Steps toward a Middle East zone Free of nuclear weapons and materials and of national enrichment plants

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Report at ***www.fissilematerials.org***

We have used 1991 UN study's working definition of the zone: Arab League + Iran + Israel

Steps we propose also should be adopted globally

1. Ban plutonium separation and use

- No economic or environmental justification
- Japan only non-weapon state separating plutonium today. Being debated because it will make nuclear power in Japan $100 billion more costly over 40 years.

2. End use of highly-enriched uranium (HEU) fuel

Only 3 HEU-fueled research reactors in Middle East today.

One (in Israel) being shut down. Two others supplied by China to Iran and Syria contain only 1 kg of HEU each and can be converted to low-enriched uranium.

Strengthen nonproliferation regime (cont.)

3. No enrichment of uranium above 6 percent U-235

–Power reactors use uranium enriched to less than 5% today.

–France even fuels its naval nuclear reactors with 6% enriched LEU

–Almost all research reactors fueled with 19.75% uranium are fueled with blended down excess weapons HEU and could be for decades.

4. No national enrichment plants

- International control proposed by Acheson-Lilienthal in 1946
- Multinational control, including in weapon states, proposed in 2003 by IAEA Director General Mohammed ElBaradei
- Urenco is multinational and today operates enrichment plants in Germany, Netherlands, UK and USA. France uses Urenco centrifuges on a "black-box" basis, i.e. without technology transfer.

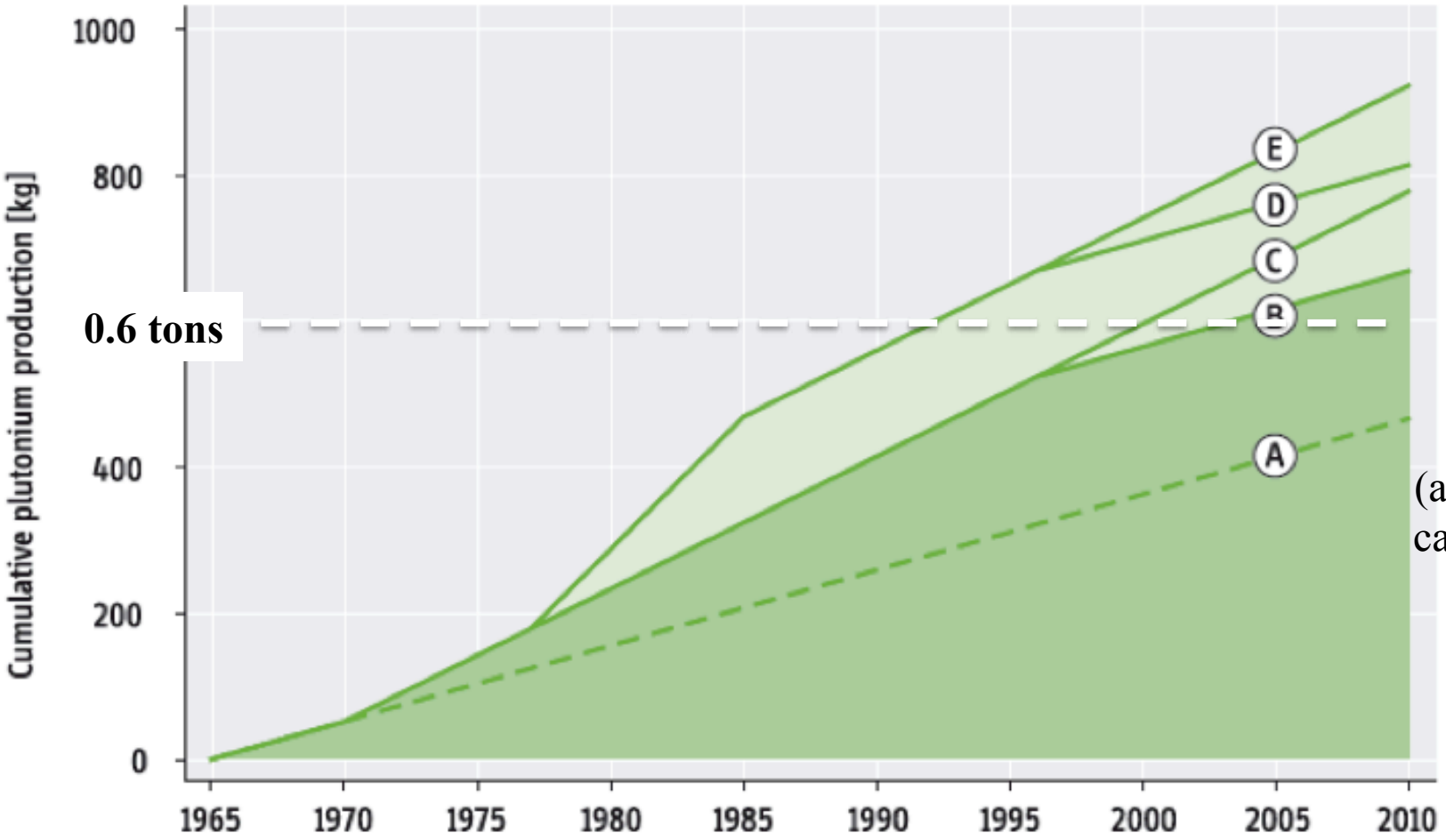
Freeze, declare and then step-by-step reductions of Israel's stocks of plutonium and HEU

