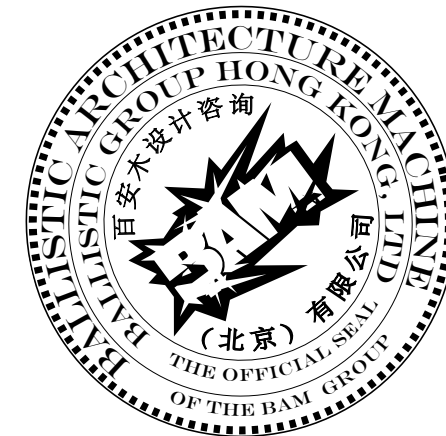




Ballistic Architecture Machine
百安木设计咨询（北京）有限公司

CCG GYLD Wise Demo Campaign
Application Proposal
Beijing, China
中国，北京

Additional Information Packet

2022.05.24

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BALLISTIC ARCHITECTURE MACHINE

Ballistic Architecture Machine (BAM) is a multidisciplinary design office based in Beijing, Shanghai and New York. It is our unwavering stance that the landscape is the most important design realm of the 21st century. While always focused on the landscape spaces of the urban realm BAM's strategy of 'just say yes' has led to an extremely diverse body of work, which fits uncomfortably into traditional definitions of Landscape Architecture, Urban Design, Architecture or Installation. The perpetual debate within the professions in and around the medium of landscape regarding the relationship of landscape to aesthetics, culture, and the environment further illuminates BAM's enigmatic slogan "Nature is an Idea."





APPLICATION DETAILS

CONTACT PERSON

Name	Xenia Otmakhova
Chinese Name	贺晓晴
Gender	F
Birth Date	1992-04-18
Nationality	Dutch / Russian
Passport No.	BT4DRPJ11
Workplace	Ballistic Architecure Machine
Position	Manager
Email	xenia@bam-usa.com
Telephone	15600276760
Current Address	28 South Sanlitun Road, Chaoyang District, Beijing, China
Focus Areas	Architecture, Urbanism, Landscape, Belt and Road Initiative, Sustainable Development
Social Media	Wechat axi_leo LinkedIn Kseniya Otmakhova

Personal Profile

Holding degrees in architecture & urbanism (MSc Delft University of Technology) and global affairs (MMSc Schwarzman College, Tsinghua University), Xenia believes in the power of spatial design as an instrument to address complex societal challenges of the 21st century and the future. This led Xenia to dedicate her thesis in Delft to analyzing China's Belt and Road Initiative (BRI) and reframing it as a socio-spatial set of challenges centered around the core theme of 'people-to-people ties' that need to be resolved by means of urban planning and landscape design. Today this work continues as Xenia joined forces with BAM starting 'New Silk Road Initiatives' in which the team takes an environmental focus and analyzes the various BRI-developments with the aim to transform these into carriers of sustainability by means of art and design.

Besides this research through design project, Xenia is responsible for BAM Public Relations and often assists in marketing, proms and other internal company processes such as employee development and annual events.

Xenia is co-chair of the Real Estate Committee at the American Chamber of Commerce in China.

PROPOSAL

Title	Camouflage Landscape: Normalizing the idea of locating Waste-related Infrastructure Within the Urban Center.
Team Name	Ballistic Architecture Machine (BAM)
Topic	Climate Change and Green Development

PROPOSAL OVERVIEW

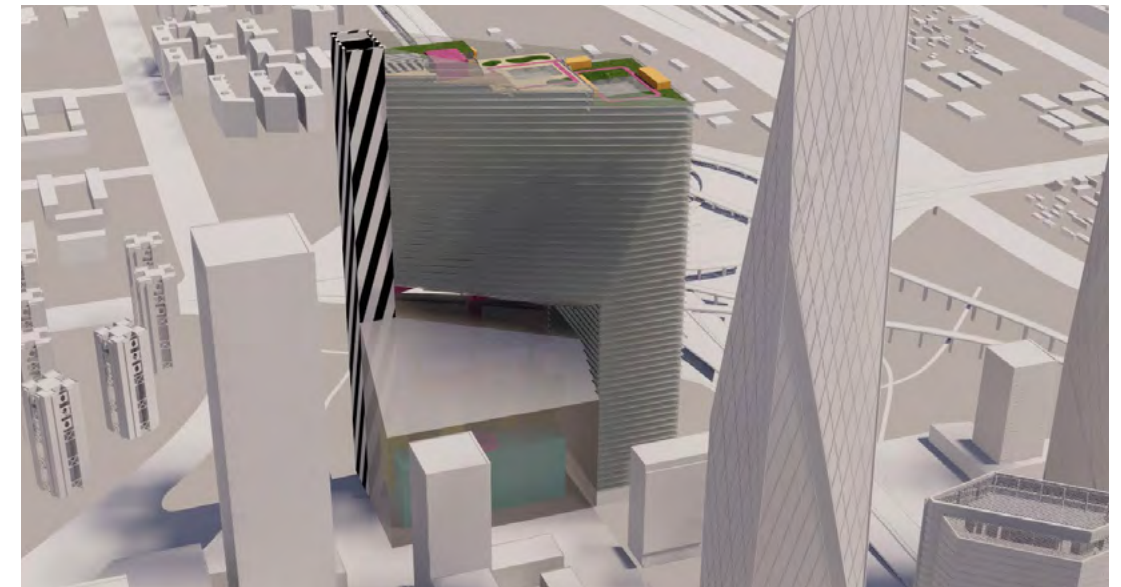
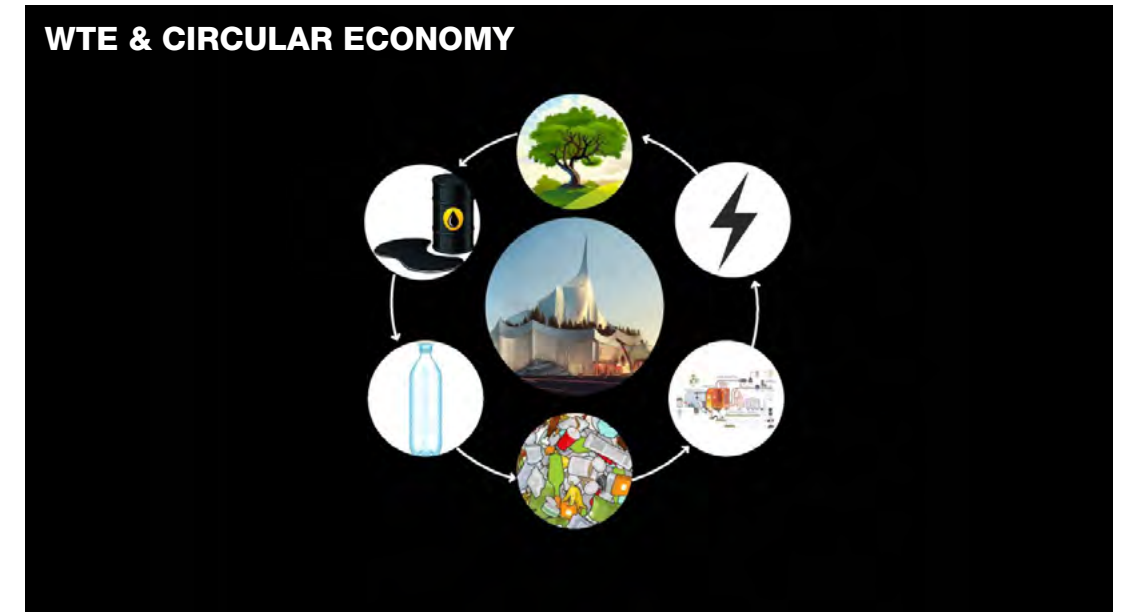
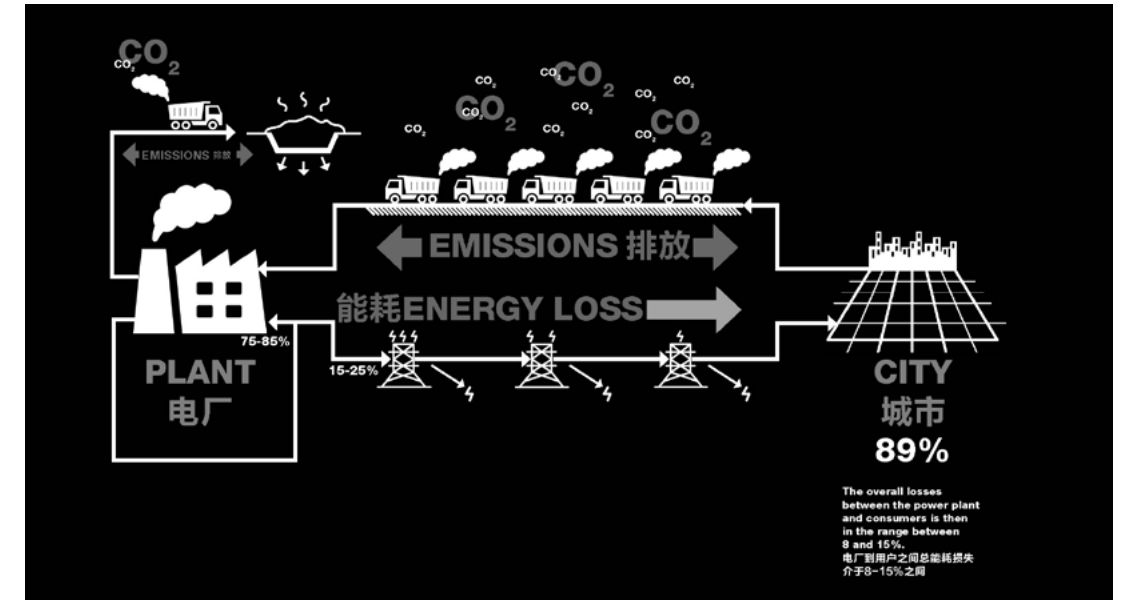
BACKGROUND SIGNIFICANCE OF THE SELECTED TOPIC

The project addresses the widespread challenge of municipal solid waste management (SWM). On an average day, Shanghai as the biggest city in China, produces about 33,000 tons of trash. Since the 1960's the landfill has been the most widely used waste management option. At the same time, landfills are essentially underutilized extracted recourses. To this point, the Waste to Energy (WTE) Power Plants, provide a solution enabling us to extract more embedded energy from our waste. China as of 2017 had 303 WTE plants operating in mainland China, processing a total of 304 thousand tons of waste per day .

China is the world's second-largest producer of municipal solid waste (MSW). Innovation for a more effective municipal solid waste management in Chinese cities is integral to China's ability to achieve the 2060 carbon neutrality goal set out by president Xi Jinping. The urgency and the importance of the SWM issue is recognised on all levels of China's policy architecture and is reflected in the 14th five year plan and the 2018 recycling policy, showing that China is very serious about addressing this issue.

However, the publics' general unawareness of the technology as well as the unattractive industrial aesthetics of WTE-plants sides them with other heavy industry and factories and makes victims of social opposition and phenomena such as the Not in My Backyard (NIMBY) pushing industrial developments to the far outskirts of the city. This in its turn reduces the transformative potential of the WTE technology by increasing costs associated with transportation and infrastructure needed to move the waste and resulting energy between consumers and the processing WTE plant. Moving waste infrastructure into the city core is the key to furthering the paradigm shift in waste management and work towards effective, integral, implementation of the policies deep into the practice and daily reality.

Therefore the aim of this proposal is to further integrate and revise the presented research, for the purpose of developing the presented prototype concept for Beijing CBD Waste-to-Energy power plant into a developed and realistic prototype that can serve as a precedent of how such stacked WTE models, with constructed and functioning precedents in Europe, can be applied within the highly dense and developed Chinese urban context, and align with the ongoing 'sponge city' urban planning model as well as with the 14th five year plan focused on circular economy.



HISTORY OF ENERGY-RETHINK RELATIONSHIP WITH ENERGY

能源的历史-重新思考人类与能源的关系

Rapid development of human civilization through technological innovation has brought about an unprecedented changes to humanity, and the environment. The rapid development of population and the side effects of human development has massively burdened the earth through overexploitation of resources, resulting in air pollution, soil desertification, a flood of plastic products, global warming, and climate change.

Human beings have to rethink their relationship to energy. converting waste into energy is one of the widely used methods for many conditions.

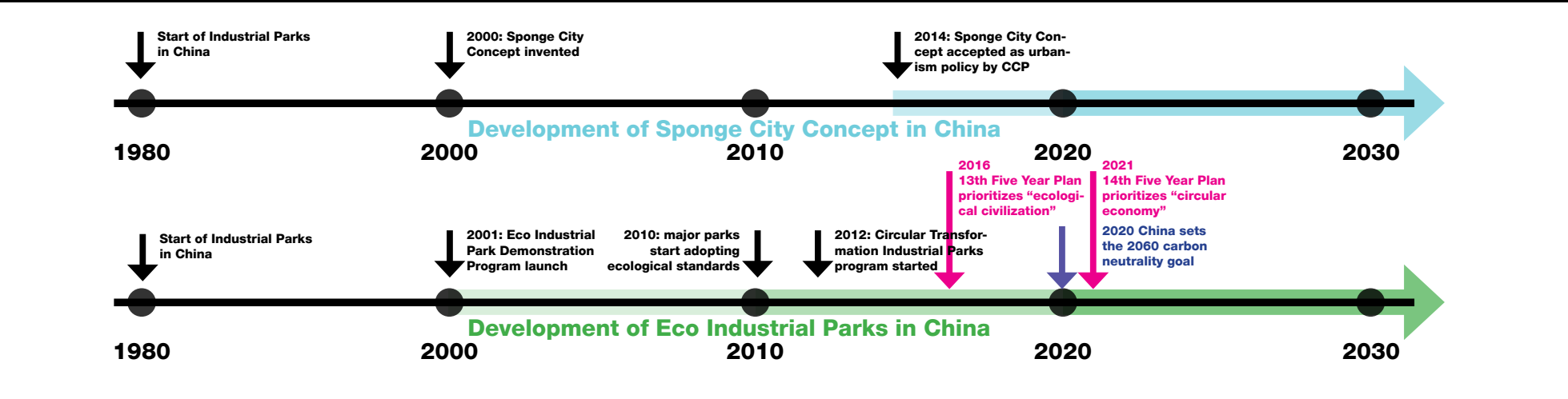
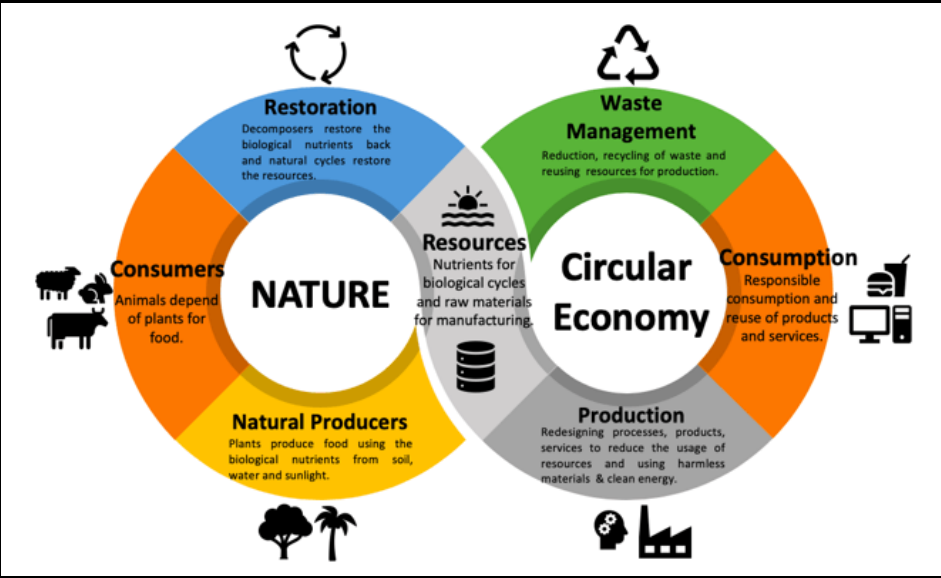
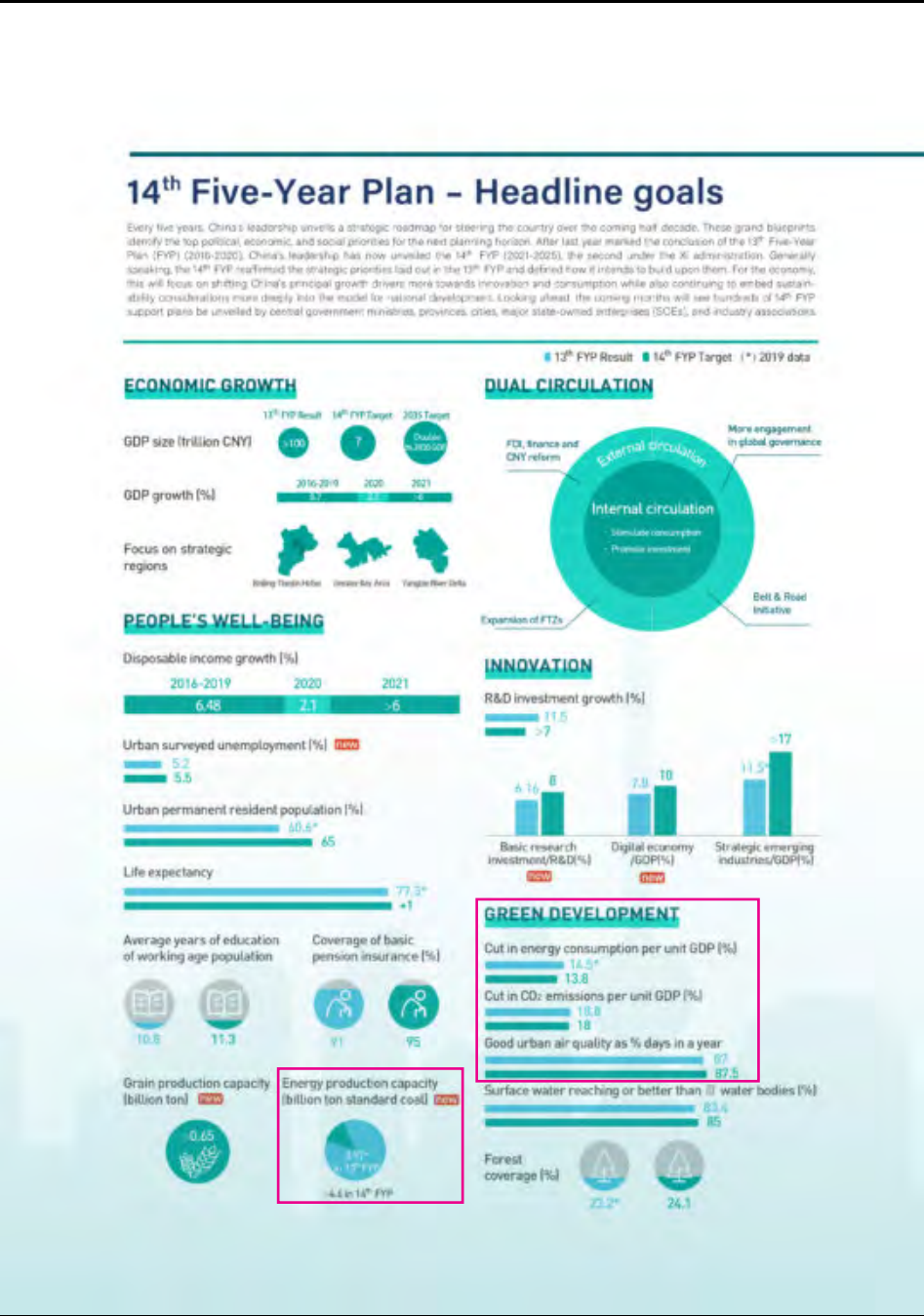
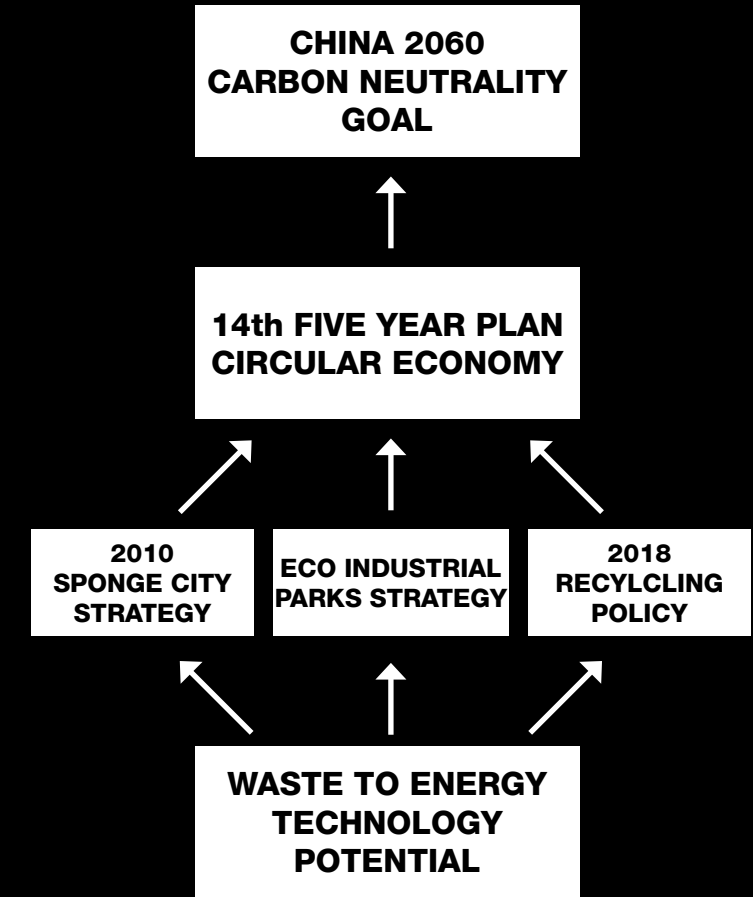


