



Y2019 SMIC Environmental Reporting

Semiconductor Manufacturing International Corporation

May 2020

Assurance Statement

SMIC (Semiconductor Manufacturing International Corporation) has ensured all the data in the report is accurate and authentic; this data has also been certified by the following third parties, which have no conflict of interest in this matter. The data showed in the report involves SMIC Shanghai, Beijing, Tianjin and Shenzhen plants:

- Data on waste gas emissions was monitored by qualified testing institutes
- Data on hazardous waste was checked by treatment vendors and the government via bills
- Data on energy consumption was verified by the related energy management agencies
- Data on greenhouse gas emissions was certified via 3rd party ISO 14064 certification

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1 Environmental Footprint

Semiconductor Manufacturing International Corporation and its subsidiaries collectively constitute one of the leading foundries in the world, is Mainland China's most advanced and largest foundry, broadest in technology coverage, and most comprehensive in semiconductor manufacturing services. SMIC Group provides integrated circuit (IC) foundry and technology services on process nodes from 0.35 micron to 14 nanometer. Headquartered in Shanghai, China, SMIC Group has an international manufacturing and service base. In China, SMIC has a 300mm wafer fabrication facility (fab) , a 200mm fab and a majority-owned joint-venture 300mm fab for advanced nodes in Shanghai; a 300mm fab and a majority-owned 300mm fab for advanced nodes in Beijing; 200mm fabs in Tianjin and Shenzhen; and a majority-owned joint-venture 300mm bumping facility in Jiangyin. SMIC Group also has marketing and customer service offices in the U.S., Europe, Japan, and Taiwan China, and a representative office in Hong Kong China .

2 Environmental Protection Policy

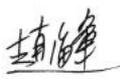
In its early days, SMIC established the environmental protection and safety and health policies based on ISO 14001 environmental management system and OHSAS 18001 occupational health and safety management system. Based on the continuously improved concept, by optimizing and revising the policy, SMIC gradually develops the following new management policies:

SMIC Environmental Protection, Safety and Health Policy

Established in 2000, SMIC provides high-quality wafer foundry services. In our daily operations, we focus on product innovation and quality control while putting emphases on preventing environmental pollution, using energy/natural resources effectively, protecting our human resources and forestalling accident loss. We believe this is vital to employee well-being as we raise environmental protection, safety, and health (ESH) standards for every employee at SMIC. We are striving to be environmentally responsible through continuous improvements. We aim to strengthen our operational risk management to ensure future growth of SMIC.

To achieve the above goals, SMIC is committed to:

1. Following ESH regulations and international protocols while fulfilling customer requirements.
2. Enhancing environmental quality and promoting employee safety and health as a primary responsibility for every SMIC manager.
3. Carrying out site ESH management through employee's ownership and teamwork.
4. Establishing a green supply chain, implementing green manufacturing and providing customers green products.
5. Strengthening accident prevention measures, emergency response capabilities and recovering abilities.

Approved by:  Date: 2017/6/2

Haijun Zhao, CEO

To achieve environmental protection objectives in the management policy, the company takes the following environmental management measures:

- Plan and take environmental protection measures and promote energy saving and emission reduction projects
- Classify, collect and recycle wastes
- Supervise and manage transfer, safety treatment and manufacturer qualification identification of hazardous wastes
- Control the content of hazardous substances in the product
- Carry out regular environmental monitoring and carbon emission check and disclose the results

3 Environmental Protection Management

Under the guideline of environmental management systems, laws, regulations and standards, SMIC systematically and normatively integrates the environmental management project into the whole process of production and operation in the areas such as organizational structure, document control, operational control, supervision and management, improvement and enhancement, by planning, implementing and operating environmental management projects.

3.1 Management Team and Capital Investment

SMIC sets up a separate environmental management sector consisting of members with professional environmental management knowledge and skills. The environmental management sector works with other functional divisions to jointly implement environmental management projects with clear responsibilities, to ensure the realization of environmental objectives and make sure that ISO 14001, ISO 14064, QC 080000 and other environmental management systems run effectively. In 2019, the company invested more than USD 43.6 million for operation, reconstruction and expansion, monitoring and third-party audit of the environmental protection facilities for waste water, waste gas and waste materials.

3.2 Cleaner production

In order to minimize and even eliminate the impact of the production process on humans and the environment, we implement cleaner production measures. These measures include reduction of pollution sources, increase of resource utilization, reduction and elimination of pollution in the links from production and maintenance to product use.

In accordance with regulatory requirements, SMIC regularly implements cleaner production audits and implements cleaner production improvement plan according to the expert audit suggestions. In 2019, SMIC implemented 27 cleaner production improvement programs with an investment of more than USD 1.5 million.

