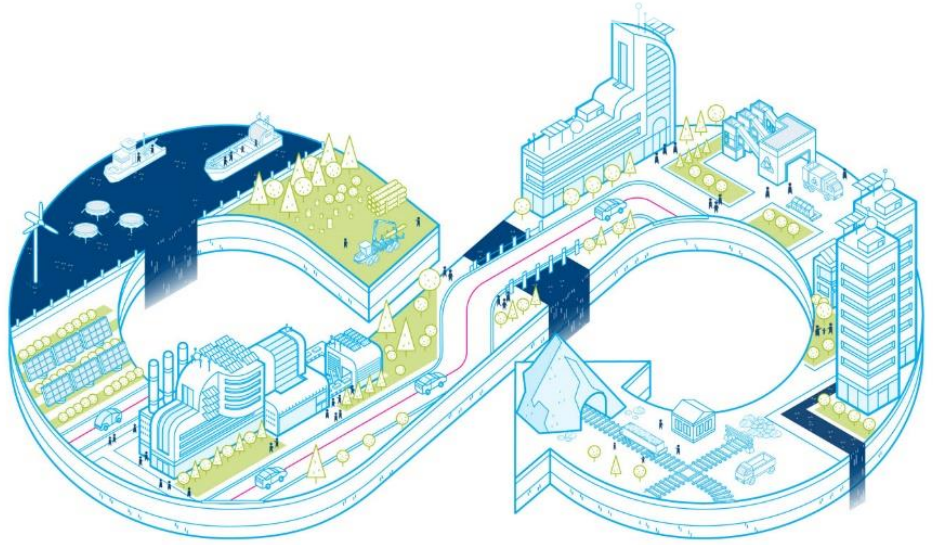
Implementing Circular Economy in the Built Environment

Comparative Study between China and the Netherlands



Shuyu Duan | 4608208 | MBE | P5

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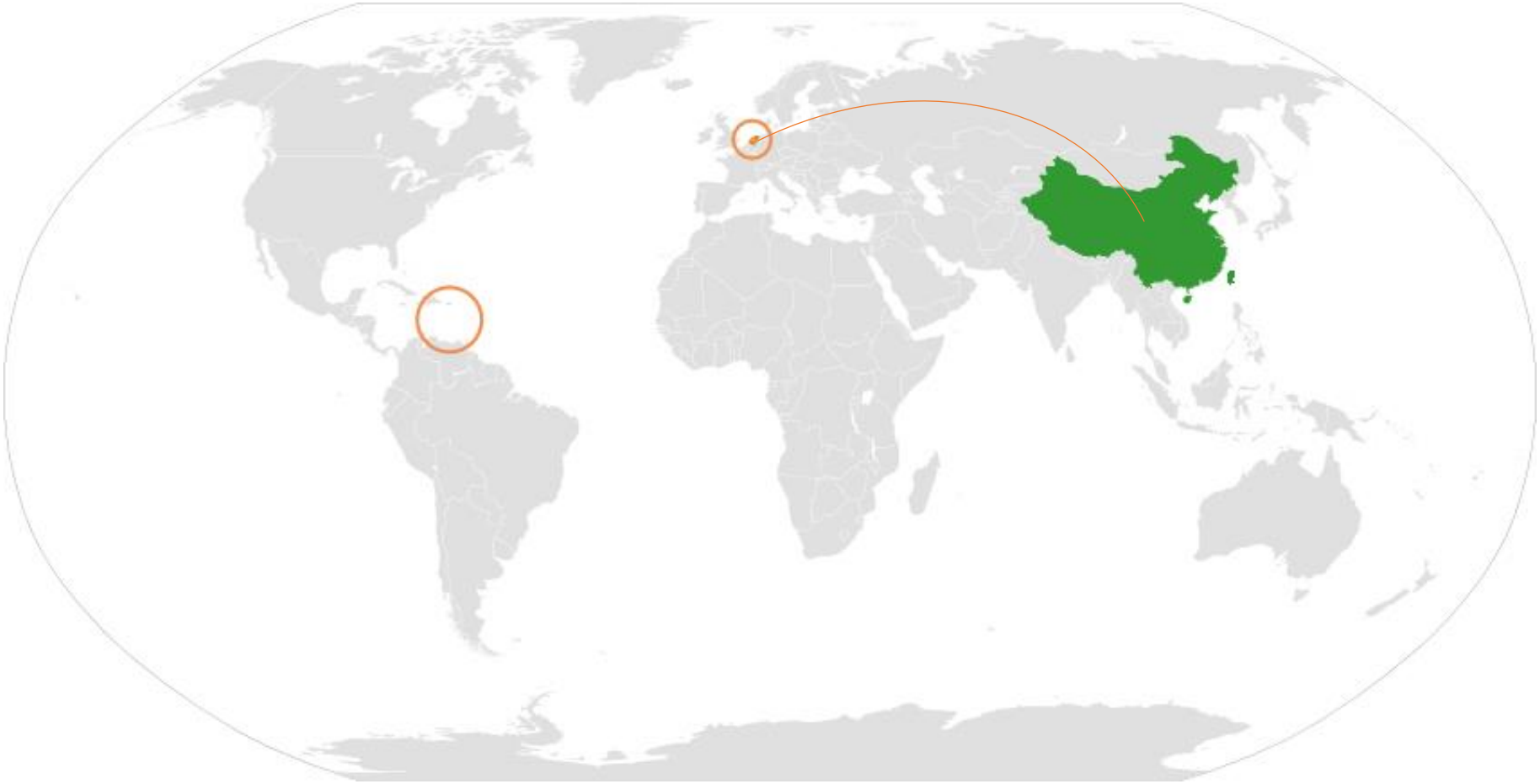
Why Circular Economy?

Why China and Netherlands?



