

Sumitomo SHI FW (SFW)

LAES – Liquid Air
Energy Storage –
pilot plant Hiroshima,
Japan

Grzegorz Kocot, Director Business Development
Sepetna, September 2026

Agenda

LAES – Liquid Air Energy Storage

Demonstration plant in Hiroshima, Japan

SHI FW – update on the recent project in CEE region

Mondi Ruzomberok (SK), Mondi Štětí (CZ), Qemetica Inowrocław (PL)

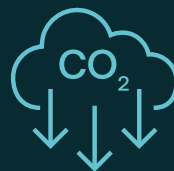
SFW response to decarbonization and climate change mitigation

Helping our customers to reach decarbonization goals



Energy generation

Energy from biomass or waste for carbon neutral or carbon negative heat & power applications



Carbon capture

Oxyfuel carbon neutral and negative CFB plants, Calcium looping for hard to abate industries and Hot potassium carbonate for biomass and WtE



Services

Life cycle solutions enabling high plant availability and efficiency



Waste to value

Gasification of solid waste into syngas, biofuels & chemicals, or plastics recycling



Energy storage

Long Duration - Enabling net zero grid systems to limit the climate change

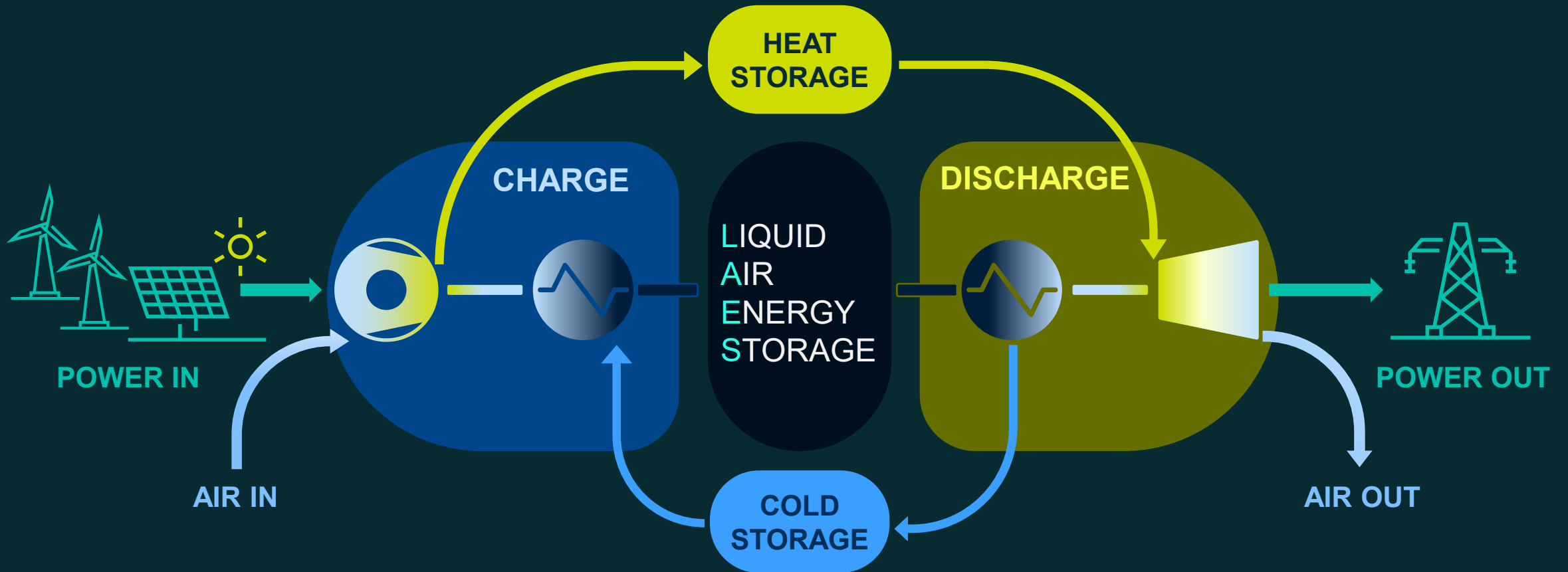
Sector integration with Liquid Air Energy Storage

