

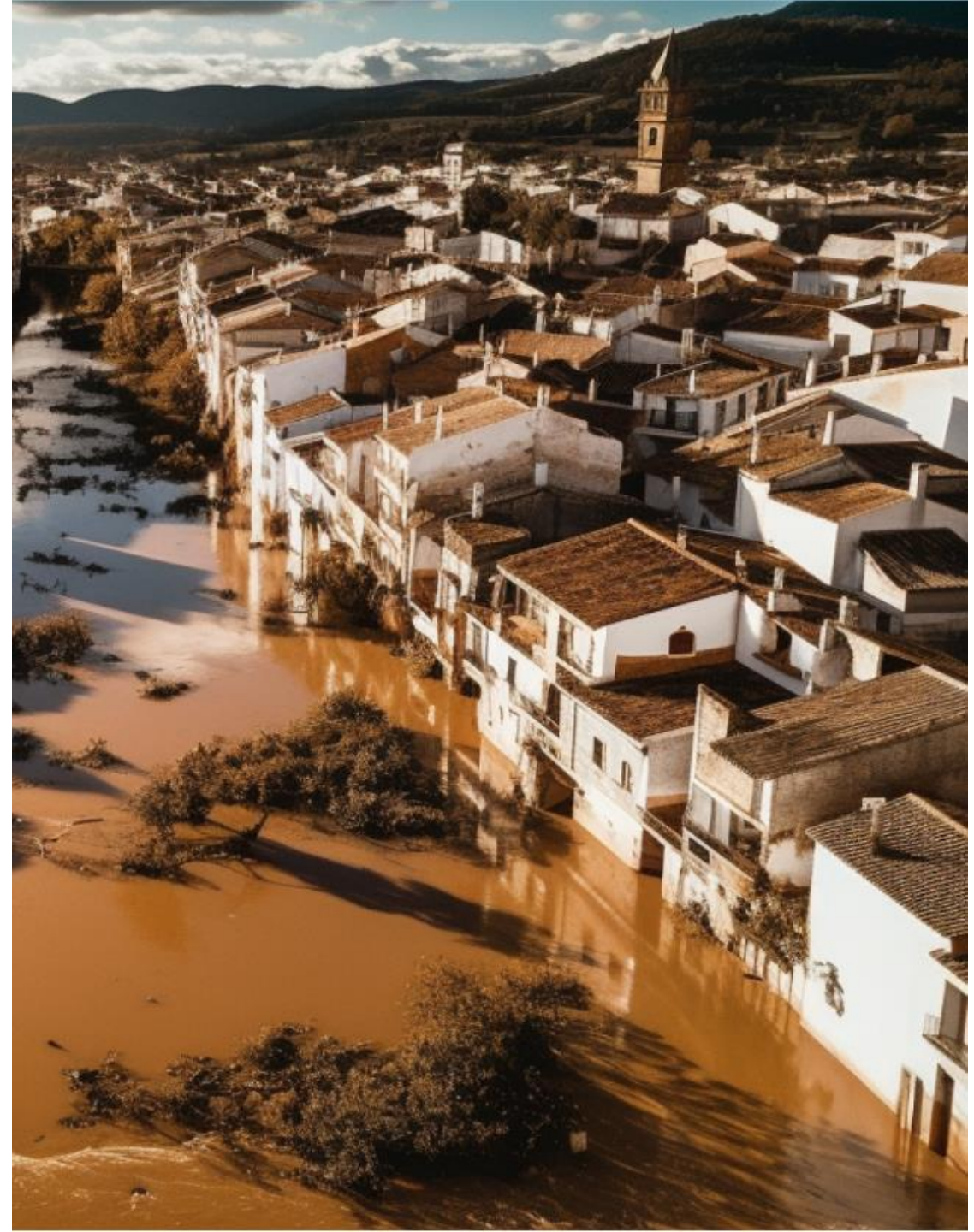
Aceptación social de tecnologías energéticas: Marco conceptual y propuestas metodológicas

Oltra, C., Boso, À., Prades, A. y Sala, R. (CIEMAT)

**III CONGRESO INTERNACIONAL DE
EVALUACIÓN DE IMPACTO SOCIAL**

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Las instalaciones energéticas (desde las centrales nucleares a los parques eólicos o las plantas solares) son infraestructuras técnicamente complejas e intrusivas y, con **impactos** sociales y medioambientales potenciales significativos

Debido a estos impactos, pero también a otros factores psicosociales relacionados, las **reacciones sociales** ante las políticas e infraestructuras energéticas han variado significativamente entre tecnologías y contextos

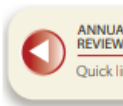
Describir, comparar y explicar estas reacciones sociales a los desarrollos energéticos (desde el rechazo a la aceptación y la copropiedad) ha sido objeto de la investigación social en las últimas décadas



Communities most likely to oppose wind farms, CNN



La investigación se inicia en los años 1970s a partir de los estudios de percepción del riesgo y las actitudes ante la energía



Ann. Rev. Energy, 1980, 5:141-72
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INTERNATIONAL CONFERENCE CLEAR POWER AND ITS FUEL CYCLE

SALZBURG, AUSTRIA • 2-13 MAY 1977



PUBLIC OPINION ABOUT ENERGY

*Barbara C. Farhar, Charles T. Unsel, Rebecca Vorles,
and Robin Crews*

Solar Energy Research Institute, Golden, Colorado 80401

PUBLIC ACCEPTANCE OF NUCLEAR POWER

GENERATION IN THE UNITED STATES

JAMES L. LIVERMAN

AND

ROBERT D. THORNE

U.S. ENERGY RESEARCH AND

DEVELOPMENT ADMINISTRATION

The end result appears to be that the American public is becoming suspicious of most sophisticated technology, especially that which seems to consider only the benefits of its end product. An example

increased gasoline and oil prices, long lines at gas stations, decreased speed limits, and demands for energy conservation. These sudden events, compounded by severe winters causing job losses and other social disruptions and by droughts decreasing the supply of hydropower, made Americans more aware of their dependence on energy.

