OKLO

ANS Webinar on Spent Nuclear Fuel

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ABOUT OKLO

Developing small advanced reactor systems

Inherently simple and robust

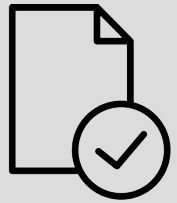
Flexible siting with minimal water resources required

The first combined license application of its kind accepted by the NRC

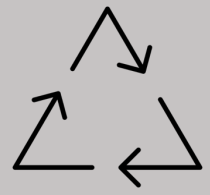
THE OKLO MODEL

Oklo owns and operates the Aurora

Oklo offers a PPA starting at a 10-year term



Competitive pricing and terms



Lifecycle management of plant and fuel

Oklo Recycling at a Glance

Oklo is pursuing commercialization of a pilot-scale (and ultimately a commercial-scale) recycling facility

Technology based on engineering-scale demonstration accomplished over decades at Idaho National Laboratory and Argonne National Laboratory

Oklo has engaged the U.S. NRC and is working to license such a facility starting in 2025

Why Recycling?

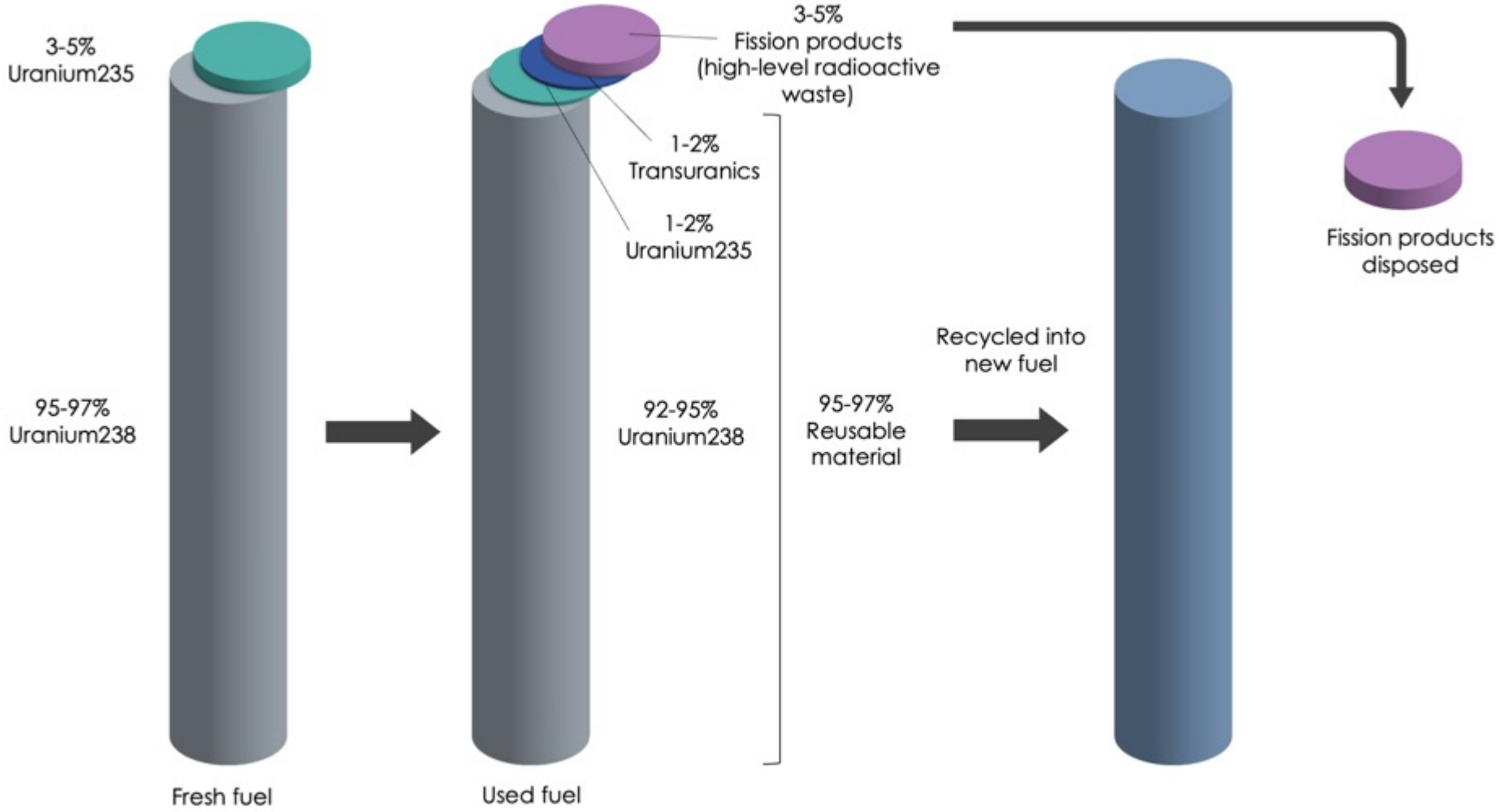
The U.S. has produced about 85,000 tons of used nuclear fuel since the 1950s and continues to produce about 2,000 tons each year

