# WHY IS THE HEAT TRANSITION IN GERMANY HAPPENING SO SLOWLY?

Comparative analysis of the German renewable heat TIS and renewable electricity TIS – based on the TIS in Context framework

**PhDs in Transitions**
Workshop in Lausanne at **EPFL**

Source: AP


Source: Ulrich Ulrich




**Julius P. Wesche**
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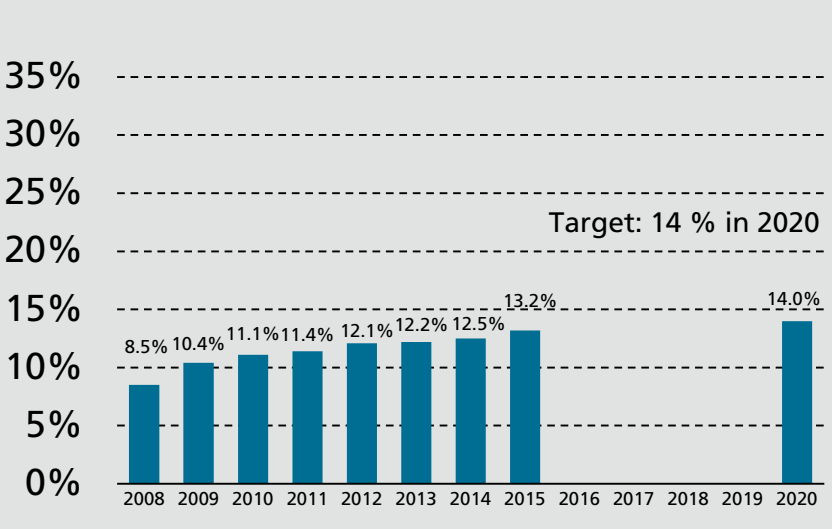
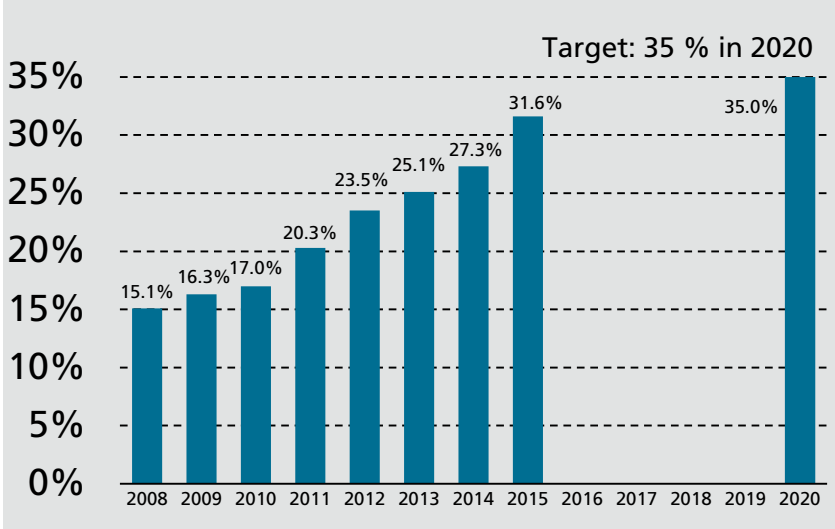
# The electricity sector is developing faster towards sustainability

## Share of renewable heat




Source: Arbeitsgruppe Erneuerbare Energien Statistik (08/2016)

## Share of renewable electricity




Source: Arbeitsgruppe Erneuerbare Energien Statistik (08/2016)



