

## Deliverable D7.3:

### First report on dissemination activities

<i>Work Package:</i>	<i>WP7 - Institutional Communication and Capitalization of the project results</i>
<i>Task/s:</i>	<i>WP7.2 - Dissemination activities</i>
<i>Responsible Partner:</i>	<i>CNR-IIA</i>

#### Document history

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V1	19/12/2016	<i>M. Segreto, V. Paolini, L. Paciucci (CNR-IIA)</i>	<i>F. Petracchini (CNR-IIA) S. Drigo, E. G. Facci, C. Rossi (AzzeroCO<sub>2</sub>)</i>



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## Introduction

The activities aim at widely informing about the project approach and results in order to foster and facilitate the adoption and exploitation of the methodology in different contexts. WP7 concerns the dissemination and exploitation of the scientific and non-scientific results of the project.

All the partners are somehow engaged in dissemination activities. Some results will, in the tradition of good science, be published also in peer-reviewed Journals. The release of most deliverables will take in consideration all the requirements needed by scientific journals in order to allow the publication., and thus, the actual availability to the scientific community. The project events will be organised taking advantage of the feedback obtained at different project stages. Whenever possible, the partners will try to organize thematic sessions at conferences and to participate to workshops on related topics.

Dissemination material and generic communication channels are indeed necessary to transfer knowledge elements to the widest audience. For this aim, a website was realized to inform on the project and to transfer knowledge elements to the widest audience. Brochures and dissemination materials were implemented (Deliverable D7.2) in order to facilitate the dissemination of the ISAAC objectives, structure, and achieved results to the scientific communities and general public as well.

Deliverable D7.3 is a report on the dissemination activities implemented during the first year of the project. Events, meetings, conferences, as well as activities on the web through the website and the Facebook page are described in detail.

## 1. Events and meetings

Representatives of the ISAAC project attended several conferences and meetings during the first year of the project, including:

- 1.1 REGATEC 2016;
- 1.2 EUBCE 2016;
- 1.3 PADUA Conference “Dal biogas al biometano: un nuovo capitolo per le energie rinnovabili”.

## 1.1 REGATEC 2016, 10-11 May at Scandic Triangeln, Malmö, Sweden

*“Bringing science, technology and industry together”*

*3<sup>rd</sup> International Conference on Renewable Energy Gas Technology*

REGATEC has a technical and industrial focus and revolves around anaerobic digestion, gasification and Power-to-gas.

The conference has been characterized by 25 oral presentations, 2 poster sessions (41 posters), an exhibition (28 exhibitors) and a networking session.

The networking session (the “Network Plus”) consisted in a large number of face-to-face meetings.

The ISAAC project was present with one oral presentation and a poster.

The oral presentation (Annex 1) was performed by Lorenzo Maggioni, Head of Research and Development Department of the Italian Biogas Consortium (CIB - Consorzio Italiano Biogas e Gassificazione), one of the partners of the project. Entitled “LBM - The future of biomethane mobility in Italy. The Arborea project”, it mentioned ISAAC, due to the fact that Arborea can be one of the case studies for the participatory process to be implemented during the project.



Figure 1 - Slides of the oral presentation “LBM - The future of biomethane mobility in Italy. The Arborea project”

A poster on the ISAAC project has been presented (Figure 2). The session was the occasion to talk about the project, its main aim and measures foreseen to overcome the (non-technical) barriers that hinder in Italy a more widespread diffusion of biogas plants, the expected results.

A special focus has been given to the calculation tool (WP4) and its capacity of fostering aggregation among farmers, breeders and the other involved stakeholders to reach the minimum facility dimension needed and thus maximise economic advantages.



Figure 2 - Poster presentation at REGATEC 2016



Figure 3 - Delegate Claudia Rossi in front of the ISAAC poster at REGATEC 2016

During the two sessions, Claudia Rossi, the ISAAC representative from AzzeroCO<sub>2</sub> (Figure 3), coordinator of the project, has got in touch with different companies and institutions. Here is a brief description of them and of the information exchanged:

- Yara International ASA, Norway (Dr. Ing. Wolfram Franke): Yara converts energy, natural minerals and nitrogen from the air into essential products for farmers and industrial customers. The main application is fertilizers, while industrial uses and environmental solutions are also important growth segments. AzzeroCO<sub>2</sub> presented ISAAC and Yara was interested in the project since farmers are

going to be involved and several activities are dedicated to spread knowledge on anaerobic digestion efficiency and use of digestate as fertilizer in Italy.

- Istituto di Studi per l'Integrazione dei Sistemi (ISIS), Italy (Dr. Stefano Proietti): ISIS is an independent Italian research institute supporting international, national and local public bodies for the analysis, the design, the implementation and the evaluation of sustainable policies in the fields of energy, environment, transport and mobility, urban planning, and knowledge society. It is the coordinator of the project BIOSURF (BIOMethane as SUstainable and Renewable Fuel), funded under the Horizon 2020 programme (grant agreement No 646533), whose main objective is to increase the production and use of biomethane (from animal waste, other waste materials and sustainable biomass) for grid injection and as transport fuel, by removing non-technical barriers and by paving the way towards a European biomethane market. One of the partners is CIB - Consorzio Italiano Biogas e Gassificazione. AzeroCO<sub>2</sub> has presented ISAAC and the main activities the company deals with. BIOSURF shares with ISAAC many challenges and objectives. AzeroCO<sub>2</sub> had known the BIOSURF project at the event "H2020 Contractors' Workshop on Bioenergy Market Uptake projects" (Brussels, 2 March 2016), represented by Attila Kovacs of EBA - European Biogas Association. On-going networking is essential to share problems, tools, results and to create synergies.
- Lund Institute of Technology, Sweden (Laura Malek): Lund Institute of Technology was there with a poster called "Renewable gas in the grid - Challenges in heating value determination and policies", showing the problem connected with allocation of the heating value of the gas when different feeding points are present or gas is a mix. AzeroCO<sub>2</sub> provided information on the actual Italian regulation on biomethane injection into the national gas grid and the actions that ISAAC intends to implement.
- DH Industries BV, The Netherlands (Francesco Dioguardi): DH Industries Group is a holding company focused on Cryogenic services, engineering and equipment. Francesco Dioguardi provided information on the proposed technology (liquefaction systems based on Stirling Cycle Cryogenerators) pointing out its strength points. AzeroCO<sub>2</sub> presented ISAAC and talk about the willingness to implement two participatory processes to facilitate the realization of plants where liquid biomethane could be produced.
- Chalmers University of Technology, Sweden (Alberto Alamia): Alamia deals mainly with gasification. AzeroCO<sub>2</sub> presented ISAAC, focusing on the calculation tool and its purpose, according to the poster structure. The fact that in Italy there is often a strong opposition to the construction of new biogas plants has caused interest and surprise. Questions on pay-back times of biogas/biomethane plants have been asked.

During the networking session, Claudia Rossi has had five one-to-one meetings (Figure 4). A brief description of the companies met and information exchanged is given below:

- Purac Puregas AB, Sweden (Rolf Håkansson): Purac Puregas is specialized in designing and delivering efficient and reliable biogas upgrading solutions (based on ammine adsorption). The company showed its interest in the ISAAC project also because the diffusion of biomethane in Italy (as ISAAC's target) could increase its market in Italy.
- Biogas Syd, Sweden (Desirée Grahn): Biogas Syd is a regional non-profit organisation for and by stakeholders within the biogas field in southern Sweden. Its main aim is to promote the production, distribution and use of biogas through networking, information campaigns and technical research. Biogas Syd was involved in the Life Project BIOGASSYS - Biogas Skåne - an energy system creating sustainable development by fighting climate change (2010-2015), whose main aim was to demonstrate the potential of biogas to become a major contributor to energy production in Europe and an important tool in mitigating greenhouse gas (GHG) emissions. AzeroCO<sub>2</sub> presented ISAAC and made questions about BIOGASSYS. Desirée Grahn was interested in the project and showed her willingness to work together in the future. BIOGASSYS shares with ISAAC many challenges and objectives. It could be interesting to exchange information and results. BIOGASSYS representatives can be invited to participate in ISAAC's local events as experts.
- Institute for Biogas, Waste Management & Energy, Germany (Johan Grope): Based on its many years' experience, the Institute for Biogas, Waste Management & Energy conducts scientific analyses, provides expert advice, undertakes development work, compiles appraisal reports on technical and economic concepts, as well as engaging in knowledge transfer. Johan Grope indicated his willingness to participate in ISAAC's local events as expert: the Institute can offer consultancy, knowledge transfer, international cooperation and help for public authorities with formulating regulations for biomethane grid injection. The involvement of the German Institute for Biogas, Waste Management & Energy can give added value to the project, both in the phase of preparing and presenting law proposal (WP5) and during the awareness events (WP3).
- TNO, The Netherlands (Dr. Marco Linders): TNO is an independent research organisation that focuses on transitions or changes in these five social themes: Industry; Healthy Living; Defence, Safety & Security; Urbanisation and Energy. Marco Linders deals mainly with biogas upgrading and CCS (Carbon Capture and Storage). He was interested in the ISAAC project and could participate as a technical expert in some local events or as an international supporter.
- Natural Resources Institute Finland (Saija Rasi): The Natural Resources Institute Finland offers its customers research and development services based on its biological and technological expertise and using high-quality experimental research environments and extensive data resources. Its main research focus areas are: Boreal Green Bioeconomy, Blue Bioeconomy, Innovative Food Chain and Natural Resources Economy in the Society. The institute was interested in the ISAAC project and could participate with its technical experts in some local events or as an international supporter.



*Figure 4 - A face-to-face meeting at REGATEC 2016*

## 1.2 EUBCE 2016, 6-9 June at the RAI Exhibition and Convention Centre, Amsterdam, The Netherlands

### *24<sup>th</sup> European Biomass Conference & Exhibition*

The European Biomass Conference and Exhibition (EUBCE) is a world class annual event which, since 1980, is held at different venues throughout Europe.

The EUBCE covers the entire value chain of biomass to conduct business, network, and to present and discuss the latest developments and innovations; the vision is to educate the biomass community and to accelerate growth.

The conference lasted 4 days and there were:

- 2 plenary sessions,
- 270 oral presentations subdivided in 4 parallel sessions,
- 750 visual presentations/posters,
- 40 stands of exhibitors,
- 3 parallel events,
- 8 workshops,
- 1 networking event.

A poster of ISAAC (Figure 5) was exposed for the whole duration of the conference.

On Monday afternoon the project was presented during a session dedicated to posters.

In this occasion there was the possibility to talk about the aims of the project and the importance of non-technical barriers to the diffusion of biogas. A rapid overview of the project actions and foreseen results was given; more details were given to the reduction of social barriers (WP3, WP4). The audience asked some more information on the participatory process and crowdfunding.

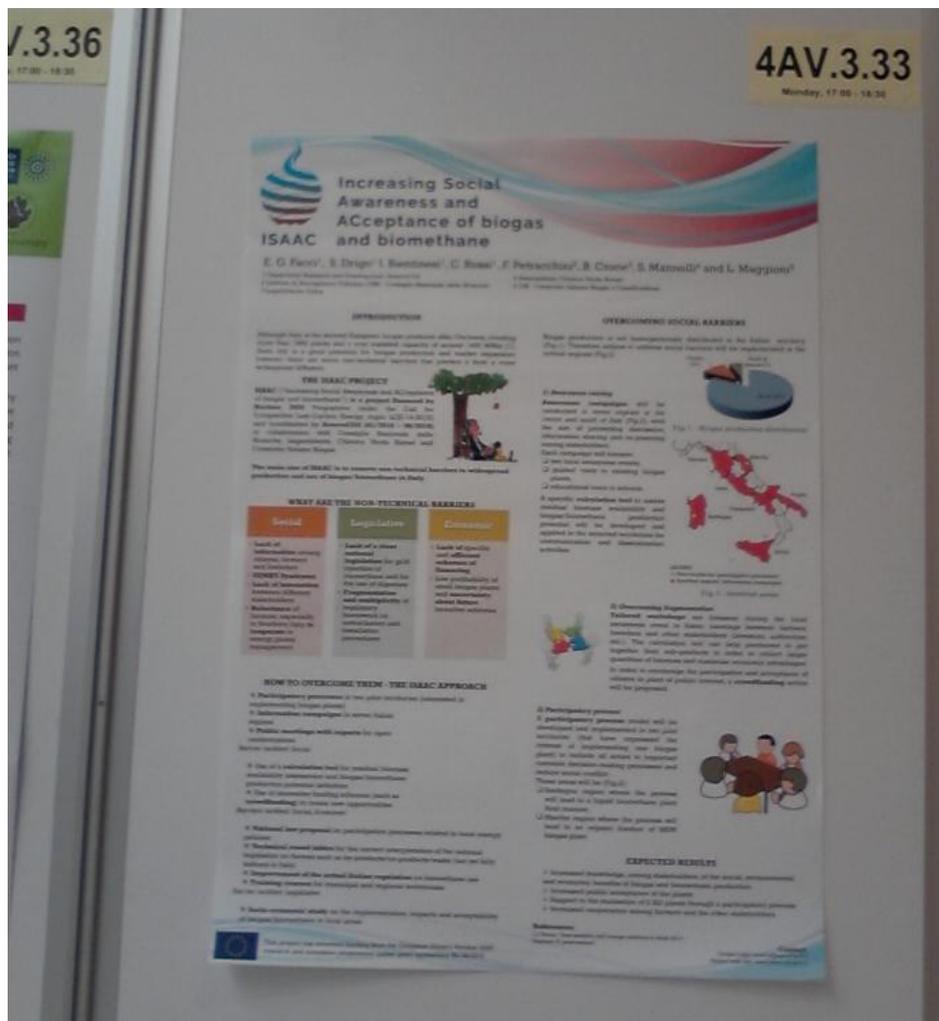


Figure 5 - The ISAAC poster at EUBCE 2016

On the 3<sup>rd</sup> day a meeting room was reserved for a networking session and Enrico Facci, ISAAC representative from AzzeroCO<sub>2</sub>, was involved in 5 bilateral meetings with delegates of Universities, companies and institutions:

- Emanuela Melis (University of Cagliari)

Melis is a PhD working as a research associate at the University of Cagliari. Her expertise is related to woody biomass supply chains, sustainable production and consumption, Life Cycle Assessment, Water Footprint Assessment and other environmental tools. She collaborates with the MEDSEA Mediterranean Sea and Coast Foundation, a non-profit organisation for the protection and the development of the Mediterranean Sea and of its coastal territories. It works in collaboration with the DICAAR Department of Civil, Environmental Engineering and Architecture of the University of Cagliari (Italy).

University of Cagliari aims at creating a synergy between a unique technological environment in Sardinia (Italy), represented by the former Faculty of Engineering, with its laboratories and rich relations with the regional industrial system, and the historic and quality cultures of the architectural project.

The areas of interest are: -Biofuels, -Biogas and biomethane, -Biomass feedstock, -Biomass production, -Energy crops, -Short rotation forestry, -Waste management.

Main outcomes: One of the regions involved in the ISAAC project is Sardinia. Melis and the research institutes she represents could be invited to local workshops and debates.

- Fabian FISCHER (University of Applied Sciences Western Switzerland)

The Institute of Life Technologies in Sion offers a range of services, which include chemical, microbiological and molecular-biological testing of food, packaging and organic compounds. The know-how and equipment enable to develop -at various scales- processes such as production of biomolecules and biomass, plant extracts, bioenergies, fertilizers and food products. Research sectors of interests are: -Algae production systems, -Bio-fertilizers, -Biofuels, -Biogas and biomethane, -Energy storage, -Waste management.

Main outcomes: Fischer appreciated the ability of AzzeroCO<sub>2</sub> and the other ISAAC partners to involve citizens.

- Beatriz FIDALGO FERNANDEZ (Cranfield University)
- Alper Oncul (AKSA Acrylic Chemical Company)
- Margrethe Balling (Aarhus University, Denmark)

The Conference was the occasion to get in touch with enterprises and researchers in the field of bioenergies and bio refineries. In particular:

- Neus Puy Marimon, a researcher at the Institute of Environmental Sciences and Technology (ICTA), Autonomous University of Barcelona. During a networking lunch she discussed with Facci about participatory process applied to biomass management. In 2006 she participated to a project on development of sustainable forest biomass energy systems in large forested areas of the Mediterranean basin. In order to understand and analyse the enhancing factors, as well as the constraints, they applied a participatory integrated assessment focus group (IA-FGs) methodology. One of the key point to develop a successful participatory process is the selection of the moderator that facilitates the discussion. In the following days she mailed a paper on this work that will be useful to design the ISAAC participatory process in the two pilot territories.
- Diego Piedra Garcia- project ISABEL. After the conference Diego wrote to stress the common issues between ISAAC and ISABEL and the possibility to collaborate. Contacts with ISABEL were already established during "H2020 Contractors' Workshop on Bioenergy Market Uptake projects" last march.
- Professor Harald Weigand of the Technische Hochschule Mittelhessen - University, Giessen
- Fraunhofer UMSICHT

### 1.3 Conference “Dal biogas al biometano: un nuovo capitolo per le energie rinnovabili”, University of Padua, Padua, 17th November 2016

The Interdepartmental Center “Giorgio Levi Cases” of the University of Padua, on November 17<sup>th</sup> 2016, organized the conference entitled “Dal biogas al biometano: un nuovo capitolo per le energie rinnovabili” (From biogas to biomethane: a new chapter for renewable energy).

The event, which was held at the University of Padua, was intended to provide an updated overview of the topic by addressing technical, economic, social aspects related to production and use of biogas and biomethane, covering the entire chain.

During the conference six speakers presented their work, including Lorenzo Maggioni from CIB. Maggioni, in his speech entitled “The social acceptability of biogas/biomethane plants: the results of a European project” (Annex 2), presented the ISAAC project and the contents of the Work Package 2 (State of the art). In particular, he focused on the results of analysis and mapping of the most relevant episodes of dispute against anaerobic digestion plants (Figure 6 and Figure 7).



