



Biogas e Biometano tra Italia e Germania:
efficienza, tecnologie e prospettive future

Convegno virtuale
13 ottobre 2020 ore 10



AHK

Deutsch-Italienische
Handelskammer
Camera di Commercio
Italo-Germanica



**MITTELSTAND
GLOBAL**
ENERGY SOLUTIONS
MADE IN GERMANY

BIOMETHANE, THE ITALIAN WAY TO MAKE TRANSPORT SUSTAINABLE

Lorenzo Maggioni, R&D CIB

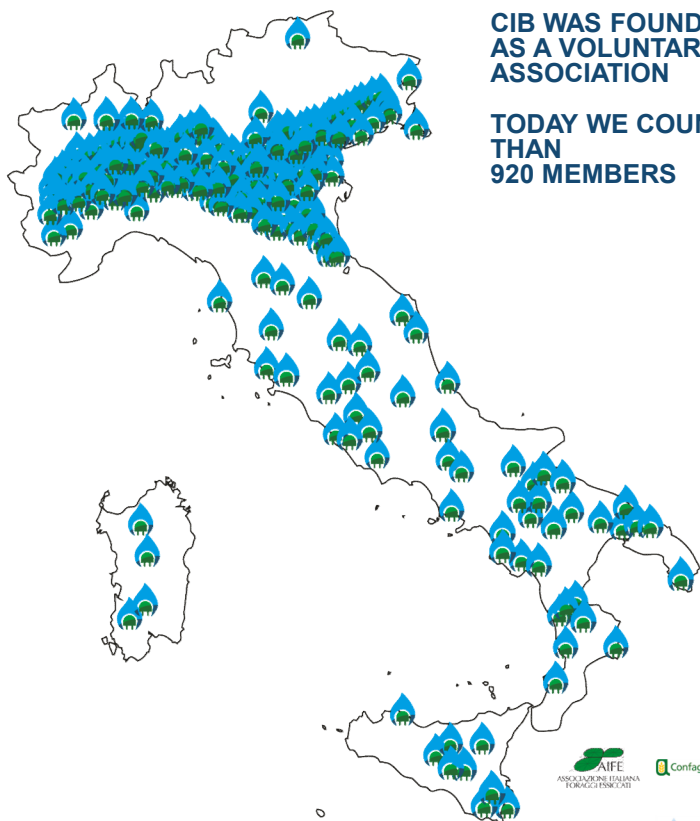
13 OCTOBER 2020



740 FARMERS

CIB WAS FOUNDED IN 2006
AS A VOLUNTARY
ASSOCIATION

TODAY WE COUNT MORE
THAN
920 MEMBERS



8 RESEARCH CENTRES AND INSTITUTIONS



CIB –Consorzio Italiano Biogas

71 BIOGAS PLANT MAKER



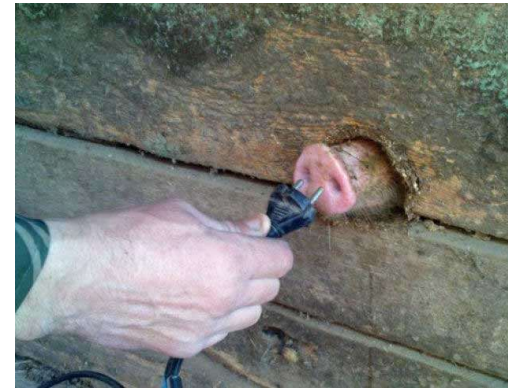
119 INDUSTRIAL AND SERVICE
COMPANIES



CURRENT SITUATION

Biogas in Italy

- **2nd European market after Germany**
- **> 4 Billion € invested in the last 6 years**
- **> 1.800 biogas plants built (*agriculture + sewage + waste + industrial*).**
- **> 1.300 MW_{el}** *(for the moment biogas used only for electricity production!)*
- **About 3 billion Nm³ Biomethane equivalent utilized per year**
- **12.000 qualified green jobs created thanks to biogas**



