



Sustainability Pillars

Environment



VTech has developed “Climate Change Strategy” to assess and address the potential risks and opportunities arising from climate change. It also promotes a culture of innovation and incorporates sustainability concepts in its operation, including high performance production chain, green manufacturing and sustainable logistic practices.

Highlights

- GHG emission per production output in our assembly and plastic factories decreased by 14.8% and 10.3% respectively compared with FY2020
- Hazardous and non-hazardous waste per production output reduced by 5.3% and 3.9% compared with FY2020
- Total water consumption per production output decreased by 18.0% compared with FY2020
- Renewable energy usage increased by 157.2% compared with FY2020



As an environmentally conscious and sustainable company, we are committed to protecting the environment and easing the impacts of climate change to move towards a circular economy. Our culture of innovation also facilitates VTech to strengthen its operational excellence with innovative solutions in the factory operation to continuously improve its productivity, and incorporate sustainability aspects in the business operations. Recognising that climate change could create uncertainties in our business development, in our new 5-year Sustainability Plan 2025, we have developed “Climate Change Strategy” to assess how climate change could affect our business operations, identify the associated risks and opportunities, and develop sustainability initiatives to address them in the coming five years. We operate our manufacturing processes and facilities in a manner that minimises the impacts to the environment, and ensure that our operations are compliant with all the relevant environmental, legal and statutory requirements. We design products responsibly, to avoid waste generation, minimise resource overuse, and turn unavoidable waste into resources.

We continuously review our environmental management approach and carbon reduction programmes in order to manage our carbon emissions in the supply chain and daily operations efficiently and effectively.

In order to ensure that our manufacturing operations are always following the best practices of the industry, we have developed a sustainable manufacturing process which includes the programmes on achieving a high performance production chain, and also established a green manufacturing practice across the manufacturing facilities of all our three product lines.

Through the adoption of the green logistic management approach, and choosing the most eco-friendly transportation mode for delivering our incoming materials from suppliers and outgoing products to our customers, we have also further reduced our GHG emissions.

Circular Economy and Environmental Management



At VTech, we strive to protect the environment and combat climate change to move towards a circular economy. We support a circular economy by designing products with minimum environmental impacts throughout the whole product life cycle and operating efficiently, to reduce GHG emission, avoid waste generation, conserve natural resources and turn unavoidable waste into resources as part of our Environmental Management System. We incorporate sustainability concepts into our production and product design without compromising the product quality and safety which are always our priority.

All our existing manufacturing sites of our TEL products, ELPs and CMS are certified with the ISO 14001 standard for environmental management, demonstrating that we are committed to continuous improvement on environmental protection.

VTech has continuously worked with different government bodies to minimise the environmental impact of our production facilities. Our TEL products manufacturing site

has been certified as the “Hong Kong – Guangdong Cleaner Production Excellent Partners” by the Hong Kong Productivity Council and Guangdong Provincial Government in recognition of our positive contribution to improving the air quality and local environment in FY2022 for eight consecutive years. It has also been recognised as the “Dongguan Environmentally Friendly Enterprise” by the Dongguan, Guangdong Province Environmental Protection Bureau in China in FY2022 for eight years. Moreover, our VOCs purification system was recognised as “Demonstration Project” under the Cleaner Production Partnership Programme of Hong Kong Productivity Council in FY2019. The Dongguan Economy & Information Technology Bureau launched an energy programme to encourage corporate and manufacturers to take the initiative of managing the energy consumptions. Our TEL products manufacturing site has also taken part in this programme since FY2015, along with the implementation of our energy saving and management projects. In return, our TEL production site was rewarded with credit for participation in this programme.

We have incorporated the 3Rs (Reduce, Reuse, and Recycle) principle into our manufacturing process, and established energy and resources management system to better utilise the resources in our manufacturing process, aiming to reduce the energy and water consumption, minimise the waste production and improve the reuse rate of resources.

VTech Environmental Policy

The major environmental impacts from VTech’s operations relate to energy and water consumption, waste generation and logistics. We are committed to minimising the potential environmental impacts from our operations with the following principles:



Comply with all relevant environmental, legal and other statutory requirements



Integrate environmental objectives into our business decisions in a cost effective manner



Maintain an Environmental Management System in line with the requirements of ISO 14001



Require all staff to address environmental responsibilities within normal operating procedures



Quantify and monitor the significant environmental impacts of our activities, products and services and set specific targets for improvement where appropriate, and review these annually



Enhance awareness of environmental and resource efficiency issues amongst our customers, suppliers, staff and stakeholders through improvement projects and programmes in the respective areas

In order to meet the above requirements in a sustainable manner, VTech has functional teams comprising individuals from different product lines and departments across the organisation. Our environmental policy is reviewed annually to ensure that it is relevant and up to date.

Climate Change – Risks and Opportunities



Climate Change Strategy

In 2015, the United Nations Development Programme announced the Sustainable Development Goals at the Paris Climate Conference which became effective in 2016. The agreement addressed the common standards and set ambitious goals for downsizing the global carbon emission amount to mitigate the environmental impacts caused by climate change. The Chinese government also announced its carbon pledge, aiming to achieve carbon neutrality before 2060.

