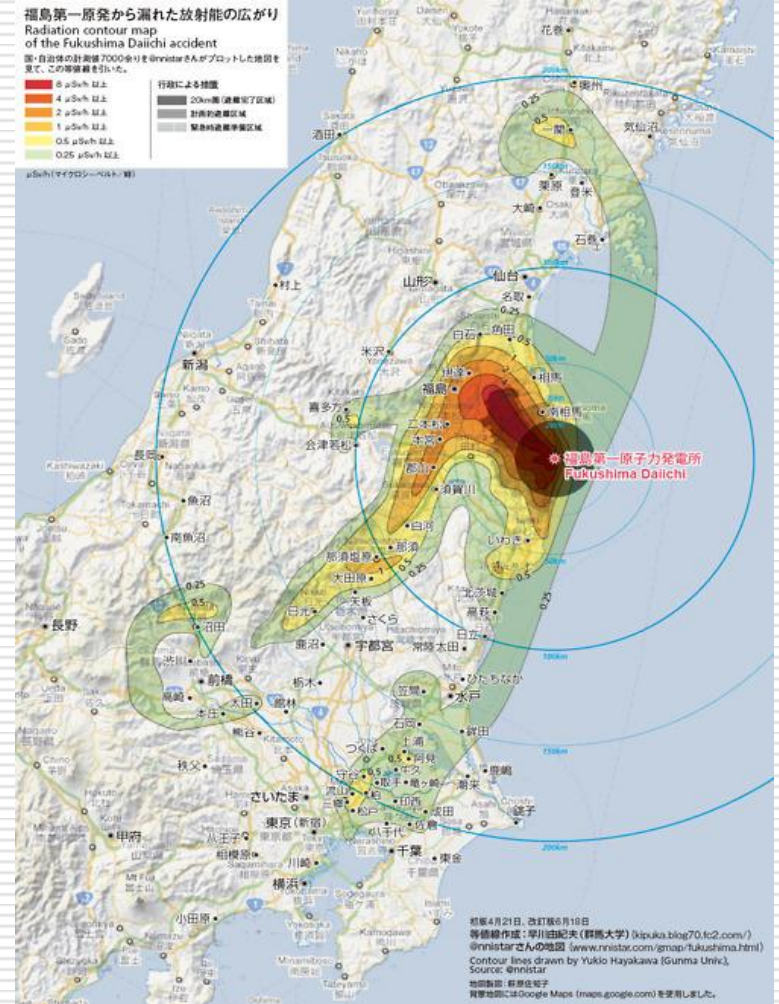
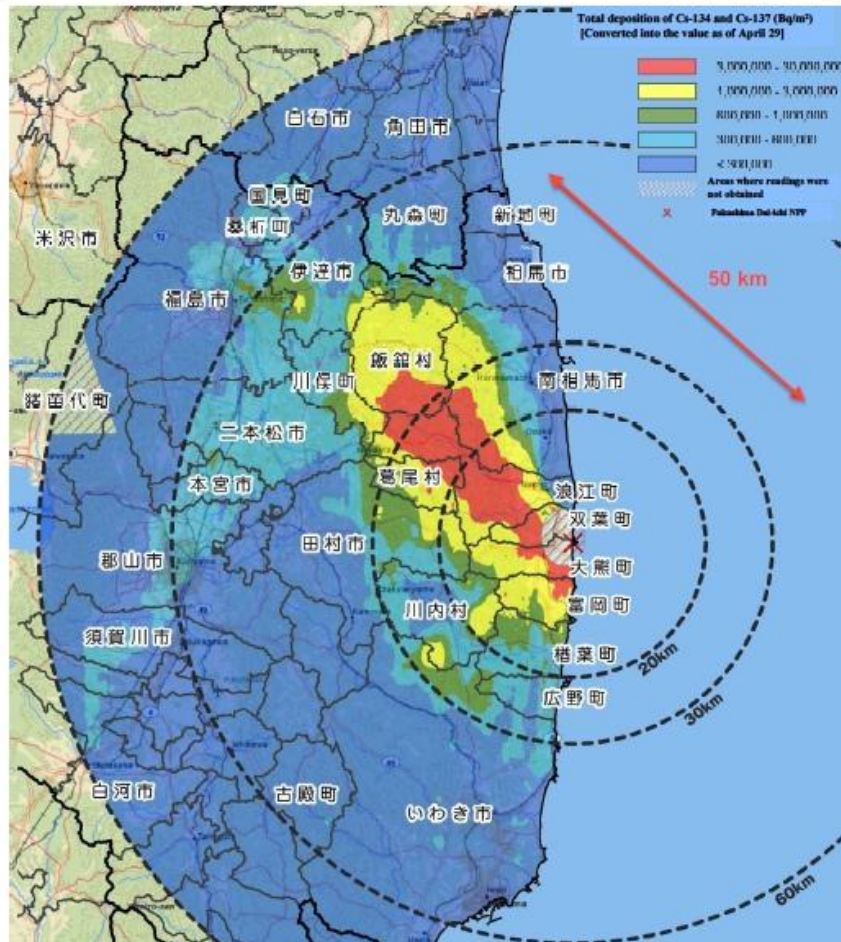


