HProduce Planner

UX Design Awards 2023 | Sarah Gelb-Wiegand, Florian Jörgensen, Daniil Starikov

22.03.23

Heidelberg Materials

UX Research

Sarah Gelb-Wiegand

22.03.23

Heidelberg Materials

How Cement is Produced

Quarry

Blasting, loading and transporting of limestone

Cement Plant

Crushing

Mixing and Grinding

Clinker burning

Cooling

Mixing and Grinding

Storing

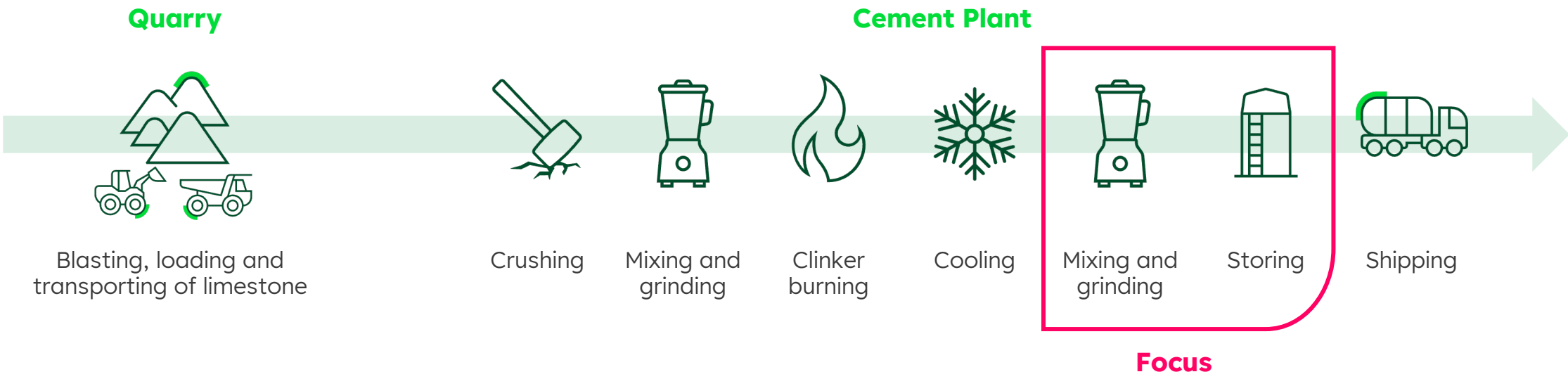
Shipping

What we did

- **Heidelberg Materials** had identified the **need to become digital** to stay competitive, attract young employees and save costs
- A **big** starting **research project** was conducted to identify **opportunities** for a **„Digital Cement Plant“** in HM:
  - In-depth **on-site research** in one German cement plant
  - **5 days** of interviewing and **shadowing**
  - Deduction of general **tasks**, **needs** and **pain points** of users along **functions** and **departments**
  - **Validation** with international **peer-plants** (in-field and remotely)
  - **Identification** of potential **starting points** for digital products

How to digitalize Cement Production?

Our Starting Point



Target Personas

Production Supervisor Grinding
Brad

- **Plans running times** of assets and **production volumes** of cement types
- **Needs to know** upcoming **sales volumes** to plan production in order to **meet customer demand**
- Needs to know **silo** fill **levels** and **energy prices**
- His **target** is: **full** cement **silos**

„As Production Supervisor Grinding, I need to be able to plan production for the next day(s) based on silo fill levels, demand, electricity prices and maintenance intervals.“

Control Room Operator
Martin

- **Operates** the whole **plant** according to the production plan
- Has to **achieve production KPIs** given to him by Production Manager
- Needs to have a **good overview** about the **production plan to** closely **stick** to it

„As Control Room Operator, I need to rely on a good production planning to operate the machines along.“

Problem Characteristics

Precise production **planning required**

Demand very **hard** to **predict**, as customers show up whenever they like. **No standard** demand **forecast** guidelines

Production planning is a **manual**, **asynchronous** and **paper-based process**

High energy consumption of grinding process and **constantly fluctuating** energy **prices**

Very **complex optimization scenario** that goes beyond human cognitive capacities

UX Design

Florian Jörgensen

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Heidelberg Materials

Production Planning

Which factors are important for me to properly do the planning?