VTech has the major manufacturing sites located in China. As an environmentally conscious and sustainable company, we are committed to contributing to GHG reduction and aligning our sustainable growth with the national and international climate change agenda. To this end, we have addressed the climate change challenges and developed our Climate Change Strategy to minimise the potential environmental impacts arising from our daily operation. As part of our Climate Change Strategy, we are dedicated to reducing our GHG emissions by minimising the energy consumption from our daily operation through our various energy and resources saving programmes. We have also been working closely with our suppliers and customers to reduce the carbon emissions through enhancing our environmentally friendly product designs, green logistic practices and carbon reduction programme.

VTech acknowledges that the extreme weather caused by climate change could affect our business in various ways. Our Climate Change Strategy is established to prepare for downside risk, maximise upside opportunities, and ensure our business strategies are not only following the longer term trajectory of climate change, but also sufficiently flexible to respond to the inevitable changes in the business environment. VTech also encourages our procurement team to explore eco-friendly materials and equipment. By choosing the right materials and equipment, we can ensure the product quality while further reducing the GHG emission generated through the manufacturing process. VTech continuously reviews our approach on climate change to enhance our resilience in response to the associated risks and opportunities.

The Environmental Protection Department of Guangdong Province has strengthened the VOCs emission standards for various manufacturing industries, regulating the local VOCs emissions and encouraging manufacturers to apply more environmental friendly materials throughout the manufacturing process, aiming to improve regional air quality.

We have not only developed the waterborne paint to replace solvent-based paint, but also adopted overmolding and inkjet printing technologies in the printing process to reduce the VOCs emission generated during our manufacturing process. In addition, VOCs purification system with high VOCs elimination rate was installed in one of our production facilities.

VTech Carbon Management Approach

Supply Chain

- Work closely with our suppliers and require them to follow our CSR requirements
- Share our energy efficiency programmes with our suppliers and help them to reduce the environmental impacts from operations

Operations

- Disclose the total GHG emissions including Scope 1, 2 and 3 emissions
- Strive to reduce our GHG emission per production output
- Report our GHG information and progress in our Sustainability Report
- Review and update our climate change policies and projects annually

Customers

- Share GHG information with customers
- Optimise the energy efficiency in the use of our products
- Measure and reduce the carbon footprint of our key products in each generation

Communities

- Support local climate change policy of our sites of operation
- Update our Climate Change Strategy and carbon reduction programmes with reference to the international and local climate mitigation targets, plans, and adaptation initiatives

Climate-related Risks and Opportunities

The Task Force on Climate-related Financial Disclosure (TCFD) was established in 2015 to provide a voluntary reporting framework for companies to consistently report climate risk to investors. Recognising the importance of assessing the climate-related risk and opportunities for a company in combating climate change and supporting the transition to a low-carbon economy, since FY2020, VTech has disclosed climate-related initiatives using the TCFD’s framework. A number of potential risks and opportunities have been identified and our RMSC performs close oversight of these potential risks to make sure they are monitored, measured, and mitigated appropriately.

In FY2022, we further analysed our climate-related risks by adopting climate scenarios during the risk assessment process. Risks exposure level and likelihood of occurrence were evaluated under two scenarios selected with reference to the TCFD recommendations. The business-as-usual scenario was selected to assess the physical risks under high GHG emissions and limited climate action. The Paris-aligned scenario was selected to help in developing our climate strategy and actions in achieving the Paris ambition of limiting the temperature at well below 2°C above pre-industrial levels. The results are shown at the climate risk matrix with risk level indicated. We strive to integrate this analysis into the existing risk management mechanism and continue to evaluate our climate risks periodically in order to reflect the latest development of the Group and the industry as well as government policy changes.

	Business-as-usual Scenario	Paris-aligned Scenario
Model Referenced	IPCC Representative Concentration Pathway (RCP) 8.5	International Energy Agency’s Sustainable Development Scenario (SDS)
Rationale	RCP 8.5 is selected to assess the impact of physical risks under a high-emissions scenario, consistent with a future with no policy changes to reduce emissions. This would enable evaluation of our adaptability to severe consequences of climate change.	SDS is selected to assess the impact of transition risks as we shift towards a low-carbon economy. This would enable our strategic planning in contributing to the Paris Agreement commitment.
Assumptions	Global average temperature increases by around 4°C by 2100, with high frequency and intensity of extreme weather events. ⁷	All current net zero pledges are achieved in full, with extensive policy efforts and technological advancement to realize emissions reductions. The temperature rise could be limited to below 2°C by 2100. ⁸



Rainwater Harvesting System at VTech Factory

⁷ We consider the assumptions and potential physical impact (including extreme weather, flooding, heat waves, sea level rise etc.) under the Business-as-usual scenario with reference to TCFD (2020) Guidance on Risk Management Integration and Disclosure.

⁸ We consider the assumptions and potential impact of transition risks (including shifts in energy mix, net-zero assumptions, clean technology development of the industry sector etc.) under the Paris-aligned scenario with reference to the International Energy Agency (IEA) World Energy Outlook 2021.



Climate-related Risk Matrix



- Physical Risks**
 - 1 Extreme weather events
 - 2 Chronic heat waves
 - 3 Shortage of natural resources
 - 4 Rise of sea levels
- Transition Risks**
 - 5 Increased carbon pricing
 - 6 Tightened climate-related regulations
 - 7 Tightened emissions reporting obligations
 - 8 Exposure to litigation
 - 9 Shifts to low-carbon technology
 - 10 Increased procurement cost
 - 11 Changing customer behaviour
 - 12 Changing investor preference
 - 13 Stigmatization of sector
 - 14 Workforce management

We have identified the climate change risks over the short- (0-1 year), medium- (1-5 years), and long-term (5+ years). While mitigation and adaptation measures are formulated in response to the various risks, some challenges brought by transition risks also present opportunities for us to align our strategies and action towards a positive change. We will continue to gear up and collaborate with suppliers and business partners to seize climate change opportunities through designing low carbon products and services through innovation, setting benchmark for the industry on climate action.

