Improving competitiveness and expanding to 200 kton

Dag Berg, General Manager Boliden Odda

Capital Markets Day 2016 | 17 March

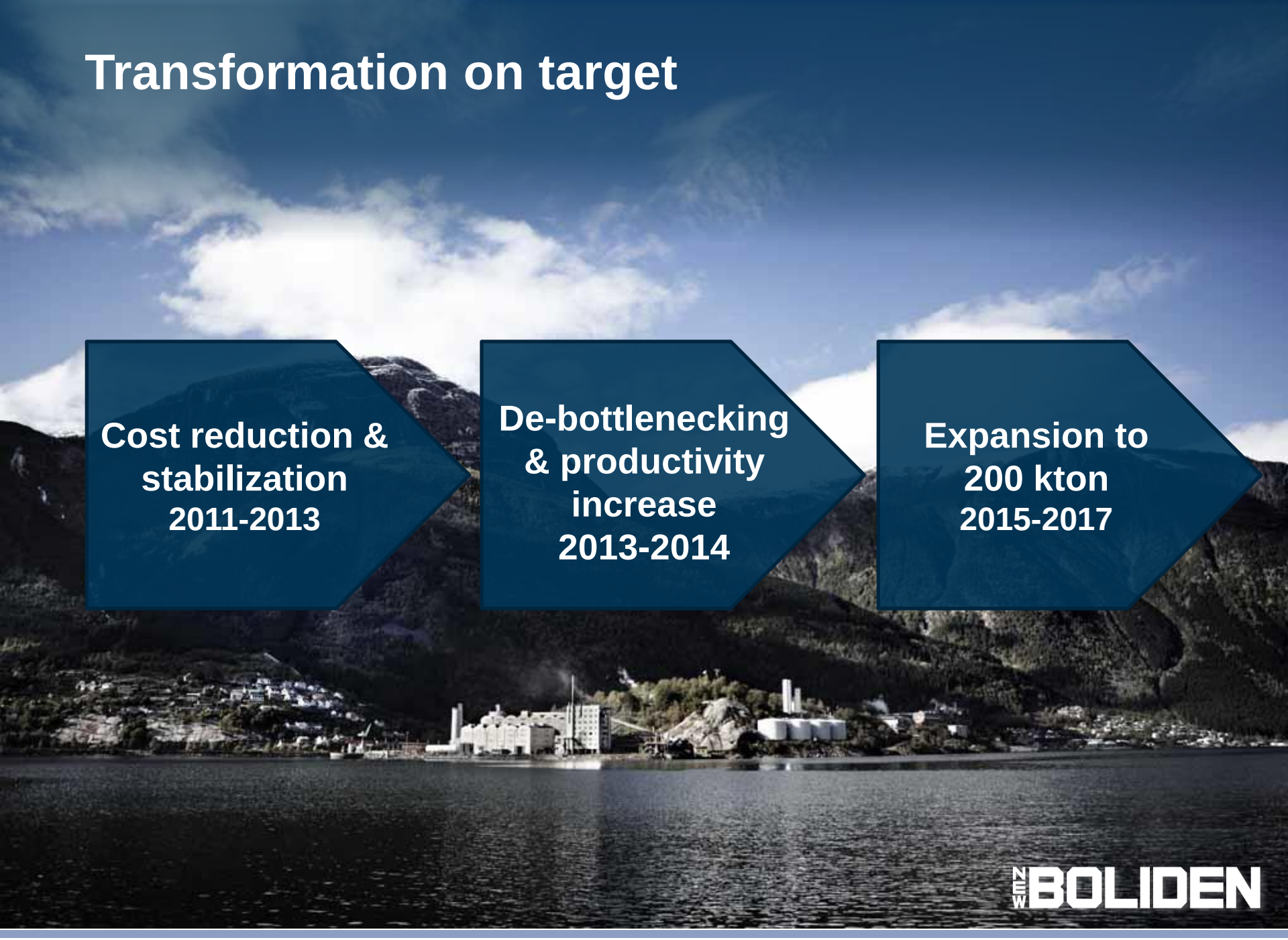
Odda site visit

10.00	Presentation of Odda
11.30	Lunch
12.15	Safety briefing
12.30	Guided tour of the plant
15.00	Bus departs
17.45	Arrival at Flesland airport (Bergen)

