NEAC International Subcommittee Report
December 13, 2011

Impact of the Disaster at Fukshima Dai-ichi

Comprehensive Fuel Services

U.S. Nonproliferation Policy

CINTAC

Committee Members

- John Ahearne
- Tom Cochran
- Marvin Fertel
- Sue Ion
- Bill Martin
- Karl Peddicord (Texas A&M U)
- Allen Sessoms
- Tom Shea (Batelle)

Office for Nuclear Regulation

An agency of HSE

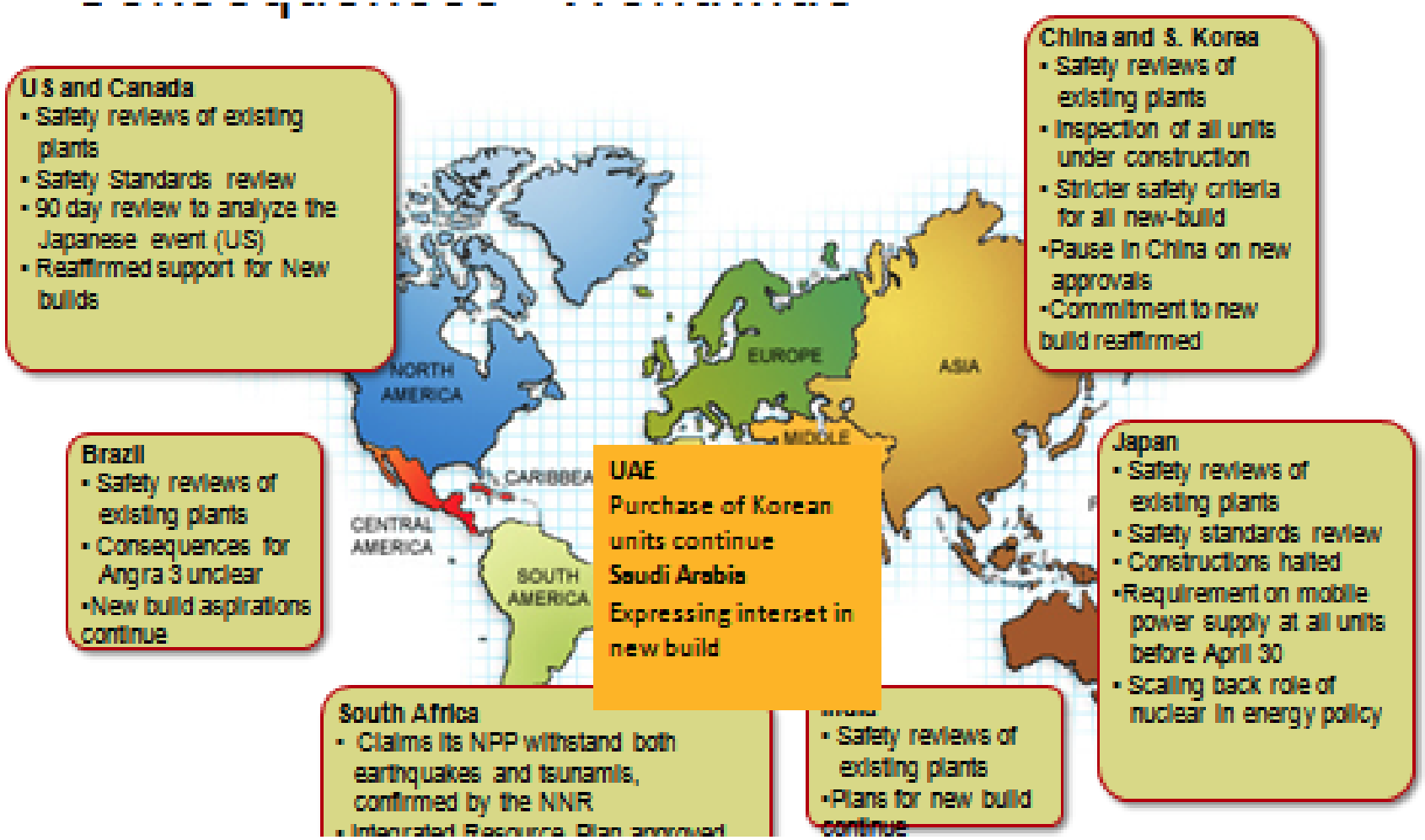
Japanese earthquake and tsunami: Implications for the UK nuclear industry

Final Report

HM Chief Inspector of Nuclear Installations

September 2011

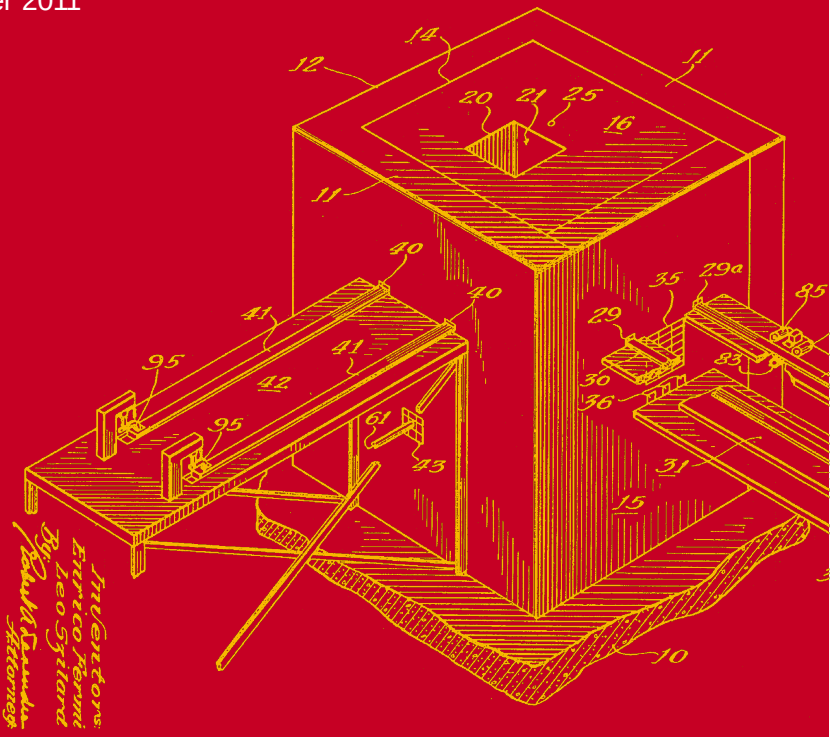
Consequences Worldwide



Consequences - Europe

Fuel cycle stewardship in a nuclear renaissance

October 2011



EXCELLENCE IN SCIENCE

THE ROYAL SOCIETY

Recommendations for best practice

Recommendation 1:
Non-proliferation (see chapter 3)

