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REPUBLIKA HRVATSKA
Ministarstvo regionalnoga razvoja
i fondova Europske unije

EIHP
ENERGETSKI INSTITUT
HRVOJE POŽAR

ENERGY PRODUCTION FROM THE SEA

Project Title:

Seawater Heat Pump Systems

Beneficiary:

Brodogradilište Viktor Lenac d.d.



SHIPYARD
1896 **VIKTOR LENAC**

Member of Palumbo Group



VIKTOR LENAC SHIPYARD

leading **REPAIR, CONVERSION & OFFSHORE** shipyard in the **MEDITERRANEAN**

127 YEARS of experience

3 floating docks up to Suezmax size

60-80 projects per year

90% on foreign market

ZSE **VLEN-R-B** (CROBEX – since 03/2021)

ISO 9001 - 45001 – 50001 – 27001



OUR STORY





PROJECT CAPACITY PER ANNUM TO BE FURTHER INCREASED BY HIGHER PRODUCTIVITY AND PROCESS EFFICIENCY AND FLEXIBILITY TO CLIENTS' NEEDS

PROJECTS AND DIVERSITY 2020-2022

	2020			2021			2022		
	Projects	Clients	Markets	Projects	Clients	Markets	Projects	Clients	Markets
Total	70	42	16	61	33	14	63	31	10
Domestic market	13	5	1	19	5	1	15	5	1
Foreign markets	52	36	14	34	27	12	35	25	8
US Navy	5	1	1	8	1	1	13	1	1



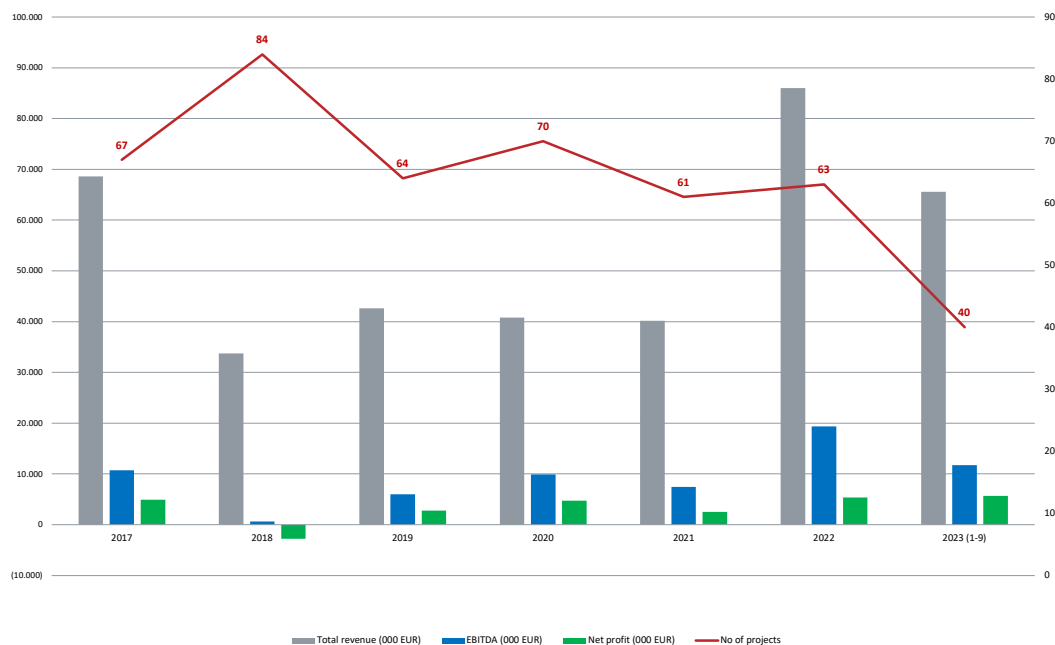
KEY BUSINESS FACTS





WE DELIVER POSITIVE RESULTS

KEY FINANCIALS 2017 - 2023 (1-9)



