MagMeMan-HM3 Ltd

Investors document
A l'attention de Yaakov Makhtabi
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MagMeMan-HM3 Ltd

MagMeMan Ltd. is an Israeli registered company.

MagMeMan is presently owned by
Efraim Wasservogel, 100%

The name MagMeMan is a contraction for
Mag – Magnesium
and
Meman – Hydrogen (in Hebrew).

Preamble 1/3

MagMeMan System intends to replace the electric battery (Electric cars as well as static batteries)

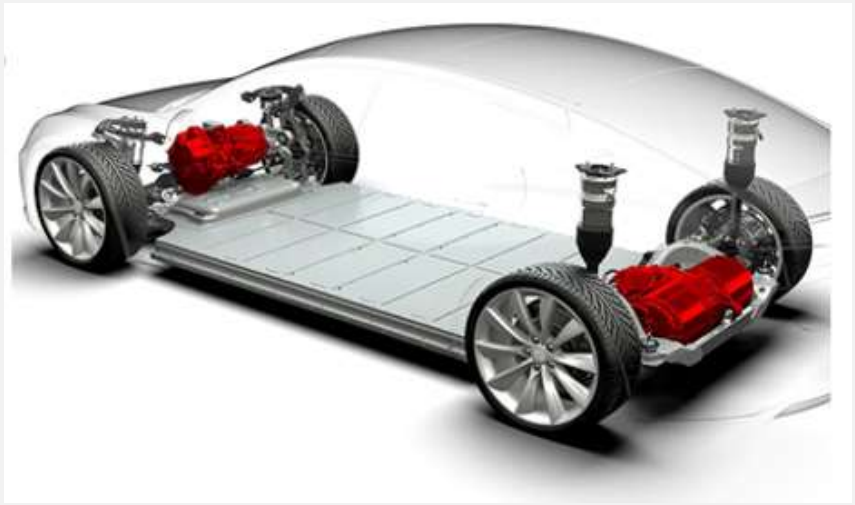
MagMeMan System is technically and product wise, a true "innovation".

It will make the life of the automobile drivers safer, easier, smoother and more comfortable.

In addition "ecologically" speaking MagMeMan System is totally clean.

Preamble 2/3

Electric vehicles are powered by Li-Ion batteries.
These batteries are big, heavy and expensive.
Moreover, their recyclability is problematic.



The battery lobby has managed to silence the medical profession: "the electromagnetic field produced by the battery on which we sit can cause cases of infertility, particularly in women".

MagMeMan offers a safe, clean and cheap solution by making the most of Hydrogen.

