The indirect energy impacts of digitalisation in daily life

Scenario exploration using the FeliX model

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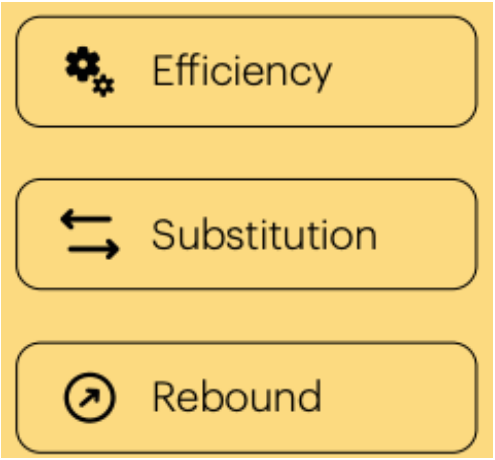
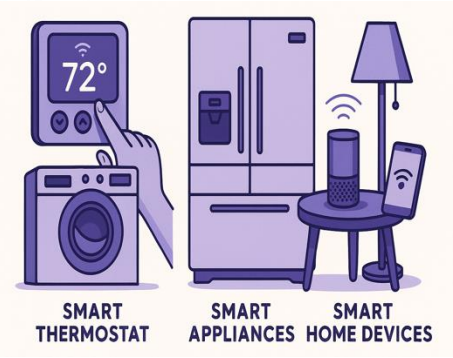
Why study digitalisation's indirect energy effects?

Diffuse, usage-dependent

long-term climate outcomes.





Photograph and graphics: Marcel Seger, Poornima Kumar

Our lives are increasingly digitised and automated.

What are the indirect energy and climate impacts of digitalisation?

Under '**desirable**' and '**undesirable**' scenarios

Energy, emissions, & resources

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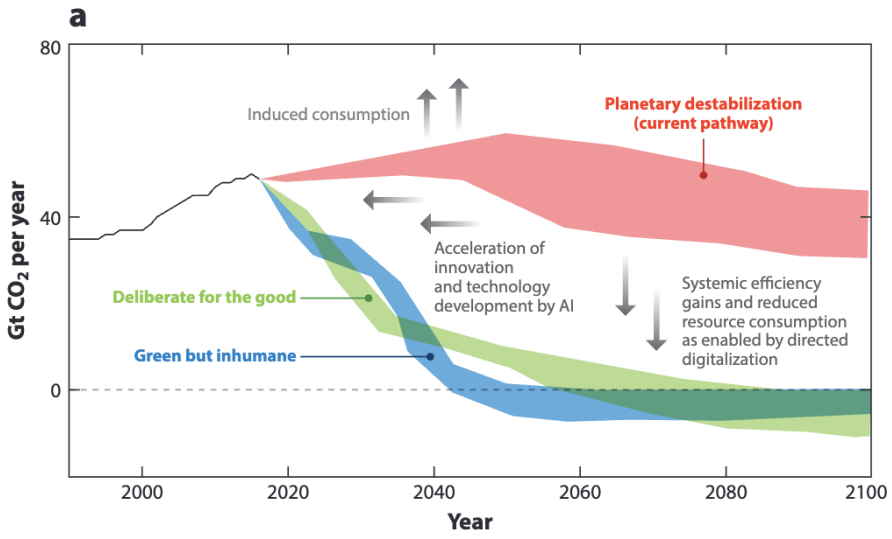
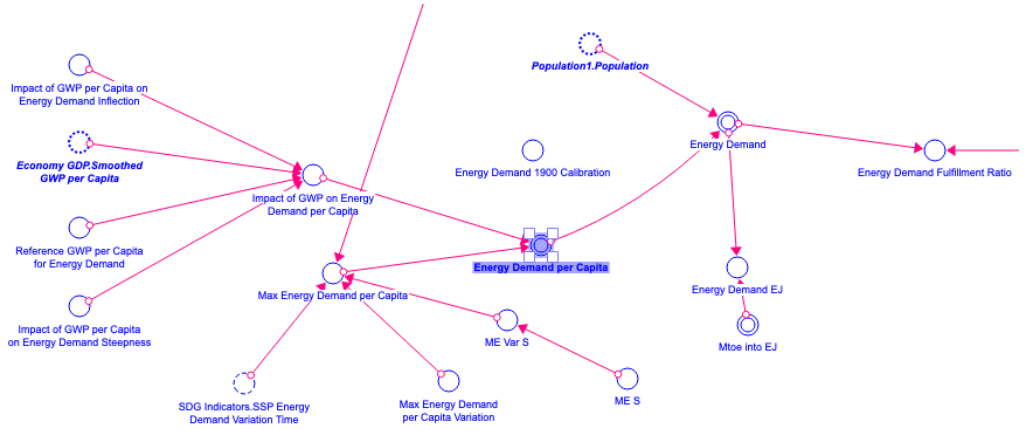


