



QTC ENERGY PCL.

บริษัท คิวทีซี เอนเนอร์ยี จำกัด (มหาชน)
QTC Energy Public Company Limited



GOING TO THE FUTURE WITH SUSTAINABLE GROWTH

Sustainability Report 2019

รายงานความยั่งยืน 2562

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Message from the Chief Executive Officer



To All Stakeholders

In 2019, the Thai economy was in the middle of the US-China trade war and the Fed's interest rate cuts to protect the US economy from global economic recession. The aforementioned situation caused unavoidable impact on the Thai economy. The exchange rate fluctuations of the Thai baht and other currencies are both financial risks and opportunities for which the Company has set proper measures in place.

Under the above circumstances, the Thai government has continued to push for using its budget to develop industry and support industry in addition to having government agencies use environmentally friendly electrical appliances to reduce direct and indirect greenhouse gas emissions, increase demand and turn to use high quality transformers capable of meeting sustainable development goals in the area of climate change at the national level.

QTC's economic overview in 2019 for transformers, electrical appliances and services showed a slight increase in income from 2018 by 0.11 percent. QTC had sales and service income at 816.48 million baht. This consisted of income from the government sector (33.25%), income from the private sector (33.54%), overseas income (29.78%) and service income (3.43%). Although income in 2019 grew only slightly from 2018, the Company's profits were better. In 2019, the Company had a net profit of 14.55 percent, while the Company's net profit in 2018 was 0.49 percent. The aforementioned result came from strategic plan modifications for 2019-2020 to be years of quality and building strength for the organization with an emphasis on financial strategy, using trade account management policies and inventory management policies as an instrument, creating liquidity and financial capacity, reducing allowances for trade accounts receivable and inventory. In the area of sales and marketing, the Company focused on profit and controlled sales expenses. In the area of production, the Company modified production processes to reduce time, waste and continually increase product quality based on the total quality management principle. Furthermore, in 2019, the Company added new products for distribution such as BUSDUCT from Dynamic Electrical SDN. BHD., Malaysia, which was distributed

under the DE BUSDUCT brand, and solar inverters from Huawei Technologies (Thailand) Co., Ltd. under the Huawei brand. This was to create another channel for the Company, because both types of equipment can be offered and sold to customers who have needs and offered to be sold at once to distribute economic risks and build the organization's strength to become a future global leader.

Concerning performance, Q Solar 1 Co., Ltd.'s income in 2019 rose from 2018 by 4.05 percent while management costs and expenses declined from 2018 to 12.87 percent, causing net profit to rise by 23.38 percent as a result of enhancements to solar panel efficiency and other equipment to achieve the highest production capacity.

In the area of main management in the organization, the Company was awarded a certificate as a member of Thailand's Collective Action Coalition against Corruption (CAC) in 2019. Based on employee satisfaction, attachment and work-life balance assessments in 2019, levels rose from 2018 by 7.46 percent, 5.14 percent and 1.2 percent, respectively. The Company continues to prioritize and recognize employee work safety as a risk. The Company created stringent measures and continues to promote awareness. In 2019, accidents were 17.39 percent less than 2018. In the area of environment management, the Company continues to give importance to cost-effective resource utilization and management of disused materials from production. In 2019, the Company was able to follow the Zero Waste to Landfill at 100 percent.

With regard to participation in community development, the Company continues to emphasize public participation in communities through public relations activities where communities meet QTC. In 2019, the Company organized supportive activities to support students' education, build inspiration and feel according to issues obtained from public relations activities in 2018. The Company received cooperation from the faculty and students from King Mongkut's University of Technology North Bangkok in organizing Science Day week activities for students in the Mabyangporn community along with supporting many community activities and project.

In closing, on behalf of the Board of Directors, all executives and employees, I would like to thank shareholders, customers, trading partners, community members and all stakeholders for supporting and encouraging the Company. The Company promised to follow the Company's stated vision, obligations and sustainable development framework. The Company remains determined and dedicated to develop processes, instruments, machines and human capital to stand amidst economic and social changes with security and sustainability.



(Mr. Poonphiphat Tantanasin)
Chief Executive Officer

Awards for Success



**Green Label for Oil-dipped Transformers
6 Sizes
Certificate No. GL2019/042
From the Thailand Environment Institute**



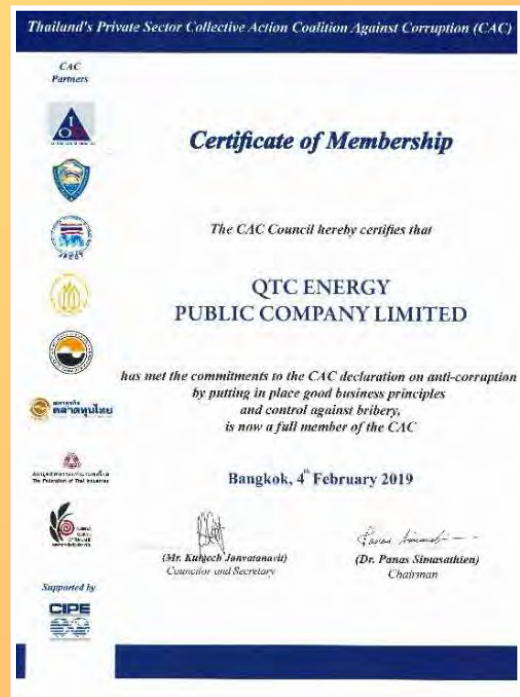
**Sustainability Disclosure Recognition
From Thaipat Institute**



**Honorary Award for Passing Assessment
In the Project to Promote Preparation of
Safety Standard Systems at the Platinum
Level from the Ministry of Labor**



**Corporate Carbon Footprint Certificate
Certificate No: TGO CFO FY19-4-029
From the Thailand Greenhouse Gas Management
Organization (Public Organization)**



**Certificate of Membership in Thailand's
Private Sector Collective Action Coalition
Against Corruption (CAC)**

About “QTC”

Business Information [Disclosure 102-1]	: QTC Energy Public Co., Ltd.
Abbreviated Securities Name	: QTC
Registration Date	: 28 July 2011 (Securities Registration)
Registered Capital [Disclosure 102-7]	: 341,092,557 Baht
Paid-up Capital	: 341,092,557 Baht
Industry Group	: Resources
Main Office [Disclosure 102-3]	: 2/2 Soi Krungthep Kritha 8, Intersection 5, Krungthep Kritha Rd., Huamark, Bangkok, 10240, Tel. 02-379-3089-92, Fax. 02-379-3097
Manufacturing Factory [Disclosure 102-4]	: 149, Moo. 2, Pluakdaeng-Huayprab, Mabyangporn, Pluak Daeng, Rayong, 21140, Tel. 03-889-1411-14, Fax 03-889-1420, http://www.qtc.energy.com
Highest Ranking Executive	: Mr. Poonphiphat Tantanasin (Chief Executive Officer)

Business Type [Disclosure 102-2]

Transformer Manufacturing and Distribution

QTC Energy PCL operates in the business of manufacturing and distributing transformers by purchase orders with capacity at 30-30,000 kVA in 1 phase and 3 phases and a voltage of no more than 36 KV. The Company has a manufacturing capacity of 4,000 transformers per year. Transformers manufactured and distributed by the Company can be divided into the following five types:

1. Distribution Transformers

Distribution transformers function to convert high voltage electricity from Metropolitan Electricity Authority or Provincial Electricity Authority distribution systems send along distribution lights at a voltage of no more than 36 KV to be lower at levels meeting power user needs such as industrial factories, residential homes and tall buildings, etc. Distribution transformers can be divided into the three following types:

- 1.1 **Hermetically Sealed Oil Type Distribution Transformer; Electric Power > 30 kVA < 4,000 kVA** – This type of transformer uses transformer oil as insulation for preventing short-circuits in the transformer and venting heat from wire coils in the transformer outside. The transformer's body is hermetically sealed to prevent air from coming into contact with oil in the transformer, giving this type of transformer excellent humidity protection properties, thereby preventing transformer oil from being easily degraded while also maintaining transformer oil insulation properties along with extending transformer maintenance time and expenses. This type of transformer is usually installed in the open.



1.2 Open Type with Conservator; Maximum Electric Power: 5,000 kVA

– This type of transformer is the original type of transformer used for a long time. This type of transformer uses transformer oil as insulation and coolant like hermetically sealed oil type transformers. However, open type transformers have a conservator installed to support transformer expansion during use with ducts to allow air to pass in and out. At the end of the duct is a bulb containing silica gel for absorbing humidity from the air before entering the transformer. This type of transformer requires regular transformer oil testing every 6 – 12 months.



2. Power Transformer

Electricity sent from generation sources via transmission lines before electricity is sent into distribution lines to users. Power transformers manufactured and distributed by the Company have capacity from 5,000 – 30,000 kilovolt amperes (kVA) and a maximum voltage of 72 KV.



3. Cast Resin Transformer

Dry type cast resin transformers are suitable for installation in buildings because dry type cast resin transformers do not use oil insulation. Cast high voltage wire coils are in epoxy resin insulation resistant to humidity, dust and the environment. Dry type cast resin transformers are used in projects such as tall buildings, residential buildings, condominiums, hospitals or shopping malls with limited space and need for transformers capable of being installed in a building. Furthermore, the Company invested in service goods and personnel readiness for customers in order to distribute cast resin transformers tested by international standards and create confidence among customers.



4. Super Low Loss Transformer

Super low loss transformers use amorphous raw materials to make transformer cores in place of silicon. Changes in raw materials have benefits including no load loss at only one-third the amount from silicon cores, enabling super low loss transformer users to save on electricity costs. If super low loss transformers replace many silicon core transformers, large amounts of electricity can be conserved at the national level with indirect effects on reducing global warming by reducing greenhouse gas emissions from electricity generation by power plants.



5. Special Transformer

The Company designs and manufactures transformers according to functions and properties needed by customers such as earthing transformers, dry-type class F&H, unit substation transformers and pad mounted transformers, etc.



Earthing Transformer



Dry-Type Class F&H



Unit Substation



Pad Mounted

6. Smart Monitoring Box

This smart accessory was designed to monitor transformer functions with sensors that track key variables such as electricity in wire coils, measure wire coil and oil temperature and detect imbalances with potential negative effects on transformers. Smart monitoring boxes can be installed to every QTC transformer model.



7. BUSDUCT

BUSDUCT is used in place of wires to distribute loads and BUSDUCT is popularly used in high-rise buildings and large industrial factories. The product is distributed under the DE BUSDUCT brand. QTC was appointed as the sole distributor in Thailand by Dynamic Electrical SDN. BHD., Malaysia. DE BUSDUCT passed conductivity testing for both copper and aluminum conduits. Furthermore, DE BUSDUCT offers Mylar and hybrid (Mylar + epoxy) insulation choices to suit various uses among contractors. DE BUSDUCT has advantages in the area of distribution with low electric potential difference and a more stable electricity system than ordinary cables.



8. Solar Inverter

Solar inverters are a product for converting direct current electricity into alternating current electricity from solar panels. QTC was appointed as a distributor by Huawei Technologies (Thailand Co., Ltd.) to distribute under the Huawei brand.



Manufacturing Contract Business (OEM)

QTC Energy PCL is engaged in the business of accepting contracts to manufacture transformers for major foreign customers with an emphasis on quality and environmental operations designed by QTC according to needs and manufacturing under customer brands to expand its customer base and build security.

Service Business

The Company's services are 24-hour transformer-related services provided by teams of engineers and technicians with excellent knowledge, expertise and experience to support and facilitate customers who purchased QTC transformers and ordinary customers. In the case of QTC transformers, the Company provides emergency contact information on the side of every electrical transformer for customers. The following services related to transformers are provided by the Company for customers:

- Transformer installation services.
- Scheduled inspection and maintenance services.
- Transformer repair and maintenance services.
- Transformer oil filling and filtering services.
- Transformer lease services.
- Standard transformer testing services.
- Transformer and electricity system consultation services.
- Steel cutting and coil binding commissioning services
- Transformer tank manufacturing contracts.



Our expert service technician teams are ready to perform 24-hour service.



ISO/IEC17025 Standard Testing Laboratory

Coiling & Steel Cutting & Body Manufacturing

Renewable Energy Production Business

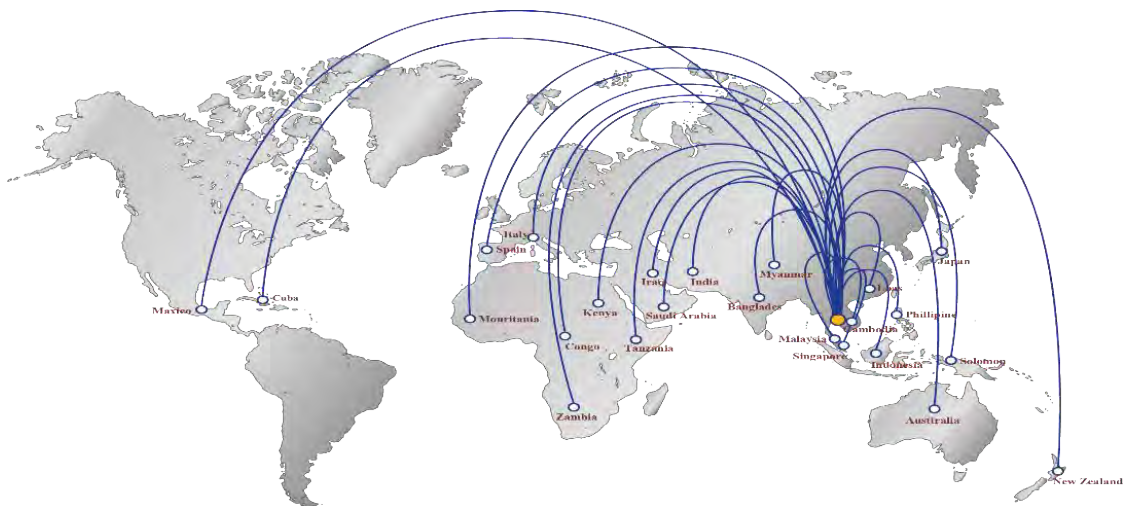
QTC Global Power Co., Ltd. (QTCGP) is engaged in the business of investing in renewable energy production businesses such as solar energy and water energy to create security and disperse business risks.

- **Q Solar 1 Co., Ltd.** produces electricity from solar cells with a capacity of 8.25 MW. The Company is located at 102, Moo 5, Bo Thong, Kabinburi, Prachinburi (Disclosure 102-4. The Company is able to generate 35,000 – 40,000 kWh of electricity per day for distribution to the Provincial Electricity Authority.



QTC's Customers (Disclosure 102-6) :

QTC's transformers and smart monitoring systems are distributed to government agencies such as the Metropolitan Electricity Authority, the Provincial Electricity Authority, the Electricity Generating Authority of Thailand and ordinary government agencies, private designer groups, construction contractors, industrial factories and condominiums, etc., in the country and overseas worldwide. The Company distributes goods under the QTC brand and manufactures OEM under customer brands. QTC is a distributor of BUSDUCT under the DE brand and QTC distributes solar inverters under the Huawei brand.

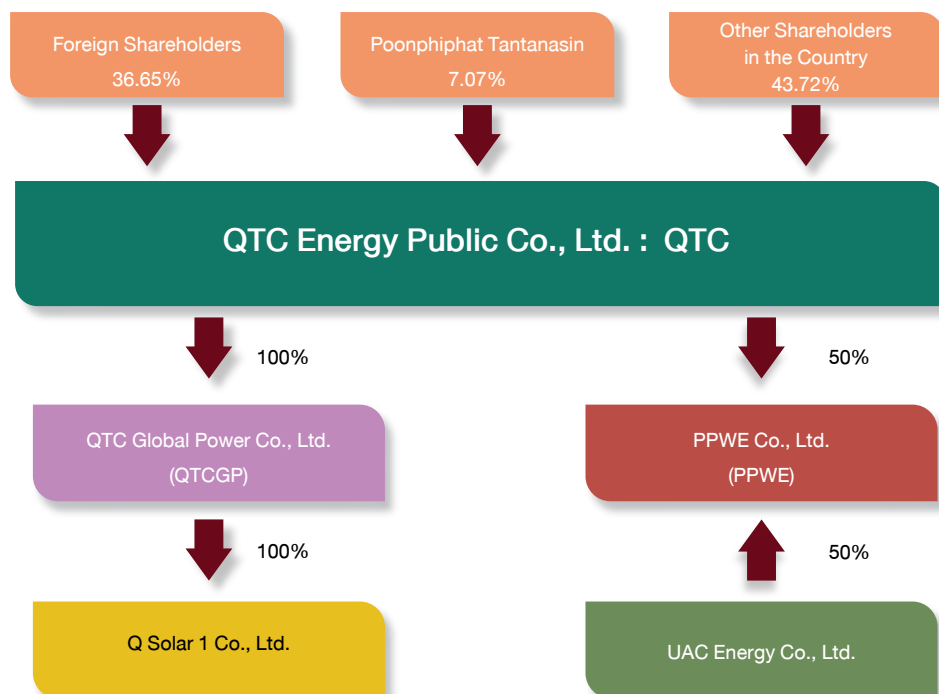


Membership in Organizations (Disclosure 102-13):



Shareholding Structure [Disclosure 102-5]

Summary of Shareholding Structure as of 26 December 2019



- QTC Global Power Co., Ltd. (QTCGP) is engaged in the electricity and other energy generation business. The Company was founded on 28 September 2016 with registered capital of 560 million baht. QTC holds 100 percent of the Company's shares.
- Q Solar 1 Co., Ltd. (Q Solar 1) is engaged in the business of generating electricity from solar energy. The Company was founded on 28 December 2009 with registered capital of 220 million baht. QTC Global Power Co., Ltd. holds 100 percent of shares on 20 September 2017 (the Company was formerly L Solar 1 Co., Ltd. and name change was registered on 31 August 2018).
- PPWE Co., Ltd. is a joint venture engaged in the energy business. The Company was founded on 12 January 2016 with registered capital of one million baht. QTC holds 50% of the Company shares, and UAC Energy Co., Ltd. holds 50 percent of shares.

Board of Directors [Disclosure 102-18]



1. Mr. Krirk-Krai Jirapaet
Chairman of Board



2. Mr. Natthaphon Lilawatthananon
Director



3. Mr. Phonrat Piathanom
Director



4. Dr. Kamol Takabut
Director



5. Mrs. Wasara Chotithammarat
Director



6. Mr. Suroj Lamsam
Director



7. Mr. Viraphonh Viravong
Director



8. Mr. Preedee Ngamsantikul
Director



9. Mr. Phairoj Boonpun
Director

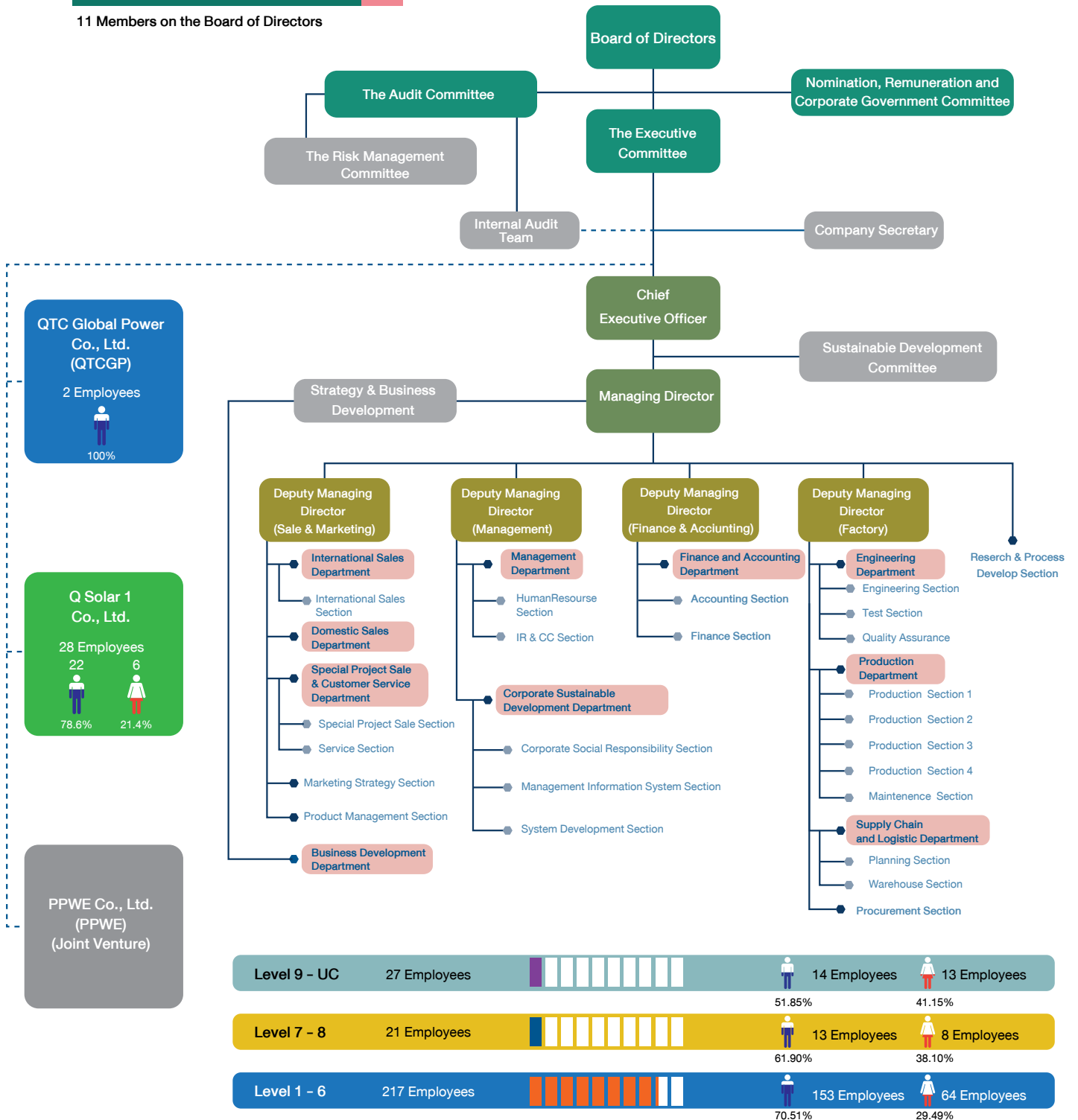
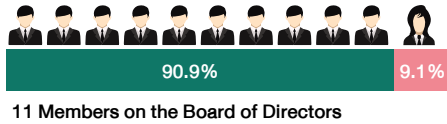


10. Mr. Poonphiphat Tantanasin
Director



11. Mr. Ruangchai Kritsnakriengkrai
Director

Regulation Structure [Disclosure 102-18]



Roles, Duties and Responsibilities (Brief)

- The Board of Directors is responsible for performing duties under the Board of Director's charter for the highest benefit of the Company and all stakeholders.
- The Board of Audit is composed of independent directors who assess the Internal Audit Team's performance and considers changing the Internal Audit Team. In addition, the Board of Audit has other roles and duties under the Board of Audit charter.
- The Nomination, Remuneration & Corporate Government Committee appoint and transfer high-ranking executives in addition to assessing high-ranking executives' performance. In addition, the Nomination, Remuneration and Corporate Government Committee has other roles and duties under the Nomination, Remuneration and Corporate Government Committee charter.
- The Corporate Risk Management Committee assesses the organization's economic, social, environmental and ethical risks along with preparing guidelines for preventing that risk. The Corporate Risk Management Committee reports to the Company's Board of Directors.
- The Corporate Sustainability Promotion Committee governs performance according to sustainable development policies by covering issues in the sustainability management framework and expanding results to subsidiaries. The Corporate Sustainability Promotion Committee reports to the Board of Executives.
- The Chief Executive Officer determines visions, policies, goals and distribution of authority and duties to drive the organization according to resolutions of the Board of Directors.
- The Managing Director determines business strategies and management to be consistent with visions for the ultimate benefit of stakeholders.

