Transportation Electrification

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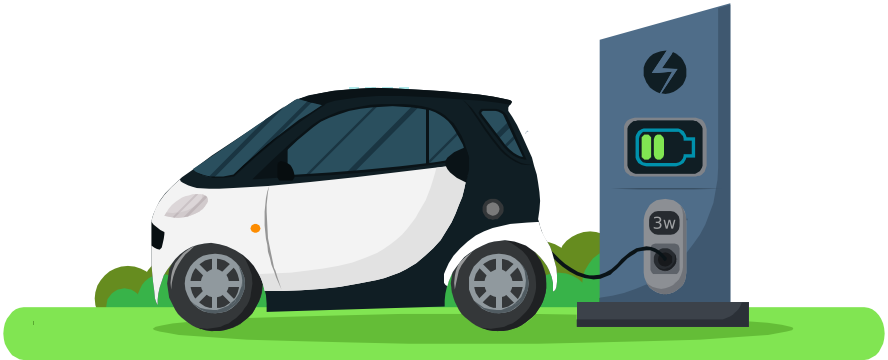
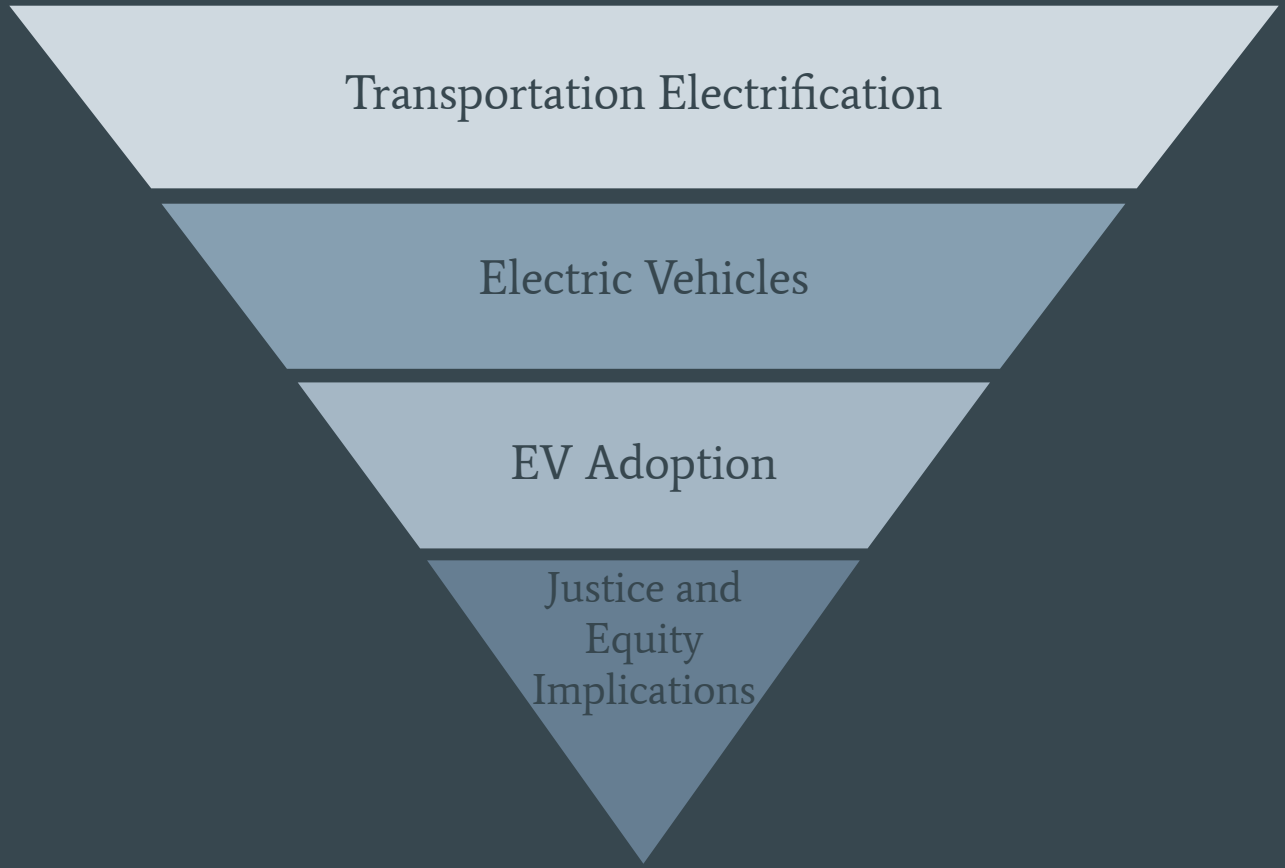