CHINA'S POLICY ARCHITECTURE ALIGNING TO COMBAT CLIMATE CHANGE

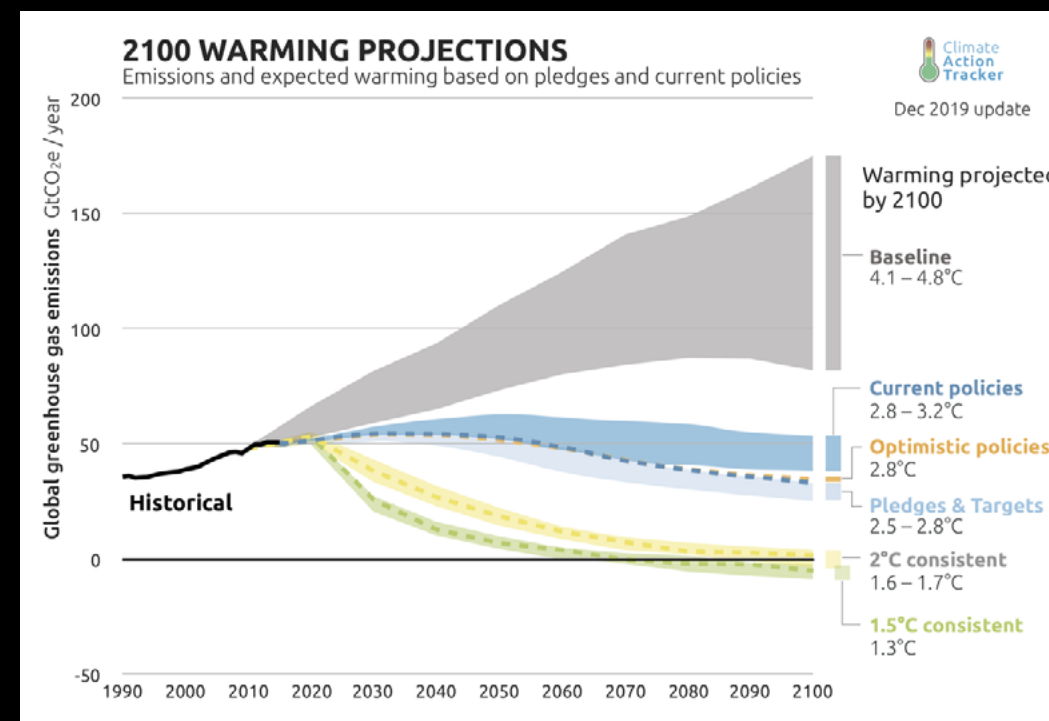
Over the past 20 years China has systematically been taking steps towards ecological and green industrial development in an effort to combat climate change. In early 2000's China started developing the 'sponge city' and 'eco-industrial park' concepts which have matured in thorough policy incentives today.

In the recent 5 years these efforts became even more serious and thorough when China incorporated the concepts of circular economy and ecological civilization into their latest 5 year plans. On top of that China has set an unprecedented and ambitious goal, committing to achieve carbon neutrality by the year 2060.

These policy incentives provide a great level of alignment but also challenge the practitioners in all industries to develop working solutions that can fulfill the new requirements and goals.



CHINA'S POLICY ARCHITECTURE ALIGNING TO COMBAT CLIMATE CHANGE



CHINA'S 14TH FYP INCLUDES AMBITIOUS GREEN DEVELOPMENT TARGETS — SUMMARY OF WASTE MANAGEMENT

Sector news April 5, 2021

The 14th five-year plan, which sets out China's vision for social and economic development of the years 2021-2025, was approved on 11th March 2021. As expected, it includes measures to tackle climate change and several green development targets, ambitious actions in the field of waste management and circular economy, for example the upgrade of environmental infrastructure and a close control of environmental impacts related to hazardous waste.



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Business

Alibaba's artificial intelligence tool to improve efficiency of China's waste-to-energy plants

- Alibaba Cloud's AI algorithm, currently deployed in 100 waste-burning facilities in 30 Chinese cities, will be installed in 300 more plants by the year-end
- China's waste-to-energy capacity, the world's largest, is growing at a compound annual growth rate of 29 per cent

Yujie Xue in Shenzhen + FOLLOW
Published: 3:30pm, 8 Apr, 2022

Why you can trust SCMP



The Gaoantun waste-to-energy plant in Beijing, China processes 580,000 tonnes of waste a day at more than 100 such plants spread across the country. Photo: Tom Wang

Alibaba Cloud is deploying artificial intelligence to make waste incineration more

PROPOSAL OVERVIEW

ANALYSIS OF THE NECESSITY

Alternative for landfills needed

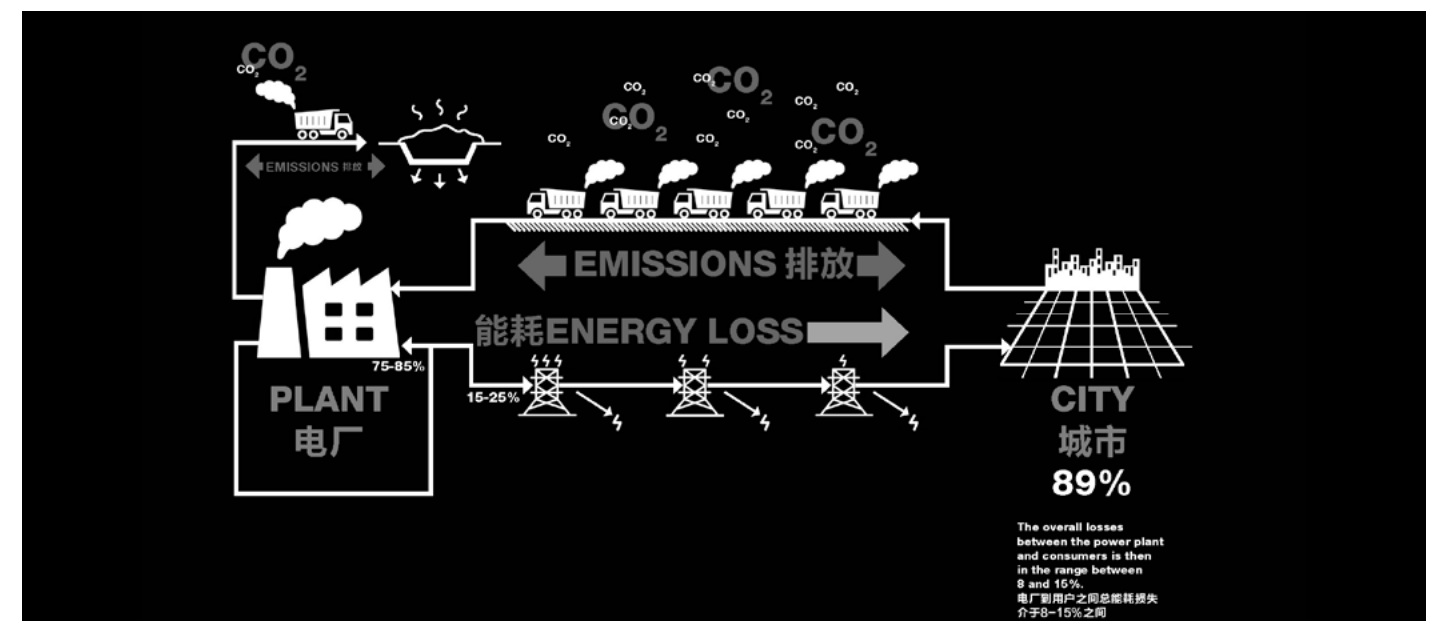
The demand for a sustainable alternative to landfills is growing rapidly. Landfills across China are reaching maximum capacity quicker than expected. In 2017, households in Beijing alone tossed out more than 9 million tonnes of garbage. About 47 per cent of which was poured into landfill sites, but these are considered bad for the environment and create odour problems. The rest of the garbage was either burned or chemically treated. And Beijing is not alone, landfill is still a major way to dispose of MSW in China. According to China's National Bureau of Statistics, 55.9 per cent of garbage collected ended up in landfills whereas 39.3 per cent of the garbage was incinerated in 2017.

Public perception of the WTE technology and NIMBY

However as this green technology is not without risks and drawbacks, the publics' general unawareness of the technology unattractive industrial aesthetics and unavoidable emissions of WTE-plants sides them with other heavy industry and makes victims of social opposition, a phenomena called NIMBY which stands for Not in My Backyard. Technology which can greatly benefit from proximity its source fuel and byproduct end user is typically pushed to the urban frindge.

WTE plants are too far away from where they are needed

Currently China is constructing more and more WTE plants. There are some of notable size and design. However, in general, these types of plants tend to be placed in the outskirts of the city. The current belief for this type of infrastructure is that the farther away the better, as property may be adversely affected, however this thinking is starting to change. The farther plants are away from urban centers, the greater the expense of operating them particularly with relation to the hauling waste, not to mention the added emissions from such trucks. European, Japanese, and Singapore plants tend to attempt innovation with the equipment itself, to save on space. While it is possible to creatively stack various components, and while it is done elsewhere, this kind of innovation is essentially nonexistent in China.



FROM LANDFILLS TO WASTE-TO-ENERGY PLANTS

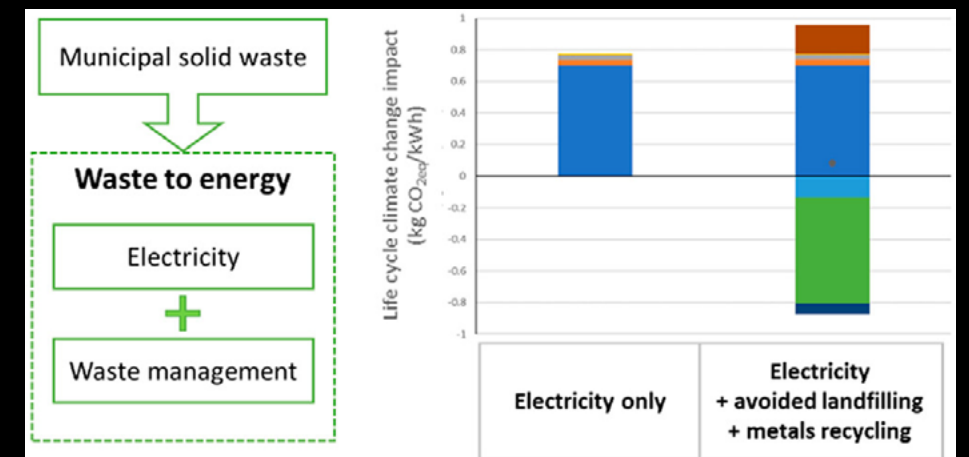
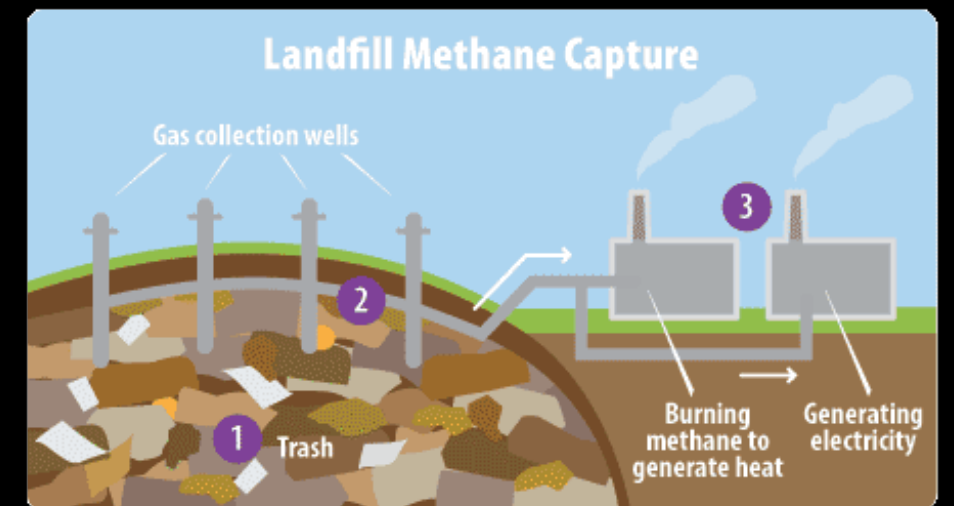
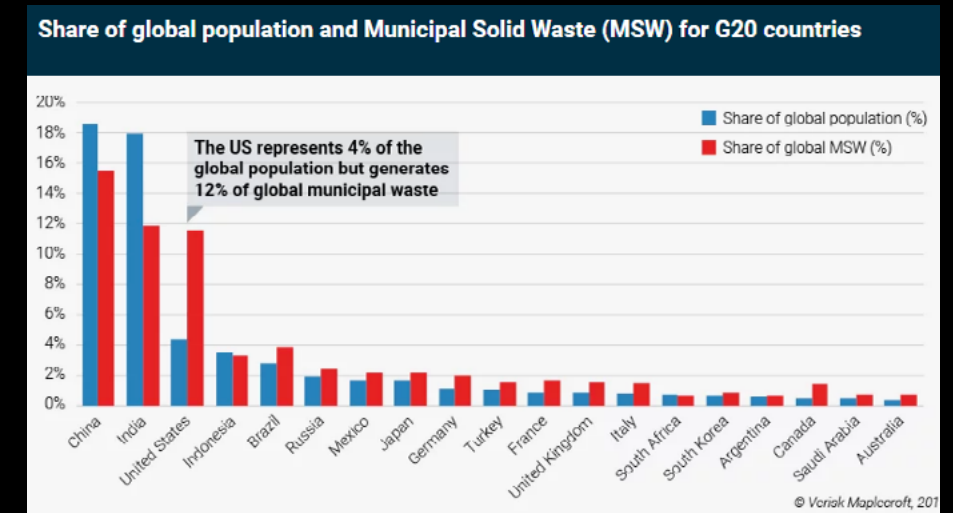
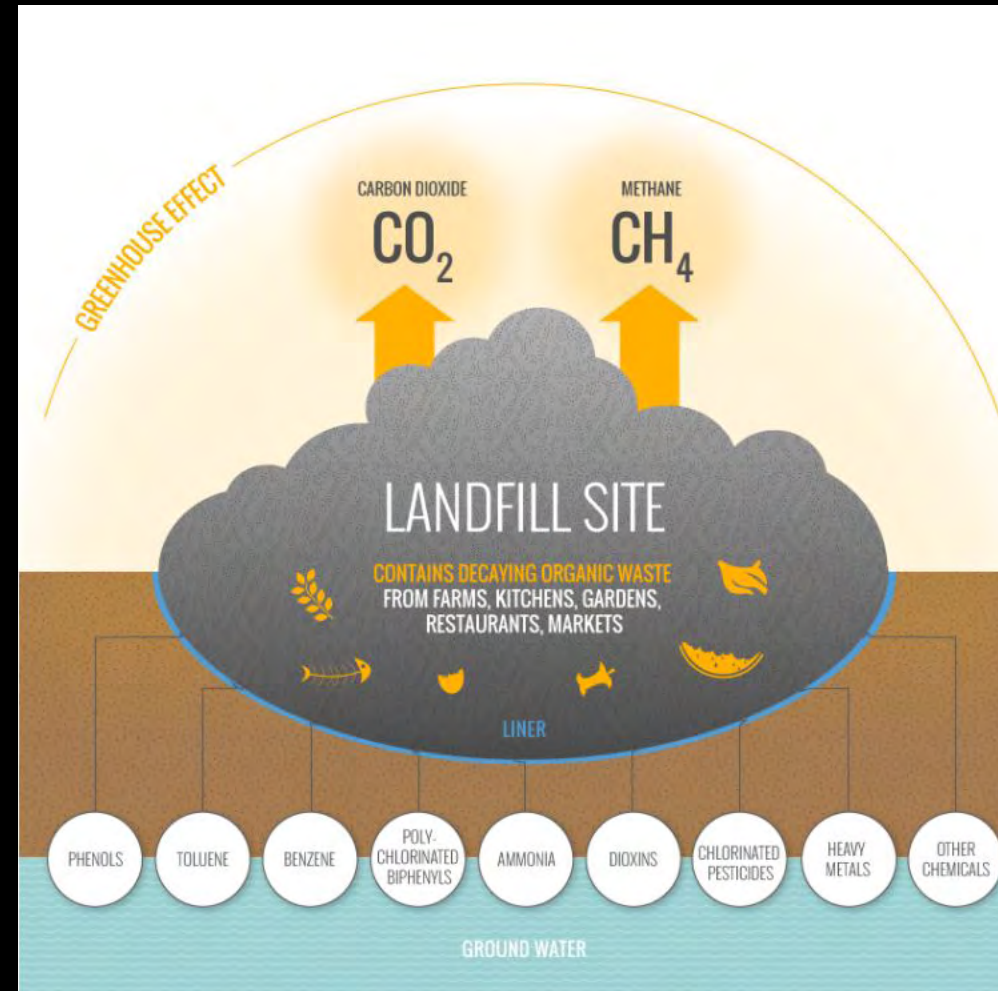
China is the world's second-largest producer of municipal solid waste (MSW). Innovation for a more effective municipal solid waste management in Chinese cities is integral to China's ability to achieve the 2060 carbon neutrality goal.