3.3 Product Hazardous Substances Control

In accordance with QC 080000 hazardous substances control system, the company controls hazardous substances risks in the whole production process, so that the products meet the Management Methods for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products; Registration, Evaluation, Authorization and Restriction of Chemicals; Halogen-Free; Sony GP standards and other domestic and international hazardous substances control standards, to reach the green product level.

Source control---promote green supplier evaluation mechanism and control hazardous substances from the source; select the suppliers that meet the requirements for green supplier evaluation, conduct regular documentation and site audits of suppliers, request the raw material suppliers to provide a statement of no hazardous substance; and require suppliers to provide periodic test reports of no hazardous substances for high-risk substances.

Process control---strictly implement production process control and put the equipment under isolation management; provide training for operators to prevent the production process from pollution by external hazardous substances.

Product test---monitor the content of hazardous substances in the products, conduct hazardous substances test for the products produced each year to verify the content of hazardous substances contained in the products is under control.

4 Greenhouse Gas Management

The climate change caused by greenhouse gas emissions has a great impact on the global ecological environment, human life and health and economy, so it is an environment issue receiving great concern from the United Nations, governments, society and business circles.

4.1 Climate Change Policy

SMIC is actively responsible for mitigating climate change, and it develops climate change policies and implements the measures to reduce greenhouse gas emissions.

SMIC Climate Change Policy

SMIC conducts business with the wellbeing of our environment, our community and our next generation in mind. Concerned about global climate change, SMIC remains committed to save resources, reduce disaster losses caused by extreme weather, slow down and reverse the effect of climate change to achieve sustainable development and leave behind a cleaner and more stable environment. To achieve these objectives, SMIC commits to:

1. Decrease Greenhouse Gases emissions;
2. Reduce product energy consumption;
3. Lower product water consumption;
4. Pursue green production and energy saving products; and
5. Enhance the ability to prevent, respond, and recover during adverse weather conditions.

Approved by:



Date:

2017/6/1

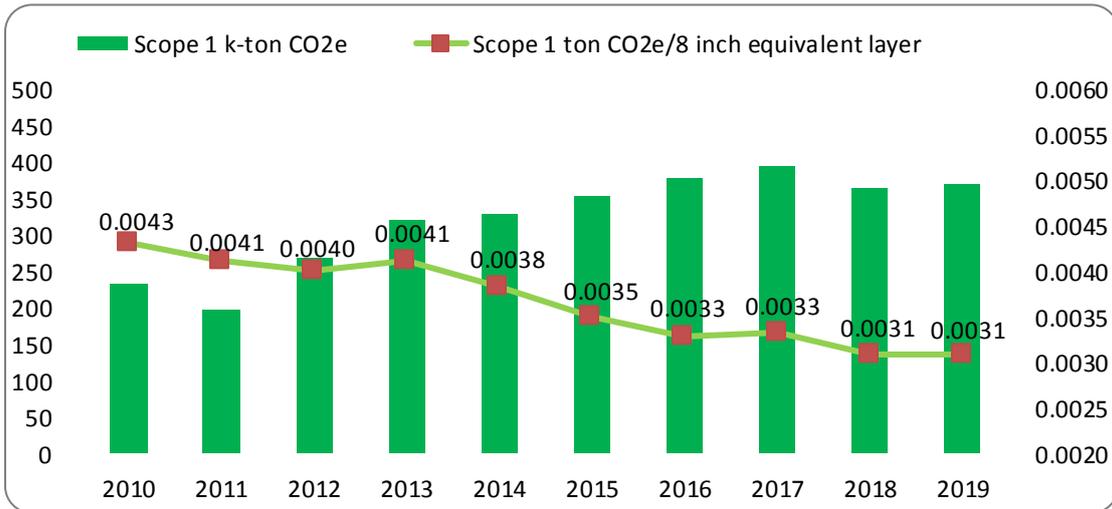
HaiJun Zhao, CEO

4.2 Verification of Greenhouse Gases

In accordance with international standard ISO 14064, SMIC establishes a greenhouse gas verification mechanism. It calculates the greenhouse gas emissions in the operating factory on a regular basis each year, to acquire the company's greenhouse gas emissions and implement emission reduction measures as planned. The total of greenhouse gas emissions decreased by 6.8% to 1,343,091 tons in 2019.