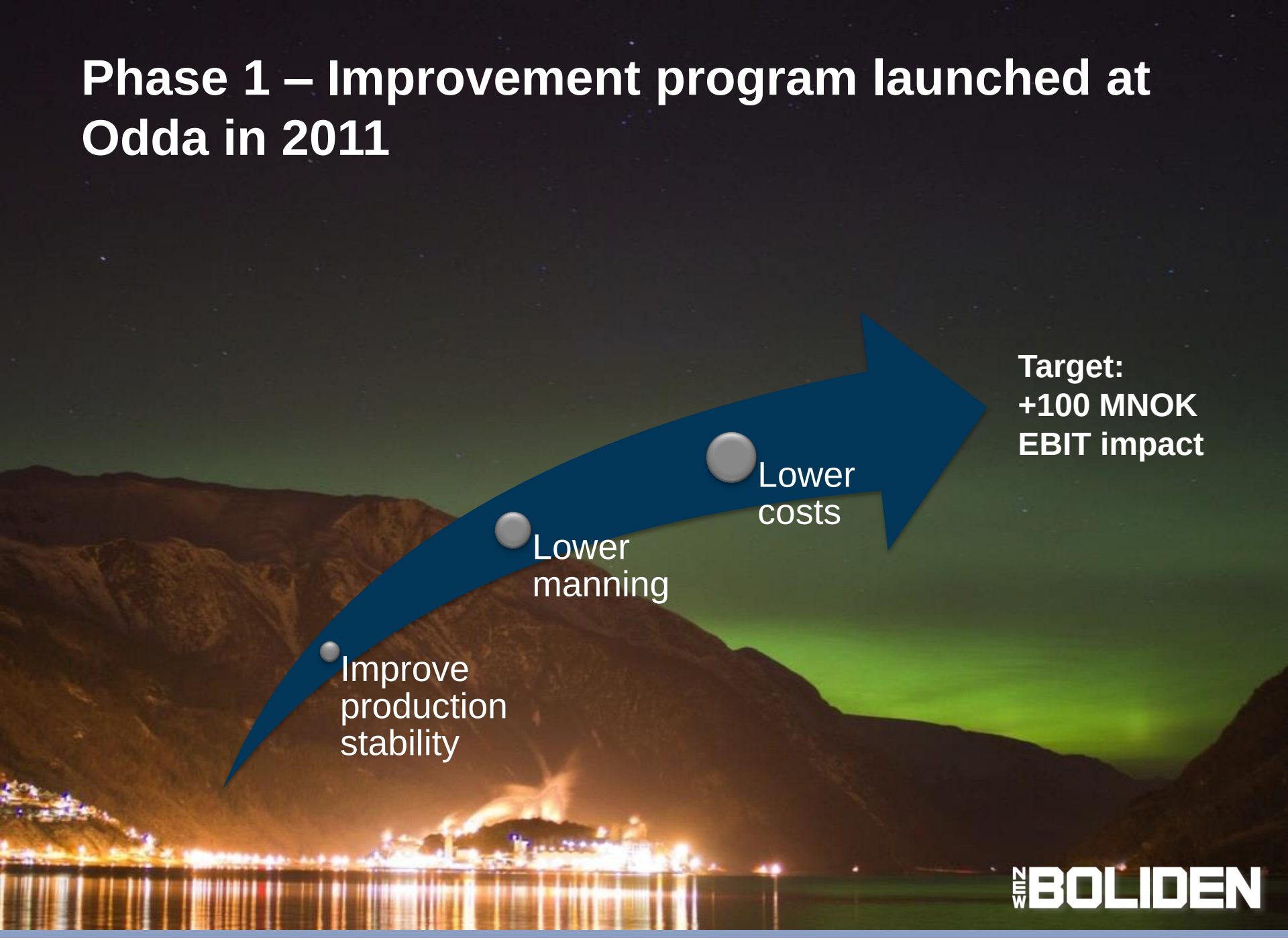
Odda – an excellent example of rapid transformation

- Zinc smelter
  - 163 (166) kton zinc produced 2015
  - Aluminium fluoride, sulphuric acid by-products
- High flexibility in handling raw materials
  - In-house developed direct leaching technology
  - Conventional roasting
  - Secondary raw materials
  - Underground disposal caverns in the mountain
- Raw materials from Boliden's mines and external European mines
- Customers mainly European steel industry
- Revenues 2015: 1 554 (1 395) MSEK
- Operating profit 2015: 390 (209) MSEK
- 289 FTEs