CURRENT SITUATION

CNG and LNG in Italy

- > 1 Bm³ natural gas / year used in the transport sector
- 1.360 CNG filling station
- 80 LNG filling station (> in the North of Italy)
- ~ 70.000 ton LNG / y in the transport sector (2019)
- 20 new LNG or LCNG station in the process of authorization
- ~ 3.000 LNG trucks
- > 1.000.000 NGV



LNG truck



LNG filling station



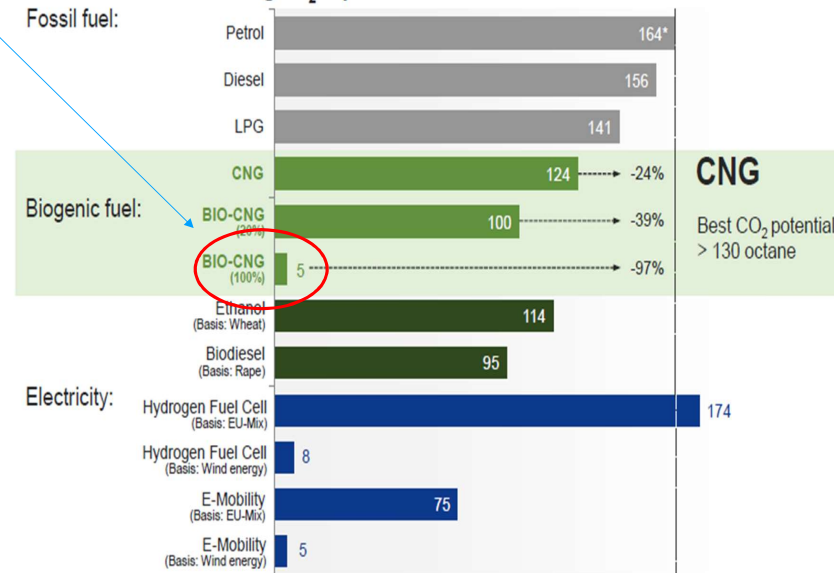
LNG filling station

Why using biomethane like a sustainable fuel?

flexible input material, flexible sale options, storable, efficient, tailored to demand, climate-friendly

- Biomethane has very low emissions
- Car engines are less noisy
- In Italy, not new distribution infrastructure needed. Natural gas grids are available
- Biomethane can be blended at any ratio with natural gas
- Thanks to “biogasdoneright®” model, it does not compete with food and can be produced in your own country
- LBM has better quality than (most) fossil LNG.
- LBM is cleaner and cheaper than other biofuels per energy unit

GHG-Emission WTW in gCO₂ eq/km

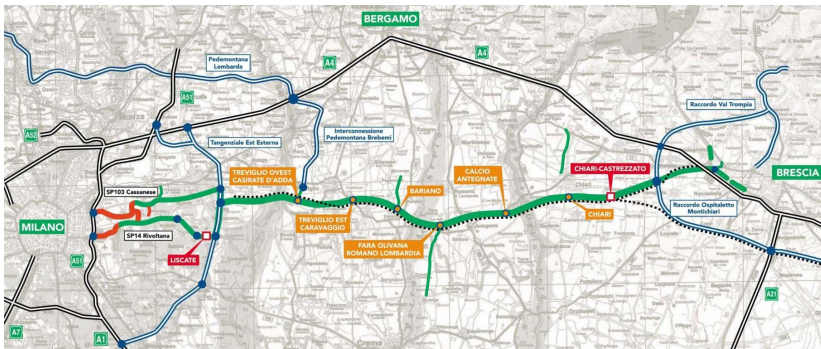


Source: DENA, JEC

*Basis: (Petrol, naturally aspirated engine), Fuel-consumption: 7l/100km

CURRENT SITUATION

Biomethane in Italy



-30% toll on
the
“BREBEMI”
highway for
LNG vehicles

Toyota C-HR 1.8 Hybrid: hybrid / petrol + CNG dual fuel system



A hybrid vehicle converted to methane can emit 24% less carbon dioxide (CO₂) than the same petrol / hybrid vehicle (data obtained by carrying out tests with PEMS - Portable emissions measurement system).

3 CNG tanks: 24+24+22 l (300-350 km range)

Snam4Mobility project in collaboration with Ecomotive Solutions and Autogas Italia.

