Hydrogen Fuel Cells

THE ONLY FEASIBLE PATHWAY TO ZERO - EMISSION

TECO 2030

SUSTAINABLE DEVELOPMENT GOALS

H2 VALUE CHAIN CONFERENCE

November 16th, 2022

TECO 2030 in brief

NORWEGIAN

- HQ: Oslo, Norway
- Offices: Miami, Singapore
- Factory: Narvik, Norway

CLEANTECH COMPANY

- Established as legal entity in 2019 (spinning out of The Group)
- Currently involved in 70+ various fuel cell projects

28 YEARS OF MARITIME EXPERIENCE

- The Group was established in 1994
- ~140 land-based employees in 13 locations world-wide
- And ~200 – 300 workers out daily during normal operation

CURRENT STATUS

Awarded projects:

- Chemgas push tugs (up to 200MW fuel cell power)
- Implenia (0.8 MW fuel cell power)
- HyTruck
- High-speed vessel of the future
- HyEkoTank

- Type Approval and Testing: 5 fuel cell modules (2 MW)

Innovation Norway

Roadmap Fuel Cell development and factory

- A purpose-made fuel cell system for maritime and heavy applications
  - Fuel Cell Module **FCM 400™ – 400 kW**
  - Fuel Cell Containers: **FCC 1600 / 3200 / 6400 ™**
  - **Received "Approval in Principle" for FCM 400™ in October 2021**
  - Approval in principle for **FCC 1600 / 3200 / 6400 ™** container solution during 2022
- Expecting class **"Type Approval"** early 2023
- Industrialize the production design and secure supply chain in 2022
- Prototype delivery to clients, **starting 2Q 2023**
- Factory production to start with 15MW in **4Q - 2023, increasing to 120 MW in 2024 & 400 MW by 2025**

COLLABORATION WITH INDUSTRY LEADERS

chemgas · Shell · Hydrogen Europe · IMO · BOSCH · Thecla Bodewes Shipyards · GMV · Gen2 Energy · Everfuel · engineered by AVL · DNV · Implenia · hydrogenious LOHC Technologies · Kongsberg · Verbund · Linde · Siemens Energy · GREENSTAT

TECO 2030

TECO2030's Product revenue stream

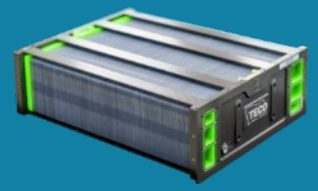
Turn-key, plug & play ready

Standardized & tailored

Flexible installation

Equipped with all auxiliary, process and safety systems

Scalable and modular



FCS 100™
0,1 MW Net Output
Equivalent to **135 HP**

FCM 400™
0,4 MW Capacity
Equivalent to **540 HP**

FCC 1600™
1.6 MW Capacity
Equivalent to **2 160 HP**

FCC 3200™
3.2 MW Capacity
Equivalent to **4 320 HP**

FCC 6400™
6.4 MW Capacity
Equivalent to **8 640 HP**

Europe's first giga production of PEM Fuel Cells

FUEL CELL GIGAFACTORY

TECO 2030 is building up a combined factory and innovation center for the production of hydrogen PEM Fuel Cells.