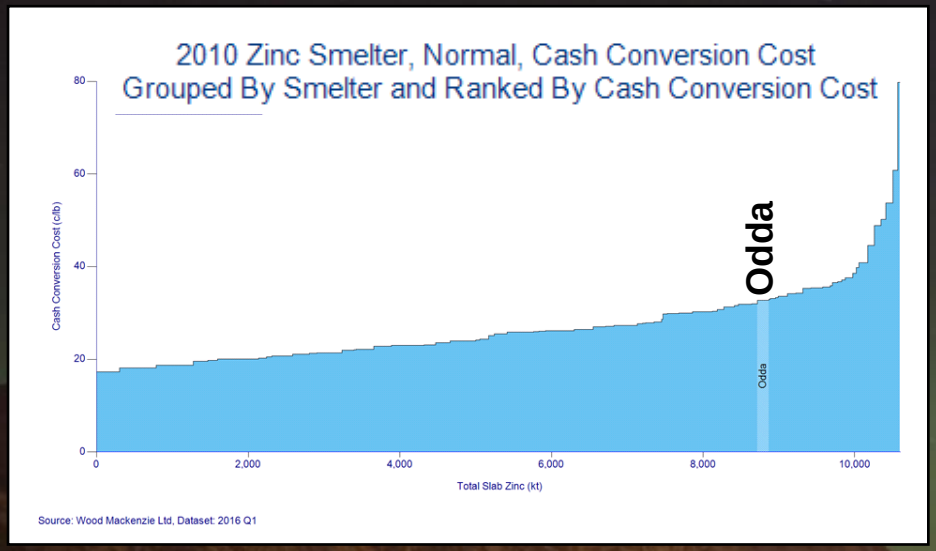
Transformation on target

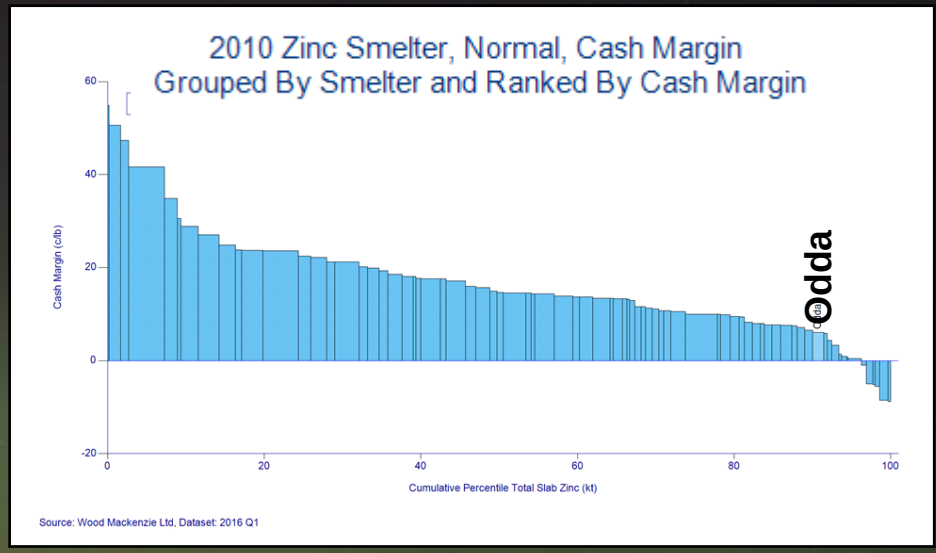


Phase 1 – Improvement program launched at Odda in 2011

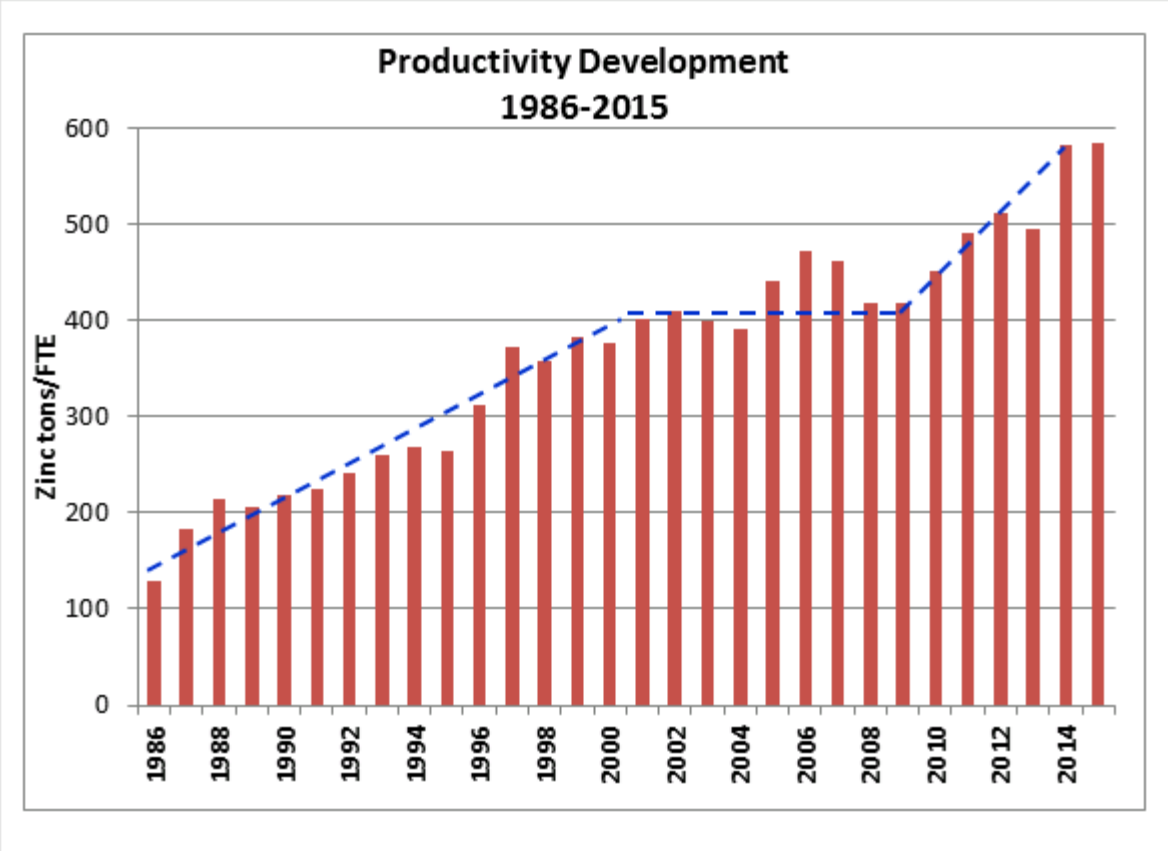


Tough starting point due to dramatic increase in power costs …





..and flat productivity between 2000-2010



Program successfully completed 2013…

Improve production stability

- Introduction of clear responsibilities by re-organizing the production and maintenance departments
- Recruiting skilled process competence

