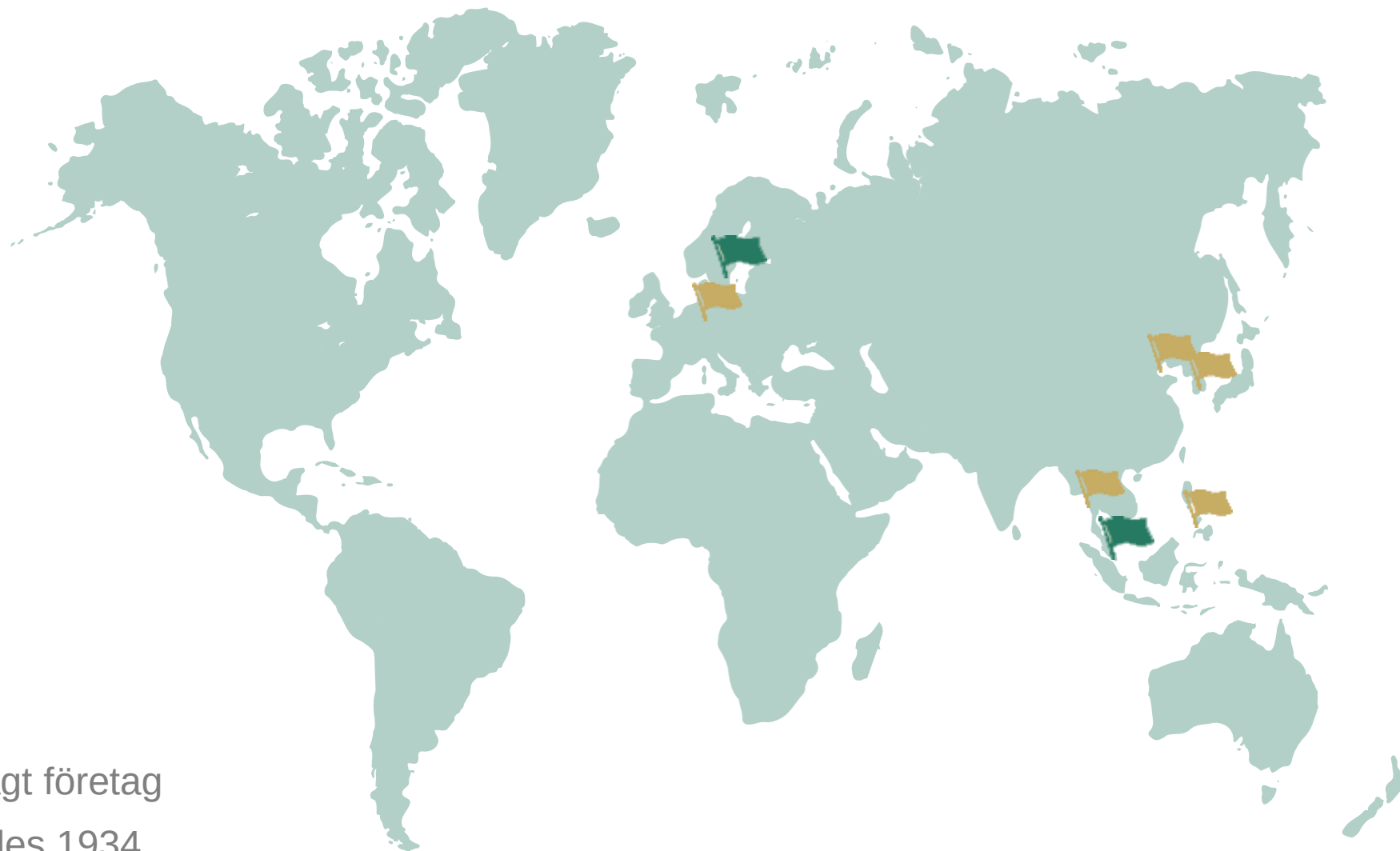


Wallenius Marine

Leading the way towards truly sustainable shipping

Carl Fagergren
Project Manager
Ship design & Newbuilding



1,110
anställda

Drift av
25
fartyg

- Familjeägt företag
- Grundades 1934
- Global verksamhet

Byggt: 2011

Längd: 228 m

Varv: DSME

Bredd: 32.3

Maskin: 19 000 kW

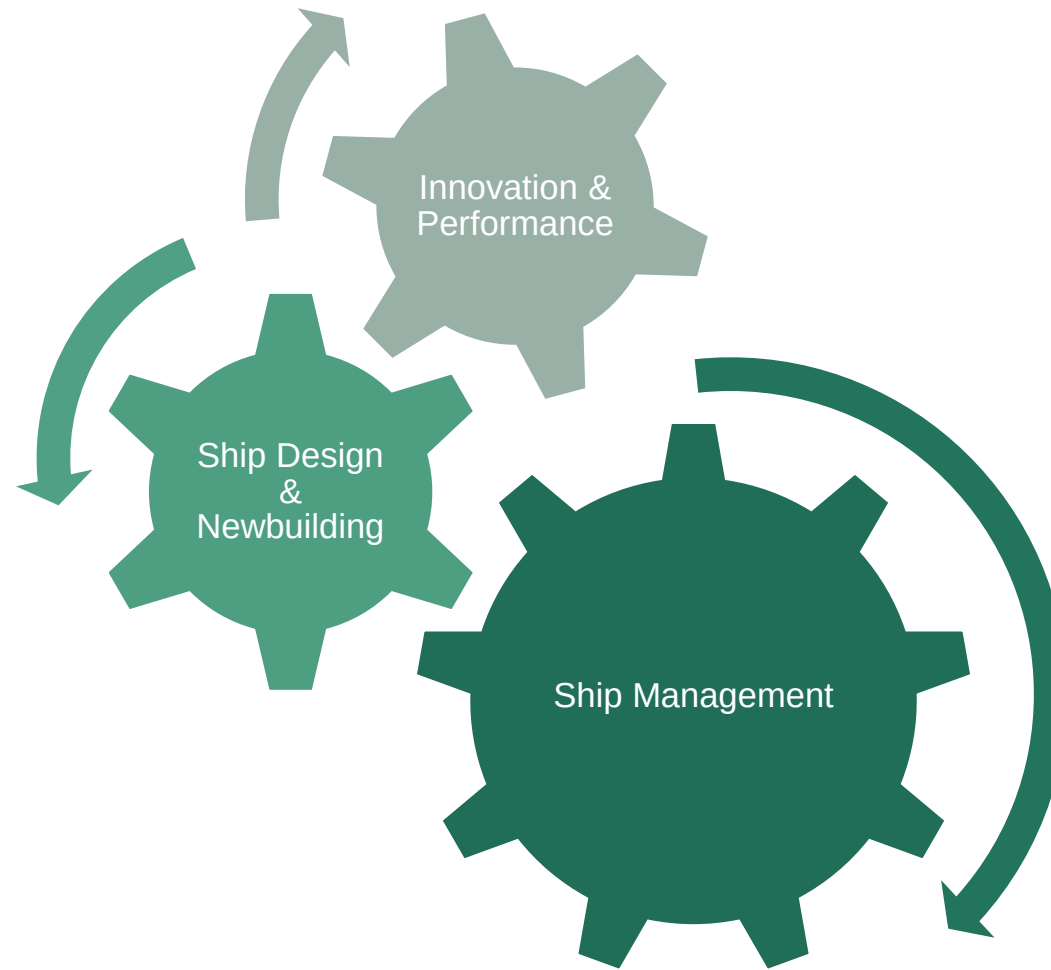
Kapacitet: 7,900 bilar