1.6 GW OF FUEL CELLS

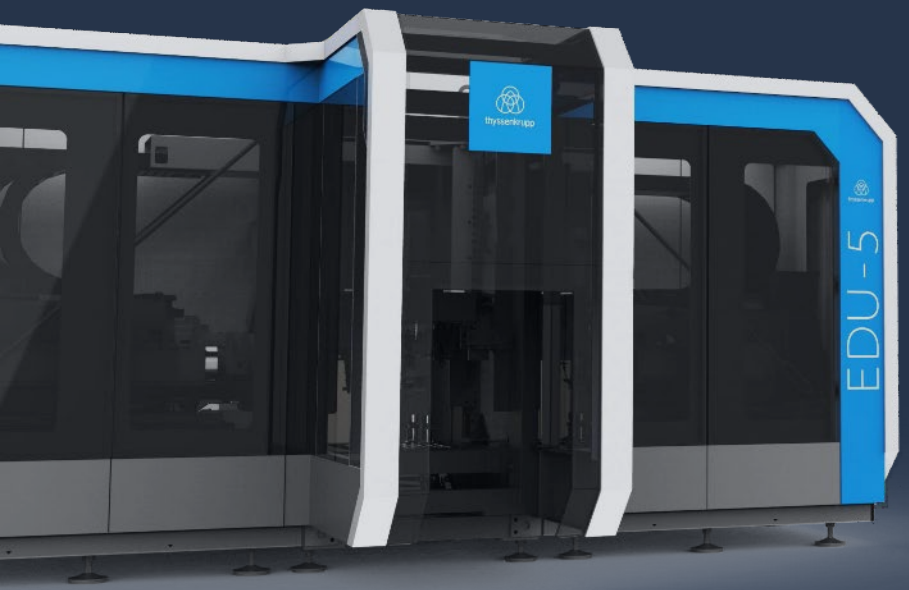
The factory is planned to start production in 4Q 2023, and to have an annual output of 400 MW in 2025 and 1,600 MW of fuel cells by 2030.

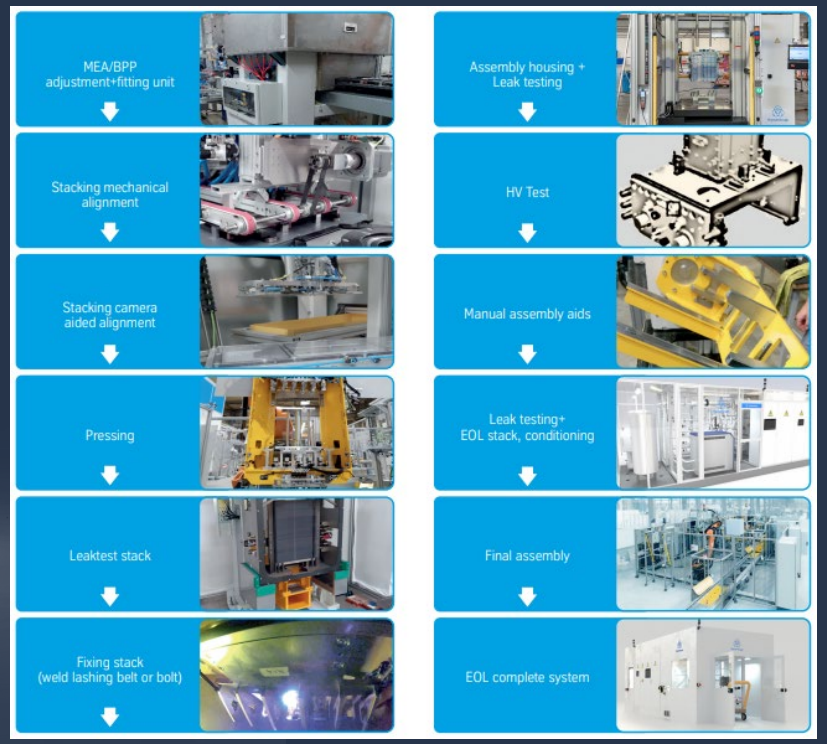
UP TO 500 NEW JOBS

TECO 2030 expects to have 100 employees at the factory before the end of 2025, and up to 500 by 2030.

Production	2020	2021	2022	2023	2024	2025	2026	2027
Output Capacity	test/dev	test/dev	test/dev/first stack	5 - 10MW	80-120MW	300 - 400MW	700 - 800MW	900MW

World leader thyssenkrupp to deliver production equipment





"We are really looking forward to work with TECO2030 in realizing zero emission shipping and heavy industry , and their goal of establishing a complete PEM fuelcell production line in Narvik"
Michael Menneking, CEO of thyssenkrupp AutomationEngineering.

thyssenkrupp

Quick facts and figures

Source: thyssenkrupp

100,000+	56	18,000+	34	100+
employees worldwide	countries	granted patents in force	billion Euro in turnover	years of experience

