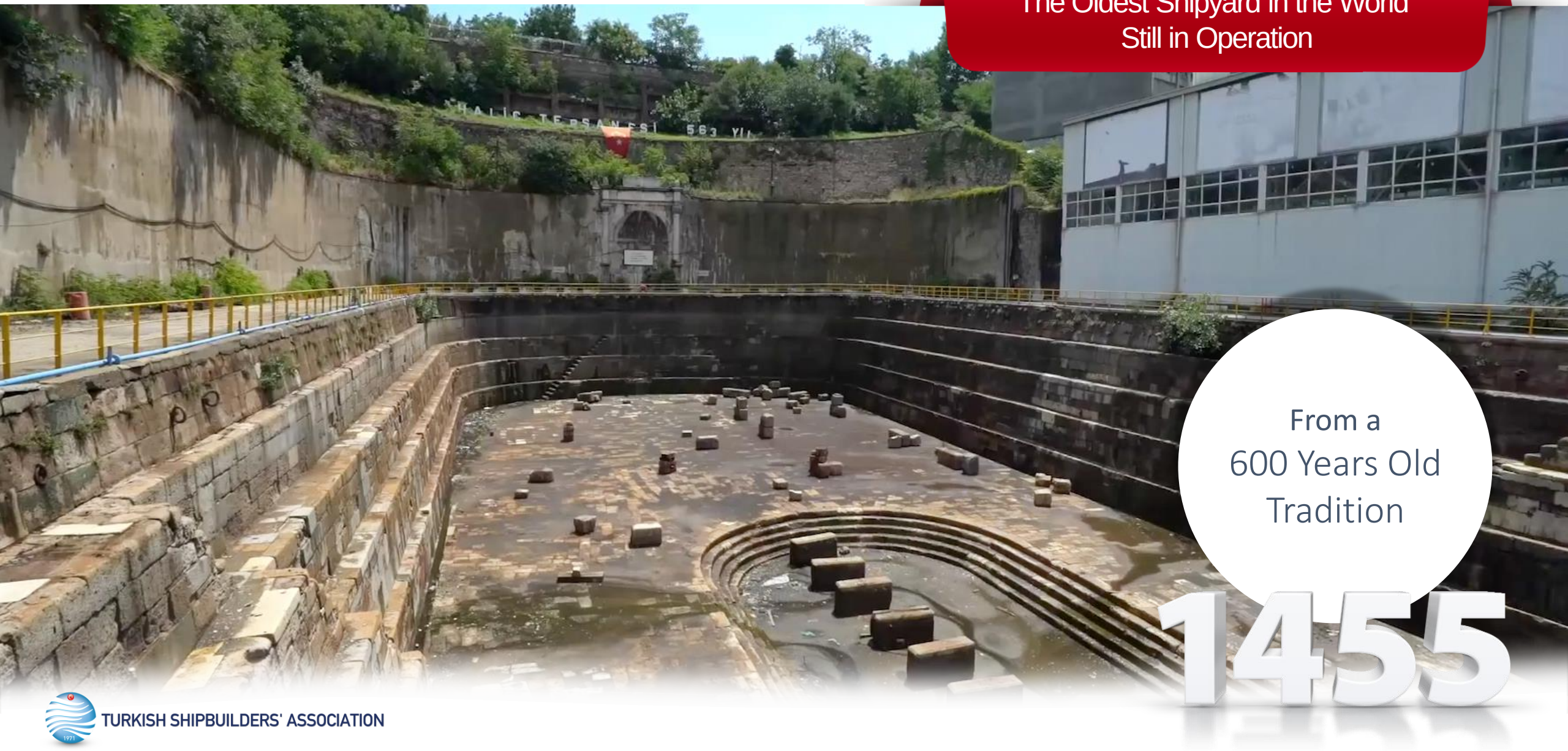
GISBIR
TURKISH SHIPBUILDERS' ASSOCIATION

THE APPROACH OF THE TURKISH SHIPBUILDING INDUSTRY IN THE TRANSITION TO LOW CARBON SHIPPING & CHALLENGING PROJECTS

History of the Turkish Shipbuilding Industry



