

» Interim report Q2 2018

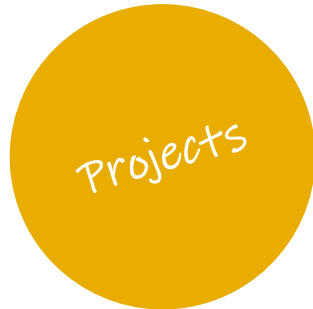
Joni Lukkaroinen
CEO
27 July 2018

Terrafame

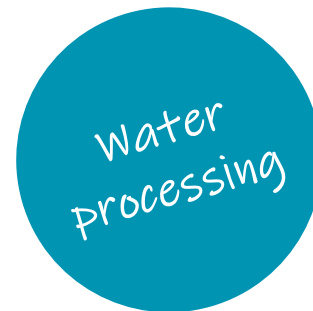
>> Key events in April–June



- Net sales totalled EUR 76.7 million.
- EBITDA was EUR 11.1 million.
- Operating result EUR 3.4 million.

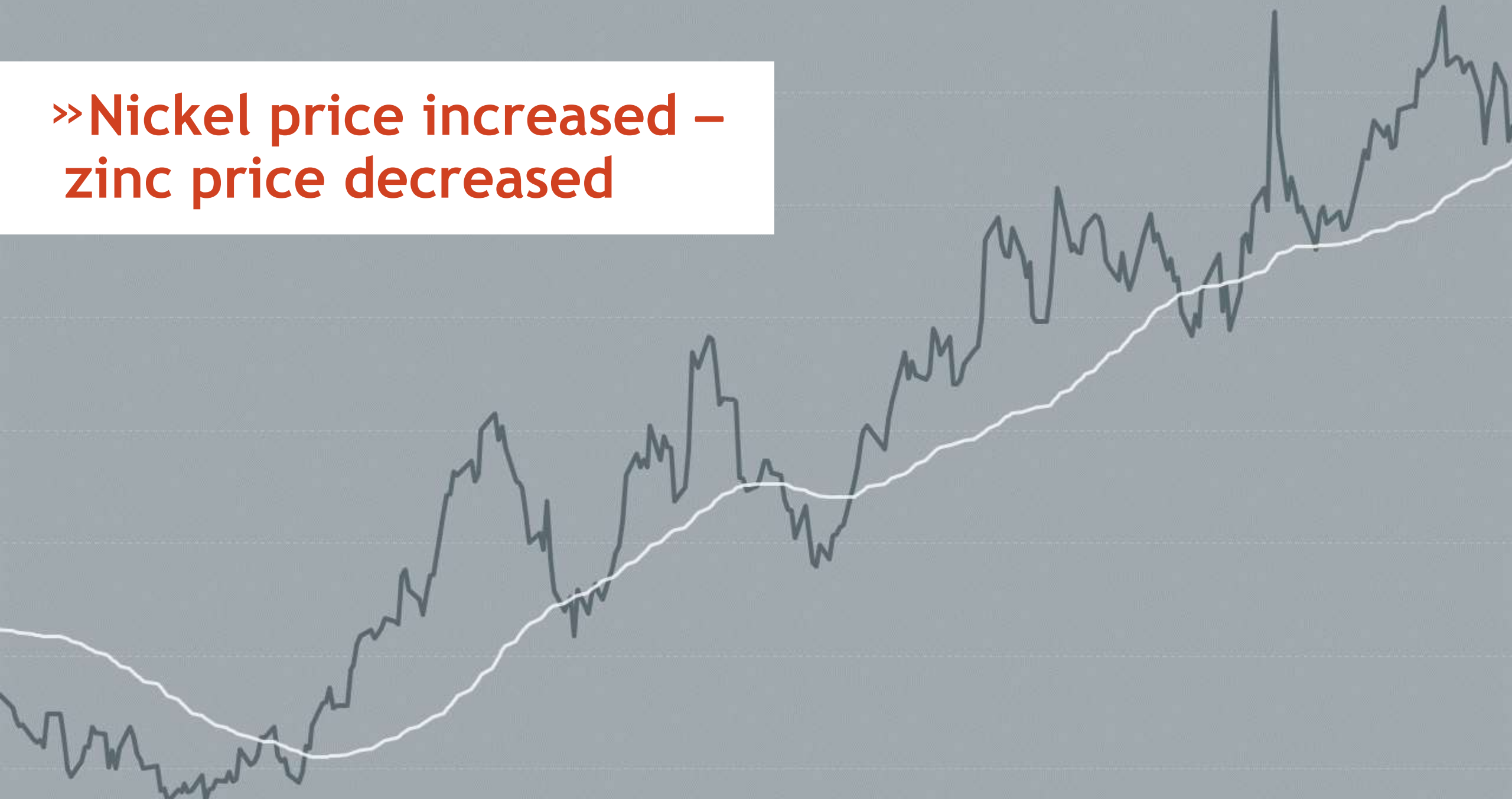


- The battery chemicals plant advanced to detailed engineering.
- Installation work of the new hydrogen sulphide production line finished.