TECO 2030

Hydrogen Fuel Cell Production Milestones

- **Q4 2022** — First fuel cell Stack Produced AVL in Canada
- **Q1 2023** — First HyTruck Stack produced
- **Q2 2023** — Pre-production of Stacks in Narvik
- **Summer 2023** — First FCM400 in Test Bench at AVL in Graz
- **Summer 2023** — First HyTruck Prototype in vehicle
- **Q4 2023** — Manual Production start FCM400 in Narvik
- **Q1 2024** — Serial Production start FCM400 in Narvik
- Assemble production equipment in Narvik

Financing and awards highlights, 2020 – 2022

2020

- Raised MNOK 80 in equity through an IPO. Listed at Euronext Growth, Oslo Børs

2021

- Raised a total of MNOK 86.5 in equity
- Allocated MNOK 50 in support from Innovation Norway for development of hydrogen PEM fuel cells in northern Norway
- Received MNOK 5 from Research Council of Norway for development of Fuel Cell Production Line
- Awarded MNOK 15.6 in public funding from ENOVA for the Implenia project

2022

- Awarded MNOK 50,- in grants from EU-Horizon. TECO 2030 launches hydrogen powered tanker concept, Hy-Ekotank, together with partners Shell, Ektank, BLOM Maritime, UMOE and TECO Solutions. Project start, Q2 2023
- Signed LOI with AVL for delivery of 100kW x 120 fuel cell stacks (12MW) to an undisclosed heavy-truck-owner. Production start, end of summer 2023. Delivery start, end of 2023.
- Awarded MNOK 20,- (MNOK 30,- if option is exercised) in contract value from Implenia. Project start, 4Q 2022
- Raised a total of MNOK 191 in loan facility and equity

TECO 2030

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Announced ongoing projects

Thank you
for your attention

post@teco2030.no

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TECO 2030

HydroPilot contract signed with Implenia for delivering zero-emission construction site fuel cell container

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ZERO-EMISSION CONSTRUCTION SITE

The order covers two TECO 2030 FCM400 fuel cell modules for a total power output of 800 kW with all additional power and automation equipment. The first fuel cell delivery is planned for Q3 2023.

Implenia has an option to include two more fuel cell modules in the HydroPilot container which can increase the power capacity to 1600 kW.

15.6 MNOK GOVERNMENT FUNDING SECURED

The project has received NOK 15.6 million in funding from the Norwegian state enterprise ENOVA.

A LEADING EUROPEAN INFRASTRUCTURE DEVELOPER

Implenia AG, a multinational construction company with approximately 9.000 employees that is headquartered in Switzerland. Implenia is currently involved in several large infrastructure projects in Norway.

AVL Fuel Cell HyTruck, will include stacks from TECO 2030, ready for summer of 2023

DELIVERING TECO 2030 FUEL CELL STACKS TO AVL ZERO-EMISSION HY-TRUCK

TECO 2030 and AVL have signed a collaboration agreement where TECO2030s fuel cell stacks will be deployed in AVL's DemoTruck which is powered by the HyTruck Fuel Cell System.

The truck is of class 8/40-ton, powered with net 300kW fuel cells. TECO 2030 stacks will be integrated into the DemoTruck mid-2023.

STATEMENT FROM AVL, THE WORLD BIGGEST INDEPENDENT DEVLOPER OF POWERTRAIN

I am really excited to see the TECO2030 stacks perform in an additional heavy-duty application other than marine. With the carbon plate stack design, we laid the foundation for pretty much everything heavy duty and it is key to find these common denominators across industries" said Falko Berg, Manager PEM Systems at AVL.

This is the only viable way to make sure that our customers like TECO2030 succeed and are able to utilize their upcoming Narvik plant for additional needs besides their main business. Customers looking for off-the-shelf solutions will be very happy to see that a world class facility can support their heavy-duty product in a timely manner," Berg adds.