Agenda

1. System Boundaries
2. Dynamic Hypothesis
3. CLD
4. FCM
5. Questions

1. System Boundaries

Scope


Transportation Electrification
Electric Vehicles
EV Adoption
Justice and Equity Implications

2. Dynamic Hypothesis

Public Policy

- Increase demand and adoption of EVs

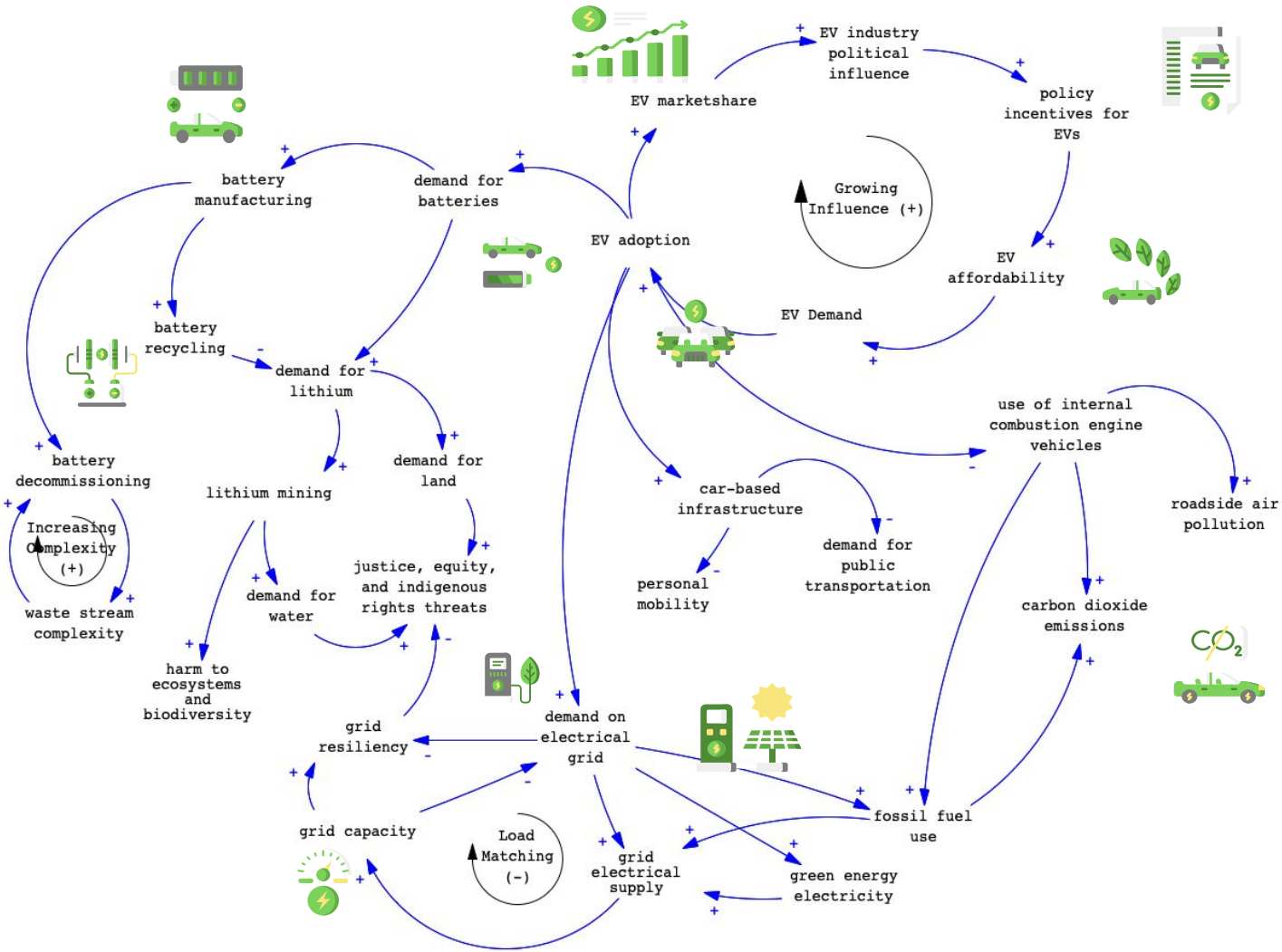
Manufacturing

- Increase demand for lithium mining
- Maturation of battery waste streams, specifically recycling

