

NUCLEAR MATERIALS SECURITY BENCHMARKING PROJECT (OCTOBER 2011)

Project Goals:

The goals of the Nuclear Materials Security Benchmarking Project are to catalyze an international dialog on the key elements of a robust materials security program, and to produce an annual index that will assess the level of materials security on a country-by-country basis. The index will have an international perspective, use meaningful indicators, employ a rigorous and transparent methodology, and be framed positively so as to urge states to take appropriate steps to improve nuclear materials security.

Project Impetus:

Strengthening and maintaining nuclear materials security requires ongoing attention. Nuclear Security Summits provide opportunities for countries to find common ground and to make progress on nuclear materials security, but this model of high level government engagement may not be sustainable. To maintain focus on this critical agenda, the Nuclear Threat Initiative (NTI) and the Economist Intelligence Unit (EIU) have partnered to undertake a Nuclear Materials Security Benchmarking project. A benchmarking index will be produced that will highlight the current status of nuclear materials security. The *process* of creating the index will serve to initiate an important international dialog on priorities. Based on outreach to governments conducted to date, we are confident that many will find this project useful as they consider their next steps.

Approach:

The index will provide an assessment of the level of nuclear materials security for each country. The initial effort will focus on the security of highly-enriched uranium, separated plutonium, and the plutonium content in unirradiated mixed oxide fuel. Over 170 countries will be assessed and divided into two groups representing those with and without substantial amounts of nuclear materials (as defined below). A distinguishing factor is that this project will take into account the influence of a broad set of factors on materials security (e.g., societal factors and meeting global norms, in addition to the core elements of physical protection). When complete, we anticipate that the index will provide a public, comprehensive and common understanding of the state of nuclear materials security around the world.

Meaningful indicators and a robust and transparent methodology are central to achieving a respected index. An index is comprised of a set of indicators that, when taken together, reflect the country's overall nuclear materials security status. Therefore, selecting indicators that span the topic (i.e., no major element has been left out), and for which quantitative or qualitative assessments are possible, is critical. A fully transparent methodology will enable a wide range of stakeholders to contribute to improving subsequent editions of the index.

The Economist Intelligence Unit is leading the analytical elements of the research program. The EIU is a private, international research organization with global reach that routinely develops respected indices for other high-profile organizations (e.g., World Bank, the Gates Foundation and many national governments). As the research arm of The Economist Group, the EIU has a team of more than 120 full-time country specialists supported by an

international network of over 600 expert contributors. Through years of experience, they have developed approaches for identifying comprehensive and reliable indicators, addressing data gaps and statistical issues and conducting critical reviews of the results. Recognizing the unique challenges in developing a nuclear materials security index, the EIU is receiving expert guidance from technical advisors and a respected international panel of experts.

International Perspective:

Continued progress on nuclear materials security requires a stronger consensus on the threat and priorities for combating it. Reflecting this need, the index development process is structured to catalyze an international dialog on priorities. Recognizing the unique challenges in developing a nuclear materials security index, the EIU also received guidance from technical advisors and a respected international panel of experts. In consultation with NTI, the EIU brought together highly respected nuclear materials security experts in a panel featuring representatives from nuclear and non-nuclear weapon states, countries with and without materials and from developed and developing nations. The group comes from Australia, Brazil, China, India, Indonesia, Kazakhstan, Russia, South Africa, the United Kingdom, the United States as well as a representative from the World Institute for Nuclear Security (WINS) and a former International Atomic Energy Agency (IAEA) official. The role of the experts, however, was not to represent their country's interests or to score their country's performance. Instead, the experts first met in London in March 2011 to assist with the selection of indicators included in the index. They met again in Washington, D.C. in July 2011 to help prioritize each category and indicator using a system of weights. Panel members also provided detailed feedback on the preliminary data gathered by the EIU. Throughout the process, the international panel has ensured the index has an international point of view.

Scope:

More than 170 countries will be assessed across 18 indicators of nuclear materials security. The index will differentiate between states with kilogram or greater amounts of HEU (including spent fuel), separated Pu, and Pu content in unirradiated MOX and states that do not have nuclear materials. There are 32 countries that have kilogram or greater quantities of nuclear materials, where as there are 144 countries that do not. Recognizing the distinction between these two groups, countries without materials are evaluated across a subset of indicators. The index's scope may be expanded in future years to include other materials (e.g., LEU, radioactive sources).

Indicators:

NTI and the EIU developed a draft list of indicators which has been reviewed by the international panel of experts and technical advisors. The five categories of indicators include:

- Materials and Sites
- Materials Security
- Global Norms
- Domestic Commitments and Capacity
- Societal Factors

Below is a list of the indicators within each category.