TURKISH SHIPBUILDERS' ASSOCIATION

Our History

ALMOST 100 MEMBERS

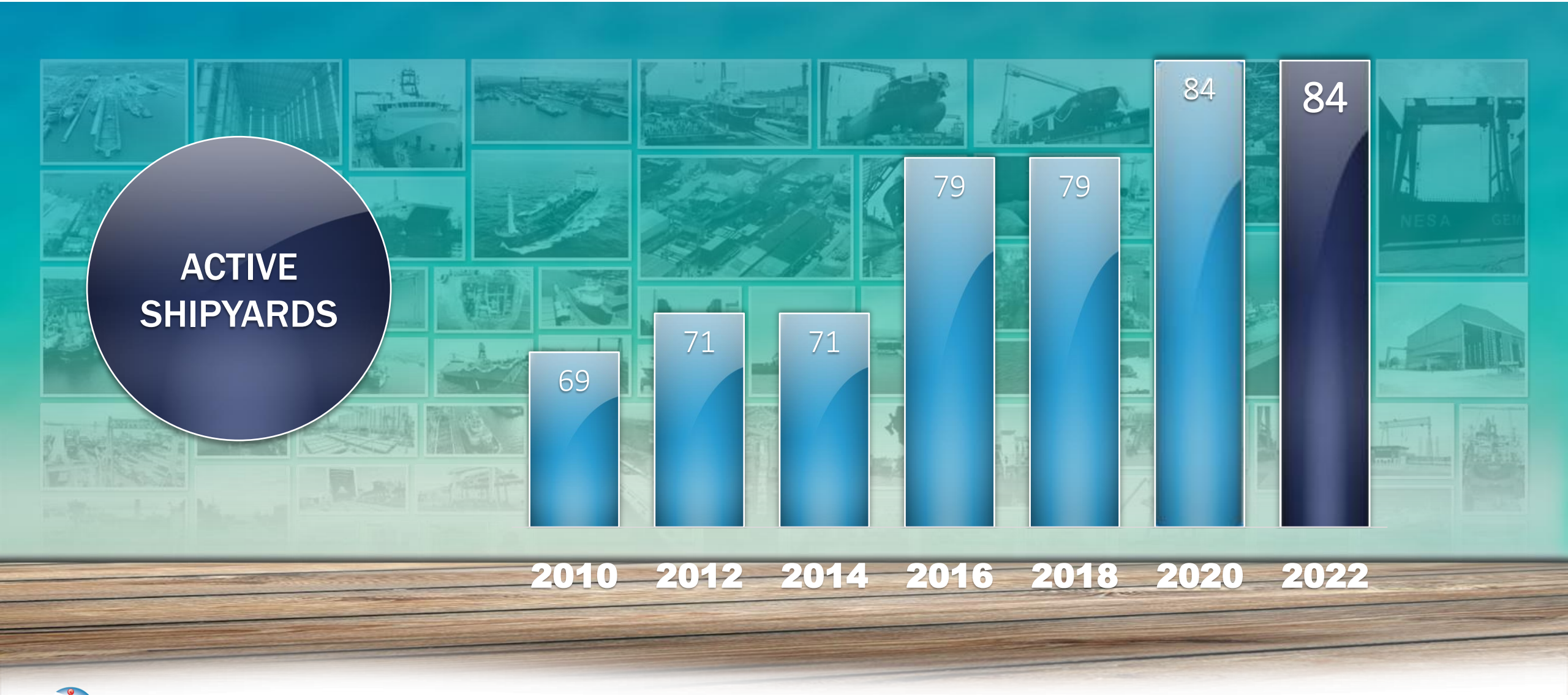
One of the oldest NGOs in Turkey

1971

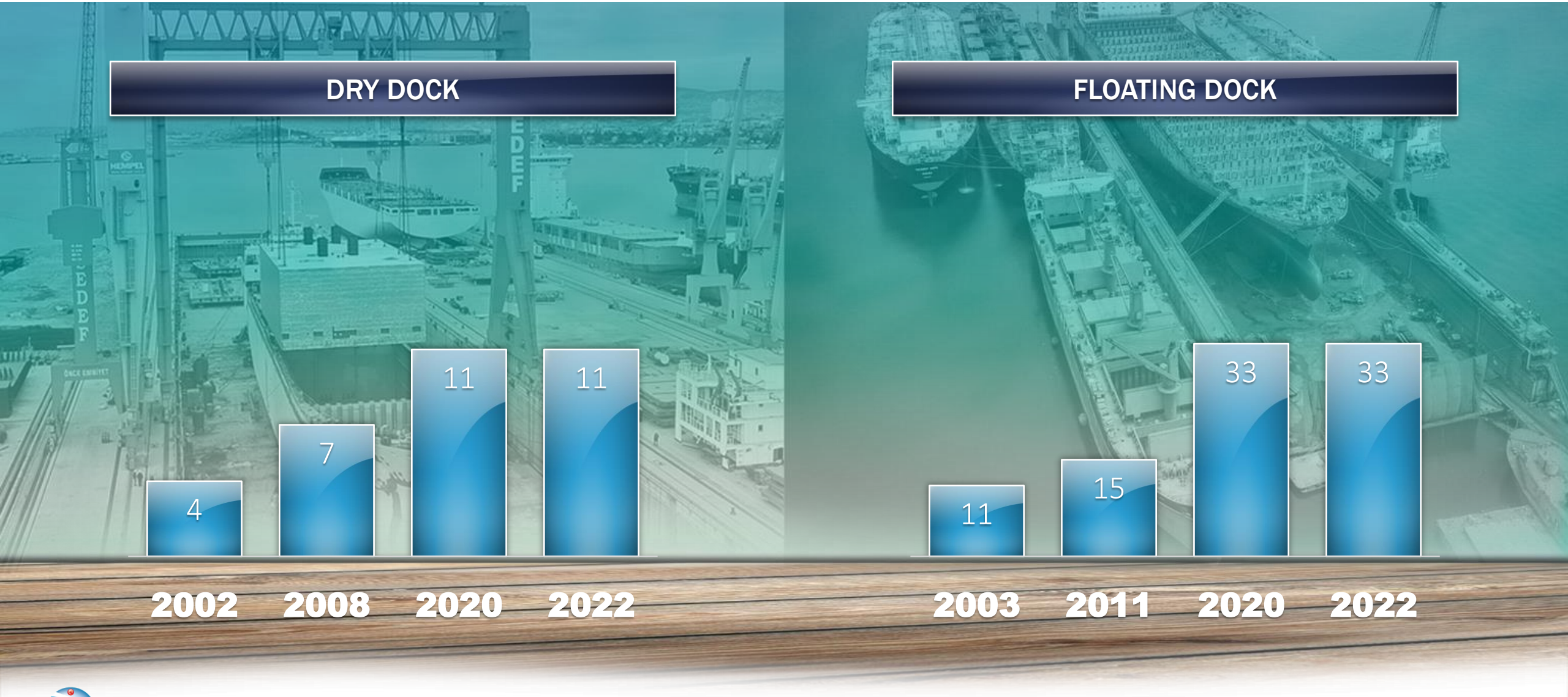
TURKISH SHIPBUILDERS' ASSOCIATION

Member of ASEF & Sea Europe

