

Kazakhstan and Global Development: Green Investments, CRM and The ACAST project

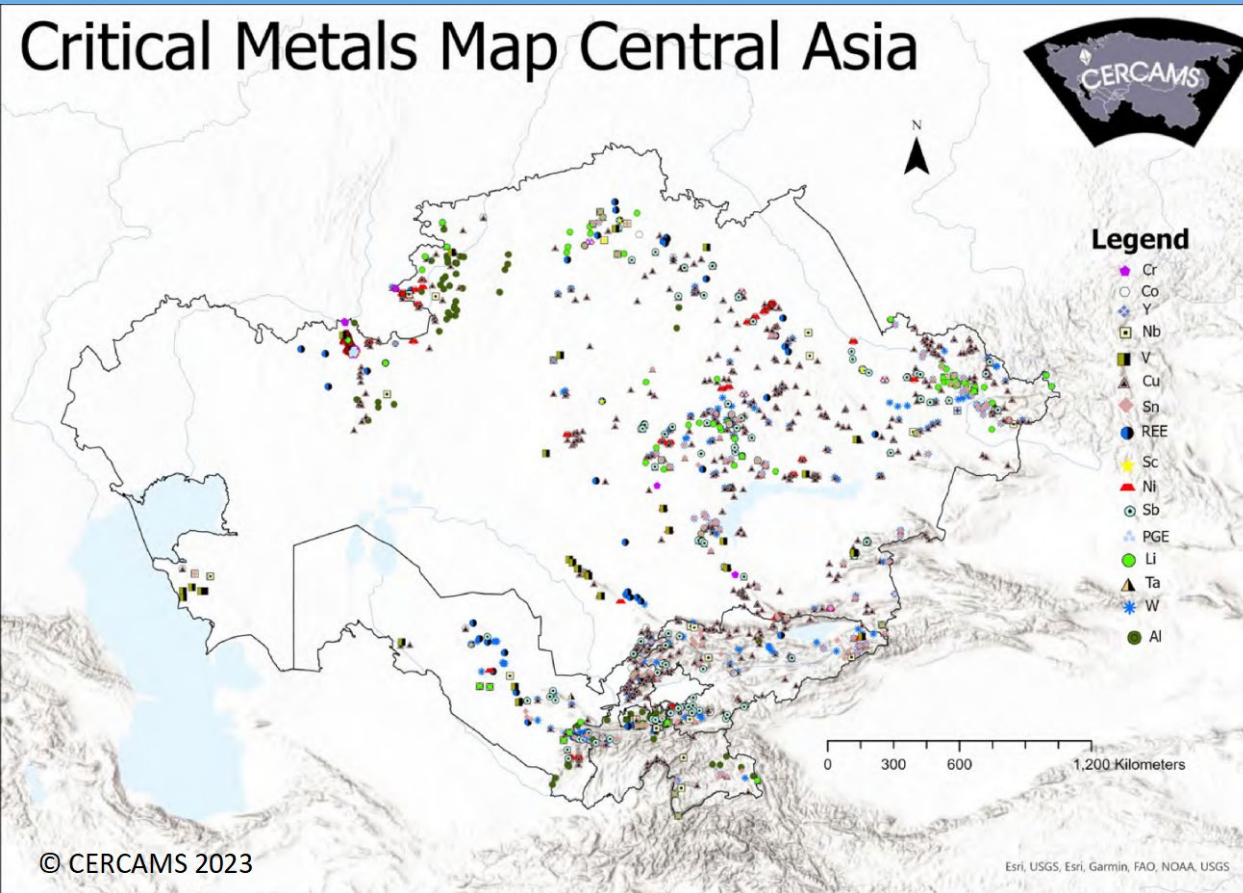
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**Kazakh-British Technical University
University of Cambridge
UNECE**

UNECE Resources Management Week, Geneva, Switzerland, September 13, 2023.

