



——It is everyone' s responsibility to improve the deteriorating environment .

GEM 格林美 for the Green Industry

We integrate the development of industry, the value of environment and the benefits of staff to realize the harmonious unification of enterprise performance, employee growth and social value.

1、Taking “Limited resources, unlimited recycling” as industrial conception, we make the idea of recycling into reality, and make the slogan of low-carbon into practice.

2、Exploit urban mines and become the world' s recycling factory. By developing urban mine exploiting model, advanced recycling model and low-carbon products manufacturing model, we aim to become China' s urban mine recycling demonstration base.

3、Low-carbon manufacturing, energy-saving and emission reduction. We develop an ecological disassembling process to deal with solid waste, and utilize the waste resources to produce low-carbon goods such as WPC, and establish a low-carbon recycling model of E-wastes and other waste resources.

4、Eliminate pollution, we swear to be the guardian of our land; Recycling resources, we are the pioneer of the low-carbon industry.

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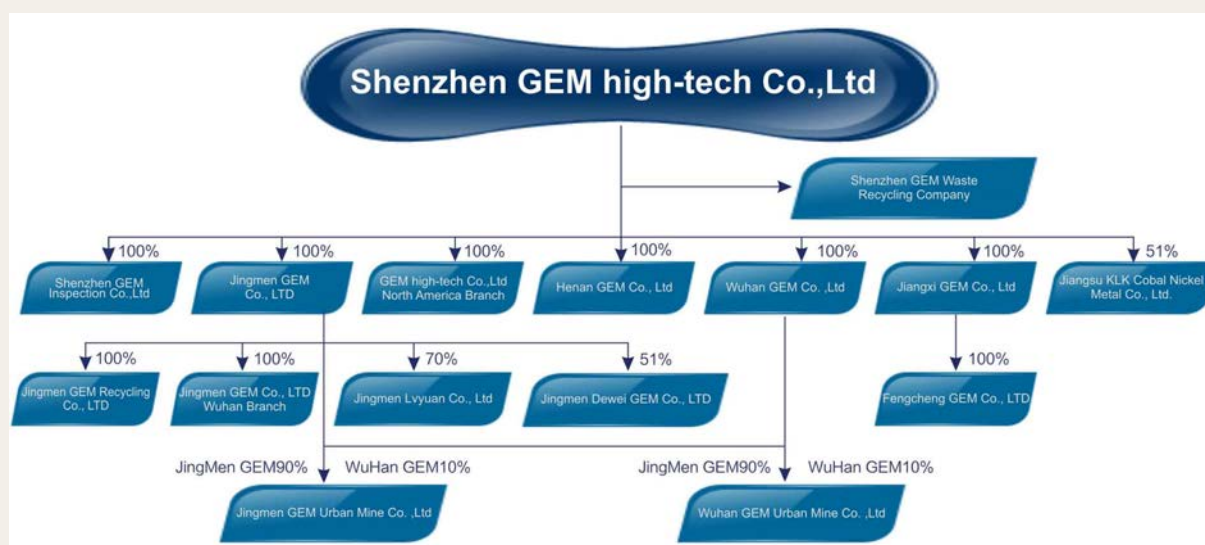
Part one: Company Profile

Profile of GEM

Shenzhen GEM Hi-tech Co., Ltd (hereinafter GEM) was founded on 28th December 2001. And it was successfully listed on Shenzhen Stock Exchange on 22th January 2010 (stock code 002340), with the registered capital of RMB 579.58 million and 2850 registered employees. It has 7 wholly-owned subsidiaries/branches, 5 grandson companies and 3 joint venture companies.

In 2003, we first proposed the idea of “exploiting the urban mines” and formed the concept of “Limited resources, unlimited recycling” (Authorized by China’ s National Copyright Administration on 12th January 2011). Taking the used batteries and E-waste as main business, we are active in developing the recycling model of China’ s urban mines, which include E-waste, used batteries, waste cobalt/nickel materials, end-of-life vehicle and waste tubes. Since its foundation, GEM obtained more than 300 patents and 90 national and industrial standards, participated in 40 national and provincial projects. The project “The key technology of E-waste circuit boards green recovery and recycling” was listed in National 863 Projects 2013. GEM was granted the national circular economy pilot enterprise, the national innovative enterprise, the national high-tech enterprise, the national intellectual property pilot unit, the national circular economy education base, one of the sixty typical models of China’ s circular economy, the national circular economy advanced unit, and has become the leading enterprise of China’ s low-carbon manufacturers.

We have five recycling industrial parks, located in Wuhan, Jingmen, Fengcheng, Lankao, Taizhou respectively. Taking the used batteries, E-waste, waste cobalt/nickel materials and waste rare metals as the main business, GEM has recycled various rare resources and to produce high-tech products, such as cobalt, nickel, copper, tungsten, gold, silver, palladium, rhodium, WPC, new energy materials, environmentally friendly bricks and so on. Those products have formed the most complete recycling industry chain of rare metals in China.



Organizational Structure

Industry status

- One of the leading enterprises in China's urban mines exploitation and utilization,
- The world's advanced recycling enterprise of used batteries and waste cobalt/nickel materials,
- The world's advanced E-waste recycling base,
- The World's third-largest, China's largest ultrafine cobalt/nickel powder producer,
- China's fastest growing WPC manufacturer.



GEM Jingmen Recycling Industry Park



GEM Jiangxi Recycling Industry Park



GEM Wuhan Recycling Industry Park



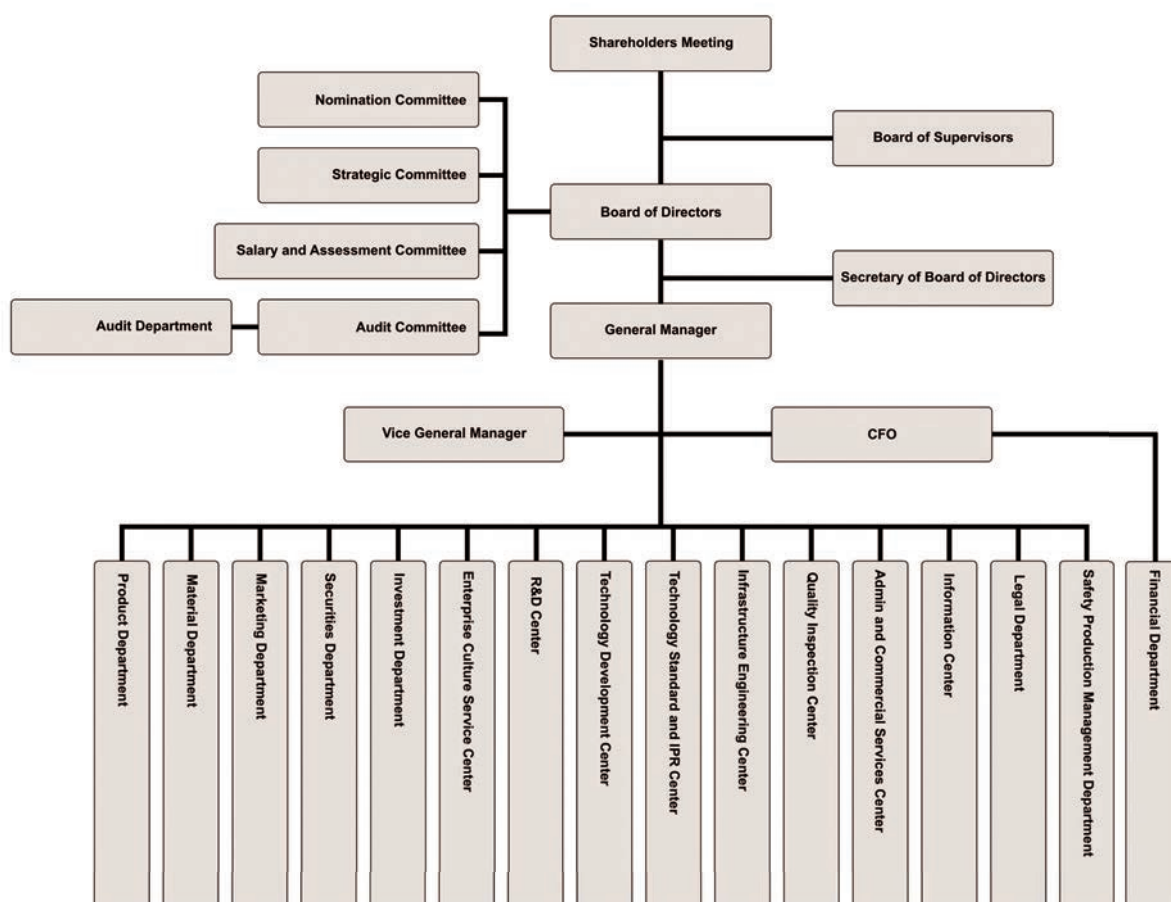
GEM Henan Recycling Industry Park



GEM Jiangsu Recycling Industry Park (Jiangsu KLK)

Governance structure

According to the "Corporation Law", "Articles of Listed Corporation" and other related regulations and laws, we established the governance structure of shareholders meeting, board of directors and board of supervisors. We also established the Rules of Procedure, and clarified the responsibility of decision-making, implementation and standard operation. Meanwhile, there are four sub-organizations, which are the nomination committee, the audit committee, salary and assessment committee, the strategic committee.



