Functions of Models Illustrating the Transitions of Energy and Mobility Systems

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NEON – Lighting the way to zero emission energy and mobility

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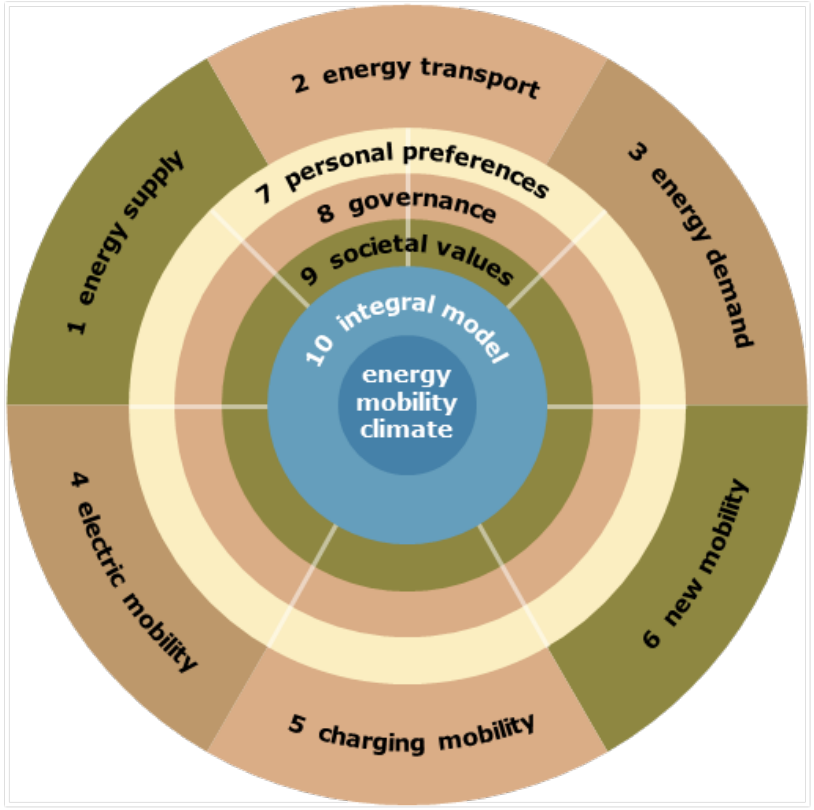
PhDs



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Creating energy and mobility transition model(s)

Challenges

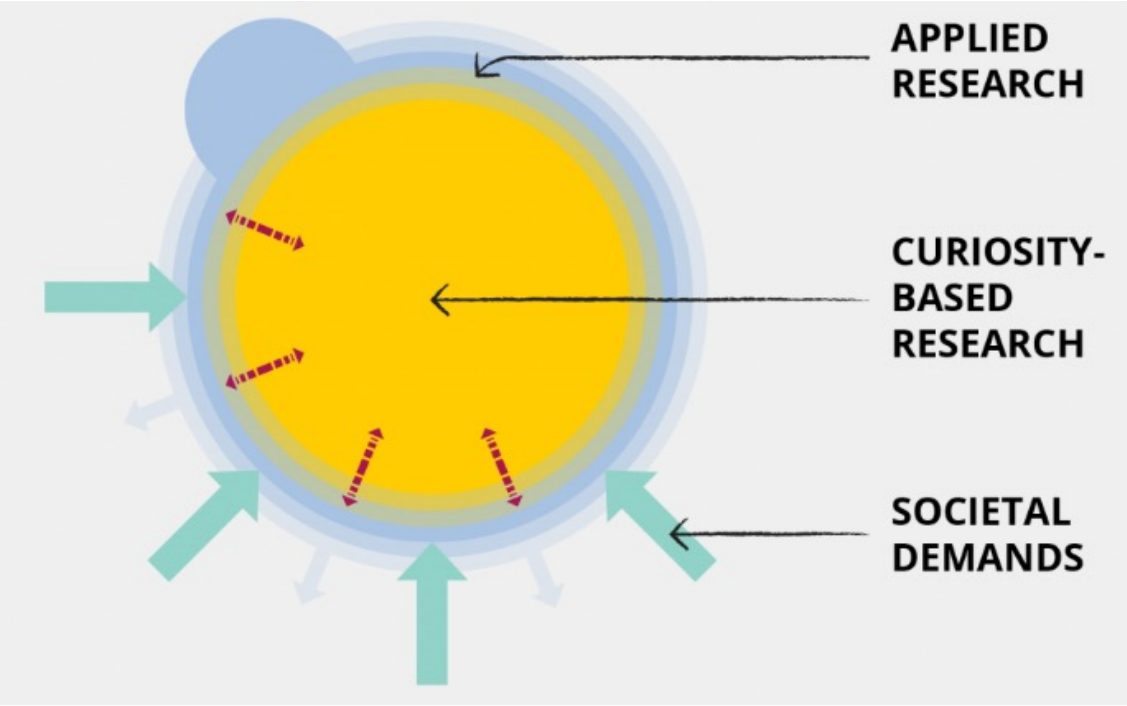
Ambiguity and uncertainty involved in designing the energy and mobility transition model in the context of transdisciplinary research

