



# Strategies for a sustainable energy transition: The case of the housing sector in Graz, Austria

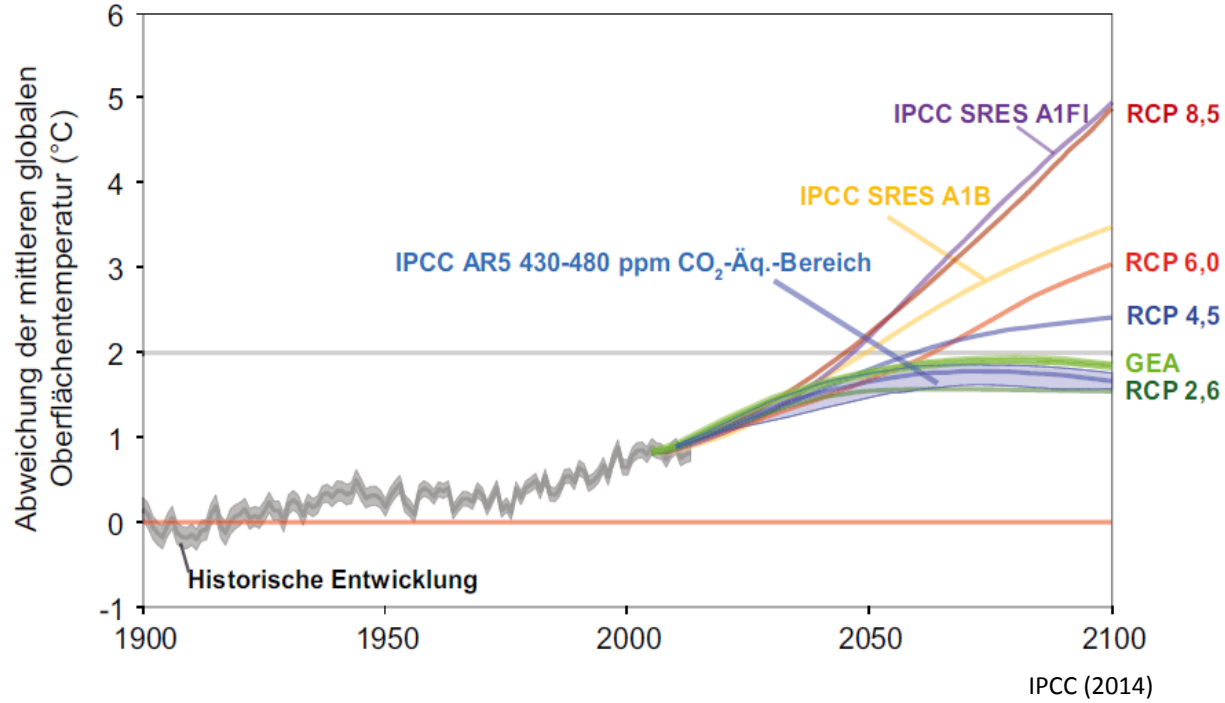
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Bernhard Hohmann

University of Graz, Department of Geography and Regional Science,  
Heinrichstraße 36, 8010 Graz

E-mail: [bernhard.hohmann@uni-graz.at](mailto:bernhard.hohmann@uni-graz.at)