Climate-related Physical Risks

In medium term, physical risks include acute risk from extreme weather events such as flood, tropical cyclone and breaking out of natural disasters. While for long term, we anticipate chronic physical risk including water shortage, changes in precipitation pattern and extreme variability in weather patterns. Both medium-term and long-term acute and chronic physical risks affect VTech's operation which could lead to assets write-offs, increased insurance premiums and reduction in revenue from decreased production capacity and supply chain disruption. We mitigate physical risks through implementing and reviewing the Business Continuity Management (BCM) programme and other emergency measures to ensure adequate climate change resilience capacity.

Climate-related Transition Risks

Transition risks are also identified for moving towards a low-carbon, less polluting, greener economy. For VTech, the major transition risks are related to the shifts towards low-carbon technology which lead to increased capital expenditure in the long term. The unexpected shifts in fuel and energy price due to changing climate policies will also increase our procurement cost. In short term, we anticipate that the regulatory authorities will keep enhancing the emissions-reporting obligations which will increase our costs in meeting the new requirements. New regulatory requirements in relation to climate change on operation, product and service are expected to be released in the medium term. With the requirement for companies to bear the cost of GHG emission, such as carbon tax and GHG emissions trading scheme, we expect increases in operation costs in the long term.

Market risk in medium term has been identified as loss of market share due to changing customer preference towards sustainable products. A failure to address stakeholder concerns and their changing perceptions of an organisation's contribution to the transition to a low carbon economy can also damage our reputation.

These transition risks will lead to substantial cost increase, including operation cost, compliance cost and R&D expenditure, as well as decreased revenues arising from change in consumers' preference. We keep abreast of the regulatory changes and build internal capabilities to minimise the adverse impact of such risks on our business.

Climate-related Opportunities

The pressure stemming from climate risk also creates significant opportunities for VTech to align our strategies with the direction of climate change. To fully seize the opportunities and mitigate the climate-related risks, VTech has established the Sustainability Plan 2025 to use sustainable materials in our products, recycle our products in a responsible way, increase the use of renewable energy and reduce the natural resources consumption in our production process, and use more eco-friendly transportation modes in our supply chain management.

In short, medium and long term, we will continue to transform towards high performance production chain and collaborate with suppliers to maximise our resources efficiency and reduce our material used, electricity consumption and thus the manufacturing costs. Our green logistic practice will lead to efficient distribution processes, minimising the transportation distance and thus the GHG emissions. We will accelerate the launch of innovative green products to address consumer preference in the medium and long terms.

By switching to lower-emission or renewable sources of energy and investing in low-GHG emission technology in the long term, it could reduce our exposure to future fossil fuel price fluctuations. We aim to increase the use of renewable energy by 100% by FY2025 compared with FY2020.

	Risks Description	Potential Financial Impact	Timeframe	Impact Level ⁹	VTech's Response – Risks and Opportunities
Physical Risks					
Acute Risk	Frequent extreme weather events	<ul style="list-style-type: none"> Reduced revenue from decreased production capacity and supply chain disruption Increased operation cost from increased insurance premiums, increased expenditure on emergency response Write-offs and early retirement of existing assets due to facility damage 	Mid-term	***	Risk Mitigation: The RMSC reviews the Business Continuity Management programme annually to ensure adequacy of contingency policy to protect employees and minimize loss under extreme weather events. Building capability on climate resilience, including necessary financial resources, equipment and employee training.
	Chronic heat waves	<ul style="list-style-type: none"> Increased operation cost from expenditure on maintaining productivity 	Long-term	**	
Chronic Physical Risks	Shortage of natural resources	<ul style="list-style-type: none"> Reduced revenue from decreased production capacity and supply chain disruption Increased operation cost from increased water and energy cost 	Long-term	**	Risk Mitigation: Use of more efficient production and distribution processes. Close monitoring of our operation sites that are highly exposed to chronic physical risks. Integrating such risks into key business decisions such as adding new manufacturing sites.
	Rise of sea levels	<ul style="list-style-type: none"> Increased capital costs, write-offs and early retirement of existing assets Reduced revenue from supply chain disruption 	Long-term	**	
Transition Risks					
Technology Risk	Shifts to low-carbon technology	<ul style="list-style-type: none"> Increase in production and product development costs to explore eco-friendly solutions for products and services Uncertain investment returns on lower emissions technology Write-offs and early retirement of existing equipment due to adoption of new technology 	Long-term	***	Opportunities: Development and/or expansion of low GHG emission products and services through R&D and innovation and collaboration with suppliers. Strive to achieve sustainable use of energy and resources through adopting efficient production process. Transforming towards high automation and smart manufacturing model to further reduce resources consumption.

⁹ Impact level of climate risks: "****" denotes the highest impact level.