Figure 6 - Presentation cover of the ISAAC project results at the University of Padua Conference

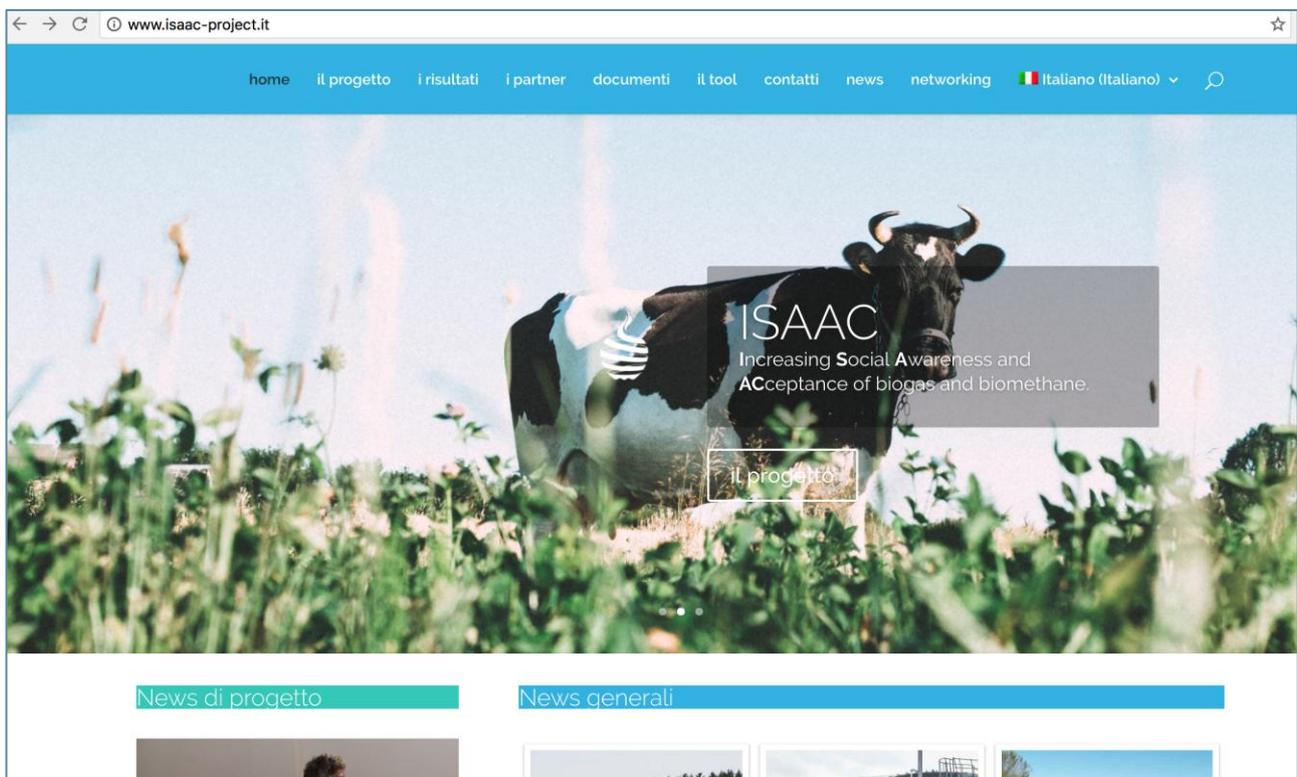


Figure 7 - Lorenzo Maggioni presenting the ISAAC results during the University of Padua Conference

## 2. Website and Facebook Page

### 2.1 Website: [www.isaac-project.it](http://www.isaac-project.it)

Starting from July 2016, a dedicated project website ([www.isaac-project.it](http://www.isaac-project.it)) (Figure 8) was created in order to spread and share as much as possible news concerning the activities implemented during the project as well as general news on the topic.



*Figure 8 - Screenshot of the ISAAC project website homepage*

As visible from Figure 9, in the period 01-July / 12-December 2016, less than six months, the website collected 1523 sessions, with 662 users, and a total amount of 5429 pages viewed (perfectly in target with the 3000 visits per year targeted at the beginning of the project). Most of the traffic is coming from Italy, as it was supposed to be, considering the target of the project, more focused on the Italian context. Nevertheless, Italy is not the only source of the traffic of the website; as visible in the figure visits are coming from UK, Russia, Germany, Austria, Unites States, etc.

As shown in the report, the average session duration is about 5 minutes, with a number of pages visited equal to 3,5. One of the most interesting data is the percentage of new visitors, 43,47%. Almost half of the traffic is generated by first-time users, showing a good trend for the future of the project dissemination activities.

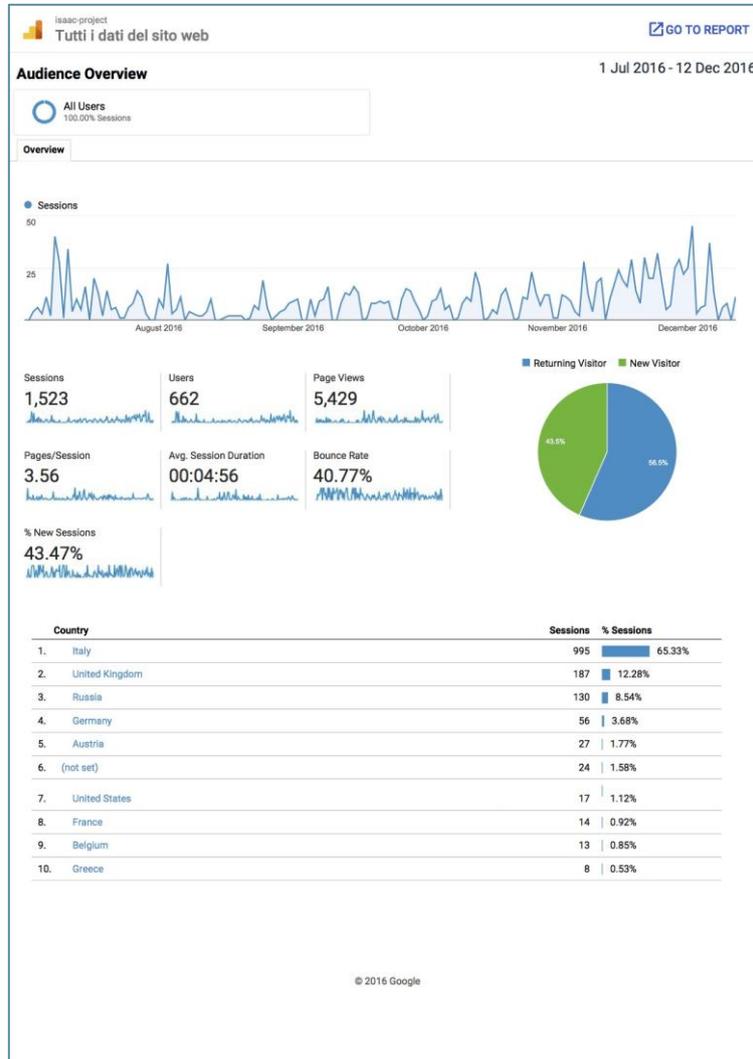


Figure 9 - Summary report of the ISAAC website from Google Analytics

## 2.2 Facebook page “ISAAC project” ([www.facebook.com/progettoisaac](http://www.facebook.com/progettoisaac))

In addition to the website, a Facebook page ([www.facebook.com/progettoISAAC/](http://www.facebook.com/progettoISAAC/)) (Figure 10) was created in order to guarantee a “social presence” of the project, giving more visibility to the project activities and spreading as well the news concerning biogas, biomethane and social awareness on the topic.

In Figure 11 there are some insights of the Facebook page, such as reach of the various posts published on the platform, the engagement with audience (through the count of reactions, comments and share) and the total reach of the page (the number of people who were served with any activity of the page). As shown, the number of persons achieved until now is only “organic reach”: this means that no advertisement or paid post

was implemented for this first semester. It is a good signal, because if any adv campaign will be implemented in the future the reach may exponentially increase.

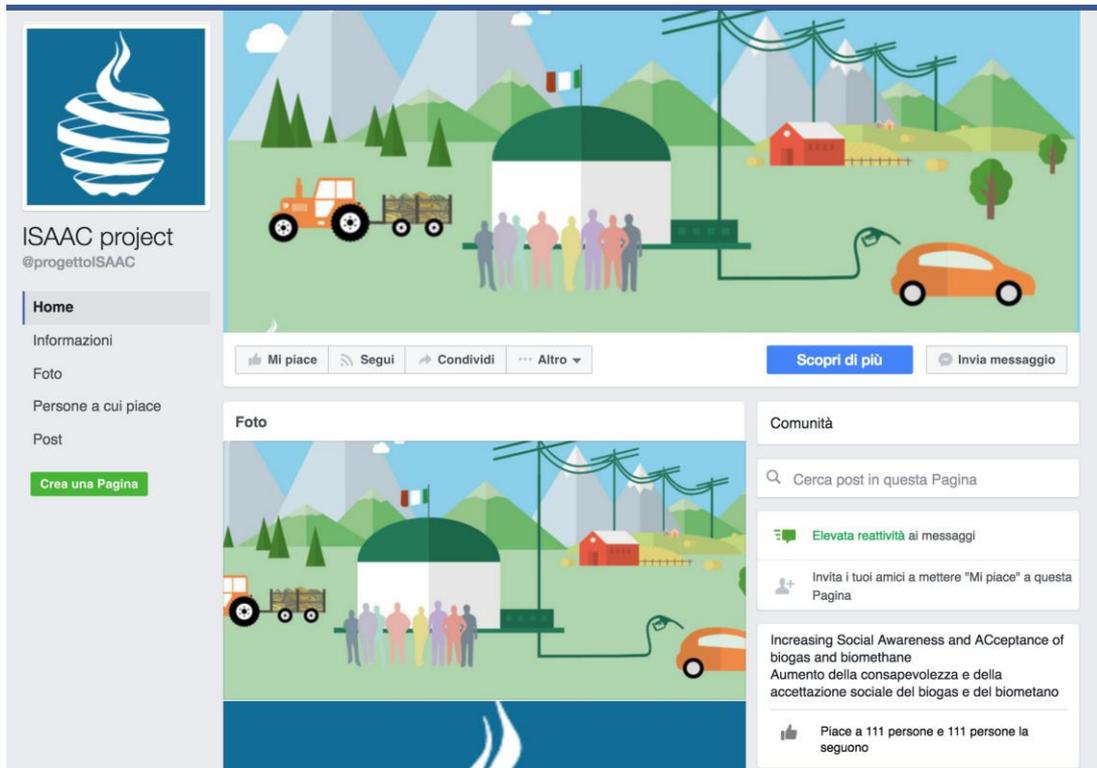


Figure 10 - Screenshot of the Facebook page "ISAAC project"



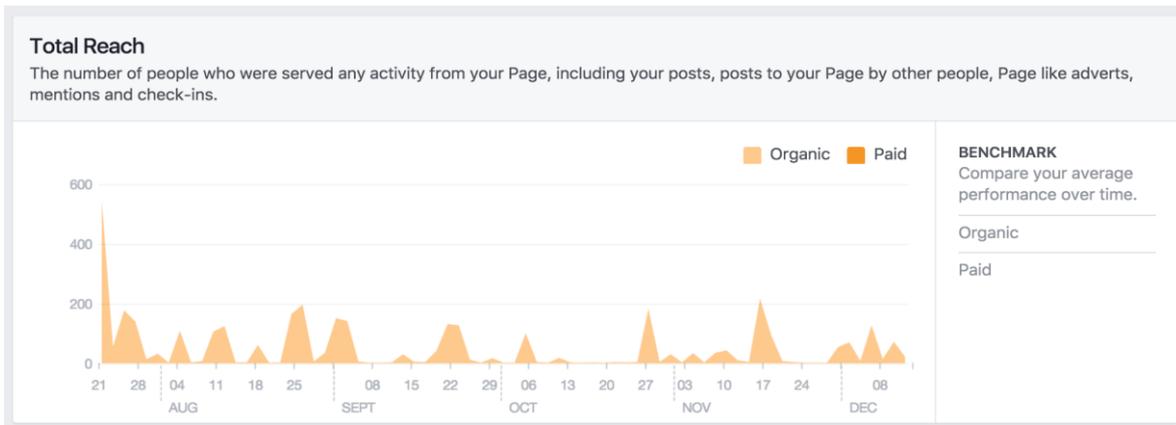


Figure 11 - Screenshots of Facebook insights of the page "Progetto Isaac" regarding the reach of the post, the reactions, comments and share, and the total reach of the page

3. ANNEX 1 – Presentation “LBM - The future of biomethane mobility in Italy. The Arborea project”, REGATEC 2016



# REGATEC 2016

*10<sup>th</sup>-11<sup>th</sup> May 2016, Malmö*

## LBM

The future of biomethane mobility in Italy.  
The Arborea project.

*Lorenzo Maggioni, R&D CIB*

**3<sup>rd</sup> International Conference on Renewable Energy Gas Technology**

**Malmö, Sweden, 10-11 May 2016**

# Consorzio Italiano Biogas (Italian Biogas Consortium)

The **CIB - Italian Biogas Consortium**, formed in March 2009, has national coverage and aims to be the reference point in the Italian biogas and biomethane sector.

## MEMBERS

- Ordinari (547) 
- Istituzionali (11) 
- Aderenti (40) 
- Sostenitori (63) 

**TOTALE: 661**



  
European projects

GREEN  
GAS  
GRIDS

<http://www.greengasgrids.eu/>

**BIOSURF**  
Fuelling Biomethane

<http://www.biosurf.eu/>



ISAAC

“Increasing Social Awareness and  
ACceptance of biogas and biomethane”

# CONTENTS

## Micro-liquefaction: the future of biomethane mobility in Italy

*of resolution and size of  
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broadcast signal is rec*  
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of an image (pict  
-- 1917 screen

- **ACRONYMS AND DEFINITIONS**



- **BIOGAS AND BIOMETHANE IN ITALY**  
*Number of plants, subsidies, potential,  
possibly developmnets, etc.*



- **BIOMETHANE AS S BIOFUEL**  
*Brief SWOT analysis*



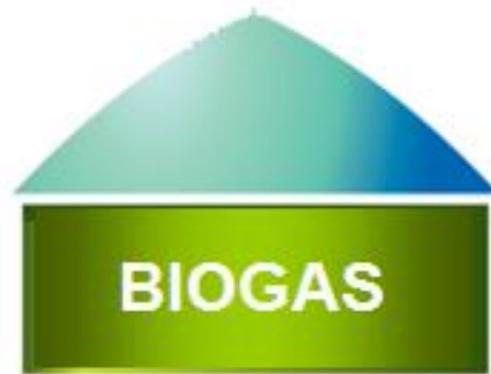
- **LNG & BIO-LNG IN ITALY**



- **THE ARBOREA PROJECT**

# ACRONYMS & DEFINITIONS

## UPGRADING UNIT



**CH<sub>4</sub>: 55-65%**



**CH<sub>4</sub> > 97%**

**Italian D.Lgs 28/2011:**

**BIOMETHANE** "...gas produced from renewable sources with the characteristics and usage conditions corresponding to those of natural gas and suitable for injection into the natural gas grid. CH<sub>4</sub>>97%

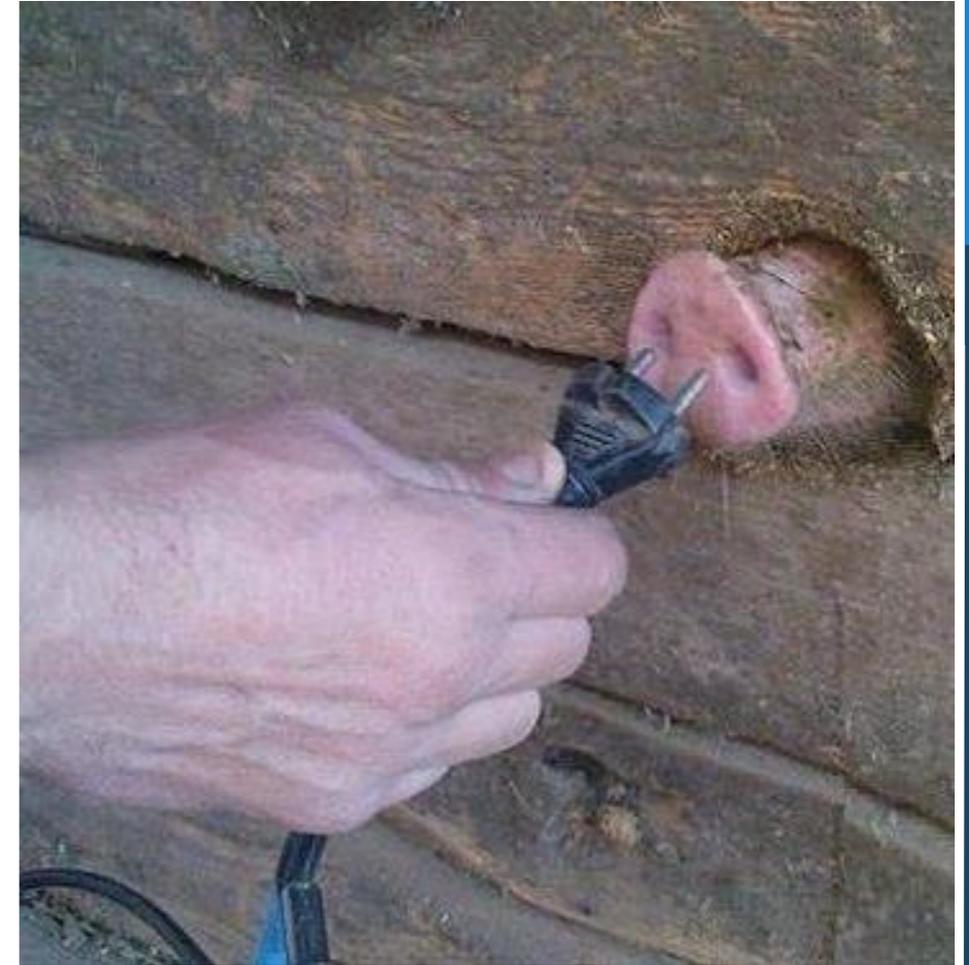
# ACRONYMS & DEFINITIONS

<u>FOSSIL FUEL</u>		<u>BIOFUEL</u>
Compressed Natural Gas	=	Compressed Biomethane
CNG	=	BIO-CNG
Compressed Natural Gas	<del>≠</del>	Compressed Bio Gas
CNG	<del>≠</del>	CBG
Liquified Natural Gas	=	Liquified Biomethane
LNG	=	bio-LNG = LBM
Liquified Natural Gas	<del>≠</del>	Liquified Bio Gas
LNG	<del>≠</del>	LBG

# BIOGAS AND BIOMETHANE IN ITALY

## *Third biogas in the world*

- **3<sup>th</sup> biogas sector after China & Germany.**
- **4 Billion € invested in the last 5 years.**
- **> 1800 biogas plants built (*agriculture + sewage + waste + industrial*).**
- **> 1.300 MW<sub>el</sub>** *(for the moment biogas used only for electricity production!)*
- **About 3 billion Nmc Biomethane equivalent utilized per year .**
- **Less than 2% of italian agricultural land used for monocultures.**
- **12.000 qualified green jobs created thanks to biogas.**



# BIOMETHANE IN ITALY

## *Number of plants*

### Upgrading plants (1995-2013)



Roma



San Giovanni Persiceto (BO)

---

### New upgrading plants (2013-2016)



Pinerolo (TO)



Pieve Fissiraga (LO)



Mantova (MN)



Ozegna (TO)

# BIOMETHANE IN ITALY

## Decree 05 Dicembre 2013



Entry into force (*art. 9 of the Decree*) :  
18 december 2013

Duration: upgrading plants that will be in service by 17 december 2018

# BIOMETHANE IN ITALY

## Decree 05 Dicembre 2013

The new rules will apply to different kinds of plant



Agriculture



Organic  
Fraction  
Municipal  
Solid  
Waste

### NEW UPGRADING PLANTS (new sites)



### EXISTING BIOGAS PLANTS (you have to add the upgrading unit)



*incentive reduced  
compared to new plants*

# BIOMETHANE IN ITALY

## Decree 05 Dicembre 2013

*<The “natural gas grid” includes not only the transport and distribution grids of natural gas, but also other useful systems for the transport of biomethane as dedicated grids, the CNG trailers and distributors (gas station), including the agriculture, also not connected to the networks of transport and distribution of natural gas>.*