Vision, Mission and Management Principles



Quality of DETAILS

Detail is the heart of our work and permeates in everything that is QTC from people, thinking methods, work methods, technology, factories, products including society and the environment.



Vision

"To be a producer and provider of world-class one-stop technology services in the power industry with responsibility to the environment and environmental responsibilities and good governance."



Mission

1. Being a leader in providing integrated technology solutions for businesses in the power industry.
2. Developing environmentally-friendly products, services and internal processes to create added value in the value chain.
3. Developing human resources to enhance professional capabilities in both hard and soft skills.
4. Operating in governance along with corporate social responsibility.
5. Building long-term, sustainable growth in business to gain the trust of all stakeholders.



Management Principles

QTC is determined to engage in business by adhering to the following three principles:

1. Ethical, just and transparent management.
2. Product and service provision meeting international quality standards.
3. Focus on corporate social and environmental responsibility in strict compliance with human rights principles.

The Company reviews visions and missions annually. Visions and missions were reviewed and approved by the Board of Directors on 19 December 2019 in order for visions and missions to be consistent with current economic conditions.

Management Principles



Ethical, just and transparent management.



Product and service provision meeting international quality standards.



Focus on corporate social and environmental responsibility in strict compliance with human rights principles.

QTC Values for Sustainability



QTC & Sustainability

The Company has established the Corporate Sustainability Promotion Committee composed of department managers of various work sections. The Committee is authorized to monitor performance in line with policies and promote activities corresponding with the sustainable management framework and the sustainability equation, “Q+R=S”. Determining the sustainability management framework is an important mechanism for driving internal management at the policy level and the management level in order to lead to practice and project operations in line with the specified framework. The Company will foster beliefs and build understanding for every employee in line with the sustainability equation that doing good work with quality, accuracy and responsibility will build satisfaction for all stakeholders, build strength and sustainability for employees and the organization. The Company has the following sustainability framework and equation:

QTC Sustainability Framework

Quality + Responsibility = Sustainability



**Quality and Responsible People, Processes,
Tools, Machines, Goods and Services**



Operating Structure

Board of Directors	Board of Directors :	<ul style="list-style-type: none"> Determines policies and goals in the area of sustainable development. Governs operations.
Board of Executives	Board of Executives :	<ul style="list-style-type: none"> Determines strategies and work goals. Manages according to goals under the sustainable development framework.
Corporate Sustainability Promotion Committee <ul style="list-style-type: none"> Managing Director Deputy Managing Directors of Every Branch All Department Managers 	Corporate Sustainability Promotion Committee:	<ul style="list-style-type: none"> Reviews stakeholder identification. Considers sustainable development issues. Prepares development guidelines to be consistent with issues and appropriately care for stakeholders. Reviews policies, goals, sustainability issues, recommend guidelines for improvement to be up-to-date and appropriate for situations. Specifies work plans and assigns sustainable development workloads in practice.
Corporate Sustainability Promotion Work Group <ul style="list-style-type: none"> Manager, Corporate Sustainability Development Department All Department Managers 	Corporate Sustainability Work Group:	<ul style="list-style-type: none"> Specifies work plans. Operates according to plans and reports results
All Subsidiaries	All Subsidiaries:	<ul style="list-style-type: none"> Manage according to sustainable development goals. Monitor and report performance.

Sustainable Development Policies

“Quality of Details” forms an important foundation that will lead the Company and other companies within the group toward sustainable growth. This means management that prioritizes creating quality in three aspects to establish balance, namely, economic, social and environmental balance based on international practices. The practice guidelines for implementation are as follows:

http://qtc-energy.com/?page_id=736

1. Conduct business honestly and fairly in compliance with the law and trade specifications while promoting clarity and transparency in corporate management to concur with international principles. In addition, support anti-corruption and prevent unlawful gain-seeking while exercising authority to create the greatest fair benefits for stakeholders.
2. Promote practices under human rights principles with awareness about the human dignity, rights, freedom and equality of individuals as protected by the Constitution of the Kingdom of Thailand and related international laws. In addition, respect the local traditions where the Company or another Company within the group is located.
3. Endeavor to improve and develop work procedures and services with the value chain based on Total Quality Management principles (TQM) to promote quality attitudes for personnel within the organization and added value for customers in addition to promoting long-term growth.
4. Encourage effective utilization of resources, which includes reduction and control of social and environmental impacts resulting from the Company’s operations, the operations of other companies in the group and related trade partners.
5. Pay attention to and place emphasis on the occupational and environmental health and safety of employees, trade partners and contacts to prevent loss of life and property, including work-related injury or sickness.
6. Manage personnel fairly and give importance to labor skill development in addition to promoting work happiness for effective steering of the organization.
7. Promote and create innovation with responsibility to society and the environment to increase effectiveness and efficiency with added value for the organization and stakeholders.
8. Create sustainable benefits for communities and society. Also support and engage in activities for public gain while promoting employees to have a good conscience for the public and performing good deeds for society.
9. Maintain firm commitment to managing risks in all areas in line with international standards to increase opportunities for success and to minimize the chances of failure and loss.

The activities under the sustainable development policies contain indices for monitoring and evaluating the effectiveness of the Company’s activities and activities of other companies in the group socially, economically and environmentally. They provide essential information for continuously and sustainably setting the corporation’s development direction. Furthermore, the Company is confident that the aforementioned policies will be effectively, extensively monitored and implemented by employees and executives on every level within the Company and other companies in the group.

Stakeholders

Identification of Stakeholders and Impacts

The Corporate Sustainability Promotion Committee reviews impacts in the process throughout the entire value chain once per year to identify stakeholders and significant issues through processes to identify work hazards and environmental impact assessment from work and products in a life cycle manner using participatory evaluation methods involving employees at all levels.




In addition to the internal evaluation of the organization, the Company has also created a forum for discussion in which communities can meet QTC once annually to hear out recommendations. Furthermore, the Company gives consideration to proposals from stakeholders through other channels such as general meetings of shareholders, expressions of opinion on webpages, etc., in order to use information in order to identify sustainability issues and specify stakeholders with the organization using criteria for considering all stakeholders in the QTC value chain (Disclosure 102-9, 102-21).






Supply Chain for Business						
Sale & Marketing	Raw Material & Product Procurement	Management & Manufacturing	Delivery	Product Usage	Maintenance Service	Waste Management
Stakeholder						
<ul style="list-style-type: none"> • Employees • Customers <ul style="list-style-type: none"> - Government - Domestic - Foreign • Dealer • Competitors 	<ul style="list-style-type: none"> • Employees • Supplier • Carrier • Competitors • Manufacturer 	<ul style="list-style-type: none"> • Employees • Board of Directors • Customer • Dealer • Shareholders • Banks • Communities, Society • Government agency • Investors 	<ul style="list-style-type: none"> • Employees • Transport • Broker Shipping • Shareholders • Banks • Communities, Society • Government agency 	<ul style="list-style-type: none"> • Customers • Product users • Communities, Society 	<ul style="list-style-type: none"> • Employees • Product users • Communities, Society 	<ul style="list-style-type: none"> • Communities, Society • Waste disposal • Product users • Mass Media • Government agency
Impact Issues						
<ul style="list-style-type: none"> • Fair Trade • Corruption • Customer confidentiality • Responsibility for products and services 	<ul style="list-style-type: none"> • Human Rights • Corruption • Fair operating practices • Supplier development • Pollution 	<ul style="list-style-type: none"> • Human Rights • Labor Practices • Health and Saafety • Good Corporate Governance • Resource Use • Pollution • Climate Change • Waste Management • Transparency • Corruption • Compliance • Risk Management • Community 	<ul style="list-style-type: none"> • Human Rights • Health and Saafety • Labor Practices • Pollution • Climate Change • Corruption • Fair Trade • Compliance 	<ul style="list-style-type: none"> • Safety in Procurement • Energy Usage • Responsibility for Products and Services 	<ul style="list-style-type: none"> • Human Rights • Health and Saafety • Labor Practices • Responsibility for Products and Services • Compliance • Pollution 	<ul style="list-style-type: none"> • Health and Saafety • Pollution • Disposal Methods • Compliance





Stakeholder Connection

Once stakeholders and their issues of interest have been identified in addition to their expectations, the Company will consider specifying communication and response methods in meeting the expectations of all groups of stakeholders.

Working with Stakeholders

Stakeholders (Disclosure 102-42)		Expectation Survey Methods (Disclosure 102-43)	Expectations (Disclosure 102-44)	The Organization's Response (Disclosure 102-43)
Employees 	Regular Employees	<ul style="list-style-type: none"> Monthly meeting of executives and employees. Suggestion activities, KAIZEN, QCC. 	<ul style="list-style-type: none"> Correct compliance to laws and ethical principles. Transparency and accountability. Business success. 	<ul style="list-style-type: none"> Safety management pursuant to OHSAS18001. Environmental management pursuant to ISO14001. Provident Fund. Strictly adhere to rights policies and employment policies. Health promoting workplace project. Organizational health for sustainable happiness project. Modify wage payment and performance assessment systems. Modify career path development system. Knowledge Management
	Temporary Employees	<ul style="list-style-type: none"> Listening to employee opinions and complaints. The Welfare Committee. The Safety Committee. Employee happiness survey. Corporate love and attachment survey. Risk assessment. Environmental impact assessment. 		
Board of Directors 	Company Directors	<ul style="list-style-type: none"> Board of Directors' meetings. Board of Audit meetings. Nomination Committee meetings. 	<ul style="list-style-type: none"> Correct compliance to laws and ethical principles. Transparency and accountability. Business success. 	<ul style="list-style-type: none"> Good business governance in compliance with policies and strict enforcement. Report performance.
Trade Partners 	Deliverers Contractors Product Manufacturers Raw Material Producers	<ul style="list-style-type: none"> Annual deliverer and contractor evaluations. Production process, product quality inspection and discussions for improvement. 	<ul style="list-style-type: none"> Receive accurate information quickly and according to conditions and schedule. Fair compliance to agreements and payment terms. Fair and transparent price competition. Knowledge provision and raw material production pro 	<ul style="list-style-type: none"> Specify clear procurement policies without preferential treatment. Development of trade partners through recommendations, knowledge provision and understanding about developing raw materials to be better than standard specifications. Have anti-corruption policies and promote practice.

Stakeholders (Disclosure 102-42)		Expectation Survey Methods (Disclosure 102-43)	Expectations (Disclosure 102-44)	The Organization's Response (Disclosure 102-43)
Shareholders/ Investors 	Shareholders Investors Analysts	<ul style="list-style-type: none"> Annual meetings of shareholders. Quarterly performance announcements. Financial analysts' meetings. Registered companies meet investors. Invitations for investors to visit factories. 	<ul style="list-style-type: none"> Good wages. Good governance over activities. Stable business and continuous growth. Correct, complete, up-to-date and transparent Company information. Good risk management system. Good audit and control system. 	<ul style="list-style-type: none"> Transparent, fair and accountable business governance. Appropriate dividend payment. Transparent disclosure of information. Strategic business plan preparation. Thorough risk management.
Customers 	Government Customers Private Customers Foreign Customers Domestic Retailers Foreign Retailers PEA (Power Purchaser))	<ul style="list-style-type: none"> Meet-ups with customers/retailers. Product exhibitions. Customer/retailer satisfaction surveys. Technical knowledge provision to customers/retailers. Opportunities for customers/retailers to observe production processes. Joint activities with customers/retailers. Contract terms. Inquiries 	<ul style="list-style-type: none"> Receive accurate technical product and service information. Appropriate product and service prices. Transparent price competition. Receive quality products and services. Fair compliance of agreements. Option to choose energy-conserving products. Warranty for products and services. Customer confidentiality preservation. Full electricity distribution according to contract terms. Energy technology knowledge sharing. 	<ul style="list-style-type: none"> Good corporate governance that is transparent and verifiable. Anti-corruption policies and promotion of quality management pursuant to ISO9001. Total Quality Management to improve product and service processes. CRM system. Ethics in maintaining customer confidentiality. Product certification pursuant to laboratory standard ISO17025. Development of energy-conserving products by R&D team. Visits to observe production processes. Visits to observe electricity generation to build confidence. Modify and maintain electricity generation equipment for maximum efficiency.
Trade Competitors 	Competitors	<ul style="list-style-type: none"> Meetings and conversations. News and information. Group member meetings. Marketing activities. 	<ul style="list-style-type: none"> Fair and transparent trade competition. Exchanges of information about products, raw material sources and tools and machinery used in production. 	<ul style="list-style-type: none"> Compliance to ethics principles to operate business fairly and transparently.
Waste Disposers 	Waste Disposers Waste Processors	<ul style="list-style-type: none"> Exchanges of knowledge about legal specifications and correct practices. 	<ul style="list-style-type: none"> Strict compliance to agreements. Correct actions pursuant to the law. 	<ul style="list-style-type: none"> Monitor and inspect actions of disposers. Evaluate waste disposers' performance.
Creditors 	Financial Institutes Deliverers of Goods, Raw Materials and Other Services	<ul style="list-style-type: none"> Meetings and discussions. Quarterly performance announcements. Shareholder meetings. 	<ul style="list-style-type: none"> Ability to comply with contract terms and agreements. Transparency in operations. 	<ul style="list-style-type: none"> Strict compliance with terms and agreements in contracts. Business visits and tours.

Stakeholders (Disclosure 102-42)		Expectation Survey Methods (Disclosure 102-43)	Expectations (Disclosure 102-44)	The Organization's Response (Disclosure 102-43)
Trade Accounts Receivable 	Trade Accounts Receivable from Sale of Goods, Services, Electricity and Other	<ul style="list-style-type: none"> Meetings and discussions. 	<ul style="list-style-type: none"> Compromise and leniency. 	<ul style="list-style-type: none"> Negotiations. Trade account management policies. Legal action.
Mass Media 	Newspaper Television Radio Magazine Online Media	<ul style="list-style-type: none"> Meetings with mass media at different occasions. 	<ul style="list-style-type: none"> Accurate and fast news and information on business progr 	<ul style="list-style-type: none"> Meet and visit with mass media at least once a year. Invite mass media to visit the business.
Government Agencies 	<ul style="list-style-type: none"> SEC SET Revenue Provincial Industry Provincial Labour Provincial Resources Provincial Transport TAO Chamber of Commerce Federation of Industries Ministry of Energy Ministry of Labour Ministry of Industry BOI 	<ul style="list-style-type: none"> Meetings and explanations of government agencies. Business inspections and visits. Conditions pursuant to the law. News and information. 	<ul style="list-style-type: none"> Ability to comply with related laws. No social and environmental effects. Development of the organization's ability to participate in modifying environmentally-friendly production processes to reduce impacts. Cooperate with the government sector to provide information for use in development. Support government sector projects with benefit for the greater good. 	<ul style="list-style-type: none"> Comply with rules and regulations prescribed by the law in every area. Complete and punctual tax payments of every type. Develop processes to seek opportunities for improvement and reduce environmental impacts. Transparent disclosure of information. Report information according to legal specifications. Annual reports.
Community and Society 	<p>Communities Around the Factory</p> <p>Communities Around the Power Plant</p> <p>General Society</p>	<ul style="list-style-type: none"> Organizing activities with communities/society. Participation on community and social development. Annual public hearing activities where communities meet with QTC. Annual public hearing activities where communities meet with the power plant. News and information. 	<ul style="list-style-type: none"> Friendliness to one another. Support for community activities. Support for products made by disabled persons in the community. Support for activities in social businesses. No negative safety and environmental impacts on communities and society. Transparency in operations. Compliance with human rights and anti-corruption principles. 	<ul style="list-style-type: none"> Support public activities. Create volunteer employees to participate in public activities. Environmental management with ISO14001 standards. Energy management with ISO 50001 standards. Safety management with OHSAS18001 standards. Human rights policies and support for practice. Anti-corruption policies and support for practices. Suitable procurement of products from disabled persons in the community for the Company's operations. Indirect investment in social businesses. Annual performance reports at association activities and other media.

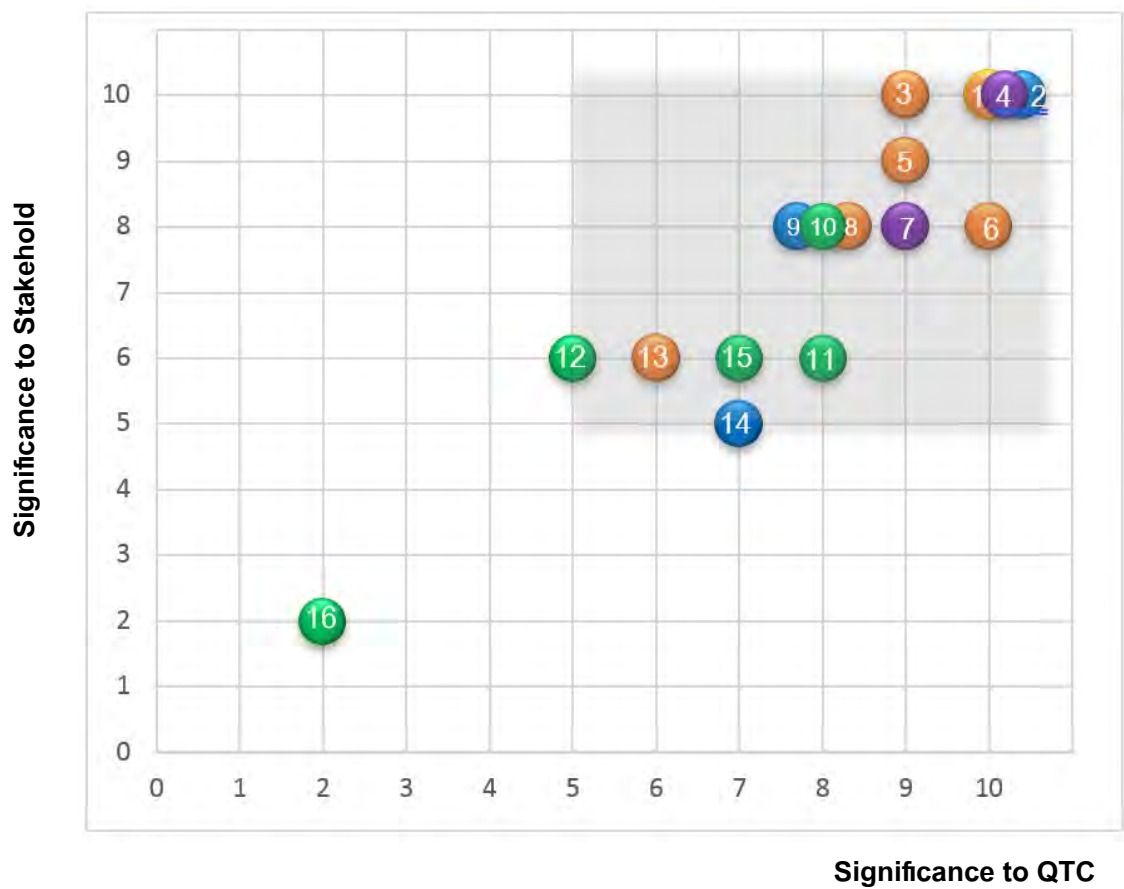
Key Sustainability Issues

The Company specifies significant sustainable development issues by considering data on needs of customers in the government sector, domestic and foreign private sectors, government sector policies, stakeholder expectations including changes to laws and specifications in the country, local areas and foreign countries where customers are based, organization risk management and business plans. In addition, the Company uses materiality selection processes based on GRI Sustainability Reporting Standards (Disclosure 102 – 40).

Principles for Issue Selection

1. **Issue Identification:** Considerations are made annually regarding the source information, beginning from the corporate sustainability framework, and information from stakeholders inside and outside the organization on issues given importance to by each group of stakeholders or expectations for impacts on the sustainability of the organization economically, socially, environmentally and good corporate governance in order to identify issues that are important to the organization and stakeholders using assessment procedures and weights according to the criteria specified by the Company.
 - **Inside the Organization:** Executive-level meetings of the Corporate Sustainability Promotion Committee and the Risk Management Committee regarding the organization's business trends and goals, operating-level meetings of the Welfare Committee and the Safety Committee, compilation of issues obtained from measuring employees' attachment to the organization, issues obtained from the happiness survey of employees within the organization and the comment box. Information was collected about the meeting, survey results and suggestions of employees in each agenda for analysis of sustainability expectations for employees and the organization to be designated as issues.
 - **Outside the Organization:** Review sustainable issues related to stakeholders' expectations from meetings of shareholders, meetings of the Board of Directors, meetings with customers, complaints, customer satisfaction survey results, community discussions, QTC meets the communities, development plan of the government and relevant government agencies. Information was collected on opinions, expectations and recommendations by interviews, questionnaires, official and unofficial discussions and analysis of information about expectations and trends of the country's development to designate issues.
2. **Prioritization of Issues:** Once issues that are significant to the organization and stakeholders have been specified, they are to be given weighted scores covering impacts to stakeholders inside and outside the organization. The Company has specified scoring criteria pursuant to the practice guidelines in ISO14001, ISO18001, ISO50001 and ISO26000 as consistent with the context of the organization when compared to the indicators in GRI standards. Consideration of prioritization led to the specification of significant issues in the Materiality Matrix.
3. **Reasoning:** In 2019, significant issues considered by the Corporate Sustainability Promotion Committee continue to be the same as in the past. However, the weight of significance changed based on stakeholder expectations because the Company added new products for distribution and expanded the assessment scope to subsidiaries, causing the number of stakeholders to increase and causing expectations to change slightly, leading to specification of sustainable development strategies. Key sustainable issues in 2019 were as follows:





Materiality Matrix



● Corporate Governance ● Economy ● Society ● Environment

- | | |
|----------------------------------|--|
| 1 Safety and Health of Employees | 9 Standards and Innovation |
| 2 Business Growth | 10 Management of Wastes and Scrap Materials |
| 3 Employment and Human Rights | 11 Environmentally-friendly Production Processes |
| 4 Corporate Governance | 12 Climate Change |
| 5 Employee Care | 13 Corporate Social Responsibility |
| 6 Employee Development | 14 Trade Partner Development |
| 7 Risk Management | 15 Resource Utilization |

Sustainable Development Issues [Disclosure 102-47]

Key Sustainability Issues	Content Reported	Scope of Impacts		QTC SD-Framework	SDGs	Pages
		Internal	External			
Key Corporate Governance and Risk Management Issues						
Corporate Governance	 Good Corporate Governance	QTC	Shareholders, Investors, Trading Partners, Government Agencies	Transparency, Ethics Anti-Corruption Respect for rule of law		29
	 Anti-corruption					33
Risk Management	 Risk Management	QTC	Shareholders	Risk Management		36
Quality Economic Issues						
Business Growth	 Economic Results	QTC	Shareholders, Investors, Competitors	Transparency Business Growth		41
	 Investment in Other Businesses					43
	 Distribution of Value to Stakeholders					44
Standards & Innovation	 Work Standards	QTC	Customers	Business Growth Fair Trade		45
	 Product Standards					47
	 Innovation					48
Trade Partner Development	 Trade Partner Development	QTC	Trading Partners	Fair operating practice		51
Responsibility to Goods & Services	 Responsibility to Goods & Services	QTC	Customers	Accountability Stakeholder Engagement		52
Quality Society Issues						
Employee Safety and Health	 Safety	QTC	Communities, Trading Partners, Government Agencies	Transparency Health, Safety & Well-being		55
	 Employee Health					65
Employment and Human Rights	 Employment and Human Rights	QTC	Communities, Government Agencies	Human Rights		69
Employee Development	 Employee Development	QTC	Government Agencies			75
Employee Care	 Employee Care	QTC	Government Agencies	Employee Development		79
Social Responsibilities	 Community Development	QTC	Communities	Community Involvement Stakeholder Engagement		86
	 Social Investment					92
	 Social Activities				93	
Quality Environment Issues						
Waste and Scrap Material Management	 Waste and Scrap Material Management	QTC	Communities, Waste Disposers, Government Agencies	Transparency Pollution		98
Environmentally-friendly Production Processes	 Green Procurement	QTC	Communities, Customers, Trading Partners, Government Agencies	Transparency Respect for rule of law Pollution		102
	 Pollution Control				104	
Environmentally-friendly Products	 Environmentally-friendly Products	QTC	Communities, Customers, Trading Partners, Government Agencies	Transparency Respect for rule of law Pollution		106
Climate Change	 Corporate Carbon Footprint	QTC	Communities	Climate Change		109
	 Greenhouse Gas Emission Reduction					113
Resource Utilization	 Energy	QTC	Communities	Resource Use Respect for rule of law		115
	 Water					118

Main Strategies for Sustainable Development

With the organization's vision to be a "world-class" leader and the corporate culture emphasizing "quality of details", combined with sustainable development policies, the Company has set in place its main strategies for conducting business through risk management and impact assessment for stakeholders in all areas. Furthermore, indicators have been set for monitoring and evaluating economic, social and environmental work effectiveness leading to the objective of extensive implementation by executives and employees under QTC's sustainability equation of Quality + Responsibility = Sustainability". And because the Company recognizes people as the most important resource in driving the organization toward the goal of becoming a world class Company, the Company specified behaviors that should be expressed by all QTC employees to create the same basic work culture in the following four areas and eight behaviors:

8 Behaviors for Building a Basic Work Culture



Based on the basic work culture specified by the Company, activities were organized to support strict compliance in each area in order to support main sustainable development strategies with performance reports made separately in the corporate governance, economic, social and environmental aspects.