	Risks Description	Potential Financial Impact	Timeframe	Impact Level ⁹	VTech's Response – Risks and Opportunities
Policy and Legal Risks	Increased carbon pricing	<ul style="list-style-type: none"> Increased GHG emissions cost from carbon tax and/or GHG emissions trading scheme 	Long-term	*	Risk Adaptation: Keep updated on the carbon tax implementation and emissions trading market at the locations where we operate, and continue to develop and maintain our carbon inventory for future assessments.
	Tightened climate-related regulations	<ul style="list-style-type: none"> New regulatory requirements in relation to climate change on operation, product and service resulting in increased operation cost, change in revenue mix and sources leading to decreased revenues 	Mid-term	**	Risk Adaptation: Developing adaptive capability, including an improved organizational structure to handle updated policy and legal requirements
	Tightened emissions-reporting obligations	<ul style="list-style-type: none"> Enhanced emissions reporting obligations resulting in higher compliance cost 	Short-term	*	Risk Adaptation: Continue to modify our data collection system according to relevant disclosure requirements
	Exposure to litigation	<ul style="list-style-type: none"> Increased compliance cost due to significant fines and penalty from environmental non-compliance 	Mid-term	*	Risk Adaptation: Keep abreast of the latest environmental laws and regulations through periodical reviews. Adjust internal policies when necessary to ensure compliance.
Market Risks	Increased procurement cost	<ul style="list-style-type: none"> Increased operational cost from increased cost of raw materials due to abrupt and unexpected increase in fuel and energy price 	Long-term	***	Risk Adaptation: Maintain emergency mechanism and use of lower emission or renewable sources of energy to reduce exposure to future fossil fuel price fluctuations. Invest in R&D to develop alternative materials.
	Changing customer behaviour	<ul style="list-style-type: none"> Decline in product competitiveness and loss of market share due to shift in consumer preference 	Mid-term	**	<p>Opportunities: Accelerate the innovation of green products, developing a better competitive position to address consumer preference</p> <p>e.g. Switching to bio-based plastic or reclaimed plastics, and sourcing FSC certified materials</p>
Reputational Risks	Changing investor preference	<ul style="list-style-type: none"> Drop in share price due to reputation damage Reduced capital availability due to changing investor preferences 	Mid-term	*	<p>Opportunities: Develop a green branding as our long-term business strategy, supported by innovation and R&D. Strengthen reporting and communication with shareholders and stakeholders on our sustainability strategy.</p>
	Stigmatization of sector	<ul style="list-style-type: none"> Decreased revenue due to increased stakeholder concern and their changing perceptions of an organisation's contribution to the transition to a low carbon economy, leading to deteriorating image of the industry 	Mid-term	*	
	Workforce management	<ul style="list-style-type: none"> Increase operational cost from employee attraction and retention as employees are more concerned with companies' environmental performances 	Long-term	*	

Sustainability Pillars

Green Manufacturing



Energy and Resources Management

Our Resource Efficiency and Conservation Team (RECT) at each manufacturing site has been making significant achievements in monitoring the energy saving progress through the implementation of our resources saving projects. The RECT includes our production floor managers, equipment technicians and internal energy analysts. They ensure our resources are well utilised at the operational level by focusing on the following areas:

Plan and Monitor the Resources Saving Programmes

- Develop energy and resources saving projects
- Maintain the energy and resources monitoring system
- Perform energy and resources usage analysis

Improve Energy Efficiency in Production Chain

- Manufacturing resource planning
- Low energy production process

Enhance Production Efficiency of Machinery

- Assess the energy efficiency and utilisation rate of the machinery
- Continuously upgrade low efficiency machines

Improve the Reuse and Recycle Rates of Resources

- Promote internal reuse of materials
- Continuously improve the waste management programme

Energy Monitoring System

As part of our energy management measures, we continue to use the real-time monitoring system and small zone lighting & timer system to control, measure and monitor the energy consumption patterns on our production floors. By collecting the daily real-time data, we could then plan for a more detailed energy saving projects, as well as optimise our energy resources through different manufacturing processes.

Energy Patrol Team

The RECT has set up the energy patrol team which conducts weekly patrols throughout our manufacturing and dormitories areas, to identify any cases of energy waste. The result of the energy patrol is added as part of the Environment, Health and Safety (EHS) rewarding scheme so that all merit and demerit points recorded by the energy patrol team will affect the monthly EHS assessment. A monthly summary report will then be sent to the factory operations management and relevant RECT members. Corrective action plan will also be prepared by RECT to address the identified weakness areas with EHS training workshops provided to the relevant employees for improvement.

This approach continues to make a significant contribution in our energy saving programmes. It not only prevents the excessive energy consumption, but also raises the awareness of preserving our valuable resources through employee engagement.

Energy Saving Programmes in Manufacturing Process

As VTech manufacturing facilities mainly consist of assembly and plastic injection plants, electricity is the major energy resource in our production process. Therefore, the majority of our energy saving projects focus on reducing our electricity consumption.

Application of Renewable Energy

VTech strives to extend the application of renewable energy in all our operating sites. In prior years, we installed solar panels on the rooftop of a dormitory and solar lamps in the operating sites. Two of our overseas offices have switched to renewable energy providers for their electricity consumption. In FY2022, our usage of renewable energy increased by 157.2% compared with FY2020.

We will continue to apply solar technology by extending the installation of solar panels and solar lamps in different areas of the operating sites in FY2023.





Upgrade of the Tubular Heater of the Injection Molding Machine

We have replaced the traditional tubular heater with coil type heater for furnace of injection molding machine. The heating coil design can trap hot air between the furnace and radiant tube. Other modifications of the tubular include narrowing the air inlet, replacing the heating wire with electrical resistance nickel, and enlarge the heat conductive surface by replacing its outer shell from single tub into finned tubes. Heat loss is greatly reduced with the upgrade of the tubular heater.

