



Power Plant Rotterdam

KIVI event

26 september 2024

ONYX POWER

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General introduction

Power Plant Rotterdam – part of Onyx Power



The Onyx Power Group is a European energy provider and expert in the safe and weather-independent supply of electricity and heat. At four locations in Germany and the Netherlands, Onyx Power currently operates five coal and biomass power plants with an installed generation capacity of around 2,350 megawatts. Headquartered in Berlin, the company employs around 450 people at its power plant sites in Bremen-Farge, Rotterdam, Wilhelmshaven and Zolling, as well as its office location in Düsseldorf.



Coal blending silos

LNG storage owned
by Gasunie

Dry bulk terminal
operated by EMO

Onyx Power station

Plot currently subleased to EMO
for coal washing

PPR Site at a Glance

Young power plant with an already eventful past



SDE+ subsidy
obtained for co-
firing biomass

2016/2017



Major boiler repairs

2020/2021



2008-2014

Construction and
commissioning



2017-2019

Sales process
Engie / Riverstone



2020-2022

Negotiations with
Dutch Ministry of
Economic Affairs on
voluntary closure



Site development projects

▪ Biomass development

• Co-firing

1 mill conversion enabling the plant the co-fire up to 460 kton of clean woody biomass and generate up to 1.1 TWh of low-carbon electricity

• Full conversion

Full conversion of coal-fired power plant to biomass fired power plant ('white' wood pellets used as feedstock). Installed capacity of 558 MW after conversion.

▪ Project Sapphire

- Production of 300 ktpa low-carbon hydrogen (H₂) using autothermal reforming (ATR) of natural gas
- CO₂ capture rate of ~98%, sequestered in empty gas fields under the North Sea
- Potential customers include those in the Netherlands, Germany, and Belgium via the new H₂ network

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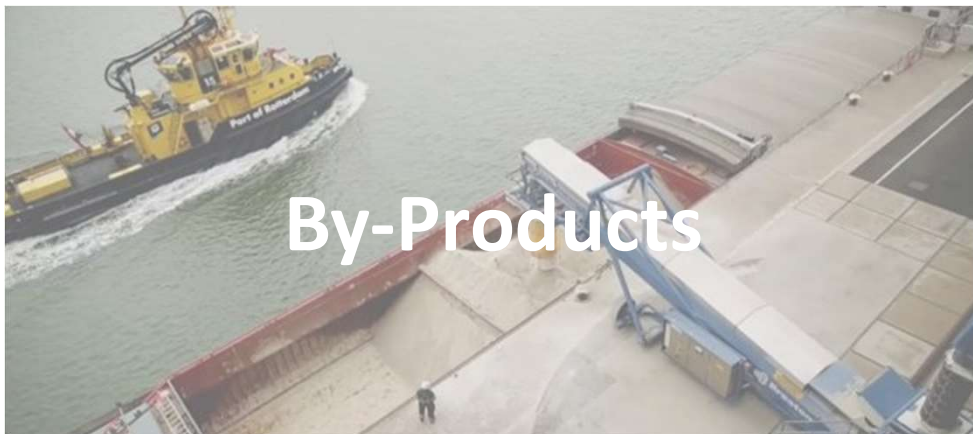
Power Plant Rotterdam specifics

Plant characteristics

COD		29 January 2015
Net max. / min. capacity		731 MW / 171 MW
Fuels	hard coal biomass light diesel oil	100% 0-25% (up to 100% permitted) Start-up fuel
Steam parameters		280 bar / 600°C / 595 kg/s
Boiler		Hitachi - ultra super critical once through
Turbine		Hitachi - 3000 rpm - 794 MW
Generator		Hitachi - 962 MVA – 790 MW – 21 kV
GSU Transformer		Siemens TRPM9056 – 932 MVA – 21/405kV
Grid connection		TenneT 380 kV – 50 Hz Stedin 23kV – 50 Hz (back-up)
Cooling		Sea water open cooling
Emissions	NOx SOx Dust CO ₂	50 mg/Nm ³ (permit limit) 40 mg/Nm ³ (permit limit) 3 mg/Nm ³ (permit limit) 750 g/kWh (average, on 100% coal)
Site	surface landowner leasing term	195.435 m ² Port of Rotterdam 30 September 2057
Logistics		All bulk logistics by ship