Economic Strategies

Increase Competitive Potential with “Quality” + “Responsible” Products and Services

This is a main strategy carried out by the Company on a continual basis. The Company sets business growth goals by creating sustainable value for stakeholders, innovations in processes and products to create competitive advantages while developing major trading partners for quality and punctual delivery and use of the following instruments and processes:

- Internal procedure development by using Total Quality Management (TQM) was carried out for the sixth consecutive year.
- Support of innovations to improve goods, services and internal processes through research and development and KAIZEN proposals at the employee level created ideas and actions on new topics and created changes at the personal level. In 2019, the Company generated income from new innovation products and the Company has over 500 applicable KAIZEN results from employees, which benefited employees and the Company.
- Develop major trading partners. Because most of QTC's trading partners are SMEs, manufacturing capacity development has many limitations. Therefore, the Company needs to reinforce technical skills and methods and learn along with recommending accurate work guidelines based on ethics and practice guidelines for QTC's trading partners in order to enable delivery of materials on time with quality meeting the Company's specifications and to enable trading partners to improve capabilities, grow and gain security. The Company's goal is one trading partner per year.
- The Company became a distributor of equipment related to electricity and energy consisting of BUSDUCT from Dynamic Electrical SDN BHD, Malaysia, under the DE BUSDUCT brand, and solar inverters from Huawei Technologies (Thailand) under the Huawei brand.

Expand the Business to Other Investments to Increase Income and Build Financial Strength

The Company has strategic plans to build security or the organization by expanding investments in energy businesses or other businesses with responsibility to society and the environment with a focus on cost-effective long-term returns for the organization and stakeholders in order to increase income and build financial strength. The Company specified risk analysis processes and prepared risk management plans according to standards.

In 2019, the management team and QTC Global Power Co., Ltd. studied projects to invest in hydroelectric power plants, solar power plants and biomass power plants, but no project was found to have returns meeting the Company's standards.



Environmental Strategies

Create a Sustainable Green Culture

This is another major strategy that has driven the organization continually for a long time with awareness of the importance of the environment influencing living conditions of generations after generations. Therefore, the Company recognizes the opportunity to modify procedures and products to improve the levels of employees' thoughts and actions in yielding the results most capable of reducing environmental impacts. The Company performed the following actions to build sustainability:

- ISO14001 environmental management standards and ISO50001 energy management standards were applied to be consistent with the organization's contexts and continual development.
- The Company manages waste and disused materials from production by not sending 100 percent of waste to landfills (Zero to Landfill).
- The Company promotes conservation behaviors by supporting reduction and not using disposable plastic along with encouraging KAIZEN in the area of the environment and energy.

**Raising
Awareness**



**Green
Culture**

Social Strategies

CSR in Process

Strengthen Safety Culture in the Organization

Safety for the lives and property of employees and the Company are significant risks for the Company and stakeholders. The Company continually promotes creating safety culture by applying the OHSAS18001 safety management system for consistent use with internal processes. In 2019, the Company began to apply ISO450001 standards to replace OHSAS118001 in 2020. In addition, the Company spends a large budget to procure personal protective equipment, modify instruments, machines, work processes, work environments, provide training, education and improve KAIZEN safety skills including organizing work safety promoting activities for employees to create awareness and avoid situations which may create accidents. The Company's goal is to have zero accidents.

**Safety
Culture**



Q Make Good People, Develop Smart People

The Company has set the organization's core competency based on corporate developmental guidelines and vision for use in setting the qualifications required for all people inside the organization as a foundation. Furthermore, capabilities for each work position have been set clearly to provide guidelines for developing employee work skills. Additionally, courses have been created for emotional and behavioral development in addition to strict enforcement of rules, regulations requirements and relevant laws to turn these people into capable workers and good people in society to create valuable work and coexist happily.

Core Competency of QTC



Q Creating Work Life Balance



The Company is well aware that happy employees in work and personal lives promote good living and good health, which influence and play a part in achieving success, security and career advancement for employees, the organization and society. Therefore, the Company has created work mechanisms to achieve work – life balance for people within the organization with the main objective of creating sustainable happiness and sharing happiness with society in general. Examples of projects and activities that promote work – life balance are the Happy Money Project, the Happy Body Project, the Quit Drinking, Smoking, Get Healthy and Save Project and the Build Warm and Happy Families for Corporate Workers Project.

CSR after Process

Q Building Trust in Stakeholders

The Company treats stakeholders fairly and adheres to good governance principles while paying attention to potential impacts from its processes by adhering to the following practices:

- Listening to the opinions of stakeholders inside and outside the organization through meetings, the Safety Committee, the Welfare Committee, community discussions and annual meetings with QTC, comments and suggestion boxes, etc. for application to the creation of mutual benefits.
- Promoting indirect social investments with allies operating in businesses for society.
- Supporting community products (in the Company's interests).
- Participating with communities in different areas of development for public benefit according to the organization's expertise and ability.
- Disclosing information about practices, business activities, environmental management, human resources development, etc. transparently and verifiably through its annual reports, sustainability reports, discussion forums, websites, etc.



ระบบ

SMART TRANSFORMER

Monitoring System

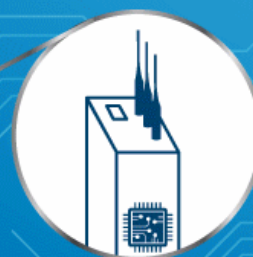
ระบบอัจฉริยะที่ติดตามการทำงานของหม้อแปลง
ด้วยระบบ sensor ที่ติดตามตัวแปรสำคัญ



QTC ENERGY PCL.



"ANY WHERE
IN THE WORLD"



SMART BOX

ระบบส่งต่อข้อมูลตัวแปรผ่าน

3G และ 4G

ทำให้ผู้ดูแลรักษาสามารถดูข้อมูล
ได้ตลอด 24 ชั่วโมง



www.qtc-energy.com



Corporate Governance

The Company has always given importance to good corporate governance and created “good corporate governance policies” <http://investor.qtc-energy.com/th/corporate-governance/corporate-governance-policy> and “business ethics” <http://investor.qtc-energy.com/storage/corporate-governance/20190131-qtc-codeofconduct-th.pdf> in writing as practice guidelines for directors, executives and employees in operating business under the governance of the “Nomination, Remuneration & Corporate Government Committee”, which consists of two independent directors and one executive director. The Company reviews corporate governance policies and business ethics according to international standards annually (Disclosure 102-23).

Performance in 2019: No issues had principles modified. Standard practices which were notified were maintained and encouraged to create practice and inspection in line with standards.

- The Company communicated the No Gift Policy to stakeholders via the Company’s website and send emails directly to QTC’s trading partners.



- The Company, represented by Mr. Poonphiphat Tantanasin, Chief Executive Officer, shared ethical corporate management experience and concepts at the Business Ethics to Sustainability seminar to support other entrepreneurs to use these experiences and concepts as guidelines in creating good corporate standards. This seminar was organized by the Thai Chamber of Commerce on 6 June 2019 at the Golden City Rayong Hotel.



Methods for Communicating with Stakeholders

Stakeholders	Communication Channels						
	Portable Handbooks	Training	Explanatory Meetings	Annual Meetings	Stages of Association	AGM	http://investor.qtc-energy.com/storage/corporate-governance/
Inside the Organization	✓	✓	✓	✓	-	-	✓
Outside the Organization	✓	-	✓	✓	✓	✓	✓

Furthermore, the Nomination, Recruitment and Corporate Government Committee recruits, selects and nominates qualified individuals for director positions and high-ranking executives in addition to considering remuneration for the Board of Directors and high-ranking executives meeting the criteria specified in <http://investor.qtc-energy.com/storage/corporate-governance/20180223-qtc-charters-th.pdf>. In 2019, the Committee held two meetings.

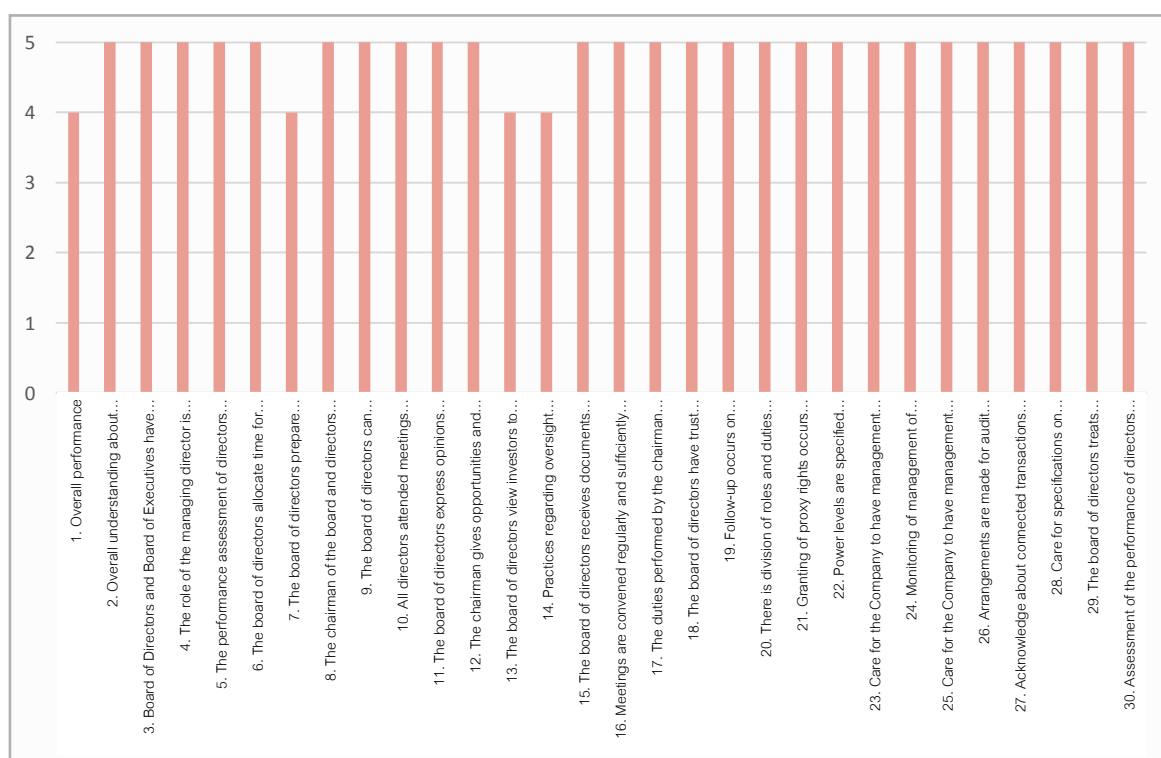
Performance Assessment

The Board of Directors has scheduled assessment of the Board of Directors' performance in addition to the ability to perform the duties of the Chief Executive Officer at least once annually. In 2019, the assessment results were as follows:

1. The Board of Directors was assessed with reference to the self-assessment forms for boards of directors of the Corporate Governance Center, Stock Exchange of Thailand, of 2015, to appropriately modify 30 questions. All 11 directors completed self-assessments of performance in 2019 and scores from each question were averaged from a full score of five points.

Graph of Self-assessment Results of the Board of Directors of 2019

Full Score: 5 Points. Average Score: 4.56 Points. Scores are at an excellent level.



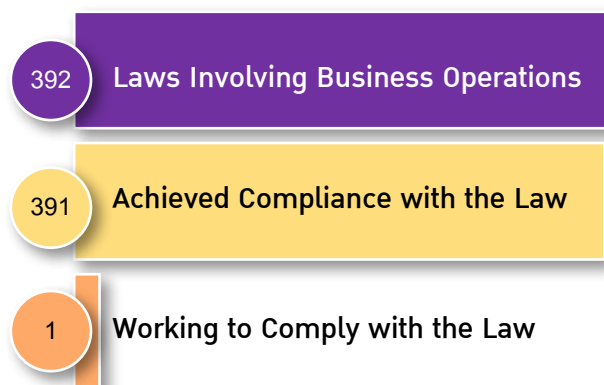
2. The Chief Executive Officer's performance capabilities assessment was conducted with reference to the self-assessment forms for boards of directors of the Corporate Governance Center, Stock Exchange of Thailand, of 2011: Eleven sections were modified. Ten directors performed independent assessments of the Chief Executive Officer's performance in December 2019. Scores were averaged from a full score of 4 points.



Compliance with the Law

This issue is a significant risk for the Company, because there are frequent changes in the stipulations of the law. And to prevent business errors, the Company prepares work procedures for assessment of compliance with the law to cover business activities, specifying the teams responsible and prepare registrations of controlling laws in the Document Control Center system. In 2018, the Company had the following performance:

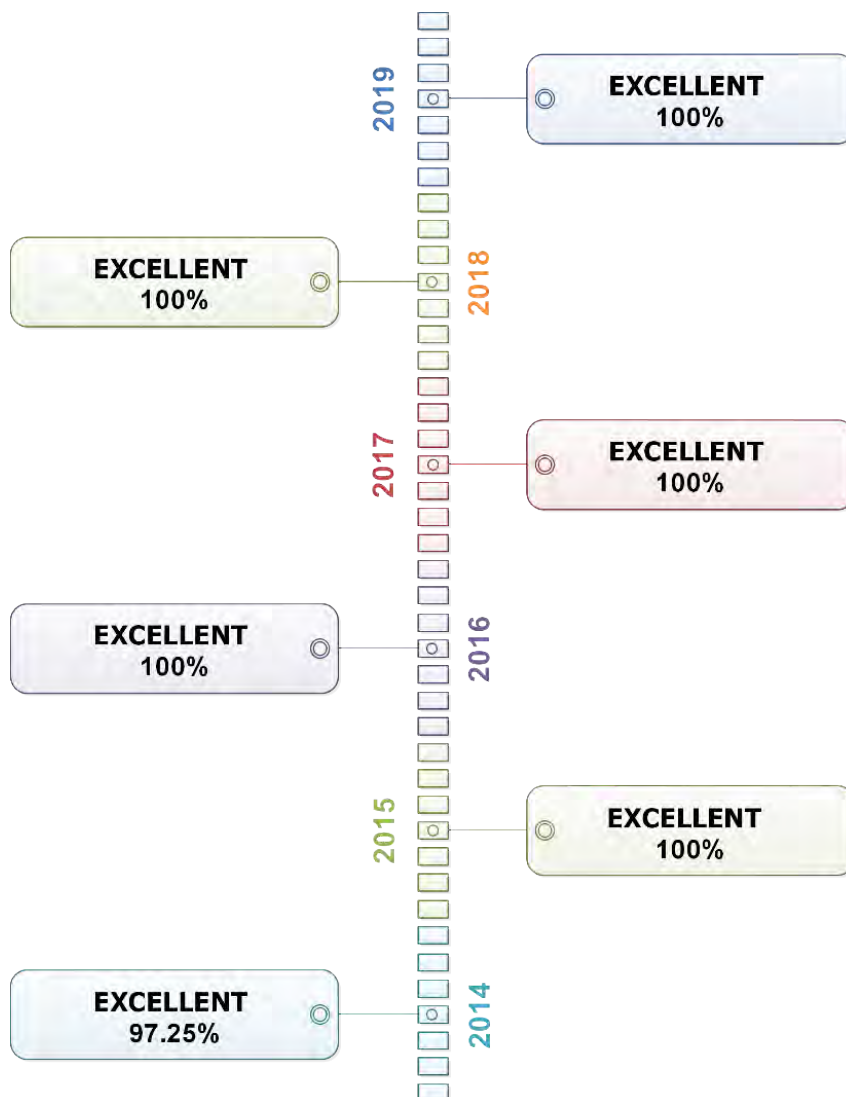
- The Company collected 392 issues involving specifications and laws related to business operations in the control system.
- The Company assessed 391 issues involving compliance with the law.
- The Company is assessing an issue involving compliance with the law because the law was not effective in



Good Governance Evaluation Results by IOD (Score: 100 Points)



Annual Shareholder Meeting Quality Assessment Results (Score: 100 Points)



The Company continues to give importance to improving internal processes to create transparency in practice with verifiability. In 2019, the Company modified anti-corruption policies for the fifth time on 10 May 2018 at <http://investor.qtc-energy.com/storage/corporate-governance/20180613-qtc-anti-corruption-policy-th-02.pdf>. The Board of Audit monitors and examines compliance with anti-corruption policies and related practice guidelines. In 2019, the Company added the position of the Manager, Internal Audit Division, to follow-up on progress in corrective and preventive measures along with advising on operations and cooperation with external auditors. BK IA & IC Co., Ltd. audited the Company's internal operations in every process, including anti-corruption and risk management practice guidelines on a quarterly basis. BK IA & IC Co., Ltd. reports to the Board of Audit composed of three independent directors with each holding a term of three years. In 2019, a total of five meetings were convened to monitor, audit and assess results.

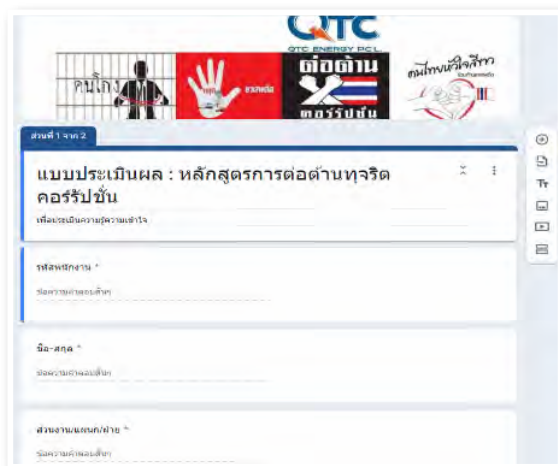
Policies into Practice

Training and Education [Disclosure 205-2]

In continuing to educate and build anti-corruption awareness among employees, the Company specified the Anti-corruption Policy and Practice Guidelines course as an essential training course. New employees must be trained and tested for knowledge in every work position. The Company's performance in this matter is as follows:

	Qty. (Employee)	Percent
No. of Employees Trained		
New Employees – Males	81	100
New Employees – Females	7	100
Knowledge & Understanding Test Results		
> 80%	79	89.77
< 80%	9	10.23

Employees who were tested for knowledge and understanding with assessment results below 80 percent reviewed knowledge and understanding with trainers again to create accurate understanding and practice.





Campaigning Against Corruption

The Company, represented by Mr. Kitti Atcharyaboonyong, Deputy Managing Director, Marketing, took a delegation of employees to participate in demonstrating energy at the Unite & Volunteer Against Corruption event on Anti-Corruption Day 2019 on 9 September 2019 at BITEC in order to express the Company's ideals to announce membership in the Thai Private Sector Collective Action Coalition Against Corruption along with building awareness among employees and all stakeholders in addition to following announced policies.

Furthermore, the Company held campaign activities in the organization to provide education on corruption for Company employees and students in the community at the 5S Safety & Happy Workplace event on 27-29 August 2019 at the factory in Rayong.



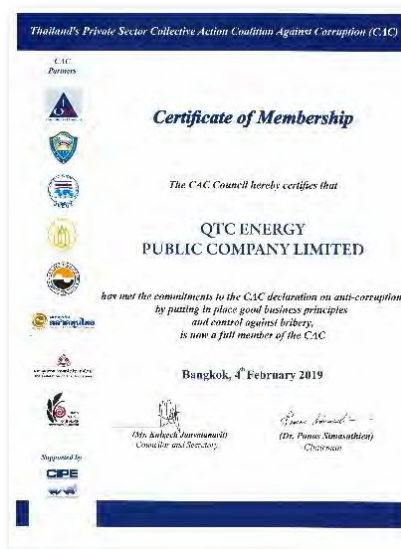
Unite & Volunteer Against Corruption at BITEC



Moral Organization Booth to Educate Employees and Students in the Community.

Confirmation as a Member in Thailand's Private Sector Collective Action Coalition Against Corruption

The Company, represented by Mr. Poonphiphat Tantanasin, Chief Executive Officer, accepted the certificate confirming the Company's membership in Thailand's Private Sector Collective Action Coalition against Corruption (CAC) from Dr. Kittipong Urapipattanapong on 26 February 2019 at the Grand Ballroom, Intercontinental Hotel.




