

# Earning the trust from a “to be” mining Municipality in Northern Norway

Øystein Rushfeldt, Nussir ASA  
EIT Minefacts Seminar - Oct.31  
2017



An exciting view





# An electric future

## The electric vehicle revolution needs our commodities

- **The electric vehicle revolution is happening and its impact is likely to be felt faster than expected**
  - Virtually all automotive players now accelerating their investment in / adoption of EV technologies
  - Governments mandating increasingly aggressive emission targets that can only be met by alternative forms of mobility
- **Supply chains are evolving rapidly with battery producers becoming critical players**
  - EV/ESS transition will require a significant change in material flows of the global economy including the installation / rebuild / replacement of supporting EV infrastructure
- **China emerging as the global leader in EV**
  - Supported by a \$361bn investment target in renewable energy generation by 2020<sup>(4)</sup>
  - Targeting 5 million cumulative EV sales and 4.8 million charging points by 2020<sup>(5)</sup>
  - 8% of 2018 vehicle sales potentially required to be domestically produced EV. 2016 vehicle sales of 28 million units (EV:300k)<sup>(6)</sup>

### The impact of electrification per vehicle: c.160kg Cu

**Battery (250kg)<sup>(7)</sup>**  
(NCM 1,1,1)

+ c.38kg Copper  
+ c.11kg Cobalt  
+ c.11kg Nickel

**Car (EV-ICEV)<sup>(7)</sup>**

+ c.100kg Copper  
  
(Contained in Cu motors  
and inverters for motors  
and charging)

**Charging Point<sup>(5)</sup>**

+ c.20kg Copper

### • Ambitious global targets ...

- Major countries targeting cumulative sales of 13.4 million BEV/PHEV vehicles by 2020, and an estimated c.52 million by 2025<sup>(5)</sup>

### • ... will have an outsize impact on metals markets

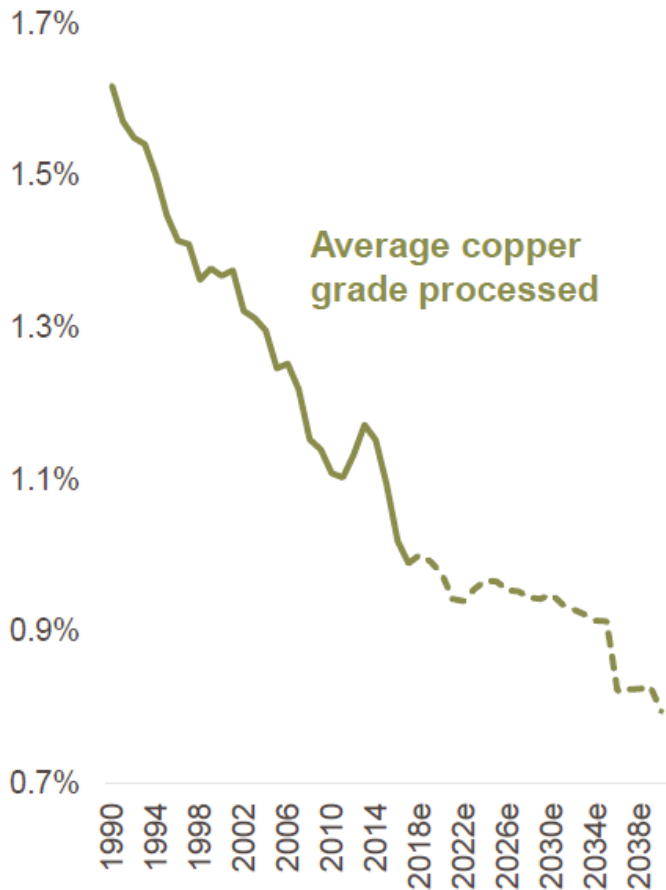
- 2020e: +c.373kt Cu demand, +c.40kt Ni demand<sup>(5)</sup>
- 2025e: +1.65Mt Cu demand, +c.210kt Ni demand<sup>(5)</sup>
- 2035e: Rapid adoption scenario where c.95% of global vehicle sales are EV would require: +20Mt Cu, +1.8Mt Ni, +679kt Co<sup>(7)</sup>

### • Higher commodity prices are required to incentivise reinvestment to offset a declining resource and aging asset base