Viktor Lenac Shipyard is publicly listed on Zagreb Stock Exchange

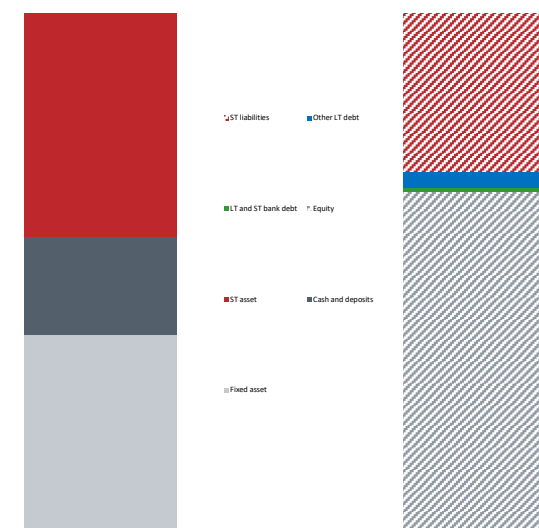
www.zse.hr

VLEN-R-B

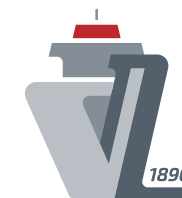
Sept 30, 2023

Asset

Equity and debt



KEY BUSINESS FACTS





CARING FOR SUSTAINABLE ENVIRONMENT

- SEA, AIR, NOISE, ENERGY
- ISO 50001 IMPLEMENTED, ENVIRONMENTAL POLICY WITHIN ISO 9001
- MONITORING OF ALL IMPACTS
- INVESTMENTS IN ENERGY EFFICIENCY AND ENVIRONMENT PROTECTION

✓ from 2013 - UHPWJ with waste water treatment plant (instead of sandblasting)

✓ from 2014 – SHORE CONNECTION WITH FREQUENCY CONVERTERS (6 PCS) instead of diesel generators and ships' engines

✓ 2015 – light modernisation - LED lights (workshops, offices, open spaces)

✓ 2016 – waste heat recovery from air compressors, hydronic heating instead of steam, fuel oil substitution with extra light fuel oil

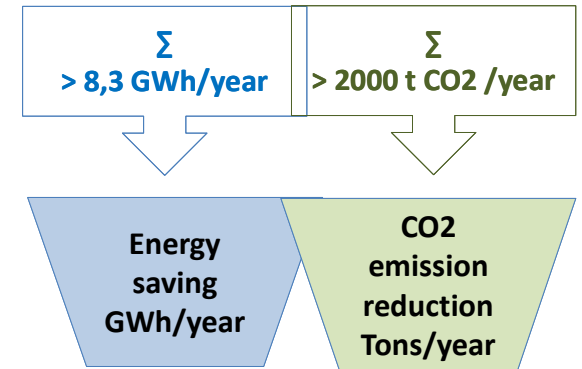
✓ Frequency converters for motor driven pumps and cranes

✓ Seawater heat pump (in course)