This article summarizes a review and analysis of the "fugitive literature" on public opinion about energy—that to be found in government documents and reports by polling organizations—between 1973 and 1979. Systematically reviewed and analyzed were over 190 surveys of the general adult population, 156 of national samples, and 33 of local or regional samples (1).¹ Studies on most energy supply alternatives are included: energy conservation, solar energy, fossil fuels, and nuclear energy. The procedure employed allowed grouping of otherwise disparate data to draw together a fragmented body of knowledge.²

In understanding public opinion about energy in the United States, several points should be kept in mind. A survey is an attempt to measure and aggregate the variegated and segmented opinions of the polity. Opinion is segmented by a variety of factors: group affiliations, geographical region

ial societies have an insatiable demand for cheap abu

The United States is presently formulating a nation and a National Plan for Energy Research, Development and Production which will result in choosing the best methods of methods to supply energy where it is needed. A high priority task for the Government is to develop a national methodology to evaluate technologies. An analysis of energy derived from the various energy sources must become a part of decisions about which source to pursue as are the social and environmental implications. These determinations must be made quickly. The results are likely to veer from the concept of the country's energy source mix, both nationally and regionally. It should be shown that only with all sectors of society working together can all benefit.

Images of Disaster:
Perception and Acceptance of Risks from Nuclear Power

Amos Tversky, Daniel Kahneman, and Baruch Fischhoff

Decision Research
A Branch of Perceptronics
Eugene, Oregon

as in G. Goodman (Ed.), Impacts and Risks of Energy Strategy: Analysis and Role in Management. New York: Academic Press, 1979.

¹This review summarizes and updates Farhar et al (1979) with 1979 data.

Ámbito de las energías renovables: Desde el NIMBY a los modelos analíticos más complejos y los estudios críticos



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Wind power implementation: The nature of public attitudes: Equity and fairness instead of ‘backyard motives’

Maarten Wolsink*

Received 13 October 2005; accepted 13 October 2005

Abstract

Public attitudes anywhere in Europe show moderate to strong support for the implementation of renewable energy. Nevertheless, planning wind power developments appears to be a complicated matter in most countries. The problems that have to be dealt with during decision making processes on the siting of wind turbines are usually referred to as mere ‘communication problems’. However, public attitudes towards wind power are fundamentally different from attitudes towards wind farms. This ‘gap’ causes misunderstandings about the nature of public support for renewables. In particular where planners easily assume support for renewables can be generated by information campaigns emphasising the environmental benefits, whereas opposition to renewable energy schemes can be explained by a selfish ‘not in my backyard’ attitude. Both explanations used by planners, authorities and, unfortunately, by many scholars, are falsified. Furthermore, policies that still take this ‘common knowledge’ for granted can have negative consequences for the implementation rates of renewables. Visual evaluation of the impact of wind power on landscape values is by far the dominant factor in explaining why some are opposed to wind power and others are supporting it. Moreover, feelings about equity and fairness appear the determinants of ‘backyard’ motives, instead of selfishness.
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Keywords: Attitudes; Wind power; Facility siting; Landscape; Nimby scale; Fairness



Energy Policy

Volume 35, Issue 5, May 2007, Pages 2683–2691



Social acceptance of renewable energy innovation: An introduction to the concept

Rolf Wüstenhagen^a, Maarten Wolsink^b, Mary Jean Burer^a

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Abstract

This paper introduces the special issue on Social Acceptance of Renewable Energy Innovation. It is a collection of best papers presented at an international research conference held in Tramelan (Switzerland) in February 2006. While there are ambitious government targets to increase the share of renewable energy in many countries, it is increasingly recognized that social acceptance may be a constraining factor in achieving this target. This is particularly apparent in the case of wind energy, which has become a subject of contested debates in several countries largely due to its visual impact on landscapes. This paper introduces three dimensions of social acceptance, namely socio-political, community and market acceptance. Factors influencing socio-political and community acceptance are increasingly recognized as being important for understanding

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Perspective

Research on the social acceptance of renewable energy technologies: Past, present and future

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ARTICLE INFO

Keywords:
Social acceptance research
NIMBY
Normative approach
Criticism approach
Critical approach
Overview

ABSTRACT

Social sciences have been very prolific in the last decades in publishing research that attempts to better understand the social acceptance of renewable energy technologies and associated infrastructures (RET) – such as high voltage power lines – and processes – such as communities’ participation in related decision-making processes. This Perspective proposes that this might be a good point in time, roughly 30 years after social sciences began looking at the social side of RET, to offer a (over)view on that research, if and how it has changed over time and where it leaves us currently or, in other words, which directions we should follow in the future. I first provide an overview of research on the social acceptance of RET, suggesting that it can be roughly organized around three waves – normative, criticism and critical –; for then identifying and discussing some avenues for future research.

La aceptación social de las tecnologías energéticas renovables como fenómeno social objeto de la investigación social empírica



Energy Policy

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Social acceptance of renewable energy innovation: An introduction to the concept

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Abstract

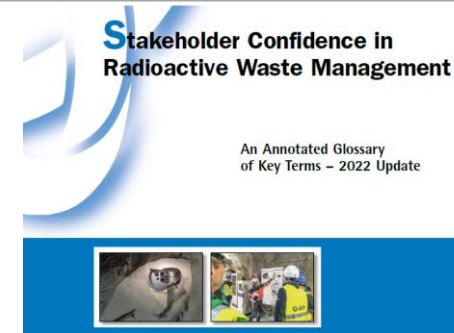
This paper introduces the special issue on Social Acceptance of Renewable Energy Innovation. It is a collection of best papers presented at an international research conference held in Tramelan (Switzerland) in February 2006. While there are ambitious government targets to increase the share of renewable energy in many countries, it is increasingly recognized that social acceptance may be a constraining factor in achieving this target. This is particularly apparent in the case of wind energy, which has become a subject of contested debates in several countries largely due to its visual impact on landscapes. This paper introduces three dimensions of social acceptance, namely socio-political, community and market acceptance. Factors influencing socio-political and community acceptance are increasingly recognized as being important for understanding



