CGI Global Summit 2022: Ambition to Action OCT 12 - 13, 2022

12 October 10:00-11:30am CEST webinar Title: Europe Energy Transition: a balancing act between securing energy and net zero targets









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Europe Energy Transition: a balancing act between securing energy and net zero targets

Introduction and moderation

Karina Litvack – Chairman, Climate Governance Initiative; Chairman, Sustainability & Scenarios Committee Committee, ENI Recent dynamics in European energy markets and board perspectives

Has Europe's focus on the energy transition caused, or exacerbated, the current energy security crisis ? What are the drivers? What are the right policies?

- Werner Schnappauf Chairman of the German Council for Sustainable Development
- Lucyna Stanczak-Wuczynska Chair Chapter Zero Poland Board Director

From ambition to action: how are strategies adapting? moderator Silvia Stefini – Chair Chapter Zero Italy

- Renato Mazzoncini CEO A2A Multiutility electricity & heating (Italy): an example of net zero plan and opportunities to accelerate the energy transition in the Italian market
- Marco Moretti BCG Regional Leader Industry Practice "Industrial Decarbonization Pact" discussing the implication of energy crisis to industrial companies with testimonials from industrial/hard-to-abate sectors

Register to the Summit here <u>https://bit.ly/3AoM5Ld</u> and select the sessions you want to attend





THE ROAD TO ITALIAN ENERGY AUTONOMY

Water, wind, sun, waste, our raw materials.

12 October 2022

RENATO MAZZONCINI

CEO and General Manager A2A





MITE'S PLAN: PERSPECTIVES OF INDEPENDENCE FROM RUSSIAN GAS We can reach 10.9 Bm³ of gas savings by 2025 using RES, energy efficiency and biogas



Fonte: Piano MITE settembre 2022

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THE ROAD TO ENERGY AUTONOMY: THE OBJECTIVES OF THIS STUDY

Elaborate a snapshot of the current state and the progress that has been made in the last years about **decarbonization** and **energy autonomy**

Qualify and **quantify** the development opportunities – under the constraints of a rapid activation and current level of technologies – of the **energy sources** available on the Italian territory



Estimate the potential **contribute** of different energy sources available on the national territory **to reach energy autonomy**



THE 5 PILLARS EMERGED FROM THIS PAPER

- 1 Italy is **fifth from bottom** (23rd country in the EU-27) in **the energy autonomy index** developed by The European House Ambrosetti (22.5% vs. 39.5% EU average in 2019)
- 2 Between 2000 and 2019 Italy has **increased its energy autonomy by 9%,** thanks to the development of renewable sources, **recording the 2nd growth among European countries**
- The potential development of renewable energy sources in Italy could generate an increase of **129.5GW of power**
- **The energy recovery from waste** and the valorization of **biomethane** are crucial variables to reach the energy autonomy
- 5 The valorization of water, wind, sun and waste would be able to triple Italy's energy autonomy



1 ITALY IS ONE OF THE EUROPEAN COUNTRIES WITH THE LOWEST ENERGY AUTONOMY RATIO (23RD PLACE IN EUROPE WITH 22.5%)

Energy Autonomy Index



5

2 BETWEEN 2000 AND 2019, ITALY HAS INCREASED ITS ENERGY AUTONOMY BY 9%, THANKS TO THE DEVELOPMENT OF RES, RECORDING THE 2ND GROWTH AMONG EUROPEAN COUNTRIES





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3 THE OPPORTUNITIES FOR DEVELOPMENT OF RENEWABLE ENERGY SOURCES IN ITALY COULD GENERATE AN INCREASE OF 129.5 GW OF POWER

Comparison between today's power and the potential additional power (GW)



Source: elaboration The European House – Ambrosetti, 2022 based on Eurostat



3 ABOUT 44% OF PRODUCTION AND 43% OF ADDITIONAL RES POWER ARE CONCENTRATED IN SICILIA, PUGLIA, LOMBARDIA E PIEMONTE

The opportunity for the development of RES in Italy: RES power and production from the deployment of additional power (Power in GW and production in TWh)



N.B. Development opportunities must be considered in the light of current technologies and existing regulatory and structural constraints. Source: elaboration The European House – Ambrosetti, 2022

THE PHOTOVOLTAIC IN A NUTSHELL: 32% OF ADDITIONAL POWER IS IN LOMBARDY, SICILY AND PUGLIA

3



N.B.: The development opportunity deriving from ground photovoltaics includes solar power that can be installed in conventional sites, quarries, exhausted mines, sites of national interest, exhausted landfills, degraded / abandoned areas, highways, railways, repowering and revamping and agrivoltaics Source: elaboration The European House – Ambrosetti, 2022



4 ITALY HAS AN OPPORTUNITY OF ENERGY RECOVERY FROM WASTE AND SEWAGE SLUDGE WHICH EXCEEDS 8MTON



The elimination of the transfer to landfill with the consequent **energy enhancement of the waste** would generate an electricity production **> 7 TWh**



Source: elaboration The European House – Ambrosetti, 2022

Data in Mt of recoverable waste

THE DEVELOPMENT OF THE BIOMETHANE SUPPLY CHAIN COULD BE CRUCIAL FOR ENERGY AUTONOMY OF THE COUNTRY



6.3 billion m³ of biomethane correspond to an electrical equivalent of **37.8 TWh** *

N.B: 2021 is the year under consideration

(*) A conversion coefficient of 6 KWh per m3 is assumed.

