

Jinan Elite City

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Address 1 - street : 103 250002 ,

Population : 130 000

Number of jobs : 15 000

Starting year of the project : 2004

Delivery year of the project : 2023

Key words : Green, healthy, humanistic, urban green lung, natural oxygen bar



3491000



2 147 483 647 ¥

Certifications :

ID CARD

Jinan Elite City is a benchmark project for CGDG. Established in 2004, it covers a total area of 5,237 mu (about 877 acres) with a total built-up area of 5.43 million square meters. It is a pioneer in residential commercialization, urban expansion, and education support in Jinan. Based on the development position of "integrated urban investment, construction, and operation", and following the concept of "top-level plotting, corporate planning, step-by-step implementation, and rolling development", Elite City aims to become a high-quality project that encompasses various product formats throughout the lifecycle, including residential, commercial, hotel, office, education, healthcare, and wellness. It is the largest and most comprehensive community in Jinan, with the most complete amenities,

the most reputable reputation, and the highest population occupancy, which achieved comprehensive coordination and high unity of economic benefits, social benefits, and ecological benefits.

Over the past 19 years, the project has delivered a total of 30,000 households, accommodating over 110,000 residents. The project has received a total of seven national-level awards and 28 provincial/city-level awards. In 2021, the whole area of Elite City obtained the Gold Level "Healthy Community Label" for the operational stage, becoming the first and largest healthy community in China. The residential products have been certified with the highest level "Platinum Certification" for healthy community design and the first and highest-level certification (Excellent) for net-zero carbon buildings nationwide, as well as the "Taishan Cup", "Quancheng Cup" and many other provincial and municipal level building certifications. The Guihe Commercial Complex has won the "Luban Award", the highest honor in the domestic construction industry, and obtained the first batch of low-carbon operation Excellent certification in China. The shopping mall, hotel and office building belonging to the complex were respectively certified with the national "Green Mall Label", and "China Green Hotel" with five-leaf and gold-leaf hotel for tourism, as well as the international LEED Platinum Certification for operations. The office buildings were selected as one of the first ten "Dual-Carbon" demonstration projects in CGDG. In 2022, the community was awarded the title of "Global Green Model Community".

The core competitiveness of the project lies in its commitment to high-quality supporting resources and high-quality community operations to cultivate products. It has created "Three Mountains, Nine Parks, and Eighteen Schools". The ecological environment has been constructed with high quality, including three mountain parks, nine urban parks, 30 kilometers of fitness trails, and a forest coverage rate exceeding 60%, which makes known as the "healthy community growing in the forest park". The project introduces education resources from a high starting point, and is the first in Jinan to establish the cooperation model of "Famous Enterprises + Famous Schools", incorporating the best education resources in Jinan, such as Yuying School and Provincial Experimental School, and has built 10 kindergartens, 4 primary schools, 3 middle schools, and 1 high school, providing a one-stop education support system. Furthermore, the project has also invested in and constructed public facilities such as water treatment plants, bus terminals, and heating plants, fulfilling the responsibilities of a central state-owned enterprise. Social amenities such as community committees, intelligent police stations, and libraries have been improved, effectively enhancing the comprehensive service level of the area. Community operations are carried out to create the "Fan Community" brand, forming 28 interest clubs, holding over 1200 events annually, and involving the participation of nearly 30,000 residents. It has directly provided over 15,000 job opportunities and stimulated the employment of 35,000 people in the surrounding area.

CO2 Impact

CO2 Impact : 537 902 CO2

Method used to calculate CO2 impact

		4.14kg/ .	GB/T 51366-2019	543	22480 /		1.184MW, 25	3105	124	2288
2.7	110		2600 /	3000	200					3000*666.66*14.3=28600 /

Project progress

- Operational phase

Procedure type

- Urban développement permit

Key points

- Governance
- Quality of life
- Economic development
- Energy /Climate

Approaches used

- Local charter

Certifications

- Autre

Data reliability

3rd part certified

Photo credit

Shandong Luneng Genfu Development Co., Ltd.