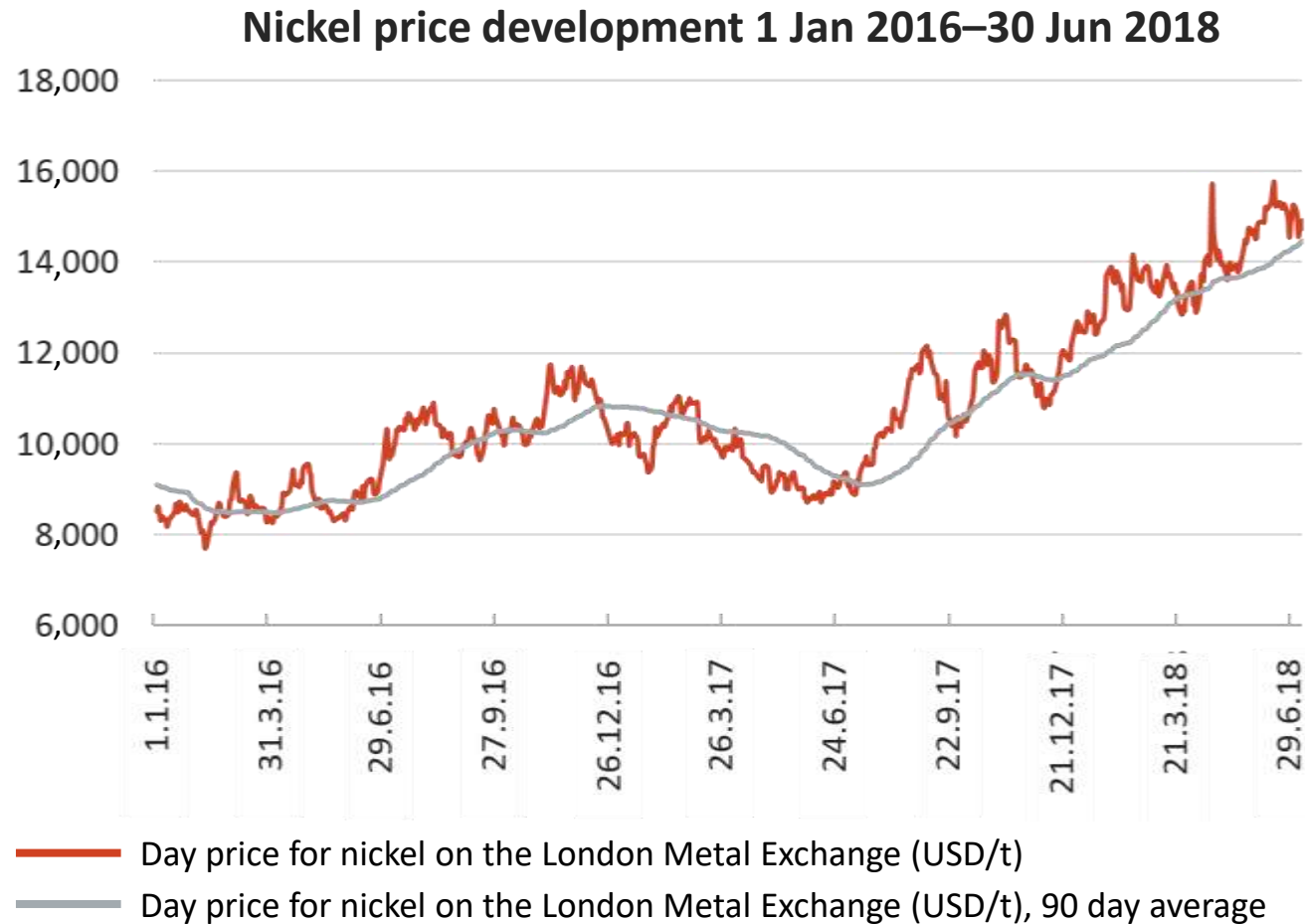


- Full discharge quota regardless of spring meltwater was not used.
- Thanks to good water balance, no water discharged from the site during 7–30 June.

» Nickel price increased –
zinc price decreased



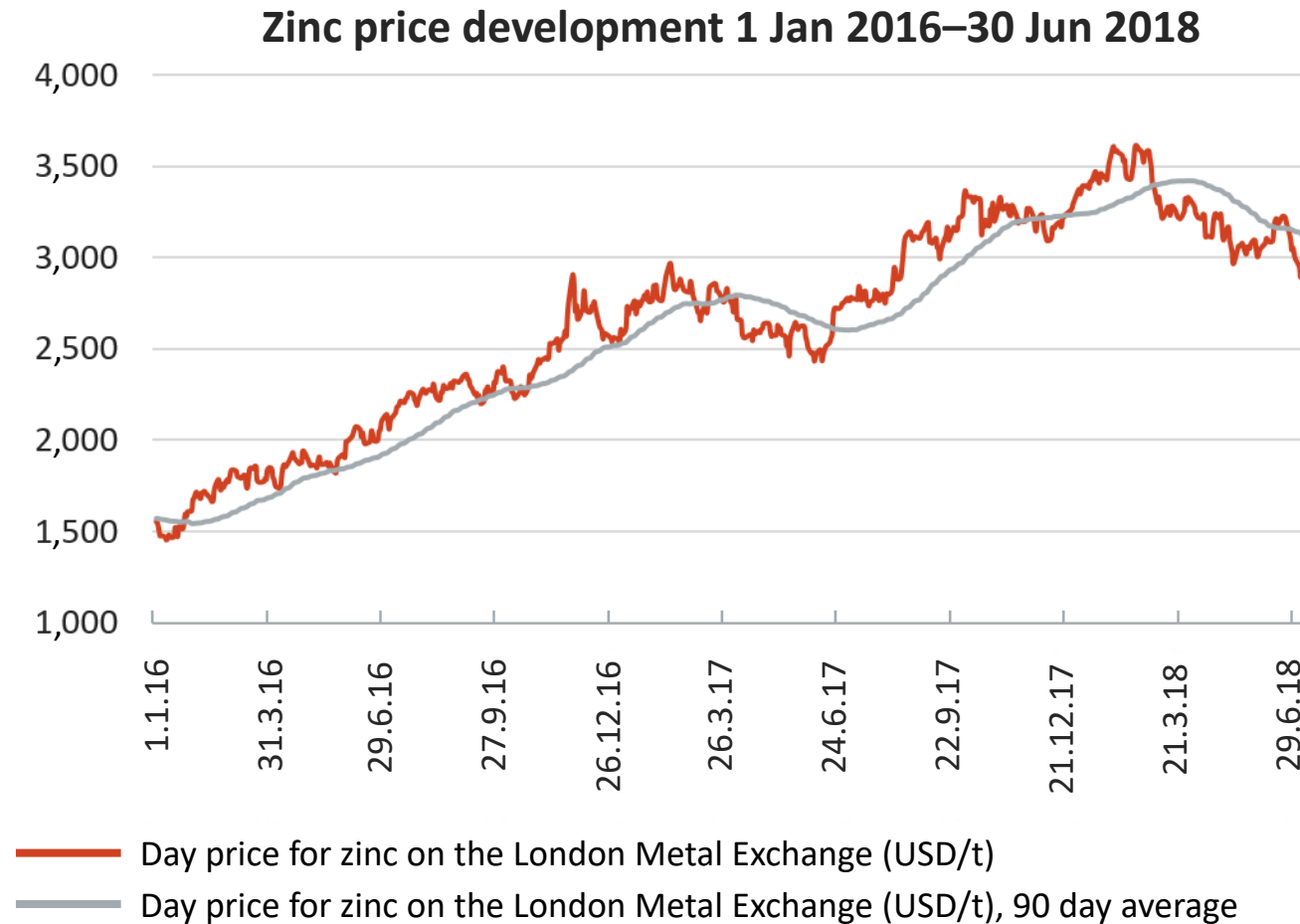
» Nickel price increased further and stock levels decreased



