

## TECO THE ENGINE OF TOMORROW



the only pathway to zero-emission



EUROPE'S FIRST GIGA PRODUCTION OF HYDROGEN PEM FUEL CELLS, NARVIK, NORWAY

## **TECO**2030

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### **EXECUTIVE SUMMARY**

- Leading global PEM fuel cell manufacturer for the Maritime and Heavy Industry, the only pathway to real zero-emission.
- Strategy aligned with Norwegian Government's export goals, to increase exports by 50%. Fuel Cell production for exports and prioritized domestic projects.
- Zero Emission propulsion for various marine applications along the Norwegian coastline, such as speedboats, workboats, ferries, and emergency vessels.
- Reuse an existing factory building which was constructed for REC Solar back in the late 2000s. 15.500 m2.
- Annual production capacity of 1.6GW in 2030, equal to approx. 2.16m horsepower's (HP).
- Hypothetical sales equivalent to 400 MEUR in 2025 and 1000 MEUR in 2030.
- Create a hydrogen innovation center together with Norwegian value chain partners:
  - Education, research, and further developments with UiT and others.
  - Testing, verification and demonstration with industrial partners and end users of hydrogen technology.
  - Training and certification of operators handling the technology everyday.
- Collaboration with industry partners to enhance the education and research in Northern Norway on hydrogen, and green energy technology. Increase the knowledge and developments in the region, towards sustainable energy and mobility solutions.



## EUROPE'S FIRST GIGA PRODUCTION OF HYDROGEN PEM FUEL CELLS





#### **FUEL CELL GIGAFACTORY**

We are 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 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.



## PRIME MINISTER STØRE, ON A MISSION TO ZERO-EMISSION, IN NARVIK, NORWAY





Prime Minister Jonas Gahr Støre and TECO 2030 CEO Tore Enger

The Prime Minister believes that what is being done in Narvik fits in well with the government's green industrial plan in several ways: Technology can cut emissions in ferry and short sea shipping, it fits in with the government's ambition for opportunities for international investments and exports, and it is happening in the north.

"So there are a lot of ideas that come out of this, where I think we have such a "to do" list on our side as well."



### LET'S GET THIS INTO PRACTICAL CONTEXT

2023	2024	2025	2026	2027	2028	2029	2030
15	120	400	800	900	1000	1200	1600
20 250	162 000	540 000	1 080 000	1 250 000	1 350 000	1 620 000	2 160 000
150	1 200	4 000	5 400	9 250	10 000	12 000	16 000
9	75	250	500	579	625	750	1 000
5	37	125	250	290	312	375	500
2	18	113	125	145	156	188	250
1250	1200	950	800	750	700	650	600
18	144	380	640	675	700	780	960
38	300	1000	2000	2250	2500	3000	4000
150	1200	4000	8000	9000	10000	12000	16000
50	75	190	330	360	400	450	500
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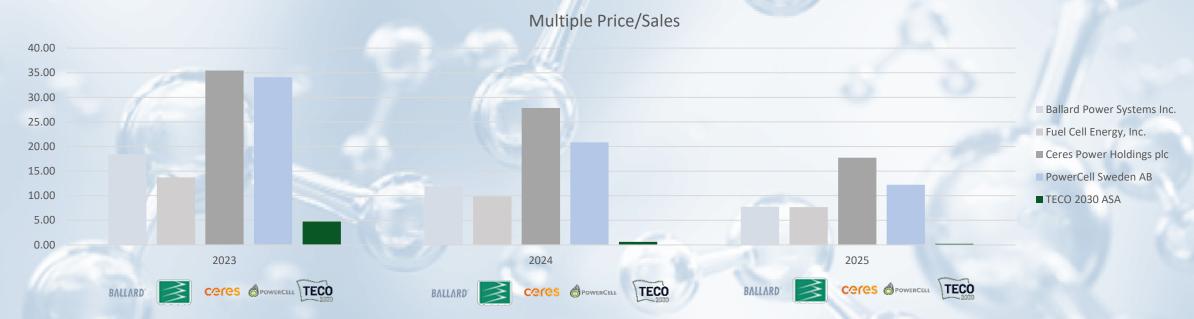