Turkish Shipbuilding Industry



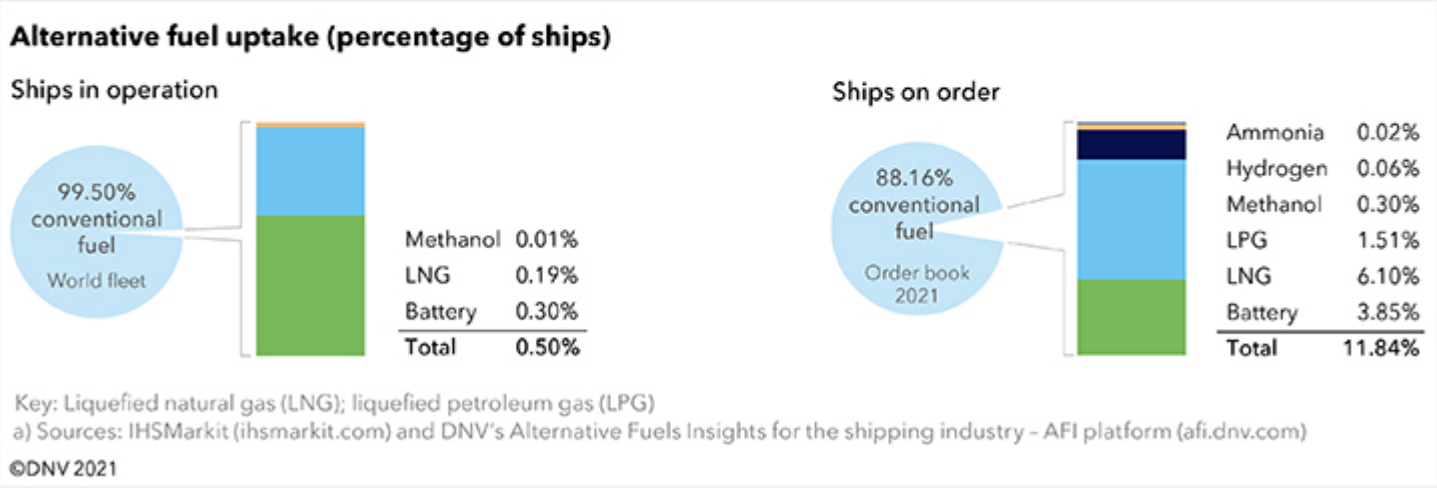
Dock Capacity



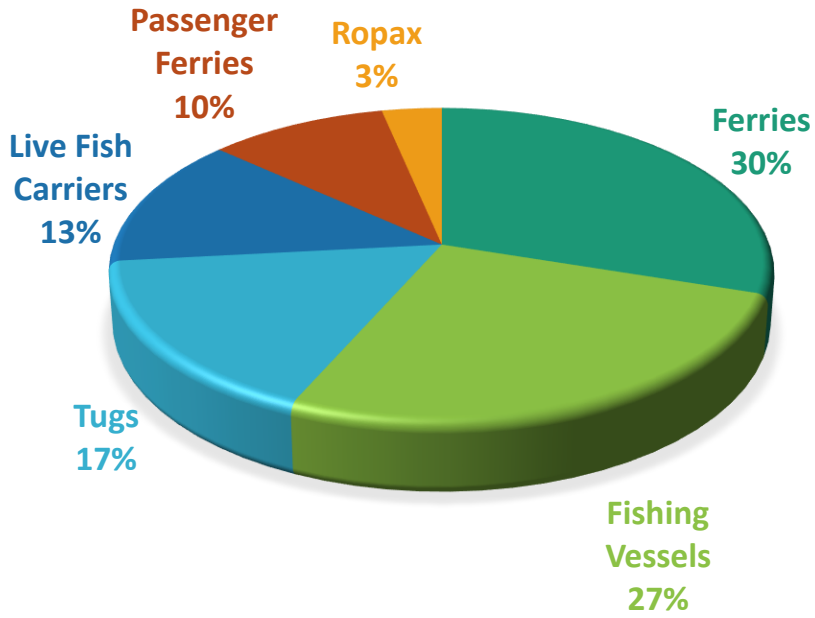
TURKISH SHIPBUILDERS' ASSOCIATION

Transition to Low Carbon Shipping: Alternative Fuels & Batterries