CURRENT SITUATION

Biomethane in Italy

Dati al 31 dicembre 2019

LINEE FERROVIARIE IN ESERCIZIO 16.779 km (1)

CLASSIFICAZIONE	
Linee fondamentali	6.468 km
Linee complementari	9.361 km
Linee di nodo	950 km
TIPOLOGIA	
Linee a doppio binario	7.721 km
Linee a semplice binario	9.058 km
ALIMENTAZIONE	
Linee elettrificate	12.016 km
- a doppio binario	7.644 km
- a semplice binario	4.372 km
Linee non elettrificate (diesel)	4.763 km
LUNGHEZZA COMPLESSIVA DEI BINARI 24.500 km	
linea convenzionale	23.032 km
linea AV (2)	1.468 km

FS ITALIANE, SNAM AND HITACHI RAIL PARTNER FOR SUSTAINABLE MOBILITY: MOU ON METHANE-POWERED TRAINS

Methane converted trains will virtually eliminate particulate matter and reduce carbon dioxide emissions by about 20%. A possible replacement of 100 trains would also lead to savings of approximately 2.5 million euros per year on fuel costs.

Conversion of railcars from diesel to natural gas



(Sweden)

<http://www.rfi.it/rfi/LINEE-STAZIONI-TERRITORIO/Istantanea-sulla-rete/La-rete-oggi>