# Climate Change

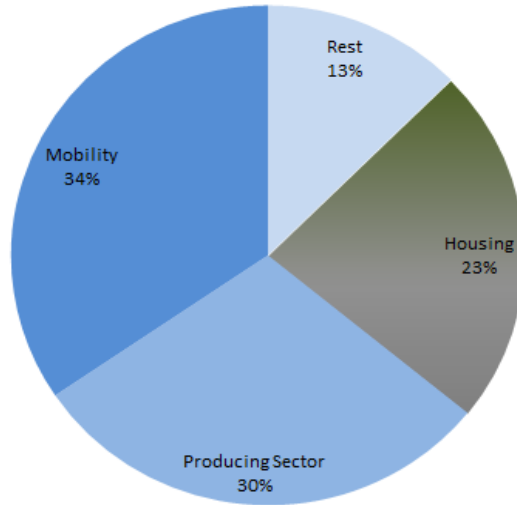


# We need an energy transition!

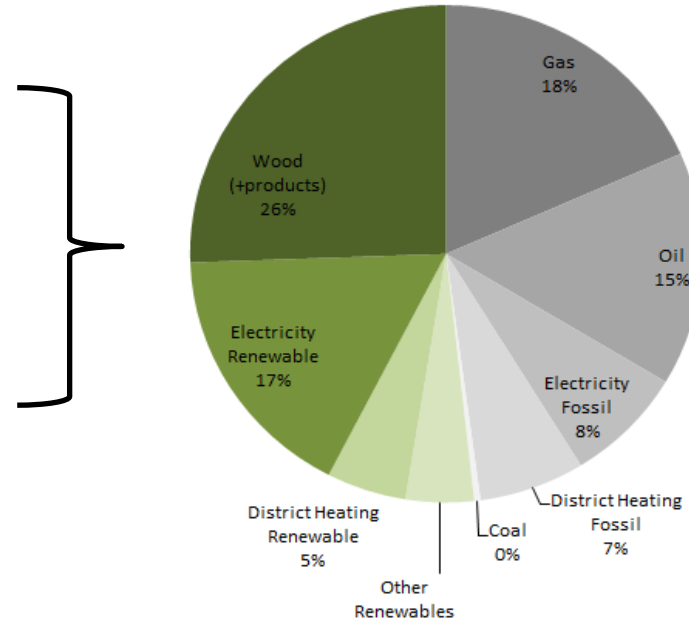


# Final Energy Consumption in Austria

Final Energy Consumption in Austria



Final Energy Consumption  
Housing Sector Austria



Based on data by Statistik Austria (2014)



1.) Increase efficiency

2.) Switch to renewables

**FIG: Renewable Energies**

→ How to adapt strategies, regulations and incentives (subsidies and tax), to enforce the right measures to promote a sustainable energy transition?

# + Spatial Dimension





Diesel generator

Photo: Thomas Höflehner (2017)

# Outline

## Research Design

- ➔ Transition studies & sustainability research
- ➔ Actor based transdisciplinary approach
- ➔ Methodology

## Results



# Transition Studies: Multi Level Perspective (MLP)

**FIG: MLP by Geels  
(2002)**

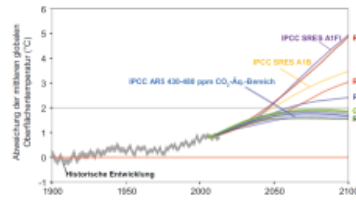
Geels (2002)

# MLP Transition

**FIG: MLP on  
transitions by  
Geels (2002)**

Geels (2012)

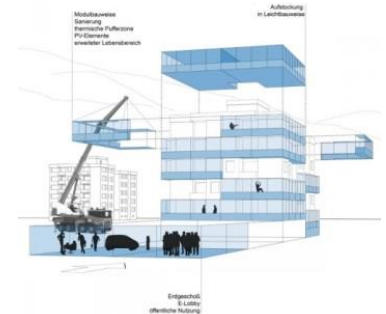
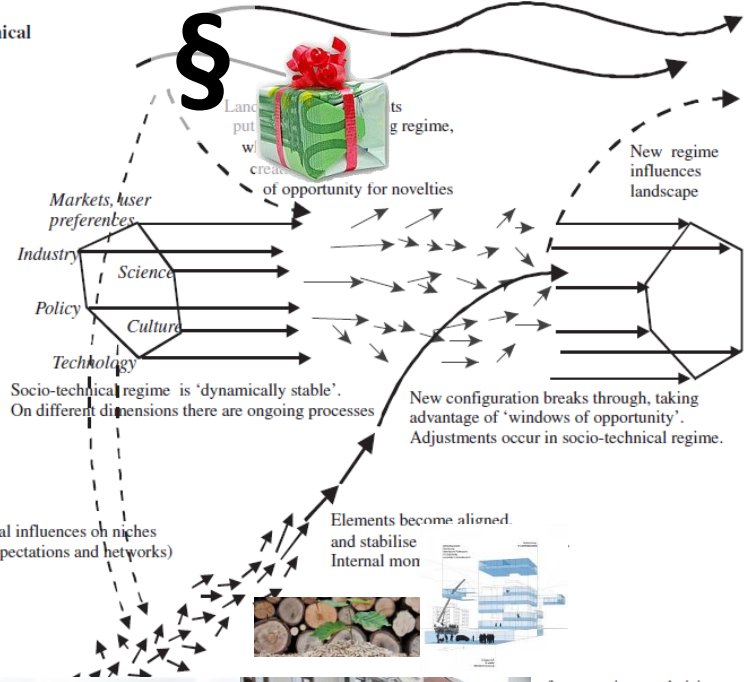
Increasing structuration of activities in local practices