CERCAMS

Critical Metals Map Central Asia



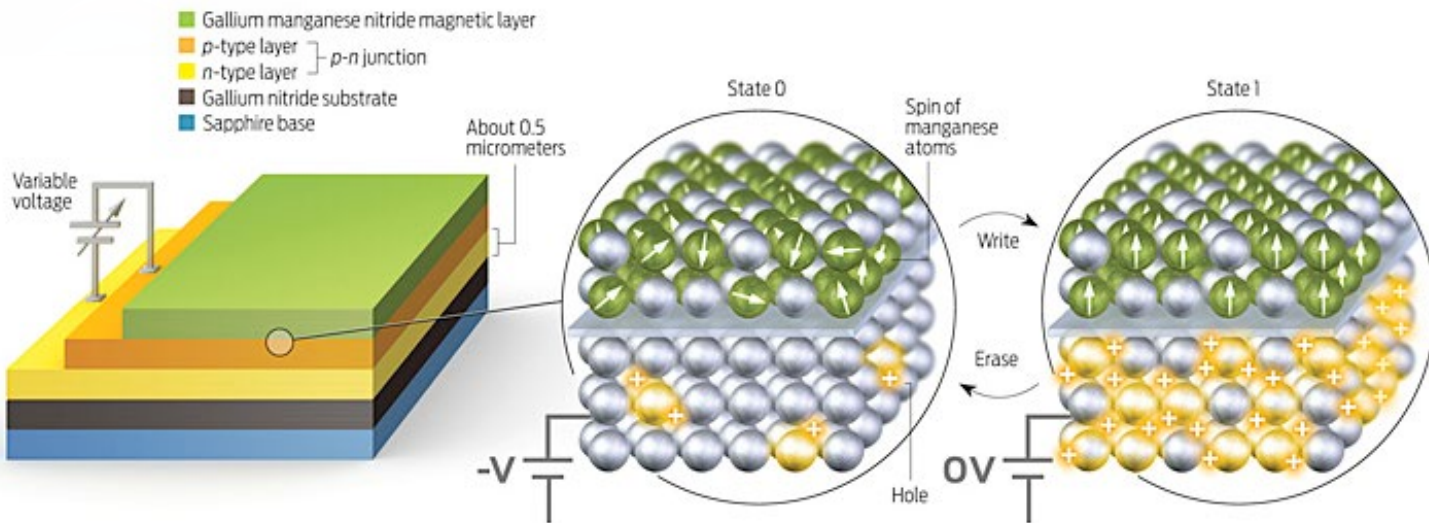
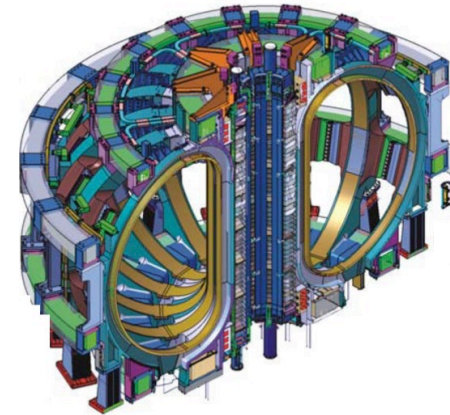
The **CERCAMS** Central Asia ArcGIS database holds a mineral inventory comprised of more than 2,000 deposits.

- Based on major and minor commodities.
- Allows for the mineral assessment of critical metal potential.

The Modern Mineral System Approach

- What controls the CRM distribution in space and time?
- When and why did the mineralisation form?
- Where can we find these deposits?
- Endowment and exploration maturity?
- Basement, Basins, Belts (undercover), Faults

Green Transition and Reindustrialisation of Kazakhstan:

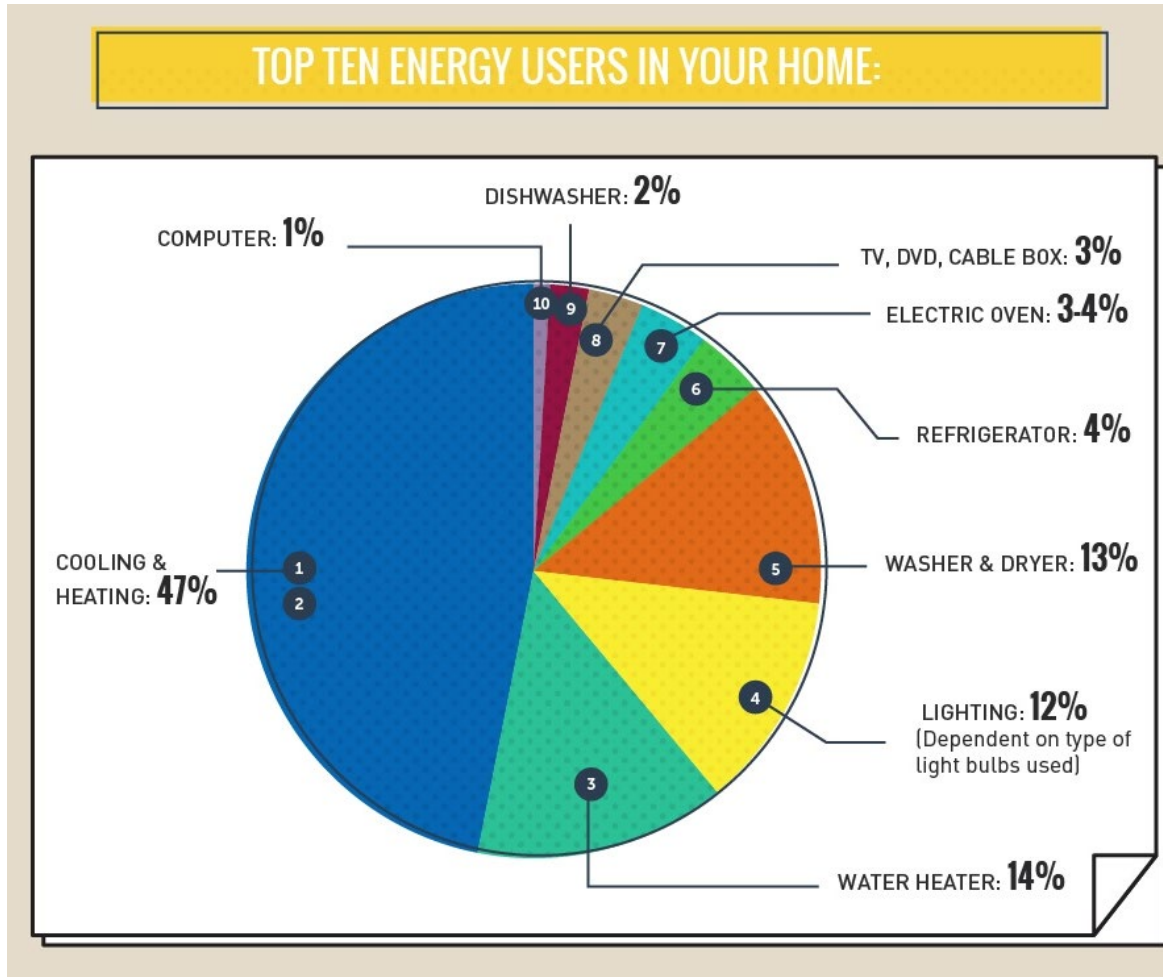


Green Transition and Reindustrialisation of Kazakhstan:

- **Spin Nematics** (*for next generation of environmental, medical and industrial sensors for applications ranging from satellite communication to chemical industry heat process management and mining exploration*)
- **Computer Memories and Information Transport** (*e.g. components and fully integrated chips for quantum computation and memory storage*)
- **Multifunctional Composites** (*these can act as both batteries for energy storage and process sunlight for energy production*)
- **Room-Temperature Superconductivity** (*for dissipation-less transmission of electricity and production of magnets for Maglev High Speed trains as well as plasma confinement reactors for energy production*)
- **Magnetic Refrigeration** (*For example, manipulation of quantum spins can produce refrigeration that no longer requires cumbersome compressors or use of environmentally damaging gases such as CFCs (chlorofluorocarbons) and HCFCs (hydrochlorofluorocarbons) like R-12 or R-22. Such technologies have the potential to power our computers, keep our food fresh*)

Magnetic refrigeration

Magnetic refrigeration is to reduce the consumption of the today's household energy by more than 70%



ACAST: Joint Cambridge-KBTU Novel Superconducting Materials research group, August, 2023

Part of the KBTU Structure, co-headed by:

- **Prof. Maratbek Gabdullin**
 - KBTU Rector
- **Prof. Siddhart Saxena**
 - Principal Research Associate Academic at Quantum Matter Group
 - Department of Physics / Cavendish Laboratory and Director of the Cambridge Central Asia Forum, Jesus College, University of Cambridge.
 - Expertise in metallurgy and properties of rare earth materials, science and technology of graphite and graphene, technology start-ups and innovation ecosystem, science and education policy in Kazakhstan and Central Asia, digitalisation policy in Central Asia and Asia.



ACAST: Joint Cambridge-KBTU Novel Superconducting Materials research group, August, 2023

Scientific Supervision

Prof. Peter Littlewood

- Fellow of the Royal Society, Head of the Faraday Institute, Department of Physics / Cavendish Laboratory at University of Cambridge; Department of Physics, University of Chicago; Director Emeritus, US Argonne National Laboratory; former head of the Cavendish Laboratory and Bell Labs division.
- Expertise: Materials for energy applications, translation of research into technology, national industrial strategy, management of megaprojects in science and industry



Professor Gilbert Lonzarich

- Fellow of the Royal Society, Quantum Matter Group, Department of Physics / Cavendish Laboratory at Cambridge University
- Expertise: discovery of new materials and conceptual advancement of material functionality in electronics, power transmission, aircraft engines, international project management, and strategic advice to governments and industry).



Welcome to the 3rd Almaty Energy Forum, KBTU!

‘Building on the discussions and recommendations from the [Almaty Energy Forum](#) in 2022, United Nations organizations – United Nations Economic Commission for Europe (UNECE), United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and United Nations Development Programme (UNDP) - are strengthening its regional partnership to help countries in Central Asia accelerate energy transition. Join us for this inclusive multistakeholder dialogue to facilitate regional cooperation, provide technical capacity support and help countries in Central Asia innovate and modernize its regional infrastructure and build resilient energy systems that are secure, affordable and deliver on net-zero targets.’

- UNECE Website

3rd Almaty Energy Forum

6–8 November 2023