### PEERS LANDSCAPE

Company	Market Cap					Revenue MUSD	Multiple Price/Sales				
		MUSD		2023		2024		2025	2023	2024	2025
Ballard Power Systems Inc.	\$	3 450,00	\$	187,00	\$	289,00	\$	446,00	18,45	11,94	7,74
Fuel Cell Energy, Inc.	\$	2 550,00	\$	186,00	\$	259,00	\$	332,00	13,71	9,85	7,68
Ceres Power Holdings plc	\$	1 950,00	\$	55,00	\$	70,00	\$	110,00	35,45	27,86	17,73
PowerCell Sweden AB	\$	1 125,00	\$	33,00	\$	54,00	\$	92,00	34,09	20,83	12,23
TECO 2030 ASA	\$	95,00	\$	20,00	\$	153,00	\$	440,00	4,75	0,62	0,22





## ROADMAP FUEL CELL DEVELOPMENT AND FACTORY

- A purpose-made fuel cell system for maritime and heavy applications
  - Fuel Cell Module FCM 400<sup>TM</sup> 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 first half 2022
- Expecting class "Type Approval" early 2023
- Industrialize the design and secure supply chain in 2022
- Prototype delivery to clients, starting 2Q 2023
- Factory production to start in 4Q 2023, increasing to 120 MW in 2024 & 400 MW by 2025



Production	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Output (MW)	test/dev	test/dev	test/dev	18	120	400	800	900	1000	1200	1600

#### **COLLABORATION WITH INDUSTRY LEADERS**





































**GREENSTAT** 



# FIRST PRODUCTION LINE PLANNED 4Q 2023



## **TECO**2030

## APPROVAL IN PRINCIPLE RECEIVED FROM DNV



#### APPROVAL IN PRINCIPLE

#### Particulars of Product

Designer:

**TECO 2030 AS** 

Product:

FCM 400™

(THREE VERSIONS)

#### This is to verify:

That the fuel cell power installation has been assessed by DNV and found to comply with current Rules of the Society, as specified below.

DNV Rules: Part 6 Additional class notations; Chapter 2 Propulsion, power generation and auxiliary systems;
 Section 3 FUEL CELL INSTALLATIONS - FC

Place: Hamburg Date: 2021-09-30



for DNV
Digitally Signed By: Drews, Olaf
Location: DNV GL SE Hamburg, Germany
Signing Date: 2021-09-30

Olaf Drews
Head of Section
Machinery Systems & Marine Products

Received an "Approval in Principle" (AIP) by DNV, one of the world's leading classification and certification bodies, for its Marine Fuel Cell System and Fuel Cell Module FCM400 $^{\text{TM}}$ 







## CLEANTECH FOR THE MARITIME AND HEAVY INDUSTRY





### PRODUCT REVENUE STREAM



Turn-key, plug & play ready



Standardized & tailored



Flexible installation



Equipped with all auxiliary, process and safety systems



Scalable and modular





FCM 400<sup>™</sup> – 0,4 MW Net Output Equivalent to 540 HP



FCC 3200<sup>™</sup> – 3.2 MW Capacity Equivalent to 4 320 HP



FCS 100<sup>™</sup> − 0,1 MW Net Output Equivalent to 135 HP

FCC 1600<sup>™</sup> − 1.6 MW Capacity Equivalent to 2 160 HP FCC 6400<sup>™</sup> − 6.4 MW Capacity Equivalent to 8 640 HP



