PURE RESOURCES LIMITED | ASX:PR1

CNTF Thermal Conductivity Exceeds Copper and Aluminium, Advancing AI Infrastructure Materials Pathway

Carbon Nanotube Fibre demonstrates thermal conductivity exceeding copper and aluminium, the benchmark metals for industrial and electronics cooling, while end user engagement and United States Government funding initiatives advance in parallel.

HIGHLIGHTS

- Carbon Nanotube Fibre achieves thermal conductivity of up to ~600 W/m·K (Watts per meter-Kelvin), approximately 1.5 times greater than copper and approximately 2.5 to 3 times greater than aluminium, with conductivity tuneable through ongoing post processing optimisation under the Rice University collaboration.
- Represents a step change in thermal performance at a time when AI data centre power density is creating critical cooling constraints.
- CNTF uniquely combines high conductivity with flexible, textile processable form factors, enabling next generation 3D thermal architectures that are geometrically unavailable to conventional metals
- Early engagement underway with hyperscale data centre operators, defence primes and advanced electronics manufacturers, with discussions covering jointly funded development, prototype evaluation and integration testing into customer thermal envelopes.
- Active United States Government funding strategy progressing across Department of Defence and Department of Energy aligned programs.
- Strategic advantage: CNTF is a non-critical mineral material exceeding the thermal properties of critical mineral grade conductors, with research being derived from large to jumbo flake graphite confirmed within the Company's 100% owned Garnet Hills Project.
- Structured value pathway: four stage data release program underway (conductivity, weight efficiency, thermal anisotropy and system level heat performance test results).

ANNOUNCEMENT

CNTF thermal conductivity outperforms copper and aluminium

Pure Resources Limited (ASX: PR1) ("Pure" or the "Company") is pleased to provide investors with a technical and commercial update on Carbon Nanotube Fibre ("CNTF"), confirming thermal conductivity performance exceeding copper and aluminium, the two incumbent metals underpinning global thermal management systems. Testing conducted under the Company's collaboration with Rice University has demonstrated CNTF thermal conductivity of up to approximately 600 W/m·K*.*

This represents:

- *~1.5 times the conductivity of copper; and*
- *~2.5 to 3 times the conductivity of aluminium.*

This result establishes CNTF as a next-generation thermal conductor at a time when thermal constraints are emerging as a primary bottleneck in AI compute infrastructure, defence systems and high-power electronics.

Importantly, this performance has been achieved in a flexible, textile processable form factor. Unlike rigid copper or aluminium, CNTF enables woven, knitted and braided 3D architectures, opening entirely new thermal management geometries not achievable with conventional metals.

