



LIMASSOL MUNICIPALITY



Frederick University



BLUE LIMASSOL
FORUM

**“Socioeconomic Impact of Cold Ironing
(Onshore Power Supply)
at the Port of Limassol
CEF Project: DECARBONLIM”**

Dr Manolis Nikolaidis

Cold ironing at the Port of Limassol — OPS is no longer optional

REGULATORY COMPLIANCE & ENVIRONMENTAL IMPERATIVE



MARKET OPPORTUNITIES (PORTS AS ENERGY HUBS)

REGULATORY DRIVERS & COMPLIANCE TIMELINE

- 2020**
MARPOL Annex VI
● **Global 0.5% sulphur cap** on marine fuels. Vessels at berth on HFO non-compliant in EU ports.
- 2024**
EU ETS Extension
● **EU Emissions Trading System** extended to shipping. At-berth fuel consumption carries a direct carbon cost.
- 2023**
AFIR
FuelEU Maritime
● **AFIR** (Reg. EU 2023/1804) and **FuelEU Maritime** (Reg. EU 2023/1805) enter force. By 2030, **TEN-T core ports** must provide OPS for container and passenger ships.
- 2030**
OPS Mandatory
● **Container & passenger ships must use OPS** at TEN-T core ports. Port of Limassol within scope.
- 2035**
Scope widened
● **OPS obligation extended** to additional vessel types. Full shore power infrastructure must be operational.

ENVIRONMENTAL BENEFITS BEYOND COMPLIANCE

LOCAL AIR QUALITY

100% NO_x · SO_x · PM eliminated at berth
950 t NO_x + 988 t SO_x avoided in 2023–2024.
Direct benefit to ~43,000 Limassol residents.

CO₂ REDUCTION

~27% less CO₂ vs MGO engines
Grid electricity (500–530 g/kWh) already cleaner than MGO combustion (721 g/kWh).
Benefit grows as Cyprus adds solar & wind.

PUBLIC HEALTH

SO_x and PM from diesel aux. engines cause respiratory disease, cardiovascular illness and premature mortality.
OPS eliminates this exposure at the source.

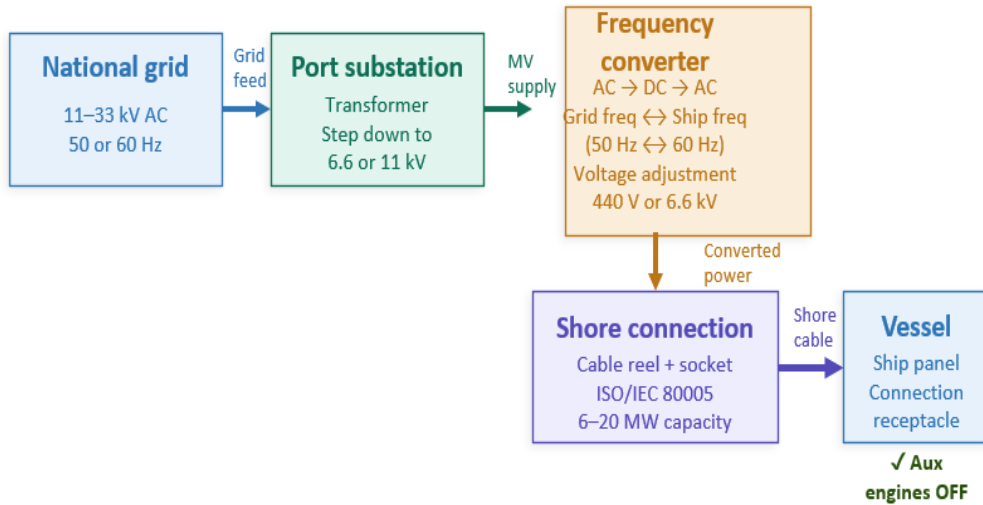
FUTURE-PROOF INVESTMENT

Each % of renewables added to the Cyprus grid automatically improves OPS carbon performance — no infrastructure changes required.