Demand Forecast

How much do i need to deliver?

Stock Levels

How much of my materials do I currently have in my silos?

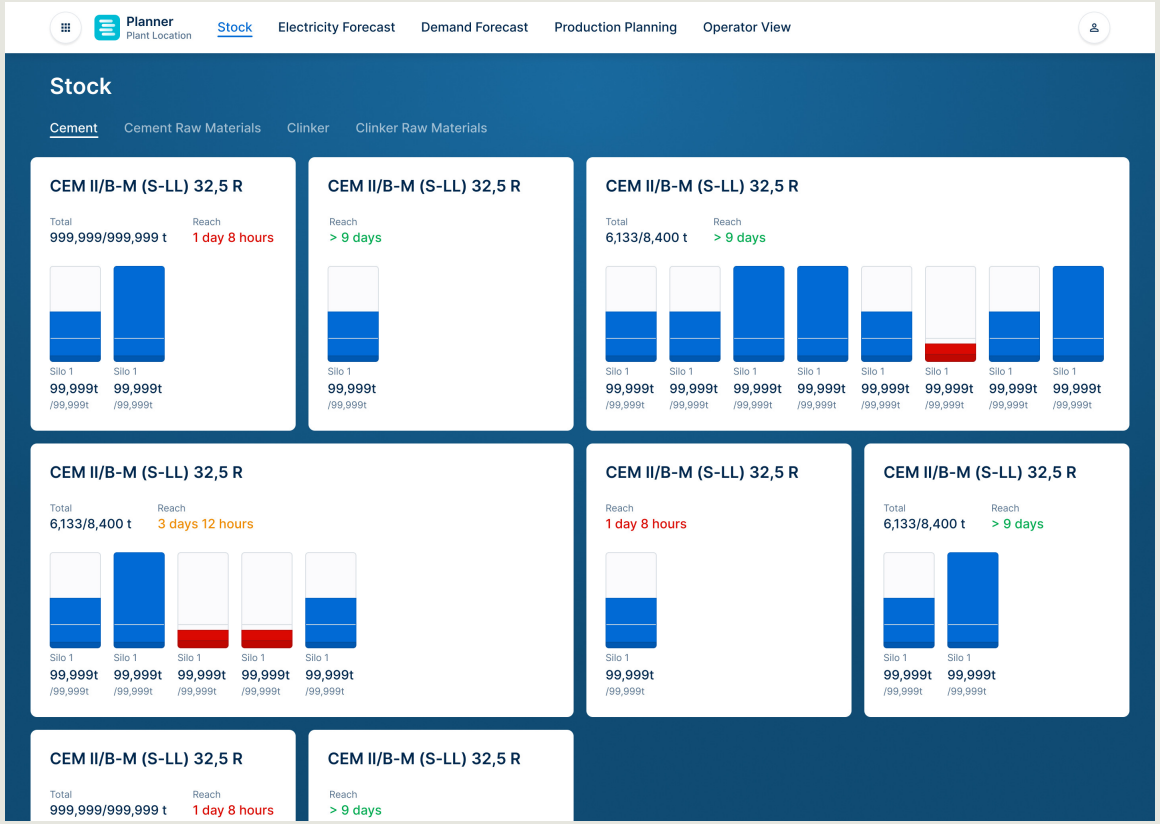
Electricity Forecast