About employees

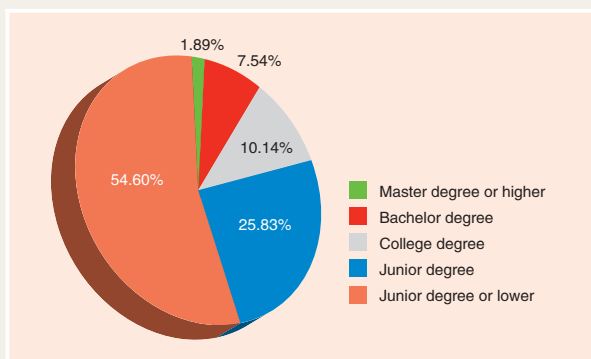
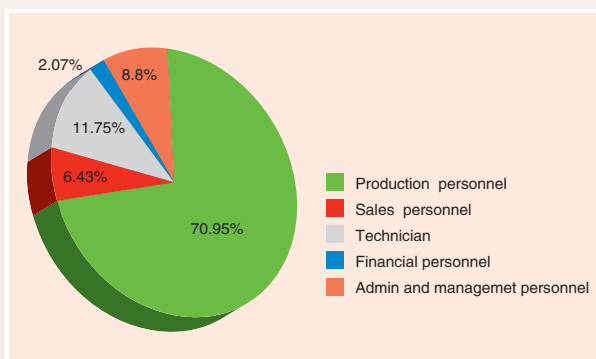
By the end of 2012, we have a total of 2850 employees with zero retired workers.

(1) Classified by employee structure

Specialty	Amount	Proportion
Production personnel	2022	70.95%
Sales personnel	183	6.43%
Technician	335	11.75%
Financial personnel	59	2.07%
Admin and managemet personnel	251	8.8%
Total	2850	100%

(2) Classified by education level

Education background	Number of employees	Proportion
Master degree or higher	54	1.89%
Bachelor degree	215	7.54%
College degree	289	10.14%
Junior degree	736	25.83%
Junior degree or lower	1556	54.60%
Total	2850	100%



Corporate culture concept

Our Mission: Recycling waste, build the world's most respected environmental protection company

Our faith: Protecting the environment is our eternal pursuit

Our philosophy: Limited resources, unlimited recycling

Our vision: Exploit Urban Mine; establish the world advanced recycling factory

Core values: Eliminating pollution, recycling resources, benefit society

Operation philosophy: Legitimate business, transparent operation, be responsible for the society and employees

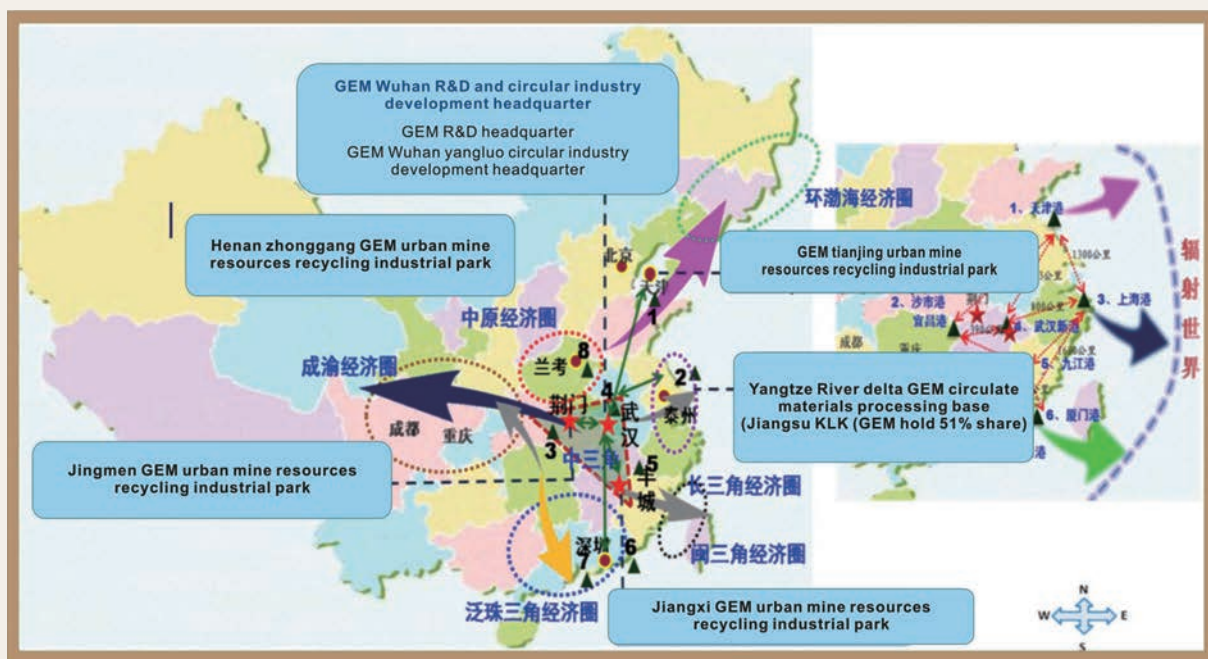
Our spirit: Dedication, innovation, speed and responsibility

Our ethics: Love our planet, love our motherland, love our company and love our family



Future Plan——Build the world' s recycling factory

In the next five years, taking used-battery, E-waste, wasted lamp tubes, discarded vehicles and waste rare metals as main business, we will make efforts to build urban mine resource processing bases all across the country. Base on the perfect multi-level recovery system, we aim to become the world advanced and domestic first-class innovative base of national comprehensive urban mine recovery system, recycling demonstration base and circular economy education base.



2012 Environmental Protection Development Events

1、Industry Development

Achievements (1): Industry culture innovation

Born for the green industry, we pay great attention to the development of green industry. "Eliminating pollution, recycling resources" is our life gene; environmental protection is our eternal faith. Since its foundation, we always take "Environmental protection" and "Recycling" as our core culture in the course of development. In 2012, we established six main business chains so as to form a complete recycling chain, respectively are "Used batteries and waste Co-Ni-W materials recycling chain", "E-waste Recycling chain", "Waste plastics and agricultural wastes recycling chain", "Waste rare earth and metals recycling chain", "Industrial waste residue and mud recycling chain", "Discarded vehicles and scrap steel recycling chain".

At the same time, we are active in building a community recovery system. Now, we have established a waste recovery system, such as "Used-battery recycling bins", "E-waste recycling store" and "3R Recycling Consumption Community Shops". Based on the multi-level recovery system, we practiced our goals and responsibilities.

In order to build a communication bridge between staff& community, and advocate our industry culture, we published four enterprise journals in 2012, named "GEM". Then we also published the corporate culture handbook in September. Through the enterprise journals, we convey the idea of environmental protection to each employees, shareholders, clients, suppliers etc, and call on every citizen to practice low-carbon environmental protection and make efforts to build a beautiful China.

Achievements(2): China's first complete recovery of rare metals from waste PCB demonstration technical line, which can takes more than 20% of China's total amount

In March 2012, we established China's first world advanced waste PCB treatment production line, it marked the scale operation of E-waste recycling. With the utilization of our independent fracturing technology and wet detinning method, we had successfully separated the base metals from precious metals, and resolved the key technological problems. We used independent technologies to extract precious metals, which reduced the pollution in the process of extracting. This new technology, which combines the advantages of physical and chemical technologies together, has renewed the traditional recycling technology and become the model in the field of PCB recycling.

