The Fissile Material Challenge and the Conference on Disarmament

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IPFM
INTERNATIONAL PANEL ON FISSILE MATERIALS

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About the IPFM

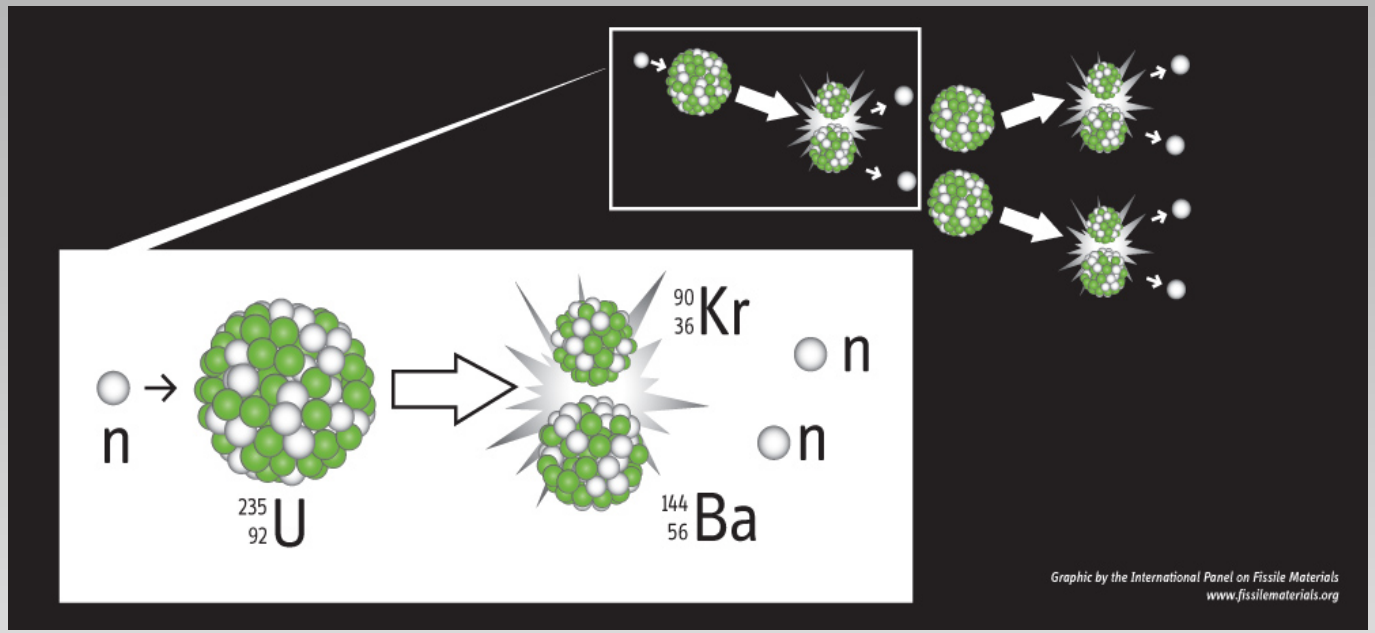
Mission: to provide the technical basis for policy initiatives to consolidate, and reduce stockpiles of fissile materials (highly enriched uranium and plutonium) and thereby help:

- Achieve irreversible nuclear-warhead reductions and lay the basis for disarmament,
- Strengthen the nonproliferation regime, and
- Reduce dangers of nuclear terrorism.

- 24 members from 17 states

Established Jan 2006 with MacArthur Foundation 5-year grant.

Nuclear explosives need fissile materials which are not found in nature



- Highly Enriched Uranium (HEU) – uranium with more than 20% uranium-235
  Weapons contain HEU typically over 90% enriched
  Enrichment plants are needed since natural uranium is 0.7% uranium-235

- Plutonium (mostly Pu-239) is produced in reactors and must be separated from radioactive spent fuel in a reprocessing plant

Modern thermonuclear weapon has about 4 kg of plutonium and 20 kg of HEU

Fissile-material stocks

Global stock of weapon-usable material is about 2000 tons

- about 1500 tons of highly enriched uranium (HEU)
- almost 500 tons of separated plutonium