Since the 1960's the landfill has been the most widely used waste management option. As it turns out landfills are also major contributors to the increase in the greenhouse gas, methane.

Landfills are also underutilized extracted recourses. To this point, the Waste to Energy (WTE) Power Plants, provide a solution enabling us to extract potential energy from our waste as well as reduce methane emissions.



WASTE TO ENERGY PLANT



**MISPERCEPTION AND UNAWARENESS OF THE WTE TECHNOLOGY
CAUSES NIMBY AND PREVENTS THIS TYPE OF THE MUCH
NEEDED SUSTAINABLE TRANSFORMATION**



WHAT PEOPLE THINK LIVING NEXT TO WTE IS LIKE



WHAT WTE ACTUALLY IS LIKE



NIMBYism, waste incineration, and environmental governance in China

Xiaodu Huang, Dali L. Yang

First Published February 3, 2020 | Research Article | <https://doi.org/10.1177/0920203X20901432> [Check for updates](#)

[Article information](#) ▾



Abstract

With the world's largest population and rapid urbanization, China is in the throes of a waste management crisis. Efforts to cope with this crisis through waste incineration have been met with growing NIMBYism as the Chinese public become more environmentally aware and are determined to protect their health and economic interests. We review the turn to incineration and the major characteristics of NIMBYism and ensuing protests against waste incinerators. We then describe the May 2014 Jiufeng incinerator protest in Hangzhou and the subsequent efforts to successfully respond to NIMBYist protests and build the proposed incineration plant on the planned site. The Hangzhou Jiufeng case offers a model for breaking the logjam between development and NIMBYism, leading to important improvements in environmental governance and regulation.

**Exploring the “not in my backyard” effect in the
construction of waste incineration power plants -
based on a survey in metropolises of China**

Mengmeng Xu, Boqiang Lin

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<https://doi.org/10.1016/j.eiar.2020.106377>

Abstract

Waste incineration power plants have become the best option in f increasing amount of garbage in China's cities. However, construc incineration power plants will cause “not in my backyard” (NIMBY) public. To identify variables causing this effect and measure the e we designed and carried out a random survey in four metropolise 3133 questionnaires distributed, 3066 are thought to be effective. I with higher educational levels, or with higher income, or having u children in their families, or thinking their neighborhoods are up willing to pay more to avoid the construction of waste incineratio their surroundings than others. In addition, provided that the res that the construction of waste incineration power plants would have an impact on their lives, they are willing to pay more no matter they own their departments or not. Finally, the estimated willingness to pay (WTP) to avoid the waste incineration power plants is 105 yuan to 133 yuan per month. Hence, **the government should treat the NIMBY syndrome well in the construction of waste incineration power plants, with WTP being one perspective to persuade the public.**

Bloomberg Businessweek

June 21, 2014, 2:04 AM GMT+8

**A New Front Line for China's
NIMBY Environmental
Movement: Waste
Incinerators**

Christina Larson

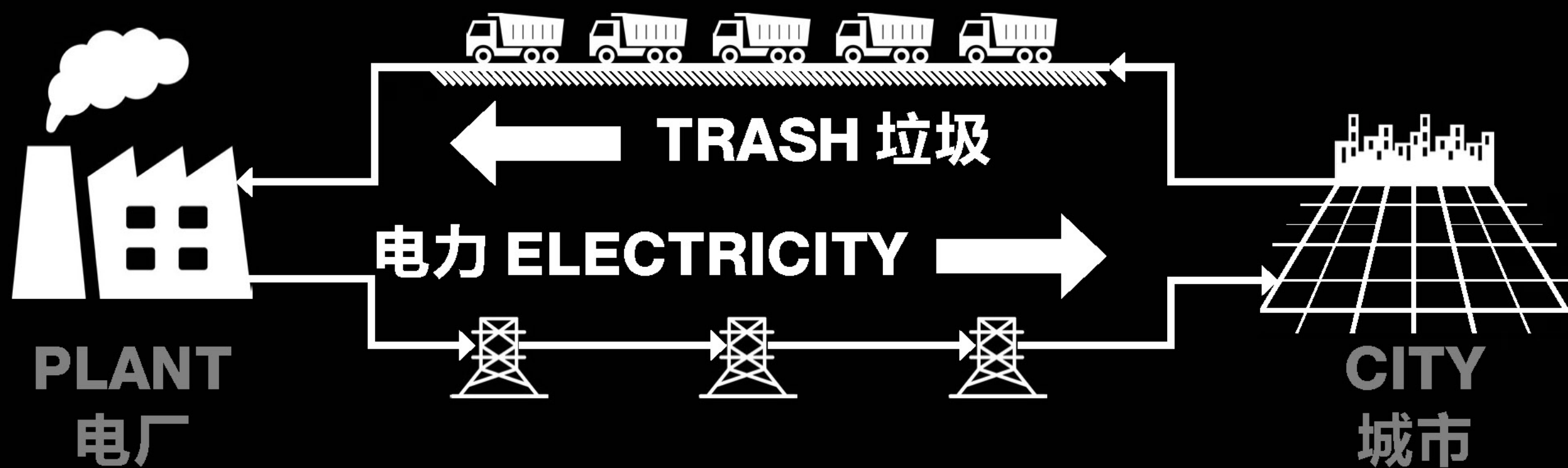


▲ Chinese police with shields during a protest against the construction of a waste incinerator in Yuhang district, Hangzhou in China's Zhejiang province on May 11. PHOTOGRAPH BY HOUJIAN PHOTO

THE CURRENT STATE OF WTE PLANTS IN CHINA
AND CHALLENGES



WTE CYCLE - CURRENT SCHEME
WTE PLANT FAR OUT OF CITY
垃圾发电循环-目前方案
垃圾发电厂远离城市

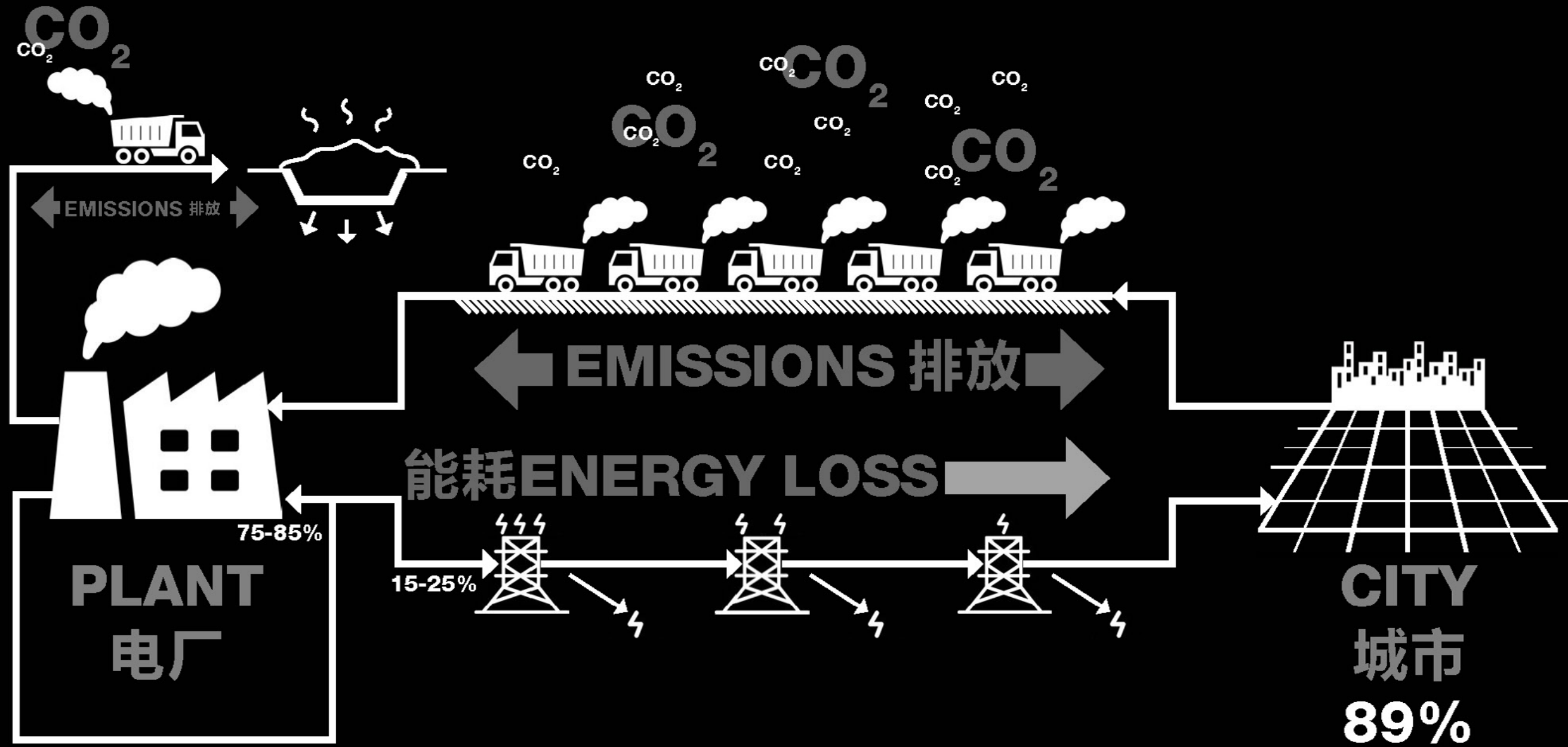


WTE CYCLE - NEGATIVE SIDE EFFECTS

EMISSIONS - ENERGY LOSS

垃圾发电循环-负面影响

排放 - 能耗



The overall losses between the power plant and consumers is then in the range between 8 and 15%.

电厂到用户之间总能耗损失介于8-15%之间

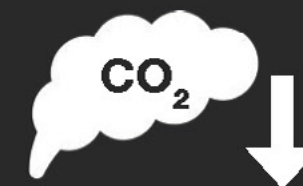


network approach
网络方式

For northern regions, it is possible to utilize the heat created for municipal heating, which will help to reduce the reliance on natural gas powered municipal heat plants.

对于北部地区，可以将产生的热量用于市政供热，这将有助于减少对天然气供热的市政热电厂的依赖。

LESS CO₂
更少二氧化碳



LOWER COSTS
更低投入



HIGHER
SECURITY
更高安全



PRECEDENTS OF INNOVATIVE WASTE TREATMENT SOLUTIONS

WITHIN THE CITY CORE

LEFT
COPENHAGEN POWER
PLANT
BIG ARCHITECTS

NEWTOWN CREEK, NY
WASTEWATER TREATMENT
PLANT ENNEAD ARCHITECTS



FAR OUT THE CITY CORE

SHENZHEN
WORLD LARGEST
WTE PLANT

SCHMIDT HAMMER
LASSEN ARCHITECTS
AND GOTTLIEB
PALUDAN ARCHITECTS



PROPOSAL OVERVIEW

ANALYSIS OF THE NECESSITY

Design to the rescue of green technology

Introducing the camouflage approach in order to integrate the WTE into the city core.

Specific problems to be solved

1. *Shift the public perception of the waste management technologies such as the WTE-plants by using innovative design*

For the green technology such as the WTE plants to realize its potential impact to the fullest, it needs to be accepted by the general audiences and freed from the negative stereotype and judgements as bad, ugly, smelly and dangerous. Even the smallest possible WTE plant will be a size of a multistory building, therefore of all design realms, the landscape design thinking provides the widest range of design solutions that can help make the WTE technology people friendly and seamlessly integrate it into the public life of modern cities and their residents.

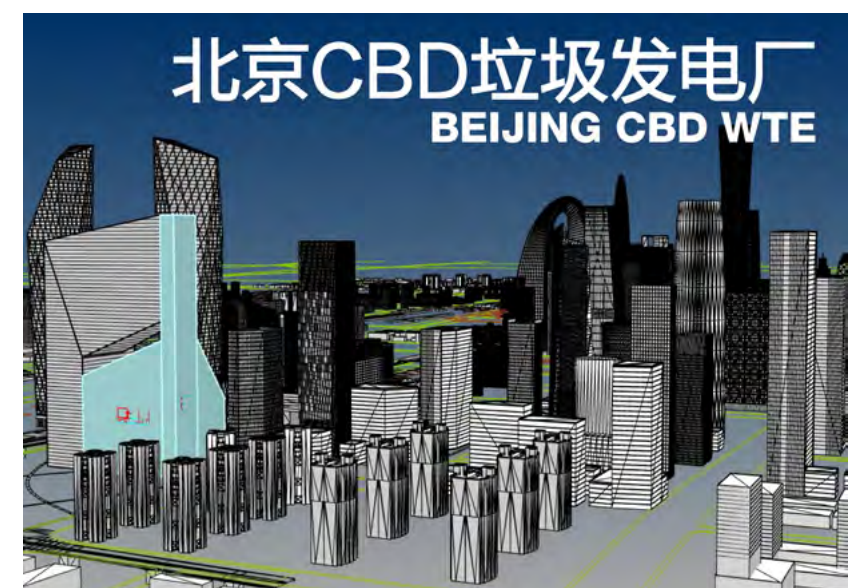
2. *Move the WTE into the city cores*

The farther plants are away from urban centers, the greater the expense of operating, particularly with relation to the hauling waste, not to mention the added emissions from trucks. European, Japanese, and Singapore plants tend to attempt innovation with the equipment itself, to save on space, making it possible to place smaller plants closer to the city core. This is essentially non-existent in China.

3. *'Camouflage' the WTE and move away from the decorated shed paradigm*

BAM committed to creating a facility more akin to a landscape or entertainment district which can potentially normalize the idea of locating waste-related infrastructure within the urban center. To do so BAM uses the camouflage approach, using landscape, architecture and programming to safely conceal the WTE infrastructure, develop new functions and user value and to change the publics perception of the WTE through new narratives.