Achievements(3): Jingmen GEM and Jiangxi GEM were selected to be the first subsidies list of Waste Electronic and Electric Equipments

On 17th June 2012, two of GEM' s wholly-owned subsidiaries Jingmen GEM and Jiangxi GEM were selected to be the first subsidies list of waste electronic and electric equipments. It was the result of our hard work and reflected the trust and hopes that national and provincial government place in us.

Achievements(4): Merged Jiangsu KLK, got through the recycling industrial chain from waste batteries, waste battery materials to new energy battery materials

On 26th December 2012, we merged 51 % share of Jiangsu KLK (Jiangsu Cobalt Nickel Metal Co., LTD)., which were respectively held by Tongda Import and Export, Shanghai Fanda etc. Through this acquisition, we completed the whole cobalt production chain, and expanded the products to down-stream products, such as lithium cobalt oxides, LiNiCoMn Lithium and etc. It also helped us to get through the recycling industrial chain from waste batteries, waste battery materials to new energy battery materials, and become the world advanced new energy battery materials manufacturer.

Achievements(5): Built the space-time information platform of renewable resources on the basis of Internet of Things and completed the overall control on the recovery, transportation and treatment of urban mines

On 28th December 2012, the key project "Regional Circular Economy Development of Key Technologies and Demonstration Project" branch — "The Space-time Distribution Monitoring of Renewable Resources, and Multi-industrial Links Technology Research Based on the Internet of Things", which was supported by national science and technology had a smooth start in Jingmen GEM Urban Mine Recycling Industrial Park. The project was led by the Institute of Geographic Sciences and Natural Resources Research, China National Resources Recycling Association and Tsinghua University and implemented by GEM. Based on the Internet of Things and GIS, the project was unfolded with two main line: the vertical space-time distribution monitoring platform and the multi-industrial links technology of renewable resources, and attempted to start from four different levels: fundamental research, data platform and system research, the model of industry links, integrated demonstration . Through the implementation of this project, GEM will complete the overall control on the recovery, transportation and treatment of urban mines recycling.



2、Recovery Model Innovation

Region Distribution Trading Market

On 6th November 2012, Shenzhen GEM high-tech Co., Ltd and the People's Government of Xiantao city held a signing ceremony of "The investment of urban mine resources market" in Xiantao Chengda Hotel. As a high-tech enterprise, GEM will provide technical support for this project.



GEM Wuhan City Circle(Xiantao) urban mine resources market, which includes the Renewable Resources Distribution center, Scraped and Second-hand Goods Sales Exhibition Center, Discarded Vehicles Parts Recycling Center, and Renewable Resources Information Center, attempt to be the distribution market center of central China and eventually become the domestically leading and world's advanced renewable resources intensive, standardization and informationization of distribution, sorting, comprehensive utilization, exhibition and sales of the demonstration center, and become the regional renewable resources green distribution of the exhibition center, the environment education base.

Cooperation with government and other public institutions

On 16th August 2012, eight pilot recycling enterprises and public service departments signed a cooperation contract in Shijiazhuang Hebei province. GEM attended the signing ceremony and gave speeches on the behalf of recycling enterprises. The cooperation was organized by the Ministry of Commerce and the Government Offices Administration of the State Council, its purpose was to construct a public waste recycling system.



On 15th October 2012, the Government Offices Administration of Hubei Province, the Department of Commerce of Hubei Province jointly issued a document to confirm Wuhan GEM as the contract company of Hubei public waste recycling system.

In 2012, GEM successively signed agreements with the Legal Affairs Office of the People's Government of Hubei Province, the Office of Hubei Provincial Poverty Alleviation and Development, Wuhan Municipal Development and Reform Commission, Wuhan Audit Bureau and other government agencies and enterprises to promote the construction of waste recycling.

3、Technology R& D

In 2012, GEM successfully applied 87 patents, 15 national/industrial standards, and established the technology and standard system in the field of rare earth, precious metals and other rare disperse metals. It also shouldered the national 863 Project "The key technologies of used PCB recycling and utilization", through which can improved the company's core competitiveness.

On 20th June 2012, entrusted by the Ministry of Commerce of PRC, GEM established the National Circular Economy Research Base. The base was found to deeply research the theory and practice of circular economy in the consumer area of China. By perfecting the renewable resources recycling system, this center will accelerate the large-scale utilization of renewable resources, and extend the green consumption patterns, so as to promote the steady development of each link of circulation and consumption in recycling economy.

On 18th December 2012, the founding conference of Hubei E-waste recycling innovation strategic alliance was successfully held in Jingmen GEM Urban mine Resources Industrial Park.



Part Two: Employees

We always take efforts to constructs an employee interest centered culture system.

Culture Quotations:

Be responsible, smile treat work;
Preclude safety accidents, environmental incidents and labor disputes;
Care about employees, be kind to employees, establish a harmonious employee relationship;
Managers take turns to greet and see off employees at the office , and get close to each of them;
Improve the work environment and accommodations;
Treat employees with consideration, help the employees in difficulties;
Prevent using any rude ways to deal with labor disputes;
Build a system to help the employees who break the rules
Provide training and learning opportunities for employees.

Fundamental Idea

Persisting with the idea "Promote synchronous development of employees and enterprise, keep the consistency of enterprise benefit and employee interests, we always insist on constructing a employee interests centered culture system, and make efforts to create a comfortable, relax and active work environment for the staff. We aim to gain a win-win between company and employees by the means of employees' participative management and performance evaluation.



Company' s philosophy on dealing with employee relations

Safety Production

Taking the “Life above all, safety production” as company’ s safety principle, we always care for workers’ safety and protect the legal rights of each employee. Our purpose is to create a safety work environment, protect the health and security of employees, and guarantee an orderly production process.

In 2012, we made safety management rules. The details include “Develop a professional safety management agency to improve the safety management system, build effective safety facilities, provide safety trainings, confirm the safety responsibilities, check and correct defects, prevent security breaches, full participation in injury and accident insurance , and prohibit insecurity work.”

2012 Safety Management Performance:

Established a safety management agency

In order to strengthen the management, promote the safety production management and personnel training, and prevent accidents, we had set up a Safety Production Management Department to take charge of the Group’ s safety production.

Work achievements in safety production 2012 :

No.	Item	Data
1	Develop safety production and management rules	26
2	Regular safety check	22
3	Safety trainings	1941
4	Workshop/department or higher managers safety meeting	39
5	The potential safety risks which have been discovered and rectified	389
6	Establish a professional fire brigade	1
7	Regular fire drill	155



Safety training



Fire drill

7S Spot Management System

In 2012, we organized “The Month of 7S Spot Management” activity to enhance the knowledge of 7S Spot Management. Through this activity, both of the managers’ 7S management level and cleanness of spot factory environment had been improved. Moreover, it promoted the production process to develop toward standardization, normalization, and routinization, and reduced the risks in the course of production.



The summing-up meeting of 7S Spot Management

Physical Examination and Environment Detecting

In 2012, we organized the physical examination and environment detecting for our employees. The physical examinations were specially organized for new employees, on-the-job employees as well as some departed employees. Through a thorough environment detecting, we had found 9 potential problems, and all the hidden dangers had been rectified at the end of October 2012.



Environment Detecting

Vocational Trainings

In 2012, we carried out a series of vocational trainings, such as “Enterprise management communicative learning activities”, “Improve the abilities of production supervisors” “Safety Production” etc. Through these activities, the managers’ comprehensive quality has been improved, and the management vision has also been broadened. Meanwhile, the managers can learn the advanced manufacturing management concepts and the key elements in production management, so as to service the company better.



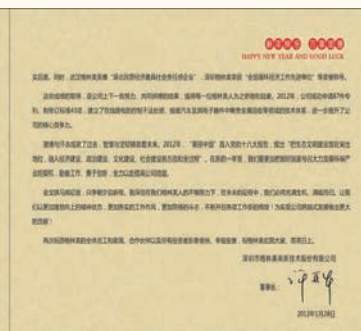
“Management level Improvement” Training



“Enterprise Management Exchange” Training

Employee Assistance Program

To show the concern to employees, the Chairman Xu Kaihua will give greetings to all employees as well as their families on holidays. Sometimes, he will go to the factory canteen and have dinner with them, so that the employees can feel reassuring to work in GEM.



Help employees in difficulties

In 2012, we launched the “Condolence difficult employees” activity. For now, we had developed a report mechanism for the difficult employees and set up a fund to help them. Moreover, the leaders represented company to visit the difficult employees and express their regards.



