Can ChatGPT (with the help of policy) support us in fueling the energy transition?

YES-Europe Policy Brief

June 2023

YES – Europe
Young leaders in
Energy and
Sustainability

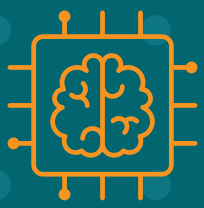
*The climate crisis is accelerating at **unprecedented levels** during the past years and its effects are felt at an even stronger pace gradually throughout the globe. Europe is no exception to this rule, as just over the past year **wildfires depicted an increase of 86%** and precipitation levels fell **below the average almost throughout the continent**. Considering the **energy sector** is responsible for **more than ⅔ of the emissions** that cause climate change in the first place, one will sure be looking at renewable energy sources for potential solutions.*

*However, these very solutions also come with inherent challenges, the most significant of which is intermittency, in particular for the two prevalent renewable energy solutions, namely solar and wind power. **Technology advances** have facilitated two solutions with regards to managing intermittency, the first one being energy storage and the second one being energy management. While the penetration of the former in our everyday lives, either through household batteries or through BE vehicles has yet failed to happen with the expected pace, predominantly due to the high costs, the latter was, until now, lagging in being incorporated chiefly due to the immaturity of web 3.0 technologies, such as **AI**, who are seen as the main drivers of the optimization of energy management.*

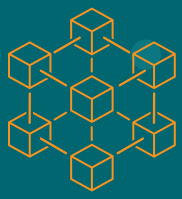
*Nevertheless, over the past years, the cryptocurrency hype, followed by the Artificial Intelligence bots one, has sparked the conversation over whether applications like **ChatGPT** can truly power the energy transition, what steps has the EU taken towards that direction policy-wise and if these practices are truly implementable everywhere.*

The role of web 3.0 in energy management

The first issue that ought to be clarified is how web 3.0 can be leveraged in the service of optimal energy management. Web 3.0 technologies comprise of data analysis, machine learning, artificial intelligence, internet of things and blockchain technologies and tools. Considering the structure of the electricity grid, the main fields that these technologies can be used for acceleration of the energy transition are the following:



AI - Optimization of transmission and distribution by system operators and minigrids: The distinction depends on whether the grid is centralized or decentralized. Through predictive models, optimal management can take place so that congestions are avoided and prosumers make the most of the energy they generate.



Blockchain - Dynamic prosumer contracts: This makes decentralized electricity trading between renewable energy communities a lot easier.

Blockchain - Incentivizing of consumers to adopt a certain consumption profile: Incentivizing citizens to use electricity at times where there is surplus by transferring their demand at certain times, either through usage of certain appliances such as laundry machines or by plugging their EVs in specific hours can really be effective in energy management. Cryptocurrency, as well as NFTs, can really facilitate this and become a true incentive.

IoT: Optimization of consumption: Incorporation of IoT tools within appliances can optimize electricity consumption and maximize energy efficiency, which is the cornerstone of energy management.

– The stance of the EU towards web – 3.0

Before the aforementioned fields, namely digital technologies and energy management intertwined, the EU had adopted three seemingly different but practically complementary legislative and policy tools. The EU Green Deal includes a set of policy and financing tools to accelerate a transition towards a future characterized by clean environment, renovated efficient buildings and a sustainable economy, whereas the Artificial Intelligence Act is used to finance, but also regulate, AI application into the economy and the Cyber Resilience Act is of clear regulatory nature about data derived and used by a wide variety of stakeholders, including the IoT data derived from electric appliances.

These sets of policies and legislations seem to be overlapping to a level that could be deemed as sufficient to power a sustainable, ethical and inclusive energy transition with the usage of web 3.0 technologies, but there are considerable deficiencies that need to be addressed.

1

The first one is related to the use of AI in the energy sector. The Artificial Intelligence Act does not account for rules on data governance, transparency and analysis that can have adverse environmental effects, which is the top priority of the energy transition. Thus, the current AI- models that are being used cannot yet be considered reliable to perform adequate sustainable energy management practices.