Preamble 3/3

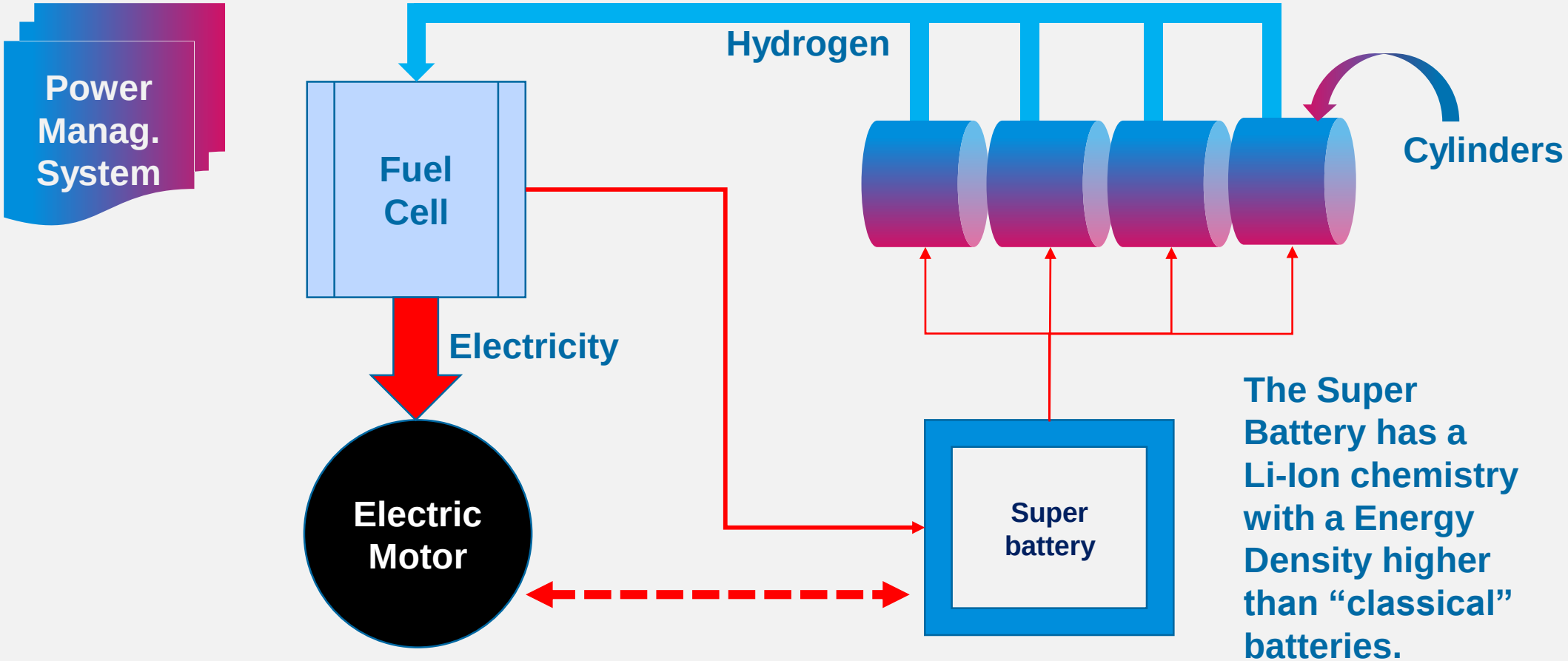
MagMeMan (an Israeli StartUp)
has developed an alternative to batteries:
MagMeMan System (M3S).

M3S' original source of power is hydrogen
and provide electricity via a Fuel Cell.

As designed, M3S
is a breakthrough.

M3S is light and significantly cheaper than a Li-Ion battery.

M3S – The product – Overall picture



The Super Battery has a Li-Ion chemistry with a Energy Density higher than “classical” batteries.

MagMeMan System: basic principle 1/3

MagMeMan System (M3S) works with
atoms of hydrogen
as opposed to
hydrogen as a gaz.

The atoms of hydrogen are stored in “cylinders”.

MagMeMan System: basic principle 2/3

A MagMeMan "cylinder",
made of Stainless steel, is 30cm of ø and 15cm length.

The cylinder is filled with a lattice of Magnesium Hydride (MgH2).

The MgH_2, contained in one cylinder is capable to absorb
680g of hydrogen (to 22kWh).
As the electric consumption of an electric vehicle is ~ 10kWh/100km,
each cylinder offers an autonomy of 220km.
As MagMeMan System is made of 4 cylinders,
the autonomy is 880km.

MagMeMan System: basic principle 3/3

A MagMeMan “cylinder” is 30cm of ø and 15cm length and it is filled with

Magnesium Hydride (MgH_2)*.