The company management visiting the difficult employees family

Colorful Activities

We built an Entertainment Center to enrich life of the staff. Besides, we also organized a series of activities such as “Talent Show” and “Party Member outdoor activities” . At the same time, we promoted low-carbon and environmental protection knowledge to employees during these activities.



Party member activity



Spring outing



Talent Show



Implement the spirit of the 18th National Congress of the Communist Party, make constructions for the beautiful China

● Beautiful China

On 8th November 2012, the 18th National Congress of the Communist Party of China was convened in Beijing. President Hu Jintao proposed that "We must give high priority to making ecological progress and incorporate it into all aspects and the whole process of advancing economic, political, cultural, and social progress, and work hard to build a beautiful country, and achieve lasting and sustainable development of the Chinese nation."

● Beautiful GEM

GEM----Add strength for the beautiful China

During the 18th National Congress, the headquarter and branches/ subsidiaries organized staffs to watch the conference and learn the sprite. We also launched an essay competition with the theme" How to make contributions for the beautiful China and be a beautiful GEM people" . In the end, we had received a total of 104 essays.



The employees were studying the spirit of the 18th National Congress

● Beautiful GEM people

In 2012, GEM emerged 127 outstanding individuals and 17 Advanced Units. These outstanding employees together set an example for all the GEM people, drive the development of other employees, and make contributions to environment protection industry.



Beautiful GEM People

Part Three : Integrity management and win-win

Shareholders &GEM

Improve the legal person governance structure, ensure the full exercise of shareholders rights

We have a sound legal person governance structure and a well established management system, mainly include the following: “Articles of Corporation” , “Rules of Procedure of the Shareholders” “Rules of Procedure of the Directors Board” , “Rules of Procedure of the Supervisors Board” , “Working Rules of Strategy Committee” , “Working Rules of Nomination Committee” , “Working Rules of Audit Committee” , “Working Rules of Compensation and Assessment Committee” , “Fund- Raising Measures” , “Rules of Internal Control of the Affiliated Party Transactions and the Decision-Making” , “Financial Management System” , “Internal Audit System” , “Information Disclosure Measures” , “Significant Issues Internal Report System” , “Investor Relation Management” , “Precautions of Funds Occupied by Strong Shareholders and the Affiliated Party” , “Salary Management System” . Meanwhile, we will regularly inspect and assess the implementation of regulations and rules so as to improve the environment of internal control.

Improve the decision-making Mechanism, fully embody the supervision and decision-making rights

Before listing, important decisions were usually made by the strong shareholders. After the company has gone public, the board of directors and the board of shareholders make decisions in accordance with the “Articles of Corporation” . Now, we has achieved the change form shareholder decision-making system to grading decision system, as well as the change from minority shareholder interests to small and medium investors which represent the interests of all shareholders.

As the first listed company in the recycling industry, the Strategy Committee of GEM fully performed its duty and played an important role in the process of expansion and development. When facing with significant issues, managers will immediately exchange opinions with the directors and listen to their suggestions. For the important decisions such as the external investment and acquisition, the independent directors will fully participate in the overall process, do an on-the-spot investigation, and give suggestions. During the evaluation, inevitably there will be some troubles, the independent directors will make future investigation to solve the problems and protect the interests of the company.

Guarantee and respect the right to know and the right of supervision

The boards of supervisors regularly attend the key meetings to master the company’ s situation and make suggestions. GEM fully respects the rights that belong to the supervisors, so that the supervisors can perform their duties, and better understand the advices and requirements from shareholders.

Obviously, as an environmental protection company, its business operation should be in accordance with the national policies. Consequently, we arranged supervisors to supervise each link of the operation, including the link of E-waste recovery, the management of environment and subsidies etc. The supervisors follow up the whole process, and give actionable suggestions based on the actual situation.

In order to ensure the smoothly development of the investment projects, we also arranged other supervisors to inspect and evaluate the projects.

Return to shareholders

Since listing, GEM has maintained a good performance and shared the fruits of development with shareholders (as the following table shows).

Year	Revenue-sharing Plan	Notes
2012	The annual dividend to all shareholders for every 10 shares represented 0.5 per cash dividend (tax); meanwhile, transfer capital reverse to shares for every 10 shares transferred to 3 common shares	The plan needs to be approved by the general meeting of shareholders.
2011	The annual dividend to all shareholders for every 10 shares represented 2 per cash dividend (tax); meanwhile, transfer capital reverse to shares for every 10 shares transferred to 10 common shares	
2010	The annual dividend to all shareholders for every 10 shares represented 1 per cash dividend (tax); meanwhile, transfer capital reverse to shares for every 10 shares transferred to 10 common shares	

Creditors & GEM

GEM always gives top priority to protecting the legitimate rights and interests of the creditors and shareholders. By the means of timely informing important issues and guaranteeing the proper rights, GEM maintains a good cooperative relationship with the creditors in the course of operation, which in turn provides the necessary conditions for long-term development.

Whenever GEM gets into difficulties, it always receives strongly financing supports from the banks. Thanks to these supports, GEM can smoothly transfer its technology achievements and expand its business.



On 2th April 2012, in the Bank Docking Enterprise Fair, Lin Fang, the President of China Development Bank Hubei Branch, signed a cooperation agreement with GEM.



On 10th June 2012, in the Second Circular Economy Investment and Financing Conference, Zhang Daoyang, the Vice President of China Development Bank Hubei Branch, signed a strategic cooperation agreement with GEM.

Suppliers & GEM

On the basis of mutual benefit and win-win, GEM keeps a good relationship with suppliers. Taking "Serving the Customers" as the common goal, the suppliers play an important role in the process of production. These high-quality materials help GEM make good products to meet customers' expectations.

Rules for choosing suppliers:

- 1) Prefer the green suppliers
- 2) Follow the principle of "Q.C.D.S" (Quality, Cost, Delivery, and Service).
- 3) The supplier should have a good reputation and a sound financial system.
- 4) The supplier should have the expertise and technical ability.
- 5) The supplier should have the judgment of the changes of waste materials market.
- 6) The infrastructure should be in a stable operation.
- 7) The supplier should be legally registered.

Sometimes, GEM will attend the Suppliers Conferences to let suppliers get more information about GEM's new products and requirements, so that the suppliers can prepare in advance and minimize the purchase cost.

In order to guarantee the stable supply of raw materials and the steady of the market, GEM has built a good relationship with its raw materials suppliers, and formed a strategic cooperation with the upstream and downstream companies in the industry.

Customers & GEM

"Creating values for clients, suffering hardship with clients" has always been the GEM's motivation for dealing the customer relationship. Persisted in the principle of "Improve quality, Server Customer, Promote understanding, Achieve mutual-trusts", GEM had built up a firm relationship with customers and accomplished the "high-end customers, international developing strategy" objective.

Over the past few years, GEM had been the leader in cobalt/nickel powder manufacturers, and accounts for more than 50% of the market. We had become the core suppliers of well-known domestic enterprises, such as the China Minmetals Corporation, Zhangyuan Tungsten Co.,Ltd etc. Internationally, we had become the third-largest cobalt powder manufacturer in the world and had partnership with leading corporations like Rio Tinto, Kennametal etc. According to their requirements, GEM adjusted the production technologies and made improvement to meet their needs.

In 2012, one of GEM's leading products----WPC (Wood-Plastic Composites) gained the first WPC life cycle carbon footprint labels and certificate from SGS. The products were exported to many countries and regions, and successfully entered the famous European building material super market. According to the customers' requirements, GEM developed the first tracking system in WPC industry, and took part in the low-carbon project which was held by WWF (World Wildlife Fund). GEM always takes efforts to make contribution for the construction of beautiful China, and cooperates with domestic famous Planning and Design Institutes, Real Estate Developers, Tourism Investment Companies, and Landscape Contractor. The WPC, which can reduce the deforestation and carbon dioxide, are widely used in garden landscaping, municipal projects etc. Now, WPC has become a well-known low-carbon product in the market. Through years' hard work, GEM has become one of the major WPC manufacturers in China.

The following table shows the information of customers, the exchanges of technologies and quality etc by the end of 2012:

Products	The number of Clients(home and abroad)	The number of added clients (home and abroad)	The exchanges of technologies and quality	Resolved problems
Co/Ni Powder	228	78	3	Corrected the detecting errors in particle size and other chemical indexes
WPC	40	12	10	Improved the material's quality, the equipment's performance, and the process of production and packaging
Electrolytic Copper	10	5	3	Increased the copper content and improved the process of packaging
Plastic Particles	10	7	3	Improved the testing standard, learned the knowledge of Impact Index , Tensile Strength etc.