**The bio-LNG is considered equivalent to bio-CNG**

# BIOMETHANE IN ITALY

## Decree 05 Dicembre 2013

DIFFERENT SCENARIOS DEPENDING ON FINAL USE OF BIOMETHANE

### CASE 1: Biomethane injected into the natural gas grids

PREMIUM TARIFF linked to the market price of natural gas

Duration of the incentive: 20 years

Supplementary incentives for use of by-products and if  $< 500 \text{ m}^3 \text{ CH}_4/\text{h}$

*In the best scenario*

*(< 500 m<sup>3</sup> CH<sub>4</sub>/h, use of 100% by-products, single buyer = GSE):*

*79,6 €/MWh*



**FOR THE MOMENT, ISN'T POSSIBLE**

# BIOMETHANE IN ITALY

## Decree 05 Dicembre 2013

### CASE 2: Biomethane used in transport

Issue of “**CIC**” (**C**ertificati di **I**mmissione in **C**onsumo di biocarburanti - *certificates of release for consumption of biofuels*) - Decree 29/04/2008, n. 110

1 CIC / 10 Gcal biomethane

Double counting for use of by-products and waste (1 CIC / 5 Gcal biomethane)

+ 50% / 10y if you build a biomethane filling station

Duration of the incentive: 20 years (if the plant is new)

Value of certificate € / CIC	Subsidies € / CIC	Subsidies € / CIC (double counting)
300	0,257	0,51
400	0,343	0,69
500	0,428	0,86
600	0,514	1,03

**+** **BIOMETHANE  
FINAL PRICE**  
*At the filling station  
1.00 € / kg CNG or LNG*

# BIOMETHANE IN ITALY

## Decree 05 Dicembre 2013

### CASE 3: Biomethane used in high efficiency cogeneration plants

Renewable source	Type	Power	WORKING LIFE of PLANTS	Basic incentive tariff
Biogas	a) products of biological origin	1 < PS ≤ 300	20	180
		300 < P ≤ 600	20	160
		600 < P ≤ 1000	20	140
		1000 < P ≤ 5000	20	104
		P > 5000	20	91
	b) by-products of biological origin referred to in table 1-A, and non-source separated waste other than that referred to under c)	1 < PS ≤ 300	20	236
		300 < P ≤ 600	20	206
		600 < P ≤ 1000	20	178
		1000 < P ≤ 5000	20	125
		P > 5000	20	101
	c) waste for which the biodegradable part is determined as a fixed amount as set out in Annexe 2	1 < PS ≤ 1000	20	216
		1000 < P ≤ 5000	20	109
P > 5000		20	85	

Fixed - constant – incentive applied during incentive period of 20 years  
Values for commissioning in 2013, -2% per year for subsequent years.

**Waiting for the new scheme (not very different from this one)**

Decree  
6 July 2012



# The **BIOGASDONERIGHT®** model

## **BIOGASDONERIGHT®**

ANAEROBIC DIGESTION AND SOIL CARBON SEQUESTRATION  
A SUSTAINABLE, LOW COST, RELIABLE AND WIN WIN BECCS SOLUTION



# BIOMETHANE IN ITALY

## The “*biogasdoneright*®” model

**BIOGASDONERIGHT**® is a technological platform that combines Anaerobic Digestion (AD) technologies and other Industrial and Agricultural practices, that when applied synergistically are able to:

- produce additional carbon both in already farmed land and in land that suffer de

- de

- produce additional carbon both in already farmed land and in land that suffer de

of soils seques

- realize this at very low cost

- contribute at the same time to an ecological agri

**Breaking the spell:  
producing energy & sequestering carbon  
is possible without lowering food & feed production**

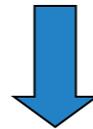
# BIOMETHANE IN ITALY

## *Potential*



National Energy Strategy, March 2013

### POTENTIAL OF BIOMETHANE



*<According to some studies, the potential for growth is important in terms of volume - **up to one billion cubic meters a year**, especially for biomethane obtained from farms, food processing companies and landfills>.*



[www.mise.gov.it](http://www.mise.gov.it)

**1 billion m<sup>3</sup> biomethane / year involves investments of 4 BILLION EURO!**

# BIOMETHANE AS BIOFUEL

## SWOT analysis - Strengths



### Why BIOMETHANE?

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



### Why USING BIOMETHANE LIKE A FUEL ?

- Biomethane has very low emissions
- Car engines are less noisy
- No distribution infrastructure needed, grids are available
- Biomethane can be blended at any ratio with natural gas
- For long distance transport or ships LBG/LNG is available



Bologna centro del Metano

# BIOMETHANE AS BIOFUEL

## SWOT analysis - Weaknesses



### UNCERTAINTY

- Quality parameters and quality measurement?
- Value of certificates?
- ~~Injection into the grid?~~



**29/05/2016: Delibera 204/2016/R/gas**

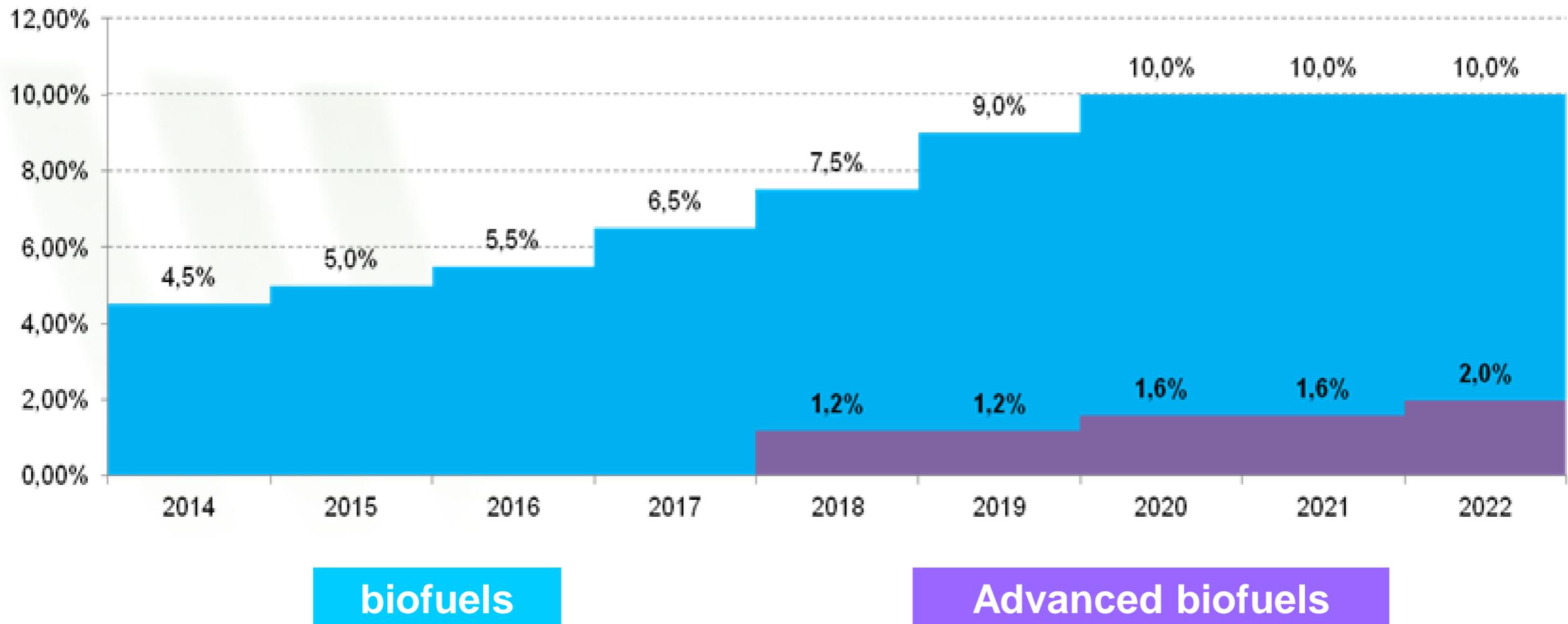


# BIOMETHANE AS BIOFUEL

## SWOT analysis - Opportunities



### ADVANCED BIOFUELS MANDATE



(actually 92% = biodiesel. Only 5% made in Italy)

**In 2018 it means ~225 Mm<sup>3</sup> biomethane (compressed or liquified)**

# BIOMETHANE AS BIOFUEL

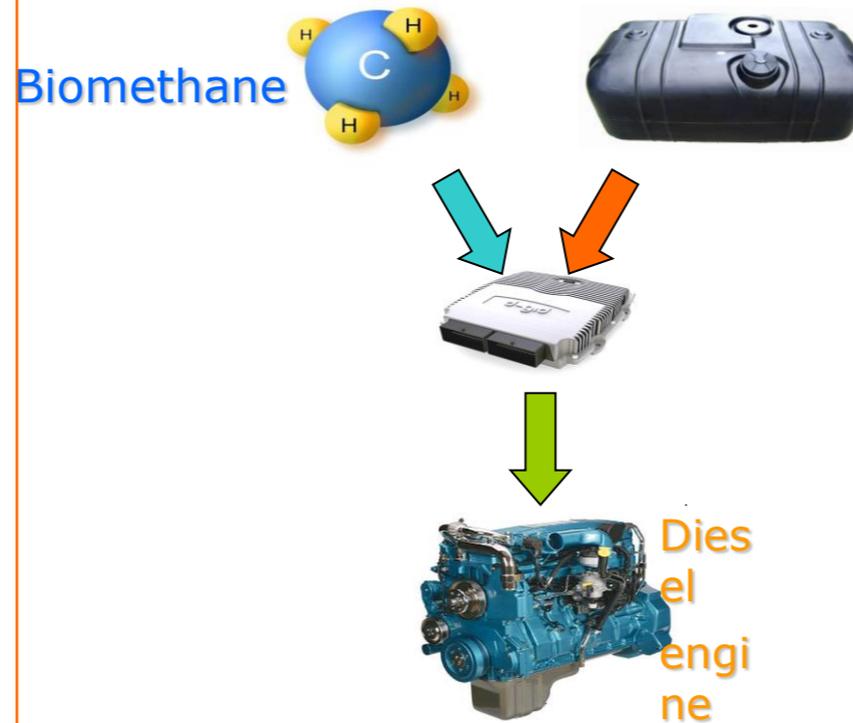
## SWOT analysis - opportunities



1° biomethane tractor  
(bio-CNG)

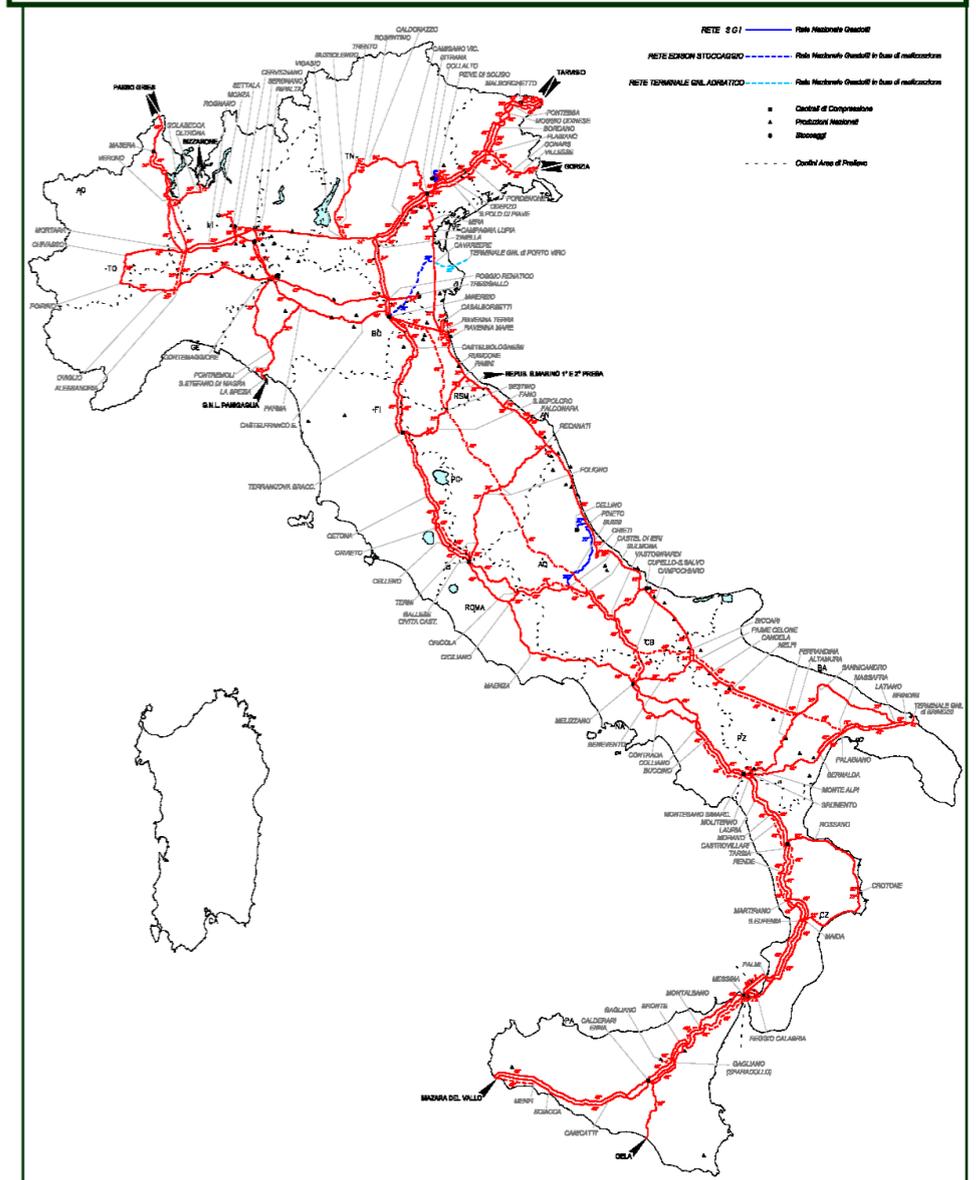


Dual Fuel:  
Biomethane + diesel



Italian Gas Grid infrastructure data:

- Primary transport network: 34,000 km;
- Distribution: 250.000 km networks.



Around 900.000 NGV

High interest from industrial groups



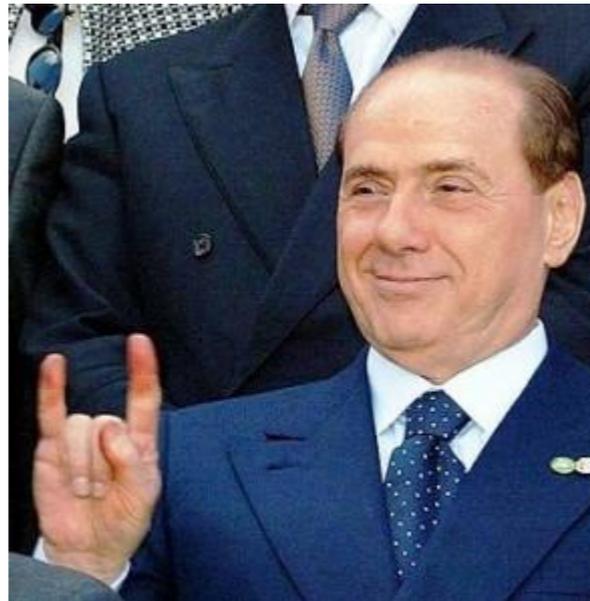
# BIOMETHANE AS BIOFUEL

## *SWOT analysis - Threats*



Powerful lobbies are fighting against biomethane

Political uncertainty



# LNG & BIO-LNG IN ITALY

## State of the art

- 8 L-CNG filling station\* (> in the North of Italy)
- 2 LNG filling station\*
- 1060 NG refuelling station
- industrial uses (e.g. [www.arborea.it](http://www.arborea.it))

\* > from *Barcelona terminal*



L-CNG



LNG



LNG for industrial use

# LNG & BIO-LNG IN ITALY

## *Advantages*

- Bio-LNG, thanks to “biogasdoneright<sup>®</sup>” model, does not compete with food.
- *Bio-LNG can be produced in your own country.*
- *Bio-LNG has better quality than (most) fossil LNG.*
- *Bio-LNG is cheaper than other biofuels per energy unit.*
- *Bio-LNG is cleaner than all other liquid fuels.*
- *Bio-LNG can be used to improve fossil LNG quality.*

Thanks to Peter van der Gaag

# LNG & BIO-LNG IN ITALY

## *Heavy transport and marine transport*

### HEAVY TRANSPORT: POSSIBLE SCENARIO IN 2030

Potential replacement of traditional fuels with 10% of LNG (up to 20% in an optimistic scenario) or LBM. LNG will cover a global market volume of **3.2 Mton**.

*In the hypothesis of 3.2 Mton LNG and in order to have the sufficient equipment to manage this volume, in Italy we could install:*

- Approximately 800 filling stations LNG (bio-LNG), L-CNG (bioL-CNG).