Source: https://en.wikipedia.org/wiki/China%E2%80%93Netherlands_relations

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China-EU agreement paves way for global adoption of circular economy

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New China-EU agreement accelerates shift towards a global circular economy

by **Kelly Cooper** kelly.cooper@elevatelimited.com | 1 August 2018

Photo Credit: Pexels.com

Collaborative accord: signaling change towards a new economic plan

In July this year, two of the world's largest economies earmarked momentous progress towards the adoption of a global circular economy. At the 20th EU-China Summit in Beijing, a joint memorandum of understanding (MoU) on Circular Economy Cooperation was signed by China and the European Union (EU). The alignment between both markets is a giant step forward towards a global system shift to a resource efficient, less wasteful and more environmentally friendly global economy – while Europe has an ambitious agenda to transition the EU economy into a circular model, China is one of the first countries in the world to adopt circular economy legislation. The cooperation and alignment from China and the EU to define what is meant by circular product, as well as which products will be allowed onto the market in a circular economy system, forms the base for accelerating the universal adoption of a circular economy.

Opportunities to business and society: a circular economy system

The China-EU agreement ratifies the circular economy as a tool for sustainable economic growth, resource efficiency and sustainable development at global scale. A McKinsey Centre for Business and Environment and Ellen MacArthur Foundation joint report, found that adopting circular-economy principles in Europe could not only benefit the EU environmentally and socially, but could also generate an annual net economic benefit of €1.8 trillion by 2030. In China a circular economy could make goods and services more affordable and offer healthier lifestyles for inhabitants of Chinese cities. Changing models in cities to become sharing, exchanging (modal shifts, electric vehicles, and substituting to a healthy food chain), and optimising (urban planning, energy efficiency, and digital supply chains) could reduce impacts associated with city dwelling existence, such as traffic congestion and air pollution.

Government of the Netherlands

atest › News ›

Large high-level delegation to visit China on economic mission

News item | 12-02-2018 | 10:46

Prime Minister Mark Rutte, trade and development minister Sigrid Kaag, agriculture minister Carola Schouten, State Secretary for Infrastructure and Veldhoven will all travel to China on a 2018.

They will be accompanied by a business delegatio Netherlands Industry and Employers. The delegat knowledge institutions in the sectors of logistics a propagation materials, life sciences and health, w green transport mobility. A separate programme v

With 1.4 billion inhabitants, China is the world's n economy has grown at an average rate of 10% a y the leading trading nation. China is working to tig rest of the Eurasian continent through its highly a opportunities for Dutch companies, which will be

Kingdom of the Netherlands

OPPORTUNITY REPORT CIRCULAR ECONOMY IN CHINA

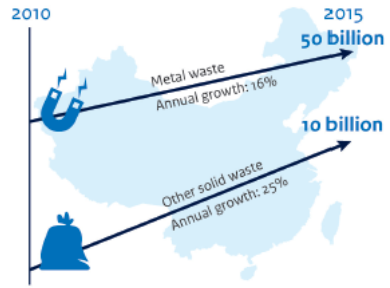
A Circular China?

Circular economy has been a buzzword in China for some years. The circular economy, in which products and materials are kept at their highest utility at all times through regenerative cycles, is an ideal Chinese policymakers strive to reach. Supportive measures are sparking new projects for improved resource management.

2009: China third country to adopt circular economy promotion law

2013: State Council publishes circular economy strategy

2015: NDRC publishes detailed circular economy plan



Market value of China's recycling sector

Direct opportunity The government initiates new circular industrial parks and municipal waste management systems.

Direct opportunity China's private sector increasingly looks for more efficient resource extraction technologies.

Long-term opportunity China still has a lot of catching up to do in cleaning up production processes and designing linked product lifecycle loops.

Waste management sector

As a net importer of waste, China's recycling inudustry is already very developed. China is one of the world's largest recyclers of metal waste and scrap, currently valued at more than EUR 50 billion. Recycling of non-metallic solid waste is rapidly catching up, with an annualized growth rate of 25% in the last 5 years. This forms the basis for China's nascent resource management.

Traditional recycling of materials such as PET plastic, paper and aluminum is taking a hit due to plummeting commodity prices. On the other hand, markets for recycled materials from organic waste,

Kingdom of the Netherlands

Dutch Circular Economy Partnership for China - Our Future Economy is Circular

"In 2050 the Netherlands will be a full circular economy"

The Netherlands is spearheading a movement towards a more circular economy and has become a "living lab" that can provide knowledge and expertise to support countries around the world.

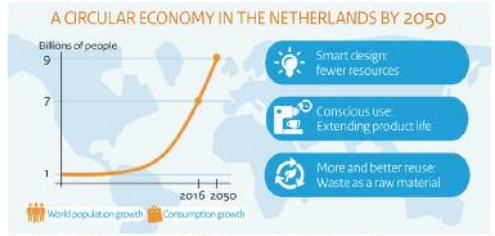
Being a frontrunner in the circular economy, the Dutch are gaining a lot of knowledge and the developments create benefits for both the Dutch economy as well as the society as a whole. There's no denying that the Netherlands has become a breeding ground for circular innovation and like many others around the world our ambition is to accelerate the global transition.

The challenges the world is facing, such as climate change and population growth are at times overwhelming. They also urge us to work together and find innovative solutions for our future. A transition to a circular economy is one of them: creating economic growth and prosperity and at the same time restoring our ecosystem.

© European Parliament

The circular economy concept decouples growth and prosperity from the use of natural resources and ecosystems. It's dependent on how well stakeholders work together. Collaboration and sharing successes and failures are key for the

Nowadays, the Netherlands is a global water management hub, the second highest dairy food exporter in the world and is among the world's leaders in waste management.



© Ministry of Infrastructure and the Environment, September 2016

The most important lesson Dutch companies and organisations have learned is that a circular economy is first and foremost an economy where working together is the key to success. Businesses, national governments, municipalities, universities and NGOs all need to find ways to cooperate more intensely than they have ever done before.

We aim to join hands with our Chinese counterparts, to look for integrated and circular solutions for our shared challenges and opportunities. Supported by the Dutch Ministry of Infrastructure and Environment and the Netherlands Enterprise Agency, the following Dutch

Why Built Environment?

