AMMONIA TO POWER

FBK – Fondazione Bruno Kessler – Italy

The project is supported by the Clean Hydrogen Partnership
and its members Hydrogen Europe and Hydrogen Europe Research.

April 2023

AMON Press Release

Project Acronym	AMON
Project Title	Development of a next generation AMmONia FC system.
Type	HORIZON JU Research and Innovation Actions
Project Coordinator	Matteo Testi (FBK)
Project Duration	January 1, 2023 – December 31, 2025 (36 Months)
Deliverable No.	D5.1
Dissemination Level	PU
Work Package	WP5 – Communication, Dissemination and Exploitation
Task	T5.2 – Communication Activities
Lead beneficiary	12 (EFCF)
Contributing beneficiary(ies)	1 (FBK)
Due date of deliverable	31 January 2023
Actual submission date	17 April 2023

History of Changes

Revision Version	Date	Changes	Changes made by (Partner)
1.0	15.03.2023	Draft submitted to Partners	Michael Spirig (EFCF)
2.0	12.04.2023	Final Quality check	Ilaria Alberti (FBK)

Table of Contents

History of Changes 2

Introduction 3

1. AMON PRESS RELEASE 4

2. DISTRIBUTION 6

Conclusions 10

Introduction

According to the Grant Agreement, at least two press release should be written within AMON Project and the first should concern the launch of the project (Deliverable 5.1). A first draft of the table of contents was briefly agreed during the kick-off meeting in Trento, hosted by the Coordinator - Fondazione Bruno Kessler.

At the beginning of February, the press released was officially approved by the consortium and published on different channels.

The main purpose of the press release was to launch the project, fostering the interest of the scientific and academic community, as well as the industrial stakeholders and the general public.

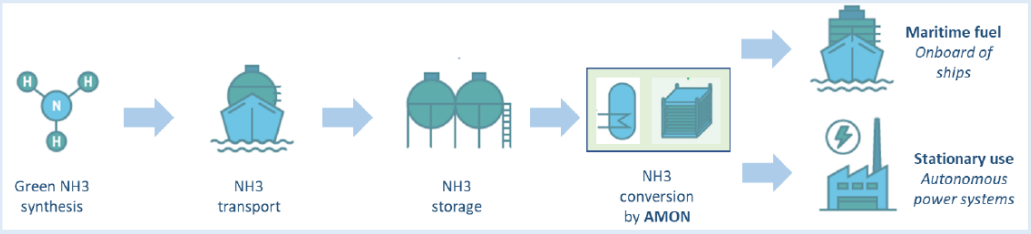
1. AMON PRESS RELEASE

This chapter reports a copy of the final draft of the press released approved by the partners.

DIRECT USE OF AMMONIA IN FUEL CELLS.
AMON PROJECT TO PAVE THE WAY FOR A NEW BREAKTHROUGH TECHNOLOGY IN EUROPE.

Trento, 3 February 2023

The kick-off meeting of the project AMON "Development of a next generation AMmONia FC system" was held on 31 January 2023 in Trento, hosted by Fondazione Bruno Kessler, and followed by a visit to the manufacturing site of Solid Oxide technology by SolydEra in Pergine. All Partners were present to launch the activities of this Horizon Europe project, which will last for 3 years and is funded from the Clean Hydrogen Partnership.



Ammonia as green energy carrier.
The energy is released by the ammonia conversion in solid oxide fuel cells:
a worldclass solution e.g. for maritime and stationary use

The overarching objective of AMON project is to develop a novel system for the utilization and conversion of ammonia into electric power at high efficiency using a solid oxide fuel cell system. The project will deal with the design of the basic components of the system including the fuel cell, an ammonia burner, ammonia resistant heat exchangers, the engineering of the whole Balance of Plants, and validation of the compliance with ammonia use for all the specific parts and components. Optionally, depending on system needs, an ammonia cracker and anode gas recirculation will be developed.
Fundamental for the project is the interdisciplinary consortium of 13 partners coordinated by Fondazione Bruno Kessler, through the Centre for Sustainable Energy. Renowned industrial leaders such as SolydEra (Italy), Alfa Laval Technologies AB (Sweden), Alfa Laval Aalborg AS (Denmark), Alfa Laval SPA (Italy) and SAPIO Produzione Idrogeno Ossigeno Srl (Italy), KIWA Nederland BV (The Netherlands) and KIWA Cermet (Italia) will collaborate with prominent research institutes such as Fondazione Bruno Kessler (Italy), Teknologian Tutkimuskeskus Vtt OY (Finland), Technical University of Denmark (Denmark), Ecole Polytechnique Fédérale De Lausanne (Switzerland), European Fuel Cell Forum AG (Switzerland) and Fachhochschule Zentralschweiz - Hochschule Luzern (Switzerland).

