



AC2021-Doc11

# ESA Advisory Committee

Annual Report of ESA for 2020

*Agnieszka Kaźmierczak, Dariusz Kozak*

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# Annual Report overview

The Euratom Supply Agency takes the **long-term** and **Community** perspective on the supply of nuclear materials and fuel.

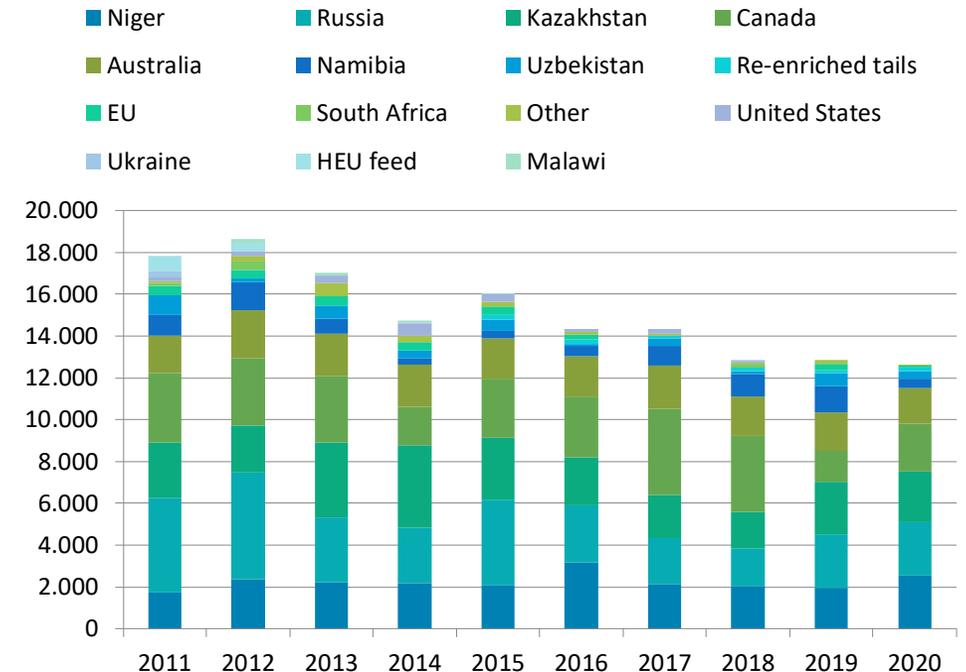
ESA Annual Report 2020 provides:

- ✓ Overview of ESA activities and management
- ✓ Analysis of supply and demand of nuclear materials and services in the EU
- ✓ ESA recommendations related to security of supply
- ✓ Overview of nuclear energy developments in the EU and in the world market for nuclear fuel
- ✓ ESA Work Programme for 2021

# Demand of nuclear fuel

- **1 908 tU of fresh fuel** was loaded into commercial reactors (10% down)
- Fuel loaded **was produced using 13 124 tU** (8% down) of natural uranium and **188 tU** (55% down) of reprocessed uranium as feed, enriched with **9 988 tSW** (8% down).
- **5% of annual needs** are covered by savings in natural uranium resulting from the use of MOX fuel and use of reprocessed uranium, which constitutes **domestic secondary sources**
- Demand for natural uranium in the EU represented approximately one quarter of global uranium requirements. **EU utilities purchased a total of 12 592 tU**, which is 2% less compared with the previous year.