Source: elaboration The European House – Ambrosetti, 2022



ALMOST ALL THE ITALIAN REGIONS HAVE HIGH DEVELOPMENT POTENTIAL

Installable power of biomethane deriving from integration biomass, conversion of biogas plant and additional OFMSW treatment for the Italian regions (milion of m³), 2020



Source: elaboration The European House – Ambrosetti, 2022 based on data from Consorzio Italiano Biogas, Istat e Althesys, 2022

5 THE VALORIZATION OF WATER, WIND, SUN AND WASTE WOULD BE ABLE TO TRIPLE ITALY'S ENERGY AUTONOMY



The incremental production linked to the exploitation of the opportunities for developing the sources available in the area was compared to the estimated primary energy consumption of the country, equal to 1,155 TWh, in line with the prospects for electrification of consumption and energy efficiency envisaged by the "Fit for 55 "official provided by the European Commission and taking into account a greater installed capacity of renewable energy sources than the" Fit for 55 "scenario.

Source: elaboration The European House – Ambrosetti, 2022



5 HOW TO UNLOCK THE POTENTIAL: THE CRITICAL ISSUES THAT MUST BE FACED TO PROMOTE THE VALORIZATION OF OUR RAW MATERIALS

1. Water	 Lack of certainty returns of investment in large hydroelectric concessions and disincentive regulatory framework Duration of the concessions is one of the shortest in Europe (between 20 and 40 years vs France and Spain 75 years) and a market open to competition
2. Wind 3. Sun	 Low social acceptability (NIMBY syndrome) Authorization times (the average time required to authorize a new plant is 5 years, with peaks of up to 9 years, for wind power and 1.5 years for photovoltaics) Fragmentation of competences and involvement of multiple <i>stakeholders</i>
4. Waste	 High costs to produce biomethane and uncertainties about the incentive system NIMBY syndrome particularly deep for energy recovery plants Insufficient levels of separate collection in some Italian areas Construction times for waste disposal and treatment plants (4.7 years)



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A2A Company profile



A2A LIFE COMPANY

Where we are and what we do

We are a **Life Company**, and our businesses are:



ENVIRONMENT



WATER



We preserve the **natural resources**, protect the **environment**, and use and produce **clean energy...** 112 đ ų 11 ÷

... by applying the most sophisticated technologies, because we look ahead.

Thinking about the Planet's future. To improve everyone's life.



A2A. Life Company.











~1,9 Mton of waste

Treatment Capacity

~6,4 Mton of waste

treatment capacity

collected

0

Waste treated



Ш

~3,4 Mton of waste treated

Heat Production

~1.6 TWht of heat

from WTE

production

æ

34 treatment plants, **9WTE** and 36 biogas / biomass / bioenergy

Plants

18

Power production from WTE and **Biogas**

~2,1 TWh of power generated



Costumers Detail (.000)















BU SMART INFRASTRUCTURES

2021 in a nutshell







THANK YOU FOR THE ATTENTION

Renato Mazzoncini

BCCF BOSTON CONSULTING GROUP

Energy crisis and decarbonization in Industrial Goods

WEBINAR

OCTOBER 12, 2022



2,42

Talk about the unfolding energy crisis and the implications on the industrial sector Decarbonization as one of the lever for more secure and sustainable supply

Identify opportunities to progress on the sustainability path, while increasing resilience to the energy markets volatility

CO

European gas prices: elevated and volatile, with perverse backward dated structure



Notes: Dates of forward curve: 8 August, 13 July and 13 June Source: EnergyScan; BCG analysis

European electricity prices: significant spikes and volatility in prices, expected also in the future

European Power Prices Baseload (EUR/MWh)



Before Ukraine crisis, € 1,000+ Bln allocated with the EU Green Deal to support decarbonization

EU Green Deal funding (€ Bln)



1. Multiannual Financial Framework 2. Equal to 30% of total allocated funds (€ 1,074 Bln) 3. Equal to 30% of total allocated funds (€ 750 Bln in 2018 prices) 4. Includes potential public-private investments guaranteed by InvestEU Fund and Just Transition Mechanism 5. Increased to € 300 Bln by 2030 Sources: EU Commission, NextGeneration EU, EU MFF

As response to Ukraine crisis, EU publishes RepowerEU, which provides € 210 Bln on top of other funds



1 End EU dependence on Russian fossil fuels by 2027; as of now

- Coal import already banned
- Oil import banned by 2023 (with the sole exception of oil pipeline to Hungary)
- Methane import to be reduced by 67% in 2022

