



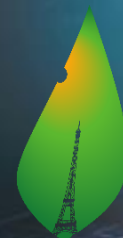
# TECO 2030

Fuel Cells & Hydrogen is the only pathway to ZERO EMISSION

Company Presentation, non-deal roadshow, May 2024



TECO  
2030



PARIS2015  
UN CLIMATE CHANGE CONFERENCE  
COP21-CMP11



TOGETHER TOWARDS NET ZERO

# Disclaimer and Forward-Looking Statements

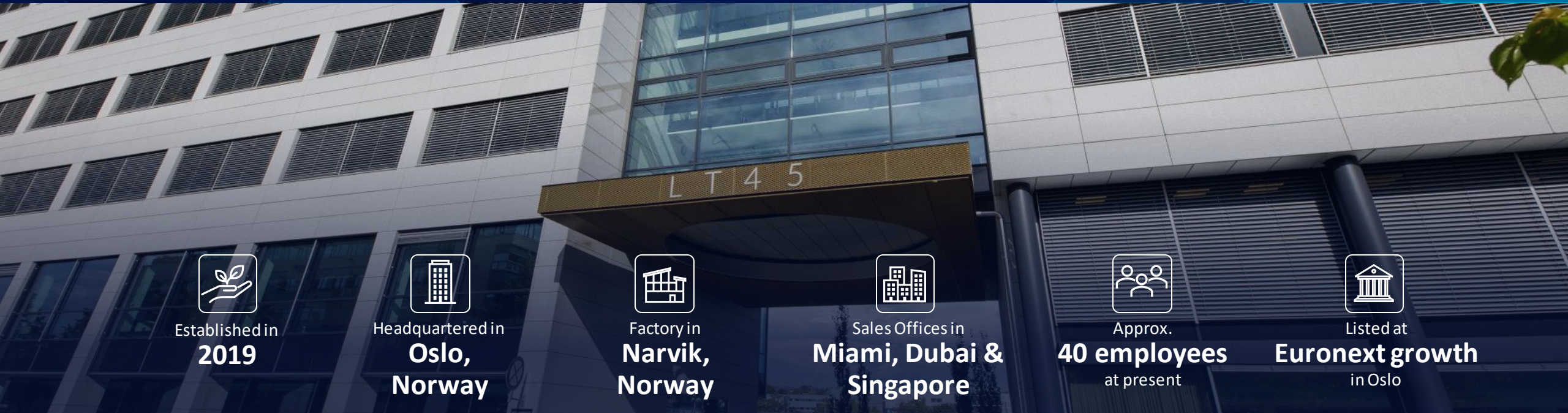


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A large iceberg floating in a clear blue ocean under a bright blue sky with scattered white clouds. The visible tip of the iceberg is small and jagged, while the much larger, submerged portion is visible through the water, illustrating the concept of an executive summary.

# Executive summary

# TECO 2030 part of TECO Group



Established in  
**2019**



Headquartered in  
**Oslo,  
Norway**



Factory in  
**Narvik,  
Norway**



Sales Offices in  
**Miami, Dubai &  
Singapore**



Approx.  
**40 employees**  
at present



Listed at  
**Euronext growth**  
in Oslo



TECO 2030 is a spin off from the TECO Group.



Co-founded Scanship (now: VOW), converting waste into clean energy, world biggest player in the cruise industry. Biggest shareholder from 2008 – 2017.



TECO Group has 30 years experience in ship repair, marine engineering, installation and integration, automation and electronics, chemicals and logistics.



Total of approx. 150 employees in 14 countries, and ~250 external service specialists.