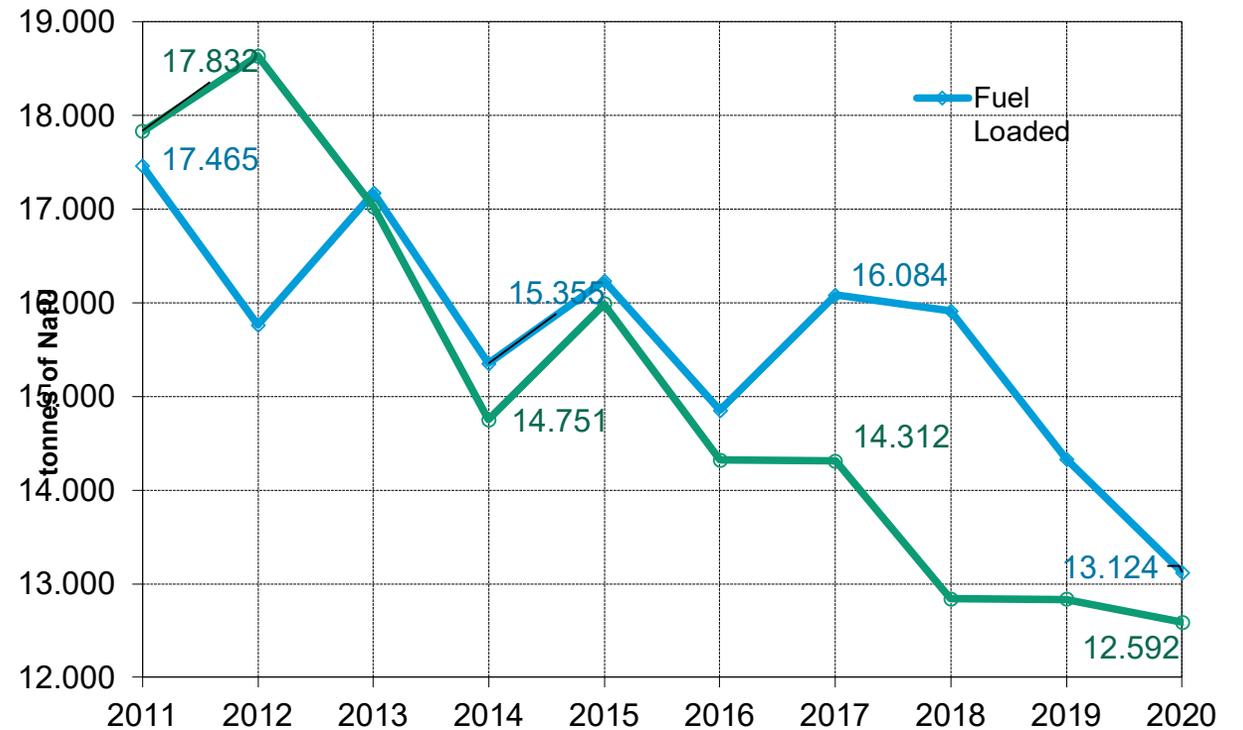
Purchases of natural uranium by EU utilities, by origin, (tU)



# Demand of nuclear fuel

- For the last 7 consecutive years EU utilities have been loading into reactor more material than buying, which results in continuous **decrease in inventories level**.
- **Demand in the EU gradually decreases**, from approx. 15.800 tU in 2020 to 10.400 tU in 2039
- **Demand for enrichment services in the EU decreases** from 13.000 tSWu in 2020 to 8.700 tSWU in 2039