Data source: Metal Bulletin
LME = London Metal Exchange
SHFE = Shanghai Futures Exchange

- In Q2, average price was 14,476 USD/t – 9.0% higher than in Q1.
- Compared with 2017 Q2, average price was 56.9% higher.
- The combined stock levels of LME and SHFE decreased by 69,000t in Q2 and were below 300,000t at the end of June.
- Key factors affecting price development were the growth in nickel demand for stainless steel production and for Asia's battery industry.

» Both zinc price and stock levels decreased



Data source: Metal Bulletin
LME = London Metal Exchange
SHFE = Shanghai Futures Exchange

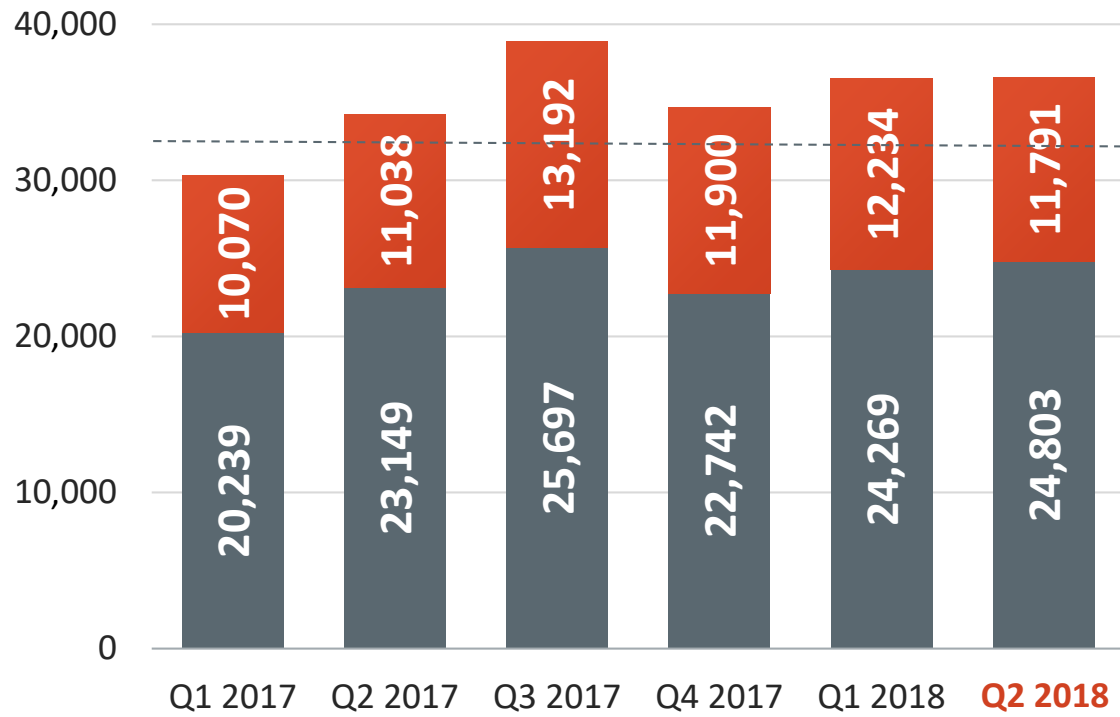
- Average price was 3,112 USD/t in Q2 – 9.0% higher than in Q1.
- Compared with 2017 Q2, average price was 19.9% higher.
- The combined LME and SHFE stock levels decreased by 32,000t in Q2 and reached 330,000t in the end of June.
- The price development was driven by the weakening demand in the Chinese market as well as concerns over the global economy arising from the import duties set by the US.



» Production increased compared to the previous year

» Ore stacking to bioleaching continued at the target level

Nickel and zinc to primary bioleaching (t)