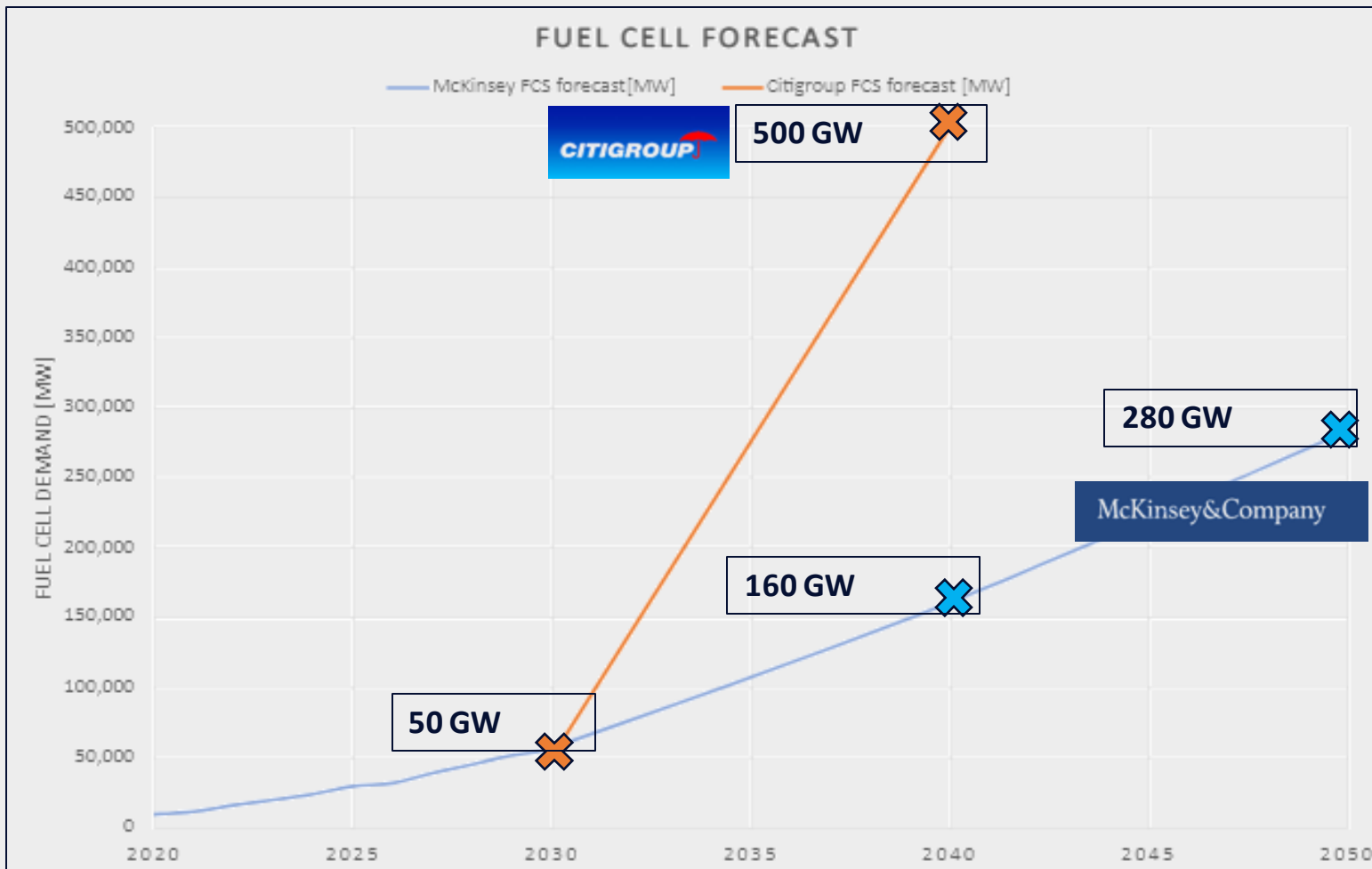
## Group offices



Houston • Miami • Algeciras • Gibraltar •  
Oslo • Skien • Gdynia • Krakow • Pula •  
Montenegro • Athens • Dubai • Fujairah • Singapore

