

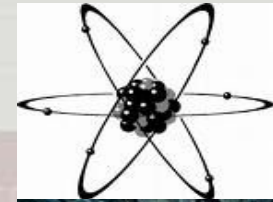
Seminar on Global Nuclear Fuel Supply
IAEA, Vienna, 26 January 2009

**Enrichment: present and
projected future, supply and
demand - TENEX view**

Alexander Pavlov

Key Facts

- **TENEX – world-wide supplier of nuclear materials, services and equipment**
- **One of the leading Russian exporters**
- **Agent of the Government of the Russian Federation for the HEU-LEU Agreement**
- **Access to large and reliable source of enrichment capacities**



TENEX Main Activities

TENEX's key activities are exportation of the nuclear fuel cycle products and services - primarily deliveries of enriched uranium and uranium enrichment services:

I. Uranium products and uranium enrichment services

- Uranium enrichment services
- Uranium conversion services
- Enriched uranium in various forms
- Reprocessed uranium enrichment services

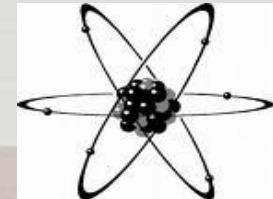
II. Isotope products

- Radioactive, stable isotopes and their compounds

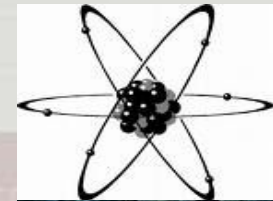
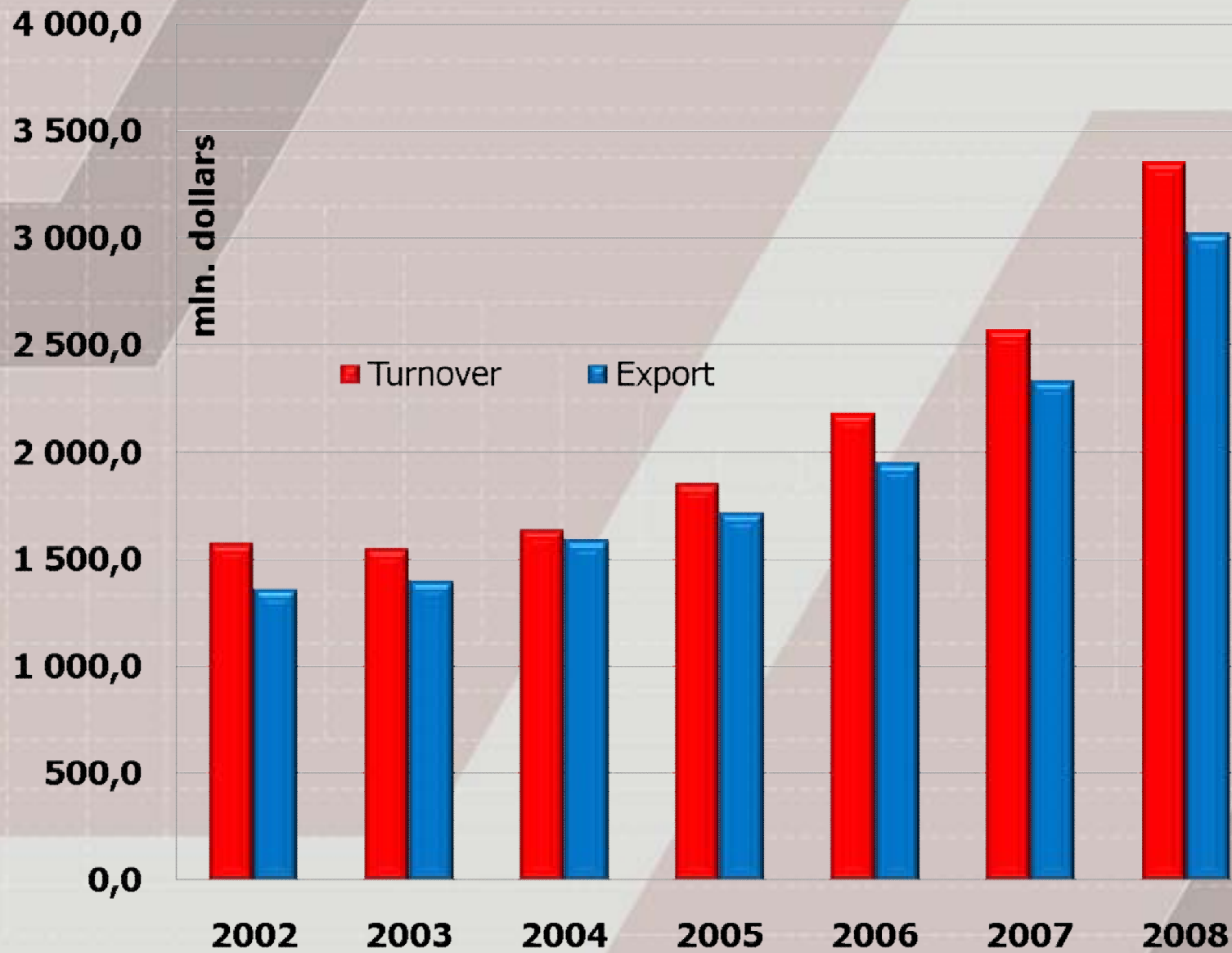
III. Non-nuclear products