### SUMMARY PROJECTS AND PIPELINE

#### **SIGNED PROJECTS**

Chemgas, supply chain agreement signed, 200MW Fuel Cells, delivery, pilot 2023, delivery 2024 – 2028 Port of Narvik, subject to ENOVA, 1.6MW Fuel Cells, delivery 2023 Implenia, agreement aligned, support from ENOVA received, size not disclosed, delivery 1<sup>st</sup> half 2023

#### A SELECTION FROM OUR PROJECTS/PIPELINE, WE ARE INVOLVED IN ROUGHLY 60 PLANNED PROJECTS AROUND THE GLOBE

Project announced, Undisclosed owner, project, work in progress: 1 x 1.6MW, delivery in 2024

Undisclosed ship owner, shipyard, infrastructure, work in progress: 1 x 1.2MW, delivery in 2024 earliest

Undisclosed ship owner, shipyard, infrastructure, work in progress: large infrastructure developer, undisclosed size

Undisclosed ship owner, shipyard, infrastructure, work in progress: 1 x 1.6MW, delivery in 2024 earliest

Undisclosed ship owner, shipyard, infrastructure, work in progress: 2 x 1.2MW, delivery in 2024 earliest

Undisclosed ship owner, shipyard, infrastructure, work in progress: large taker, hybrid installation, starts 2023 and forward

Undisclosed ship owner, shipyard, infrastructure, work in progress: 4 x 4.0MW, deliver 2024 and forward

Undisclosed ship owner, shipyard, infrastructure, work in progress: 2 x 8.0MW, delivery 2024 and forward

Undisclosed ship owner, shipyard, infrastructure, work in progress: 1 x 3.2MW, delivery 2024



### FUEL CELL TECHNOLOGY DEVELOPED IN COOPERATION WITH AVL

Fuel Cell world

600

**Engineers** 

300 **Projects** 

400 kW PEM FC System

1.2 MW PEM system

Modular 1.2 MW H2/PEM prototype

system for special application

Modular FC system for marine and heavy duty



**SOP 2023** 

20 Years

experience

Source: AVL

Passenger car

AVL is strategic development partner for FCEV SOP Development of major European OEM.



**SOP 2022** 

Commercial vehicles

development for a LD/MD Truck



**SOP 2022** 

Commercial vehicle

PEM 35kW Range Extender SOP Development



11,000

employees worldwide

1,500 engine designs

of turnover invested in inhouse R&D

granted patents in

force

1.7 turnover

years of experience

70 +

TECO2030 has access to all fuel cell patents developed by AVL throughout the past 20 years, and jointly own the developed patents for the PEM fuel cell cooperation,

machinery.

AVL is the world's largest

testing.

development, simulation, and

independent company in powertrain

AVL experienced in developing engines for the maritime sector, passenger cars, commercial and

construction vehicles, trains,

mining and other heavy

50/50 with AVL.

support for large scale PEM submarine stack

PEM submarine

Stack design, simulation & layout

100kW fuel cell system SOP



12%

1,500

billion Euro in

TECO2030 owns 100% of the commercial rights of the "50/50" patents developed.

independent developer of power

train and testing

### **IMPORTANT HIGHLIGHTS 2020 - 2022**

Start of Fuel Cell Development with AVL, world biggest

Supply Frame Agreement with Chemgas for up to 200 MW Fuel Cell propulsion in the "Green Hydrogen @ the Blue Danube" project

Received Approval in Principle from DNV for Fuel Cell system FCM 400

Launched a project for the Port of Narvik, aiming to build the world's first highspeed hydrogen fuel cell workboat, 1.6 MW Fuel Cells

Cooperation Agreement with Implenia Norway - emission free construction site concept

Moved into our new production facility in Narvik

Carbon Capture & Storage, Cooperation Agreement with Chart Industries

Signed Cooperation agreement with UiT, University of Tromsø, Campus Narvik

Signed strategic cooperation agreement with Al-Misehal Group in the Kingdom Saudi Arabia (KSA). The strategic cooperation agreement aims to result in a Joint Venture between the parties with the purpose of conducting business which will reduce environmental impact in the KSA.