www.snam.it/en/Media/Press-releases/2019/FS-Italiane-Snam-Hitachi-Rail.html

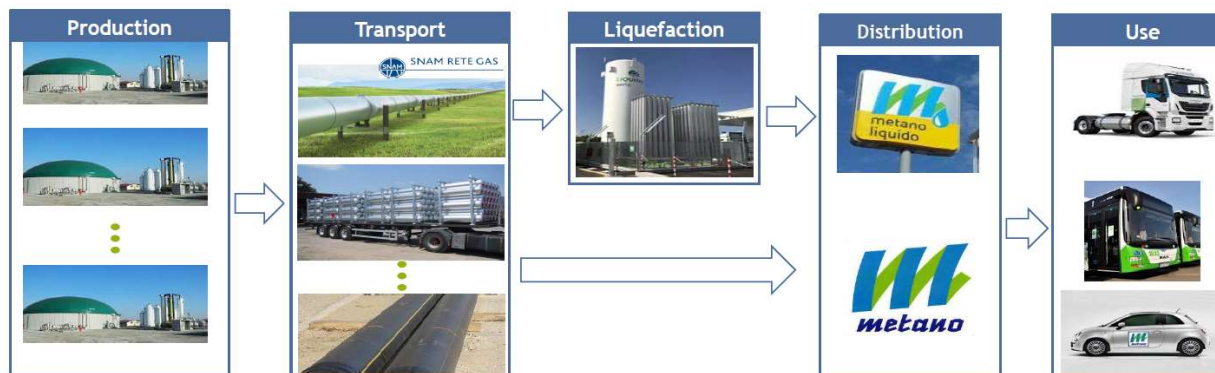
CURRENT SITUATION

Biomethane incentive scheme



Maximum biomethane
production with subsidies:
1,1 billion m³/year

100% in the transport sector



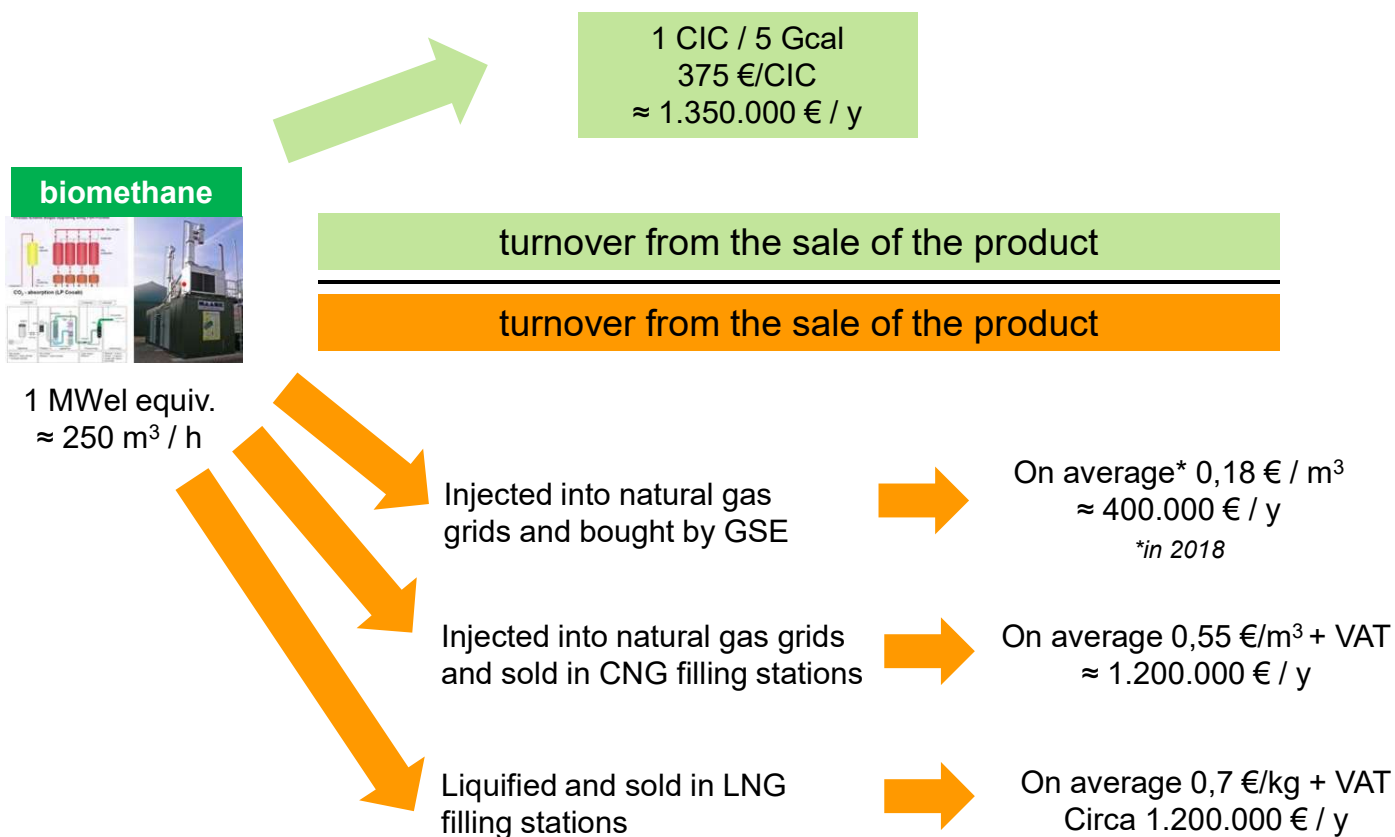
Biogas e biometano tra Italia e Germania, 13/10/2020

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Fatturato da vendita biometano