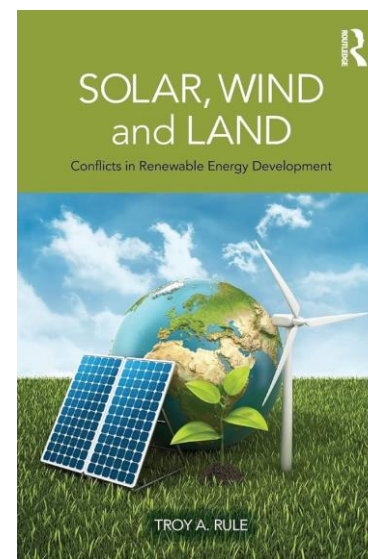
GUÍA DE MEJORES PRÁCTICAS PARA EL DESARROLLO DE PLANTAS SOLARES

Marzo 2022
UNEF

La aceptación social como estado deseable a alcanzar por los promotores



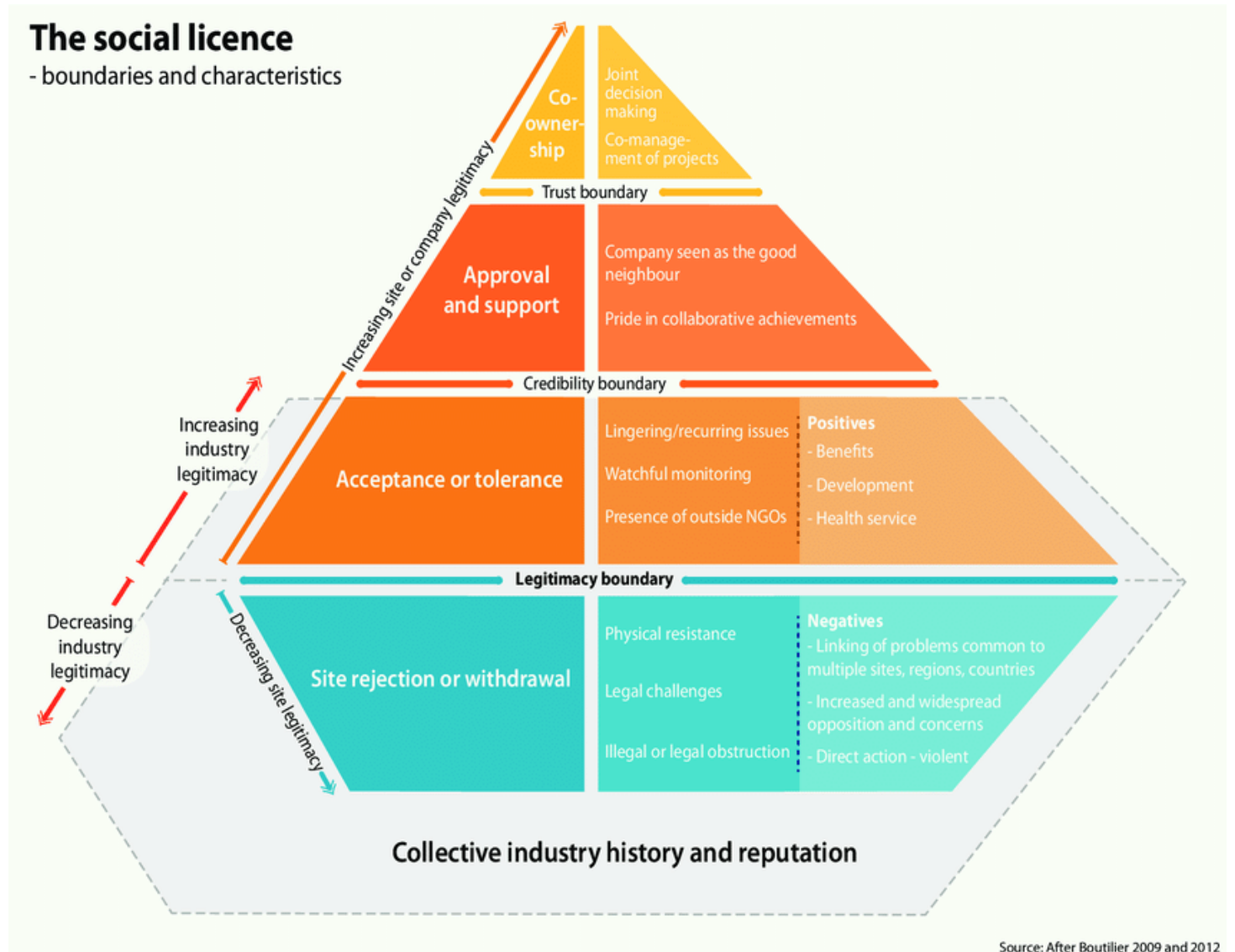
Disparador del diálogo, el debate y el conflicto como medios productivos para dirigir el cambio social.



Definición de aceptación, niveles y dimensiones

Aceptación social

La aceptación social de las tecnologías energéticas refiere a la disposición de los individuos, las comunidades y las sociedades a aceptar la implantación y el funcionamiento de tecnologías energéticas



Aceptación social

Se trata de un concepto complejo, polifacético y dinámico que engloba varias **dimensiones** actitudinales, **niveles o contextos y actores**, entre ellas las percepciones, actitudes y comportamientos del público y los actores clave hacia las políticas, infraestructuras y aplicaciones energéticas.