# Global fuel cell market, trillion-dollar market

## FUEL CELL MARKET PREDICTIONS – HIGH DEMAND EXPECTED FROM 2024/25



### CITIGROUP and McKinsey forecast

- 2025: 30 GW
- 2026: 32 GW
- 2027: 38 GW
- 2028: 45 GW
- 2029: 51 GW
- 2030: 56 GW

### TECO 2030 Giga Factory, Production Capacity

- From 2025 to 2030
- Capacity from 0,4 GW to 3,2GW

Source;  
McKinsey & Company, Hydrogen Counsel, Global Hydrogen Flows

# TECO 2030 business segments

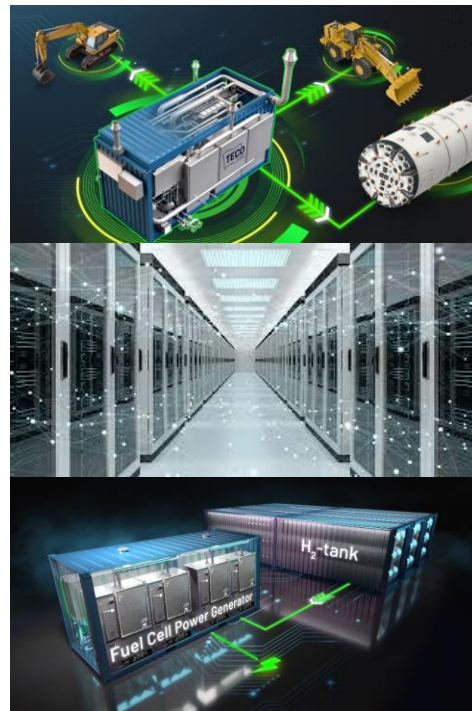
## Maritime and heavy-duty applications

Retrofit, newbuilds, port applications



## Stationary power generation

Power Generators, Data Centers, EV Charging stations



## Mobility hydrogen fuel cell vehicles

Aviation, mining vehicles, trains & heavy-duty trucks



## Offer license agreement for local production

Stack Production, Module Production, Full factory setup



# Fuel Cell for defence applications

- Significant opportunities towards the defense industry in collaboration with the right partners.
- Flexible towards the sector by having inhouse module and stack design.
- Currently discussing strategic collaboration with a potential partner
  - Mobile power / Disaster relief units
  - Air Independent Power systems.
- Other segments identified:
  - Coastal patrol/coastguard
  - General logistical support functions



Logistic emission reduction



Coastguard emission reduction



Mobile power / Disaster relief



Air independent Power capability



# A Euronext listed Norwegian public company



- Approx. 40 people employed at present
- Approx. MNOK 500,- in market cap
- Approx. MNOK 440,- raised in equity
- Approx. MNOK 15,- in a convertible bond loan
- Approx. MNOK 200,- in various funding support and grants, project and development related.
- HQ in Oslo, Gigafactory in Narvik, Norway
- Sales offices in Miami, Dubai & Singapore
- Approx. 130 active fuel cell projects ongoing





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# EUR 1,4 billion in outstanding quotes at present

Represents approx. 130 projects worldwide, another 100 projects underway, not quoted yet.



Increasing interest for heavy duty Fuel Cells, all over the world

# Ongoing projects



Ongoing



- Zero emission for construction site
- 0,8 to 1.6 MW fuel cell
- Up to 100% emission reduction in port



Ongoing

- High speed passenger vessel
- Up to 300 pax
- Speeds over 35 knots
- 3.2 MW fuel cell, Concept phase



Ongoing



- EU Horizon project, Europe, MEUR 5,-
- SHELL funding MUSD 5,-
- 2,4 MW Fuel Cell installation
- World biggest ongoing retrofit



Ongoing



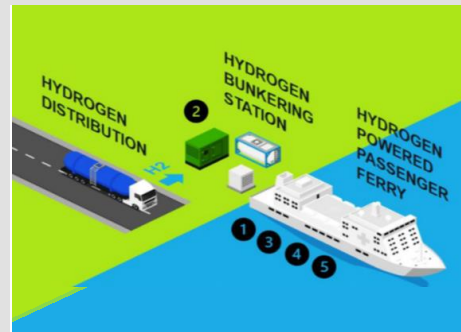
- TECO 2030 delivery scoop includes a complete system of fuel cells installed on a skid solution as well as power and automation equipment
- A 12 MW Fuel Cell installation for full propulsion
- 6 x 63 000 DWT. First deliver 2027
- Project pending financing