2

Another issue is that currently the EU has earmarked more than EUR20 billion for funding of AI-related innovations in digital governance, space technologies and overall infrastructure connectivity projects, but fails to provide any of the funding for energy uses.

3

One final issue that ought to be addressed are data centers. Worldwide, data centers are among the most energy-intensive pieces of infrastructure and, within the existing legal framework, the use of AI powered by carbon-intensive data centers is not taken into consideration, which can result in a useless energy management system, as the dirty energy that we end up not using, might be used by the data centers after all.

The situation is somewhat different in the case of blockchain. The current EU Green Deal framework has been revised to take into consideration the power-intensive nature of cryptocurrency mining and hence the policy foundation for responsible and ethical blockchain in energy management exists.
On the other hand, what does not yet exist is **the clear regulation over the utilization of blockchain on energy technologies**. Pilot projects have taken place both in France and in the Netherlands, all of which have leveraged EU and national funding, which shows the fact that the existing framework in blockchain is highly favorable for energy management as well, in contrast to AI.
Yet the introduction of decentralized or even centralized cryptocurrencies is still debatable in the European realm and hence the legislative and policy framework is still absent.

The main rationale behind the existing situation is the long-standing dispute over the existence of decentralized finance within the EU. Finally, with regards to IoT and electric appliances, the challenge is much less complex.

The main challenge that every state actor has to face with regards to policy is the ethical and just use of data and the respect of privacy, which, with regards to data, is protected in accordance with the data privacy act that **was signed in May 2016** and the flagship data protection law, namely GDPR.

Best practices transfer

During this critical assessment of the existing policies, it is paramount that the remarkable steps undertaken at an EU level towards a clean energy future are not omitted.

The Green Deal already facilitates the adoption of renewable energy sources, provides many funding opportunities to incorporate energy storage and has already created the first framework for **renewable energy communities**, the directive 2019/944, and the role of the prosumership.

Also, the cyber resilience and AI acts, together with the data protection law, create a comprehensive framework for data privacy respect and for the ethical use of data. Both types of frameworks could very well be adopted in other regional blocs across the Global South. Priority ought to be given to the renewable energy communities framework, namely the directive 2019/944. This can prove to be a solution to many isolated communities, as many countries in regions such as South America, Central Asia and Sub-Saharan Africa are fully isolated from the rest of the country.

This can later be followed by legislative and regulatory pieces for the introduction of web 3.0 technologies in this sector. However, what ought to be taken into consideration, is the geomorphological, demographic, financial and cultural profile of each country.

Policy advisors, policymakers and other stakeholders involved in the policy creation process ought to respect the values of each different country and culture and adapt the envisioned strategies to the aforesaid profiles.

The way forward for the EU

However, the Global South is not the only place where strategies are expected to be revised. As this brief has delineated, web 3.0 technologies have the potential to become the backbone of the energy transition, through their role on optimal energy management. Hence, it is in the best interest of all actors involved that a set of regulations and policies is developed about the exact use of digitalization on energy management, so that two main goals are achieved.

The first one is the incorporation of financing tools about the use of AI, blockchain and IoT specifically in energy.

The second one is about the regulation of their use, so that it can be ensured that the aforementioned tools are used exactly for the purpose of powering a transition towards truly renewable energy communities, decentralized by nature, profitable, inclusive and just.

Conclusions

Overall, the major congestion issues across the whole EU, as the penetration of renewables increases, outlines the need for sophisticated energy management tools.

This sophisticated element, however, can really make or break the EU energy strategy, if the existing policy tools are not chosen wisely and if new ones are not adopted. The hype of Chat GPT and the fear that AI might overtake human beings and rule the world might hopefully function as a boost to find innovative policies towards that direction.

However, the biggest hope is that it will push all relevant stakeholders to collaborate altogether so that these exact policies are a result of co-designing and collaboration, with the objective of being as just, inclusive as possible and contribute towards the optimal use of energy at the same time.