Figure: Uptake of alternative fuels for the world fleet as of June 2021 including ships in operation and on order

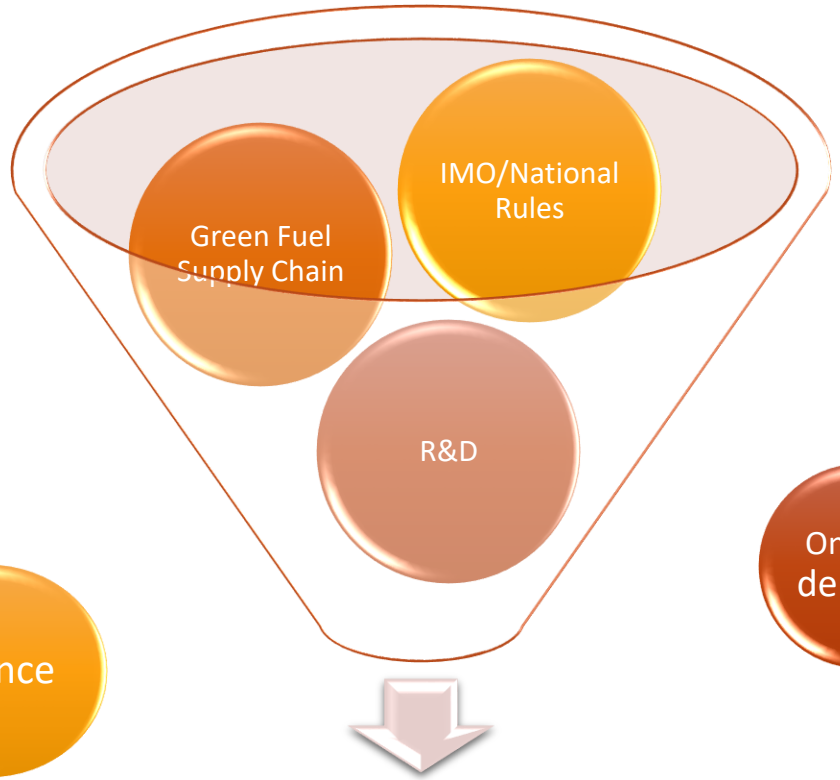


Number of ECO (hybrid&battery) Ships in Turkish Shipbuilding Industry (Delivery in 2022 &2023)= **30 ECO Vessels =%35 of All Orders**