Experience from commercial
demonstration plant in Hiroshima



The Liquid Air Energy Storage process

5

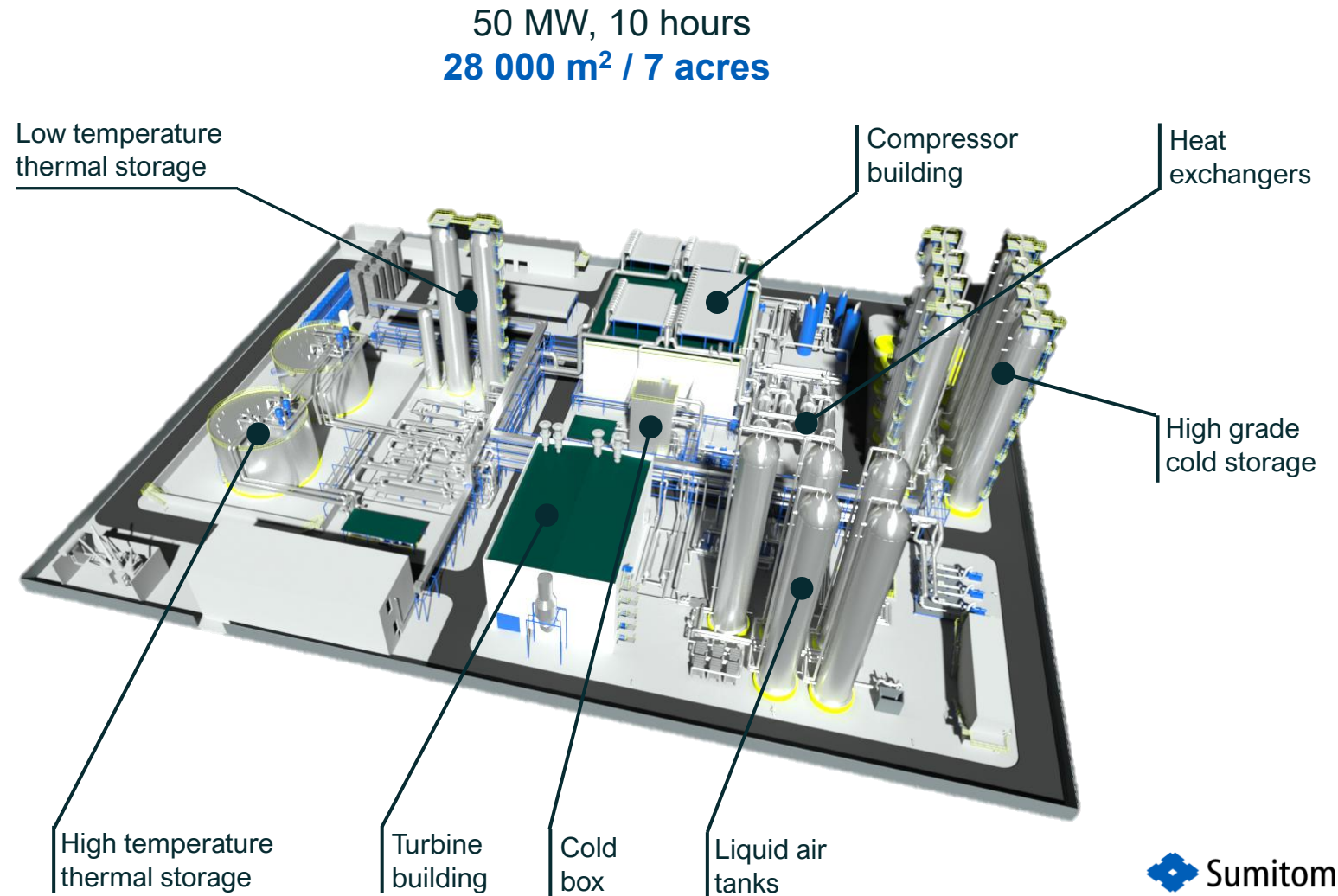
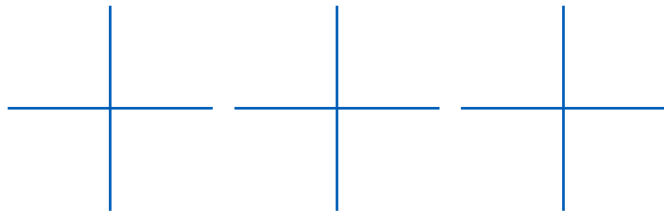


Liquid Air Energy Storage (LAES) – Redefining Sustainability

LAES uses proven industrial equipment to store energy using clean air

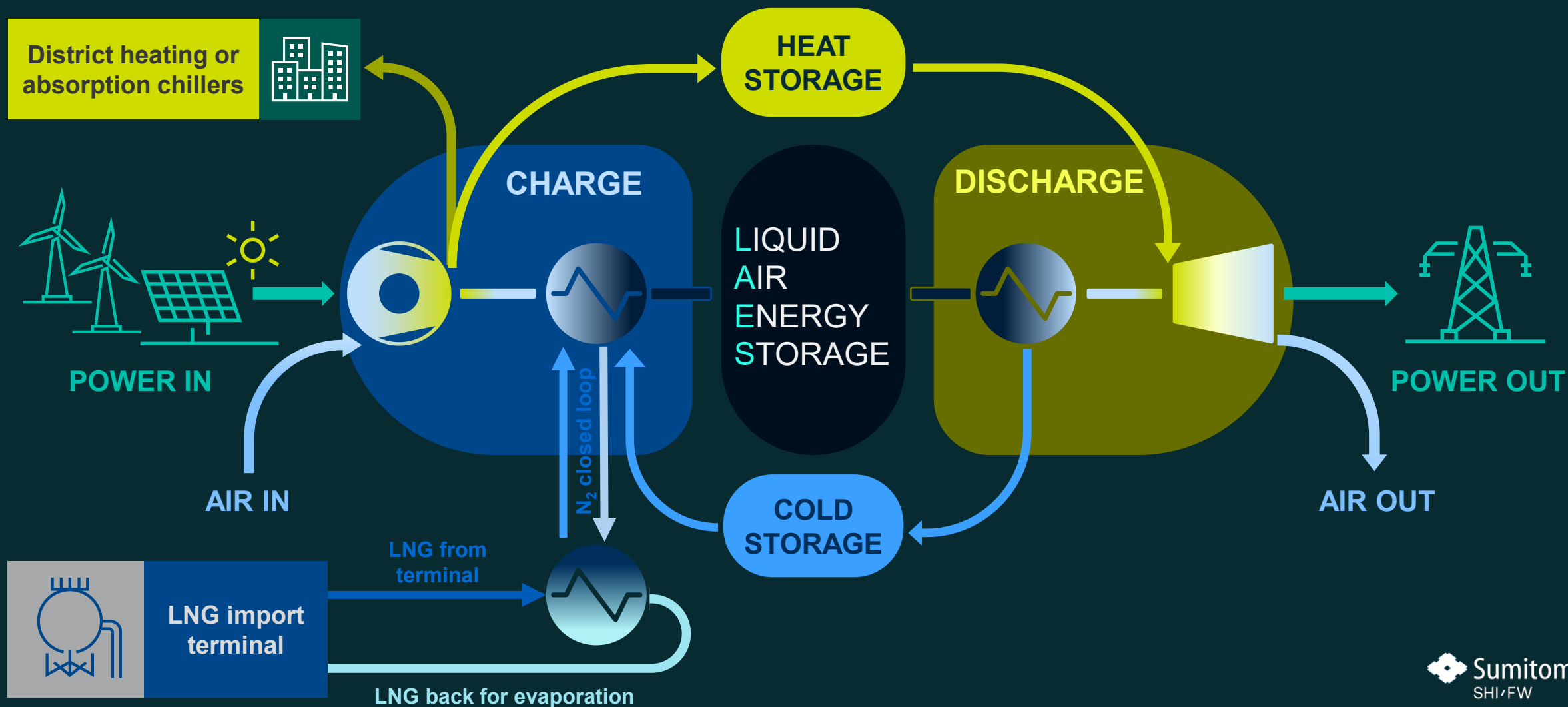
Round-trip-efficiency **50-70%**
Power output **25-200 MW**
Duration **8-24 hours**
Lifetime **30+ years**

