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P.III.2 — Beyond technology: how media narratives shape the social acceptance of biorefineries

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Social acceptance, renewable energy, energy transitions, media discourse, communication power, biorefinery, democratic legitimacy, energy policy

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P.III.2 — Beyond technology: how media narratives shape the social acceptance of biorefineries

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The successful deployment of biorefineries depends not only on technological performance and economic feasibility but also on their social acceptance. Research on renewable energy acceptance has progressively demonstrated that public perceptions are shaped by social, institutional, and communicative factors rather than by technology alone [1]. Media narratives therefore play a central role in framing benefits, risks, and stakeholder legitimacy, influencing how citizens perceive renewable energy infrastructures [2,3].

This study examines how Spanish digital media portray biorefineries and how these narratives contribute to the construction of public acceptance or resistance. A mixed-methods approach was applied to a corpus of 350 digital news articles covering 88 biorefinery projects published between 2019 and 2024. Data were collected through the social listening platform Onclusive Social and complemented by manual validation. The analysis combined qualitative discourse analysis with statistical techniques, including logistic regression and cluster analysis, to identify relationships between media actors, narrative frames, geographical contexts, and public sentiment.

The findings reveal that media discourse is strongly influenced by the actors who dominate the communication process. Corporate and institutional actors are substantially more visible than citizen organizations, resulting in narratives that primarily emphasize economic development, technological innovation, and sustainability benefits. These frames are consistently associated with positive media coverage. Conversely, narratives centred on environmental impacts and health concerns are mainly promoted by local communities and are significantly associated with negative sentiment, particularly in rural areas where biorefinery projects are located. These results reinforce previous studies highlighting the importance of procedural justice, place attachment and community participation in renewable energy acceptance [4,5].

Building on these findings, the study proposes the Communicative Hegemony Model in Energy Transition (CHMET), a conceptual framework explaining how asymmetries in media visibility influence the social legitimacy of renewable energy infrastructures. The model integrates perspectives from the political economy of communication [6], communication power [2], and social acceptance research [1] to explain how dominant narratives and counter-publics shape public debate around biorefineries.

The results suggest that communication should be integrated into the planning and governance of circular bioeconomy initiatives from their earliest stages. Transparent communication, independent scientific information, participatory processes, and balanced media representation can strengthen trust, reduce conflict, and improve the long-term legitimacy of biorefinery projects. The proposed framework offers practical guidance for researchers, policymakers, industry, and communication professionals seeking to enhance the social sustainability of circular economy innovations.

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