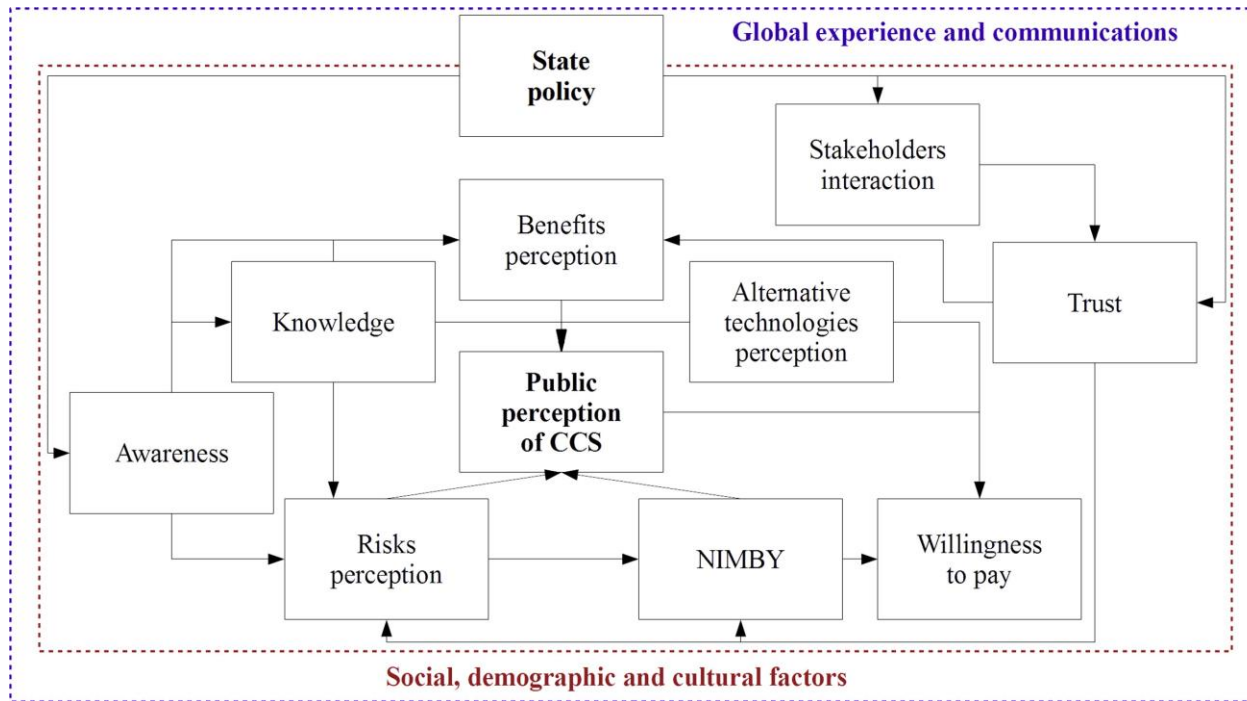
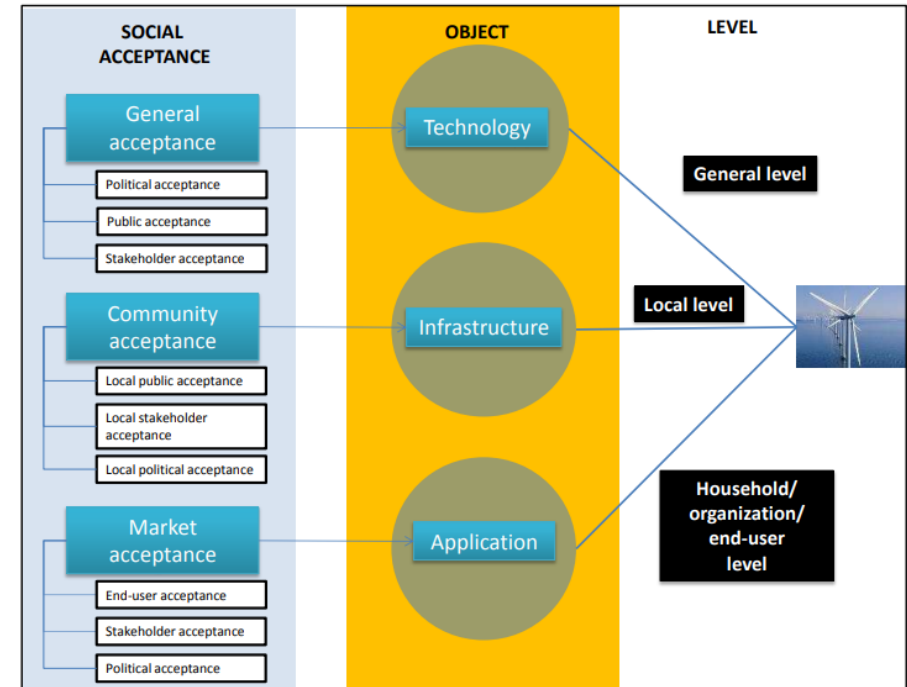


Figure 1 A context-based classification of types of energy technology acceptance



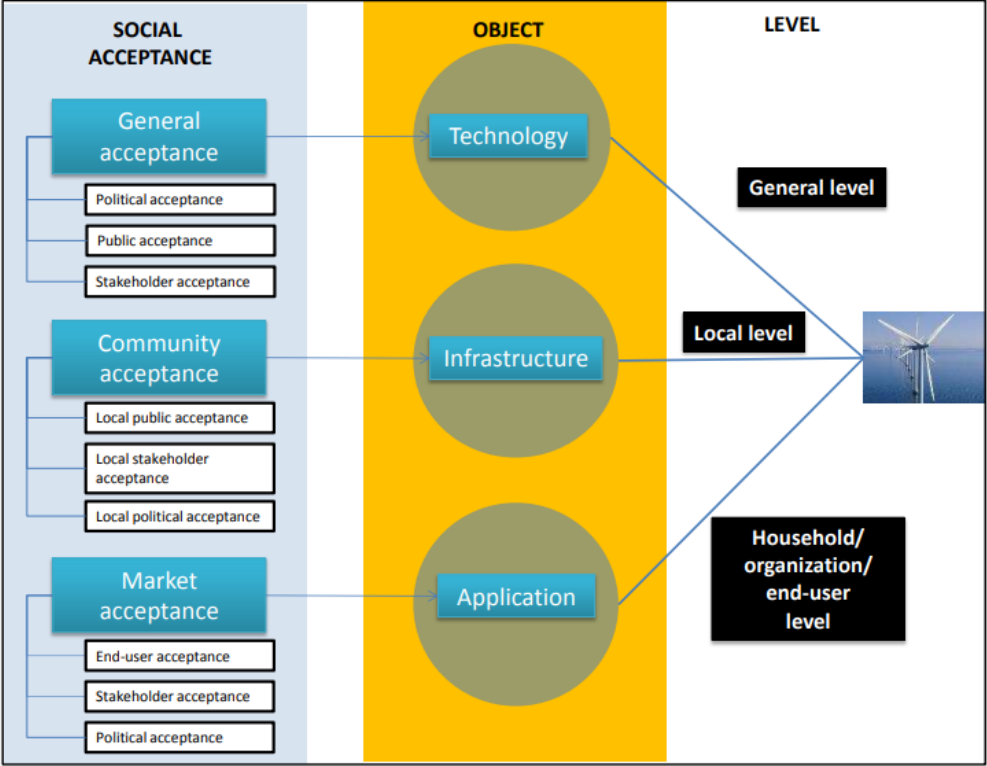
Tcvetkov, P., Cherepovitsyn, A., & Fedoseev, S. (2019). Public perception of carbon capture and storage: A state-of-the-art overview. *Heliyon*, 5(12).

Upham, P., Oltra, C., & Boso, À. (2015). Towards a cross-paradigmatic framework of the social acceptance of energy systems. *Energy Research & Social Science*, 8, 100-112.