Part Four: Build the world advanced urban mine demonstration base

In 2012, GEM proposed to build the leading urban mine demonstration base in the world. We will make efforts to become the world advanced and domestic leading urban mine recycling innovation base, the recycling demonstration base, the R&D and technology promotion base, and the circular economy education base.

Business Model

Taking the urban mines exploitation and low-carbon industry system as the main body, GEM built a recycling business model "Waste resources----Recycled products----Replace the ore mine products----Replace the import products----Famous-brand products". In order to maximize the utilization of waste resources, minimize the pollution and implement low-carbon production, GEM developed a multi supply tunnels to reduce the use of natural resources. The model, which set up an example for recycling industry, reflects the "Reduce," "Reuse", and "Recycle" function of circular economy, and interprets the culture of "Limited resources, unlimited resources".

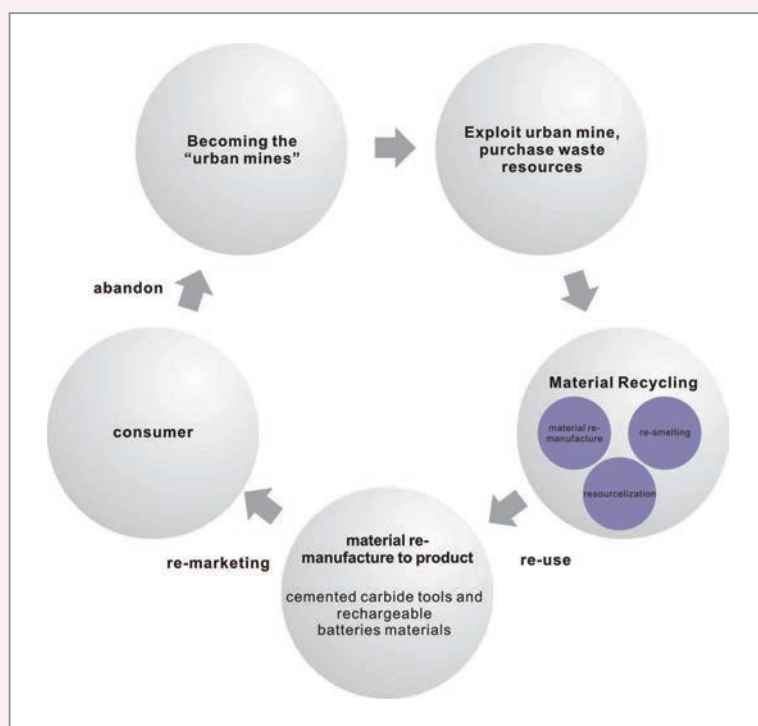


Chart 4-1 GEM Urban Mine Recycling Model

Create a harmless, low-carbon high-tech recycling model

● Independent Innovation, break through key technologies, and become the technology leader in recycling industry

Over the past ten years, GEM had successfully resolved the green recycling technology problems and industrial problems of used-battery, waste tubes and E-waste recycling, and formed a strong development force and a perfect technical standard system.

In 2012, GEM obtained 87 patents in the field of used batteries, E-waste, rare metals, and scattered metals recycling, 9 national/industrial standards, and published 6 technological standards. It also established the recycling technology system in the field of urban mine resources recycling. The system, which covers the links of classification, recovery, delivery, storage and recycling, has become the standard in the industry.

Table4-1 Patent application and license

Type	PCT	Invention Paten	Practical Patent	Design Patent	Total
The number of Patents Application	3	32	24	28	87
The number of Patent License	/	9	17	34	60

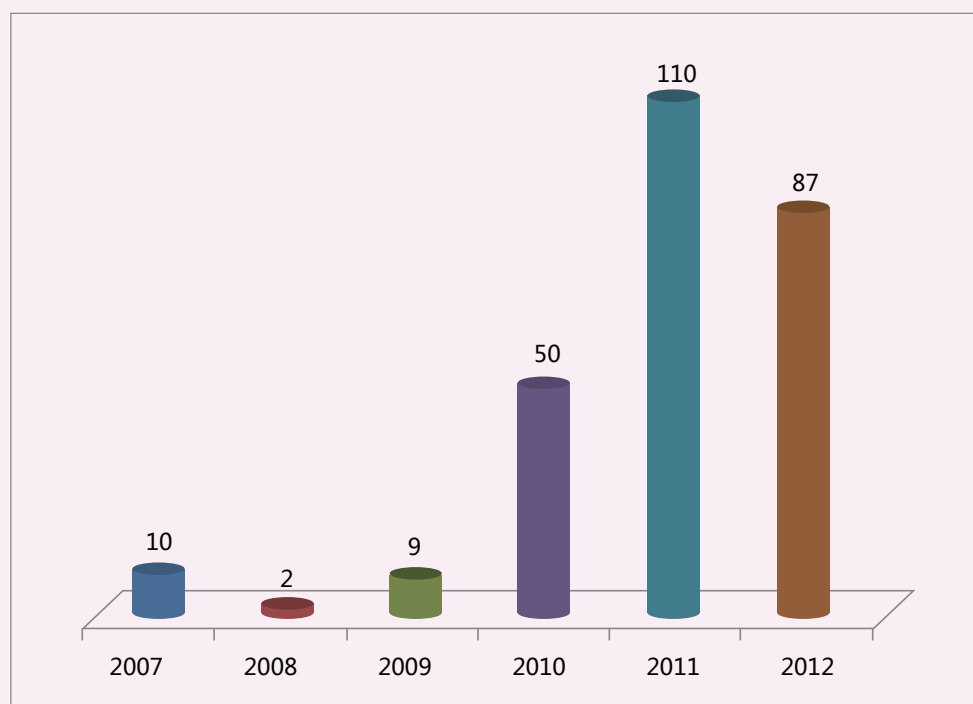


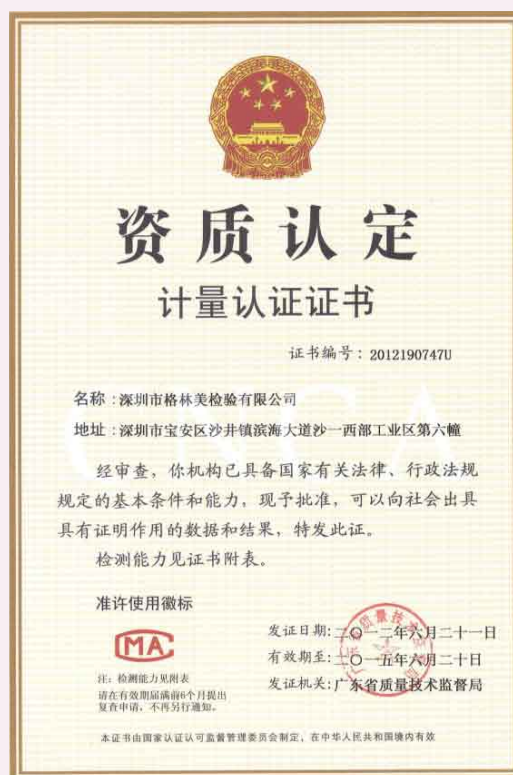
Chart 4-2 The achievements in patent application

Table4-2 Published Standards in 2012

No.	Plan Name	Standard Type	Plan Number	Plan Phase
1	Mechanical Property testing of WPC	National Standard	GB/T 29418-2012	Published
2	Electrolytic Nickel Powder	National Standard	GB/T 5247-2012	Published
3	chemical analysis for tungsten, Part 6: Determination of iron content by Spectrophotometric method	National Standard	GB/T 4324.6-2012	Published
4	Chemical analysis for tungsten Part 19: Determination of Titanium content ----The dianipyrylmethane photometric spectrophotometry	National Standard	GB/T 4324.19-2012	Published
5	Waste Chemicals Terms	National Standard	GB/T 29329-2012	Published
6	The testing of the repose angle of powders	National Standard	YS/T 56-2012	Published
7	Yttrium Oxide	National Standard	20120526-T-469	Drafting
8	Europium Oxide	National Standard	20120527-T-469	Drafting
9	The technical specification for remanufacturing of automotive components Water pumps	National Standard	20120241-T-339	Drafting
10	Coated Cobalt Powder	Industry Standard	2012-0632T-YS	Drafting
11	Recovery Processing of Used Rare Earth, Part 1: The Recovery of Rare Earth from Waste CRT	Industry Standard	2012-1597T-XB	Drafting
12	Recovery Processing of Used Rare Earth, Part 1: The Recovery of Rare Earth from Waste Fluorescent Lamp	Industry Standard	2012-1598T-XB	Drafting
13	Waste Gallium materials	Industry Standard	2012-1593T-YS	Drafting
14	The treatment method of Aldehydes Leak	Industry Standard	2012-1538T-HG	Drafting
15	The treatment method of Benzenes Leak	Industry Standard	2012-1539T-HG	Drafting

