

## A differentiated small modular reactor offering providing low cost, low risk, low carbon off-grid energy with a high heat output

U-Battery is an advanced small modular reactor (AMR/SMR) based on proven, existing high temperature gas reactor technology. The key innovation is its size, with an output scaleable, from 10MW thermal/4MW electric and a footprint of just 350m<sup>2</sup> (c.1.5 tennis courts), which opens up a number of new applications and markets.

The U-Battery solution is:

- Low-cost –Each U-Battery unit is projected to cost c.£50m, enabling it to provide competitive energy for its target markets over its lifespan.
- Low risk Using process manufacturing and a modular construction processes, quality assurance and testing can take place during the manufacturing stage, with construction timescales reduced and transportation to the customer site simplified.
- Low carbon U-Battery's high temperature, 710°C output, distinguishes it from other advanced small nuclear designs. It can provide a sustainable solution for difficult to decarbonise industrial processes with high heat demand, ensuring these industries have a sustainable pathway to continued low-carbon operations.

- **High safety\*** The reactor size and design, and the use of highly accident tolerant TRISO fuel deliver inherent safety.
- **High heat** Unlike its SMR competitors, by using high temperature gas reactor technology U-Battery is ideally suited to act as a sustainable solution for generating process heat.
- Off grid U-Battery' cogeneration capabilities would provide a locally embedded and reliable source of power and heat. Unlike competitor designs, it is not competing to replace grid capacity.
- Flexible design Modular design enables output to be sized to meet requirements for specific applications.
- **Future applications** The heat generated by U-Battery could also be deployed toward efficient, low-carbon hydrogen production, water desalination as well as other applications.



## A unique advanced small modular nuclear reactor technology that presents an important solution in the drive to Net Zero



TRISO fuel is constructed by triple coating spherical particles of uranium fuel. A uranium centre is coated in a layer of pyrolytic carbon, which in turn is coated in silicon carbide, with a further outer layer of carbon. The structure and spherical shape of TRISO fuel means that it maintains its integrity under extreme conditions.





- 1. Gas turbine generator
- 2. Helium/Nitrogen Heat Exchanger
- 3. Reactor
- 4. Reactor cavity cooling system
- 5. Reactor cavity cooling system vent stack
- 6. Dry fuel store
- 7. Dry fuel store vent stack
- 8. Spent fuel export facility
- 9. Confinement building

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