✓ More efficient welding equipment

✓ Sewage system

✓ Using of process (stream) water whenever possible



4,2

994

2,1

507

1,3

363

0,17

39

0,16

37

0,39

93

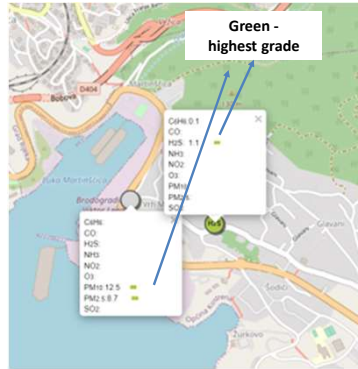
SUSTAINABLE DEVELOPMENT



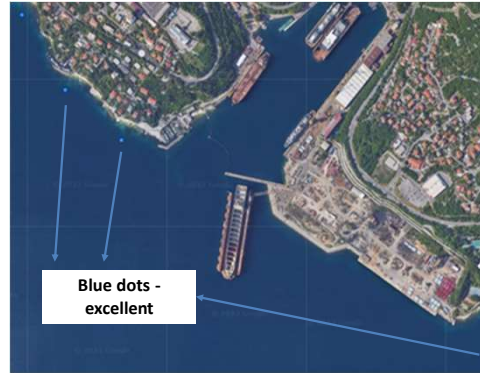


CARING FOR SUSTAINABLE ENVIRONMENT

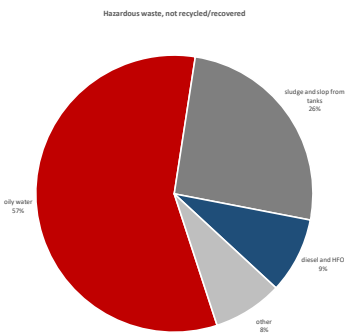
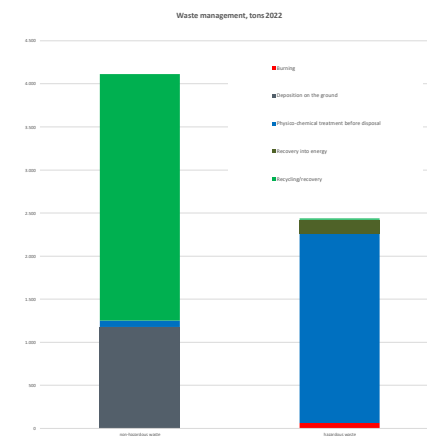
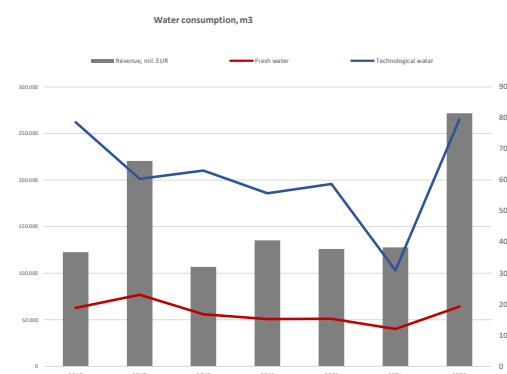
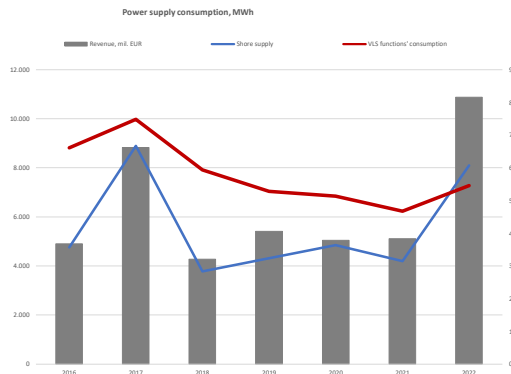
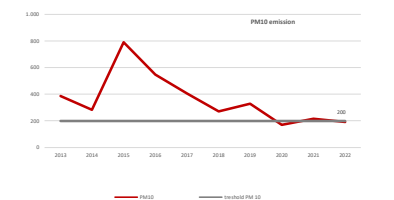
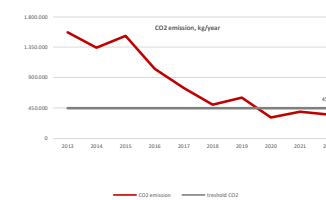
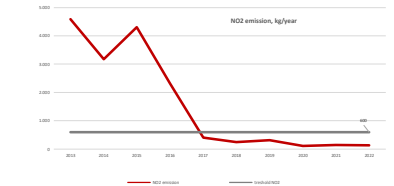
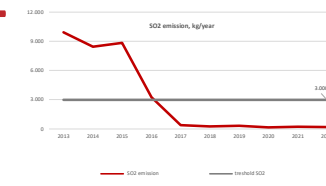
Air quality



