



Social Acceptance of TES

9th Swiss Symposium Thermal Energy Storage
January 2022

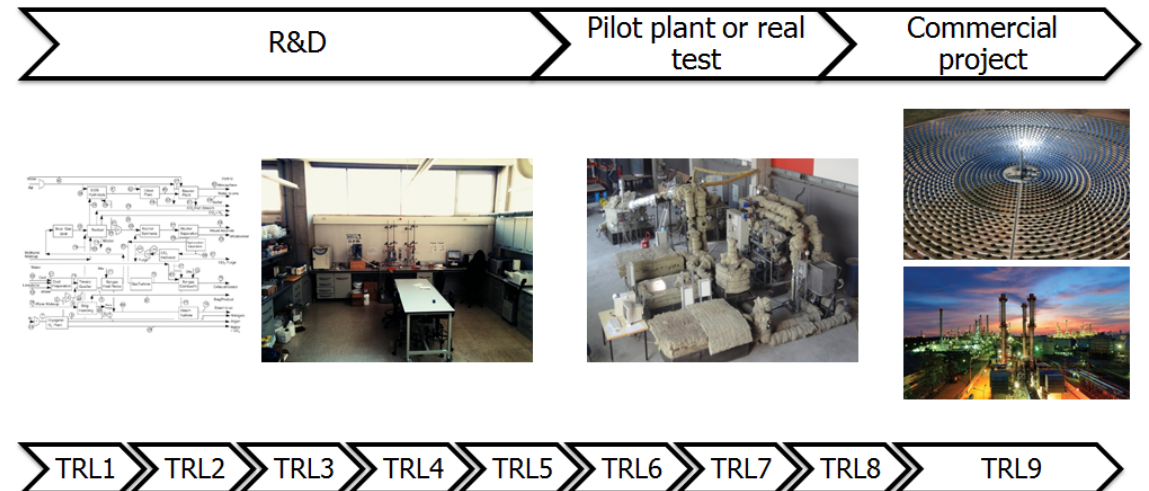
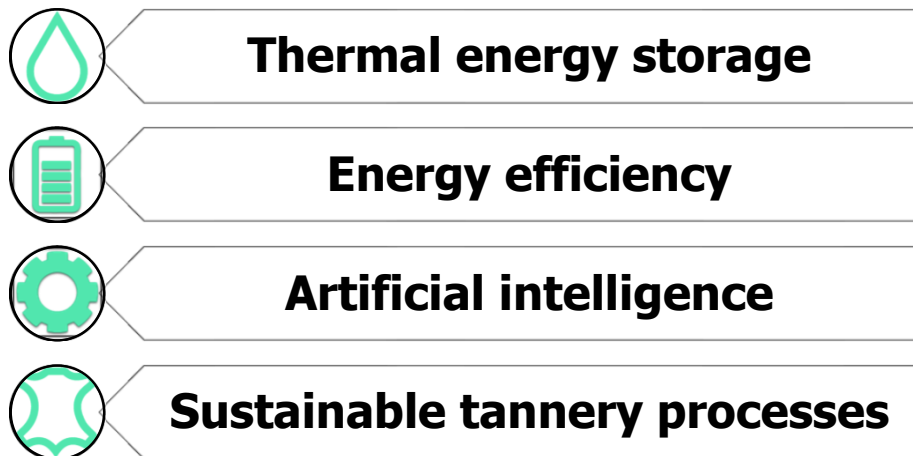


Prof. Dr. Luisa F. Cabeza

Who we are?



- Vision
 - Being a reference group of engineering at an international level, always linked to the University of Lleida
- Mission
 - To propose solutions to the industry in the fields of sustainability, energy engineering and control, through research, technology transfer and training
- Objectives
 - To improve existing knowledge through research and innovation
 - To help increase the competitiveness of companies through collaborations, whether for the design of new products or as a technology consultancy



GREiA Team



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consolidated Research Group



European Technology Platform on
Renewable Heating & Cooling



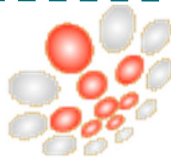
Reference network of advanced
materials for energy (XRE4S)



Campus IBERUS



Spanish Thematic Network of
Thermal Energy Storage



Cidades Inclusivas Resilientes
Eficientes e Sustentáveis (Red CIRES)



International Energy Agency
Energy Conservation through
Energy Storage (ECES-IEA)



Lleida Biotech, local bioproducts
industries cluster



International Solar Energy Society
(ISES)



INPATH-TES Network



Red Iberoamericana de investigación,
desarrollo y transferencia para la aplicación
de energías renovables (RedRibErA)

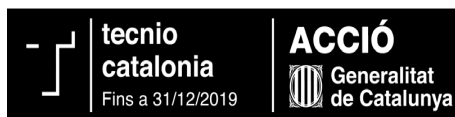


Research Centre for Sustainable
Technologies (INSPIRES)



Universitat
de Lleida

TECNIO network of
Generalitat de Catalunya



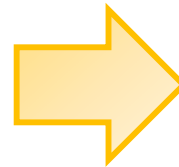
- From Wikipedia:

Social acceptance affects people of all social and age groups. Social acceptance can be defined as tolerating the differences and diversity in others because most people attempt to look and act like others do in order to fit in.