Example from Creutzig et al, 2022

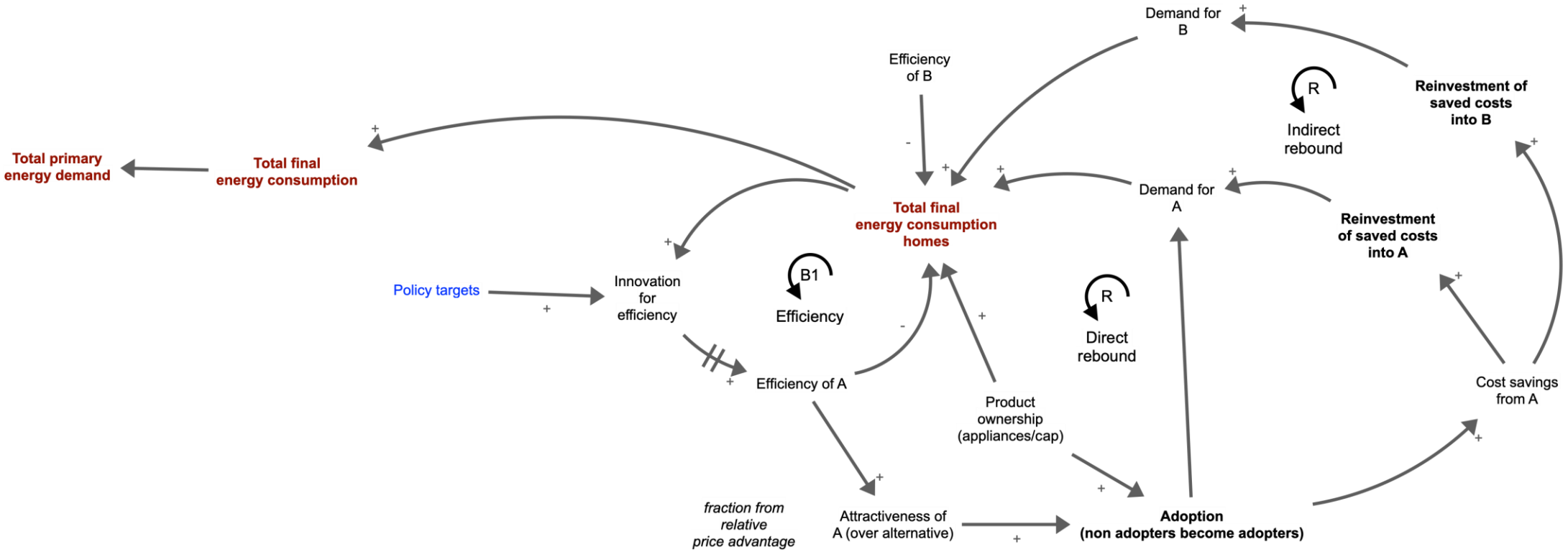
Steps:

1. Endogenise, sector-split energy demand
2. Introduce digitalisation indicators into FeliX
3. Scenarios – best and worst