KEY FIGURES

Green areas, roofs included

Green areas, roofs included : 2 234 240 m²

Public spaces area

Public spaces area : 892 500 m²

Office floor area

Office floor area : 46 000 m²

Commercial floor area

Commercial floor area : 710 000 m²

Public facilities floor area

Public facilities floor area : 17 800 m²

Housing floor area

Housing floor area : 3 821 700 m²

Number of residential units

Number of residential units : 26 841

Total investment costs (before tax)

Total investment costs (before tax) : 9 000 ¥/m²

GOVERNANCE

Project holder

Name : Shandong Luneng Genfu Development Co., Ltd.

Type : Para-public owner)

General description :

China Green Development Investment Group Co., Ltd. (referred to as CGDG) is a central state-owned enterprise with diversified equity, directly managed by the State-owned Assets Supervision and Administration Commission of the State Council. Since its establishment, the company has focused on green development and implemented the "Emission peak & Carbon neutrality" initiative. With the development direction of green energy, low-carbon cities, happiness industries, and strategic emerging industries, it has created a comprehensive leading enterprise with green and low-carbon as its main business, and built a world-class green industry investment group.

CGDG has deeply implemented the important instructions of the CPC, the work deployment requirements of the State-owned Assets Supervision and Administration Commission of the State Council, taken "promoting green development and building a beautiful China" as their mission. It has focused on promoting the strategic task of green, low-carbon, and high-quality development, promoting the optimization and structural adjustment of state-owned capital layout, and forming a nationwide industrial layout.

Green Energy: CGDG implemented the new energy security strategy proposed by President Xi Jinping, which includes the "Four Revolutions and One Cooperation" in energy security (promoting a revolution in energy consumption, energy supply, energy technology, and energy system, and strengthening international cooperation). With the overall concept of "building foundations, demonstrating leadership, and developing unique characteristics", CGDG adheres to a quality-oriented and efficiency-driven development approach, focusing on building world-class, focusing on creating a new highland for green product supply, green brand dissemination, green technology innovation, and green capital operation, and helping to achieve the goal of "Emission peak & Carbon neutrality". By the end of the 14th Five-Year Plan, CGDG aims to build and operate an installed capacity of 30 million kW, and with the support of the listed company platform, further promote the strong and optimized development of the green energy industry. Currently, the company has projects in 12 resource-rich provinces in China, with 57 power stations in operation, a total installed capacity of 7.18 million kW, and an annual power generation capacity exceeding 8 billion kWh.

Low-carbon Cities: In line with the aspirations of the people for a better life, the company promotes low-carbon urban development, creates industry-leading healthy homes products to support cities in achieving low-carbon and zero-carbon emissions, and fosters healthy, minimalist, and low-carbon urban construction and lifestyle. With over 30 years of urban development experience, projects cover 27 cities nationwide and implement integrated first and second-level linkage development, creating iconic regional projects such as Jinan Elite City, Chongqing Star City, Beijing Shunyi New Town, Hainan Sanya Bay New Town, and Wenchang Shanhaitian, promoting and popularizing the CGDG green and healthy product system. Through the application of low-carbon concepts in urban development, a total of 194 green building certifications and 33 healthy building certifications are obtained.

Happiness Industries: CGDG implements the requirements of "building a high-quality and efficient service industry system", promoting a green, low-carbon, and healthy lifestyle, accelerating the construction of a "1+6" first-class platform system for the happiness industry, focusing on high-end commercial properties,

healthy aging, vacation clubs, theme entertainment, distinctive commerce, and national exchange residences to build a world-class green asset management and quality living service enterprise. Currently, the company has been operating 33 international high-end brand hotels, including JW Marriott, Renaissance, Conrad, Hilton, and InterContinental, 9 large-scale commercial and office projects such as Jinan Guihe, Tianjin Luneng, and Chongqing Luneng, 5 large-scale cultural and tourism projects, including Changbai Mountain Luneng Resort, Jiuzhaigou Luneng Resort, Qiandao Luneng Resort, Wenan Jing-Jin-Ji Elite City, and Chongqing Jiangjin Beautiful Countryside, as well as 6 regional property and high-end property management companies.

