RECOMMENDATIONS FOR THE FURTHER DEVELOPMENT OF THE GERMAN SYSTEM OF GUARANTEES OF ORIGIN

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Overview

Knowledge of the origin of electricity is an important pillar of the energy transition, particularly in terms of reducing greenhouse gas emissions. The use of Guarantees of Origin (GoO) is becoming increasingly significant in this regard, as it enables the labeling of electricity from renewable sources. GoOs can be purchased by electricity suppliers, and their value is based on the amount of renewable energy produced by renewable sources. The paper presents the current state of the GoO system and proposes a roadmap for updating it to meet the growing demands of the energy sector.

Methods

In order to identify the requirements for an improved labelling process, the current and future applications of a GoO system are analyzed. The labeling of electricity origin is essential in various energy-related fields, such as marketing certain electricity products as green energy, combating fraud and greenwashing, providing incentives for the expansion of renewable energy sources, and promoting user behavior changes. The European Union's Delegated Act for RED II requires certain criteria to be met to label hydrogen produced through electrolysis as "green", including obtaining electricity through Power Purchase Agreements (PPAs) from unsubsidized renewable energy sources. However, there is currently no means to demonstrate the necessary temporal resolution correlation between generation and consumption without environmental assessments. Germany's new law on GoOs for Gas, Hydrogen, Heat or Cold from renewable energy sources could enable the verification of the green characteristics of electricity-based heat through electricity labeling. The growing demand for heat pumps would likely result in increased demand for the verification of the origin of the electricity used. However, decoupling the production and devaluation of the labeling creates obstacles to incentivizing load shifts and reducing emissions in electricity-based heat generation. Additionally, as corporate sustainability reporting requirements increase, there will likely be an increase in demand for evidence of renewable electricity source procurement and devaluation, resulting in higher labeling prices. This increase in labeling prices could have a positive impact on the expansion of renewable energy sources.

Results

Different measures are deduced that can be taken to gradually transition towards an origin tracking system that meets the requirements of current and future energy market applications. The first recommendation is to create a digital interface to automate the process of registering, applying for, and invalidating certificates. The second measure involves transitioning to using smart meter data to collect energy data instead of relying on current methods, which will enable the automation of the labeling process and reduce the time required to certify the GoOs. The third measure involves increasing the temporal resolution of certificates to account for the seasonal and daily volatility of energy generation. Lastly, connecting energy generation and consumption more closely is suggested, which can be achieved through the connection of GoOs with actual energy delivery. The paper also discusses potential issues that could arise with each measure and how they might be resolved.

Conclusions

In summary, there is a growing pressure to revise the current GoO system due to its low impact on the energy transition and failure to meet various requirements. The increased demands include reporting obligations of companies, the provision of genuine green energy with coupling of generation and consumption, proof of green hydrogen and heat, PPAs, and the implementation of energy communities and local electricity markets. Various steps are proposed to overhaul the GoO system, including the creation of digital interfaces, process improvement, the use of smart meters, and the integration of storage. The InDEED project demonstrates a potential solution for a digitally enabled system with real-time evidence. Overall, the options presented gradually lead the current system towards a digitally enabled solution that meets the various requirements.

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