- Electronic and physical equipment

IV. Gas centrifuge supply



TENEX Key Figures



Companies at the Front-End NFC Market

		Companies present in front-end							
	Average specific weight of NFC stages in nuclear fuel cost	Rosatom	Toshiba - Westinghouse	Areva	Urenco	Cameco	USEC	KazAtomProm	GE
Natural uranium	40%	+	-	+	-	+	-	+	-
Conversion	5%	+	-	+	-	+	-	-	-
Enrichment	40%	+	-	+	+	-	+	-	-
Fabrication	15%	+	+	+	-	-	-	-	+
Integrated indicator of Company share in worldwide sales (Tenex evaluation)		36%	4%	17%	8%	5%	5%	4%	2%

Trade Restrictions for Russian Uranium Materials (1)

USA:

- ✓ **1991** - the Antidumping Investigation initiated
- ✓ **1992** - the Agreement Suspending the Antidumping Investigation on Uranium From the Russian Federation was concluded
- ✓ **at present** – Amended Suspension Agreement and “Domenici Law”

European Union:

- ✓ Applies Unofficial Quotes with some reserve

Trade Restrictions for Russian Uranium Materials (2)

Suspension agreement:

- ✓ In place since October 1992, when the underlying antidumping investigation was suspended
- ✓ Upheld by The 2nd Sunset Review in 2006.
- ✓ Covers a wide range of uranium products exported from Russia including: natural uranium ores, natural uranium concentrates, low-enriched uranium (LEU) and highly-enriched uranium (HEU), including compounds of enriched uranium.
- ✓ Allows for imports of LEU derived from weapons-grade HEU (delivered to the U.S. Executive Agent, USEC, this LEU currently accounts for close to 50% of all enriched uranium used to fuel commercial nuclear power reactors in the United States each year)
- ✓ Allows ship material into the United States for reprocessing and re-export within 12 or 36 months (a total quota available is 6 million pounds)
- ✓ Amended multiple times; most recently on 01.02.2008:
 - ❑ the goals of the 01.02.2008 Amendment: to provide Russia with some commercial access to the U.S. market – in particular when the HEU Agreement ends in 2013 – but also to maintain stability and security of supply at the U.S. market

Domenici Law:

- ✓ In place since September 2008 - the sec. 3112A of the USEC Privatization Act as amended in accordance with H.R. 2638: Consolidated Security, Disaster Assistance, and Continuing Appropriation Act, 2009.
- ✓ Basic LEU quantities are the same as in Suspension Agreement except that deliveries may start earlier, the limits for the years after 2013 being conditional upon the future event, i.e. the “completion of the Russian HEU Agreement”.
- ✓ LEU purchased pursuant to SWU contracts is included in the annual limits, irrespective to the Eurodif case outcome.
- ✓ Adds “Russian HEU down blending incentive”:
 - ❑ If the U.S. and Russia agree to a bilateral agreement under which Russia commits to down blend an additional 300 MT of HEU, then Russia may import up to a limit of an additional 120 MT of LEU per year through 2020.
- ✓ Supersedes the recently amended Suspension agreement where there is an overlap.