Buildings

Infrastructure

Districts

Cities

Problem Definition

Industrial Parks Limit Circular Economy

New Urbanization Plan

Linear Construction Sector

Circular Construction

Circular Area Development

Problem Statement

- Up to now, a lack of Circle Construction in China
- A lack of much unified Circular Economy community
- New Urbanization Plan requires sustainable urban development

- Circular Netherlands?

Research Goal

To explore possible circular economy opportunities in Chinese and Dutch urban context and learn lessons from practice

Main Research Question

How can circular economy be implemented in the built environment
in China and the Netherlands
and what lessons can be learned from Dutch circular area development in the cities?

Research Objectives

- *to develop a framework to compare the adoption of circular economy in China and the Netherlands;*

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- *to provide practical guideline on circular approaches to the built environment in two countries;*

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- *to develop a framework to compare the adoption of circular economy in China and the Netherlands;*

- *to provide practical guideline on circular approaches to the built environment in two countries;*

- *To learn lessons and make recommendations for implementing circular economy in different urban context.*

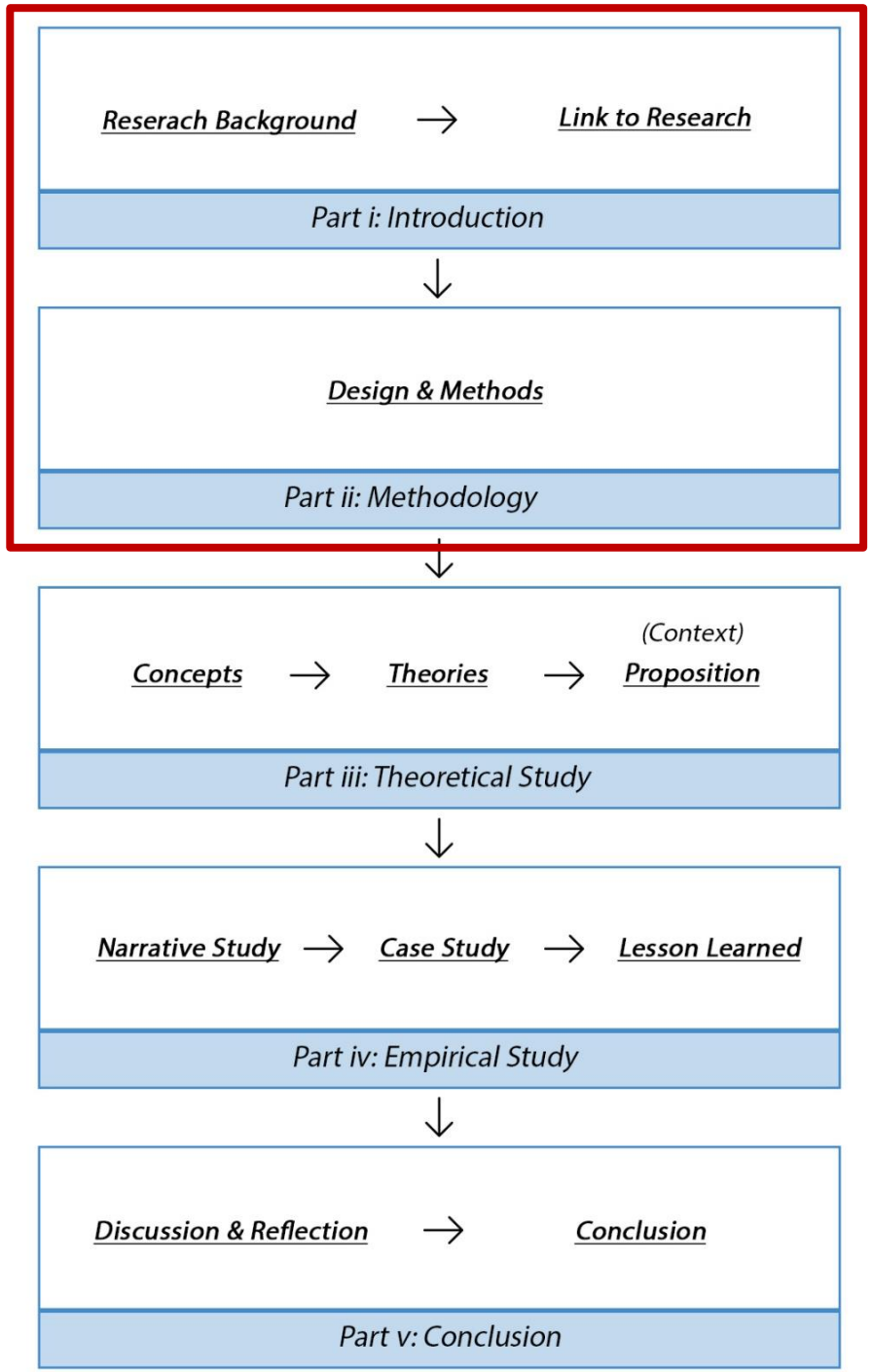
Sub-Questions

- What does circular economy mean to the Netherlands and China?
- What does circular economy mean to the built environment in the Netherlands and China?
- What lessons can be learned from Dutch circular area development for a Chinese urban context?