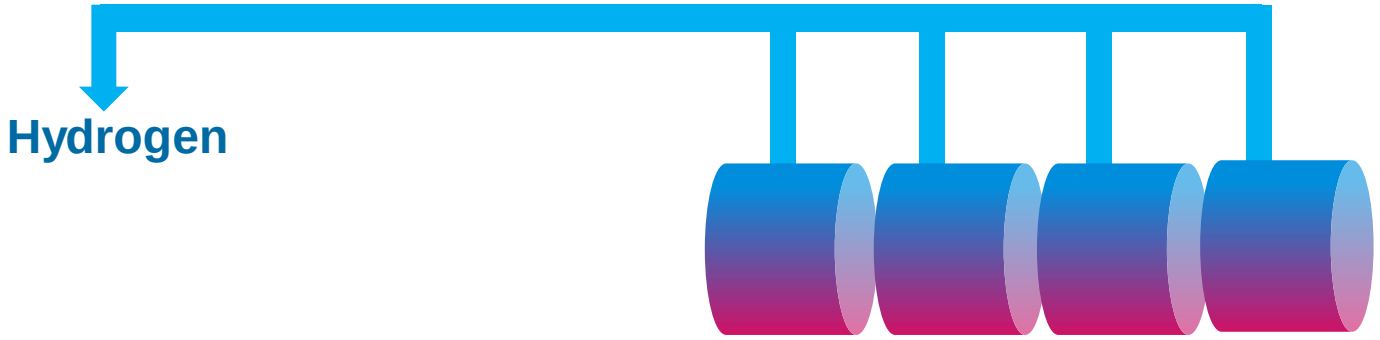
The MgH_2, contained in one cylinder is capable to absorb 680g of hydrogen which is energy-equivalent to 22kWh.

As the electric consumption of an electric vehicle is 10Wh/100km, each cylinder offers an autonomy of 220km.
As MagMeMan System is made of 4 cylinders, the autonomy is 880km.

*MgH_2 is not hazardous in low pressure and when not exposed to oxygen. Therefore the cylinder must be properly sealed.

M3S – The Product - Cylinders

The cylinders are the core of M3S



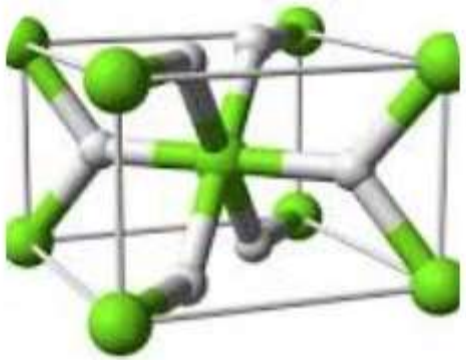
Each cylinder contains 10 pellets of Magnesium Hydride.

The cylinder absorbs atoms of hydrogen (up to 686g of H_2)
– stores the H_2 atoms –
and "desorbs" the H_2 when needed.

Each cylinder stores 22kWh of energy. The 4 cylinders store 88kWh.

MagMeMan: Central Innovation – 1

Magnesium hydride (MgH_2)



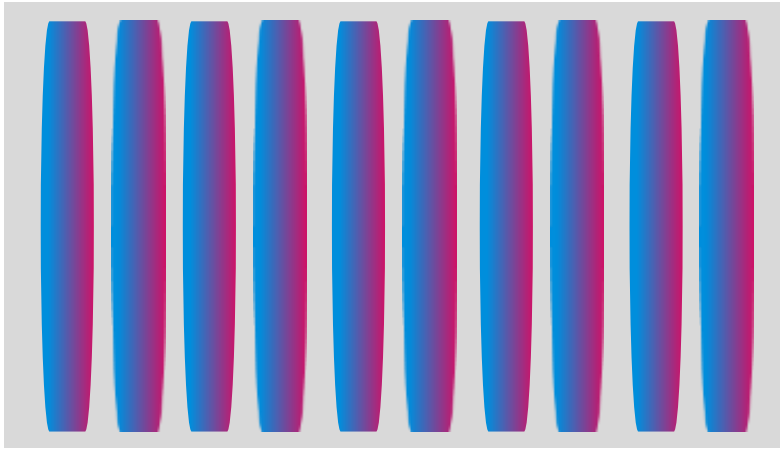
is a promising material for atoms H_2 storage due to its high storage capacity (7.6 wt%).

MagMeMan manufactures “pellets” of MgH_2 and inserts 10 of these pellets in one cylinder.

MagMeMan cylinder

A MagMeMan cylinder contains 10 “pellets”.
The pellets are made of compressed Magnesium Hydride.
Each pellet weights 1kg and can absorb 68g of hydrogen.