Fart: 20 kn

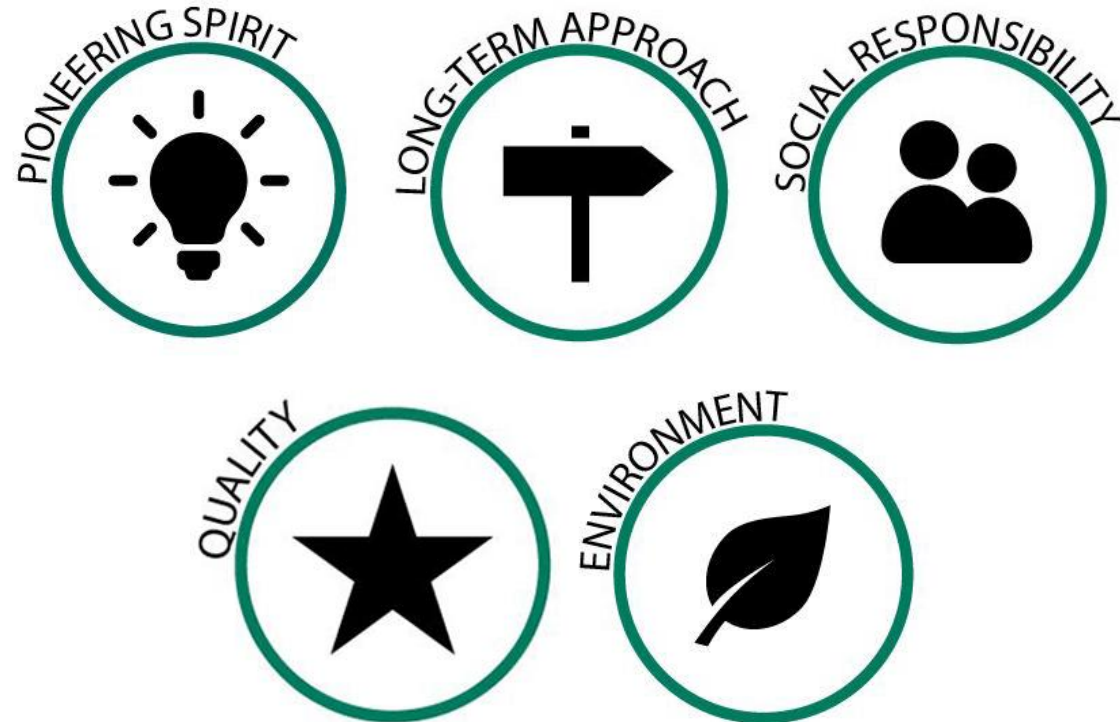


Wallenius Marine har designat och lett nybyggnadsprojekt för 70 fartyg sedan mitten på 90-talet.

Affärsområden



“Leading the way towards truly sustainable shipping”



ZERO (Zero Emission ROro)

2010



Roadmap – plan för hur vi ska nå vår vision om emissionsfri sjöfart

2020



Grund för design av våra kommande fartyg

2030 ?



