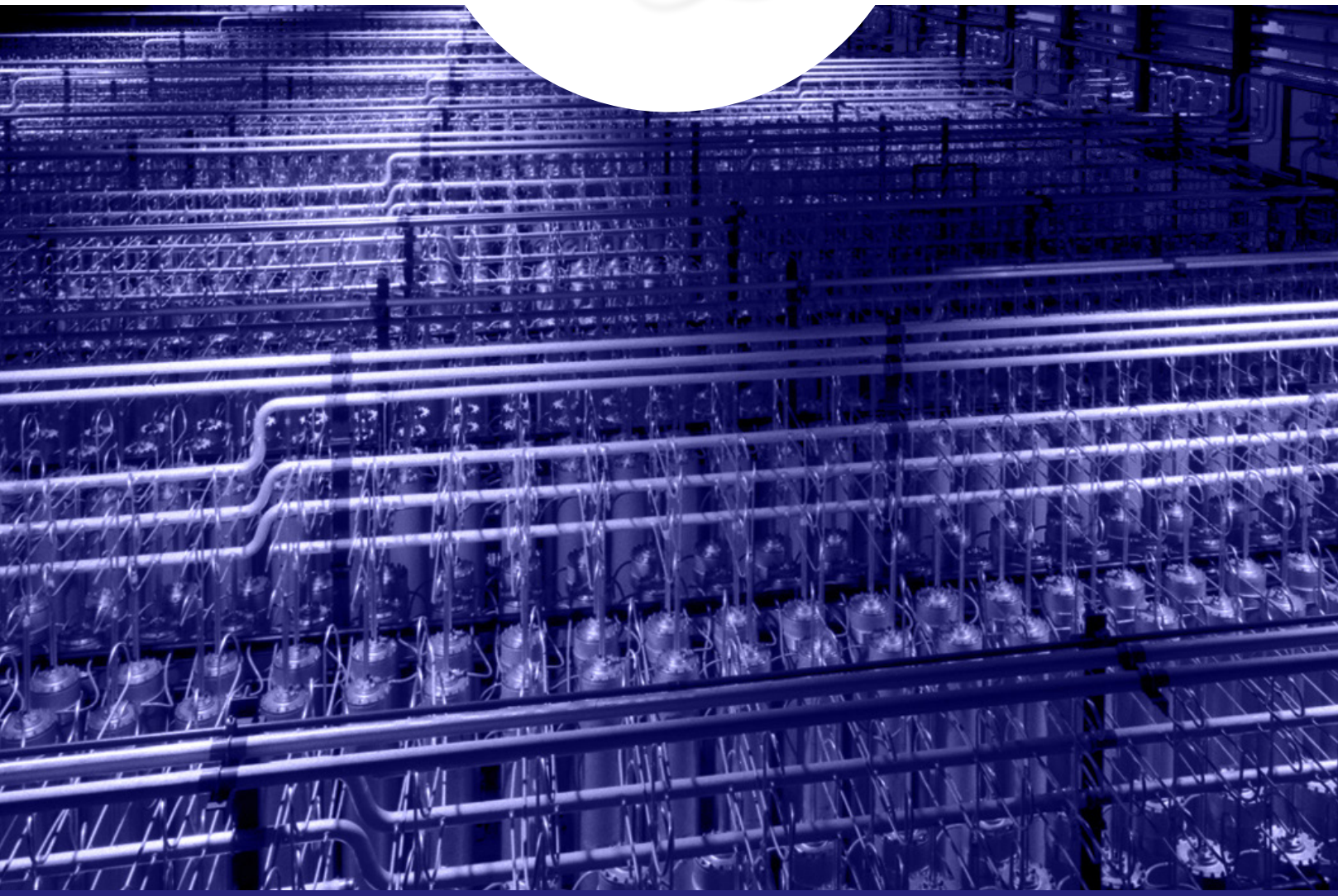

Quarterly Uranium Market Report

2nd Quarter 2022

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Uranium Prices Analysis

During the second quarter of 2022, ESA processed 39 transactions, including contracts, amendments and notifications on the frontend activities. Between April and June, European utilities concluded 5 new spot natural uranium supply contracts (including purchases, sales, exchanges and loans) and no new long term contract.