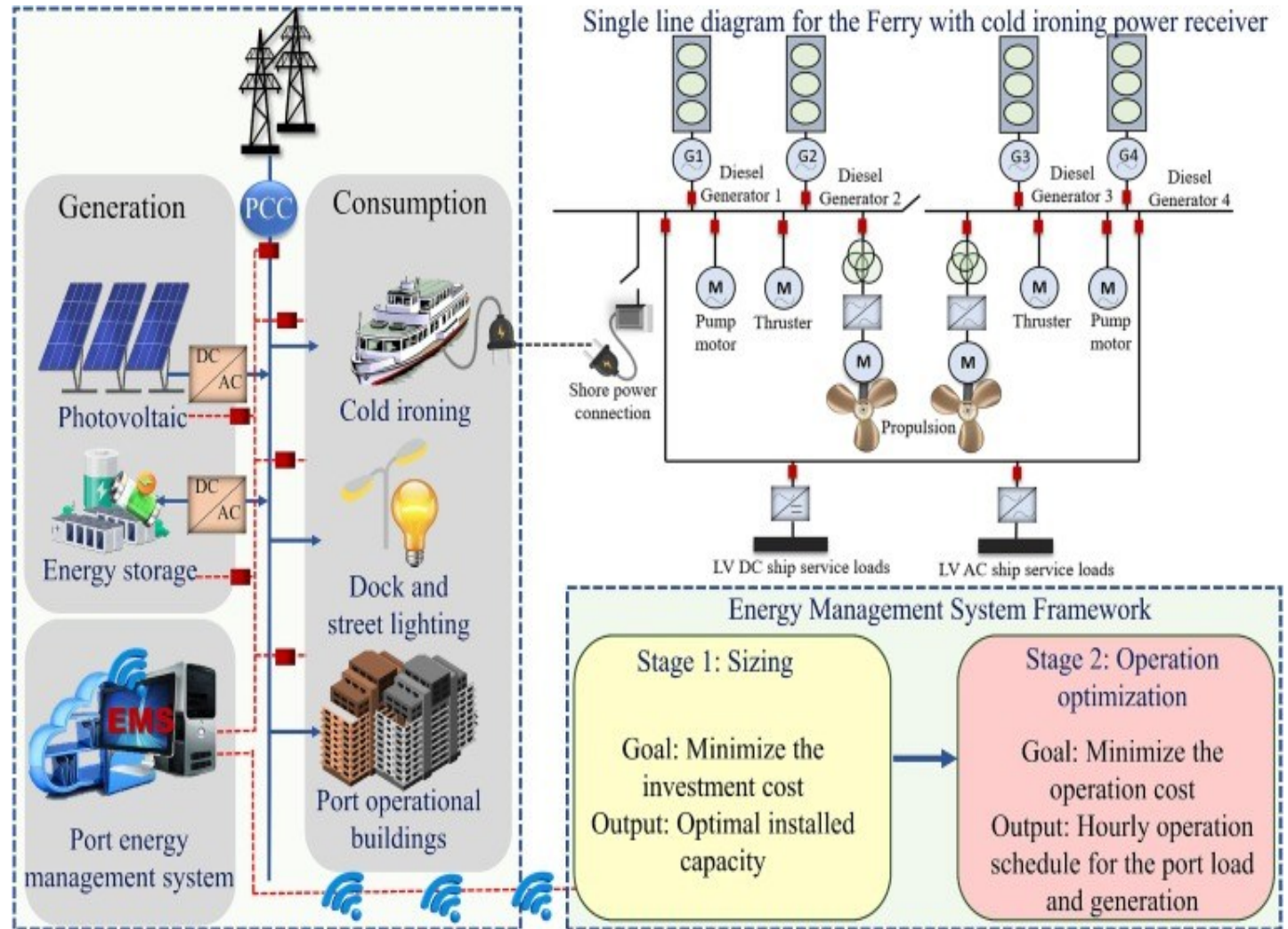
NOISE & PORT ENVIRONMENT

Shutting down auxiliary engines at berth significantly reduces noise — improving conditions for workers, passengers and the Limassol waterfront.

Onshore Power Supply connection



Onshore Power Supply (OPS), also known as **shore-side electricity** or **cold ironing**, is the practice of **supplying shore-side electrical power to a ship at berth** so it can shut down its diesel engines and **reduce noise, fuel consumption, and emissions of CO₂, NO_x, SO_x, and PM**, improving air quality in port areas.