### MARINE TRANSPORT

In Italy announced the construction of:

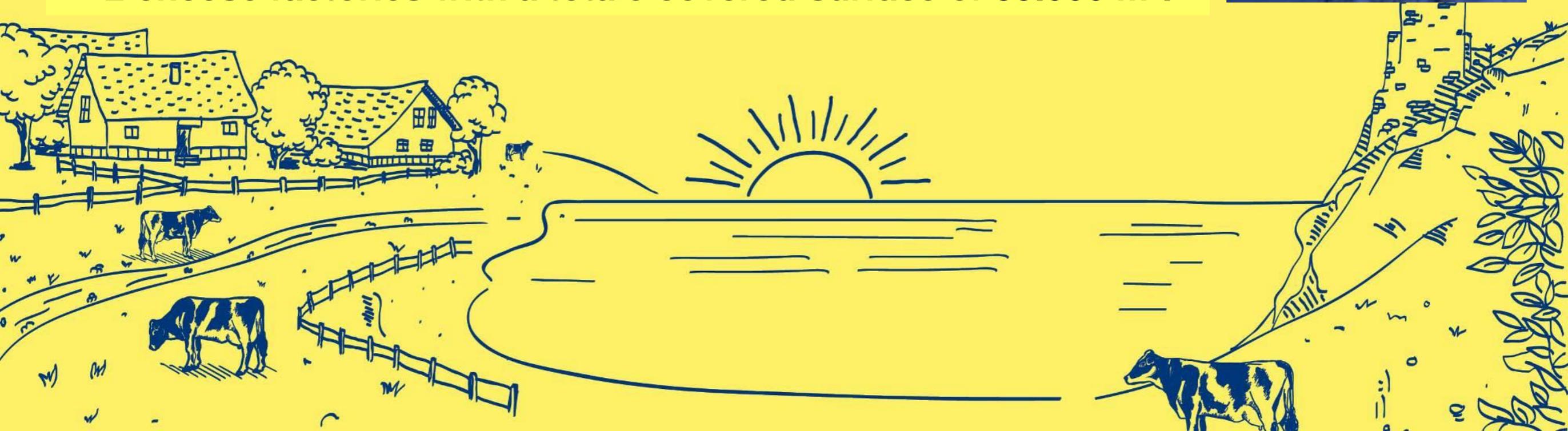
**3 LNG cruise ships; 1 LNG warship; 2 dual-fuel LNG ferries**



L'isola felice delle mucche



- **Cooperative, founded in 1956, with 248 shareholders owning farms with milk production.**
- **50,000 head of Friesian and Brown Swiss cows, with an average milk production of 524.000 liters/day**
- **8000 hectares of forage farm land.**
- **150.000.000 € turnover (2014) and 330 employees.**
- **2 cheese factories with a totale covered surface of 85.000 m<sup>2</sup>.**



# ARBOREA PROJECT

## *the problem to be solved*

	number	Kg N / y per head	kg N / y total
Milking cows	17.000	83	1.411.000
Young cows	14.000	29,5	413.000
Beef cattle	3.000	36	108.000

<b>total</b>	<b>1.932.000</b>
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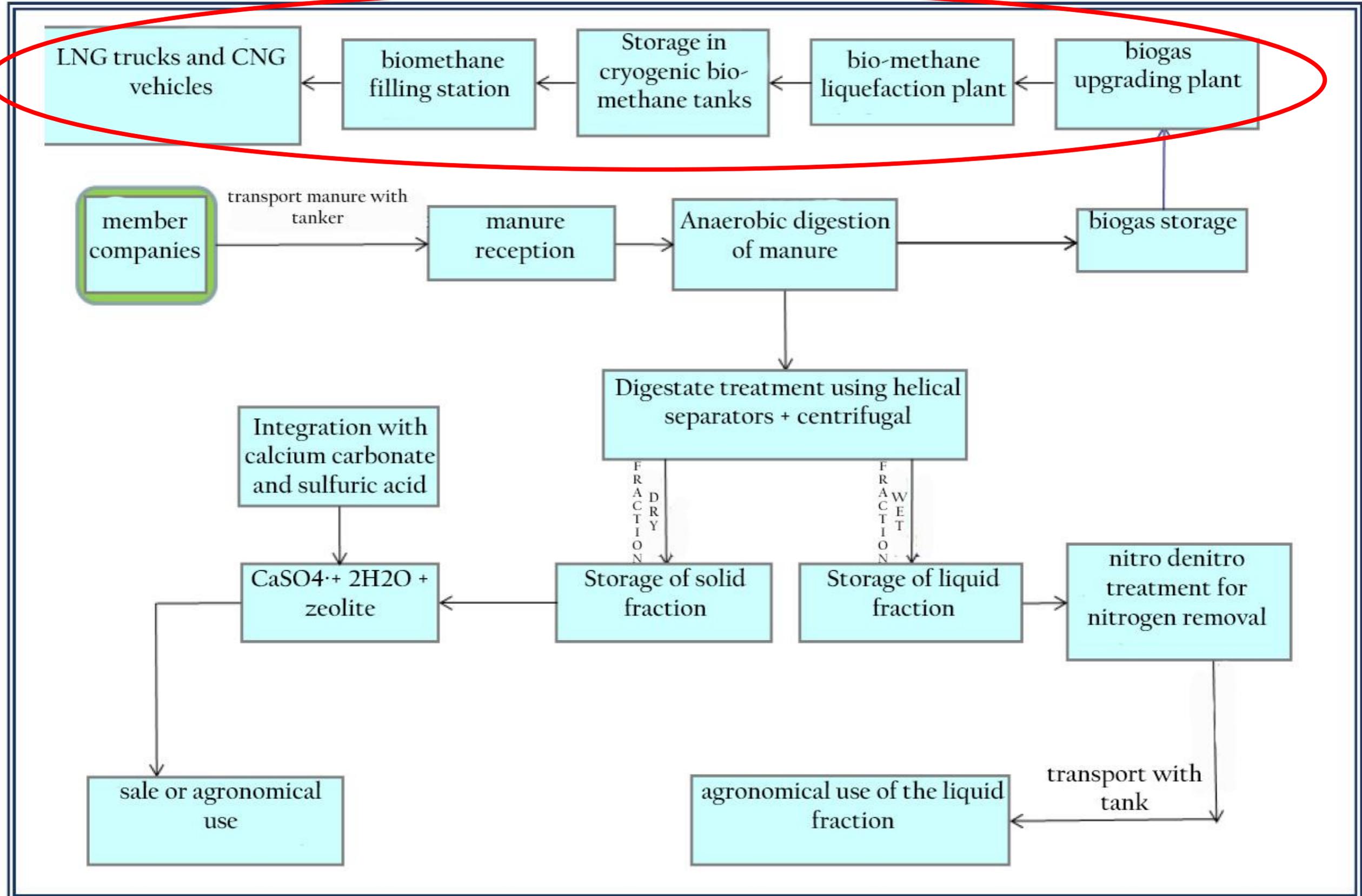
	Hectares	Max N distributable <i>kg Nitrogen / y</i>
Vulnerable area	4000	680.000
Not vulnerable area	2175	739.500
		<b>1.419.500</b>
Kg nitrogen produced / y		1.932.000
Difference (kg N / y)		<b>-512.500</b>
Surface area requirement (min-max)	<b>1.507- 3.014</b>	

Arborea is an Italian town, in Sardinia region, of 4,005 inhabitants, which was designated "vulnerable area by nitrates from agricultural sources", with a maximum of 170 kg/ha of nitrogen from livestock per year.

In Arborea there is not sufficient land for the agronomic use of the total quantity of manure produced. The management of the nitrogen excess involves higher costs for the farmers member of the Cooperative Arborea.

# ARBOREA PROJECT

## *the solution*



# ARBOREA PROJECT

## *LBM production*

- In Sardinia there are not natural gas grids.
- The Cooperative “Assegnatari Associati Arborea - 3A” is already using LNG (100 m<sup>3</sup> storage at the milk factory in Arborea) with a 1 MW<sub>el</sub> and 1,2 MW<sub>th</sub> CHP.
- They decided to produce LBM and not bio-CNG. The preference is for a cryogenic upgrading system with full recovery of the CO<sub>2</sub> produced but other solutions will be evaluated too.
- The project includes, also, the construction of 3 bio-LCNG filling stations, one closed to the cheese factory and two located in the province of Cagliari and Sassari.
- The LBM and the bio-CNG will be used to refuel company trucks and vehicles of other companies.
- If there were problems with the use of LBM in the transport sector, it can replace LNG.



# ARBOREA PROJECT

## *milestones*

- The Cooperative Arborea has decided to carry out a tender inviting 13 qualified European companies with proven expertise and references.
- A technical committee is evaluating the bids received in order to identify the one that would be more deserving to win the contract.
- The Cooperative Arborea commissioned the Engineering “Studio Corrao” (based in Cagliari) to study the tender documents and specifications of the project.



### MILESTONES

- **March 31, 2016: closing terms for the tenders presentation.**
- **End of May 2016: contract signature and start authorization process.**
- **End 2016: start of construction of the plant.**
- **End 2017: completion of work and first LBM production.**

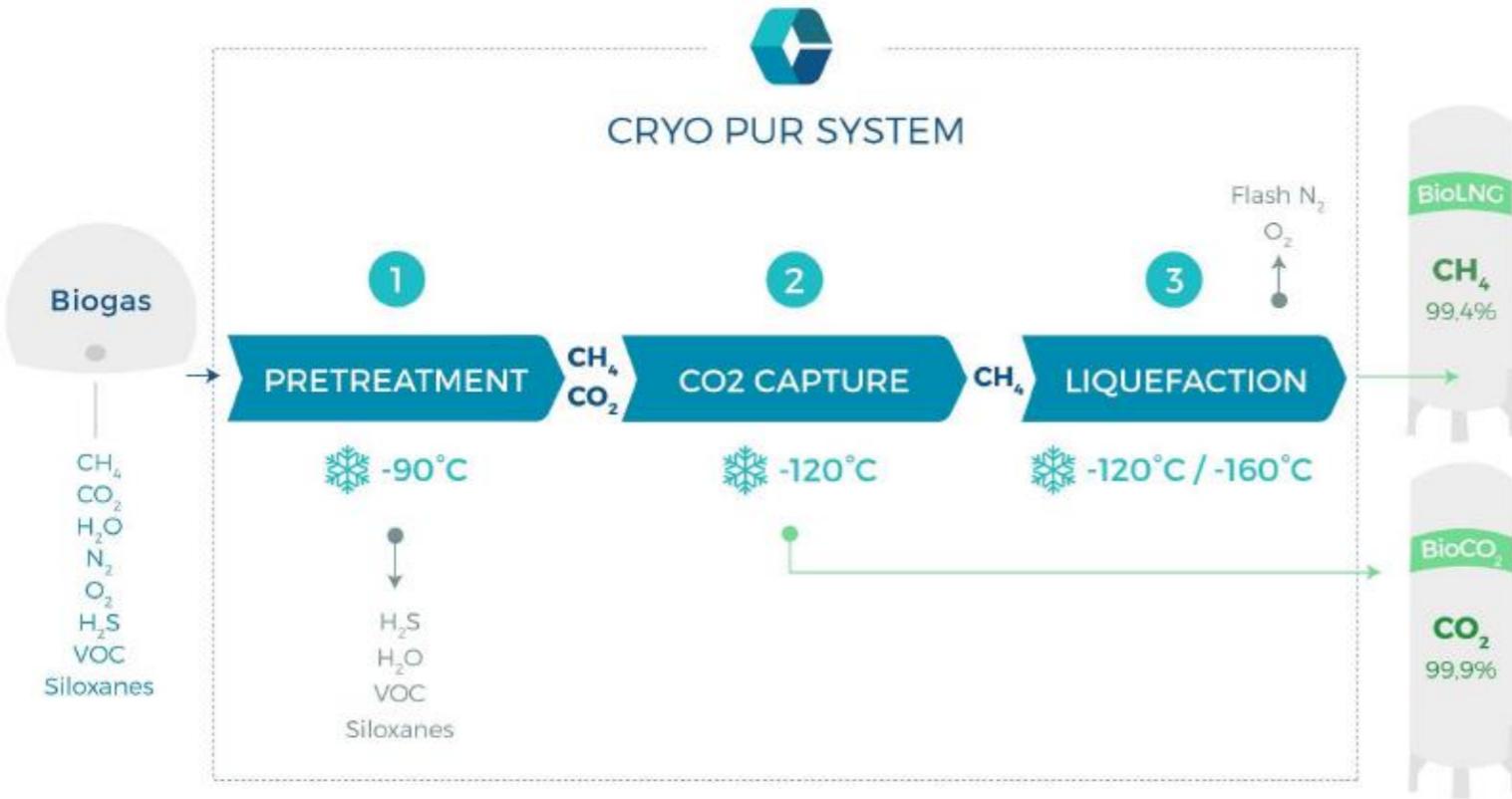
# ARBOREA PROJECT

## *numbers*

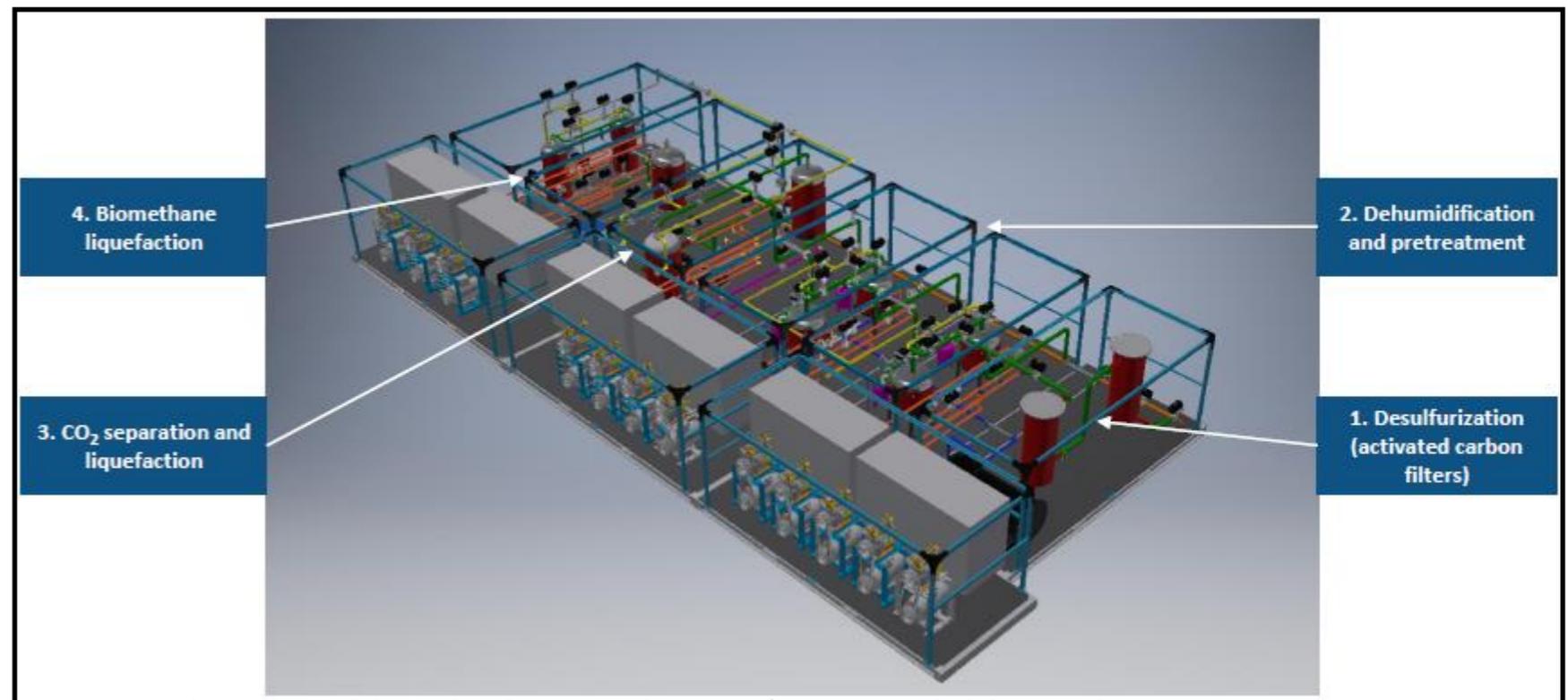
- Average amount of manure to be treated: 335 m<sup>3</sup> / day.
- 3 anaerobic digesters with a total volume ~ 14.000 m<sup>3</sup>.
- Raw biogas production: 500 m<sup>3</sup> /h di biogas.
- Expected CH<sub>4</sub> average content: 55%
- Expected biomethane production: 275 m<sup>3</sup> /h
- Expected LBM production ~4,5 t/d
- Average amount of Nitrogen to be removed: ~ 580 Kg / d.
- Total investment for the construction of the plant (*anaerobic digestion, LBM production, distribution and LBM digestate treatment*): ~ 10 million Euro.

# ARBOREA PROJECT

*which technology for LBM?*



Product	Nominal biogas flowrate (Nm <sup>3</sup> /hr)	Nominal bio-LNG production* (TPD)	Nominal LCO <sub>2</sub> production* (TPD)
CP 70	70	0.6	1.3
CP 150	150	1.3	2.8
CP 250	250	2.3	4.7
CP 500	500	4.6	9.4
CP 800	800	7.4	15.1
CP 1000	1 000	9.2	18.9
CP 1500	1 500	13.8	28.4
CP 2000	2 000	18.5	37.9



[www.cryopur.com](http://www.cryopur.com)

# ARBOREA PROJECT

*which technology for LBM?*

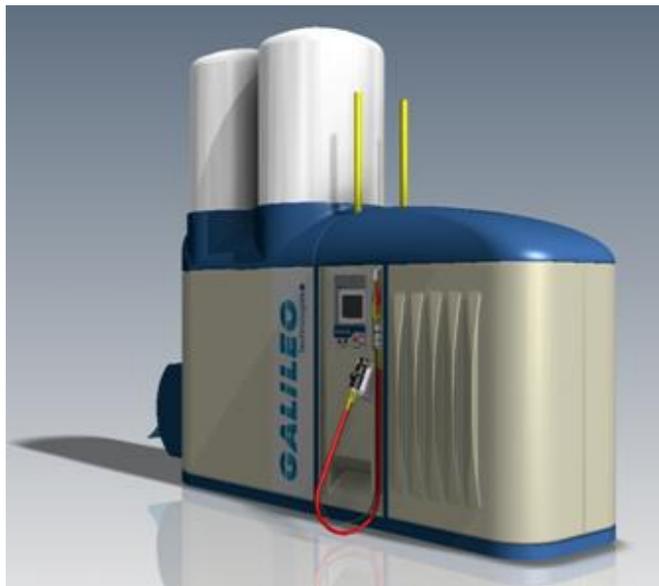


**GALILEO**

CRYOBOX - 200



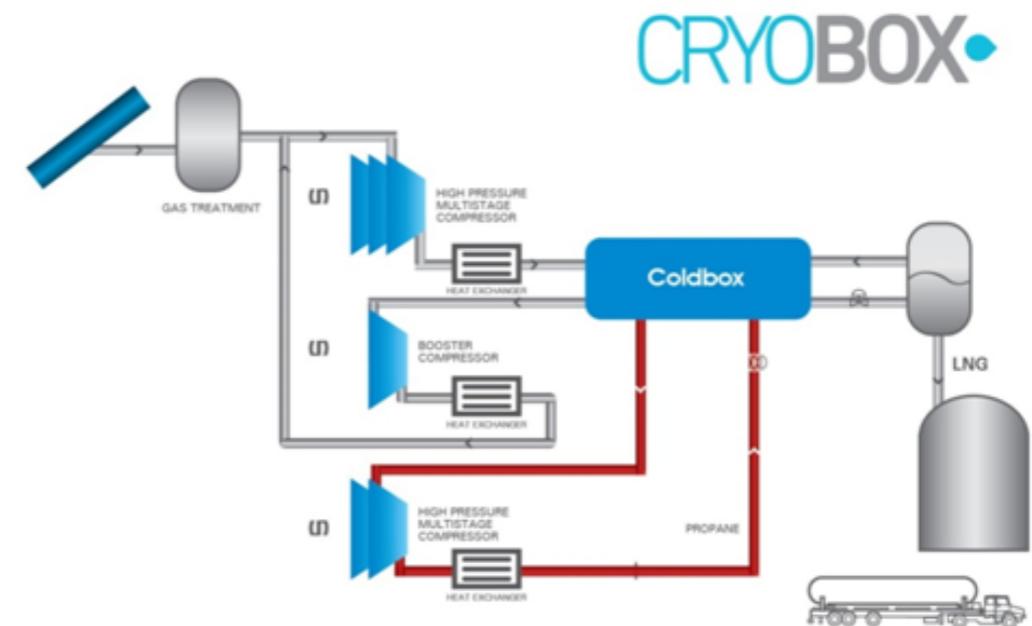
PATAGONIA (LCNG)



### How its works?

Cryobox units operate with Galileo exclusive upgrading technology which combines Separation Membranes with PSA cycle, plus the LNG liquefaction cycle at high pressure for small scale production.

