HYDROGEN
ECOSYSTEM
NORTH ADRIATIC
CONFERENCE

CTS H2
CLEAN TECHNOLOGY SYSTEM
HYBRID & HYDROGEN

HydroHub: a renewable and movable HRS

Federica Zagarella, CTS H2 Project Manager

Daniele Verardo, CTS H2 General Manager

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CTS H2 BUSINESS PROFILE AND TEAM

- **BUSINESS PROFILE:** 15-years experience technology provider and system integrator of green H2 systems **from H2 production to distribution** for civil, industrial and transport applications
- **2 PATENTS:** swappable cylinders and high pressure hydrogen generation
- **3 EU PROJECTS:** partner of EIT UM H2 Cargobike, EIT UM H2 Dispenser and HORIZON NAHV
- **MEMBER OF** H2IT association and Cluster Green Tech
- **TEAM:** experienced team in company business management and research with focus on energy and hydrogen

Daniele Verardo

General Manager

Roberto Cremonese

Business Development Manager

Massimiliano Boccia

R&D Manager

Giovani Gaspar

Product Manager

Federica Zagarella

Project Manager

OUR SOLUTION IN A NUTSHELL

Realization and industrial validation of a new hydrogen **self-sufficient, movable, compact, transportable and scalable HRS**, for the on-site distribution of **green hydrogen**, equipped with **2 macro modular and movable systems**, one to manage the **storage of H2 on heavy vehicles**, and one for **distribution of cartridges for light vehicles**.

→ Integration and upgrade of already developed solutions.

UNIQUE VALUE PROPOSITION

- SUSTAINABILITY & SELF-SUFFICIENCY : 100% green hydrogen
- ACCESSIBILITY: hydrogen distribution closed to the clients for fuelling both heavy and light vehicles
- COMPACT AND TRANSPORTABILITY: the system within plug-and-play container can be dismounted and moved in different locations based on different demands or emergency with less impacting infrastructures
- SCALABILITY & ADAPTABILITY: the system can be scaled with larger storages to supply higher demand, it can be upgraded with more efficient components, an can be adapted to develop new business models
- FLEXIBILITY: grid balancing at community level

H2 REFUELING STATION CONFIGURATION (NAHV)

Heavy vehicles refueling

Possibility of **storage** energy
up to 2MWh (**seasonal** energy)

Micro-Cogenerator
(produce water 50°)

Possible **TOTAL disconnection**
from the grid

Possibility of **using 100%**
of the stored energy

UPS in case of Blackout

H2 Dispenser Unlimited
tank recharges without
cycles
100% of charge
0% discharge

100%
self-consumption of the
energy produced
by renewable sources

Energy (kWh) stored
depends on the tank and not
from the power of the system

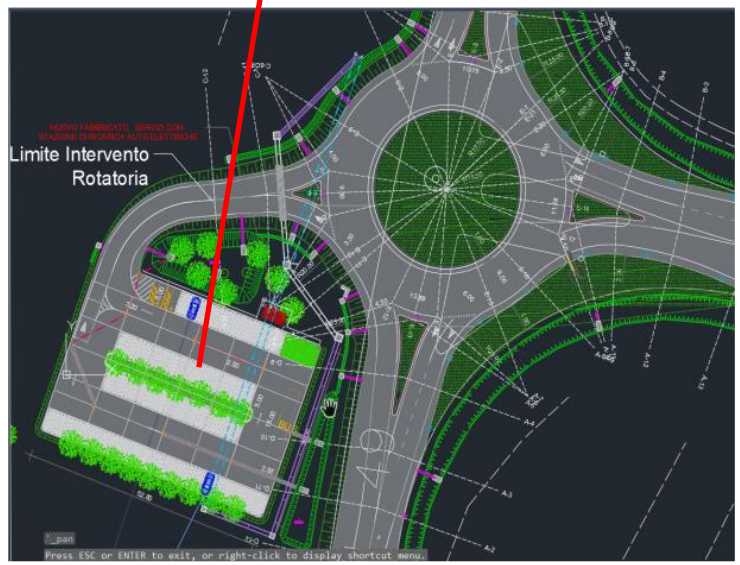
Simultaneous storage
and delivery of energy
ideal for energy
communities

H2 DISPENSER (NASHA)

- **Movable and transportable dispenser and on-site recharger of H2 cartridges for fuel cell–based light vehicles**
- connected to on-site PV system
- current model: up to 6 rechargeable cylinders
- Scalability and adaptability to different volumes and vehicles (2 to 13.5 litres)
- **Fast (2-3min) recharging time** of HFC-vehicle thanks to the **patented swapping technology**

IMPACT ON THE TERRITORY

- **H2 PRODUCTION:** 6000 kg H2 per year able to fuel buses and trucks to run 50'000 km
- **CO2 EMISSIONS:** sequestration of 56.600 kg CO2 and release of 30.000 Nmc O2 per year
- **STRATEGIC LOCATION:** a parking and service area for trucks on the motorway junction "Osoppo Gemona" of the highway «Udine-Tarvisio» (1.5 mln trucks per year)
- **INTEGRATION OF SUSTAINABLE MOBILITY AND TOURIST NEEDS:** the defined site is on the Core Network Corridors (touristic cycle path)