Who are users of the models?
(What would the model look like?)

Why do we create models?
(How can we evaluate our performance?)

Challenges

Ambiguity and uncertainty involved in creating energy and mobility transition models in the context of transdisciplinary research



Exploratory research – what would be societal demands?

Figure 2. Adopted from Robinson. (2019). Transdisciplinarity: The limitations of the alphabet. *Utrecht University*

Structured interviews with 11 practitioners who directly and indirectly utilize computational models in local & regional government, industry and academics in the Netherlands

Models in practice

Useful models

Future model design

Models in practice

Strengths

"***Facilitating tendering process*** by gaining the detailed prognosis on EV charging demand"

– EV charging management in a province

Limitations

"***Creating business opportunities*** by understanding the behaviors of residents"

– EV charging station provider

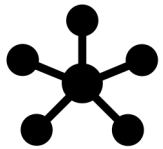
Models in practice

Strengths

Limitations

Limited viewpoints

Uneasiness to understand assumptions



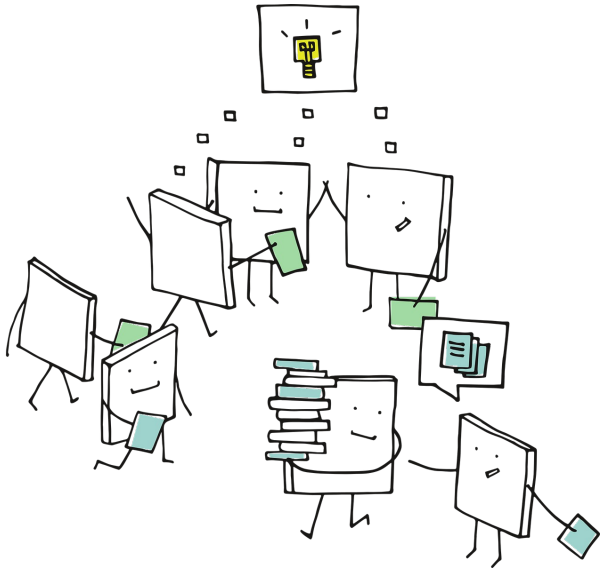
Lack of integrated models

Needs for short-term projection & early delivery of models

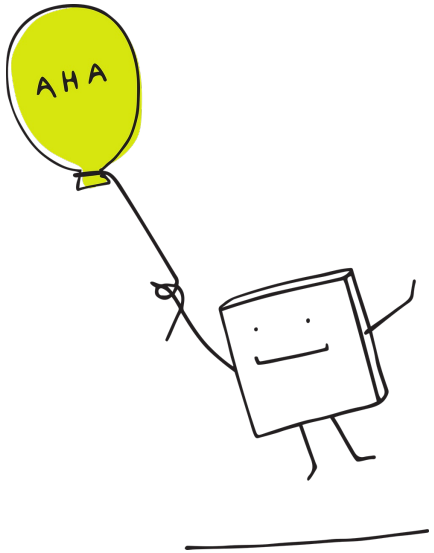
Detailing

Functions of useful models

Facilitating discussions among parties on energy mobility systems design and planning



