



Aalto University  
School of Arts, Design  
and Architecture

# *Form-giving and back-casting: How to support alternative futures*

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5.3.2019

# Outline

- **Technological / Socio-technical transitions**
- **Socio-technical transitions to sustainability**
  - Multiactor, long-term, goal-oriented, disruptive, contested, and nonlinear processes.
- **Urban transitions**
  - How does space matter?(Freiburg, Graz, Helsinki)
  - Intermediation of sustainability transitions
- **Creating conditions for sustainability transitions**

# SMART ENERGY TRANSITION (SET)

REALIZING ITS POTENTIAL FOR SUSTAINABLE GROWTH FOR FINLAND'S SECOND CENTURY

(Academy of Finland 2015-2020)

[www.smartenergytransition.fi](http://www.smartenergytransition.fi)



# Incremental change vs paradigm shift?

**‘Every change of a technoeconomic paradigm which has so far occurred, the new paradigm had already emerged and developed within the previous one.**

- Steam power (the second technoeconomic paradigm) was based on a technology already well established.
- Electric power (the third technoeconomic paradigm) was developing over half a century before the generation and transmission of electricity became widespread towards the end of the 19th century.
- Mass production (the fourth technoeconomic paradigm) was already established in such industries as meat-packing and automobiles decades before it became the dominant system.
- The fifth information and communication technology paradigm has been developing since World War II to the point where it is achieving dominance today.’

Kemp, R. (1994). Technology and the transition to environmental sustainability: the problem of technological regime shifts. *Futures*, 26(10), 1023-1046.

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# Technological paradigm / regime

**‘A ... core technological framework which is shared by the entire community of technological and economic actors (Kemp 1994)  
Shared cognitive routines in an engineering community explain patterned development along ‘technological trajectories’.  
(Nelson and Winter 1982)**

**“the efforts and the technological imagination of engineers and of the organizations they are in are focused in rather precise directions while they are, so to speak, ‘blind’ with respect of other technological possibilities.” (Dosi 1982).**

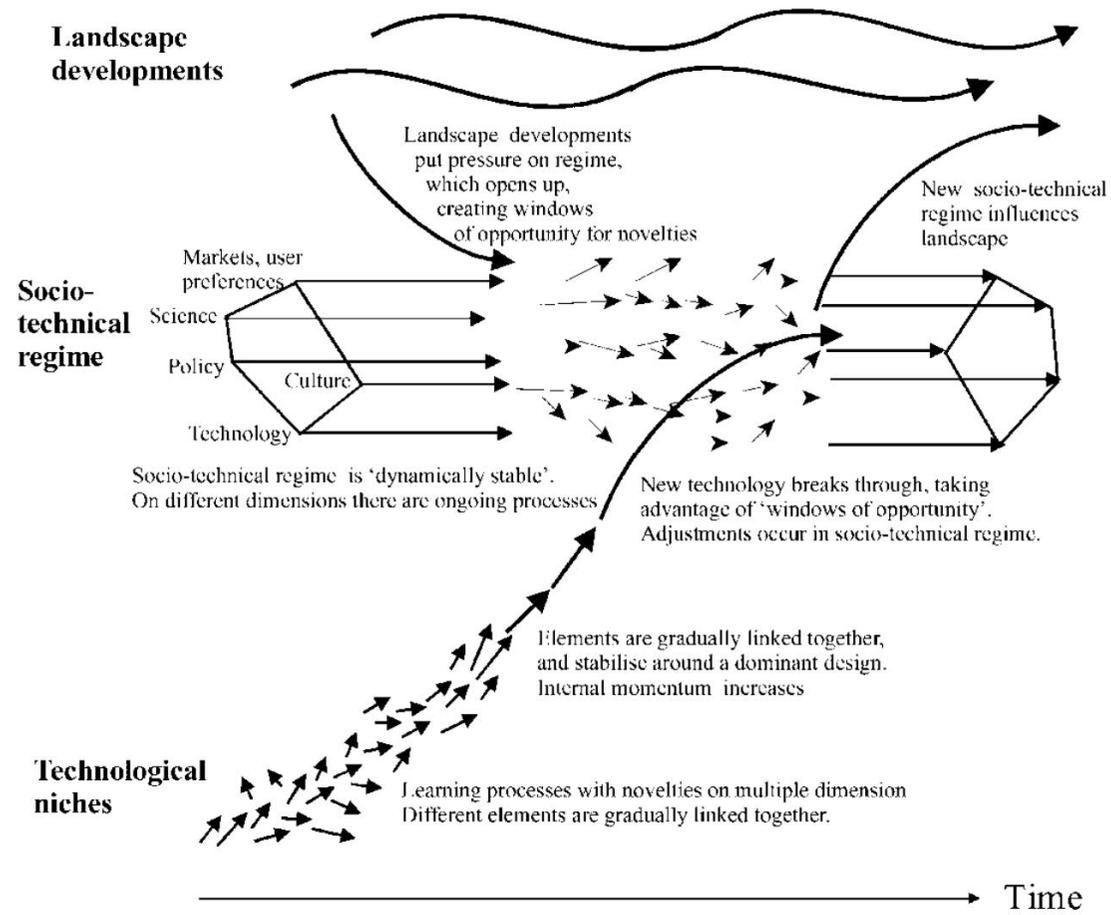
Kemp, R. (1994). Technology and the transition to environmental sustainability: the problem of technological regime shifts. *Futures*, 26(10), 1023-1046.