Coal Supply and By-Products

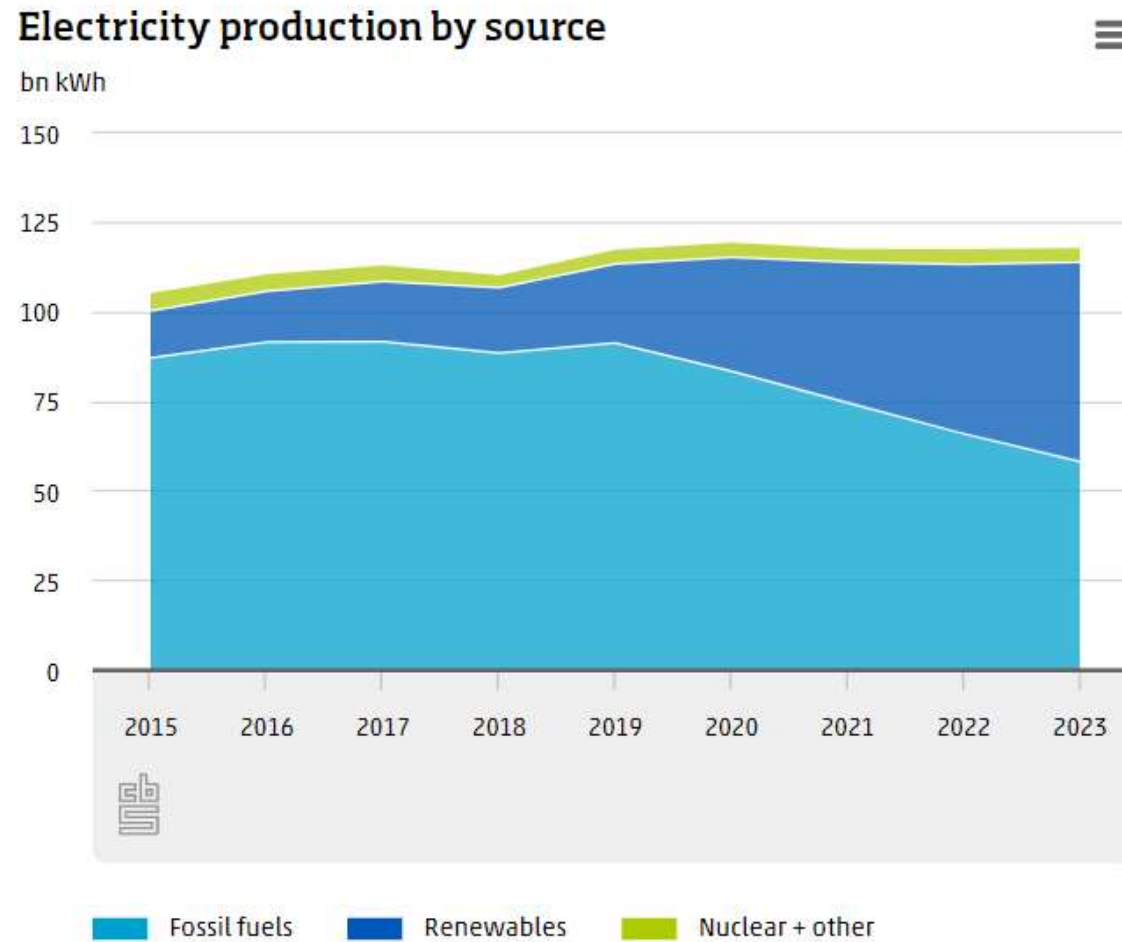


- **Hard coal:** up to 1,500,000 TC25 per year
- **Blending in silos:** 8 x 7,000 tons
- **Blend options:**
 - *Base coal:* Columbian, Kazakhstan, South Africa BHP6000
 - *High sulfur coal:* US ILB, US CAPP
 - *High ash coal:* South Africa BHP4800, Mozambique, Chile
- **Blend specifications:**
 - *NCV [GJ/t]:* 22-29
 - *Moisture [% ar]:* 6-18 | *Volatile matter [% ar]:* 21-43