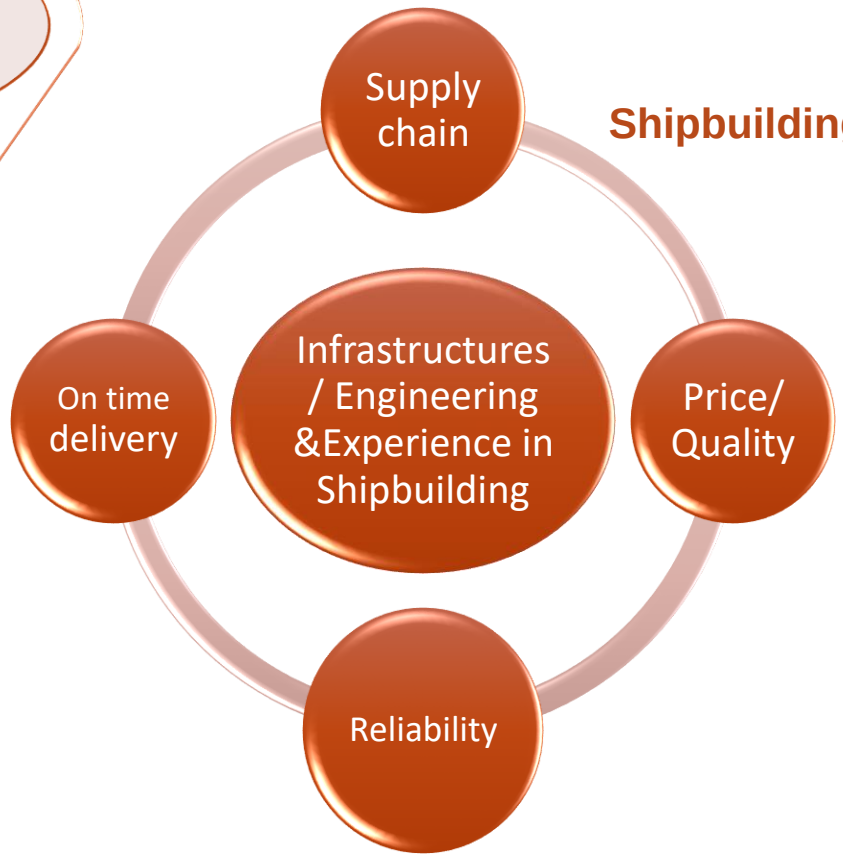
Transition to Low Carbon Shipping: Key Elements for Proper Transition

Shipowners



PROPER ECOSYSTEM FOR TRANSITION

Shipbuilding



Türkiye is one of the most experienced countries for building new generation low/zero carbon ships and retrofits of existing ships which complies with these key elements

TURKISH SHIPBUILDERS' ASSOCIATION

Decarbonization Journey of Turkish Shipbuilding Industry

- Low/Zero Carbon Projects Experience-

• Succesfully delivered low/zero carbon ships:

- Full battery powered ships,
- Highly energy efficient ships,
- LNG powered, hybrid ships

(Some of them are the World's First Vessels)

• New technologies: Dual fuel methanol and MDO/HVO

• Increasing efficiency of existing ships by retrofits (lengthening, propulsion & steering systems & hull form changes etc.)

Decarbonization Journey of Turkish Shipbuilding Industry

- Access to Technology for Newbuilds and Retrofitting-

• New propeller and rudder designs and manufacture: Gate Rudder, twisted rudder

• Wind technologies

• New alternative fuel engines

•After treatment technologies :

- Scrubbers,
- Exhaust gas heat recovery,
- Possible future technologies such as Carbon capture

FERRIES – PASSENGER VESSELS

SEFINE SHIPYARD

RO-RO Car & Passenger Ferry

200 PCU Diesel-Electric

CEMRE SHIPYARD

Ferry/Ropax

Largest Zero Emission Freight Ferry

Diesel/Battery (10 MWh battery)
Upgrade to Methanol

TERSAN SHIPYARD

Coastal Passenger Ferry Series

World’s Largest Battery Packs

Hybrid Powered (LNG&Battery)

TUGBOATS

TK TUZLA SHIPYARD

The World’s 1st Battery-Powered Full Electric

Harbour Tugboat

2021 TUG OF THE YEAR AWARD WINNER

SANMAR SHIPYARD

The World’s 1st LNG Fuelled

Escort Tug

SANMAR SHIPYARD

AVD Hybrid Tug

OFFSHORE SUPPLY VESSELS

CEMRE SHIPYARD

Windfarm Support Vessel

1st Hybrid-battery, DP2 SOV

TERSAN SHIPYARD

Construction Service Operating Vessel (CSOV)