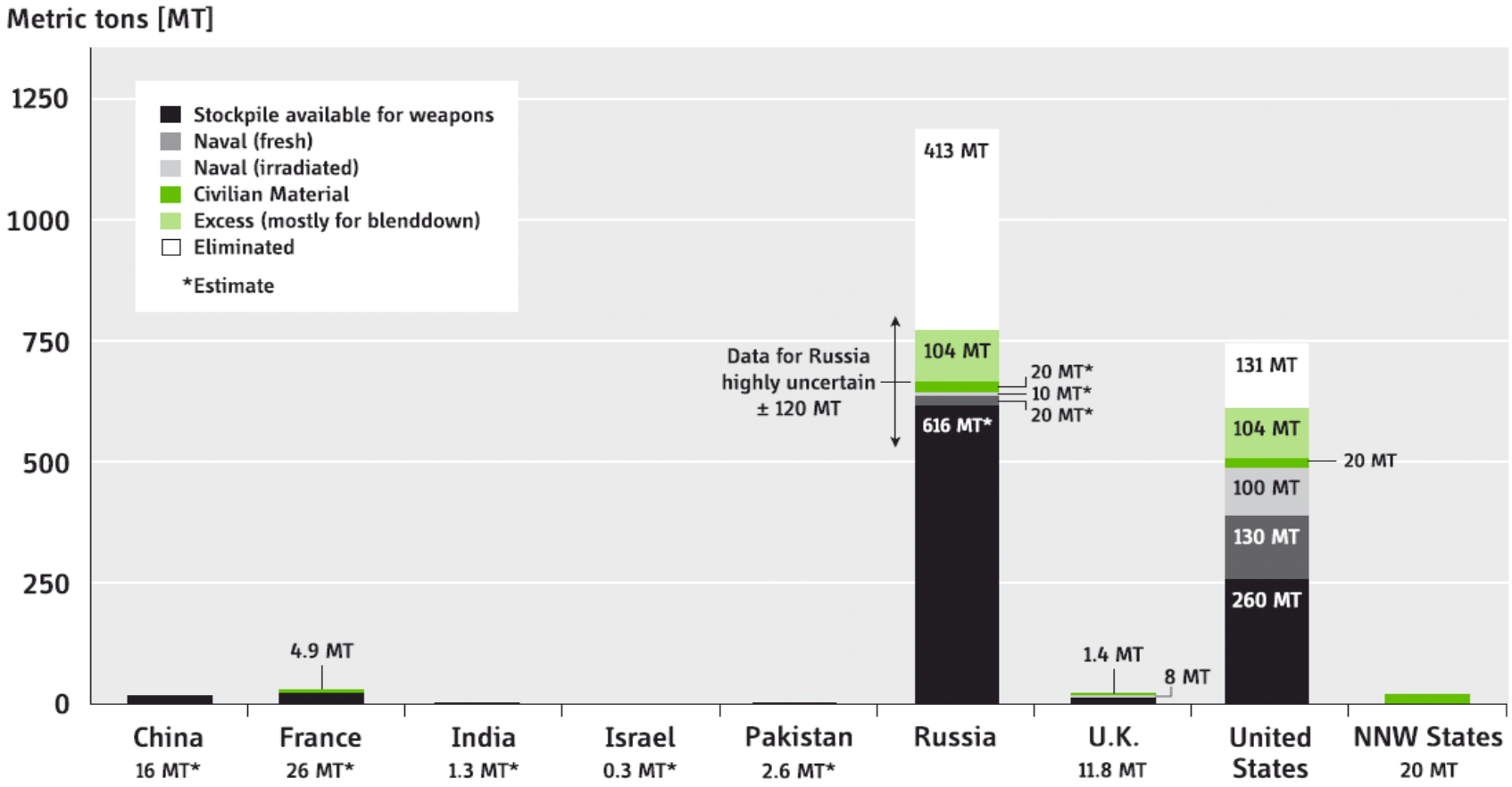
What are “stocks”?

- Weapons stocks [held by 9 states]
- Former weapons stocks declared as ‘excess’ [3 states]
- Naval and research reactor HEU fuel stocks [mostly naval – 4 states]
- Civilian stocks [mostly plutonium – 10-11 states]