Socio-technical landscape (exogenous context)

Socio-technical regime

Niche-innovations

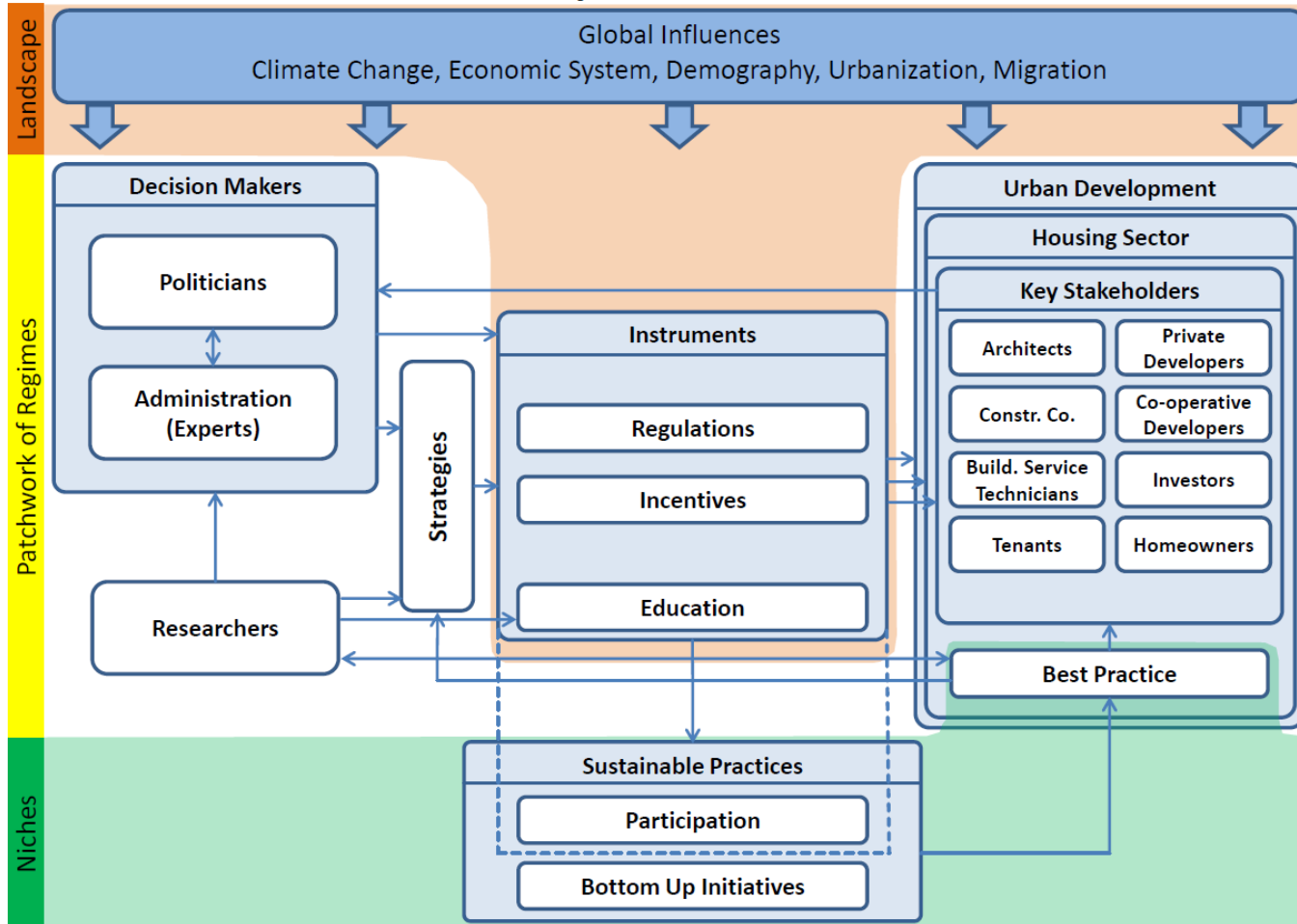


STELA, Institut für Gebäudelehre TU Graz (2014)