Methanol-Marine Diesel Oil (MDO)/HVO Powered DP2

OFFSHORE SUPPLY VESSELS

CEMRE SHIPYARD

The World’s 1st DP2 SWATH Type

Service Operation Vessel

Powered by Batteries and Dual Fuel /Methanol

UZMAR SHIPYARD

Pollution Control Vessel

FISHING VESSELS

SEFİNE SHIPYARD

Dual Fuel : LNG, Biogas and Potentially Ammonia

Live Fish Carrier

CEMRE SHIPYARD

The World’s Largest Live Fish Carrier

Hybrid/Battery Powered

TERSAN SHIPYARD

The World’s First Purpose-Built Vessel Combined Longliner and Danish Seiner

2020 WORK BOAT WORLD BEST LONGLINER

FISHING VESSELS

TERSAN SHIPYARD

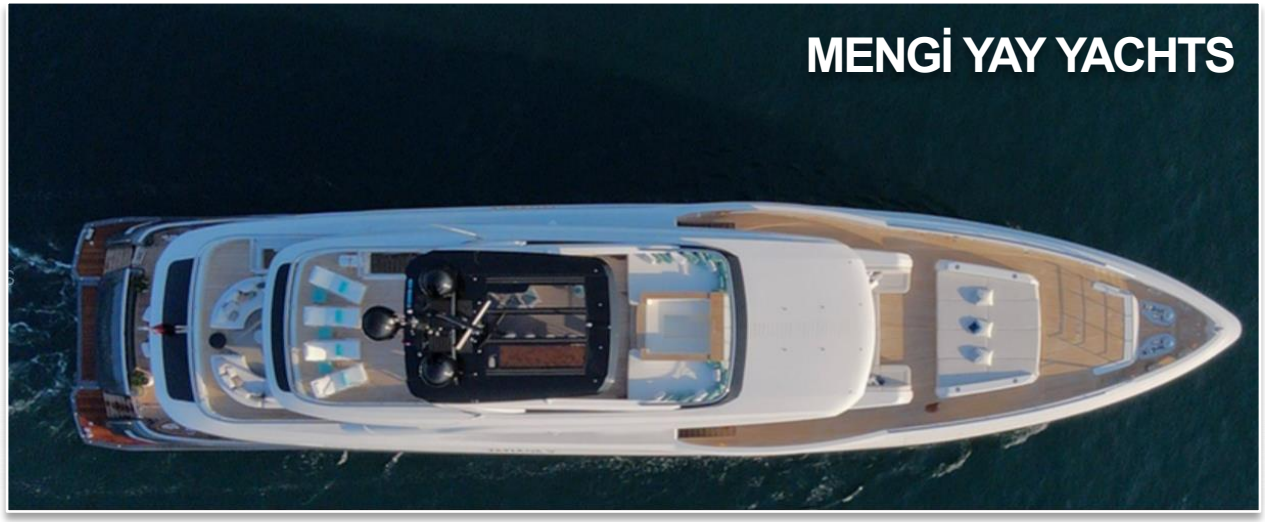
Direct LNG Fuelled

Live Fish Carrier

CEMRE SHIPYARD

World's first LNG&Battery Driven Purse Seiner Trawler

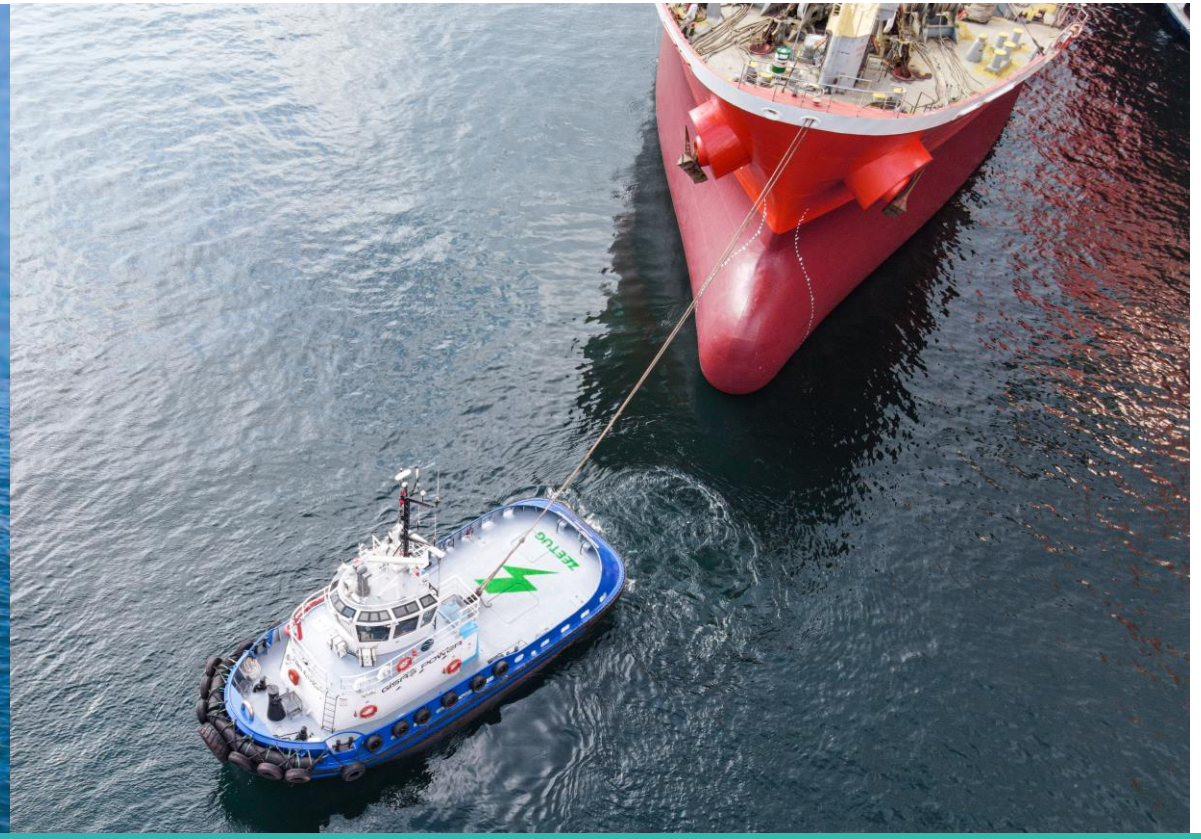
MEGA YACHTS & YACHTS
3rd in the World for Yacht Building