Methods for Communicating Stakeholders


The Company has specified the following channels for communicating anti-corruption policies and related practice guidelines:


Stakeholders	Communication Channels								http://investor.qtc-energy.com/storage/corporate-governance/
	Portable Handbooks	Training	Explanatory Meetings	Annual Meetings	Stages of Association	e-mail	Mail	Shareholder Meetings	
Inside the Organization	✓	✓	✓	✓	-	✓	-	-	✓
Outside the Organization	✓	-	-	✓	✓	✓	✓	✓	✓


Channels for Reporting Clues or Complaints

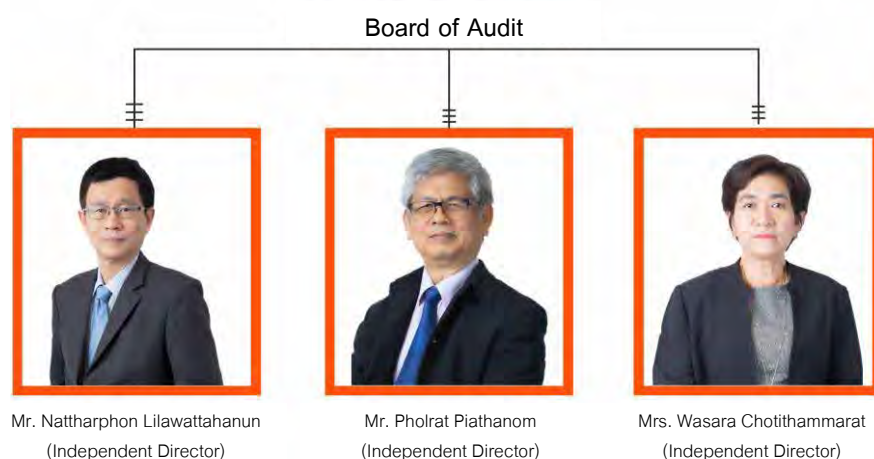
In cases where there are doubts or witnesses of activities causing suspicion that employees, executives or directors of the Company violated or refused to comply with the law and QTC's rules, regulations, ethics or corporate governance policies, you can inquire or report clues or complaints and send information and evidence via the following channels:


Channels for Reporting Clues or Complaints


Board of Audit
 QTC Energy Public Co., Ltd.
 2/2, Soi Krungthep Kritha 8, Intersection 5
 Krungthep Kritha Road
 Hua Mak, Bang Kapi


audit@qtc-energy.com

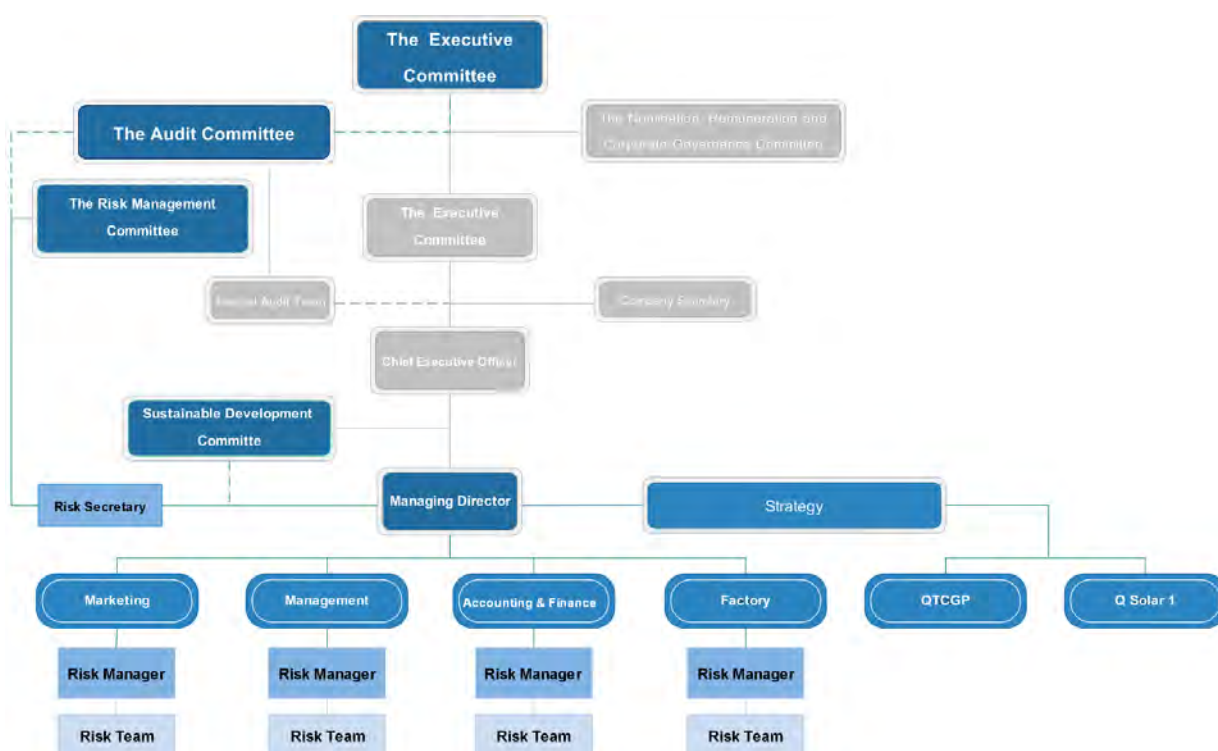




Risk Management

In order for the Company's operations to achieve business objectives, maintain obligations and concur with the organization's vision of becoming a world class Company under constantly changing economic, social and environmental challenges, the Company has set in place corporate risk management policies at http://qtc-energy.com/?page_id=887&land=th and specified risk management processes based on international COSO (Disclosure 102-11) standards in addition to creating channels for systematic reporting, monitoring and assessments covering economic, social, environmental and corruption dimensions. The risk management structure is a committee composed of the Managing Director as the Chairman, Deputy Managing Directors from every branch, division managers, including managing directors of subsidiaries who act as risk managers to monitor, examine work, assess risks and specify preventive and corrective measures while departmental managers form a risk team with the duty to identify risks and implement preventive or corrective measures in practice to yield clear results along with reporting performance and holding reviews on a quarterly basis.

Risk Management Committee



Organization risk identification and assessment in 2019 showed risks in 80 issues categorized into 11 risks that require monitoring and 69 risks with appropriate preventive measures in control.

Significant Risks

1. 1. Economic Risks [Disclosure 102-29]

Risk Issues	Performance
<p>1.1 Income Inconsistency and Dependence on Major Customers in the Transformer Business</p> <p><i>Performance on Page 45-53</i></p>	<p>Most of the Company's income was from bidding in the government sector with political uncertainty influencing government sector budgets and expenditures. In addition, the Company has many competitors in the market. This is an uncontrollable factor. The Company has established the following measures to mitigate risks:</p> <ul style="list-style-type: none"> The Company has agencies and persons directly responsible for government sales in addition to specifying clear roles and duties. The Company applied for accreditation with the Green Label to enhance competitive capacity under the terms of government agencies. In 2019, the Company applied for the Green Label for six transformer items. In one item, the Company won the bidding for 227 devices valued over 37 million baht. The Company expanded overseas markets with OEM manufacturing. Currently, the Company has two countries consisting of Australia and Japan (the Company is unable to mention brand names because brand names are a trade secret). The Company developed super low loss and smart transformer products to create new different options for customers. The Company modified manufacturing standards and related procedures to reduce production costs without reducing quality (Do Little, Get a Lot) The Company appointed foreign sales distributors under the QTC brand. The Company restructured the organization in sales work by adding the Product Development Division to take care of customers and coordinate regarding new companies distributed by the Company in Thailand such as BUSDUCT from Dynamic Electrical SDN. BHD. And solar inverters from Huawei Technologies (Thailand) Co., Ltd.
<p>1.2 Foreign Currency Exchange Rate and Raw Material Price Fluctuations</p> <p><i>Based on performance in 2018, the Company's exchange rate profit was 4,854,937.00 baht.</i></p>	<p>Because transformer manufacturing requires 60 percent of main raw material values used per year to be imported from abroad and transformer exports make up 20 – 30 percent of sales and because exchange rates fluctuate according to the global economy and significant global situations, the Company has set the following risk prevention measures in place:</p> <ul style="list-style-type: none"> Policy to trade foreign currency in advance in forward contracts. Close monitoring of changes in prices of raw materials such as copper, silicon and transformer oil. In addition, the Company reserves raw materials in advance if the Company recognizes opportunities for trade advantages.
<p>1.3 Investment in Other Businesses</p> <p><i>Performance on Page 43</i></p>	<p>To distribute the risks of investment in energy businesses connected to the transformer business through the work of QTC Global Power Co., Ltd. (GTCPG), a subsidiary, and the energy business in which most of QTC's personnel have no expertise, the Company has set the following risk prevention measures in place:</p> <p>The Company hires more executives and teams with special knowledge to manage GTCPG.</p> <p>The Company hires outside specialist consultants to study information of projects in which the Company will invest by covering economic, social and environmental aspects. Any investments in other businesses must be approved by the Board of Directors and shareholders' decisions.</p>
<p>1.4 Debtor Management Risks</p>	<p>Due to current competition in trade, loans had to be offered to customers to gain competitive advantages. In the meantime, customers who were granted loans from the Company, lack financial discipline and refuse to comply with repayment agreements will create unpaid debts, causing the Company to not receive money at the scheduled time with effects on financial liquidity management. Therefore, the Company has set the following measures in place:</p> <ul style="list-style-type: none"> The Company sets allowances for bad debts (accounting expenses) if debts were unpaid for more than one year. The Company adjusts the policy on offering credit to customer by clearly specifying criteria in assessing credit offers to customers. In cases where customers fail to meet the criteria for credit, the Company sells in cash. <p>In 2019, the Company was able to control trade accounts receivable to decline from 2018 by 58.19 percent with a collection period of 72 days.</p>

2. 2. Social Risks [Disclosure 102-29]

Risk Issues	Performance
<p>2.1 Employee Health & Safety</p> <p><i>Performance on Page 55-68</i></p>	<p>Employee working conditions involve the use of instruments, machinery, chemicals and work procedures. In addition, the factory coexisted with the community for over 20 years. Accidents may occur with effects on employees and communities. Therefore, the Company specified the following preventive measures:</p> <ul style="list-style-type: none"> • Safety management with OHSAS18001 standard systems. • Appropriate work safety and PPE standard specifications and periodic machine maintenance. • Electrical system and building examination and certification by outside experts. • Automatic fire alarm system installation. • Fire suppression and fire evacuation drills. • Safety awareness building with KYT activities. • Safety week activities to provide knowledge and raise awareness among employees and communities. • Safety committees (SCs) elected by employee representatives consider work safety guidelines. • Health promotion projects to reduce, abstain and quit smoking and drinking along with vaccination benefits based on epidemic situations.
<p>2.2 Departures in the Engineering Profession and Employees in Significant Positions</p> <p><i>Performance on Page 75-78</i></p>	<p>Because the factory is located in an industrial zone with significant labor competition from the level of manual laborers to professional employees, the Company outlined the following measures:</p> <ul style="list-style-type: none"> • Appropriate employee wage and benefit restructuring by comparing with the same industry. • Career path development projects. • KM compilation and preparation projects in every work process to create digital media for easy access and understanding. • Automatic fire alarm system installation. • Create organization happiness following the Happy 8 guideline.
<p>2.3 Investment in Other Businesses</p> <p><i>Performance on Page 31</i></p>	<p>The Company's business is an industrial factory with manufacturing, repair and distribution services for domestic and foreign government and private sectors. Therefore, the Company must comply with many laws and specifications. Laws or specifications change with the times to prevent business operation errors. The Company specified the following preventive measures:</p> <p>The Company specifies persons responsible for monitoring, compiling and assessing the consistency of laws and trade specifications from appropriate channels such as the Royal Thai Government Gazette and other notifications.</p> <p>The Company prepares work procedures for assessing the consistency of laws and specifications to create practice guidelines governing the entire organization.</p> <p>The Document Control Agency prepares a registry of laws, related trade specifications and reports to the Corporate Risk Management Committee every quarter.</p>
<p>2.4 Corruption</p> <p><i>Performance on Page 33</i></p>	<p>The Company's business is an industrial factory with manufacturing, repair and distribution services under criteria of related specifications and laws. Moreover, the Company contacts, coordinates and pays fees, taxes and trades with government agencies, which may create gaps for corruption. The Company modified work processes to be consistent with the announced anti-corruption policy and strictly enforces the policy. In addition, the Company is officially a certified member of Thailand's Private Sector Collective Action Coalition Against Corruption.</p>

3. 3. Environmental Risks [Disclosure 102-29]

Risk Issues	Performance
<p>3.1 Hazardous Waste and Scrap Material Management</p> <p><i>Performance on Page 98-101</i></p>	<p>In manufacturing processes and transformer service provision, the Company has scrap materials from manufacturing and hazardous waste requiring controlled disposal in compliance with Ministry of Industry notifications. Disposal is performed through disposal companies that follow the methods specified by the Department of Industrial Works. However, the Company may have risks from disposal companies' irresponsibility and failure to comply with conditions, causing environmental impacts. Therefore, the Company specified the following preventive measures:</p> <ul style="list-style-type: none"> • The Company petitioned for approval to register disposal companies from the Department of Industrial Works by type of waste. • Teams evaluate areas and disposal methods in disposal companies' areas without giving notification in advance. • The Company controls transportation and containment to prevent spills and leakages before leaving the factory. • The Company prepares 3R projects for sorting and maximum benefit. • The Company organizes the Zero Landfill project to deliver landfill waste to power plants.

4. Business Interruption Risks

Risk Issues	Performance
<p>4.1 Emergencies</p> <p><i>The Company is working according to complete work plans. Risks are low. However, risks need to be monitored and work plans need to be practiced continually.</i></p>	<p>Emergencies are risks from disasters such as flooding at the Bangkok main office, fires at the main office or the Rayong factory. The Company laid down the following preventive measures and emergency preparations:</p> <ul style="list-style-type: none"> • The Company prepares fire prevention and suppression plans and holds drills every year. • The Company prepares data recovery plans and practices plans on an annual basis. • The Company purchases insurance policies with coverage of risks.
<p>4.2 Dependence on Main Executives in Business Operations</p> <p><i>Performance on Page 77</i></p>	<p>The Company's management is performed mostly by leaders with special experience in transformers, which is part of the product's brand creating confidence among stakeholders. Any changes in the future may have effects on confidence. Therefore, the Company has the following measures:</p> <ul style="list-style-type: none"> • Succession plan preparations and successor selection. • Promotion of leadership and successor skill development along the career path. • Marketing promotion using product brands and factory standards to lead.

DE BUSDUCT

POWERLINE SERIES

EXTRUSION ALUMINIUM HOUSING BUSDUCT SYSTEM



QTC ENERGY PCL.



**UL CLASSIFIED
PRODUCT**



www.qtc-energy.com



The Board of Directors and the organization's executives recognize that business operations benefit shareholders, employees and all stakeholders under corporate social responsibility. Good governance is the highest responsibility to achieve under the Company's given vision and mission with a scope of responsibility for operations of QTC Energy PCL, subsidiaries and all joint ventures. The Company has set the following economic goals:

Business Growth



Economic Results

Main Financial Points

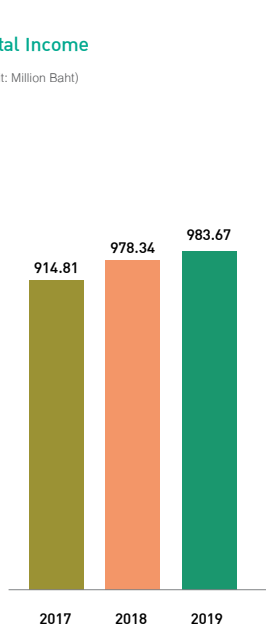
(Unit: Million Baht)

Financial	2560	2561	2562
Sales & Service Income	901.53	958.05	965.17
Total Income	914.81	978.34	983.67
Sales & Service Cost	(760.81)	(747.76)	(615.25)
Gross Profit	154.00	230.58	368.42
Sales & Management Expenses	(394.72)	(193.89)	(153.17)
Profit Before Interest and Income Tax	(237.99)	35.66	217.62
Net Profit	(247.25)	(0.12)	198.40
Profit for the Year	(252.46)	(0.48)	197.18
Net Profit Per Share	(0.89)	0.001	0.578
Dividends Per Share	Canceled (341,088,220)	Canceled (341,092,557)	0.15* (341,092,557)
Total Assets	2,037.27	1,918.99	1,856.37
Total Liabilities	595.18	477.34	217.54
Shareholders' Equity	1,442.09	1,441.64	1,638.83

*Pending approval from the Annual General Meeting of 2020.

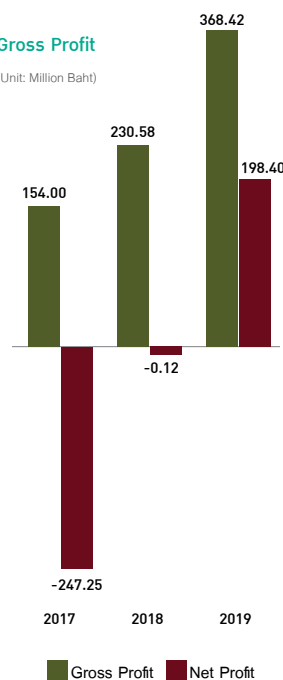
Total Income

(Unit: Million Baht)



Gross Profit

(Unit: Million Baht)



Total Assets, Total Liabilities & Shareholders' Equity

(Unit: Million Baht)

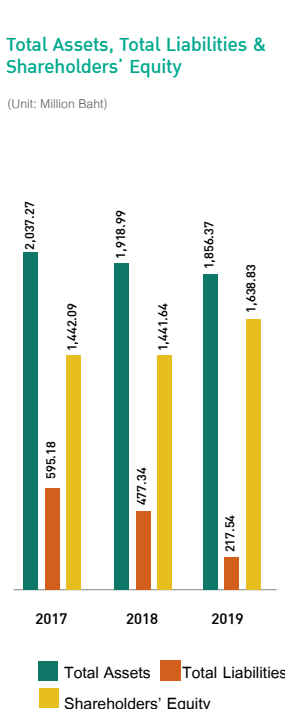
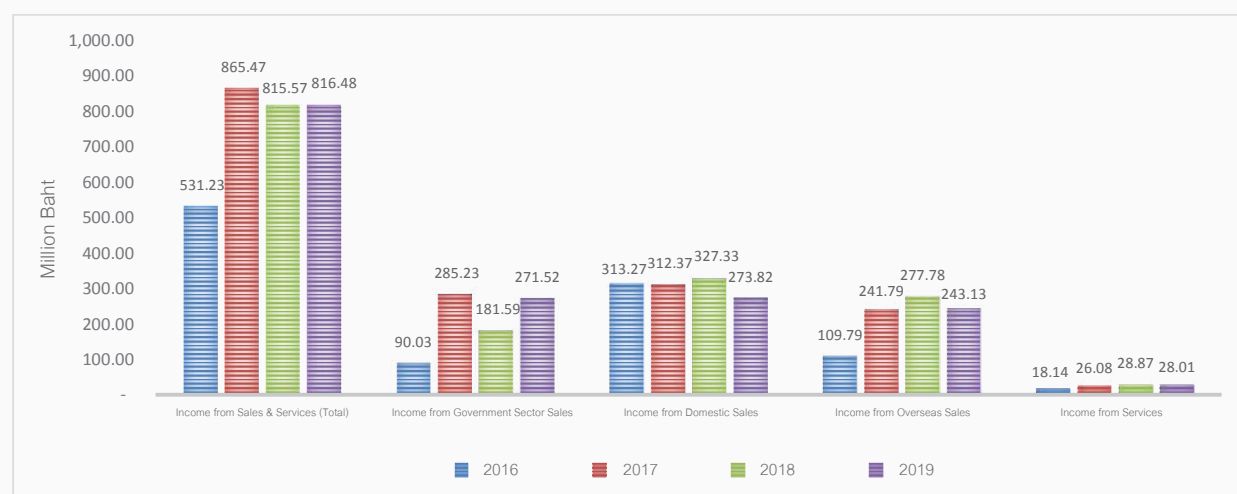


Table Showing Economic Results with Comparison of 2016-2019

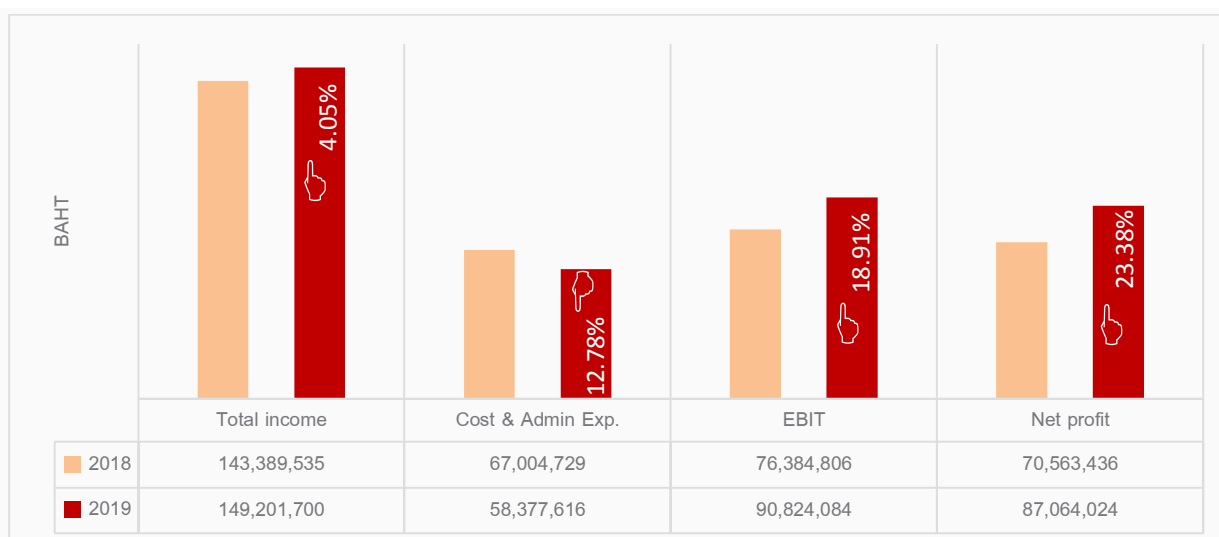
Item		Separate Statement		2018		2019	
		2016	2017	Separate Statement	Consolidated Statement	Separate Statement	Consolidated Statement
Income from Sales and Services	(million baht)	531.23	865.47	815.57	958.05	816.48	965.17
EBITDA	(million baht)	(48.45)	(159.43)	38.83	71.77	166.64	275.22
Net Profit (Loss)	(million baht)	(79.33)	(219.34)	4.10	(0.12)	122.18	198.40
Accrued Profit (Loss)	(million baht)	162.03	(68.79)	(64.69)	(98.93)	54.61	96.84
Net Profit per Share	(baht)	(0.33)	(0.81)	0.01	0.00	0.38	0.58
Rate of Asset Returns	(%)	-6.94%	-14.25%	0.22%	(0.01)	6.87	10.51
Rate of Shareholder Returns	(%)	-11.94%	-20.07%	0.29%	-0.01%	8.18	12.88

Remarks: The consolidated statement began to be reported in 2018.



Sales & Service Income Graph (Only QTC Energy) Comparing 2016-2019

According to the graph showing comparison of income from sales and services and the table of economic results, income had a slight, yet noticeable rise from 2018 by 0.11 percent with total sales and service income at 816.48 million baht. This consisted of income from the government sector (33.25%), income from the private sector (33.54%), overseas income (29.78%) and service income (3.43%). In 2019-2020, the Company modified strategic plans to declare a year of quality and built strength by emphasizing financial strategy, using trade account management policies and inventory management policies as an instrument, creating liquidity and financial capacity, reducing allowances for trade accounts receivable and inventory. In the area of sales and marketing, the Company focused on profit and controlled sales expenses. In the area of production, the Company modified production processes to reduce time, waste and continually increase product quality based on the total quality management principle. Furthermore, the Company added new products for distribution such as BUSDUCT from Dynamic Electrical SDN. BHD., Malaysia, which was distributed under the DE BUSDUCT brand, and solar inverters from Huawei Technologies (Thailand) Co., Ltd. under the Huawei brand. Furthermore, the Company earned income and profit from investments in Q Solar 1 Co., Ltd., causing the Company to have a net profit of 198.40 million baht at the end of 2019.



Graph of Economic Performance (Only Q Solar 1) Comparing 2018-2019

According to the graph, in 2019, Q Solar 1 Co., Ltd. had income from power sales to the Provincial Electricity Authority and other income at a total of 149.20 million baht, an increase of 4.05 percent from 2018. Sales costs and management expenses were at 58.38 million baht or a 12.87-percent reduction from 2018, causing profit before financial cost and income tax to be 90.82 million baht, an increase from 2018 by 18.91 percent. In addition, the Company's net profit was 87.06 million baht, an increase from 2018 by 23.38 percent. Q Solar 1 Co. Ltd. managed electricity generation, modified solar panel efficiency and equipment for the highest production capacity along with developing standard work systems. QTC Energy Co., Ltd. managed human resources, information, accounting & finance by sharing personnel to create work flexibility and cut expenses.

