

# Role of Private Sector in Promoting Greener Buildings



2020. 09



# 1 Self-Introduction

## Daniel Zhang

- **Executive Director** and **Social Responsibility Principal** of BROAD Group
- **General Manager** of BROAD Core Digital Technology Co., Ltd.
- **Co-Founder** of P8 Sustainable & Innovation Community
- **Founder** of Blue Sky Lab
- **Chief Concept Artist** of BROAD Pavilion in Shanghai Expo

Architecture major of Carnegie Mellon University

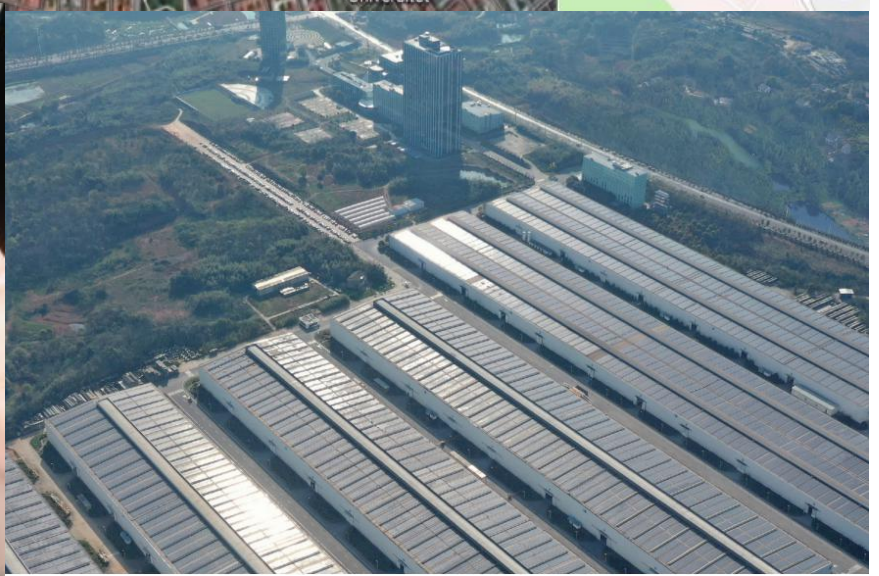
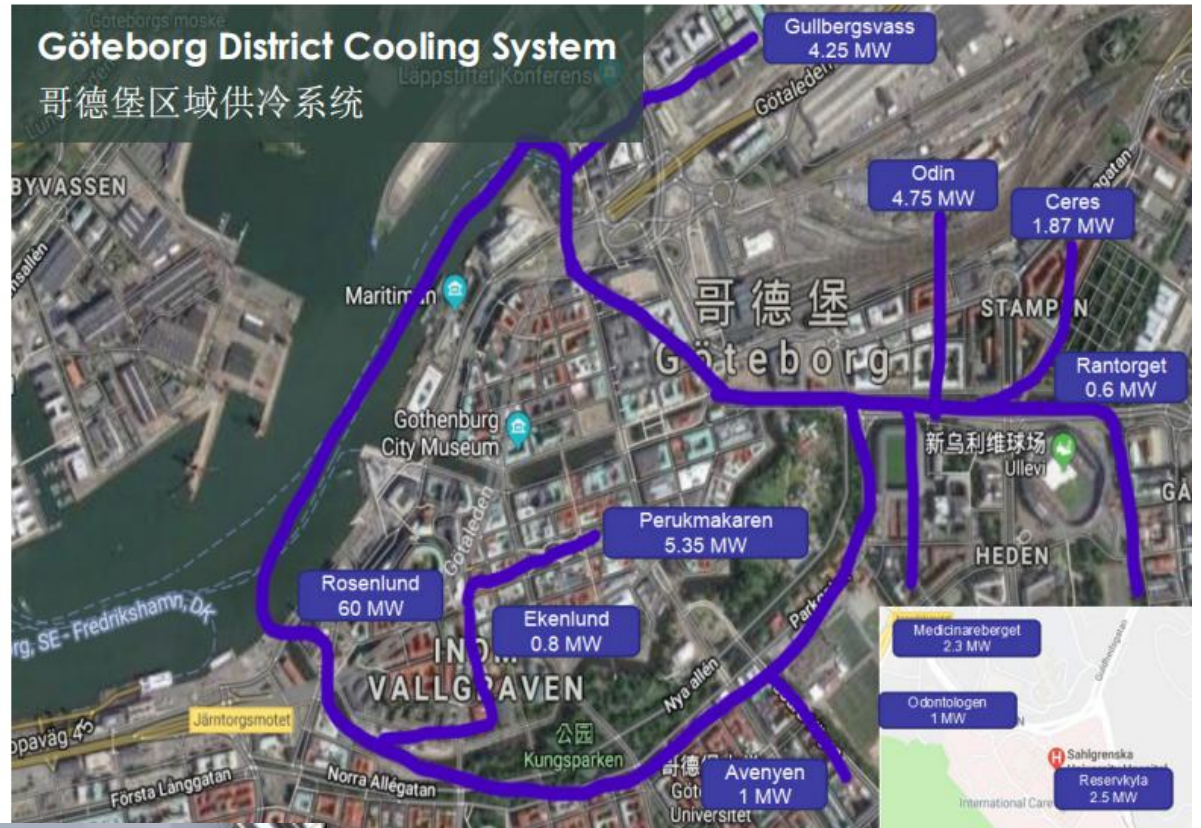
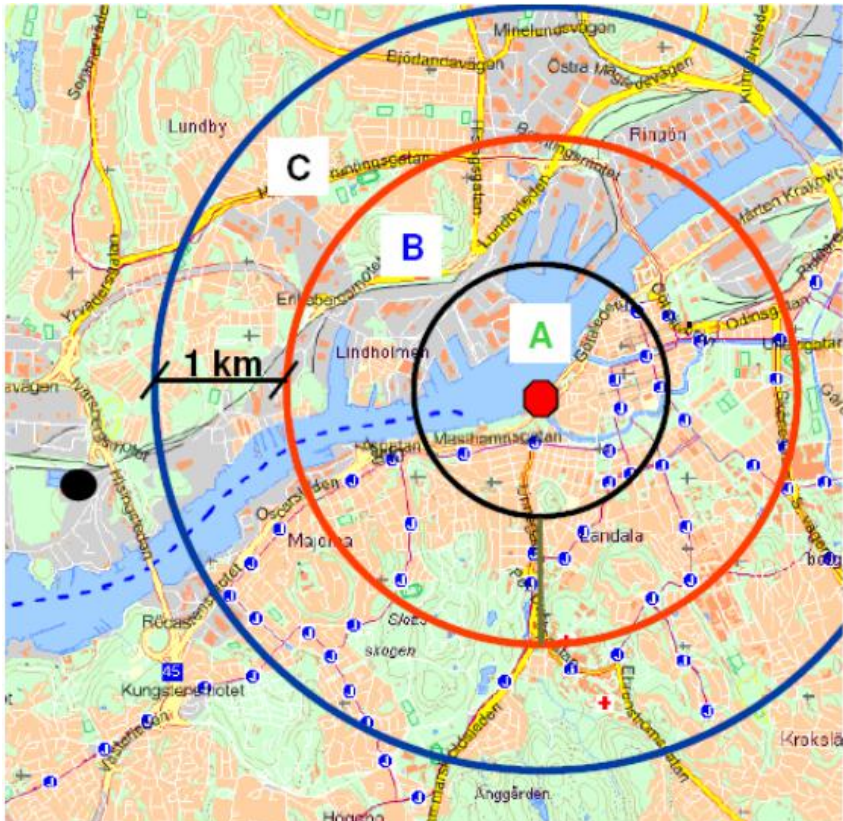
Visiting scholar in the Public Policy Dept. of India Tata University