Dosi, G. (1982) ‘Technological paradigms and technological trajectories: a suggested interpretation of the determinants and directions of technical change’, *Research Policy*, 6.

Nelson, R. Winter S. (1982). *An Evolutionary Theory of Economic Change*. Belknap Press, Cambridge, MA



Flickr/FerdMels



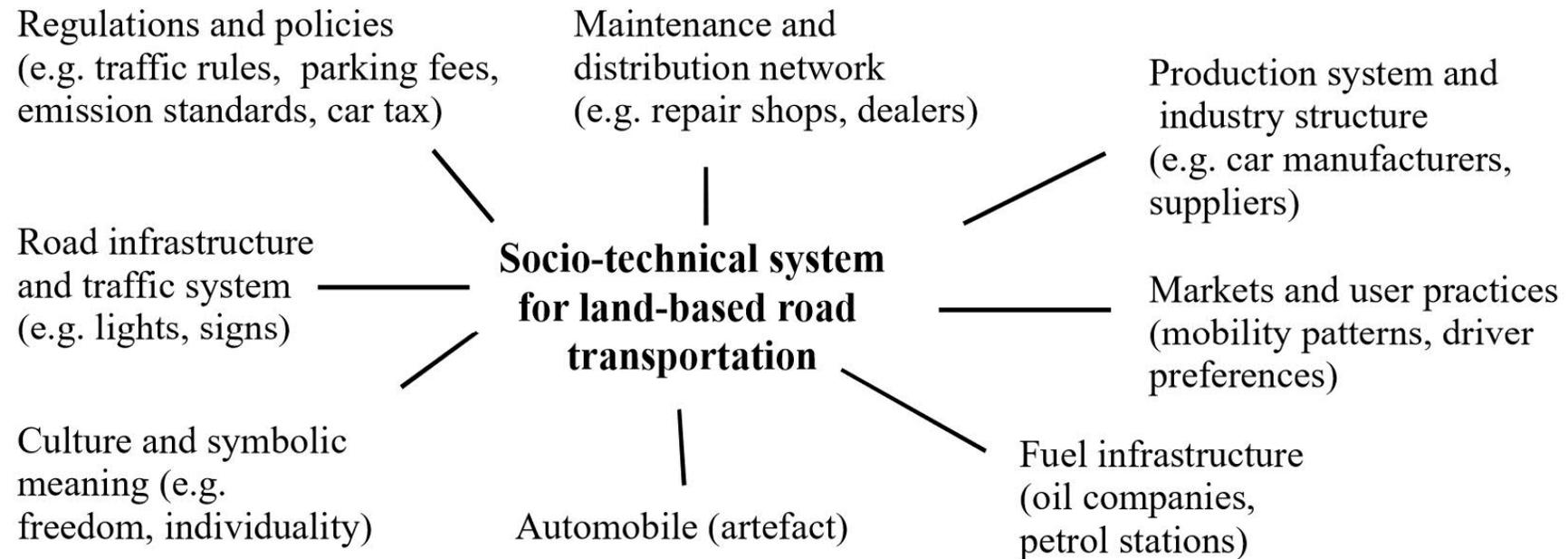


Fig. 1. Socio-technical system for modern car-based transportation.

