



5° AIEE Energy Symposium

Current and Future Challenges to Energy Security

Energy efficiency and future strategies of the energy industry

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**Rome, 15-17 December, 2020
Bocconi University**



Since 1945, Federmanager has been a key Association representing managers leading companies that produce goods and services, with about 180,000 managers, both active and retired.

It focuses on aspects such as:

- Contractual aspect
- Institutional aspect
- Social aspect aspect
- Professional aspect
- Cultural aspect



It has a **Central National Structure** and **57 Regional structures** across the Italian territory



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For several years, **Federmanager** has established a solid scientific relationship with **AIEE**, drawing up four reports on contemporary energy topics.

1° Report – March 2017 – ***An Energy Strategy for Italy - Compatibility between safety, economy, efficiency and the environment***

Energy security and Efficiency

2° Report – January 2019 – ***The ways for decarbonization and the Italian economic and industrial development***

Decarbonization

3° Report – February 2020 - ***Green transition and development. Can the Circular Economy contribute to the relaunch of the Italian system?***

Circular Economy

4° Report -2021- ***The energy communities role in the transition process towards decarbonisation***

Energy Communities

Our long term goal is to become the main interlocutors of politicians and stakeholders, both in Italy and in Europe.

List of Topics

- European Green Deal and key targets for 2030



- PNIEC and Energy Efficiency targets in Italy



- The transitional process: circular economy and energy communities



Introduction

- ❑ To achieve the 2050 net-zero emissions goal, is needed a high level of attention on green energy issues and on the decarbonization process.

Actions in the next decade are crucial!

- ❑ By using energy more efficiently and thereby consuming less, Europeans can:

Lower their energy bills

Improve their life quality

Mitigate climate change

Help protect the environment

Reduce reliance on external suppliers



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- ❑ To attain these benefits, it is fundamental to improve energy efficiency throughout the full energy chain (from production to final consumption).



The European Green Deal

The EU action plan aims at:

Restore biodiversity and reduce pollution to improve people's health

Promote the efficient use of resources by moving to a clean and circular economy

To reach these goals the EU will need to:

- Invest in **environmental friendly technologies**;
- **Introduce cleaner**, cheaper and healthier forms of **private and public transports**
- **Decarbonise the energy sector**
- Ensure superior building **energy efficiency**
- Collaborate with international partners to **improve global environmental standards**

European key targets for 2030

- ❑ A reduction of **55% of greenhouse gas emissions** (compared to 1990 levels)
- ❑ A minimum of **32% of renewable energy**
- ❑ An improvement of at least **32.5% in energy efficiency**

To meet the EU's energy and climate targets for 2030, each EU Member State needs to establish a 10-year integrated national energy and climate plan (NECP) for the period from 2021 to 2030.

European measures will focus on sectors where the potential for energy saving is the greatest, such as buildings, or where a harmonised approach across State Members is necessary, like energy labelling.

The purpose is to create new opportunities for sustainable growth and green jobs by reducing Europe's dependence on energy importation.

Ensure a secure/stable EU energy supply and affordable energy for all consumers.

Italy: the new Integrated National Plan for Energy and Climate

- ❑ PNIEC establishes the national targets for 2030 on energy efficiency, renewable sources and the reduction of CO₂ emissions.
- ❑ Italy intends to achieve and exceed the EU objectives by placing citizens at the center of the Italian energy transition.

The plan is structured on **5 steps**:

Research, innovation and competitiveness

Development of the internal energy market

Decarbonization

Energy security

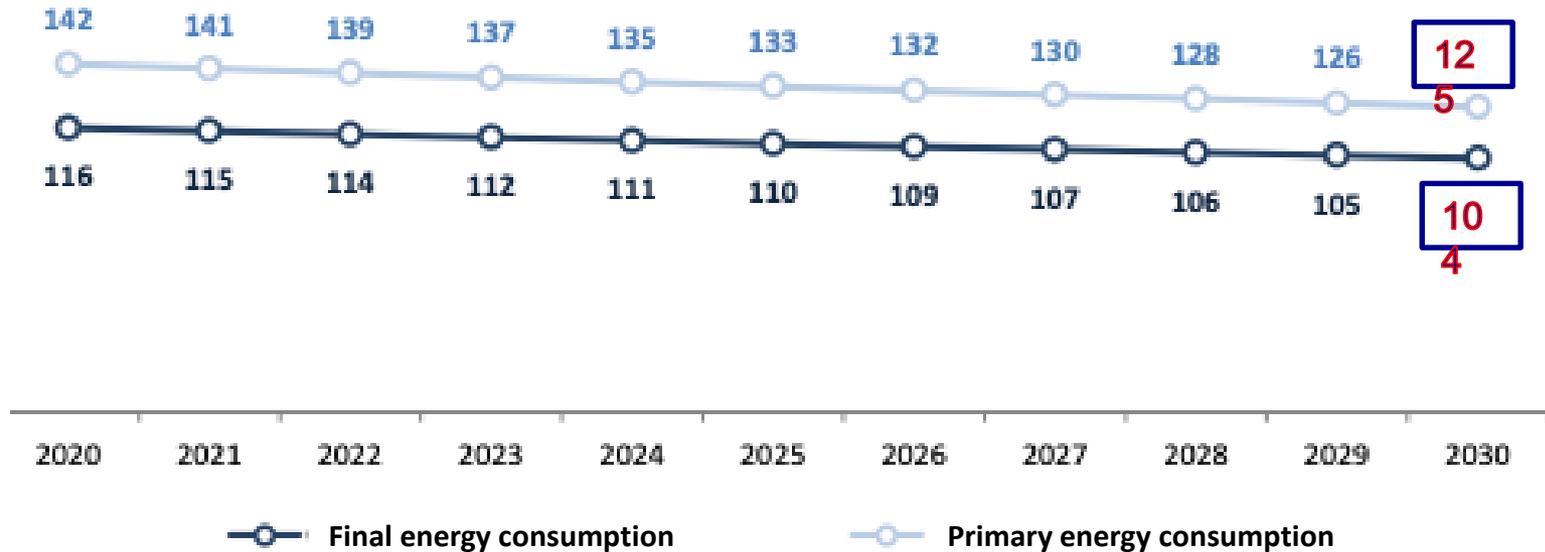


Energy efficiency



- **-43% of primary energy consumption**
- **-39.7% of final energy consumption**