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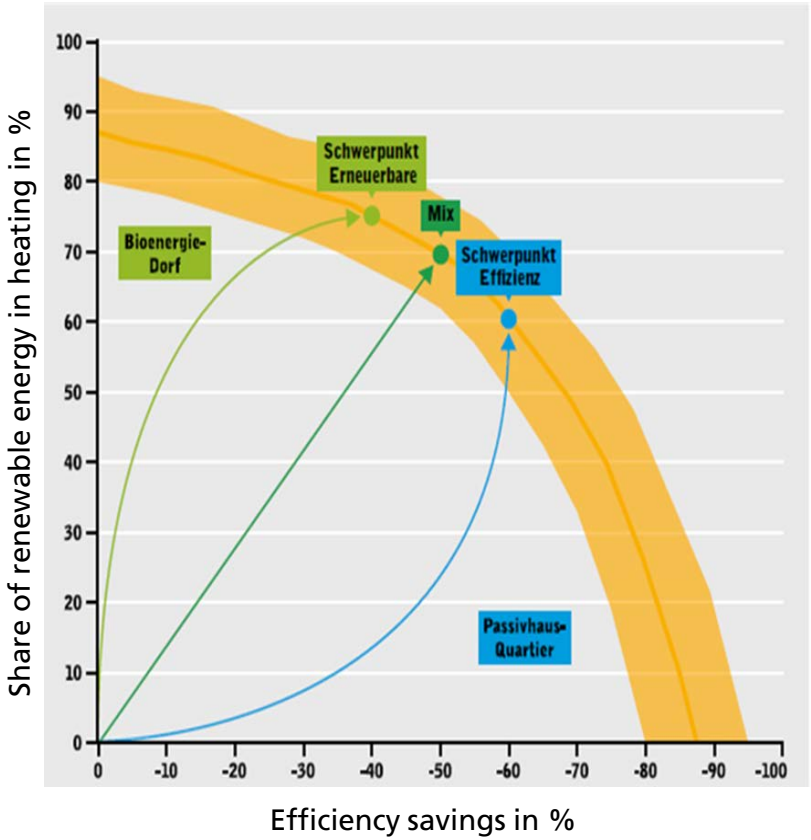
# Comparative analysis → Comparing what to what?




Source: IFEU – Institut Heidelberg (2015)

- The efficiency side is also developing in both sectors, but without major effect.
  → High shares of renewables are still needed.
- Focus on the renewable dimension.
- Taking development phase into account.
- Why is it feasible to compare sectors with regard to transition speed?
  - → The transition speed of one sector can only be determined in comparison to another sector in transition.
- Why is the German **electricity** TIS a good choice as a comparison TIS to learn about the German **heat** TIS?
  - → Because these TISs face (to a certain degree) the same external pressures
  - → Because they are (to a certain degree) embedded in the same institutional context.