Ipotesi 1 MW_{el} equivalente



CURRENT SITUATION

Biomethane in Italy

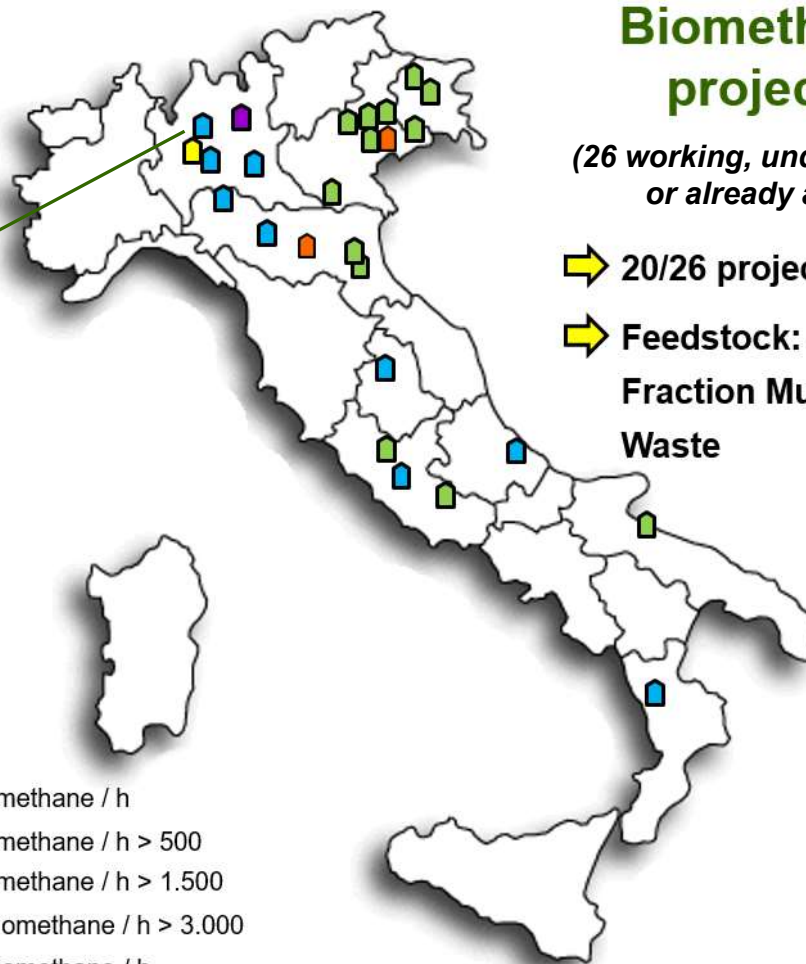
Grid connection type	City/Town	Biomethane Feed-in Capacity (m3/h)	Substrates used	Upgrade process	Start of operation
Transport	Montello (BG), Lombardia region	3750	OFMSW	MEM	2017
Transport	Sarmato (PC), Emilia Romagna region	500	OFMSW	MEM	2019
Transport	Este (PD), veneto region	2000	OFMSW	MEM	2019
Transport	Maniago (PN), Friuli Venezia giulia region	3000	OFMSW	MEM	2019
Distribution	Foligno (PG), Umbria region	500	OFMSW	MEM	2019
Transport	Bresso (MI, Lombardia region	120	SEW	MEM	2019
Transport	Rende (CS), Calabria region	600	OFMSW	MEM	2019
Transport	Faenza (RA), Emilia Romagna region	2000	FAB	MEM	2019
Distribution	Guglionesi (CB), Molise region	500	OFMSW	MEM	2019
Transport	Trento (TN), Trentino alto Adige region	500	OFMSW	MEM	2019
Transport	Codigoro (FE), Emilia Romagna region	600	FAB	PHS	2020
Ditribution	Anzio (RM), Lazio region	450	OFMSW	PHS	2020
Transport	Bottrighe (RO), Veneto region	450	FAB	PHS	2020
Distribution	Finale Emilia (RE), Emilia romagna Region	350	OFMSW	PSA	2019
Transport	Sant'Agata Bolognese (BO), Emilia Romagna region	1000	OFMSW	WS	2019
Transport	Corbetta (MI), Lombardia region	635	AGR	MEM	2020
Distribution	Pinerolo (TO), Piemonte region	800	OFMSW	PHS	2020
[Bio-LNG]	Candiolo (TO), Piemonte region	300	AGR	PSA	2020

OFMSW: Organic Fraction Municipal Solid Waste; SEW: sewage; FAB: Industrial Organic Waste from Food and Beverage Industries; AGR: agricultural residues
MEM: membrane; PHS: Physical Scrubbing WS: Water Scrubbing; PSA: Pressure Swing Adsorption



First agricultural plant.
Injection into the
natural gas grid:
December 20th, 2019
600 m³ CH₄ / h

-  < 150 m³ biomethane / h
-  151 < m³ biomethane / h > 500
-  501 < m³ biomethane / h > 1.500
-  1.501 < m³ biomethane / h > 3.000
-  > 3.001 m³ biomethane / h