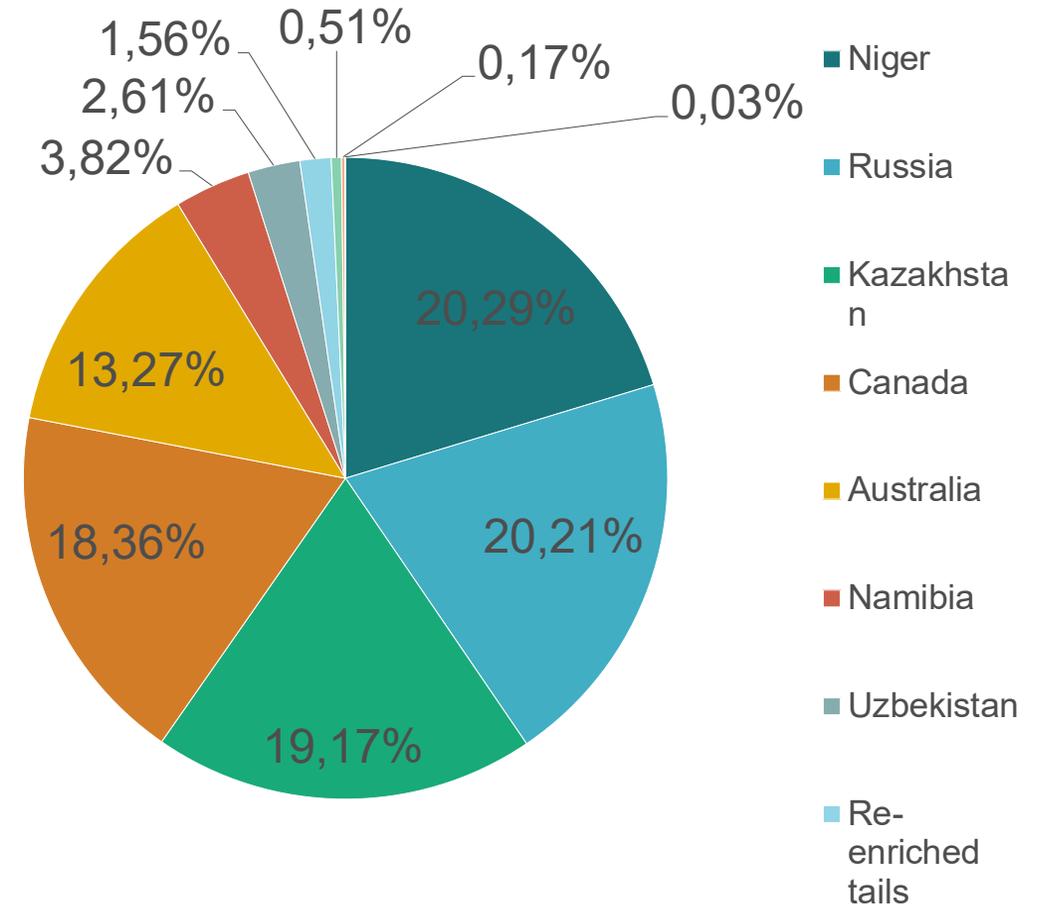
Natural uranium loaded and delivered, (tU)



# Supply of nuclear fuel

- **Natural uranium supplies to the EU continued to come from diverse sources, five big producing countries provided almost 91 % of all natural uranium supplied to the EU (12 592 tU).**
- **Niger, Russia and Kazakhstan** were the top three countries delivering natural uranium to the EU in 2020, providing almost 60% of the total.

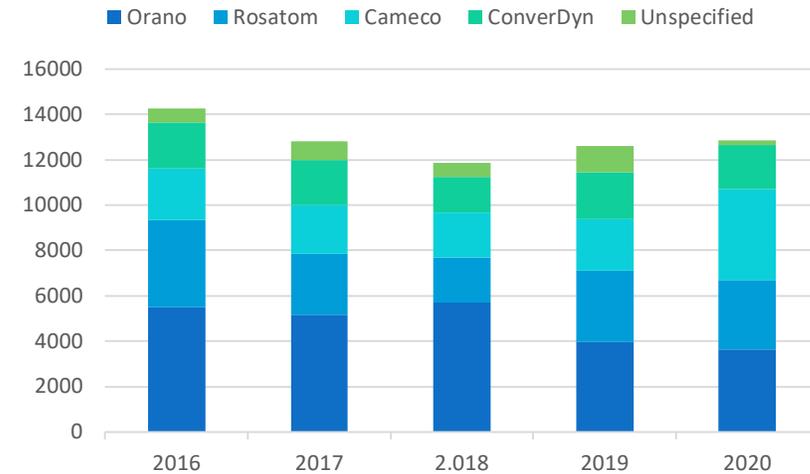
Origins of uranium delivered in 2020, (tU)