Ongoing



- 40t / Class 8 HD Truck
- Easy retrofit solution
- Demonstration expected first half 2024
- 4 x 100kW TECO 2030 FC stack



Ongoing



- EU Horizon project, Croatia, MEUR 13,5-
- Passenger ferry
- 1,2 MW Fuel Cell installation
- 100% emissions-free, 300 pax

# Promising prospects



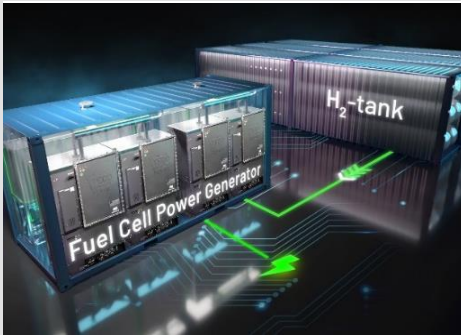
Prospect

- 5000 TEU container vessel
- 1.6 MW fuel cell
- Zero emission auxiliary power
- Up to 100% emission reduction in port



Prospect

- Bulk carrier, newbuild
- Multi megawatt size
- Fully Hybrid
- Up to 100% emission reduction



Prospect

- 6 – 8 MW fuel cell
- Ship to shore connection
- Zero emission port operation
- Up to 100% emission reduction in port



Prospect

- Container vessel, 1000 TEU
- 3,2 MW Fuel Cell
- Fully hybrid
- Up to 100% emission reduction



Prospect

- 2 Vessels
- 2 X 2,8 MW
- Zero Emission Operation
- Fully financed



Prospect

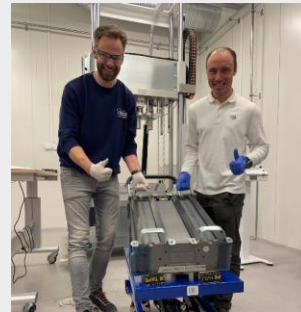
- Signed Supply Frame Agreement
- 50 Tugboats and 120 barges
- Up to 200 MW
- Waiting EU funding

# Milestones & where we're headed



**Q4 2020**

Fuel cell development project start



**Q4 2022**

FCS 100 stack built



**2024**

Continue module testing in Graz, Austria



**Q3/4 2024**

Type Approval expected from DNV



**Q1 2026**

Start mass-production of fuel cell modules, FCM 400 TRL 9



**Q4 2021**

DNV approval in principle



**Q4 2023**

FCM 400 Module in testbed



MANUAL PRODUCTION

**Q3 2024**

Starting manual production of modules in Narvik, Norway



**Q3 2025**

Start mass-production of fuel cell stacks, FCS 100 TRL 9

# Our factory, 15.000 sq meter northern Norway



# Giga fuelcell factory ready to start production

Cell Production

Stacking

System assembly

Test systems

Fuel cell production flow:



Fuel cell factory flow:



Year:  
Test, dev, production  
Max. Output Capacity:

2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
test/dev	test/dev	test/dev/ firststack	First Module	Manual production	42MW	375MW	800MW	1200MW	1600MW	3200MW

# Factory potential production capacity

Year of Production	2026	2027	2028	2029	2030
<b>Production capacity output (MW)</b>	<b>400</b>	<b>800</b>	<b>1200</b>	<b>1600</b>	<b>3200</b>
Hypothetical price indication per kw sold in EUR	1000	1000	850	750	700
<b>Hypothetical sales per year MEUR</b>	<b>400</b>	<b>800</b>	<b>1020</b>	<b>1200</b>	<b>2240</b>
Hypothetical gross margin 30% MEUR	120	240	306	360	672
<b>Hypothetical EBITDA margin of 20% MEUR</b>	<b>80</b>	<b>160</b>	<b>204</b>	<b>240</b>	<b>448</b>

## FOR CALCULATION PURPOSES ONLY

TECO 2030 can not guarantee for any of the numbers above.