Sea water quality



Source: Department of Public Health PGC



SUSTAINABLE DEVELOPMENT



Energy Efficiency



Our successfully implemented energy efficiency projects

- ✓ Reduced impact on the environment
- ✓ Reduced cost of production

Shore supply

- Annual energy savings of 4,210,000 kWh
- Emission reduction of 994 t CO₂/year



Shore-to-ship power converters



Our successfully implemented energy efficiency projects

Lighting

- Outdoor, Temporary, Workshop and Office

→ Annual energy savings of 2,147,245 kWh

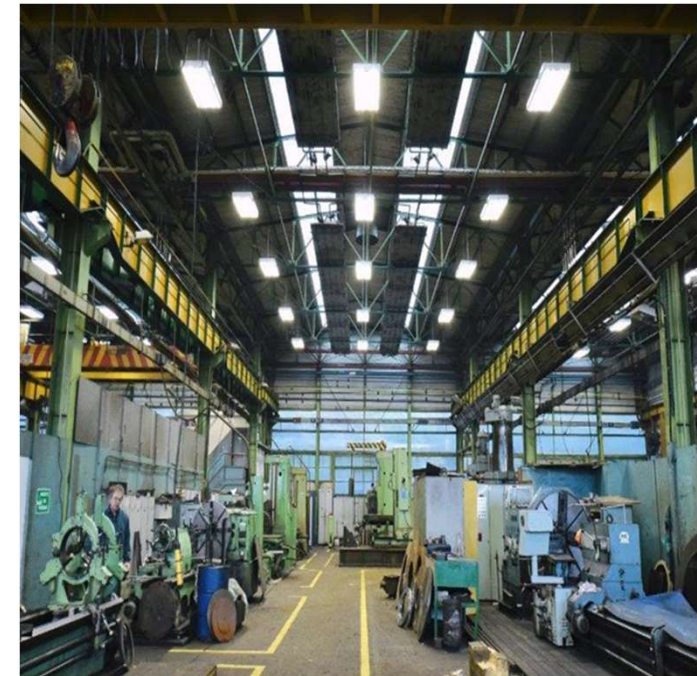
→ Emission reduction of 507 t CO₂/year



Temporary lighting



Outdoor lighting



Workshop lighting



Our successfully implemented energy efficiency projects

UHPW technology

- Ultra High Pressure Anti-Corrosion Water Treatment operating at pressures up to 3000 bar
 - Annual energy savings of 335,300 kWh
 - Emission reduction of 78,700 kg CO₂/year



Spider



Our successfully implemented energy efficiency projects

Improved welding quality

REL and MIG-MAG

- Annual energy savings of 393,700 kWh
- Emission reduction of 92,900 kg CO₂/year