In 2019, Q Solar 1 Co., Ltd. received a BOI investment in Card No.1114 (1)/2554 dated 27 January 2001. The Company was granted juristic person income tax exemption benefits for the fiscal year of 1 January 2019 to 1 December 2019. Moreover, the Company was granted exemption from juristic person tax for five years from 2 December 2019 and ended on 1 December 2024.

Investment in Other Businesses

Concerning investment in other businesses, the Company was interested in several projects but the Company did not decide to invest in 2019. QTC Global Power Co., Ltd. examined, considered and reviewed projects and analyzed effects for the maximum benefits of shareholders and stakeholders.

Distribution of Value to Stakeholders

	QTC Energy (Baht)	QTCGP & Q Solar 1 (Baht)
Distribution of Value to Shareholders		
Dividends to Shareholders		0.00
Dividends Per Share		0.00
Personnel Investment		
Employee Wages	123,018,874	10,772,266
Executives' Wages	22,840,166	
Social Investment		
Donations and Financial Support	1,164,393.80	163,166.82
Support for Social Enterprises (SE) (Indirect)	156,330.00	18,000.00
Activities for Society	182,241.00	183,742.11
Funds for Promoting and Improving Quality of Life among Disabled Persons	219,000.00	-
Environmental Investment		
Internal Environmental Management Cost	451,985.00	61,200.00
Waste and Other Management Cost	348,152.00	10,000.00
Sharing of Value with Business Partners (Raw Materials)		
Domestic Procurement	271,177,209.76	11,823,194.92
Overseas Procurement	154,997,587.32	-
Product Procurement from Disabled Persons in Communities	46,920.00	-
Other Economic Value		
Financial Cost (Interest)	5,976,692.00	2,863,692.78
Taxes Paid to the Government**	9,448,394.11	11,060,58.11

Table Showing Comparison of Sharing of Value to Stakeholders

Stakeholder Groups	Unit	(Only QTC Energy)			Total
		2016	2017	2018	2019
Trade Partners (Raw Materials)	(Million Baht)	426.7	564.79	545.62	426.17
Employees*	(Million Baht)	88.63	116.95	123.74	156.63
Shareholders	(Baht)	0.03	0	0	0
Financial Institutes (Interest)	(Million Baht)	7.76	11.27	9.41	5.98
Community & Society	(Million Baht)	0.31	0.49	0.60	1.69
Environment	(Million Baht)	-	0.59	0.85	0.87
Quality of Life Promotion and Improvement for Disabled Persons.	(Baht)	219,000	219,000	219,000	219,000
Government Sector (Taxes)**	(Million Baht)	0.39	0.38	0.37	9.45



* Salaries, wages, benefits, social security funds, the Provident Fund, personnel development expenses, monthly wages, annual wages and meeting gratuities.

** Juristic person income tax, value-added tax, building tax, signage tax, local taxes.

Standards & Innovation

Transformers are the main equipment in the power distribution system and are used to send electricity, link high-voltage electricity systems and low-voltage electricity systems, adjust voltages or electricity currents, depending on design, to meet objectives. Faulty designs or substandard manufacturing may have safety effects on workers, company employees and the general public along with economic effects on users. Therefore, the Company needs to prioritize creating design standards in addition to good and effective manufacturing standards to create positive outcomes in the area of product quality. Furthermore, the Company places importance on the research and development of processes and products to reduce environmental impact and create maximum value for users by allowing every employee in every company under the Company's direction to participate in modifications.

Because key sustainability issues, international work standards and product standards including guidelines for promoting innovation are major issues for QTC and high-ranking executives, the Board of Executives and the Sustainability Promotion Committee specified practice guidelines and encouraged practices with the following goals and performance:

Goals	Performance
 <ul style="list-style-type: none">• No less than three transformer items pass the Short Circuit Performance Test.• Modify work processes with involvement to reduce losses by no less than three million baht.• Manufacture at least one product to create a social innovation.	 <ul style="list-style-type: none">• Five transformer items passed the Short Circuit Performance Test in Germany• Work modifications reduced losses and returned a value of 1,846,820 baht to the organization.• The Company manufactured smart monitoring boxes and offered the product to customers. The Company gained a value of 450,000 baht in the first year.



Work Standards

The Company applies international standards in the organization by considering the needs of domestic and foreign customers, legal enforcement and specifications, consent from executives and employees in order to improve personnel capabilities, build confidence among customers and stakeholders while also increasing opportunities to enter competition. Applied standards include applications for certification by trusted agencies at the national and international levels and references for suitable application without certification requests. The list of standards is as follows (not including lists of accounting and product quality control standards):

Table Showing Work Standard Certifications Applied for by the Company

No.	Standards	Assessment Frequency	Certification Agency	Certification No.
1	ISO14001:2015	Once a Year	SGS-NAC	TH08/1236
			SGS-UKAS	TH08/1235
2	OHS18001:2007	Once a Year	SGS	TH08/1237
3	ISO9001:2015	Once a Year	SGS-NAC	TH00/2729
			SGS-UKAS	TH00/2728
4	ISO/IEC17025	Once a Year	TISI	18035/0659
5	Green Industry Level 4	4 Years/Time	Ministry of Industry	4-116/2559 Certificate expired; renewal assessment pending.
6	Q-Mark (Trade and Services)	4 Years/Time	The Thai Chamber of Commerce Council, the Thai Bankers' Association, the Federation of Thai Industries	Q002/2562
	Q-Mark (Production)			Q004/2559 Certificate expired; renewal assessment pending.

Table Showing Standards Used for Referencing

No.	Reference Standards	Remarks
1	ISO26000	Referenced as practice guidelines for corporate social responsibility
2	ISO14064	Referenced as practice guidelines for preparing reports on greenhouse gases and certification applications in each year.
3	ISO50001:2011	Referenced as energy management guidelines.
4	COSO-ERM	Referenced as corporate risk management guidelines.
5	5S	Referenced as basics in working.



Product Standards

QTC's electrical transformers are designed, manufactured and tested pursuant to IEC, TIS 384-2543 and customer standards or standards of trade partner countries such as ANSI, IEEE, JIS, etc. Furthermore, the Company also submits electrical transformers for short circuit performance test to guarantee the quality of QTC's electrical transformers. In 2019, the Company sent ten transformer items to be tested with the Short Circuit Performance Test at the FGH Engineering & Test GmbH Laboratory in Germany by using a budget of 6,183,853.05 million baht. Five transformer items passed the test.



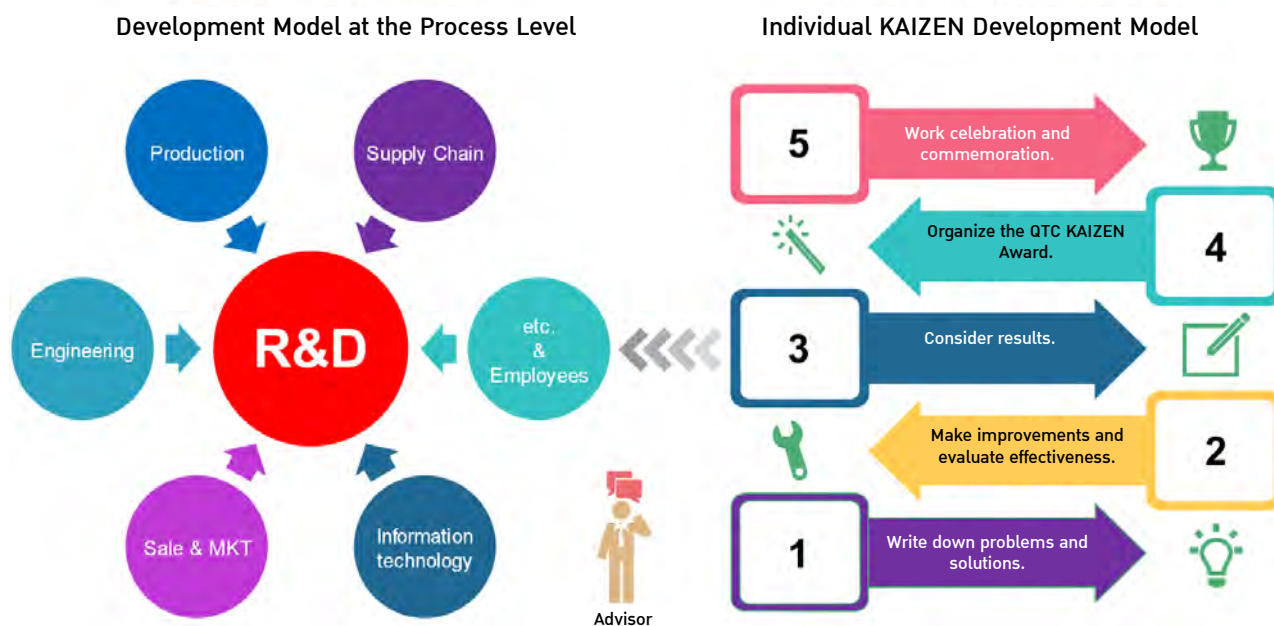
Short Circuit Performance Test at the FGH Engineering & Test GmbH Laboratory in Germany

Table of Standards Referenced in Designing QTC Transformer Products

IEC	ANSI/IEEE	UL	NEMA	DIN	JIS	AS	Other
IEC 60071-1	IEEE C57.12.90	UL 1561	NEMA Standards Publication No. TR 1-1993 (R2000)	DIN 42530	JIS C 3104	AS 2374	TIS 384-2543/TIS84-2000
IEC 60076-2	IEEE Std. C57.104-1991			DIN 42531	JIS C 3202		BS EN 50464
IEC 60076-3	ASTM D117-02			DIN 42532			EN 50588
IEC 60076-4	IEEE Std. C57.12.00			DIN 42533			Electricity Installation Standards for Thailand B.E. 2556 (A.D. 2013)
IEC 60076-5	IEEE C57.110			DIN 7168			TGL-117-16
IEC 60076-6				DIN 125			
IEC 60076-7				DIN 127			
IEC 60076-8				DIN 933			
IEC 60076-10				DIN 934			
IEC 60076-11							
IEC 60076-12							
IEC 60076-14							
IEC 60296							
IEC 156							
IEC 61378-1							
IEC 61378-2							

Innovations

The Company continues to give importance to and promote innovation within the organization in processes developed by the research and development team with an emphasis on product and production innovations. At the operational level, the Company encourages employees to use KAIZEN work improvement techniques without limits to concepts and method while focusing on results. All employees can implement KAIZEN on quality, safety, the environment or energy independently based on their perspectives but must demonstrate the effectiveness obtained from their KAIZEN. KAIZEN achievements capable of effectively changing work processes were supported and built on by the research and development team.



Process Supporting Innovation Development in the Organization

The ongoing research and development process from 2017 to 2019 in the areas of production processes, the Company's products and services focused on meeting customer needs and creating the highest benefit for the organization covering economic, social and environmental aspects. The Company expended a research and development budget of approximately 655,000 baht in 2019.



Development at the Process Level

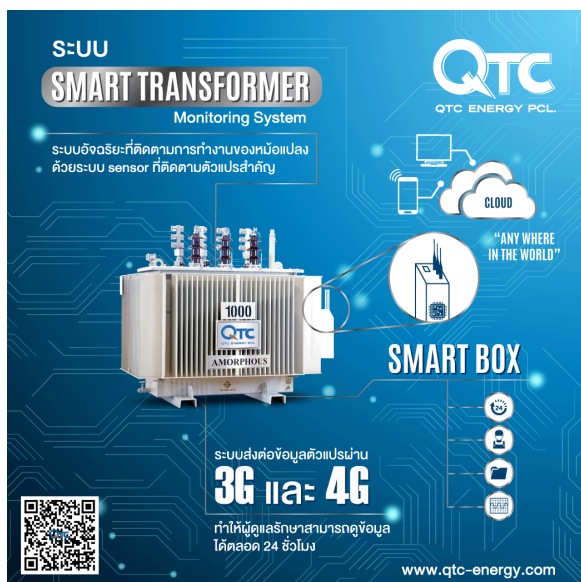
Smart Transformer System V.3 Development Project



QTC Smart Transformer Function Model

This project is an ongoing development project from 2017. QTC smart transformers are a smart system that tracks transformer functions with sensors that track key variables such as electricity in wire coils, voltage, tank pressure, oil level in tank and oil temperature, particularly imbalances that may have negative effects on transformers. Variable data is sent via 3G and 4G systems, enabling caretakers to view data in all 24 hours. Therefore, smart transformers are an auxiliary system that makes transformers become Transformer 4.0 because QTC is more than just a transformer. In 2019, the Company began marketing a new product called smart monitoring boxes, which were sold and installed in many provinces such as Bangkok, Samutprakarn, Chonburi, Rayong, Prachinburi, Saraburi and Koh Samui, etc.

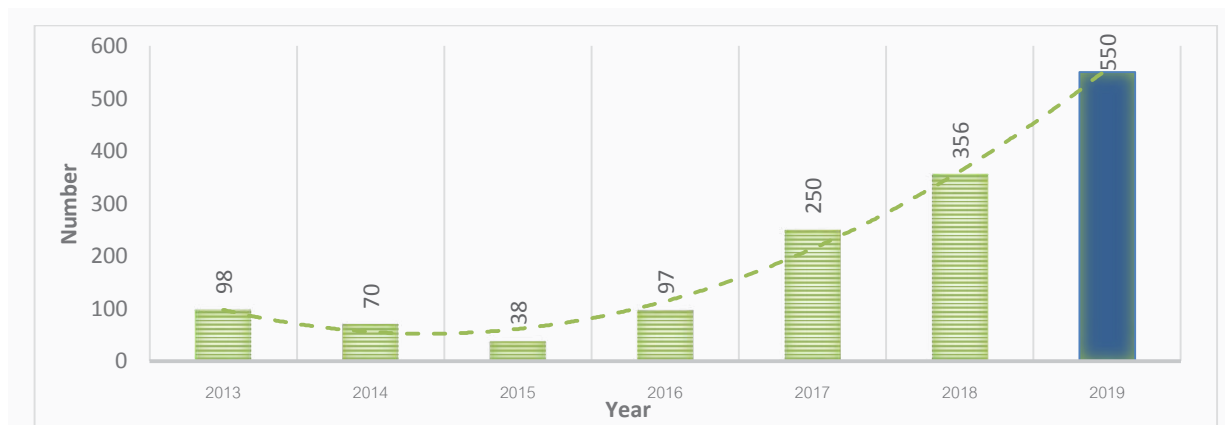
The value of the project for studying and developing the Smart Transformer Monitoring System and smart monitoring boxes amounted to 2,300,000 baht. In 2019, commercial sales were made to customers with a value of 450,000 baht. In 2020, the Company is making marketing plans to offer sales to customers in the government and private sectors as an additional sales option with transformers.



Personal Development (KAIZEN Promotion)

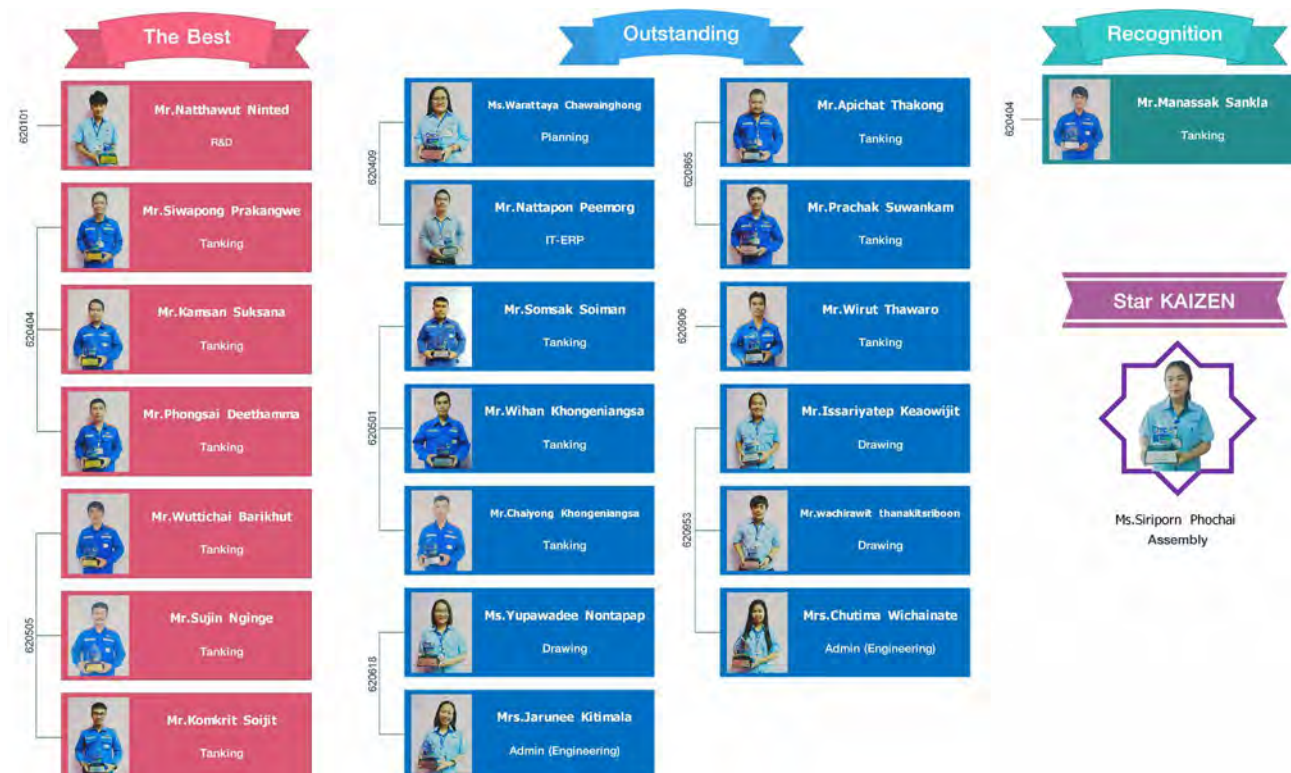
QTC's promotion of KAIZEN activities emphasize building participation among employees in the entire organization by having employees perform KAIZEN of their own work first because employees will know their own work best. Education on KAIZEN, training of thinking, analysis, experimentation skills, budget support and KAIZEN time are important in pushing for employees to think and do. In many KAIZEN, employees were able to reduce waste, work time, work piece quality and create satisfaction for internal and external customers. Therefore, employees' KAIZEN can be concluded to have supported work procedure development and reduce costs effectively.

In 2019, 550 KAIZEN modifications were made. The Company provided 78,636 baht in rewards for achievements and saved 1,846,820 baht from modifications to employees' work.



Statistics of KAIZEN Modification Achievements



Out of 550 KAIZEN achievements, 11 achievements passed the selection round for the QTC KAIZEN Award 2019. However, 10 outstanding achievements created changes in work procedures of the agencies responsible and influenced the organization's capacity until the Company received awards at the QTC KAIZEN Award 2019 competition.



Trade Partner Development

Since the majority of QTC's trade partners are SMEs lacking the capital to apply standard systems and petition for certification for various standards and trade partner capacity assessment guidelines, the Company issued procurement policies and prepared ethics and practice guidelines for QTC's trade partners at <http://investor.qtc-energy.com/storage/corporate-governance/20180613-qtc-coc-for-suppliers-th-02.pdf> for trade partners to follow the guidelines of QTC at least. The qualifications of trade partners are assessed at least twice annually to keep them registered as QTC's trade partners. If assessments find indicators that a trade partner lacks any qualification, the QTC work team will provide consultation and recommendations as well as opportunities for improvement in order to ensure correct practice.

Trade partner development is aimed at improving trading partner capabilities to be able to deliver quality materials on schedule for quality transformer production and punctual delivery to customers. This is to build mutual strength with the following goals and performance:

Goals	Performance
 <ul style="list-style-type: none">• Develop at least one trading partner per year.• Deliver at least 95 percent of quality raw materials per year.• At least 95 percent of raw materials are delivered on time.	 <ul style="list-style-type: none">• Unable to develop a trading partner according to the goal.• Raw materials delivered and achieved a 99.08-percent score based on quality criteria.• Raw materials were delivered on time at 98.56 percent.

In 2019, trading partner development was not carried out clearly in projects. The Company offered only recommendations on practice guidelines to enable raw material deliveries to meet goals. Trading partners remained able to deliver quality raw materials on time in 2019. Raw material deliveries failed to meet quality criteria for 14 times and raw materials were not delivered on schedule for 22 times in 2019.

Nevertheless, the Company will continue to make efforts to support and improve SME trading partners to have higher capacity for mutual benefit by using new channels or guidelines in 2020



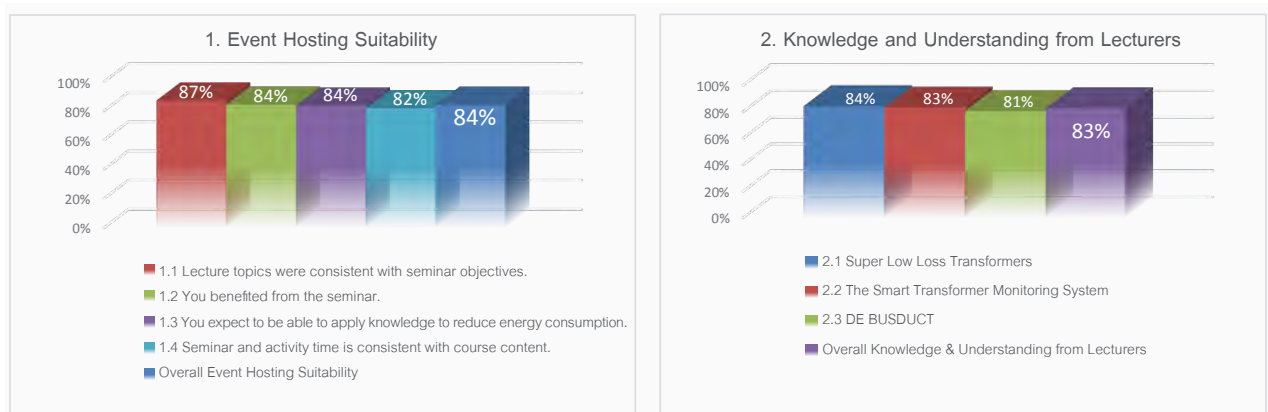
Responsibility to Goods & Services

The Company continues to place importance on being determined to meet customer needs to solve problems caused by the Company's goods and services via customer complaint channels and customer satisfaction survey channels in order to make modifications and continual improvement on issues of customer interest. In 2019, the Company remained focused on communication and providing knowledge on the Company's products for customers in the target group directly by hosting seminars such as:

An academic seminar providing knowledge content on energy conservation, enhancing transformer efficiency in which the Company launched two new QTC products consisting of smart monitoring boxes and DE BUSDUCT. On 29 March 2019 at the Centara Grand Hotel at Central Plaza Laddprao Bangkok, Vibhavadee Ballroom C. The Company invited experts on amorphous cores, namely, Mr. Somsin Nakornwong, from Hitachi Metals (Thailand) Ltd., and Mr. Somporn Prakobmai, Manager of Engineering, provided knowledge on special properties of super low loss transformers. In addition, Mr. Panitan Tampinyo, Manager of the Process Research & Development Division, who played an important role in developing the smart monitoring box product, lectured on the Smart Transformer Monitoring System while Mr. Hu Mung Chee (Managing Director, Dynamic Electrical SDN. BHD., Malaysia) lectured on the BUSDUCT, a new product distributed by QTC under the DE BUSDUCT brand.