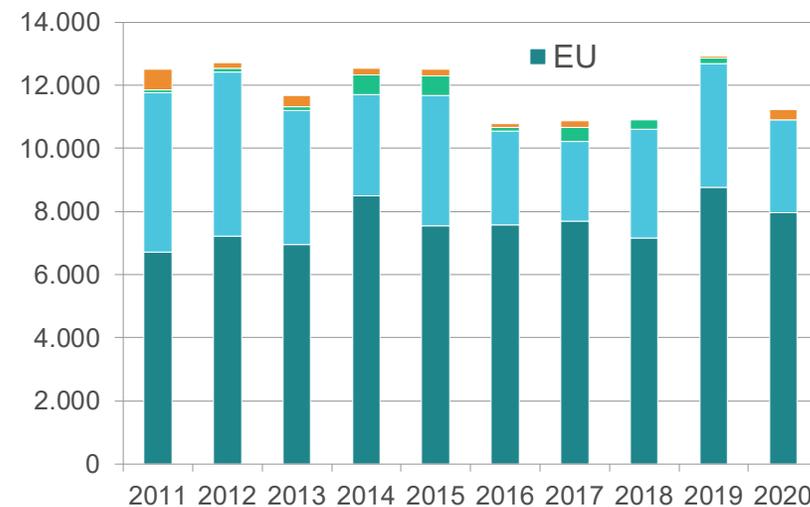
# Supply of nuclear fuel

- Provisions of **conversion services** accounted for 12 850 tU (2% up), 28% delivered by EU converter
- **Enrichment services provided** to EU utilities totalled 11 224 tSW (15% down), 71% delivered by EU enrichers

Supply of conversion services in 2020, (tU)



Supply of enrichment services in 2020, (tSWU)