BAM's proposal for WTE Camouflage attempts to move away from the highly prevalent 'deco-rated shed' paradigm, whereby unwanted infrastructure is embellished with a fanciful shell. By understanding that in the future these types of facilities may need to be directly integrated into highly populated urban cores, BAM seeks to find ways to experiment with ideas in which these types of facilities are also viewed as more than infrastructure, but as urban amenities.



A young owl is perched on a tree trunk, its mottled grey and white feathers blending perfectly with the rough bark. The owl's large, yellow eyes are looking directly at the camera. The background is a dense forest with green foliage and tree branches.

伪装

CAMOUFLAGE

In recent years BAM has developed and has experimented with the “Camouflage approach” in several projects to attempt to normalize the idea of locating waste-related infrastructure within the urban center.

To do so BAM experimented with landscape thinking, architecture language, educational leisure and entertainment programming to conceal the WTE infrastructure, develop new functions and user value and change the public’s perception of such facilities through new narratives.

伪装的 三种方法

THREE METHODS OF
CAMOFLAGE USED

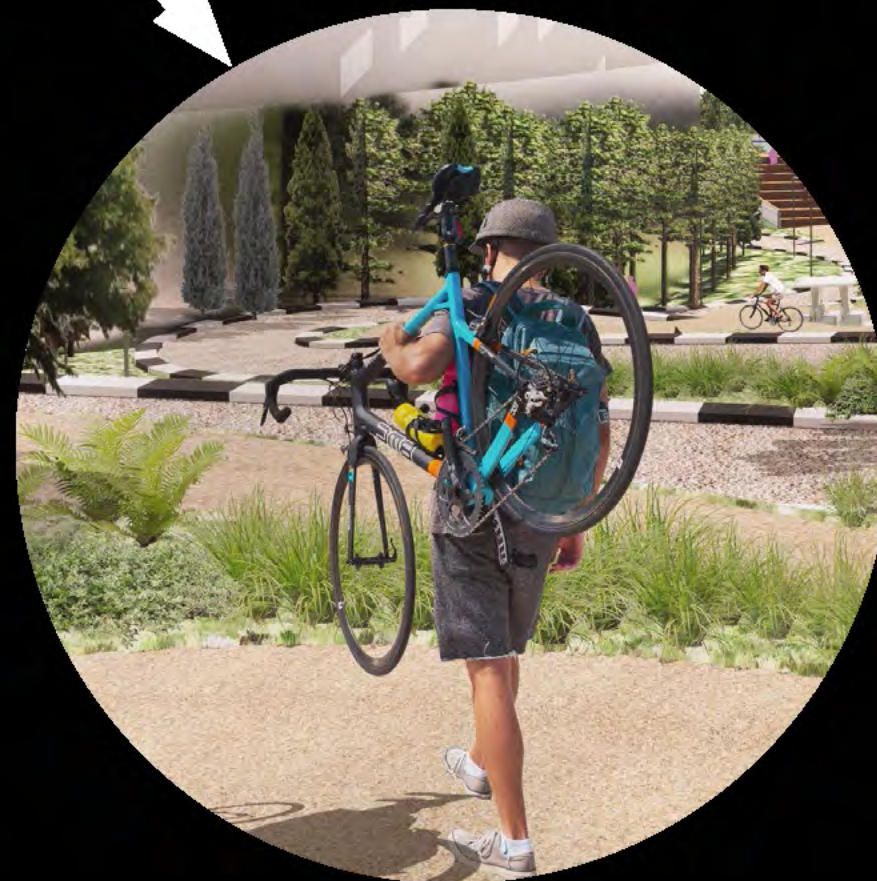
景观
LANDSCAPE



现状场地
EXISTING SITE



活动
ACTIVITIES



EXAMPLES CAMOUFLAGE APPROACH BAOSHAN WTE

CLIMATE POSITIVE DESIGN

气候积极设计

Through AFFORESTATION as well as other landscape methods the project will work to achieve a climate positive design.

通过植树造林和其他景观方法，该项目将致力于实现气候积极方向设计。



LAND USE AFFORESTATION

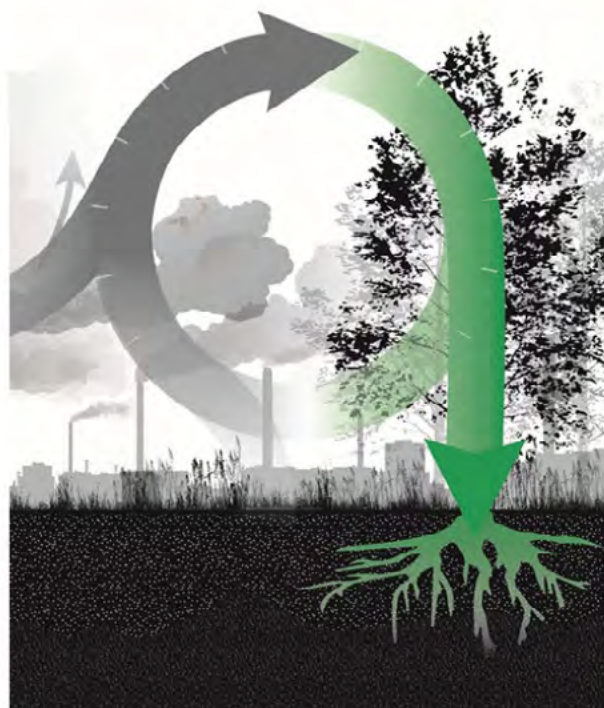
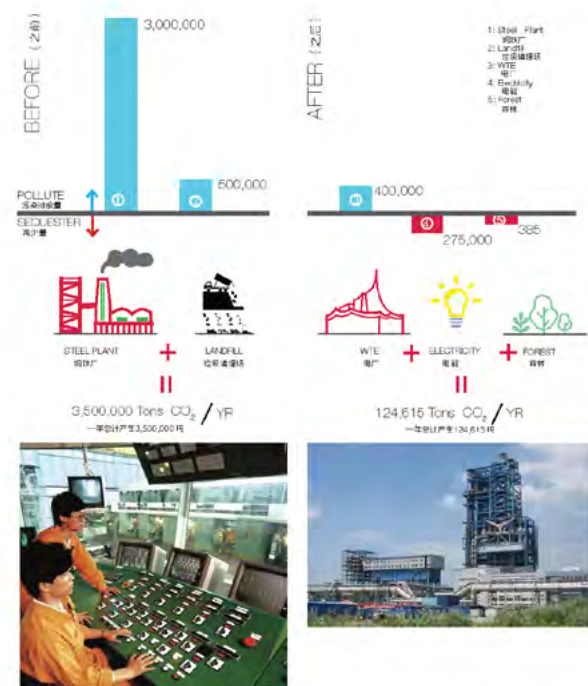
The capacity of trees to synthesize and sequester carbon through photosynthesis as they grow has made afforestation an important practice in the age of warning. Creating new forests where there were none before in areas that have been treeless for at least fifty years is the aim of afforestation. Degraded pasture and agricultural lands, or other lands severely corrupted from uses such as mining, are ripe for strategic planting of trees and perennial biomass. So are eroding slopes, industrial properties, abandoned lots, highway medians, and wastelands of all stripes—almost any space that is understated or forgotten can help draw down atmospheric carbon.

The most successful afforestation projects are those that plant native trees. Replanting, however, can take a variety of forms—from sowing diverse plots of diverse indigenous species to introducing a single exotic as a plantation crop, such as the fast-growing Monterey pine, the most widely planted tree in the world. Whatever the structure, they all function as carbon sinks, drawing in and holding on to carbon, and distributing carbon

into the soil. How much carbon is sequestered annually depends on the details of species, site, soil conditions, and structure.

A recent paper out of the University of Oxford makes a conservative estimate that afforestation could draw down one to three gigatons of carbon dioxide per year in 2030. Global availability of land is a key variable and one that is difficult to predict, affected by factors ranging from population and diet to crop yields and bioenergy demands. While afforestation projects have significant carbon sequestration potential, forests, new or old, are vulnerable to fire, drought, pests, and the axe or saw.

To date, plantations comprise the majority of afforestation projects and are on the rise globally, planting trees for timber and fiber and, increasingly, selling carbon offsets as well. (While plantation forestry makes up just 7 percent of total forest cover, it generates roughly 60 percent of commercial wood.) Plantations have been and remain controversial because they are often created with purely economic motives and little regard for the long-term well-being of the land, environment, or surrounding



PRESENTATION OF SOLUTIONS

PROPOSED INITIATIVE

DESIGN DEVELOPMENT FOR BEIJING CBD WASTE TO ENERGY POWER PLANT

The concept of WTE Camouflage is not something that we've thought of overnight. It is a result of commissioned design work on the Baoshan WTE project in Shanghai and self-initiated re-search work done in close collaboration with leading experts over the past 3 years.

Building off our experience with design and construction of the Baoshan WTE project, BAM initiated a study to explore the restructuring of such traditional largescale WTE plants, to make them suitable for integration into the high-density urban cores of the Chinese City. In this study BAM took a theoretical model of a stacked WTE plant, compacted to fit the urban environment of Manhattan, and scaled this model up to fit the standards of Chinese WTE. This new model was placed into the context of Beijing CBD, in the western half of Chaoyang district, an area which is lacking large-scale trash management facilities.

In the past BAM has worked with the Beijing CBD commission advising on future sustainable planning for the district. If granted funding and support BAM aspires to work closer with the governing bodies of the district in order to do further feasibility studies and develop our initial concept into a more detailed and realistic prototype.

This prototype would be a first one in its kind in China, and would serve not only for the purpose of furthering research on this topic, but more importantly together with other precedents, such as the Baoshan WTE project, the developed concept and narrative could be used to shape a new positive image for the integration of WTE technologies in the cities, amongst the general audience as well as the relevant governing bodies in charge of sustainable development not only in Beijing but also other major cities in China.

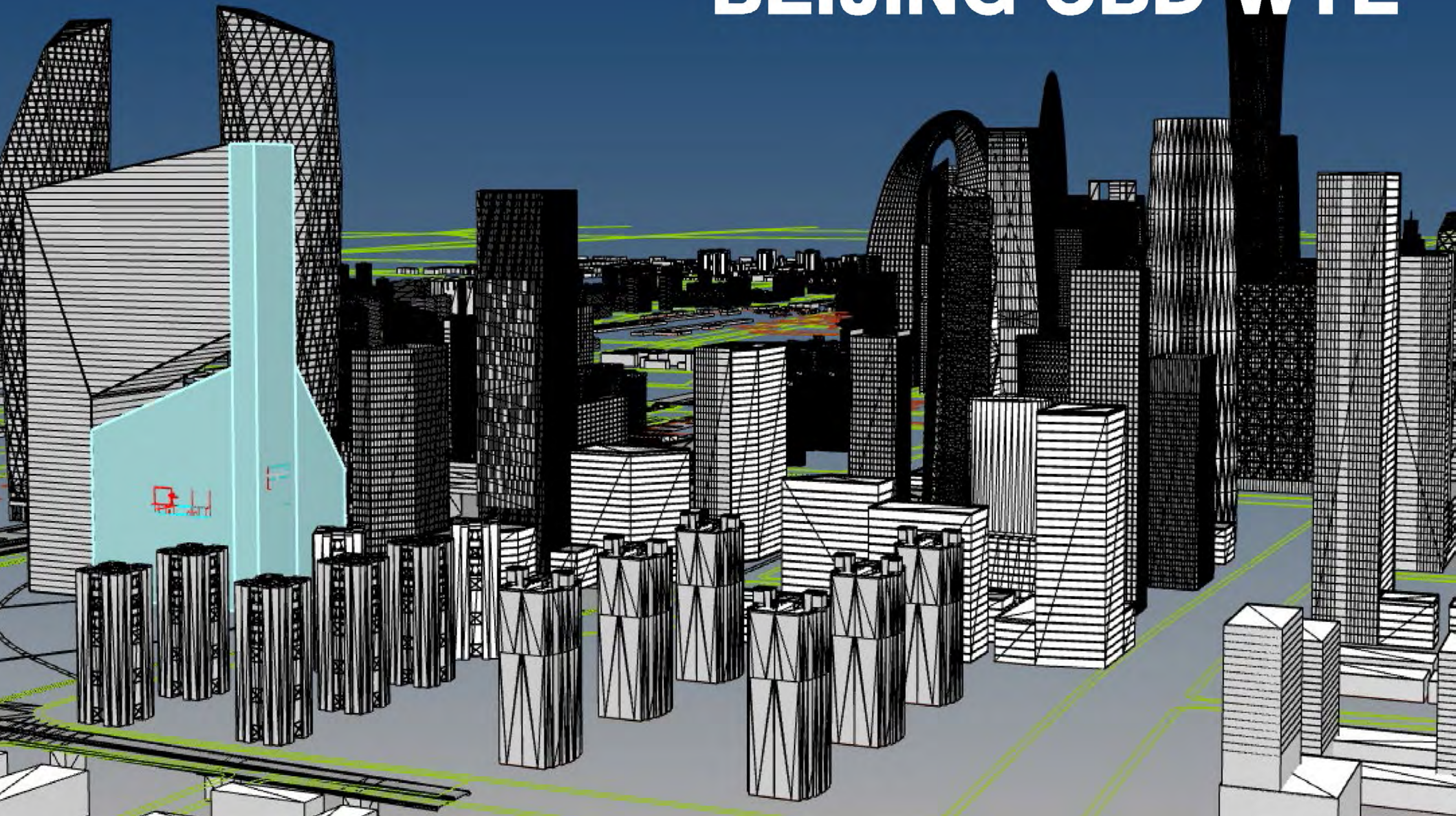
Ultimately the outcome of this proposal will bring greater awareness to the role landscape can play in infrastructure projects, so that they can be more acceptable to the general public.

OUR INTENTION WITH THE WISE DEMO CAMPAIGN IS TO DEVELOP THIS PROTOTYPE BY ADRESSING POLICY IMPLEMENTATION CHALLENGES, AND DEVELOPING A MORE DETAILED TECHNICAL MODEL



北京CBD垃圾发电厂

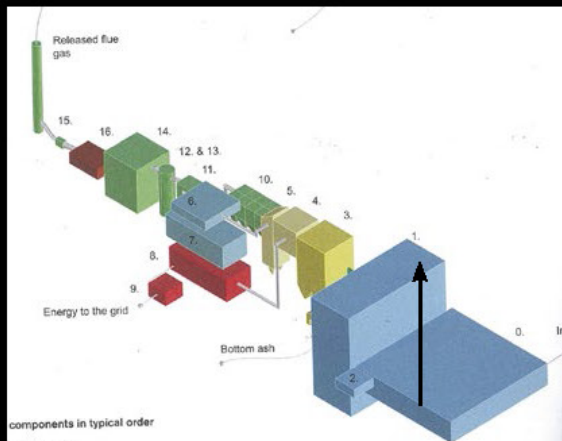
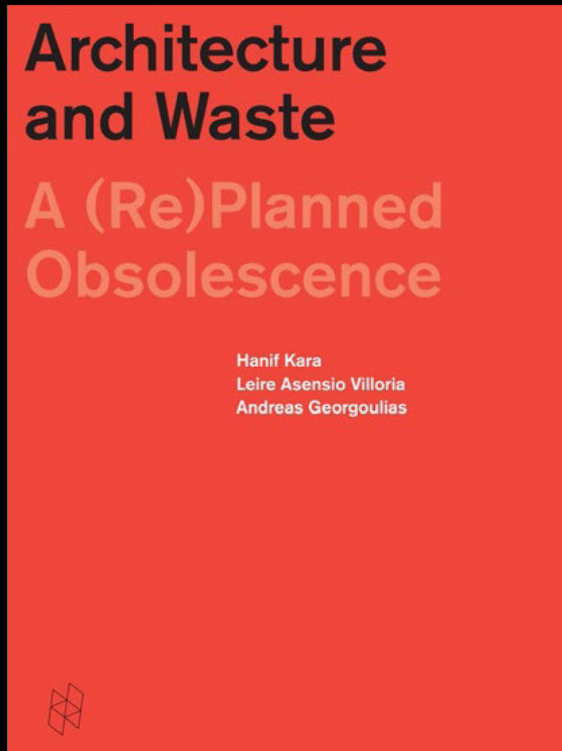
BEIJING CBD WTE



Restructuring Waste-to-Energy (WTE) Infrastructure for the Chinese City

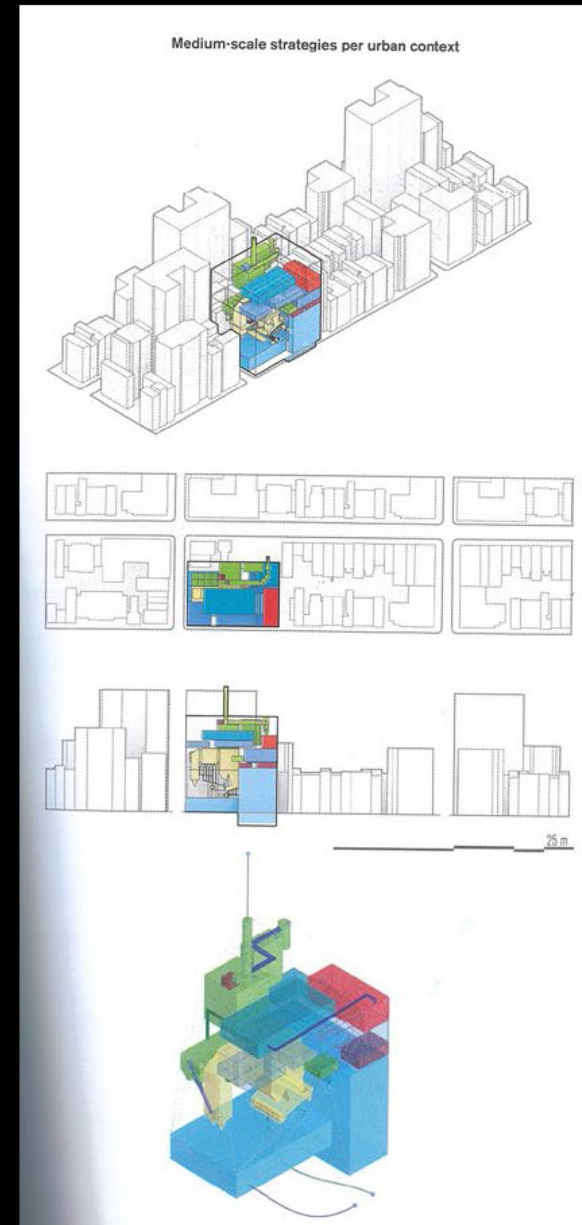
This project aims to explore the restructuring of traditional waste-to-energy (WTE) plants in order for better integration into urban contexts.