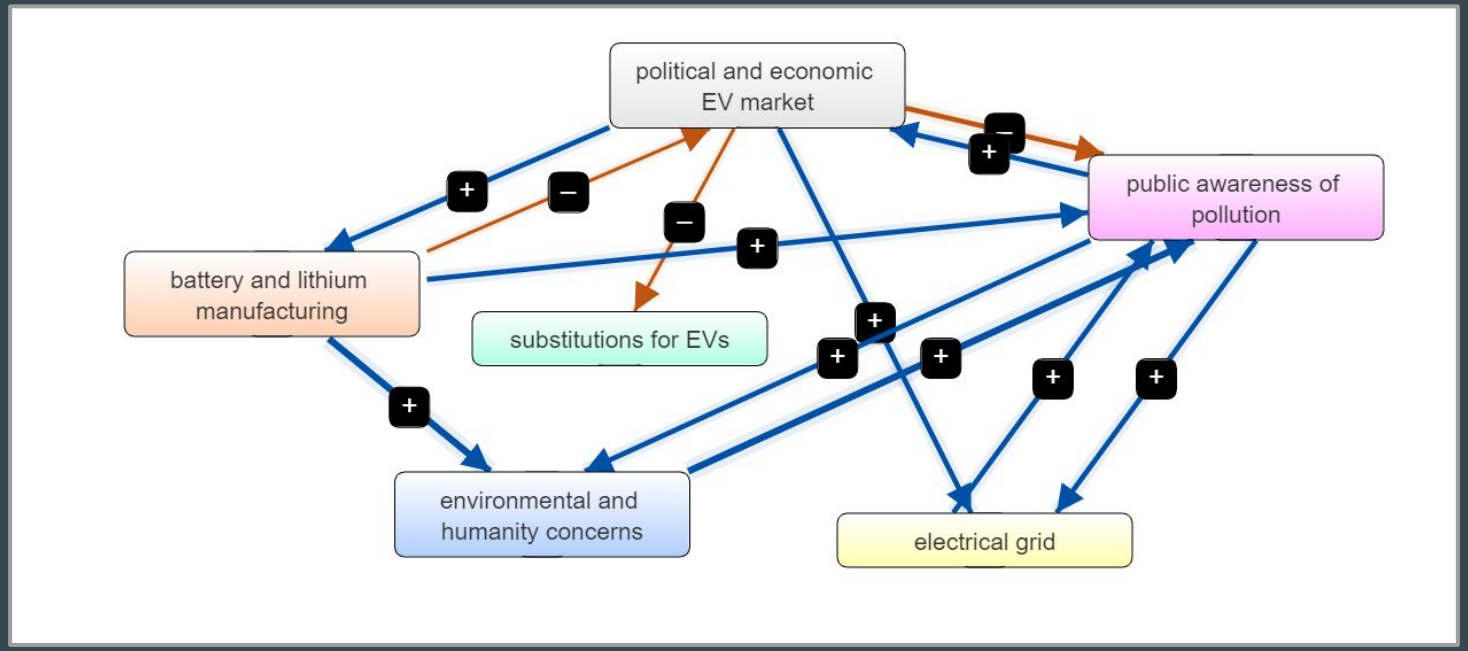
Electricity Grid

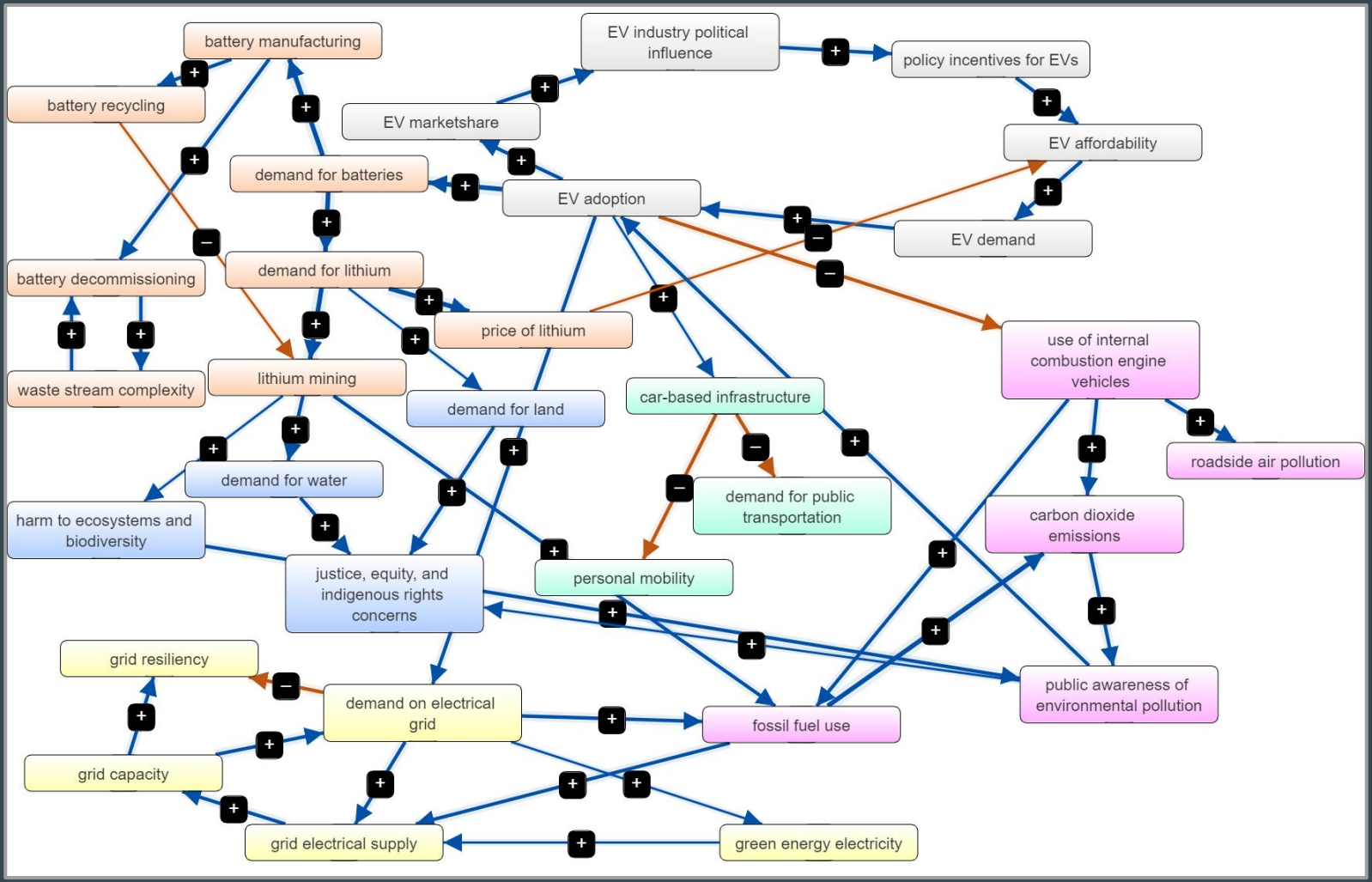
- Develop renewable energy power plants
- Increase grid resilience overtime