This cycle with patented technology allows production of LBG at very cost effective process, of up to 8,000 Nm<sup>3</sup> per day per Cryobox unit with a very low operating cost and investment levels significantly lower than those of any LBG production facility available in the market.

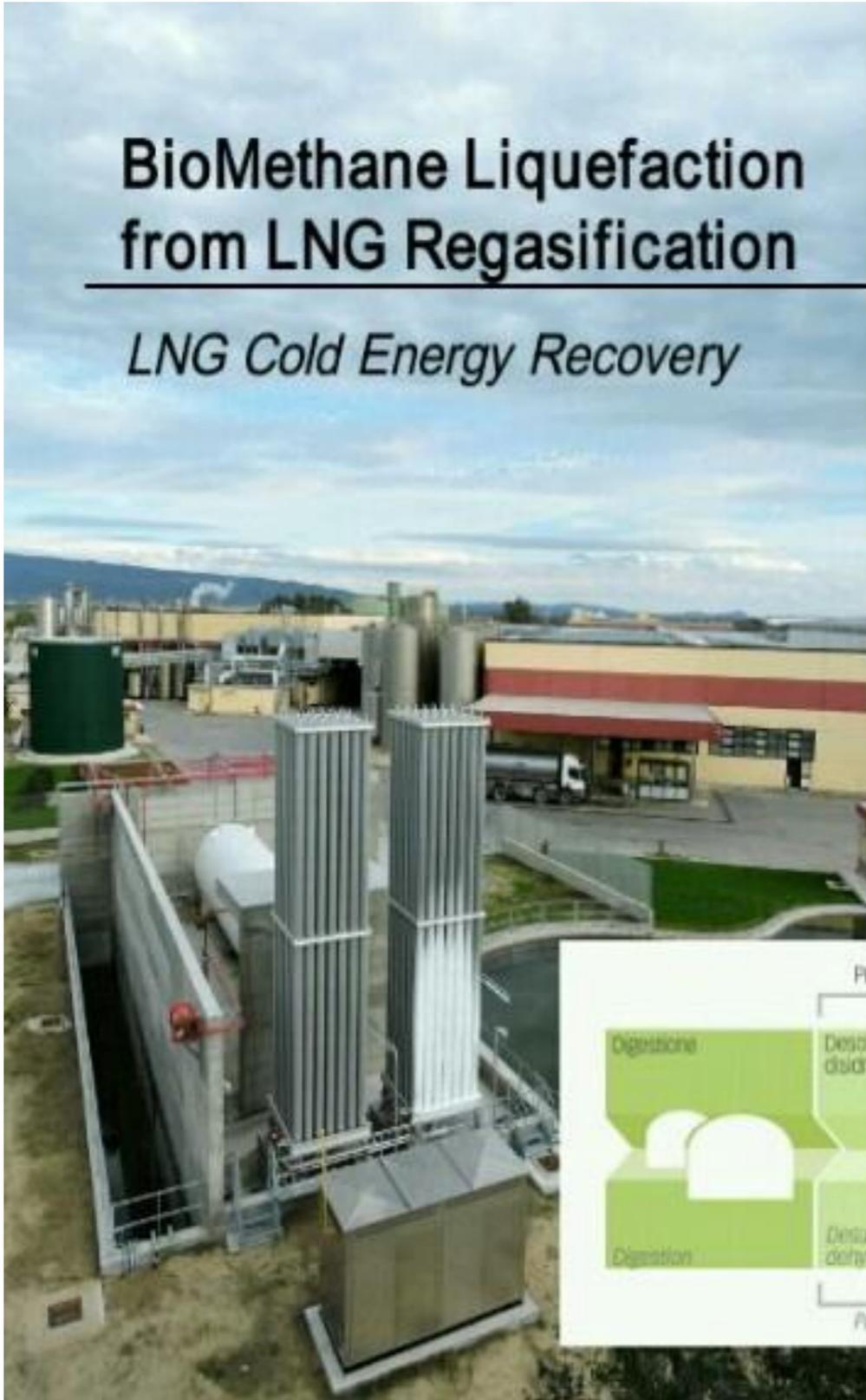


≈ 1 KWh / kg bio-LNG (upgrading + liquefaction)

[www.galileoar.com](http://www.galileoar.com)

# BioMethane Liquefaction from LNG Regasification

*LNG Cold Energy Recovery*



*LNG Regasification* → *BIO-LNG Liquefaction*

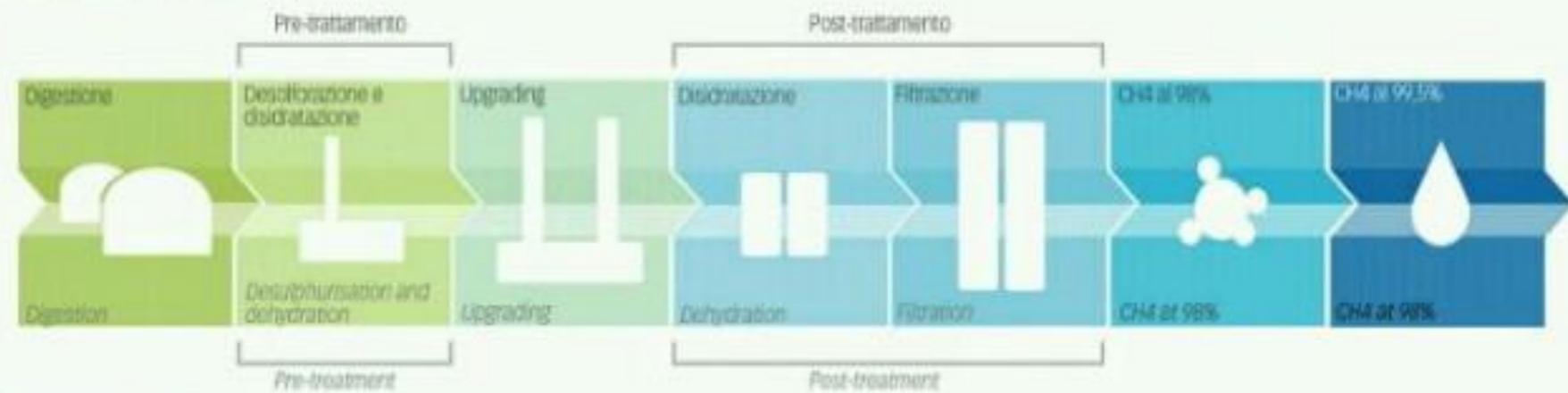
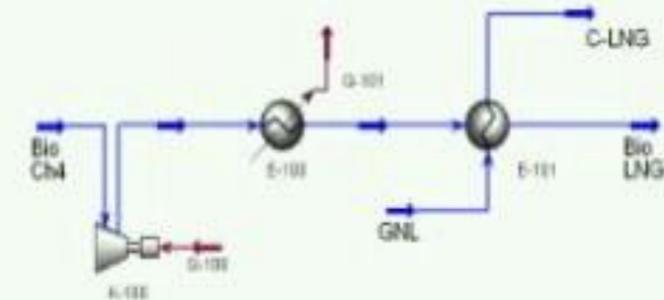
Liquefaction Power Consumption: <math><0,5 \text{ Kwatt/Smc}</math> (\*)

Upgrading Electrical Power Consumption: 0,08 kWatt/Smc (\*)

Upgrading Thermal Power Consumption: 0,9 kWatt/Smc (\*)

Bio-LNG -160°C @ 1 bar

Avoid Methane slip



(\*) biomethane



The Arborea LBM plant will be, also, used as case study in the European project “Increasing Social Awareness and ACceptance of biogas and biomethane – ISAAC”, funded by the Horizon 2020 Programme.

The main goal of the ISAAC project consists on the construction of a communicative model oriented to spread balanced information, based on environmental and economic benefits, between all the actors potentially involved in biogas/biomethane implementation.

A participatory process model will be developed as the main project’s approach to reduce social conflict and to include all actors in important common decision making process.



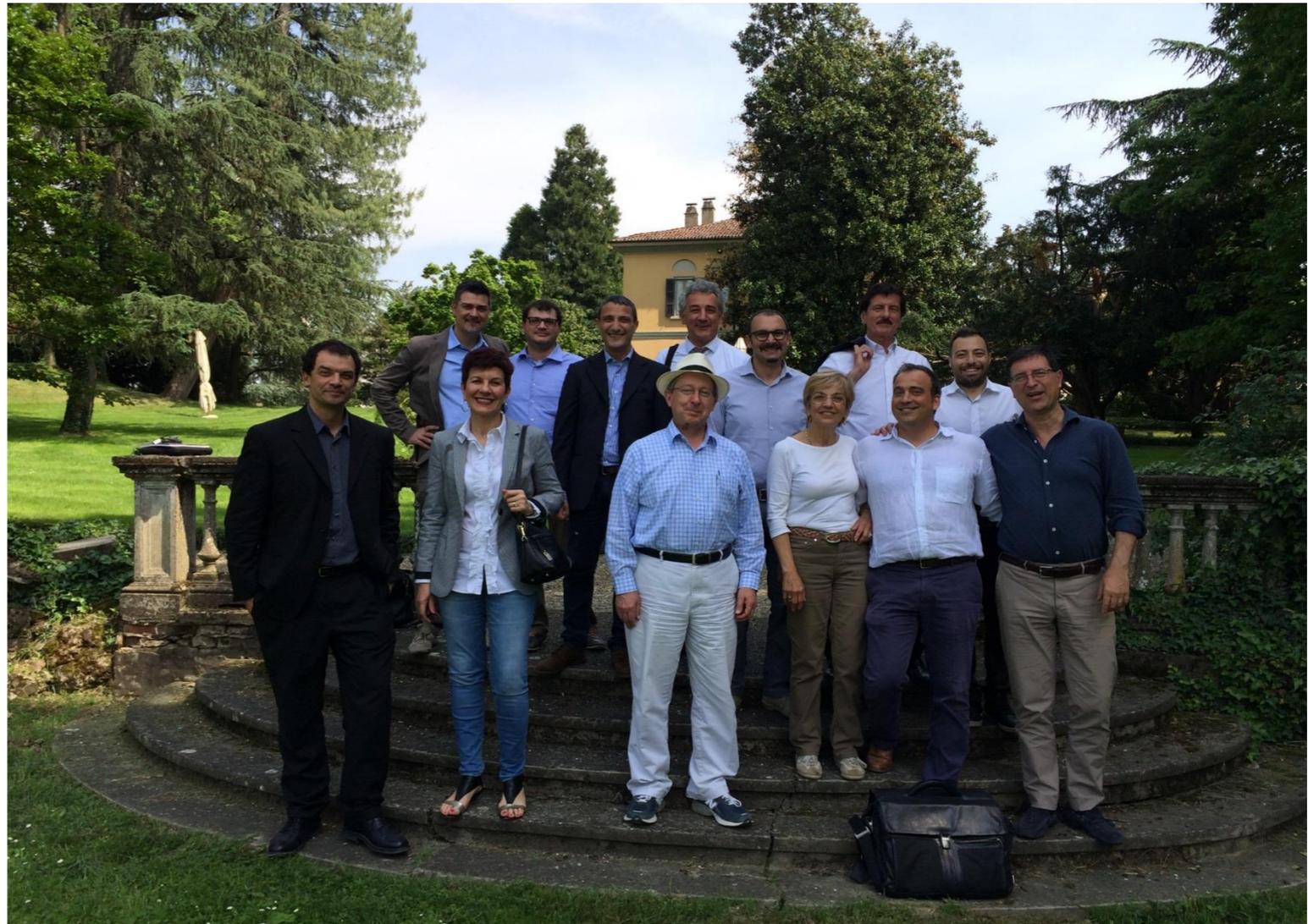
This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 646533.

**CIB**  
**Consorzio Italiano Biogas**  
**P.IVA: 09248721004**  
**www.consorziobiogas.it**

**c/o Parco Tecnologico Padano**  
**Via Einstein,**  
**Loc. Cascina Codazza**  
**Lodi (LO)**

**Segreteria**  
**Telefono +39(0)3714662633**  
**Fax +39(0)3714662401**

**Lorenzo Maggioni**  
**ricerca@consorziobiogas.it**



Executive Committee Meeting of Italian Biogas Consortium: “Biogasdoneright”  
Cremona, Italy May 8, 2015

# Thanks for your attention!

4. ANNEX 2 – Presentation “L’accettabilità sociale degli impianti biogas/biometano. I risultati di un progetto europeo”, Conference at the University of Padua



Centro studi di economia e tecnica dell'energia Giorgio Levi Cases  
Centro interdipartimentale di ricerca



UNIVERSITÀ  
DEGLI STUDI  
DI PADOVA

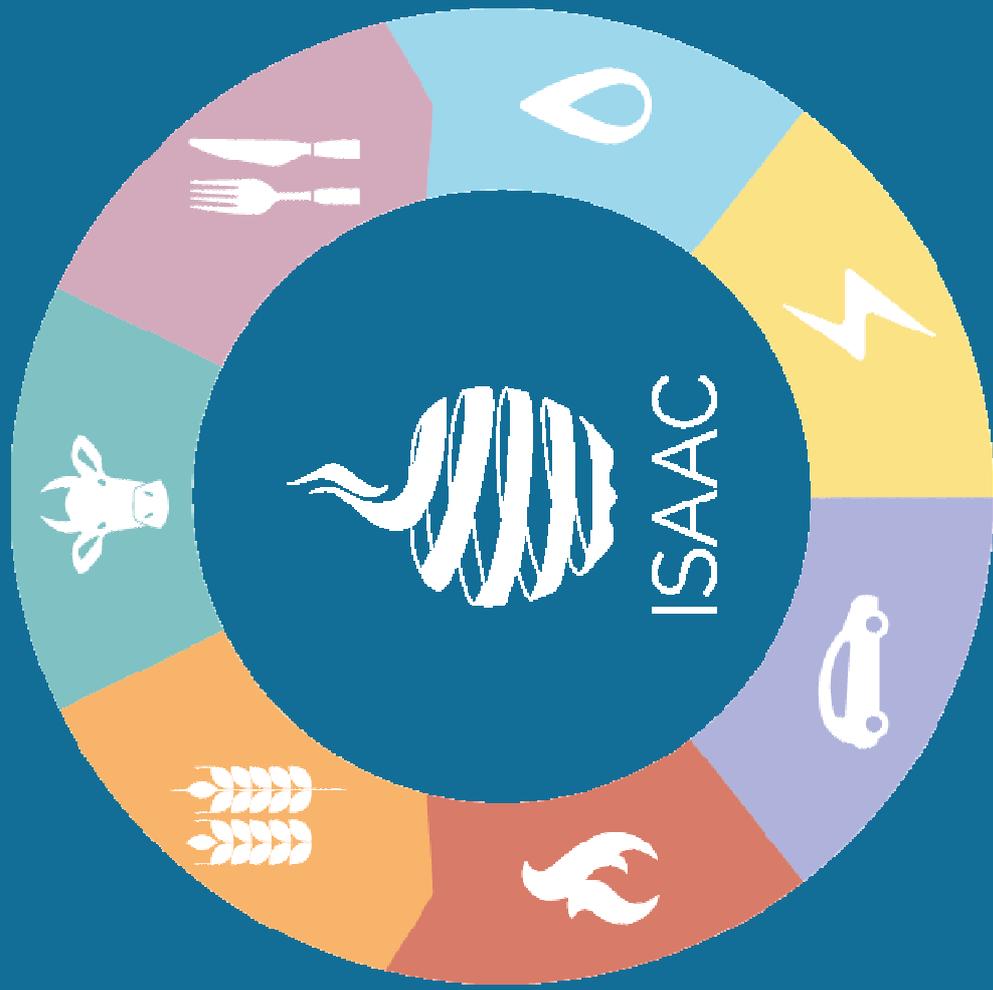
*Seminario «Dal biogas al biometano: un nuovo capitolo per le energie rinnovabili»  
Padova, 17 novembre 2016*

# **L'accettabilità sociale degli impianti biogas/biometano: i risultati di un progetto Europeo**

Dott. Lorenzo Maggioni

Centro interdipartimentale Giorgio Levi Cases

Dipartimento di Ingegneria Civile Edile ed Ambientale-Università degli studi di Padova



INCREASING SOCIAL AWARENESS AND  
ACCEPTANCE OF BIOGAS AND BIOMETHANE

## PARTENARIATO

AzzerCO<sub>2</sub>

Legambiente

Consiglio Nazionale delle Ricerche (CNR)  
Istituto sull'Inquinamento Atmosferico  
Istituto di Ricerca sulla Crescita Economica Sostenibile

Associazione Chimica Verde Bionet

Consorzio Italiano Biogas e Gassificazione (CIB)

Questo progetto è stato finanziato dal  
programma europeo di ricerca  
e innovazione Horizon 2020 con  
grant agreement n. 691875



[www.isaac-project.it](http://www.isaac-project.it) | [info@isaac-project.it](mailto:info@isaac-project.it)

## IL PROGETTO ISAAC

Sebbene l'Italia sia il secondo produttore di biogas europeo dopo la Germania, ha ancora un grande potenziale inespresso di produzione ed espansione del relativo mercato, soprattutto nelle regioni centro-meridionali.

Secondo le elaborazioni del CIB - Consorzio Italiano Biogas e Gassificazione (basate sul rapporto annuale 2015 del GSE - Gestore dei Servizi Energetici), sono più di 1550 gli impianti installati con una potenza totale di circa 1160 MW<sub>eL</sub>, ma le barriere non tecnologiche, che ne impediscono una maggiore diffusione, rappresentano ancora una pesante criticità.

**ISAAC è un progetto finanziato dal programma europeo Horizon 2020**, all'interno della Call for Competitive Low-Carbon Energy, iniziato a gennaio 2016 e che terminerà a giugno 2018, con l'obiettivo di favorire e supportare lo sviluppo del settore del biogas in Italia e in Europa.

