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Renewable Energy Communities: The Benefits for Businesses and Individuals

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Renewable Energy Communities (RECs) represent a key innovation in the global energy landscape, providing sustainable and democratic solutions in energy production. This article will broaden the focus by exploring the benefits and applications of RECs in an international context.

What are Renewable Energy Communities (RECs)

Renewable Energy Communities (RECs) play a fundamental role in sustainable energy. They allow groups of people and organizations to collectively produce, use, and share renewable energy. This model not only fosters the adoption of renewable energies, reducing environmental impact, but also promotes energy independence and community resilience. RECs represent a significant innovation in the energy sector, actively contributing to the transition towards a cleaner and more sustainable energy future.

Renewable energy communities in Italy are growing, thanks to a favorable regulatory framework. These communities allow citizens, businesses, and local administrations to produce, consume, and share renewable energy at the local level. Italian legislation has introduced incentives and simplifications to promote these initiatives, encouraging greater energy autonomy and the spread of renewable energies. Renewable energy communities represent an important step towards a more sustainable and decentralized energy model, contributing to the country's energy transition.

The global energy transition towards renewable sources is crucial for addressing climate change and ensuring a sustainable future. This transition involves a shift from traditional energy sources, such as coal, oil, and natural gas, to cleaner and renewable sources, such as solar, wind, hydroelectric, and biomass. This change significantly reduces greenhouse gas emissions, helping to limit the rise in global temperatures. Moreover, it enhances energy security, reduces dependence on fossil fuels, and stimulates technological innovation, creating new economic opportunities and jobs. Therefore, the energy transition is a fundamental pillar for sustainable development and environmental protection worldwide.

Global Advantages of a RECs

Globally, Renewable Energy Communities (RECs) offer significant **environmental benefits**, the most important of which is the reduction of greenhouse gas emissions. By using clean energy sources such as solar, wind, and hydroelectric power, RECs help decrease dependence on fossil fuels, the main contributors to global warming. This reduction in emissions is crucial for combating climate change and achieving global environmental sustainability goals.

RECs offer significant **economic benefits**, including savings on energy costs for businesses and consumers. These savings arise from local energy production, reducing the need to import energy from external and costly sources. Moreover, RECs can benefit from government and tax incentives, further increasing economic savings. These advantages make RECs not only an ecological choice but also an economically beneficial solution for individuals and communities.

RECs have a significant **social impact**, which includes job creation and the promotion of energy equity. The development and management of renewable energy projects require skilled labor, thus stimulating employment in the renewable energy sector. Additionally, RECs promote energy equity by allowing more people and communities to access clean and affordable energy sources. This reduces energy disparity and supports local economic development, improving the quality of life in the involved communities.

RECs in Italy and Around the World

According to *Legambiente's* "Renewable Communities 2021" report, **Italy** has about twenty active or in the process of activation Renewable Energy Communities, distributed throughout the national territory, with seven more in planning. The self-production plants are mostly between 20 and 60 kW.

The future is expected to see exponential growth in the number of Energy Communities. A study by The Italian University *Politecnico di Milano* (Electricity Market Report) estimates that by 2025, there will be about 40,000 Italian energy communities involving about 1.2 million families, 200,000 offices, and 10,000 SMEs.

In Europe, there is a federation of energy cooperatives that includes about 1,900, totaling over 1.2 million citizens.

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A recent study published in the scientific journal [Nature](#) surveyed energy communities across 29 European countries, including 26 EU member states. In the **EU**, there are 9,252 energy communities, but there is a significant disparity among member countries. Over half of these communities are in Germany, which boasts 4,848 energy communities. Other EU states follow, but some countries like Bulgaria, Malta, Romania, and Hungary have only one.

Examples of existing Energy Communities worldwide:

- There are over 420 Energy Communities in **Great Britain**. In particular, the one in the Isles of Scilly is also experimenting with marine energy.
- In **Brooklyn, New York**, citizens and traders participating in the local Energy Community can buy and sell renewable energy through an app.
- In **Australia**, where about 100 Energy Communities operate today, the first to be born was Hepburn Wind, which began generating energy in 2011.
- In **Japan**, the *enerugikomyuniti*, which mainly exploit solar energy, are widespread.

A Practical Example: The REC and a Swimming Facility

The municipal swimming pool has all the ingredients for a widespread and useful REC for energy aspects, but not only.

The walls of the swimming pool are owned by the municipality, which has leased them to a manager through a **public-private agreement** (so-called PPP). A swimming pool has 3,000 to 4,000 users, all of whom are neighborhoods with few exceptions. The swimming facility often has surfaces that can be covered by photovoltaic panels and always is a highly energy intensive entity. Aggregative forms of association already exist within the pool, such as amateur sports associations. Moreover, the public entity itself is an interested party since it owns the infrastructure. Not least the social utility of sports and the synergies with a REC are self-evident.

The imagination of the managers and the specific needs of each natatorium and its target community are the elements that will determine the particularities of the individual case, but here the important thing is to point out an example not far from common experience.