Niveles y contextos de la aceptación

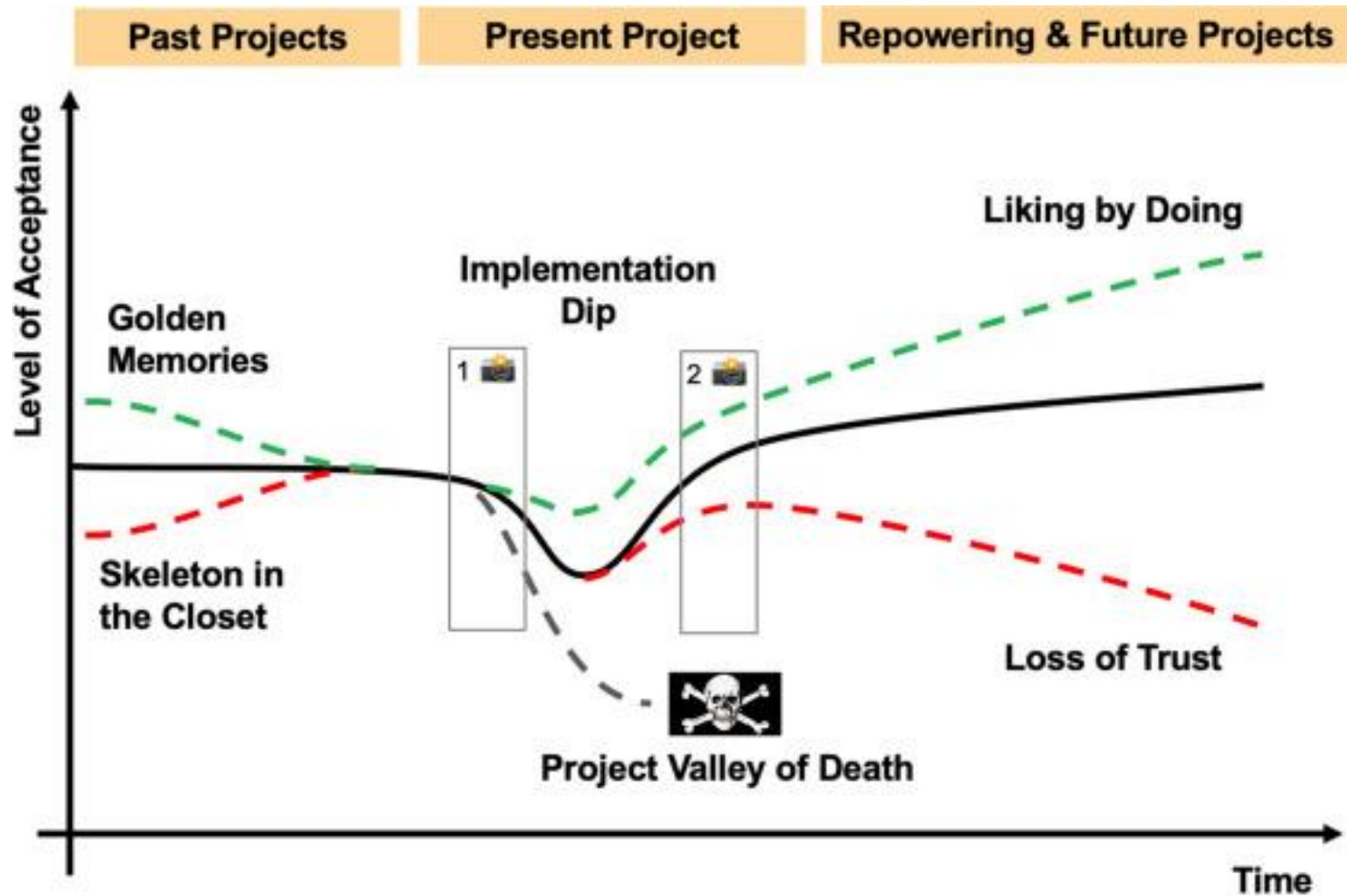


Figure 1 A context-based classification of types of energy technology acceptance



Wüstenhagen, R., Wolsink, M., & Bürer, M. J. (2007). Social acceptance of renewable energy innovation: An introduction to the concept. *Energy policy*, 35(5), 2683-2691.

Upham, P., Oltra, C., & Boso, À. (2015). Towards a cross-paradigmatic framework of the social acceptance of energy systems. *Energy Research & Social Science*, 8, 100-112.



🏗️ 1 or 2: Typical focus of cross-sectional studies on social acceptance

Fuente: Ellis, G., Schneider, N., & Wüstenhagen, R. (2023). Dynamics of social acceptance of renewable energy: an introduction to the concept. *Energy Policy*, 181, 113706.

Determinantes de la aceptación: de la materialidad a las percepciones, el proceso y el contexto

Boudet, H. S. (2019). Public perceptions of and responses to new energy technologies. *nature energy*, 4(6), 446-455.