Upgrade the Heating Plate of Hydraulic Press Machine

We have upgraded the insulation of heating plate that allows the generated heat gathered and supplied to the mould. This improvement increases efficiency of the moulding process by increasing the heating rate, v minimising heat loss to the environment, and hence reducing the energy consumption.

Energy-efficient Air Compressors

We have continued to phase out existing air compressors with energy-efficient models. The latest model obtained Class 1 of the China Energy Efficient Label, representing best-in-class in energy performance. It operates with high energy efficiency with lower speed, lower flow rate and lower noise level. Variable-Frequency Drives was installed in the air compressor which adjusts the speed automatically, and stops operating as soon as it has reached the pressure level required, reducing unnecessary energy usage.

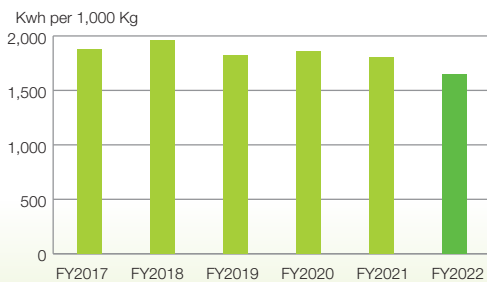
Energy Consumption and Carbon Emission

With our continuous efforts on implementation of many energy saving programmes, VTech's total electricity consumption per production output decreased by 12.6% compared with FY2020. In addition, our total energy consumption per production output in assembly and plastic factories decreased by 14.5% and 11.0% respectively compared with FY2020. We will continue to promote resources conservation programmes in the living and working areas of our factories, without compromising the provision of a comfortable and pleasant living environment for our employees.

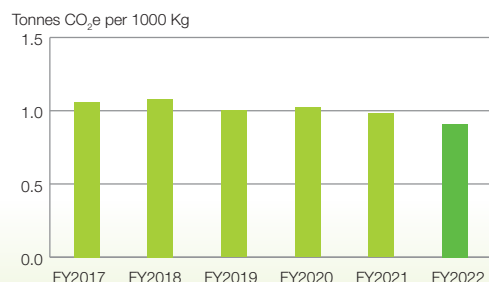
The use of energy is the major contributor of both direct (Scope 1) and indirect (Scope 2) emissions in VTech. With the target of minimising the environmental impacts, our energy conservation programmes and activities have made a notable reduction in the energy consumption and thus the carbon emissions. Direct emissions (Scope 1) only account for 5.6% of our total carbon emissions in the manufacturing sites while the dominance of electricity (Scope 2) for carbon emission is more noticeable in our operations. As a result, most of our energy saving activities are focused on reducing electricity consumption.

VTech's GHG objectives and targets are set and tracked relative to a base year of FY2020. Our total Scope 1 and Scope 2 emissions were 85,741 tonnes of CO₂e with emission per production output decreased by 12.2% against FY2020. We have also managed to reduce total Scope 1 and Scope 2 emissions per production output in our assembly and plastic factories by 14.8% and 10.3% respectively compared with FY2020.

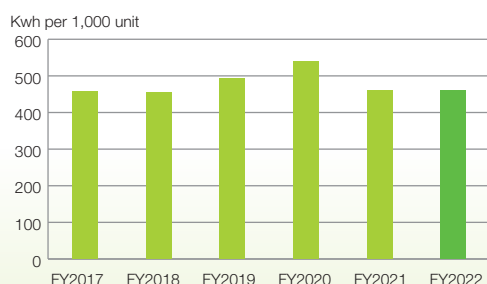
Electricity Used per Production Output (Manufacturing Facilities of Plastic Factories)



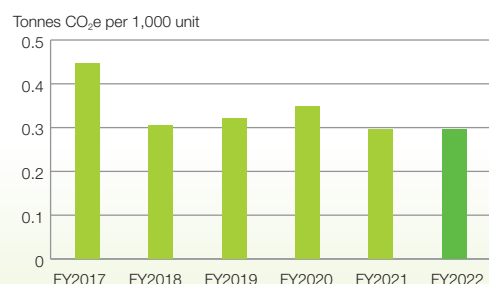
GHG Emission per Production Output (Plastic Factories)



Electricity Used per Production Output (Manufacturing Facilities of Assembly Factories)



GHG Emission per Production Output (Assembly Factories)



Sustainability Pillars

Water



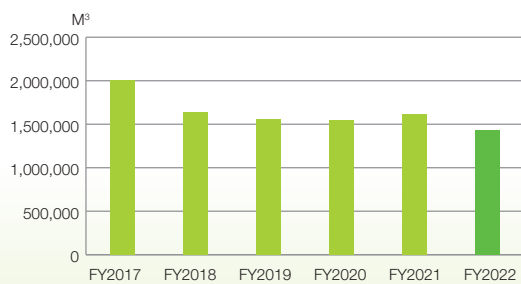
Clean water is a valuable resource, which VTech is committed to conserving. We only use water supplied from municipal sources and do not have any on-site wells or boreholes. None of our factories are operating in the water-stressed regions. The wastewater is mainly generated from workers' living activities. To control water pollution, VTech continuously reinforces wastewater treatment by strictly following ISO 14001 and local government requirements, carrying out measurements of required items, in order to meet the wastewater standards. To increase the awareness of conserving water resources, we have been carrying out various water saving campaigns at dormitories and manufacturing sites.

Water used for washing fruits and vegetables has been reused for greenery and flushing. Infrared sensor taps, water usage controller and low-flow shower heads have been installed in order to avoid water wastage.