● R&D Ability

By the year of 2012, GEM had established the NDRC Urban Mine Resources National and Local Joint Engineering Research Center, Ministry of Commerce Circular Economy Research Center, Hubei Urban Mine Resources Recycling Technology Research Center, Guangdong E-waste Recycling Technology Research center, Shenzhen Environmental Friendly Metal Material Technology Research Center. Besides, GEM also has eight laboratory centers, respectively are Used Batteries and Rare Metals Recycling Laboratory Center, Rare Earth and Rare Metals Recycling Laboratory Center, E-waste Recycling Laboratory Center, End-of-Life Vehicles Recycling Laboratory Center, Waste Plastics and Agricultural Waste Recycling Laboratory Center, Advanced Material Reproducing Laboratory Center, Testing Center, Environment and Carbon Assessment Center. Moreover, GEM owns two state-level Engineering Research Centers, which were certified by CNAS and CMA.



雄厚的研发基础

For now, we have a total of 335 R&D staffs, including 8 Doctors/Professors. Employees with a bachelor or higher degree account for more than 65.37% of the total.

Over the past five years, GEM spent large sum of money on R&D, account for more than 3% of the sales revenue. GEM can hardly make significant progress without the enormous R&D investment (detail at right).

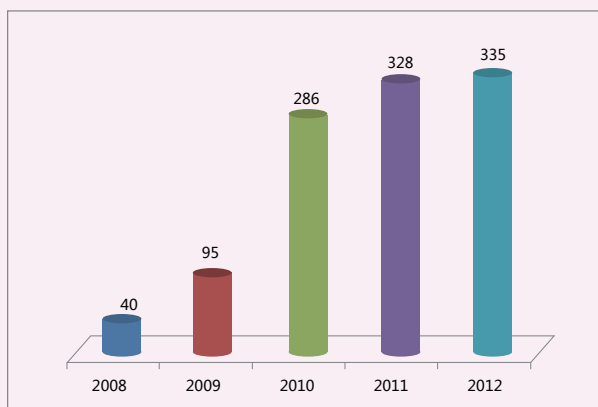


Chart4-3 R&D Staffs 2008-2012

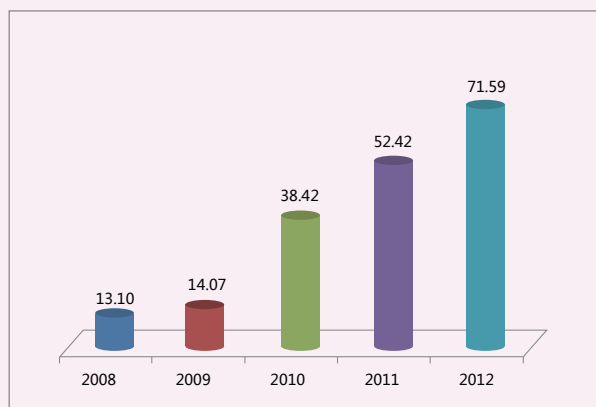


Chart 4-4 R&D Investment 2008-2012 (million RMB)

Six Main Business Chains, “Zero Waste” Business Model

Take the Jingmen Urban Mine Recourses Recycling Industrial Park as our recycling industry headquarter, we concentrate on the fields of used batteries, E-waste, End-of-Life vehicles, rare earth and precious metals and other urban mine resources, and slowly extend from Central China to all across the China. With the complete multilevel recovery system, we aim to build a big recovery and terminal market for urban mines. Based on the Six Recycling Industry Chains, and with our main products, we make effort to be the world’s advanced, domestic leading multilevel urban mine recycling innovation center, recycling demonstration base, R&D and technology promotion base, and circular economy education base.

Six Main Business Chains



Part Five: Social environment Responsibility

We make the idea “Recycling” into reality.

As the leading enterprise in recycling industry, we integrate the industry development, environment and employee interest together, and realize the unification of enterprise performance, employee growth and social value. At the same time, we also actively response the 18th CPC National Congress spirit, practice the social environment responsibility and make contributions for the beautiful China.

Social Responsibility

Over the past ten years, based on the stable development, we always persist in practicing social responsibility, and maintain the customer relationship and other social public interest. Moreover, we are also active in social welfare and public activities; realize the unification of profit maximization and social efficiency maximization.

● On 31th March 2012, together with the students of Shenzhen Foreign Languages School, we launched the “The Hour, The Way” Earth Hour 2012 activity. As the sponsor, GEM actively promoted the awareness of environment protection to citizens and fully performed the enterprise social responsibility.



Students Environment Protection Alien



Parents are teaching their children the knowledge of environment protection

● On 13th July 2012, GEM joined the SEE (Society of Entrepreneurs & Ecology). The mission of SEE is to protect global ecology and environment, care for our home land, and create a harmonious environment of man with nature. GEM committed to promote the environment protection, make contribution for low-carbon economy. GEM also promised to positively attend the low-carbon activities ever year, such as “Earth Hour” , “Car Free Day” , “Green Office” etc.

● As the saying goes, "A difficult one, P Plus support." the GEM people are always active in helping people in difficulties. In 2012, we organized the "Volunteer Blood Donation" activity; the employees positively participated in the work of blood donation.



Jingmen GEM employees took part in "Blood Donation"

"Life extension, Beautiful life" ----the story of Li Jingfeng

On 2th May 2012, in order to save the life of a leukemia sufferer, Li Jingfeng, a common worker of Jingmen GEM, gratuitously donated 400ML blood stem cells. Once again, on 11th January 2013, Li donated 200ML lymphocytes for free in Wuhan Tongji Hospital. He is the first person in Jingmen city and the third person in Hubei province to gratuitously donate stem cells twice.

Li Jingfeng, 32 years old, is a driver of Jingmen GEM. He is a kind-hearted person and always eager to help others. From the age of 19, he began to donate blood for free. For now, he has donated 26000ML blood, and was praised "National Blood Donation Compensation". On 11th June 2004, Li Jingfeng joined the CMDP Hubei Register, and became a blood stem cell donor.



On 2th May 2012, Li Jingfeng donated 400ML blood stem cells for a leukemia sufferer. She was a 49 years old minority. After eight months, Li Jingfeng received a call from CMDP Hubei Register, he was told that the patient's conditions were deteriorating, and they asked him if he would like to donate his bone marrow to this patient again, for he was the most suitable person. Li answered immediately. Later, when he heard that the patient had difficulty in undertaking the cost of treatment, he donated 1000yuan which was awarded by Jingmen Red Cross and afforded the examination fees himself.

In the morning of 11th January 2013, after 3 hours donation, the 200ML lymphocyte was sent to Beijing by air and saved the patient's life. When Li was interviewed by the media, he said "This is a copy of my heart, and I felt it was my duty to do so."

At the same time, he processed the donation of cardiac death in Hubei Red Cross. His action was also infected with colleges and friends around him, they had positively joined the team of volunteer blood donation .

When the Chairman heard the story of Li Jingfeng, he called on all employees to learn from him, study the spirit of "Care for others, Dedication to Society" , study the act of dedication, and study the culture of "Love the motherland, Love the Society, Love the Company, Love the Family" .



Li was holding his blood stem cells



Li was greeted by his colleges



● As the circular economy education demonstration base, GEM is active in practicing social responsibility. We had set up the special Circular Economy Reception Office to promote circular economy. Since its foundation, the demonstration base has been viewed thousands of times. It plays an important role in environment protection education, and become the important window to promote China Green Industry to the outside world.



The pupils visited the recycling factory



The middle school student visited the recycling factory



Social Organizations visited the demonstration base



Promoted circular economy knowledge to the pupils

Assume Environment Responsibility

As the representative enterprise of China Circular Economy, we positively assume the environment responsibility. According to the requirements of “National Emerging Industries Development Program” and “The 12th Five-year Circular Economy Development Program”, we make constructions to save resources, improve resource utilization and natural environment, reinforce ecological civilization construction, and strive to develop circular economy.