Strategic Emerging Industries: Facing major national needs, seizing the opportunities of a new round of technological revolution and industrial transformation, CGDG focuses on key areas of strategic emerging industries, implements innovation-driven development, strengthens industrial coordination and actively builds a world-class liquefied air energy storage industry platform, establishes the dual carbon research and development center focusing on researching and planning emerging industries such as "green energy +" data centers, new materials, green hydrogen energy, as well as carbon asset management. All the above aims to achieve breakthroughs in crucial core technologies, to promote the integrated, clustering and ecological development of strategic emerging industries, and to cultivate new engines for green and low-carbon growth.

As the investment and construction group for this project, CGDG is committed to creating high-quality living scenarios and striving for comprehensive green building construction, laying a solid foundation for the sustainable development of the urban area, and creating the "Three Mountains and Nine Gardens" basic sports facilities to provide free natural fitness venues for residents.

Project management

Description :

Jinan Elite City is a benchmark project for CGDG. Established in 2004, it covers a total area of 5,237 mu (about 877 acres) with a total built-up area of 5.43 million square meters. It has been regarded as "the largest development project around Jiangbei". Based on the development position of "integrated urban investment, construction, and operation", and following the concept of "top-level plotting, corporate planning, step-by-step implementation, and rolling development", Elite City aims to become a high-quality project that encompasses various product formats throughout the lifecycle, including residential, commercial, hotel, office, education, healthcare, and wellness. Currently, it has accommodated 110,000 residents, and once fully completed and operational, it will be able to accommodate 130,000 people.

Project stakeholders

Shandong Luneng Genfu Development Co., Ltd.

Function : Developer

as the project development and construction unit

China Academy of Building Research

Function : Technical consultancy agency

as the project green building consultant unit

QUALITY OF LIFE

Quality of life / density

- Regarding **educational facilities**, a one-stop education pattern of 18 schools (13 completed and 5 under construction) has been formed in the application project, consisting of 10 kindergartens, 4 primary schools, 3 middle schools, and 1 high school. Adopting the "Famous School + Famous Enterprise" cooperation model, the Jinan Elite City project has become a model for the education group development in Shizhong District, while introducing the highest quality educational resources (national top 100 primary and secondary schools) in Shizhong District including Shengli Street Primary School and Yuying Middle School. In recent years, the admission rate and school performance of key high schools have ranked among the top in the whole city, making them the undisputed top tier in Shandong education.
- In terms of **commercial facilities**, a commercial corridor has been built, integrating commercial complexes, distinctive shopping streets, and centralized office spaces, with a total commercial area of 710,000 m², including 410,000 m² of commercial complexes, 127,000 m² of characteristic shopping streets, 43,000 m² of the Elite Center, and 130,000 m² of various distributed commercial spaces.
- Regarding **medical and healthcare facilities**, the project benefits from abundant medical resources, including J1 Hospital (under construction) with a size of 22,800 square meters, along with the CGDG International Health City Community Health Service Centers, which provide medical and health services for the community and surrounding residents. The project plan will transform the H3 plot into a comprehensive health and wellness complex, providing comprehensive health and wellness services such as institutional and home care to meet the medical and wellness needs of the elderly in the community.
- In terms of **public facilities**, the company has invested nearly 2 billion yuan to improve and hand them over without compensation, continuously enhancing the public amenities within the community. The company has invested in the construction of municipal roads, parks, schools, heating, fire-fighting, water supply stations and other supporting facilities. Among them, the heating plant covers the heating needs of the Jinan Elite City, surrounding communities, schools, and government agencies, with a heating area of 7.1 million m². There are also two bus depots covering an area of approximately 11,000 m², and 13 municipal roads with a total area of approximately 462,000 m² and a total length of 17.7 kilometers. These improvements greatly enhance and perfect the regional supporting services.
- **Community cultural construction.** Community is the "last mile" of urban governance". CGDG not only pays attention to the quality of environmental supporting facilities but also places particular emphasis on the humanistic care of communities. Starting from the spiritual culture, hobbies, and family needs of homeowners, Jinan Elite City created a full-age neighborhood co-construction, sharing, and co-creation platform -- "CGDG Fan Community". With the purpose of "finding interesting people and meeting better me", 28 interest clubs have been established, including yoga, tai chi, paper cutting, traditional Chinese culture, and reading. There are 1,200 activities organized each year with the participation of 30,000 homeowners, benefiting a total of 110,000 residents in their pursuit of a happy life.