TIS → Technological Innovation System

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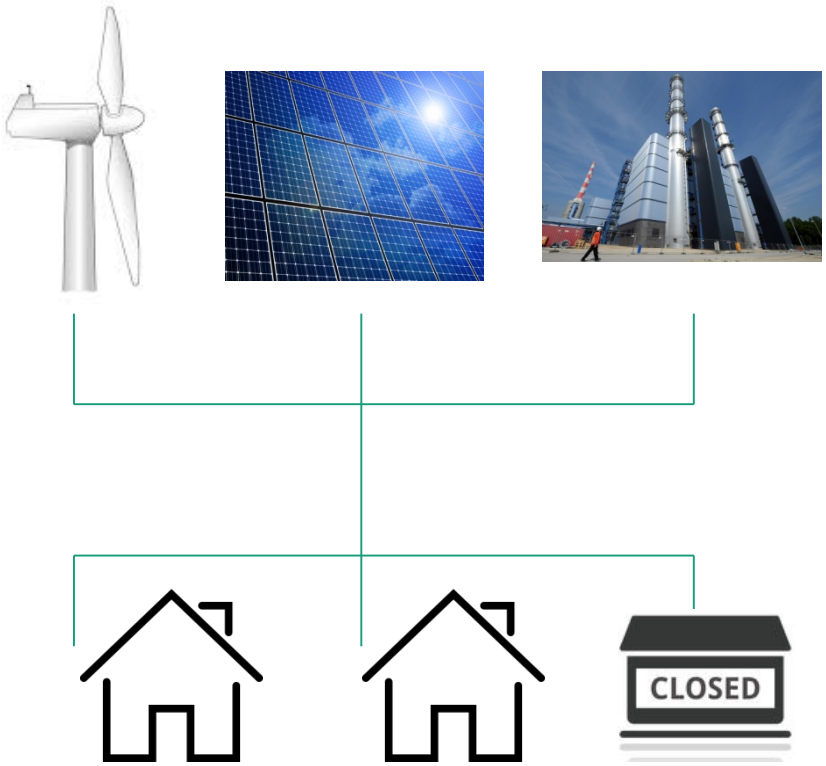
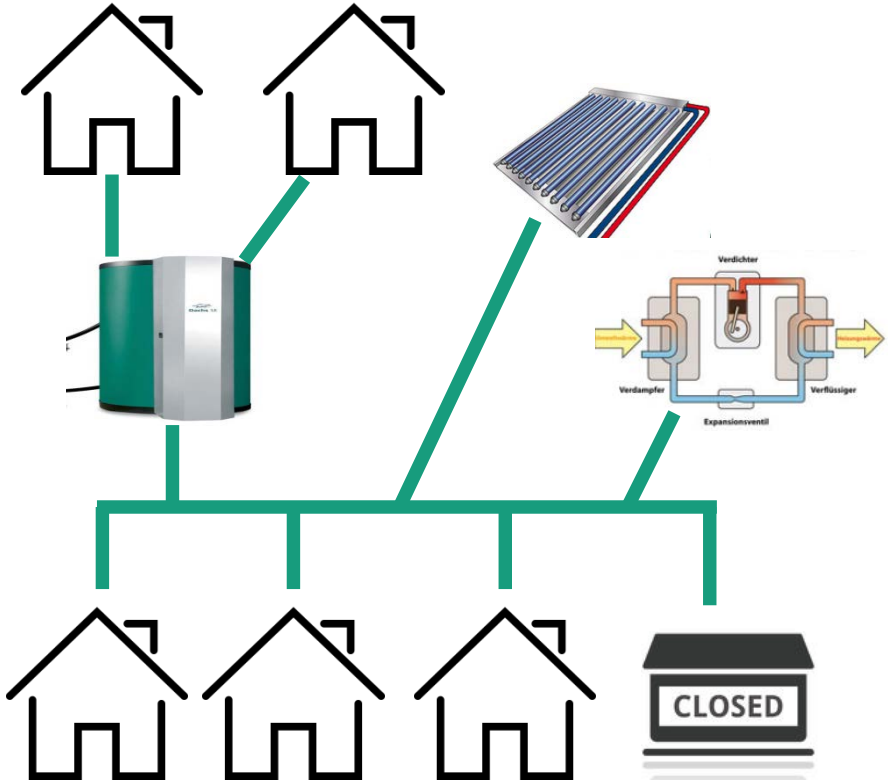
# The heat and electricity sectors in a nutshell

## Electricity sector




## Heat sector



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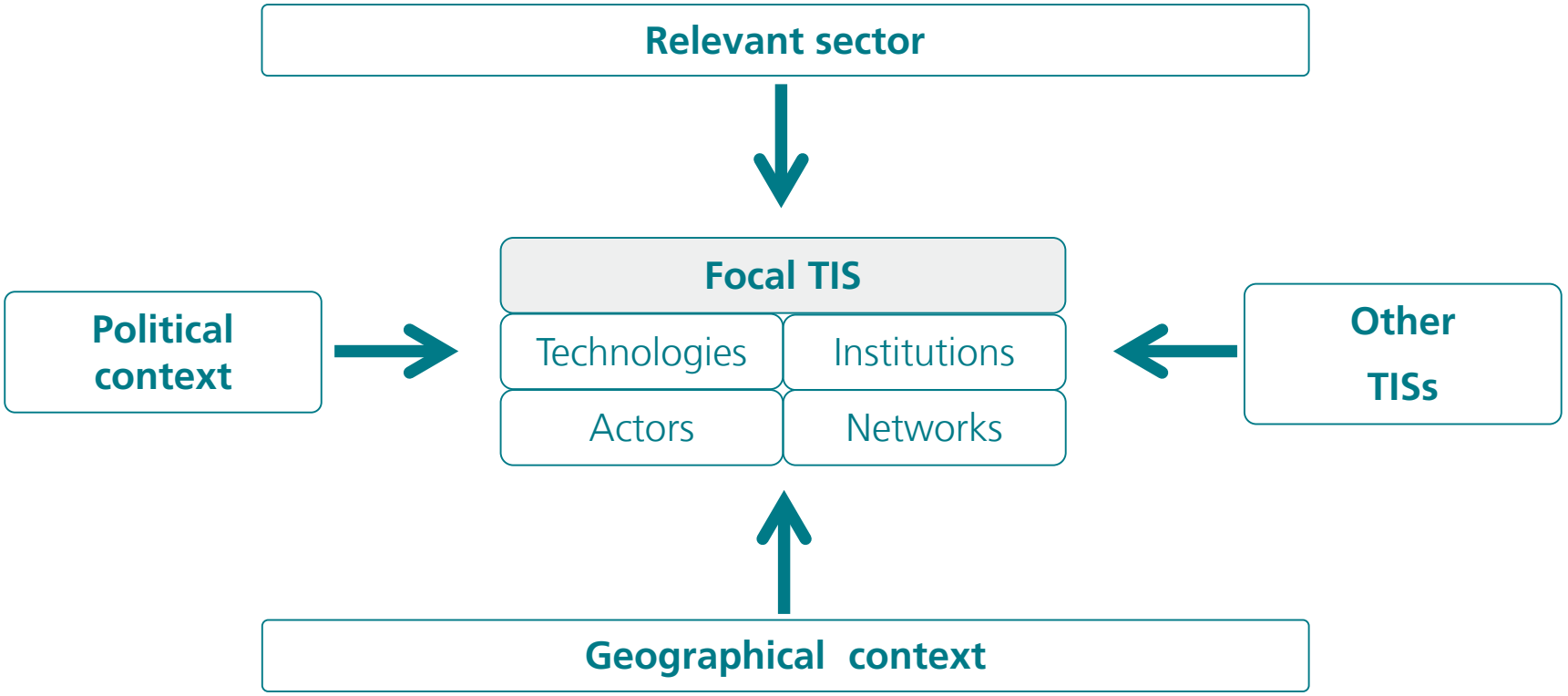
# Approach