Starting Point



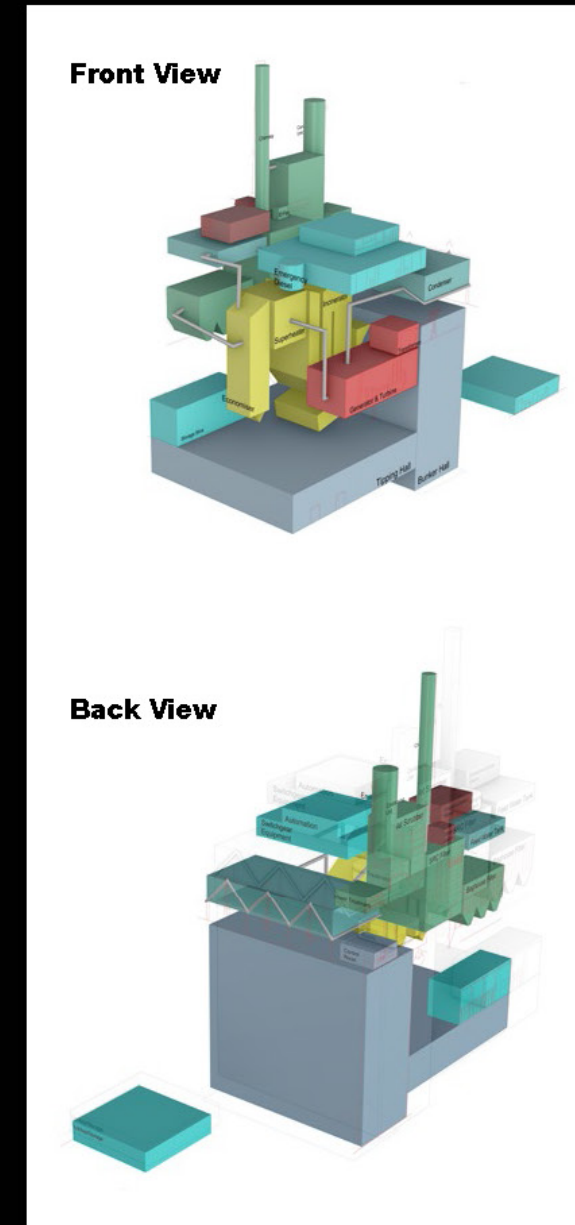
(A) Model of a traditional, single-line incineration WTE plant featured in the book

Theoretical model



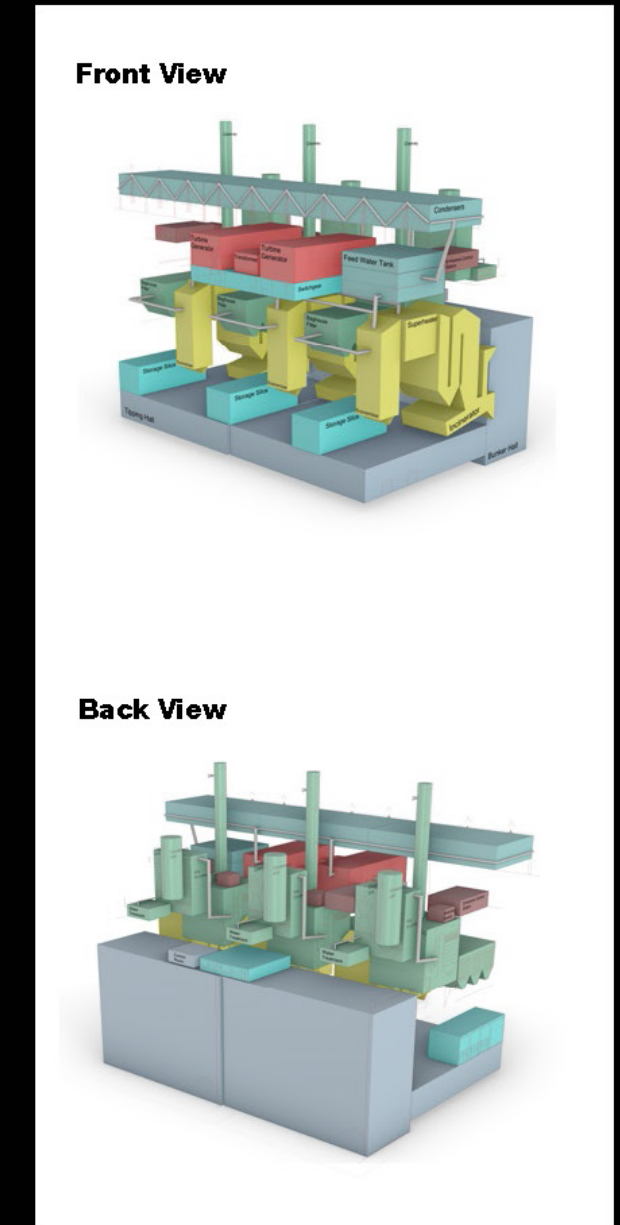
(B) Model of "stacked" WTE plant, compacted to fit the urban layout of Manhattan, New York (population density: 27,562/sq.km)

Stacked model 1 line plant



(C) Recreation of "stacked" model in Rhino, with minor adjustments and stricter adherence to spatial constraints

Stacked model 3 line plant



(D) Stacked model scaled up to include three incineration lines and two turbines

Approximate size
of stacked, 3-line
WTE plant

120m

70m

Chaoyang District, Beijing

Population: 3,545,000

Approx. trash generation: 4699.674 tons/day



Xiaoguan Subdistrict

Population: 61,966

Density: 24017

Trash consumption: 84.35
tons/day



Panjiayuan Subdistrict

Population: 100,272

Density: 23319

Trash consumption: 136.49
tons/day



Balizhuang Subdistrict

Population: 98,084

Density: 22291

Trash consumption: 133.51
tons/day



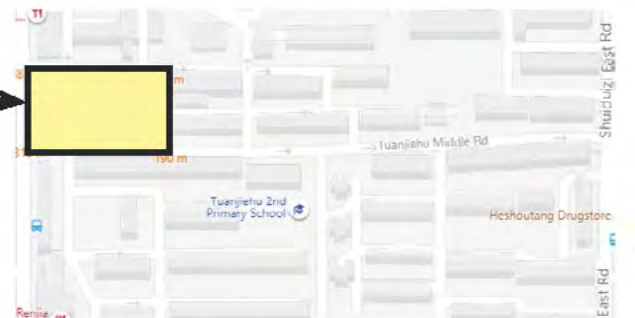
Chaoyang Xunhuan
Economy Industrial
Park



Gao'antun Waste
Incineration
Power Plant
Treatment Capacity:
1600 tons/day



Gao'antun Waste
Sanitary
Landfill Site
Treatment Capacity:
1000 tons/day

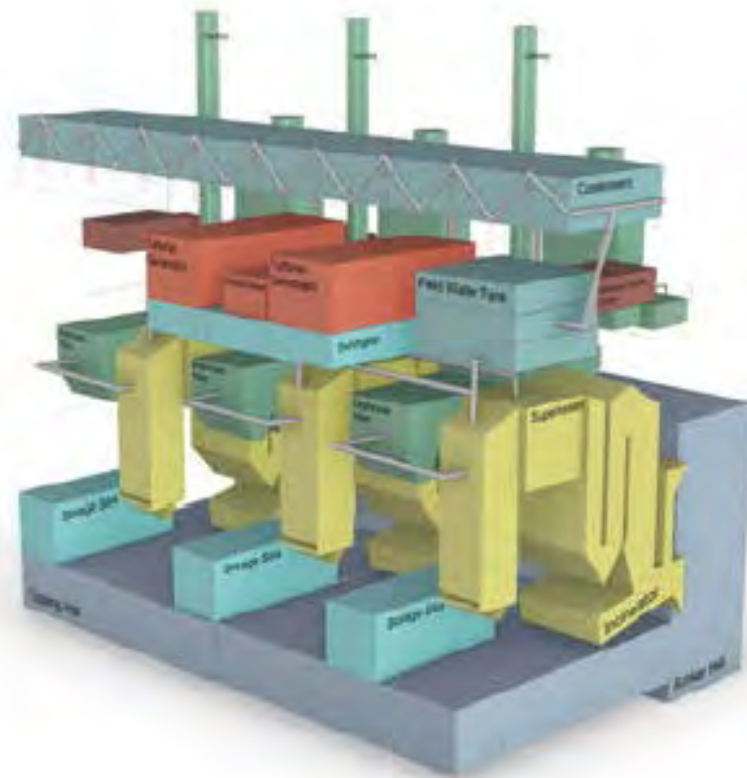


Tuanjiehu Subdistrict

Population: 32,091

Density: 26,090

Trash consumption: 40.68
tons/day



Stacked 3-line WTE plant prototype

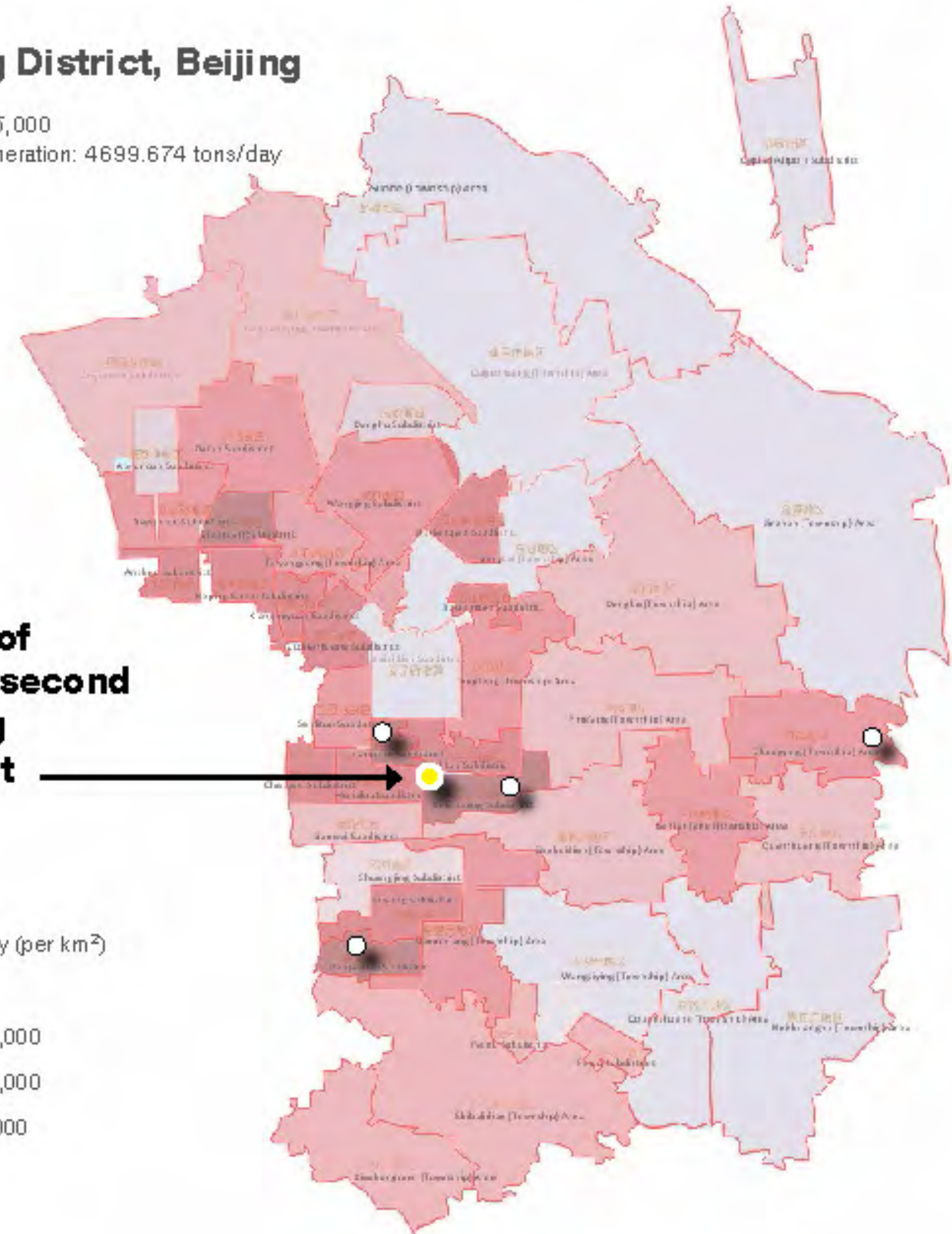
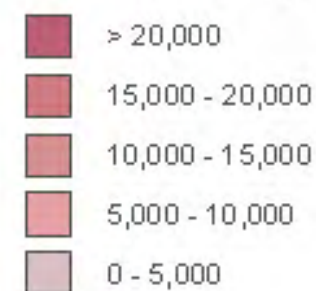
Chaoyang District, Beijing

Population: 3,545,000

Approx. trash generation: 4699.674 tons/day

Location of potential second Chaoyang WTE Plant

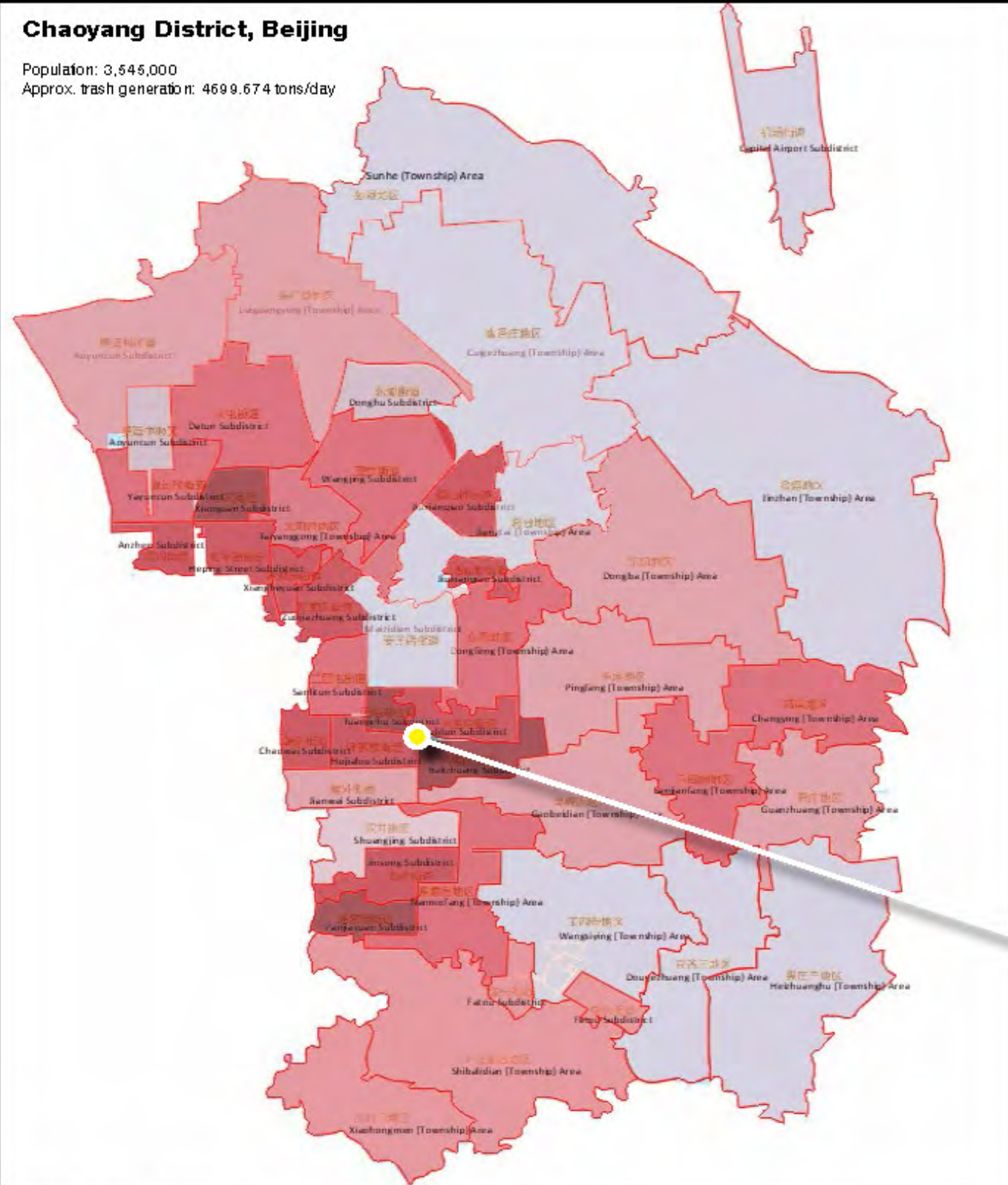
Population Density (per km²)