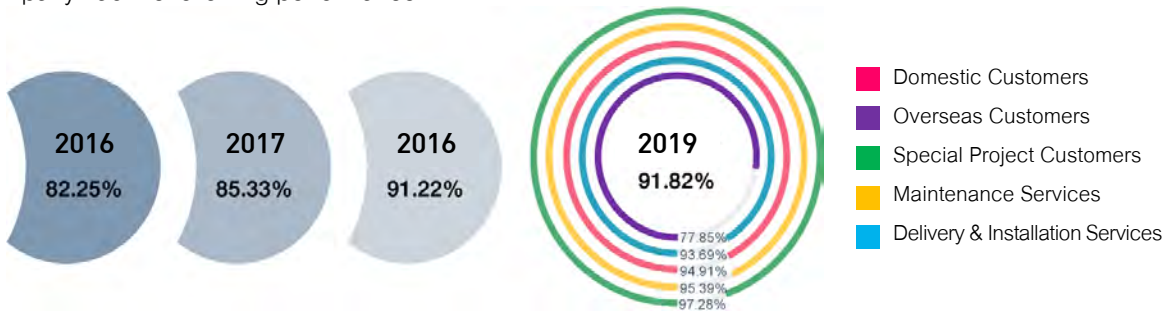
Event Atmosphere



Event Hosting Assessment Graph

Goals & Performance

Customer satisfaction measurement in 2019 had indicators modified from a passing criteria of 70 percent of survey results to more than 80 percent and 70 percent of survey results must meet a criteria of more than 90 percent. The Company had the following performance:



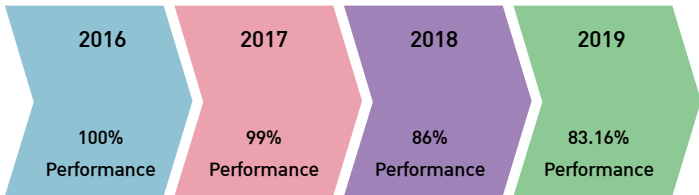
According to overall customer satisfaction survey results, the Company achieved goals except for satisfaction among overseas customers, which will need further improvement from the Company.



- Concerning ability to manage customer complaints in the area of goods and services, the Company's performance goal was 100 percent. Performance in 2019 showed 16 customer complaints and the Company was able to manage 100 percent of complaints.

2016	2017	2018	2019
38 Complaints	28 Complaints	30 Complaints	16 Complaints
100% Closed	100% Closed	100% Closed	100% Closed

- The Company was able to provide transformer checking and maintenance services in the warranty period with a goal of more than 90 percent. From the number of transformers due to be checked in the year, performance in 2019 showed the Company to have achieved 83.61 percent. The Company failed to achieve goals because the Company was unable to schedule appointments with customers to use services. The number of customers left in 2019 will be combined with the number of customers due to be served in 2020.



- The Company recognizes the importance of keeping customers' confidential information and specified as part of the sales policy for sales employees and/or persons involved with the aforementioned information to strictly comply with the policy. The Company's goal is to have zero complaints from customers on the issue of leaked customer secrets.





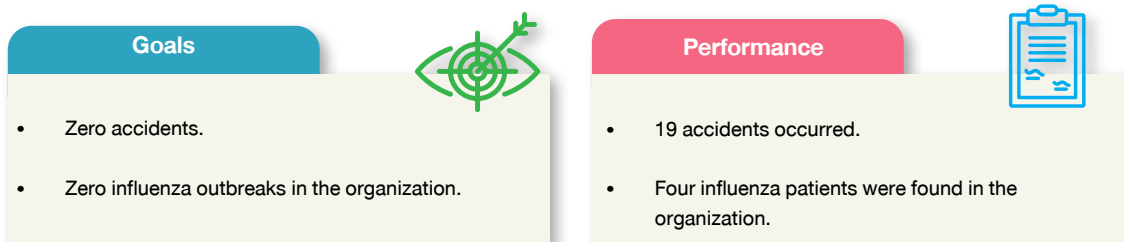
QTC บริการด้วยความใส่ใจ ปลอดภัยด้วยมาตรฐาน





Employee Safety & Health

Employee health and safety is the most important sustainability issue for QTC and stakeholders and a risk that must be strictly controlled. The Company is determined to support and create work safety for employees and related stakeholders to prevent accidents, injuries and illness in addition to continually working to detect, eliminate or control lack of safety along with creating a culture of safety in the organization in line with the safety, occupational health and work environment policy. Moreover, the Company supports activities with the following goals and performance:



Safety

Employee work safety is considered the most important issue for all employees at every level, as well as other related stakeholders. In 2019, the Company continues to consider work safety a risk requiring control while also creating a safety culture for employees' benefit.



Standard System

For safety, occupational health and work environment, QTC proceeds in compliance with the specifications of OHSAS18001 and is certified by SGS (Thailand) Co., Ltd. once per year. The Company clearly specifies the following personnel and operating framework:



List of the Safety Committee (Saf. Com.) in 2019-2020

(From election in 2018)

First Name-Last Name	Position	Remarks
1. Mr. Charoensak Sarawong	Committee Chairman	Appointed
2. Mr. Sayan Dangprasert	Director	Appointed
3. Mr. Man Trinai	Director	Appointed
4. Mr. Tanwa Pumraya	Director	Elected
5. Mr. Wachirawit Tanakiatsriboon	Director	Elected
6. Mr. Ong-at Wanpake	Director	Elected
7. Miss Arunroj Intasiri	Director/Secretary	Appointed
Calculated as 2.64 percent of all employees on the Committee.		

The Safety Committee's roles are in compliance with laws on specification of management standards and management of safety, occupational health and work environment of B.E. 2549 (A.D. 2006).

Support

The Company's executives at every level have given importance and provided support, time, supporting equipment, personnel and necessary budgets for safety management operations. A high-ranking executive was placed as the Chairman of the Safety Committee in order to closely govern the Committee, monitor results and report performance to the Executive Board on a monthly basis in addition to making quarterly performance reports to the Board of Directors. In 2019, the Company modified work areas to create safe work environments in the following project:

- In the project to modify the flammable chemical work area at Factory Building 6, the Company installed six vacuum fan filters to prevent dispersion of chemical particles and odor along with reducing effects on workers and the environment. The Company used a budget of 238,200 baht to perform installations



Mobilization of Knowledge into Practice

The Company used many channels to transmit knowledge and improve employees' work safety skills such as training in necessary courses, KYT and safety group activities, practice for real learning, sharing experiences from persons who encountered accidents, developing necessary skills to assist victims, using video media or public relations documents and news to help employees including outside workers working in the Company have awareness regarding safety, generosity and preventing accidents from occurring to themselves, colleagues and the Company's property. In 2019, the Company organized four operation training courses and spent a budget of 88,280 baht on the following courses:

1. The Basic Firefighting and Fire Evacuation Course required by the law with a budget of 46,280 baht (outside lecturer).
2. Near-miss Report Preparation Course in five classes and 92.18% of trainees with a budget of 1,000 baht (in-house lecturer).
3. The Course on Performance of Duties Related to Overhead Cranes, Controllers, Commanders, Signalers and Holders with 97.96 percent of people involved in training and a budget of 40,000 baht (outside lecturer).
4. Forklift Work Safety Course in two classes with 100 percent of people involved with the work participating and a budget of 1,000 baht (in-house lecturer).



Safety Newsletter



Practical Training: Near-miss Report Preparation



Practical Training: Crane Control



Practical Training: Forklift Driving



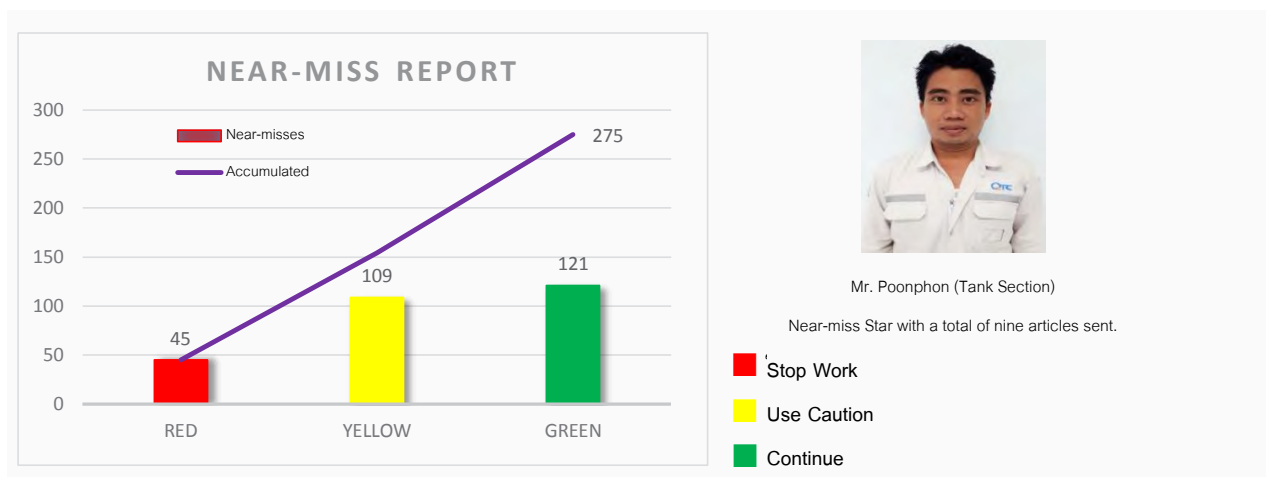
Practical Training: Basic Firefighting

Enforcement of Regulations

The Company maintains strict measures to enforce safety rules and regulations. According to accident reports from the past to the present, most accidents were caused by human negligence to wear personal protective equipment before working or removing protective equipment when no one sees. This was because employees were unaware of potential hazards occurring at any time. Executives and supervisors have the duty to create understanding and warn employees according to the system and apply strict disciplinary actions. In 2019, a written warning was issued to one employee due to negligent work by driving faster than the legal limit, which can cause accidents.

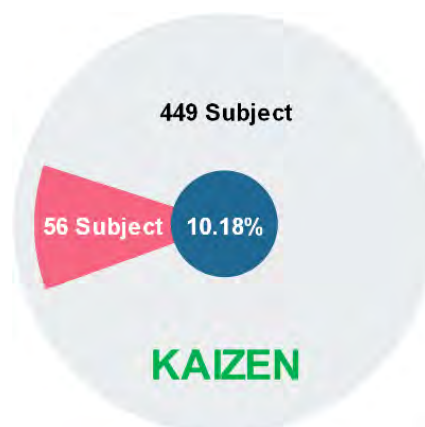
Creating Participation

Supporting KAIZEN and near-miss accident reports builds employee involvement in presenting concept and methods for eliminating safety before accidents. In 2019, 56 employees sent 56 KAIZEN articles on safety out of 550 KAIZEN and 275 near-miss accident reports. KAIZEN and near-miss accident reports sent by employees enable the Safety Committee and the management team to manage abnormalities which may cause significant accidents in the future.

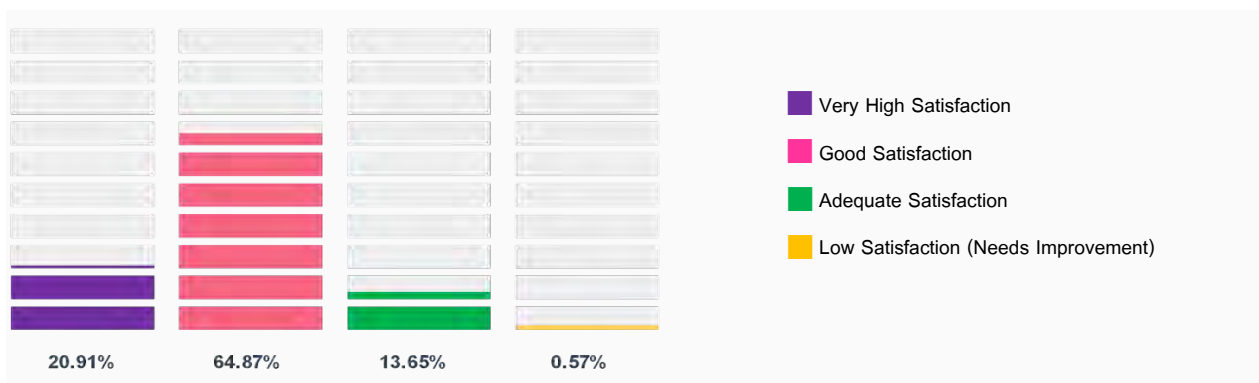


Graph of All Near-miss Accidents and Total Number

Employees sent 550 KAIZEN articles
 with 56 KAIZEN articles on safety or
 10.18 percent of all KAIZEN sent in 2019.



Building participation is another form of ongoing weekly 5S Safety & Happy Workplace activities carried out by the Company under the responsibility of the Safety Committee. In 2019, activities were held on 27-29 August with safety culture photograph competitions, safety video clip competitions and competitions with inventions from disused materials leftover from the production process, happy organization project booth activities, anti-corruption education activities and the Company invited outside agencies to exhibit booths in an effort to combine 5S work and happy workplace activities with safety work because the Company saw these three topics to support one another under the concept where the 5S system helps to reduce accidents and create happiness in working. This activity covered participation by employees from every company. Furthermore, the Company allowed students from schools in Mabyangporn to participate in activities and spent 53,404.34 baht in operations. Results from a survey of satisfaction toward activities among participants were as follows:



Survey Results from Participants on Satisfaction toward Activities



Image of 5S & Happy Workplace 2019 Activity Atmosphere

Safety KAIZEN Modification Example Tank Station for Testing Leaks and Relieving Aches and Fatigue

This KAIZEN is from the work environment at the testing point for leaks at tank edges under the responsibility of Mr. Wiroot Tawaro, the welder at the station. His main task was to test assembled transformers for leaks. If errors were found, repairs had to be made to ensure that transformers are in 100-percent condition before handing over to the next station. The workspace's characteristics originally did not facilitate work and was against ergonomic principles in working. Workers had to bend and come back up, causing back pain and a long time was required to test. To solve his own problem, Mr. Wiroot Tawaro used KAIZEN to invent a base station for placing disassembled tanks and adjusting levels that can be disassembled and removed when space is needed. He used available steel scraps and his personal welding expertise. The base station for placing tanks to test for leaks can support tank sizes of 30 kVA – 630 kVA.

Results from Modification

- ✓ Saved time in testing for leaks from 60 minutes per transformer to 40 minutes per transformer. This calculation showed time loss was saved when compared to capacity to accept more work valued at 17,336 baht in 2019.
- ✓ Body movement while working is in line with ergonomic principles, resulting in no back pain, aches from work and more happiness in working.

Before Modification



After Modification



"Spotting leaks with eyes is inconvenient. It takes a long time to check and repair. Work is difficult and it makes my back ache."

That's a problem that a worker like me knows well and is directly affected by. I was lucky that the manager listened, supported me in making modifications and recognized the value of what I did...Thank you"

The achievement was considered for the QTC KAIZEN Award 2019 at the Outstanding Level. Mr. Wiroot received a trophy and a reward valued at 3,000 baht.



Measuring Safety, Occupational Health and Work Environment (QTC)

The Company assesses work environment to monitor risk factors concerning employee health comprehensively and regularly. The assessment results in 2019 were as follows:

Area	Test Point	Annual Test Results					Standard	Unit
		2016	2017	2018	1/2019	2/2019		
		10/12/16	16/6/17	19/6/61	15/3/62	23/7/19		
Factory 1	Steel Core		78.7				85	dB(A)
Factory 1	Human Resources Department		62.1	63.5		74.5	85	dB(A)
Factory 3	Unicoil Metal Cutting Machine	78.3		77.5		77.9	85	dB(A)
Oil Baking & Filling	Tanking	79.1	77.1	76.8		75.0	85	dB(A)
Assembly	Wood Cutting Room	81.5	93.7	81.9		78.8	85	dB(A)
Steel Core	Work Shop	81.2	86.5	85.3		89.0	85	dB(A)
Factory 4	Steel Pellet Shooting Area	89.6	88.6	86.0			85	dB(A)
Assembly	Work Shop					74.3	85	dB(A)
Assembly	Copper Core Welding		82.7				85	dB(A)
Equipment Installation	Spray Booth					76.8	85	dB(A)
Coiling 1	Coiling						85	dB(A)
Coiling 2	Coiling						85	dB(A)
Coiling 3	Coiling		71.3	69.0		74.3	85	dB(A)
Coiling 4	Coiling		70.9	75.7		69.9	85	dB(A)
New Coiling Building	Coiling Machine	74.1	74.1	75.0		73.0	85	dB(A)
Paper Cutting Room	Paper Cutting					77.2	85	dB(A)
Factory 4	Chassis Assembly and Welding	91.3	90.3	85.0		86.0	85	dB(A)
Factory 4	Plasma Cutting Machine					85.7	85	dB(A)
Factory 4	Manufacturing Building Office					68.1	85	dB(A)
Factory 5	Chassis Assembly and Welding				86.4		85	dB(A)
Factory 5	Steel Pellet Shooting Area				84.3		85	dB(A)
Factory 6	Spray Booth				80.1		85	dB(A)
Factory 6	Spray Booth (Large)				81.0		85	dB(A)

In 2019, noise disturbance was tested in the work area twice and four areas were found to have sound levels higher than the law's specifications, which have been designated as hazardous areas for workers by the Company and people who will enter the area to work must wear specified PPE strictly. However, the Company will continue to seek opportunities to make improvements and reduce sound levels through process development. According to health checkup results in 2019, no employees with hearing problems were found in all four hazardous areas.

Results from Measuring Noise Disturbance outside Factories (Community)

Parameter	Area	Annual Test Results				Standard	Unit
		1/2016	1/2017	1/2018	1/2019		
		1-2/6/2016	19-20/6/2017	19-20/6/2018	23-24/7/19		
General Volume Level (L _{eq} 24hr)	Employee Dormitory	65.8	62.4	65.6	67.0	70	dB(A)
General Volume Level (L _{max})	Employee Dormitory	96.3	87.3	92.7	104.0	115	dB(A)

Test Results of the Environment for Working with Chemicals

Area	Parameter	Annual Test Results						Standard	Unit
		01/2016	2/2016	01/2017*	2018				
		1/6/2016	10/12/2016	16/06/2017	25/6/2018				
Steel Core: Factory 3	Iron Dust	<0.007	<0.007	0.015	Not Detected			10	mg/m ³
	Total Dust			<0.25	Not Detected			15	mg/m ³
Steel Core: Factory 1 Steel Arrangement	Xylene	<0.25	Not Detected	<0.25	Not Detected			100	ppm
	Toluene	0.33	Not Detected	1.81	0.49			200	ppm
	Acetone	<0.30	Not Detected	Not Detected	Not Detected			250	ppm
	Total Dust			Not Detected	0.28			15	mg/m ³
Steel Core: Steel Clamp Paint	Xylene	<0.25	Not Detected	Not Detected	Not Detected			100	ppm
	Toluene	<0.25	2.41	Not Detected	2.41			200	ppm
	Acetone	<0.30	<0.30	Not Detected	Not Detected			1,000	ppm
Steel Core: Plasma Cutting	Total Dust	<0.25	0.43	<0.25	Not Detected			15	mg/m ³
	Carbon Monoxide	<1	1	1	Not Detected			50	ppm
	Copper Fume	<0.007	Not Detected					0.1	mg/m ³
	Xylene			Not Detected	Not Detected			100	ppm
	Toluene			Not Detected	0.30			200	ppm
	Iron Fume			0.01	0.023			10	mg/m ³
	Acetone			Not Detected	Not Detected			1,000	ppm
	Total Dust			0.84	<0.25			15	mg/m ³
Coiling: Coiling 3	Total Dust	<0.25	Not Detected	Not Detected	0.34			15	mg/m ³
Coiling: Coiling 4	Copper Fume	<0.007	Not Detected	Not Detected	Not Detected			15	mg/m ³
	Total Dust	0.34	Not Detected	Not Detected	Not Detected			15	mg/m ³
Coiling: New Coiling Building	Copper Fume	<0.007	Not Detected	Not Detected	Not Detected			0.1	mg/m ³
	Total Dust	<0.25	<0.25	0.43	0.42			15	mg/m ³
Coiling: Paper Cutting Room	Respirable Dust			0.1	0.2			5	mg/m ³
	Copper Fume	0.008	Not Detected	Not Detected				0.1	mg/m ³
Assembly: Transformer Assembly	Iron Fume	<0.007	<0.007	Not Detected				10	mg/m ³
	Copper Fume	<0.007	<0.007	Not Detected	Not Detected			0.1	mg/m ³
Assembly: Workshop	Iron Fume	<0.007	<0.007	Not Detected	Not Detected			10	mg/m ³
	Total Dust	0.42	0.34	Not Detected	<0.25			15	mg/m ³
Assembly: Wood Cutting Room	Respirable Dust	0.4	Not Detected	Not Detected	Not Detected			5	mg/m ³
	Total Dust	0.68	Not Detected	Not Detected	2.36			15	mg/m ³
Equipment Installation: Spray Booth	Xylene	<0.25	<0.25	Not Detected	Not Detected			100	ppm
	Toluene	<0.25	1.57	Not Detected	<0.25			200	ppm
	Total Dust	<0.25	Not Detected	< 0.25	0.25			15	mg/m ³
Transformer Repair	Oil Mist		0.08					5	mg/m ³
	Total Dust	0.34	Not Detected	< 0.25	1.53			15	mg/m ³
Chassis: Chassis Assembly Welding	Carbon Monoxide	<1	3	1	Not Detected			50	ppm
	Iron Fume	0.206	0.018	0.046	0.095			10	mg/m ³
	Total Dust								
Chassis: Plasma Cutter	Carbon Monoxide	<1	5	< 0.25				50	ppm
	Iron Fume	0.153	0.018	0.038	<0.007			10	ppm
	Total Dust				Not Detected			15	mg/m ³
Steel Pellet Firing Room (inside)	Iron Fume	0.182	0.090	0.046	0.042			10	mg/m ³
	Iron Fume	0.016	0.042					10	mg/m ³
	Respirable Dust			0.100	Not Detected			5	mg/m ³
	Oxygen			21.000	21.000			19.5 – 23.5	%
Steel Pellet Firing Room (outside)	Iron Fume			0.011	0.019			10	ppm
	Total Dust								
Spray Booth, Factory 4	Carbon Monoxide	<1	2	Not Detected	Not Detected			50	ppm
	Iron Fume	0.017	0.012	Not Detected	0.072			10	ppm
	Respirable Dust	0.05	<0.10	0.2	0.9			5	mg/m ³
Baking and Oil Filling	Carbon Monoxide				Not Detected			50	ppm
Amorphous	Total Hydrocarbon				4.85			N/A	ppm
	Total Dust				0.51			15	mg/m ³
	Respirable Dust				Not Detected			5	mg/m ³
	Bie-phenal A				0.060			5	mg/m ³