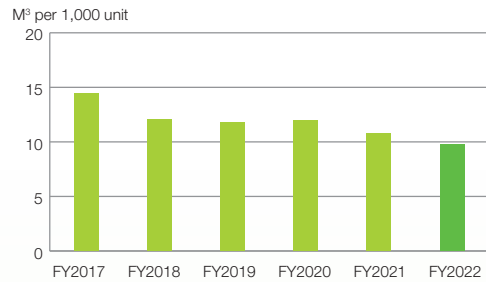
In order to avoid water loss, we have upgraded our water infrastructures at our manufacturing sites. By installing the anti-sprinkler net and cooling fan control system, it has reduced water splashing out of the cooling tower.

During FY2022, we installed flow restrictors in the water supply pipes that connect to the taps at manufacturing sites and canteens. The flow restrictor limits and lowers the water flow rate, which reduces wastage from the taps.

Total Water Consumption



Total Water Consumption per Production Output



Reuse of rainwater and treated wastewater

We have put extensive effort on reusing both rainwater and industrial wastewater. Rainwater harvesting system has been in place to gather rainwater for greenery and flushing to reduce freshwater usage. In FY2022, we extended the rainwater harvesting system to other operating sites with rain wells, pumps and pipe networks constructed across the site, supplying water for greenery, cleaning and dormitory consumption.

Since FY2014, we have installed wastewater treatment system to purify the industrial wastewater for gardening and toilet flushing. Grey water harvesting system has also been set up to collect water for cooling ovens at canteens. In FY2022, we expanded wastewater reuse to the manufacturing processes, including the cooling of air-conditioning facilities, water curtain spray booth for painting, and washing painting equipment at our metal factory. To facilitate water reuse for multiple purposes, we have increased the volume of rainwater and treated wastewater storage by adding more water tanks.



With the extensive effort in our water saving programmes, we reduced total water consumption per production output by 18.0% compared with FY2020. Going forward, we will continue to evaluate opportunities to improve water efficiency and management through various innovative water saving projects.



Material, Waste and Recycling



VTech aims to operate our factories with maximum resources efficiency by minimising the materials used throughout the manufacturing process and increasing the recycling rate and the use of reusable materials. We keep track of the materials that we use, aiming to minimise unnecessary waste of materials from the product design, downsize the PCB rims and reduce the use of packaging materials. We have also installed machinery and devices to further reduce the consumption of excessive parts and materials.

Non-hazardous Waste Management

In order to increase our recycling rate and maximise our resources efficiency, we have set up recycling centres at all our manufacturing sites, where staff collect and compact recyclable materials, including cardboard, plastics and metals. Recyclable materials are recycled and reused internally at material recovery centres before being further handled by licenced recyclers. Non-recyclable wastes are collected by municipal authorities. We also work closely with our suppliers by returning our plastic recyclables to suppliers for reuse. As a result, we could create a close-loop recycling system by increasing the use of recycled materials. We have achieved recycling rate of 81.4% as compared with 81.0% in FY2020 and the non-hazardous waste per production output reduced by 3.9% compared with FY2020.

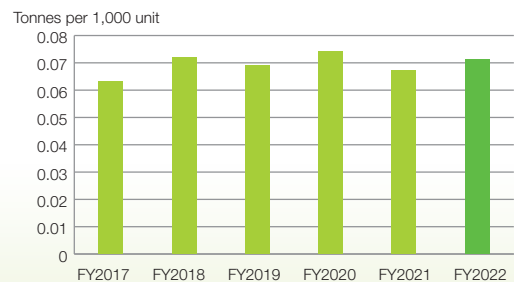
We embrace the 3Rs (Reduce, Reuse, and Recycle) principle for non-hazardous waste management to minimise direct disposal. On-going measures include increasing our internal reuse rate by replacing disposable cardboard boxes and dividers with durable plastic ones, and reusing plastic bags and cardboard dividers that are collected at our recycling centres as internal packaging materials. In FY2021, we reused construction waste for building the cargo platform extension and the roof insulation board at the rooftop of canteen, so as to reduce the use of raw materials for the construction. Besides, we have continued to promote food waste reduction among our workers through supporting the nationwide “Clean Your Plate” Campaign.

Reduction of Plastic Waste

In FY2022, we replaced one-time-disposable plastic lunch boxes with stainless steel lunch boxes for our warehouse staff. The stainless steel lunch boxes are reused after washing, eliminating plastic used to contain food.

The blister trays used for parts protection during the production process have been reused in our primary production lines, rather than sending them to local recyclers.

Non-Hazardous Waste per Production Output



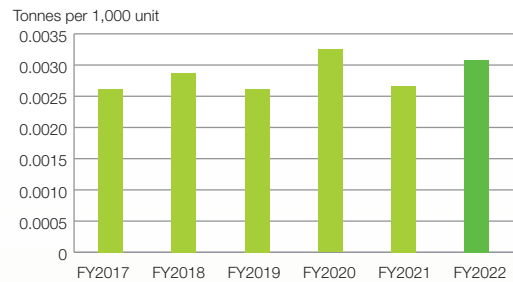
Hazardous Waste Management

Our approach in Hazardous Waste Management Scheme is to reduce the environmental impact that is caused by the use of hazardous chemical and to deal with the hazardous substance responsibly by controlling the use of these chemicals and strictly following the Management of Solid Waste Disposal Ordinance released by the Central People’s Government of the People’s Republic of China (PRC Government).