Culture and heritage

Community is the “last mile” of urban governance”. Jinan Elite City, starting from homeowners’ spirit culture, hobbies, and family needs, has created an all-age neighborhood platform for co-construction, sharing, and innovation called the “CGDG Fan Community”. There are already 28 interest clubs, including yoga, tai chi, paper cutting, traditional Chinese culture, and book sharing, organizing 1,200 activities each year with the participation of 30,000 homeowners, benefiting a total of 110,000 residents in their pursuit of a happy life. In addition, the community collaborates with the Jinan Municipal Bureau of Culture and Tourism as well as the Municipal Library to create the Quancheng Study, a public reading center. Currently, it holds 8,000 books and is connected to the borrowing systems of the Shandong Provincial Library and Jinan Municipal Library, enabling unified borrowing and return services and promoting a strong atmosphere of loving reading, reading good books, and reading well.

Social diversity

In 2017, adhering to the original mission of “creating a better life for the people”, CGDG established the neighborhood interest platform Fan Community in the Jinan Elite City. Aimed at residents of different ages and interests, colorful community activities in a planned manner are carried out daily to enrich the cultural life of the residents and create a happy and harmonious community. After more than five years of careful operation, the Fan Community has built five shared zones for community activities and formed 28 interest clubs. Annually, there are around 1,200 community activities organized, with the participation of over 30,000 residents. Various and diverse activities take place in every corner of the community, bringing joy, sharing, and celebration. The happiness of “Being together” has become the most cherished thing, and beauty is growing throughout the entire community.

Social inclusion and safety

On May 31st, 2019, the smart police station in Jinan Elite City was officially put into use after nearly 4 months of dedicated effort. The newly installed smart guiding robot is an artificial intelligence virtual robot system that integrates natural human-machine interaction technologies such as voice recognition, semantic understanding, facial recognition, gesture recognition, and emotion recognition, providing 24-hour thoughtful services such as welcoming and guiding, intelligent consultation, and information delivery. The welcoming and guiding feature can be automatically activated through human body sensing, proactively greeting people who are there to handle business and showcasing the process and methods of business handling through various forms such as maps and animations. People can also use the self-service reporting feature by having conversations with the smart robot. The robot has prepared standardized templates for recording statements, and the reporter may follow the voice prompts and the displayed content to complete the reporting process. The process is standardized and simple, and supports multiple input methods such as voice, handwriting, and pinyin, making it easy to use.

As a lifelong living city, the project has a rich product line that covers all areas and demands. The three major product lines, namely, the Elite Series, the Central Park Series, and the Manshan Villa Series cover high-rise, house, villa, commercial hotel, apartment, and other property types, covering the full area of 60-488 m², aiming to respectively meet the rigid demand, quality improvement demand, and high-end residence demand. Currently, 23 residential plots and 4 commercial plots are completed and delivered. After more than ten years of development, Jinan Elite City has become a livable city that integrates prestigious school resources, ecological advantages, mature supporting facilities, and prosperous business districts.

Ambient air quality and health

The full exploration of ecological resources. To reinforce the protection of natural forest resources in Quanzi Mountain, Aози Mountain, and Wanghualou Mountain, the project unified the planning to create the “Three Mountains and Nine Parks”. The overall green coverage area is more than 3,000 mu, with a green coverage rate of over 60%, per capita green area of 20m², which is seven times higher than the standard requirements. The negative oxygen ion content reaches 10,000 ions/cm³, which makes the project known as “a healthy community growing in the forest park”.

Environmental monitoring. A community-based weather station was set up to continuously monitor outdoor air temperature, humidity, and relevant pollutant information. Based on the results of environmental monitoring, dynamically control the carbon emission intensity of transportation and buildings. It is proved that regional environmental quality evaluation consistently ranks first in Jinan.