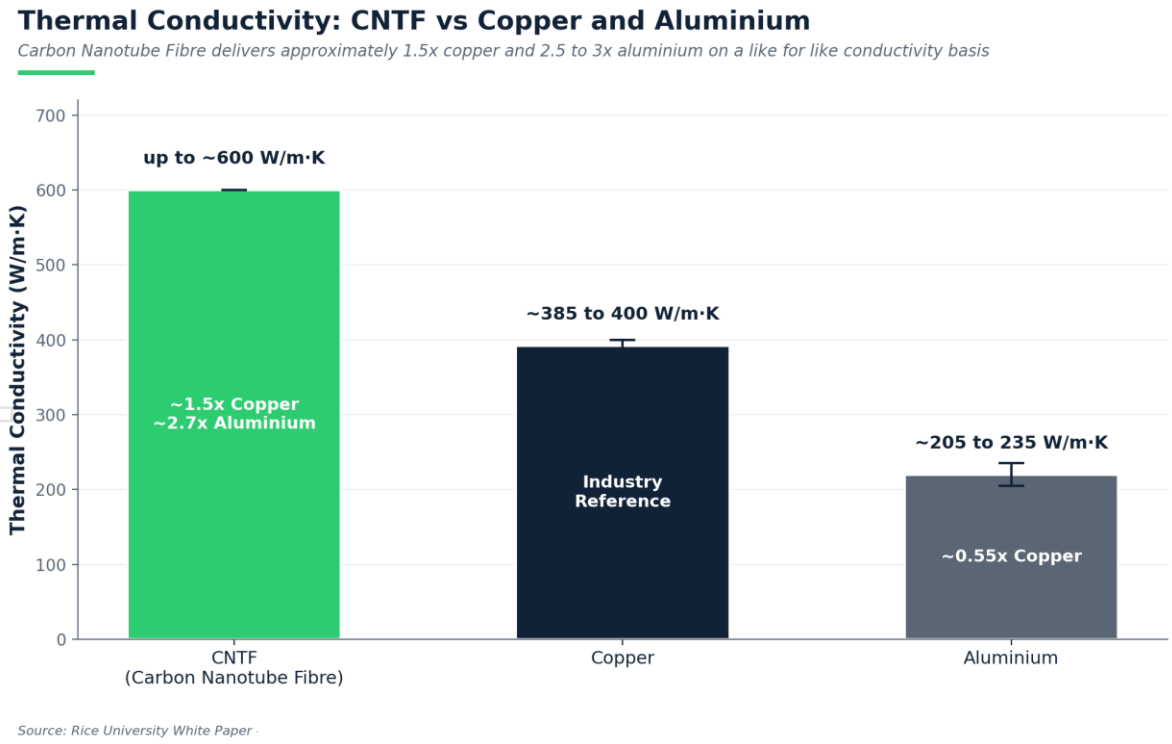

Figure 1: Thermal Conductivity: CNTF vs Copper and Aluminium.

Commercial Context and Strategic Positioning

The Board considers this result highly significant in the context of accelerating demand for high-density compute and power systems, where thermal performance is increasingly constraining system design and capital efficiency.

CNTF is being positioned directly into this constraint.

In parallel with technical validation, the Company has commenced early-stage engagement with:

- Hyperscale data centre infrastructure operators;
- Defence prime contractors; and
- Advanced electronics manufacturers.

Discussions are progressing across prototype evaluation, jointly funded development and integration testing.

At the same time, Pure is advancing a structured United States Government funding strategy, targeting programs aligned to advanced materials and thermal management under Department of Defence ("DoD") and Department of Energy ("DoE") frameworks.

These dual pathways commercial engagement and government funding, are being progressed in parallel to minimise the gap between prototype validation and pilot-scale deployment.

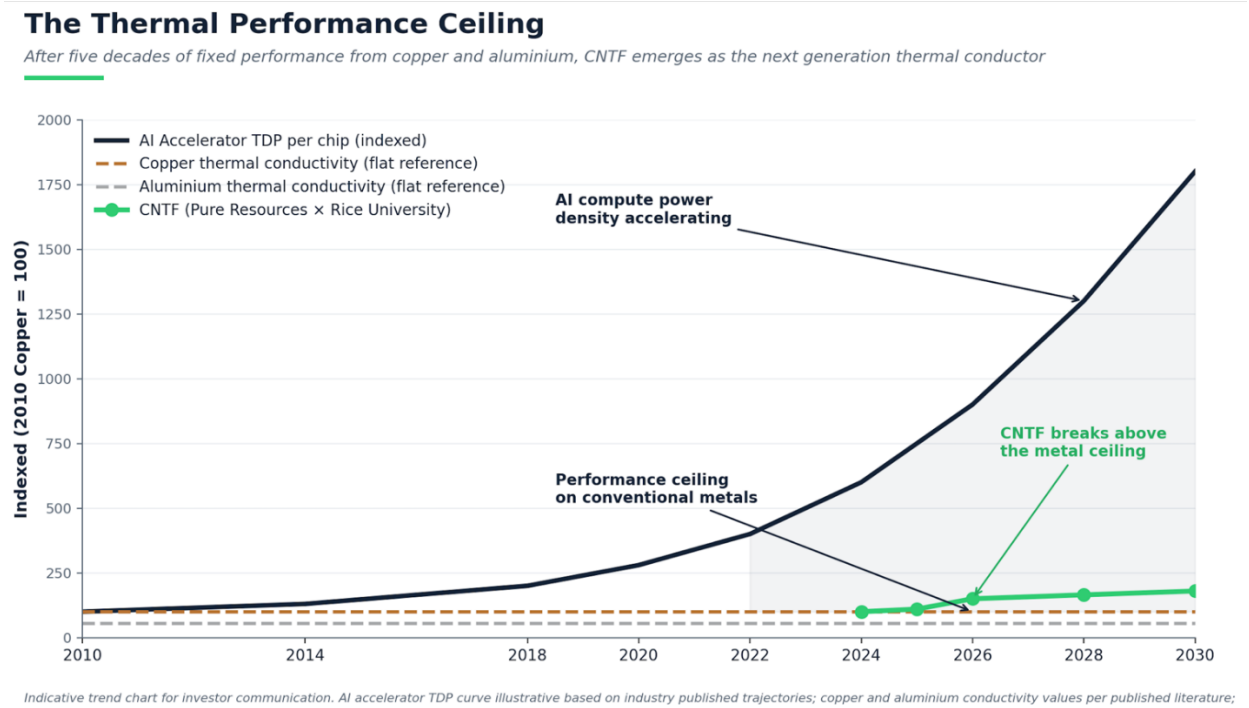

Figure 2: The Thermal Performance Ceiling.

COMMENTARY

"The result is clear. CNTF is now demonstrating thermal conductivity beyond copper and aluminium, the two materials that have defined thermal management for decades.