Children and teenagers tend to desire to be accepted among friends as part of that group, and act upon that desire through peer pressure. Peer pressure sometimes determines how people style their hair and clothing to "look cool". A desire to be accepted by those whose friendship one values can determine their openness towards popular behavior smoking, drinking, swearing, and more. People exhibit and avoid certain behaviors out of the desire for the approval of their friends, which may include drinking or taking drugs.




Automated window blind



I prefer fix ones!!!

- In Scopus:

Concept	Number of documents (4 Jan 2022)
Social acceptance	6,889
"Social acceptance" and technology	2,400
"Social acceptance" and energy	1,350
"Social acceptance" and technology and energy	1,070
"Social acceptance" and "energy storage"	27
"Social acceptance" and technology and "energy storage"	19
"Social acceptance" and "thermal energy storage"	3
"Social acceptance" and technology and "thermal energy storage"	3



- Lentswe, K., Mawire, A., Owusu, P., Shobo, A. A review of parabolic solar cookers with thermal energy storage Heliyon 7 (2021) e08226
- Simó-Solsona, M., Palumbo, M., Bosch, M., Fernandez, A.I. Why it's so hard? Exploring social barriers for the deployment of thermal energy storage in Spanish buildings Energy Research and Social Science 76 (2021) 102057
- Carneiro, J.F., Matos, C.R., van Gessel, S. Opportunities for large-scale energy storage in geological formations in mainland Portugal Renewable and Sustainable Energy Reviews 99 (2019) 201-211

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- Mentions “social acceptance” once in the abstract as one more aspect to consider

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- Social acceptance appears in:
 - Keywords
 - Introduction
- Social aspect highlighted as a socio-cultural factor that can explain the mismatch between technology development and actual implementation of TES

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- Technology related

artificial intelligence, internet of things, sensors, waste management, digitalization, emerging technologies, social media, system dynamics

- Energy related

wind energy, electric vehicle, renewable energy, bioenergy, grid expansion, solar energy, shale gas, smart meter, energy efficiency, energy storage, consumer, energy infrastructure, geothermal energy, municipal solid waste, electricity, marine energy

energy planning, demand response, energy transition, energy justice

- “social acceptance” and energy - keywords
 - Environmental aspects

life cycle assessment, sustainability, carbon dioxide, sustainable development, climate change, decarbonization, circular economy, waste-to-energy, clean energy, environmental impact, global warming

- Economic aspects

social capital, economic feasibility, economics, willingness to pay

- “social acceptance” and energy - keywords
 - Social aspects

adoption, focus group, technology adoption, ethics, moral acceptability, responsible innovation, co-creation, risk communication, trust, public acceptance, public attitudes, public opinion, public engagement, barriers, challenge, policy, perception, rural development, user acceptance, user experience, regulations, society, innovation, awareness, decision making, social impact, institutional change, stakeholder, local opposition, nimby

- **Socio-political acceptance**
 - Focuses on acceptance of technology by policy makers or the general public, measured via opinion polls
- **Market acceptance**
 - Focuses on willingness-to-pay models and the diffusion of new technologies in households and corporate organizations
- **Community acceptance**
 - Focuses on local responses to the siting of infrastructures

Wustenhagen, R., Wolskink, M., Burer, J. Social acceptance of renewable energy innovation and introduction to the concept. *Energy Policy* 35 (2007), pp. 2683-2691

- **Socio-political acceptance**
 - Focuses on acceptance of technology by policy makers or the general public, measured via opinion polls
 - Done by:
 - Policy makers
 - Key stakeholders (in renewable energies – energy companies and regulators)
 - General public
 - Important questions:
 - What are the best policy measures needed (e.g., incentive programmes, R&D)

Fast, S. Social acceptance of renewable energy: trends, concepts, and geographies. *Geography Compass* 7/12 (2013) pp. 853-866

- Market acceptance
 - Focuses on willingness-to-pay models and the diffusion of new technologies in households and corporate organizations
 - Done by:
 - Consumers
 - The market
 - Important questions:
 - What is the willingness-to-pay for a given technology?

Fast, S. Social acceptance of renewable energy: trends, concepts, and geographies. *Geography Compass* 7/12 (2013) pp. 853-866

- Community acceptance
 - Focuses on local responses to the siting of infrastructures
 - Done by:
 - Local communities
 - Important questions:
 - Is there a fair decision making process?

