Addressing the Oracle Problem: Decentralized Authentication in Blockchain-Based Green Hydrogen Certification

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Abstract : The aim of this paper is to present a concept for addressing the Oracle Problem in the context of hydrogen production using renewable energy sources. The proposed approach relies on the authentication of the electricity used for hydrogen production by multiple surrounding actors with similar electricity generation facilities, which attest to the authenticity of the electricity production. The concept introduces an Authenticity Score assigned to each certificate, as well as a Trust Score assigned to each witness. Each certificate must be attested by different actors with a sufficient Trust Score to achieve an Authenticity Score above a predefined threshold, thereby demonstrating that the produced hydrogen is indeed "green."

Keywords : hydrogen, blockchain, sustainability, structural change
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