 Nickel

 Zinc

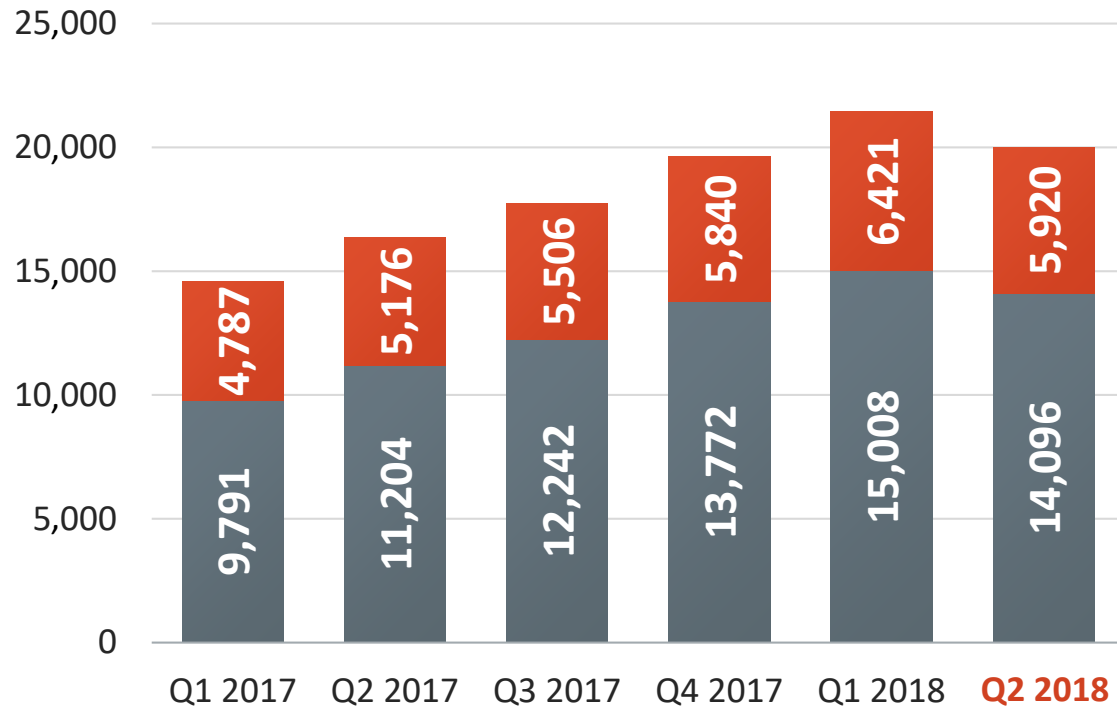
H1 2018: 24,025t
Year 2017: 46,200t

H1 2018: 49,099t
Year 2017: 91,827t



>> Metals production limited due to maintenance stoppage

Nickel and zinc production (t)



 Nickel

H1 2018: 12,341t
Year 2017: 20,864t

 Zinc

H1 2018: 29,104t
Year 2017: 47,205t

Nickel H1 2018

24%

higher compared to
H1 2017.

Zinc H1 2018

39%

higher compared to
H1 2017.

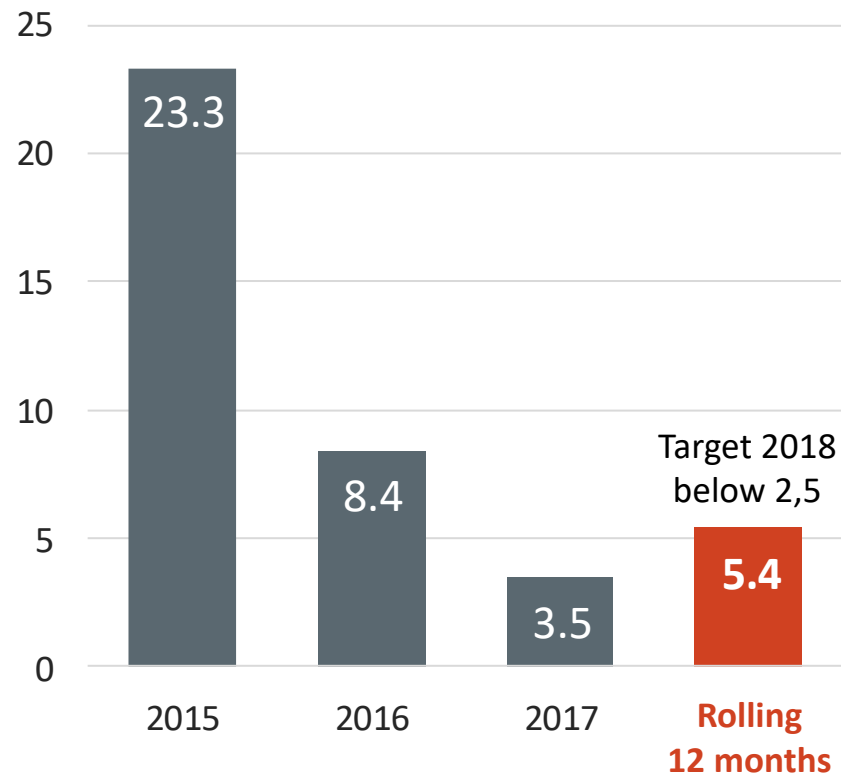
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» Safety is a key issue



» Rolling lost-time injury frequency for 12 months 5.4

Lost-time injury frequency
Terrafame employees



Lost-time injury frequency = number of injuries
per one million person-hours worked.

711
Terrafame
employees



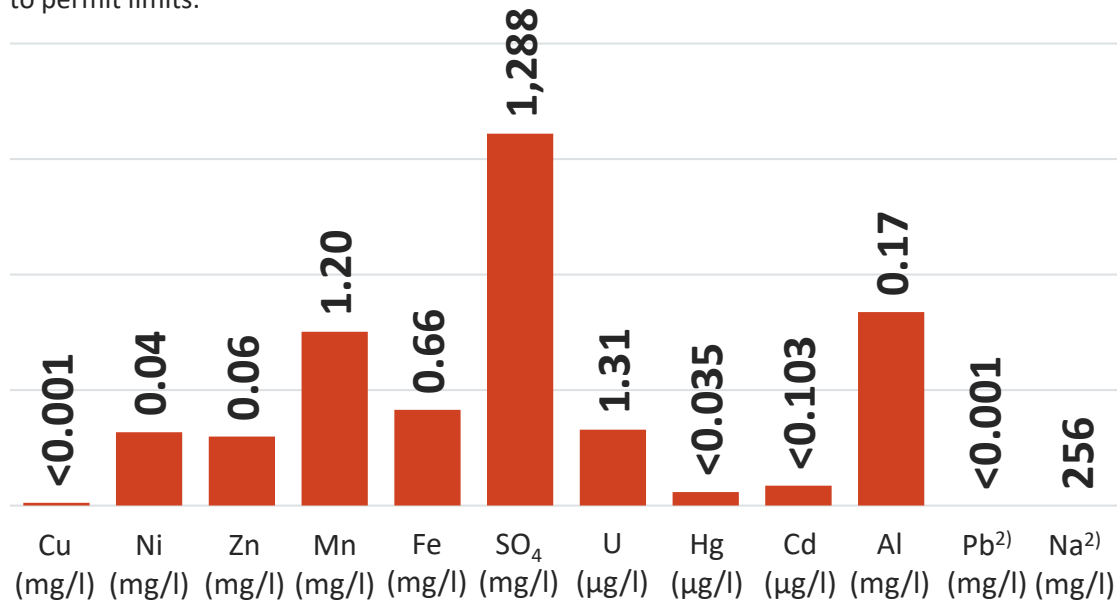
» Concentrations of discharge water clearly below permit limits