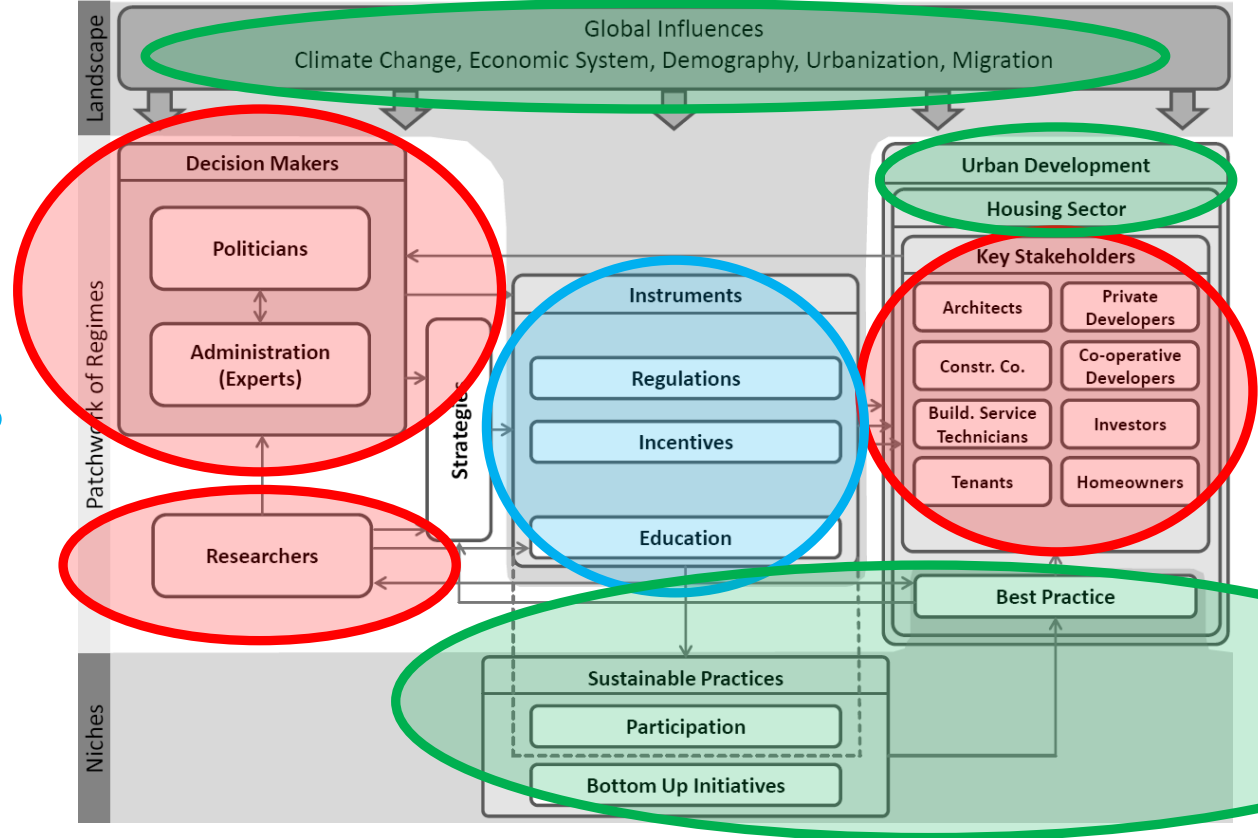


Time Geels (2012)