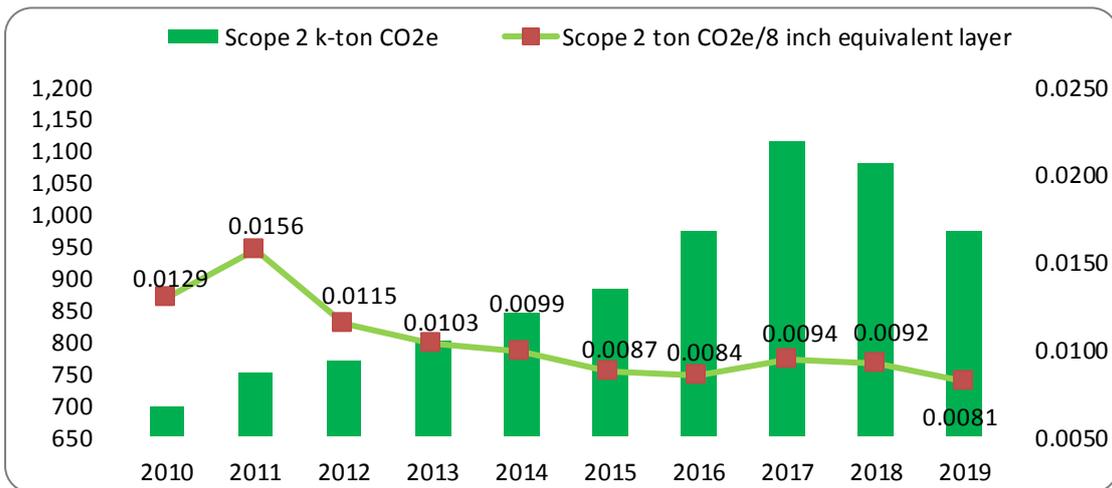
4.2.1 Direct Emissions of Greenhouse Gas

Direct greenhouse gas (Scope1) sources: combustion of gasoline, diesel, natural gas and other fossil fuels, perfluorinated compounds gas in the process of chemical vapor deposition and dry etching, organic exhaust combustion, refrigerant fugitive emissions, wastewater treatment system emissions and pure water system fugitive emissions, etc.



4.2.2 Indirect Emissions of Greenhouse Gas

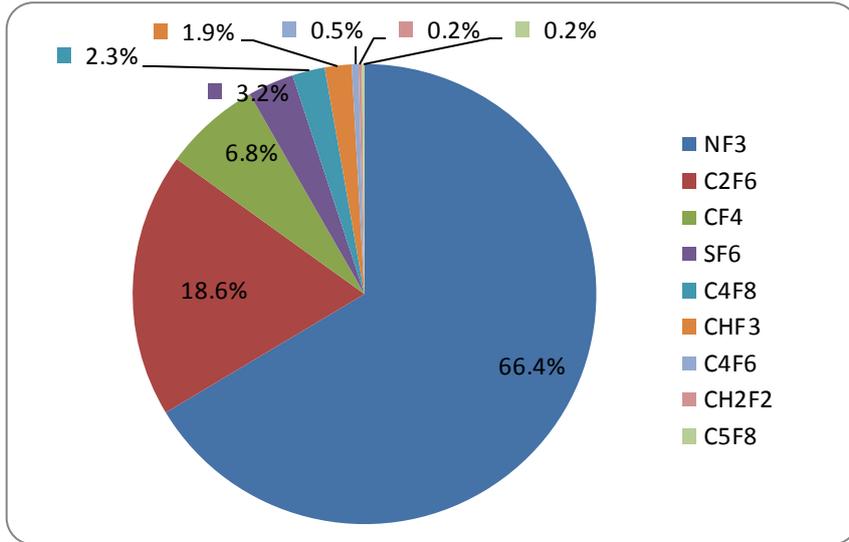
Indirect greenhouse gas (Scope2) sources: greenhouse gas emissions of outsourced power, steam, heat and other energies.



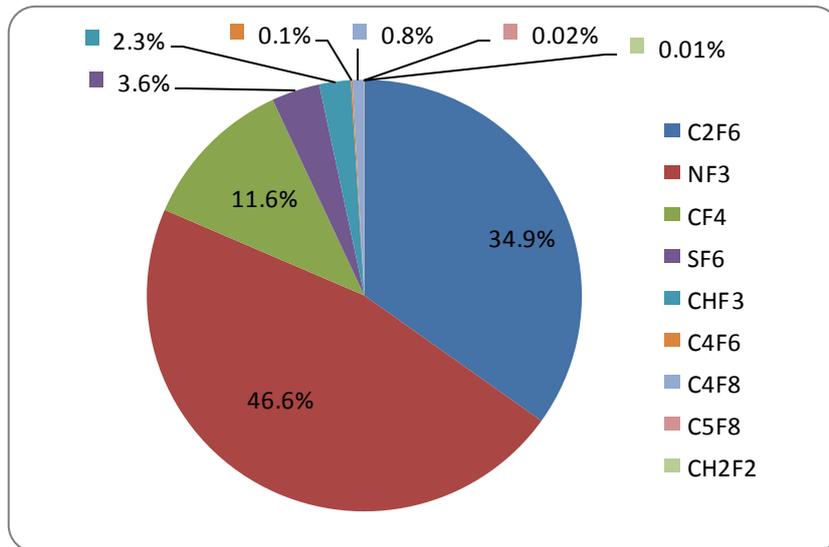
4.2.3 Perfluorinated Compounds Greenhouse Gas Emissions