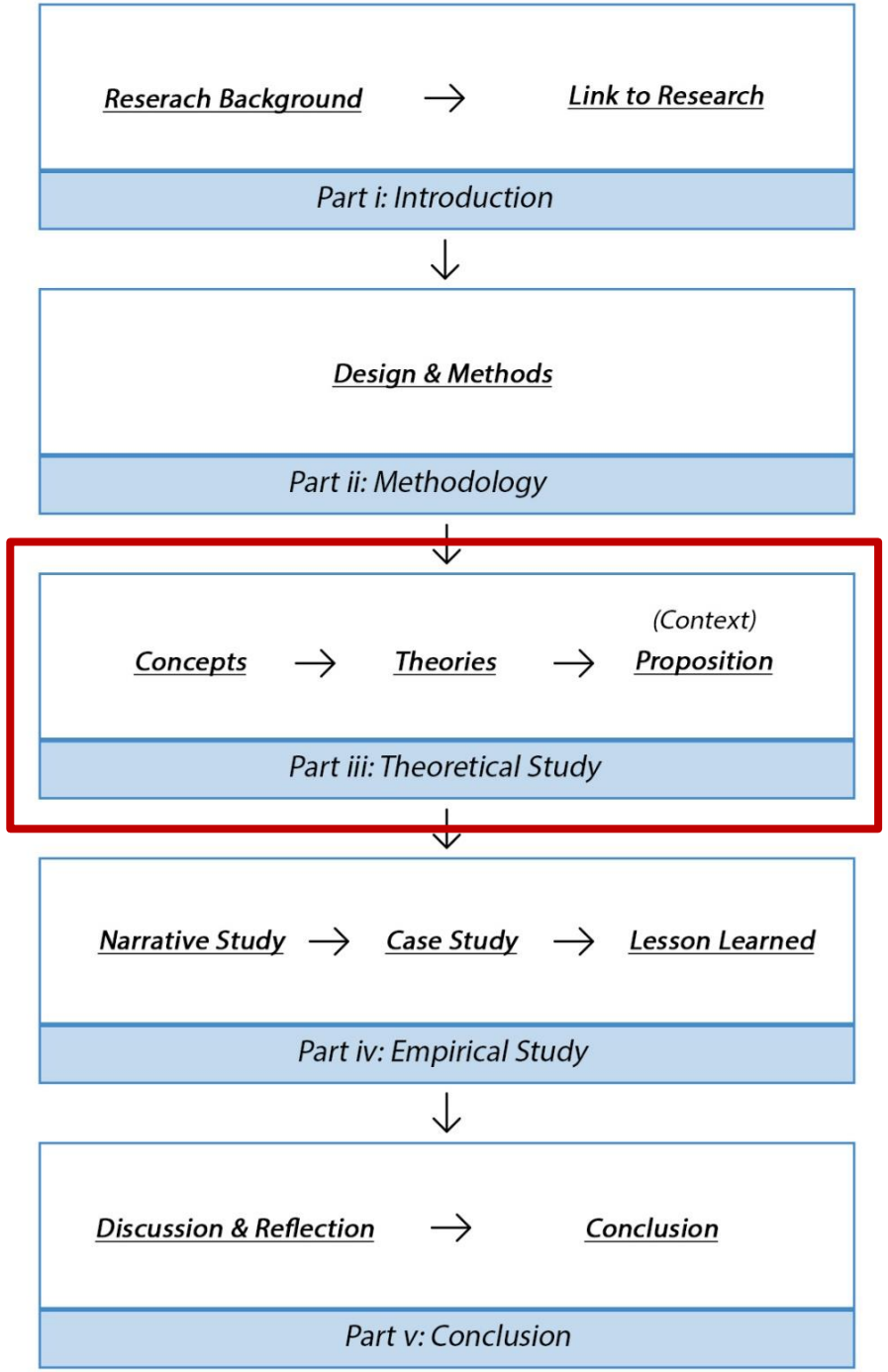
PART II: Methodology

International Comparative Research

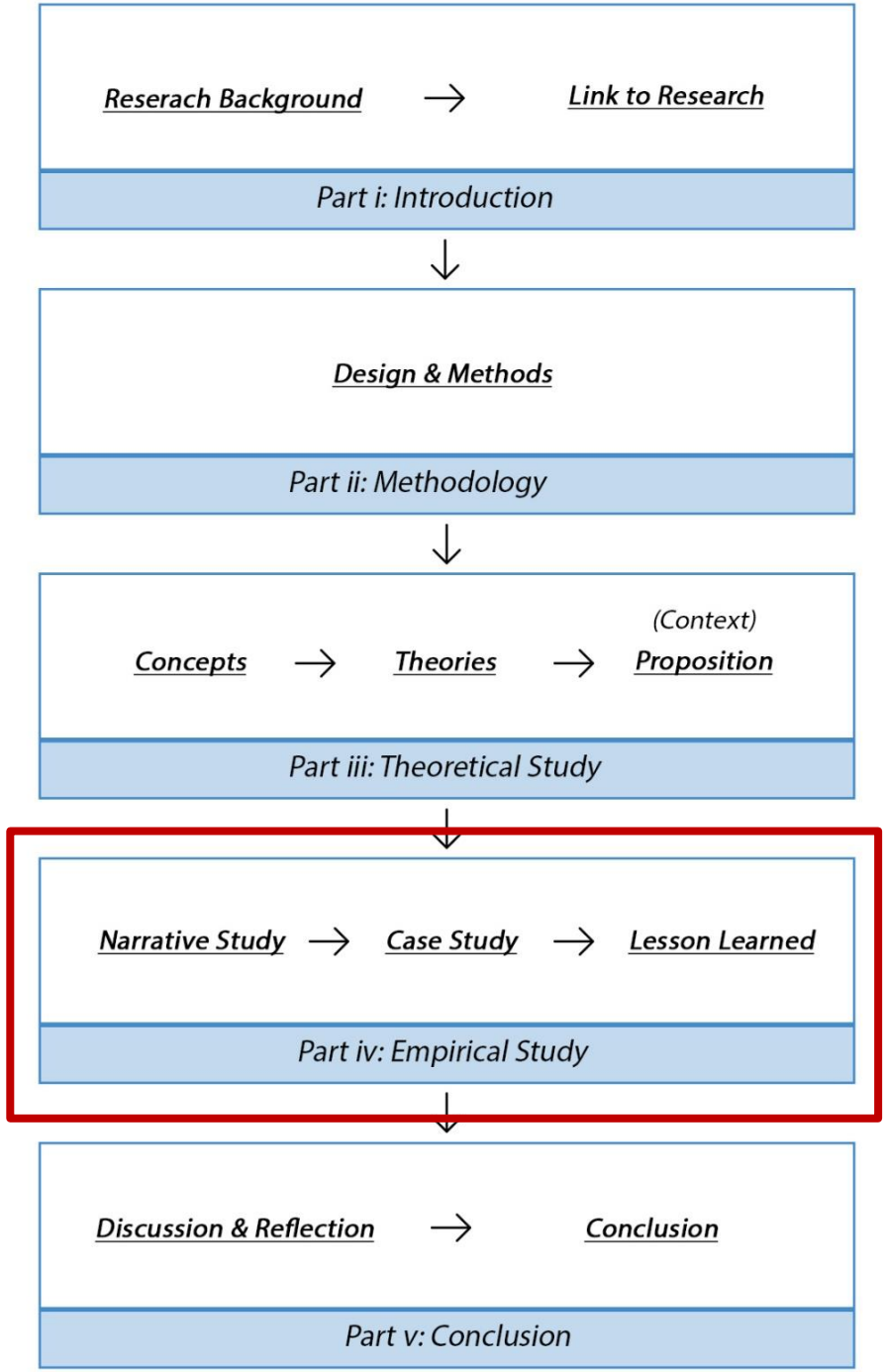
Matter of Equivalence



(1) Decision Criteria – desk research & explorative interviews