- All states with nuclear weapons programmes should separate them from their civil nuclear power programmes, and then place the latter under international safeguards.
- All non-nuclear weapon states with existing nuclear power programmes or embarking on nuclear power for the first time should adopt and implement IAEA comprehensive safeguards and the Additional Protocol.
- Universities and industry organisations should develop education and awareness raising courses on non-proliferation and nuclear security to be included in the training of personnel in the nuclear industry, including scientists, engineers, technicians and managers.
- Nuclear fuel should be developed and nuclear reactors configured to enable the maximum burn up of fuel, thereby decreasing the attractiveness of plutonium in spent fuel for use in nuclear weapons. To be feasible, this needs to be consistent with efficient and economic operation.

Recommendation 2:
Nuclear governance (see chapter 5)

- At the national level, regulation of nuclear power programmes should be based upon an integrated approach to nuclear safety, security and safeguards.
- At the international level, in the absence of a specific Convention on nuclear security, appropriate security information could be included on a voluntary basis in national reports submitted as part of the peer review process of the Convention on the Safety of Spent Fuel Management and Safety of Radioactive Waste Management, and the Convention on Nuclear Safety. This practice would be promoted by integrating nuclear safety and security into the IAEA's advisory services for member states.
- An integrated approach to industry-led peer reviews should be developed possibly through collaboration between the World Association of Nuclear Operators and the World Institute of Nuclear Security.
- Non-proliferation and nuclear security need to feature more explicitly in corporate governance arrangements with similar status to that given to nuclear safety.

Recommendation 3:
Integrated fuel cycle management (see chapter 6)
Spent fuel should be reprocessed only when there is a clear plan for its reuse. This plan should seek to:

- Minimise the amount of separated plutonium produced and the time for which it needs to be stored.
- Convert separated plutonium into Mixed Oxide (MOX) fuel as soon as it is feasible to do so.
- Identify nuclear power reactors in advance to use MOX fuel and ensure conversion into MOX fuel matches reactors' loading schedules and fuel specifications.
- Transport plutonium as MOX fuel rather than in a separated form.

Nuclear Islands:
International Leasing of Nuclear Fuel Cycle Sites

Christopher E. Paine
Thomas B. Cochran
Nuclear Program
Natural Resources Defense Council

Presentation to
A Breakfast Briefing Hosted by:
The Nonproliferation Review
James Martin Center for Nonproliferation Studies
November 18, 2010

Basic Elements of The Proposal

- Establish new freestanding "International Nuclear Fuel Association" (INFCA) alongside the IAEA
- Conduct enrichment (and later reprocessing) activities within long-term "Internationally-Secured Leased Areas" (ISLAs) controlled by the INFCA
- ISLA contracts would endure for entire life-cycle of a civil nuclear fuel cycle facility, through end of decommissioning, even in the event a state withdraws from the NPT
- INFCA would certify legitimate producers and track certified end-uses of critical components for enrichment and reprocessing

Tom Shea's Take on This Issue

- Agrees with Cochran "in principle" but doesn't think that "leasing" will get traction
- He suggests instead *Providing multinational fuel cycle facilities in response to international community needs.* Two circumstances might be pursued:
- (a) The international community may wish to find suitable locations for spent fuel reception and storage, spent fuel recycle, nuclear waste conditioning and final waste repositories.

All of these capabilities are essential to the long-term viability of nuclear power generation and creation of global solutions will ensure that the needs are met responsibly.

- (b) In response to concerns raised by some States, several proposals have been put forward under which nuclear suppliers would seek to ensure the supply of fresh fuel against political interruption not related to proliferation concerns as a means to dissuade States from pursuing enrichment technology. The German proposal for a Multilateral Enrichment Sanctuary Project is a particularly noteworthy example.

Countries that have Worked on Nuclear Weapons

- U.S.
- U.K
- France
- Russia
- People's Republic of China
- South Africa
- India
- Pakistan
- Libya
- North Korea
- Iran
- Syria
- Israel
- Iraq
- Argentina
- Brazil
- Japan
- Sweden
- Switzerland
- South Korea

Steps to Enhance the Nonproliferation System

- There are a number of incremental steps that should be taken in the immediate future to improve the system (Cochran, Shea, Poneman, et al).
- Here I suggest more comprehensive enhancements.

Suggested Next Steps

- 1. Reduce reliance on constraining the use of "sensitive" nuclear technologies, coupled with a much more robust international and national inspection regime;
- 2. Level the playing field for 123 agreements;
- 3. Establish an international regime for managing separated plutonium from commercial reprocessing;
- 4. Fund the IAEA as an entitlement under U.S. law.

CINTAC and Funding for NE-6 Activities

- Department of State (Alex Burkhart) stated that NE-6 participation in State led negotiations were an essential carrot that advanced U.S. interests;
- NNSA (Mark Whitney) stated that, in order to set a positive tone for non-proliferation discussions, cooperation in the peaceful uses of nuclear energy were a prerequisite and thus NE-6 participation as a "door opener" was necessary.
- Commerce (Sarah Lopp) stated that the absence of NE-6 from the table during discussions put U.S. companies at a significant competitive disadvantage when compared to other potential suppliers.