As an important member of China Semiconductor Industry Association, SMIC provides annual perfluorinated compounds greenhouse gas emission information to the Association, which then report it to the World Semiconductor Council (WSC). SMIC is actively implementing the agreement developed by WSC on voluntary greenhouse gas emission reduction of perfluorinated compounds (PFC), trying to implement the best practice emission reduction technology advocated by WSC and reduce the emission of PFC greenhouse gas.

2019 PFC gas consumption information is shown in the following figure:



Information of CO₂ from PFC emission in 2019 is shown in the following figure:



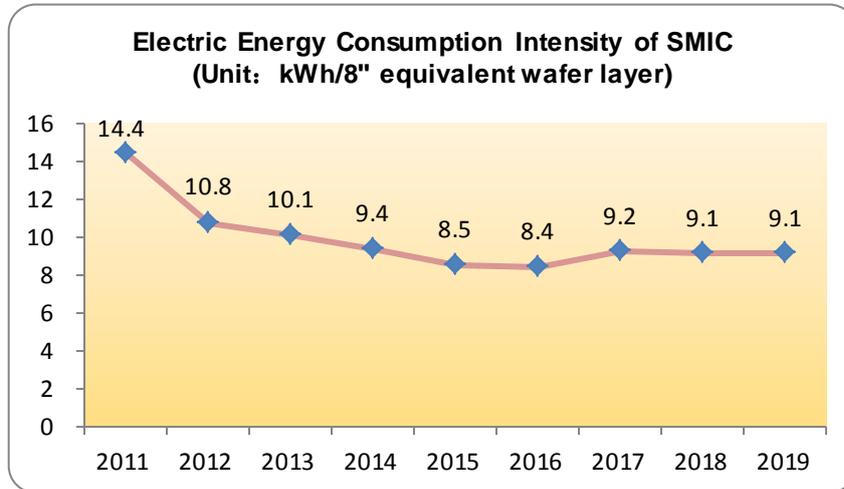
SMIC has been following WSC's goal which is equivalent to a 30% Normalized Emission Rate (NER) reduction from the 2010 aggregated baseline to 2020. The NER in 2019 is 0.579kg/cm² which achieved 55% reduction from the 2010 baseline with 1.29 kg/cm². But the great efforts are still being made to achieve the WSC's NER absolute reduction goal with 0.22kg/cm². (The NER value calculated via WSC's computation method).

5 Energy Management

SMIC actively responds to national energy-saving and emission reduction calls, establishes energy management organizations and continues to implement energy-saving and emission reduction projects, achieving a double win for economic and environmental benefits.

5.1 Consumption of Energy

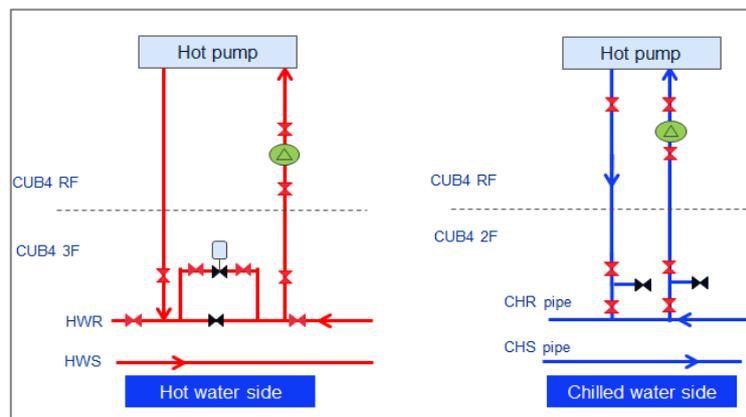
Compared with 2018, the energy consumption intensity per unit output presented an steady trend in 2019.



5.2 Main Energy Saving Projects in 2019

5.2.1 Heat Recovery of the Heat Pump Ice Machine Energy Saving Project in Shanghai Plant

The fresh air system (MAU) shall be used to maintain stable temperature and humidity in the warehouse and other areas. In the process of dehumidification, MAU shall also use hot water to heat the dehumidified low-temperature air in the MUA. In winter, steam is used to heat MAU, and the heat required by MAU is not much in summer compared with winter, so the steam hot water system can be stopped. Satisfied the heat required by the MAU through the warm water produced by the cooling water heat recovery system of the heat pump ice machine, so as to achieve the purpose of energy saving.