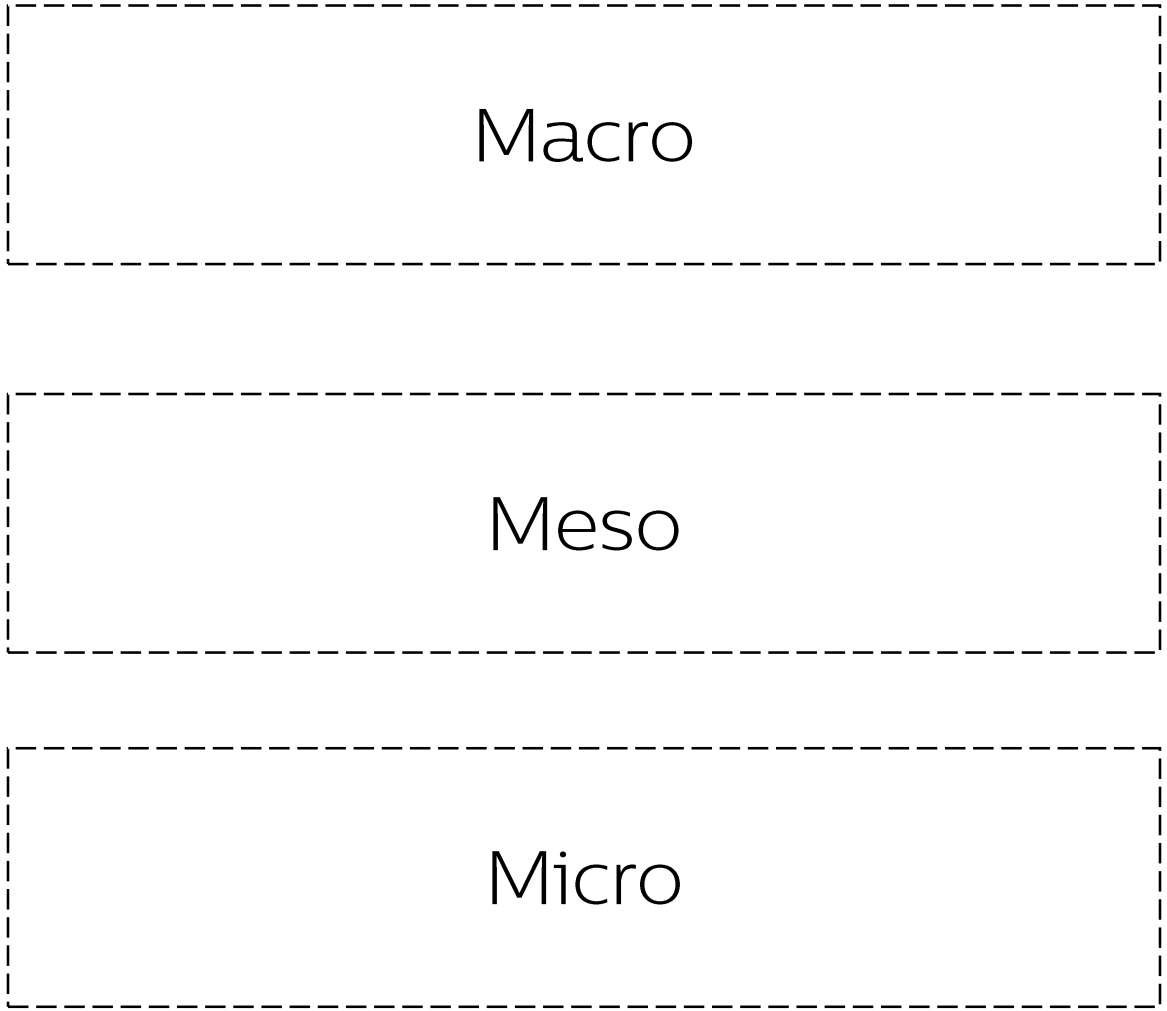


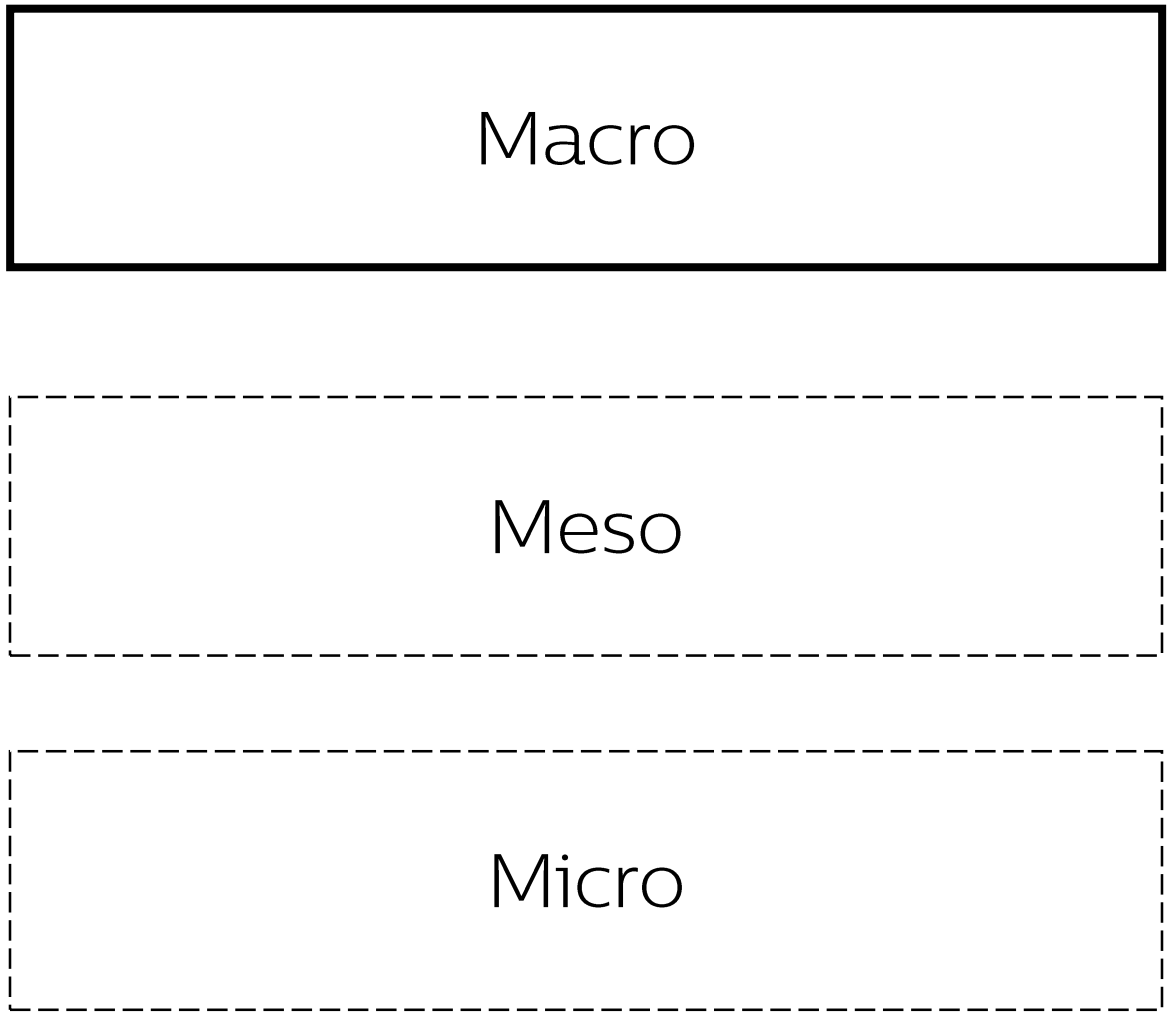
(2) What to compare – desk research & expert interviews



(3) How to compare – narrative research (CN) + case study (NL)