HVO & Battery &
Methanol & Fuel Cell

Innovative
& Environmentally Friendly
Implementations

Innovative & Environmentally Friendly Implementations



GISAS operates «The Worlds' First All- Electric ZERO Emission Tug» «ZEETUG» in Tuzla Bay Shipyard Region and plan to change all fleet to ZEETUGs in order to Decarbonize tug operations

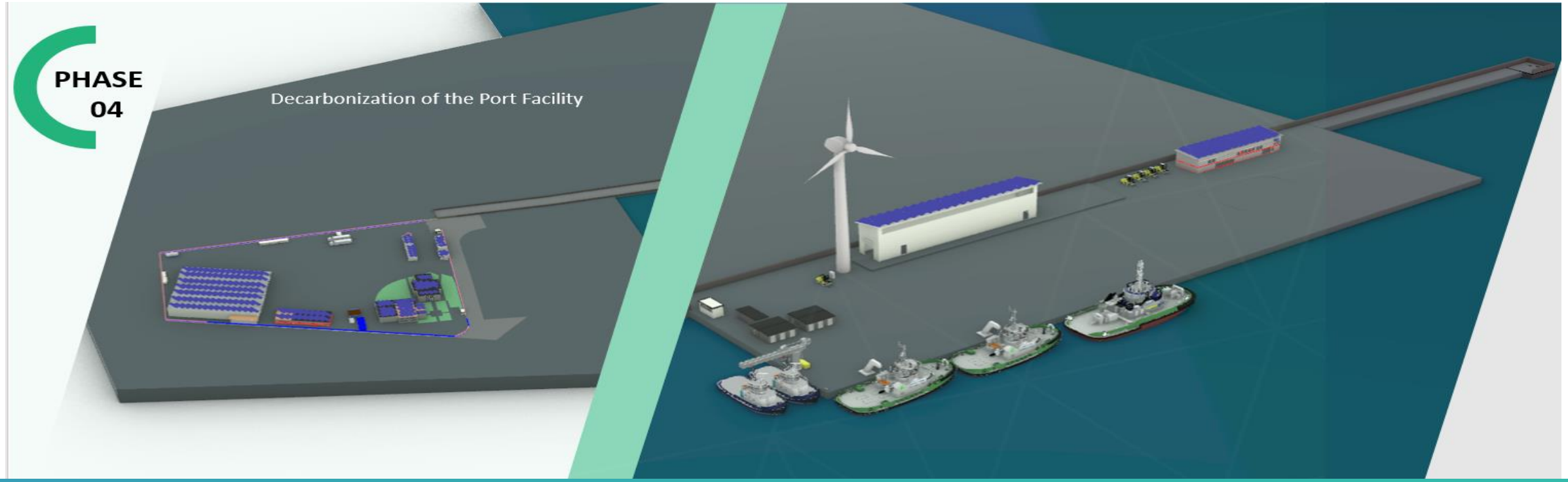
WHAT IF We Can Decarbonize All Tugs in the World within 10 Years ???

- The number of over the 100GRT tugboats, which was 18884 in mid-2018 (Clarksons Research, 2019), increased to 20543 as of November 2021 (Marcon International, Inc, November-2021)
- 1850 tugboats are scrapped every year in the world (Marcon International, Inc, November-2021).
- For 2021, estimated amount of CO2e is about 45 million tonnes from tugboats.

As seen in the Figure, the start of worldwide production of zero emission tugboat in 2023 will end the greenhouse gas effect within ten years. Without zero emission tug production, there will be a total of **506 million tons of GHG emissions by 2032.**

EVERY YEAR TUGS EMIT APPRX. 5% OF CO2e COMPARED TO TOTAL SHIPPING CO2 EMISSIONS.
IT IS POSSIBLE TO START REDUCTION OF TUG GHG EMISSIONS NOW !!!!