Geels, F. (2005). Co-evolution of technology and society: The transition in water supply and personal hygiene in the Netherlands (1850–1930)—a case study in multi-level perspective. *Technology in society*, 27(3), 363-397.



Fig. 12. Advertisement from the Limburg water company in 1930 contrasting the hard work of water pumping with the ease of piped water [47, p. 76].

# What is the role of cities?

Are transitions ‘national’?

Are cities just ‘receiving’ transitions?

‘...territorial governance priorities increasingly require degrees of control and influence over energy, water, waste and transport regimes. In terms of a purposive transition the issue this raises is the extent to which urban territorial governance priorities effectively be coordinated and aligned with the priorities and social interests that constitute socio-technical regimes’

Hodson, M., & Marvin, S. (2010). Can cities shape socio-technical transitions and how would we know if they were?. *Research policy*, 39(4), 477-485.



# Rohracher & Spät

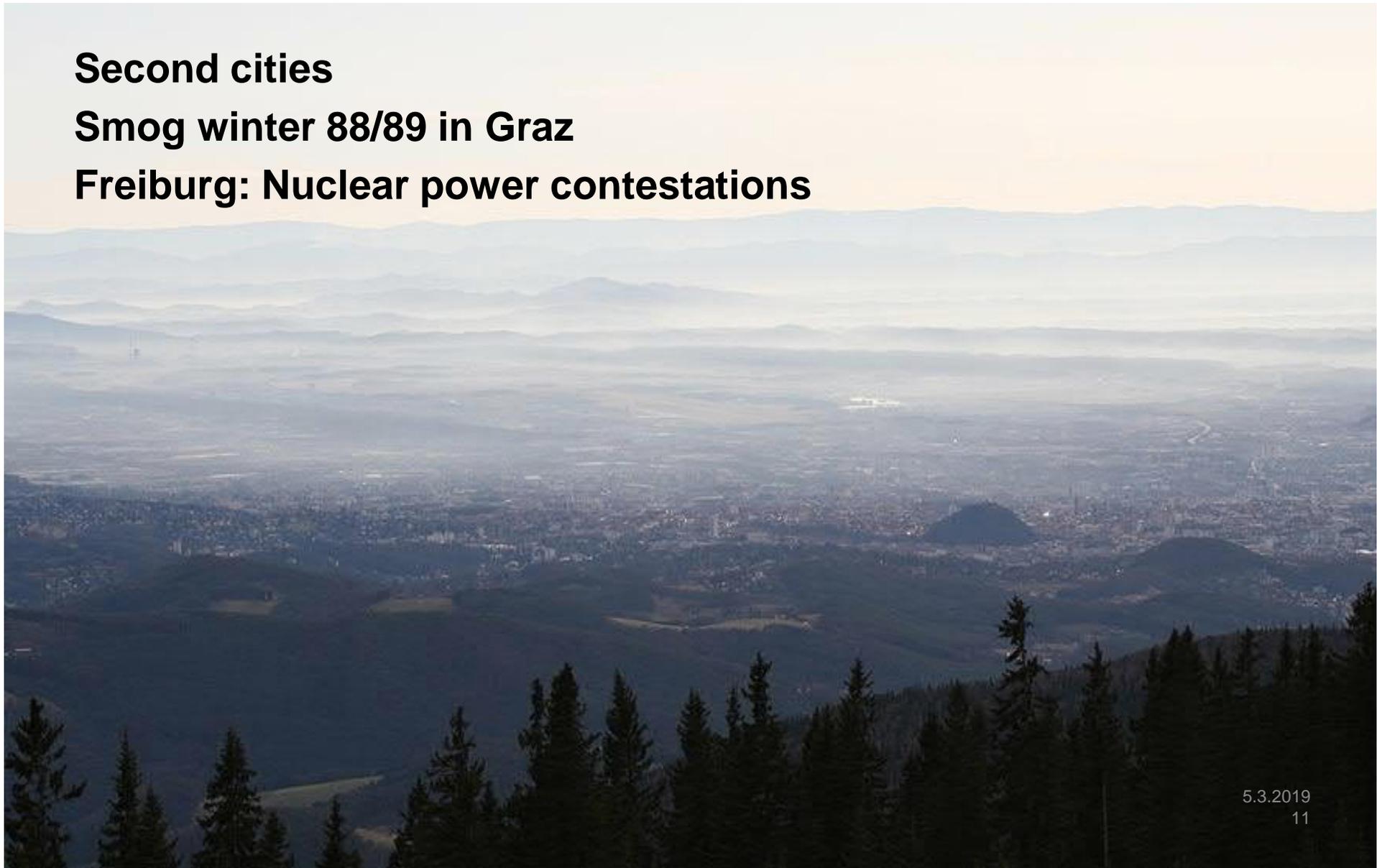
**Are local actions mediating between the niche and regime level and have they a particular function in facilitating and stabilizing change processes?**