Trade Restrictions for Russian Uranium Materials (3)

*Limits * on EUP supplies under Suspension Agreement /Domenici law*

Supplies of EUP regulated by:

- ✓ Suspension Agreement, with Amendment dated 01.02.2008
- ✓ Domenici Law , September 2008

Delivery years	2008-2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
LEU, kg EUP S.A. Amendment	16 559**	24 839	41 398	485 279	455 142	480 146	490 710	492 731	509 058	514 754
LEU, kg EUP Domenici Law	16 559	24 839	41 398	485 279	455 142	480 146	490 710	492 731	509 058	514 754
HEU down blending incentive, kg EUP Domenici Law				120 000	120 000	120 000	120 000	120 000	120 000	120 000

* Limitations on commercial supplies of Russian EUP shall be lifted after 31.12.2020

** In 2011 only

Exceptions to annual limits:

- ✓ Initial cores
- ✓ Uranium for re-exportation
- ✓ Uranium to be added to the inventory of the DOE (under Domenici Law)

Commercial Enrichment Suppliers: today and in the future

today

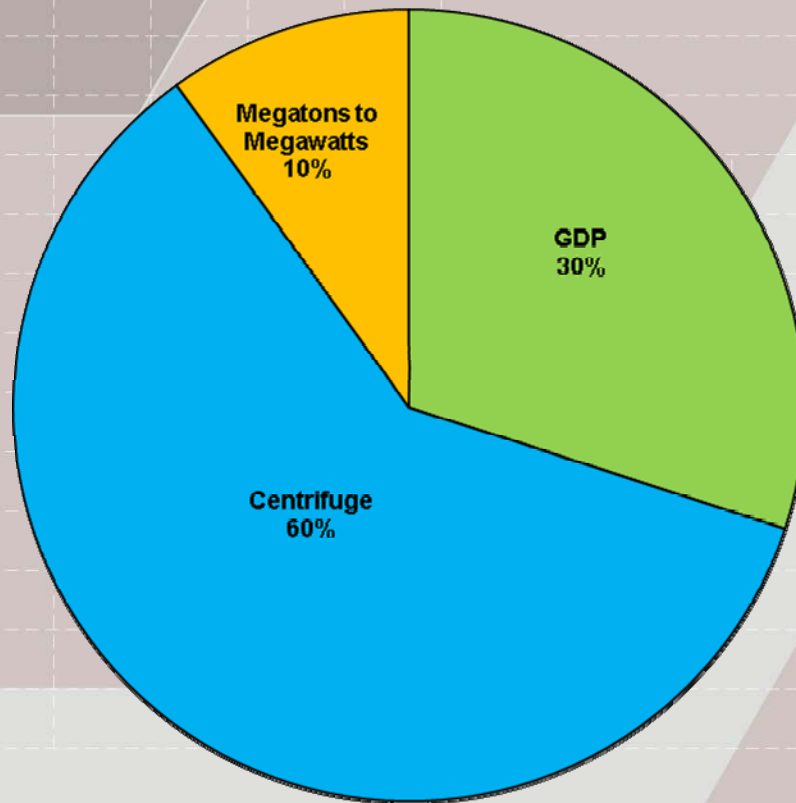
future



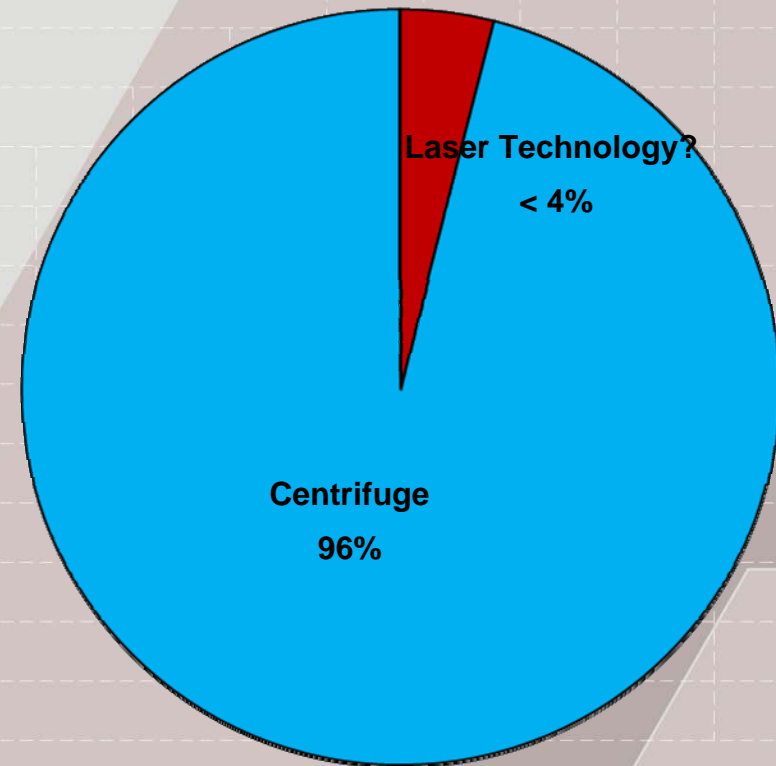
World Enrichment Capacity by Type

- ▶ Diffusion technology scheduled to be phased out by 2015.

2008



2015



Source: World Nuclear Association Nuclear Fuel Cycle Plenary Session, 13 January 2009

Gas Centrifuge Types



Russian centrifuge plant



Urenco centrifuges

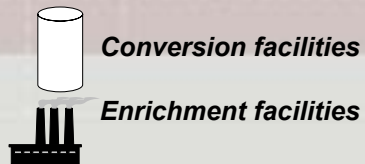
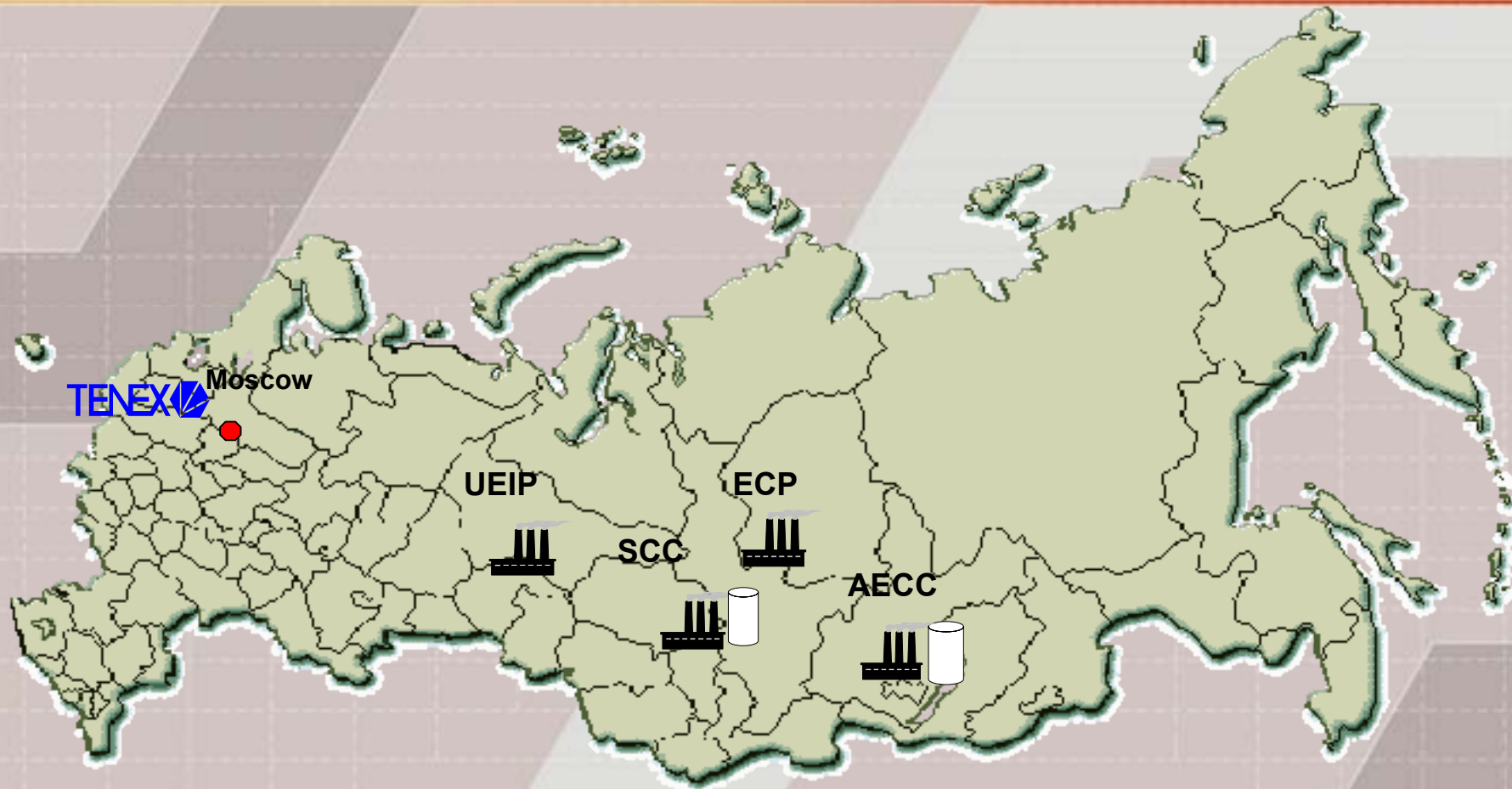