Lower manning

- Reduced manning with 20%
- Insourcing of critical external services such as electricians and automation

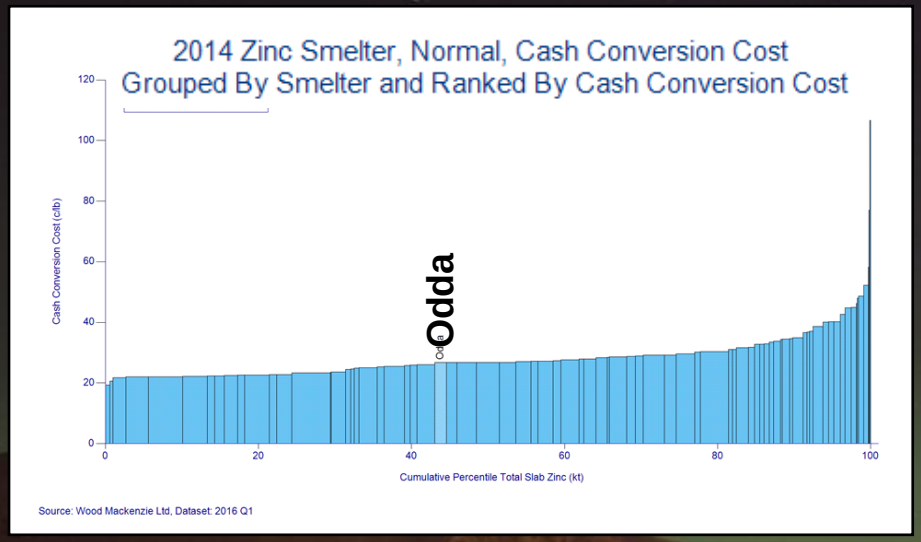
Lower costs

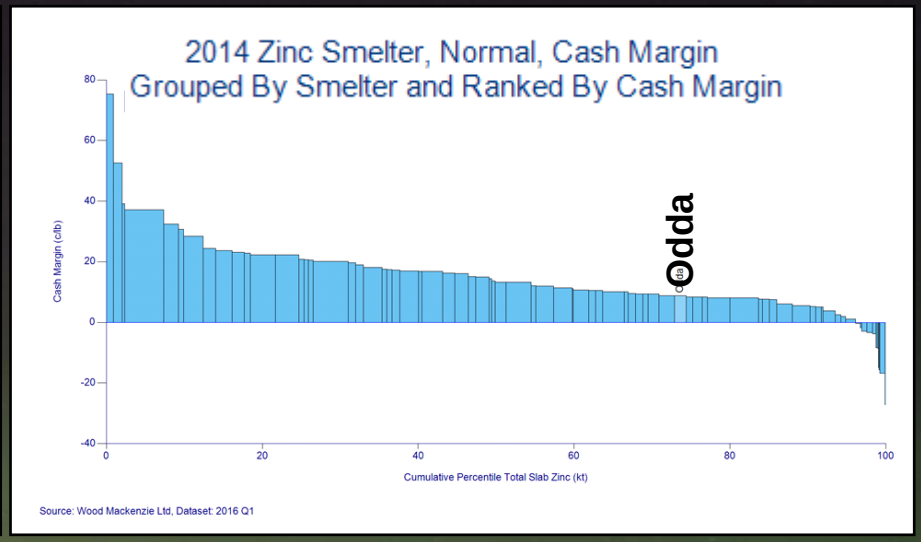
- Clear cost responsibility and follow up
- All employees knew the business case
- Several improvement teams
- Re-negotiated several supplier contracts

Reduced variance with > 50%

15% lower total costs or totally 110 MNOK per year

…and increased Odda's competitiveness





Important success factors

Clear target – what to achieve and when

Creating awareness of importance to succeed with program

Cost conscious culture – everyone involved

Measure progress and stick to the plan

The people behind this transformation!