Concentrations (av.) in the water discharged

1 Jan 2018–30 Jun 2018

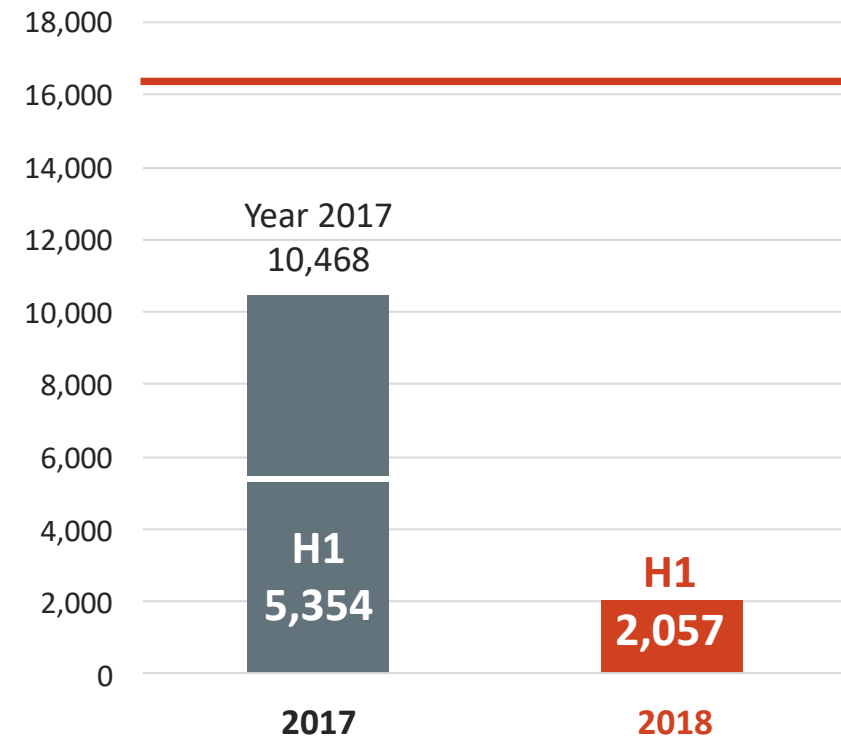
0.3 ¹⁾	0.3 ¹⁾	0.5 ¹⁾	4	4	2,000	10 ¹⁾	1,5	3	0.5
mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	mg/l

Concentrations in relation to permit limits.



Sulphate quota 16,300 t

Discharge pipe 15,000 t/a and old routes 1,300 t/a



¹⁾ Max. allowed concentration in a single sample.

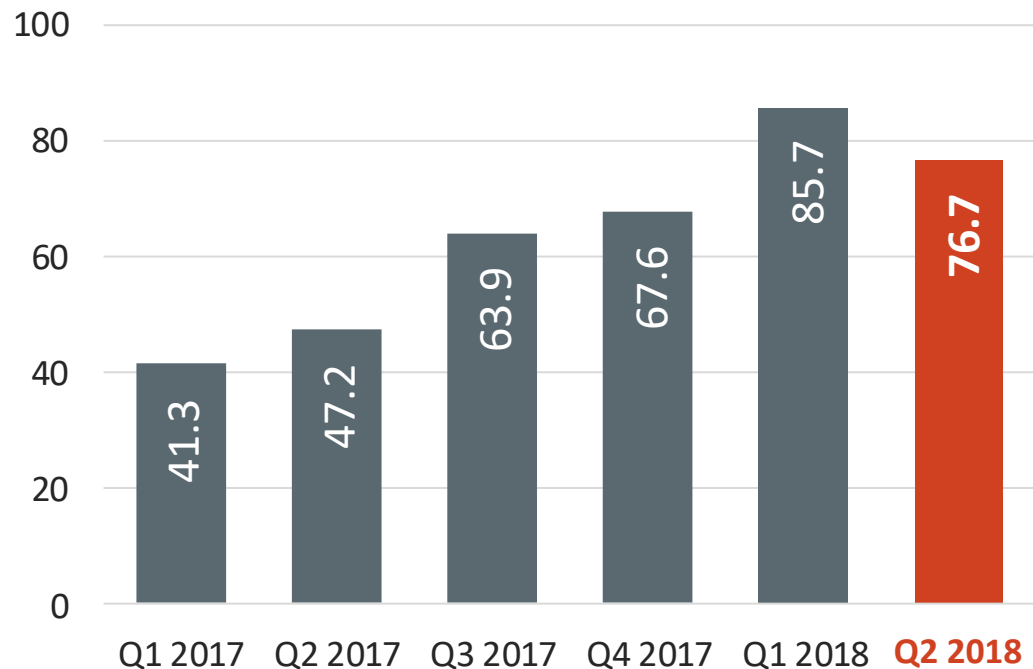
²⁾ No permit limits for lead (Pb) and natrium (Na).



