



## Ending Fissile Materials Production: A Fissile Material Cut-off Treaty and Beyond

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### Summary

*The stalled negotiation of a fissile materials cut-off treaty (FMCT) may finally be restarted by the setting up of a high-level expert preparatory group whose mandate is to make recommendations on substantial elements for a future treaty. Meanwhile, the world (except the nuclear weapon possessor states, and those states under the umbrella of extended nuclear deterrence arrangements) welcomed the adoption of the Treaty on Prohibition of Nuclear Weapons (Ban Treaty) in July 2017. Given the Ban Treaty prohibits production of nuclear weapons, the need for an FMCT would decline if the Ban Treaty were to be signed by states that can produce fissile materials for nuclear weapons ("capable states"). At present though, "capable states" are unlikely to sign the Ban Treaty and thus an FMCT remains important. Furthermore, as the global stockpile of fissile materials is increasing due to increased production for non-nuclear weapons use, including civilian nuclear power programs, the ban on the production of fissile materials should go beyond FMCT and include a ban on production for civil power generation. In order to minimize the risk of nuclear security and diversion of fissile materials, it is a good time to be thinking about banning the production of fissile materials for all purposes.*

### Introduction

1. A fissile materials cut-off treaty (FMCT) is a proposed international treaty to ban production of fissile materials [highly enriched uranium (HEU) and plutonium] for manufacturing of nuclear explosives. Countries that joined the Nuclear Non-Proliferation Treaty (NPT) as non-nuclear weapons states are already prohibited from producing such fissile materials for nuclear weapons. So the FMCT could provide new restrictions on the five NPT recognized nuclear weapons states (NWS: US, Russia, France, UK and China) under the NPT, as well as the four non-NPT nuclear weapons possessor states [Israel, India, Pakistan, and the Democratic People's Republic of Korea (DPRK)]. Another key difference between an FMCT and the NPT is that unlike the NPT division of States Parties into those who possess nuclear weapons and the rest, the FMCT would apply all restrictions equally to those who have and do not have nuclear weapons.

2. Although the negotiation of an FMCT has been stalled, informal discussion on the treaty has been making progress. In 2016 the United Nations General Assembly voted to establish a high level expert preparatory group whose mandate is to make recommendations on sub-

stantial elements for a future treaty.<sup>1</sup> This may create the opportunity to start negotiation of an FMCT.<sup>2</sup>

3. Meanwhile, on 7 July 2017, the Treaty on Prohibition of Nuclear Weapons (the “Ban Treaty”) was adopted at the UN General Assembly – a historic moment in nuclear disarmament. The treaty was opened for signature on 20 September 2017 and signed by 53 and ratified by 3 states in the following three weeks. The treaty will enter into force 90 days after ratification by 50 states. It is likely that the treaty will enter into force within a few years. Parties to the Ban Treaty undertake not to “develop, test, produce, manufacture, otherwise acquire, possess, or stockpile nuclear weapons” (Article 1, 1(a)).<sup>3</sup> Therefore, the Ban Treaty may reduce the need for an FMCT if all states who can produce fissile materials were to join it. However, so far, all nuclear weapons possessor states, as well as states under the nuclear umbrella (some of which can produce fissile materials) have made clear that their intention is not to join the Ban Treaty.

4. It should be noted also that the global stockpile of fissile materials is increasing primarily due to increase in plutonium production by civilian reprocessing programs.

5. Given this background, what are the prospects for FMCT negotiations? How will the adoption of the Ban Treaty affect such negotiation? Are there more effective ways to minimize the risks of fissile material stockpiles? These are the questions this paper addresses.

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<sup>1</sup> See paragraph 2 of UN General Assembly resolution 71/259, “Treaty banning the production of fissile material for nuclear weapons or other nuclear explosive devices” (A/RES/71/259, 23 December 2016), <http://undocs.org/A/RES/71/259>.

<sup>2</sup> See Daryl Kimball, “Fissile Material Cut-off Treaty (FMCT) at a Glance,” September 2017, <https://www.armscontrol.org/factsheets/fmct> for further discussion on the history of FMCT negotiations.