Challenges and Opportunities

Creating a Renewable Energy Community (REC) can pose common **challenges**, including:

- **Legislation and Regulation:** Dealing with complex regulations and legal requirements can be a challenge. RECs must adhere to national and local laws related to energy, taxation, and shared energy ownership. Often, working with local and national authorities is necessary to ensure compliance.
- **Access to the Energy Grid:** Connecting an REC to the energy grid can be complex and require agreements with energy distribution and transmission companies. Ensuring fair and cost-effective access to the electrical grid is crucial.
- **Initial Funding:** Raising the necessary funds to initiate an REC project can be a challenge. Initial financing for equipment purchase, installation of facilities, and covering administrative expenses may require significant resources.
- **Community Participation:** Actively engaging community members and ensuring their commitment can be complex. It is important to educate the community about the benefits of RECs and motivate participation.
- **Technology and Infrastructure:** Selecting, installing, and maintaining technologies for energy production and distribution requires technical expertise. The infrastructure must be reliable and sustainable in the long term.
- **Management and Administration:** Managing the day-to-day operations of an REC requires organizational and administrative skills. Effective procedures for maintenance, billing, and energy data management need to be established.
- **Member Agreements:** Defining agreements among REC members can be a challenge. It is important to establish clear rules regarding participation, distribution of benefits, and dispute resolution.
- **Economic Sustainability:** Ensuring the economic sustainability of the REC in the long term is crucial. This may involve seeking ongoing sources of funding and managing operating expenses.

- **Communication and Awareness:** Effectively communicating with community members and the general public is essential. Raising awareness about RECs and their benefits can positively influence engagement and support.
- **Monitoring and Evaluation:** Monitoring the performance of the REC and assessing the effectiveness of operations is important for making improvements and adapting to changing energy market conditions.

Addressing these challenges requires careful planning, collaboration among community members, and strategic partnerships with energy industry experts. With the right effort and guidance, RECs can overcome these challenges and contribute to a more sustainable energy future.

Opportunities for growth and innovation in the Renewable Energy Communities (RECs) sector are significant. Here are some key areas where growth and innovation can be pursued:

- **Technology Advancements:** Continuous advancements in renewable energy technologies, energy storage solutions, and grid integration offer opportunities to make RECs more efficient and sustainable. Research and development in these areas can lead to breakthroughs that benefit both existing and new RECs.
- **Scaling Up:** Increasing the scale and capacity of RECs can have a substantial impact. This involves expanding the size of renewable energy projects, incorporating more participants, and connecting with larger energy grids. Scaling up can lead to economies of scale and greater energy production.
- **Digitalization:** The integration of digital technologies, such as smart meters, IoT devices, and data analytics, can optimize the management and distribution of renewable energy within communities. Real-time monitoring and control can improve energy efficiency and reliability.
- **Community Engagement:** Encouraging greater community participation and engagement is crucial. Educational programs, outreach initiatives, and incentives can foster a sense of ownership and responsibility among community members, driving the success of RECs.
- **Financial Innovation:** Exploring innovative financing models, such as crowdfunding, community bonds, and green investment funds, can provide the necessary capital for REC projects. These models can attract a broader range of investors and supporters.
- **Regulatory Support:** Advocating for supportive policies and regulatory frameworks at the local, national, and international levels is essential. Clear and favorable regulations can remove barriers and facilitate the growth of RECs.
- **Diversification:** RECs can expand beyond electricity generation to include other forms of renewable energy, such as heat and transportation. Diversifying the types of renewable energy sources can increase resilience and sustainability.
- **Cross-Border Collaboration:** Collaborating with neighboring regions or countries can enable cross-border energy sharing and trading, unlocking new opportunities for REC growth and cooperation.
- **Energy Storage Solutions:** Developing innovative energy storage solutions, including advanced batteries and pumped hydro storage, can enhance the reliability of renewable energy supply within RECs.
- **Circular Economy:** Embracing principles of the circular economy, such as recycling and reusing materials, can reduce waste and promote sustainability within RECs.
- **Education and Training:** Investing in education and training programs for community members and professionals in the renewable energy sector can foster innovation and knowledge sharing.
- **Partnerships and Networking:** Building partnerships with industry stakeholders, research institutions, and governmental bodies can open doors to collaboration and access to resources.

Overall, the Renewable Energy Communities sector offers numerous opportunities for growth and innovation, contributing to a more sustainable and resilient energy future.

Social Role of REC

“The primary objective of the community is to provide community-wide environmental, economic or social benefits to its members or associates or to the local areas in which the community operates and not to make financial profits,” so reads the letter of the law. The fact that it specifically singled out “religious bodies, those in the third sector, and environmental protection bodies” among the participants is not accidental, it has as its specific purpose to want to stimulate the formation of grassroots, socially active RECs, not simply passive generators of energy.

Especially in the transitional phase, most of the renewable energy communities were established in the form of unrecognized associations.

Conclusion

Renewable energy communities represent an example of development consistent with the UN **SDGs** as well as with the goals of the **European green deal**. Local communities, in its most diverse forms, are placed at the center of ecological, but also inclusive and collaborative development.


Who can participate in an energy community? What are the economic benefits to a citizen, an apartment building, a public administration, or a business that chooses to join a REC?

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