Italian primary and final energy consumption (Mtoe) in the period 2020-2030

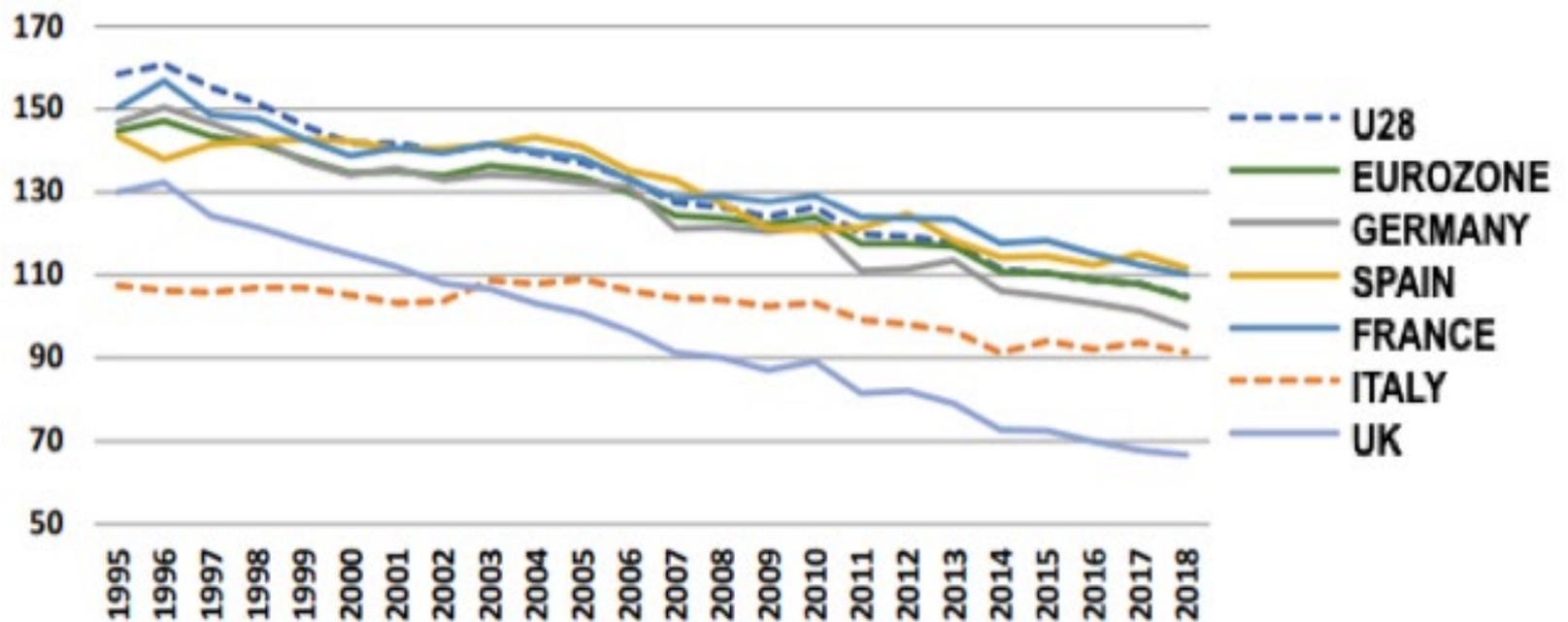


PNIEC's Targets

Source: RSE

- Increase the efficiency in the use of energy resources absorbed by the residential sector.
- Reduce costs of energy bills.
- Define specific technologies for the promotion of energy efficiency through consumers awareness.
- Study and implementation of methodologies for the development of energy communities.

Primary energy intensity in some EU28 countries, years 1995-2018 (tep/M€2015)



Source: Eurostat Data

- Italian primary energy intensity in 2018 amounted to 91.36 tep/M€2015 (-2.4% compared to 2017).
- The Italian power sector and the manufacturing system are among the most efficient in all Europe after UK.

Ways to achieve energy efficiency goals

- ❑ Improve the way people consume by growing circular economy and *energy recovery* systems (Pyrolysis).

- ❑ Create local *energy communities* developing innovative methods of management and control of the electricity grid through distribution logics able to increase energy efficiency in the cycle of production, transport and distribution of electricity.

- ❑ Develop citizens' ethic: reduction of citizens' energy waste (consumer awareness).

- ❑ Digitalization and technologies (*co-generation*).

Energy Recovery

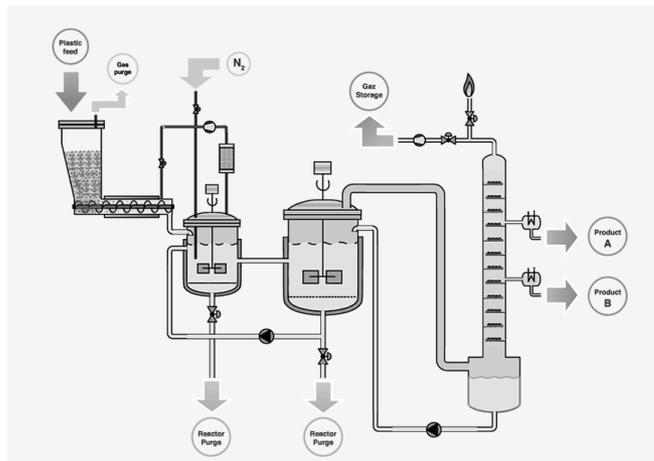
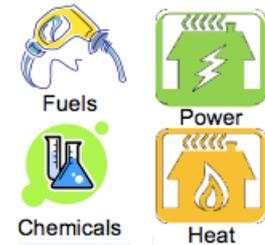
Conversion of non-recyclable waste materials into useable heat, electricity, or fuel through a variety of processes, including combustion, gasification, pyrolysis, anaerobic digestion, and landfill gas (LFG) recovery.

Pyrolysis: How does it work?

1) Renewable energy (purchased from the electricity grid) and non-recyclable plastics are injected into the system.

2) Thermal conversion process - made in the absence of oxygen (without combustion and CO₂ emissions)

3) Resulting fuels: *Liquid fuels, Syngas and Char*



Source: GRT Group

- *The polymers are placed in a reactor and brought to the temperature of 700-800 ° C. Due to the heat effect, the plastics decompose into **Syngas, Liquid fuels and Char**.*
- **Raw materials** are the **non-recyclable waste** (such as plastics), normally destined to landfill, environment or incinerators (with CO₂ emissions issues).
- Using the “Pyrolysis”, non-recyclable waste would gain an intrinsic value, therefore constituting an incentive to their correct management and preventing them from being dispersed in the environment.

