Ludvika Iron Mines
Europes next high grade producer

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What defines a good iron ore project these days?

- Access to railway direct to deep sea port
- High Grade fines/concentrate >65%
- Large iron resources, JORC compliant
- Low operating costs
  - >30 USD/dmt 62% Fe, FOB
- Low capital intensity
  - <130 USD/annual tonne production, 62% Fe
- Scaleability
- Mining friendly legislation
- Low political risk
- All permits in place providing project continuity

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**Reopening Ludvika Mines**

- All Permits now in place
- Large mineral resources with expansion
- High Specification Mainline Railway network.
- Oxelösund Port: Babycake capacity
- Swedish State - new investor
- DFS phase 1 ready H1 2016
Our targets

- Production Phase I = 1.43 Mtpa
- Commissioning new beneficiation plant Q4 2018
- Production at full capacity = 4.3 Mtpa
Niché Producer of High Quality Product

- 69% Fe Concentrate
  - Magnetite/ Hematite
- Low impurities
- Demand moving towards higher quality

- At a competitive cash cost:
  
  USD 43/dmt (FOB)
  (normalized USD38/dmt @ 62%Fe)
Ludvika Mines vs planned/ongoing (?) IO project
High quality niché producer
Solid economics

- Phase I (stand alone):
  - CAPEX USD 180 m
  - <USD130/dmtpy
  - IRR 18% (@TSI US$75)
- At full production 4,3 dmtpy
  - IRR 30% (@TSI US$75)
- 15+ years life of mine
Summary: main project characteristics

1. Existing logistics & fully permitted
2. High quality product
3. Competitive Capex/Opex
4. Low development risk
Bergslagen – A historic Mine Region since 800+ years

- Iron Ore
- Base Metal
The Ludvika area
Extensive Iron Ore mineralisations covered
One of Sweden’s largest iron mineralisations

Current Mineral Resources

Häksberg Mining Concession:
Indicated 25 Mt @ 36%Fe
Inferred 12 Mt @ 36%Fe

Väsman South concession application:
Indicated 7 Mt @ 39%Fe
Inferred 86 Mt @ 38%Fe

Blötberget *mining concession
Measured 43 Mt @ 42%Fe
Indicated 6 Mt @ 38%Fe
Inferred 5 Mt @ 33%Fe

*MRE April 2015 (JORC 2012)
Väsman - Additional Expansion potential

Targeting mineral resources in excess of 300mt (Fe 35%-45%)

Magnetic field map of Väsman
Beneficiation plant next to existing railway
Ludvika Mines – Integrated scaleable project

- Development in three phases
Ludvika Mines – Phase 1 Blötberget surface & underground
3D-view of orebodies and old mine layout
Ludvika Mines – Phase 1 Blötberget
Footwall view of new mine layout and orebodies
New process Plant and Train Terminal

Trafikverket (Swedish rail authority) completed terminal design & ready for procurement & construction.
Ludvika – Oxelösund- The Heavy Gauge Rail Route

Multiple by pass alternatives

Swedish Government allocates 65 MUSD for rail related investments for the ore and steel rail route
Oxelösunds Port
Existing High Capacity Bulk Port
Low development risk

- Existing logistics
- Existing mine infrastructure
- Existing services
- Scaleable project
- Permits in place
- Low capital intensity
- Experienced team in place
Market Segmentation - overview
High Grade, Medium Grade, Low Grade Iron Ore

- **UHGIO**: 72% (CSN, Vale, Anglo, Chile, Canada)
- **HGIO**: 68% (Vale, Anglo American)
- **MGIO**: 65% (BHP, Rio Tinto)
- **LGIO**: 62% (FMG, Roy Hill)
- **ULGIO**: 58% (Dannemora)

**Spot price grade**
- High Grade: ~10%
- Medium Grade: 90%
- Low Grade: 50%
Junior mining development

Lessons learned – some common denominators

- No real mine development & construction experience at board level
- Limited experience from execution of complex construction projects at management level.
- Short cuts at DFS stage
  - Time constraints
  - Cost constraints
  - Organisational and system constraints
  - Insufficient process tests, ie only bench scale tests, limited representative samples
  - Blurring the picture- SPV for logistics and other adjacent important functions spun outside the DFS
- Disconnect between the DFS and the construction phase
  - Can depend on changes due to issues at the permitting stage
  - Delays in securing construction financing
  - New project team with no relation to the study phase
  - Too little focus on the execution plan in the DFS
Is it possible to succeed as a junior these days?

- Brown field – industrial redevelopment
- Efficient mine & high grading process layout
- Access to existing rail and port logistics
- IO product > 65% Fe
- Transparent legislation and permitting processes
- Access to financing at the right time

Small is still possible
&
Quality beats Quantity

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Thank you

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