



# Country Update Italy

# Policy framework

- Funding schemes as consequence of the National Research Plan (PNR) still under definition and of the SEN, National Energy Strategy
- Funding volumes: share government / industry not yet defined, but usually it will be under the EU rules
- Road maps: Trying to define once again the National Platform on Hydrogen and Fuel cells technologies





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# The situation in Italy (1)

- The Italian activities are in line with the European priorities the ones established in the MAWP
- R&D&D on hydrogen and fuel cell technologies are going on since early 80'
- Universities, research centers engaged not only performing basic research but also supporting Italian industry with applied and product oriented researches and technology transfer
- Some SMEs have developed marked ready products and started market penetration

• Some investors are aimed to realize CHP systems replacing incumbent technologies (ICE, GT, ... with FC systems (power range 50-100 kW towards

The EU Fran

MW scale)

We still miss the National H2&FC platform, ...work in progress...





# The situation in Italy: ENEA statistic(2010-13)

	Acronym	Enea Budget	Funds from FCG-JU
		(euro)	
1	H2FC-LCA	148.640	99.274
2	NELLHI	510.560	335.856
3	MCFC-CONTEX	898.910	428.008
4	COMETHY	676.127	436.773
5	FC-EUROGRID	85.184	62.595
6	SOCTESQA	516.700	285.115
7	UNIFHY	711.263	380.986
8	SCoRed 2:0	590.376	356.704
9	PREPAR-H2	81.120	46.120
10	SOL2HY2	582.963	376.570
	TOTAL	4.801.843	2.808.001





# The situation in Italy (2)

### Good news

- •Many Italian Regions have included in their own Regional Energy Plan (PER) activities concerning both development and implementation of hydrogen a fuel cell technologies :
- Sicily includes a series of actions identified by the use of hydrogen vectors, systems and components for distributed generation and cogeneration based on hydrogen and fuel cells technologies
- Sardinia: development of a program of industrial research for the production of hydrogen from renewable energy sources
- Puglia since 2005 promotes action plans to develop the scientific and technical research on hydrogen as an energy vector for the future. Construction and operation of a mobile photovoltaic structure to produce hydrogen from renewable sources and electricity with FC.
- Lazio: the local government has taken measures to promote research and production in the field of smart energy and hydrogen, with particular emphasis on-hydrogen systems and renewable energy, including photovoltaic with organic cells
- **Liguria**: Riviera Project, 5 H2&FC buses , with H2 produced by photovoltaic plant
- Piedmont, Lombardy, Campania, Veneto, Trento, Bolzano...





# Some relevant regional projects

- Civitavecchia Hydrogen Pole is operating a 100kW gasifier for hydrogen production from biowaste and developing a bus fuelled by hydrogen.
- Hydrogen Park Consortium, was promoted by Venice Industrial Union: develop H2 as a fuel and demonstrating its use in high density industrial and civilian areas.
- Ingrid Project (High-capacity hydrogen-based green-energy storage solutions for grid balancing) (Puglia) has a budget of 23.9 million (€ 3.8 million from EU) H2 from wind energy for grid balancing
- FC-Lab, Campania: realization of a fuel cells testing facility to promote the involvement of SME in the field of H2&FC technologies





# Italian excellences in FC&H2 technologies

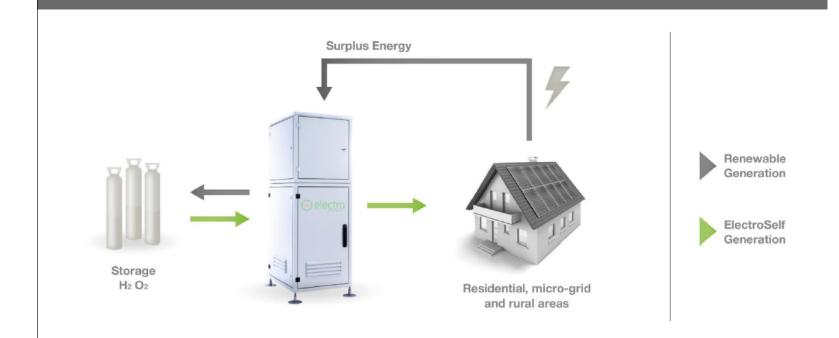
The number of Italian players in this field is growing, more and more investors or SMEs are looking at FC&H2 technologies with growing interest, among these four excellences become already a reality:

- 1. ELECTROPOWER System
- 2. Genport
- 3. Dolomitech
- 4. SOFCPOWER



# The cleanest and cheaper Energy Storage worldwide

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- the Fuel Cell generates energy and water from hydrogen.