Agency Support for NE 6 Participation

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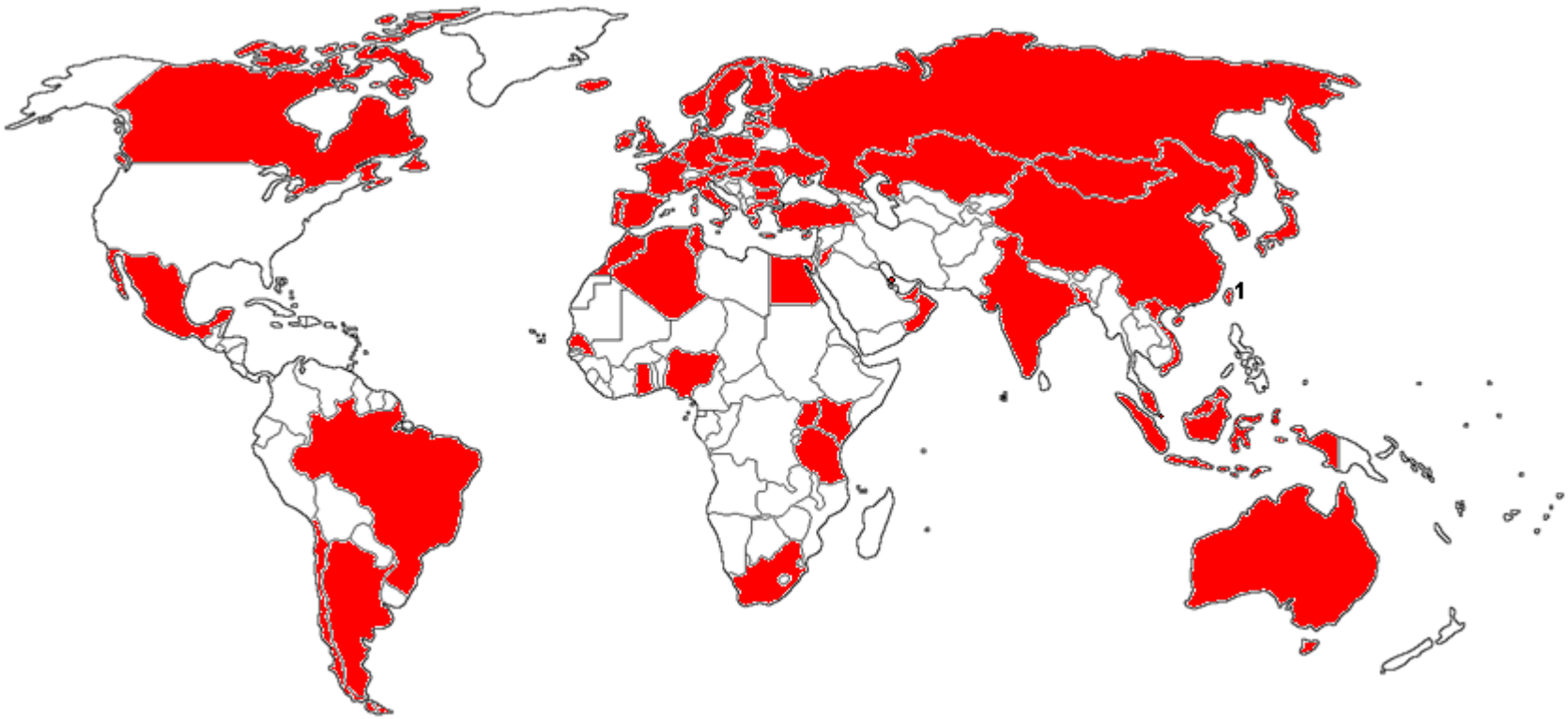
The Problem

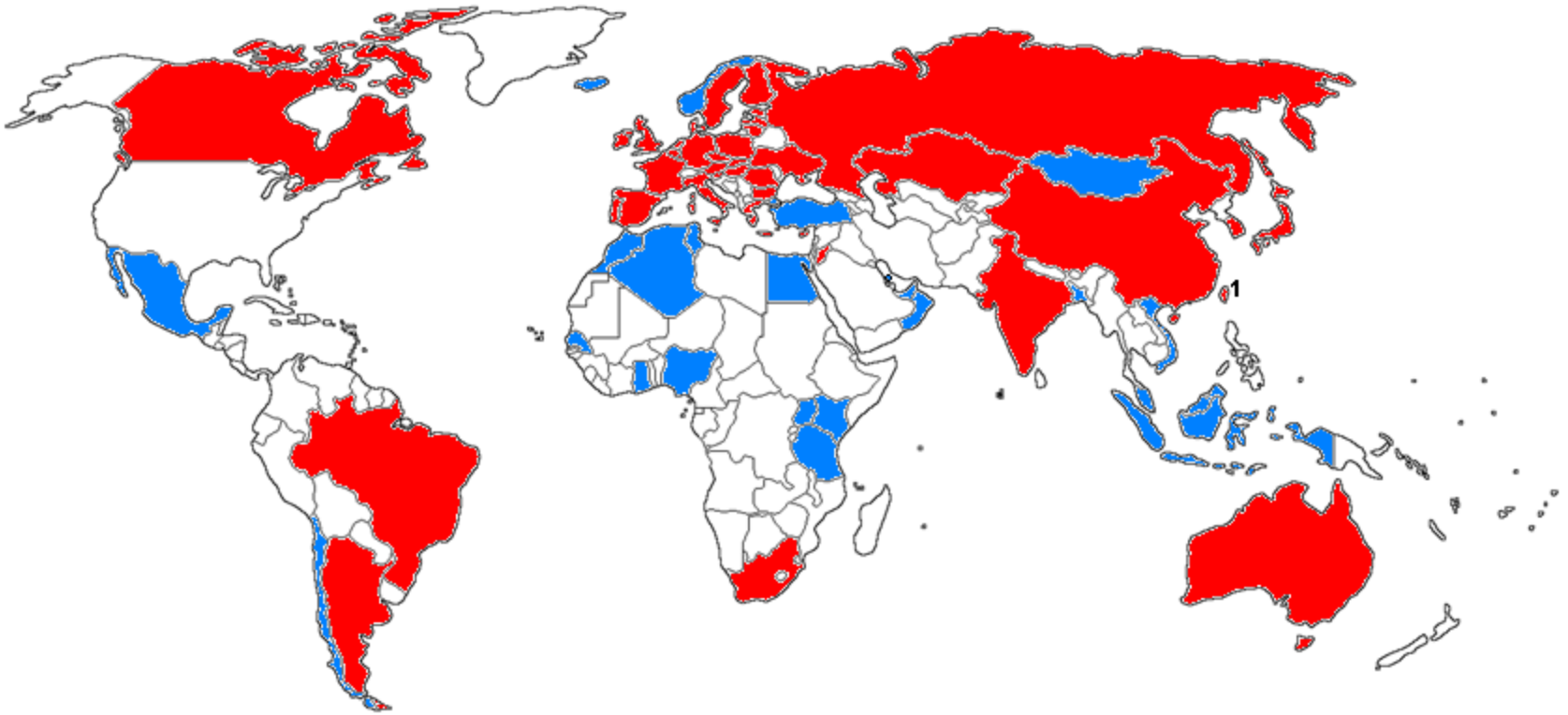
- NE-6 is not funded to engage in these activities.
- The extent of NE-6 international engagement without adequate funding is substantial but not nearly as effective as should be the case if they are to support president Obama's goals with respect to national security and domestic job creation.