# We are facing a global problem, which fuel cell solves



**Significant reduction of CO<sub>2</sub> emissions are required to achieve the 2°C Paris climate target**



**Core Technology & development partner**

# World premier, November 2023



- Fuel cells are the next generation of engines and power generators, where hydrogen is the fuel.
- Operating one of this unit instead of a diesel generator, saves our planet over 9000 tons of CO<sub>2</sub> emissions – during 35,000 hours of operation.
- Switch to fuel cells signifies a major step in supporting the clean transition targets under the European Green Deal, the U.S. Inflation Reduction Act and other frontrunner regions.



# Fuel Cell Module (FCM400) key figures



## FCM400 Key figures



Dimensions  
**1382 x 975 x 2288 mm**



Weight (operational)  
**1567 kg**



Fuel cell type  
**LT-PEM**



Net rated power (BOL)  
**325kW**



Net stack power (BOL)  
**366kW**



Design lifetime  
**Up to 35.000 hours**



Stack  
**Gen 1 - TECO2030**



Safety principle  
**Inherently Gas safe**



System approval status (DNV)  
**AIP granted; type approval ongoing**



System size  
**Modular concept, capable of multi-MW**

# Fuel Cell Stack (FCS100) key figures



## FCS100 Key figures



Dimensions  
**160 x 460 x 705 mm**



Weight (operational)  
**53 kg**



Fuel cell type  
**LT-PEM**



Net rated power (BOL)  
**110+ kW**



Net peak power (BOL)  
**130+ kW**



Design lifetime  
**Up to 35.000 hours**



Stack  
**Gen 1 - TECO2030**



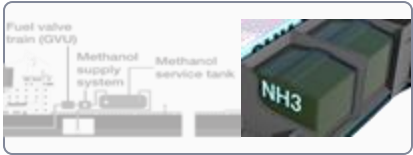
Operational requirements  
**According to DNV Emergency gen set rules**



System approval status (DNV)  
**AIP granted; type approval ongoing**

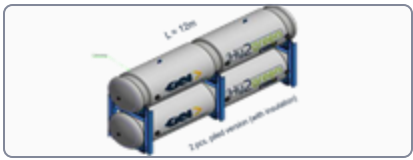


# FCM400 – Low feed pressure is the key



**Methanol / Ammonia**  
Active research on pre-treatment

Pre-treatment



**Metal Hydride hydrogen storage**  
Unique fuel tank-fuel cell heat regulation system



**Liquid organic hydrogen carriers (LOHC)**  
Eliminates the need for compression and makes it safer



**Liquid hydrogen (LH<sub>2</sub>)**  
Maintains high efficiency with low H<sub>2</sub> input pressure



**Compressed hydrogen (CH<sub>2</sub>)**  
Can operate on pressure ranges up to 700 bar



# Development partnering

TECO2030 have partnered with AVL for the development of the FCM400 and the unique stack platform that powers it.

AVL is the world's largest independent company for the development, simulation and testing of powertrain systems.

75 years track record

1500+ engines designed

1.86 BN EUR in sales in 2022

11% of yearly sales goes back to into R&D

11 200 employees, HQ Graz, Austria



Powertrain Engineering



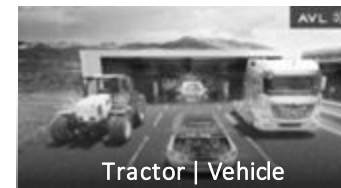
Development Platform



Simulation & Testing



AVL is experienced in ships engines, cars, construction and commercial vehicles, as well as large engine applications for power plants, trains, mining and other heavy machinery.



Tractor | Vehicle



Construction



Racing



Marine



Power Plants



Commercial Vehicle

# Prime partners & stakeholders, the pathway to success





# Fuel Cell for defence applications

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  - Mobile power / Disaster relief units
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Logistic emission reduction