PART III: Theoretical Findings


Macro
Meso
Micro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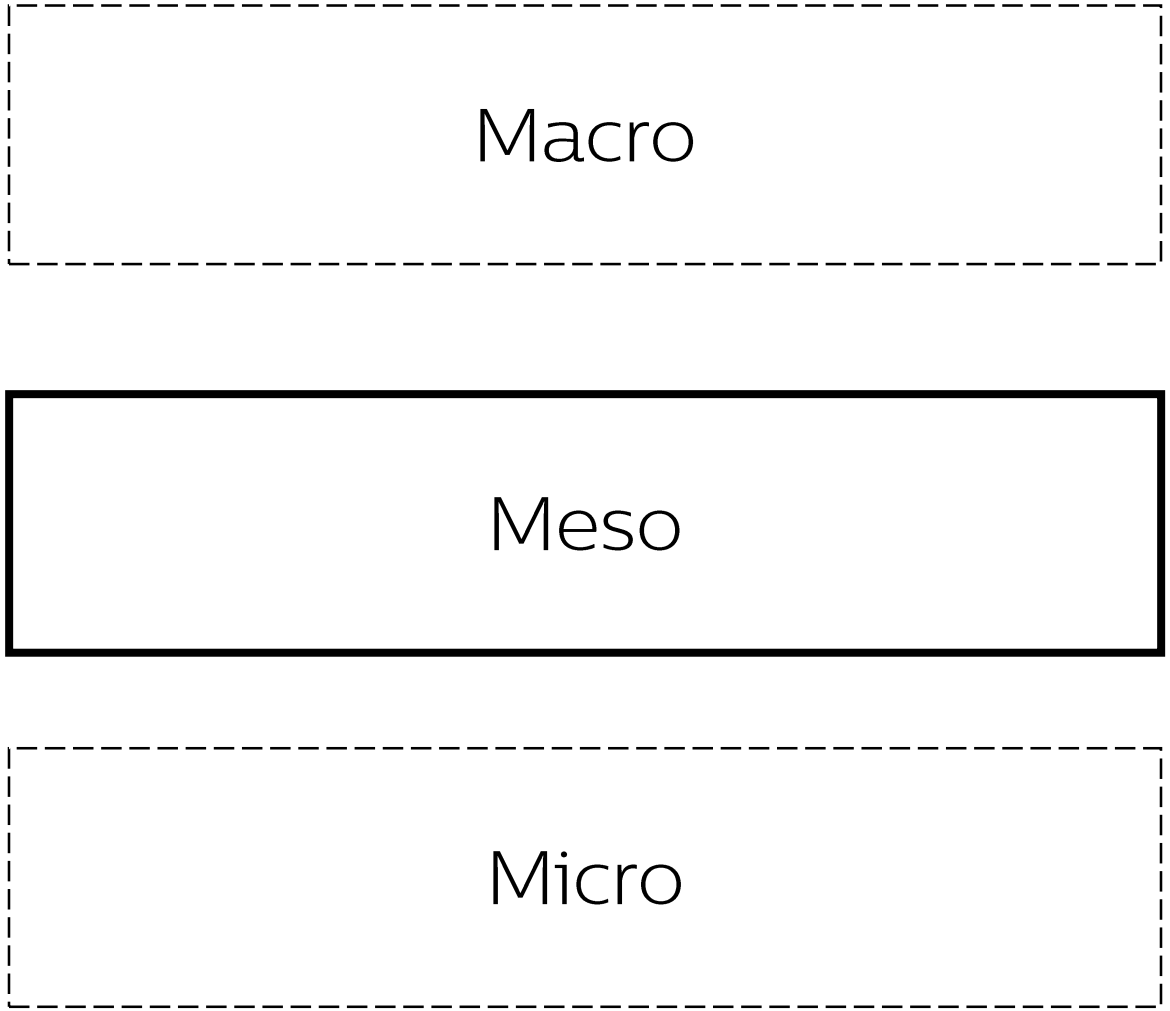