Visiting scholar in the Psychological Education Dept. of Freie Universität Berlin

PhD of Teri University



# 2 Renewable Energy Sources



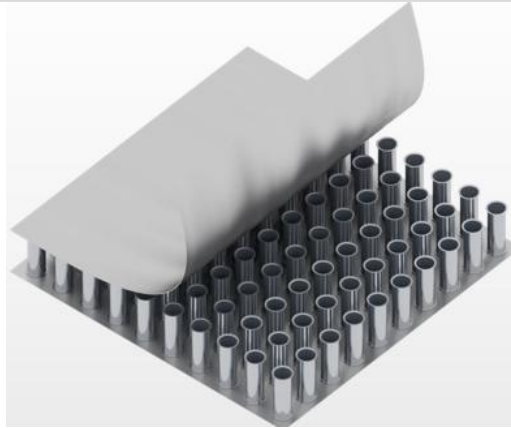
## “ Greener Buildings ”

BROAD Group



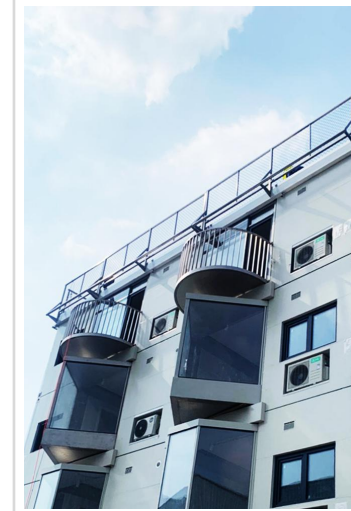
### Steel Structure Building

9 degree earthquake resistance, 5 times energy saving, less than 1% construction waste



### Material Revolution

extend rate  $\geq 40\%$ , corrosion rate is 0.005, weight of steel is 1.25 times of the honeycomb panel



### 5D Building

steel consumption  $100\text{kg}/\text{m}^2$   
restackable,  
flexible in construction

Mungyeong Project  
in South Korea

2009

2018

2020.04~

# 4 Latest Case

## Mungyeong NPI Room Project in South Korea

### Project Background

- ✓ NPI room was urgently required due to the breakout of COVID-19 in South Korea in Feb, 2020.
- ✓ contract signed on Mar 8th, 2020 acceptance and operation on Apr 2nd, 2020

on-site photo

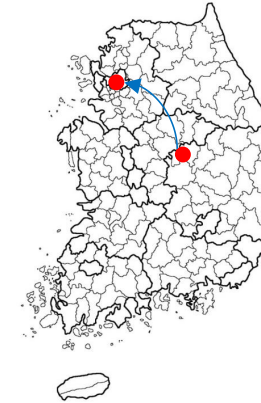


Reported by CCTV in "Economy Half Hour"



## Postscript

Requirement Change: the NPI room will be relocated to Seoul in the future.



### Continuous Cooperation

#### Other project



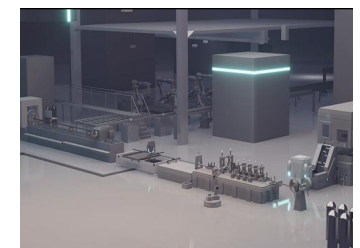
- NPI Room
- Apartment
- Residential housing