This fuel still contains more than 90% of its original energy content

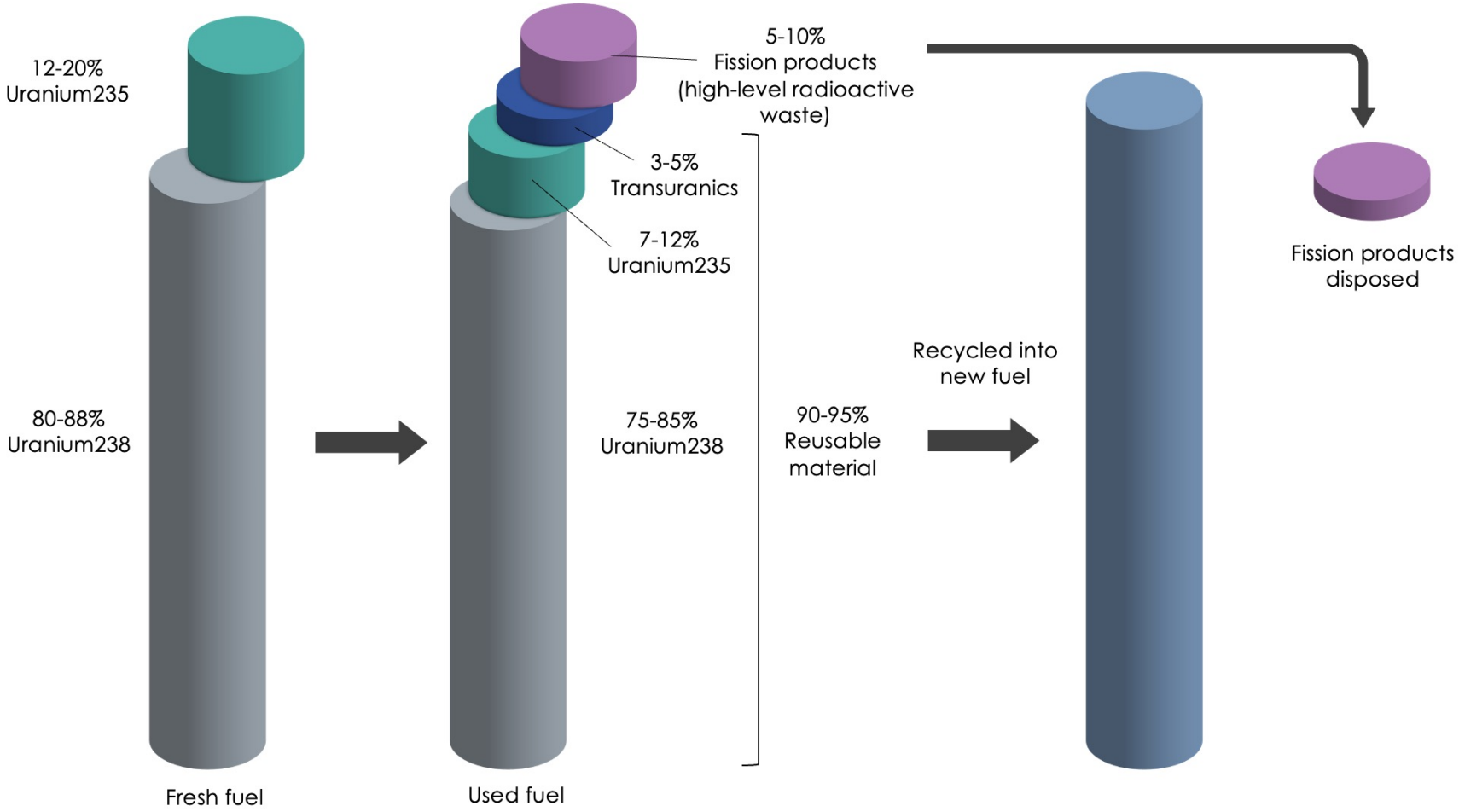
Oklo uses electrorefining to separate uranium and the transuranic elements from the shorter-lived waste, and then fabricates this material into metal fuel for fast reactors

There's enough energy in used fuel to power the U.S. for over 150 years

Recycling used LWR fuel



Recycling used Oklo fuel



Recycling Economics

A Smaller, Simpler, Cheaper System

History of being big and expensive

Fast reactors + electrorefining = paradigm shift

TRU kept together means a "messier" feed product, and thus a simpler process and facility

Argonne and Landmark Foundation study presented economic models for 100 MT and 400 MT facilities.

Found that Oklo recycling can produce fuel more cheaply than fresh HALEU (today's market rate is approx. $8k/kg)

Recycling Economics: LWR Used Fuel

100 MT/year pilot facility

- Produce approximately 2 to 3 Oklo cores per year from recycled LWR used fuel
- Produce fuel for about $5k-$10k/kg of 19.75% HALEU equivalent
- Charging for recycling could yield fuel for $500-$800/kg

400 MT/year facility

- Produce approximately 6 to 10 Oklo cores per year from recycled LWR used fuel
- Produce fuel for about $1.9k-$4k/kg of 19.75% HALEU equivalent
- Charging for recycling could yield fuel for -$2.5k/kg (yes negative! You could build plants for less than $1/W)

(Current market rate for fresh HALEU would be approximately $8k /kg)

Recycling Economics: Oklo Used Fuel

100 MT/year pilot facility

- Produce fuel for about $600/kg of 19.75% HALEU equivalent

400 MT/year facility

- Produce fuel for about $210/kg of 19.75% HALEU equivalent

(Current market rate for fresh HALEU would be approximately $8k /kg)

RECYCLING TIMELINE

2020

Oklo begins pre-application for its recycling facility

2025

Oklo submits license application

2027-2028

Construction begins

Oklo has been selected for three cost-share projects by the U.S. Department of Energy to commercialize advanced reactor fuel from nuclear waste

TECHNOLOGY COMMERCIALIZATION FUND

Develop advanced sensors for key recycling process efficiency improvements

ARPA-E OPEN

Utilize machine learning and digital twinning for recycling efficiency improvements and material accountability

ARPA-E ONWARDS

Demonstrate the recycling process end-to-end and develop the technical basis for the commercial-scale fuel recycling facility