Chaoyang District, Beijing

Population: 3,545,000

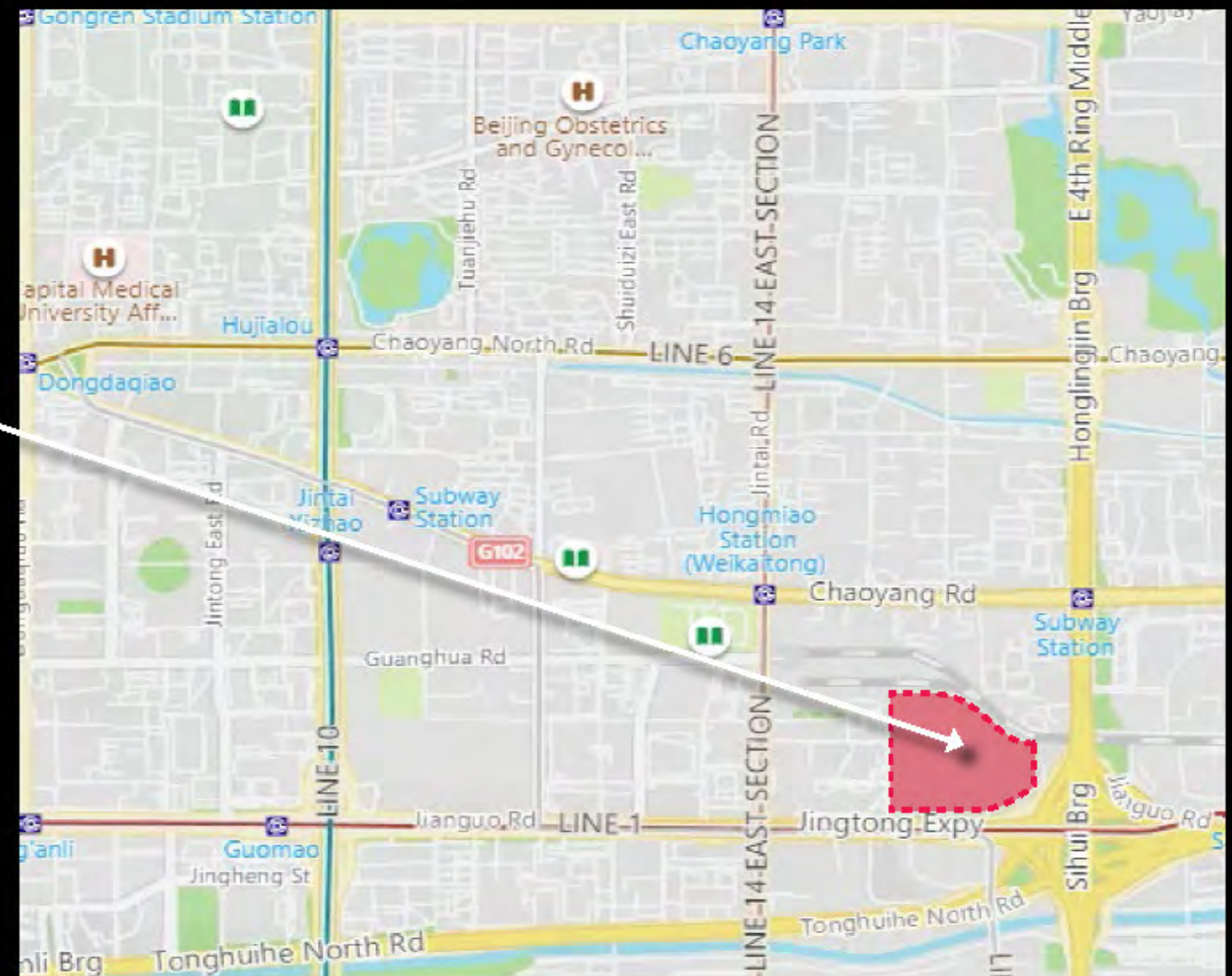
Approx. trash generation: 4699.674 tons/day

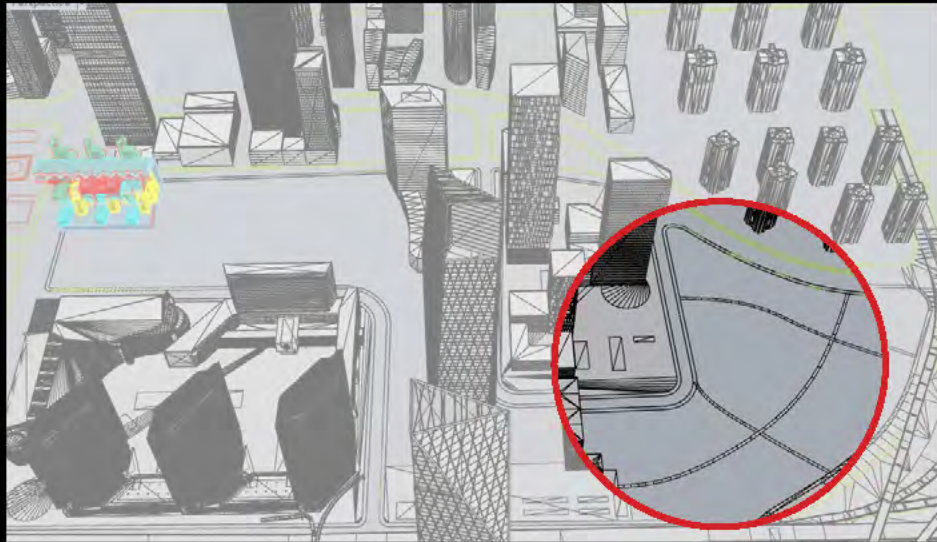


Location: Eastern CBD Area

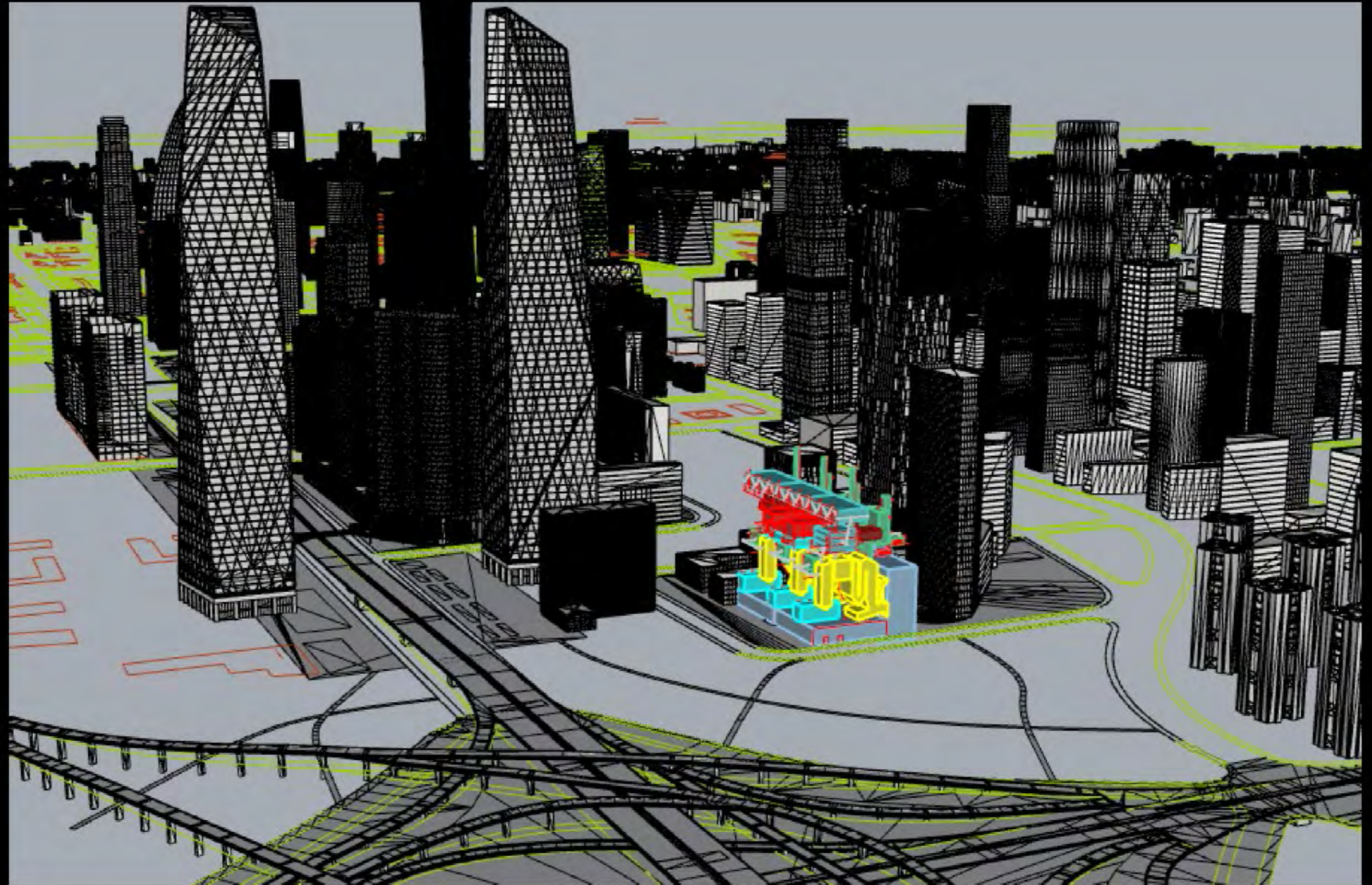
Advantages:

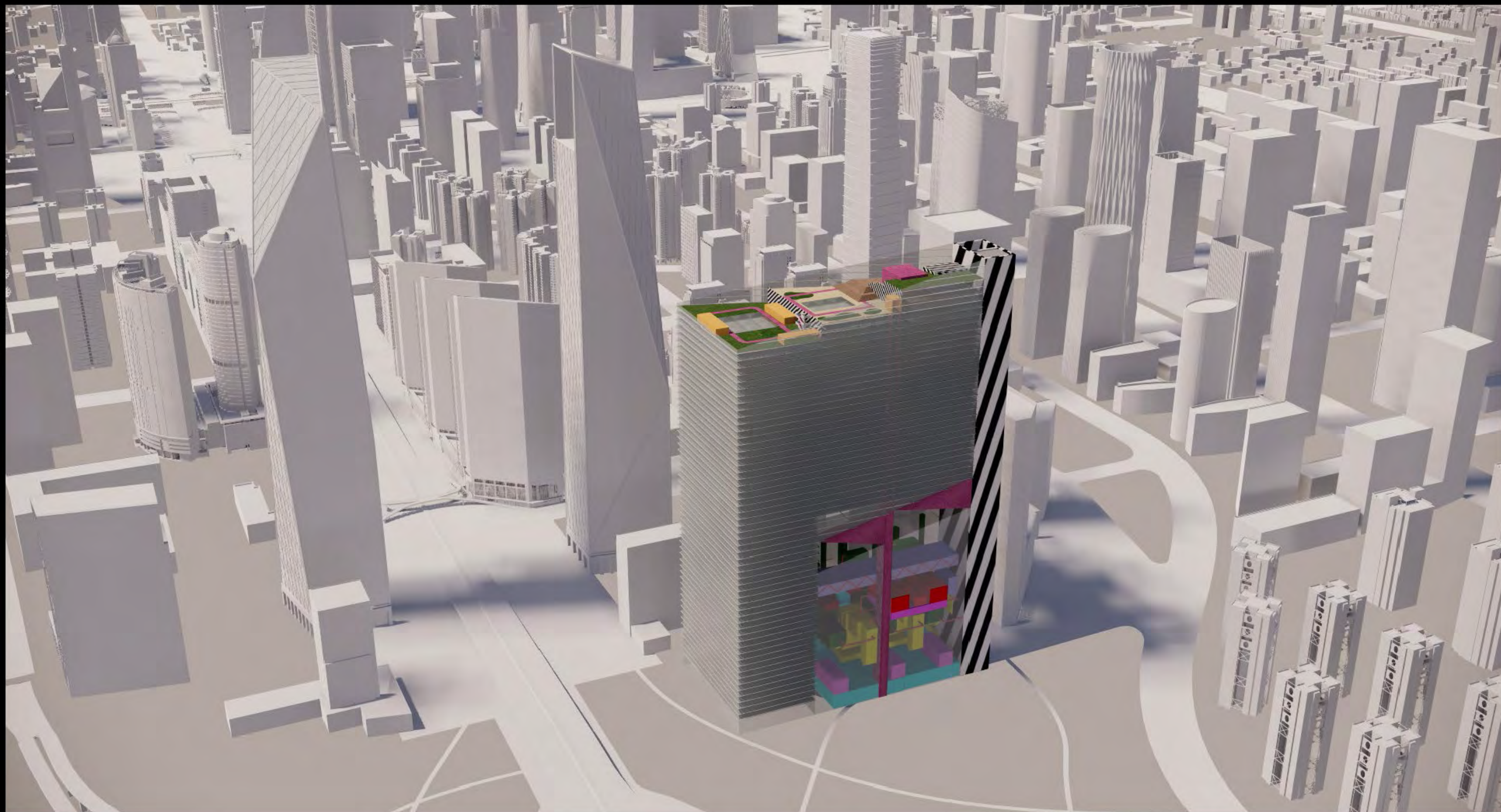
- Central location, and conveniently located between two subdistricts with the highest population density
- Located on the western half of Chaoyang, in an area lacking large-scale trash management facilities
- Contains the site of a former plant





Rhino model of the east side of CBD is shown, including relative size of our stacked WTE model and the location of the former plant, which could serve as a potential location for the stacked plant







PRESENTATION OF SOLUTIONS

CONCEPT PROTOTYPE DESCRIPTION

BEIJING CBD WTE

Our proposal for a WTE in Beijing CBD is the next step in this evolving research. Beijing CBD Waste to Energy Power Plant is a theoretical proposal to create a stacked model of a WTE Plant that can be placed into the dense urban cores such as the Beijing CBD.

This idea is based study and publication done by the Graduate school of Design at Harvard University, where the WTE plant was 'stacked' and reconfigured, making it possible to integrate into the urban context as a building.