#### MOU



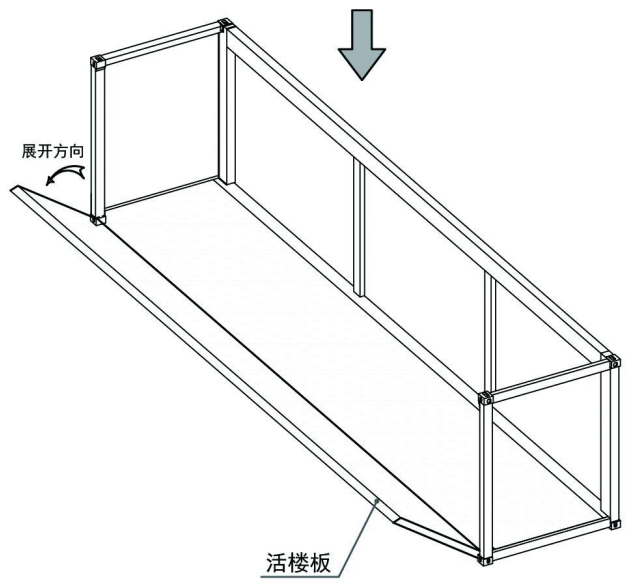
- Further cooperation
- Exploring the global market

#### Joint cooperation in factory

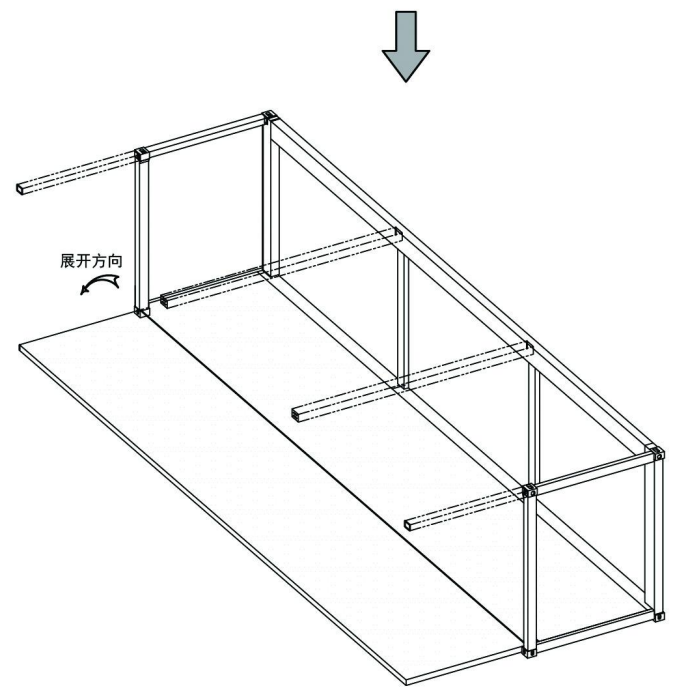


- Material factory
- 5D Building factory

**One project usher in friendly and deeper cooperation.**



模架展开过程示意图



模架展开完成示意图

## Existing Building

## Energy consumption

## Lifetime

**Short**

- ① Short life and hardly maintenance of the Reinforced Concrete building
- ② Difficult to recycle of the abandoned steel material

## Movement

**Fixed**

- ① Reconstruction is the only solution for client's change in demand.
- ② Resources waste caused by the low resources utilization rate.

## Safety &amp; Efficiency

## Speed

**Slow**

- ① Wet processing, low speed.
- ② Steel structure building, component prefabricated.

## Quality

**Large deviation, precision control ×**

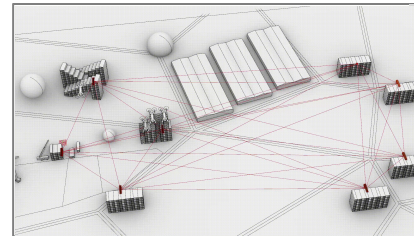
- ① Reinforced concrete makes lower building quality.
- ② Steel structure building can give rise to water leakage and cracking issues.

