

COMPLETION OF DESIGN OF LONG DURATION ENERGY STORAGE PILOT

Following successful completion of the test work program conducted at TU Freiberg by INEMET, the Company is pleased to announce the completion of the design of the pilot thermal energy storage (TES) and power generation system (TES Generation System). The test work results (see market release dated 28 November 2022) provided the necessary data to finalise the design of the pilot TES cells.

The procurement stage of the pilot project is scheduled to commence as soon as QSP and ProTherm shortlist key vendors and approve contractual arrangements. Subject to finalising these arrangements, construction is expected to commence by the end of this quarter.

Sunlands Co.'s TES technology is a long duration energy storage (LDES) storage solution that delivers one of the few paths to decarbonisation of electricity grid networks by the retrofitting of coal fired power stations. LDES technology is considered the critical solution for the conversion of intermittent renewable energy to round the clock dispatchable baseload generation.

QSP is the exclusive global manufacturer of the flake graphite based thermal storage media (Uley Media), the main component of TES cells. QSP contractual arrangements with Sunlands Co. require it to deliver the manufactured Uley Media to Sunlands Co. as specified to meet TES cell production schedules. Based on the current prices for competing products to Uley Media and the current flake graphite market conditions:

- QSP's expected prices for Uley Media is likely to exceed US\$3,500; and
- QSP's expected margin on Uley Media will be twice that of the Company's margin on the sale of its flake products.

TES cells utilise renewable energy to store heat at ultra-high temperatures. This heat is delivered to a power station's existing steam turbine generators which dispatch base load generation to the grid network.



ABOUT QUANTUM GRAPHITE LIMITED

QGL is the owner of the Uley flake graphite mineral deposits located south-west of Port Lincoln, South Australia. The company's Uley 2 project represents the next stage of development of the century old Uley mine, one of the largest high-grade natural flake deposits in the world. For further information, qgraphite.com.



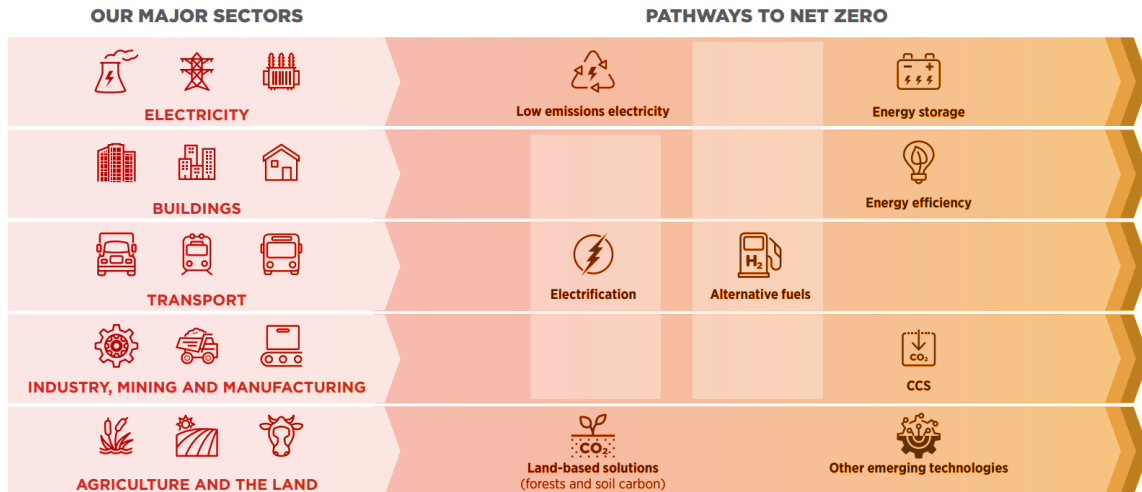
ABOUT THE QUANTUM SUNLANDS PARTNERSHIP

QSP is our joint venture with Sunlands Co. for the manufacture of coarse natural flake based thermal storage media. The flake will be sourced exclusively from the QGL's Uley mine. The manufactured media will be fitted within Sunlands Co.'s long duration energy storage cells. <https://www.sunlandsc.com/>

The displacement of coal as the fuel source of these major power stations is the key to meeting Australia’s net zero emissions milestones. The long duration storage capability of the Sunlands Co.’s TES cells achieves very large-scale storage and time shifting of renewable energy to those times during the day when renewable generation is not available especially during the evening peak period.

The Australian Government’s Long Term Reduction Plan (dcceew.gov.au) recognises energy storage as a critical pathway for the decarbonisation of the electricity grid (see Figure 2.1).

Figure 2.1 Critical pathways to net zero for Australia’s economic sectors



Note: This Figure illustrates some of the more critical pathways, but many technologies will find application across many sectors.