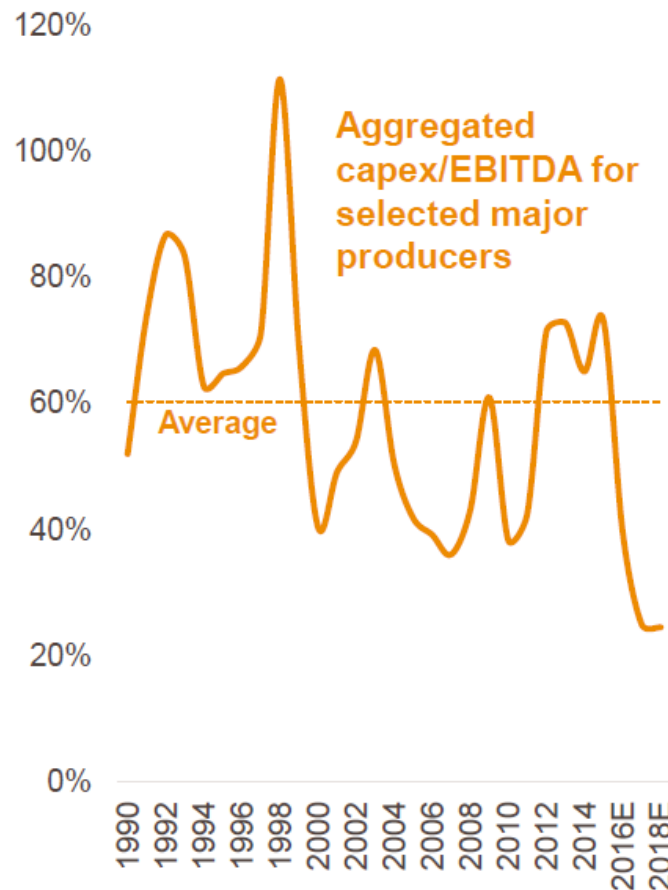
# Supply

## Sustaining copper mine supply is progressively more challenging

Mined copper grades continue to decline<sup>(1)</sup> ...



Sector reinvestment has collapsed<sup>(1,2)</sup> ...



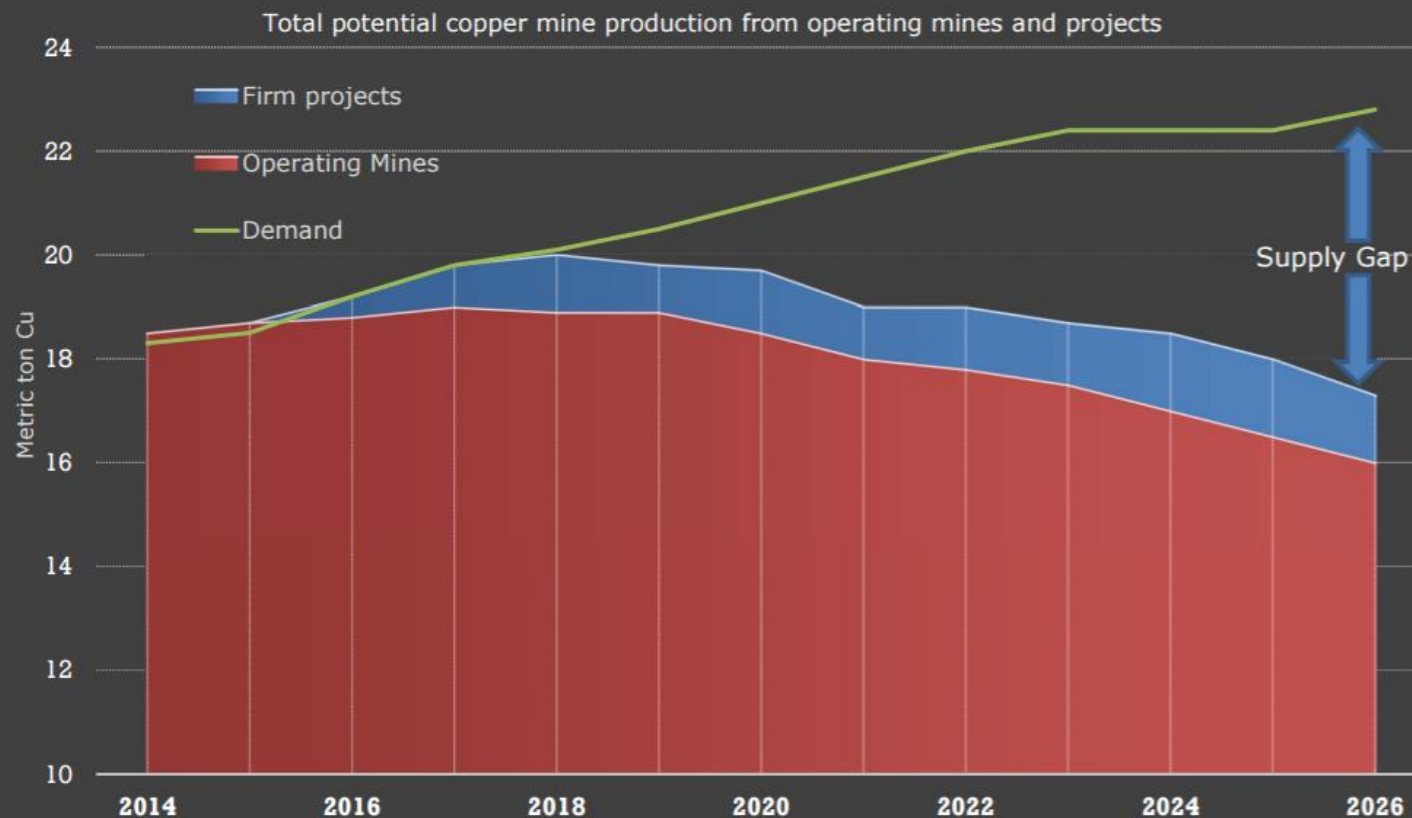
Exploration has been increasingly unsuccessful<sup>(1)</sup> ...