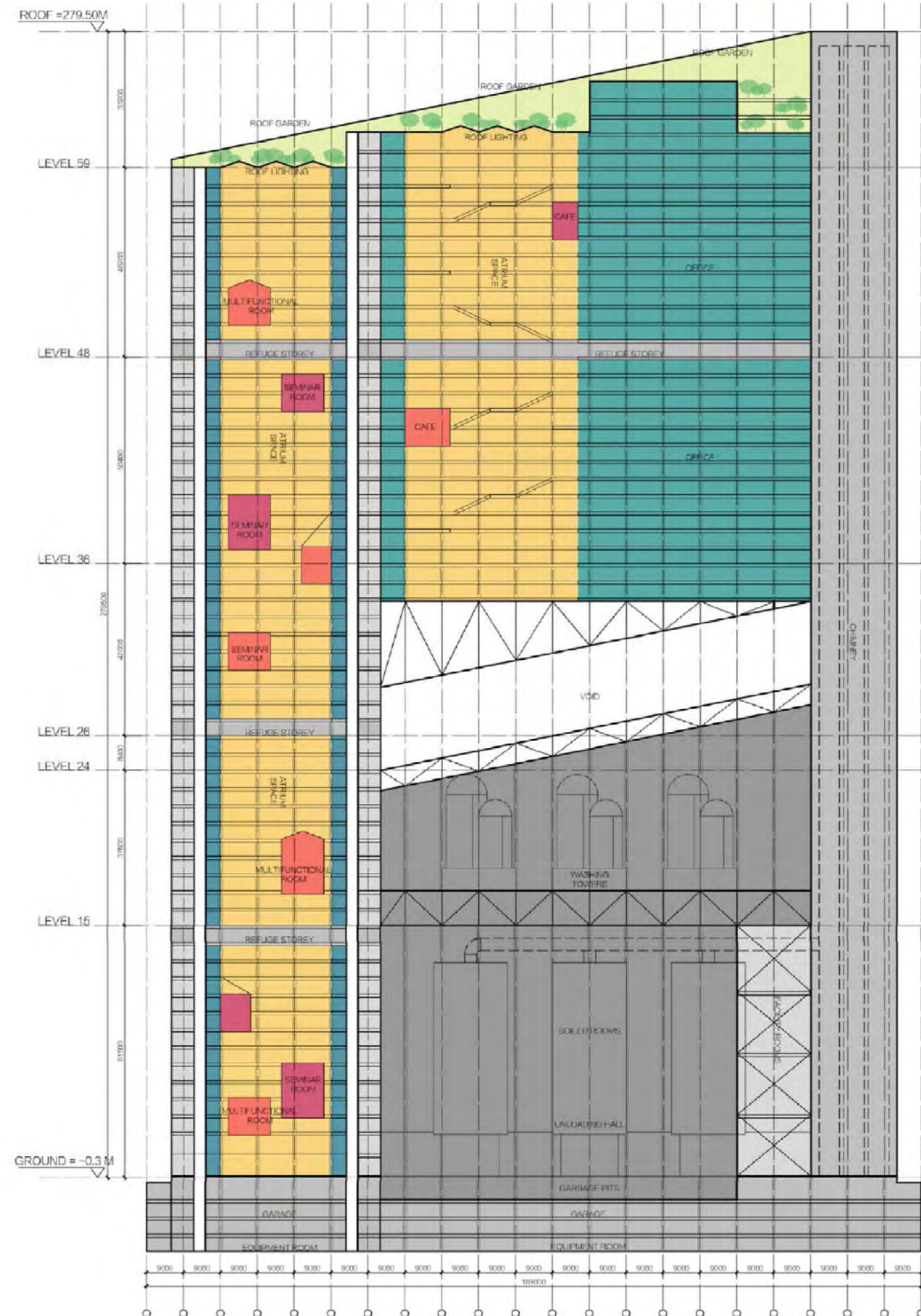
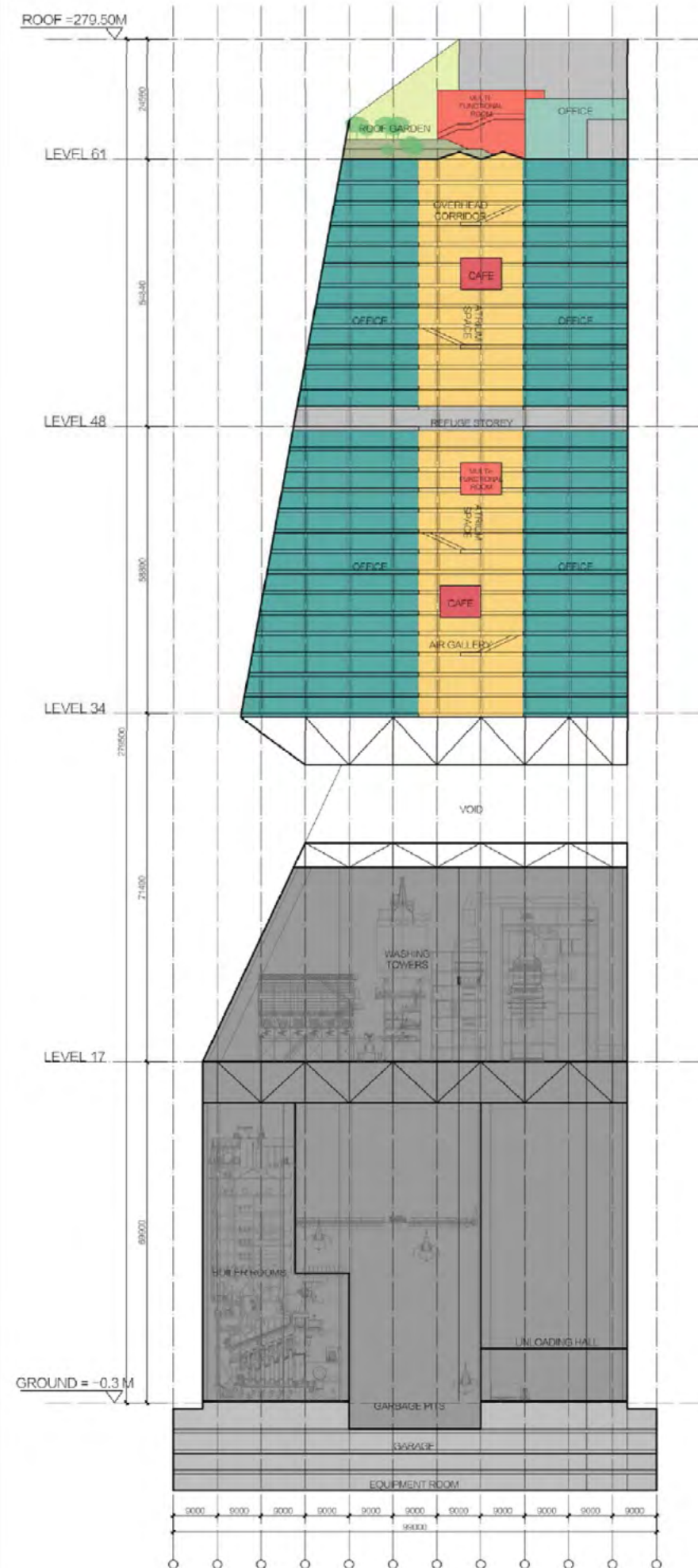
In BAM's preliminary research we emulated the research undertaken by the Harvard GSD. BAM selected the model developed for Manhattan an urban lay out similar to Beijing with a population density of 27,562/sq.km.

Utilizing our past experience with designing and building a real WTE plant we examined the feasibility of this theoretical stacked model and made minor adjustments with stricter adherence to safety related spatial parameters. Then we developed a new prototype by scaling up the model to include three incineration lines and two turbines, the smallest type of WTE that would be feasible in a Chinese city according to widely accepted waste management methodologies in China.

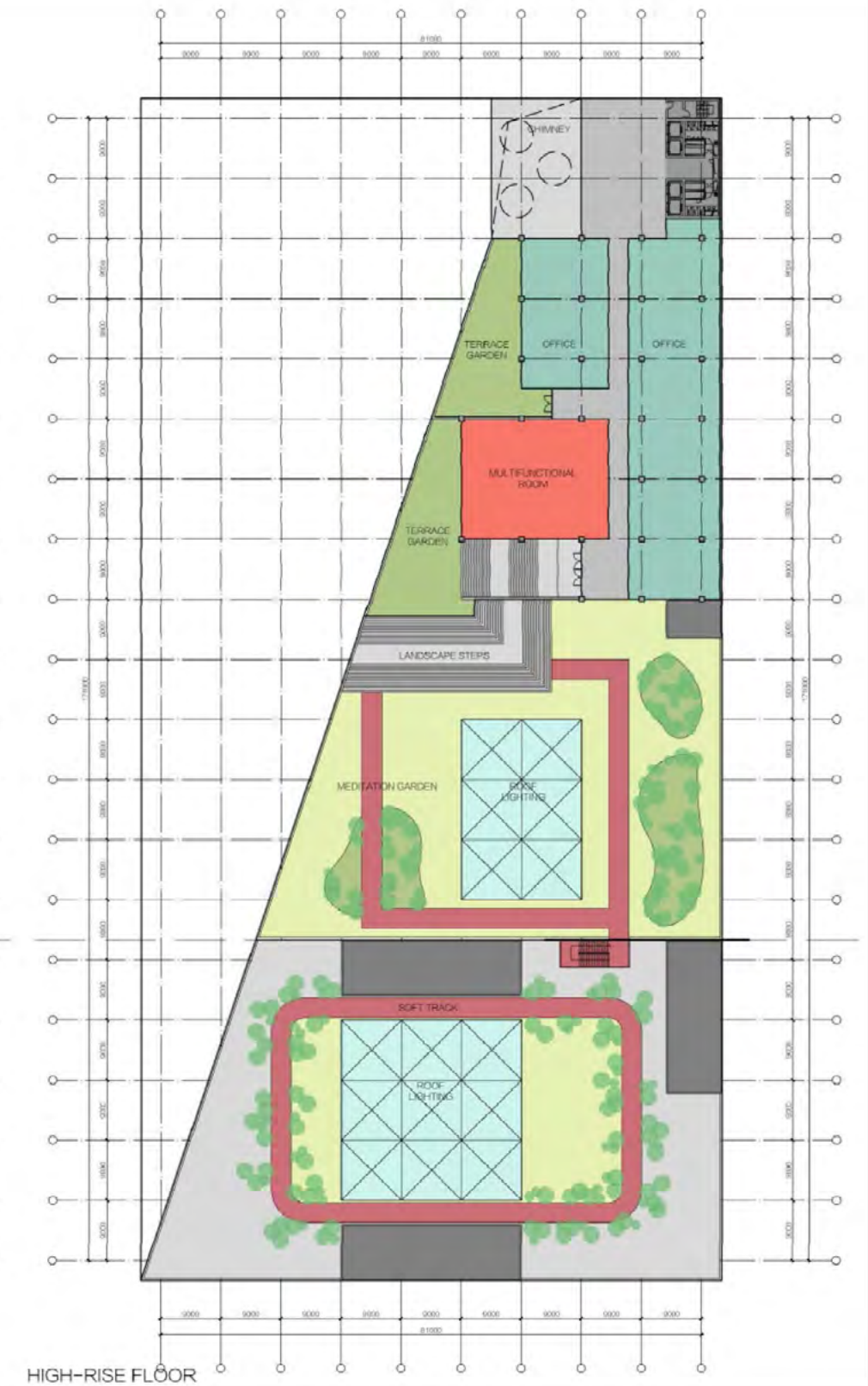
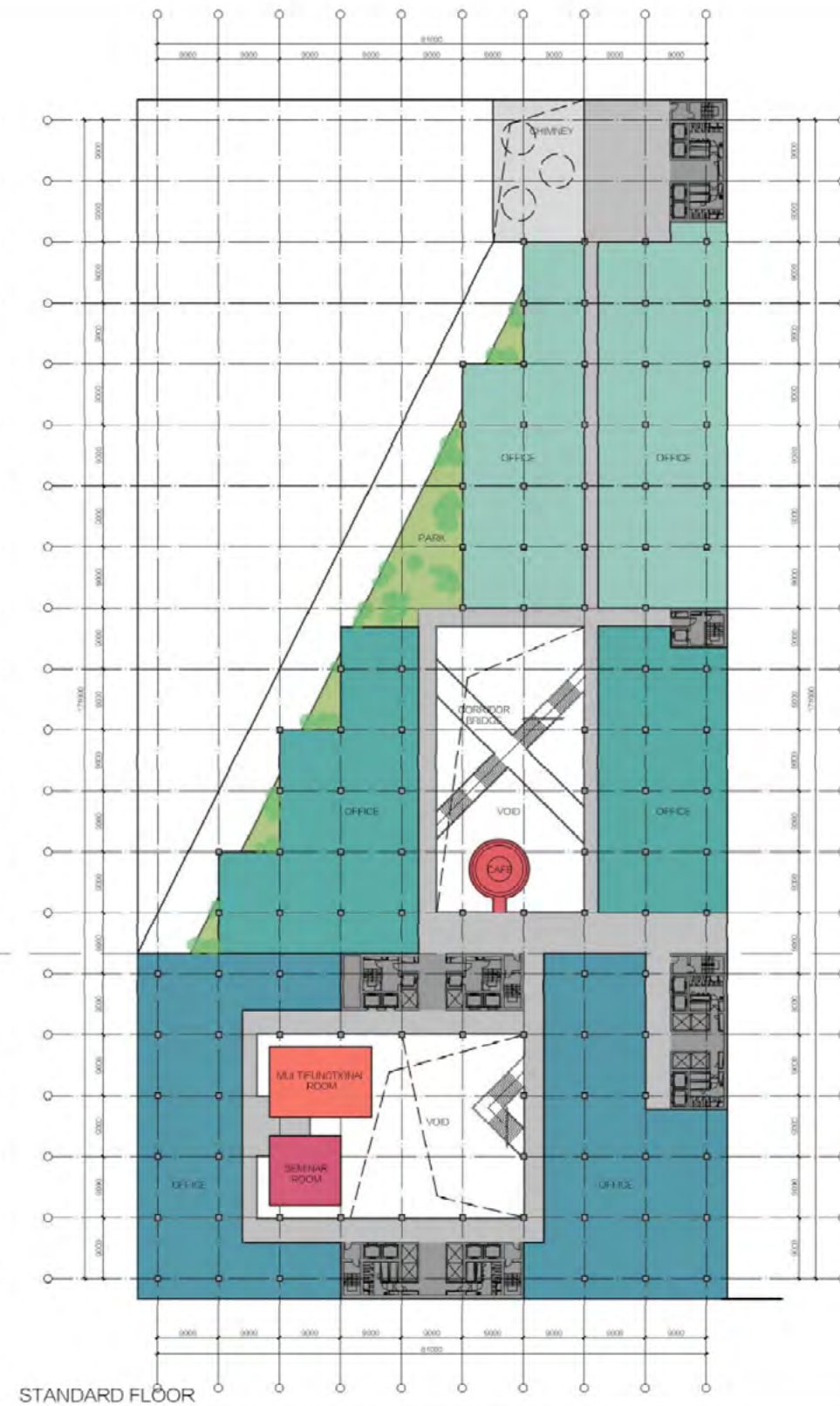
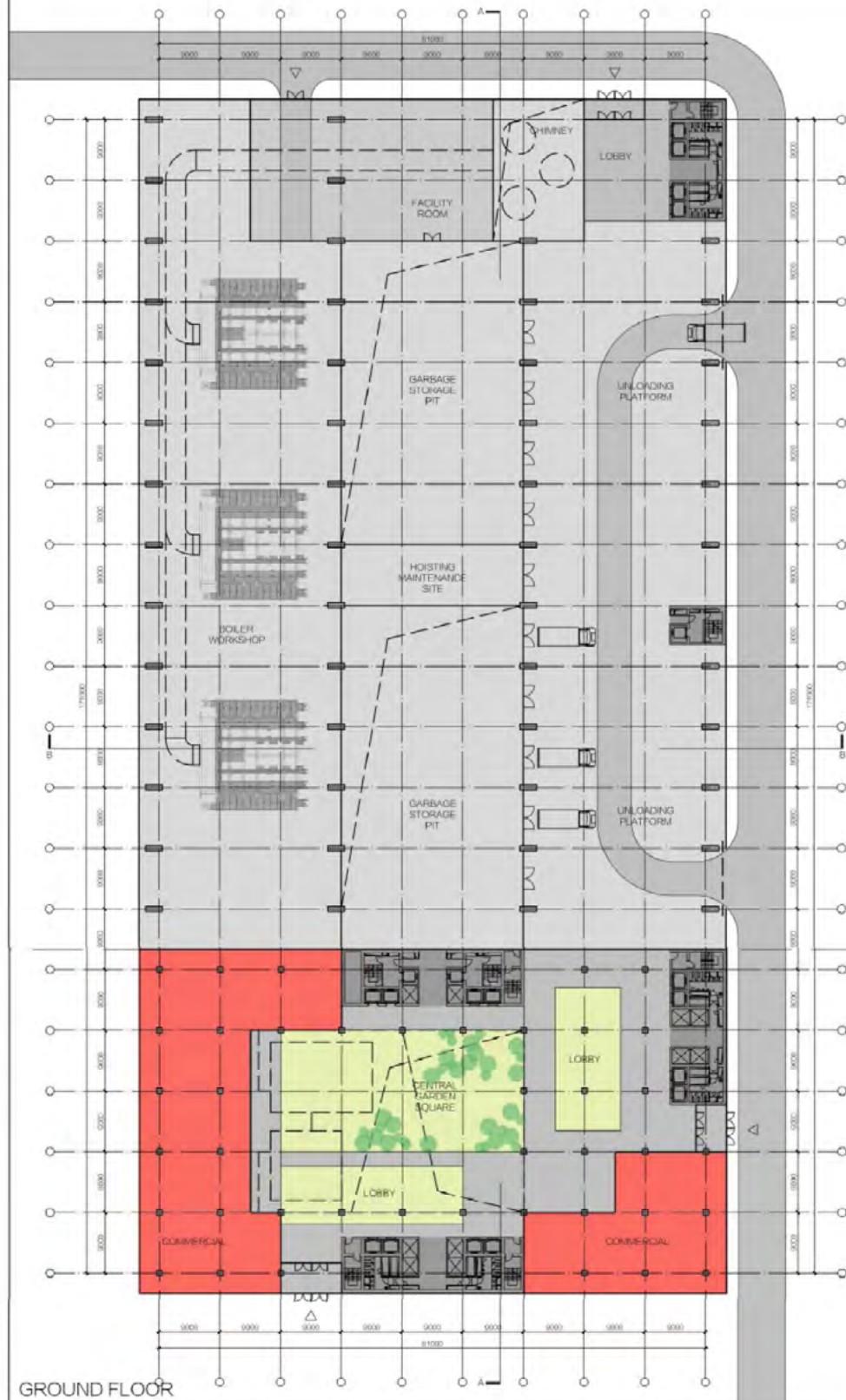
The resulting prototype 120 by 70 meters in footprint and approximately 30 stories high, was theoretically placed in Chaoyang Districts most populous and densest region which generates the most trash which we estimated at roughly 4700 tons per day. Chaoyang district already has one WTE plant, far to the east, in a relatively low population area, with capacity to process an estimated 34% of Chaoyang district's daily trash. So we looked into Chaoyang's densest sub districts for a potential location to place our stacked WTE plant into. 4 areas stood out of which 2 were adjacent to each other.

This led us to Beijing CBD district, in particular phase 2 area of the CBD, not far from the CBD core. The site is currently the location of a no longer operational industrial plant. Industrial past of the site, located within the very CBD, provides additional opportunities to camouflage the WTE and naturally integrate it into the fabric of the city.