- Negligible degradation
- Potential for heat and cold integration



LAES integrates with thermal systems for increased efficiency

Waste heat used for district heating and/or LNG regasification used as heat sink for LAES liquefaction system

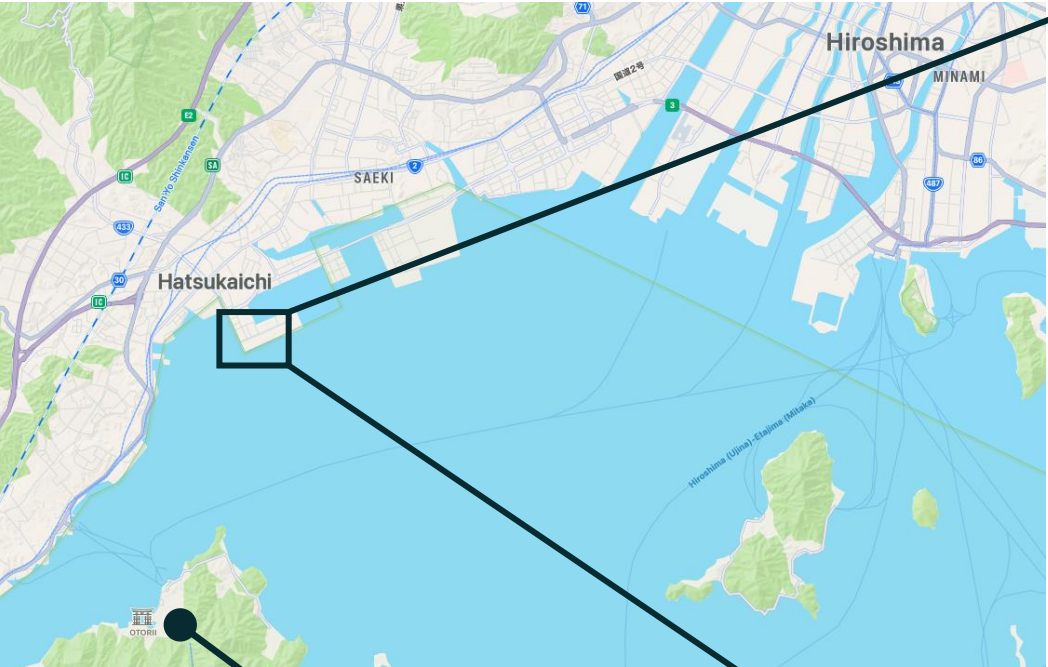


Worlds first LNG integrated LAES plant

Hatsukaichi city
Hiroshima prefecture
Japan



Hatsukaichi city, Hiroshima prefecture, Japan



Itsukushima Shrine
(World Heritage Site)



**Hiroshima Gas Co.,
Ltd. Hatsukaichi LNG
import terminal**

LAES plant

Major milestones of the project

10



October 2023

Start of civil works on site in Hiroshima Prefecture, Japan. The plan is implemented in collaboration with Hiroshima Gas Co., Ltd.



July 2024

Main rotating equipment is delivered to site and mechanical installation starts



September 2024

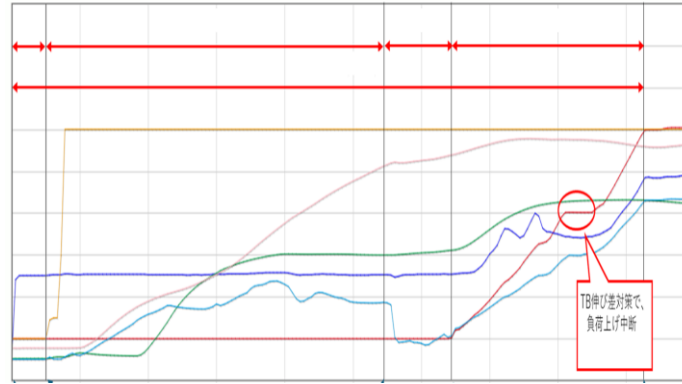
Tank erection on site. After which assembly of all smaller equipment, piping, cabling, auxiliaries, etc. around main equipment