- Graz: Detailed action plans relying on a broad range of actors
- Graz: Success stories for politicians set in motion a self-re-enforcing process.
- Graz: Energy Agency as an intermediary
- Freiburg: Local civic action is able to challenge the energy company and create momentum around an alternative to nuclear power.
- Freiburg: A national and international leader in eco-city developments

**Second cities**

**Smog winter 88/89 in Graz**

**Freiburg: Nuclear power contestations**

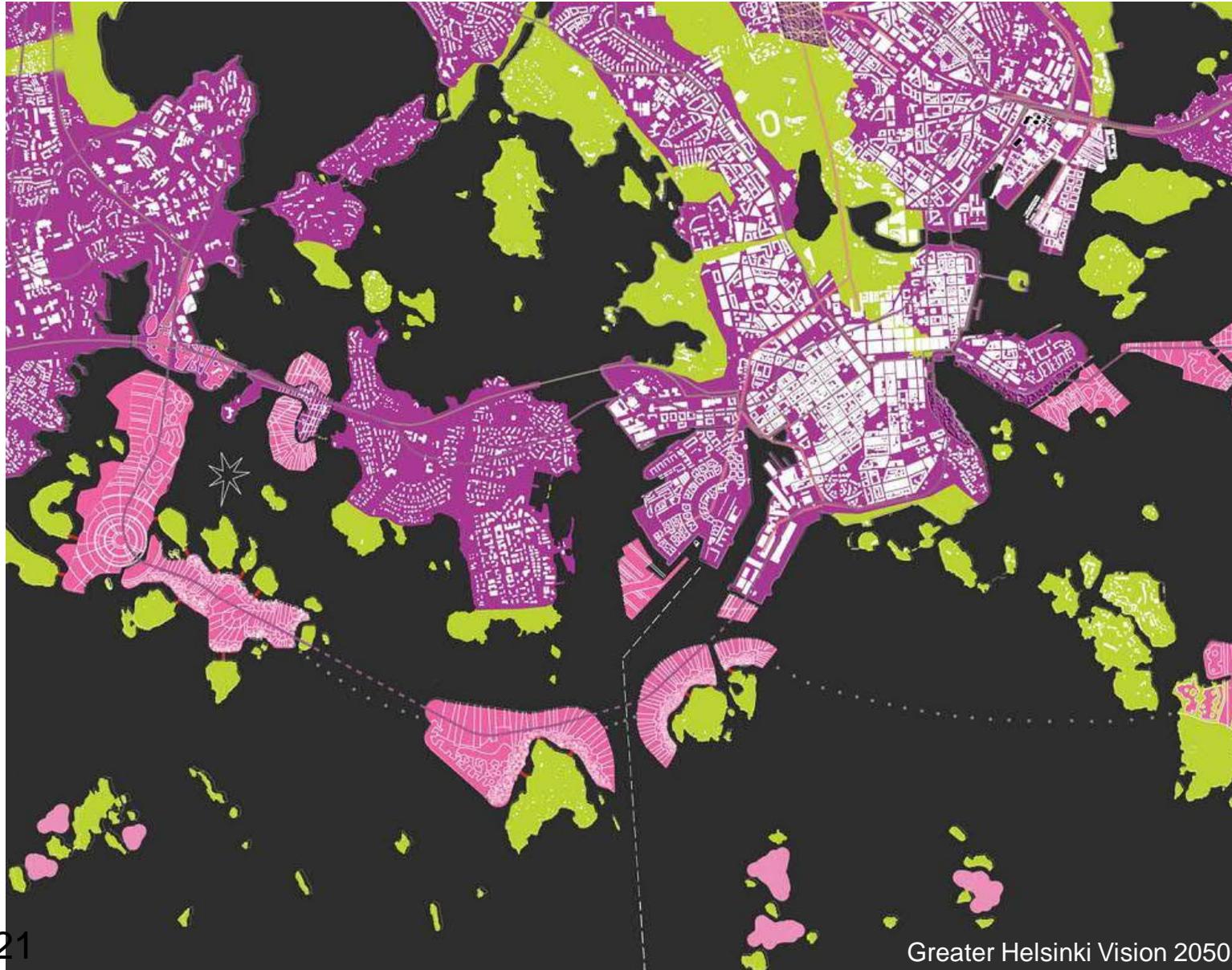


# Visions + Intermediation = Transition

**Visions: Developing a shared understanding of a transition. A process of a narrow or a broad constituency. Who should be involved?**

**Intermediation: Articulate visions. Bringing actors together. Organise participation. Arbitrate. Coordinate. Lobby support. Provide momentum ( ... functions of transition intermediaries)**

**FORUM  
VIRIUM  
HELSINKI**



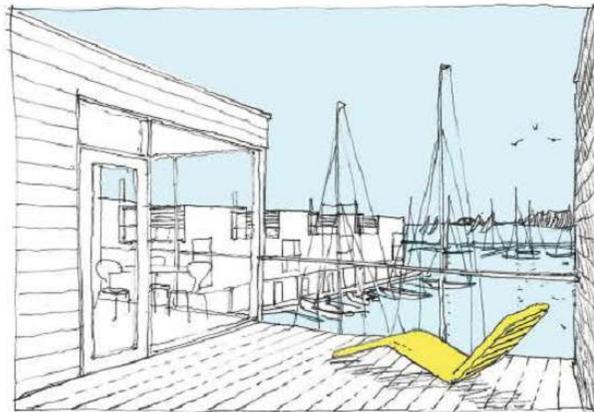
## **Koivusaari competition in 2009**

The purpose of the competition is to create a personal living and working area in Koivusaari, on the subway line, near downtown Helsinki, Keilaniemi, Otaniemi, and Tapiola. The area will be characterised by fast public transportation, seaside living and recreational surroundings, and high-class original architecture. The purpose is also to create a recognisable character with beautiful archipelago vistas for Koivusaari on the incoming route to Helsinki.



# Everyday life at Koivusaari

- Seaside recreation
- Walking and bicycling distances
- Subway-suburb (3525 inhabitants, 1630 jobs, 1920 parking places)