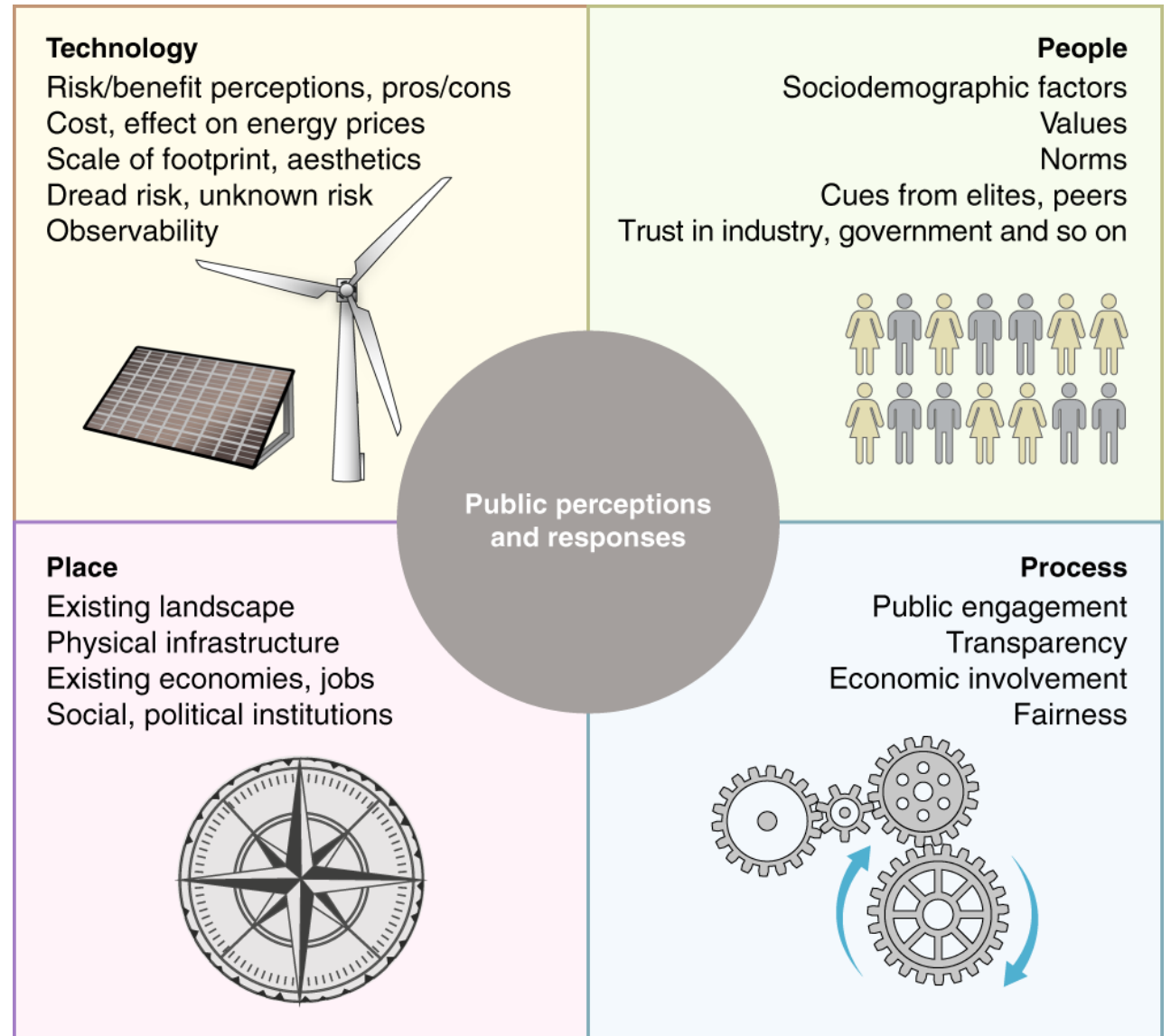


Fig. Factors affecting public perceptions of and responses to new energy technologies.

Las tecnologías energéticas a menudo se perciben a través de la lente de los valores culturales y sociales existentes. Comprender y respetar estos valores es crucial para adaptar las estrategias de comunicación y participación.

Valores culturales y sociales



Contexto

Las personas sopesan los beneficios percibidos de las tecnologías energéticas, como la sostenibilidad ambiental y las oportunidades económicas, frente a los riesgos potenciales, como la contaminación acústica o los impactos estéticos.

Confianza



Beneficios y riesgos percibidos



Justicia procedimental percibida

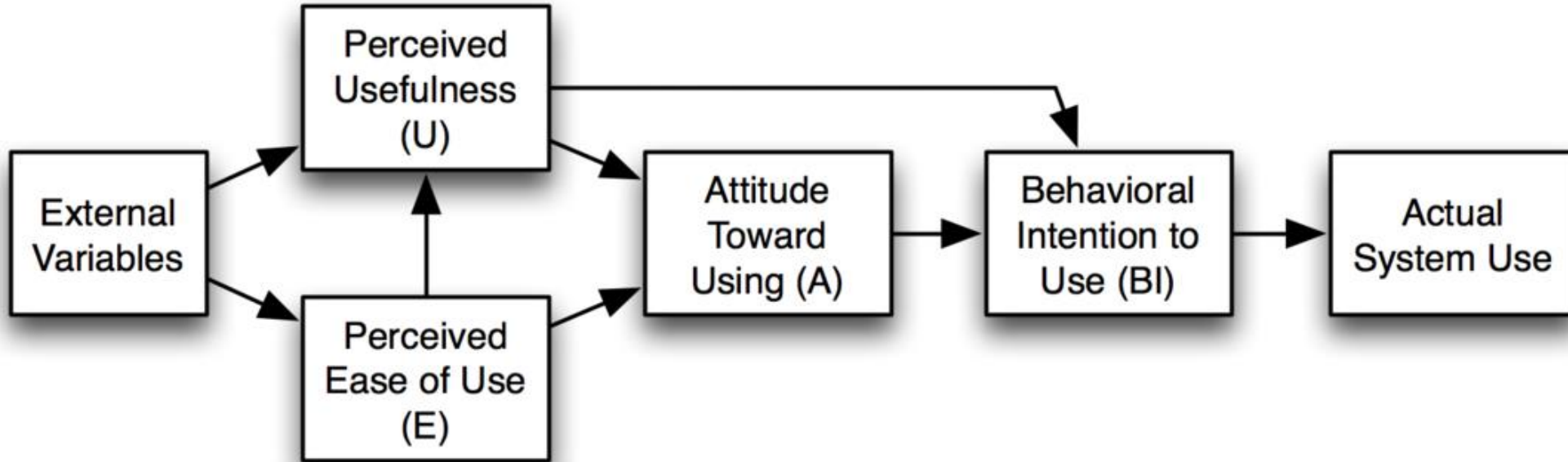
Las personas valoran los procesos de toma de decisiones justos y equitativos que consideran sus preocupaciones y perspectivas. La participación inclusiva de las partes interesadas y la toma de decisiones participativa pueden fomentar la aceptación social.

La confianza pública en las entidades responsables del desarrollo e implementación de tecnologías energéticas juega un papel importante en la configuración de la aceptación. La comunicación abierta, la transparencia y la participación comunitaria son esenciales para generar confianza.

Rechazo-Aceptación-Identificación

Factores influyentes en la aceptación pública (a nivel individual) de infraestructuras energéticas

Elaborado a partir de Jagers et al.; 2017; Huijts et al., 2012



El Modelo de Aceptación de Tecnología (TAM) es una teoría que modela cómo los **usuarios** llegan a aceptar y utilizar una nueva tecnología. Fue desarrollado por Fred Davis en 1989 y desde entonces se ha convertido en uno de los modelos más influyentes de adopción de tecnología en ámbitos como las TIC.

Los determinantes de la aceptación de tecnologías energéticas emergentes operan en sistemas sociales dinámicos y complejos. El análisis de su potencial impacto causal entraña retos metodológicos.