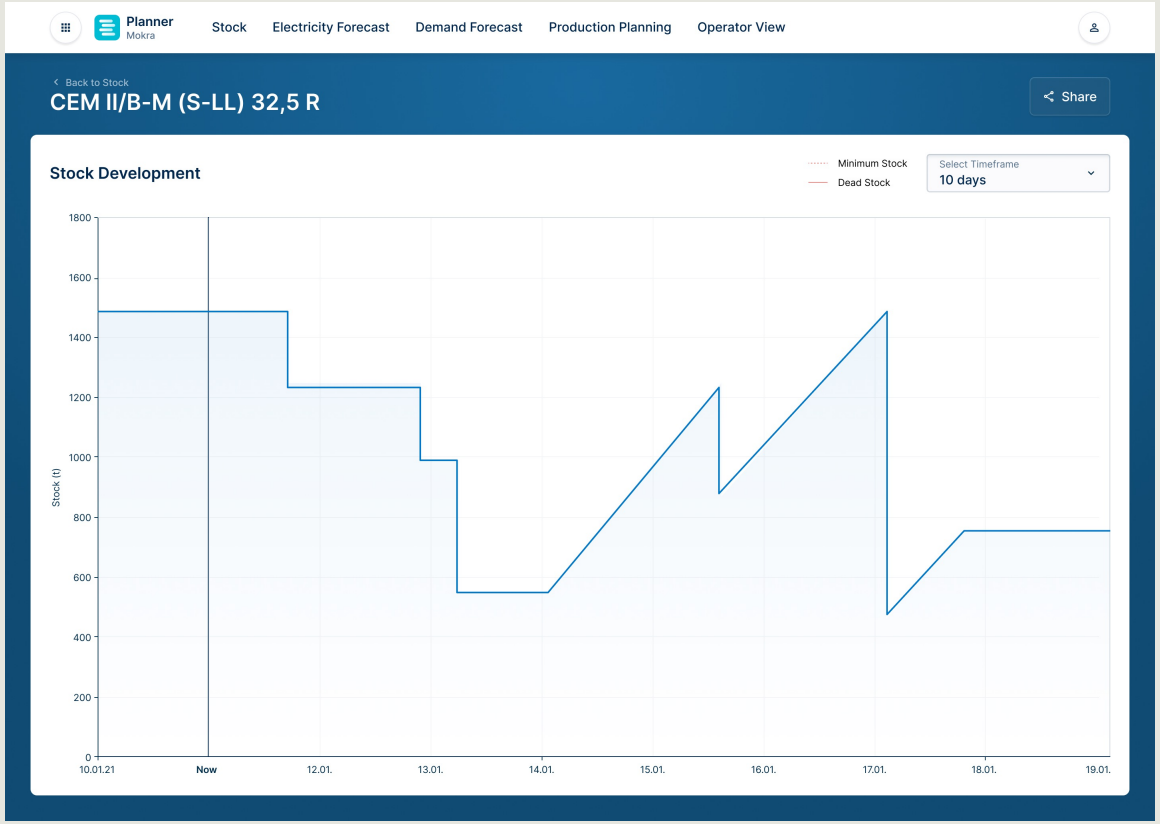
What will be the price of electricity at the time of production?

Production Capacity

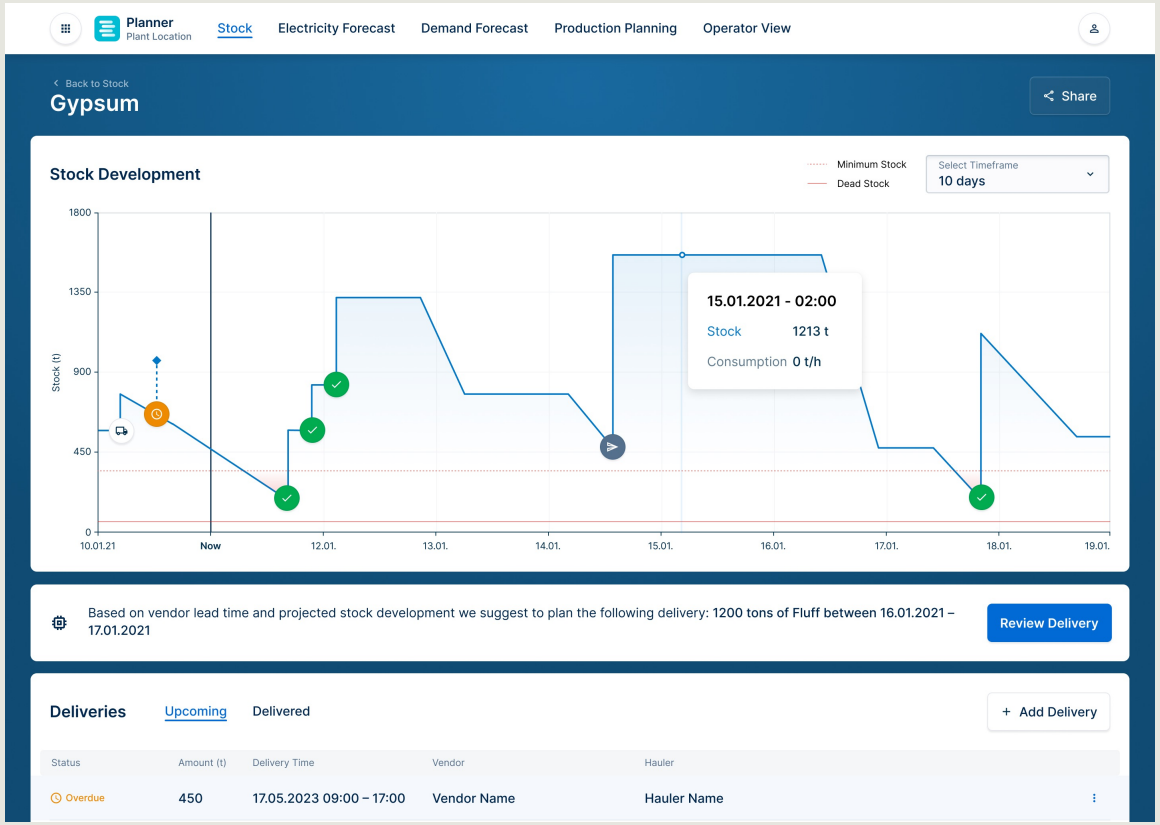
What is the availability and throughput of my assets?