1. NÄKYMÄ ASUNNON KATTOTERASSILTA



2. NÄKYMÄ KOHTI KOIVUSAAREN KESKUSTAA



# Successful intermediation

**‘A ‘totally successful’ process would have a fully coordinated constituency at the ‘end point’ of an urban socio-technical transition. Those who intermediaries need to engage to realise the vision would have been successfully enrolled. Any issues, controversies or problems that arose would subsequently have been addressed through involvement the ‘necessary’ social interests and the ‘relevant’ resources and be coordinated – through various methods – with the initial objectives of the vision.’**

Hodson, M., & Marvin, S. (2010). Can cities shape socio-technical transitions and how would we know if they were?. *Research policy*, 39(4), 477-485.

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# Successful intermediaries

**Long-term finance and employment stability**

**Learning culture and utilization of knowledge**

**Local presence and local networks**

**Communication and visibility a first-mover**

**How to define and follow up effectiveness and success of intermediation**

Hodson, M., & Marvin, S. (2010). Can cities shape socio-technical transitions they were?. *Research policy*, 39(4), 477-485.



# A?

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## Policy – Transition arenas to design pathways ... to end the use of coal

Hyysalo, S., Perikangas, S., Marttila, T., & Auvinen, K. (2018). Catalysing pathway creation for transition governance. In Design Research Society International Conference: Catalyst. Design Research Society.