ProTherm have prepared the detailed specifications and design of the three components of the pilot TES Generation System as originally described in the Sunlands Co. Commercialisation Report. The complete TES Generation System consists of:

- the TES Cell;
- the heat transfer fluid plant (see Figure 1.1); and
- the steam turbine generator package.

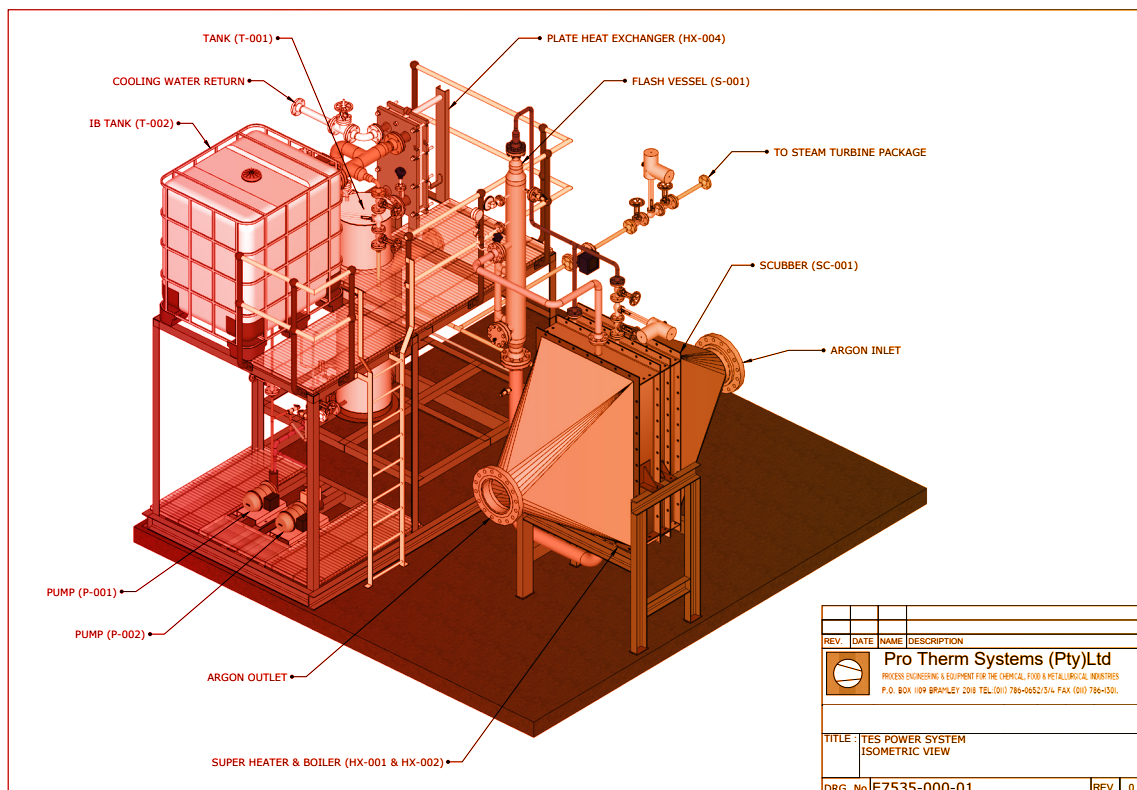


Figure 1.0 Heat transfer fluid plant

The detailed results of the testwork conducted by INEMET included the key findings of the specific heat performance for each of the various configurations of the Uley Media. These findings confirmed that Uley Media Blocks in these various configurations could be deployed within TES Cells as described in Sunlands Co.'s Commercialisation Report.

An important aspect of the findings is the uniformity and consistently high level of heat storage capacity. These findings matched the performance of high grade isostatic graphite products.

These features of Uley Media will support a more simplified method of manufacture and enable manufacturing to be undertaken at a scale far greater than anticipated. Operation of the pilot and the production of key data from the continuous energy cycle (i.e., charge and discharge of the TES cell) is the final milestone prior to commencement of commercialisation.

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ABOUT PROTHERM

Protherm Systems, founded in July 1987, is a leading thermal process engineering company, based in South Africa. The Company designs and supplies a wide range of thermal and related thermal processing plant and equipment for industrial users world wide, such as Plate Heat Exchangers, Shell and Tube Heat Exchangers, Air Dryers and Evaporators.



ABOUT INEMET

The Institute for Non-Ferrous Metallurgy and High Purity Materials focuses on sustainable and innovative processes that rethink existing production processes and the handling of supposed waste products in the spirit of the circular economy and zero waste thinking. INEMET's dedicated team work toward a greener future and the revolutionizing of non-ferrous metallurgy. It develops existing processes within pyrometallurgy, hydrometallurgy and the semiconductor industry in working groups and in a variety of projects. <https://tu-freiberg.de/en/fakult5/inemet>