Indoor environment. Environmental-friendly building materials are used in the development and construction of each community, especially in newly constructed high-end hardbound projects where 100% of the materials are environmentally friendly. Furthermore, fresh air systems with a filter efficiency of over 98% are installed, effectively filtering PM_{0.3}, PM_{2.5}, and PM₁₀ particles to ensure indoor and community air quality.

Thermal comfort and microclimate. Combined with the climate characteristics, the project has planned a street network and park green space to form a ventilation corridor and strengthen ventilation. The average outdoor wind speed is 2.8m/s in summer and 2.9m/s in winter, creating a comfortable thermal environment and avoiding the heat island effect.

Noise control. The project has set up speed limits on roads within the community, prohibited decoration during rest time, and set up noise prevention reminders in activity areas. In addition, the high greening rate has the effect of sound insulation and noise reduction. During the day, the noise is generally controlled within 55 dB, and during the night, it is controlled within 45 dB, resulting in good acoustic environmental quality in the area. Focusing on the Healthy China strategy, the project pioneered the development of the CGDG “Quiet Housing” system, becoming the industry’s first technical system to systematically solve the acoustic environment problem, and was applied to the Yuexi Healthy Housing project, effectively addressing noise-related concerns.

ECONOMIC DEVELOPMENT

Local development

CGDG is committed to fulfilling the responsibilities of a central enterprise by ensuring and improving people’s livelihoods through development, transforming creating a better life for the people into vivid social practices, and striving to make the achievements of green development benefit more people. Since its development, the Elite City project has paid a total of 10.5 billion yuan in taxes and fees, making outstanding contributions to local economic development. At the same time, as the most comprehensive, fully functional, reputable, and densely populated comprehensive community in Jinan, the project has accommodated more than 3,000 market entities (including 350 legal entities and approximately 2,650 individual businesses) and has directly provided over 15,000 job positions,

stimulating employment for an additional 35,000 people in the surrounding area.

Circular economy

Efficient Energy Utilization: Primarily rely on technological progress and institutional innovation to improve energy efficiency. At the building level to improve the energy-saving rate, develop ultra-low energy, nearly zero energy, and net-zero carbon buildings, and improve the proportion of renewable energy utilization.

Non-traditional Water Resource Utilization: The project utilizes non-traditional water sources from the municipal reclaimed water station (located in the northwest corner of the Elite city) for landscape greening and road watering. A rainwater reuse system is built as supplementary water supply and connected to the community's reclaimed water pipeline network.

Resource Circulation and Recycling: Build a circular economy chain and establish a waste recycling and reuse system. Domestic waste, construction waste, and industrial waste shall be classified, utilized, and centrally disposed of; build a connection between the waste collection and recycling system and integrated with terminal waste disposal, achieving harmonious coexistence between urban development and ecological environment.

TRANSPORT

Mobility strategy

Green Travel and Transportation System: The community has developed a dedicated green transportation plan that comprehensively coordinates various transportation facilities in Elite city from both external and internal levels. With optimizing road traffic organization and implementing a green transportation management system (Intelligent Transportation System), it ensures green travel routes and improve the efficiency of green transportation.

Public Transportation: The launch of bus routes 43, 66, and 506 in Jinan's public transportation system has expanded the capacity of bus stops in the Elite City area. The extension and optimization of these three routes greatly facilitate the travel needs of residents. All buses are new-energy vehicles or electric vehicles.

Vehicle Parking and Charging: The project fully implements the *Implementation Opinions on Accelerating the Construction of New Energy Vehicle Charging Infrastructure in Jinan City*, which specifies that after October 1, 2020, newly completed residential areas must lay power supply lines for charging infrastructure to parking spaces, or reserve conditions for installation (including buried power conduits and reserved power capacity). Charging facilities must be built at a proportion of no less than 10% of parking spaces and the construction situation shall be included in the acceptance scope. The project has coordinated the construction of 1,000 charging piles to provide charging services for owners of new energy vehicles without fixed parking spaces.