REL welding



MIG-MAG welding



Our successfully implemented energy efficiency projects

Variable frequency drive

- pump stations, cranes

→ Annual energy savings of 165,000 kWh

→ Emission reduction of 38,900 kg CO₂/year



Frequency regulation of PS2 pumps



Our successfully implemented energy efficiency projects

Water heating

- Annual energy savings of 1,315,000 kWh
- Emission reduction of 363 t CO₂/year



Central boiler room – Water heater boiler

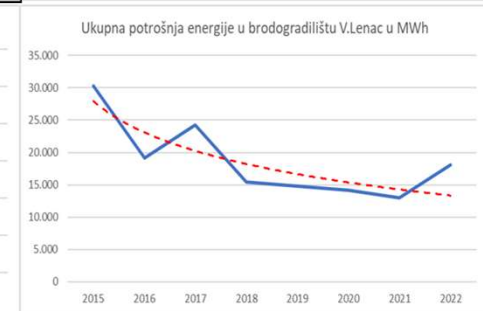
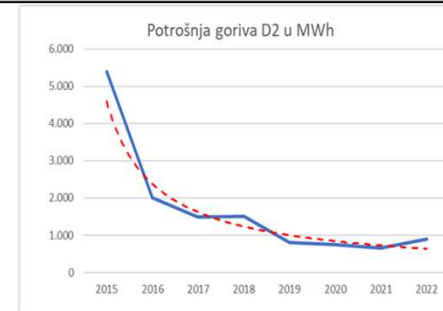
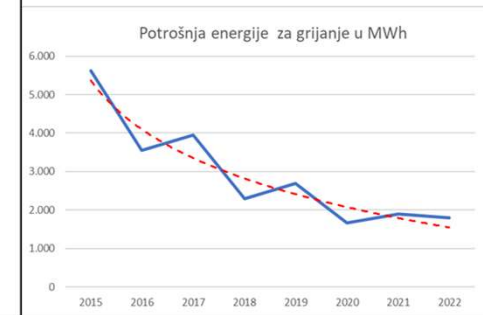
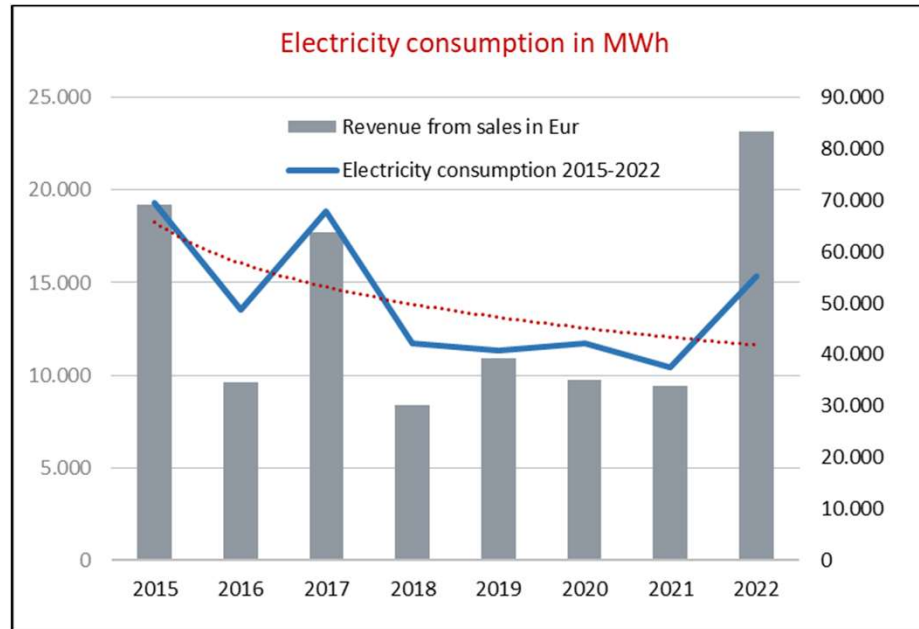