Source: (1) Bernstein European Metals and Mining, 8 March 2017, Copper & Gold – Not a production wall ... it's a production cliff! (2) Selected producers includes Rio Tinto, BHP Billiton, Anglo American, Glencore, Vale, First Quantum, South 32, Antofagasta. Estimates for 2016-2018 based on company guidance and approved projects only.

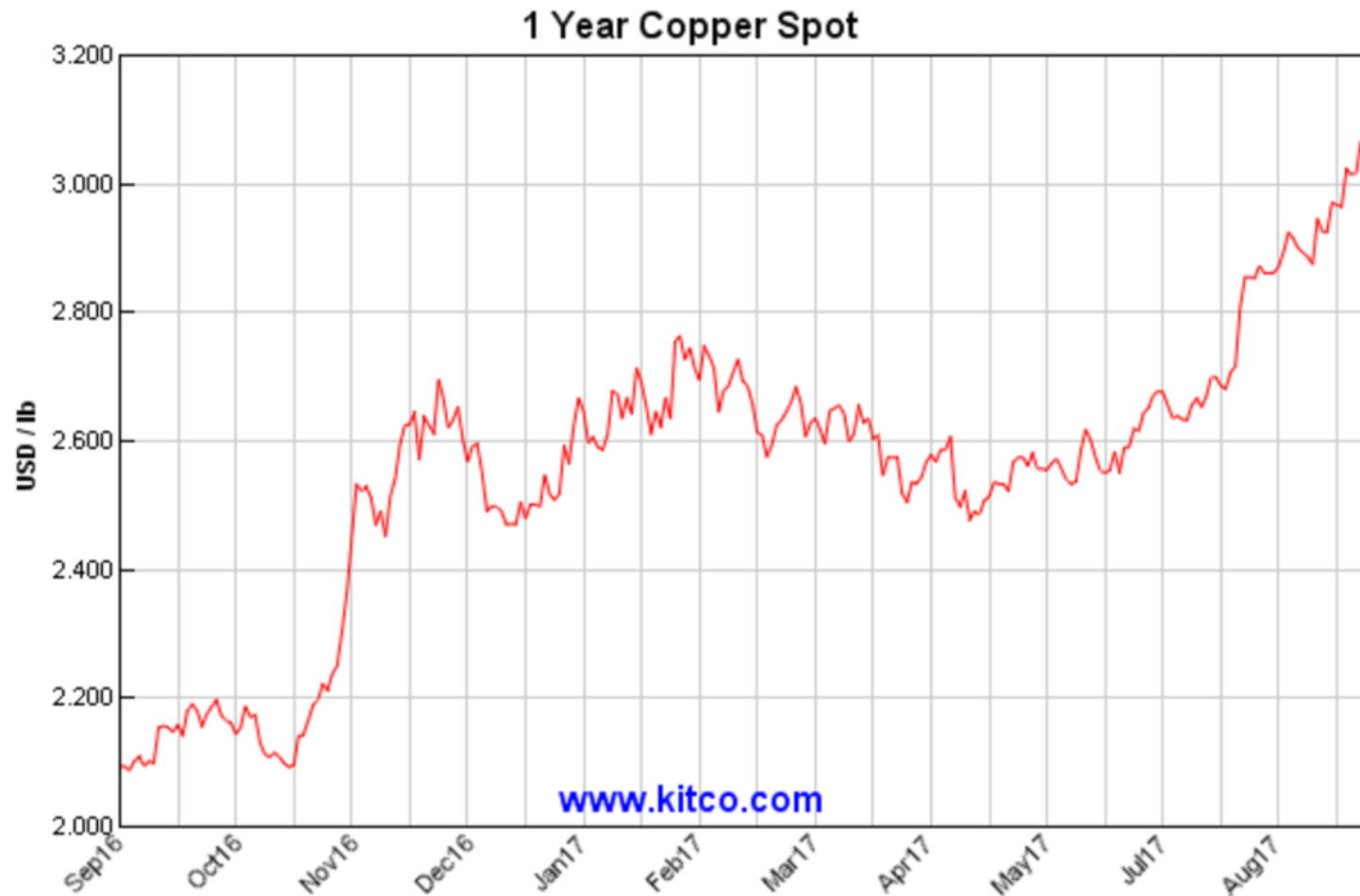
# Lack of new copper mines

## Copper Supply Gap



Source: CRU

# Market response







# A sea of possibilities

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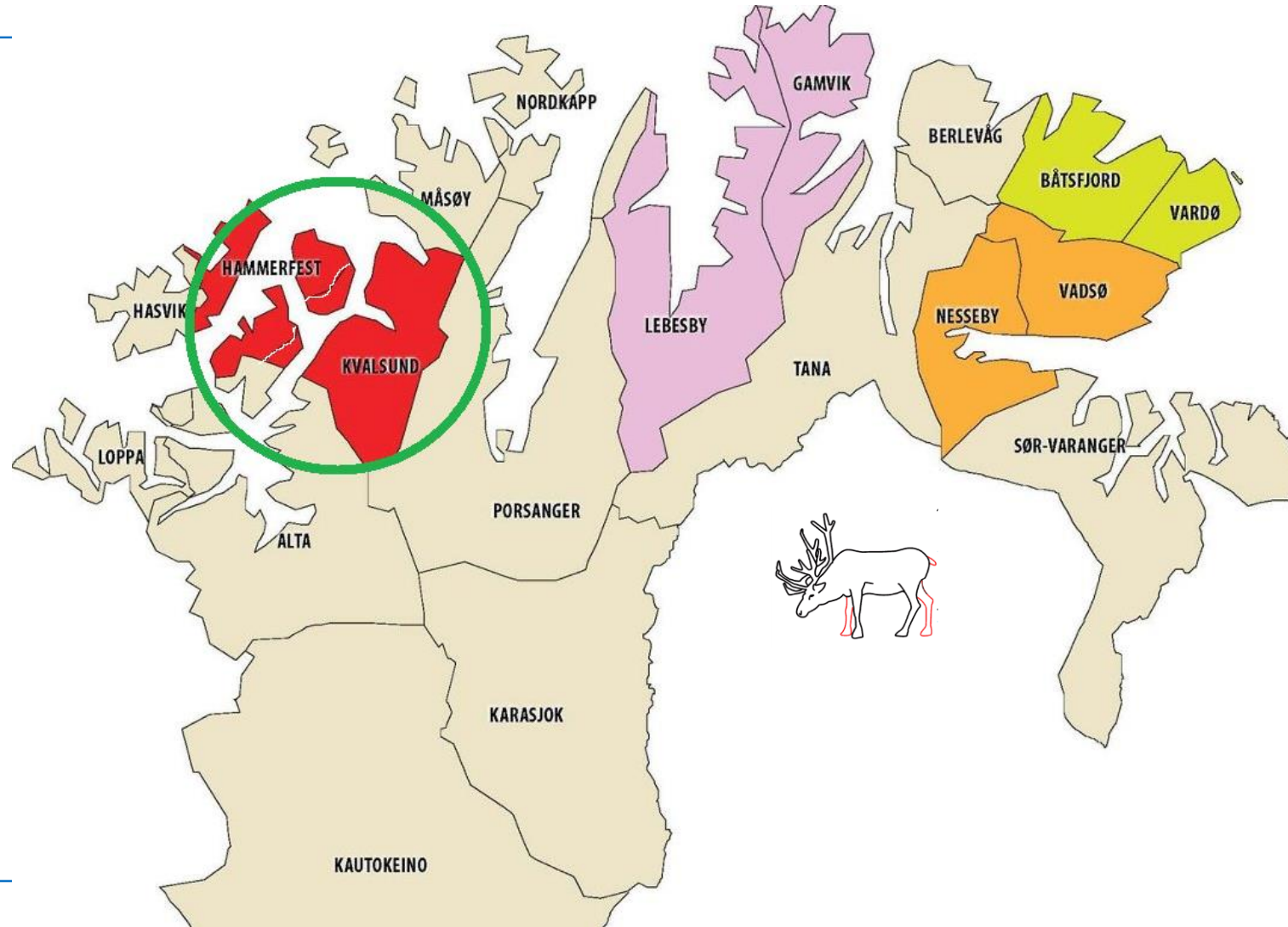