# ESA price indices

## Spot:

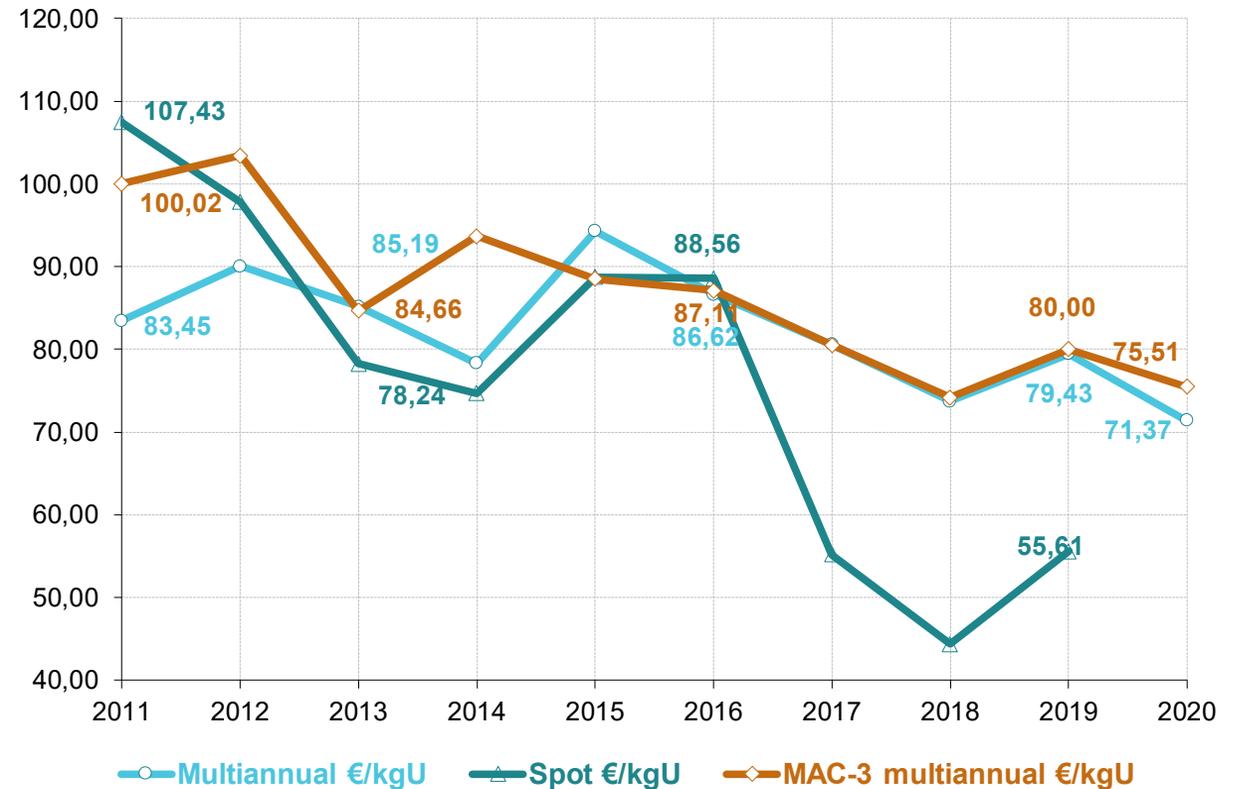
No price

## Multiannual:

- 71.37 EUR /kgU (10% down)
- 31.36 USD/lb U3O8 (8% down)

## MAC-3:

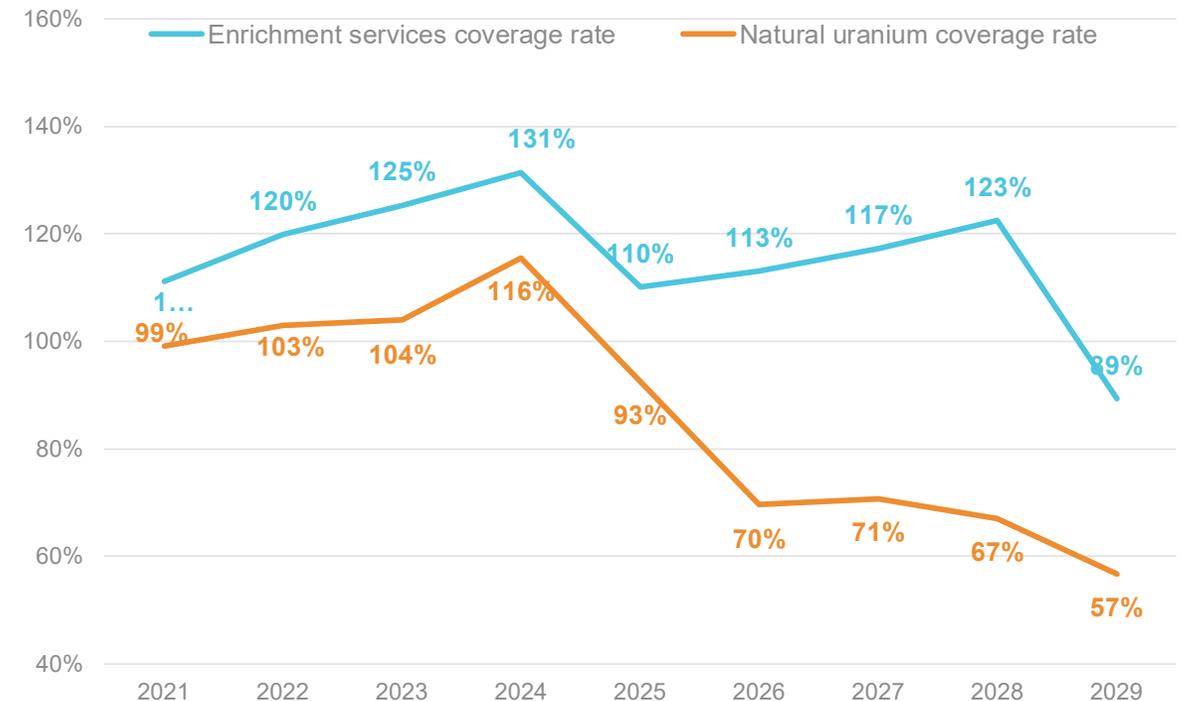
- 75.51 EUR /kgU (5.6% down)
- 33.17 USD/lb U3O8 (3.7% down)



# Security of supply of nuclear fuel

- Quantitative analysis of contractual coverage rate for natural uranium shows, that **EU utilities are covered around 100% and more** under existing contracts until 2024. The coverage rates drops down from 93% to 57% from 2025 until 2029.
- Contractual coverage rate for enrichment services **is more than 100%** until 2029. It drops down to 89% in 2029.
- **Conversion services coverage rate is above 100% until 2025**, than it fluctuates between 90 and 99% to finally drop to 82% in 2029.