Major milestones of the project



September 2025

First liquid air production achieved



November 2025

Plant performance tests completed



December 2025

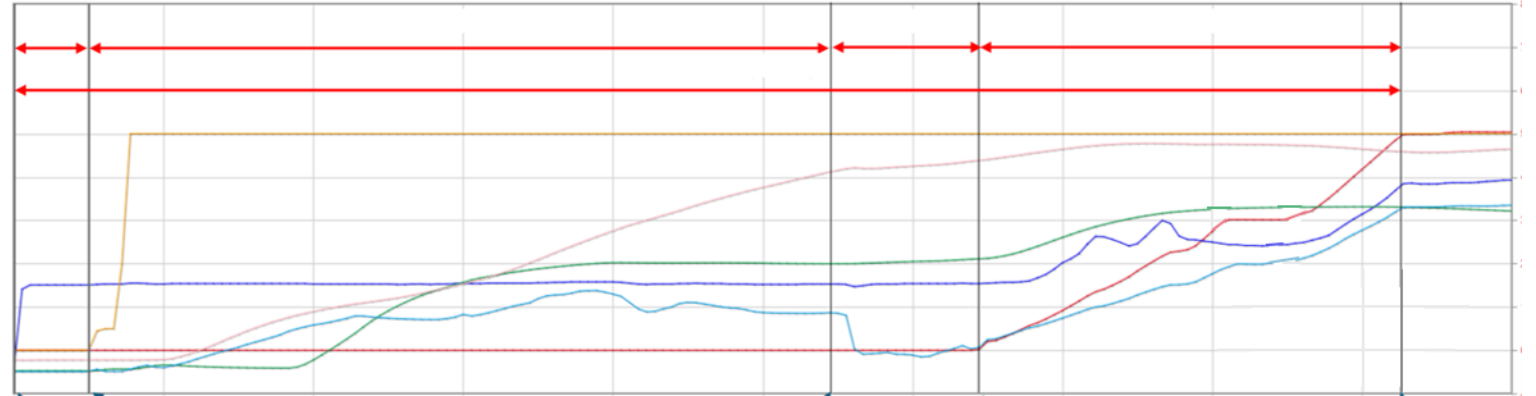
COD achieved and formal plant inauguration ceremony held

Plant is gradually optimized for faster starts and dynamic operation

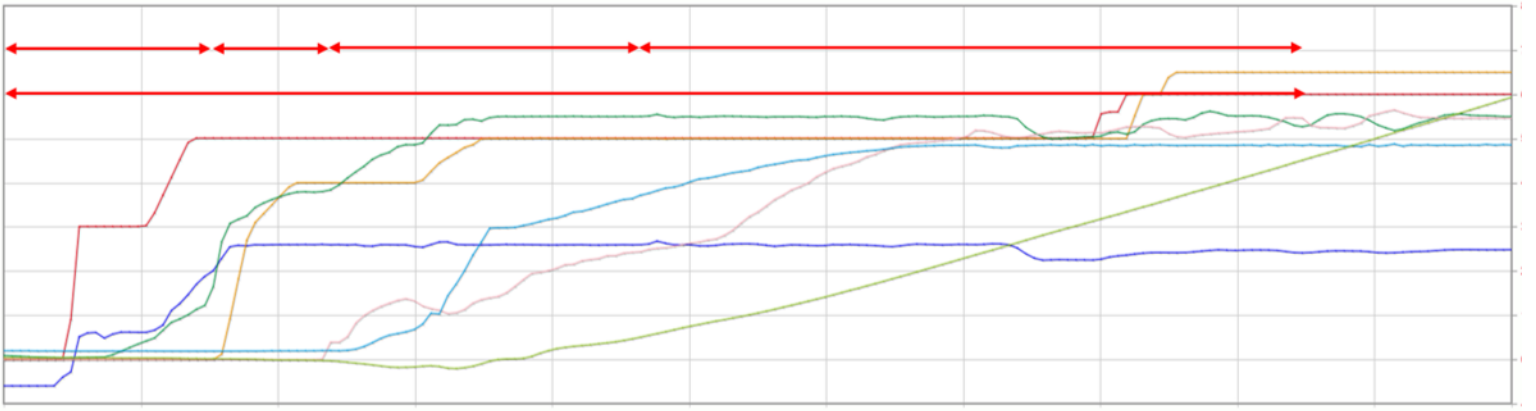
January 2026

Passed capacity adequacy test, required for eligibility as grid capacity provider

DISCHARGE



CHARGE



SFW response to decarbonization and climate change mitigation

Helping our customers to reach decarbonization goals



Energy generation

Energy from biomass or waste for carbon neutral or carbon negative heat & power applications



Carbon capture

Oxyfuel carbon neutral and negative CFB plants, Calcium looping for hard to abate industries and Hot potassium carbonate for biomass and WtE



Services

Life cycle solutions enabling high plant availability and efficiency



Waste to value

Gasification of solid waste into syngas, biofuels & chemicals, or plastics recycling



Energy storage

Long Duration - Enabling net zero grid systems to limit the climate change

SHI FW – update on the recent projects 1/3 – Mondi Ruzomberok (SK)