5.2.2 Vacuum Pump Renovation Energy Saving Project in Shanghai Plant

The tail gas end of the vacuum pump without special gas reaction chamber of 50 dry etch equipment is equipped with energy saving device to reduce energy consumption. The vacuum pump starts to drive, with the rotation of each rotor R1 to R5, the gas is squeezed and discharged layer by layer. When it reaches rotor R4, the exhaust pressure rises to higher than atmospheric pressure. Generally, there is final discharge pressure under this condition, which is quite power consumption. The vacuum pump continuously depressurizes the exhaust through the exhaust port, reducing the load of R4 to R5 rotary exhaust. The principle of the energy saving device is to use the Venturi effect, install it at the exhaust outlet of the vacuum dry pump, and use the existing nitrogen or compressed gas for cleaning to generate a negative pressure at the downstream of the check valve of the energy-saving device, so as to reduce the exhaust pipeline pressure of the vacuum dry pump. Reduce the load of R4 and R5, and finally achieve the effect of power saving.

5.2.3 Other Energy-saving Projects

| Plant | Project Name | Brief Description of Project | Energy-saving Performance |
|----------|---|--|---------------------------|
| Shanghai | Energy-saving Renovation Project of Lighting System | The 160 sleeve lamps in the central walkway of the office building are replaced by 8-watt LED lamps from 2 13-watt downlights; the 14000 37-watt fluorescent tubes in the office building are replaced by 10.5-watt LED lamps to meet the lighting requirements and save energy | Power : 1,650,209 kWh |
| Shanghai | Energy-saving Renovation Project of Plasma local Treatment System | The plasma torch current of 89 plasma local scrubbers are optimized, and the 160 V DC current was changed from 65-80A to 60-75A , so as to save energy | Power : 623,710 kWh |
| Shanghai | Energy-saving Renovation Project of Fresh Air-conditioning System | Optimize the fresh air-conditioning in the office area to achieve half operation and reduce energy consumption | 1,153,152 kWh Power |
| Beijing | Energy-saving Heat recovery Project of Heat Pump Ice Machine | After the heat pump ice machine of is put into operation from November to March every year, the heat pump unit is connected in series with the heat return water pipeline, and the original heating system remains unchanged. The hot return water is heated from 55 °C to 68 °C to replace part of the steam heat. At the same time, the evaporation side of the heat pump unit also produces 7 °C low temperature water, providing free cooling capacity | Steam : 23,040 tons |
| Beijing | Energy-saving Renovation Converter Project of Ultra Pure Water System | The pump of ultra pure water pre-treatment system is initially installed with soft start, and the manual valve at the pump outlet is used to adjust the flow and pressure to meet the requirements, so the power consumption of this operation mode is large. The existing 28 | Power : 844,355 kWh |

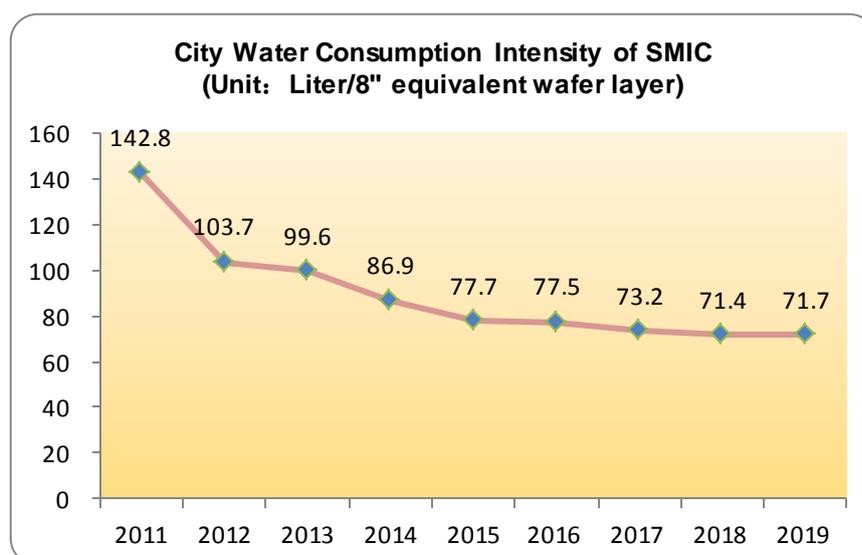
| | | | |
|-----------------|--|--|--------------------------|
| | | water pumps are transformed from soft start to frequency converter, which can effectively reduce the running current and energy consumption | |
| Tianjin | Energy-saving Renovation Project of Bulk Compressed Air | The old air compressor system is replaced by the compressed air from the bulk gas station of the new project to ensure the stable supply of compressed air and save the energy consumption of the air compressor | Power : 3,239,580 kWh |
| Shenzhen | Energy-saving Renovation Project of Office area Optimization and Consumption | Optimize the use of office space, try to concentrate the office staff, reduce the opening of office space, and save the power consumption of air conditioning, lighting, etc. | Power : 433,770 kWh |
| Shenzhen | Energy-saving Renovation Project of Water Treatment System | Add frequency converter to AMT fan, FWP, DWP, RWP pump to improve equipment efficiency and reduce energy consumption | Power : 336,459 kWh |