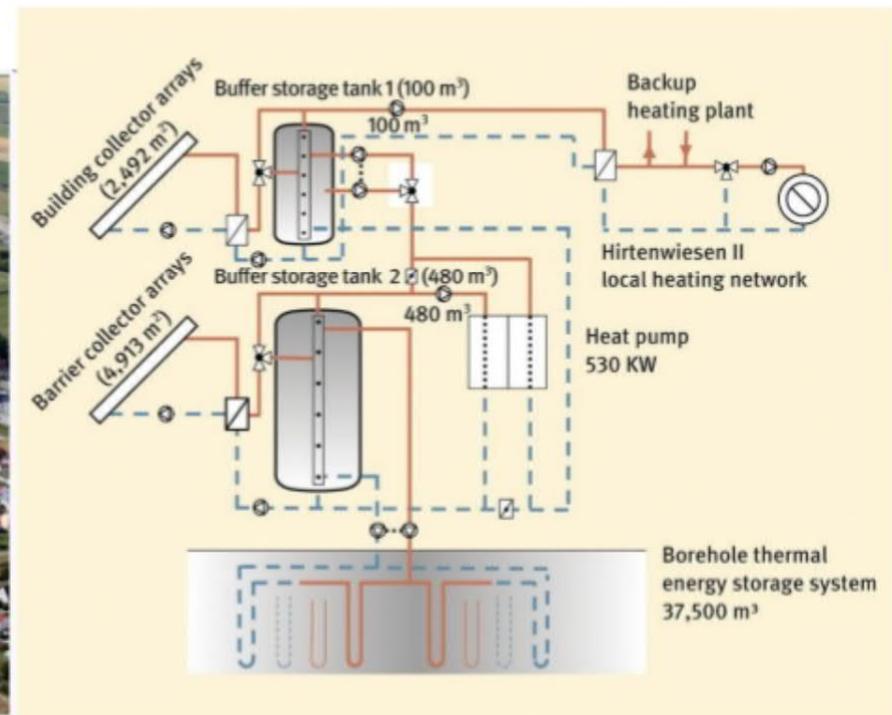




# Towards Free Carbon district, Crailsheim, Germany



260 buildings, solar fraction 51%



# Transition arenas

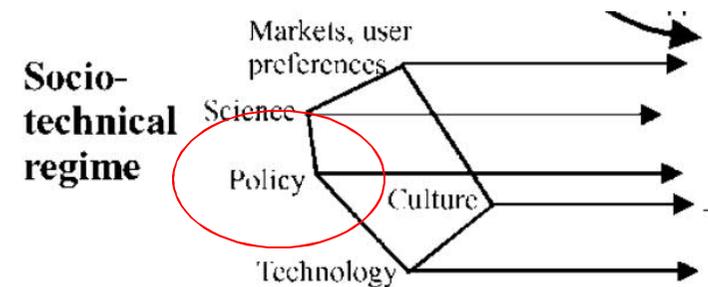


# Transition arenas



# How does policy effect transitions

- Policies of supporting the new
- Policies of destabilizing the old
- Policies for fair distribution of burdens
- Transition pathways
  - Taking targets earnest
  - Planning concrete steps, stages and experiments
  - Creating a politics of transitions



## Ministeri Tiilikainen: Kivihiilen kielto 2029 – kannustepaketti nopeille luopujille

fi | sv | en

Työ- ja elinkeinoministeriö © 10.4.2018 16.03

TIEDOTE



Hallitus on päättänyt, että kivihiilen käyttö energiantuotannossa kielletään lailla vuonna 2029. Lisäksi valmistellaan 90 miljoonan euron kannustepaketti niille kaupunkien kaukolämpöyhtiöille, jotka sitoutuvat luopumaan kivihiilen käytöstä jo vuonna 2025.

– Ilmastonmuutoksen hillitsemiseksi kasvihuonekaasupäästöjä on vähennettävä paljon aiottua nopeammin. Luopumalla kivihiilen energiakäytöstä

lämmityksen päästöjä vähennetään merkittävästi, toteaa ministeri **Kimmo Tiilikainen**.