**Lo scopo di ISAAC è la rimozione delle barriere non tecnologiche per favorire la diffusione del biogas/biometano nel mercato italiano e rendere più semplice la realizzazione degli impianti.**



## SOCIALI

Mancanza di informazione tra cittadini, agricoltori e allevatori

•

Sindrome NIMBY

•

Mancanza di interazione tra i diversi stakeholder

•

Riluttanza degli agricoltori, specialmente nel sud Italia, a cooperare nella gestione di impianti per la produzione di energia



## ECONOMICHE

Mancanza di specifici ed efficaci schemi di finanziamento

•

Bassa redditività dei piccoli impianti a biogas e incertezza sugli incentivi futuri



## LEGISLATIVE

Mancanza di una legislazione nazionale chiara sull'immissione in rete del biometano e sull'uso del digestato

•

Frammentazione e molteplicità di quadri normativi su autorizzazioni e procedure di installazione

## LE BARRIERE NON TECNOLOGICHE

Processi partecipativi in due territori pilota  
(interessati alla realizzazione di impianti a biogas)

Campagne informative in sette regioni italiane

Incontri pubblici con esperti per confronti aperti



Utilizzo di uno strumento di calcolo per valutare la disponibilità di biomassa  
residuale e definire il potenziale di produzione di biogas/biometano

Utilizzo di forme di finanziamento innovative  
(come il crowdfunding) per la creazione di nuove opportunità

Studi socio-economici sullo sviluppo, gli impatti e l'accettabilità  
degli impianti a biogas e biometano in territori specifici



Proposte legislative a livello nazionale sui  
processi partecipativi legati a politiche energetiche locali

Tavoli tecnici per la corretta interpretazione della legislazione nazionale  
su temi quali sottoprodotti/co-prodotti/rifiuti

Miglioramento dell'attuale legislazione italiana sull'utilizzo del biometano

Corsi di formazione per tecnici comunali e regionali

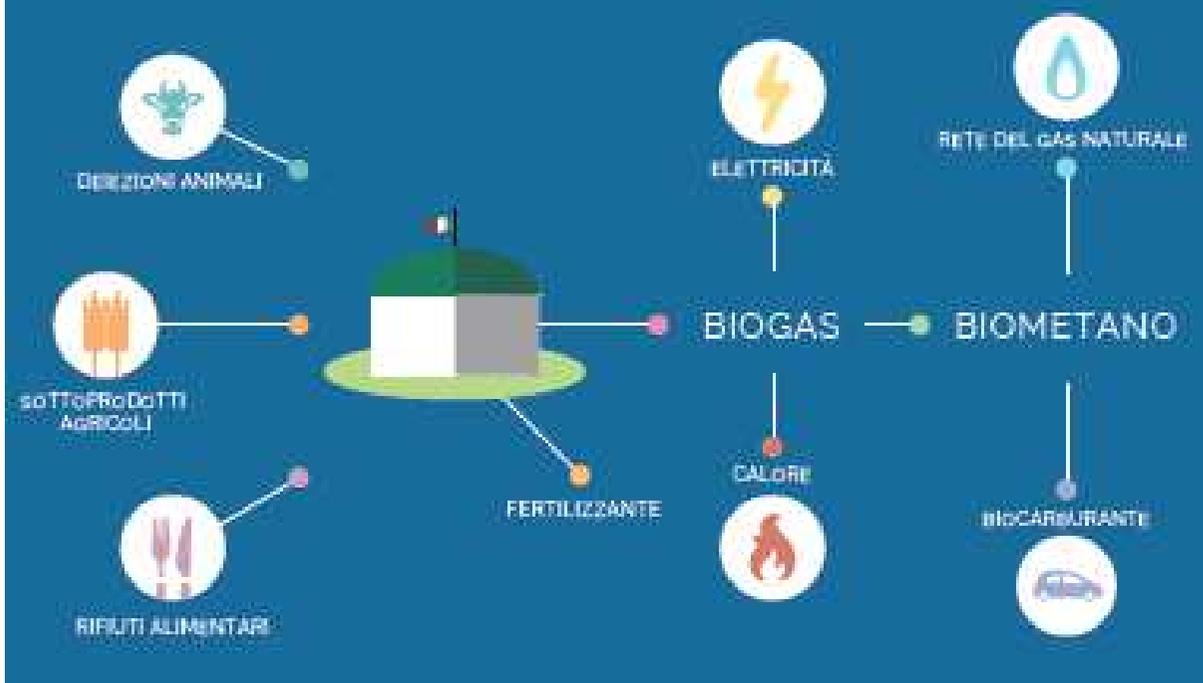


## L'APPROCCIO DI ISAAC PER SUPERARLE

## RISULTATI ATTESI

Il progetto contribuirà a:

- Aumentare la quota di energia da biogas nei consumi finali
- Sviluppare una politica più efficace a livello nazionale e regionale e programmi di finanziamento ad hoc per la realizzazione di nuovi impianti
- Divulgare informazioni e notizie sulla produzione e uso di biogas/biometano
- Sviluppare un percorso di accompagnamento degli agricoltori e degli altri soggetti economici verso il concetto di biogas come nuova fonte di reddito e il loro coinvolgimento nella transizione energetica

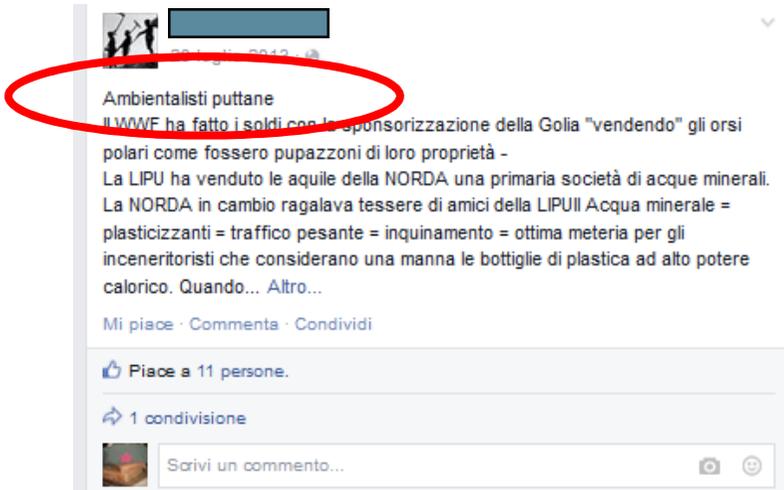


# L'accettabilità sociale degli impianti biogas/biometano



## Esempi di contestazione

# Esempi di contestazione



Ambientalisti puttane  
Il WWF ha fatto i soldi con la sponsorizzazione della Golia "vendendo" gli orsi polari come fossero pupazzoni di loro proprietà -  
La LIPU ha venduto le aquile della NORDA una primaria società di acque minerali. La NORDA in cambio regalava tessere di amici della LIPU. Acqua minerale = plasticizzanti = traffico pesante = inquinamento = ottima materia per gli inceneritori che considerano una manna le bottiglie di plastica ad alto potere calorico. Quando... Altro...

Mi piace · Commenta · Condividi

👍 Piace a 11 persone.

➦ 1 condivisione

Srivi un commento...



SI AVVICINANO LE AMMINISTRATIVE. RICORDARSI DEI FIGLI DI PUTTANA CHE HANNO VOLUTO LE BIOMASSE O NON HANNO MOSSO UN DITO PER EVITARLE

Mi piace · Condividi · 2 marzo alle ore 22:43

👍 Piace a 35 persone.

➦ 3 condivisioni

Visualizza un altro commento

Mi [redacted] ha invitato tutti i comitati a prendere posizione contro i candidati sindaci e liste che hanno regalato alle loro comunità le biomasse  
Ieri alle 14:32 · Mi piace · 👍 4

[redacted] intoro senza dimenticarsi di chi era in minoranza o di opposizione e ha fatto finta di non saper leggere e scrivere.  
Ieri alle 15:36 · Mi piace · 👍 5

[redacted] concordo con Vincenzo. A volte hanno saputo e hanno taciuto anche le "opposizioni"  
Ieri alle 15:40 · Mi piace · 👍 5



Ma rubare ai ladri è furto?

<http://www.espressonline.it/p=365415>



**Ancora furti nel ferrarese, svaligiata la centrale biogas | estense.com Ferrara**  
estense.com

I furti nel ferrarese non si limitano ad abitazioni e sedi di piccole aziende: questa volta infatti a essere colpita dai malintenzionati è stata la centrale

Mi piace · Condividi · 2 marzo alle ore 22:45

👍 Piace a 11 persone.

Mi [redacted] [redacted] 1500 €. Loro ci rubano i milioni....  
2 marzo alle ore 22:46 · Mi piace · 👍 1

Com [redacted] cotrecase ... ci rubano la salute ed il futuro!  
Ieri alle 15:31 · Mi piace · 👍 1



Coordinamento nazionale TERRE NOSTRE

Anniballi che è dell'Istituto Superiore della Sanità invece di preoccuparsi per la salute si preoccupa per i poveri biogassisti che non possono sterilizzare le matrici per la digestione (come fanno in altri paesi più seri) perché "costa troppo". Poi accredita tutte le infamie biogassiste: che fa bene all'ambiente e all'agricoltura e che valorizza miracolosamente gli scarti. Ci credo che poi lo scritturano su Biogas Channel. MA LO PAGHIAMO NOI QUESTO SIGNORE.

re responsabili della comparsa di difetti tecnologici nei formaggi e nelle conserve di pomodoro, in particolare, *C. butyricum* può costituire un pericolo per la salute pubblica, in quanto già associato a casi di botulismo umano. D'altro canto è necessario sottolineare che alcune specie di clostridi, presenti nei digestori, sono capaci di esercitare un ruolo di antagonisti naturali nei confronti di *C. botulinum*. La selezione di tali specie, potrebbe essere quindi utilizzata per assicurare la sicurezza dei digestati senza ricorrere alla sterilizzazione che comporta costi impiantistici e energetici non trascurabili.

Il biogas rappresenta una grande risorsa per l'agricoltura e per l'ambiente, in quanto permette l'integrazione del reddito agricolo attraverso il raggiungimento dell'autonomia energetica dell'azienda e la valorizzazione degli scarti delle lavorazioni agricole e zootecniche, che non devono più essere smaltite come rifiuti. Considerando le avversità che l'opinione pubblica esercita in taluni casi rispetto all'installazione degli impianti di biogas, sarebbe utile promuovere una serena discussione fra le parti in causa, soprattutto per fornire alla popolazione la possibilità di formulare un'opinione scevra da ogni preconcetto e ogni pregiudizio. In questo contesto l'Istituto Superiore di Sanità e in particolare il Centro Nazionale di Riferimento per il Botulismo, quale organi tecnico-scientifico del Sistema Sanitario Nazionale ed Ente di ricerca deputato alla salvaguardia della salute pubblica, potrebbe giocare un ruolo di primaria importanza.

Mi piace · Commenta · Condividi

# AFLATOSSINE CANCEROGENE E BIOGAS

14 h · Mi piace · 1

M...za che piace ai biogassisti

Anniballi che pontifica è un "tecnico di laboratorio laureato in biologia che tra le sue competenze indica "biogas". Un medico o un veterinario non parlerebbero come lui.

14 h · Mi piace · 1

Co...e ... a quanto pare purtroppo ci sono parecchi itaGLiani che hanno l'anello al naso!

48 min · Mi piace

Scrivi un commento...

# Biogas·bombe·microbiologiche

NOV 1

Biogas sversa digestato e inquina gravemente il fiume Mincio (Mantova)

## BIOGAS INFAME "Una svista" causa un disastro ecologico che coinvolge il fiume Mincio Sono bombe ecologiche disseminate per la pianura padana per arricchire gli speculatori

E perché Arpa, ente al servizio della politica e non dei cittadini non campiona le acque? Per paura di scoprire la presenza di batteri patogeni? E se basta una svista per procurare uno shock ecologico a un fiume significa che le autorizzazioni vengono concesse da irresponsabili che non tengono conto adeguatamente dei rischi (per non disturbare il big business)

Un'altro, l'ennesimo, episodio di fiumi inquinati dal biogas. Piazzare centinaia e centinaia di biogas nella pianura padana (innervata da un fitto reticolo idrografico) è un crimine ecologico. Sono gli stessi speculatori ed inquinatori biogassisti ad ammetterlo quando dicono "E' stata una svista". Se basta una svista per provocare uno shock ecologico a un fiume significa che le biogas sono BOMBE ECOLOGICHE (e lo saranno sempre di più quanto più gli impianti diventeranno vetusti).



NOV 9

A fuoco un'altra centrale a biomasse (a Pescara)

Prosegue senza sosta la serie di incidenti alle centrali a biomasse e biogas. In questo caso, avvenuto nel pascoese, vi sono delle abitazioni vicine. Per favorire il business speculativo si sono realizzate centrali ovunque senza riguardo ai rischi per la sicurezza, per la salute, per l'ambiente. Quando la speculazione arriva a questo livello non è più solo speculazione, è crimine.

08/news/il-fumo-nero-di-un-incendio-avvolge-l-impianto-a-



## Picciano, il fumo nero di un incendio avvolge l'impianto a biomasse della Ecogen

Due squadre dei vigili del fuoco e carabinieri nella zona industriale di contrada Le Piane

08.11.14) PICCIANO (Pescara) Un incendio è in corso nell'azienda Ecogen, zona industriale di Picciano, a contrada Le Piane. Un fumo nero, visibile anche da lontano, si è alzato nelle prime ore del pomeriggio dalla centrale termoelettrica dell'impianto che produce energia a biomassa. La Ecogen si trova a pochi passi dalla ditta Terra Verde, andata a fuoco

# "Botulismo cronico" - MORTE DAGLI IMPIANTI A BIOGAS



# Esempi di contestazione



COMUNE DI VESCOVATO  
26039 PROVINCIA DI CREMONA

P.zza Roma, 45 - Vescovato - TEL. 0372/830492 - FAX 0372/830036

Prot. 1434 / A.S.  
Rif. prec.prot. 536

Vescovato, 01/03/2014

Sig.ra   
Capogruppo di minoranza

OGGETTO: Risposta ad interrogazione per probabili sversamenti di liquami in agricoltura

Con riferimento alla Sua interrogazione, pervenuta il 24.01 u.s. al n. 536 di prot., si comunica che diversi sopralluoghi condotti dagli Uffici Tecnico e di Polizia Locale, nonché direttamente dal Responsabile del Servizio Tecnico in data 7.2.2014, e successive verifiche, hanno evidenziato quanto segue:

1. per quanto riguarda i terreni invasi da presunti liquami, si è appurato che si trattava di acqua piovana stagnante e non erano presenti segni di sversamenti di reflui
2. per quanto riguarda i cumuli di letame, non si è stati in grado, dalla fotografia, di identificare gli esatti luoghi, ma avendo ispezionato accuratamente l'intorno della zona segnalata, si può presumere che fossero stati effettuati depositi provvisori, poi rimossi.
3. i nostri uffici stanno comunque vigilando così come, ci risulta, sta operando anche la Polizia Provinciale.

Distintamente

IL SINDACO  
Giuseppe Superti



## Deliverable D2.1: State of the art and best practices collection

<i>Work Package:</i>	<i>WP2 - State of the art</i>
<i>Task/s:</i>	
<i>Responsible Partner:</i>	<i>CIB</i>

### ***Cap. 8: Research, collection, analysis and mapping of the most important episodes of movement of public opinion against biogas***

# Materiali e metodi



- 1200 questionari distribuiti nel periodo febbraio-marzo 2016 (anche attraverso intervista telefonica).
- Ricerca e classificazione di articoli riportanti casi di contestazione ad impianti biogas nel periodo 01/01/15 – 31/12/15 su 32 quotidiani a diffusione nazionale, 19 riviste specializzate e 360 quotidiani a diffusione locale.

**PROBLEMI CON COMITATI NO BIOGAS** (mettere una X sulla risposta corrispondente; elencare nelle caselle sottostanti le principali contestazioni ricevute e quali danni ha subito in seguito alle proteste dei comitati no-biogas)

HA MAI AVUTO PROBLEMI CON I COMITATI NO BIOGAS?  SI  NO

SE SI

IN FASE AUTORIZZATIVA  SI  NO

CON IMPIANTO IN ESERCIZIO  SI  NO

PRINCIPALE ARGOMENTO DI CONTESTAZIONE DEI COMITATI

DANNI SUBITI (sia di tipo economico che di immagine o altro)

REFERENTE/NOME COMITATO NO BIOGAS

AZIONI DI PROTESTA DEL COMITATO (mettere una X sulle tipologie di azione di protesta utilizzate dai comitati no biogas; descrivere l'azione di protesta nella casella ALTRO nel caso non corrispondesse ad una di quelle elencate)

RIUNIONI CON CITTADINI, SINDACO ETC. E PRESUNTI ESPERTI DI BIOGAS

MARCIA/CORTEO DI PROTESTA

ESPOSTO ALLE AUTORITA'

ALTRO

I PROBLEMI CON I COMITATI NO BIOGAS HANNO AVUTO UNA SOLUZIONE?  SI  NO

SE SI QUALE?

QUALI AZIONI SONO STATE SVOLTE PER CONTRASTARLI/INTERAGIRE CON I COMITATI?

SAREBBE DISPONIBILE A PARTECIPARE AD UNA GIORNATA " IMPIANTI APERTI " E FAR VISITARE LA SUA AZIENDA?  SI  NO

LA SUA AZIENDA HA PRODUZIONI ALIMENTARI CERTIFICATE ( DOP, IGP, BIOLOGICO ETC... ) ?  SI  NO

SE SI QUALI?



# Materiali e metodi



Ogni caso (raccolto grazie all'analisi della rassegna stampa o grazie ai questionari) è stato mappato e classificato secondo i seguenti criteri:

- alimentazione dell'impianto (FORSU o biomasse agricole),
- momento in cui si è verificata la contestazione (in fase autorizzativa, con impianto in esercizio, entrambi).

Nel contempo le principali contestazioni mosse agli impianti biogas sono state classificate usando 8 categorie.

Objections against biogas	Description
Smell	Unwanted odours from the anaerobic digester.
Risks	Fear of damaging effects on the landscape, fear of accidents (explosions, fires), fear of risk for public health (air pollution), worries that biogas plants exploit excessively agricultural products specially cultivated (energy vs. food).
Traffic	Traffic nuisance owing to biomass transport and to digestate transport.
Noise	Nuisance caused by CHP unit and / or by trucks used for the transport of biomass and of digestate.
Digestate	Improper management of the digestate.
Neighbours	Loss in value of residential buildings.
Biomethane	Fear of pollution or other problems linked to the production of biomethane.
Other	For example, fear of incorrect use of biomass; fear of groundwater pollution.