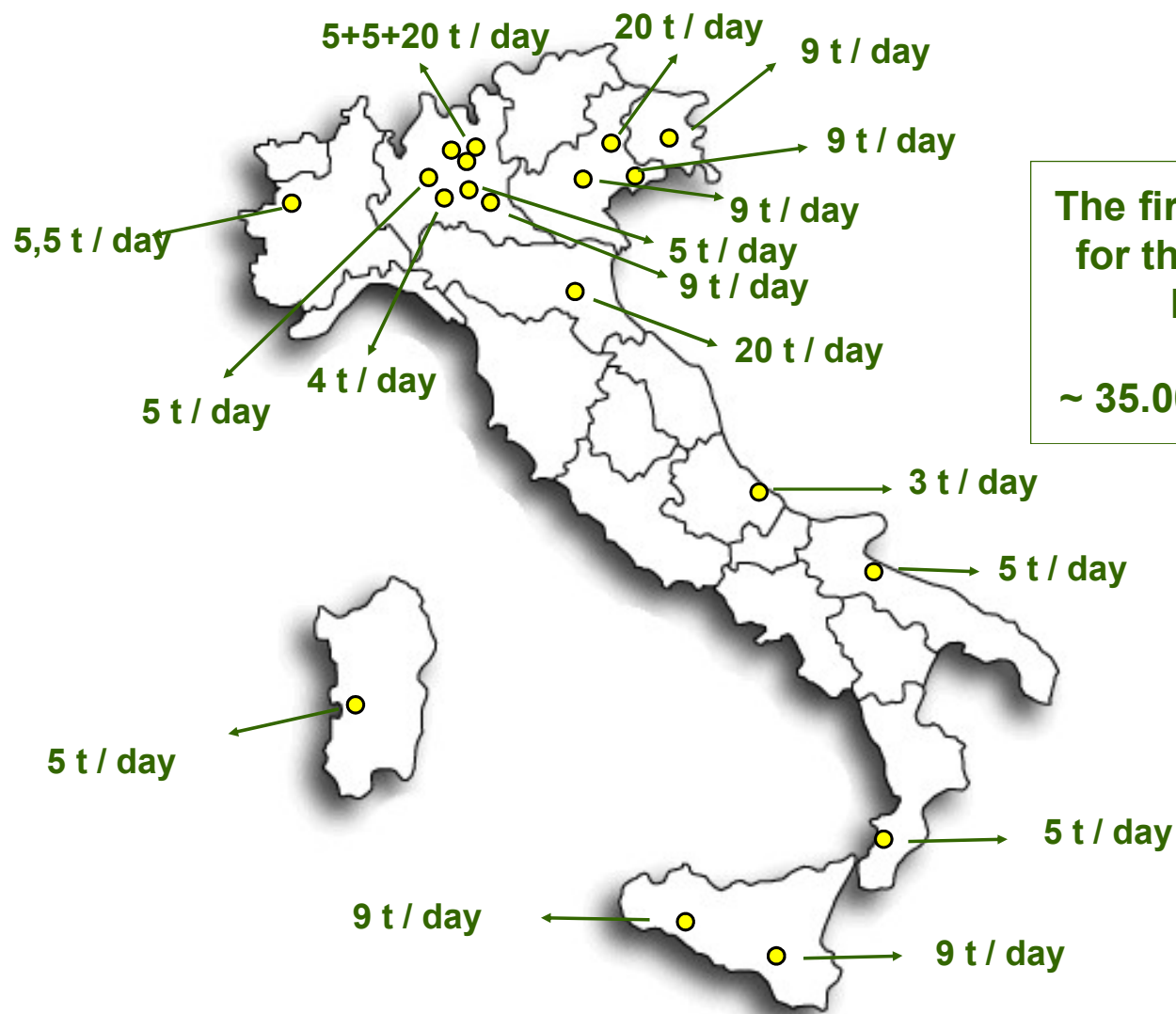


Biomethane projects

*(26 working, under construction
or already authorized)*

➡ 20/26 projects: membrane

➡ Feedstock: actually > Organic
Fraction Municipal Solid
Waste



**The first Italian projects
for the liquefaction of
biomethane**

~ 35.000 ton bioLNG / y

CASE STUDY 1

Cooperativa Speranza, Candiolo (TO)



- 2 existent biogas plants (1 + 1 MW_{el})
- First bioLNG Italian plant
- 100% agricultural by-products
- Entry into operation: January – February 2020
- 5,5 t bioLNG/d



1.000
KW_{th} / h



Candiolo Cancer Institute

CASE STUDY 1

Cooperativa Speranza, Candiolo (TO)



- 2.000 t bioLNG / year
- 25% Maganetti SpA fleet fueled 100% by bioLNG



Biogas e biometano tra Italia e Germania, 13/10/2020

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CASE STUDY

Why (bio)LNG?