"More importantly, this is not just a materials result, it directly addresses a known constraint in AI infrastructure, defence systems and high-power electronics.

"We are now seeing alignment between technical validation, commercial engagement and government funding pathways, which together form a structured pathway toward deployment.

"This is the first of a series of releases that will progressively demonstrate CNTF as a next-generation step-change in thermal management solution."

"Importantly, If CNTF performs across the four planned property and performance releases as the conductivity data is currently signalling, the addressable market extends well beyond AI thermal management into directed energy weapons, hypersonics thermal protection, electric vehicle battery thermal management, robotics, aerospace and grid scale power electronics. Each is a multibillion dollar end market in its own right."

— Rocco Tassone, Interim CEO Pure Resources Limited

DETAIL

The Conductivity Case: CNTF vs Copper and Aluminium

Thermal conductivity, the rate at which a material transfers heat, is the foundational metric in heat sink and thermal interface material design. Copper and aluminium have set the reference standard for industrial and electronics cooling for over five decades. Development of Novel CNTF Heat Sinks (Pasquali, Preston, Sanchez and Wehmeyer), characterises CNTF as delivering thermal conductivity that matches and, in targeted configurations, exceeds the thermal conductivity of copper, while introducing engineering properties that the metals intrinsically cannot provide:

- Thermal Conductivity: On a like for like conductivity basis, CNTF is approximately 1.5 times more conductive than copper and approximately 2.5 to 3 times more conductive than aluminium.
- Conductivity scalability and tunability: while copper and aluminium thermal conductivity can be modestly adjusted through processing variables such as grain size, the available engineering range remains narrow and is bounded by the underlying metal chemistry. CNTF conductivity, by contrast, retains substantially greater engineering headroom and can be progressively optimised through annealing, doping and spinning processes under active development at Rice University, with the conductivity ceiling for CNTF structures yet to be reached.

- Form factor: copper achieves its conductivity in a rigid, geometrically constrained form, machined or extruded only. CNTF achieves comparable and superior conductivity while remaining flexible and textile processable, enabling 3D knitted, braided and conformable thermal architectures that are physically impossible to replicate in machined copper or extruded aluminium.

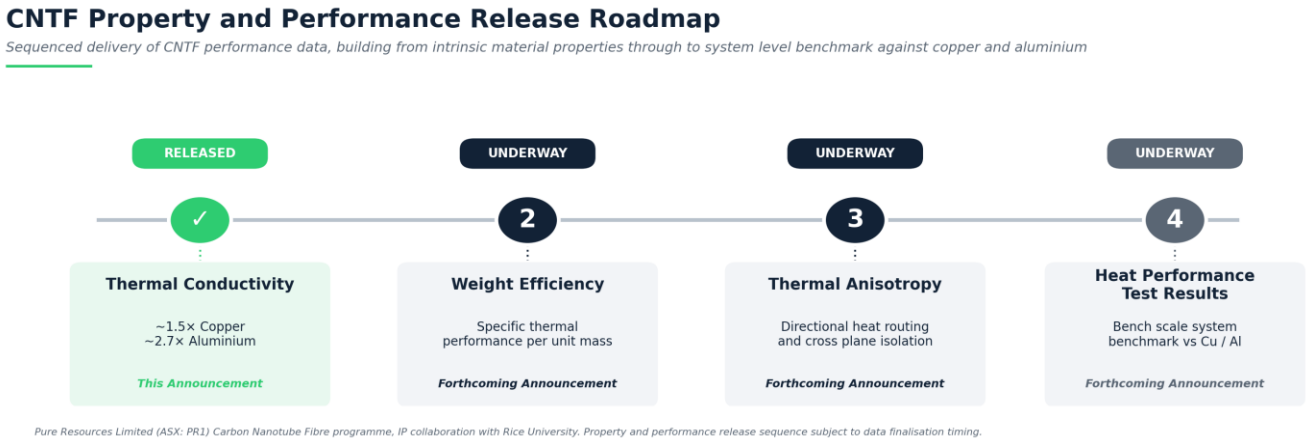

Figure 3: CNTF Property and Performance Release Roadmap.

Technical Context: CNTF is Set to be a Game Changer

CNTF provides a unique positioning advantage:

- Outperforms incumbent thermal conductors;
- Avoids excessive reliance on critical mineral supply chains; and
- Enables new manufacturing pathways via textile processing.

This combination aligns strongly with global policy priorities around supply chain resilience and advanced manufacturing capability.