 - *Ash [% db]:* 4-18 | *Sulfur [% db]:* 0.2-1.5
- **Fly Ash:**
 - Up to 200,000 tons/year
 - *Customer industry:* Concrete and cement
- **Bottom Ash:**
 - Up to 20,000 tons/year
 - *Customer industry:* Concrete (UK)
- **Gypsum:**
 - Up to 100,000 tons/year
 - *Customer industry:* Plaster Board

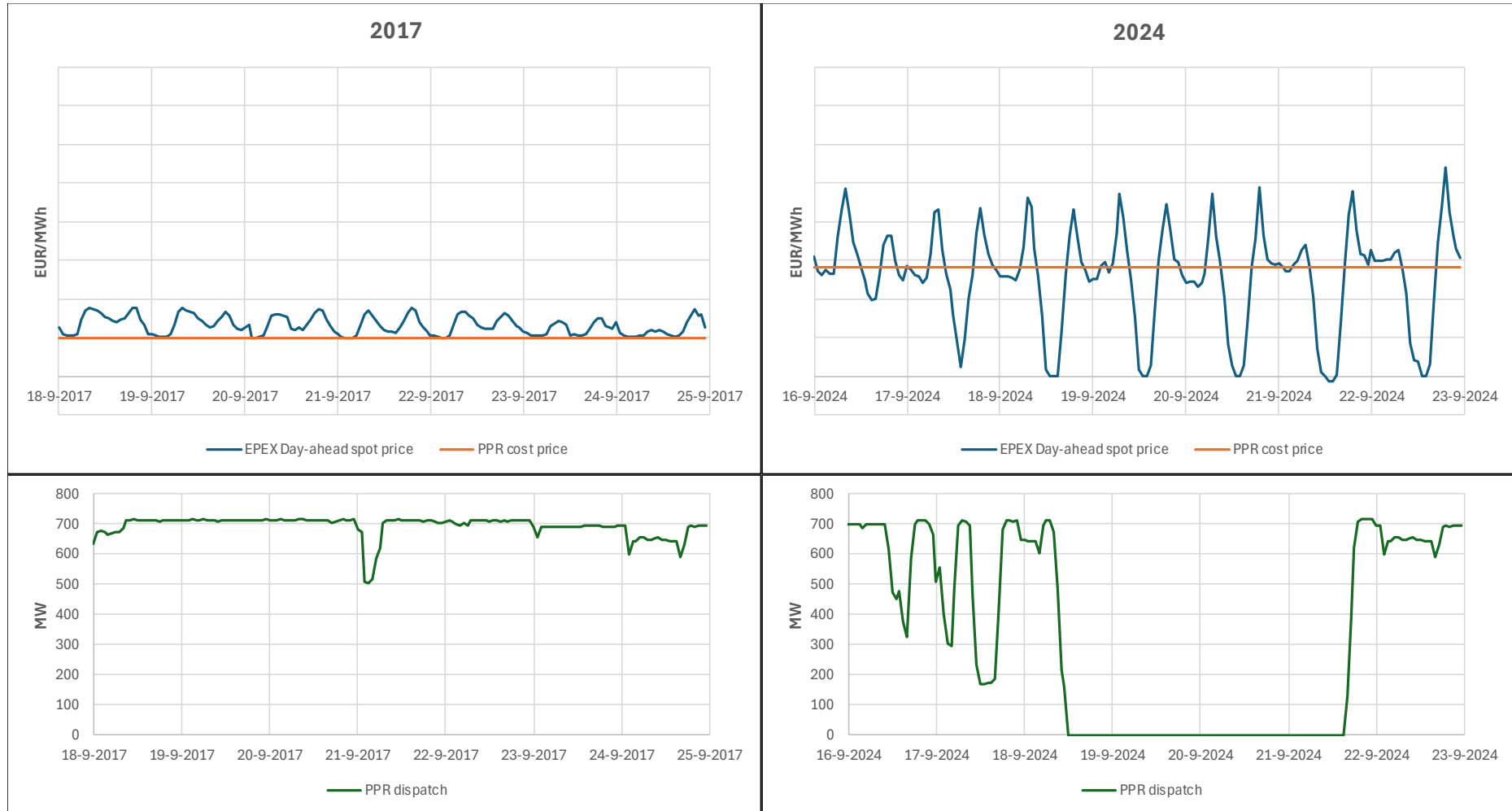
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Asset Management in a changing energy market