A battery, 100% clean and cheaper than any other technology.



We also provide off-grid, micro-grid and mobility solutions...



### **UNSTABLE GRIDS - RESIDENTIAL BUSINESS CASE**

EPS hybrid solution reduces the Li-lon investment and guarantee days of autonomy in case of grid disruption, instability or long blackouts.



## **FULL OFF-GRID BUSINESS CASE**

EPS represents the perfect small storage solution. When coupled with PV, enables 100% off grid residential application.



\*Source Bloomberg New Energy Finance 2014 from actual market prices

## TELECOMUNICATIONS BUSINESS CASE

Autonomy and reliability are crucial elements for Telecom operators. EPS can provide better performance at lower costs.

- After Tohoku earthquake which affected more than 29,000 BTS, Operators have launched plans to increase backup in their network.
- 24h hours of backup is becoming the standard in Japan
- Green Base Station developments to replace Lead Acid with Li-lon
- Small Base-stations with AVG consumption of 1kW

24h autonomy

14h autonomy

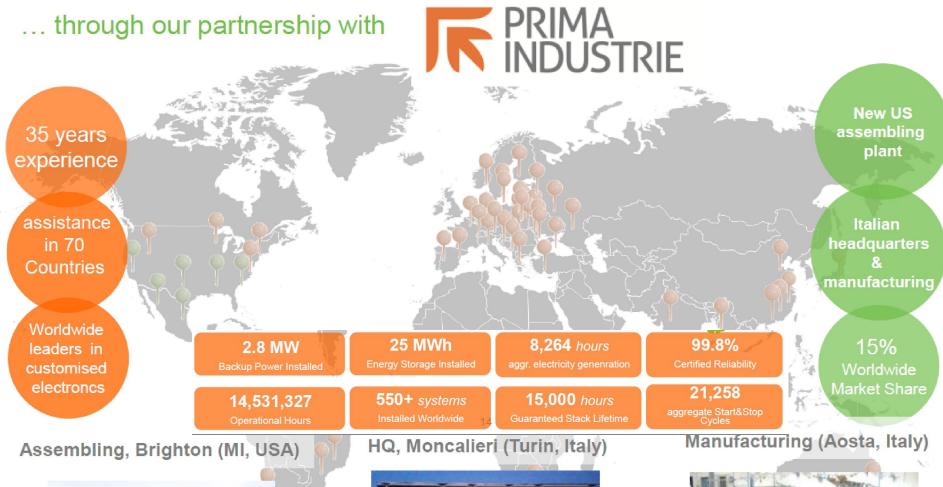
\$27,000

EPS solution @1.5kW 24kWh storage ~1125 \$/kWh

\$44,942 Li-lon Samsung SDI 14.4kWh storage

# We have a global service and assistance network...







BNC plant 100% dedicated to EPS





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Electro Power Systems S.p.A.

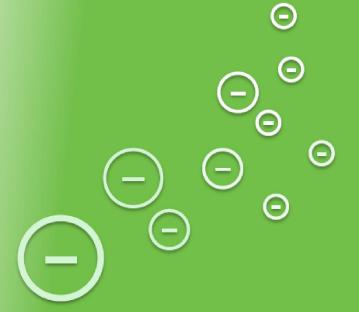
### Headquarters

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### Manufacturing

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# Clean. Smart. Ready.







# **GENPORT The Company Overview**



Headquarter in Vimercate, Italy (Vimercate Tecnology Park)

Location in West Lafayette, IN (Purdue Technology Park)



POLITECNICO DI MILANO





### **Foundation**

**Genport srl** in 2009 as spinoff Politecnico of Milan, **Genport North America Corp.** in 2012.

# **Headquarters and Laboratory**

Vimercate (IT)

# Subsidiary

West Lafayette (IN)

### **Shareholders**

Politecnico Milan, Genbee, Petrone Group

# **Technology Partners**

Texas Instruments (US), Linear Technologies (US) Arbin Instruments (US), Schunk (D), Politecnico of Milan (IT), Purdue University (IN)







