*Press release*

**NRG PALLAS launches new qualification tests for SMR developer KAIROS POWER**
*Irradiation tests in the HFR accelerate the development of advanced nuclear reactors*

Petten, 29 April 2026 – NRG PALLAS and the US company KAIROS POWER are taking a significant step forward in the development of a new generation of Small Modular Reactors (SMRs). Advanced materials research is being carried out at the High Flux Reactor (HFR) in Petten, which is crucial for the safety and lifespan of innovative reactors. The second phase of the graphite research for KAIROS POWER has started mid-April. In addition, the two organisations are collaborating on test programmes for the highly promising TRISO fuel and metal components.

KAIROS POWER is developing a compact, modular advanced nuclear reactor that operates at high temperatures and is cooled by molten salt. In addition to producing $CO_2$-free electricity, this technology can also supply industrial heat. KAIROS POWER is set to build 500 MW of generating capacity for Google to supply clean energy to data centres. In Tennessee, KAIROS POWER is currently building the HERMES demonstration reactor series, which will enable the deployment of its future commercial fleet. (see image)

**Accelerated testing under extreme conditions**
In a nuclear reactor, materials are exposed to intense neutron radiation. This radiation can alter the structure and properties of materials. To ensure that reactors operate safely and reliably, these effects must be thoroughly investigated.

The HFR in Petten offers unique opportunities to accelerate this research. Thanks to the high neutron flux, materials can be tested up to ten times faster. This makes it possible to gain insight into behaviour over the entire lifetime of reactor components in a shorter time.

Materials (in this case graphite) are irradiated in several stages, with each stage representing a portion of the reactor's lifetime. Between these steps, the properties of the graphite are accurately measured in the hot cell laboratories of NRG PALLAS. This provides a detailed picture of how the material behaves over its entire lifetime. This knowledge forms an essential basis for the reactor's safety case.

Two types of irradiation tests are being carried out. The ATHENA series, in which the graphite samples are allowed to 'expand and contract' freely, began in mid-February. In the ATLAS series, graphite is irradiated to determine 'creep effects'. The first ATLAS irradiation test was successfully completed in November. The samples have been analysed and will be irradiated from mid-April in the follow-up test, ATLAS-2.

**Broad collaboration and future perspective**
In addition to graphite research, KAIROS POWER and NRG PALLAS are also collaborating on test programs for metal components and nuclear fuel in the form of TRISO particles. TRISO fuel (TRi-structural ISOtropic) is considered one of the safest and most robust nuclear fuels in the world and is promising for the new generation of nuclear installations. The first irradiations are expected in 2027.

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Micah Hackett, Vice President KAIROS POWER, Fuels & Materials: *"NRG PALLAS has been a trusted partner in measuring and validating material irradiation performance at conditions that inform our reactor licensing basis. This work is foundational to the design, construction, and operation of safe, reliable reactors to supply affordable electricity to our customers."*

Joost van den Broek, Director Nuclear Energy Services NRG PALLAS: "*This collaboration underlines the role of NRG PALLAS as an international partner for high-quality nuclear research. Through our expertise in irradiation testing of fuel and materials, we help accelerate the development of innovative nuclear technologies, enabling large companies to access clean energy sooner."*

The research in the HFR plays a key role in accelerating innovation within the nuclear sector. In the future, this type of research will be continued in the new PALLAS reactor, which is currently under construction and will succeed the HFR.

*Architect's rendering: The Hermes 2 Demonstation Plant*

**More about NRG PALLAS**
NRG PALLAS develops and delivers medical products and contributes to energy solutions. With the High Flux Reactor, medical isotopes are produced, and irradiation research is carried out on structural materials and nuclear fuels. The construction of the PALLAS reactor ensures that the availability of nuclear knowledge and the security of isotope supply for more than 30,000 patients per day are safeguarded.

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