Table 1. ESA Quartely Spot Prices

Quarter	ESA Spot[1] EUR/kgU	ESA Spot USD/lb U_3O_8	ESA Spot All Users[2] EUR/kgU	ESA All Users USD/lb U_3O_8
2021 Q2	-	-	-	-
2021 Q3	-	-	-	-
2021 Q4	-	-	86.07[3]	37.95[4]
2022 Q1	-	-	-	-
2022 Q2	-	-	-	-

Table 2. Number of contracts processed by ESA

Quarter	Number of spot natural uranium contracts concluded by EU utilities[5]	Number of spot natural uranium contracts concluded by All parties[6]	Total number of contracts processed by ESA
2021 Q2	1	1	60
2021 Q3	2	2	61
2021 Q4	1	5	61
2022 Q1	0	3	68
2022 Q2	5	7	39

EU News

REPower EU: A plan to rapidly reduce dependence on Russian fossil fuels and fast forward the green transition

On 18 May the European Commission presented the REPowerEU Plan, its response to the hardships and global energy market disruption caused by Russia's invasion of Ukraine. There is a double urgency to transform Europe's energy system: ending the EU's dependence on Russian fossil fuels, and tackling the climate crisis. By acting as a Union, Europe can phase out its dependency on Russian fossil fuels faster, to replace fossil fuels in homes, industry and power generation.

1 ESA Quarterly Spot Uranium Price is a simple average of natural uranium prices. It accounts for one transaction only or multiple transactions executed during the quarter and one of the parties is EU utility. It is calculated, only if, at least three transactions with reported prices were executed.
2 ESA All Users Quarterly Spot Uranium Price is a simple average of natural uranium prices. It accounts for one transaction only or multiple transactions executed during the quarter and one of the parties is EU utility or other user (intermediary, producer)
3 Price calculated for half year period
4 Price calculated for half year period
5 including purchases, sales, exchanges and loans
6 including contracts, amendments and notifications on the front-end activities

The green transformation will strengthen economic growth, security, and climate action for Europe. The Recovery and Resilience Facility (RRF) is supporting coordinated planning and financing of cross-border and national infrastructure as well as energy projects and reforms. Targeted amendments to the RRF Regulation are proposed by the Commission to integrate dedicated REPowerEU chapters in Member States' existing recovery and resilience plans (RRPs).

The Plan emphasizes also the importance of diversifying energy supply options for EU Member States that rely on Russia for nuclear fuel serving either power generation or non-power uses. This requires working within the EU and with international partners to secure alternative sources of uranium and boosting the conversion, enrichment and fuel fabrication capacities available in Europe or in EU's global partners.

State Aid: Commission opens in-depth investigation into Czech support for new nuclear power plant in Dukovany

On 30 June the European Commission opened an in-depth investigation to assess whether public support that Czechia plans to grant for the construction of a new nuclear power plant in Dukovany is in line with EU State aid rules.

In March 2022, Czechia notified the Commission of its plan to support the construction and operation of a new nuclear power plant in Dukovany, which is already the site of an existing nuclear power plant.

The new plant, which is scheduled to start operating in 2036, should increase the security of electricity supply for Czechia and for neighbouring countries, helping the decarbonisation of the energy sector and diversifying the Czech energy mix.

The Commission has found the project necessary, but there are doubts as to whether the measure is fully in line with EU State aid rules.

For this reason, the Commission has decided to open an in-depth investigation in relation to:

- the appropriateness and proportionality of the three components of the measure, and

- the market impact of the decision to set up a specific State-owned company for the resale of the nuclear electricity, in particular considering that it is unclear if this future entity will aim at maximising its profit.

The Commission will investigate further to determine whether its initial concerns are confirmed.

European Observatory on the Supply of Medical Radioisotopes

The security of supply of medical radioisotopes came to the public attention at the time of severe supply shortages in 2008, which triggered the 2010 Council Conclusions "Towards the Secure Supply of Radioisotopes for Medical Use in the European Union". To support the security and sustainability of supply in the EU, the European Commission and the nuclear medicine industry organization for Europe AIPES jointly proposed the European Observatory on the Supply of Medical Radioisotopes (Observatory)[7] which was finally set up in June 2012.

Since 2013, the Observatory has been in the hands of Euratom Supply Agency (ESA) and AIPES (later renamed Nuclear Medicine Europe – NMEu) who co-chair it.

The major factors contributing to the supply issues were fragility of the production chain, which has been due to the low number and ageing research reactors, and the potential scarcity of high-enriched uranium (HEU) and high assay low-enriched uranium (HALEU) required to feed the chain. Initially, the Observatory had four strategic objectives:

- to support a secure Molybdenum-99/Technetium-99m (Mo-99/Tc-99m)[8] supply across the EU,
- to ensure that the issue of Mo-99/Tc-99m supply gets high political visibility,
- to encourage the creation of a sustainable economic structure of the supply chain, and
- to establish periodic reviews of the supply capacities and demand.

7 https://euratom-supply.ec.europa.eu/activities/supply-medical-radioisotopes_en
8 Molybdenum-99 (Mo-99) and its daughter product Technetium-99m (Tc-99m) is used in 80% of all nuclear medicine diagnostic procedures worldwide

Accordingly, four dedicated Working Groups focused on global reactor scheduling and Mo-99 supply monitoring, full-cost recovery mechanisms, management of HEU-HALEU conversion and target production, and capacity and infrastructure development. By 2014, the working groups finalized their work, resulting in publication of two reports: Management of Conversion from HEU to HALEU and Target Production[9] and Capacity and Infrastructure Development [10].