SMART CITY

Smart City strategy

In terms of smart communities, taking Baishiyu A plot within the Elite City as a model, the project utilizes IoT and IPv6 technologies to create a benchmark smart community based on IPv6. Based on traditional intelligent systems, the project focuses on building a seven technology system including smart facilities, smart security, smart access control, smart homes, smart low-carbon, healthy air, and smart fire protection, etc. Additionally, it has incorporated advanced technologies such as AI video monitoring, object-falling from heights detection, electric vehicle entry monitoring, key location emergency alarm, outdoor environmental monitoring, and smart lampposts, all based on IPv6. With the integration of the "Luneng Smart Living" property service platform, a digital, intelligent, and green multiple-application scenario has been constructed to promote the optimization and upgrading of green, intelligent, and healthy quality communities.

Environmental Monitoring System: This project has established an outdoor air quality monitoring and public display system located within the community. The monitoring parameters include CO₂, PM_{2.5}, PM₁₀, O₃, SO₂, NO_x, and other parameters. Screens are installed near the monitoring points to display real-time monitoring data and are updated every half hour. In the northern part of Elite City, a reclaimed water treatment station has been set up to recycle community wastewater for treatment and reuse. An online monitoring system is installed to monitor the water quality in real-time, focusing on parameters such as COD, ammonia nitrogen, pH, suspended solids, and flow rate.

Lighting Control: The landscape lighting circuit adopts both manual and timely control methods, allowing adjustments based on usage. The lighting fixtures are divided into main lighting and decorative lighting: ① the main lighting fixtures are turned on from 18:00 to 6:00; ② the decorative lighting fixtures operate from 18:00 to 24:00.

Communication Facilities: The project area is fully covered by 5G network.

RESOURCES

Water management

This project places great emphasis on water quality testing and treatment, rainwater harvesting and utilization, rainwater and sewage separation, and the utilization of recycled water resources to create a safe, healthy, and circular water system. In terms of **domestic water supply**, the community has installed direct drinking water dispensers throughout the area, and new projects are even equipped with spring water supply systems and ensure the residents' water safety through online water quality monitoring systems. In terms of **drainage**, all newly constructed projects since 2016 have adopted the same-floor drainage, with anti-overflow floor drains installed in key areas such as bathrooms and kitchens to ensure a stable and smooth drainage system; the outdoor area in the park has separate systems for rainwater and sewage. As for **water source utilization**, a large community water station (with a daily treatment capacity of 10,000 cubic meters) is allocated to realize the recycling of sewage and wastewater in the whole area of the community. For **sponge city construction**, on December 12,

2013, according to the concept of sponge city, Luneng Elite City took the lead in responding to the construction of sponge city, actively promoted the transformation of sponge city across the region, implemented sponge city technology in all new projects, achieved the goal of 75% of the total annual runoff control rate across the region, and created a sponge city demonstration park. Specific measures: Fully implemented the sponge city construction on the whole area of municipal roads, greening and parks; through the fall of permeable paving, rainwater collection module, sunken green space, rain gardens and other comprehensive measures form a recycling water environment; develop 110,000 m² of flood drains landscape corridor system, set up ecological grass ditches, permeable paving, sunken green space, etc., to collect mountain rainwater and reduce runoff.

Soil management

Soil Conservation: The original site of Jinan Elite City had several quarries and lime mines, resulting in severe damage to the mountains, therefore, CGDG has attached great importance to ecological issues from the beginning of the construction. Through persistent efforts, six broken areas of the mountains have been restored, covering an area of over 300,000 m², which is equivalent to 42 standard soccer fields; over 40 kinds of trees with more than 100,000 plants have been planted; a 30-kilometer mountain trail has been built, along with sports parks that include basketball courts, football fields, and playground equipment. The green area exceeds 3,000 mu, where also locates an ecological forest park as a home to over 2,000 pigeons.