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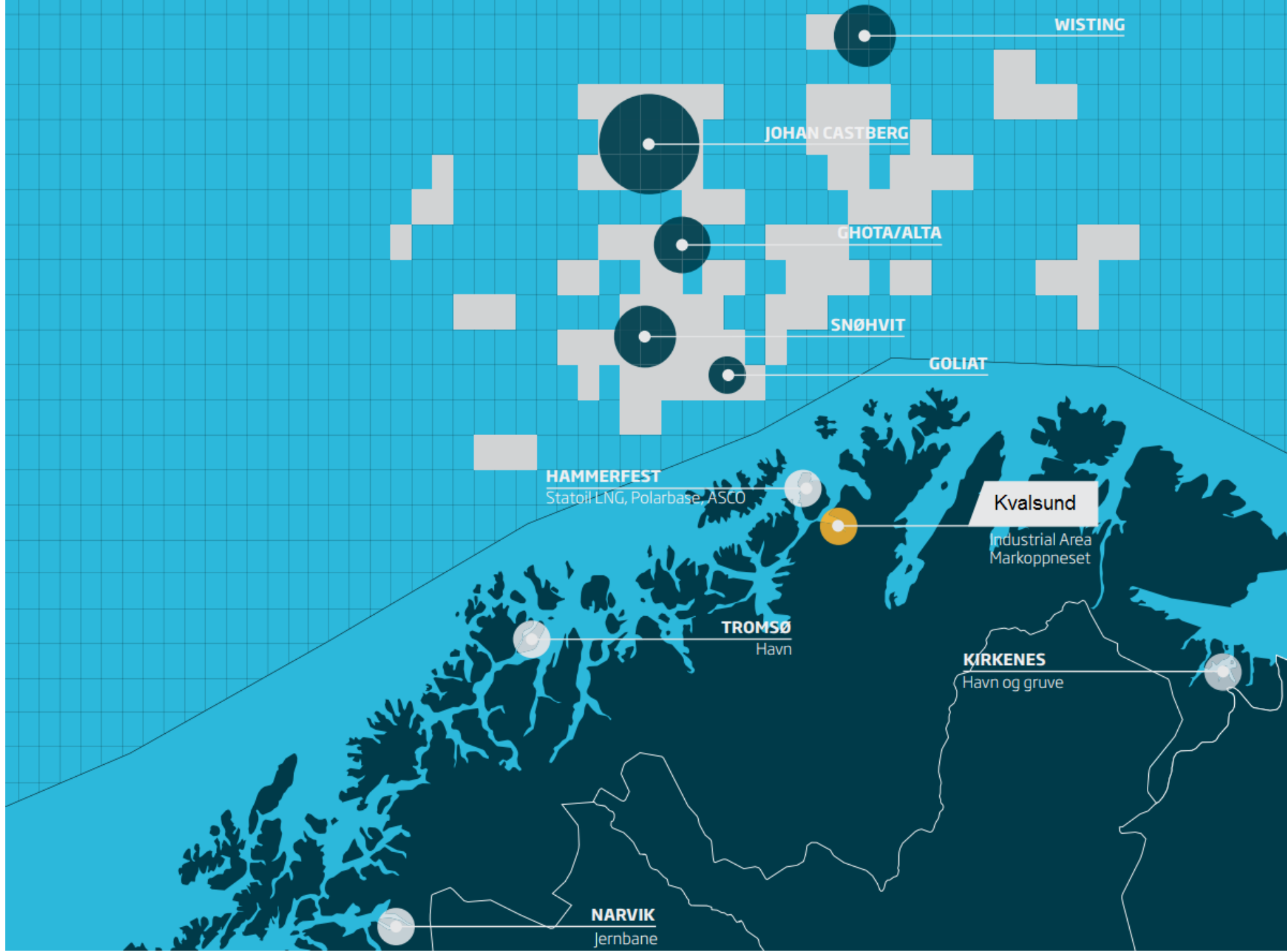
**Abundant Natural resources**



# Where are we?









# GNOK Industries in Hammerfest og Kvalsund



10 anlegg i produksjon

Copper discovery –  
ca. 100 mrd NOK





# Kvalsund sentrum







# HUB70 – Markoppnes

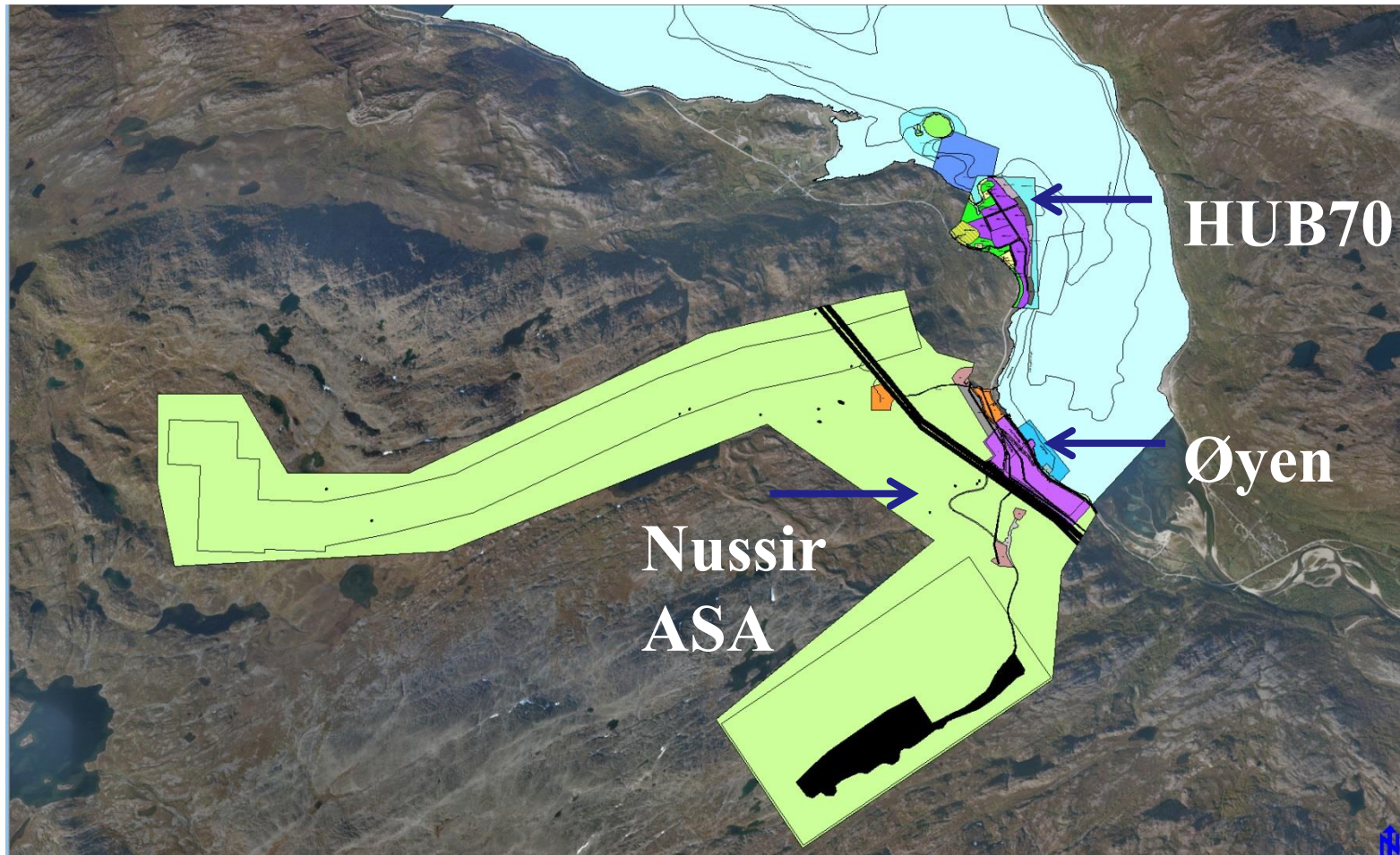
- 385.000 m<sup>2</sup> industrial area regulated
- 2019 → 60.000 m<sup>2</sup>