H_2 is desorbed from the cylinder



H_2 is injected in the cylinder

The cylinder, made of 10 pellets, stores 680g of hydrogen.
The hydrogen is injected in the cylinder at a low pressure (20atm).

MagMeMan: Risk analysis

Two risks must be overcome.

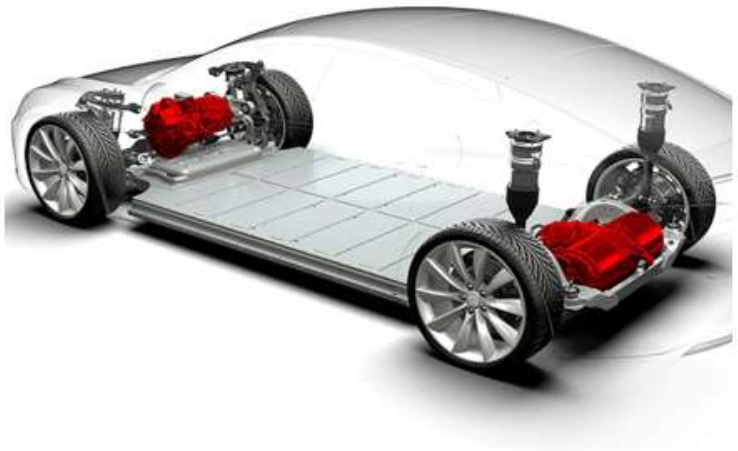
1. **Heat management**
   Hydride of Magnesium, MgH_2, absorb and desorb H_2.
   - **The absorption is highly exothermic.**
     Absorption produces heat up to 300°C… Heat management is required.
   - **At the contrary desorption is endothermic and heat must be provided.**

2. **MgH_2 is highly inflammable (pyrophoric) in presence of Oxygen.**
   This is why MgH_2 must be encapsulated in gas-proof cylinders which will in-take only H_2.

MagMeMan: Patent

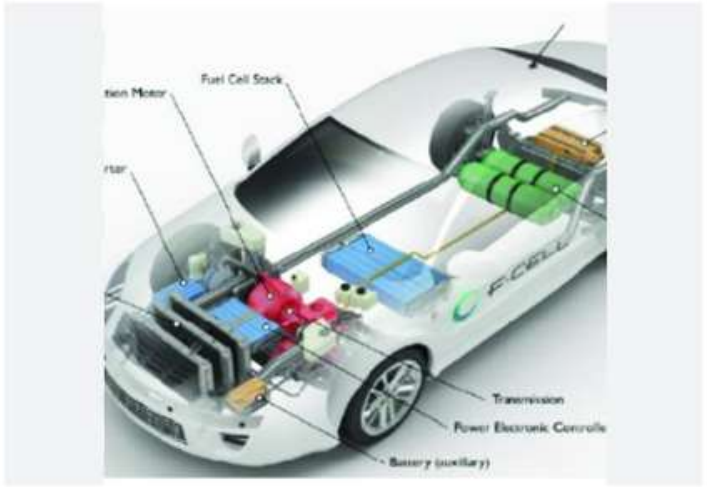
MagMeMan
has filed a Provisional Patent (63/754,613).