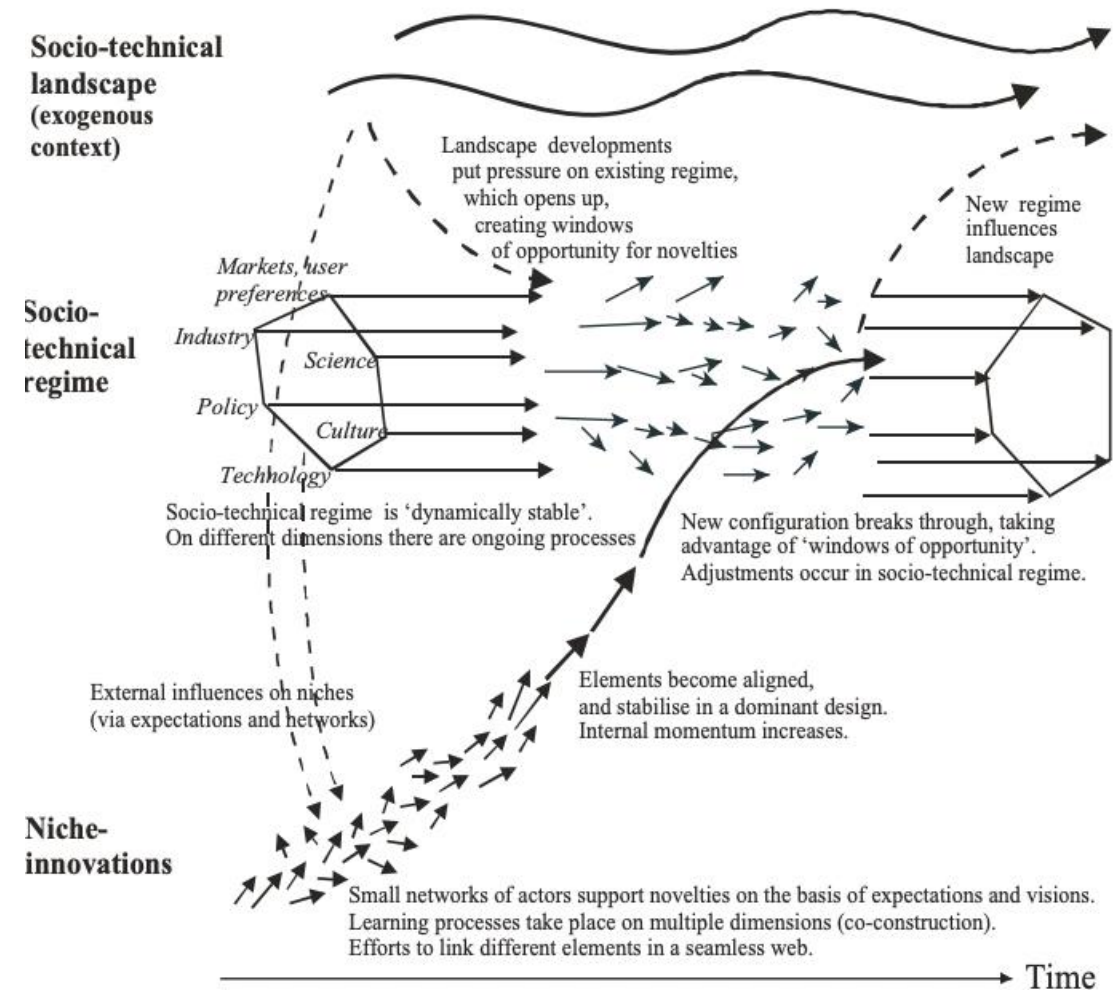
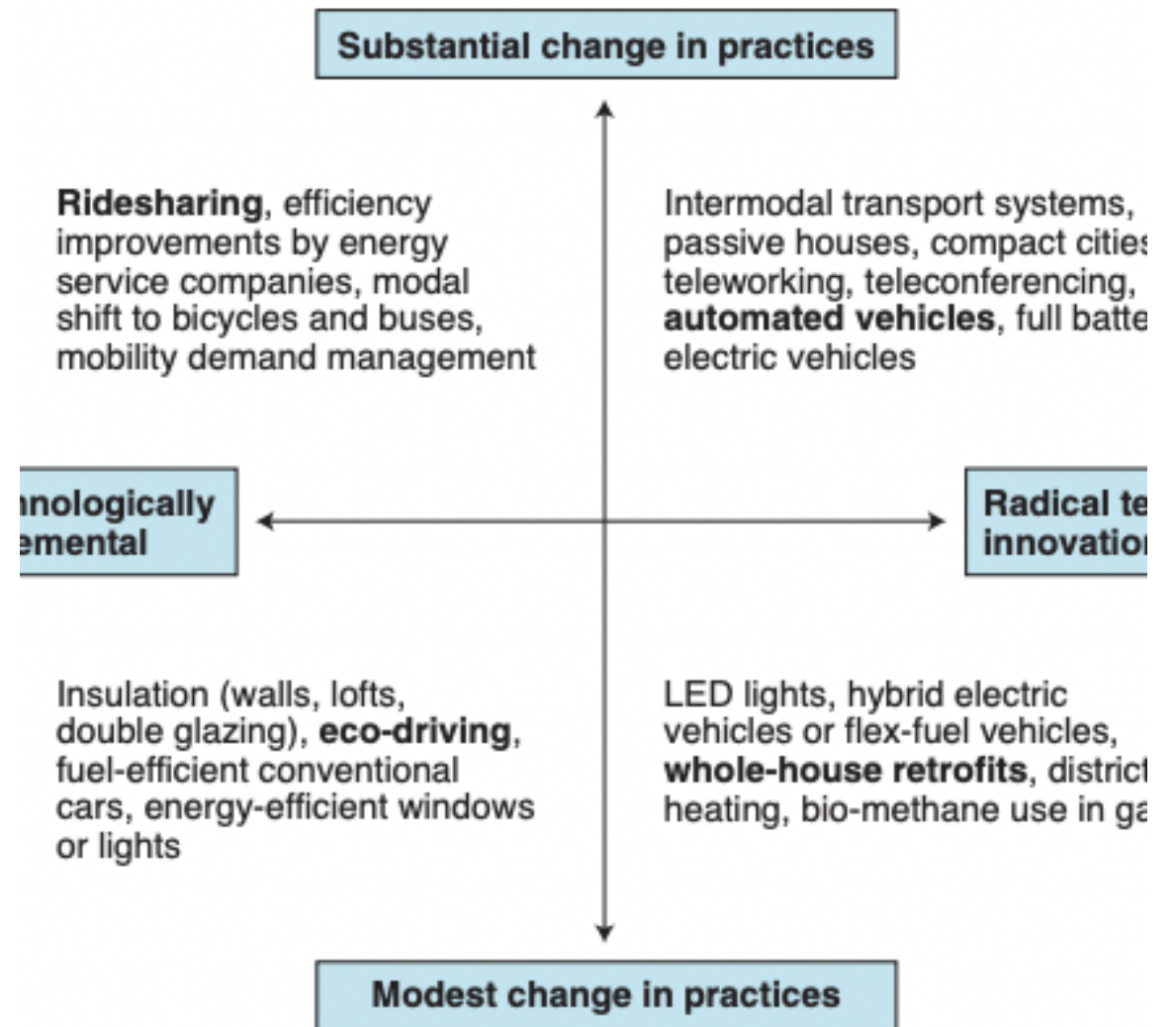