Centrifuge plant in Japan



USEC American Centrifuge

Russian Enrichment Capacities



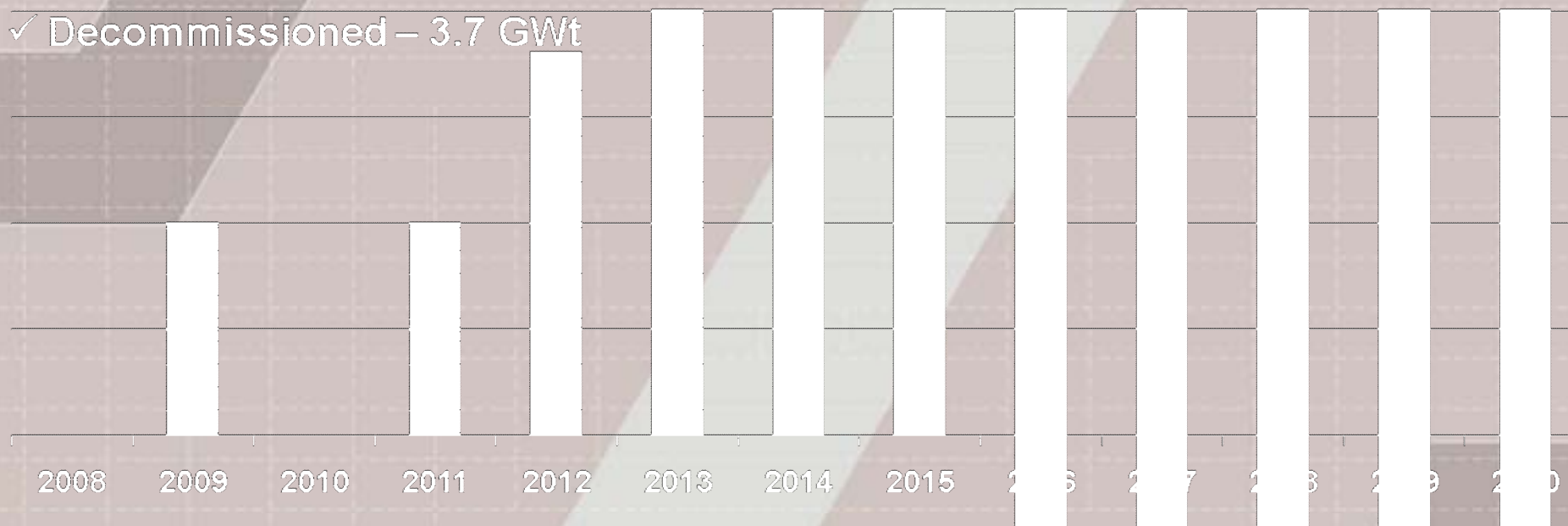
SCC-The Siberian Chemical Combine
UEIP – The Ural Electrochemical Integrated Plant
AECC – The Angarsk Electrolysis Chemical Combine
ECP - The Electrochemical Plant

New Nuclear Plants in Russia: Planned and Under construction

Russian NPP's Capacities in 2020 – 40 GWt:

✓ New – 19.8 GWt

✓ Decommissioned – 3.7 GWt



Russian SWU Requirements in 2020:

✓ tails assay 0.1 % - 8.2 mln. SWU

✓ tails assay 0.25 % - 5.7 mln. SWU



***Thank you for
your attention!***