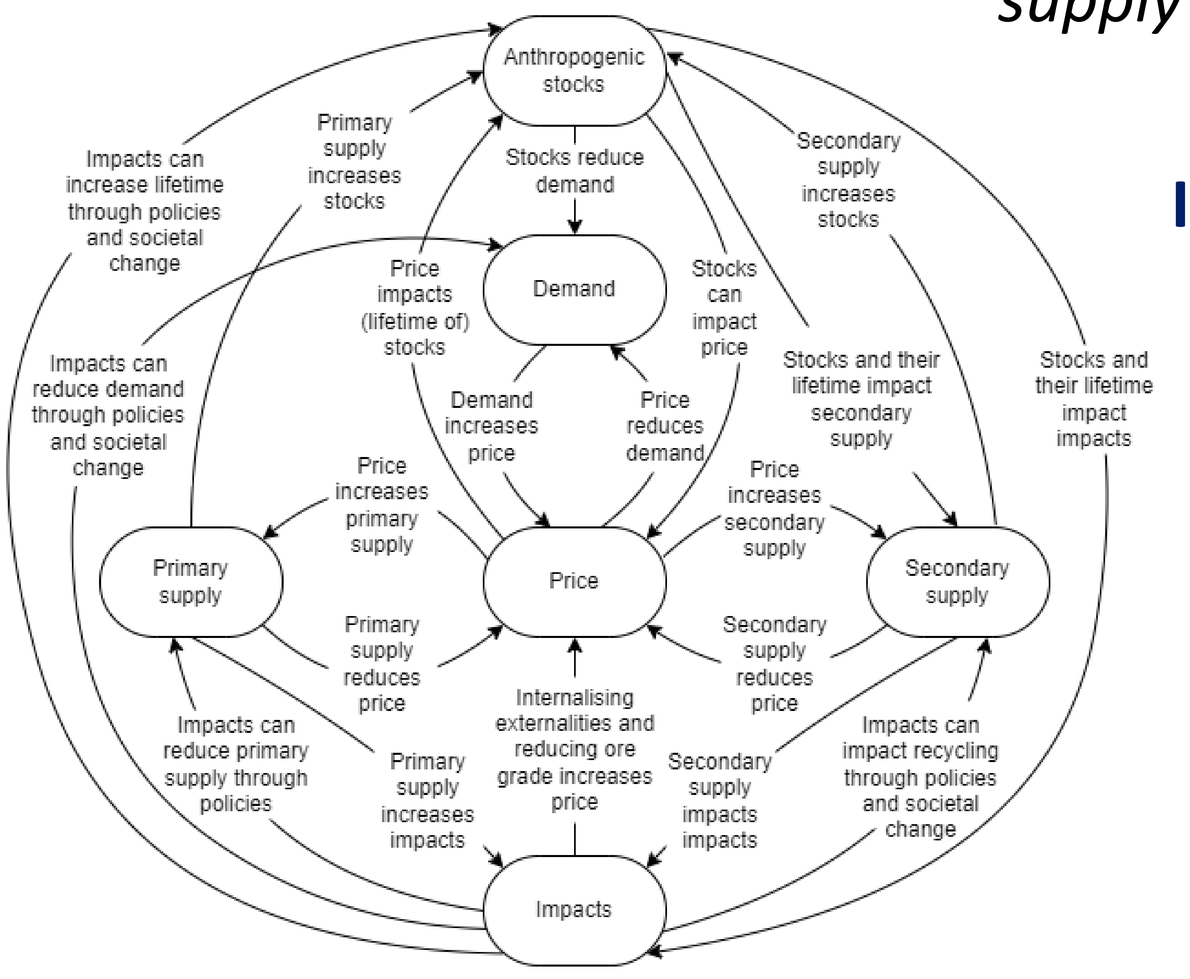
Critical Raw Material in Solid Oxide Fuel Cells for Future Propulsion Systems

Centre for Sustainability
Leiden-Delft-Erasmus Universities

AIRBUS

The Challenge:

How to reduce ecological impact of the critical raw materials supply chain?

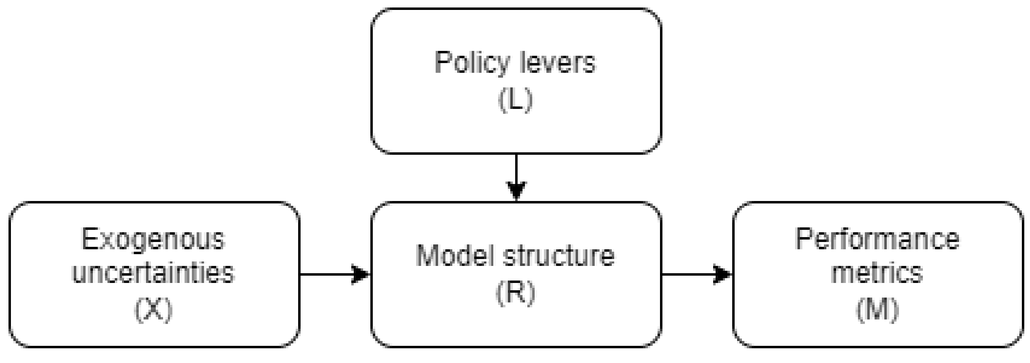


Introduction

Decarbonization of civil air mobility is enabled by new kinds of propulsion concepts. These propulsion systems need non-fossil-based energy storage and highly efficient conversion systems. While current key material challenges of kerosene combustion engines is shifted to new functionalities, the ecological impact may be shifted to other stages in these systems' life-cycle.

Method

An exploratory system dynamic approach (ESMDA) is used to examine the future behavior of the life cycle of critical raw material in SOFC for future propulsion systems. Ethnographically developed scenario's will test Airbus corporate strategies on their efficiency in reducing certain ecological factors through the XLRM framework (pictured right).



Results

Considering the lifetime of SOFC devices, if widespread use is implemented, then it is crucial that recycling techniques are developed. In parallel, it is recommended to invest in lifetime-extending research and CRM-free designs.

Conclusion

CRM issues are rarely studies from a holistic systems view. Data scarcity, especially in EoL processes, hinders a quantitative approach. However, system dynamics proves a valid approach to investigate the behavior of the life cycle of CRM.

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