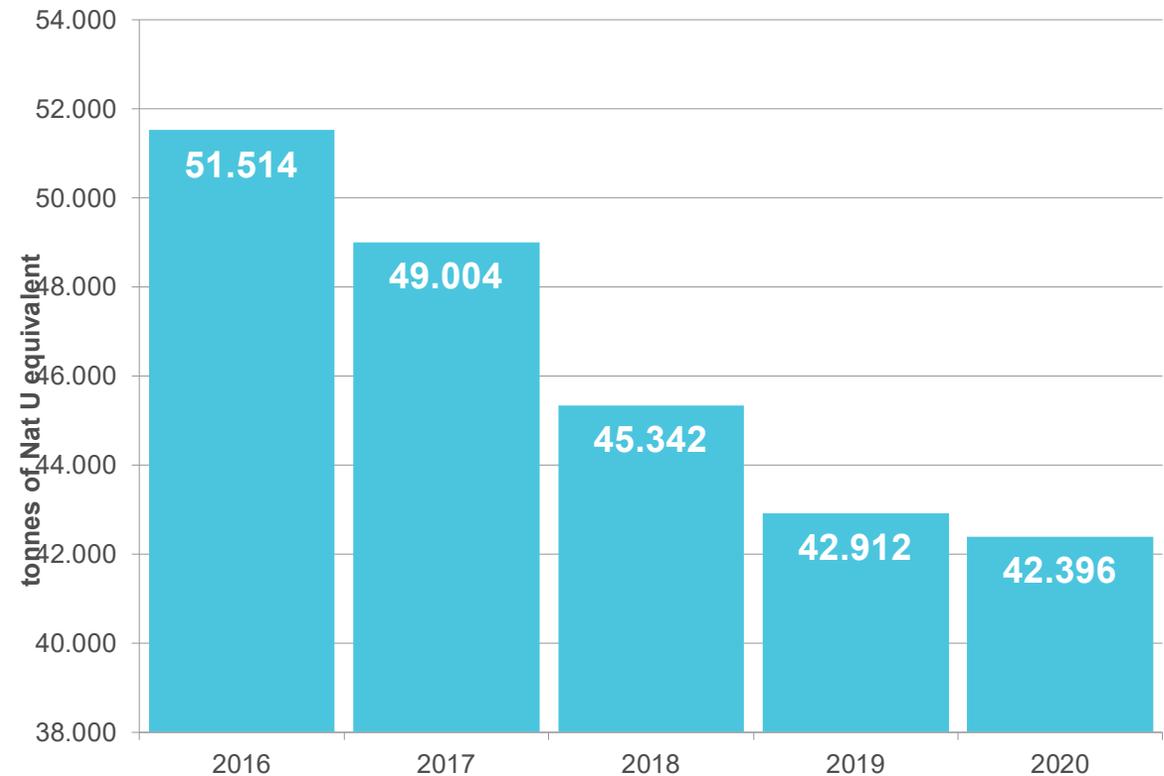
Coverage rate for natural uranium and enrichment services, (%)



# Security of supply of nuclear fuel

- Based on average annual EU gross uranium reactor requirements uranium **inventories can fuel EU utilities' nuclear power reactors for 2.5 years on average.**
- In line with ESA recommendations **utilities keep a sufficient quantity of inventories for at least one reload**

Total uranium inventories owned by EU utilities at the end of the year, (tU)



# Findings and recommendations

ESA notes that:

- **oversupply of uranium** in the market remains a concern, which depresses prices and delays investments in key segments,
- with few exceptions, such as conversion in the EU, **insufficient investments are being made to guarantee long-term security of supply,**
- **transport issues** remain as a risk in security of supply.

# Findings and recommendations

In the short and medium term, the needs of EU utilities for both **natural uranium and enrichment services** are well covered. However, the **100% reliance on a single design for VVER fuel** remains a matter of concern and particularly as it can also be leveraged to supply additional products and services.

ESA has recommended that operators:

- apply best practices in the field of security of supply, including an **assessment of their risk exposure**,
- cover most of their current and future requirements under **multiannual contracts**.



# Thank you



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