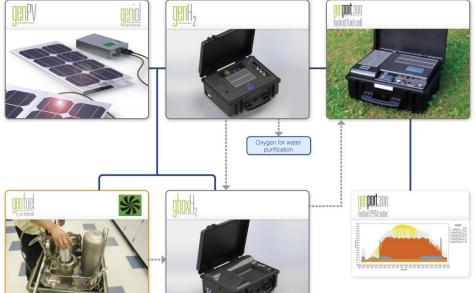


# **Making Energy Available Any Time, Anywhere**

# we power

# **Company Overview**























Lead Acid **Batteries** are Heavy, bulky, dirty, and require costly air conditioning



Gasoline and Diesel Generators are noisy & unreliable, with dangerous emissions

## **Mission**

### Small Portable & Stationary Maximize energy density

- Avoid environmental impact
- Provide reliable power in extreme conditions
- Reduce cost of energy

# **Core Technology**

# **Hybrid Power Sources**

- Fuel Cells long runtime
- Lithium Batteries easy, quick start
- H<sub>2</sub> Generation light, safe energy
- Dynamic Real Time **Optimization Controls**

# Smart Lithium-Ion Battery and M2M Energy

# **Harvesting**

- Advanced Battery Management System for monitoring, balancing, charging, MPPT
- Custom design supporting evolution

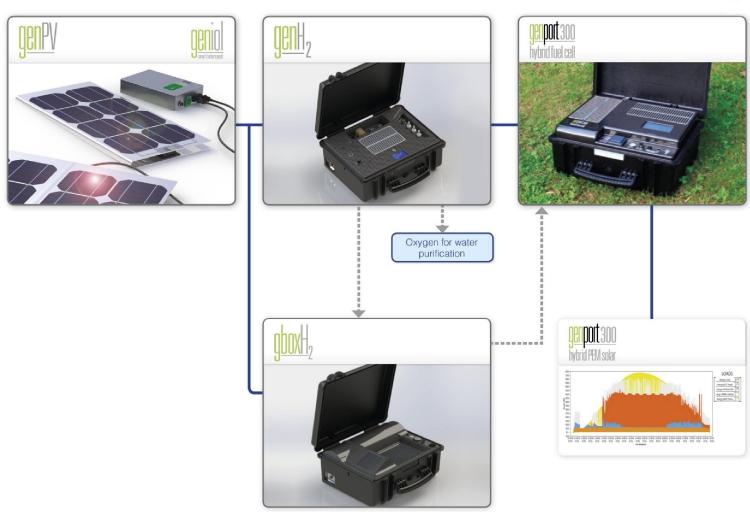
# **Intellectual Property**

- Hybrid battery fuel cell
- Sodio-boro based solid hydrogen
- Ergonomy, wearability
- Hybrid solar fuel cell
- Modular Ion lithium based energy storage
- Proprietary Know-How

### **Off-Grid Portable Power Sources**

# **G300 Platform**







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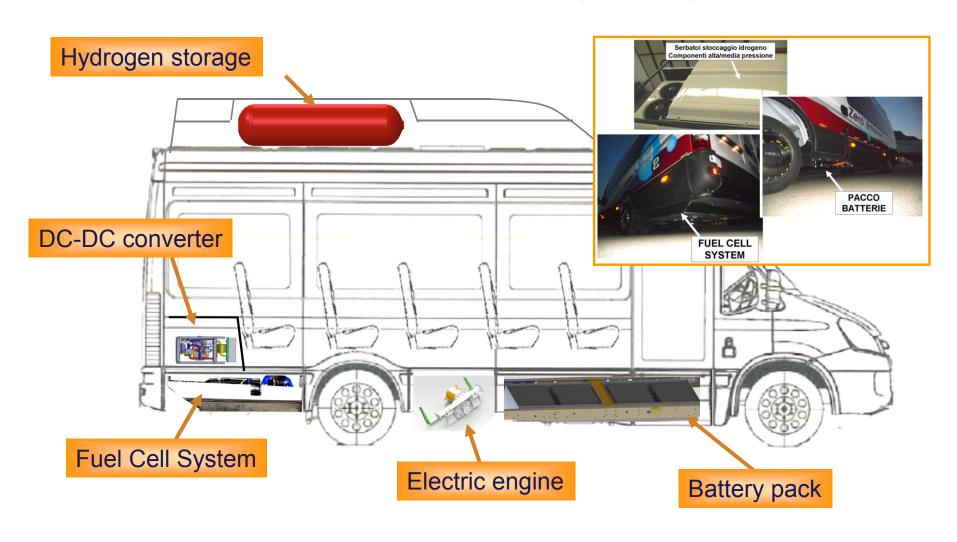