TECO 2030 sign LOI with AVL on behalf of undisclosed customer for the delivery of 120 fuel cell stacks (30 Trucks), starting end of 2023

DELIVERING TECO 2030 FUEL CELL STACKS TO AVL ZERO-EMISSION HY-TRUCK

The customer has the target to equip 30 Heavy Duty trucks with fuel cell system based on AVL HyTruck platform. Each of this systems would require 2x100kW stacks from TECO 2030. which sums up to in total 120 stacks (30mW) The delivery of these stacks is intendent to start Q4/2023.

QUOTE, TORE ENGER, TECO 2030

This will have a huge positive impact on our production start, earlier than anticipated, and we are confident that this will mark the start of a worldwide green transition towards a sustainable hydrogen fuel cell future, says Tore Enger, Group CEO, TECO 2030 ASA.

QUOTE, JUERGEN RECHBERGER, AVL LIST

We see increasing traction in the adoption of fuel cell technology, in particular in the heavy-duty truck segment. With this project, we want to support one of our customers in bringing vehicles early to the market with a performance and drivability not seen before with fuel cells, says Juergen Rechberger, Vice President Hydrogen & Fuel Cell, AVL List GmbH.

Developing zero-emission container vessel with shipowner Samskip

TECO 2030 ASA

KEY STATISTICS

Goal of 100% Fuel Cell Hydrogen operation
Direct CO2 savings annually 27.35kt

DEVELOPING ZERO-EMISSION OPERATION IN THE CONTAINER SEGMENT

TECO 2030 is supporting Samskip as technology provider developing zero-emission container vessel

NOK 147 MILLION (MUSD 14,7) GOVERNMENT FUNDING SECURED

The project has received NOK 147 million in funding from the Norwegian state enterprise ENOVA to build two container ship to sail between Oslo Fjord and the Netherlands where hydrogen will be the fuel combined with fuel cells and sail emission-free

SAMSKIP, A GLOBAL LOGISTICS COMPANY

With offices in 24 countries across Europe, America, Asia and Australia, they offer transport and related services by land, sea, rail and air, around the world, focusing on cost efficient, reliable and environmentally friendly solutions.

DELIVERY IN 2025

First delivery is scheduled for 2025.

TECO 2030, Shell and partners to receive EUR 5 million in Horizon Europe Grant for 2.4 MW TECO 2030 PEM Fuel Cell system for tanker retrofit project

TECO 2030 ASA

TECO 2030 with partners have been invited for HORIZON EUROPE funding of EUR 5 million to realise the hydrogen powered tanker concept, HyEkoTank.

All beneficiaries have now signed the GA Declaration of Honour, stating that they are committed to participate in the project.

The consortium expects to finalise the Grant Agreement process within the end of this year, and plans project startup by February 1st, 2023.

The project will retrofit an 18.600 DWT product tanker with a 2.4 MW fuel cell system by TECO 2030 and 4000 kg compressed hydrogen storage for demonstration in 2024.

The hydrogen powered tanker will allow zero emission at berth, and up to 100% reduction of GHG emissions during voyage.

Developing zero-emission bulker vessel with Shipowner Thor Dahl

TECO 2030

A/S THOR DAHL

TECO 2030 ASA

DEVELOPING ZERO-EMISSION OPERATION IN THE BULK SEGMENT

TECO 2030 is supporting Thor Dahl as technology provider developing zero-emission bulker vessel

NOK 97 MILLION (MUSD 9,7-) GOVERNMENT FUNDING SECURED

The project has received NOK 97 million in funding from the Norwegian state enterprise ENOVA.

THOR DAHL, 135 YEARS OF HISTORY

Thor Dahl has during its 135 years of history, previously converted from vessels powered by sail to steam and from steam to diesel. Now the company and the maritime industry face an equally groundbreaking change, as the need to reduce the climate footprint of ocean transport is changing the future ship design and propulsion technology dramatically.