Pressure test passed in August 2026



SHI FW – update on the recent projects 2/3 – Mondi Štětí (CZ)

Enhancing Mondi's energy management

Design and Erection (D&E) including foundation works

Location: Mondi Štětí a.s., 41108 Štětí, Czech Republic

Parameters: 203MWth, 69,44kg/s, 520°C, 94.5bar(a)

Fuels: Biomass, Secondary Sludge

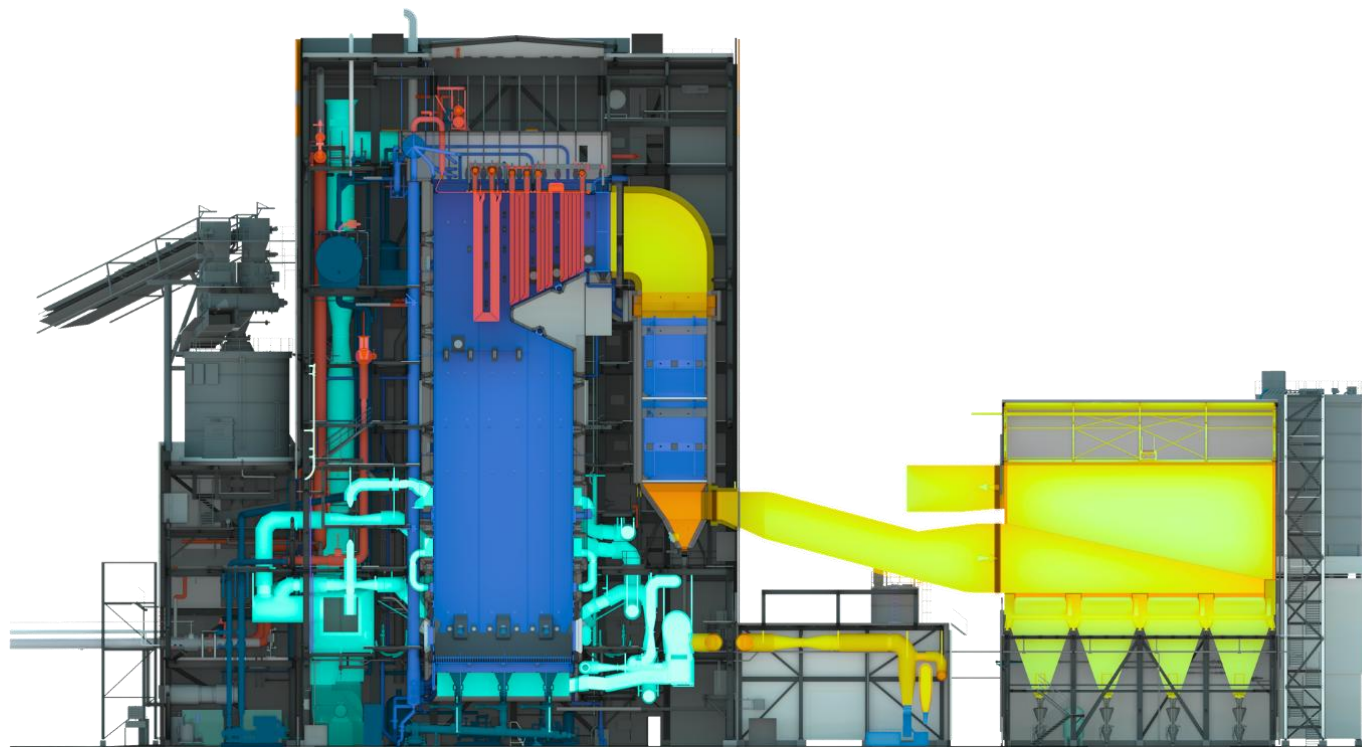
Commissioning: Q3/2028



Mondi Štětí a.s.

Enhancing Mondi's energy management

Process flow drawing



SHI FW – update on the recent projects 3/3 – Qemetica Inowrocław (PL)

Established in 1879, Qemetica Soda Polska (previously: CIECH Soda Polska) is the second largest European producer of heavy and light soda ash (sodium carbonate). It also manufactures evaporated salt.

Tender criteria for boiler parameters – conversion of a pulverized coal-fired boiler commissioned in 1978, to 100% wood-chip-fired BFB boiler:

Parameters to be achieved	Unit	Before conversion	After conversion
Maximum cont. rating of steam	t/h	110	min. 80
Main steam temperature	°C	465	465
Main steam pressure	bar	75	75
Feedwater temperature:	°C	105	105
Annual average boiler efficiency	%	90%	>87%