3. Causal Loop Diagram



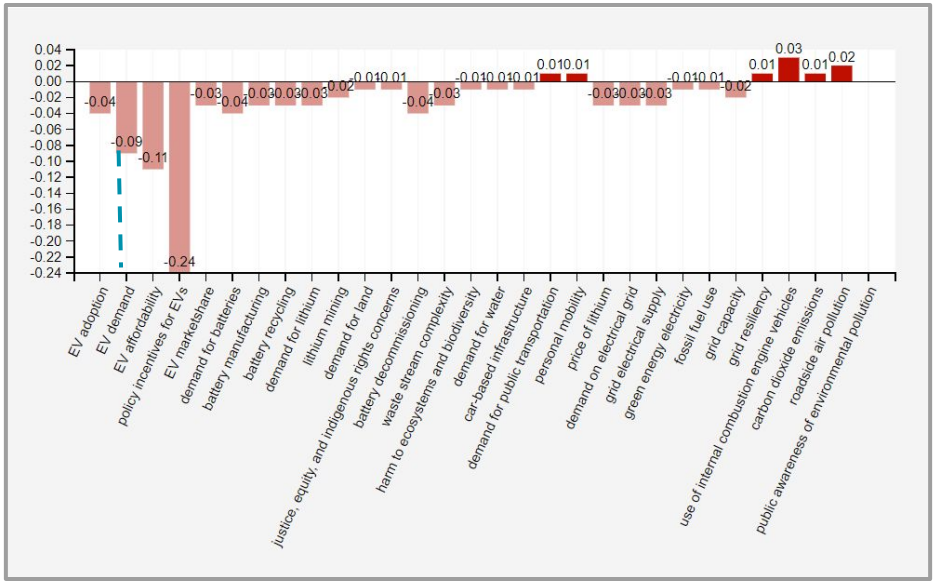
4. Fuzzy Cognitive Map-breaking down with categories




battery manufacturing
battery recycling
battery decommissioning
waste stream complexity
EV industry political influence
policy incentives for EVs
EV marketshare
EV affordability
demand for batteries
EV adoption
EV demand
demand for lithium
price of lithium
lithium mining
demand for land
car-based infrastructure
use of internal combustion engine vehicles
roadside air pollution
demand for water
harm to ecosystems and biodiversity
demand for public transportation
carbon dioxide emissions
justice, equity, and indigenous rights concerns
personal mobility
grid resiliency
demand on electrical grid
fossil fuel use
public awareness of environmental pollution
grid capacity
grid electrical supply
green energy electricity

4. Scenario I

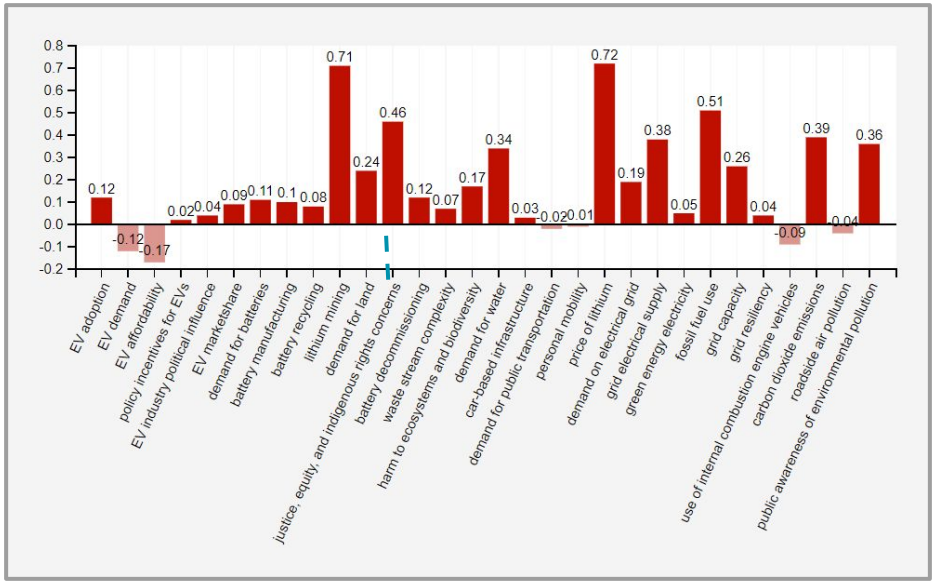
Effect on EV demand as political influence decreases by 50%