M3S Compared to Li-ion battery and Compressed Hydrogen



Battery Li-ion - 500kg - 50kWh

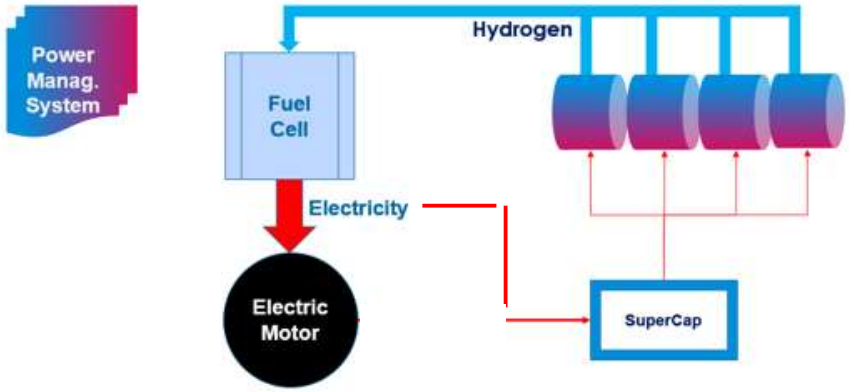
Toyota Mirai



Tanks 120 litres of compressed hydrogen at 700 Atm

MagMeMan
Hydrogen for Mobility

88kWh 50kg - 40*30cm

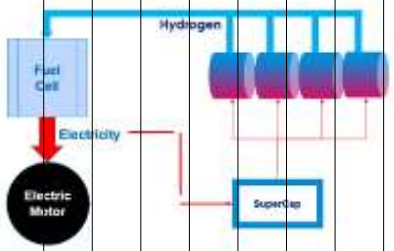


Solid hydrogen stored in Magnesium-Hydride

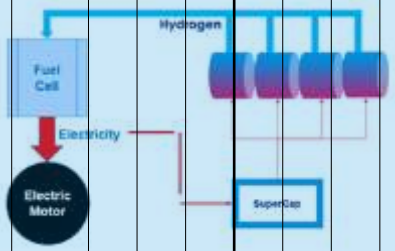
M3-H2 – Agenda & Investments

2024			2025											2026												2027												2028											
10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12

Engineering and developing the DEMO prototype of MagMeMan



Engineering and developing the INDUSTRIAL prototype of MagMeMan



Serial Production

Investment until the Demo Prototype: 2.5M$

Investment Ind. Prototype: 4.0M$

Marketing & Sales: 1.5M$

Total Investment pre-manufacturing: 8M$

Subcontracting the Manufacturing: 15M$

MagMeMan System Applications

- Vehicles
  - Private cars
  - Light delivery trucks
  - Trucks…
- Industrial applications
  - Electric backups
  - Clean electricity storage (Photovoltaic cells, windmills…)
  - Heavy electric storage…

Mobility Hydrogen Market Size

Hydrogen Vehicle Market Size was valued at USD 1.8 billion and is estimated to register an annual Growth Rate of over **28%** between 2024 and 2032." (published by GMI- Global Market Insight)
Source: https://www.gminsights.com/industry-analysis/hydrogen-vehicle-market

Hydrogen Fuel Cell Vehicle Market Size was valued at USD 0.72 billion in 2021.
The Hydrogen Fuel Cell Vehicle market industry is projected to grow from USD 1.2 Billion in 2022 to USD 46.8 billion by 2030, exhibiting a compound annual growth rate (CAGR) of 68.52% during the forecast period (2024–2030).
The trend toward clean fuels and green technology has changed due to the population boom's impact on growing pollution levels. The need to successfully reduce carbon emissions is the key market driver enhancing market growth.
Source: https://www.marketresearchfuture.com/reports/hydrogen-fuel-cell-vehicle-market-4722

What is MagMeMan looking for?