2040 ??



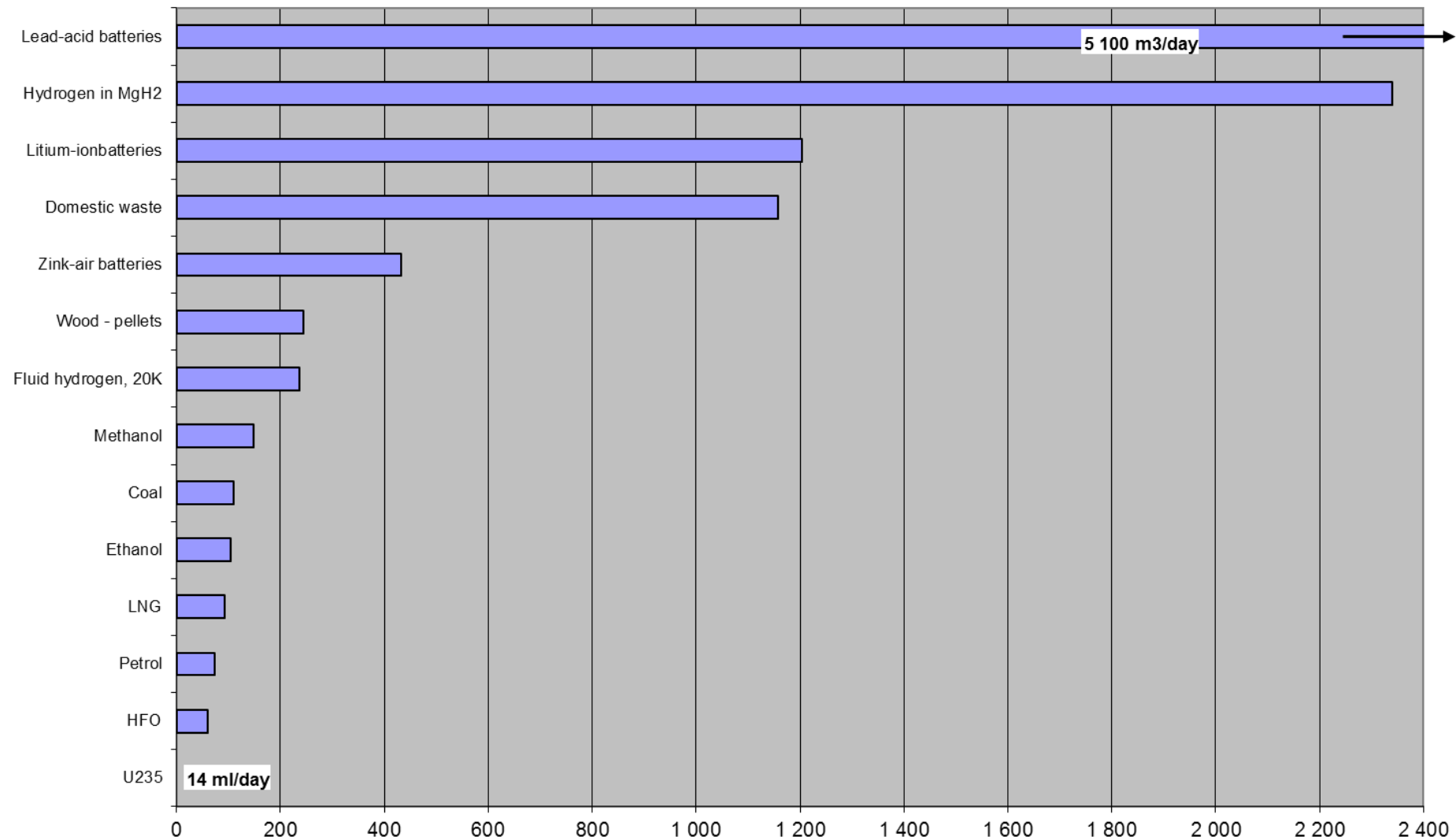
Kartotek ny teknik och F&U

Hull concepts
Longer and narrower Vessel
Wider Vessel
Catamaran
Trimaran
Pentamaran
Air Cavity System
Hull materials
Aluminium
FRP
Propulsors
Fixed pitch propeller
Controllable pitch propeller
Foils
POD
Voith-Schneider
Contrarotating propellers
Pre-Swirl Stator
Friction reduction
Low-friction paint
Air bubbles