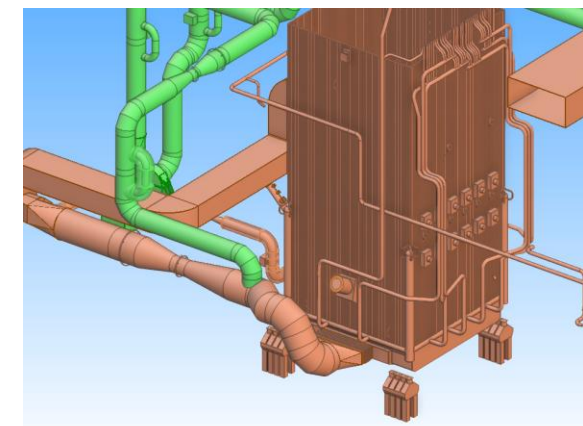
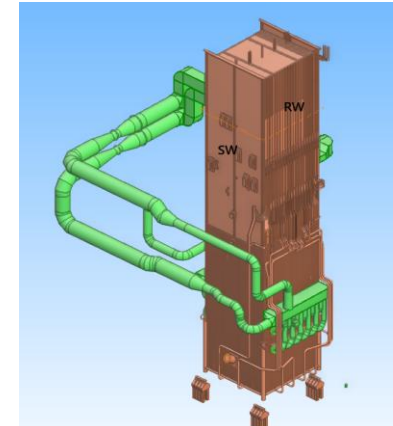
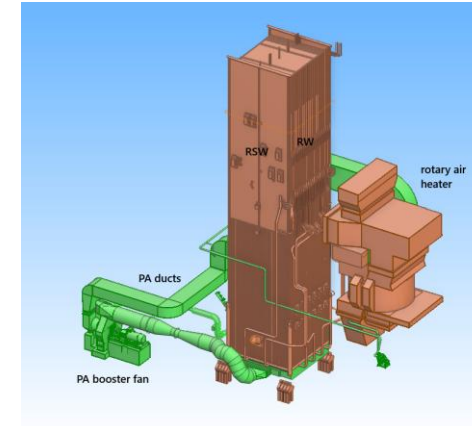
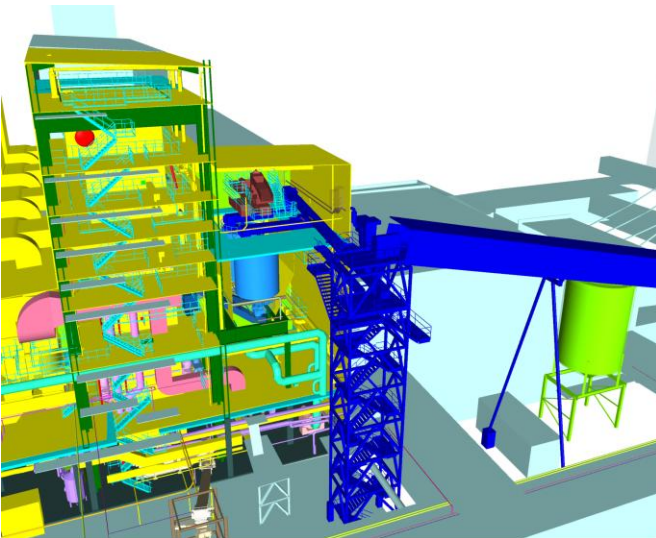
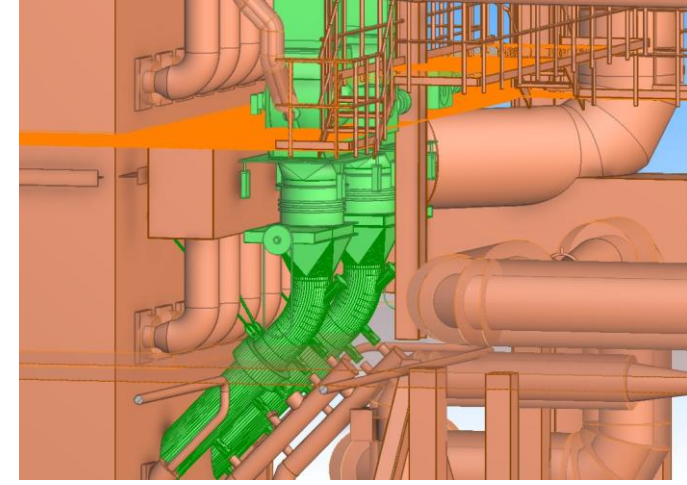
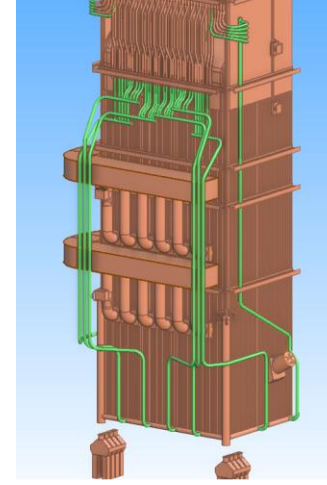
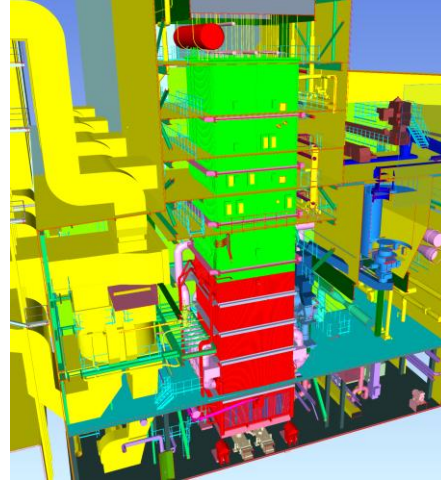
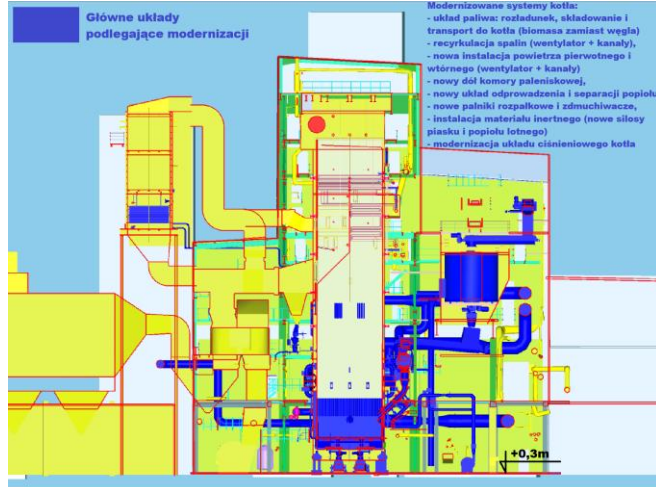
Wood chips parameters	Unit	Value
Lower calorific value	MJ/kg	7.5 – 13.0
Moisture	%	27.5 – 55.0
Bulk density	t/m3	0.20 – 0.45
Ash	% dry	0.1 - 10