## BROAD 5D Building



## BCore Slab

- Extending life of the building to 1000 years, low steel consumption
- Recoverable and cycling utilization



## Flexibility in Construction

- Completely dismantlable
- Relocated and reconstructed



## 100% Factory Prefabrication

- 3 stories/day (MEP + factory-fabricated interior decoration, 1 worker/module for installation)
- 3 workers/module for dismantlement and reconstruct



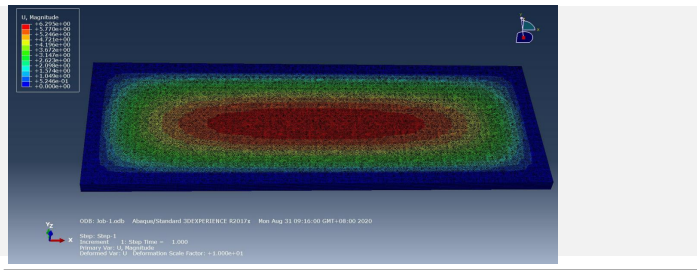
## Reliable Quality

- Factory-made, small deviation, safe and reliable
- Completely factory prefabricated to solved the water leakage and cracking issues.

# 6 5D Building Test

## Structure

- ✓ Under more than 500 times large destructive test
- ✓ 500-ton pressure in maximum
- ✓ 280 times in average intensity weight ratio



## Durability

- ✓ Neutral salt spray test
- ✓ Refer to the "GB/T 10125-2012 Corrosion Tests in Artificial Atmospheres - Salt Spray Tests", to evaluate the corrosion resistance of BCore Slab.



## Trial building

- ✓ 4 hours to complete installation of the trial building on Sep 9th, 2020

## Other

- ✓ Preparation of fire-fighting, sound and thermal insulation, etc.

## Structure of BCore Slab (test video)



## Salt Spray Test Result-BCore slab 240h (240 years) VS Carbon Steel (2h)



## Structure Verification



## Coupling Installation



## Trial Building

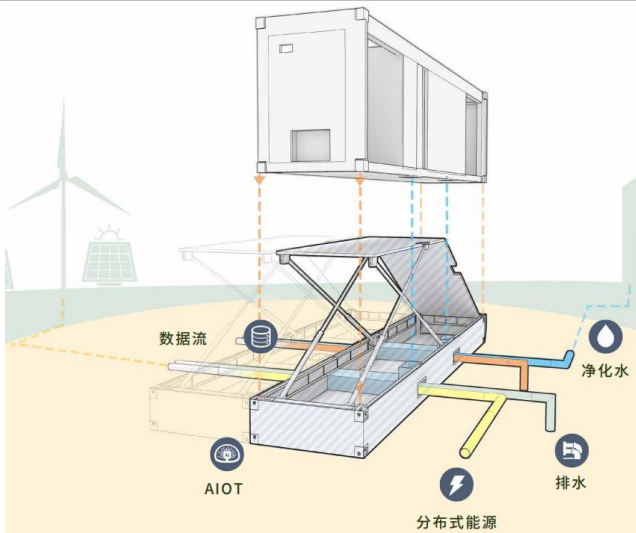




# 7

## More challenge

### Base Station



### Creativity



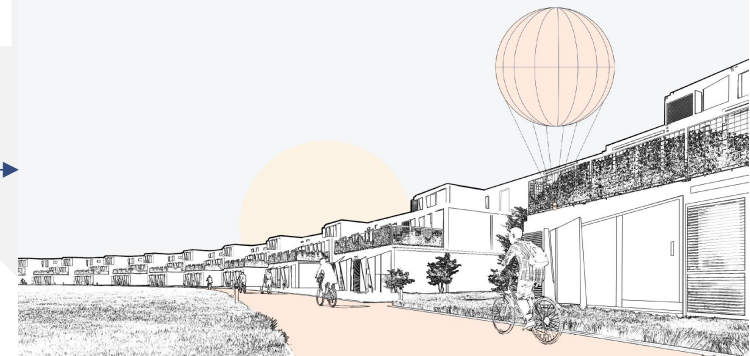
### Policy Suggestions

Laws to elevate compliance standards regarding energy efficiency, carbon emissions, and state invested projects, such as state owned companies' facilities, public infrastructure should take leadership in renewables and climate compliances.

### Aesthetic



### Community





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