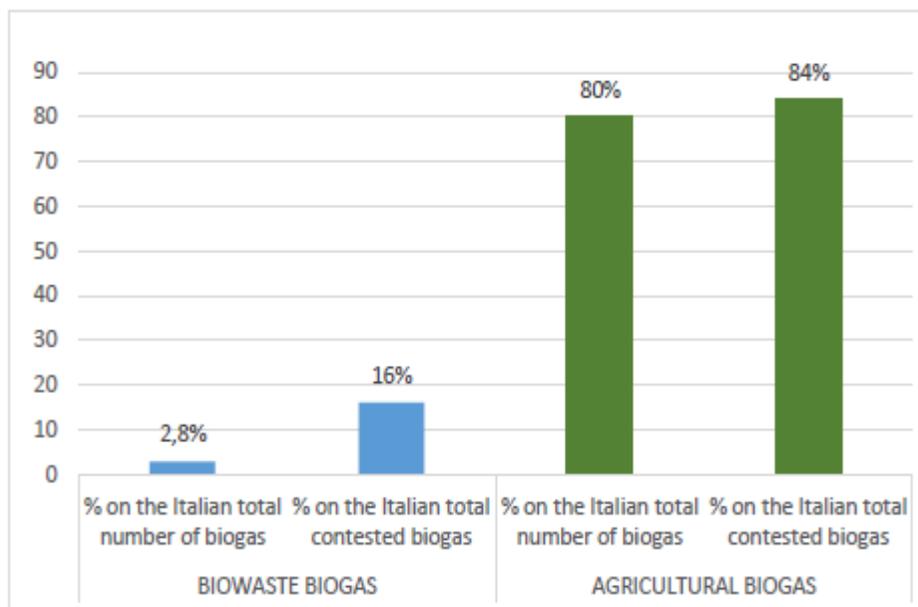


# Risultati

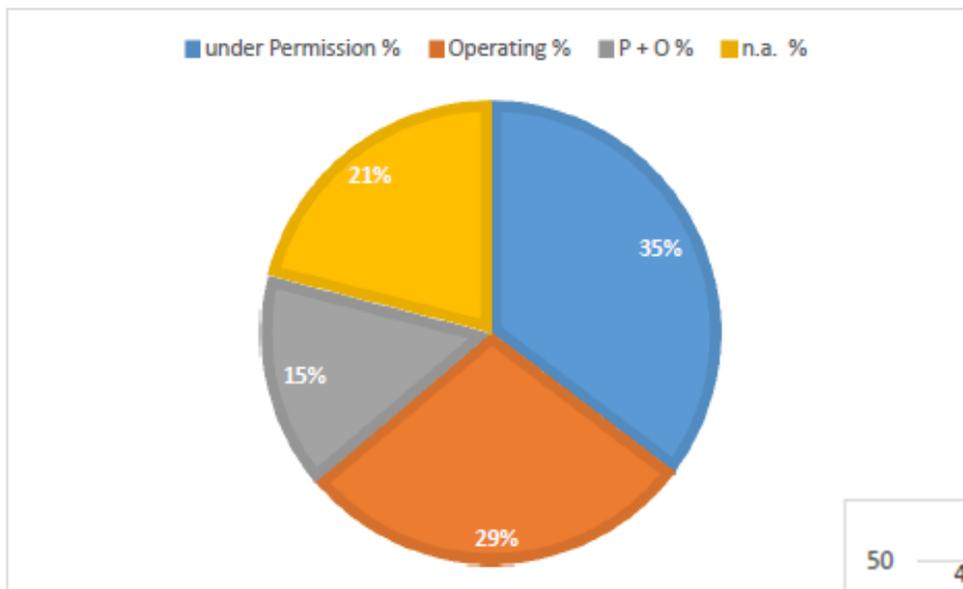


Alla fine di maggio 2016, sono state raccolti 391 questionari (pari a circa il 32% dei totali somministrati).

Dall'indagine è emerso che circa 119 impianti (pari a circa l'8%), su un totale di 1.555 operativi alla fine del 2015, hanno subito episodi di opposizione

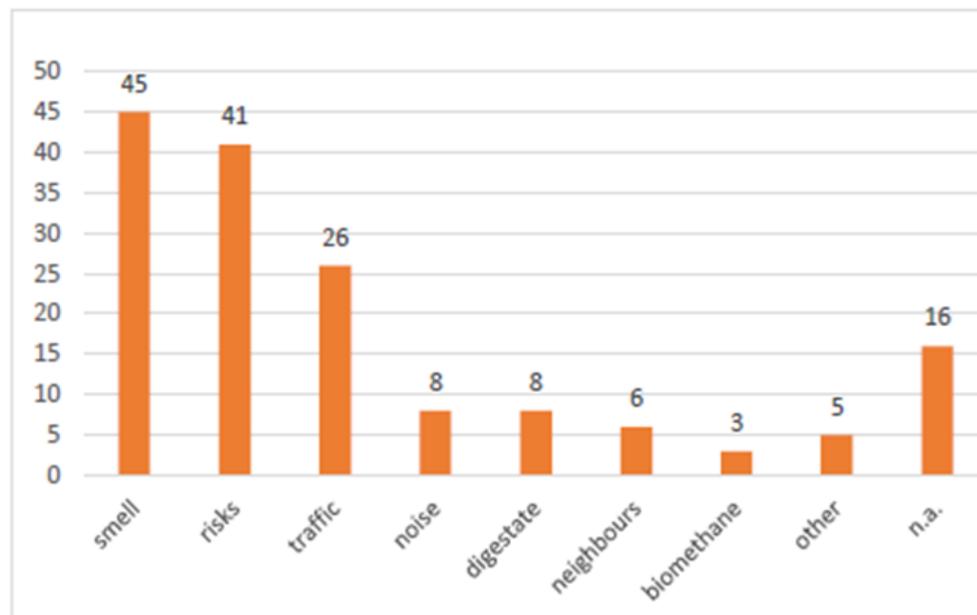


# Risultati

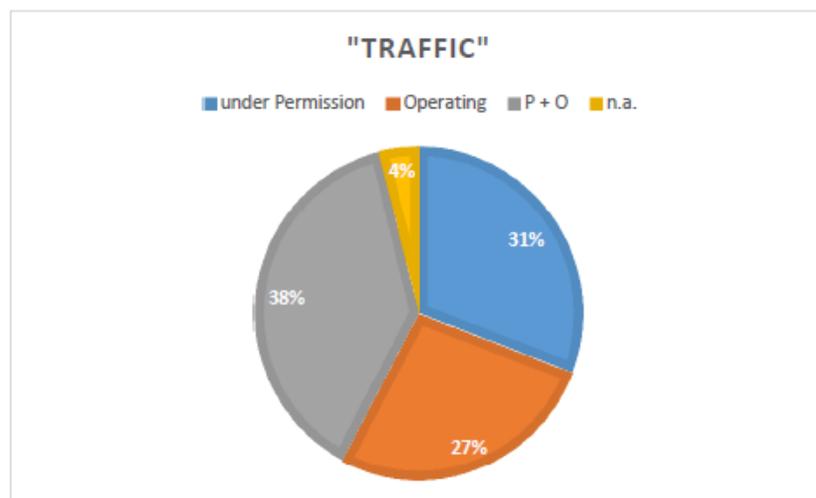
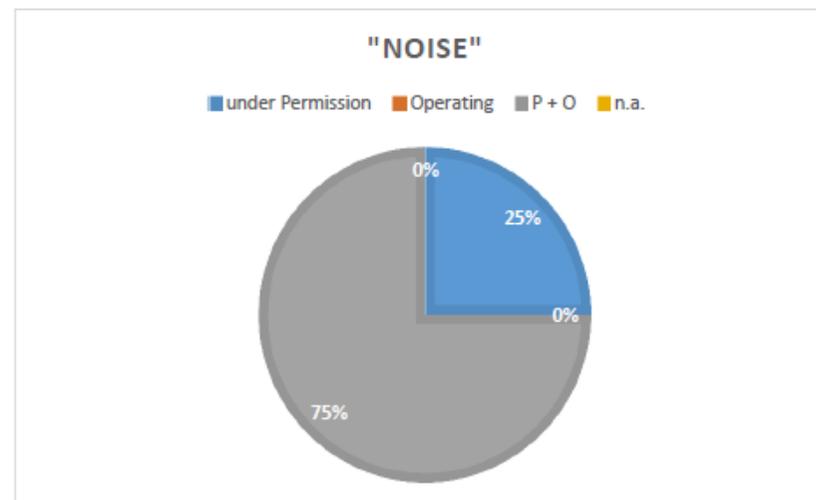
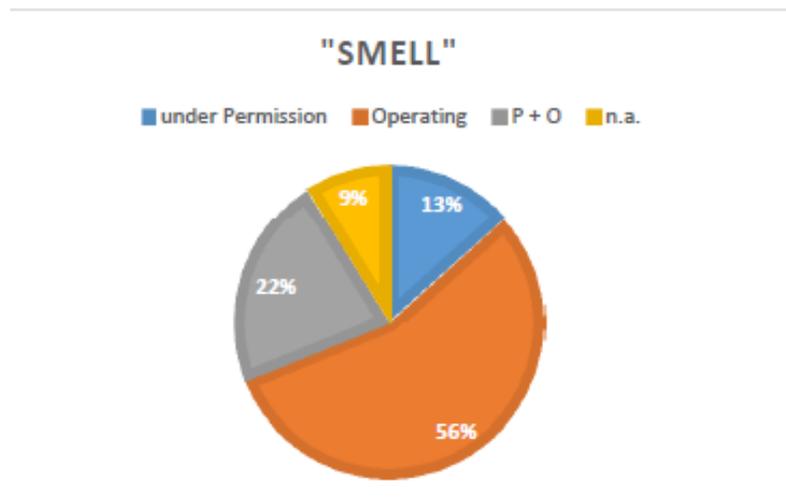


Il 35% degli impianti è stato contestato in fase autorizzativa

La contestazione principale è quella delle emissioni odorigene, seguita dalle preoccupazioni per possibili impatti negativi sull'ambiente e per l'aumento di traffico veicolare.

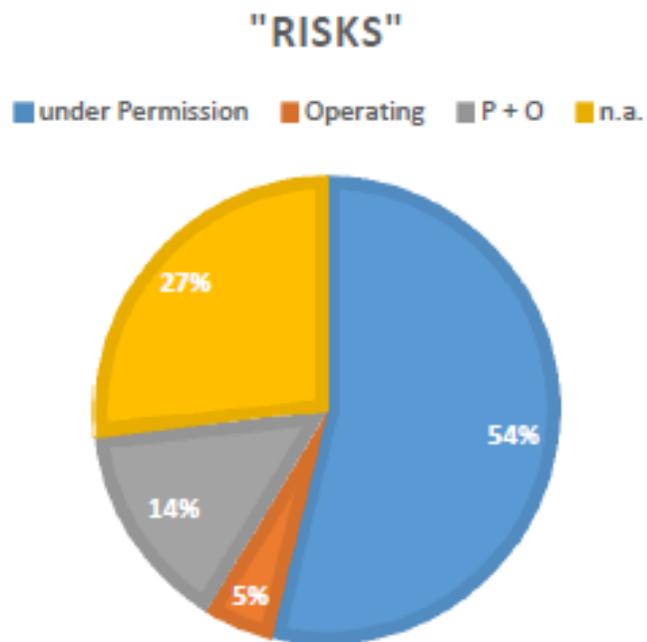


# Stato dell'arte



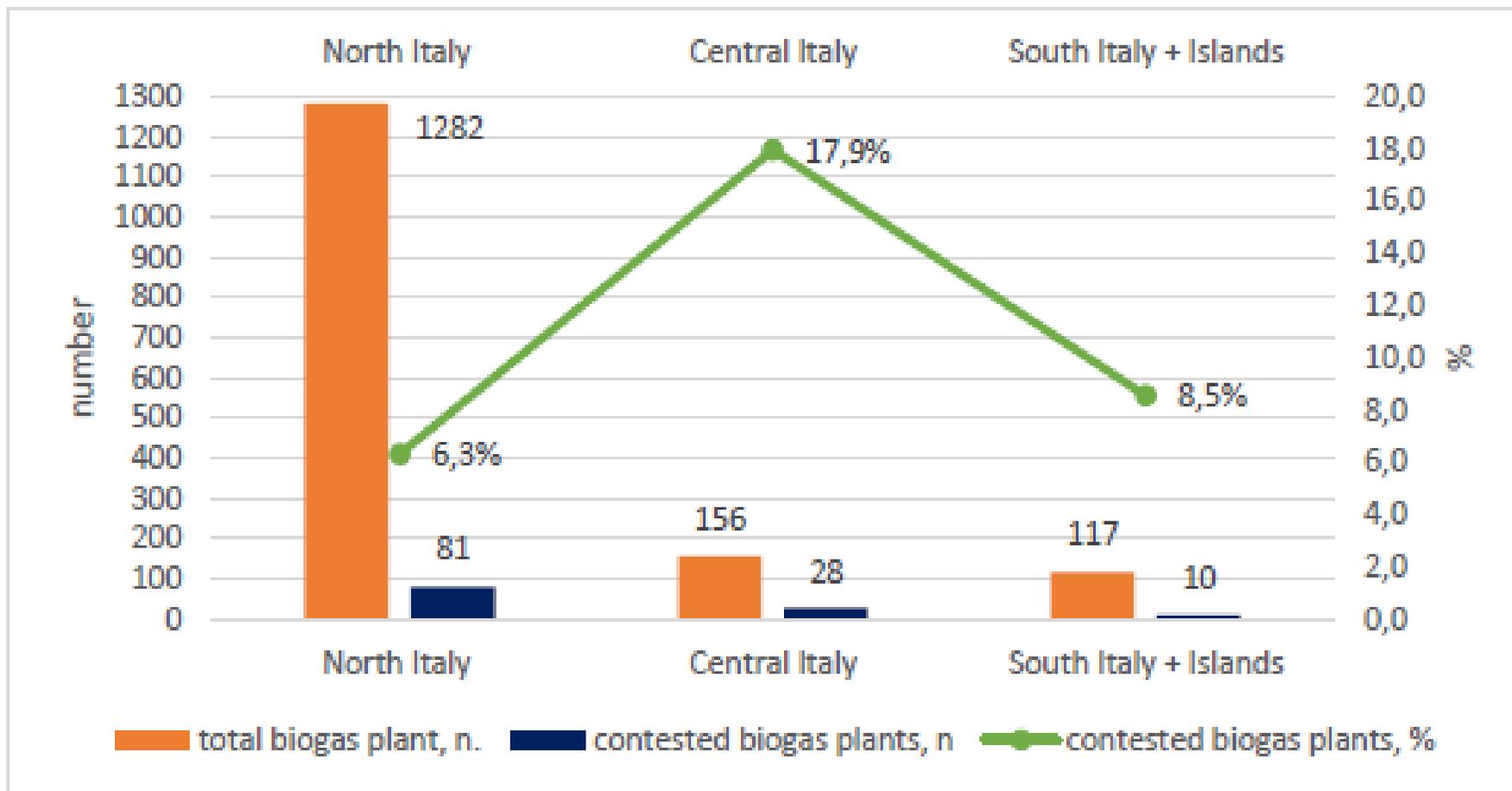
I problemi dell'aumento del traffico veicolare, del rumore e degli odori sono motivo di proteste anche prima che si siano verificati (rispettivamente nel 31, 25 e 13% dei casi).

# Risultati

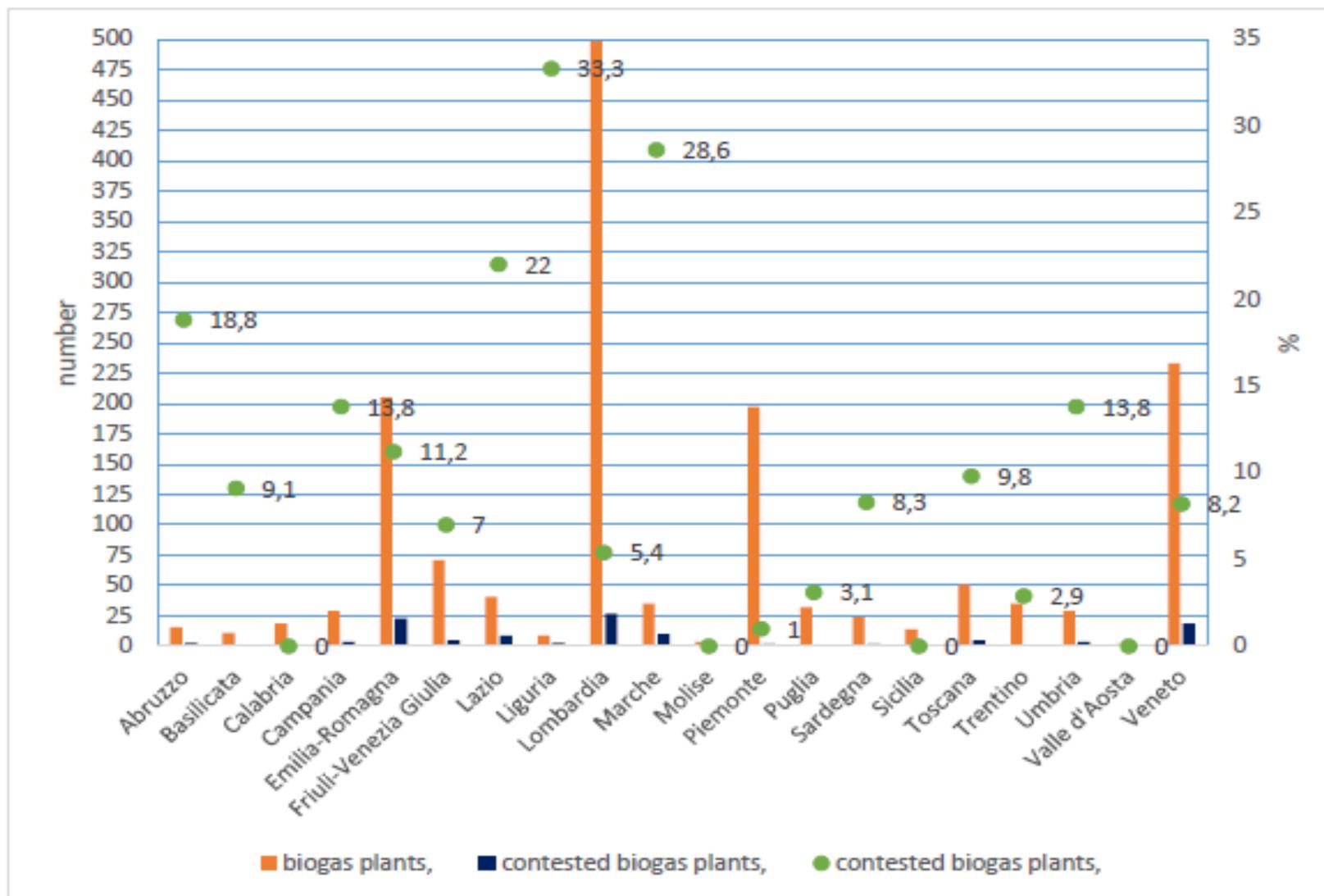


La paura per possibili rischi di carattere ambientale e/o legati alla salute della popolazione spinge i cittadini a protestare quando l'impianto è ancora in fase di autorizzazione (54% dei casi). Ad impianto operativo le proteste legate a questo problema calano drasticamente.