KEY STATISTICS

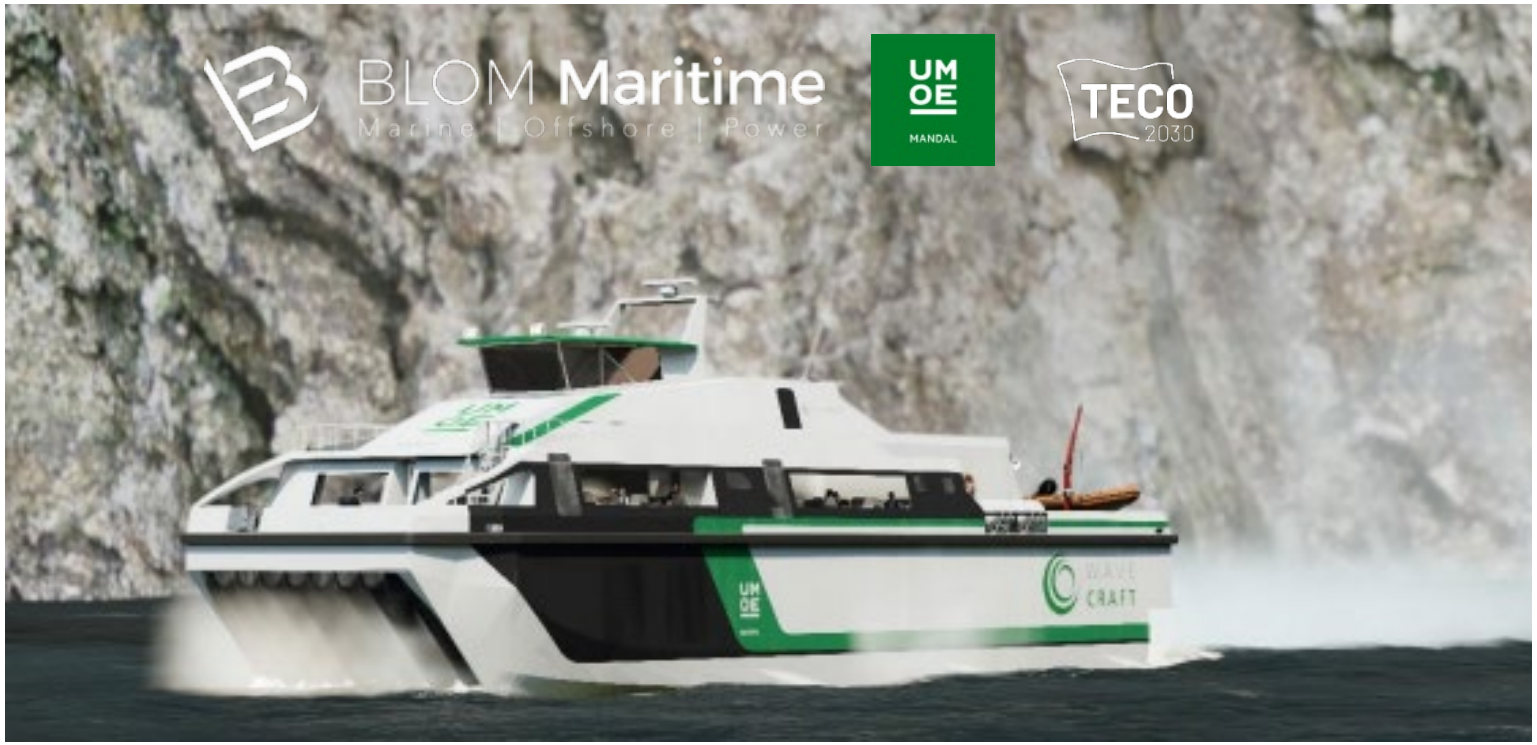
Goal of 100% Fuel Cell Hydrogen operation
Direct CO2 savings annually 4.63kt

DELIVERY IN 2024

Delivery is scheduled for 2024.

ENOVA

High-speed vessel of the future



"By introducing hydrogen as an energy carrier for high-speed vessels, we can create the uncompromising high-speed vessel that can replace all current high-speed vessels in Norway," says the county mayor in Nordland, Tomas Norvoll.

In project "High-speed vessel of the future", the county municipalities of Finnmark, Nordland, Trøndelag and Vestland aims to develop, build and demonstrate the world's first hydrogen-powered high-speed vessel.