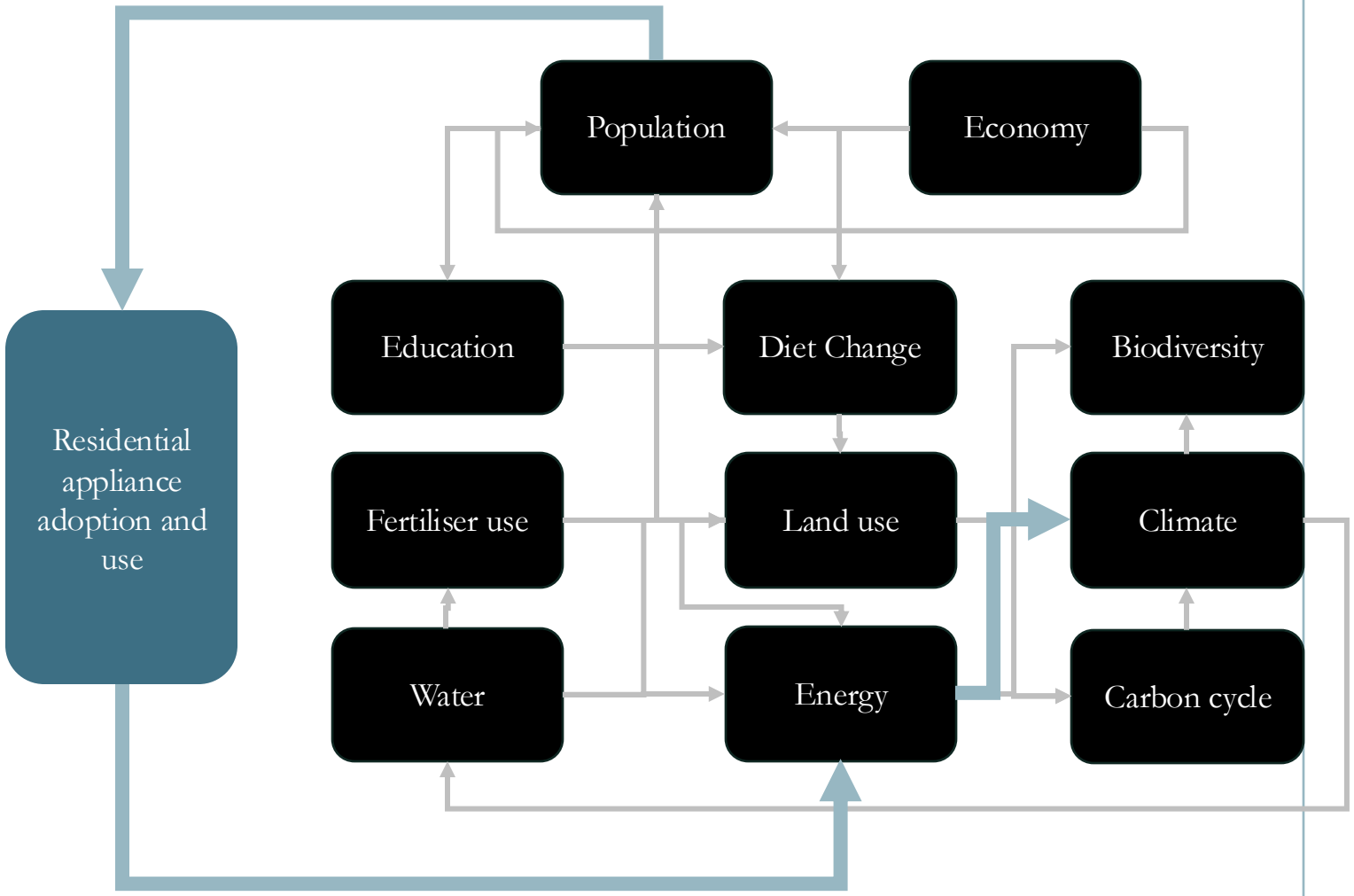


Source: https://iiasa.ac.at/models-tools-data/felix

Conceptual model: Efficiency improvements via digitalisation can lead to direct and indirect rebound.



The idea is to explore digitalisation dynamics through FeliX, IIASA's in-house system dynamics model



Adapted from Ye, Q., Liu, Q., Swamy, D., Gao, L., Moallemi, E. A., Rydzak, F., & Eker, S. (2024). *FeliX 2.0: An integrated model of climate, economy, environment, and society interactions*. https://doi.org/10.1016/j.envsoft.2024.106121