Since then, the Observatory has continued to monitor the EU supply chain of Mo-99/Tc-99m and to engage on a variety of topics on the EU supply of other widely used medical radioisotopes. It brings together various supply chain stakeholders (industry, research organizations and EU Member States), nuclear medicine organizations, members of NMEu, international organizations concerned as well as relevant Commission services and EU Agencies.

In 2018, the Observatory prompted the European Research Reactors to develop their Position Paper on Scenario for Sustainable Molybdenum-99 Production in Europe[11]. The Paper highlighted:

- the importance of the full cost recovery for the front-end actors in order to be able to maintain and renew the facilities and support back-up capacities,
- need for one or two new (at least partly) dedicated irradiation reactors in the next decade to replace the reactors expected to shut down, and,
- improved standardization of targets, transport containers, target handling equipment and transport licensing as means to improve efficiency and further increase the security of supply within the EU.

The NMEu's Security of Supply Working Group ensures effective coordination of reactor maintenance schedules to avoid and mitigate disruptions in the supply of Mo-99/Tc-99m. Within this working group, the Emergency Response Team (ERT) is composed of representatives of research reactors, Mo-99 processors and Mo-99/Tc-99m generator manufacturers, and monitors emerging production and supply issues. This continuous monitoring enables identifying potential shortages of Mo-99 and draws up mitigation action plans involving all stakeholders.

The joint communication team (JCT), created by the Observatory, disseminates timely the information received from the ERT to various stakeholder groups, including the EU administrations, OECD/NEA and IAEA. In addition to dealing with various unplanned outages of research reactors and processing facilities, issues related to transport of fuel for research reactors, uranium targets and medical radioisotopes, the ERT/JCT work has been instrumental in ensuring an uninterrupted supply of Mo-99/Tc-99m, particularly in light of Brexit preparedness and contingency actions and covid-19 pandemic-related concerns.

In March 2021, the Observatory's mission statement was revisited and new terms of reference drafted. Both documents, adopted jointly by ESA and NMEu, provide suitable governance for the Observatory's work and the challenges it will face. They also allow for the increased collaboration and new dynamics among all actors involved in the supply chain as the group of members was extended, offering national governments of EU Member States an access to the expertise and information they need to define strategies and policies in this area in their respective countries.

The following objectives were set for the Observatory:

- to support secure and sustainable medical radioisotope supply across the EU taking into account the worldwide need and supply;
- to ensure that the medical radioisotope supply issue is given high political visibility in international and national institutions, organizations and bodies;
- to identify any event or trend likely to impact the medical radioisotope supply, including logistics, and call relevant parties to take appropriate countermeasures;
- to promptly disseminate through agreed communication channels the enquired information regarding any possible supply disruptions or other supply related issues;
- to establish periodic reviews of the medical radioisotope supply chain and capacities with all stakeholders across the EU, taking into account the worldwide need and supply, and to forecast future needs;
- to build a foresight overview of the supply and demand of medical radioisotopes at EU level;
- to acquire the latest information on the development and implementation of new and alternative methods and technologies of medical radioisotope production.

9 https://euratom-supply.ec.europa.eu/system/files/2021-09/WG3%20report.pdf
10 https://euratom-supply.ec.europa.eu/system/files/2021-09/WG4_Report.pdf
11 https://euratom-supply.ec.europa.eu/system/files/2021-09/European%20Research%20Reactor%20Position%20Paper%20for%20DGE%20Energy%20%202018%20report_20180801.pdf

The last plenary meeting of the Observatory, which also marked its 10-year anniversary and gathered around 50 participants, was held on 29 June 2022 in Brussels.

The meeting was largely devoted to the impact of the Russian military aggression in Ukraine on the supply of medical radioisotopes. In this context, a panel discussion on the security of supply of medical radioisotopes took place with the participation of representatives from European Medicines Agency (EMA), NMEu, European Association of Nuclear Medicine (EANM) and ESA. It was followed by discussions on possible production of stable isotopes in EU, with URENCO and ORANO presenting their projects to start domestic production of target materials, namely, Mo-98, Mo-100 and Ytterbium-176 (Yb-176). Currently, these isotopes are supplied by Russia. The topic was completed by the presentation of the recent ESA Advisory Committee Working Group on European production of HALEU report. HALEU production is equally dependent on supplies from Russia and US.

At the meeting, a keynote speech was delivered on the outcomes of the Special Committee on Beating Cancer (BECA)[12] by its Chair, MEP Bartosz Arłukowicz. The next Observatory meeting is foreseen to take place in 2023.

12 https://www.europarl.europa.eu/committees/en/beca/home/highlights