# System Model



## System Model



Theory Discussion

Instrument Analysis

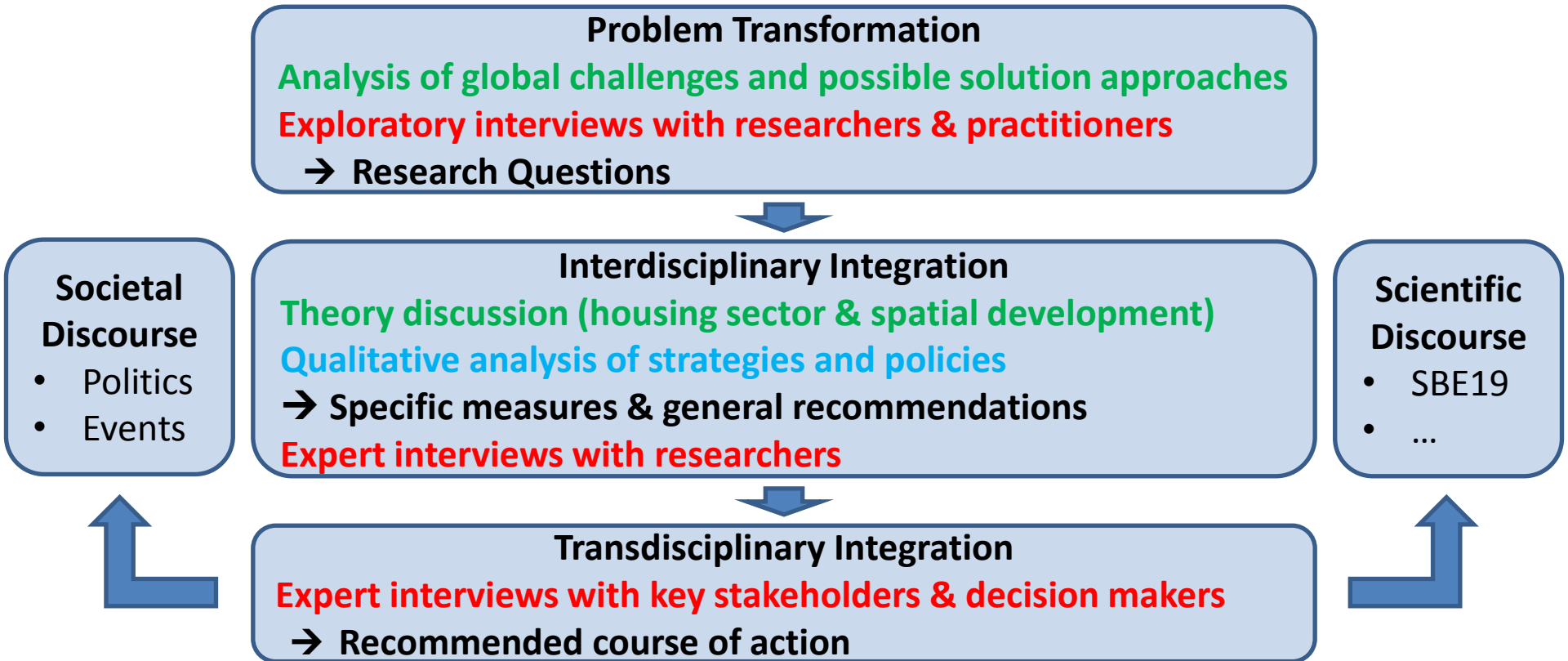
Expert Interviews

# Transdisciplinary Research Process

**FIG:  
Transdisciplinary  
model by Jahn et.  
al. 2012**

Jahn et. al. (2012)

# Methodology



# Results

## **Interdisciplinary Integration**

➔ 96 recommendations

## **Transdisciplinary Integration**

➔ Recommended Course of Action:  
26 specific measures & 27 general recommendations



# Specific Measures (Examples)

## National Level

- Adaption of the apartment property law ("Wohnungseigentumsgesetz"), as it frequently leads to the prevention of the implementation of refurbishments.

## Provincial Level (Styria):

- Mandatory use of LCAs in the construction of buildings.

## Local Level (Graz):

- Increased incentives for extensive and intensive greening of roofs on new and existing buildings.

# General Recommendations (Examples)

## National Level

- Introduction of a tax on CO<sub>2</sub> emissions in combination with an eco-social tax reform.

## Provincial Level (Styria):

- Supply of neutral information (e.g. total cost comparisons) by independent agencies - transparent, accessible and most importantly visible.

## Local Level (Graz):

- Increase of the number of public bicycle parking spaces, also considering bicycle trailers and cargo bicycles.

# Contribution

- Scientific Discourse
  - Transdisciplinary Approach + MLP on Transitions
  - Possible transferability to other cases
- Societal Discourse
  - Presentation to political decision makers
  - Learning among key stakeholders and decision makers
  - Housing Dialog Event

# Future Work

- S'REVIT Project at the RCE Graz-Styria

**S'REVIT**  
Smarte Revitalisierung – Integrative Sanierung von Wohnbauten

 **RCE** Graz-Styria  
REGIONAL CENTRE OF EXPERTISE  
Education for Sustainable Development

- Wohnbaudialog in the HDA Graz

  
**WOHNBAU.DIALOG**  
**STEIERMARK**

**HDA**  
HAUS DER ARCHITEKTUR

# References

Geels, F. W. (2002). Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Research Policy*, 31(8-9), 1257–1274.