● ISO14000 Environmental Policy

——Ecological Design, Process Control, Cleaner Production

——Reduce Consumption, Save Resources, Save Energy

——Recycle Resources, Reduce Emission, Emission on Standard

Ecological Design, Low Carbon Manufacture Maximize Recycling, Maximize Reduction



● Recovery System

China's largest used batteries recovery system. From 2006 to 2012, the recovery rate of used batteries was increased from less than 1% to more than 10%.

- Installed 20000 used – battery recycling bins
- Covered 100 cities: a total area of more than 20,000 square KM
- Undertook 100 Launching Ceremony
- 3000 committees, 500 schools, 1000 government agencies, 500 business unions, and 100 million people took part in recycling activities.
- Distributed 5 millions handouts



Developed the nation's first E-waste recycling stores, built the "Fair Trade, Transparent Transaction, Regularize Recovery, Green Treatment" GEM model.

For now, we had built 300 E-waste recycling stores and renewable resources recovery stations covering 20 cities in China, and created the "Fair Trade, Regularize Recovery" GEM model. It marks a transition from the disordered recovery way to the one of regulation and transparency. Based on the complete recovery system, we can recovery a total of 5000 tons E-waste every month.



The world's first 3R low-carbon recycle consumption community shop, created a new business model of circular consumption, covering production, consumption and recovery.

By the end of 2012, we had established 20 3R shops. 3R shops is a low-carbon consumption shop integrate the function of low-carbon products sales, second-handed goods sale and renewable resources recycling.



Region Distribution Trading Market

On 6th November 2012, GEM and the People's Government of Xiantao city held a signing ceremony of "The investment of urban mining resources market". GEM Wuhan City Circle(Xiantao) mining resources market will build itself into the distribution market center for central China, including the Renewable Resources Distribution center, Scraped and Second-hand Goods Sales Exhibition Center, Discarded Vehicles Parts Recycling Center, and Renewable Resources Information Center, and eventually become the domestically leading and world's advanced renewable resources intensive, standardization and informationization of distribution, sorting, comprehensive utilization, exhibition and sales of the demonstration center, become the regional renewable resources green distribution of the exhibition center, the environment education base.



Mobile Shredder Vehicles

We had installed a shredding machine in each of our recovery vehicles. All the hard disks will be crushed immediately to prevent information leakage.



● Promote Environment Protection

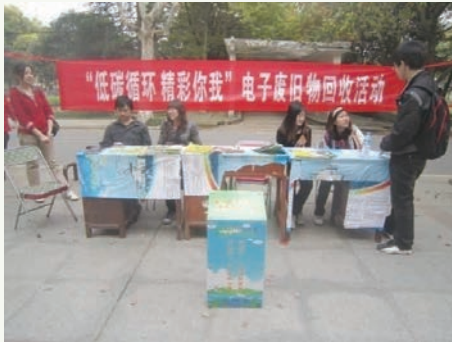
In 2012, except to practice the responsibility of environment protect, we make efforts to promote the awareness of environment protection as well as the idea of "Limited resources, unlimited recycling". We are active in sponsoring environmental activities, popularizing the construction of public recovery system and other public activities.

In 2012, we took part in the "Environment and Health Communication" activity. The theme slogan of this activity was "Green, Low-carbon, Health, Harmony; Step toward Green Economy, Achieve Sustainable Development; Develop the Green Economy, Enjoy healthy life".



On 5th June 2012, we participated in the environment protection promotion activity which was held by Jiangxi Province Environmental Protection Authority. Xu Kaihua the Chairman of GEM, made a speech on the activity. He called on the public to develop green industry and establish a lifestyle of low-carbon. He also exchanged views with students, and invited them to visit Jiangxi GEM Recycling Industrial Park.

We promote our employees to participate in voluntary recycling of waste classification so as to recycle internal waste resources. Each employee is bound to recovery 6kg of used batteries and electronic waste, 2 kg of waste paper. Energy saving and emission reduction have been widely accepted as a part of our enterprise culture.



Used battery Recycling Program in WTU



The employee was recovering the used batteries



In addition, we take chances to promote GEM Low-carbon conception to the world. We use all kinds of domestic and foreign propaganda platform for strong advocacy of environmental protection, and participate in major trade fairs at home and abroad.

In 2012, we took part in a total of five high-end exhibitions at home and abroad including Chinese Architecture Exhibition, the 111th Canton Fair, the 25th World Tungsten Fair, 2012, the first session of the Urban Mines Expo.



Exhibition site

● Increase the investment of environmental protection facilities

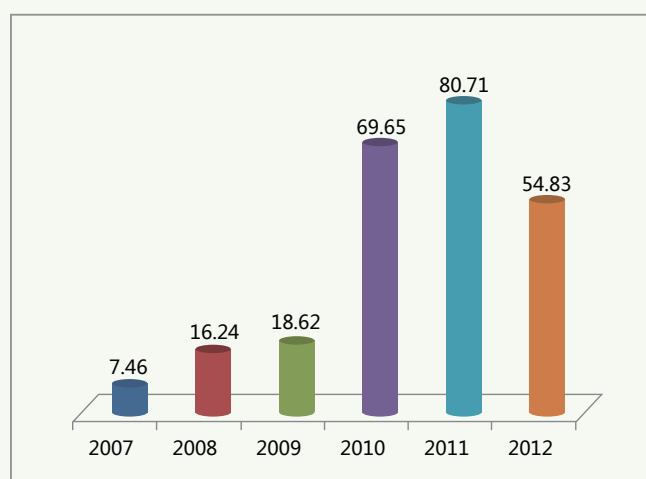
In 2012, we invested 54,829,800 RMB to improve the recycling system of effluent, sludge, and off-scum. We launched several environmental protection facilities in the workshops and warehouses, which were listed below in the table 5-1.

Table 5-1 GEM environmental protection investment profile in 2012

No.	Project Name	Investment (Thousand RMB)	Problem solved
Jingmen GEM			
1.	Ammonia absorption and recycling system	6,060	This system use vitriol as absorbent, to absorb the ammonia gas generated from ammonia nitrogen stripping process during the effluent recycling. The ammonia was made into ammonium sulphate fertilizer and traded. This method could reduce the ammonia nitrogen content in the emissions efficiently and improve the air quality.
2.	The emission treatment facilities of WPC pre-processing workshop were enhanced	3,200	After the enhancement, the operating environment of the workshop had been greatly improved and the emissions were released up to standard.
3.	The main facility and equipment of effluent station was enhanced	6,000	Important for preventing the leakage during production process and ensure the effluent was released up to standard.
4.	Launched the Co, Zn, Mn, and As online monitoring system in the effluent station, which was directly linked to Environment Protection Agency	1,000	Important for monitoring the up-to-date heavy metal content and changes in the effluent discharged.
5.	The production line of sludge and off-scum recycling was constructed.	35,320	This production line could recycle 50000 tons of sludge and off-scum per year after putting into operation, which could produce 40 million pieces of standard brick, reduce the exploration of 50000 tons of soil resources, and reduce the land occupancy of 10000 square meters.
Subtotal		51580	
Wuhan GEM			
6.	The online auto monitoring system of stationary pollution source (water quality) was constructed according to the requirement of Wuhan Environment Protection Agency. The main outlet was up to standard.	20.8	In accordance with the requirement of Wuhan Environment Protection Agency, the standard outlet was built and sign was hung.
7.	Vacuum cleaner in the e-waste workshop	15	Introduced the advanced industrial vacuum cleaner to avoid the leakage of fluorescent powder.
8.	Precast concrete cover plate	5.4	Improve the storm water tank, in order to apply the flocculants.
9.	Maintenance of epoxy floor level of 1# workshop, and antiseptic project of iron plate.	52	The antiseptic and seepage-proofing project in the workshop could avoid secondary pollution during disassembling process.
10.	Ground painting in the WPC raw material warehouse and refrigerant recycling room.	220	The antiseptic and seepage-proofing project in the workshop and warehouse could prevent secondary pollution inside the plant.
Subtotal		313.2	