The 600 W/m·K conductivity figure outlined is significant in the context of where individual carbon nanotubes can in principle reach. Single walled carbon nanotubes have measured thermal conductivities reported in the published literature in the range of approximately 3,000 to 6,000 W/m·K. CNTF, being an assembly of trillions of nanotubes spun into a continuous fibre, today delivers only a fraction of that fibre level upper bound. The performance ceiling for CNTF structures is therefore not a physical limit but a process limit. Rice University is actively progressing post processing improvements through annealing, doping and spinning protocols designed to close the gap between current fibre performance and the theoretical capability of the underlying nanotubes.

Figure 4: Form Factor: Why Conductivity Alone is Not the Whole Story.

Two further engineering points are relevant for end users. First, modern AI accelerators and high-power defence electronics dissipate hundreds of watts from die areas under 10 cm², meaning the relevant cooling metric is heat flux through the thermal interface and heat sink path, not bulk conductivity in isolation. CNTF textile architectures characterised by handling capability above conventional fin and vapour chamber baselines.

Second, CNTF maintains thermal performance over a wider operating temperature envelope than copper or aluminium and is not subject to the oxidation and creep limits that constrain metals at elevated operating temperatures, which is directly relevant to defence, aerospace and high-power electronics applications where the operating envelope is mission critical.

AUTHORISATION

Approval & Release

This announcement is approved for release by the Board of Pure Resources Limited.

Rocco Tassone
Chief Executive Officer
Pure Resources Limited

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ABOUT

Pure Resources Limited (ASX: PR1) is an ASX-listed advanced materials and critical minerals company pursuing an integrated mine-to-market strategy — from 100% ownership of an upstream graphite and garnet asset in Western Australia, through a US DoE Strategic Partnership for heavy rare earths, to a funded downstream R&D collaboration with Rice University (Houston) in high-performance carbon nanotube fibre.

THE MATERIAL OF THE INTELLIGENCE AGE

"CNTFs are not just an incremental improvement — they represent a step change in materials capability. Through advanced materials science, they unlock lighter, stronger and more conductive systems that redefine performance across defence, energy and advanced manufacturing. This is not evolution; it is a fundamental revolution in what materials can do."

01 UPSTREAM

Garnet Hills Project
Graphite & Garnet

The Company's 100% owned **Garnet Hills Project** provides upstream exposure to graphite and garnet under a granted mining lease in Western Australia.

02 STRATEGIC PARTNERSHIP

Oak Ridge National Laboratory
HREEs & Yttrium

The deposit has attracted a **Strategic Partnership Projects Agreement with the US Department of Energy (DoE) Oak Ridge National Laboratory**, targeting the recovery of **Heavy Rare Earth Elements and Yttrium** for United States critical materials supply chains.

03 IP COLLABORATION

Rice University
Carbon Nanotube Fibre (CNTF)

Pure is executing a downstream strategy anchored by a funded R&D collaboration with **Rice University**, focused on **Carbon Nanotube Fibre thermal management technology** for AI data centre infrastructure and defence applications.

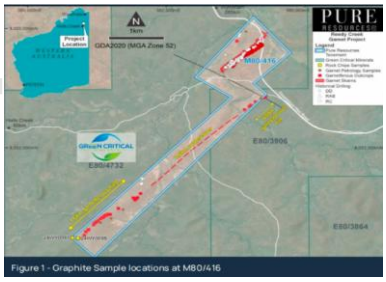

Fig. 1 Graphite sample locations at M80/416, Reedy Creek Garnet Project (GDA2020, MGA Zone 52).

• WESTERN AUSTRALIA · GRANTED MINING LEASE

Fig. 2 US DoE Oak Ridge National Laboratory — HREE & Yttrium recovery programme.

• US DEPARTMENT OF ENERGY · ORNL PARTNERSHIP

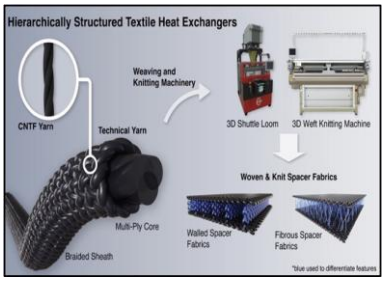

Fig. 3 Hierarchically structured textile heat exchangers — CNTF yarn to woven & knit spacer fabrics.

• RICE UNIVERSITY · FUNDED R&D COLLABORATION

DISCLAIMER

Forward-Looking Statements

*This announcement contains forward-looking statements concerning Pure Resources Limited (ASX: PR1) (**"Pure"** or the **"Company"**) and its current expectations, intentions and projections regarding the Company's future operating and financial performance, business plans, projects, strategies, prospects and the markets in which it operates. Forward-looking statements can generally be identified by the use of words such as "anticipate", "believe", "expect", "intend", "may", "plan", "project", "potential", "estimate", "target", "forecast", "guidance", "should", "will" and similar expressions.*