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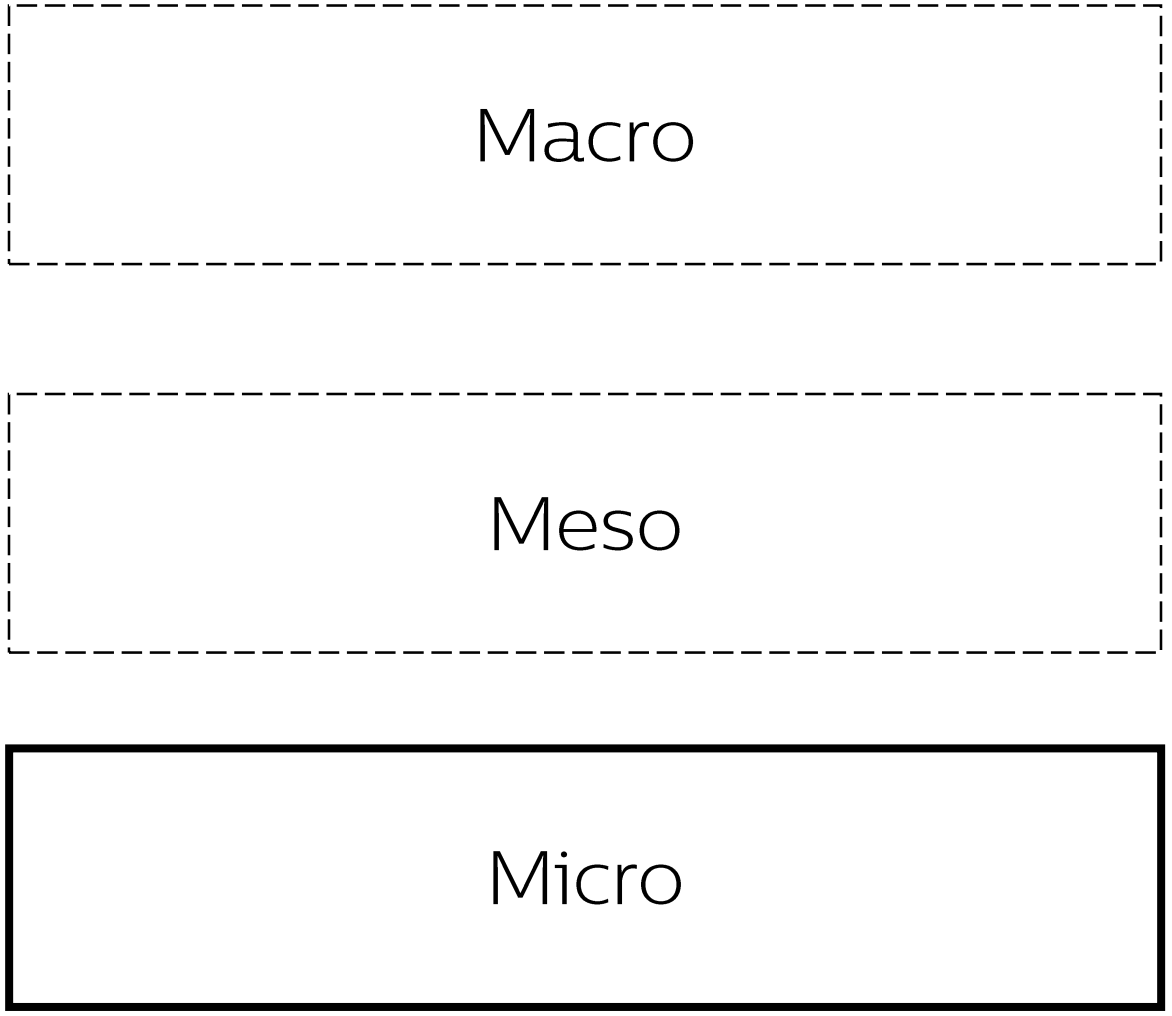
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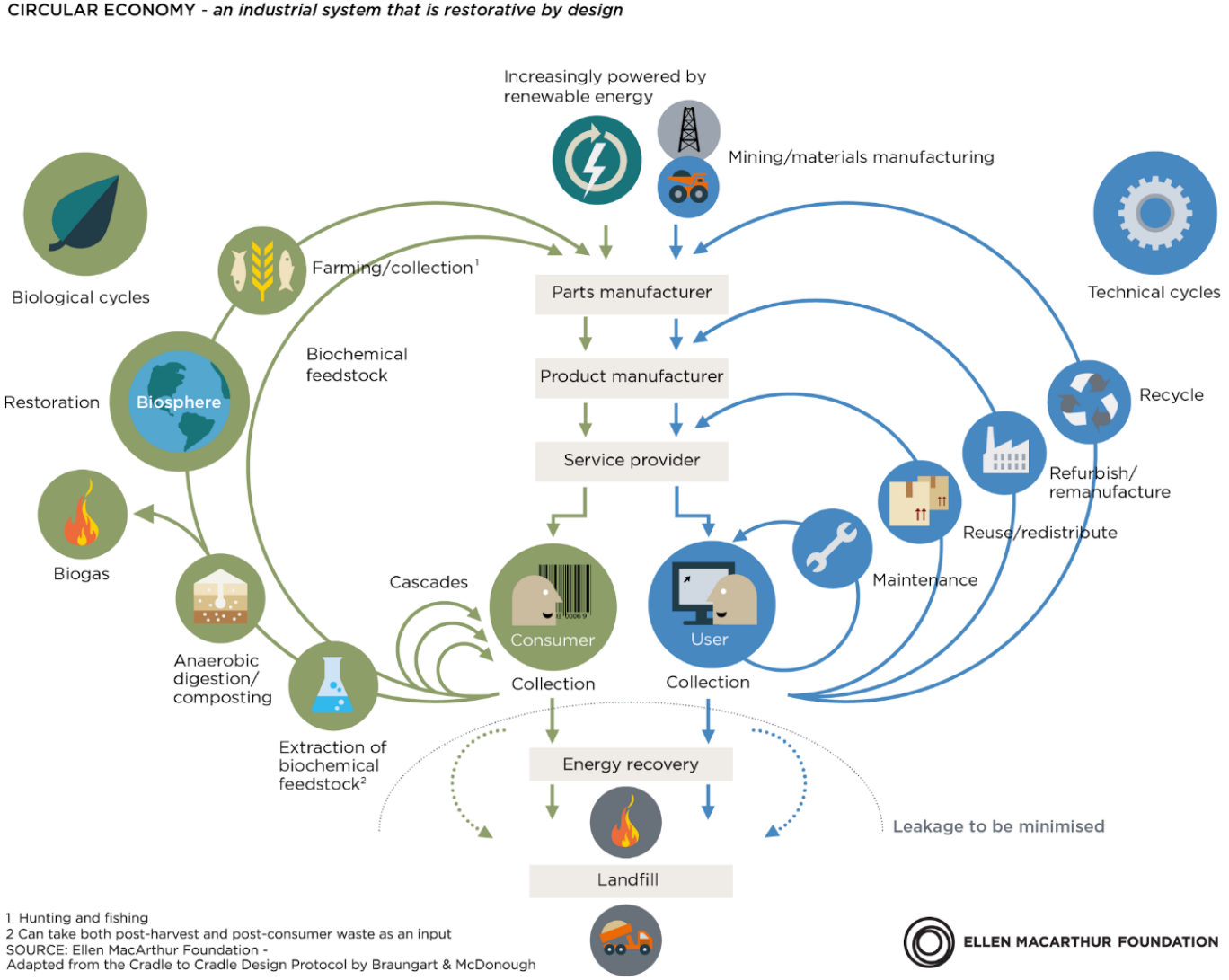
Micro