Table 5-1 GEM environmental protection investment profile in 2012

No.	Project Name	Investment (Thousand RMB)	Problem solved
Jiangxi GEM			
11.	Effluent (generated from waste plastic cleaning process) treatment project	1,920	Recycling the effluent generated from waste plastic cleaning process.
12.	Gas emissions (generated from pelletizing process) project	250	Effectively processed the gas emissions generated from pelletizing process up to the secondary standard of < The Integrated Emission Standard of Air Pollutants >
13.	Environment monitoring	270	Multiple environment monitoring activities upon surroundings
14.	Environmental advocacy	80	Participating in all kinds of environmental protection activities, educating the hazard of e-waste and other pollution,
15.	E-waste recycling factory monitoring system upgrade	322	Fulfill the aim of monitoring the entire treatment process of e-waste.
16.	Rehearsal of environmental contingency plan.	20	Test the operability of the environmental contingency plan.
17.	Environment management system certification	30	Integrate the environmental management system, passed the ISO14000 environment certificate.
18.	Launching new environment detective devices	14	Enhance the detection of the enviroment
19.	Training fees	30	Enhanced the environmental awareness of the employees
Subtotal		2,936	
Total		54,829.8	



The environmental investment 2007-2012 (million RMB)

● Energy saving and environmental protection has a far-reaching influence

The clean natural energy like wind power and solar power, as well as low-energy LED lights, was wildly used in the GEM recycling industrial parks. The green, eco and recycling concepts were dominated during the whole process of GEM e-waste recycling, which makes us the advanced e-waste recycling touring base in the nation.



GEM use clean natural energy such as wind power and solar power to generate electricity

GEM Wood Plastic Composite had many advantages such as anti-rotten, water-proof, anti-cracking, anti-fungus, and insect-resistant. Its life span is 5 times longer than the lumber, which makes it a great substitute for lumber in all kinds of outdoor landscape designing project.

Wood Plastic Composite has significant environmental added value. A ton of Wood Plastic Composite could reduce 987.5 kg of carbon emissions, reduce 0.08 hectares of deforesting, saving 22 barrels of crude oil, saving 376 kg of standard coal. It shows GEM's corporate mission of "eliminating pollution, recovering resources".



The carbon footprint label of GEM Wood Plastic Composite were approved by SGS

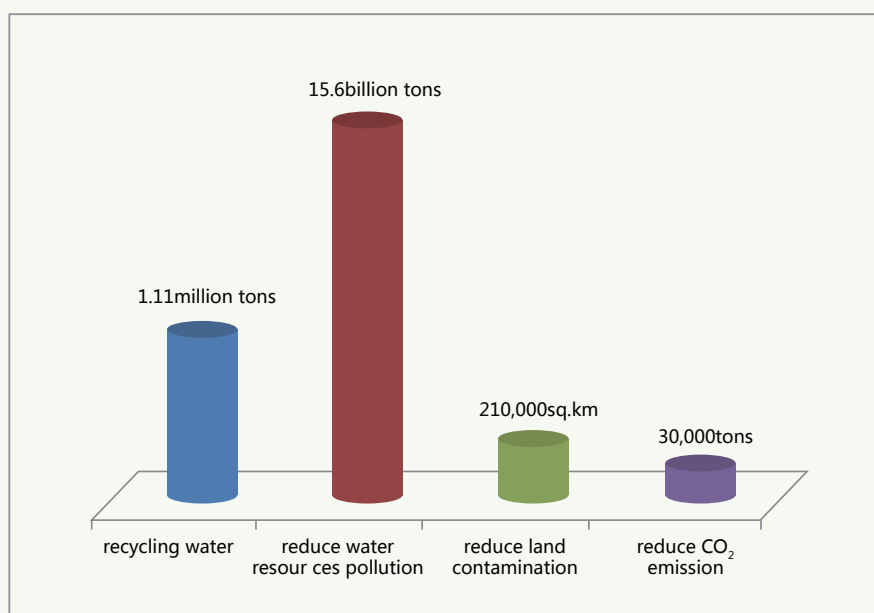
● Practice energy-saving and emission-reduction

Recycling of 1 ton rechargeable battery can save 79 tons of cobalt and nickel ore; recycling of 1 ton WPC product can decrease 0.08 hectares of deforestation, see following table.

Table 5-2 GEM Environmental Achievement Table

	Production of 1 ton cobalt and nickel powder	Production of 1 ton WPC	Production of 1 ton electrolytic copper	Recycle of 1 ton waste primary battery	Recycle of 1 ton rechargeable battery
Recycle of water (ton)	320	3.4	20	/	/
Standard Coal-saving (ton)	105	0.376	2.46	16.8	19.2
Recycle of Valuable metal (ton)	1	/	1	0.69	0.79
Reduction of water pollution (million m ³)	100	/	200	14	34
Reduction of Solid waste	99	1	133.32	68	78
Reduction of soil pollution (m ²)	2.5million	/	160 thousand	3033	8500
Reduction of deforestation (ha)	/	0.08	/	/	/
Reduction of CO2 emission (ton)	1.5	0.9875	1.1	1.0	1.2
Calculation Standard	GB8978-1996 water pollution discharge standard ; GB15618-1995 soil environment quality standard; GB21251-2007 consumption of nickel refinery; GB21248-2007 consumption of copper refinery, waste battery pollution technology policy, clean production of papermaking industry (waste paper pulp)				

In 2012, total "urban mining" resource of 325,200 tons was disposed by GEM, such as used batteries, cobalt, nickel and tungsten scrap, waste electrical and electronic products, scrap metal, and waste plastics, which was equivalent to saving 38 million barrels of petrol, 1.11 million tons of recycled water, and prevent 15.6 billion tons of water or 210,000 square kilometers of soil from pollution, and 1,409 hectares of forest from deforestation; saving 500,000 tons of standard coal, and 30,000 tons of carbon dioxide emissions. See below table.



2012 GEM Environment protection Achievement Performance – Emission Reduction

● Social concern and influence

The company was recognized by state, governmental, social environmentalists, See table 5–3.

Table 5–3 Honors, Qualification, and Awards Received in 2012

No.s	Time	Event	Organization
1.	2012 Apr.	"comprehensive utilization of waste Cobalt & Nickel Material key technologies included in the national renewable resources comprehensive utilization of advanced and applicable technologies	China Resources Comprehensive Utilization Association
2.	2012. June.	Mr. Xu Kaihua, Chairman of the Company was named "2012 China Resource Person of the Year"	2012 China Renewable Resource Person of the Year Committee
3.	2012. July	Founded state ministry of commerce recycling economy research base.	Ministry of Commerce of the People's Republic of China
4	2012. July	Was named "the Guangdong Provincial Intellectual Property demonstration enterprise "	Guangdong Provincial Intellectual Property Bureau
5	2012. Aug.	Wuhan GEM Resource Recycling Co., Ltd. was named "Hubei the most socially responsible private enterprise	Private Institute of Economic Research in Hubei Province
6	2012. Sept.	Approved the formation of the "Guangdong Province Electronic Waste Resource Engineering Research Center"	Guangdong Province Science and Technology Department, Development and Reform Commission, Economic and Information Technology Commission
7	2012. Oct.	Was named the national circular economy advanced enterprise"	National Development and Reform Commission
8	2012. Oct.	Was named "outstanding private enterprises in Hubei Province	Hubei Provincial People's Government
9	2012. Nov.	Included in the national invention patent "an environmentally friendly nickel / cobalt / iron alloy production process and system fourteenth session of the patent award	State Intellectual Property Office

● In 2012, GEM has committed to the practice of exploitation and utilization

Urban Mineral Resources, which continuously received the support from state and ministries and Guangdong, Hubei, Shenzhen, Wuhan and other levels of government and leadership. The social mainstream news media continue to focus on and support GEM development.

Part Six Vision

Advanced bravely, and light up beautiful China

In 2012, GEM opened a new chapter for “the second glorious decade”; It is a new starting point for a new journey, a new hope. Faced with the stressful situation of tight resources constrains, serious environmental pollution, and the ecosystem degradation, we always have “limited resources, unlimited recycling” as our industrial philosophy; “persistence, innovation, speed, responsibility” as the spirit of enterprise; “Exploitation of urban mining, and build up the world recycling plant” as the corporate vision.

Looking ahead, we are full of confidence in the victory. One generation has its industries, the 21st century is the era of the development of recycling economy, and this is an era and an opportunity for GEM. We will be in accordance with the requirement in “12th Five-Year” national strategic emerging industry development plan “and “the National 12th Five circular economy development plans”. Benefit from 18th CPC National Congress, GEM will advance bravely, and strive to be a great environmental-friendly enterprise in the era. Contribute to beautiful China !