Coastguard emission reduction



Mobile power / Disaster relief



Air independent Power capability





# PROJECT COMPETENSE, ESG & MANAGEMENT TEAM

# TECO 2030 Project competence



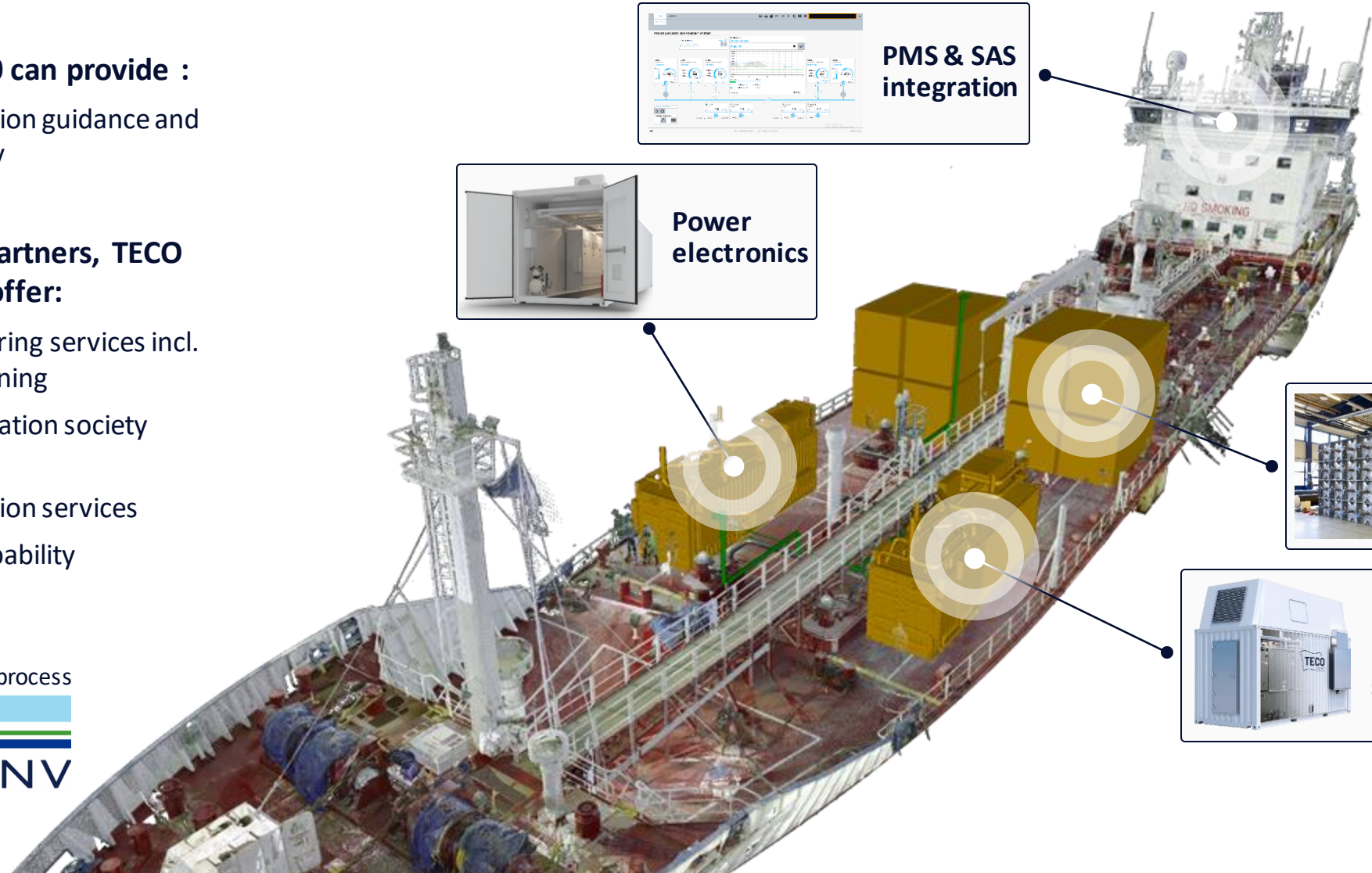
## TECO 2030 can provide :

- Integration guidance and advisory

## Through partners, TECO 2030 can offer:

- Engineering services incl. 3D scanning
- Classification society support
- Installation services
- EPCI capability