Natural Soil Conservation: Luneng Elite City fully implemented the sponge city goals, with 10 living areas obtaining the sponge city verification certificate. Based on the natural resources of the project, the project built a mountain reservoir, green fish-scale pits on top of the mountain; built earth-sheltered architectures and sponge city demonstration bases along the mountain; set interceptor ditches along the mountain trails, and took comprehensive measures such as permeable paving, rainwater collection, water storage modules, sunken green space, and rain garden, etc. to achieve the purpose of rainwater infiltration, runoff control, and form a recycling water environment. A large-scale community reclaimed water station is equipped to recycle and utilize rainwater, wastewater, and sewage, with a daily processing capacity of 10,000 m³, equivalent to the water volume of 5 standard swimming pools.

Waste management

From the community level, a large-scale garbage treatment station is set up in the Elite City community for garbage recycling and treatment, and the green waste used for composting is separated from other waste. Solid waste is classified and treated according to recyclable, non-recyclable, compostable, hazardous substances, etc. At the same time, set up classified garbage bins on both sides of the roads in the community. **In the small living area,** garbage transfer stations are built for the temporary storage of garbage and regular recycling and cleaning (at least once/day); classification recycling bins are set up within the area for recyclable waste, hazardous waste, kitchen waste, and other waste. Additionally, both garbage stations are equipped with biocide spray systems to prevent odor and bacteria growth.

BIODIVERSITY

Biodiversity and natural areas

Mountain planting and rehabilitation: Elite City continues to carry out afforestation activities during the development process, planting more than 40 species of trees, 100,000 trees, with an overall greening area of more than 3,000 mu and a greening coverage of more than 70%. In some areas, [FM1] after backfilling with planting soil, native plants with strong soil fixing ability such as sumac, peach, purple leaf plum, golden acacia, cherry blossom and acacia are used to increase the richness of the mountain greenery while ensuring the stability of the soil slopes; the backfilled site is leveled and compacted in the foothills area, and a vibrant sports field is added to create a countryside sports park with a net red card spot; the cliffs around the neighboring communities are planted by The project will also improve the surrounding environment and microclimate of the community by spraying planting soil and mixing grasses, flowers, shrubs and tree seeds, while restoring the cliffs of the mountain and enhancing the greening coverage of plants. Through the comprehensive and thorough protective development of the Pilot City project, the diversity and richness of plant communities are restored and preserved, and the living environment and microclimate of the flora and fauna in the area are continued, providing a new model for green habitat.

Biodiversity: The community has a large area of island-shaped forests, mixed green spaces of trees and grasses, and forest canopy, understory as well as soil cover suitable for bird habitats, which provides a better nesting and foraging habitat for birds. Therefore, in addition to sparrows, magpies, barn swallows, yellow-rumped warblers and other bird species commonly found in urban areas, many bird species unique to mountain woodlands are also found in the project due to its proximity to the southern mountains. For example, the red-billed mountain duck, apus pacificus, large-billed crow, small-billed crow, rock pigeon, blue jade, gray wagtail, yellow-headed wagtail, lark, crested lark, etc.; bird species such as ring-necked pheasant, Reed Parrotbill, mountain sparrow, forest wagtail, Japanese tree warbler, giant-billed willow warbler, great cuckoo, middle cuckoo, and Chinese Hwamei can be seen in areas with less human activities.

ENERGY/CLIMATE

Climate adaptation, resources conservation, GHG emissions

From the aspect of **energy efficiency and new energy utilization**, the project has always adhered to the concept of green development. Firstly, in terms of **green building**, it has achieved full coverage of green building since 2016, and has been awarded 16 green building certifications, including China Green Building Label, LEED Platinum certification and BREEAM certification. Secondly, in **green energy-saving technologies**, measures such as increasing insulation thickness, designing without cold and hot bridges, air tightness controlling, and adopting prefabricated construction methods have been implemented to reduce building energy consumption. Active equipment such as fresh air ventilation systems with full heat recovery (for hardbound residence), ice storage cooling technologies (for shopping malls and office buildings), and high-performance water pumps and chillers are used to reduce energy consumption during the operational phase. Thirdly, in terms of **the utilization of new energy**, the residential projects fully utilize solar energy and air source energy for hot water systems. In addition, in line with the "Dual carbon" development strategy, combined with the idle roofs of commercial complexes, the largest distributed photovoltaic power generation project for commercial complexes in Shandong Province has landed here, which has passed evaluation from the China Electricity Council. The installed capacity of photovoltaics is 1,184 kW, and over a 25-year operation period, the total electricity generation is approximately 30.3 million kWh, saving about 22.33 million yuan in electricity costs and reducing carbon dioxide emissions by about 27,000 tons, which has significant significance in reducing