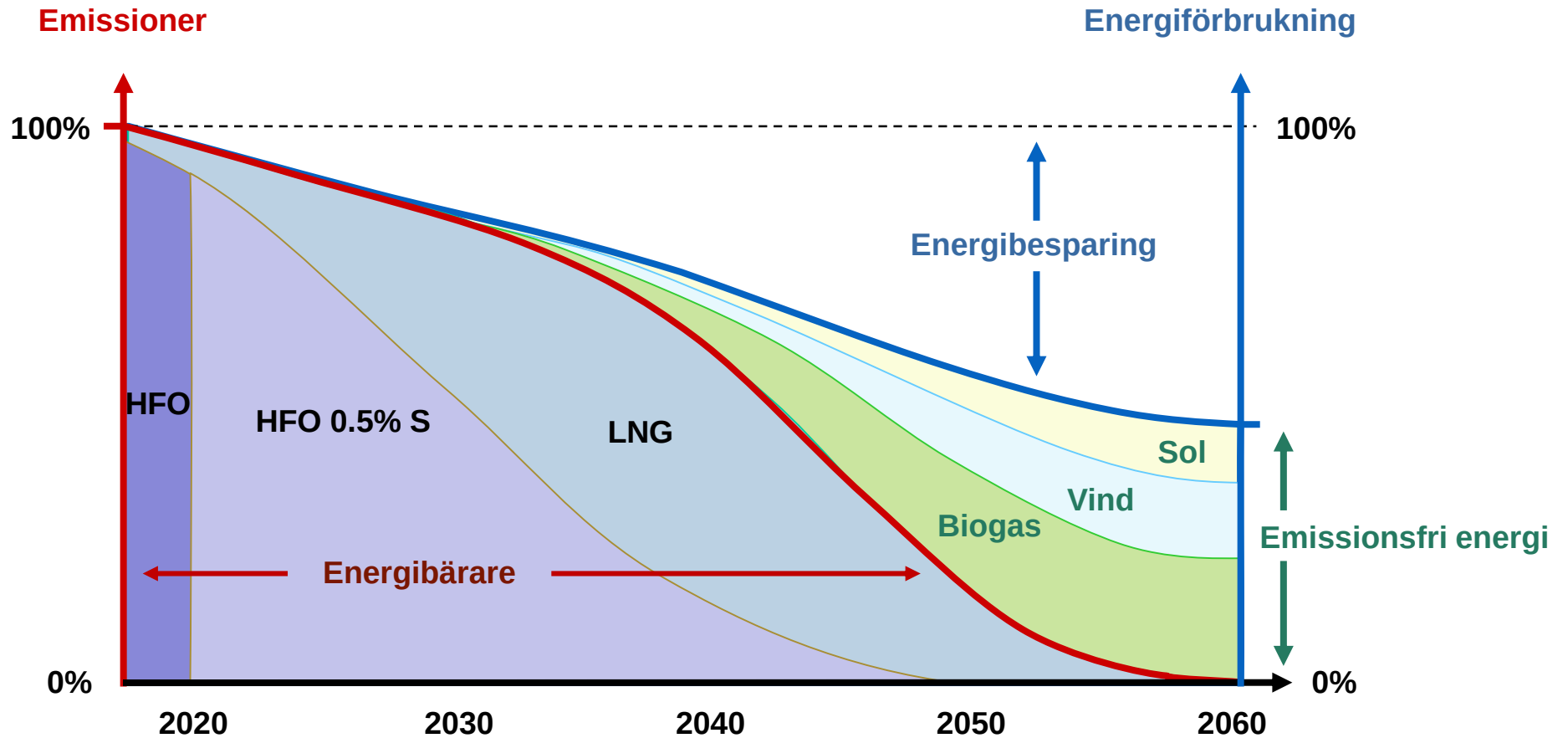
Engines - combustion engines
Dual-fuel engines
Gas engines
Heat recovery
Exhaust Gas Recirculation, EGR
Scavenger Air Moisturizing, SAM
Selective catalytic reduction , SCR
Scrubbers
Engines - others
Hybrid
Electric
Gas turbines
Steam turbines
Stirling engines
Fuel cells
Equipment, interior fittings
Energy saving technologies for the habitat
Solar-, wind- and wave power
Solar cells
Solar heat
Sails / wings
Flettner rotors
Kites

