



REE and

**KUANNERSUIT/
KVANEFJELD**



GREENLAND
MINERALS AND ENERGY A/S

Rare earth elements

- Rare Earths Elements (REEs) are a group of specialty metals with unique physical, chemical and light-emitting properties. An example is Neodymium, which is used to produce magnets used in the wind turbine industry and batteries for hybrid cars.
- The group is considered to include the 15 lanthanide elements: lanthanum, cerium, praseodymium, promethium (does not occur naturally), neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium and lutetium. The elements yttrium and scandium are also included as they have similar chemical properties, making 17 REEs in total.
- Many electrical products are powered by rechargeable batteries. One of the most efficient types of rechargeable batteries is Nickel-metal hydride (NiMH) batteries, which are used in hybrid cars and other electronic products. The alloy used for the battery's positive pole consists of rare earth metals and this makes up 26 per cent of the weight of the battery.
- Several commodities dependent on the unique properties of REE: REE is used in wind turbines, hybrid vehicles, rechargeable batteries, mobile (cell) phones, plasma and LCD screens, laptop computers, disk drives and catalytic converters. A catalytic converter is a device fitted to the exhaust system of a combustion engine that reduces the toxicity of emissions.
- Rare Earth Elements make the world's strongest permanent magnets, which are used in electric motors.

EUROPIUM
SAMARIUM
GADOLINIUM
LUTETIUM THULIU

WHAT IS THE DEMAND FOR REE?

- By 2014 global consumption of REEs is forecast to increase to 180,000 t, up by 50% from current levels, driven by significant market growth for many applications that rely on REEs. As a result the world urgently needs new, long-term stable suppliers of REEs to meet the strong demand.
- China is responsible for nearly 95 per cent of the world's production of rare earth metals. China domestic demand is such that the majority of this is consumed within China and only a relatively small proportion is available for export. China has been steadily reducing export quotas, and increasing export taxes in recognition that REE represent a very strategic commodity group.
- Unless large and stable sources of rare earth elements are found outside of China foreign companies may need to move their production facilities to China in order to access the rare earth elements.



WHY KVANEFJELD?

The Kvanefjeld is one of the largest deposits of rare earth metals in the world. Kvanefjeld has the potential to meet the world's rapidly growing demand for rare earths and in doing so, can become a major contributor to the Greenland economy for decades to come.

The ore in Kvanefjeld comprises multiple elements with commercial value, namely REEs and uranium. REEs are the primary products and uranium is extracted as a by-product. The potential annual production of REEs is more than 40,000 tonnes, being ten times more than the production of the uranium oxide by-product.

We believe that Kvanefjeld will be the start of a truly world class mining district and can be developed in a responsible, environmentally conscious manner, to become one of the world's premier source of Rare Earth Elements.