Classification process



**PMS & SAS integration**

**Power electronics**

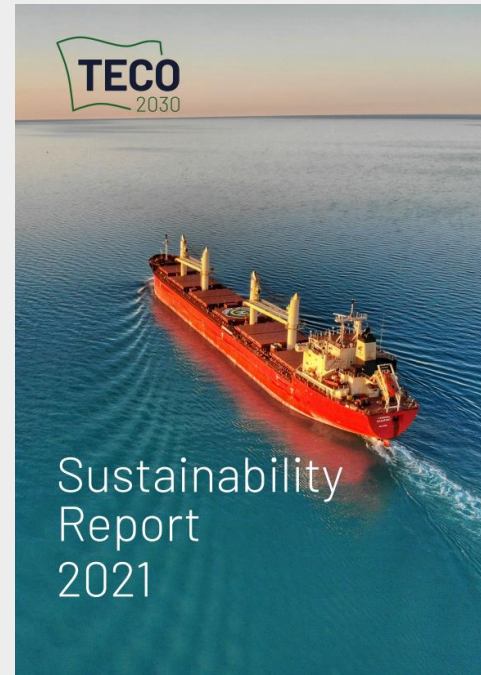
**H2 storage and handling solutions**

**Fuel Cell modules + skid solutions**

# Annual TECO 2030 ESG Reports



<https://teco2030.no/wp-content/uploads/2021/05/TECO-2030-Sustainability-Report-2020.pdf>



[https://teco2030.no/wp-content/uploads/2022/04/TECO2030-ESG2021\\_220428.pdf](https://teco2030.no/wp-content/uploads/2022/04/TECO2030-ESG2021_220428.pdf)



<https://teco2030.no/wp-content/uploads/2023/04/TECO-2030-ESG-Report-2022.pdf>





**Tore Enger**  
CHIEF EXECUTIVE OFFICER

Founded TECO Group and TECO Maritime Group in 1994. Tore is a true entrepreneur and has initiated a large number of products and services to the Maritime Industry throughout the last 28 years. He has an extensive network in the Marine Industry world-wide. Tore was the Executive Chairman and major shareholder in Scanship Holding ASA (renamed VOW ASA), listed on the Oslo Stock Exchange for approx. 10 years, (2008 – 2017).



**Tor-Erik Hoftun**  
CHIEF STRATEGY OFFICER

Holds a Bachelor of nautical science from the University of South-East Norway, combined with a specialization in arctic ship operations from the university center of Svalbard. He has been part of the TECO Group of companies for 12 years. Last 4 years in various management positions at TECO 2030 prior to this, 7 years in various positions in (VOW ASA) Scanship. Last position as project development manager. Further, Tor-Erik has experience from Oceania Cruises, sailing as deck officer.



**Paal Christian Johnsen**  
CHIEF FINANCIAL OFFICER

Holds a Bachelor of Commers (Hons) in Finance and Accounting from the Flinders University of South Australia. He has been part of the TECO Group of companies for 8 years, the last four years as CFO in TECO 2030. Prior to this, he worked 6 years as CFO in AS Naturbetong. Further, Pål Christian has 6 years' experience from the Norwegian Police force, where of three years at the National Authority for Investigation and Prosecution of Economic and Environmental Crime. He has been a board member in various companies within the real estate and maritime sector.



**Hans-Peter Klein**  
CHIEF OPERATING OFFICER

Over 10 years of experience in project management and engineering at AVL. Leading project teams in Fuel Cell Systems, HV Battery Pack development and a DE for various OEMs (e.g. DAIMLER, MAN, CAT, Ford, Maserati,). 4 years project management for fully automated intralogistics systems at SSI SCHÄFER. 2 years on-site project management in the US to develop logistics systems for Walgreens, Walmart, Amerisource etc. MSc Automation Technology & Business from CAMPUS 02 University of Applied Sciences and Technical University of Dublin.