HEU stockpiles, 2010

Global stockpile is about 1500 tons

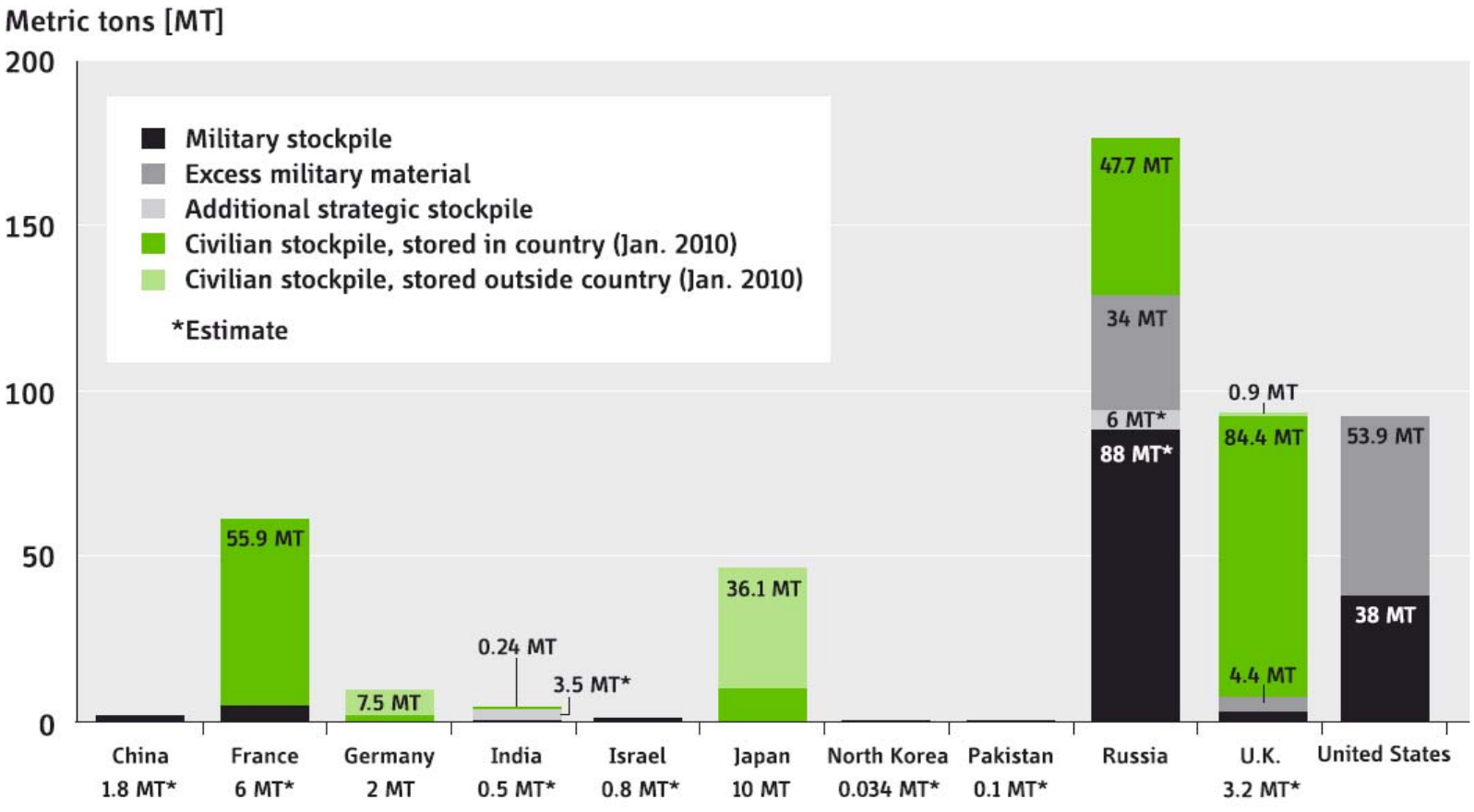
over 99% is in weapon states -- 95 % in Russia and U.S.



Stockpiles of separated plutonium, 2010

Global stockpile is almost 500 tons

half of this is civilian and this stock is growing



Fissile material production

Active production for weapons in only three states

- Israel
  - Dimona reactor (since 1960s)
- India
  - Dhruva reactor (CIRUS reactor shut in 2010, after fifty years)
  - Unsafeguarded power reactors and reactor-grade plutonium
  - new unsafeguarded reactors being built and planned
  - uranium enrichment (for nuclear submarine and possible weapons)
- Pakistan
  - 2 Khushab reactors
  - 2 Khushab reactors under construction
  - Uranium enrichment for weapons since 1970s

Pakistan blocks the FMCT at the CD

- Stocks – Pakistan will not accept a fissile material 'gap'
  - India's unsafeguarded reactor-grade plutonium stockpile
  - India's breeder reactor program can produce weapons plutonium
  - US-India nuclear deal allows India to expand its nuclear arsenal
- Size of arsenal – Pakistan aiming for a much larger arsenal
  - India's large conventional forces
  - India's plan for missile defenses
  - Triad: Pakistan Army, Air Force, Navy all have "Strategic Commands"
  - Nuclear establishment (SPD/PAEC) wants to grow
- Bargaining chip – a way to leverage parity with India
  - nuclear deal, like US-NSG-India deal to lift nuclear sanctions
  - Membership of export control groups (Nuclear Suppliers Group, etc.)