Overall NE International Engagement



1 Engagement with American Institute in Taiwan led by State Department.

NE International Engagement

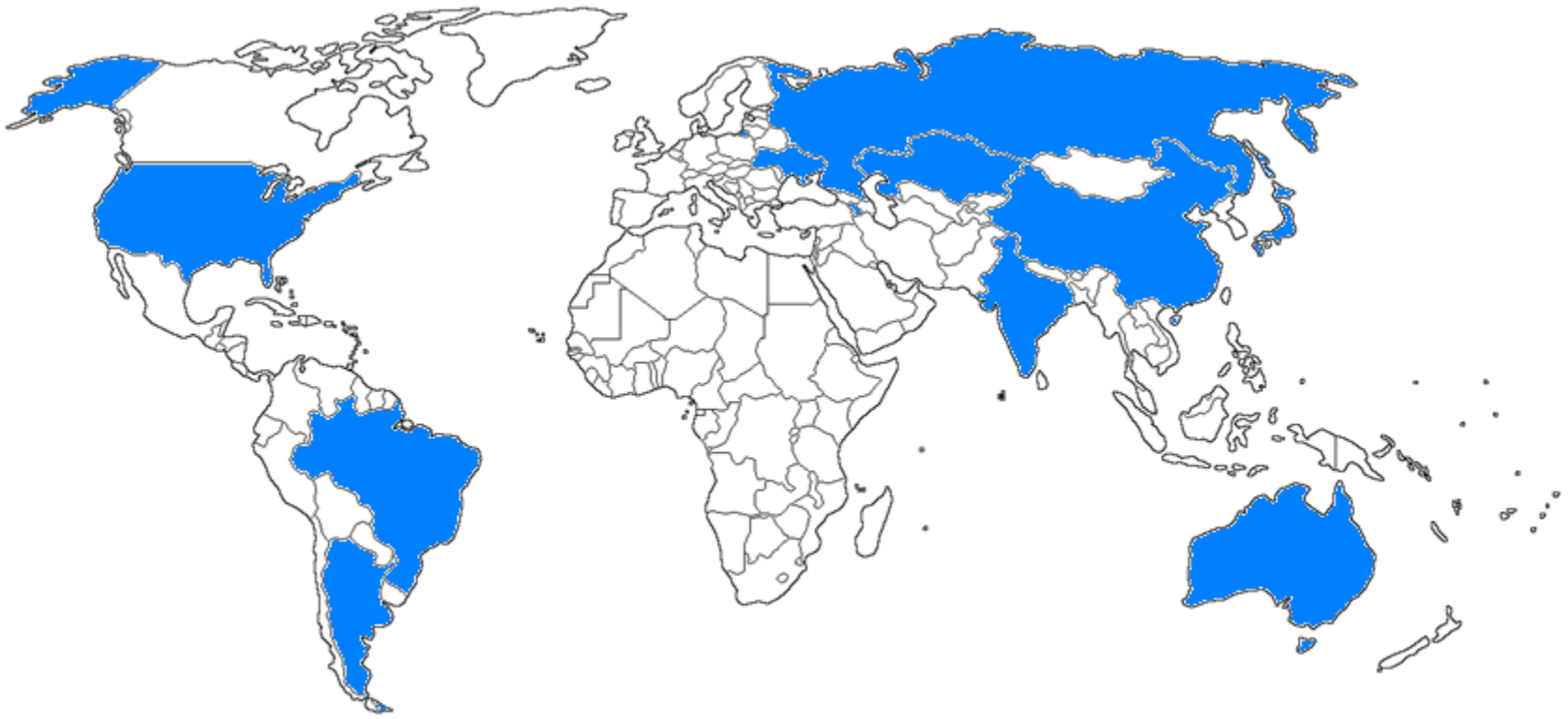


Bilateral Engagement [2] (INERIs, Working Groups & Action Plans, R&D Agreements, MOU, Trilateral Agreement, JSCNEC, PUNT)