Windmills
Wave power
Biofuels
Methanol
Ethanol
Biodiesel
Biologic diesel
Biogas
Synthetic fuels
Hydrogene
Biochar
Pellets
Fossile fuels
Liquefied Natural Gas, LNG
Energy storage
Batteries
Flywheels
Others
Carbon hydrates cracking to hydrogen
Transformation of carbon dioxide into carbon-neutral liquid fuels
Skin friction elimination
IGBT Converter

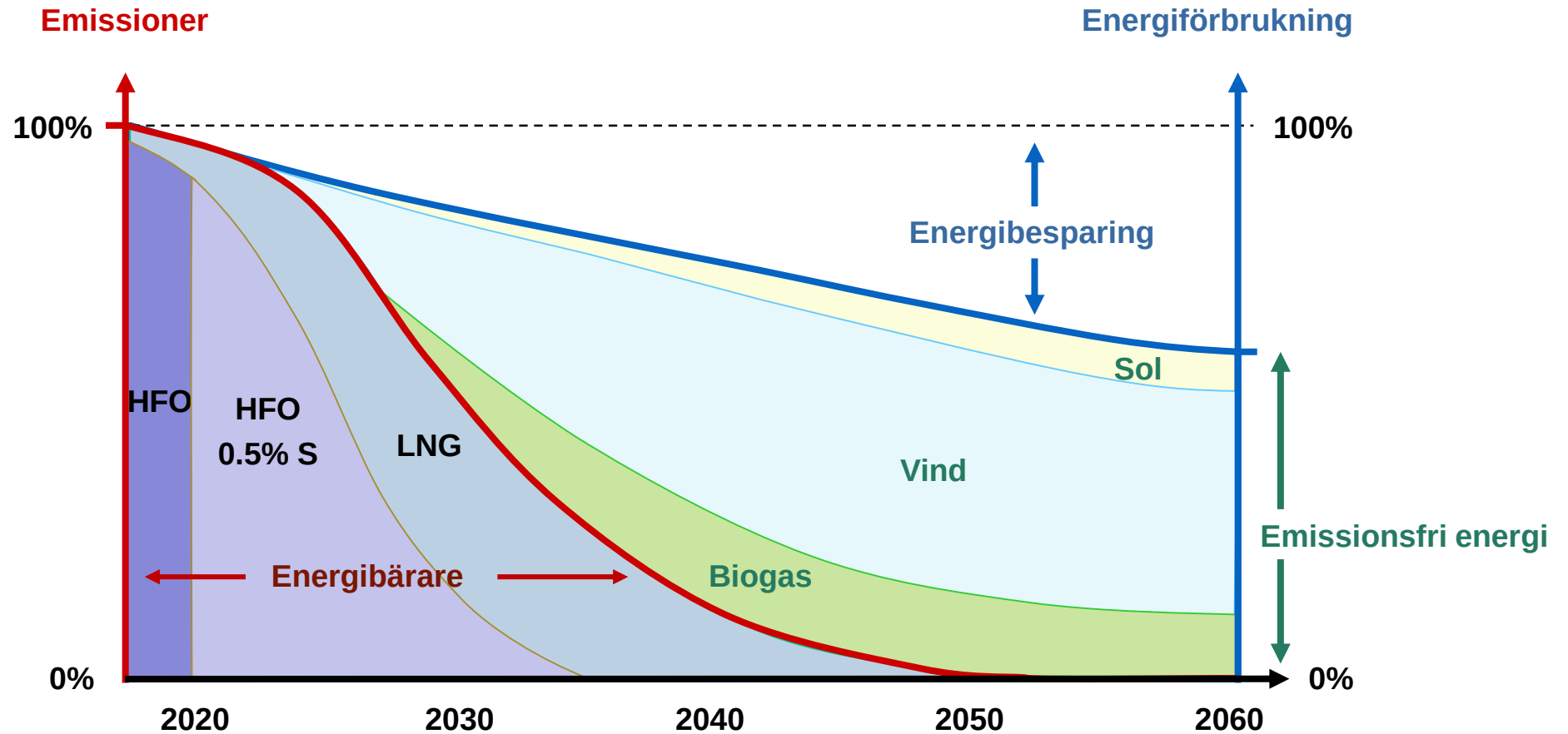
Energibärare – m³/dag, PCTC @ 19 knop



"Slow progressive" scenario



"Disruptive" scenario



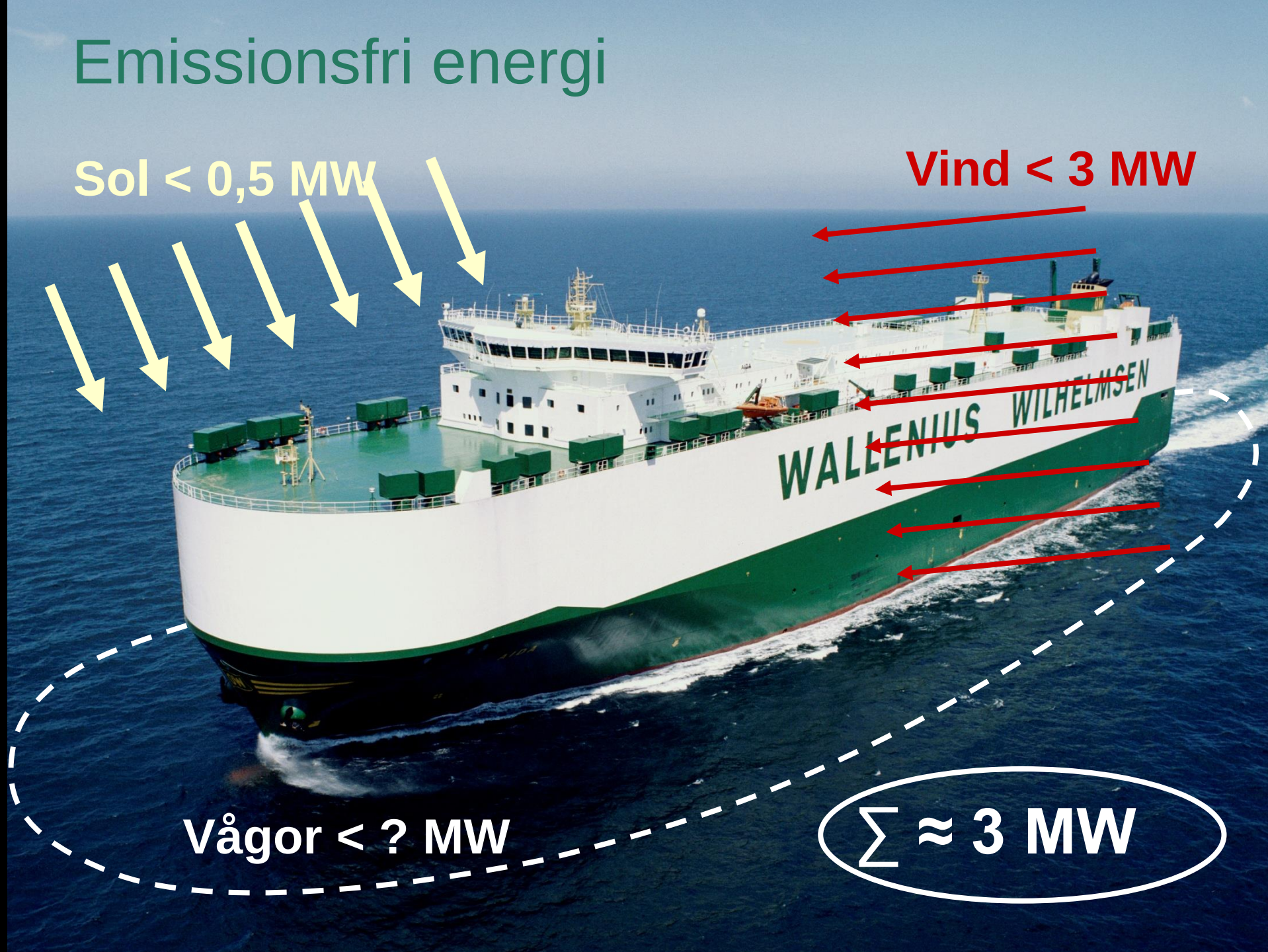
Emissionsfri energi

Sol < 0,5 MW

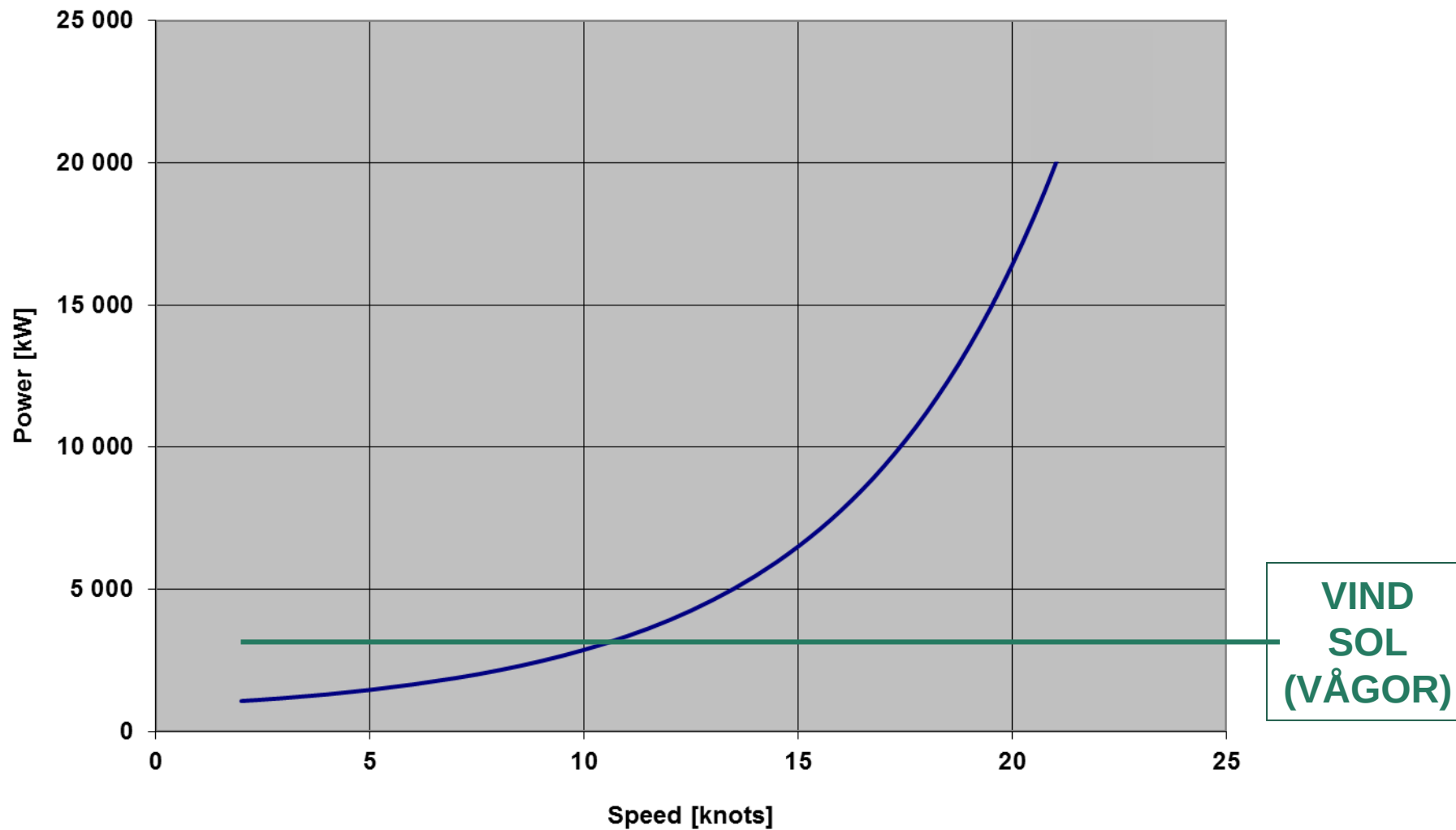
Vind < 3 MW

Vågor < ? MW

$\Sigma \approx 3 \text{ MW}$



Fart – effekt (PCTC, 8000 bilar)



Vindkraft



Examensarbete, Petter Delin, KTH, 2010

Koncept Solway:

Kapacitet: 8.000 bilar

Vingsegel

Elhybrid

Biobränsle => Emissionsneutral

Medelfart 8-10 knop

Slutsatser

Det är fullt möjligt att bygga ett emissionsfritt fartyg redan idag, med existerande teknologi

Det handlar inte bara om teknik!