carbon emissions. In terms of **material and resource utilization**, during the construction phase, this project adopted industrialized construction methods and prefabrication in factories such as floor slabs, stairs, and air conditioning panels to avoid material waste caused by on-site processing. This project achieved materials are sourced locally, reducing waste caused by material transportation by taking into account the project's geographical location. Moreover, waste separation bins are set up throughout the project to achieve full utilization of waste materials.

Energy sobriety

From the aspect of **energy efficiency and new energy utilization**, the project has always adhered to the concept of green development. Firstly, in terms of **green building**, it has achieved full coverage of green building since 2016, and has been awarded 16 green building certifications, including China Green Building Label, LEED Platinum certification and BREEAM certification. Secondly, in **green energy-saving technologies**, measures such as increasing insulation thickness, designing without cold and hot bridges, air tightness controlling, and adopting prefabricated construction methods have been implemented to reduce building energy consumption. Active equipment such as fresh air ventilation systems with full heat recovery (for hardbound residence), ice storage cooling technologies (for shopping malls and office buildings), and high-performance water pumps and chillers are used to reduce energy consumption during the operational phase. Thirdly, in terms of **the utilization of new energy**, the residential projects fully utilize solar energy and air source energy for hot water systems. In addition, in line with the "Dual carbon" development strategy, combined with the idle roofs of commercial complexes, the largest distributed photovoltaic power generation project for commercial complexes in Shandong Province has landed here, which has passed evaluation from the China Electricity Council. The installed capacity of photovoltaics is 1,184 kW, and over a 25-year operation period, the total electricity generation is approximately 30.3 million kWh, saving about 22.33 million yuan in electricity costs and reducing carbon dioxide emissions by about 27,000 tons, which has significant significance in reducing carbon emissions.

Energy mix

The energy used in this project can be roughly divided into electrical energy, municipal heating energy, electricity, and cooking gas. The energy structure of the building operation is optimized by making full use of clean energy in the following ways: Firstly, 100% of the new projects are reserved for the installation of charging piles, and 10% of the charging piles are installed in place and encourage the use of clean energy. Secondly, 100% of the solar hot water system is installed during the construction of the project. Thirdly, the largest distributed photovoltaic power generation project in Shandong Province is built on idle rooftops. The installed capacity of photovoltaics is 1,184 kW, and over a 25-year operation period, the total electricity generation is approximately 30.3 million kWh, saving about 22.33 million yuan in electricity costs and reducing carbon dioxide emissions by about 27,000 tons, which has significant significance in reducing carbon emissions. Lastly, the energy-saving measures of the building are fully considered at the beginning of the planning and design; taking the passive energy-saving as the main principle, supplemented by the active energy-saving. Measures such as increasing insulation thickness, designing without cold and hot bridges, controlling air tightness, and adopting prefabricated construction methods are implemented to reduce building energy consumption. Active equipment such as fresh air ventilation systems with full heat recovery (for hardbound residence), ice storage cooling technologies (for shopping malls and office buildings), and high-performance water pumps and chillers are used to reduce energy consumption during the operational phase.

Total electricity production of the project area /year

Total electricity production of the project area /year : 1 240 000,00 kWh

BUILDINGS

Buildings

1. The proportion of green buildings above two stars in new construction area (%): 44.83%
2. The proportion of existing buildings area with green building certificates (%): 7.52%
3. The proportion of assembled construction area to new construction area (%): 100%
4. Number of construction projects awarded with the Green Construction Demonstration Project (%): 37
5. The number of projects that obtained Green Building Operation Label as a percentage of the number of completed projects (%): 3.5%.

Luneng International Center obtained LEED Platinum operation certification. With the total completed projects of 29, the proportion is $1/29 \times 100\% = 3.5\%$.

Contest





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