Energy communities

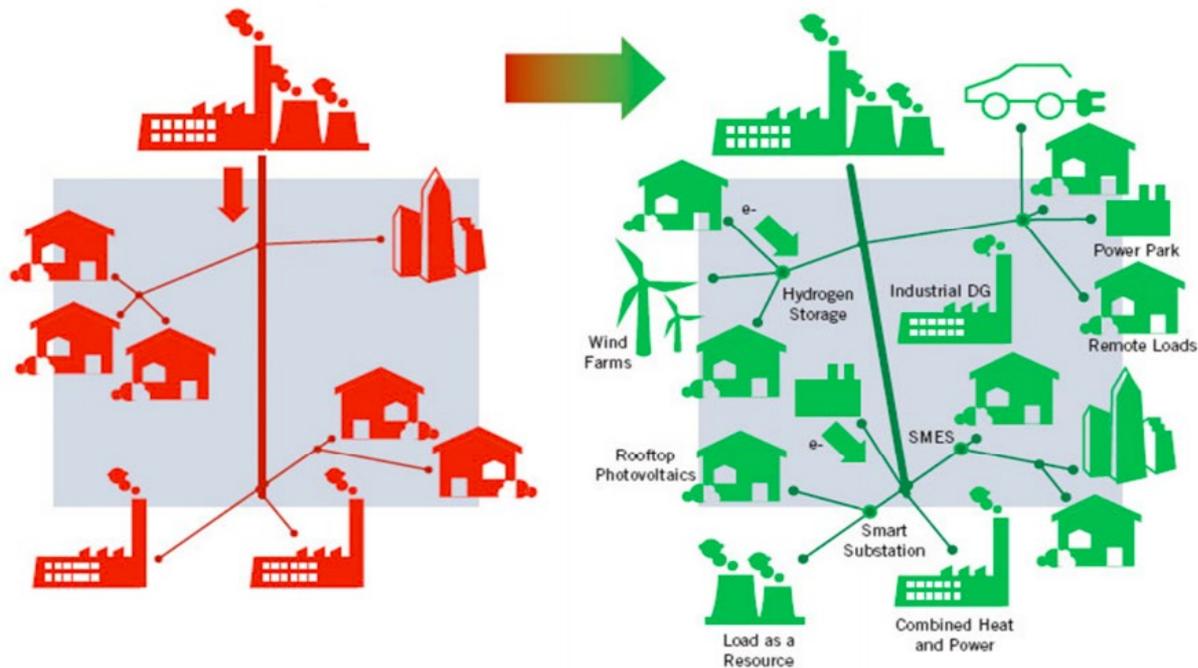
The aim of energy communities is to move from a single concentrated generation to a distributed generation coming from an energy mix composed of :

Renewable energy

Energy recovery

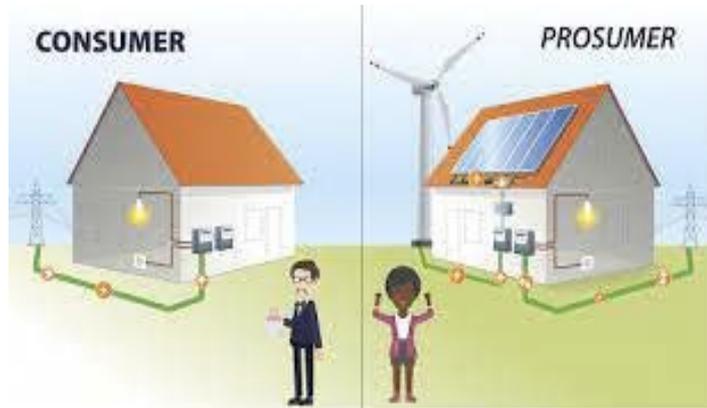
Energy efficiency

Circular economy



To organise collective energy actions through open democratic participation, governance, and the provision of benefits for the local community members.

- ❑ The exchange of energy between residential units of the same building is one of the possible configurations called "Energy Community".



- ❑ Buildings can become aware **prosumers** and invest in improving energy efficiency allowing residents to install photovoltaic systems.
- ❑ The direct exchange of energy would make electricity consumption more efficient by sharing electrical utilities and exchanging the energy accumulated for each user thanks to accumulators.
- ❑ Distributed production is also useful for the lightning network avoiding their distribution overload, reducing transport costs (transport which together with system charges almost double the cost of energy, penalizing Italian companies and energy dispatching) and containing network losses (energy efficiency).

Conclusions

- ❑ **Italy** is among the **most energy efficient countries** in Europe and worldwide. Such performance has primarily been driven by the industrial sector, including the power sector.
- ❑ In this positive scenario, it looks fundamental to **implement** measures such as **energy communities** capable of improving buildings energy efficiency, reducing energy bills and **preserving** the **environment** and the citizens **life quality**, and creating new **green jobs**.
- ❑ Energy Efficiency is set to play a **crucial role to achieve the European and Italian 2030 targets** according to the NECPs. The actual achievement of such target will depend on the regulatory framework and how it will enable investments.
- ❑ **Crow funding**, alternative finance tool that allows the raising of capital for a project or a company through web platforms, is a possible resolution to **increase citizen participation** in renewable energy investments and in energy communities projects.