Negev Nuclear Research Center near Dimona.

- Plutonium production reactor
- Reprocessing plant
- Enrichment plant?

Estimated size of Israel's plutonium stockpile depends upon history of the Dimona reactor's thermal power output. HEU stockpile probably small

(IPFM, *Global Fissile Material Report 2010*)



Megawatts (thermal)

≤140

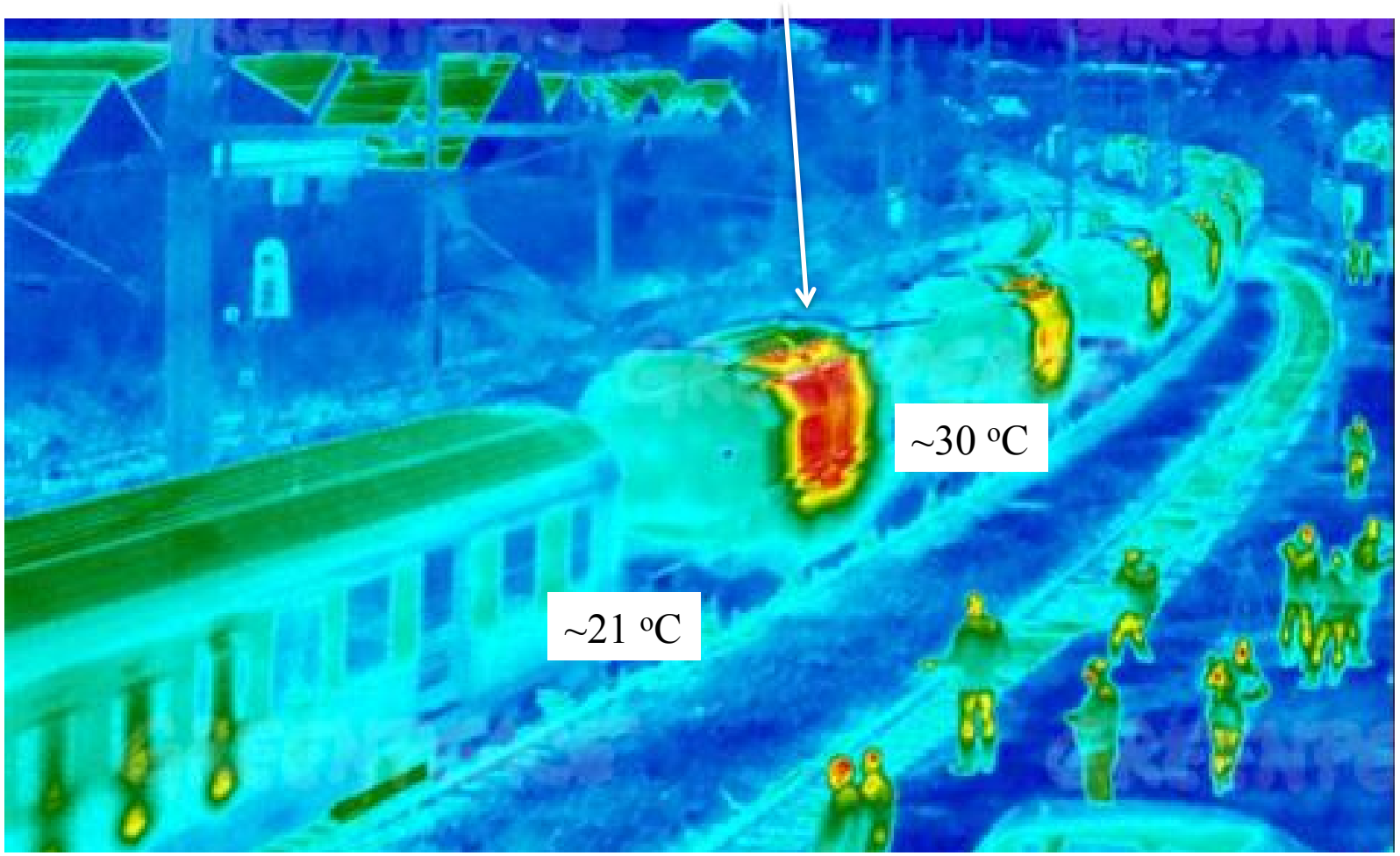
≤70

≤40

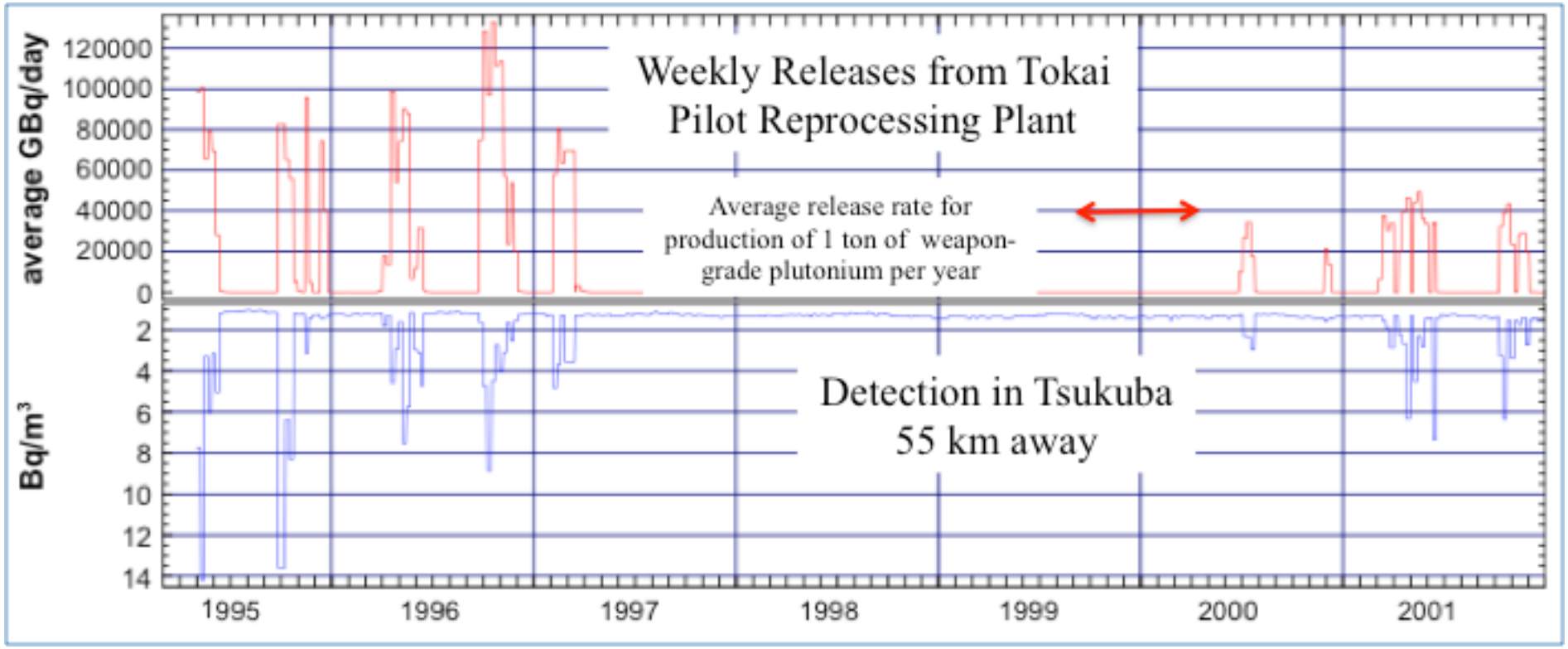
(assuming 75% capacity factor)

If Israel turned off its ~70 MWt reactor, could be detected with infrared sensors on aircraft or in space

(*~35 kWt from spent fuel cask – Greenpeace*)



If Israel did not shut down its reprocessing plant, could be revealed by down-wind detection of gaseous fissile product, krypton-85, released when irradiated uranium fuel is dissolved.



On-site verification

IAEA

- Comprehensive safeguards agreements on nuclear activities (all but Djibouti, Somalia and Israel already have CSAs)
- Additional protocols (all but above plus Egypt, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, Syria and Yemen have APs)

Regional verification organization

(like Euratom or Brazil-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC)]

- Needed because of history of NPT violations in Middle East
- Also could be an umbrella for multinational enrichment
- Also could deal with regional verification of CWC and BWC

Summary

A Middle East without:

- separated plutonium or HEU,
- reprocessing plants or
- national enrichment plants would be

1) Free of near-breakout nuclear-weapons programs,

2) A good model for a stable world without nuclear weapons.