<sup>3</sup> “Treaty on the Prohibition of Nuclear Weapons,” 7 July, 2017, A/CONF.229/2017/8, <http://www.reachingcriticalwill.org/images/documents/D disarmament-fora/nuclear-weapon-ban/documents/TPNW.pdf>.

## Lack of Progress in FMCT Negotiations: Major Issues and Barriers

6. The FMCT was originally proposed by US President Bill Clinton in 1993 at the UN General Assembly. The UN Conference on Disarmament (CD) is the forum where discussion on the FMCT is taking place, but official negotiations for an FMCT have not yet commenced. The CD requires consensus for action to take place, and there are certain number of countries that are unwilling to allow negotiations to start. There are two highly contested issues in the current consideration of what an FMCT might require: one is the question of whether the treaty should address existing stockpiles or only future production; the other is the required verification procedures.

7. Pakistan is one of the main countries blocking negotiations, primarily for the first reason: it wants past stocks to be considered as well as future production. According to Asma Khalid, Research Associate at Strategic Vision Institute, Islamabad, Pakistan blocked the negotiations on the FMCT, “strictly following [its] ... stance that pre-existing stockpiles should be included in the draft of FMCT before negotiations.”<sup>4</sup> Pakistan supported the so-called “Shannon Mandate” (1995)<sup>5</sup> because “it will help to deal with the pre-existing stocks of fissile material.” Pakistan argues that extensive difference between India and Pakistan’s fissile material stockpiles could “erode the nuclear deterrence

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<sup>4</sup> Asma Khalid, “Pakistan’s policy on FMCT,” *Daily Times*, 6 February 2017.

<https://dailytimes.com.pk/30539/pakistans-policy-on-fmct/>.

<sup>5</sup> “Report of Ambassador Gerald E. Shannon of Canada on Consultations on the Most Appropriate Arrangement to Negotiate a Treaty Banning the Production of Fissile Materials for Nuclear Weapons or Other Nuclear Explosive Devices,” CD/1299, 24 March, 1995. It says, “During the course of my consultations, many delegations expressed concerns about a variety of issues relating to fissile material, including the appropriate scope of the Convention. Some delegations expressed the view that this mandate would permit consideration in the Committee only of the future production of fissile material. Other delegations were of the view that the mandate would permit consideration not only of future but also of past production. Still others were of the view that consideration should not only relate to production of fissile material (past or future) but also to other issues, such as the management of such material.”

<https://documents-dds-ny.un.org/doc/UNDOC/GEN/G95/610/27/PDF/G9561027.pdf?OpenElement>

stability in the region because there is no doubt that India will use its fissile material stocks to manufacture the nuclear weapon.” Pakistan simply cannot “agree to accept or freeze the inequality.” Pakistan also has concerns on the term “FMCT” because “cut-off” means a mere halt in future production whereas the actual objective of the treaty is to ban the production and the stockpiling of fissile material.

8. Most of the Non-Aligned countries, such as Syria, Iran and Egypt, are also supporting Pakistan’s position. Some argue that the FMCT should be FMT, excluding the term “cut-off” as the treaty should not only ban future production but also deal with existing stockpiles (i.e. past production) of fissile materials.

9. The second issue is verification procedures. On 18 May 2006, the Bush Administration submitted to the CD a draft text of an FMCT without any provisions for international verification, arguing that effective verification would be impossible “even with extensive verification mechanisms and provisions – so extensive that they could compromise the core national security interests of key signatories, and so costly that many countries would be hesitant to implement them.”<sup>6</sup> In 2008, an independent study group, the International Panel on Fissile Materials (IPFM) issued a report on scope and verification of a FMCT.<sup>7</sup>

10. The IPFM argued that the FM(C)T<sup>8</sup> should contain verification provisions because:

- Agreed verification measures have been considered by the parties to be essential to creating confidence and trust for virtually all treaties pertaining to nuclear weapons.
- The non-nuclear-weapon NPT State Parties have accepted comprehensive in-

ternational verification of their commitments under that treaty. Many of these states have repeatedly expressed concerns that, by not requiring parallel verification in the NPT NWS, the treaty puts the non-NWS at a competitive disadvantage in the development of civilian nuclear power. A verified FM(C)T would go far towards redressing this inequity.