Awarded to Consortium between Sumitomo SHI FW (Consortium leader) and Mostostal Zabrze Realizacje Przemysłowe S.A. with winning concept.



PC to biomass BFB boiler conversion including external biomass handling system

Scope of works – boiler area



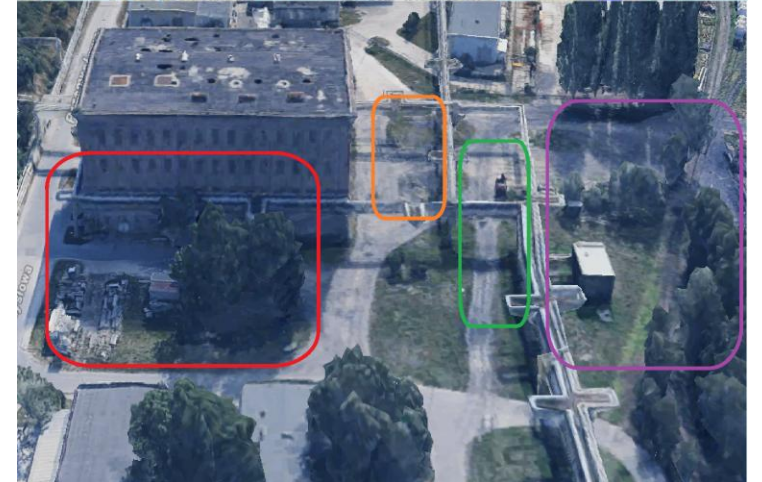
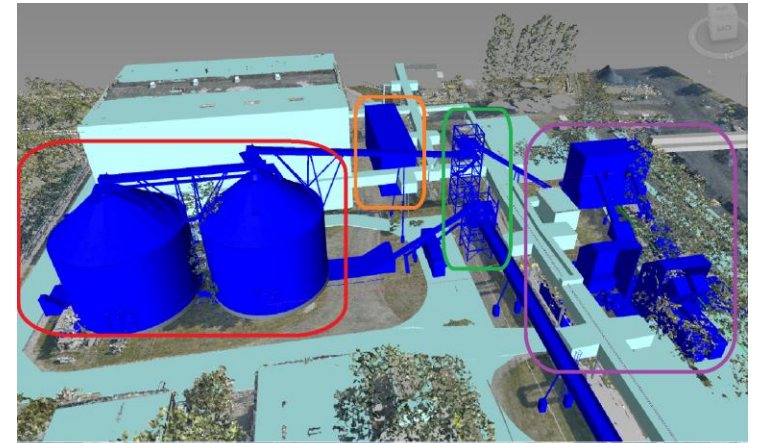
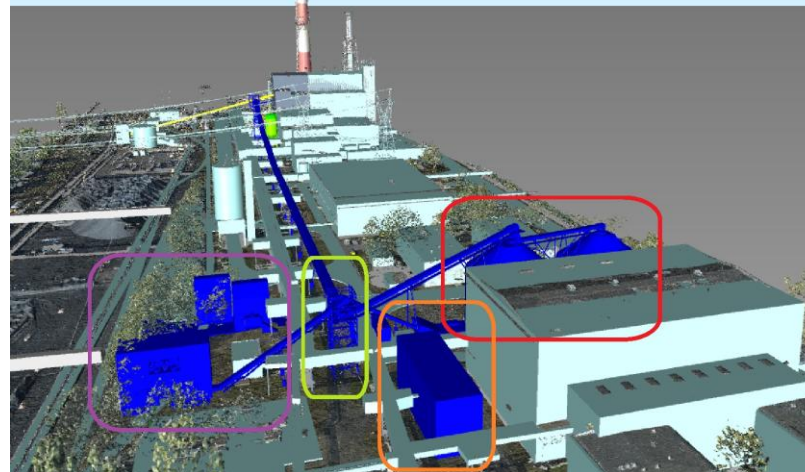
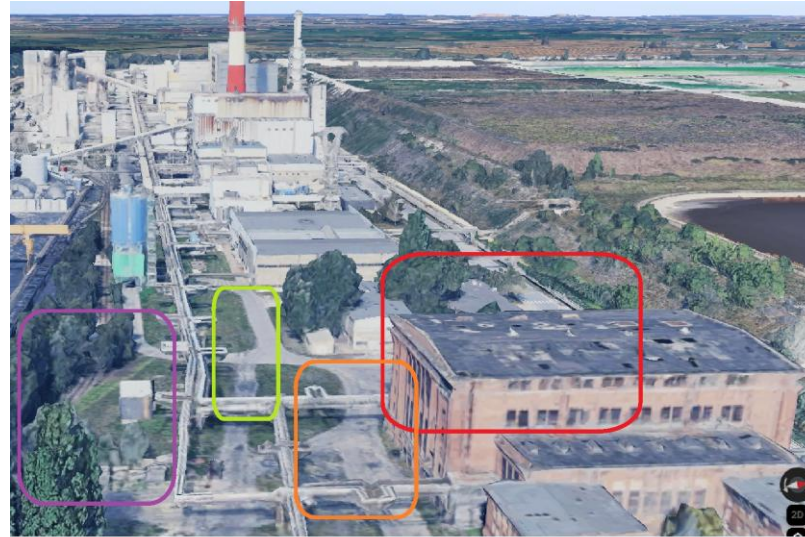
PC to biomass BFB boiler conversion including external biomass handling system