**Arild Eiken**  
CHIEF TECHNOLOGY OFFICER

Head of the Fuel Cell & Hydrogen technology. 23+ years within Fuel Cell & Hydrogen, Maritime and Offshore O&G industries. Working experience from Equinor, Aker, Aibel, NOV, HAV Design, Ulstein Group and HYON a joint venture previously owned by PowerCell Sweden AB, Nel ASA and Hexagon Composites ASA. Educated Naval Architect – Marine Technology at the Norwegian University of Science and Technology



**Shyam Thapa**  
CHIEF DEVELOPMENT OFFICER

Shyam Thapa has held a profession within maritime Research & Development for more than 12 years. Mr. Thapa has been in charge of R&D in a Yara Marine Technologies turning startup into a multinational 350 employee company. Thapa has developed multiple new product lines and successfully been awarded five patents. He joined TECO 2030 in October 2020 and he is part of TECO 2030's management and technical Leadership team. He is responsible for developing and executing the organization's technology strategy in alignment with its overall business objectives.



**Fredrik Aarskog**

**BUSINESS DEVELOPMENT DIRECTOR**

M.sc. Electrical power engineering. 8 years R&D experience within maritime fuel cell systems and 5 years within development of MW-scale power converters for O&G. Holds 15+ patent applications. Has been leading TECO 2030 state aid activities and secured 2 Horizon Europe, 1 Innovation Norway, 1 ENOVA and 2 Skattefunn grants (total grants >€26 million) for fuel cell development and piloting, so far.



**Erling Hoftun**

**MANAGING DIRECTOR TECO 2030 ASA**

Erling Hoftun started in TECO 2030 in 2021 as Vice President Special projects. Mr Hoftun was responsible to establish a factory in Norway for producing fuel-cell stack and modules. When the facility in Narvik was secured, Erling had the responsibility to establish a management team locally in Narvik. In 2022, he took over the role as Managing director in TECO 2030 ASA, and as the chairman of the board in TECO 2030 Innovation Center ASA. Erling was a part of the startup team when Scanship Engineering (Vow ASA today) was established in 1993. During his tenure in Scanship, he held various roles. Other than that Erling has experience from the O&G, real estate and piping industries.



**Rune Karlsen**

**MANAGING DIRECTOR  
TECO 2030 INNOVATION CENTER**

Rune Karlsen joined TECO 2030's team in Narvik in December 2021. Rune was previously a part of the management team of the REC Scancell factory, which was located in the same facility as the TECO 2030 Innovation Center is today. Rune has experience within factory ramp-up from his time in REC Scancell where they employed approx. 310 employees in less than 4 years. In addition, he has extensive management experience from various industries during his professional career. Karlsen has an MSc. in process technology from the University of Telemark and a BSc. in mechanical engineering from Narvik University College.



**Bettina Nowak**

**CHIEF EXECUTIVE OFFICER, USA**

Bettina, 20 years of Maritime Experience. She started working for Scanship (VOW ASA) and the Cruise Industry in 2004. In 2007 Bettina entered the position as Managing Director and Partner for Scanship Americas, a position she held for 11 years. She joined TECO in March 2018 as CEO in Miami responsible for US Operation. 15 years within The TECO Group of companies with strong connections to the Maritime Industry in the USA.



**Nikhil Garg**

**MANAGING DIRECTOR, APAC**

Nikhil is working as Director of Business Development and Sales for Asia Pacific region and is responsible for creating strategic partnerships with Governments and Industries. He holds a Master of Business Administration in Strategy & Organization and a Master of Science in Marine & Offshore Technology from National University of Singapore. He is an accomplished business leader with a career span of more than 16 years in the LNG & Renewable Energy sector in Singapore. He has worked with Keppel Offshore & Marine for 14 years in various leadership roles executing FPSO & FLNG projects



**Rizkallah Abed**

**MANAGING PARTNER MIDDLE EAST**

Rizkallah demonstrates an impressive track record of more than 30 years' experience in international corporations as a regional executive leading multi-national teams in multi-division matrix organizations. Set up and managed operations, local productions and service center's as well as sales channels all over the MENA geographical area. Building on this international exposure, Rizkallah has led profitably and successfully highly reputable and diversified GCC businesses. Young Presidents' Organization (YPO) - MENA Gold Chapter - Board Member. Engaged in talents education and coaching as Supervisory Board Member in American University of Dubai and Canadian University of Dubai.



**Thank you  
for your attention**



post@teco2030.no