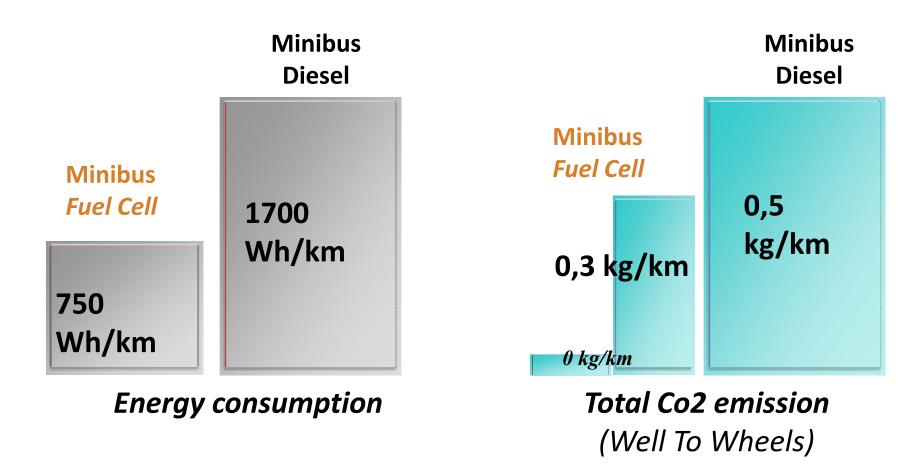




# I minibus a Fuel Cell: component and system lay-out







### International Partnership for Hydrogen and Fuel Cells in the Economy



Supplemento ordinario alla "Gazzetta Ufficiale,, n. 192 del 20 agosto 2014 - Serie generale

Spedia. abb. post. - art. 1, comma 1 Legge 27-02-2004, n. 46-Filiale di Roma



# APPROVATO IL 07 AGOSTO 2014

### DELLA REPUBBLICA ITALIANA

PARTE PRIMA

Roma - Mercoledi, 20 agosto 2014

SI PUBBLICA TUTTI I GIORNI NON FESTIVI

DIREZIONE E REDAZIONE PRESSO IL MINISTERO DELLA GIUSTIZIA - UFFICIO PUBBLICAZIONE LEGGI E DECRETI - VIA ARENULA, 70 - 00186 ROMA Amministrazione presso l'istituto poligrafico e zecca dello stato - via salaria, 1027 - 00188 roma - centralino 06-85081 - libreria dello stato Piazza G. Verdi. 1 - 00198 roma

N. 72/L

LEGGE 11 agosto 2014, n. 116.

Conversione in legge, con modificazioni, del decreto-legge 24 giugno 2014, n. 91, recante disposizioni urgenti per il setto-re agricolo, la tutela ambientale e l'efficientamento energetico dell'edilizia scolastica e universitaria, il rilancio e lo sviluppo delle imprese, il contenimento dei costi gravanti sulle tariffe elettriche, nonché per la definizione immediata di adempimenti derivanti dalla normativa europea.

# "FC contributing to energy saving"

In the list of possible measures to save energy they have added **«and or fuel cell systems with electrical efficiency higher than 48%»** 

Time limit: September 1<sup>st</sup>, 2017

Furthermore they introduced the possibility to issue, at Regional Level, new rules for building realization incorporating this new regulation to fully develop the micro-CHP based on FCs (i.e. Emilia-Romagna Region);

Worthwhile to mention already existing incentives:

- 1. Energy efficiency credits (Titoli di Efficienza Energetica (TEE)
- 2. Tax reductions (55%-50%).





### What have been the most valuable aspects or outcomes of IPHE?

- The possibility to have a constantly update vision of strategies, visions and main achievements all around the world, which are very useful tools to demonstrate that H2 and FC technologies are still alive and are gaining more and more attention and are reaching more and more concrete results entering the real market with very good products.
- Results of workshops (such as energy storage, HRS) and of working groups

### What is your greatest need that can be addressed through IPHE?

• Stimulate political commitment in Italy and engagement of younger generation new workforce

### List top 3 actions/next steps to be undertaken through IPHE.

- produce documents with IPHE logo such as position papers, shared worldwide long term vision
- Open to other bodies joining forces: for example Impact of national FCH targets on CO2 reduction in cooperation with IEA
- Overview of impact workforce: educational needs
- National Regulatory Review (see EU initiative)

### List at least 1 specific action you would be willing to support.

 Produce documents with IPHE logo such as position papers, shared worldwide long term vision National Regulatory Review (see EU initiative)