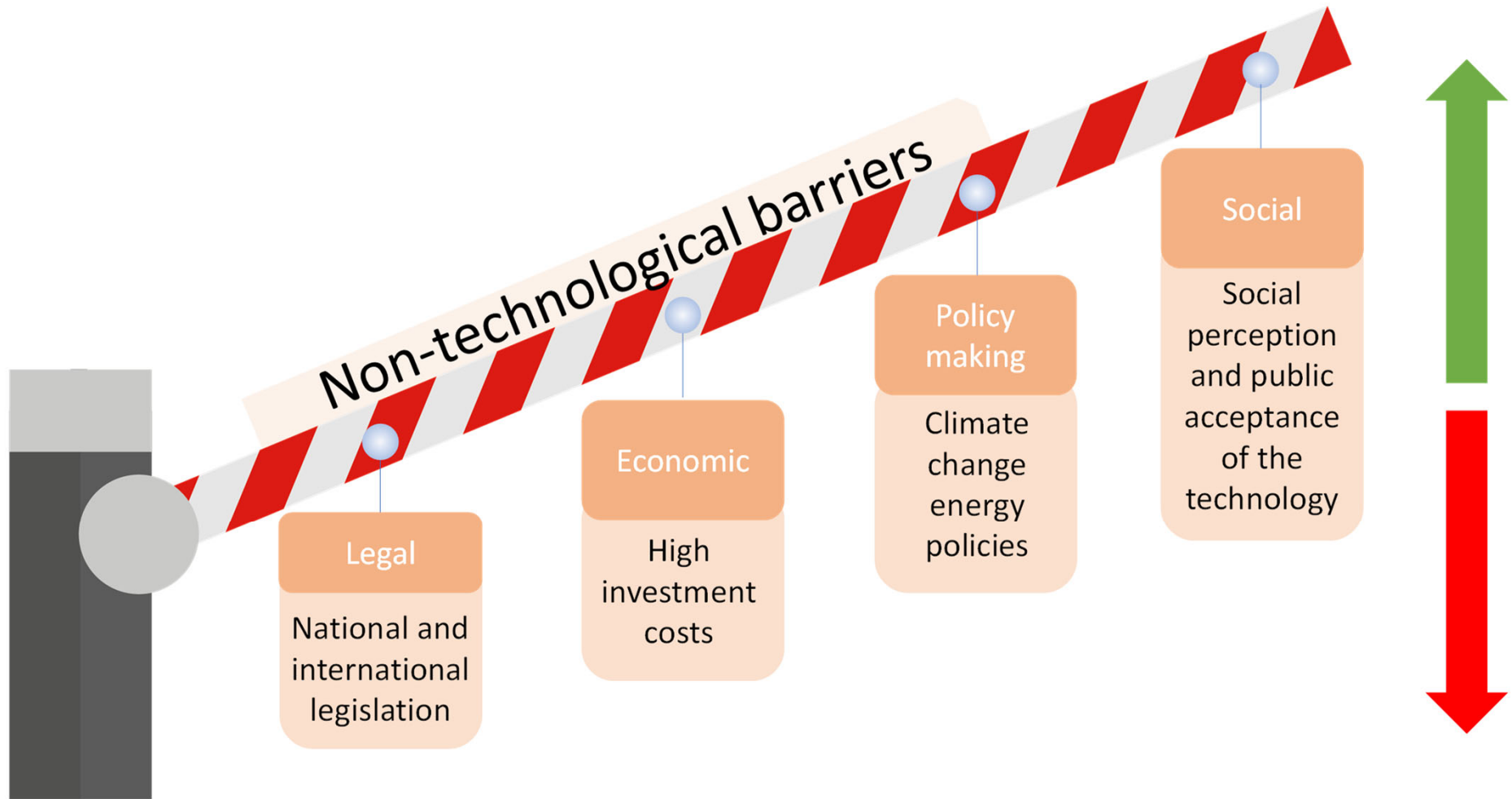
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- Statistical analysis that assesses which variables are correlated with regulatory acceptance or rejection of projects
 - Wind power projects [Harper et al. 2019]
- On-line survey to examine public general and local acceptance
 - Renewable technologies [Baur et al. 2022]

M. Harper, B. Anderson, P. James, A. Bahaj. Assessing socially acceptable locations for onshore wind energy using a GIS-MCDA approach. *Int. J. Low Carbon Technol.*, 14 (2019), pp. 160-169, 10.1093/ijlct/ctz006

Baur, D., Emmerich, P., Baumann, M.J., Weil, M. Assessing the social acceptance of key technologies for the German energy transition. *Energy, Sustainability and Society* 12 (2022), 4

- Social acceptance is essential for a technology to reach the market
- Social acceptance is recognised as a clear barrier for thermal energy storage deployment
- There is a clear literature gap on evaluating the social acceptance of TES and how to increase it



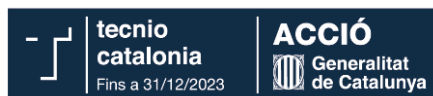
Acknowledgements

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GREiA is certified agent TECNIO in the category of technology developers from the Government of Catalonia.



Thank you for your attention!



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