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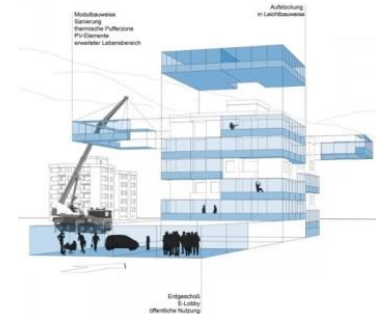
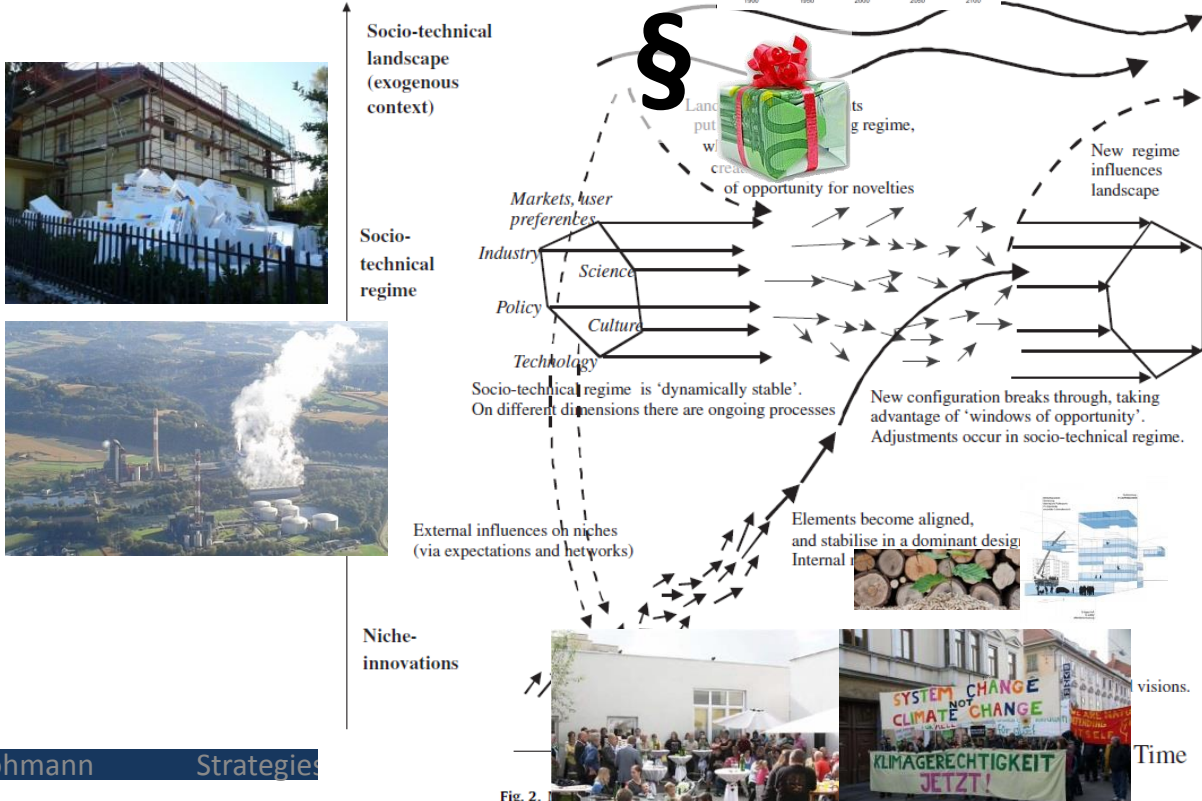
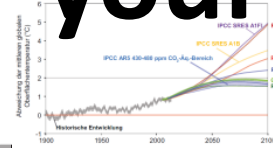
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IPCC (2014). *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press.

Jahn, T., Bergmann, M., & Keil, F. (2012). Transdisciplinarity: Between mainstreaming and marginalization. *Ecological Economics*, 79(C), 1–10.

# Thank you for your attention!

Increasing structuration  
of activities in local practices



STELA, Institut für Gebäudelehre TU Graz (2014)

Fig. 2.