



“Energy as a common approach in shrinking cities energy transitions”

Simone Di Pietro

*Early Stage Researcher Reviving Shrinking Cities- Innovative Training Network,
PhD student in Spatial and Environmental Planning Technische Universität Kaiserslautern*

Energy communities for collective self-consumption: frameworks, practices and tools
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Research Question

In what conditions do shrinking cities represent socio-spatial contexts suitable for the implementation of energy transition projects or energy communities?

Objective

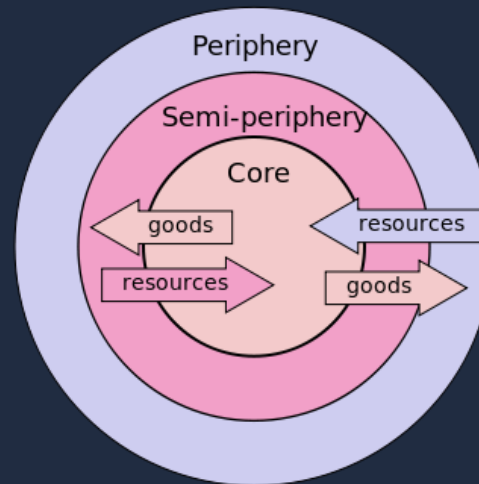
Through a theoretical discussion and the reference to three specific cases, I try to identify some distinct paths of energy transitions in shrinking cities

Background

About Shrinking Cities

Silverman (2018) retakes the theory of dependency between the global North and South to explain the phenomenon of shrinking cities within the relations between global and peripheral cities.

North / South

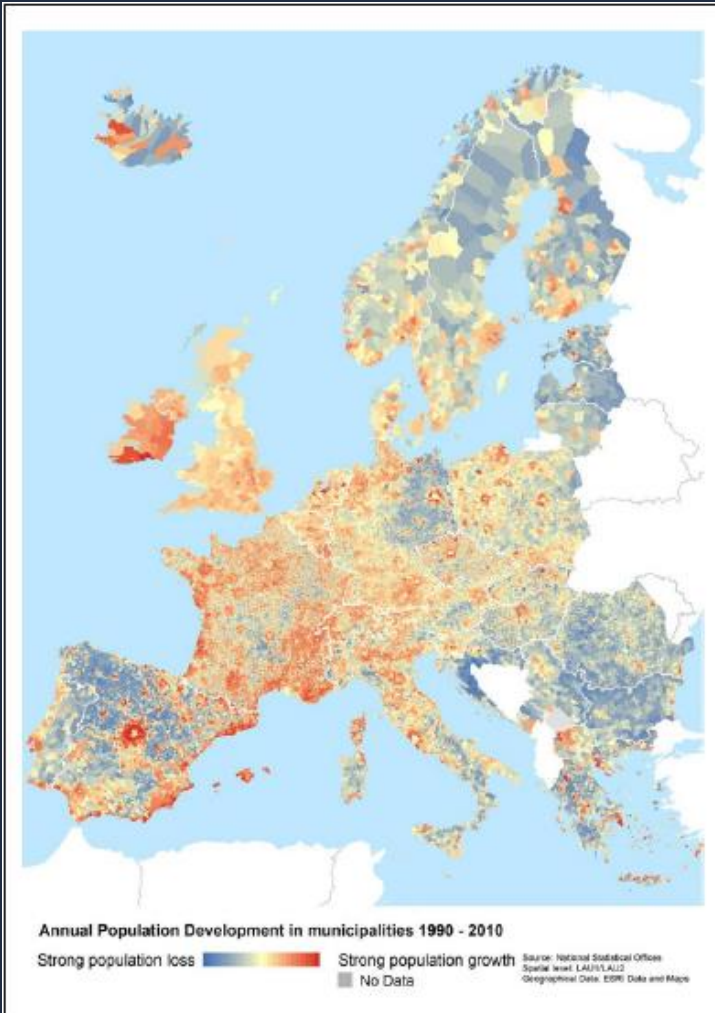


Global Cities/
Peripheral Cities

Colonized mindset and subconscious processes would be the real obstacles for the local endogenous development in shrinking cities

Background

About Shrinking Cities



Source: Wolff & Wiechman, 2018

Type	Characteristics	Underlying Causes	Selected Contemporary Examples	Policy Implications (examples)
Shrinkage is Imposed	Conflicts/war Political or economic reforms Depletion of resources	Political and military Conflicts Spatial/Administrative Reforms — national govt. Uneconomic exploitation of natural resources	Beirut, Lebanon; Phnom Penh Chinese county, towns & villages Nauru & other mining cities— including resource towns	Conflict resolution Administrative Reforms New technology; Efficient methods of resource extraction
Shrinkage due to comparative disadvantages	Lack of economic opportunities/diversity Lifestyle attractions Climatic conditions Infrastructure provisions	Core/periphery drift Globalization De-industrialization Re-industrialization (rise of Regional inequalities; Knowledge economy) Climatic differences Metropolitan lifestyle	Poland relative to EU S. Korea -- regions outside of Seoul Metro region France (non metro Paris) Scotland NE China old industrial centers Rust belt (USA)	Reinforce regional resilience Ensure embeddedness of economic activities Regional decentralization policies
Shrinkage due to societal / global changes	Absolute decline of population Ageing population Climate change	Low birth rate (fertility decline) Low population replacement rate Population structure "Demographic onus" Global climate changes	Dresden, Germany Kyoto, Japan Australian outback towns	Population policy Urban amenities/infrastructure investments Global climate policies/programs

Characteristics of urban shrinkage. Source: produced by Torres Moraes, based on Wu et al., 2018

Background

About Shrinking Cities Energy Systems

Problem: Overcapacity of Urban Infrastructure including Energy Systems (Moss, 2008)

High maintenance costs at the expenses of descendant resources



Less Energy Efficient (Liu et al., 2020)

Need to consider environmental issues: distribution of people, carbon emissions and land uses

Decentralized Energy Systems (DES) applications would improve redundancy, reliability and slowing the urban metabolism, exploiting one of the main characteristics of shrinking cities: the presence of vacant spaces.