Environmental Test Results for Working with Chemicals

Area	Parameter	Annual Test Results						Standard	Unit
		01/2016	2/2016	01/2017*	2018	01/2019	02/2019		
		1/6/2016	10/12/2016	16/06/2017	25/6/2018	15/3/2019	23/7/2019		
Steel Core: Factory 3	Iron Dust	<0.007	<0.007	0.015	Not Detected		Not Detected	10	mg/m ³
	Total Dust			<0.25	Not Detected		Not Detected	15	mg/m ³
Steel Core: Factory 3 Steel Arrangement	Acetone						Not Detected	250	ppm
	Xylene						Not Detected	100	Ppm
	Toluene						<0.25	200	ppm
	Total Dust						Not Detected	15	mg/m ³
	Xylene							435	mg/m ³
Steel Core: Factory 1 Steel Arrangement	Xylene	<0.25	Not Detected	<0.25	Not Detected			100	ppm
	Toluene							435	mg/m ³
	Toluene	0.33	Not Detected	1.81	0.49			200	ppm
	Acetone	<0.30	Not Detected	Not Detected	Not Detected			250	ppm
	Total Dust			Not Detected	0.26			15	mg/m ³
	Xylene							435	mg/m ³
Steel Core: Steel Clamp Paint	Xylene	<0.25	Not Detected	Not Detected	Not Detected		1.86	100	ppm
	Toluene							200	ppm
	Toluene	<0.25	2.41	Not Detected	2.41		8.62	200	ppm
	Acetone	<0.30	<0.30	Not Detected	Not Detected		10.0	1,000	ppm
	Total Dust	<0.25	0.43	<0.25	Not Detected			15	mg/m ³
Steel Core: Plasma Cutting	Carbon Monoxide	<1	1	1	Not Detected			50	ppm
	Copper Fume	<0.007	Not Detected					0.1	mg/m ³
	Xylene			Not Detected	Not Detected			100	ppm
	Toluene			Not Detected	0.30			200	ppm
	Iron Fume			0.01	0.023			10	mg/m ³
	Acetone			Not Detected	Not Detected			1,000	ppm
Steel Core: Work Shop Steel Cutting Saw/Drill Base	Iron Dust						Not Detected	10	mg/m ³
	Iron Fume						Not Detected	10	mg/m ³
	Total Dust						1.19	15	mg/m ³
Coiling: Coiling 3	Total Dust			0.84	<0.25			15	mg/m ³
	Copper Fume						Not Detected	0.1	mg/m ³
	Respirable Dust						Not Detected	5	mg/m ³
Coiling: Coiling 4	Total Dust	<0.25	Not Detected	Not Detected	0.34			15	mg/m ³
	Copper Fume	<0.007	Not Detected	Not Detected	Not Detected		Not Detected	0.1	mg/m ³
	Respirable Dust						Not Detected	5	mg/m ³
Coiling: Coiling Building	Total Dust	0.34	Not Detected	Not Detected	Not Detected			15	mg/m ³
	Copper Fume	<0.007	Not Detected	Not Detected	Not Detected		Not Detected	0.1	mg/m ³
	Respirable Dust						Not Detected	5	mg/m ³
Coiling: Paper Cutting Room	Total Dust	<0.25	<0.25	0.43	0.42		Not Detected	15	mg/m ³
	Respirable Dust			0.1	0.2		Not Detected	5	mg/m ³
Assembly: Transformer Assembly	Copper Fume	0.008	Not Detected	Not Detected			Not Detected	0.1	mg/m ³
	Iron Fume	<0.007	<0.007	Not Detected				10	mg/m ³
	Total Dust						Not Detected	15	

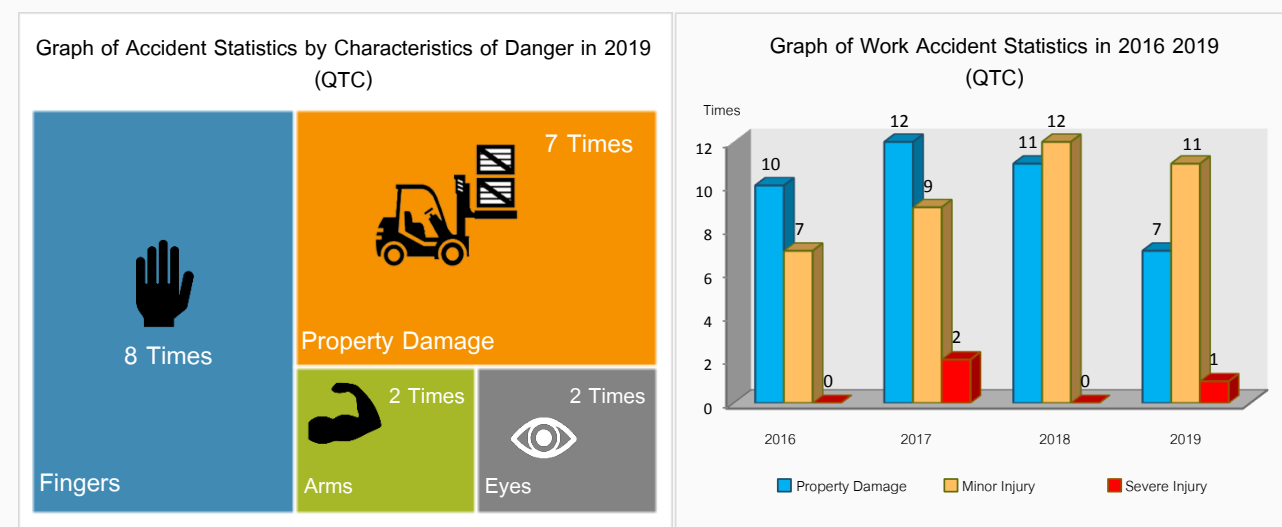
Performance Accident Statistics

In 2019, the Company had some risks concerning work-related accidents. The Company continues to give importance to and the Company is determined to modify management processes according to the policy. Performance did not achieve the goal. The Company had a total of 19 accidents. One accident was a severe accident and caused the Company to stop work for one day. The injury was fingers trapped by a transformer lid, causing swelling and inflammation. The doctor allowed one day of rest. This injury was caused by unsafe work environments and the Company made improvements immediately.

Table Comparing Work Accident Statistics (2016-2019) for QTC

Severity/Damage	No. of Times/Year			
	2016	2017	2018	2019
Property Damage	10	12	11	7
Minor Injury (No Interruption)	7	9	12	11
Severe Injury Causing Interruption	0	2	0	1
Total (Times)	17	23	23	19
Total Length of Interruption Caused by Work Accident (Days)	0	4	0	1
Sickness from Working (Sick Leaves)	0	0	0	0

Remarks: In 2019, Q Solar 1 did not have work accidents.

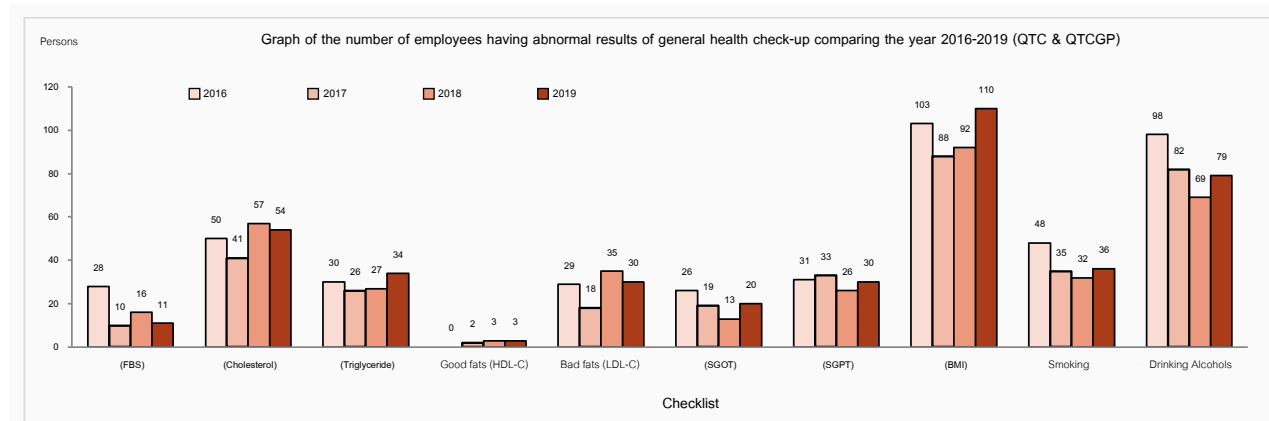


According to the graph, work accidents were mostly accidents involving the use of hands or fingers to work. One accident was caused by inappropriate work environment and seven accidents were caused by workers' negligence. These were followed by property damage from accidents valued at 31,331 baht. Most of the damage was caused by moving materials by using forklifts or other labor-saving devices with negligence. Injuries to the arms and eyes were caused by work processes involving body steel, welding work and steel cores. Steel powder flew into workers eyes. In every case when accidents occur, the Company places importance on seeking corrective and preventive measures. In every case, the Company informs employees about the causes of accidents and advises on methods for preventing recurrences in order to maximize employees' work safety.

Good health of employees is an important factor that makes employees perform their responsibilities efficiently. The Company announces and applies the policy on health promotion and healthy organization, http://qtc-energy.com/?page_id=899&lang=th. In addition, the Company arranges the workplace to have a clean and comfortable environment which controls lighting, noise, heat, chemicals, consumption, the abstinence from alcohols, cigarettes and drugs, etc., including provides annual health check-ups and follows up results continuously.

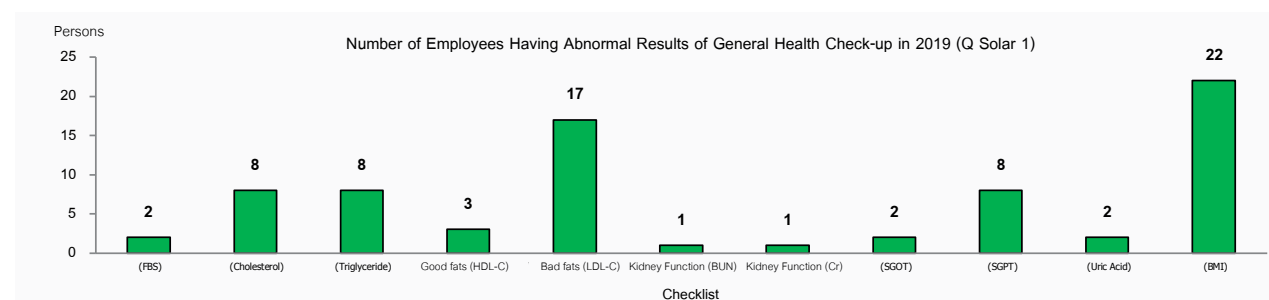
Annual Health Check-up

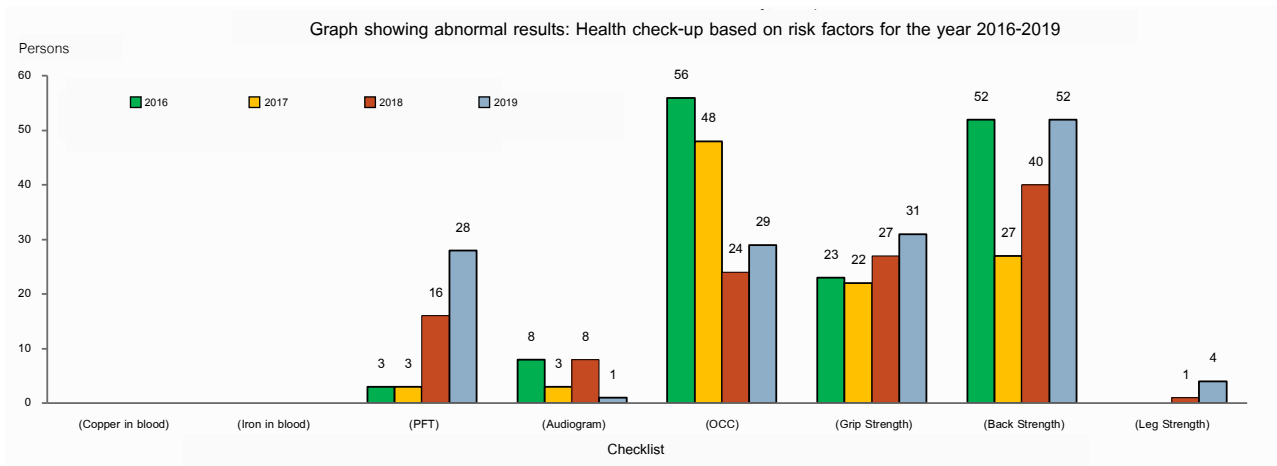
The Company provides the health check up to employees once a year for both Bangkok office and Rayong factory. 2 hospitals are used to provide such service, which are BMC Plus Hospital collaborated with Phyathai Sriracha Hospital and Samitivej Srinakarin Hospital. However, occupational physicians are provided to explore the working environment in order to determine the health check-up program based on risk factors. Regarding the health check-up program, it will be in accordance with the law and also provided to employees encountering risks according to age range and gender. In 2019, the total budget was 530,811 Baht.



According to the graph, it was found that the number of employees (QTC) that had abnormal results of general health check-up increased from the year 2018 due to non-exercise behavior and the proportion of new employees increased by more than 10%. The Company therefore continues supporting activities to promote exercises. Every month there will be factory nurses providing knowledge on health and exercise in activities of executives and employees meeting. In addition, various sport competitions were organized to be a part of motivating employees to exercise based on their preferences.

Regarding the health check-up of employees of Q Solar 1 Company, it was operated according to the policy of QTC. , Chularat 304 International Hospital used the budget of 52,365 Baht.





According to the health check-up based on risk factors from work for the year 2019, it was found that the risks which were likely to increase continuously were as follows; abnormal back muscles found in a group of workers winding coils and standing for a long time to work with machines, lung disorders found in a group of welders encountering with lead fume and having risky behavior of smoking, the risk of hearing disorders found in a group of welders working in the noisy environment at all times, and the risk of noise and air. The Company has measured and improved the process to be in accordance with the laws. In addition, factory nurses organized activities to individually give advices and instructions on how to properly take care of health to employees having the risks.



Photos of Annual Health Check-up for the Year 2019



Giving Advices and Consultation on Health

Health Promotion Project

“When should I exercise? Now or while sick”



It is the continuous project from the year 2015 to encourage employees to exercise and select appropriate foods for consumption. Regarding such promotion, the Company widely offers opportunities to employees at all level because the Company understands that “health” is the personal right that each individual has to take care of it by oneself. The Company continues arranging budgets to promote activities according to preferences and abilities of employees, such as activity of football club, badminton club, Takraw club, etc.



Football club



Takraw club



Activity of Badminton club



Volleyball club



Table tennis club

“Quitting Alcohol and Smoking for Good Health and Savings” Project Year 2

It is the continuous project from the year 2018. In 2019, an additional team was appointed to follow up and give advices to the project participants. There were 4 employees voluntarily participating in the Project which consisted of 1 employee smoking tobacco and 3 employees drinking alcohol. The performances were as follows;

The performances of the Project caused the employees participating in the Project to reduce their smoking tobacco and drinking alcohol. However, they were unable to completely quit smoking and drinking. According to the annual health check-up, it was found that people smoking tobacco and drinking alcohol increased from the year 2018 due to the group of new employees. However, the Company will continue implementing this Project in order to reduce the health risks of employees.

Group with Risk Behavior	Behaviors before Participating in the Project	Behaviors after Participating in the Project
1. People smoking tobacco	Smoking 10-15 cigarettes a day	Smoking 1-3 cigarettes a day
2. People drinking alcohol	Drinking alcohol regularly and daily	Drinking alcohol once a week on a holiday

Project Team Members

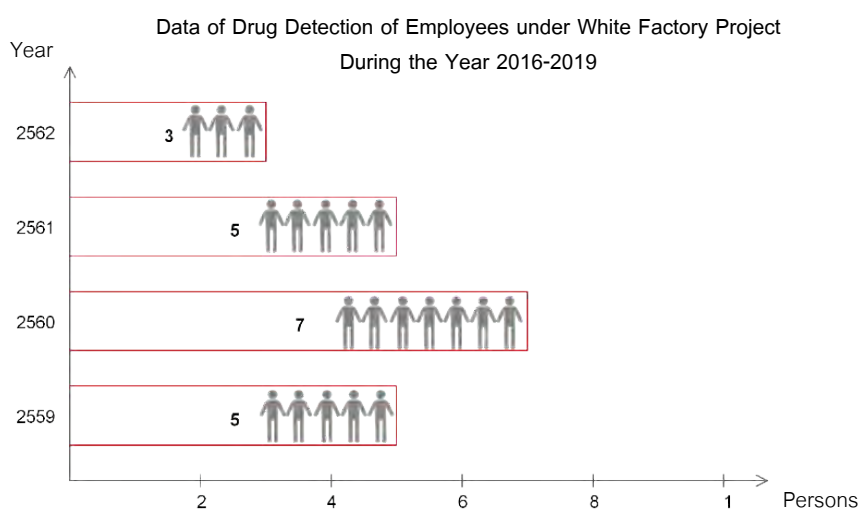


Project Participants

White Factory Project

The Company still focuses on the prevention and suppression of drugs in a proactive and constant way as it is aware of the threat from drug problems that will affect the health of employees and relationship with colleagues, family, communities as well as the Company. The Company regularly provides the random drug test without prior notice in accordance with the policy and strictly enforces rules and regulations. In 2019, the Company continued implementing the measure on drug test by inviting police officers (Pluak Daeng Police Station) to perform the 100% test at least once a quarter. It was found that there were 3 employees having drug substances in their body. The Company offered opportunities for treatment and close surveillance according to the policy.

According to the data of strict implementation and surveillance during the year 2016-2019, the number of employees involved with drug addiction gradually decreased. Some drug users were able to improve themselves and they are still the employee of the Company. However, some drug users were unable to improve themselves and resigned from the Company according to the Company's policy.

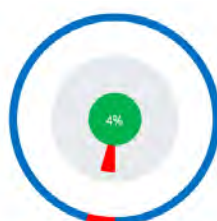


Influenza Vaccination Project

The objectives of Influenza Vaccination Project are to promote health of employees and reduce illness due to health risk factors. Since it was found that, in 2018, there were 10 employees having influenza and transmitting the virus to others in the Company. After the administration of influenza vaccine in 2019, there were 3 employees receiving the vaccine and having influenza and 1 employee refusing the administration of influenza vaccine and having influenza. The total number was 4 employees, decreased from the year 2018 by 6 employees. According to such result, it was shown that influenza immunity could not 100% prevent flu illness according to the medical principles, but it might reduce the risk. Therefore, the Company determines that influenza vaccination is the part of the annual health check-up program. The vaccination must be based on voluntary of employees requiring the vaccination without any charge. It is carried out for QTC employees and employees of all subsidiaries.



Proportion of Employees with Influenza in 2018





Proportion of Employees with Influenza in 2019



Employment and Human Right

The Company is aware of and recognizes the importance of respect for the international human rights principles by considering the human dignity, freedom and equality of individuals. All directors, executives and employees of the Company and its subsidiaries must strictly comply with these principles, which have been announced as the policy on human resource management policy, http://qtc-energy.com/?page_id=901&lang=th, and the policy on human rights for practices, http://qtc-energy.com/?page_id=895&lang=th. The promotion of the practice on human rights within the organization is carried out through specified practices and any activity channels. The objective is to allow all employees to acknowledge their legal rights and the respect for each other's rights. The measurement of human rights performances within the organization is determined by the number of persons which their right being violated.

Regarding the implementation of human rights in the value chain, the Company specifies that this is the part that QTC's business partners must comply with in the QTC's Code of Conduct and Practices for Business Partners, <http://investor.qtc-energy.com/storage/corporate-governance/20180613-qtc-coc-for-suppliers-en-02.pdf>. The objectives are to allow business partners in the value chain of QTC to acknowledge the practices on human rights and develop work processes to be in line with QTC. The evaluation of human rights performances of QTC has not been referred according to the Universal Declaration of Human Rights. However, it is a simple form of evaluation which is consistent with relevant laws. The goals of the implementation in 2019 were as follows;

<div style="background-color: #00838f; color: white; padding: 5px; text-align: center; margin-bottom: 10px;">Goals</div>  <ul style="list-style-type: none"> Number of business partners complying with the specified policy and criteria > 90% Number of employees which their right being violated is zero. 	<div style="background-color: #e91e63; color: white; padding: 5px; text-align: center; margin-bottom: 10px;">Performances</div>  <ul style="list-style-type: none"> QTC's business partners passing the evaluation on human rights violation based on the specified criteria is 906.43%. No issues on human rights violation in the organization
--	--



Business partner evaluation on issues relating to human rights (based on the criteria specified by QTC) in 2019 was as follows;

Number of business partners being evaluated	56 persons
Number of business partners meeting the criteria specified by QTC	47 persons
Number of business partners disqualified but providing improvement plans	7 persons
Number of business partners disqualified and no improvement plans	2 persons

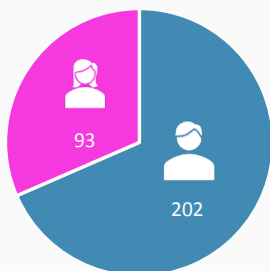
54 business partners can perform the AVL registration and there are 2 business partners cancelling the registration, accounting for 96.43%

In 2019, the number of employees increased from the year 2018 by 8.16% due to the termination of the foreign labor hiring and the recruitment of permanent Thai employees. The proportion of employment was as follows;

Table of Employment Proportion

Employment Status	QTC Energy								QTCGP & Q Solar 1	
	2016		2017		2018		2019		2019	
	Number (Person)	%	Number (Person)	%	Number (Person)	%	Number (Person)	%	Number (Person)	%
Categorized by gender										
Male	131	62.98	132	63.16	160.00	65.31	180	67.92	22	73.33
Female	77	37.02	77	36.84	85.00	34.69	85	32.08	8	26.67
Categorized by level										
Manage	13	6.25	25	11.96	-	-				
Male	6	-	14	-	-	-				
Female	7	-	11	-	-	-				
Knowledge	110	52.88	102	48.81	-	-				
Operate	85	40.87	82	39.23	-	-				
L9 – UC	-	-	-	-	26.00	10.61	27	10.19		
Male	-	-	-	-	14	-	14	-		
Female	-	-	-	-	12	-	13	-		
L7 – L8	-	-	-	-	20.00	8.16	21			
Male								-		
Female								-		
L1 – L6	-	-	-	-	199.00	81.22	217			
Male								-		
Female								-		
Categorized by age										
Age 18-35 years	145	69.71	154	73.68	159.00	64.90	178	67.17	11	36.67
Age 36-50 years	55	26.44	48	22.97	76.00	31.02	77	29.06	12	40.00
Age over 50 years	8	3.85	7	3.35	10.00	4.08	10	3.77	7	23.33
Categorized by area										
Headquarters in Bangkok										
Male	22	10.58	23	11.00	22.00	8.98	29	10.94	1	3.33
Female	23	11.06	23	11.00	27.00	11.02	29	10.94	2	6.67
Factory in Rayong										
Male	109	52.40	109	52.16	138.00	56.33	151	56.98	21	70.00
Female	54	25.96	54	25.84	58.00	23.67	56	21.13	6	20.0
Total number of employees at the end of the year (Persons)	208		209		245		265		30	

Proportion of Employees Categorized by Male-Female (Total number)



Proportion of Employees Categorized by Age Range (Total number)

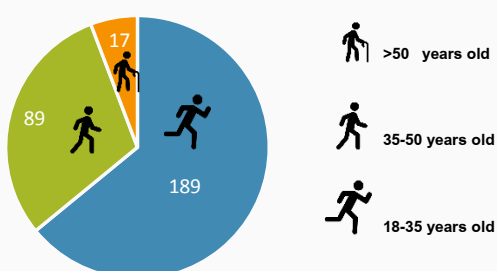
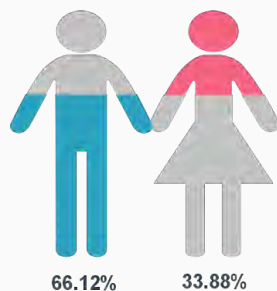


Table of Proportion of Wage and Remuneration Payment

Employment Status as of December 31	QTC Energy								QTCGP & Q Solar 1	
	2016		2017		2018		2019		2019	
	Amount (Baht)	%	Amount (Baht)	%	Amount (Baht)	%	Amount (Baht)	%	Amount (Baht)	%
Categorized by gender										
Male	59,480,140.42	7.11	62,103,865.00	62.89	68,766,169.00	64.66	83,794,896.00	65.38	7,477,872.00	75.69
Female	29,144,864.14	2.89	36,648,700.00	37.11	37,581,465.00	35.34	44,363,794.00	34.62	2,413,752.00	24.40
Categorized by level										
Manage	-	-	36,141,644.00	36.60	-	-	-	-	-	-
Knowledge	-	-	40,638,699.00	41.15	-	-	-	-	-	-
Operate	-	-	21,972,222.00	22.25	-	-	-	-	-	-
Level 9-UC	-	-	-	-	37,081,539.00	34.87	43,253,655.00	33.75	-	-
Level 7-8	-	-	-	-	15,726,200.00	14.79	15,729,210.00	12.27	-	-
Level 1-6	-	-	-	-	53,539,895.00	50.34	69,175,825.00	53.98	-	-
Total Wage and Remuneration Payment (Baht)			98,752,565.00		106,347,634.0	-	128,158,690.00		9,891,624.00	
Categorized by executives and employees							Amount (Baht)		%	
Executives (Board of Executives)					-		17,971,960.00		13.02	
Employees							120,078,354.00		86.98	
Total Wage and Remuneration Payment (Baht)	-						138,050,314.00			

Note: Such wage and remuneration do not include other benefits paid by the Company, expenses paid by the employer to the employees according to the law, training, etc.