Sources: UNEP/GRID-Arendal, European Environment Agency; AMAP Assessment Report : Arctic Pollution Issues, Arctic Monitoring and Assessment Programme (AMAP), 1998, Oslo; European Monitoring and Evaluation Programme (EMEP); Co-operative programme for monitoring and evaluation of the long range transmission of air pollutants in Europe, 1999. Adapted from *Le Monde Diplomatique*, July 2000.



# Particularities of Nuclear Risk 3

Results of airborne monitoring by MEXT and DOE  
(Total surface deposition of Cs-134 and Cs-137 inside 80 km zone of Fukushima Dai-ichi NPP)



# ***Particularities of Nuclear Risk 4***

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Result: nuclear exclusion clause in  
insurance policies

Compensation: Nuclear Insurance Pools



*(association of insurers who jointly insure a particular risk  
or class of business)*



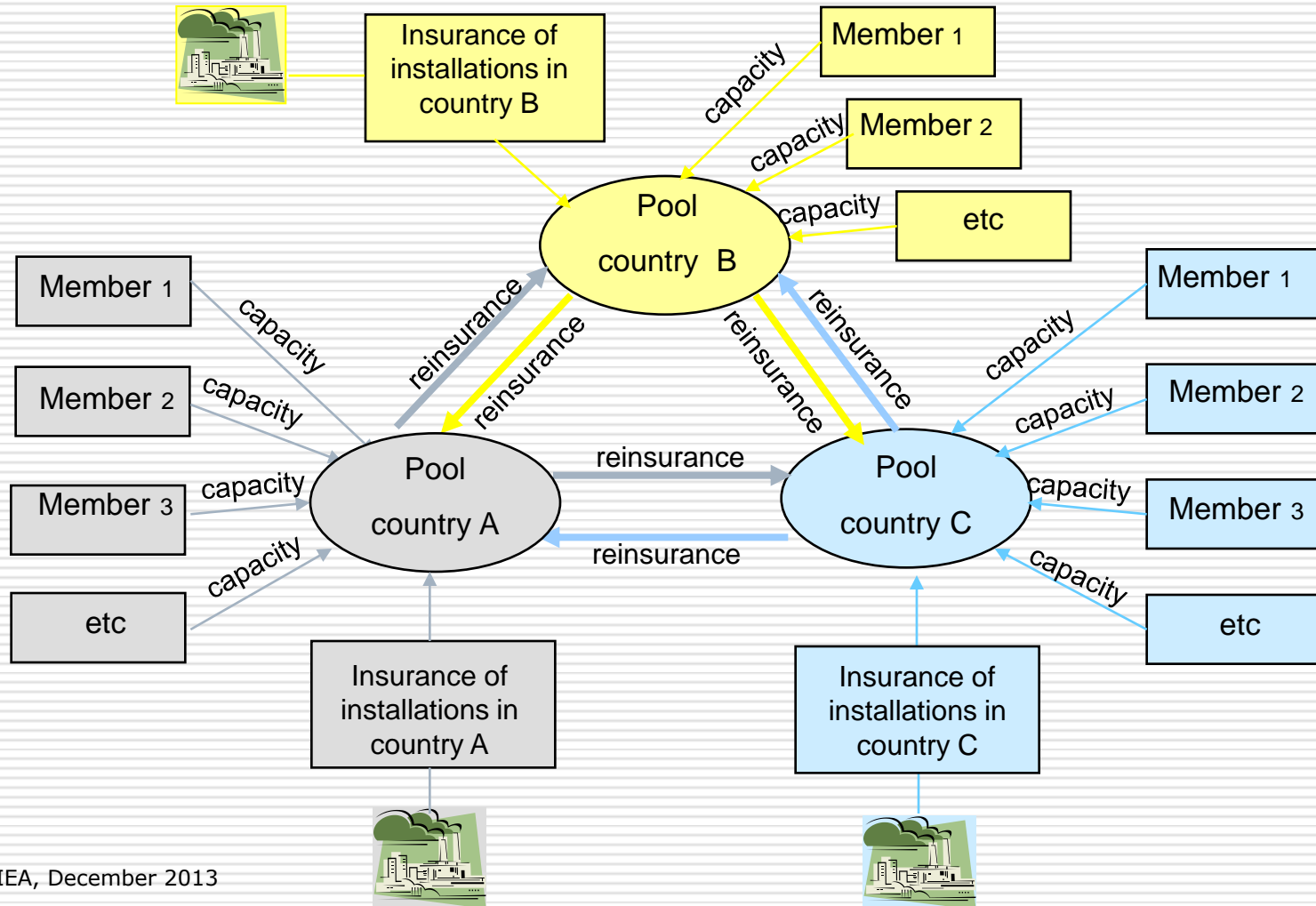
# ***Pool Operation: fundamental Principles***