Onshore Power Supply connection

OPS – POWERING FINANCIAL OPPORTUNITIES FOR LIMASSOL, ITS STAKEHOLDERS AND LOCAL MARKETS



OPS is more than an environmental solution. It is an **INVESTMENT** that delivers **LONG-TERM ECONOMIC VALUE** for Limassol and Cyprus.

LOCAL MARKETS

OPS creates new demand, jobs and business for local companies and workers.



JOB CREATION

New jobs in electrical installation, operations, maintenance and engineering.



SUPPLY CHAIN & SERVICES

Increased demand for local suppliers, technicians, logistics, and professional services.



SKILLS & TRAINING

Development of local expertise in green technologies and maritime electrification.



INCREASED ECONOMIC ACTIVITY

More cruise calls, longer stays and higher spending in local businesses, shops, restaurants and hotels.



STAKEHOLDERS

OPS strengthens the value proposition for all stakeholders in the port ecosystem.



CRUISE LINES

Fuel and emissions savings, compliance with regulations, enhanced brand image, and preferred port access.



TERMINAL OPERATORS

Higher efficiency, ability to attract more cruise calls, and long-term operational cost savings.



LOCAL BUSINESSES

More tourists, more spending, more opportunities across retail, hospitality and transport.



PUBLIC AUTHORITIES

Improved air quality, compliance with EU goals, increased resilience and stronger city reputation.



PORT OF LIMASSOL

OPS enhances the port's competitiveness and generates long-term financial returns.



NEW REVENUE STREAMS

Shore power fees create a sustainable and predictable income stream.



COMPETITIVE ADVANTAGE

A future-ready port attracts more cruise lines and positions Limassol as a regional leader.



INVESTMENT & FUNDING

Access to EU funding, green financing and public-private partnerships.



PORT VALUE GROWTH

Increased asset value and long-term economic sustainability.

environmental impact and more...!!



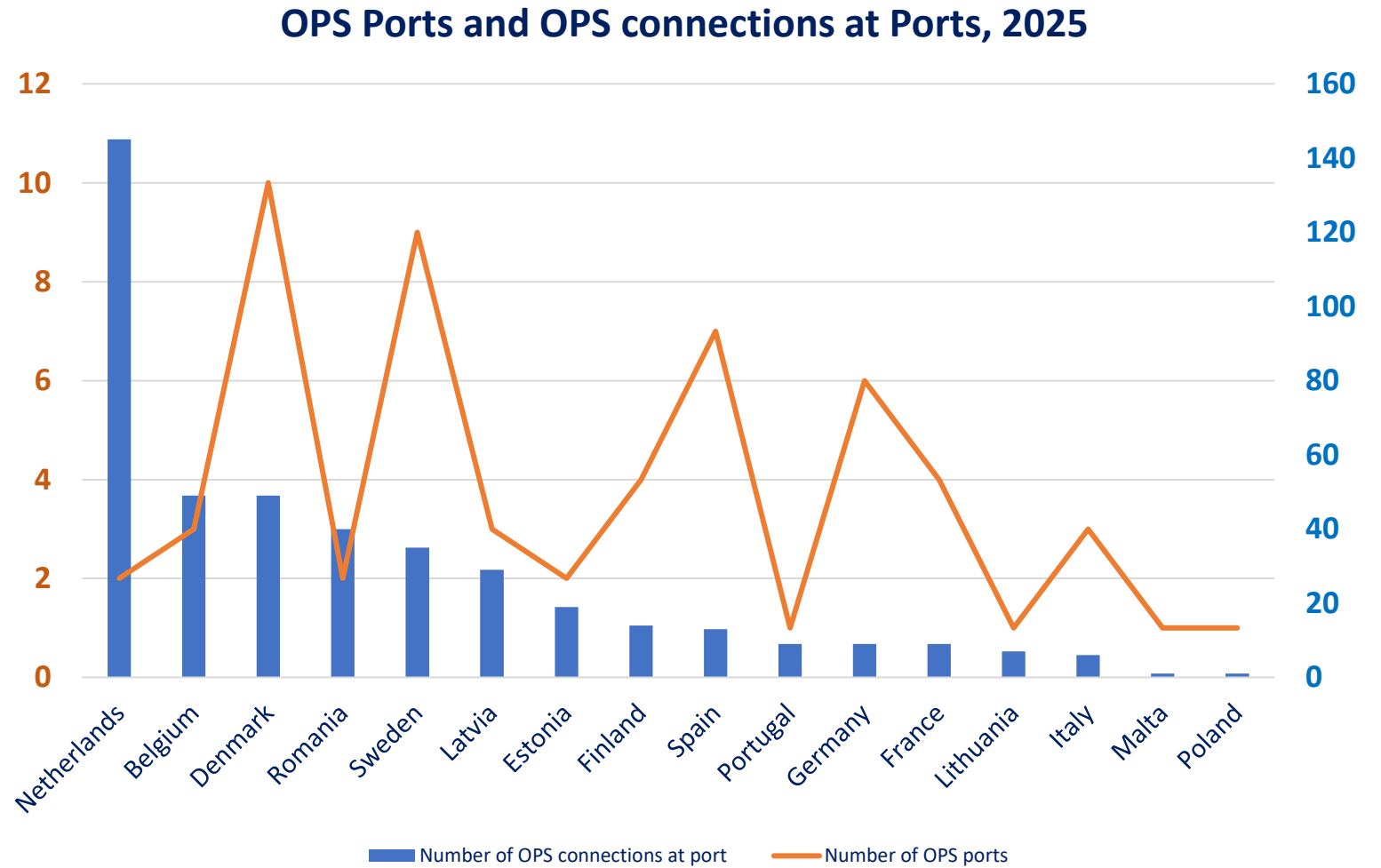
OPS – Powering a Sustainable Limassol
Protect our city. Protect our future.