Taking the FMCT outside the CD?

- **US** – “If we cannot find a way to begin these [FMCT] negotiations in the CD, then we will need to consider other options.”
- **Russia** – "it is counterproductive to launch any discussions of the FMCT topic parallel to the CD due to the fact that they do not comprise all countries possessing military nuclear arsenals."
- **China** – “CD is the only and the best place to negotiate FMCT."
- **UK** – "The CD remains the best and only option for negotiating an FMCT with all of the key nuclear players. The inclusion of these key players in any treaty is essential..."
- **India** – "CD is the appropriate forum for negotiating the FMCT.“
- **Pakistan** – will not participate in non-CD negotiations on FMCT.

Getting Pakistan to allow and join FMCT talks

- Give Pakistan what it wants
  - Unacceptable to most states (especially nuclear weapon states).
- Force Pakistan to make hard choices
  - For US and others, the war against the Taliban is more important.
- UN Security Council Resolution 1172 (June 1998 – unanimous):
  - India and Pakistan "to stop … nuclear weapon development programs [and] further production of fissile material for nuclear weapons."
  - Urges India and Pakistan to participate .. in a positive spirit.. on the basis of the agreed mandate, in negotiations [at CD on FMCT];
  - *Requests the Secretary-General to report urgently to the Council on the steps taken by India and Pakistan to implement the present resolution;*
  - *Expresses its readiness to consider further how best to ensure the implementation of the present resolution;*
  - *Decides to remain actively seized of the matter.*

Lay the groundwork for a verifiable FMCT that can offer a path to nuclear disarmament

As a way to create the conditions for negotiating an effectively verifiable FMCT that is both a non-proliferation and a disarmament measure:

- Build trust in good intentions and a shared goal of disarmament
  - End nuclear complex and arsenal modernization programs
  - US, Russia, France, China and UK have modernization plans
- Develop verification approaches and technologies that can apply to an FMCT and also would contribute to verification of nuclear disarmament
- Create facts on the ground (behave as if FMCT were in force)
- Embed the FMCT in an explicit disarmament framework

Increasing transparency about fissile materials and nuclear weapons production

Nuclear weapon states could update and consider how to implement a multilateral version of the 1997 U.S. National Academy of Sciences proposal for a US-Russia data exchange about nuclear arsenals:

- description of facilities at which nuclear explosives have been designed, assembled, tested, stored, deployed, maintained, and dismantled, and which produced or fabricated key weapon components and nuclear materials; and the relevant operating records of these facilities.

- current location, type, and status of all nuclear explosive devices and the history of every nuclear explosive device manufactured, including the dates of assembly and dismantling or destruction in explosive tests.

The Future of U.S. Nuclear Weapons Policy, NAS, 1997, p.61.

Collaborative FMCT verification projects

- Develop bilateral, trilateral and multilateral cooperative projects (with IAEA) on nuclear archeology methods
- Window of opportunity for cooperative nuclear archaeology projects as US, UK, Russia, France and China all have shut-down production reactors and in some cases plans to dismantle them and to dispose of depleted uranium from HEU production.
- The weapon states might begin by each identifying one production reactor as a potential test bed for international studies to clarify the capabilities and limits of nuclear archaeology.
- Weapon states could provide access to legacy production and waste storage sites to international teams (including IAEA) to carry out measurements that would reveal the quantities and types of fissile materials produced there.

Start putting fissile material stocks under safeguards

Nuclear weapon states could begin to offer 'excess' weapon material, naval and civilian fissile material for IAEA safeguards

- U.S. and Russia reduced arsenals and declared fissile material "excess" (1993-94 for HEU, and 1996-2000 for plutonium)
  - US still has HEU and plutonium for 10,000 weapons
  - Russia still has HEU and plutonium for 20,000 weapons
- UK has cut arsenal to 160 deployed warheads but has fissile material for over 700 warheads and only a small amount of material declared excess
- France has reduced arsenal by 50%, to 300 warheads but declared no material excess
- China has not reduced weapons nor declared material excess

A framework convention on fissile materials as a path to disarmament

- A commitment to the elimination of nuclear weapons-usable fissile materials and the irreversible disposition under safeguards of these materials;
- Creation of a formal negotiating machinery for setting targets and deadlines for fissile material stockpile reductions;
- Establishment of an initial register of and targets for fissile material stocks;
- a regular public review, reporting, and implementation assessment procedure.
- Models for such Conventions are:
  - 1985 Vienna Convention for the Protection of the Ozone layer
  - 1992 UN Framework Convention on Climate Change