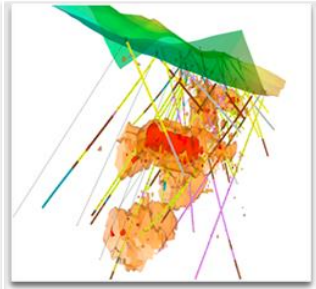
# Zoning plan, Repparfjord, Kvalsund



- ✓ **Controlling Norway's largest base metal deposits**
  - ✓ **Strong exploration potential on existing deposits**
  - ✓ **Large underexplored prospective area around deposits**
  - ✓ **Brownfield character of infrastructure**
  - ✓ **Capable management with strong track record**
  - ✓ **Political goodwill on local, regional and national level**
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# Phases of a mining project



**Utforskning**  
(lete, ressurs-  
estimering)



**Utvikling**  
(planer,  
godkjennelser)



**Etablering**  
(finansiering,  
konstruksjon)



**Drift**  
(operasjon,  
produksjon)



**Tilbakeføring**  
(avslutning,  
revegetering)



# A part of the community

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- Nussir ASA is focused on reaching a broad based public consent for its activity
  - Existing activities needs to experience both a protection of their interest and a benefit from the new activity
  - Early involvement
  - Full transparency
  - True dialogue
- Active and positive municipality



Simon Karlsen (18) og Simon Åkesson (17) var møtt opp for å høre på hva Nussir og Øystein Rushfeldt hadde å si om fremtiden for Kvalsund. Foto: Marlus B. Støvel

## Coexistence

- It is possible to become good neighbours in coexistence with existing traditional activities.
- Mining companies has to prove worthy of trust
- Sami dialogue meetings (~ 50 meetings)
  - Fielttar, Fala
  - Sametinget +
- Agreements