2020

Raised NOK 80 million in equity through an IPO, listed at

Euronext Growth, Oslo Børs

2021

Raised a total of NOK 86.5 million new equity

Granted NOK 50 million in support from Innovation Norway for its development of hydrogen fuel cells in northern Norway

Received NOK ~5 million from Research Council of Norway for development of Fuel Cell Production Line

Received NOK ~5 million from Research Council of Norway - for Carbon Capture & Storage development

Awarded NOK ~16 million public funding from ENOVA for the Implenia project

2022

Raised NOK 7,- million new equity

-inancing

Funding



## TECO 2030 HAS BEEN GRANTED MNOK 50 FROM INNOVATION NORWAY



**FUEL CELL DEVELOPMENT, MNOK 50,- SECOND LARGEST GRANT IN 2021** 



TECO 2030 has been granted NOK 50 million in support from Innovation Norway for its development of hydrogen fuel cells, which will lead to the creation of up to 500 new jobs in northern Norway by 2030 and contribute to reducing greenhouse gas emissions.

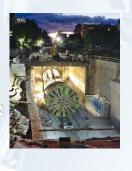


## TECO 2030 - RECEIVED FOLLOWING GRANTS FROM NORWAY









#### **FUEL CELLS FOR HEAVY INDUSRTY, MNOK 15.6**

TECO 2030 is cooperating with Implenia Norway on developing and piloting zero-emission hydrogen fuel cell generators for use at construction sites





#### **FUEL CELL PRODUCTION LINE, MNOK 5.4**

TECO 2030 has been granted up to NOK 5.4 million in support in the form of tax deductions for developing its first semi-automated production line for hydrogen fuel cells at the TECO 2030 Innovation Centre in Narvik



### FRAME AGREEMENT SIGNED WITH CHEMGAS, GREEN HYDROGEN @ BLUE DANUBE PROJECT

#### **CONCEPT**

Green hydrogen produced from solar and wind energy in Romania will be transported on barges along the Danube river to industrial buyers in Austria and Germany.

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.

The modules will enable the logistic chain of Chemgas to operate emission free along the Danube river.







#### **FACTS**

2,000 MW off-grid wind and solar energy production

1,800 MW electrolysis for hydrogen production

40-60 push tugs and up to 120 hydrogen transport barges

#### Prototype delivery expected to take place in 2023

80,000 tons of hydrogen for industry, power + mobility hubs (500 trucks/100 HRS) along the Danube

3.2 million tons of annual CO<sub>2</sub> reductions

#### Verbund









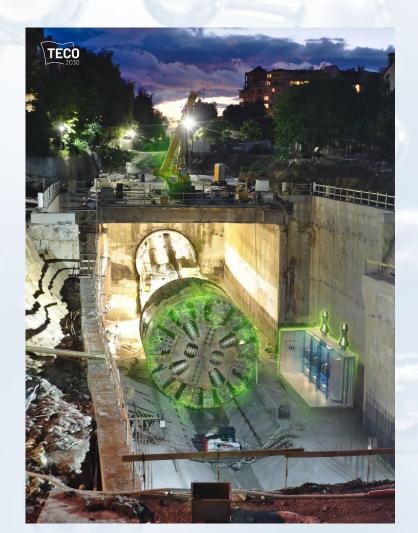






### TECO

## DEVELOPING ZERO EMISSION CONSTRUCTION SITE WITH IMPLENIA FOR DELIVERY 2Q 2023



**DEVELOPING ZERO-EMISSION CONSTRUCTION SITE SOLUTIONS TOGETHER WITH IMPLENIA** TECO

2030 is cooperating with Implenia Norway on developing and piloting zero-emission hydrogen fuel cell generators for use on construction sites.

#### 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

Headquartered in Switzerland, Implenia plans and builds complex infrastructure projects in Switzerland, Germany, Austria, France, Sweden and Norway, and employs more than 8,500 people in Europe.