# New business models for the old and the new.

## AURINKOVOIMALAT

KIVIKKO | 0 vapaana



SUVILAHTI | 0 vapaana



### PV 4.0

All-New Cheetah Series 400W

Cheetah

Smarter Energy for a Better Life

- Higher Revenue
- Simple & Easy
- Safe & Reliable

Huawei FusionHome Smart Energy Solution

## Slovakian utility ZSE launches virtual battery for residential PV

The service, costing €2 per month, is for residential customers that use PV products provided by the power company. The system is provided by E.ON group – a shareholder in the Slovak utility – and has already been launched in Germany, Czechia and Italy.

FEBRUARY 12, 2019 **EMILIANO BELLINI**

- DISTRIBUTED STORAGE
- ENERGY MANAGEMENT SYSTEMS
- ENERGY STORAGE
- GRIDS & INTEGRATION
- MARKETS
- RESIDENTIAL PV
- STRATEGIC ALLIANCES
- SLOVAKIA

### Keep up to date

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5.3.2019  
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INTERNATIONAL  
ENERGY AGENCY

## ***SAVING ELECTRICITY IN A HURRY***

*Dealing with  
Temporary  
Shortfalls in  
Electricity  
Supplies*

OECD 

# Activity timespace – eventfulness of everyday life

Lefebvre (in Schatzki 2010, 37) defines moments as 'intense, festival-like attempts, born out of and contained in everyday life to achieve a total realization of a previously impossible project, activity, or way of being.'

Schatzki, T. R. (2010). *The timespace of human activity: On performance, society, and history as indeterminate teleological events*. Lexington Books.



Jeff Newton

# Exposure, timing and 'opportunistic' design

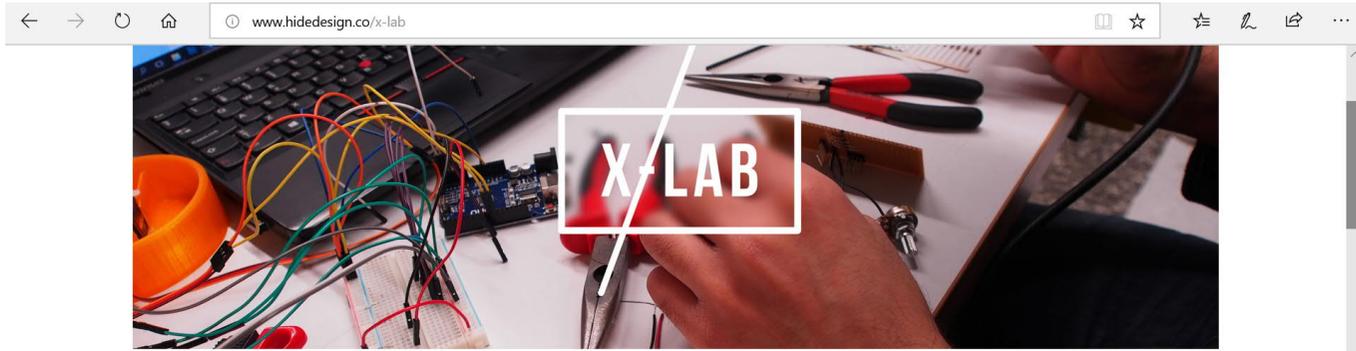
'Not all car-drivers are equally ready to try public transportation. The results presented in this paper show that the effect of ... the free travel card was limited to people who had recently (i.e., within the last three months) changed either residence or workplace.'

Thøgersen, J. (2009). SEIZE THE OPPORTUNITY: THE IMPORTANCE OF TIMING FOR BREAKING COMMUTERS' CAR DRIVING HABITS. *Consumer Citizenship: Promoting New Responses*, 35.

## Sunday: Ciclovía, Bogota



Photo: Mikko Jalas



EXPERIMENTAL LAB

# X-LAB STORY.

Welcome to X-LAB! Here we share our side activities and projects in HIDE. These are mainly experimental projects which we collaborated with other designers to make these awesome new products.



