



Tsakos Columbia
Shipmanagement (“TCM”) S.A.



new or green
technologies from
a shipowner
perspective



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Shipping industry’s environmental footprint –Status quo

Ballast water

Air emissions

Biofouling

Sewage/Greywater

Oily wastes

Garbage

Ship recycling

Regulatory framework

- International Ballast Water Convention
- MARPOL Annex VI (SO_x, NO_x, CO₂)
- AFS Convention, IMO Biofouling guidelines
- MARPOL Annex I, IV, and V
- Other regional or national requirements

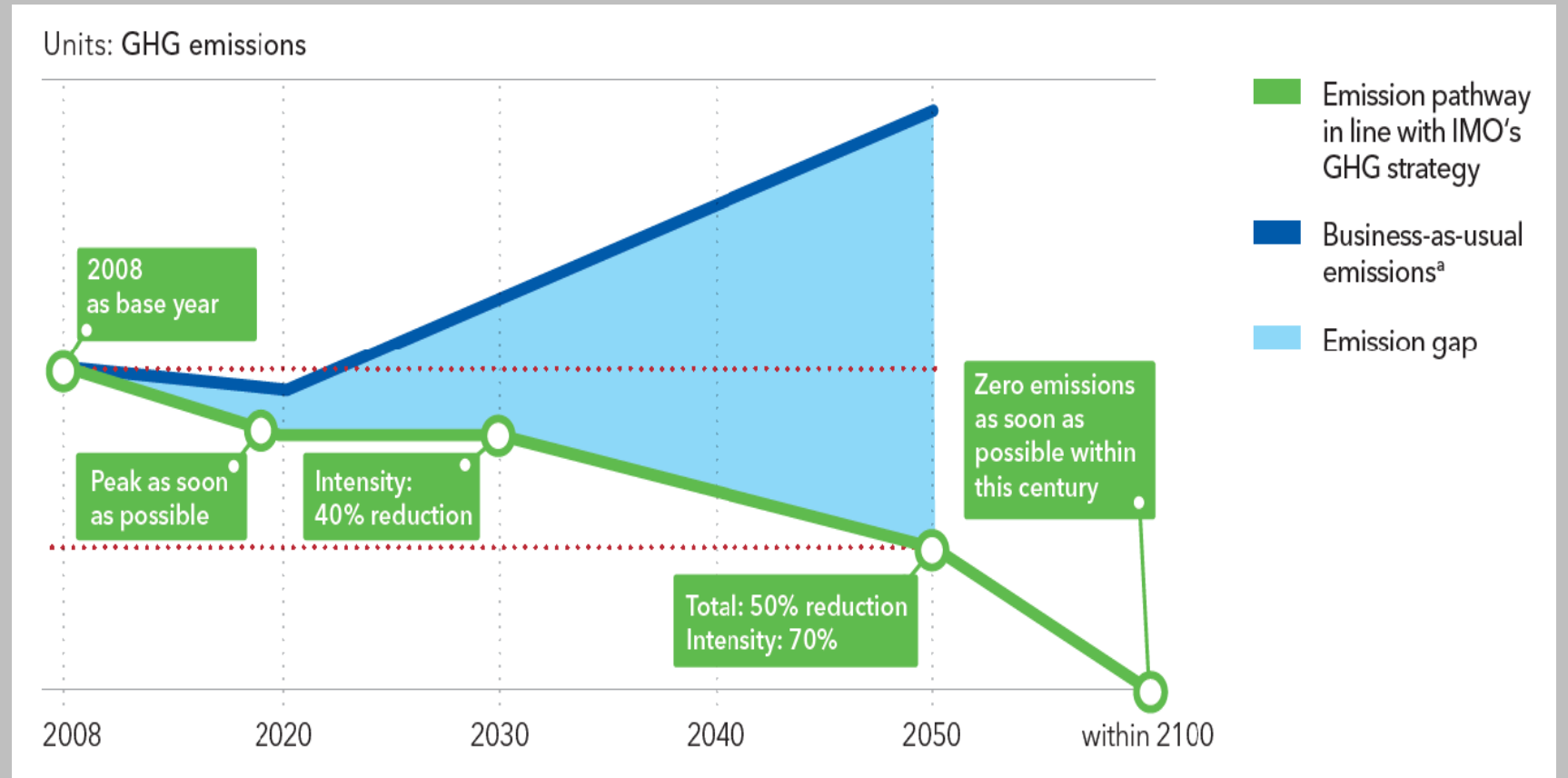
Current **green** technologies

- Ballast Water Treatment Systems
- Scrubbers and NOx reduction methods
- Anti-fouling systems, underwater cleaning drones and capture machines
- Oily water separators, Oily discharge monitoring systems, waste management mechanisms
- Sewage treatment plants and greywater systems
- Incinerators, food waste comminutors, garbage compactors and other garbage management equipment



Industry's **decarbonization** in progress...

- Energy Saving Devices
- Alternative Fuels
- New vessels designs



Source: DNV GL

Interrelation between the shipping and the port industry...

- Port Waste Management Services
- Shore power and alternative fuels services
- Green logistics
- Great potential for a “green” Greek model





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Thank you very much