OPS installations in EU Ports

At least 100 ports across 15 Member States and 100+ ports worldwide, have already implemented OPS infrastructure, with a total of 352 berths equipped with shore-to-ship power supply facilities.

European Environment Agency, EMSA, European Maritime Transport Environmental Report (EMTER) 2025.
<https://emsa.europa.eu/emter-2025/> and EEA EMTER



CEF Project: Integrated Approach on Alternative Marine Power for the Port of Limassol

Acronym: DECARBONLIM

Lead Beneficiary:



Partners:



F R E D E R I C K
U N I V E R S I T Y



DP WORLD



Electricity
Authority
of Cyprus



Subcontractors:



ERIC VAN HOOYDONK
ADVOCATES – ADVOCATEN – AVOCATS – RECHTSANWÄLTE

Funding: CEF Infrastructure Projects - European Climate, Infrastructure and Environment Agency (CINEA)

Budget: 1.169.812 Euro, Duration: 11/2024 – 10/2026

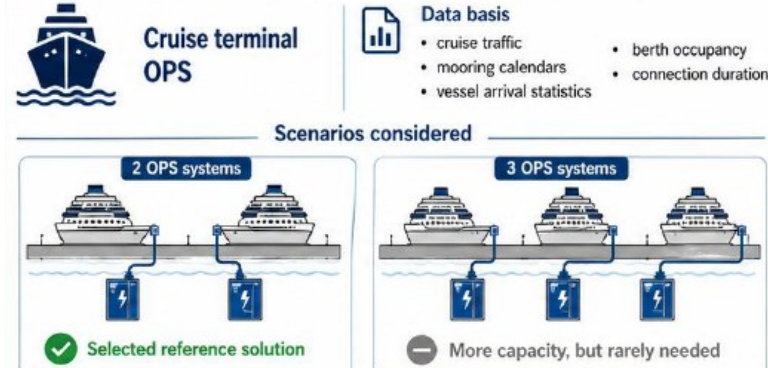
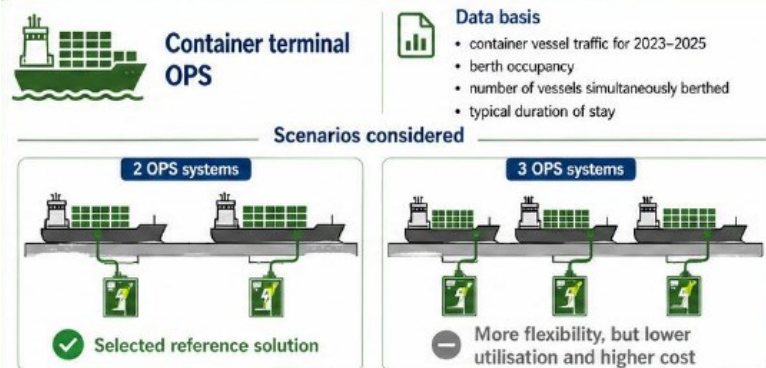
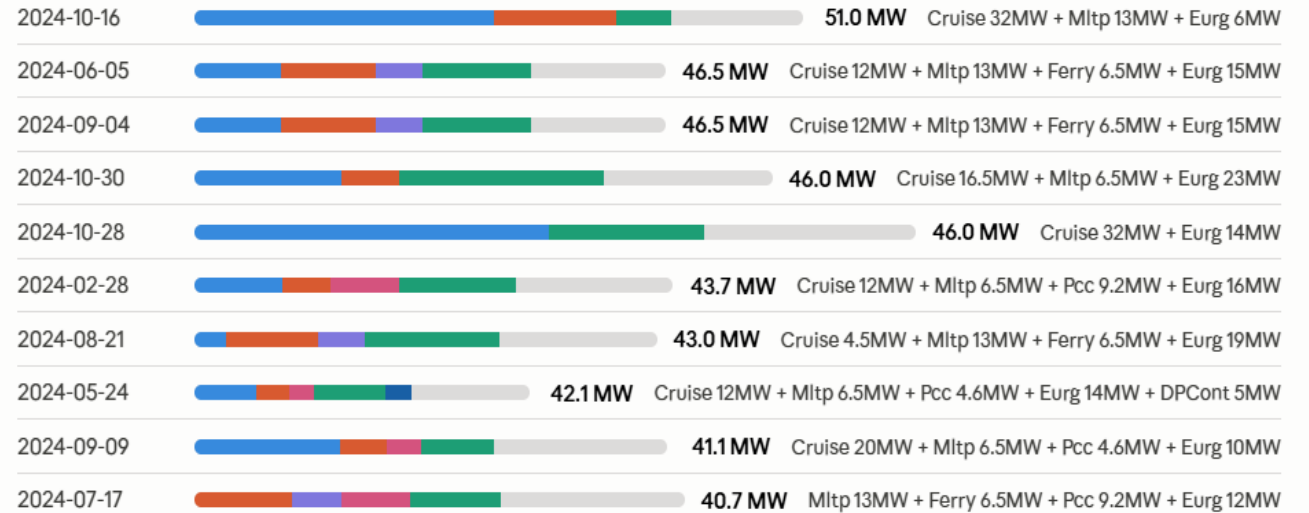