OUR TRL AND GO-TO MARKET APPROACH

TRL Now TRL 6

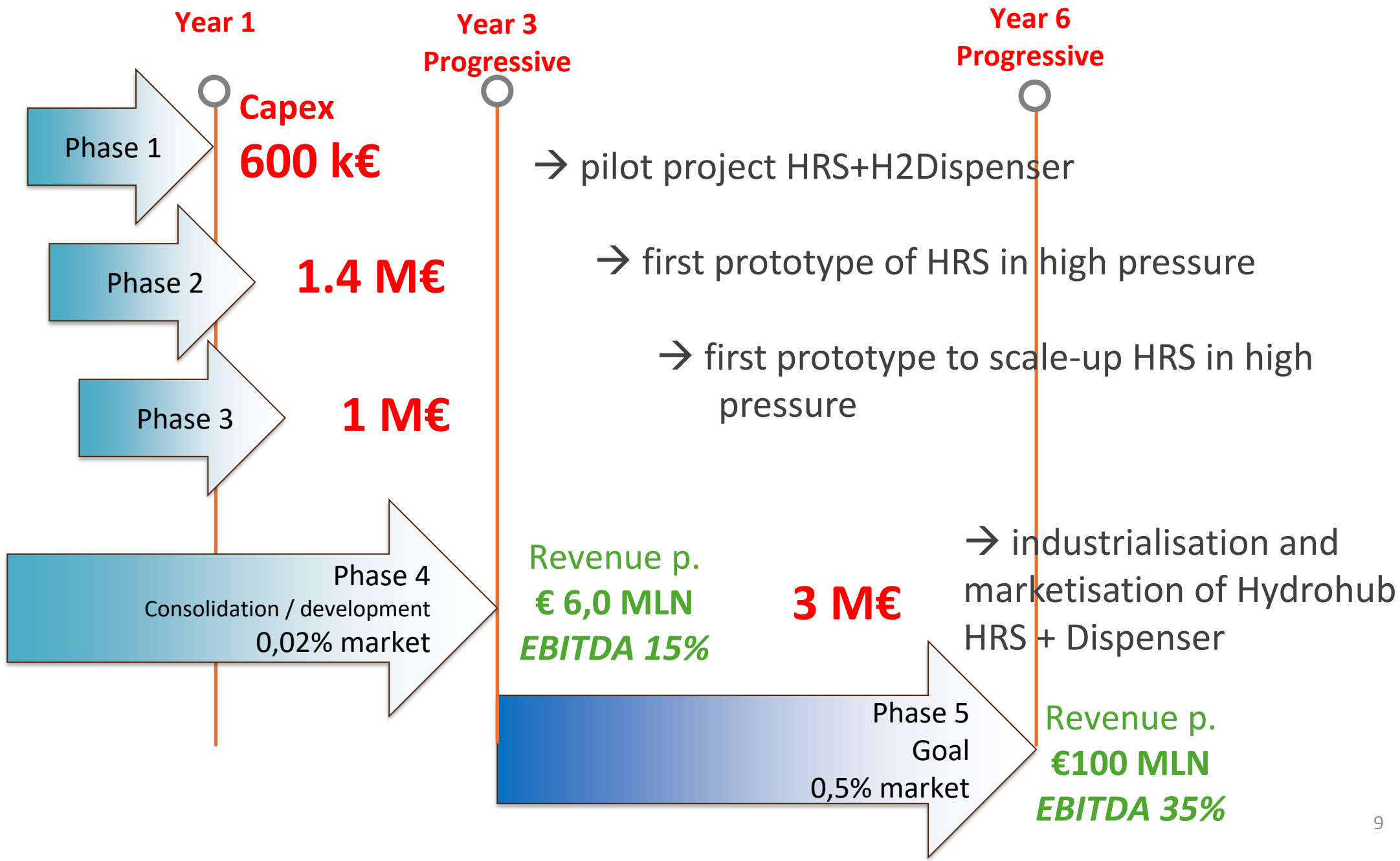
WORKPLAN 1 year for pilot realisation, including logistic works, 1 year and half for market entry, including all needed certification (thanks to EU cascade fundings)

MARKET ENTRY APPROACH: POSSIBLE CUSTOMERS

- SME interested in starting a sustainability balance towards a system for storing and producing electric energy and supplying hydrogen to forklifts and trucks at the same time
- Logistic multi-functional centres that need to fuel with zero impact vehicles for last-mile logistic in limited traffic areas
- Compact and transportable refueling stations in strategic locations – lighter administrative and authorization processes towards speeder diffusion

MARKET ENTRY APPROACH: SEARCHED PARTNERS

- investors (equity)
- industrial partners


Year 1
Year 3
Progressive
Year 6
Progressive
Capex
600 k€
Phase 1
Phase 2
1.4 M€
Phase 3
1 M€
→ pilot project HRS+H2Dispenser
→ first prototype of HRS in high pressure
→ first prototype to scale-up HRS in high pressure
Phase 4
Consolidation / development
0,02% market
Revenue p.
€ 6,0 MLN
EBITDA 15%
3 M€
→ industrialisation and marketisation of Hydrohub HRS + Dispenser
Phase 5
Goal
0,5% market
Revenue p.
€100 MLN
EBITDA 35%

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QUESTIONS?

THANK YOU.

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