Energy transitions in shrinking cities

The importance of vacant spaces is related to what Shellenberger (2019) calls **poor physics** of renewable energy, so for example “*solar farms occupy 450 times more land than nuclear plants and wind farms takes 700 times more land than natural gas wells to produce the same amount of energy*”

Three types of interventions can be identified in shrinking cities energy transitions

1. Renewal by demolition through more efficient urban planning interventions exploiting the concepts of **compact city**, **polycentric urban forms** and **passive areas** for the buildings

2. Small scale renewable energy production with bottom up governance models

3. Large scale renewable energy production with top down governance models

Complexity of Energy transitions

Two main dimensions

Political Dimension

- Legal marks for energy transitions: feed in tariffs; subsidies; market regulations
- Coalitions between territories f.e. Covenant of Majors;
- Decoupling GDP – availability of energy;
- Interests of largest energy companies;
 - Application of energy transitions in neocolonial logics in the global South;
 - New dynamics between territories (for example high and lowlands);
- New economic intermediaries or emerging markets

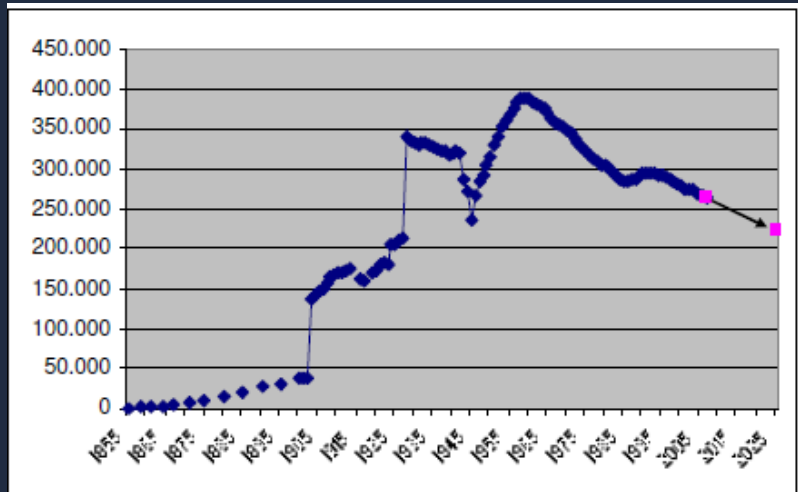
Technological Dimension

- Energy Return Rate for the manufacture of each technology;
- Possible vulnerabilities to national electric grid in terms of supply;
- Specialized knowledge availability and distribution;
- Technological progress makes increasingly sophisticated and efficient the production, transport and storage phases

Energy as a common?

Three cases of energy transition models in shrinking cities

«Structural Conversion to Green Economy»:
Gelsenkirchen and Herne



Gelsenkirchen population between 1855 and 2007, with a projection for 2025. Source: Jung et al. 2010



Science Park Gelsenkirchen. Source: Jung et al. 2010



Training Academy Mont Cenis, Herne. Source: Pallagst et al., 2019. Picture of Sabrina Förch

Energy as a common?

Three cases of energy transition models in shrinking cities

Cooperative Energy Community: The town of Melpignano



Demographic trend in Melpignano.
Source: ISTAT



PV energy production in Melpignano
rooftops



Agora in Melpignano. Source:
www.comune.melpignano.le.it



«Water House» Melpignano Source:
www.vita.it

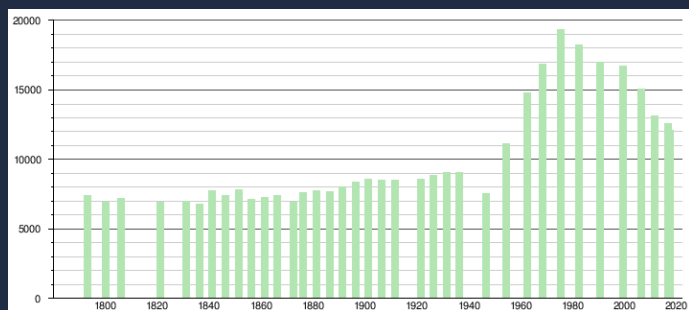
Energy as a common?

Three cases of energy transition models in shrinking cities

Planned shrinkage with integral energy transition approach:
 Vitry le François



Communauté de communes Vitry, Champagne et Der. Source: Ministère de la transition écologique et solidaire



Demographic change in Vitry le François. Source: Cassini, HESS

Energy Program Vitry le François. Source: Trehet, 2018

Conclusions

- We can argue that the patterns of energy transitions implemented depend strictly on the context of the shrinking city taken into consideration. In this sense, the most important **variables** are: the size of the cities, the presence of vacant spaces, already built environment, socio-demographic and political characteristics of the community.
- **Adoption of DES** is not sufficient by itself to indicate a high degree of energy transition.
- Bottom up governance in urban energy transitions could be more realistic in small towns or EcoDistricts, while large scale energy transitions often requires coordination mechanisms and institutional partnerships in agreement with the greater quantities of investments necessary to convert urban infrastructure.

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THANK YOU!