6 Water Resource Management

SMIC's factories are located in different areas, where there are differences in the conditions of the available water resources. We measure local conditions and implement management measures to conserve water resources.

6.1 Water Consumption Status

SMIC manages water resources to save water consumption, increase water resources usage efficiency and reduce waste water discharge. See water consumption data of SMIC in 2019 in the following figure. Compared with 2018, the unit water consumption presented an steady trend in 2019.



6.2 Main Water Saving Projects in 2019

6.2.1 Flushing Drainage Recycling Project in Beijing Plant

The first flushing drainage of wet etch machine is continuously increasing, and the original capacity cannot meet the requirements of all water recycling, so the recycling equipment is added again to recycle the flushing drainage. This part of water can be supplied to pure water system instead of tap water after recovery treatment, and the recycling water volume can reach 1000 m³ per day.

Project achievement: In 2019, the project saved a total of 310,980 m³ of city water.

6.2.2 Tap water Recycling Project in Shanghai Plant

Replacing part of tap water with WWR in pure water system, saving tap water cost. UPW system AC / SF back wash water is collected in BWW original water tank, SS and organic matters in the water are removed through UF pretreatment. And the produced water meets the RO inlet water quality conditions. Then remove the salt through further treatment by RO, so the produced water can meet the reuse standard and enters into the self-supplied water tank, unqualified water enters into BWW raw water regulating tank or DOWA & DWWA raw water tank for bacterial nutrition.

The raw water of DOWA & DWWA is lifted to the raw water regulating tank through the intermediate water tank, through the pH regulating tank, aeration tank, MBR tank, continuous activated carbon tower, gravity filter, RO system, and then sent to the self-supplied water tank.

Project achievement: In 2019, the project saved a total of 711,695 m³ of city water.

6.2.3 Other Water-saving Projects

| Plant | Project Name | Brief Description of Project | Water-saving Performance (m ³) |
|----------|---|--|--|
| Shenzhen | Rainwater Recycling Project | There are seven reserved pools on the top of the other half of the cooling towers which can be used for rainwater collection. The collected rainwater is supplied to the existing cooling tower for water supplement and reduce the tap water consumption t | 2,242 |
| Tianjin | Process Water system Optimization Project | After the formal mass production of the new plant, the flow of process water at the idle end of the wet etch machine is optimized to save the process water consumption and reduce the tap water consumption | 29,800 |
| Shenzhen | Mountain Spring Water Recycling Project | The underground spring water collection pool is built in the plant area. The lifting pump and control unit are used to transport the spring water to the waste water recycling system and the local waste gas treatment equipment system, so as to reduce the consumption of tap water | 16,539 |

6.3 Water Pollution Prevention and Control

According to the nature of production wastewater, SMIC constructs a number of waste water treatment facilities to treat production wastewater and domestic sewage, so that discharged wastewater meet national or local standards. Besides, we strictly implement wastewater discharge monitoring requirements to conduct real-time or regular monitoring of the concentration of pollutants in wastewater to ensure that all wastewater meets discharge standards. For specific monitoring data, see the information published on: http://www.smics.com/site/about_ESH



Life Sewage Treatment Facilities

Waste Water Recycling Treatment Facilities

7 Air Pollution Prevention and Control

SMIC is concerned about the air quality in its business locations and attaches great importance to the treatment of the company's exhaust gas. All emitted gas is treated and meets national or local standards. Data on waste gas emissions are as following:

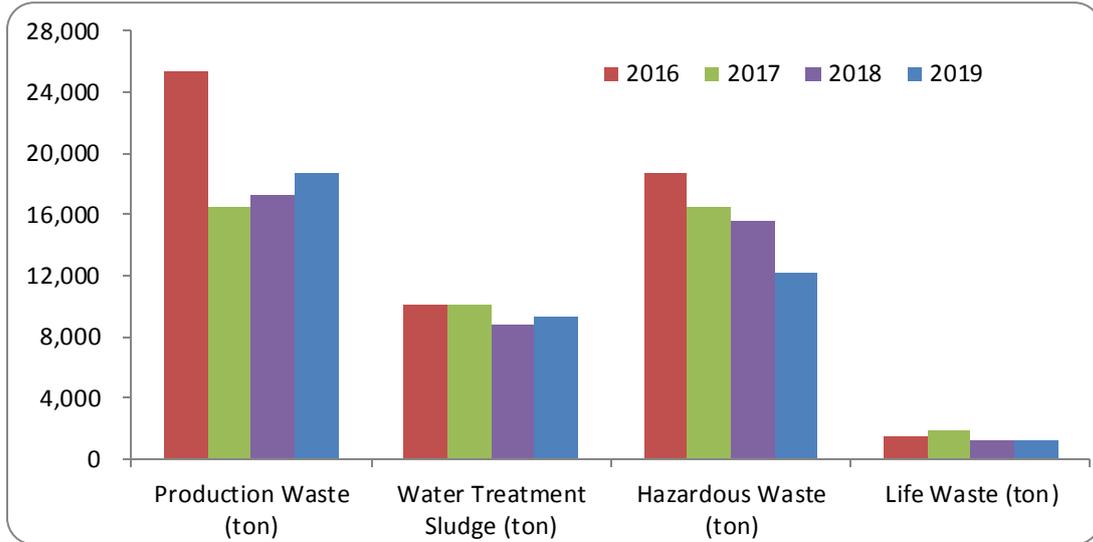
| Data Name | Total |
|--|--------|
| Total Emission of Exhaust Gas (Million Cubic Meter) | 66,402 |
| Emissions of Nitrogen Oxides (ton) | 57 |
| Emissions of Sulfur Dioxide (ton) | 1 |
| Emissions of Volatile Organic Solvents (ton) | 58 |

The company employs two- levels waste gas treatment at the console end and the central processing end, respectively. In the production process, the waste gas emitted from the console end is first treated by the local waste gas treatment system to meet the stipulated standards and then sorted into the main pipes for exhaust gas collection. The main pipes for exhaust gas collection fall into acidic, alkaline, organic and general types, where acidic and alkaline waste gas enters the acid central washing tower via the main pipes and enters the alkaline central washing tower for retreatment, while organic waste gas enters the zeolite runner system for burning. The waste gas processed by the central system is discharged into the atmosphere by the exhaust pipe conforming to the requirements of the State. To verify emission compliance, we regularly entrust third party agencies to monitor emissions and all test results meet national requirements. For specific monitoring data, see the information published on: http://www.smics.com/site/about_ESH



8 Waste Management

SMIC establishes a sound waste management system and strictly complies with the national regulations in treatment of the produced waste. The waste produced in the workshop is subdivided into acidic, alkaline, toxic, oxidizing, natural, flammable and general substances, which are distinguished with the recycling buckets in different colors. The classified waste substances are collected on a regular basis and transported to the hazardous waste warehouse for temporary storage, before being delivered to the firms with hazardous waste treatment qualification. The waste liquid produced in the workshops is transported to the temporary waste tank by an independent pipeline, and then treated by the firms with the corresponding qualification. The waste treatment plants must be under strict management and all waste treatment firms need to have a government-approved qualification and meet our company's waste management evaluation scores to sign the contract; during the cooperation, the Environmental, Safety and Health Division will conduct on-site or vehicle-following examination of the waste treatment firms; for hazardous waste, strict implementation of the waste transferring table system is required. Production of various types of waste in 2019 is as follows, which presented an increasing trend in 2019, it is due to many tools and facilities were installed in Beijing and Shenzhen plants newly:

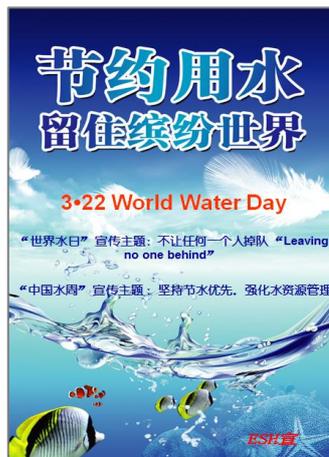


9 Promotion of Environmental Awareness

In 2019, the company continued to hold environmental awareness advocacy activities to enhance employees' awareness of environmental protection in the form of posting posters, sending initiative mails to all employees, displaying promotional documents on the company's internal website, organizing special events such as second-hand market, garbage cleanup, tree planting, and species conservation activity and so on.