Co-financed by the Connecting Europe
Facility of the European Union

Cold Ironing installation – challenges and limitations

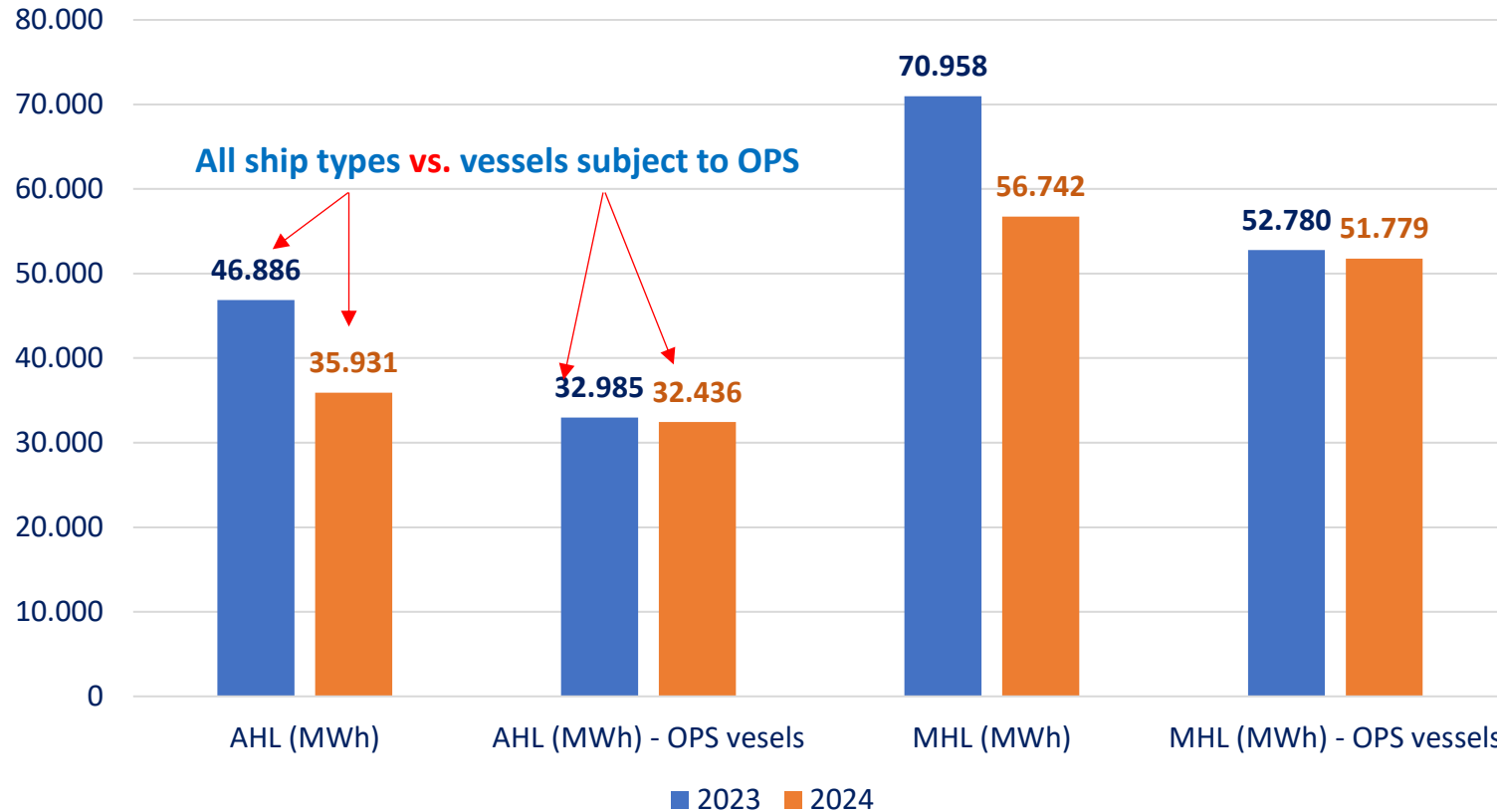


TOP 10 PEAK DAYS OBSERVED — 2024



Cold Ironing – Port of Limassol with / without OPS

Total Electricity Demand in MWh (2023, 2024)