Roadmap

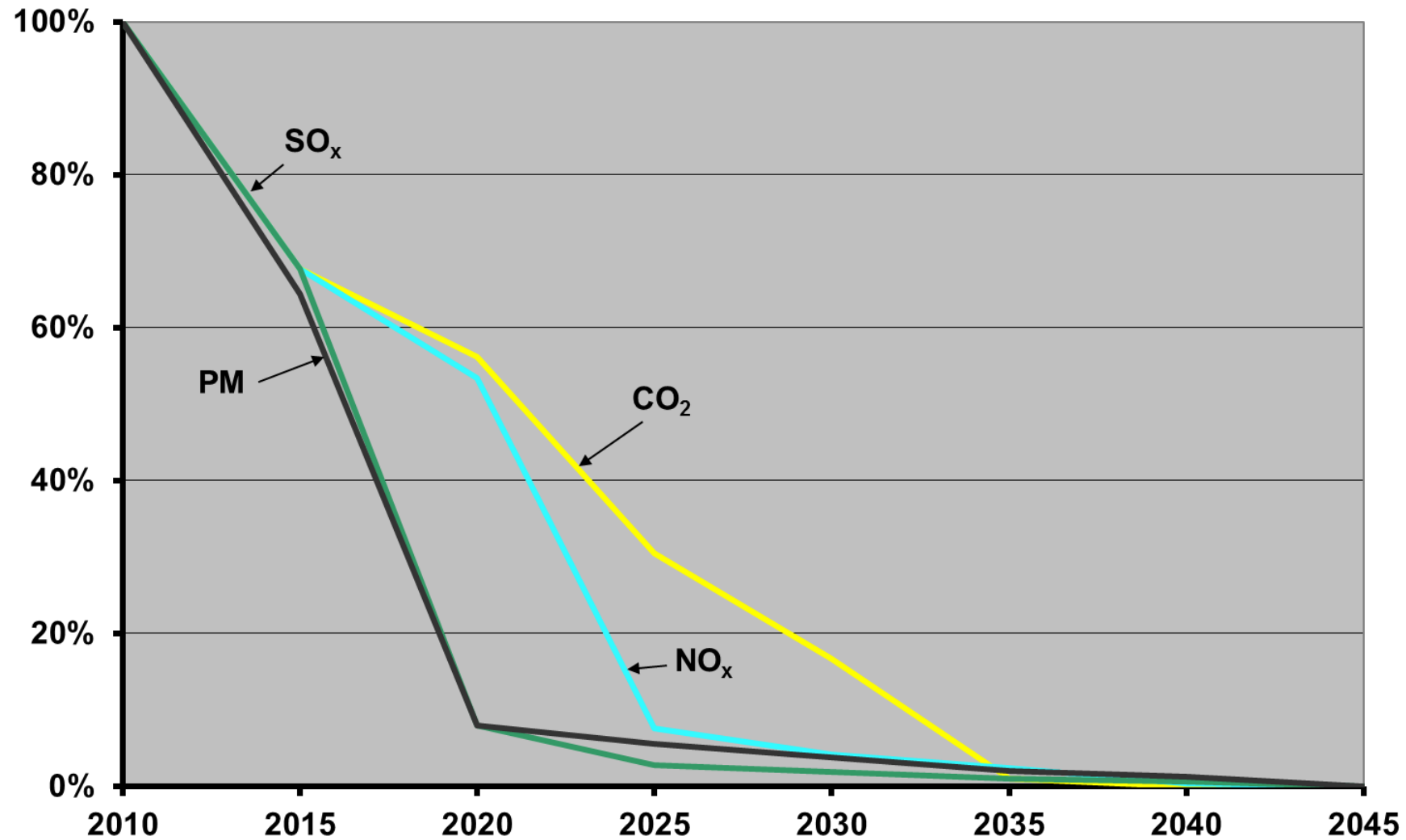
Roadmap för:

- operation
- energibärare
- teknik
- Wallenius fartyg
- energiförbrukning
- emissioner
- Wallenius Marines kompetens

Roadmap för design av fartyg

	2015	2020	2025	2030	2035	2040	2045
Capacity	Multi purpose roro 8000 cars	Multi purpose roro 8000 cars	Multi purpose roro 6000 cars	Multi purpose roro 6000 cars	Multi purpose roro 6000 cars	Multi purpose roro 6000 cars	Multi purpose roro 6000 cars
Speed	17 knots	16 knots	14 knots	12 knots	11 knots	10 knots	10 knots
Range	42,000 nm	20,000 nm	18,000 nm	15,000 nm	15,000 nm	18,000 nm	20,000 nm
Hull concept	Monohull Low friction paint	Monohull Air bubbles Low friction paint	Monohull Air bubbles Low friction paint	Monohull Air bubbles Low friction paint	Monohull Air bubbles Low friction paint	Monohull Air bubbles Low friction paint	Monohull Air bubbles Low friction paint
Primary energy carrier	HFO	HFO 0.5%	LNG	LNG	Biofuel	Biofuel	Methanol
Energy carrier 2	MGO	LNG	Biofuel	Biofuel	Hydrogen	Hydrogen	Batteries
Energy carrier 3			Batteries	Batteries	Batteries	Batteries	
Propulsion	Two stroke diesel Fixed pitch propeller	2 stroke DF diesel Fixed pitch propeller	2 stroke gas diesel Fixed pitch propeller	2-stroke gas diesel Fixed pitch propeller Wings	Hybrid machinery Wings	Hybrid machinery Wings	Hybrid machinery Wings
Auxiliary 1	Diesel engines	DF engines	Gas engines	Gas engines	Gas engines	Fuel cells	Fuel cells
Auxiliary 2	Shaft generator	Shaft generator	Biofuel engines	Fuel cells	Fuel cells	Photovoltaic panels	Photovoltaic panels
Auxiliary 3			Photovoltaic panels	Photovoltaic panels	Photovoltaic panels		

Roadmap emissioner till luft



Tack för att ni lyssnat!

Leading the way towards truly sustainable shipping

Carl Fagergren

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