Phase 2 in the transformation

De-bottlenecking & productivity focus…

One modern cellhouse

- New transformer and rectifier in Cellhouse 5
- Re-Spacing of Cellhouse 5
- New additional cooling tower
- Closure of old Celllhouse 4

Centralized control room

- New modern integrated process control system
- Closure of the old Roaster & Acid plant control room
- R&A and Leach & Purification in the same control room

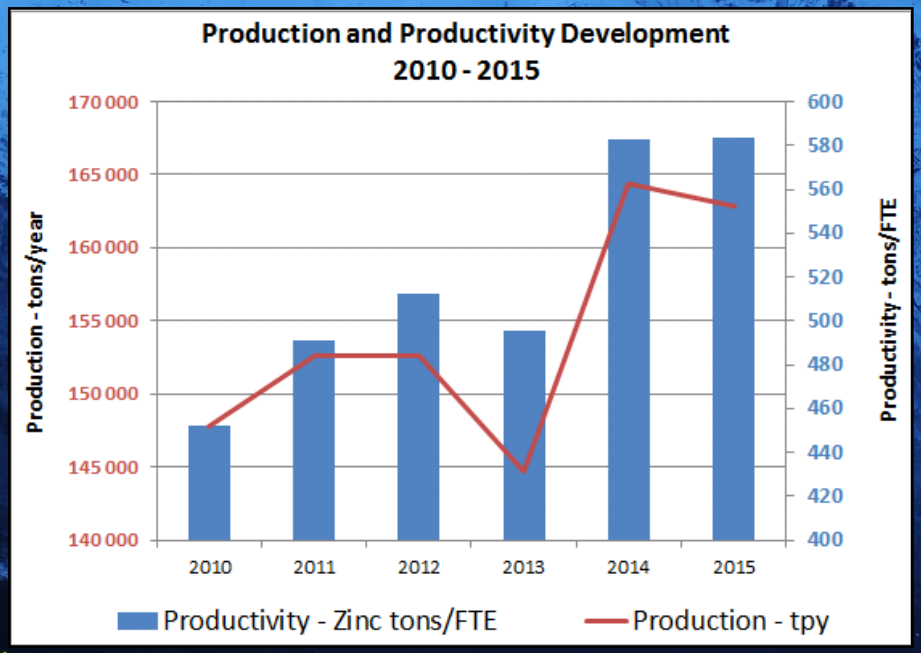
Upgrading of critical equipment

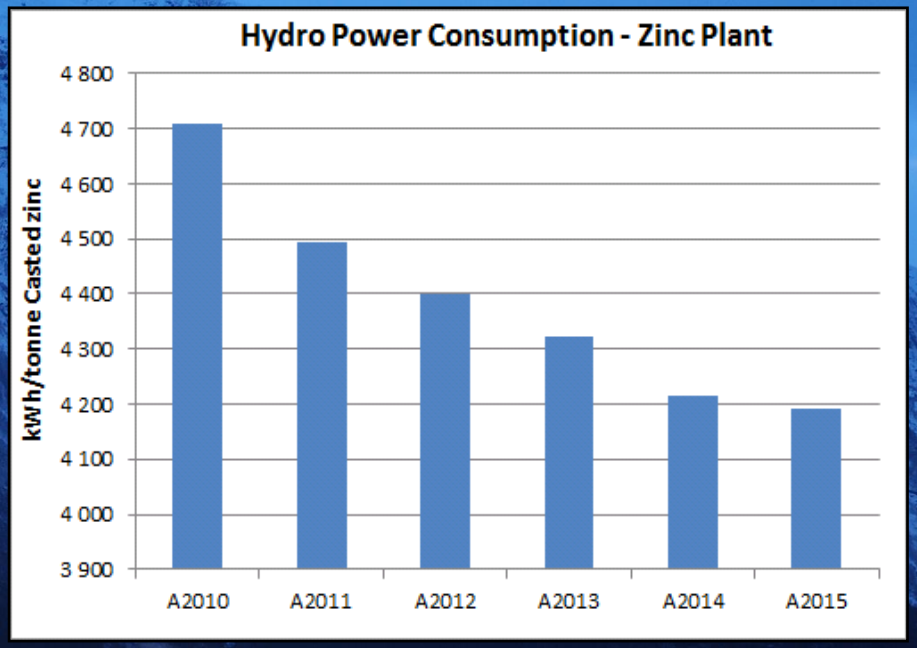
- Quay unloading crane
- Raw material mixing crane
- New Motor Control Center's

Decentralised and lean organisation

- One management in the R&A and L&P departments
- Zinc plant operated with a team based organization
- Implemented New Boliden Way & Lean principles

…resulted in several records in 2014





Phase 3 – increase zinc capacity to 200 kton

- +30 kton to 200 kton zinc/year
- De-bottlenecking investments
- Capex 350 MNOK
- New capacity level beginning Q2 2017

Expansion project on plan

Revamping & modernization of old cellhouse

- Respacing to reduce energy consumption
- New polymer concrete cells – maintenance free
- New anode preparation machine