The PRC Government has published the Management of Solid Waste Disposal Ordinance, where all hazardous waste is clearly defined under this ordinance with the reference to a list of hazardous substances and chemicals. To meet our stakeholders’ expectations and our environmental goals, it is critical to ensure that we have the highest degree of safety in treating our hazardous waste, as well as complying with the local industrial solid waste disposal legislation. We strive to achieve our goals by following the best practices:

- Provide clear work instructions and personal protective equipment for employees at all times
- Ensure employees have attended the hazardous waste and chemical management training before getting on board
- Hazardous wastes are stored in rigid and articulated containers that are acid and solvent resistant. Hazardous wastes are also delivered in isolated truck and spark arrested solvent vehicle within the site
- Storage units for storing the hazardous wastes are specially constructed to prevent exposure, spillage, fire and explosion at isolated area within the site
- Hazardous wastes are categorised and stored in corresponding sections within the storage units
- Conduct hazardous waste and chemical spill drill every year
- Hazardous waste will be disposed of and handled by PRC Government authorised hazardous waste disposal companies
- Disposal of wastes with approvals granted by the Environmental Protection Division of local government

Hazardous Waste per Production Output



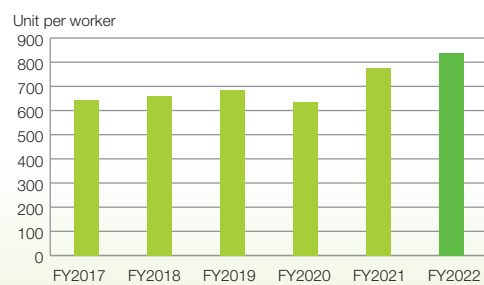
In FY2022, our total hazardous wastes generated from our operations including waste electrical and electronic items, waste chemicals and gas cylinders were 450 tonnes as compared to 422 tonnes in FY2020. But our total hazardous wastes per production output decreased by 5.3% compared with FY2020.

High Performance Production Chain



VTech has developed a high performance production chain to maximise our resources efficiency and improve the productivity while maintaining a green manufacturing and logistics practice. VTech strives to operate its manufacturing processes and facilities in a manner that minimises the impacts to the environment, and ensure that our operations are compliant with all the relevant environmental, legal and statutory requirements.

Production Output per Worker



Two key principles – “produce for quality” and “produce for efficiency” are the main drivers for our manufacturing process improvement. In FY2022, our production output per worker increased by 30.1% compared with FY2020. We have been implementing the low cost automation and lean manufacturing management to maximise our resources efficiency and improve our productivity without compromising the quality of our product, while aiming to reduce the potential environmental impacts throughout the manufacturing process.



Lean Manufacturing

In order to further improve our production efficiency and flexibility, our manufacturing team has been implementing our lean manufacturing principles. The idea of lean manufacturing is to add value at each production stage while reducing the handling time in each process and increasing the flexibility for production. It shortens the through-put time and minimises the idle time during the process.

Laser Cutting Automation

Laser technology was adopted to remove the runner from the injection molded parts automatically. This automation improves the production efficiency and reduce human error from removing the materials manually.

Transforming Towards Industry 4.0

Industry 4.0 is a current trend which brings revolutionary changes to the way of manufacturing. Some of our production lines have been transforming towards Industry 4.0, setting up closed-loop control system without human interference. The highly automated system integrates various operational modules. With more interconnectedness between machines via Internet of Things and more data exchanged and analysed, it allows automated decision-making and execution. As a result, production problems can be resolved efficiently. Product inspection and error tracing can be done quickly and accurately. Production capacity is optimised with lower operational cost. This not only creates great cost-saving opportunities but also upgrades our innovative solutions that bring better customer experience.

Low Cost Automation

VTech has dedicated its efforts to incorporate Low Cost Automation into the production chain. In order to fulfil the market demand, we have started to introduce our in-house-developed mechanical and electrical devices that are “fit for use” since FY2015. These devices have improved our production efficiency and consistency, as well as enhanced the flexibility of the manufacturing process. These include automatic solder dispensers, glue dispensers, screw fastening machines, auto box folding machines, robotic arm for assembly and automatic locator for positioning the components. They not only create less labour intensive working environment, but also make significant improvements in the quality of our products. In FY2022, we continued to phase out the traditional machinery and increase the application scale of these in-house-developed devices to further optimise the manufacturing process.

Multi-Function Automatic Glue Dispenser

The full automatic glue dispenser replaced the existing semi-automated machine. It is able to load and unload printed circuit board (PCB) during epoxy dispensing process, accurately dispense epoxy on die, and sort PCBs by models for further processing. This has improved the manufacturing efficiency for this production process.

Automatic Selective Flux Spraying Machine

We enhanced the automatic flux spraying machine with selective spraying function to facilitate wave soldering process during PCB manufacturing process. By using the computer vision sensor, flux can be sprayed on the selected area of the PCB, which reduce excess usage of solder flux and thus cut down the material cost.

Automatic Soldering Machine with Vibrating Function

We added the vibrating function for the automatic soldering machines to reduce the dosage of solder wire. The vibration of the solder gun increases the fluidity of molten solder to spread and cover the solder joint evenly. This has enabled us to maintain high soldering quality with minimum amount of solder.