**» Net sales almost doubled
in the H1 2018**

» Net sales EUR 76.7 million

Net sales (M€)



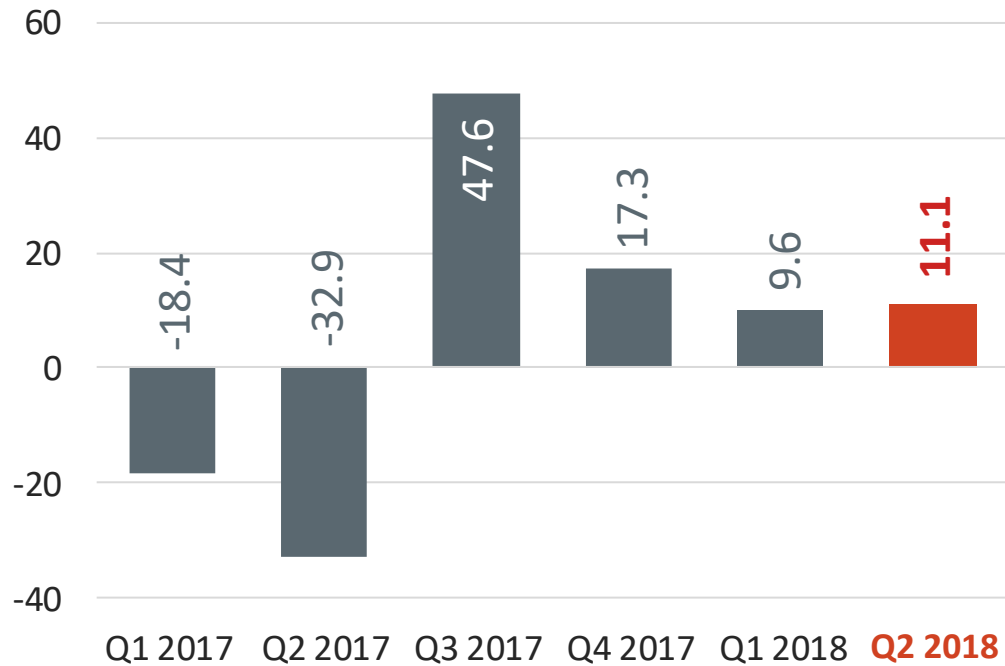
H1 2018: 162.4 M€

Year 2017: 220.0 M€

- The net sales EUR 162.4 million for H1 2018 almost doubled from EUR 88.5 million for H1 2017.
- Sales in April–June were limited due to maintenance stoppage.
- Compared to Q1, the average nickel price in USD was 9.0% higher and in EUR 12.5% higher.
- Compared to Q1, the average zinc price in USD was 9.0% higher and in EUR 6.2% higher.

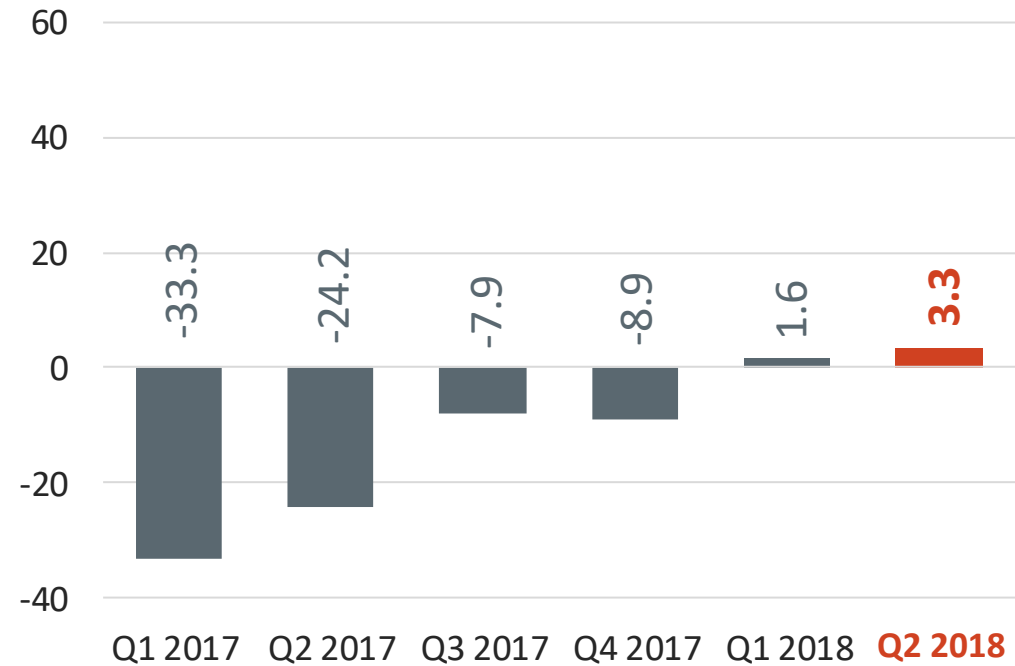
>> EBITDA improved

EBITDA (M€)



H1 2018: 20.9 M€
Year 2017: 13.6 M€

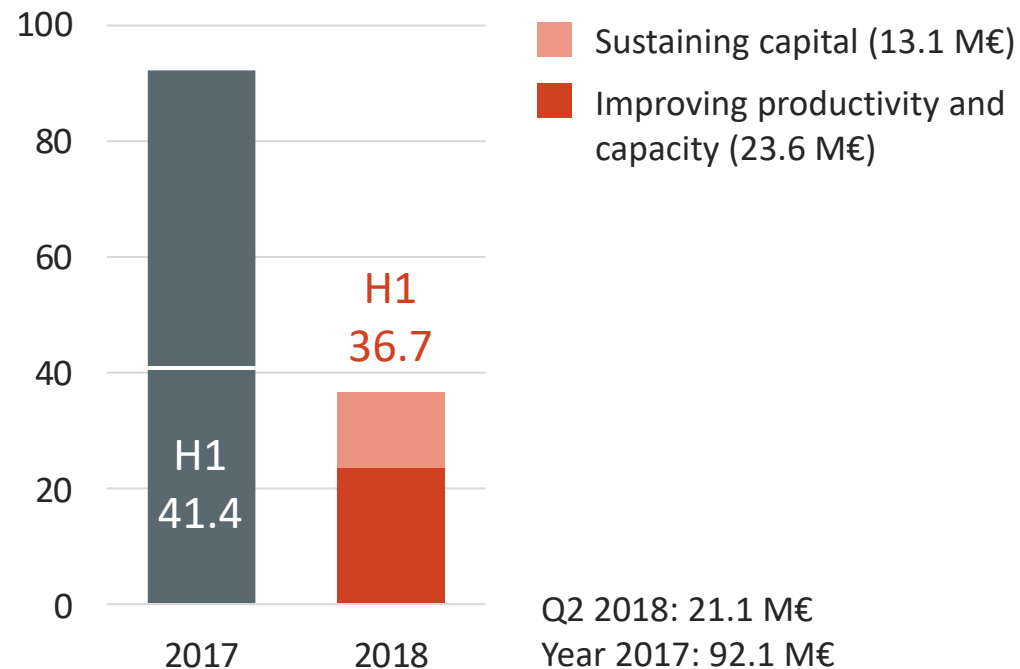
EBITDA excl. change in WIP (M€)