AHL: Actual Hotel Load
MHL: Max Hotel Load
Efficiency rate: AHL/MHL: 63%

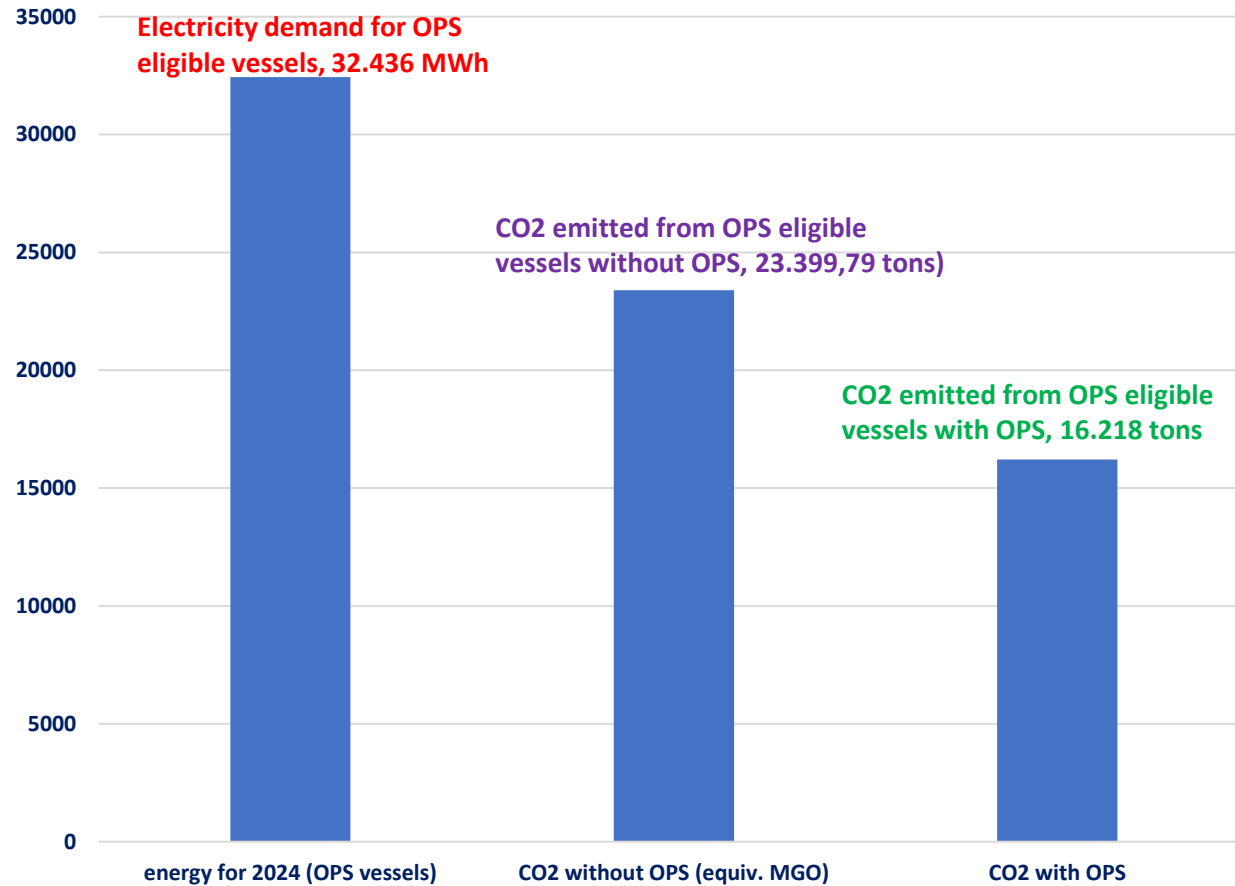
Economic Leverage!!

Tariff scenario:

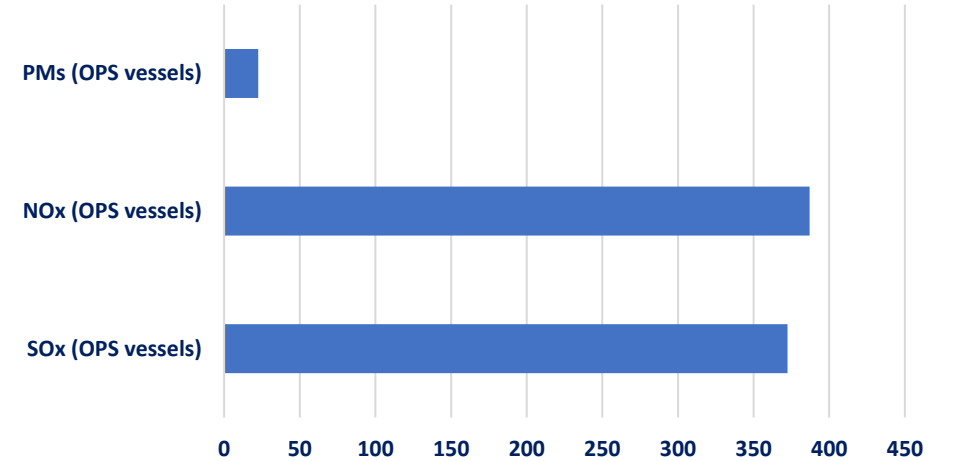
Commercial rate: (€0.263/kWh) >7 m. euro
Medium voltage: (€0.11/kWh) >4 m. euro
High voltage: (€0.09/kWh) 3.5 m. euro