The consortium of TECO 2030, BLOM Maritime and Umoe Mandal is one of three qualified consortiums and have decided to use SES (Surface Effect Ship) Technology, same technology used by the Royal Norwegian Navy.

Key statistics

- Service speed at least 35 knots
- Capacity of 275 pax

Frame agreement signed with Chemgas, Green Hydrogen @ Blue Danube project

- TECO 2030 has signed supply frame agreement with Chemgas, which could lead to delivery up to 200MW of Fuel cell modules over the next 3 to 8 years
- Green hydrogen produced from solar and wind in Romania will be transported on barges along the Danube river to industrial buyers in Austria and Germany
- The modules will enable the logistic chain of Chemgas to operate emission free along the Danube river. 40-60 push tugs and up to 120 hydrogen transport barges
- 80,000 tons of annual production of hydrogen for industry, power + mobility hubs (500 trucks/100 HRS) along the Danube
- 3.2 million tons of annual CO_2 reductions

Prototype delivery expected to take place in 2024

About TECO Maritime Group

A front enabler of the maritime green transition with a strong position in the market, servicing more than 2000 vessels on a yearly basis

TECO 2030

TECO 2030 ASA

28 YEARS OF MARITIME EXPERIENCE

- The Group was established in 1994
- HQ Oslo – Norway
- ~140 land-based employees in 14 locations world-wide
- ~ 200 – 300 workers out daily during normal operation

PROVIDE FOLLOWING SERVICES

- Naval Architects & Marine Engineers
- 3D Scanning and reversed engineering
- Installation and integration of automation and electronics
- Ship repair and upgrades, new and existing equipment
- Marine chemicals for SoX and NoX reduction, less emission
- Marine chemicals for next cargo, tank preparation
- Blasting and painting
- Ballast Water treatment system
- Exhaust Gas Cleaning system
- HVAC
- Supervision, both online and physically

Clients from all over the world – some references.

Group Companies & locations

TECO

Crosscomar Ship Repair Marine Services

BLOM Maritime Naval Architects & Marine Engineers

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

About AVL fuel cells

>300
fuel cell projects completed

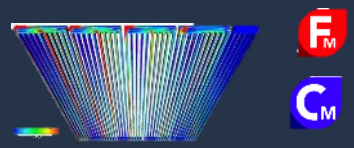
600
fuel cell engineers and fuel cell scientists

20 years +
fuel cell experience

Development & Integration – From cell to vessel

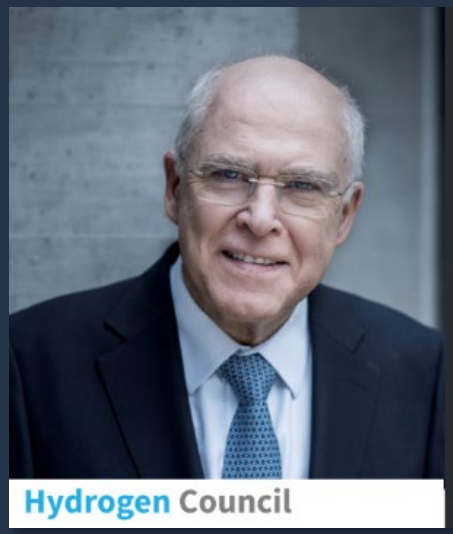
Fuel cell system development
PEM + SOFC

Fuel cell simulation tools



Fuel cell test systems

Energy storage & H_2/Synfuel production



"AVL aspires to contribute to the rise of a complete hydrogen ecosystem for new mobility and energy solutions. We strongly believe in a much broader use of hydrogen as a major energy carrier to transform our energy system towards renewable resources such as wind and solar."

PROFESSOR HELMUT LIST
Chairman & CEO, AVL

AVL'S NEW FUEL CELL TEST CENTER:

- Capacity of up to 20 test rigs
- Fuel cell system test rigs up to 400 KW
- Test rigs for all subsystems & components

AVL owns four times more fuel cell patents than all competitors combined!

Source: AVL

TECO 2030 ASA