Mobilizing Low Carbon Transition: Transnational Practice of Energy Efficiency in the Urban Building Sector

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Structure

1. Introduction
2. Conceptual Framework
3. Cases
4. Discussion
Climate Change, City and Building

Global greenhouse gas emissions by country
Source: Figure 2.3 in the UNEP Emission Gap Report 2018

Global GHG Emissions by Sectors
Source: Global Alliance for Building and Construction(2018 Global Status Report)
Knowledge Mobility and Low Energy Building

<table>
<thead>
<tr>
<th>Group</th>
<th>Actor</th>
<th>Working Scope and Sample Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transnational</td>
<td>UN-HABITAT, UNDP, UNEP, World Bank, ADB, AIIB, Cities Alliance, OECD, IPCC, WorldGBC, GBN, ICLEI, C40, UCLG, Climate Alliance, EUROCITIES etc.</td>
<td>Cities networking, best practices libraries, cross-border development cooperation, Urbanization Knowledge Platform Cross-Sector Work Groups</td>
</tr>
<tr>
<td>Governmental/bilateral</td>
<td>USAID, GIZ, DEZA, UKDFID, DENA etc.</td>
<td>Nationally Appropriate Mitigation Action (NAMA) EU-China Eco-Cities Link Bilateral Development Aids</td>
</tr>
<tr>
<td>Private Sector Benefactors</td>
<td>Bloomberg, Bosch, Stiftung Mercator etc.</td>
<td>Urban Green Finance Facilities Climate Mitigation Advocacy Policy Transfer Networks</td>
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<tr>
<td>Practitioners</td>
<td>CDP, ARUP, SIEMENS, IBM, THINKSTEP, Passive House Institute, etc.</td>
<td>Smarter Cities Program Green Development Technology and Tools Development</td>
</tr>
<tr>
<td>Educational and Research Institutions</td>
<td>Earth Institute, Fraunhofer, Wuppertal Institute etc.</td>
<td>Urban-Rural Integration Innovation and Knowledge Transfer Learning Cities Case Studies</td>
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</tbody>
</table>

Global players in support of cross-border knowledge dissemination on the topic of Urban Development - Climate Protection - Energy
Research Questions

• What makes an idea of low carbon innovation globally transferable?

• How is the knowledge adapted during the process of translating from the emerged context to the adopted one?

• What makes a success/failure of transferring low carbon development model into a new geographic, social, political, economic, cultural context?
Conceptual Framework

Source: Geels, 2012.

The multi-level perspective.
Conceptual Framework

Supply-Side

**Landscape**: climate change, national strategies, Values, Behavior Patterns etc.

**Socio-Technical system**: standards, norms of the market/industry, existing infrastructure etc.

**Niches**: Experiments, pilot projects, policy guidelines, innovations, local initiatives etc.

Demand-Side

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Technology, Experiments, Good Practices, Models etc.
Passive House in Germany and EU: from Experiment to Standard

The first Passive House, 1991, Darmstadt-Kranichstein, Germany
Source: Passive House Institute
Passive House in Germany and EU: Experiment and Local Assemblage

Passive House District in Bahnstadt, Heidelberg
Source: City of Heidelberg, Passive House Institute
Passive House in China: Disseminating, Translating and Adapting

- The first Energy Conservation Design Standard for Civil Building (1986)
- "German-Chinese Working Group for the Promotion of Energy-Efficient Building"
- Hamburg House built by Hamburg city in Shanghai World Expo 2010
- Hebei province released the first voluntary passive building standard
- International Passive House Conference in Gaobeidian
- The First Sino-German Passive Ultra-Low-Energy Pilot Project
- China’s launched national emissions trading system
- State Council: the concept of passive house appeared in the National Guidelines on Urban Planning and Development
- MoHURD: 13th Five-Year Plan for the Building Energy Efficiency and Green Building Development

Keru Feng
Sustainable Built Environment Conference 2019
## Certificated passive low energy building in China by 2017

<table>
<thead>
<tr>
<th>Certification</th>
<th>Quantity</th>
<th>Awarded by</th>
<th>Standard</th>
<th>Description</th>
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</thead>
</table>

Passive House in Chinese Urban Context: Bahnstadt In Gaobeidian

Bahnstadt in Gaobeidian is the largest passive house housing development in the world, which includes about 400.00m$^2$ of residential buildings.

Source: Bahnstadt Gaobeidian, Passive House Institute
Analysis and Discussion

- Translatable knowledge distilled from an experiment needs to be clearly defined and succinct. Its form should be able to overcome the context (socio-technical regime and landscape) from which the knowledge emerged and re-align with the context into which it is translated.

- Recognize the co-evolving nature with socio-technical system throughout the translation process.

- The contexts (socio-technical regime, landscape and their driving forces) from both knowledge supplying and demanding sides should be full addressed and understood.
If each city is like a game of chess, the day when I have learned the rules, I shall finally possess my empire, even if I shall never succeed in knowing all the cities it contains.

- Italo Calvino, Invisible Cities
Thank You

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