



IAEA

International Atomic Energy Agency

Atoms for Peace

International overview of ISL uranium mining operations

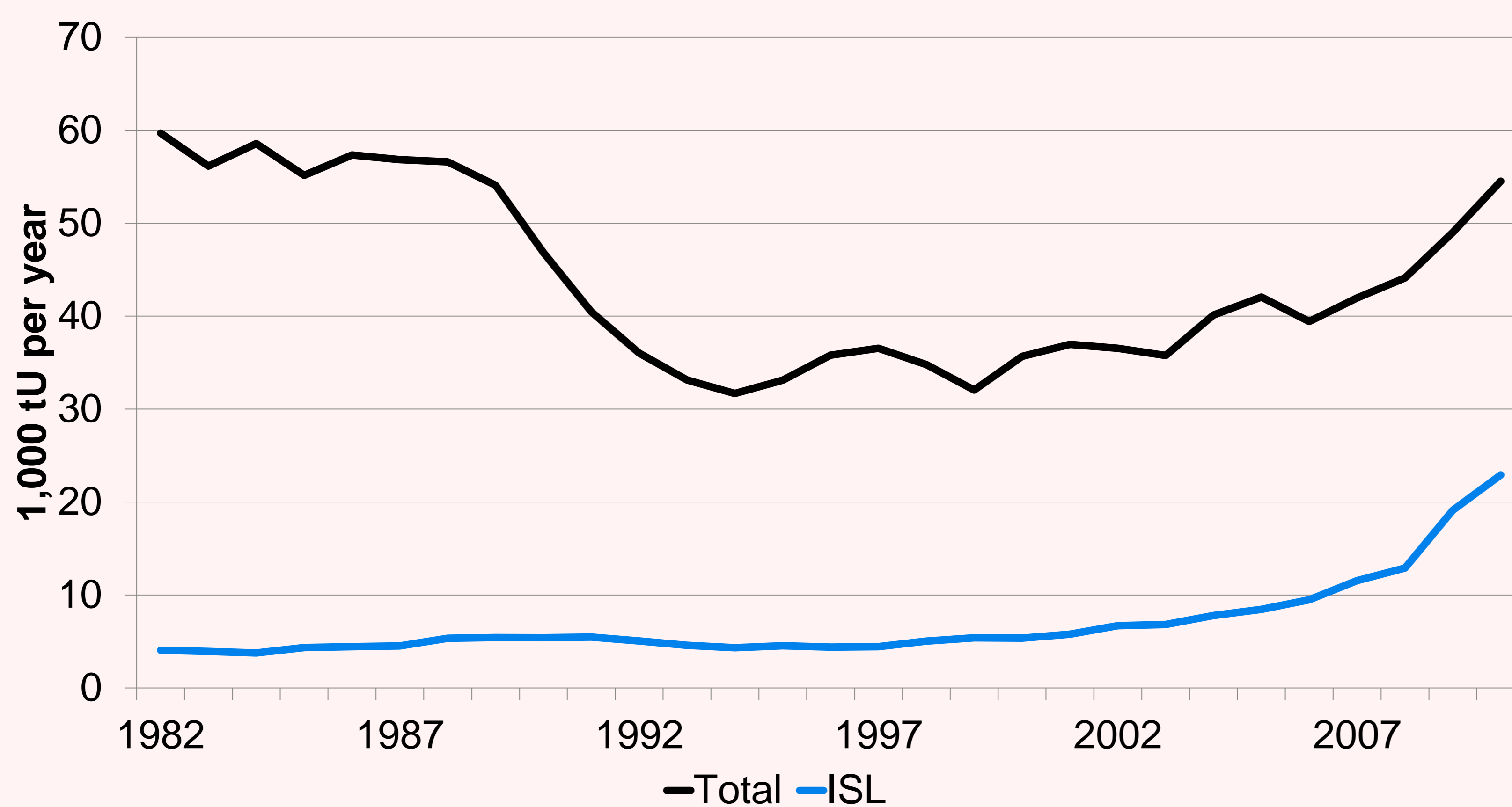
Peter Woods¹, Thomas Pool², Vladimír Beneš³, Olga Gorbatenko⁴, Bryn Jones⁵, Horst Märten⁶, Igor Solodov⁷, Jan Slezak¹

¹ International Atomic Energy Agency, Vienna, Austria; ² International Nuclear Inc, Golden, Colorado, USA; ³ DIAMO/Consultant, Liberec, Czech Republic; ⁴ Kazatomprom, Astana, Kazakhstan; ⁵ Uranium Equities, Perth, Western Australia, Australia; ⁶ Umwelt- und Ingenieurtechnik GmbH Dresden, Germany/Heathgate Resources Pty Ltd, Adelaide, South Australia, Australia; ⁷ ARMZ Uranium Holding Co., Moscow, Russian Federation

ABSTRACT

In situ leach (ISL; also called in situ leaching or in situ recovery, ISR) mining has become one of the standard uranium production methods, following early experimentation and production in the 1960s. Its application to amenable uranium deposits (in certain sedimentary formations) has been growing in view of its competitive production costs and low surface impacts. In 1997 the ISL share in total uranium production was 13%; by 2009 it had grown to over 30%, reaching 46% in 2011. In the past, ISL technology was applied mainly in Ukraine, the Czech Republic, Uzbekistan, Kazakhstan, Bulgaria and the USA. Recently it has been used in Kazakhstan, Uzbekistan, the USA, Australia, China and the Russian Federation, with small operations or experiments elsewhere. ISL mining is gaining widespread acceptance.

World and ISL Production



As with any mineral, ISL-amenable uranium deposits are where you find them. Only certain styles of uranium deposit are suited, mostly sandstone-hosted; however, other key characteristics apply and not all sandstone-hosted uranium deposits are suitable for ISL mining.

The IAEA is preparing an overview document to show how ISL experience around the world can be used to direct the development of technical activities, taking into account environmental considerations and an emphasis on the economics of the process, including responsible mine closure.

The document is based on Technical Meetings held in Vienna, Austria: 7–9 June 2010 and 15–18 April 2013, and Consultants' Meetings also held in Vienna: 12–14 April 2010 and 19–21 November 2012. The authors are listed above.

With this document Member States and interested parties will have more information to design and efficiently and safely regulate current and future projects, with a view to maximize economic performance and minimize negative environmental impact. The report's findings will provide a summary of the IAEA's involvement in ISL over recent decades. Many reference links will be provided to allow access to voluminous additional information.

The document is in the late stages of internal IAEA review and should be released in late 2014 or early 2015. Presentations from the IAEA's ISL technical meeting of April 2013 can be downloaded from: <http://www.iaea.org/OurWork/ST/NE/NEFW/Technical-Areas/NFC/uranium-production-cycle-tm-ISL-2013.html>