# NELSON MANDELA UNIVERSITY



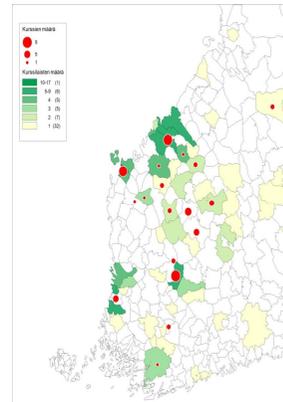
Faculty of Engineering, the Built Environment and IT

## WORKSHOP

If you want to participate in Espoo in June 2019, contact [philip.hector@aalto.fi](mailto:philip.hector@aalto.fi)

# Finnish solar-heat self-building courses

- Above 700 participants up to 2013
- Increasing demand, less cost benefits
- Participants get the device, but also become more energy literate, alert and active in their own community



# Learning by doing

- For some people self-building is an easy first step to get involved in renewable energy systems
- Self-building courses create opportunities for peer-to-peer learning and activate people also in wider terms



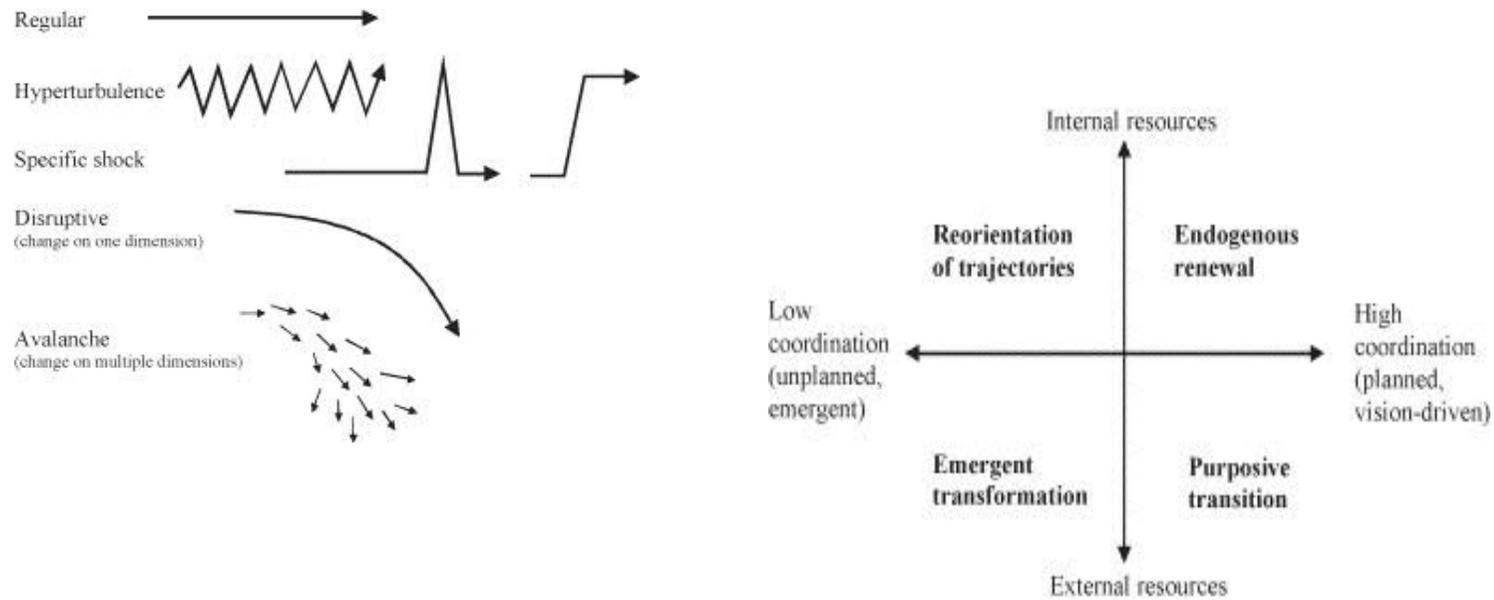
# Not only adoption, but local adaptation

User system level designs  
User modifications  
User hacks, add-ons,  
relocating, repurposing



Hyysalo, S., Juntunen, J. K., & Freeman, S. (2013). User innovation in sustainable home energy technologies. *Energy Policy*, 55, 490-500.

# Typology of transition pathways



Geels, F. W., & Schot, J. (2007). Typology of sociotechnical transition pathways. *Research policy*, 36(3), 399-417.

# Thanks for your attention!

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