Why is ammonia important?

Ammonia production accounts for around 45% of current global hydrogen consumption, i.e. 33 million tonnes (Mt) of hydrogen in 2020, essentially fossil-derived. Replacing conventional ammonia with renewable ammonia produced from renewable hydrogen presents an early opportunity for action in decarbonising the chemical sector. As a transportable and storable energy carrier with high hydrogen energy content, it assists the H_2 economy and can also promote new flexible stationary power generation.

What is the purpose of the project and what impact is targeted?

The goal is to demonstrate highly efficient, direct conversion of ammonia in fuel cells. Such a breakthrough would enable further major steps towards a sustainable energy economy. For instance, ammonia is also proposed as hydrogen carrier for long-range transport: new applications being explored include renewable ammonia as zero-carbon fuel in the maritime sector and for stationary power generation. Green ammonia is considered suitable for

deep decarbonisation of the shipping sector, where it is a common commodity stored and transported in harbour environments with dedicated infrastructure and storage facilities. Furthermore, harbours are particularly exposed to strong load changes when ships dock or leave the ports. The use of fuel cell systems would be an opportunity to stabilise and support the port grid with localised power generation units. Running on a very likely future marine standard fuel, ammonia can be used to generate electricity without CO_2 emissions. Ammonia can be produced from fully renewable sources at economically viable costs in various parts of the world, representing therefore an important vector to cover Europe's energy import needs towards 2030. In REPowerEU it accounts for 20% of target final consumption of hydrogen at 2030 equivalent to 4 Mt of Hydrogen, mainly through import.

How to achieve the goals?

For the development of the solid oxide fuel cell, a G8X stack from SolydEra will be utilized, first validated in the laboratory at the level of single cells, for electrochemical properties, degradation, and post-operation analysis, at the level of single repeating units for the validation of interconnects and sealing components, and at the level of stacks and stack modules. An overall ammonia fuel cell system will be engineered and manufactured by Alfa Laval to be tested in a relevant environment in a port area (Venice) by SAPIO. The final system will be a 8 kWe, with a heat management system and a possible ammonia cracker. It will aim at an overall electrical efficiency of 70%.

"The *Amon project will realize a breakthrough for the direct conversion of ammonia in Solid Oxide Fuel Cells*" states Luigi Crema, Director of the Centre for Sustainable Energy of FBK, and AMON project coordinator. "*Ammonia will become an important energy carrier for Europe, and as indicated in the Repower EU Report, it may constitute 40% of hydrogen imported in EU @2030. Ammonia will thus be important for the maritime and shipping sector, for autonomous power systems and remote datacentres, and for all applications where large amounts of energy need to be stored in small quantities. As Fondazione Bruno Kessler we are strongly motivated and glad to support AMON and drive the project to a successful impact*"

Representatives of AMON Consortium at Fondazione Bruno Kessler

Representatives of AMON Consortium during the visit at SolydEra

Contacts of the Coordinator:
Luigi Crema crema@fbk.eu - Center for Sustainable Energy | FBK

2. DISTRIBUTION

This chapter reports the channels where the press release was distributed.

Fondazione Bruno Kessler

The Press release was published by the Coordinator in two languages English and Italian, on the media section:

1. https://www.fbk.eu/it/press-releases/uso-diretto-dellammoniaca-nelle-celle-a-combustibile/
2. https://www.fbk.eu/en/press-releases/direct-use-of-ammonia-in-fuel-cells/

The media section is a web page where FBK publishes press releases launched with FBK logo or initiatives in which FBK participates. These are substantially news and unique contents destined to traditional medias: radio, TV, journal papers.

The news, in English, was also published by the Centre for Sustainable Energy of FBK: https://energy.fbk.eu/news

The news was then posted on LinkedIn with both accounts, and Twitter with FBK account:

1. FBK LinkedIn account: https://www.linkedin.com/posts/fbkresearch_uso-diretto-dellammoniaca-nelle-celle-a-activity-7040621049486487552-FKzy?utm_source=share&utm_medium=member_desktop
2. FBK Twitter account: https://twitter.com/FBK_research/status/1634852485205508097/photo/1
3. FBK Sustainable Energy: https://www.linkedin.com/feed/update/urn:li:activity:7033471747131682817

After a few days, the post of the Centre for Sustainable Energy had received a lot of visualisation (1.371) and was reposted 8 times.