New Direct Leach reactors

- Two new additional leach reactors
- Expanded concentrate and calcine storage

Revamping of leaching and purification

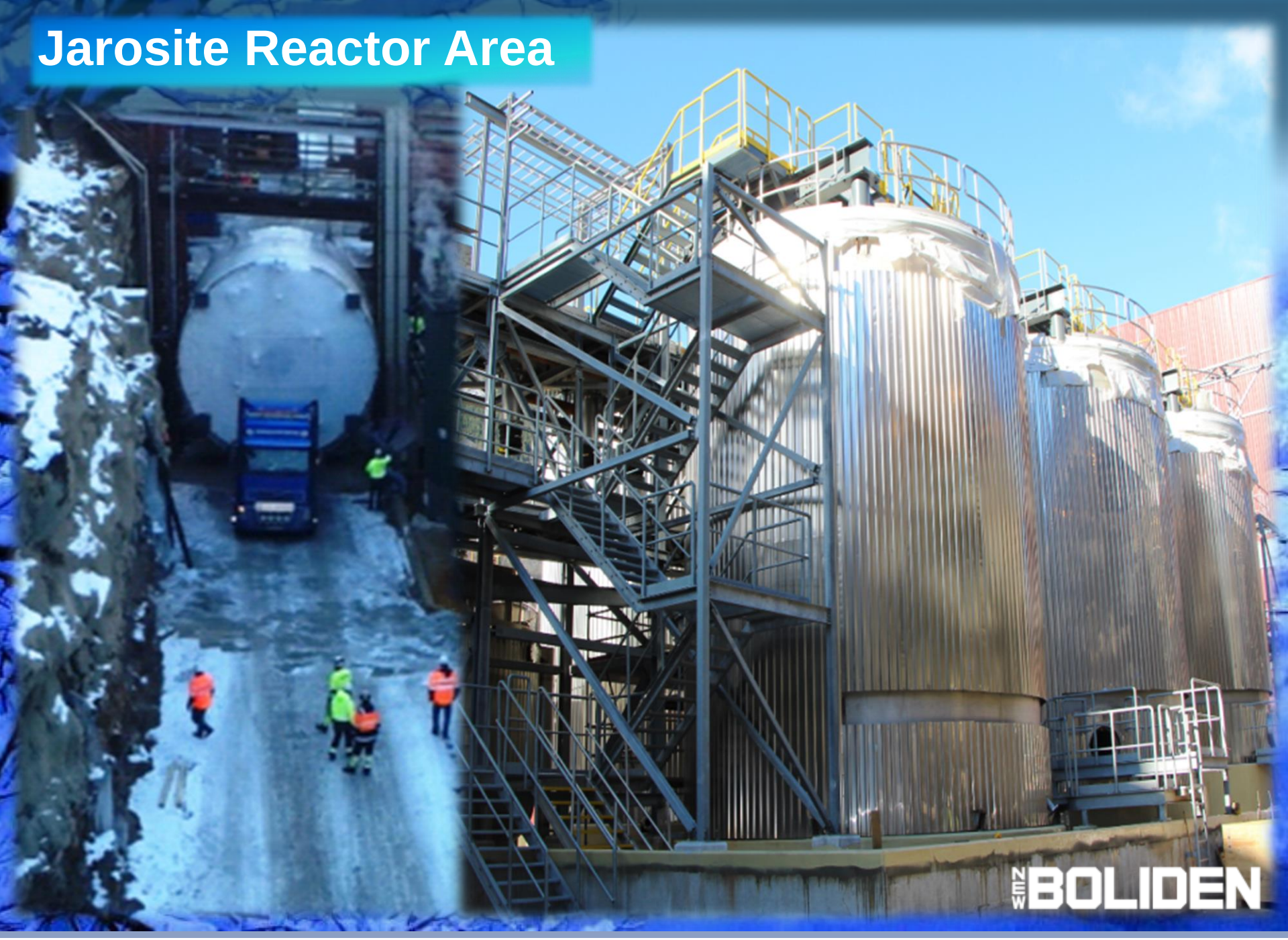
- New and expanded jarosite plant
- New purification reactors & filters
- Expanded surge volumes


Gypsum removal
Cellhouse 4
Jarosite Reactor Area
Calcine Storage
Direct Leaching Area
Solution Purification