Decreases by 0.09

4. Scenario II

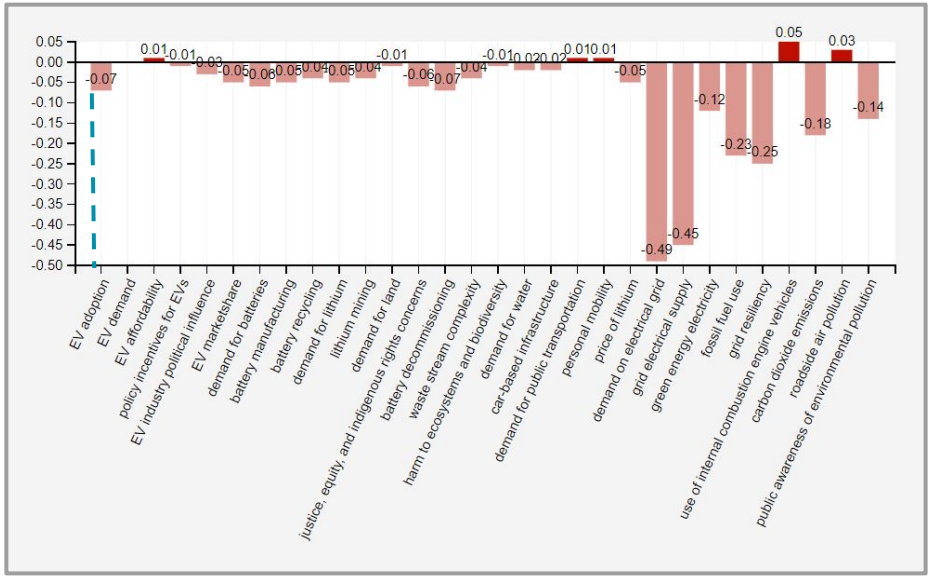
Effect on justice, equity, and indigenous rights concerns as demand for lithium increases by 100%



Increases by 0.46

4. Scenario III

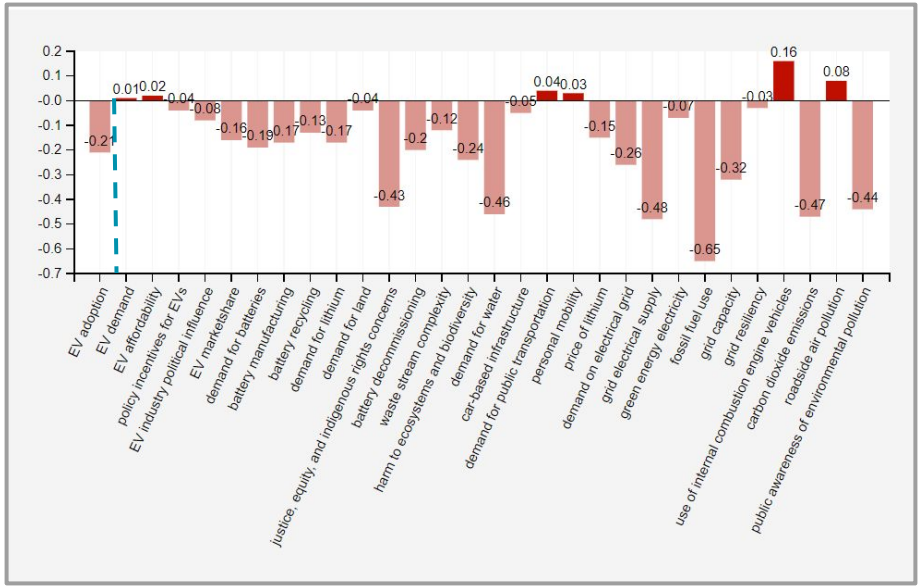
Effect on EV adoption as grid capacity decreases by 100%



Decreases by 0.07

4. Scenario IV

Effect on demand for public transportation as lithium mining decreases by 100% (was banned)



Increases by 0.01

Questions:

1. Are there any important variables in this system that we may have missed?
2. Are there any scenarios that you'd like to see tested that we didn't simulate?
3. What are the most important variables in this system? What components should we focus on to narrow down the scope?
4. What outcomes would be the most useful based on your field/area of focus? ex) policy, emissions, etc.
5. What feedback do you have on the causal relationships we identified in our CLD/FCM?
    a. Do you agree with our strengths of connection?
    b. Are there variables we should break down

Thank you!

Q&A