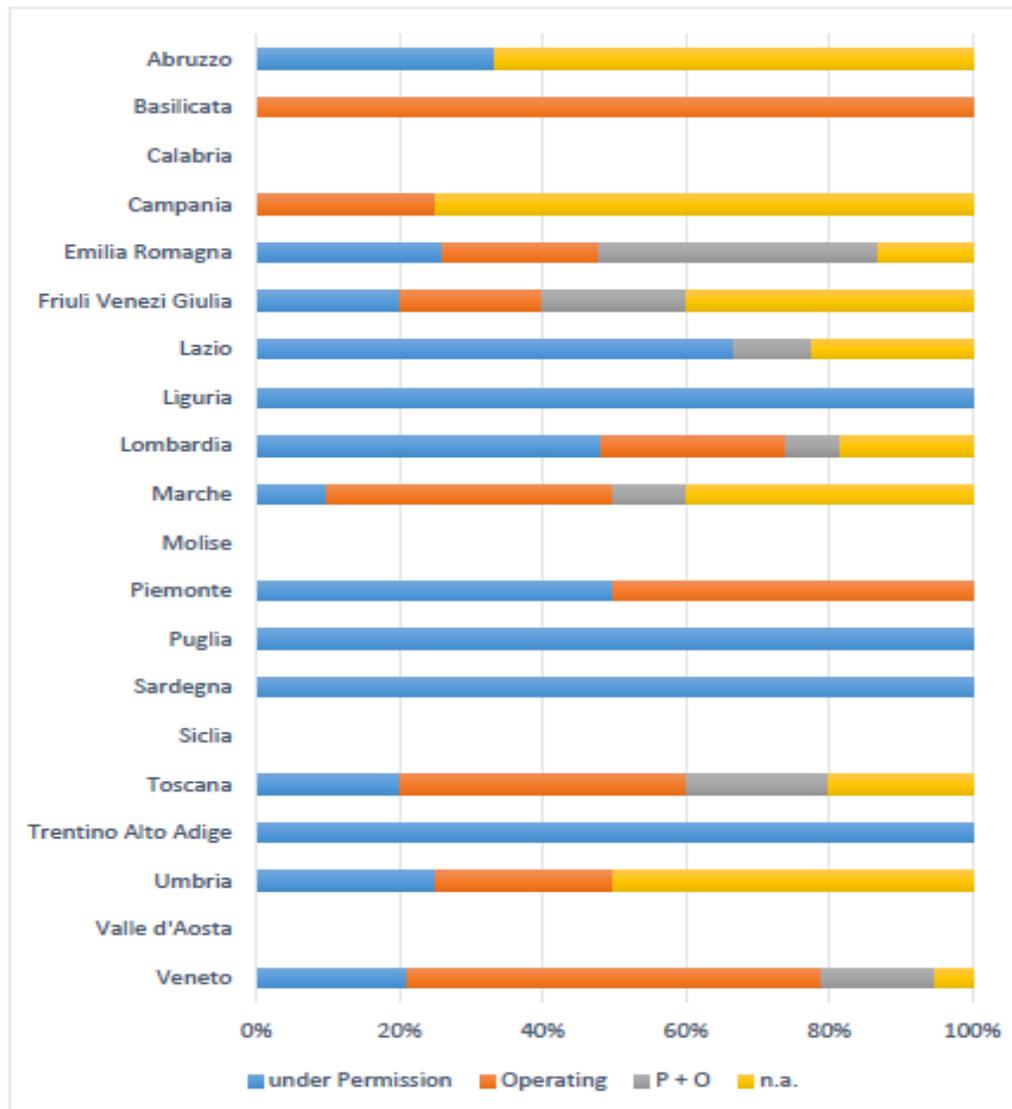
# Risultati



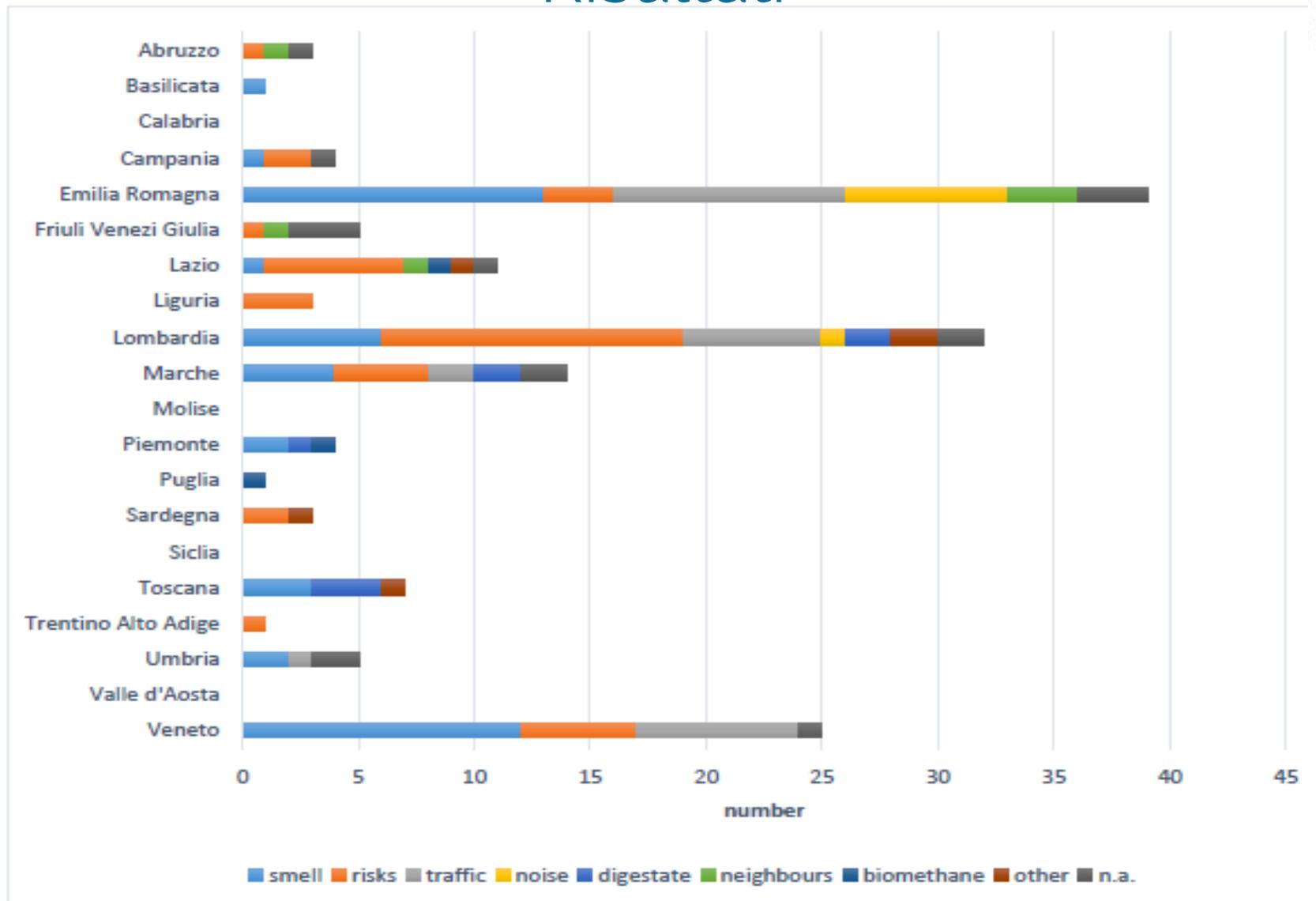
# Risultati



# Risultati



# Risultati



# Risultati



Province	Total biogas plants number in the province	Percentage of contested biogas plants on the total operating ones (national level)	Percentage of contested biogas plants on the total operating ones (provincial level)
Cremona	168	7,7	3,0
Brescia	87	7,7	3,4
Lodi	78	7,7	3,8
Mantova	77	7,7	10,4
Padova	74	7,7	13,5
Pavia	68	7,7	1,5
Venezia	46	7,7	6,5
Udine	42	7,7	7,1
Alessandria	39	7,7	2,6
Bologna	39	7,7	12,8

*Table 8.21. Top 10 Italian provinces for the number of operating plants with at least one problem of public acceptance, percentage of provincial contested plants compared to the national*



# Risultati



Province	Total biogas plants number in the province	Percentage of contested biogas plants on the total operating ones (national level)	Percentage of contested biogas plants on the total operating ones (provincial level)
Lecce	6	7,7	16,7
Biella	4	7,7	25,0
Genova	4	7,7	50,0
Rimini	4	7,7	50,0
Sondrio	4	7,7	25,0
Frosinone	3	7,7	33,3
Pescara	3	7,7	33,3
Savona	3	7,7	33,3
Nuoro	2	7,7	100,0
Avellino	1	7,7	100,0

*Table 8.21. Top 10 Italian provinces for the number of operating plants with at least one problem of public acceptance, percentage of provincial contested plants compared to the national*



# NOI DICIAMO SÌ AL *#biogasfattobene*

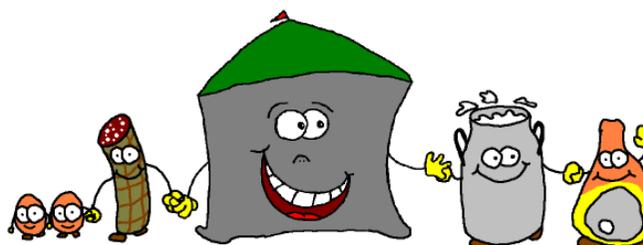
SIAMO TUTTI PRODOTTI DI QUALITÀ'

IL DIGESTATO È RAFFINATO



d.m.4

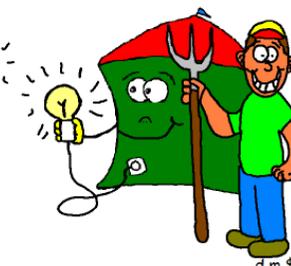
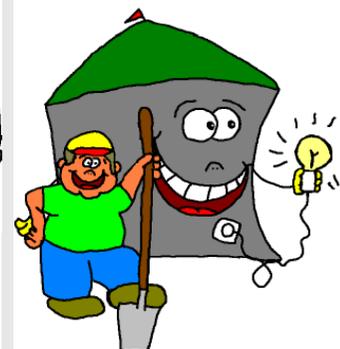
Il digestato è un prodotto più "raffinato" rispetto al liquame e permette un miglior utilizzo agronomico della frazione azotata.



d.m.5

Da sempre le aziende agricole italiane realizzano prodotti di alta qualità. Tra questi, oggi, si aggiunge il biogas.

AD OGNUNO LA SUA TAGLIA



d.m.6

È fondamentale progettare l'impianto di biogas in funzione della superficie aziendale, degli indirizzi e delle opportunità offerte dal mercato.

# PERCHE' DIRE SI AL BIOGAS

## Il punto di vista del WWF Internazionale



### Biogas — saving nature naturally in Nepal

Like 3 Tweet 0 Email 0 ShareThis 85

Posted on 06 March 2007

By Trishna Gurung\*

"One day I woke up and told my husband that I wasn't going to risk my life by collecting wood from the forest any more and that we were going to get a biogas stove, even if we had to take a loan," recalls Jari Maya Tamang, 41, as she stands proudly next to the first biogas system in her village in Badreni, Nepal.



© Trishna Gurung / WWF Nepal

Enlarge

#### Biogas and climate change

Biogas also has a direct positive impact on climate change, helping to reduce greenhouse gas emissions and global warming. According to WWF, a single biogas plant reduces carbon emissions by 4.7 tonnes per year.

<http://wwf.panda.org/?95320/Biogas-saving-nature-naturally-in-Nepal>



## PERCHE' DIRE SI AL BIOGAS

# Il punto di vista del Natural Resources Defense Council



NRDC is the nation's most effective environmental action group, combining the grassroots power of 1.4 million members and online activists with the courtroom clout and expertise of more than 350 lawyers, scientists and other professionals.

The New York Times calls us "One of the nation's most powerful environmental groups." The National Journal says we're "A credible and forceful advocate for stringent environmental protection."

### Advantages of Biogas Energy

- Air quality improves significantly because the biodigester reduces the smell of manure, turning its volatile organic compounds (VOCs) into odorless methane and carbon dioxide. Hydrogen sulfide, the source of the "rotten egg" odor, is captured in the biogas and destroyed during combustion.
- Cleaner water is an important benefit: biodigesters reduce bacteria levels in animal waste, which means that any runoff to surface waters will be less harmful. Digesters also reduce biochemical oxygen demand (BOD), a measure of the ability of organic wastes to remove oxygen from water. Aquatic species depend on dissolved oxygen in water for survival, so farms that reduce BOD help protect aquatic ecosystems.
- Greenhouse gas reduction is critical in mitigating climate change. Seven percent of methane emissions in the United States come from livestock and poultry manure, most of which in turn comes from swine and dairy operations. Biodigesters eliminate nearly all methane emissions, and as a renewable source of energy they reduce our reliance on fossil fuels.

**Biodigesters have the potential to slash methane emissions by 1.8 million metric tons -- the equivalent pollution reduction of taking 6.5 million cars off the road**

<http://www.nrdc.org/energy/renewables/biogas.asp>



# PERCHE' DIRE SI AL BIOGAS

## Il parere dell'Istituto di Ricerca Svizzero sull'Agricoltura Biologica



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### **New biogas-handbook for organic farmers**

(March 19, 2014) Organic farmers considering investing in biogas production to improve farm income and contribute to the environmental sustainability of their farms now have new tools at hand.

The SUSTAINGAS Handbook:

- > gives a compact overview of concepts, farmers' perspectives and best practice examples for sustainable biogas production on organic farms



## PERCHE' DIRE SI AL BIOGAS

# Biogas ed agricoltura biodinamica in Svezia



## On-Farm-Biogas-production-with-solid-manure-in-organic-farming

Evaluation-of-the-two-stage-dry-anaerobic-biogas-plant-production-and-recycling-on-Skilleby-experimental-farm-in-Järna-2004-2010-Final-report-December-2011

Artur Granstedt

Biodynamic-Research-Institute-Skilleby, 153-91-Järna, Sweden

[http://www.jdb.se/sbfi/files/Rapport On Farm Biogas production with solid manure in organic farming.pdf](http://www.jdb.se/sbfi/files/Rapport%20On%20Farm%20Biogas%20production%20with%20solid%20manure%20in%20organic%20farming.pdf)

### Reduce negative impact to the environment

...The lower nitrogen emissions and higher nitrogen efficiency mean that emissions of NH<sub>4</sub> N and N<sub>2</sub>O N are reduced with about 50 %. However the effect on N<sub>2</sub>O and NO<sub>3</sub> N emissions from soil after the use of liquid manure fraction need further study. In the literature lower emissions of CH<sub>4</sub> have also been documented.

### Effective internal recycling of plant nutrients and improved crop production

The field experiment with additional application in May of 20 tonnes biogas liquid manure ha<sup>-1</sup> gave 14 % higher yield of the cash crop winter wheat (15 % higher N yield) and also a corresponding increase of crop residues. In the total balance the nitrogen surplus was 35 instead of 36 N kg-1y-1 thus reducing the total potential nitrogen emissions from the biogas plant system compared to the conventional manure management system. The higher production of crop residues with a high C/N ratio also increases nitrogen immobilisation and in this way also contributes to increased humus content in the soil.

### Humus content in soil, long term fertility and production capacity



# Biogas in organic agriculture – effects on productivity, energy self-sufficiency and greenhouse gas emissions

Siri Pugesgaard\*, Jørgen E. Olesen, Uffe Jørgensen and Tommy Dalgaard

Department of Agroecology, Aarhus University, Blichers Allé 20, DK-8830 Tjele, Denmark.

\*Corresponding author: [siri.pugesgaard@agrsci.dk](mailto:siri.pugesgaard@agrsci.dk)

A positive farm energy balance was obtained for all biogas scenarios, showing that biomass production for biogas on 10% of the farm area results in an energy surplus, provided that the heat from the electricity production is utilized. The energy surplus implies a displacement of fossil fuels and thereby reduced CO<sub>2</sub> emission from the farm. Emissions of N<sub>2</sub>O were not affected substantially by biogas production. Total emissions of methane (CH<sub>4</sub>) were slightly decreased due to a 17–48% decrease in emissions from the manure store. Net GHG emission was reduced by 35–85% compared with the current situation in organic agriculture. It was concluded that production of biogas on organic farms holds the possibility for the farms to achieve a positive energy balance, provide self-sufficiency with organic fertilizer nitrogen, and reduce GHG emissions.

# PERCHE' DIRE SI AL BIOGAS

## Biogas per riscaldare ospedali



### Gundersen Lutheran teams with brewery on unique 'green' endeavor

“Healthcare” and “brewery” aren’t two words that typically go together. But, Gundersen Lutheran Health System based in La Crosse, Wis., has entered into a unique renewable energy partnership with a local brewing company, City Brewery. In 2009, the two organizations powered up a combined heat and power project that is expected to generate eight to 10 percent of the electricity used on Gundersen Lutheran’s campuses in La Crosse and Onalaska, Wis.

The renewable energy project uses waste biogas discharged from City Brewery’s waste treatment process and turns it into electricity. It is generating three million kilowatt (kW) hours per year. That is equivalent to planting 490 acres of forest or removing 395 cars from the road and is enough electricity to power 299 homes.

Here’s how it works. The brewing process creates waste that must be pretreated by City Brewery before it is sent to La Crosse’s municipal waste water treatment facility. Biogas, including methane,



Gundersen Lutheran and City Brewery in La Crosse, Wis., powered up a first-of-its-kind combined heat and power project in 2009. The renewable energy project generates three million kW hours per year by using waste biogas discharged from the City Brewery waste treatment process and turning it into electricity.

[Watch a video about this partnership.](#)



# PERCHE' DIRE SI AL BIOGAS

## Evidenze scientifiche



BIOGAS MASTER – L'energia allo stato virtuoso

29 Settembre 2014 – Museo della Scienza e della Tecnica - Milano



# BIOGAS E BOTULISMO: QUANTO C'È DI VERO?

**Fabrizio Anniballi**

Istituto Superiore di Sanità  
Dipartimento di Sanità Pubblica Veterinaria e Sicurezza Alimentare  
Centro Nazionale di Riferimento per il Botulismo  
Viale Regina Elena, 299 – 00161 Roma  
Tel. 06 - 4990 2254 – Fax 06 – 4990 2045  
fabrizio.anniballi@iss.it

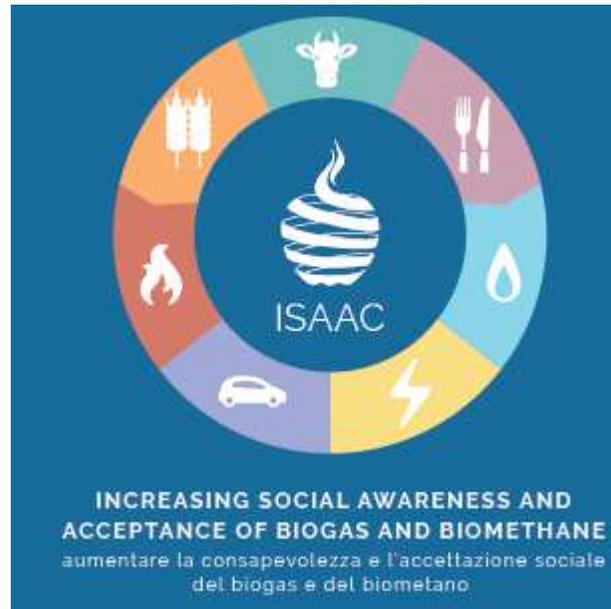
<https://www.youtube.com/watch?v=KL8uila2iGo>



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 691875



[www.isaac-project.it](http://www.isaac-project.it)



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# CERTO, È BIOGAS.

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CIB  
Consorzio Italiano Biogas e Gassificazione  
segreteria@consorziobiogas.it  
P.IVA: 09248721004



c/o Parco Tecnologico Padano  
Via Einstein,  
Loc. Cascina Codazza  
Lodi (LO)

**Grazie per l'attenzione**

**Lorenzo Maggioni**  
**ricerca@consorziobiogas.it**