PART IV: Empirical Findings

1. Equivalence of Concepts

Circular Economy



Butterfly diagram.
Source: Ellen MacArthur Foundation

Ecological Civilization

Ecological Civilization

Clean energy

Circular economy

Sustainable development

2. Prioritized Circular Methods

NL: 25 million tonnes CDW/year

CN: 2.5 billion tonnes CDW/year

Key Approach

China

- Modular construction
- Prefabrication
- Use of secondary material

Netherlands

- Material passport
- Circular procurement
- Alternative business model

Key Approach

China

- Modular construction
- Prefabrication
- Use of secondary material
  - Top-down enforcement on residential market
  - Bottom-up market for historical building material

Netherlands

- Material passport
- Circular procurement
- Alternative business model
  - Social aspect

> They have their own way and channels to sell those components…because there is a huge market for the interior design with historical value.
> – Interview with Wang Dan (2018, Tianjin).

> …it really changed the way of thinking and doing. If it worked with that, maybe we can also do for carpet, furniture, etc. It's interesting for clients to work this way.
> – Interview with Freek Wullink (2018, Utrecht).

3. Circular Opportunities in Urban Context

Opportunity:
Urban Revitalization

A case: Werkspoorkwatier

Identify Problems….

Dimensions	Variables
Governmental	Top-level vison • Political will and commitment • Clear and consistent goals • Long-term empowerment Governmental support • Properly designed and enforced regulations • Coordinative mechanism • Supervision
Knowledge	Circular vision • Type of circularity • Shared principles Knowledge development • Knowledge creation and exchange • Leaning behavior
Organizational	Stakeholder collaboration • Actors • Commons and protocol • Network stratification of process • Permeability of boundaries Operational logic • Focus of action (WHAT) • Drivers (WHY)

Governmental

Identified problems

- Top-down interventions
- Focus on short-term GDP target
- Complicated ownership of the land
- Bureaucratic decision-making process

Solutions adapted from the case

- No clear top-level goals
- Long-term global vision only
- Little influence on project
- Balance between regulations and innovative actions

Knowledge

Identified problems

- Lack of awareness of CE
- Lack of integrated CE approach.

Solutions adapted from the case

- Direct lessons: CE approach
- Knowledge sharing & lesson learned
- Practical knowledge & theoretical input

Organizational

Identified problems

- No common vision among actors
- “One-formula” development pattern

Solutions adapted from the case

- Intrinsically circular motivated actors
- Collaboration with knowledge institute
- Many social service organizations

> The basis of ‘creative industry’ is creative people. But there are not so many creative people to support the creativity industry when government and developer only focus on market.
> – Interview with Wang Dan (2018, Tianjin).

PART V: Conclusion

Towards Circular Economy in the Built Environment in China and the Netherlands

China	Netherlands
Macro CE	
Top-down enforcement on construction production	Bottom-up initiative in the market
Bottom-up approach on real estate & service	Need more clear top-down vision to speed up
Meso CE	
Along value chain: Upgrade traditional value chain in pilot zones ➔ Scale up across the country	*Across value chain:* small innovation + social aspect = client's attention ➔ Create circular momentum
Between government and business: ➔ Require less governmental control ➔ Seek new collaboration among government, private sector and knowledge institute to break the silos	*Between government and business:* ➔ Require more governmental interactions regarding guidelines, standards and supervision for private sector
City network: Collaborate with other circular economy community Manage the existing secondary material market	*City network:* knowledge creation and sharing Localize secondary material information
Micro CE	
Focus on material quantity Facilitate the on-going urbanization	Focus on material quality Retain the value of materials and business

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Recommendations for Future Research

- Experimentation at different scales
- Development of indicator systems
- Digital solutions related to circular economy

Questions?