# Article information:

Decarbonizing the chemical industry: A systematic review of sociotechnical systems, technological innovations, and policy options - ScienceDirect  
<https://www.sciencedirect.com/science/article/pii/S2214629623000154>

# Article summary:

1. The chemical industry is a major emitter of greenhouse gases due to its energy consumption and carbon-intensive materials.

2. A comprehensive review of decarbonization innovations for the industry identified four groups: raw materials, chemical making processes, chemical product making and usage, and waste management and recycling.

3. The review discusses potential benefits, barriers, and policy options for achieving decarbonization targets in the chemical industry.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

The article "Decarbonizing the chemical industry: A systematic review of sociotechnical systems, technological innovations, and policy options" provides a comprehensive overview of the challenges and opportunities for decarbonizing the chemical industry. The authors conducted a systematic review of more than 5.6 million articles and analyzed 246 studies to identify potential transformative technologies for decarbonization.

The article highlights the significant energy consumption and carbon footprint of the chemical industry, which is responsible for substantial greenhouse gas emissions during production and use. The authors identify four groups within the sociotechnical system of the industry: raw materials, chemical making processes, chemical product making and usage, and waste management and recycling.

The article discusses current and emerging practices for decarbonization, including optimization, renewable energy, energy efficiency, carbon capture utilization and storage (CCUS), plasma catalysts, solid oxide electrolysis cells, bioreactors with electrochemical systems, enzymes and organisms for synthesizing chemicals. The authors also examine benefits to sector decarbonization as well as barriers across economic, technical, political, and behavioral aspects.

While the article provides a thorough analysis of potential transformative technologies for decarbonization in the chemical industry, it does not explore counterarguments or potential risks associated with these technologies. Additionally, there is limited discussion on how financing or business models can be harnessed to support decarbonization efforts.

Overall, this article provides valuable insights into the challenges and opportunities for decarbonizing the chemical industry. However, readers should be aware that some biases may exist due to potential conflicts of interest from funding sources or affiliations with certain organizations.

# Topics for further research:

* Risks associated with decarbonization technologies in the chemical industry
* Financing models for decarbonization efforts in the chemical industry
* Business models for decarbonization in the chemical industry
* Counterarguments against decarbonization in the chemical industry
* Environmental impacts of decarbonization technologies in the chemical industry
* Social and economic implications of decarbonization in the chemical industry

# Report location:

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