 Secure long-term sustainability, costeffectiveness, and energy supply through a phased disconnection from Russia



Short term

Long term

Reduce energy demand

- From 9% to 13% energy efficiency target¹
- Further support building renovation
- Electrification of transport and industry
- Curtailment plans²

Diversify imports and future proof infra

- Expand power grids and LNG import points
- Set-up of platform for EU-wide energy purchases
- Fill gas storages by 80% by 1Nov each year

Accelerate the clean energy transition

1. 2020-2030 energy demand reduction vs inertial projections 2. Only for non-protected customers and in extreme cases

"REPowerEU" as levers for energy crisis but it requires time and investment

Estimated reduction in Russian imports from quantifiable policies in the REPowerEU strategy¹ (Bcm equivalent)



Draft

1. Imports and reduction measures shown for EU countries only 2. Difference versus previous slide based on country segmentation Source: Rystad, Aurora, Broker reports, BCG analysis

Industry as key sector to decarbonize

Almost three-quarters of emissions come from energy use

Global greenhouse gas emissions by sector



1. Fugitive emissions are the often-accidental leakage of methane to the atmosphere during oil and gas extraction and transportation Source: Climate Watch, the World Resources Institute (2020)

Service BDI × BCG

OUTLOOK Climate-neutral Germany in 2045

Approx. 305 TWh PtL demand for net-zero emissions in air and maritime transport, in chemicals, and in remaining combustion engines on the road, thereof approx. 295 TWh in imports

> 480 GW wind and PV Expansion from around 110 GW in 2021 to the limits of potential in order to meet approx. 990 TWh of electricity demand

Heavy power grid expansion including extension of the most ambitious network development plan 2035 and bringing it forward to 2030

> 58 GW backup (H₂) power plants Provision of guaranteed capacity, 100% powered by green gases

> 100% green industrial heat from renewable generation via power-to-heat, heat pumps, bromass, and green gases

New facilities in steel, chemicals, coment, and line Complete switch to hydrogen DRI for primary steel, material defossilization in basic chemicals, and CCS plants in cement and time

> Approx. 740 TWh hydrogen demand thereof approx.130 TWh through imports from the European hydrogen backbone; development of a national infrastructure

CCS infrastructure

for transport and storage

of COs on land and at sea

100% GHG-neutral air transport Conversion to 100% green fuels and alternative powertrains

> 59 Mt negative emissions through biomass CCUS and direct air capture, additional 11 Mt CCUS for fossil process emissions in building materials

> > 100% green district heating and neighborhood solutions 4M buildings connected

> > > Comprehensive modal shift Rail transport performance grows by 50% for passengers and 70% for freight compared to 2019

> > > > Decarbonization in road transport 39M batery-electric cars, accounting for over 85% of the vehicle fleet; 400K batery-electric and 115K hydrogen-powered trucks

Nationwide charging/Hi Infrastructure to enable ramp-up, early expansion to 9M private and 6M public charging points already by 2030

> Sustainable agriculture and forestry More efficient land and fertilizer use, creation of carbon sinks through LULU CF

2.1% energy-efficient building renovation rate Building renovations to an average of approx. 70 kWh/(m² a)

100% green building heat including ISM heat pumps



Italy: similar picture with different mix

Top three levers to reach net zero in Italy are electrification green gases and CCUS

2050



Hard to abate sector decarbonization requires a long journey, supported by an ecosystem of players (1/2)

July	2021 Nov	vember 2021 Apr	ril 2022
Phase-1: Decarb. of the Hard To Abate industries	Phase-2: Plan to de "Pianura"	ecarbonize Northern Italy Padana Region"	Implementation phase
Commissioned by a consortium of 7 HTA associations	Involved key infrastructure operators	Involved industrial players to define priority anchor projects	ĭ A ĭ B ĭ C
Pulp Ceramics Chemicals Glass Steel Foundry Cement		 Ravenna ind. hub decarb. Green Metals Brescia Low Carbon Cement Green Fuels for Ceramic 	 Anchor Projects activities Formalization of decarb. consortiums Application to public funds
1st Presentation to Italian Ministries ¹	2nd Presentation I Italian Ministries	to 1	

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Anchor projects as key modular approach for implementation



Description

Objectives

Consortium of Chemical, Steel and waste to energy industries with mainly process emissions

Carbon Capture from the different emitters sharing infrastructures

CO2 transport and storage as a service from energy players (Eni and Snam)

Key results

Total project costs



CO2

~1 MTPA abated from Industrial hub

2.7 B€





Consortium of Steel, Foundry and Aluminum industries to decarbonize via H2 e biomethane

Fuel switch to biomethane also supporting investments in the industrial sector

Assessment of POC hydrogen projects to be eventually scaled up with H2 production in S. Italy



~0.2 MTPA abated

~115 Mm³/yr of natural gas switched to biomethane and hydrogen

2 B€





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