Innovative & Environmentally Friendly Implementations



Renewable energy sources: Wind and photovoltaic panels

Fully electric port facilities: E-Trucks; E-Cranes; E-Handlers; ZEETUGs

Energy Efficiency Implementations

Green Step from Tersan: Rooftop Solar Energy System

Tersan Shipyard, which consumes 2 million KWh of electricity per month, currently uses 100% renewable energy produced from IREC certified (International Renewable Energy Certificate) wind farms.

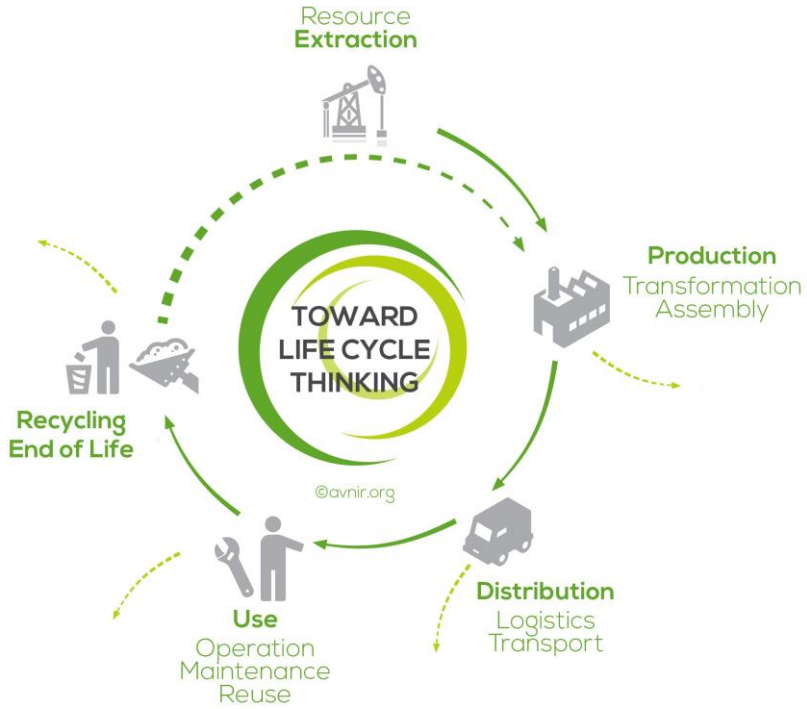
Sedef Shipyard offers energy-efficient lighting solutions with the high energy cost, maintenance and operation difficulties caused by the installation height, and the demand to ensure minimum safety standards in the shipyard. For this purpose, LED lighting solutions have been applied throughout the entire shipyard.

Innovative & Environmentally Friendly Implementations

RESURGAM project

H2020 RESURGAM Project: 13 partners from EU including GISBIR are researching to apply Friction Stir Welding (FSW) to steel for panel asseblies and underwater robotic welding. FSW has low energy consumption and there is no need to use consumable materials.

Innovative & Environmentally Friendly Implementations



GISBIR conducted LCA Inventory Studies for various types of ships including new building and repair & maintenance.

Proposed Implementations – Depends on the Availability of Finance

Ongoing preparations for WB, EU proposed funds :

- EU&EBRD blended finance opportunities for 4-5 small scale pilot projects (Ports, ships, short sea shipping)

- WB pre feasibility studies for decarbonization of ferries in İstanbul

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

Decarbonization Journey of Turkish Shipbuilding Industry
-Skills Development-

• Due to complex designs of new generation ships; engineers & technicans :

- Need to understand state of art technologies in detail in order to comply functional requirements of the ships
- Need to solve possible risks (fire, explosion, noxious, environmental hazards, corrosion, leakage etc.) of new type of alternative fuels
- Deal with complex design parameters (proper identification of tank capacities, fuel storage conditions, material competibilities, integration of all systems such as battery systems etc.)

Decarbonization Journey of Turkish Shipbuilding Industry -Increasing & Emerging Roles

• Due to complex designs of new generation ships; increasing/new roles are emerging about:

- Software development for integration of systems (battery management systems & integration of electrical systems)
- Data/statistic analysis for operational behavior of ships (determination of fuel/energy supply)
- LCA assesment for ships including shipyard operational impact
- 3D scanning technologies due to complex piping, installation needs specifically for retrofits

GISBIR
TURKISH SHIPBUILDERS' ASSOCIATION

THANK YOU FOR YOUR ATTENTION

For your questions & suggestions:
mehtapozdemir@gisbir.org