The LinkedIn post of the Centre for Sustainable Energy was then reposted by the Clean Hydrogen Partnership, which surely give a much wider visibility on a European level.

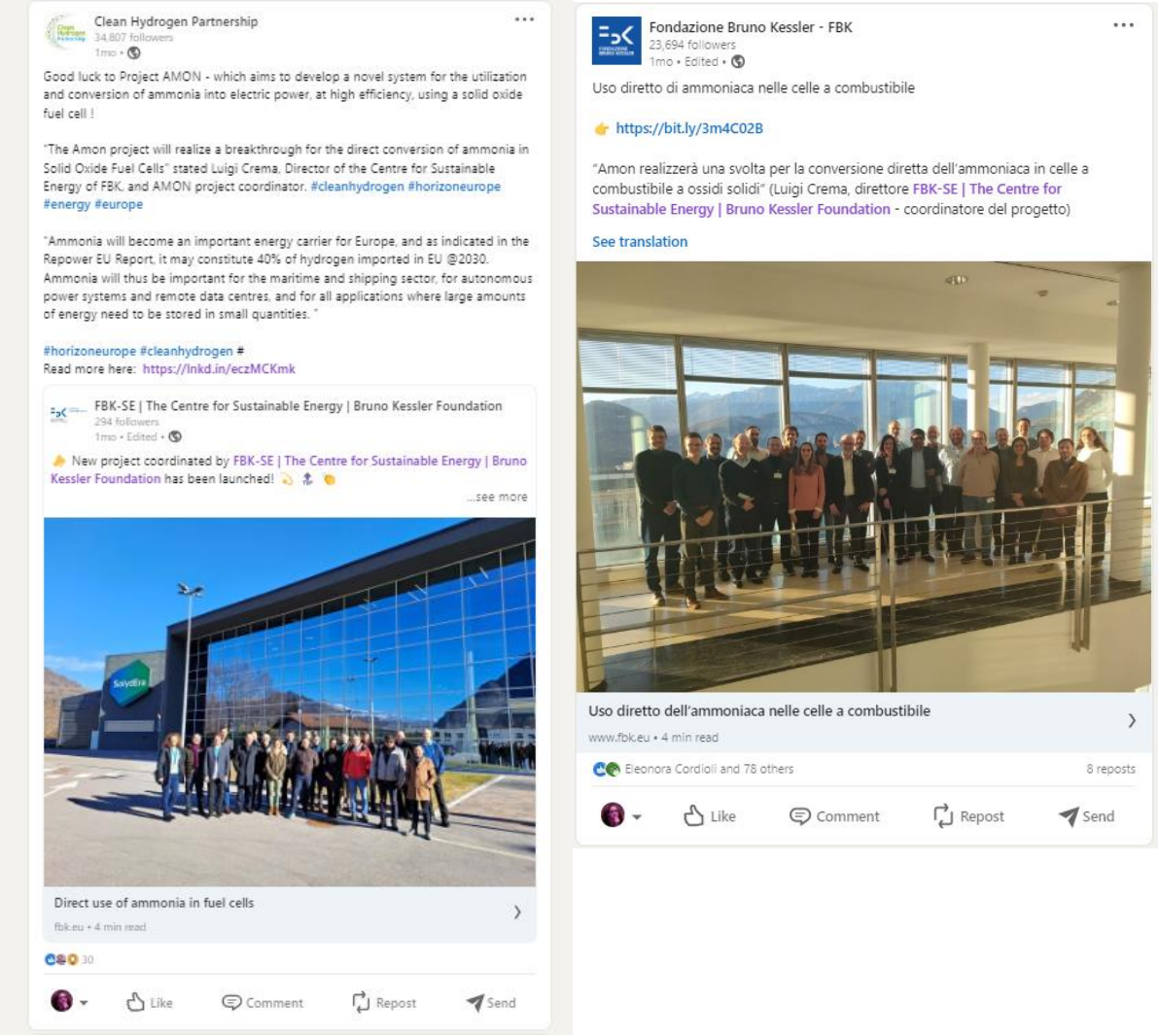


Figure 1. Screenshot of the post published by FBK (LinkedIn) and by the Clean Hydrogen Partnership