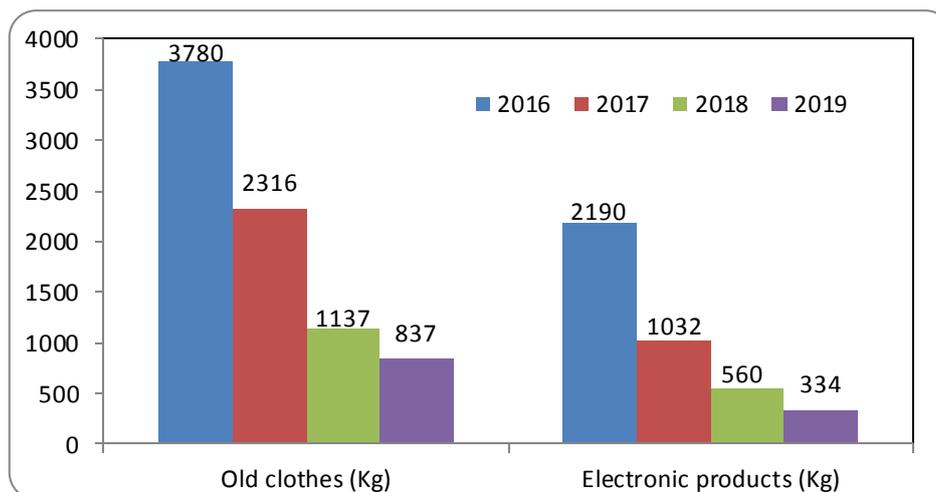
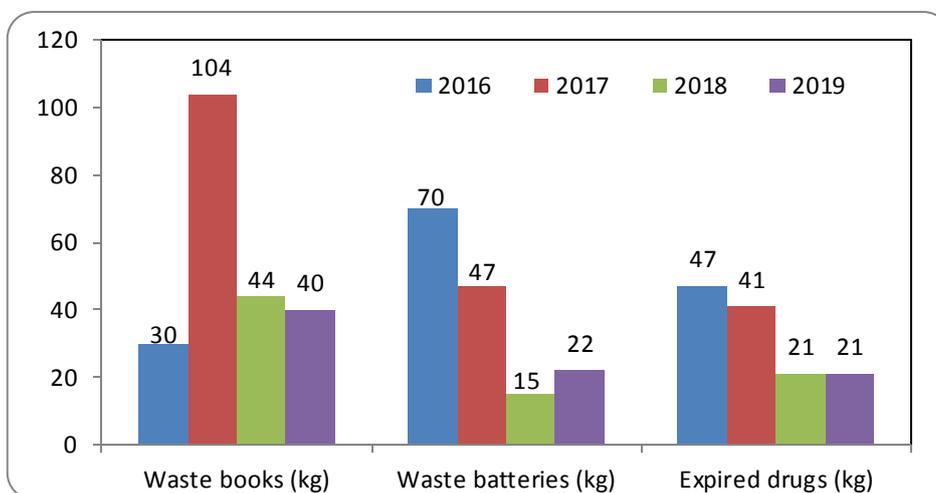
9.1 Theme Day Activities

- Publicize "World Water Day" on March 22, calls all employees to participate to save water.
- Publicize "World Earth Day" on April 22, calls all employees to practice low carbon life and save resources.



9.2 Second-hand Market

In 2019, our Shanghai Plant, Beijing Plant, Tianjin Plant and Shenzhen Plant held a number of special second-hand market activities to promote waste utilization. The number of people involved and the results were more than last year.



9.3 Tree Planting Activity in Inner Mongolia

Tree planting activity in Inner Mongolia began in 2007, which is a joint program launched

by "Root and Bud" association and the Environmental Protection Club of SMIC Shanghai Private School, aiming to enhance environmental awareness and show the way to reduce the impact of personal behaviors on the environment. The program gives people the opportunity to grow trees in Inner Mongolia. It was the 13th year in 2019 for SMIC Shanghai Private School to participate in the program and the Environmental Protection Club raised money to fund 3,000 trees. Teachers and 16 students went to Inner Mongolia to plant the trees, where students received environmental education in the real environment.

9.4 Pay attention to ocean pollution

On May 11, 2019, the company united friendly business organization launched the " Pay attention to ocean pollution " rising Jingtian environmental protection public welfare activity. 92 volunteers came to Nanhuizui beach to participate in activities to protect the marine ecological environment. Through unity, cooperation and joint efforts, a total of 420kg of garbage was collected. Use our actions to contribute to ocean health. Activity results: 4810 pieces of garbage, 420.35kg of garbage, 4.57kg of garbage per capita .