- Interest in nuclear disarmament has recently revived. Much deeper cuts in the nuclear stockpiles will require intrusive inspections in the NWS. International verification of a FM(C)T would be a step in the process of establishing a verification system for fissile materials in the NWS.

11. By analyzing the current verification scheme under the NPT, the IPFM concluded that in principle, verification of an FM(C)T in the civilian sectors of the NWS could be based on the NPT verification procedures. But they also noted that some of these procedures may be difficult to implement quickly in the NWS. The IPFM argued that the FMCT and NPT verification regimes should converge. But it also stated that there would be special challenges in NWS relating to excess fissile materials in “classified forms” (that is, forms that reveal secret information on weapons design) and inspections in military nuclear facilities.

12. In order to overcome these issues, a number of proposals were reviewed including the following suggestions put forward by South Africa:<sup>9</sup>

- Material declared as excess should be included in a starting inventory of a state upon the treaty’s entry into force, and be subject to verification without an obligation to declare “completeness and correctness” of historical production.

<sup>6</sup> “United States of America: White Paper on a Fissile Material Cutoff Treaty,” U.S. Mission to the United Nations in Geneva, Press Release, 18 May 2006. <https://2001-2009.state.gov/t/isn/rls/other/66901.htm>

<sup>7</sup> International Panel on Fissile Materials (IPFM), “Global Fissile Material Report 2008: Scope and Verification of a Fissile Material (Cutoff) Treaty,” <http://fissilematerials.org/library/gfmr08.pdf>.

<sup>8</sup> FM(C)T denotes either of both variants: a fissile materials cut-off treaty (FMCT) or a fissile materials treaty (FMT).

<sup>9</sup> Jean du Preez, “Fissban Sans ‘C’: A South African Perspective”, in IPFM, “A Fissile Material (Cutoff) Treaty and its Verification: Progress Report from the International Panel on Fissile Materials,” 2 May 2008, Geneva, <http://fissilematerials.org/library/ipfmbriefing080502.pdf>.

- Additional excess material produced would be added to the starting inventory in an irreversible way.
- Some excess material in sensitive geometrical or compositional form would rule out *direct* verification, but alternative verification approaches have been developed.
- Declared excess materials converted such that they were no longer in sensitive forms could be introduced into the verification system as new material. For example:
  - HEU could be blended down for use in reactors;
  - Plutonium could be used for production of mixed oxide (MOX) fuel as the need arises;
  - Plutonium could be mixed with high-level radioactive waste for direct disposal;
  - Remaining materials would be stored under normal verification conditions.

13. Japan, with rich experience of safeguards of civilian nuclear programs, especially with safeguards of large reprocessing plant, can play an important role in developing the verification procedures and systems that will be required by an FMCT.

### The Ban Treaty and FMCT

14. How will the adoption of the Ban Treaty impact FMCT negotiations? Since the Ban Treaty prohibits the production of nuclear weapons, it will have the effect of banning the production of fissile materials for weapons purposes. Accordingly, the need for an FMCT could be eliminated once all “capable states” join the Ban Treaty. However, in reality, it is very unlikely that all states with nuclear weapons or with technical capability to produce fissile materials will join the Ban Treaty in the foreseeable future. Therefore, an FMCT is still very important for nuclear disarmament and the management of fissile materials.

15. In fact, an FMCT and the Ban Treaty could reinforce each other well. For example, negoti-

ation of verification procedures for the FMCT could help to design the verification procedures for the Ban Treaty also. Dealing with existing stockpiles of nuclear weapons and fissile materials by the Ban Treaty could also be useful in resolving obstacles in the FMCT negotiations.

16. Therefore, countries that are strong advocates of an FMCT, such as Japan, can work with states that are in favor of the Ban Treaty to promote negotiation of an FMCT. This is one of the “bridging roles” between NWS and non-NWS that Japan has been advocating.