H1 2018: 20.9 M€
Year 2017: 13.6 M€

>> Majority of the capital expenditure was allocated to improving productivity and capacity

Capital expenditure (M€)

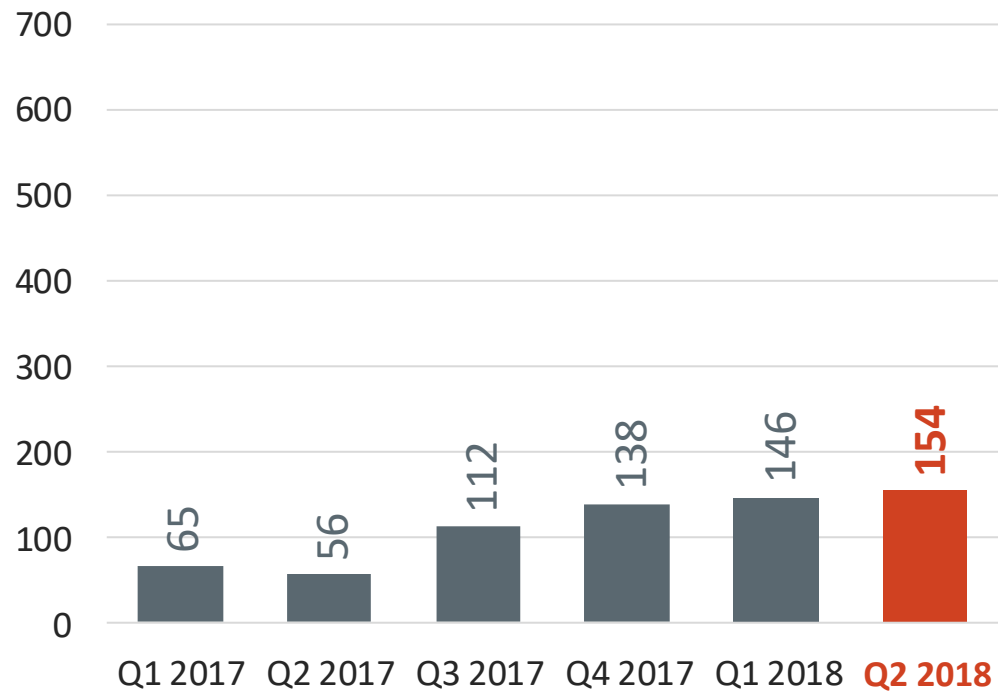


Key capital expenditures in H1:

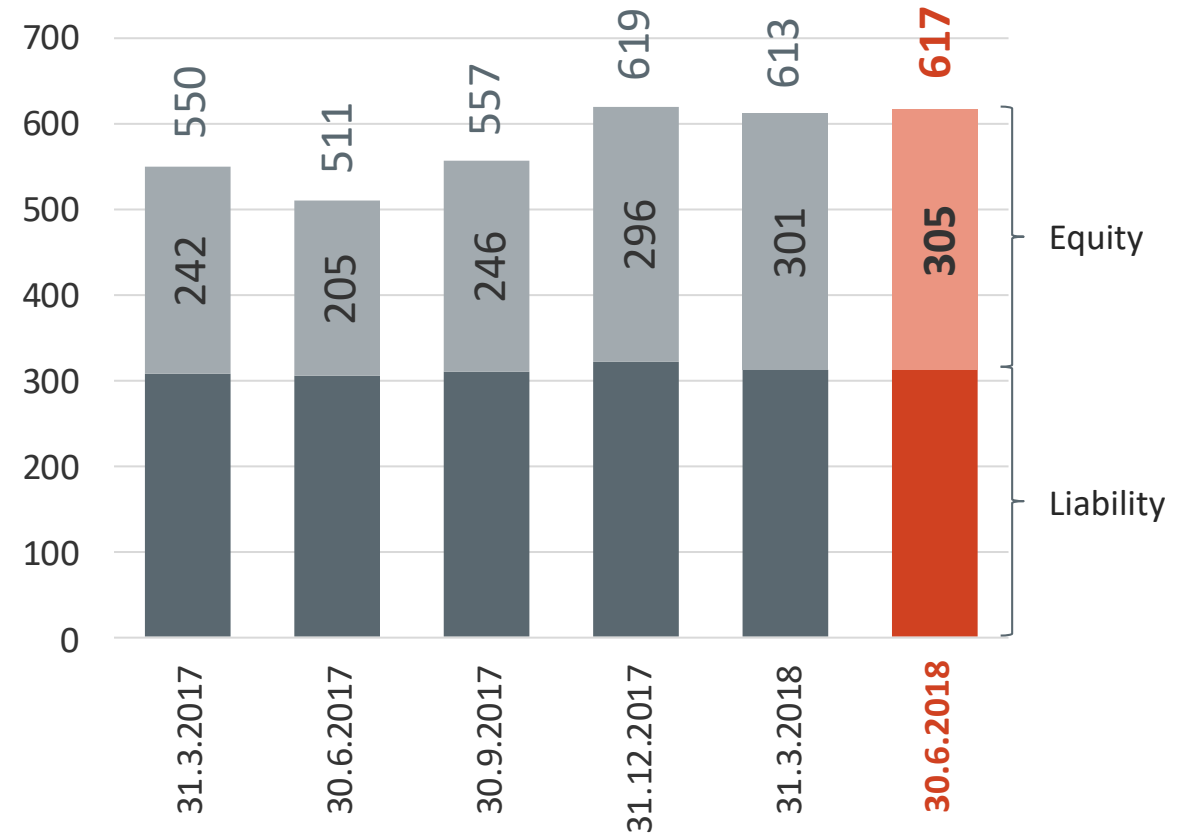
- Battery chemicals production plant project
- Construction of foundations in the second section of waste rock area
- Installation work of the new hydrogen sulphide production line
- Construction of foundations in the secondary bioleaching area block 4
- Development of aeration in the primary bioleaching area