Supply	Diesel	LNG
Model	Veicolo a Gasolio	Iveco Stralis 400 NP
Medium consumption	3,2 km/L	3,5 km/L
Fuel cost	0,9 €/L	0,75 €/L
Purchase cost	€ 100,000	€ 130,000
Maintenance in 5 years	€ 19,200	€ 21,000
Auto tax li 5 years	€ 4,100	free
Urea	€ 5,850	free
National incentive		- € 20,000
Cost in 5 years 500.000 Km	€ 269,775	€ 245,286
Savings Using LNG	€ 24,489	

Economic data of LNG Valtellina
Logistica Sostenibile Project

CASE STUDY

Why (bio)LNG?

Vehicle fleet in 2016	12 Iveco Stralis 330 LNG
Vehicle fleet in 2017	27 Iveco Stralis 400 N.P.
Vehicle fleet in 2018	3 Iveco Stralis 460 N.P.
School Bus Gera Lario nel 2017	1 Iveco CNG (28 posti)
Kilometers routes	3,007,000 km
LNG used	859,000 kg
average consumption	3.5 km/kg
Saved GHG towards diesel vehicle (€ 6 LimitS)	CO ₂ : – 373,000 Kg (– 15 %)* NO _x : – 3,800 Kg (– 70 %)* PM: – 1,700 Kg (– 99 %)* Noise: – 6 decibel (for each vehicle)*
Refueling station LNG MANGANETTI of Gera Lariano	In operation from 13 September 2016
LNG provided by the refueling station	1,100,000 Kg