1. MATERIALS	2. MATERIALS SECURITY	3. GLOBAL NORMS	4. DOMESTIC COMMITMENTS AND CAPACITY	5. SOCIETAL FACTORS
1.1 Total quantities of nuclear materials	2.1 On-site physical protection	3.1 International legal commitments	4.1 UNSCR 1540 implementation	5.1 Level of political stability
1.2 Number of sites with kilogram or greater quantities of nuclear materials	2.2 Control and accounting procedures	3.2 Voluntary commitments	4.2 Quality and scope of domestic nuclear materials security legislation	5.2 Corruption pervasiveness
1.3 Material production / elimination trends	2.3 Personnel and security infrastructure	3.3 Nuclear security and materials transparency	4.3 Safeguards adoption and compliance	5.3 Presence of group(s) known to be trying to acquire nuclear materials
	2.4 Physical security during transport		4.4 Independent regulatory agency	
	2.5 Response capabilities			

Indicators will be scored using publicly available primary and secondary sources; the EIU may also make use of expert judgment where appropriate. Assessments will be performed at the country – not facility –level. A key element of the research process is validation of the data that is collected. This will be achieved through a rigorous assessment by experts and governments. The 32 countries with nuclear materials will be offered an opportunity to review the data collected before the index is launched. Identified data gaps may form the basis for future research.

Launching the Index:

The first index is scheduled to be released on December 8, 2011. It will be accessible as part of a printed report as well as online. The printed report will include a narrative that provides the broader context for the nuclear materials security agenda (e.g., progress made to date), explores key themes, and recommends policy prescriptions. The report will be framed positively, and highlight those states that have made recent progress. Additionally, the report will include a findings and methodology section followed by the actual index. The online presence for the project will include a version of the index model where the weightings of categories and indicators can be changed and country profiles are available. The results of this project should be useful in the lead up to the next Nuclear Security Summit and beyond.

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APPENDIX: Country List

Based on a review of *Securing the Bomb—2010*, and taking into account recent developments and other reports, there are 32 countries that have kilogram or greater quantities of HEU (including spent fuel), and/or separated Pu, and/or Pu content in unirradiated MOX.

COUNTRIES WITH MATERIALS

Argentina	Hungary	Norway	Uzbekistan
Australia	India	Pakistan	Vietnam
Austria	Iran	Poland	
Belarus	Israel	Russia	
Belgium	Italy	South Africa	
Canada	Japan	Sweden	
China	Kazakhstan	Switzerland	
Czech Republic	Mexico	UK	
France	Netherlands	US	
Germany	North Korea	Ukraine	

For the purpose of this research, the Index will also assess 144 countries that possess less than kilogram quantities of nuclear materials or have no nuclear materials.

COUNTRIES WITHOUT MATERIALS

Afghanistan	Côte d'Ivoire	Jordan	Oman	Tanzania
Albania	Croatia	Kenya	Panama	Thailand
Algeria	Cuba	Kuwait	Papua New Guinea	Timor-Leste
Angola	Cyprus	Kyrgyz Republic	Paraguay	Togo
Armenia	Denmark	Laos	Peru	Tonga
Azerbaijan	Djibouti	Latvia	Philippines	Trinidad and Tobago
Bahamas	Dominican Republic	Lebanon	Portugal	Tunisia

Bahrain	Ecuador	Lesotho	Qatar	Turkey
Bangladesh	Egypt	Liberia	Romania	Turkmenistan
Barbados	El Salvador	Libya	Rwanda	Uganda
Belize	Equatorial Guinea	Lithuania	Samoa	United Arab Emirates
Benin	Eritrea	Luxembourg	São Tomé and Príncipe	Uruguay
Bhutan	Estonia	Macedonia	Saudi Arabia	Vanuatu
Bolivia	Ethiopia	Madagascar	Senegal	Venezuela
Bosnia and Herzegovina	Fiji	Malawi	Serbia	Yemen
Botswana	Finland	Malaysia	Seychelles	Zambia
Brazil	Gabon	Mali	Sierra Leone	Zimbabwe
Brunei	Gambia	Malta	Singapore	
Bulgaria	Georgia	Mauritania	Slovakia	
Burkina Faso	Ghana	Mauritius	Slovenia	
Burundi	Greece	Moldova	Solomon Islands	
Cambodia	Guatemala	Mongolia	Somalia	
Cameroon	Guinea	Montenegro	South Korea	
Cape Verde	Guinea-Bissau	Morocco	Spain	
Central African Republic	Guyana	Mozambique	Sri Lanka	
Chad	Haiti	Myanmar	Sudan	
Chile	Honduras	Namibia	Suriname	
Colombia	Iceland	Nepal	Swaziland	
Comoros	Indonesia	New Zealand	Sweden	
Congo (Brazzaville)	Iraq	Nicaragua	Syria	
Congo (Democratic Republic)	Ireland	Niger	Taiwan	
Costa Rica	Jamaica	Nigeria	Tajikistan	