Cold Ironing – Port of Limassol emissions w/o OPS

Energy and CO2 emissions for OPS eligible vessels



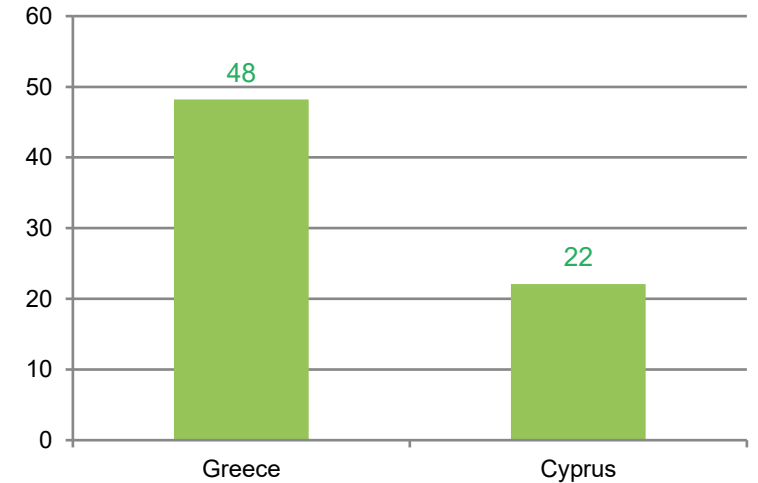
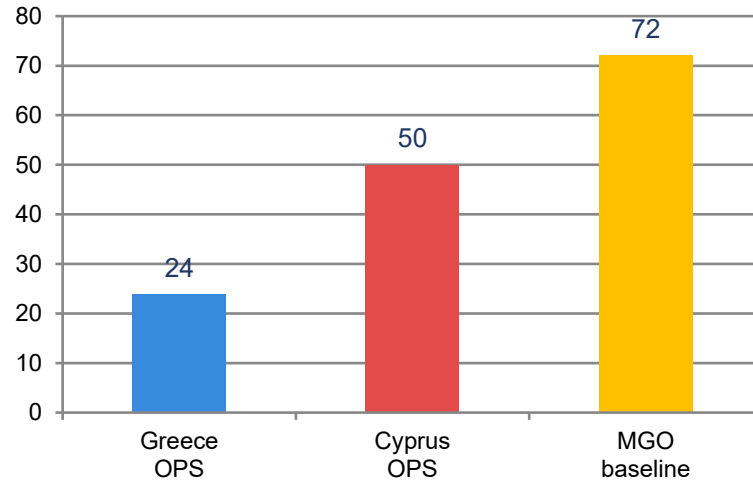
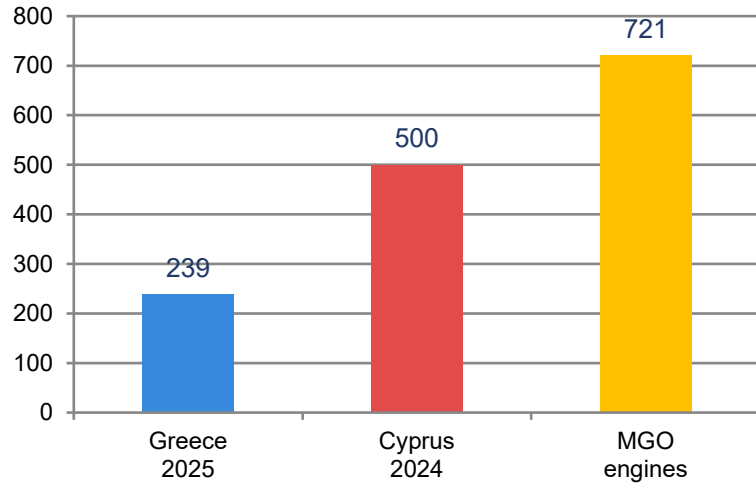
Harmful emissions **without OPS** (in tons, 2024)



Harmful emissions are eliminated with shore power (OPS)!!!

Greece vs Cyprus — OPS environmental performance

Grid quality drives climate impact from onshore power supply



Metric	Greece (Piraeus)	Cyprus (Limassol)	Dif.
Grid CO ₂ intensity	239 g/kWh	500 g/kWh	-52%
Renewable energy	54% (wind, solar, hydro)	28% (solar 23%, wind 3%)	+26pp
Primary fossil fuel	Natural gas (41%)	Oil (72%)	
OPS CO ₂ (100 MWh)	23.9 tonnes	50.0 tonnes	-52%
CO ₂ saved vs MGO	48.2 t (67% reduction)	22.1 t (31% reduction)	2x better
Local air quality	100% NO _x /SO _x /PM elimination	100% NO _x /SO _x /PM elimination	Equal ✓

Bottom line: cleaner grid (54% renewables, gas-based) delivers **2x the CO₂ savings**. Both achieve **100% elimination of local air pollutants** (NO_x, SO_x, PM) at berth. As grids decarbonize, OPS benefits improve automatically.



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thank you for your attention...