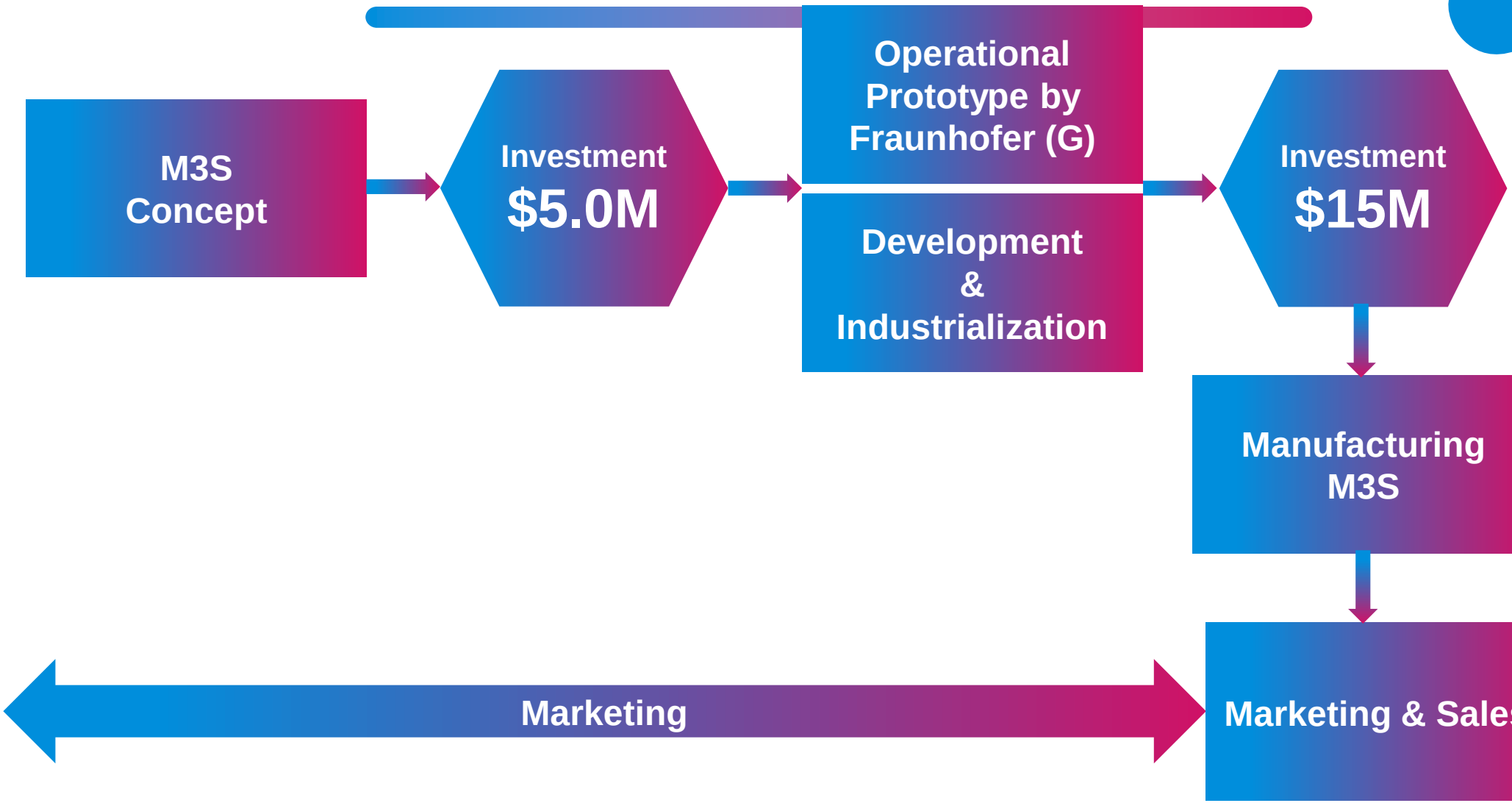
€5,000,000 to finance a full-scale operational prototype and launch the industrial development.

Proposed stake:

33% of the pre-money capital
25% of the post-money capital

Pre-money valuation:	M€15.0
Post-money valuation:	M€20.0

MagMeMan Business Model



MagMeMan – Expected Sales

Cost forecast: $1,000
Price forecast: $2,000

Year 2027 Year 1	2028	2029	2030
100,000 units	200,000 units	1 million units	2 million units
Turnover			
$200M	$400M	$2B	$4B

MagMeMan – Risks & Mitigation

New competition	Super-batteries with better power density, lighter, smaller	Super=batteries will be inservice not earlier that 2030. MagMeMan must pave its market as soon as possible.
M3S does not deliver what expected	• MgH_2 (as designed) does not absorb as much H_2 as expected • M3S' efficiency is lower than 70% • …	• Redesign of MgH_2 • Reconfigure the Fuel Cell • …
M3S' cost is significantly higher than expected		We shall be much more clever when the prototype will be manufactured