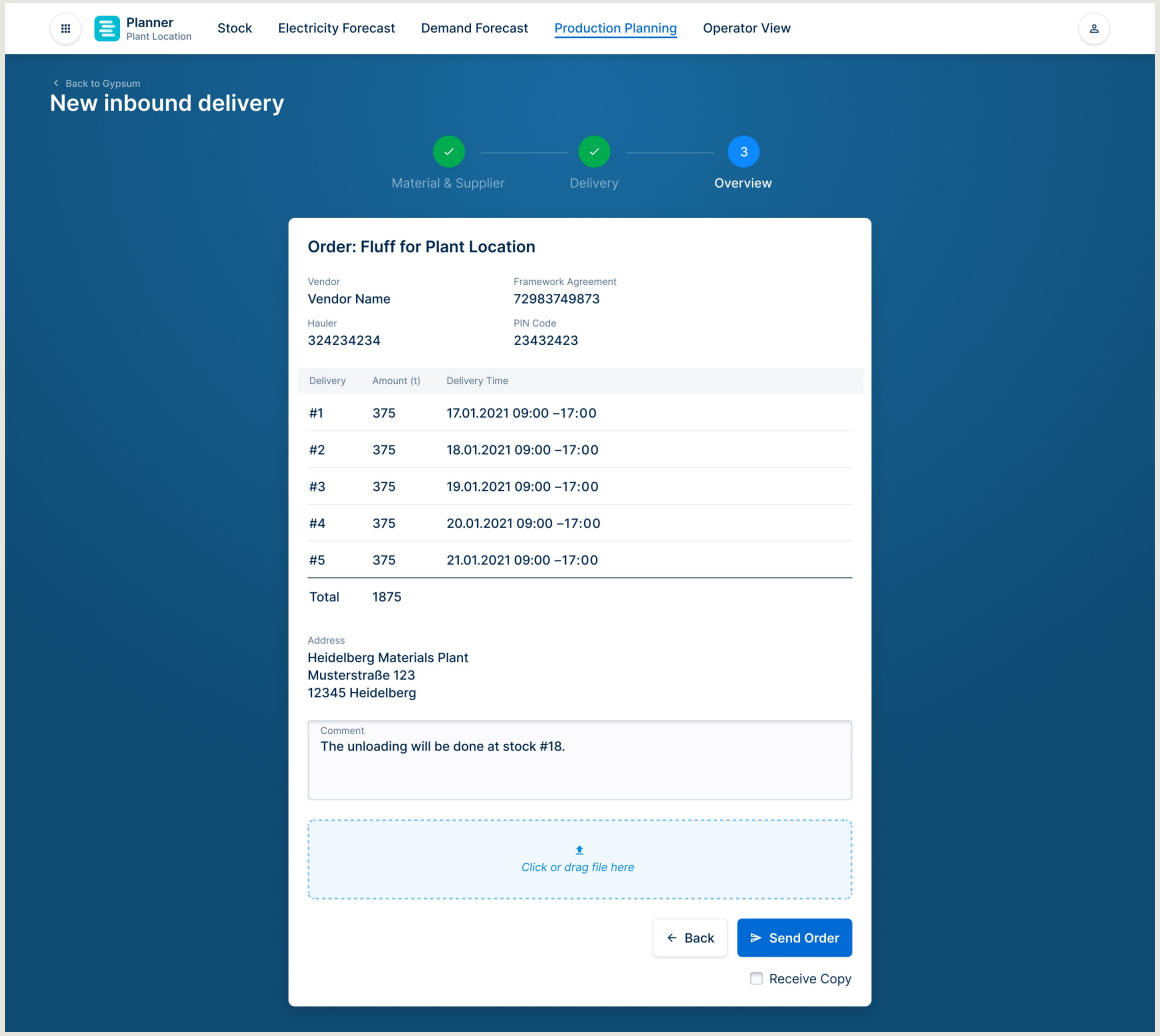
Stock Levels



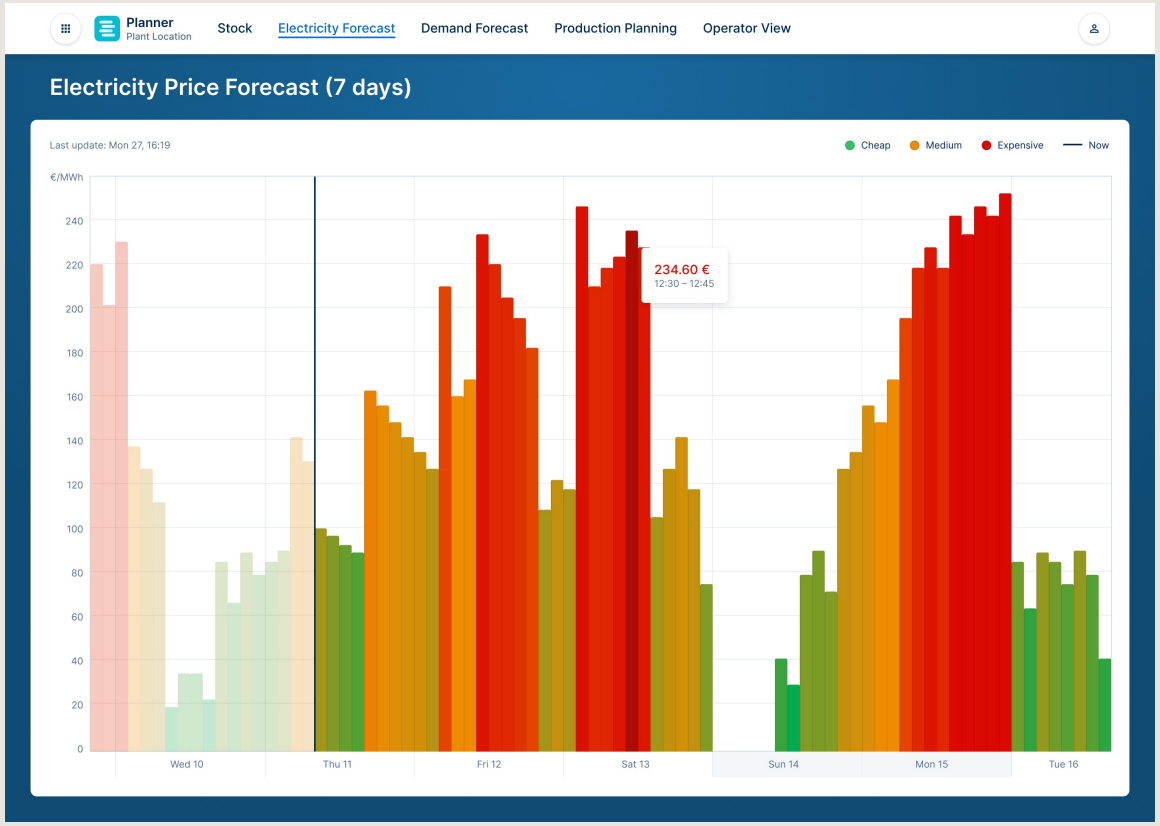


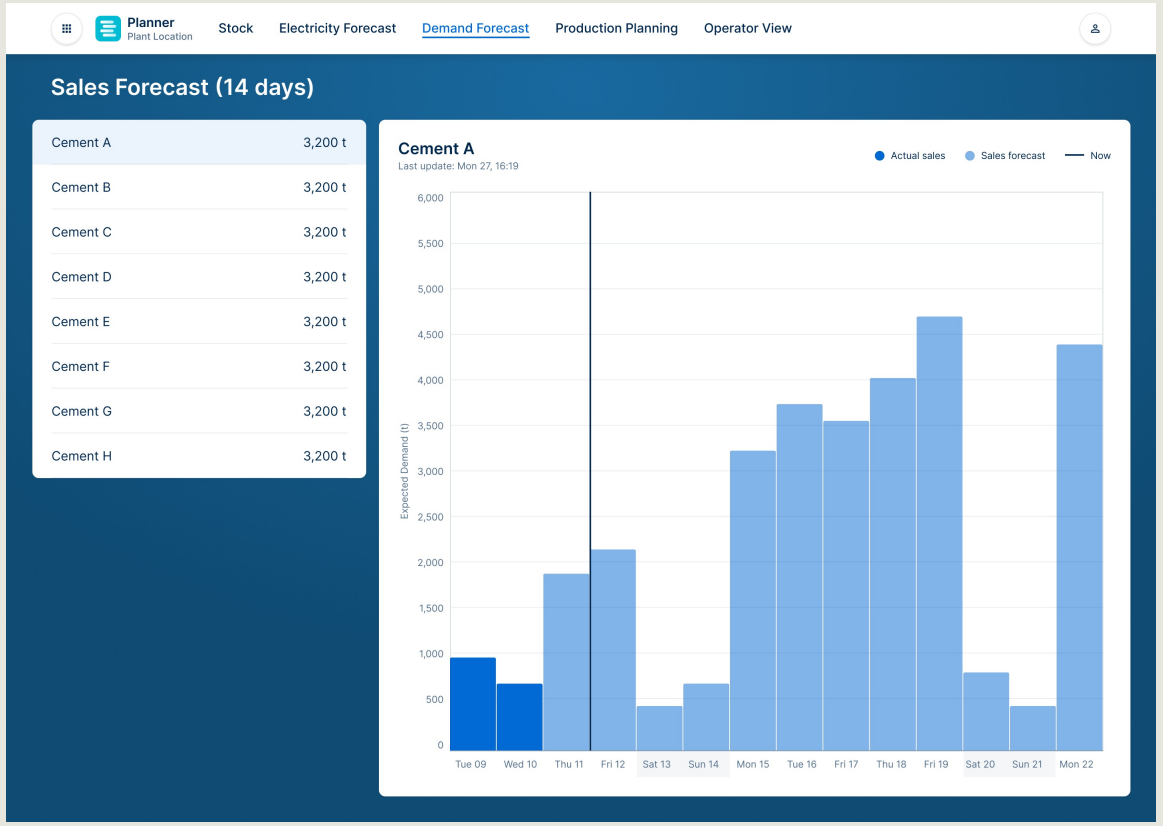
Stock Levels



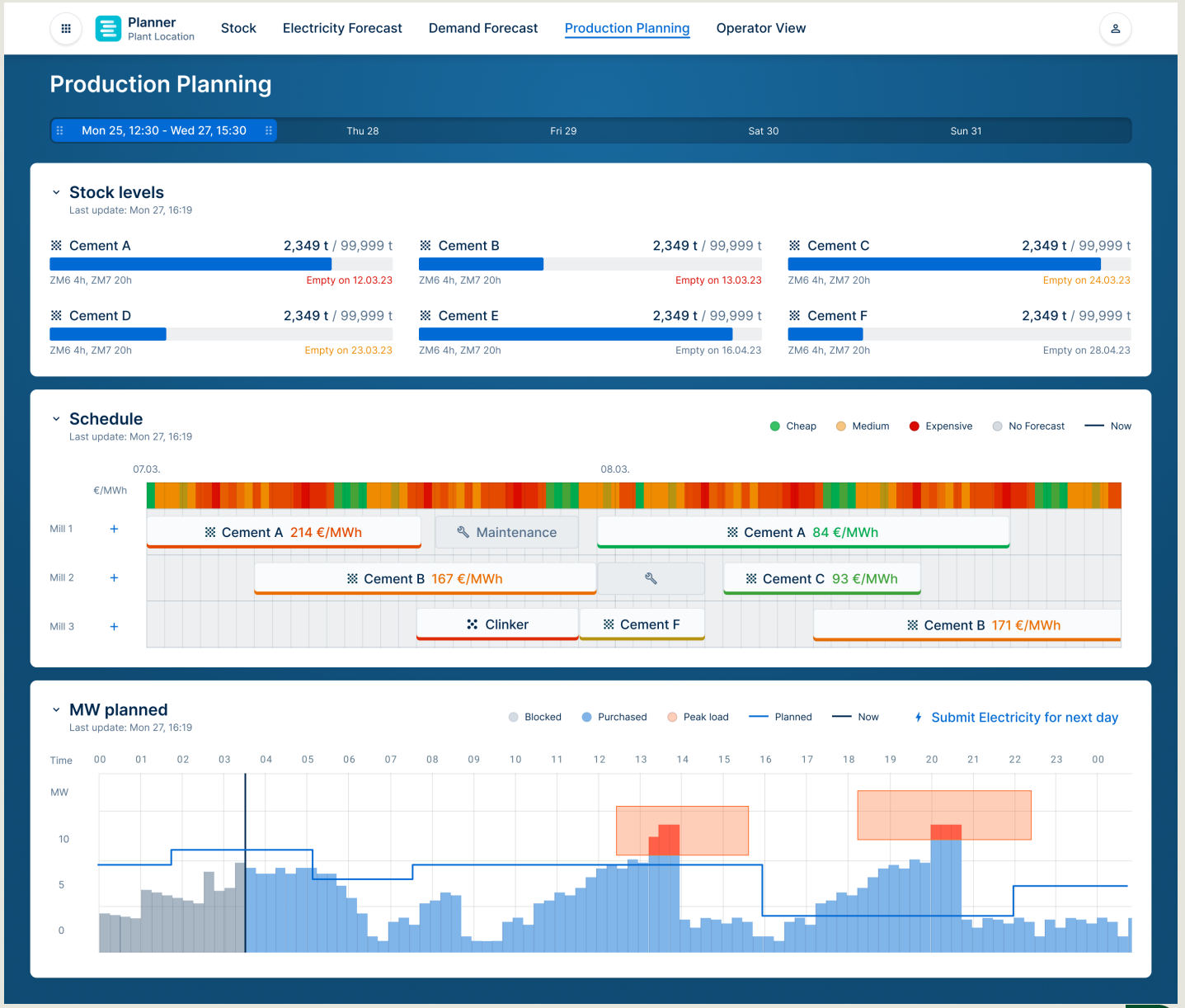


Forecasts


Planner
Plant Location
Stock
Electricity Forecast
Demand Forecast
Production Planning
Operator View
Electricity Price Forecast (7 days)
Last update: Mon 27, 16:19
Cheap
Medium
Expensive
Now
€/MWh
234.60 €
12:30 – 12:45
Wed 10
Thu 11
Fri 12
Sat 13
Sun 14
Mon 15
Tue 16


Planner
Plant Location
Stock
Electricity Forecast
Demand Forecast
Production Planning
Operator View
Sales Forecast (14 days)
Cement A 3,200 t
Cement B 3,200 t
Cement C 3,200 t
Cement D 3,200 t
Cement E 3,200 t
Cement F 3,200 t
Cement G 3,200 t
Cement H 3,200 t
Cement A
Last update: Mon 27, 16:19
Actual sales
Sales forecast
Now
Expected Demand (t)
Tue 09
Wed 10
Thu 11
Fri 12
Sat 13
Sun 14
Mon 15
Tue 16
Fri 17
Thu 18
Fri 19
Sat 20
Sun 21
Mon 22