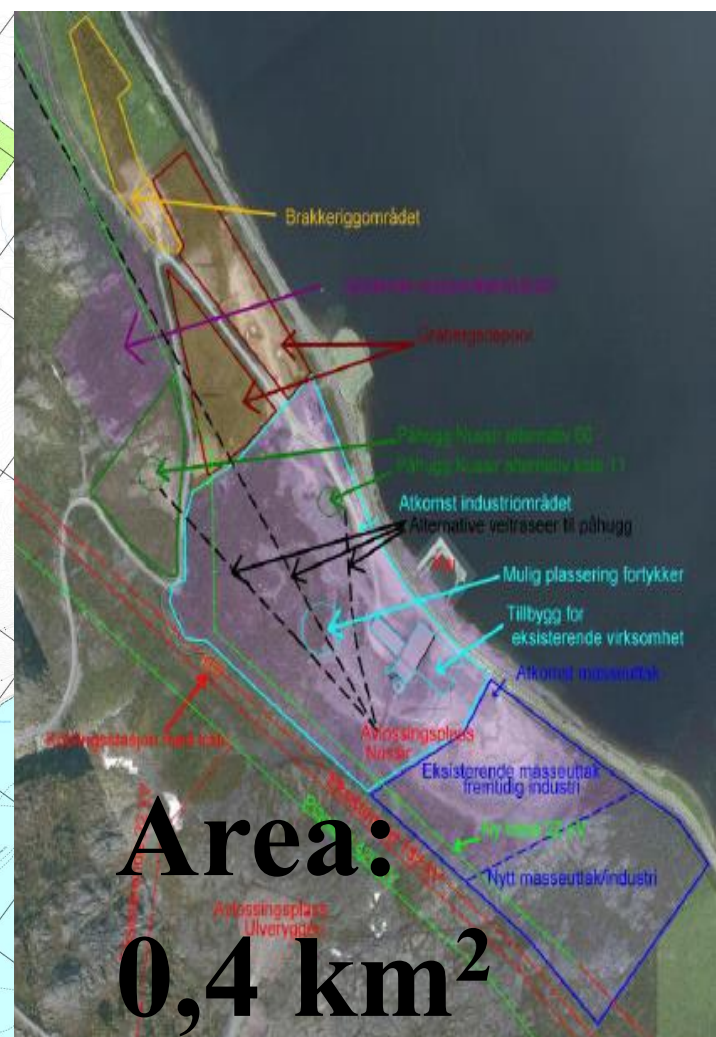
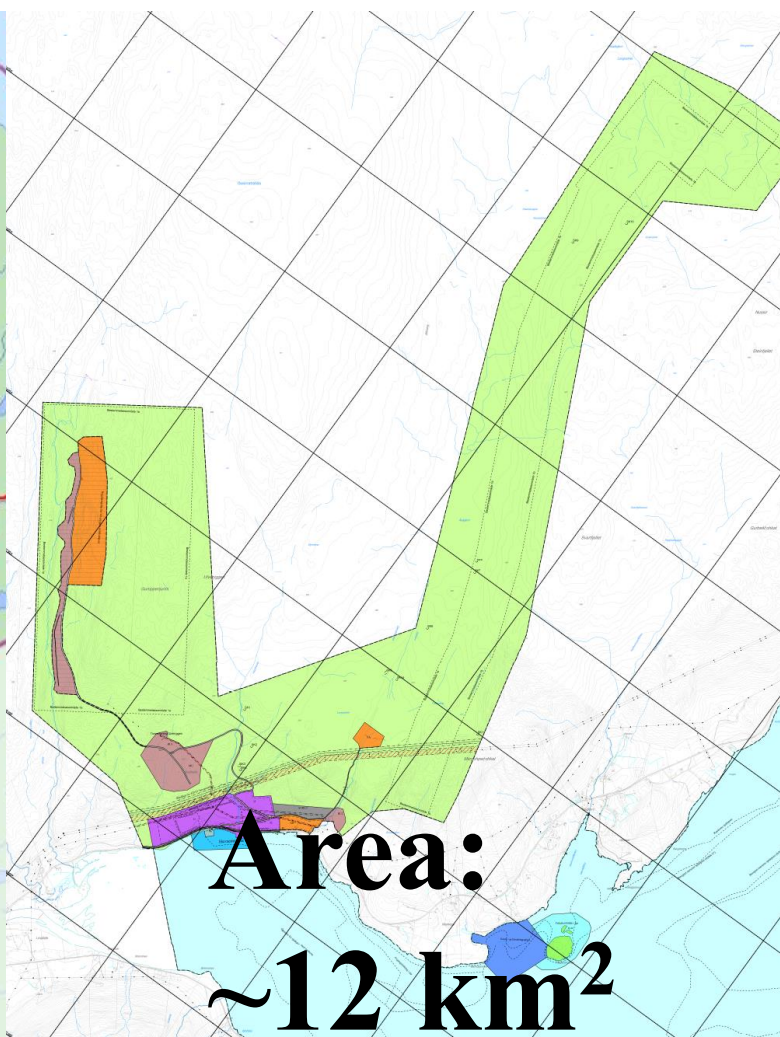