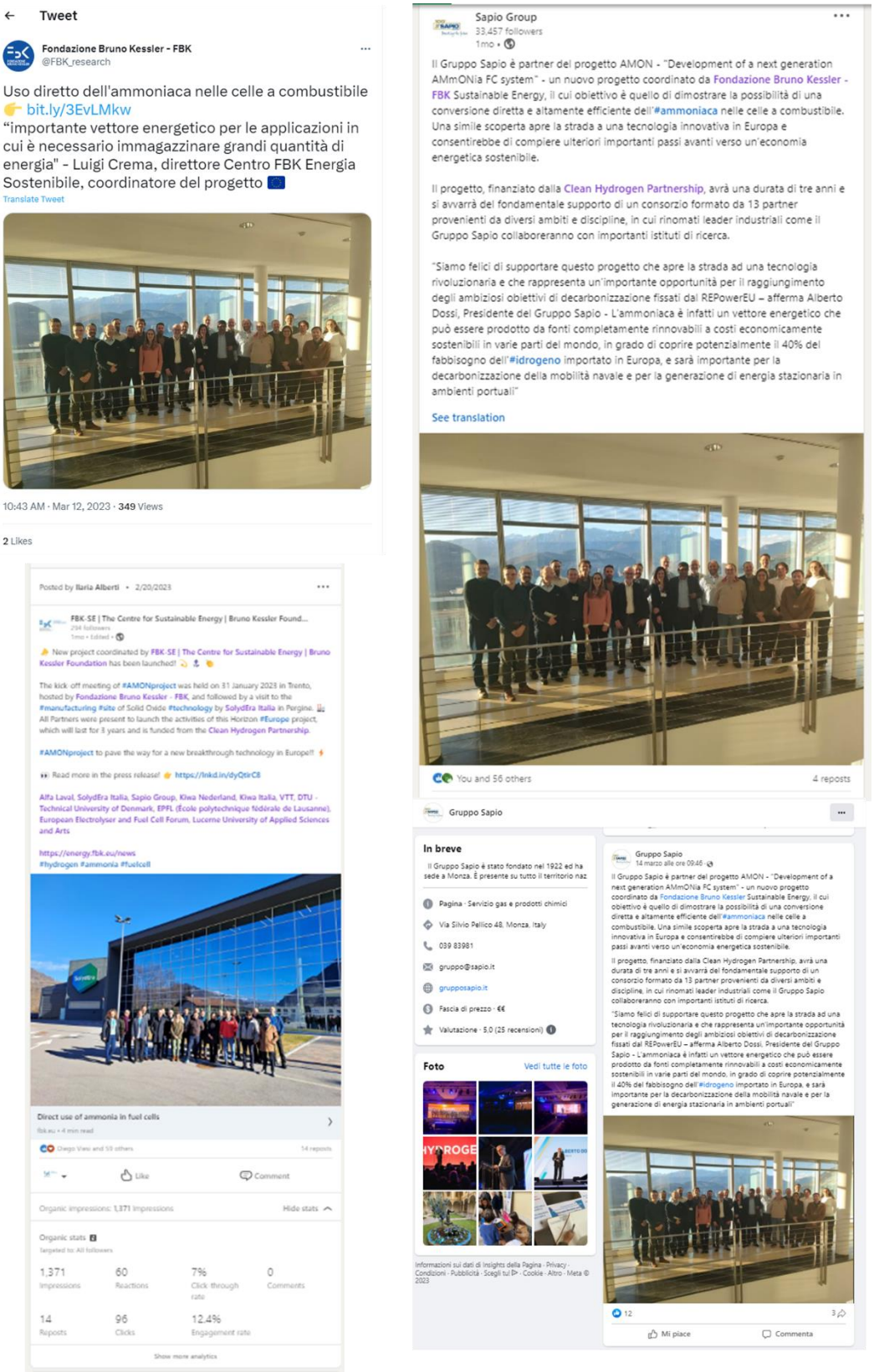


Figure 2. Screenshot post FBK (Twitter), FBK SE (LinkedIn), Sapio (LinkedIn and Facebook)

SAPIO Produzione Idrogeno e Ossigeno

SAPIO launched the press release only via social media: Facebook and LinkedIn. The latter was then re-posted by the Centre for Sustainable Energy:

1. Sapio Facebook: https://m.facebook.com/story.php?story_fbid=797331555305353&id=100050855481054
2. SAPIO LinkedIn: www.linkedin.com/posts/grupposapio_ammoniaca-idrogeno-activity-7041327390882508800-9Z2R?utm_source=share&utm_medium=member_desktop
3. FBK – Centre for Sustainable Energy: https://www.linkedin.com/feed/update/urn:li:activity:7041488345616527362

Solydera:

SolydEra published both the versions, in English and in Italian, on the website: https://solydera.com/en/direct-use-of-ammonia-in-fuel-cells/

EPFL:
EPFL published the English version on the website https://actu.epfl.ch/news/direct-use-of-ammonia-in-fuel-cells-2/

EFCF here:
EFCF published the English version on the website: https://www.efcf.com/partners/int-projects

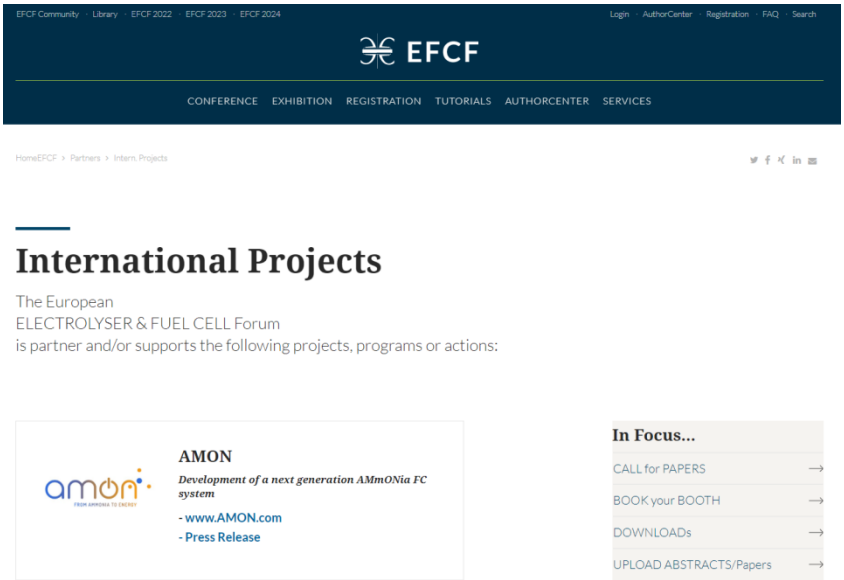


Figure 3. Screenshot website EFCF

The press release will be published on the AMON website, which is still under construction, and will be reposted on social media channels, once they will be opened.

Notwithstanding, just few partners published the press release, a good visualisation has been reached.

Conclusions

The Consortium prepared and distributed through different communication channels the first AMON press release. The impact of the press release was indeed moderate to high in the social media such as LinkedIn, but moderate on the official channels of newspapers and national TV channels. For this purpose, a new press release more focused to this second communication target will be planned as soon as there will be some relevant project result to be communicated.
This should happen at about month six of the AMON project, in correspondence with the finalization of the initial process flow diagram (PFD).

AMMONIA TO POWER

Clean Hydrogen Partnership

The project is supported by the Clean Hydrogen Partnership and its members Hydrogen Europe and Hydrogen Europe Research.

Co-funded by the European Union

FBK
Fondazione Bruno Kessler
(Italy)

SolydEra
(Italy)

Alfa Laval Technologies AB
(Sweden)
Alfa Laval Aalborg AS
(Denmark)
Alfa Laval SPA (Italy)

SAPIO
Produzione Idrogeno
Ossigeno Srl
(Italy)

KIWA Nederland
BV (The Netherlands)
e KIWA Cermet (Italy)

Teknologian
Tutkimuskeskus
Vtt OY (Finlandia)

Technical University
of Denmark
(Denmark)

Ecole Polytechnique
Fédérale De Lausanne
(Switzerland)

European Fuel Cell Forum
AG (Switzerland)

Fachhochschule Zentralschweiz
Hochschule Luzern
(Switzerland)

Amon – Ammonia to power

Coordinator Contacts:
Matteo Testi testi@fbk.eu
Center for Sustainable Energy | FBK

Clean Hydrogen Partnership

The project is supported by the Clean Hydrogen Partnership and its members Hydrogen Europe and Hydrogen Europe Research.

Co-funded by the European Union