» Terrafame has a good solidity

Value of work in progress (M€)



Equity and liabilities (M€)



A close-up photograph of a dark, crystalline mineral specimen, likely a sulfide, showing bright, reflective inclusions. The mineral has a complex, fractured surface with sharp edges and a metallic luster. The background is a plain, light blue surface.

**» Mineral Resources
and Ore Reserves
estimates updated**

» Mineral Resources and Ore Reserves will enable operations for several decades

- Terrafame updated its mineral resource and ore reserve estimates in summer 2018.
- The measured, indicated and inferred mineral resources amount to 1,525Mt (2016: 1,458Mt).
- Content:
 - nickel 0.25%
 - zinc 0.52%
 - copper 0.14%
 - cobalt 0.019%

Kolmisoppi
886Mt

Ore prospecting
area

Kuusilampi
638Mt



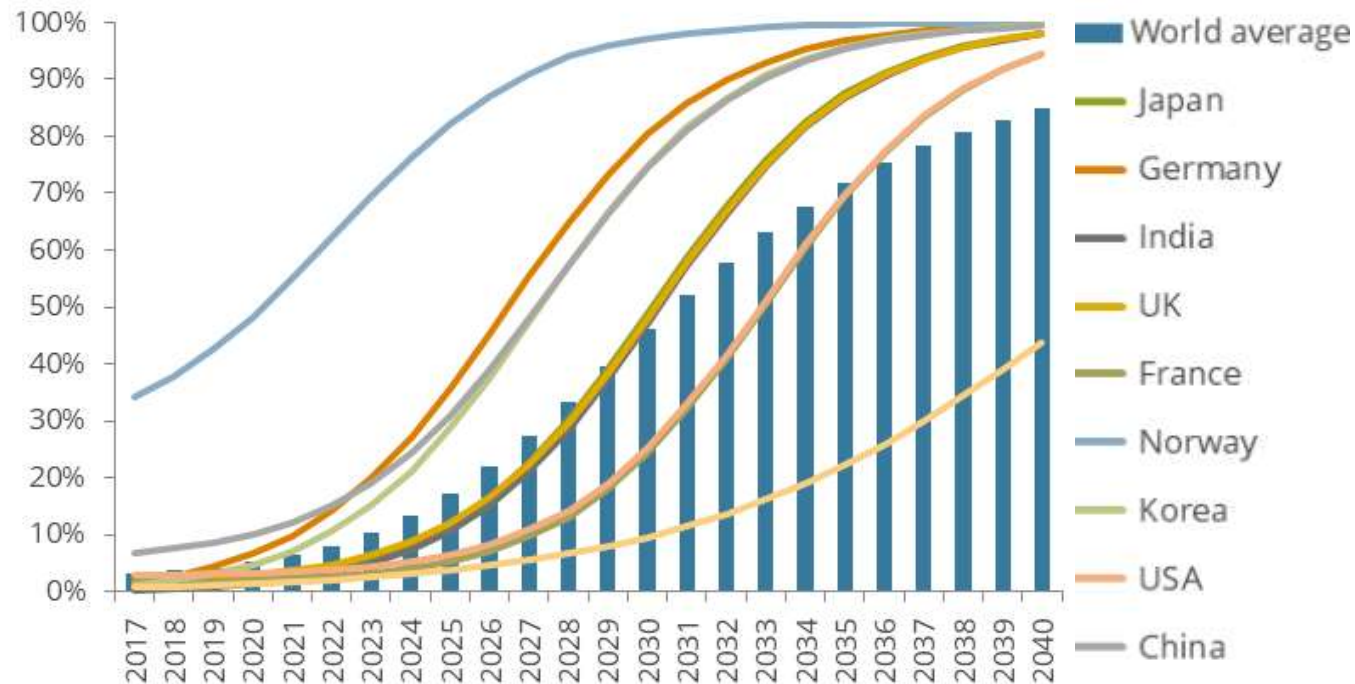
» Mining enables transport electrification



» Terrafame is well positioned for the EV market growth

Outlook for deep electrification, 2017–2040

PHEV, FCEV, LSEV and BEV sales as % of total



Battery pack of an electric vehicle

	2017 NMC622 55kWh	After 2025 NMC811 75kWh
Nickel	35kg	52kg
Cobalt	12kg	6.6kg
Lithium	7.4kg	8.4kg

Source: Roskill, 2018

PHEV = Plug-in hybrid electric vehicle, FCEV = Fuel cell electric vehicle

LSEV = Low speed electric vehicle, BEV = Battery electric vehicle

Source: McKinsey, 2017

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»» Near-term outlook

- Terrafame will continue production ramp-up and improving profitability.
- In the battery chemicals plant project, the technological alternatives for main processes will be analysed and negotiations on equipment purchases will be carried out.
- The new hydrogen sulphide production line will be commissioned.
- Also the exploration related to the recovery of rare earth elements and uranium will be continued.



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