**Industrial area to be “recycled”.**





# Footprint



## Extensive planning process

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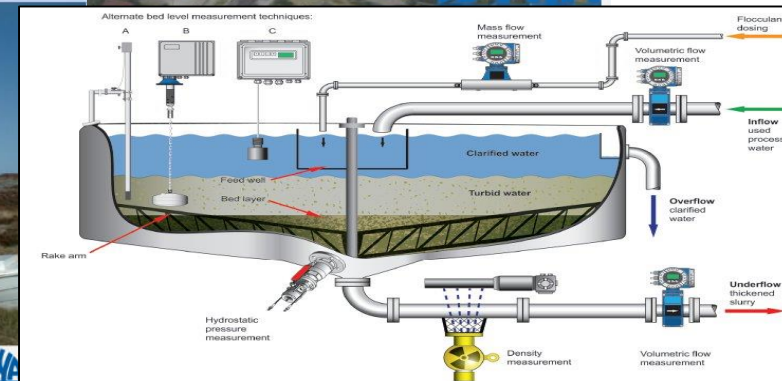
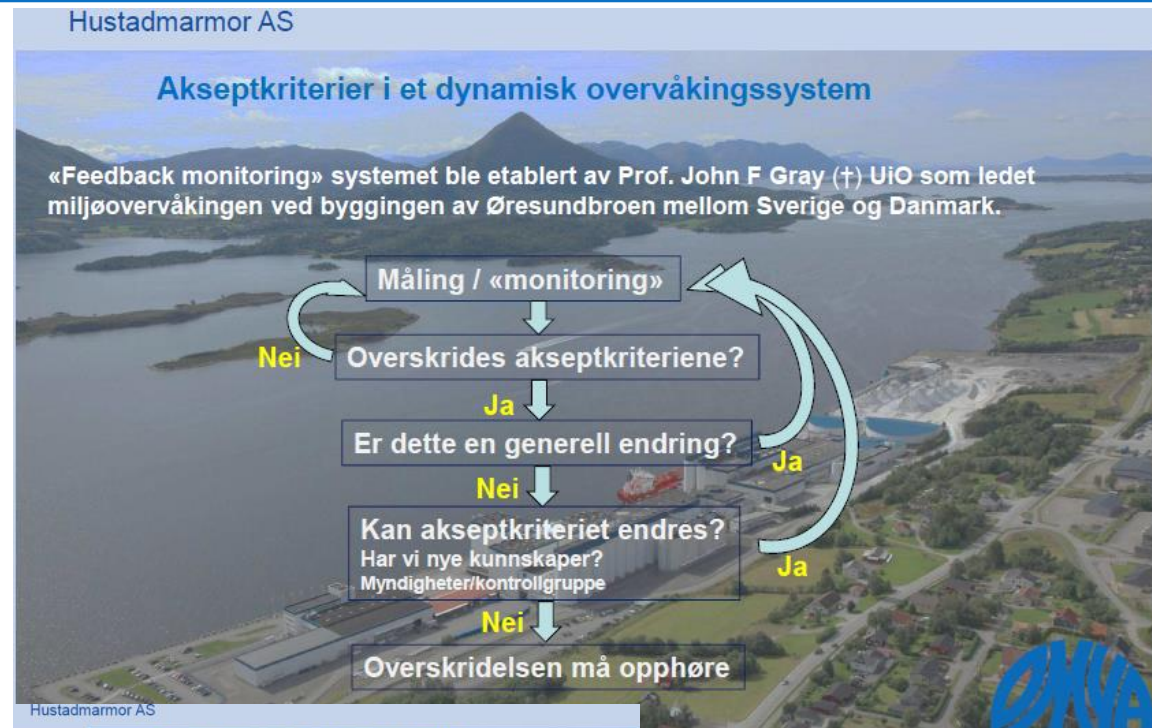
- 2009 Dialogue groups started
  - 2010 June ESIA scheme adopted by Kvalsund Municipality (KM)
  - 2011 June ESIA, ROS and Zoning plan submitted to KM
  - 2011 Sep Consultation with 120 participants
  - 2012 May Zoning plan approved by KM
  - 2012 Sep Mediation with Sami's
  - 2013 Mar Site visit from Ministry of Environment
  - 2014 Mar Zoning plan approved by Ministry of Regional Affairs
  - 2016 Jan Discharge permit - Directorate of Environment
  - 2016 Dec Discharge permit final - Ministry of Environment
  - 
  - 2018 Mining concession - Directorate of Mining
  - 2018/20 Construction
  - 2020/21 Operations
- 





# Best practice on environmental involvement

- Nussir ASA will utilise positive experiences from Hustadmarmor with Acceptance criterias and Resource group
- Well developed dynamic monitoring
- Broad involvement also during normal operation
- Using best technology



# Leading environmental technology

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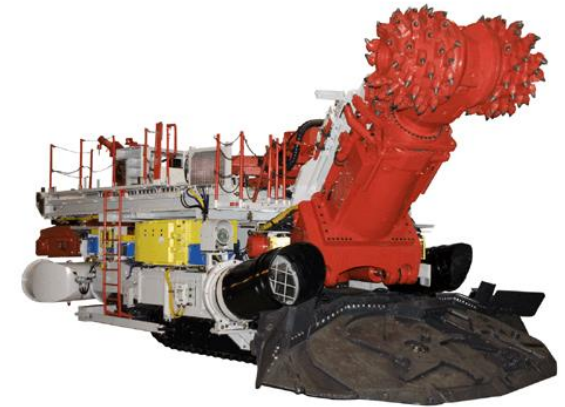
## - Electrification



## - Automation



## - Continuous miner



- Sale of waste rock (Statoil + others)
  - Study commercial products from tailings (Sintef)
  - Optical sorting of Cu-ore (Outotec / Tomra)
  - New low energy flotation technique (Woodgrove)
  - BAT happens mostly in actual mines
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# Summing up

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- Copper from Finnmark can be one of the more environmentally friendly in the world market
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**Thank you !**

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## Nussir lea ovdánahtti ruvkesearvi

man mihttomearrin lea buvttadit máilmmi metállamárkaniidda mat sturrot jođánit.

### Ođđasat

**Tilsvár til høringsuttalelser KLIF / Response to environmental submissions**

2012-08-28

Tilsvár til høringsuttalelser levert til KLIF i forbindelse med Nussirs utslippssøknad / Response to the submissions

### Mediija

**Nussir svarer KLIF**

2012-08-29 GEO 365

**Etterlyser fart i sakene**

2012-08-28 Dagens Næringsliv

### Biras

**Tilsvár KLIF dokument / Response to KLIF document**

2012-08-08

Dokumentet som er levert KLIF i forbindelse med tilsvár til høringsuttalelsene om sjødeponi / Response document to