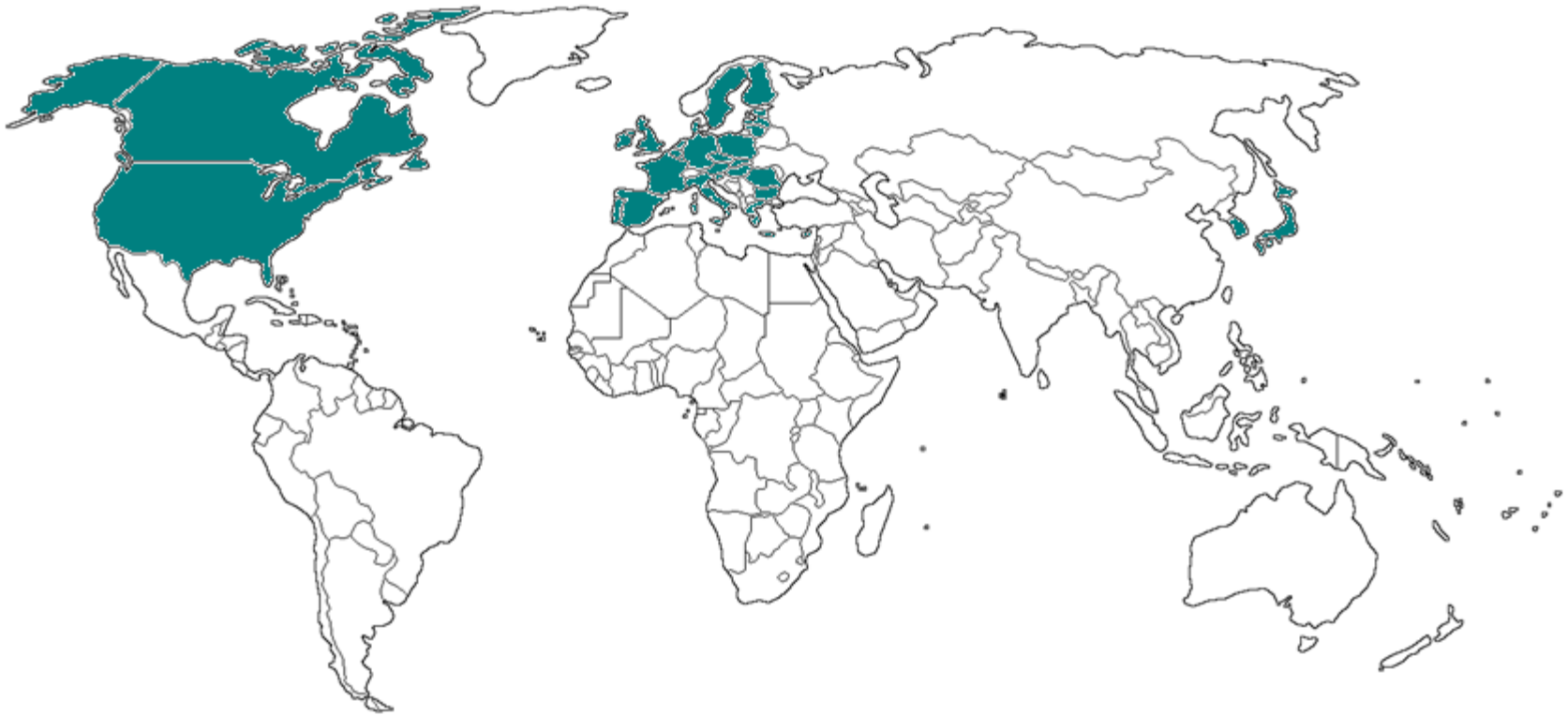
Exclusively Multilateral Engagement (IFNEC, GIF, OECD/NEA)

1 Engagement with the American Institute in Taiwan led by State Department. **2** Bilateral engagement does not preclude multilateral engagement.