Creating knowledge within an organization about energy and mobility systems



Assessing the impacts of business practices and solutions striving for the transitions

Functions & representations of useful models

Local & regional government
"Tools for *collaborative* design"

Key performance indicators
"Design criteria"

Design of

- Cost-effective regional energy system
- Cost-effective electricity network
- Resilient power grids for diverse types of transitions
- Strategies for local infrastructure adaptation to realize zero-emission mobility systems

Functions & representations of useful models

Local & regional government
“Tools for *collaborative* design”

<u>Key performance indicators</u>
<u>“Design criteria”</u>

Cost
Space usage
Resiliency
Labor availability
Energy efficiency
Time

GHG emissions
Air quality
Regional economic development
Material circularity
Climate adaptation

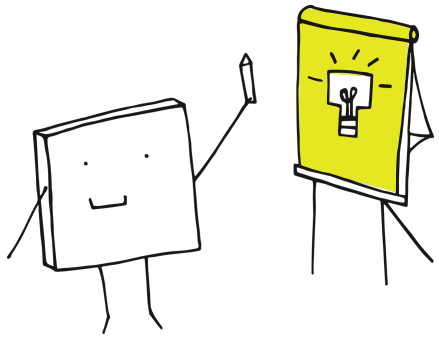
Energy price paid per citizen
User friendliness
Public acceptance

Functions & representations of useful models

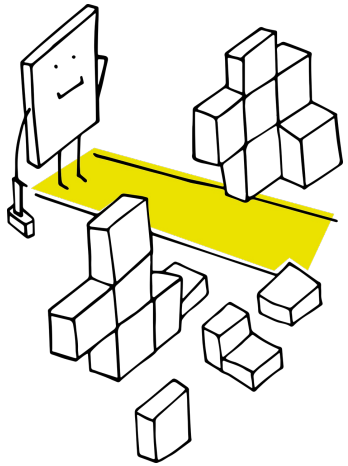
Industry & Knowledge management
“Tools for knowledge generation”

- Impacts of flexibility solutions on the power grid
- Mobility choice depending on car size, fuel, technology etc.
- Accessibility of clean mobility
- Future business opportunity (charging pole demand)
- Societal values of flexibility solutions
- Strategies for making organization sustainable

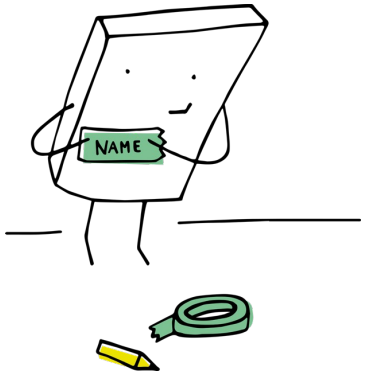
Ideas for designing useful models



Visualize
radical ideas and changes in future for risk-averse users



Understand
users learn step by step (e.g., Maslow's hierarchy & Bloom's taxonomy)



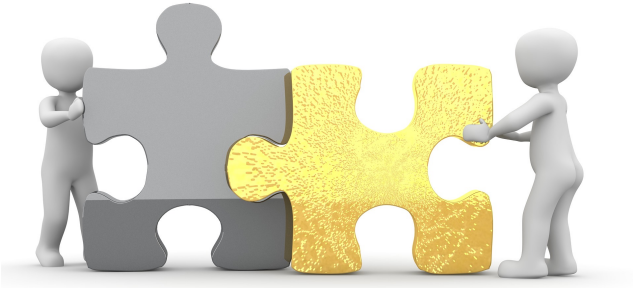
Sharpen
target users (Don't say "policymakers")

Document
assumptions properly

Discussion

Why is modelling crucial in transdisciplinary projects?

*What about **other users**?*



Collaboration with artists and practitioners in virtual collaboration & communication

Thank you

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