- Focus on the renewable heat TIS (encompassing all renewable heat technologies).
- The renewable heat TIS is compared to the renewable electricity TIS (which encompasses all renewable electricity technologies)
- The comparison of these TIS will be conducted the recently developed “TIS in Context” framework (Bergek et al. 2015 / see next slide).

# "TIS in Context" Framework as a means to assess the disparity of the heat and electricity sectors




Based on Bergek et al. 2015



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# How do the technologies structurally differ?

## The renewable heat TIS…

- .. offers less potential for standardization, due to decentralized networks and the diversity of technologies.
- … has a lower potential for economies of scale (lower profit margins for investors).
- … has a demand side problem: Heating technologies are an integral part of buildings (comparison PV-panels)
  → Involves higher levels of inconvenience when retrofitting homes.
- …is subject to more path dependencies than electricity infrastructure.
- … will most likely involve an accelerated development of heating grids. They come with high transaction costs due to the high level of interaction and consensus seeking.

# How does the interaction within the sector context differ?

## The renewable heat TIS…

- … does not command strong ties to Berlin's political arena. There is not even one strong lobby group to represent the interests of the renewable heat TIS. Furthermore, heat incumbents control a number of campaigning initiatives that act locally.
- …only has a small number of actors that persistently challenge the incumbents in the heating sector.
- … requires installers not only to acquire additional technical knowledge (e.g. PV), but also to exchange their knowledge to a large extent (heat grids, heat pumps)
  → Low acceptance / inertia.

# How does the interaction within the political context differ?

## The renewable heat TIS…

- …lacks a strong second pressure (Electricity → nuclear phase-out).
- …lacks political priority on the national agenda
  - Lower political targets for share of renewables in the heat sector.
  - Absence of levy for renewable heat (feed-in tariff) → Leads to direct competition with fossil fuels.
- …lacks powerful campaigning and lobbying groups.

# How does the interaction within the geographical context differ?

## The renewable heat TIS…

- …features smaller distances between generation and consumption.
- …has no grid that permits general feed-ins.
- … development is impeded by competition between villages and towns that leads to a lack of stricter heating regulation implementation (e.g. compulsory connection and usage of heat grids).

# How does the interaction with other TISs differ?

## The renewable heat TIS…

- … finds itself in competition with the renewable electricity TIS for political/media attention and financial subsidies.

# Conclusions

- There are differences in all the context factors between the renewable electricity and the renewable heat sector.
- A great variety of factors influence the transition speed in the heating sector

  → What are the really relevant factors?
- Little experience with application of the concept.

# THANK YOU FOR YOUR ATTENTION


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