### Ending Production, and Elimination, of Fissile Materials

17. Even if we are very successful and an FMCT is eventually adopted, risks posed by fissile materials may remain. In order to eliminate such risks, it is important to consider the risks surrounding existing stockpile of fissile materials for “all purposes” (including civilian ones). As of the end of 2015, global stockpile of HEU is estimated to be 1,338.6 tonnes, which is more than 20,000 bombs equivalent to the Hiroshima bomb (64kg/bomb). And only about 10 per cent of this stockpile is civilian. The HEU stockpiles have been declining: military stockpiles were reduced by 82 tonnes in the last ten years; and civilian stockpiles were reduced by 310 tonnes in the same period.

18. Meanwhile, total plutonium stockpiles amount to about 511.4 tonnes, which is more than 85,000 bombs equivalent to the Nagasaki bomb (6kg/bomb). Unlike HEU, more than 70 per cent of this stockpile is in “non-military” uses (including excess plutonium declared by NWS). Unfortunately, the total plutonium stockpile has been increasing. Military stockpiles were reduced by about 10 tonnes in the last ten years, however civilian stockpiles were increased by 28.6 tonnes in the same period. Combining the plutonium and HEU stockpiles we still have more than 106,000 bombs equivalent in the world.<sup>10</sup>

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<sup>10</sup> Research Center for Nuclear Weapons Abolition, Nagasaki University (RECNA), “A World of Potential Bombs Fissile Material Inventory,” June 2017.

19. It is clear that we need to stop production of fissile materials and eventually eliminate all stockpiles.

20. Ending production of fissile materials for all purposes (including civilian ones) would be very difficult as Article IV of NPT acknowledges the “inalienable right” of member states to develop civilian nuclear technologies, including production capability of fissile materials for peaceful purposes. But, only a handful of countries continue to produce HEU and plutonium for civilian purposes. At the 2014 Nuclear Security Summit, participating countries agreed to the communique, which says: “We encourage States to minimize their stocks of HEU and to keep their stockpile of separated plutonium to the minimum level, both as consistent with national requirements.”<sup>11</sup> This is an encouraging sign and a significant step towards stopping production of fissile materials for all purposes. It is time to consider such an agreement.

21. Another important milestone in this regard is the Joint Comprehensive Plan of Action (JCPOA) agreed between Iran and P5+1 (US, Russia, France, UK, China and Germany). In the JCPOA, Iran agreed that “for 15 years Iran will not, and does not intend to thereafter, engage in any spent fuel reprocessing or construction of a facility capable of spent fuel reprocessing.”<sup>12</sup> Although Iran has maintained its “inalienable right” of civilian technology development, at least Iran will not engage in reprocessing, that is, production of plutonium for 15 years or more.

22. This could be a good model for future regional agreements, such as in Northeast Asia, to halt future production of plutonium. In Northeast Asia, Japan is the only non-NWS and NPT member state which has a large plutonium stockpile (47 tonnes as of the end of 2016) and still plans to continue reprocessing. It is a good time for Japan to reconsider its reprocessing policy and to contribute to minimizing the

global stockpile of plutonium. It would be more desirable for the international community to agree to end (or at least adopt a moratorium on) production of fissile materials for all purposes.

## Conclusion

23. An FMCT is one of the important proposed treaties for nuclear disarmament and it deserves renewed attention, given the fact that the Ban Treaty is adopted and the risks associated with fissile materials remain high and may be becoming higher. Only a handful of countries continue to produce fissile materials for both military and civilian purposes. It is a good time to pay more attention to fissile materials management and to restart FMCT negotiations. It is important to note that FMCT and the Ban Treaty can reinforce each other. Finally, given the fact that the total inventory of fissile materials, especially plutonium for civilian purposes, has been increasing, it is also important for international community to start thinking seriously about ending and eliminating both the production and stockpiles of fissile materials for all purposes including civilian.

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<http://www.recna.nagasaki-u.ac.jp/recna/en-nuclear/a-world-of-potential-bombs-fissile-material-inventory>.

<sup>11</sup> “The Hague Nuclear Security Summit Communique,” 25 March 2014, <http://www.mofa.go.jp/files/000135986.pdf>.

<sup>12</sup> “Joint Comprehensive Plan of Action,” 14 July 2015, <https://www.state.gov/documents/organization/245317.pdf>.

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