Direct Leaching Area

Calcine Storage

Jarosite Reactor Area

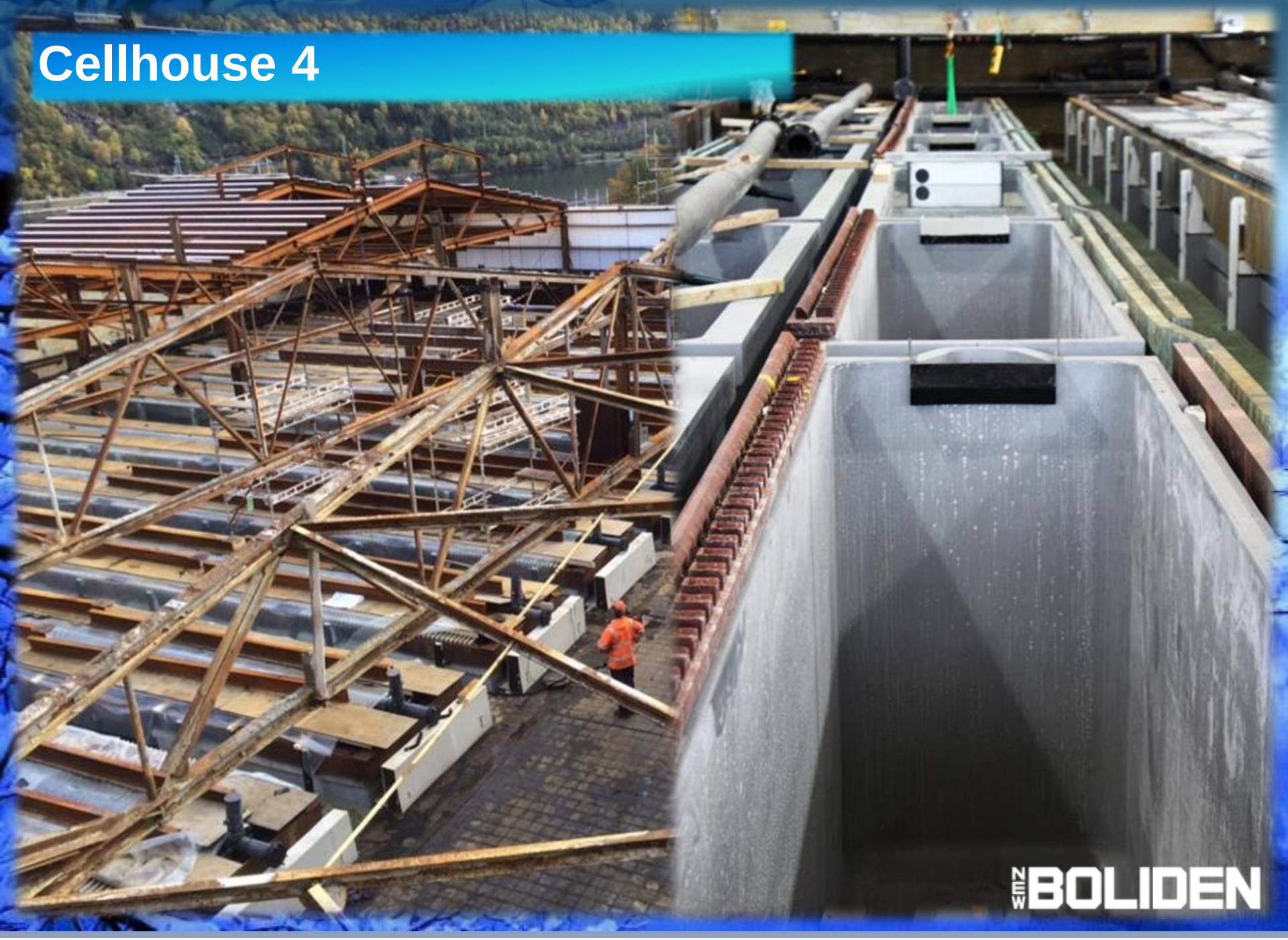


Solution Purification

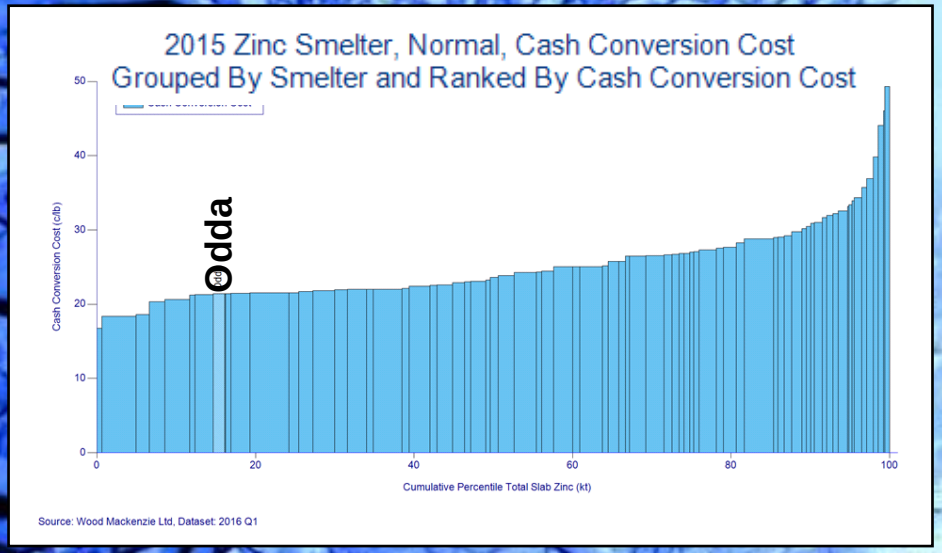
Gypsum Removal

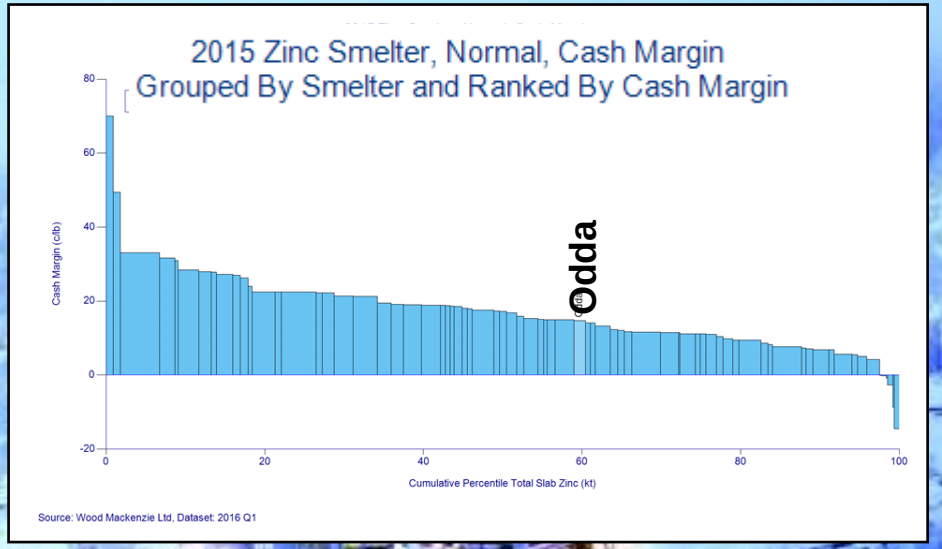
Spent Acid Distribution

Cellhouse 4



