Graphite and graphene for a new, smart industry

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Background:
STRIM – Swedish strategic innovation program for mining & refinement industry
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Formal role:
General Manager, Talga Sweden

In practice:
Make sure the strategic Sweden venture is successful
ABOUT TALGA RESOURCES
An Australian-European smart materials company – with in-house mining

- Our idea: **Smart minerals** – building blocks in the new economy
- Focus: **Graphite** and **graphene** for green industry applications

### Mineral deposits
- Highest grade in the world
- Largest deposit in the EU
- Cobalt, copper, gold
- Green energy

### Refinement & processing
- Proprietary processes
- High yield = efficiency
- Economies of scale

### Material tech & IP
- In-house R&D
- Hi-tech products for e.g. battery industry

Vertical integration

- Building materials
- Energy
- Coatings
- Composites & Resins

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SUSTAINABLE TRANSFORMATION – A GROWTH MARKET

...where Sweden is strategically located within the European market

Source: Benchmark Minerals. Assumed utilization level and usage of 1200t graphite anode per GWh.
WHAT IS GRAPHITE?

- Consist exclusively of the basic element carbon
- Can be produced either synthetically from crude oil or from mining of natural graphite ores
- Crucial component in Li-on batteries (anode: 10x lithium)
- Electric vehicles: **10-90 kg graphite** in their batteries
- Critical mineral according to EU

Graphite+ clay+ heat= **pencil carbon**!
1x graphite = **graphene**! (nano material)

The Graphite from *Talga’s Vittangi ore* has many **beneficiary properties** as compared to competing synthetic materials.
TALGA IN SWEDEN

- 2011: Started exploration in Scandinavia for **graphite for environmentally friendly products**
- **High grade deposits** located and targeted in Sweden
- **Small scale testing** in Nunasvaara by refraction of 5,000 metric tons – **completed, restored and approved**
- Material refined in **dedicated German testing facility**
- **Product development** in partnership with potential clients
WHY SWEDISH MINERALS?

- Mineral deposits recognized as **national interest**
- World’s highest grade graphite* – significantly lowered environmental footprint
- Planned **refinement in Sweden** – battery materials and graphene products
  - Highest quality graphite for Li-on batteries
  - Graphene – lighter, stronger, less chemicals
- Sweden’s largest **cobalt deposit**

* JORC/NI43-101
WHY NORTHERN SWEDEN?

- **Sustainable energy** – low CO₂ footprint and low cost
- **Existing infrastructure** – roads, railroads, harbors
- **Proximity towards planned ‘Gigafactories’** – Sweden, Poland, Hungary, Germany, etc.
- **Leading edge mining innovations cluster**
- **Very high productivity within the industry** – six times higher than global average*

*Source: P3 Consulting 2017

Data and graphics from Invest in Norrbotten
LATEST DEVELOPMENTS & NEXT STEPS

- New local team members
- **Kiruna office** in June
- **Pre feasibility study** to be finalized shortly
- **2019:** Processing concession and environmental permits
- **Socio-economic study** under way
- Product development – **anode material** focus
- **Refinement facility** being planned
Thank you!

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