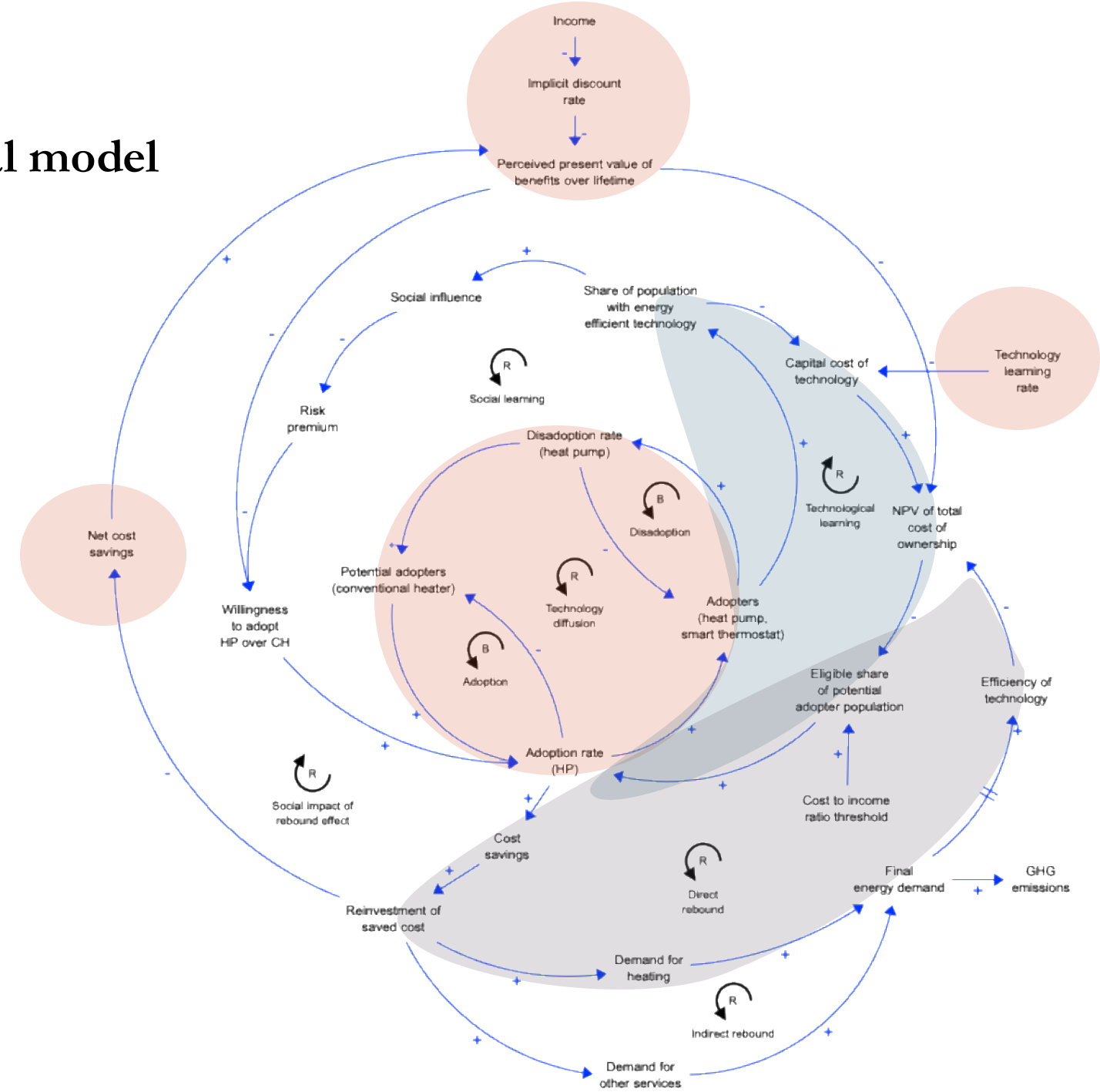
Using smart heating as a test case, I'm building a module to explore:

How do interactions between **technological and social learning dynamics** shape digital adoption?

How do these interactions impact **rebound mechanisms**?

What are the indirect effects on **energy demand**?

Conceptual model



Let's talk about:

Bridging the qualitative-quantitative divide

Bringing more empirical research into quantitative system dynamics modelling

Exploring the interactions between feedbacks at different system levels and their impacts on digitalisation

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IIASA www.iiasa.ac.at

iDODDLE
The Impacts of Digitalised Daily Life on Climate Change

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Thanks for your time.

Questions?

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