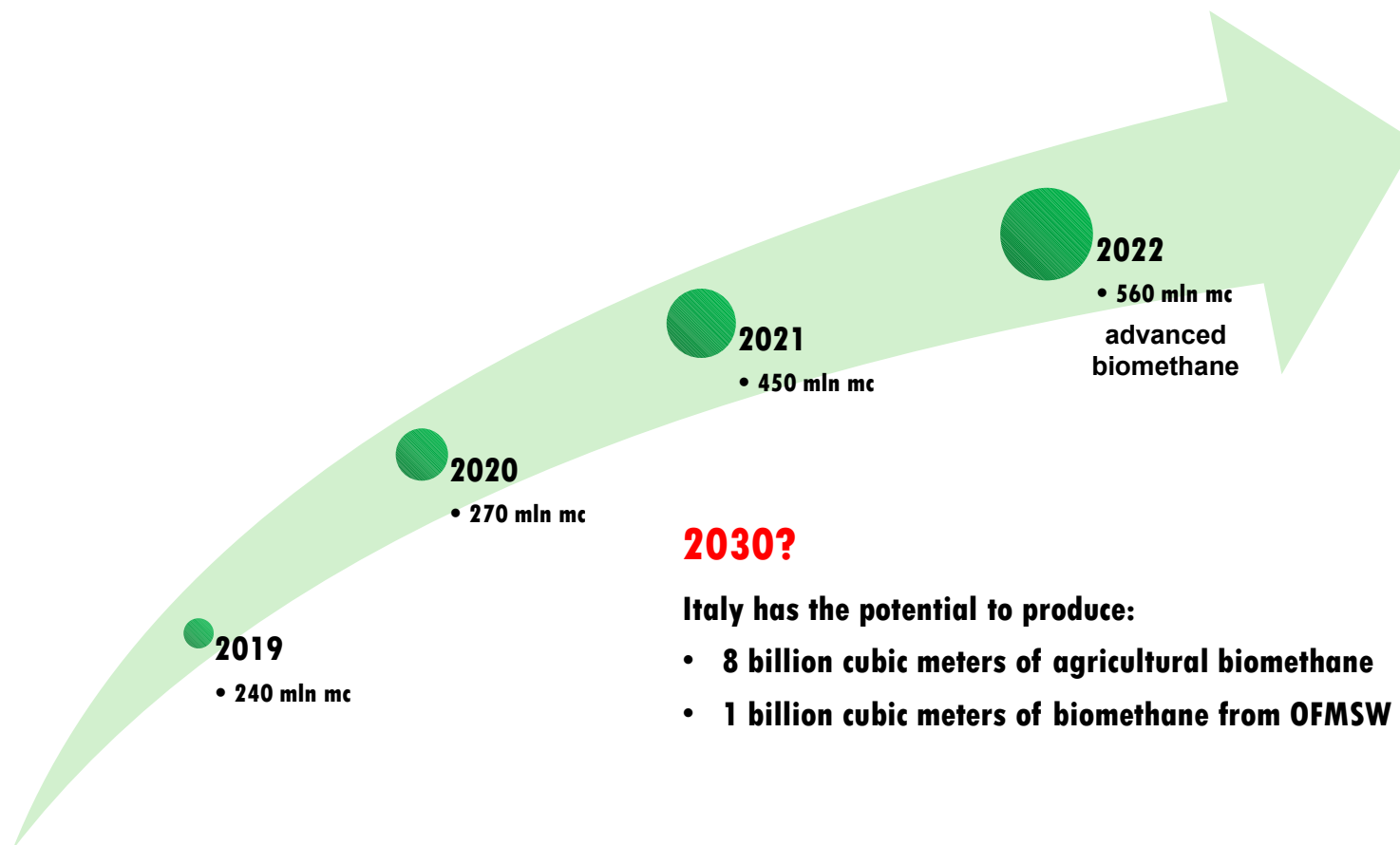
60 - 100% if bioCH₄

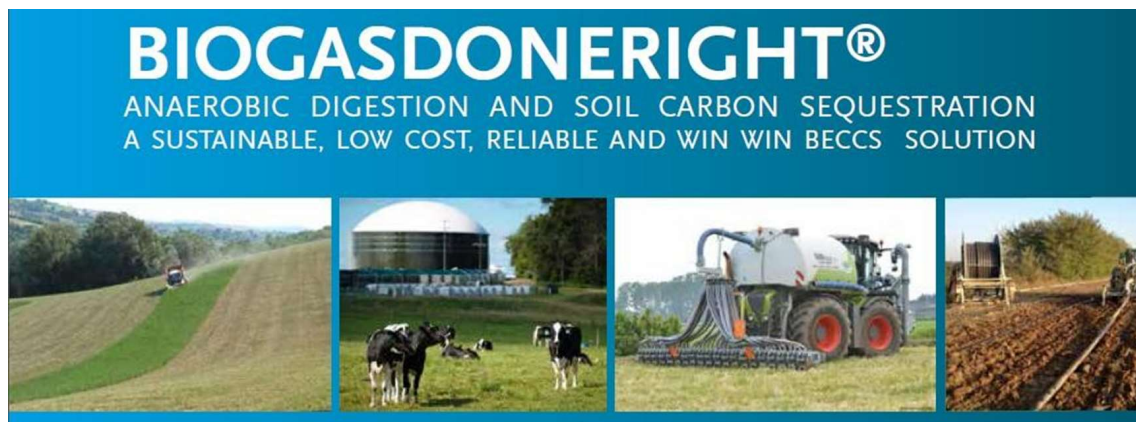
UNI/TS 11567
Guideline for the qualification of economic operators (organizations) involved in the production chain of biomethane for traceability and mass balance purposes

General project statistics and environmental savings at 1 March 2018

Figures calculated for Iveco Stralis 400 NP (Source Iveco – CO₂ emissions reduction of – 15 % compared to diesel equivalent, – 70 % NO_x, – 99 % PM, – 90 % NMHC, – 6 db vs E6 limits)

PERSPECTIVE *Biomethane in Italy*





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**Thanks for
you attention!**