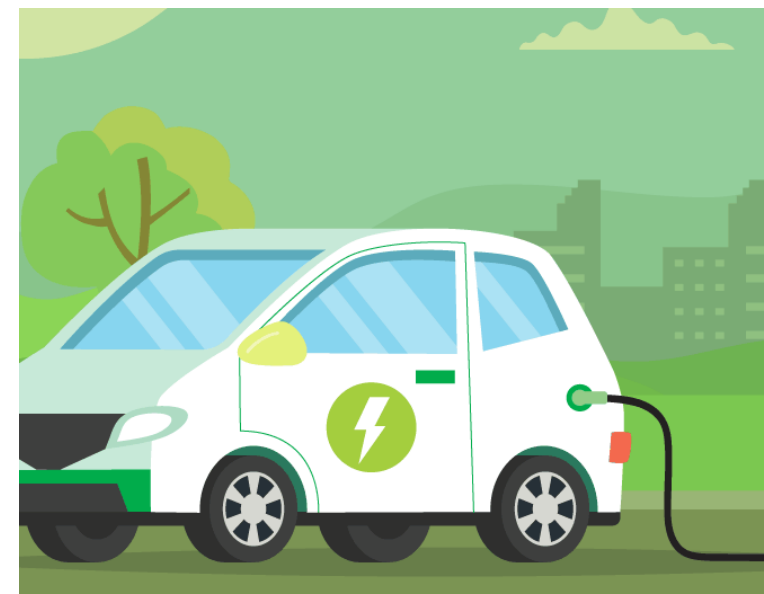
Fig. 2. Multi-level perspective on transitions.

Toda innovación tecnológica, incremental o disruptiva, implica cambios en las prácticas sociales que interaccionan con la(s) cultura(s) energética(s) de la comunidad.

- Sovacool, B. K., & Griffiths, S. (2020). Culture and low-carbon energy transitions. *Nature Sustainability*, 3(9), 685-693.



Contextos de aplicación y métodos



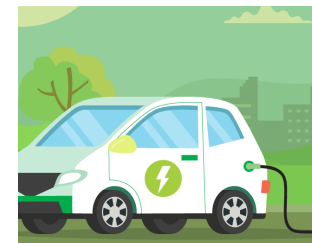
Políticas – Aceptación sociopolítica



Infraestructuras – Aceptación por la comunidad



Aplicaciones – Aceptación en el hogar/organización



All reviewed articles could be divided into Qualitative (47 articles), Quantitative (83 articles) and studies with combined analysis (5 articles). The most commonly used data collection methods (Table 7) in these articles are online surveys (including one online focus group [62]), interviews and organization of various sessions (mostly focus group discussions – 14 articles).

Table 7. Methods of data collection distribution.

Method of data collection	Type of analysis			Total
	Qualitative	Quantitative	Combined	
Survey (not specified or traditional paper-and-pencil questionnaire)	1	27	1	29
Mail survey	0	7	0	7
Information-choice questionnaire	2	11	0	13
Online survey	2	28	1	31
Interviews	17	17	2	36
Telephone survey	3	8	0	11
Media analysis	4	3	0	7
Various sessions (workshops, seminars, panels, focus group)	12	15	3	30
Theoretical (including reviews and case studies)	22	0	0	22

The most common research methodologies (Table 8) are descriptive statistics and various types of parametric analysis (mostly regression analysis – 33 studies). Only in three studies [69, 150, 163], modeling elements based on ecological-economic indicators are used. It should be noted that the TPB (Theory of Planned Behavior) is a base for a significant number of Quantitative studies related to the influence of various factors on public perception. However, this fact clearly stated only in 11 articles.

Table 8. Methodologies distribution.

Methodology	Type of analysis			Number of studies
	Qualitative	Quantitative	Combined	
Case study	10	5	1	16
Review	5	0	0	5
Ecology-economical modeling	0	3	0	3
PESTEL analysis	0	1	0	1
Non-parametric analyses (Wilcoxon tests, Mann-Whitney U tests, Kruskal-Wallis tests, chi-squared test, Friedman test, component, and structure analysis)	0	13	0	13
Descriptive statistics (frequencies, means, standard deviations, correlations)	0	68	4	72
Parametric analyses (t-test, ANOVA, regression analysis, cluster analysis)	0	44	2	46

Investigación en aceptación social en el CIEMAT. Contextos y métodos

Tecnología energética	Dimensión de la aceptación			
	Sociopolítica Público general/ Stakeholders	Comunidad	Adopción hogar	
Energía de fusión	Encuesta on-line World café Recovened focus groups	Delphi		
Captura y Almacenamiento de CO2 (CAC)	Encuesta on-line Focus Groups?	Entrevistas Regional Stakeholder Commitees	Perfil de la comunidad Encuesta telefónica Encuesta on-line? Grupos de discusión	
Hidrógeno	Encuesta	Entrevistas Encuesta on-line	Encuesta on-line Focus Groups	Encuesta on-line
Fisión	Encuesta	Entrevistas Encuesta on-line		
Fotovoltaica	Encuesta			Encuesta on-line Focus Groups

Retos

- Necesidad de combinar datos cualitativos (explorar, identificar temas, ejemplificar) y cuantitativos (medir, describir, buscar correlaciones)
- Tecnologías poco conocidas y alejadas de vida cotidiana: la necesidad e suministrar información (“pseudo-opiniones”) y potencial de métodos reflexivos/deliberativos (opiniones informadas)
- Representatividad de los actores
- Inter-multi-trans disciplinarietàad: la investigación social como elemento primordial en proyectos tecnológicos
- De la investigación social a la implicación pública

Conclusión



- Comprender la dinámica social en la aceptación de las tecnologías energéticas ha dado lugar a un **ámbito de investigación social** muy productivo en las últimas décadas.
- La integración de la investigación social en el desarrollo tecnológico y la aplicación de métodos tanto cualitativos como cuantitativos son cruciales para abordar los desafíos en este campo. A medida que las tecnologías energéticas evolucionan, también deben hacerlo nuestra **comprensión y nuestras estrategias** para abordar las reacciones de individuos, hogares, organizaciones, comunidades y sociedades y abordarlas de modo ético e informado.