Scope of works – biomass handling area

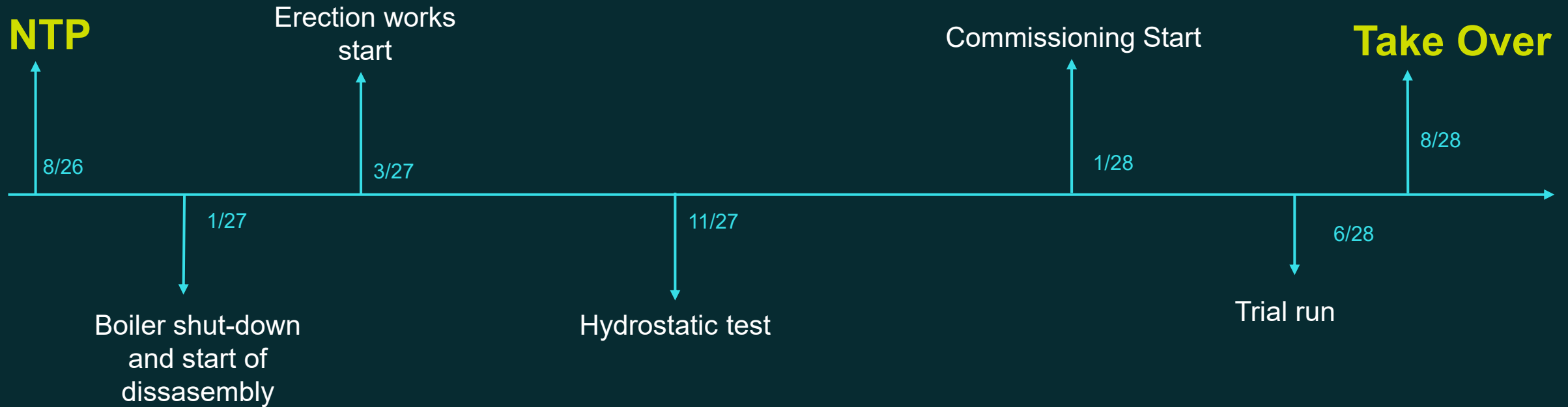
Example photos:



Visualisation for Qemetica project:



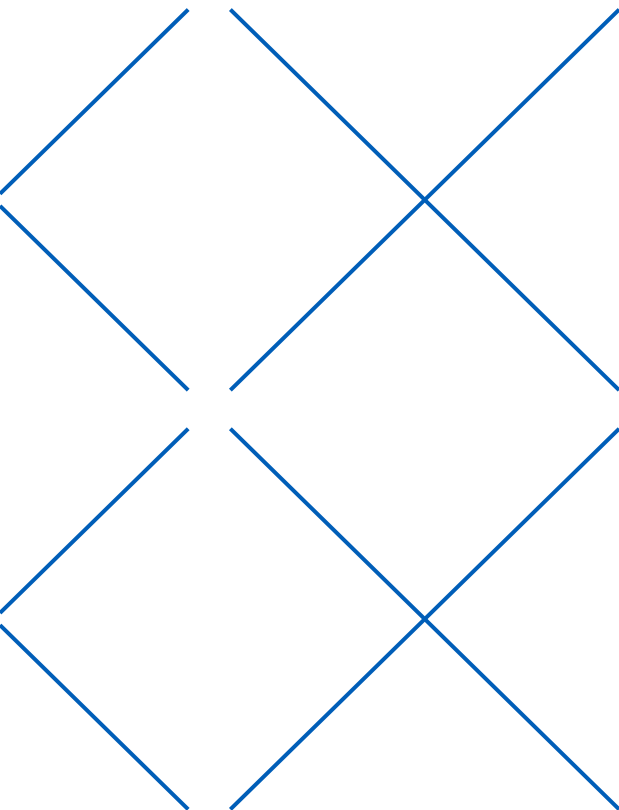
Execution milestone schedule



Duration

Execution
24 months

Total boiler shutdown
15 months



The information contained in this document is proprietary information of Sumitomo SHI FW and is disclosed in confidence. No part of this document may be reproduced or copied in any form or by any means without the prior written permission of the copyright holder. The numbers and values presented in this document are examples only and shall not be constructed or understood as guarantees provided by Sumitomo SHI FW. All documents, including but not limited to, drawings and specifications, prepared or presented by Sumitomo SHI FW in this connection are not intended or represented to be suitable for reuse by others in production or on any other project. Any reuse without prior written authorisation and, as the case may be, verification or adaptation by Sumitomo SHI FW shall be at the customer's sole risk and without liability or legal exposure to Sumitomo SHI FW.

Thank you

For more information, please visit:

www.shi-fw.com

Or contact:

Grzegorz Kocot, MSc.

Director Business Development

+48 663663223

grzegorz.kocot@shi-g.com