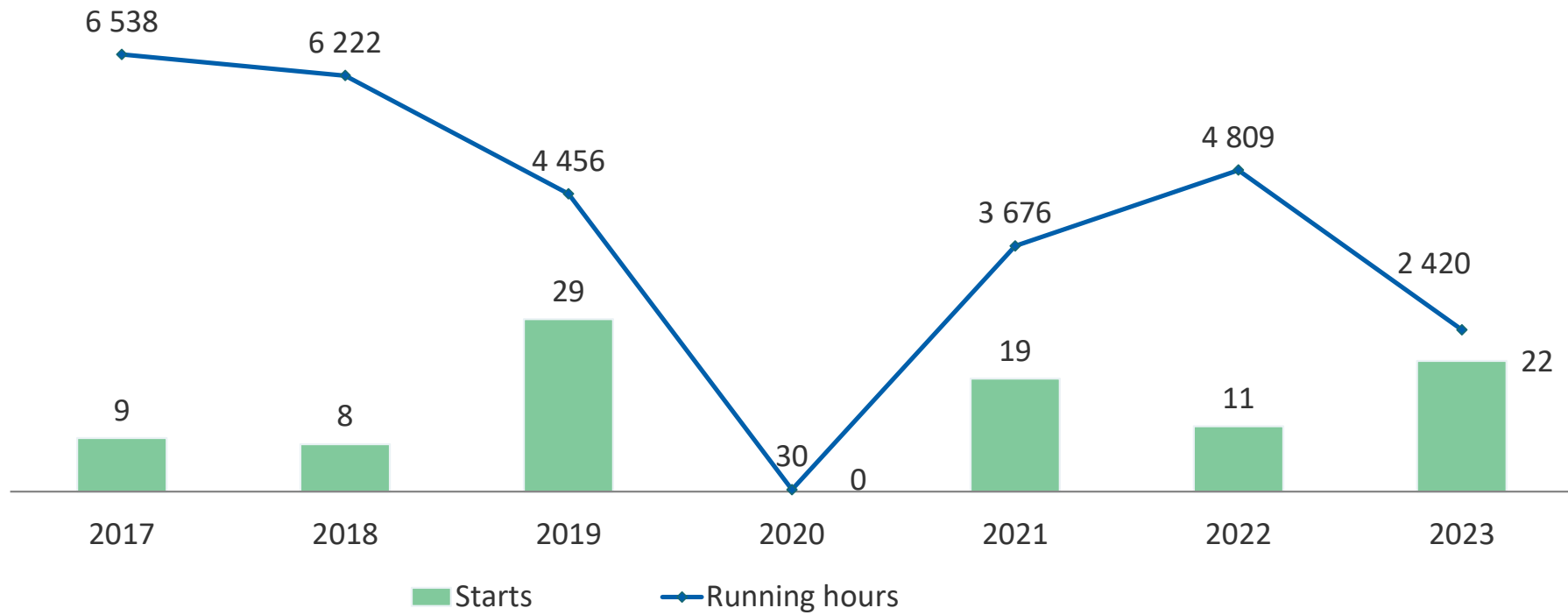
The energy transition triggers a market shift



The market shift impacting PPR dispatch



Changing operating regime of PPR



Impact of a changing operating regime on Asset Management



Preventive maintenance programs

- Assessment of maintenance intervals / scope
- Conservation of equipment



Organization of maintenance

- Planning options for maintenance
- Extended overhaul intervals on low running hours



Organization of operations

- Maintain knowledge and skills of operations teams
- Scheduling of emission measurement campaigns

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