Good starting point for the future

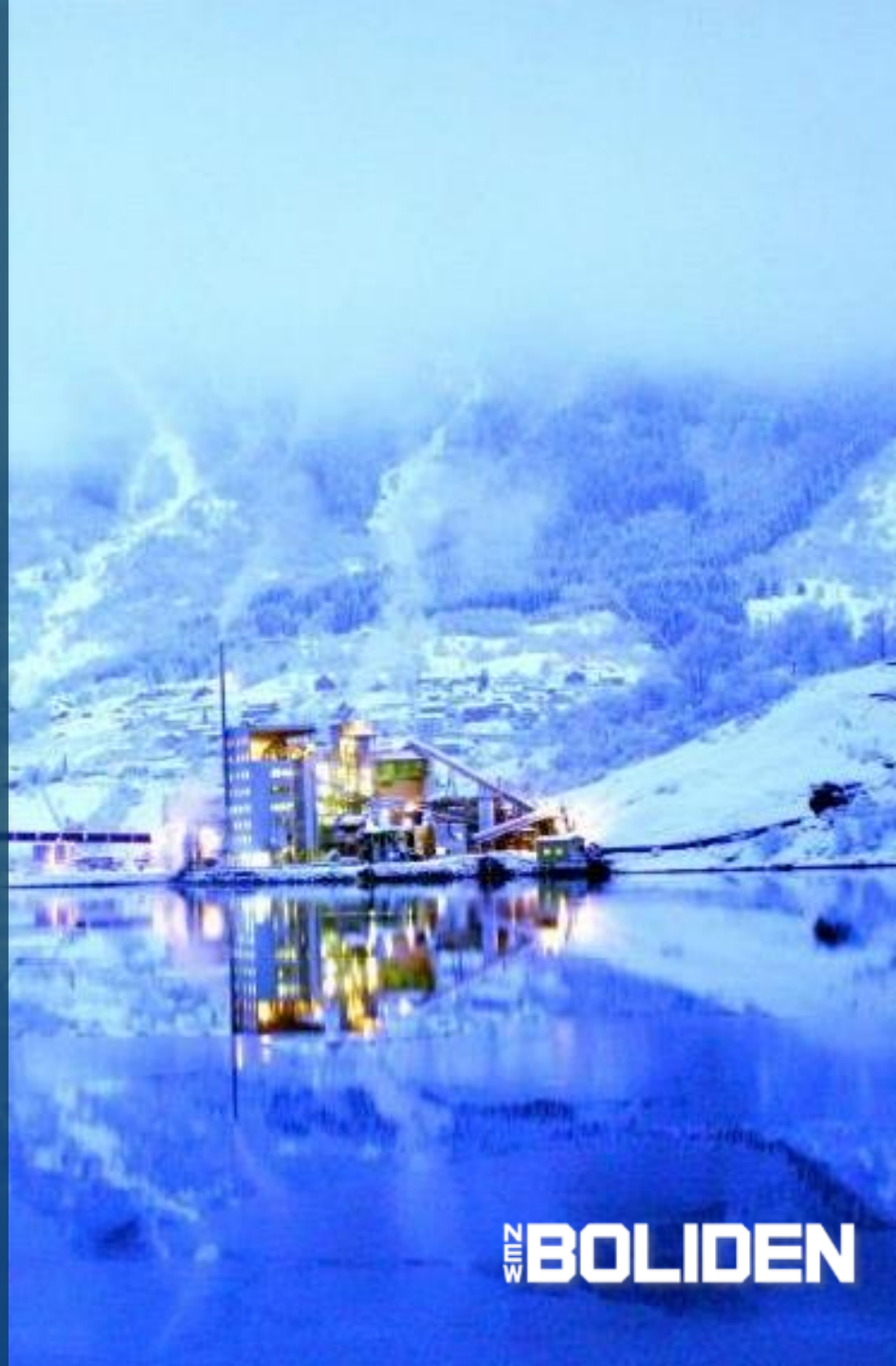




Q&A

Improving competitiveness and expanding to 200 kton

- Cost reduction & stabilization
- De-bottlenecking & productivity increase
- Expansion to 200 kton



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