Pick and Place Labelling Automation

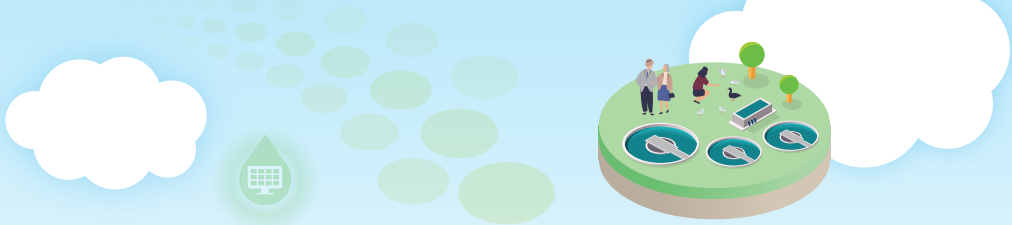
The pick and place labelling machine is designed to pick up label and place on the products automatically. It has enhanced the production efficiency by reducing manpower and increasing accuracy of the label position.

Automatic Tape and Reel Packaging Machine

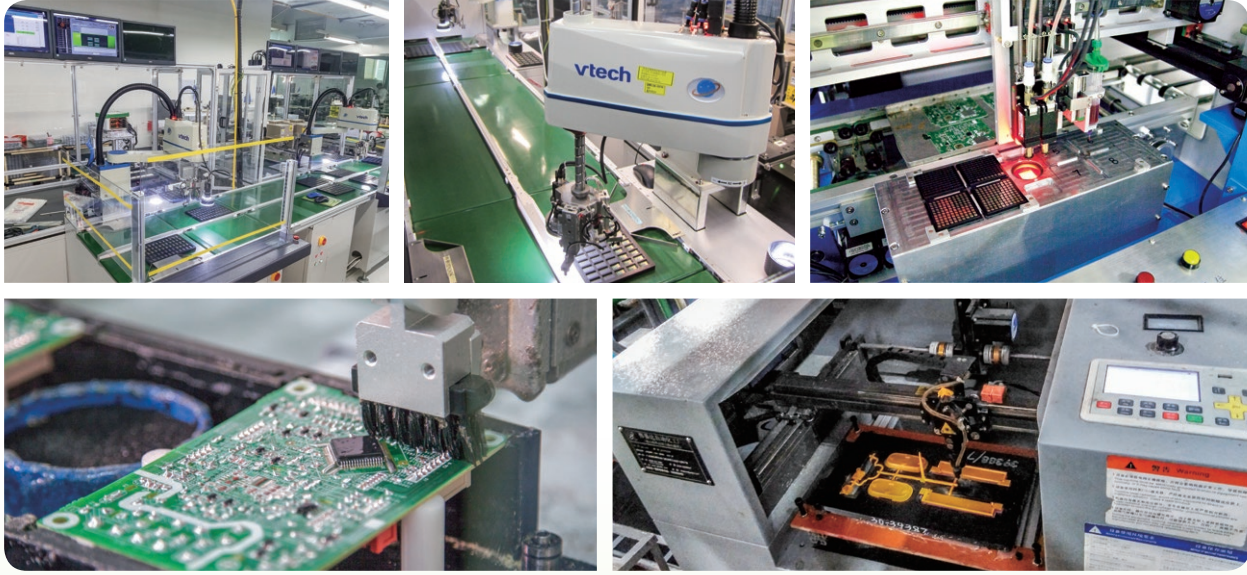
The automatic tape and reel packaging machine is designed to pick and place tin sheet on the solder mask of PCB for soldering. This has simplified work procedures and at the same time improved the soldering quality of the PCB.

Automatic Loading Machine for Adaptor Plug

The automatic loading machine was designed to install plug stamping parts in the mould before undergoing injection moulding process. This has enabled us to reduce the number of workers needed for manual installation.



Lean Manufacturing and Low Cost Automation



Sustainable Logistics Practice



As most of our products are shipped to the major markets in North America and Europe, it is crucial for us to manage our shipping orders in an energy efficient manner so as to reduce the transportation costs and minimise the associated environmental impacts. We also work closely with our suppliers and customers to consolidate and combine the shipping orders for the incoming materials and outgoing products respectively, in order to reduce the frequency of shipments. For our Continental European operations, our logistic hub in Netherlands which is managed by our major logistic service provider also helps us to consolidate shipping volume and increase the filling rate of each truck for the delivery of goods within Europe. As for the transportation mode, sea shipment is always our primary option for long distance transportation compared to the air shipment. For the inland goods delivery, we are also increasing the use of rail freight as it is the most cost efficient mode of transport with less environmental impacts compared with shipment by truck.

In recent years, we have implemented the decentralised warehousing strategy to locate our distribution centres in the US and Australia. Originally the only distribution centre of ELPs in US was located on West Coast, after relocating our distribution centres to both the East and West coasts, we are able to respond to customers demand more efficiently. As for Australia, we previously had only one distribution centre in Melbourne for ELPs. Three more distribution centres in Sydney, Brisbane and Perth were set up. Compared with the previous approach, this strategy has greatly enhanced our logistic efficiency. It not only reduces the time and distance for transporting our products to our customers but also saves a great deal of fuel consumption and thus carbon emission. In FY2021, we relocated the distribution center in Canada from Vancouver to Toronto as it is closer to the distribution centers of our major distributors. In FY2022, we set up a new distribution center in Spain to reduce delivery time and carbon emission.

Our logistics team has kept on using our cargo measuring software (CargoWiz) to optimise the loading capacity of each container. In FY2022, we reached the average of 87.2% of loading capacity.

Container Loading Capacity