Bilateral Working Groups & Action Plans

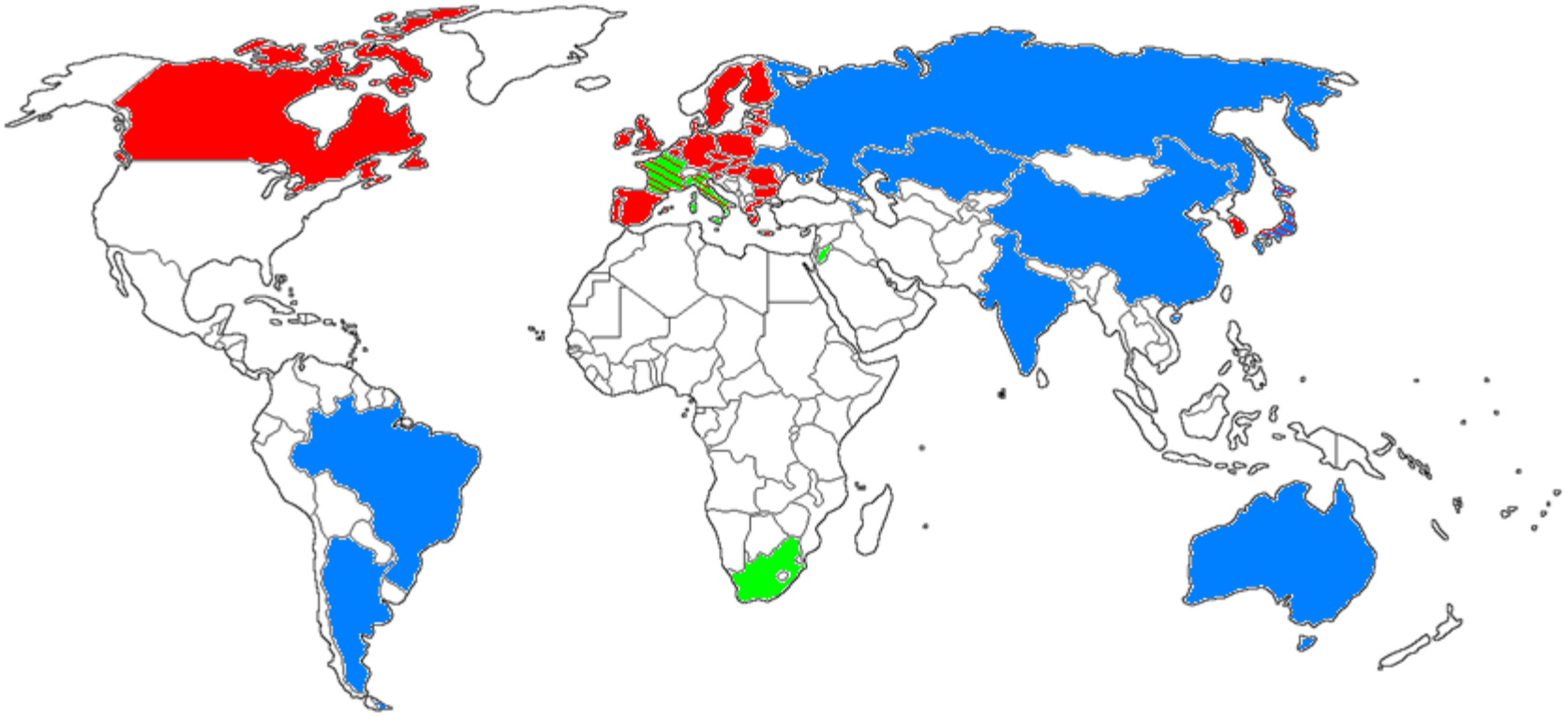


I-NERIs



Trilateral Agreement

All DOE / NE Bilaterals

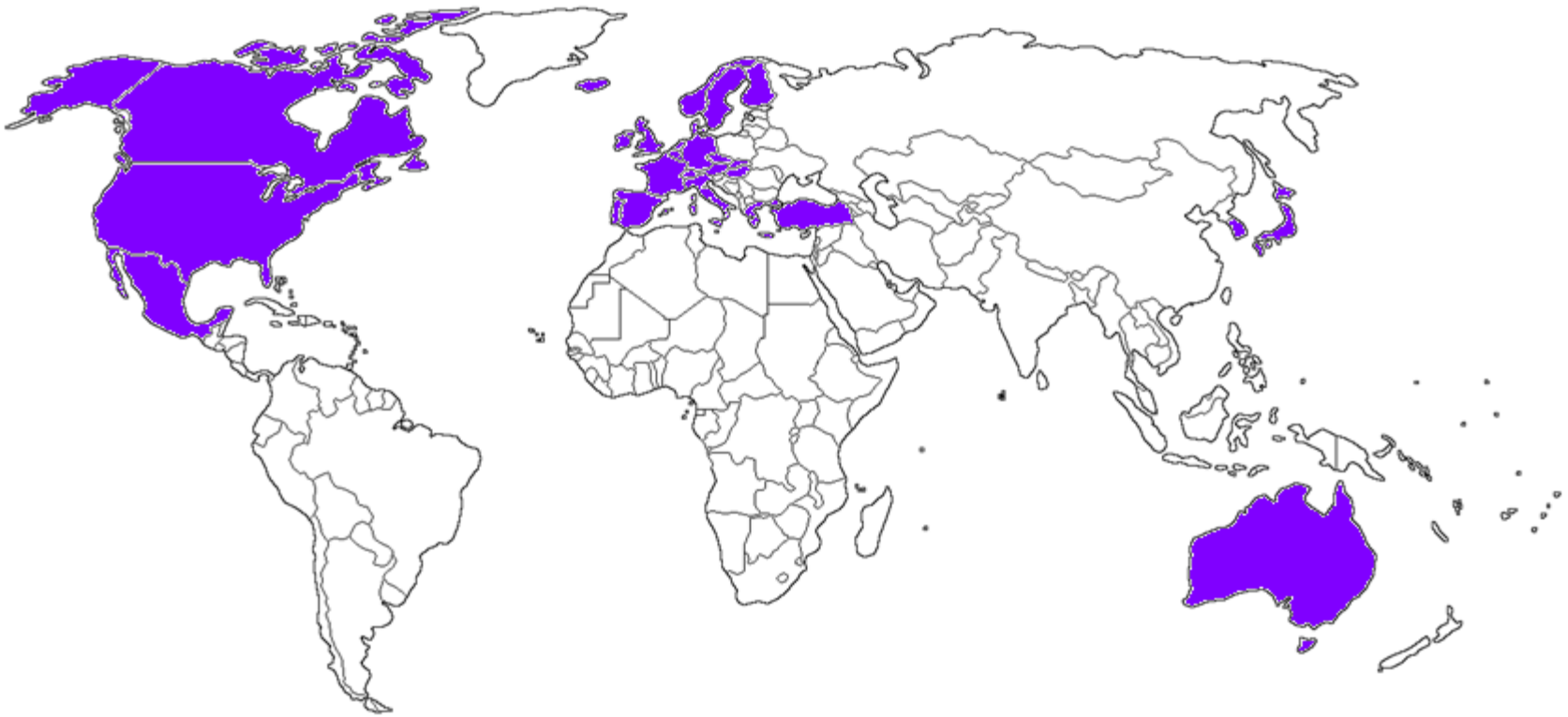


Bilateral Working Groups & Action Plans

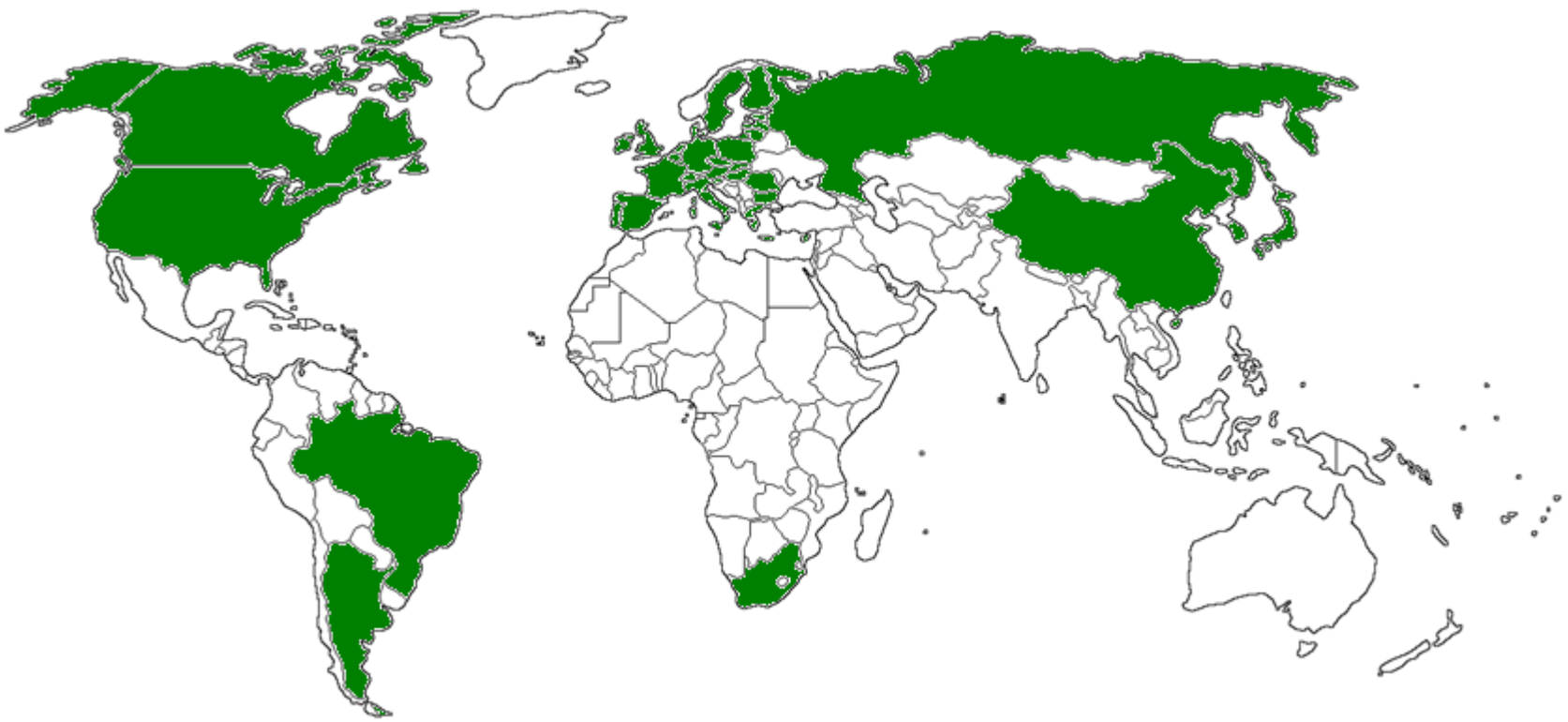
MOUs/R&D Agreements

I-NERIs

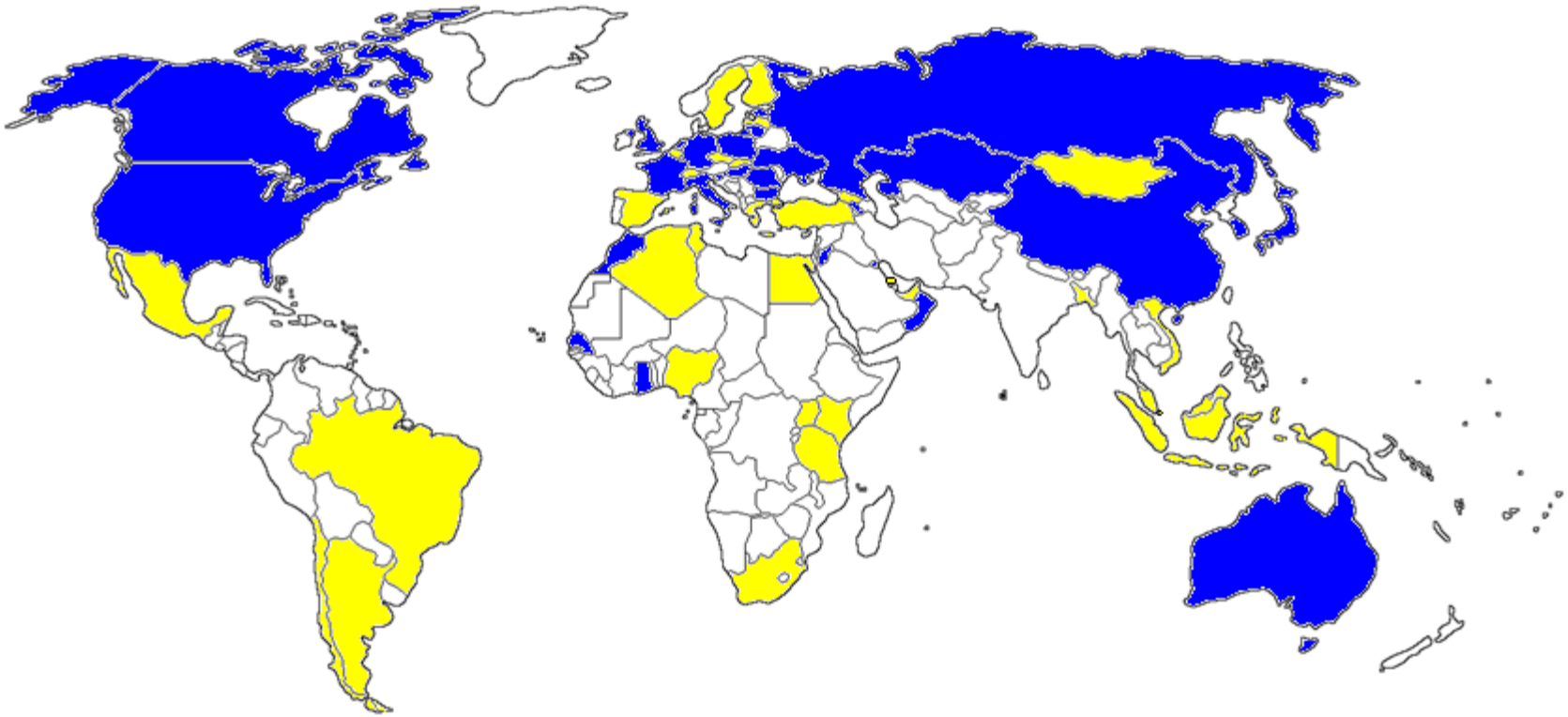
OECD / NEA



GIF



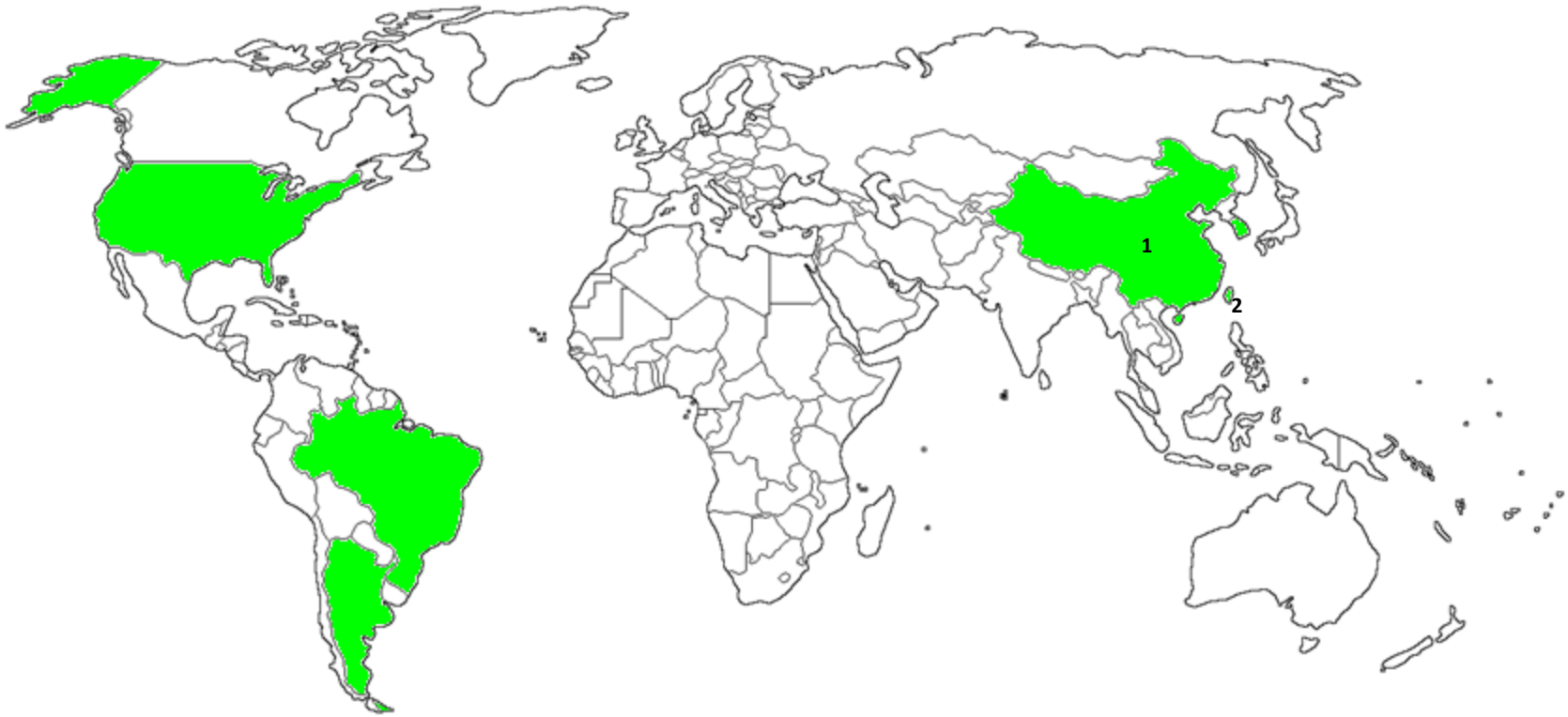
IFNEC



Participant Countries

Observer Countries

Joint Standing Committee on Nuclear Energy Cooperation (State Department)



1 China and the United States have a Peaceful Uses of Nuclear Technology (PUNT) Agreement instead of a JSCNEC; consequently the meetings are run by the Department of Energy rather than by the State Department.

2 This non-JSCNEC is with the American Institute in Taiwan – Taipei Economic and Cultural Representative Office (AIT-TECRO)

Next Steps

- NE-6 staff are preparing estimates of reasonable costs per type of engagement as a function of time in order to be credible and effective in the international arena.
- Marv Fertel has put together a very useful paper that discusses ways to improve U.S. commercial nuclear exports that makes several specific recommendations. A couple relate to specific “products” that industry would find helpful for DOE to implement as a package that would represent the USG’s commitment to supporting industry export efforts. (USA, Inc.). The costs of these engagements will have to be estimated.

Next Steps II

- The committee, working with NE staff, will analyze which current engagements are important to promote and what type of additional commitments are likely to emerge in the near to medium term.
- Based on this analysis the committee will recommend that NEAC send a letter to secretary Chu by the end of January requesting that he work with the other relevant cabinet officers to press OMB to fund this activity at the appropriate level.

Next Steps III

- The committee will seek to informally convene a meeting, with industry, of senior level USG officials (from, for example, NRC, NSC, Commerce, State, Ex-IM Bank, Treasury, OSTP), or to inject itself into currently ongoing discussions, to consider how collectively they might more aggressively support the President's goals of enhancing domestic job creation while improving the non-proliferation regime.