Production Planning



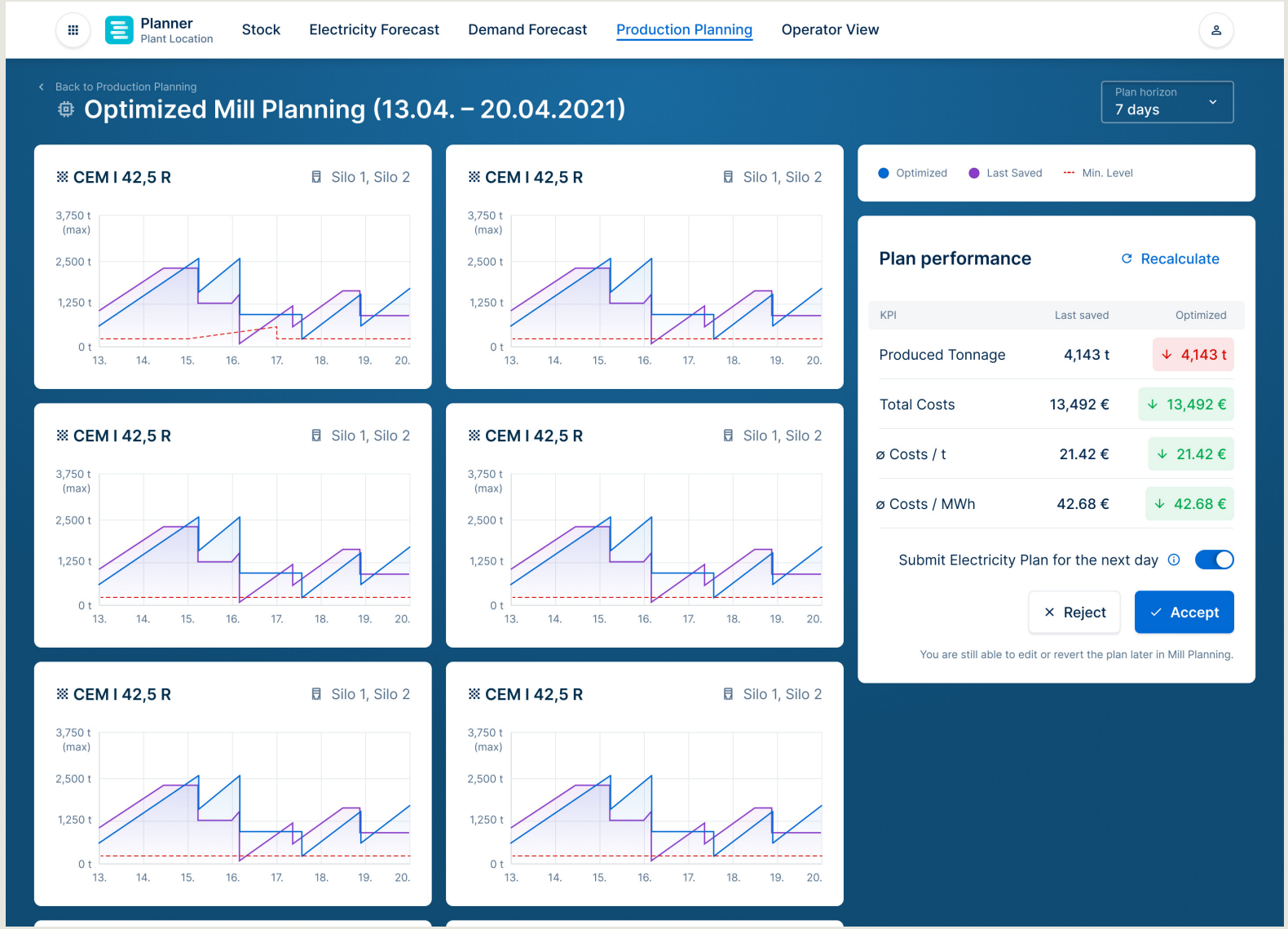
Optimizer

10:00 - 01.01.2021

Calculation done

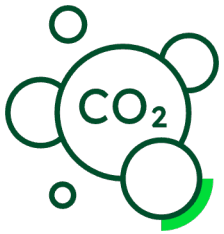
The calculation you have triggered for the optimized planning has finished.

→ View Optimized Planning



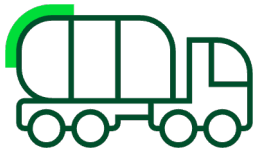
What's next?

We have some exciting new features ahead of us to further complete the journey of planning



Portfolio simulation
Simulate the yearly targets with different recipes, expose the CO2 impact throughout the journey

Integration with Aggregates
Unify the planning landscape inside Heidelberg Materials by integrating the Aggregates branch



Fleet Management
Cement Demand prediction factors in actual need in fleet size.

Long-term planning
Extend the planning scope beyond the next weeks to cover a flexible monthly and yearly target setting.

Q&A

Event | Location | Topic | Author
22.03.23

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