#### **FIRST FUEL CELL DELIVERY IN 2023**

The first fuel cell delivery is planned for Q2 2023.







## PORT OF NARVIK, FUEL CELL DRIVEN, ZERO EMISSION SPEEDBOAT, DELIVERY 2024



The Port of Narvik needs a new workboat which should be both fast and emission-free

They will now build the world's first hydrogen powered speedboat, which will be equipped with 1.6 MW (equivalent to 2 000 HP) of hydrogen fuel cells from TECO 2030 capable of 23 knots

Subject to support from





## VESTFJORDEN, ZERO-EMISSION RUN, NORWEGIAN CONTENT SHOULD BE HIGH



## **TECO**

## STRATEGIC COOPERATION AGREEMENT WITH AL-MISEHAL GROUP, KINGDOM OF SAUDIA ARABIA





The cooperation is built to contribute towards the KSA's "Vision 2030" with an ultimate goal of achieving net zero by 2060. The TECO2030 and Al-Misehal cooperation aims to be a leading supplier of zero emission hydrogen-based fuel cells in the region, with an intended goal of converting various power sources towards zero emissions. The vision is built around three themes: a vibrant society, a thriving economy, and an ambitious nation. This strategic cooperation will be a rewarding partnership in terms of knowledge sharing, economic growth, and innovative thinking for achieving the ultimate goals of the net zero vision.

Al Misehal Group Company (AMG) has, over the past 30 years, built an outstanding reputation for delivering excellent service to its partners and customers. AMG combine commitment, its local market knowledge with the technical expertise and diverse product ranges of its overseas partners to forge long lasting successful relationships. These range from supporting start-up operations looking for their first sale in the market through to Joint Ventures with leading Blue-Chip Corporations. AMG has both the experience and capability to get the job done efficiently and the confidence and ambition to expand and grow. Agility and flexibility enable AMG to support its partners and their projects and is one of the key strengths behind its success. For more information, please visit <a href="https://www.almisehal.com">www.almisehal.com</a>.



## TECO2030 | ESG PROJECT PLAN

















Project phase

#### Kick-off

#### 1. Value chain analysis

#### 2. Materiality assessment

#### 3. KPIs and reporting structure

#### 4. Sustainability reporting

Project planning

Assess sustainability impacts throughout value chain

Identify most important sustainability topics, ensure management commitment

Define KPIs, indicators and reporting structure according to GRI

Support sustainability reporting

Content

- Project scope
- Project plan
- Define roles, responsibilities and involvement
- Value chain analysis conducted as desktop research, quality checked by TECO 2030
- Based on current business model and strategy, stakeholders, market and competitors, scenarios
- Identify industry best practices on sustainability strategy, targets and reporting
- Materiality assessment conducted as desktop analysis andworkshop
- Determine at least one indicator per material issue (as defined by GRI or TECO 2030), as well as goals and ambitions
- Determine ambition level for sustainability reporting

 Facilitation of sustainability report to be written in line with GRI recommendations (not necessarily in accordance with GRI)

TECO 2030 activity

- Attend kick-off meeting
- Share information on company & products for input to next stages
- Attend workshop where we go through the impacts of each stage of the value chain
- Attend workshop to discuss and prioritize sustainability issues

- Attend workshop to discuss and define ambitions
- Evaluate current management approach of each material sustainability issue
- Author sustainability report



### ABOUT TECO GROUP | THEIR CLIENTS

The Group is at the forefront in the green maritime transition and has a strong position in the market, after almost 30 years in operation.

The Group has for several years been helping customers comply with new regulations related to the environment. The companies have delivered engineering, installation or after sales to more than 300 vessels in connection with new IMO regulations.

Provide a comprehensive range of individual and integrated solutions, includes marine engineering, system installations, ship repair, automation and marine chemicals.





# Thank you for your attention

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