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## **Pools are market wide**

- Spread of risk
- Market-wide participation                       capacity enhancement
- Concentration of expertise/experience        cost efficiency
- Appropriate and extensive claims handling mechanism
- Maximum security to insureds and victims: controlled, solidarity based membership
- Reciprocal reinsurance

# Nuclear Insurance Business Flow



# ***Prerequisites for Pool Cover***

convention adherence  
- 0 -  
acceptable domestic  
nuclear legislation

techn. acceptability of  
installation  
- 0 -  
adequate regulatory  
control

participation of domestic  
insurance industry  
- 0 -  
facility to reinsure  
outside domestic market

premium payment  
in hard currency  
freed

CO

no trade restrictions

# ***Subject of Insurance***

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## **All Pools:**

Nuclear Power Stations



## **Most Pools:**

- Other Installations of the Nuclear Fuel Cycle
- Nuclear Transports



## **Some Pools:**

Radioisotopes or Nuclides

# ***Types of Insurance Cover***

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# ***Material Damage Insurance***

## **Cover**

- No insurance obligation, freedom of negotiation
- Standard practice: fire & allied perils plus nuclear perils
- Some pools: machinery breakdown cover
- Some pools: business interruption cover (difficult!)
- Exceptional: pool cover for CAR/EAR exposures

## **Indemnification**

Based on client's choice as regards:

- insured limit (replacement value, actual cash value, fixed value)
- the application of sub-limits for certain exposures



# ***Third Party Liability Insurance Cover***

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## **Relation to international Conventions**

- Strict, no-fault liability
- Channelling of liability
- Liability limited in time and amount
- Requirement of financial security:  
*insured amounts vary per country and are criticised of being low*

# Convention revisions: Problem areas for Insurers

## Concept of Nuclear Damage

1. loss of life, personal injury  
2. loss of or damage to property

3. economic loss related to 1 and 2

4. reinstatement of impaired environment  
5. use or enjoyment of environment  
6. preventive measures

## Prescription periods

duration up to 10 years

duration exceeding 10 years

*insurable*

*Difficulties with insurability*

# ***Financial Cover in the USA***

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Total: \$12.015bn

SECONDARY FINANCIAL  
PROTECTION LAYER

\$11.64 Billion

(\$111.9 Million x 104 Reactors)

Insurance  
Policies Limit:  
\$375M

US nuclear pool & reinsurers

NB: similar structure in Germany up to a total of € 2.5 billion

# EC Investigation

Total: € 15 bn .....

€ 10 bn catastrophe only cover provided by the risk transfer insurance market?

€ 5 bn .....

€ 2.5 bn catastrophe only cover provided by nuclear utilities (like Germany)

€ 2.5 bn .....

€ 2.5 bn statutory cover providing by pools, mutuals, states

# ***Risk Characterization***

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- International operating experience
- Insurance surveys
- Guidelines reflecting best practice in loss prevention:
  - ***International Guidelines for Machinery Breakdown Prevention at Nuclear Power Plants 2000***
  - ***International Guidelines for the Fire Protection of Nuclear Power Plants 2006***
  - ***Nuclear Safety & Operations/Third Party Liability Guidelines 2010***

<http://www.nuclearpools.com/procedures.asp>

# Claims Experience

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- **Nuclear TPL insurance:** Limited large loss experience
  - Chernobyl (not privately insured)
  - Fukushima (not privately insured; operator/gvt. so far paid \$ 30.7bn)
  - Tokai Mura
  - Three Mile Island (paid by US Pool \$71m)
    - within 24 hours of accident American Pool had office near facility making emergency assistance payments*
  
- **In general:** wide expertise in handling multiple claims
  
- **Pools:** specific large scale loss regulation preparedness (co-operation with local authorities)