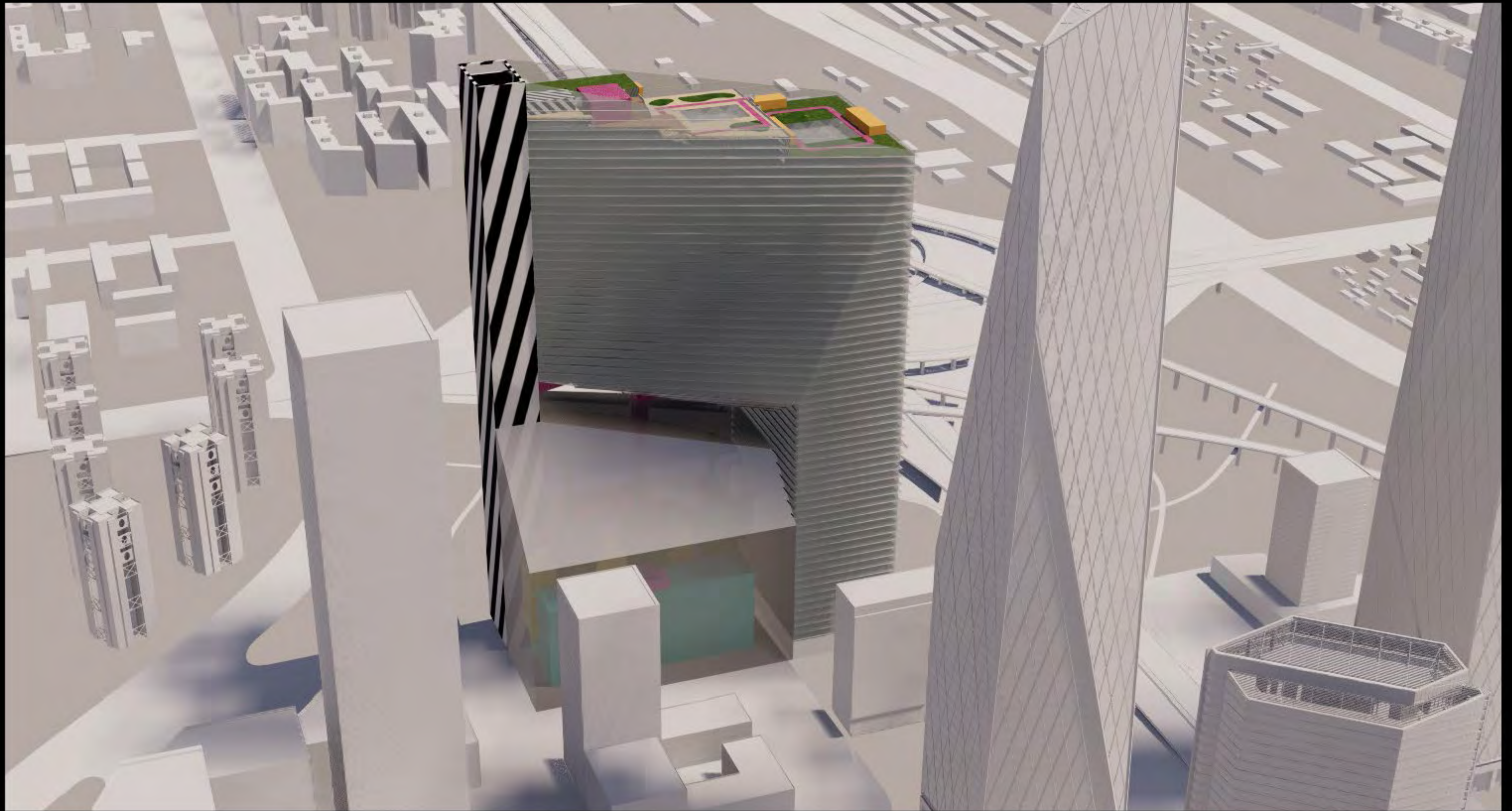
Finally, we took the next step to integrate an office building over the stacked WTE model.



In these sections you can see how the massing of the lower part of the building from the ground up is allocated to the WTE plant. The upper 30 stories are then predominantly offices, various kinds of meeting spaces connected by vertical galleries and a roof gardens.



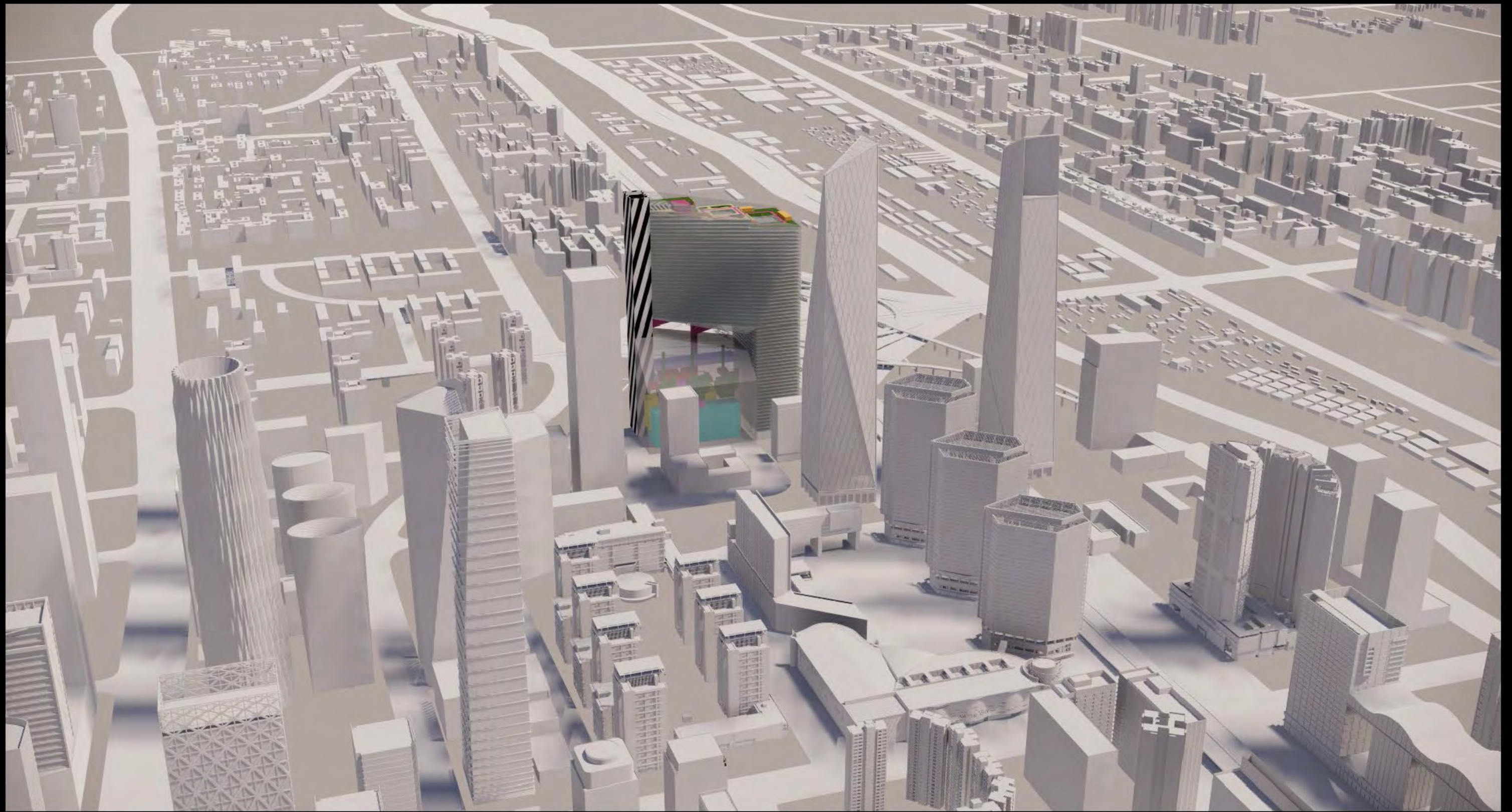
In these sections you can see how the massing of the lower part of the building from the ground up is allocated to the WTE plant. The upper 30 stories are then predominantly offices, various kinds of meeting spaces connected by vertical galleries and a roof gardens.





The vertical galleries visually provide a peek into the technology below, keeping it safe, but visibly integrated into the daily indoor patterns of the CBD office workers. Outdoors too, the architecture of the building integrates the chimney, that is strongly associated with the idea of 'bad factories' among the general audience. But at the same time the mass of the WTE plant is articulated and kept visible in a safe and pleasant way, as such integrating the presence of this crucial for the cities technologies into the very core of the daily urban life.





PROPOSAL INNOVATION

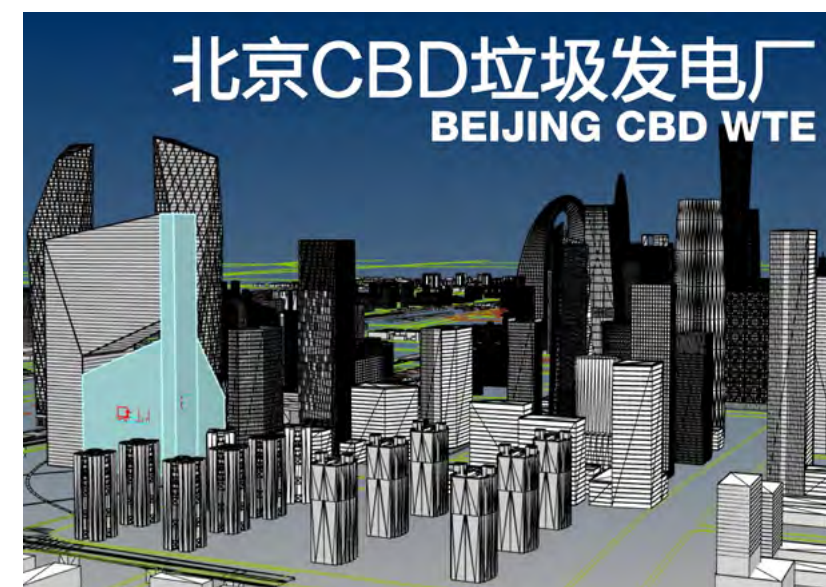
The innovation of BAM's proposal lies in the idea of using camouflage strategies on various levels of landscape and architectural design to avoid NIMBY movement to halt the so much needed integration of WTE infrastructure into the city cores, thus promoting sustainable development and providing actionable solutions to help China move closer to the achievement of the 2060 carbon neutrality goal set out by president Xi Jinping in 2020.

Currently China is constructing these types of plants everywhere. There are some of notable size and design. However, in general, these types of plants tend to be placed in the outskirts of the city. The current belief for this type of infrastructure is that the farther away the better, as property may be adversely affected, however this thinking is starting to change. The farther plants are away from urban centers, the greater the expense of operating them particularly with relation to the hauling waste, not to mention the added emissions from such trucks. European, Japanese, and Singapore plants tend to attempt innovation with the equipment itself, to save on space. While it is possible to creatively stack various components, and while it is done elsewhere, this kind of innovation is essentially nonexistent in China. Speed, scale, and an excess of land currently dictate the form of innovation, which is essentially copies of the same plant, with minor tweaks, and a fanciful shell. BAM's proposal for WTE camouflage attempts to move away from the highly prevalent 'decorated shed' paradigm by understanding that in the future these types of facilities may need to be directly integrated into highly populated urban cores, BAM seeks to find ways to experiment with ideas in which these types of facilities are also viewed as more than infrastructure, but as urban amenities. Landscapes and parks are almost ubiquitously welcomed urban amenities. The closer such infrastructure can be to parks and open spaces, the father into the urban fabric they can be integrated.

There are very few examples of MSW treatment facilities being utilized as public parks, however we predict that this trend will start to pick up and become more popular. China is currently lacking in this regard. There is one other example of a WTE Plant in the new city of Xiong'An which is similarly attempting a park landscapes atop the roof of the plant. During BAM's previous research we had also located an already constructed sewage facility in Yunnan which garnishes a park on top. While the design of the park is clearly not well planned nor executed, it does appear to be a first step in China, towards the idea that these types of facilities can become landscapes. Other international examples of underground sewage treatment facilities with parks atop are much more common and appear to be executed at much higher levels.



China's building worlds biggest WTE with integration of sustainable technology. This is very applaudable, and a good step forward, but this WTE follows the general trend of putting this technology far outside the city, which we consider problematic in the bigger scale of the challenges surrounding the public acceptance of the WTE.

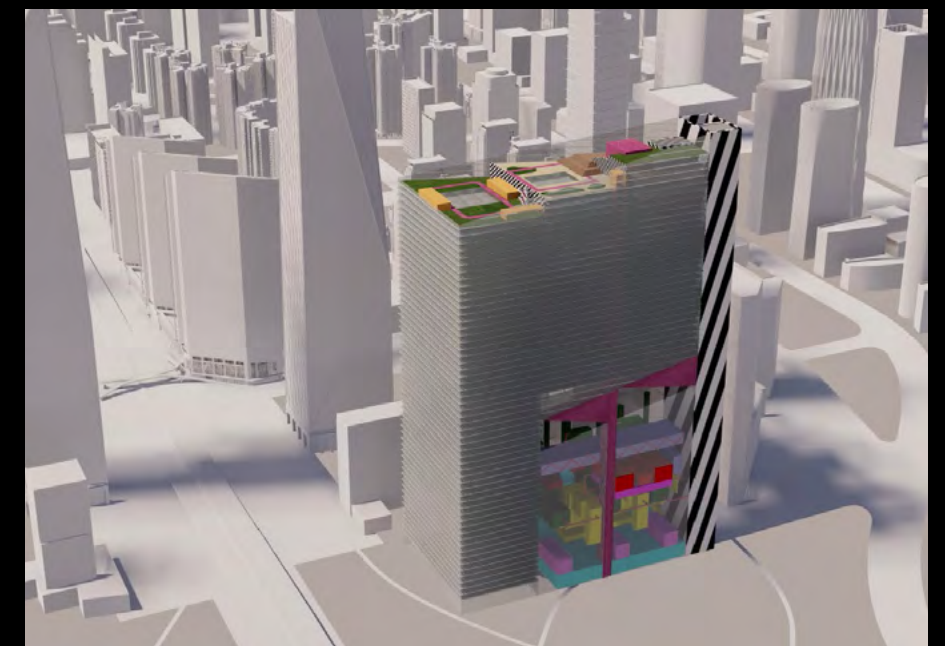
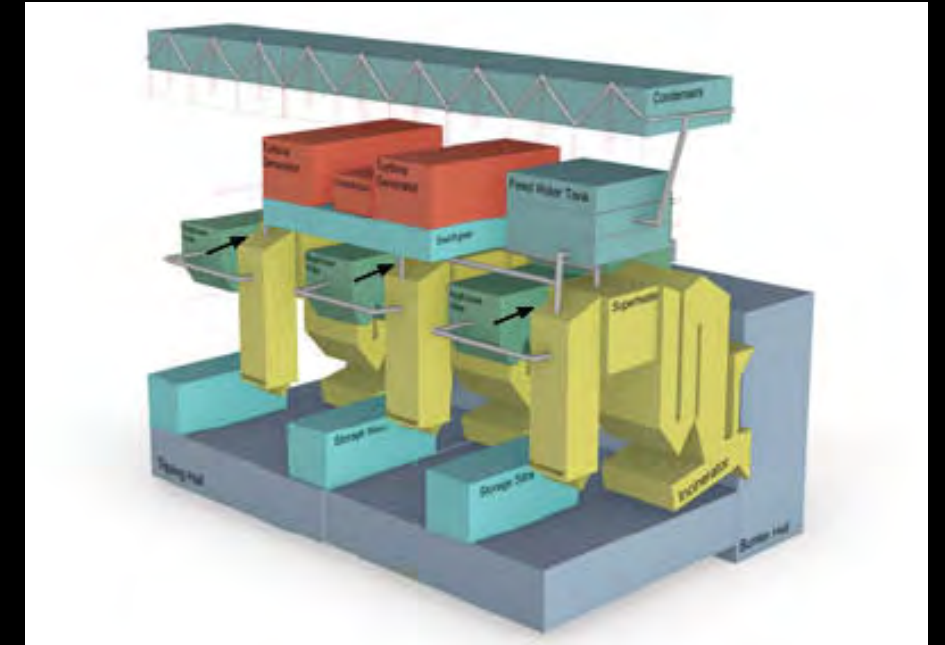


Therefore we aim to set a realistic and serious precedent of china's smallest WTE that can be replicated all over China and will be integrated into the very cores of the country's countless smart and green cities, causing a change of perception of this technology by the masses and therefore significantly helping China forward on their road to 2060 carbon zero goal.

OBJECTIVES

IF GRANTED GYLD/CCG SUPPORT

- examine the technical feasibility of stacked WTE
- connect with experts in CCG network, explore policy implications and political context
- explore ways how design can help to overcome public opposition against WTE technology





ADVISORS

CCG Mentor Wu Changhua

BAM's Advisory Committee

While working on Baoshan WTE project, BAM's other environmental projects and “Urban Initiatives” (details in ‘other information’ section) BAM actively reached out to leading experts’ guidance and collaboration, whose support BAM will also rely on the for this current proposal.

Professor Zhang Xiliang

Professor of Management Science and Engineering and Director of the Institute of Energy, Environment, and Economy at Tsinghua University.

Vice President of China Renewable Energy Industry Association.

Institute of Nuclear and New Energy Technology, Division of Energy System.

Heading the expert group on China's national carbon market design, which is a taskforce of the Climate Change Department in the Ministry of Ecology and Environment.

Professor Xu Haiyun

Chief Engineer at China Urban Construction Research Institute Corporation.

Secretary-General of Urban Waste Treatment Professional Committee of China Environmental Protection Industry Association.

Ren Xiangyu (PhD)

Senior Engineer of Ecological Restoration and Environmental Engineering

Environmental engineer and Ecological consultant at Shanghai Municipal Engineering Design Institute (Group) Co., Ltd.

Allocated funding and CCG/GYLD network and knowledge resources will be directed towards developing detailed prototypes for WTE camouflage in other urban contexts, for example the dense city cores such as the Beijing's Central Business District.

Ballistic Architecture Machine

百安木设计咨询（北京）有限公司

Beijing, New York

email: info@bam-usa.com
office: +86 010 5826 4817

www.bam-usa.com