MagMeMan Team

Dr. Efraim Wasservogel
Former Executive CEO of RENAULT

Felix Trojer
M.S. and Ph.D. at Massachusetts Institute of Technology, Earth & Planetary Sciences

Laurent Isal
Advocate

INKVIZE AVOCAT

David Haddad
Founder of ITS computer and CMS electronics (Paris)

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Résumé
Efraim Wasservogel

Efraim F. Wasservogel

בס"ד

Résumé – updated February 2025

Personal

Born in Poland (Dec. 2, 1943); Married; Three children — Citizenship: Israeli, French

Education:	Mathematics, Economics	University of Paris

Professional:

- 1966	**United Nations, Caracas (Venezuela)**	Special Fund's Junior Expert
- 1967 – 1973	**Paris-University**	Associate Professor, Mathematics
- 1968 – 1976	**Renault, Headquarter-Paris**	**Executive VP, Product Engineering[1]**
- 1977 – 1985	**Battelle-Geneva[2]**	**Director**
- 1986 – 1996	**Usinor-Sacilor (Arcelor), Headquarter-Paris[3]**	- **President and CEO, "E.Metal" Ltd[4].** - **Executive VP, Automotive Division[5]**

1997 – "Aliya[6]"

- 1997 – 1998	**Bank Hapoalim**	**Director at Poalim-Shoukeon[7]**
- 1999 – 2010	**Major Israeli and European companies**	**Manager or Advisor**
- 2006 – 2013	**ELBIT Systems[8]**	- **Project Director** - **CEO – BrightWay[9]**
- 2014 – 2016	**AQUARIUS Engines Ltd[10]**	**Executive VP**
- 2017	**IAI – Israeli Aerospace Industry**	**Special Advisor[11]**
- 2018 - 2020	**ForeSight[12]**	**Advisor – Executive Committee**
- Since 2020	**Plasan[13]**	**Strategic Director**
- Since 2023	**MagMeiMan (M3)[14]**	**Co-founder and Co-CEO**

Others

- Languages: French (mother tongue), English, German, Spanish, some Polish, some Hebrew קצת עברית
- Publication: Author of "***L'Auto Immobile***" - Foreword: Pierre Dreyfus, Chairman of Renault
- Former professional pilot
- Since 1990 Technion[15] – Haifa, Honorary Life Member of the Board of Governors

[1] I have been working under the authority of Mr. Pierre Dreyfus
[2] Battelle was the 1st largest private R&D organization. Headquarted in Columbus-Ohio. Battelle runs 5 "laboratories": Columbus and Seattle in the US, Geneva and Frankfurt in Europe and Tokyo in Japan.
[3] Usinor-Sacilor (now Arcelor) is the largest worldwide steel producer – Has been acquired by MITTAL (India).
[4] "E-Metal" is the electrical division of Usinor-Sacilor with 19 mini-mills over Europe and producing 10 Mt of special steel.
[5] The Automotive Division of Usinor-Sacilor (Arcelor) is designing, manufacturing and marketing worldwide to all the OEMs and their 1st Tier suppliers all the requested steel for the Automotive Industry: Carbon Steel Stainless Steel Sheets; Carbon Steel, Special Steel and Stainless Steel bars and tubes
[6] "Aliya" means that the family moved to Israel
[7] Poalim-Shoukeon is the investment bank of Bank Hapoalim
[8] Developing Commercial and Industrial applications based on Defense technologies
[9] BrightWay is an ELBIT's daughter company designing and developing night vision systems for cars.
[10] AQUARIUS has designed and developed a Linear Thermal Engine especially dedicated to "Series" Hybrid Vehicles.
[11] Special Advisor to IAI-Robotics – Unmanned vehicles
[12] ForeSight designs and develops a 4 cameras ADAS system
[13] Plasan is producing armored vehicles
[14] MagMeMan is working on storing Solid Hydrogen
[15] The Technion is the Israeli Technology University.

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Thanks
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