Waste heat from compressor



2015-2022 Annual Energy Savings

Electricity, Extra light fuel oil
and Diesel D2 in MWh



Developing an Effective Solution



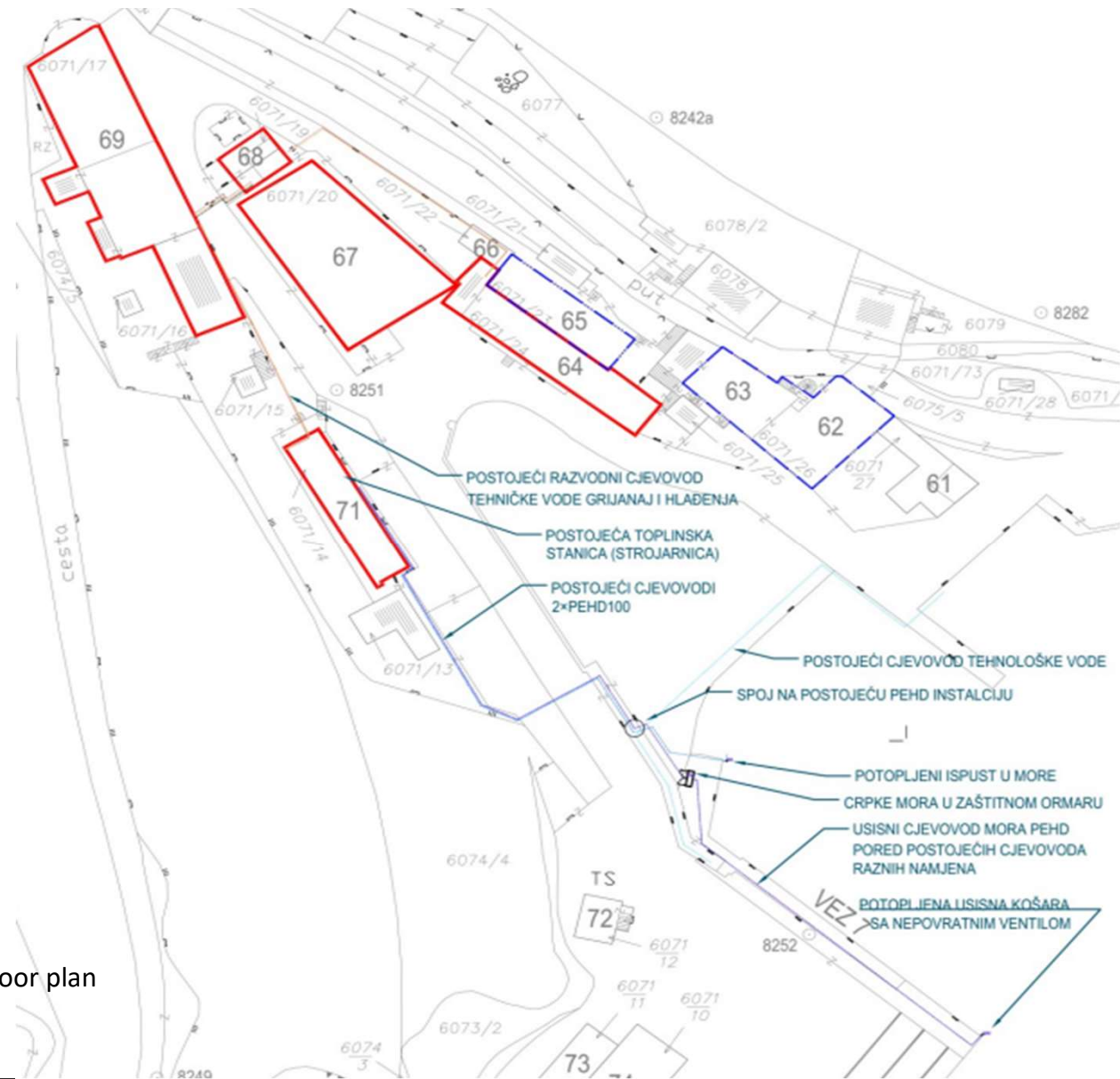
Seawater Heat Pump

ENERGY PRODUCTION FROM THE SEA

Goal

- Increasing the scope of use of renewable thermal energy sources
- Reduction of heating costs (electricity)
- Cooling energy use in buildings

Seawater heat pump systems installation floor plan



Grant Agreement

- ✓ Concluded in May, 2022
- ✓ Programme Operator: Ministry of Regional Development and EU Funds
- ✓ **Project Implementation Period:** 1 June 2022 – 31 March 2024
- ✓ **Total Project Amount:** EUR 480,312.54
- ✓ **Grant:** EUR 232,583.52



Electricity consumption will decrease by

155.872 kWh/year



Emission reduction CO₂ by

36.600 kg/year



Where are we now



Step Project Checklist

- A contract with an external expert consultant concluded
- Promotional materials designed and printed
- Technical documentation produced
- A public procurement procedure for installation works completed – Selection of the contractor in progress

→ Supervision of works to be contracted

→ Project audit

Expected completion of the project: 31 March 2024



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Thank you for your attention!

Brodogradilište Viktor Lenac d.d.

www.lenac.hr

Project Consultant: SENSUM d.o.o.

Donor Programme Partners

Iceland, Liechtenstein and Norway

**Working together for a Green, Competitive and
Inclusive Europe**