Proportion of Wage Payment Categorized by Male-Female



Proportion of Wage Payment Categorized by Management Level-Employee Level

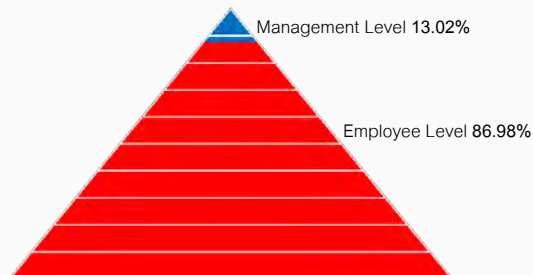




Table of Number of Female Employees Taking Maternity Leave and Returning to Work

Year	2016	2017	2018	2019	
				QTC	QTCGP&Q Solar1
Number of employees taking maternity leave (person)	5	7	4	8	-
Number of employees resuming work (person)	4	6	3 (1 employee taking maternity leave during the interval period of the year 2019)	7 (1 employee taking maternity leave during the interval period of the year 2020)	-

Note: There was 1 employee taking the maternity leave during the interval period of the year 2018-2019 and resuming work in 2019.

Initial Wage Rate and Welfares

Item	L1 - L6 Level	L7 - L8 Level	L9 - UC	
			Section	Department
Initial wage (Excluding experience fee): Baht	9,900 – 20,000	Based on wage structure		
Travel expenses	⊙	⊙	⊙	-
Cost of living	⊙	⊙	-	-
Controlled engineer License fee	Only engineers holding a professional license		-	-
Risk fee	Only high-risk works		-	-
Diligence allowance	⊙	⊙	-	-
Accident insurance	⊙	⊙	⊙	⊙
Telephone bill	-	บางตำแหน่งงาน	⊙	⊙
Employer-provided car	-	-	-	⊙
Child scholarship (if any) according to conditions	⊙	⊙	-	-
Provident fund (Maximum contributions of 15% for employees, 3- contributions of 6% for the Company according to conditions)	⊙	⊙	⊙	⊙
Funeral allowance for employees' relatives	⊙	⊙	⊙	⊙
Funeral allowance for employees	⊙	⊙	⊙	⊙
Allowance for wedding ceremony (Paid only once)	⊙	⊙	⊙	⊙
Maternity allowance	⊙	⊙	⊙	⊙
Medical expenses of not more than 1 time of salary/person/year	⊙	⊙	⊙	⊙
Dental fee (1,000 Baht / year)	⊙	⊙	⊙	⊙
Skill fee	⊙	⊙	-	-
Food expenses for overtime work	⊙	⊙	-	-
Attendance bonus	⊙	⊙	-	-
Shuttle bus	⊙	⊙	⊙	⊙
Dormitory	⊙	⊙	⊙	⊙
Annual outing	⊙	⊙	⊙	⊙
Awards for 10 years of service, 20 years of service	⊙	⊙	⊙	⊙
Uniform	⊙	⊙	⊙	⊙
Pregnancy clothes (Only pregnant employees)	⊙	⊙	⊙	⊙

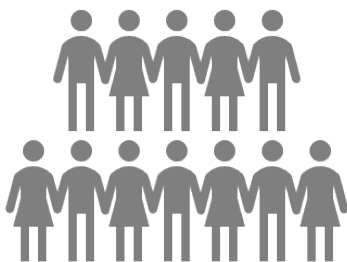
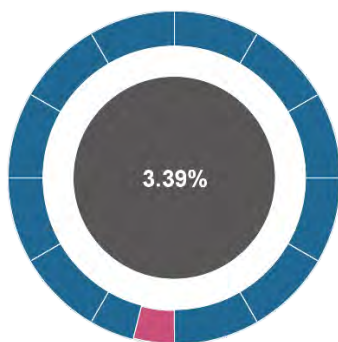
Note: The minimum wage for the year 2019 in Bangkok area = 325 Baht, Rayong Province = 330 Baht, Prachinburi Province = 318 Baht

Welfare Committee

The Company appoints the welfare committee from the election which has the role to represent employees in order to present opinions on the improvement of environment, public utilities and welfare as required by the laws to the Company. Employer's representatives (Human Resources Department) are obliged to attend the meeting at least once a quarter. If the operation of the welfare committee is approved by the Board of Executives and the Board of Directors, it will be effective to all subsidiaries. The current welfare committee has a 2-year term of service (2019-2020), consisting of the following members;

Welfare Committee			
First Name – Last Name		Department Representative	Position
1. Ms. Juthamanee	Rotchansaeng	Production Department	President
2. Mrs. Thippayawimon	Thavornchart	Sustainability Development Department	Director
3. Mr. Chatchai	Saeng-arphai	Production Department	Director
4. Mr. Ekkachai	Siphenwan	Management Department	Director
5. Mr. Jessada	Prateep	Production Department	Director
6. Ms. Phakkanat	Tungtrakul	Management Department	Director
7. Mrs. Chorphaka	Kanphaipheun	Accounting and Finance Department	Director
8. Ms. Phetcharat	Suthiraphonchai	International Sales Department	Director
8. Mr. Watcharin	Klaksikit	Special Project Sales Department	Director
10. Ms. Mayuree	Suramanee	Service Department	Director
11. Ms. Panida	Suwansri	Domestic Sales Department	Director
12. Ms. Sutthirak	Sutthisathit	Sustainability Development Department	Secretary

Proportion of Welfare Committee to All Employees

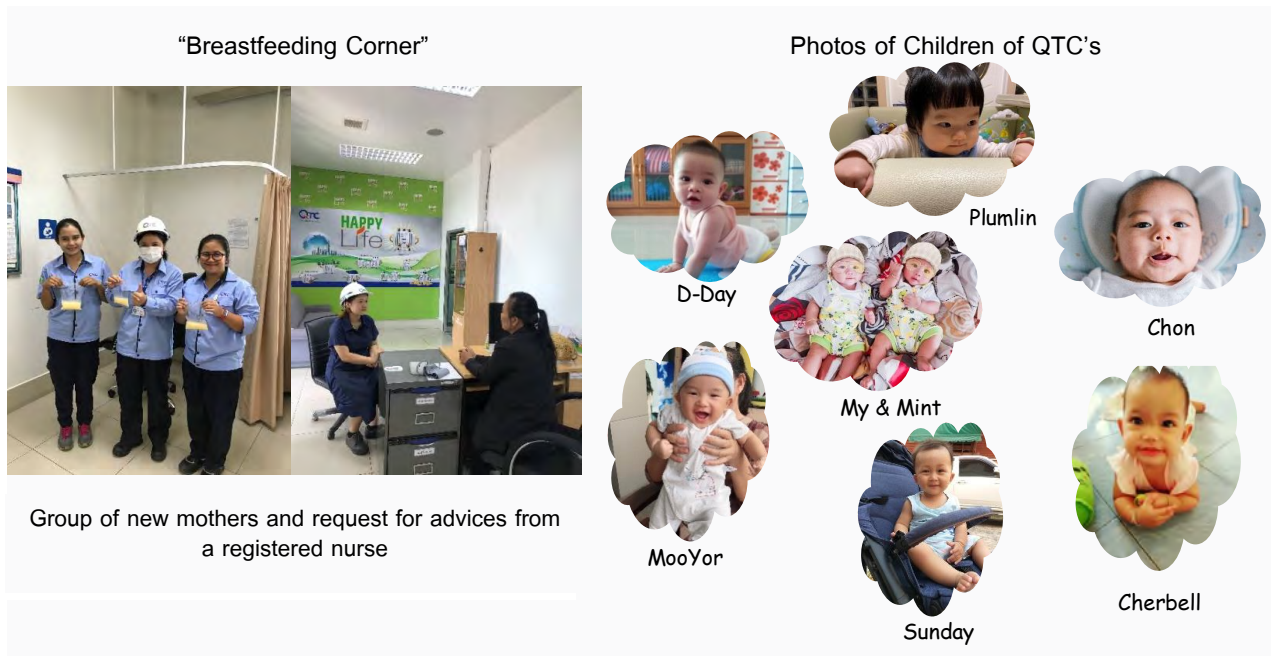


Performances of Welfare Committee in 2019

1. Proposing to increase the accident insurance welfare ✓ Approved
2. Proposing to increase welfare of pregnancy clothes for pregnant employees ✓ Approved
3. Proposing to adjust welfare of funeral allowance ✓ Approved
4. Proposing to increase drinking water locations ✓ Approved

“Breastfeeding Corner”

The Company still encourages mothers to use the area of “Breastfeeding Corner” to pump breast milk and freeze it for their babies so that they can consume breast milk for as long as possible. It is also the linking of the rights for children to receive good quality of care. (Mothers can request for the permission from their supervisor to use this service every time when it is time for breast pumping.) The service is open from 8:30 am - 4:30 pm every working day. In addition, nurses are available to provide important advices on breast milk production and child-rearing.

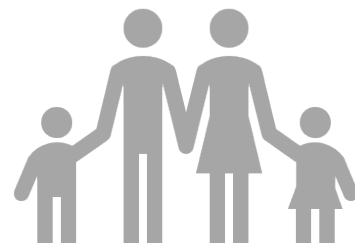


Scholarship for Employee's Children Project

In 2019, the welfare committee considered proposing 50 scholarships for employees' children according to the specified conditions, which were divided into 3 levels as follows;

1. Kindergarten level	13 scholarships	@ 1,000 Baht
2. Elementary education level	29 scholarships	@ 1,500 Baht
3. Secondary education level	8 scholarships	@ 2,000 Baht

Total 72,500 Baht



Employee Development

Always stuck in the past, refusing to change the way of thinking, and denying practicing new skills necessary for oneself is an obstacle to self-development.



Happy Brain

The Company is committed to developing skills, knowledge and competency of employees in accordance with the sustainability equation of $Q + R = S$. Important strategies are applied which are to develop human resources in all areas to create “good” and “smart” people in order to improve the ability of employees to be in line with the core competence of the organization and the collection of knowledge of the organization in a systematic manner for learning anytime. There are 3 types of development training as follows;



Model of Human Resource Development

Goals of Implementation in 2019

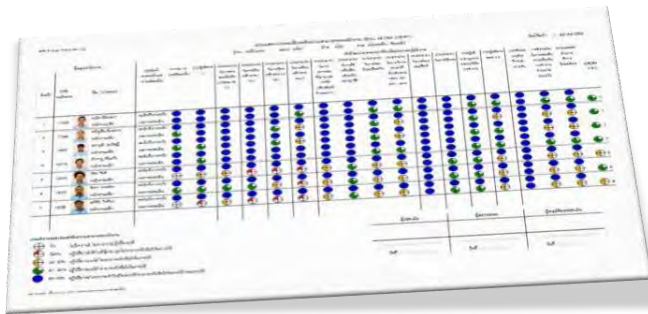
Goals	Performances
<ul style="list-style-type: none"> Developing employees, increasing abilities, reducing gap by 50% Individual Development Plan (IDP) is successful based on the specified plan. Preparing at least 5 matters of knowledge of the organization 	<ul style="list-style-type: none"> Results of work skill evaluation can reduce gap by 33.56%. Individual Development Plan (IDP) is implemented, accounting for 87.43%. Collecting and preparing 7 matters of knowledge of the organization

Statistics of Training Hours

Employee	Number of Hours/Person/Year									
	QTC Energy								QTCGP & Q Solar 1	
	2016		2017		2018		2019		2019	
Categorized by level	Total number of training hours	Average/ Person /Year	Total number of training hours	Average/ Person /Year	Total number of training hours	Average/ Person /Year	Total number of training hours	Average/ Person /Year	Total number of training hours	Average/ Person /Year
Manage	1,290.50	99.27	1,671.50	64.29	-	-	-	-	-	-
Knowledge	7,300.00	64.60	2,709.50	26.05	-	-	-	-	-	-
Operate	2,621.00	29.12	4,468.00	52.56	-	-	-	-	-	-
L9-UC					1,587.50	56.70	2,829.50	104.80	-	-
L7-L8					1,067.50	50.83	2,628.50	131.43	-	-
L1-L6					6,314.10	29.37	9,150.00	36.17	-	-
Categorized by gender										
Male	7,670.50	55.99	5,880	43.64	5,919.90	41.40	10,410.50	61.97	337	15.32
Female	3,541.00	44.82	2,969	37.31	3,049.20	38.12	4,197.50	49.38	87	10.88
Total number of training hours a year (Hours)	11,211		8,849		8,969		14,608		424	
Average number of employees a year (Person)	216		214		223		253		30	

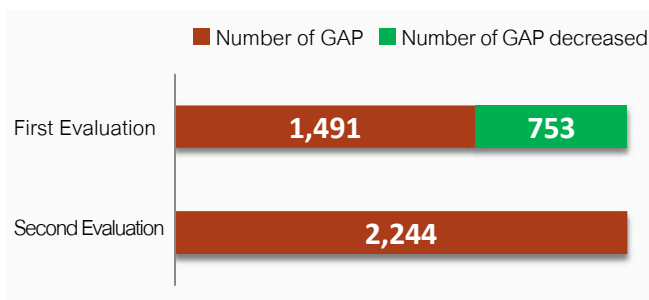
Training & Development

Develop knowledge and skill to reduce GAP



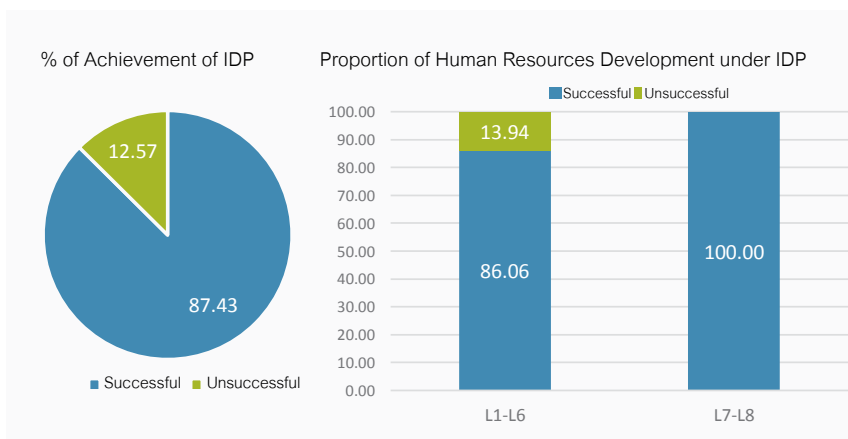
The Company is committed to developing hard and soft skills (Knowledge, Attitude, Behavior) by applying the Skill Matrix Chart for evaluation performed by the department supervisor and HRD. Obtained GAP is used to provide knowledge, train, and develop employees to increase work skills which result in the quality of products, punctual delivery, and the quality of life of employees.

Gap decreased by 33.56%



Individual Development Plan

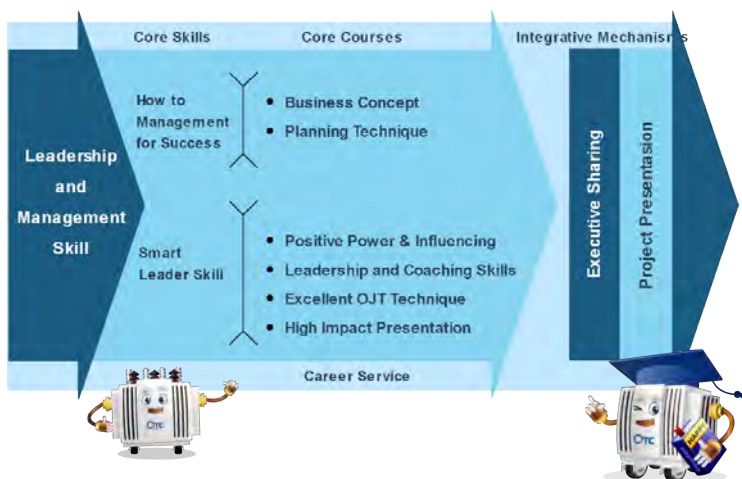
To develop human resources to be capable and grow according to their career path, the Company has established the Individual Development Plan (IDP) to prepare appropriate courses, supervise, monitor and evaluate results which will enhance the skill levels of employees to work and achieve goals in the field according to the business strategies. In 2019, Individual Development Plan (IDP) could be implemented, accounting for 87.43%.



Succession Plan Project)

Objectives of Leadership Development Program are to improve skills of top executives and develop the Company's successor. It is the continuous project from the succession plan project in 2018. The Company uses consulting services of Human Achievement Service Company Limited to outline the program, which is a subsidiary of Human Intellectual Company Limited providing the succession plan project in 2018. As a result, the program outline is clear and can be developed to meet the needs of the Company. In 2019, the operating expenses were 630,000 Baht. The details of the program were as follows;

Leadership Development Program



Business Concept: To allow participants to understand components of business operation and acknowledge the concepts, tools, management and development of businesses for sustainable growth, recognize future business trends, especially business operations in the digital world, apply and communicate them to employees to know the organization's goals, and prepare an action plan appropriately

Planning Technique: To allow participants to have knowledge, understand planning, communication and plan follow-up clearly, and increase their skills on priority of works in order to prevent risks or wastes that may occur during the operations

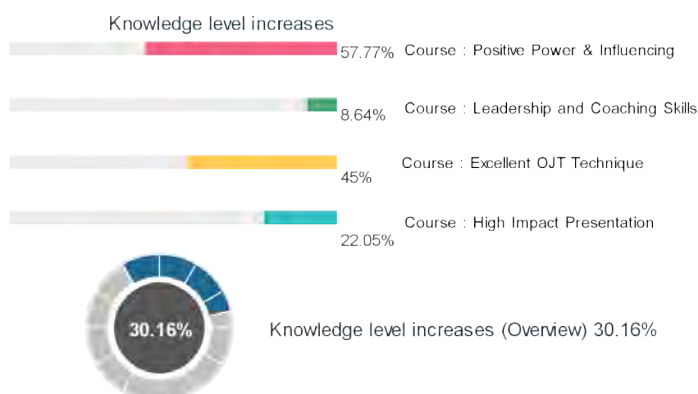
Positive Power & Influencing: To allow participants to learn and become aware of teamwork and increase their skills in using positive energy and influence to lead their team to achievement; Participants can use positive influences to promote their works and also build good relationships with colleagues.

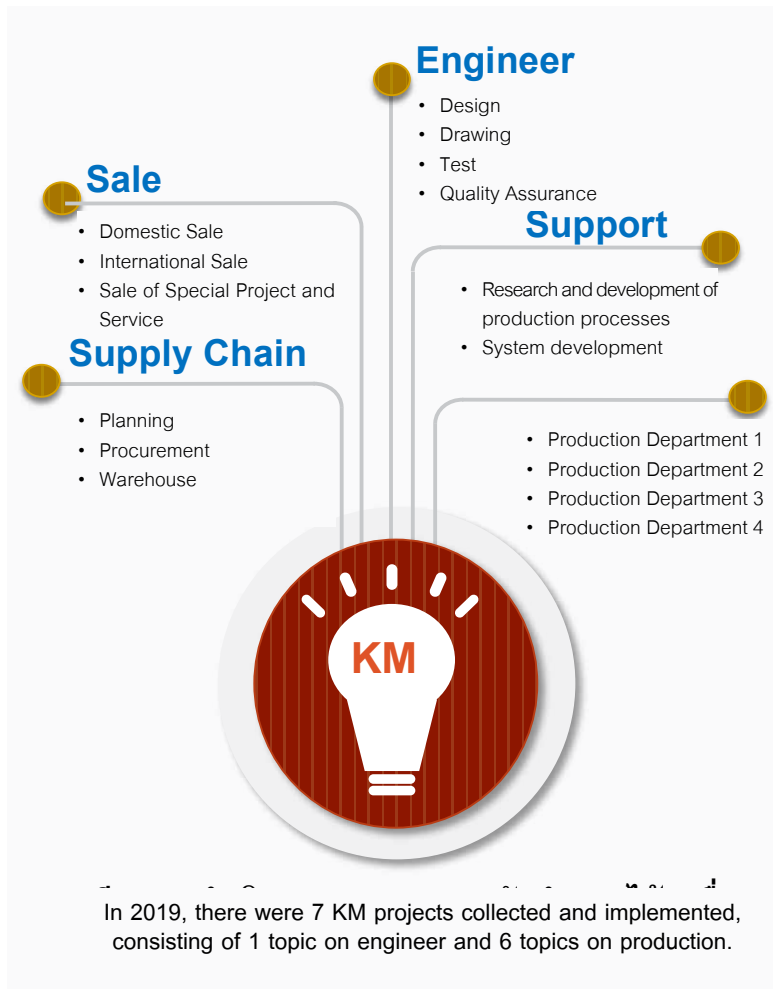
Leadership and Coaching Skills: To allow participants to understand how to develop themselves and others through coaching techniques, create an understanding on the role of coaching to executives, and enhance skills and effective coaching techniques

Excellent OJT Technique: To provide knowledge and understanding on their duties as a coach to operators based on the OJT procedures and develop on-the-job training skills efficiently

High Impact Presentation: To allow participants to have knowledge and understand principles of presentation and apply techniques to build self-confidence for effective presentation

Evaluation of skills development for lower level executives





E-Book



Clip VDO



Presentation



For over 20 years, QTC Energy (Public) Company Limited has manufactured and distributed quality transformers produced with the skills of personnel with knowledge and expertise of each process from long time experiences. Currently, the Company grows and establishes energy subsidiaries. Therefore, new generation of personnel joining to be a part of the organization has increased.

To apply “knowledge” of personnel, tacit knowledge from experiences, talents or instincts to understand things, including working skills, to convey to the new generation of personnel and the learning of employees in the organization, the human resources department has therefore collected, created, and distributed knowledge of the organization throughout the organization in order to extend knowledge, apply it for benefits, and create the culture of learning within the organization. Existing knowledge of personnel or documents is collected to develop into a system so that everyone in the organization can access such knowledge and develop oneself to be an expert and apply it to operations for effective and efficient knowledge.

Employee Care

The Company realizes that employees are the significant resource to drive the organization to the goal. Care and attention to both work and lifestyle of employees enabling them to create their own happiness is the important mission that the Company provides support in terms of personnel, time, and necessary resources under the happy workplace policy, <https://qtc-energy.com/happy-workplace-policy/?lang=th>, drives projects providing education and understanding through various promotional activities to be an appropriate option for each individual, sets a goal to create sustainable happiness, and creates a balance between life and work, including employee engagement and the lower turnover rate.

Goals



- Turnover rate of employees is lower than 1%.
- Happiness level of individuals in the organization is more than 75%.
- Satisfaction, engagement and life balance are more than 75%.

Performances



- Turnover rate in 2019 = 2.2%
- Happiness level of individuals in the organization in 2019 = 62.2%
- Satisfaction of 67.7%, engagement of 67.5% and life balance of 50.8%

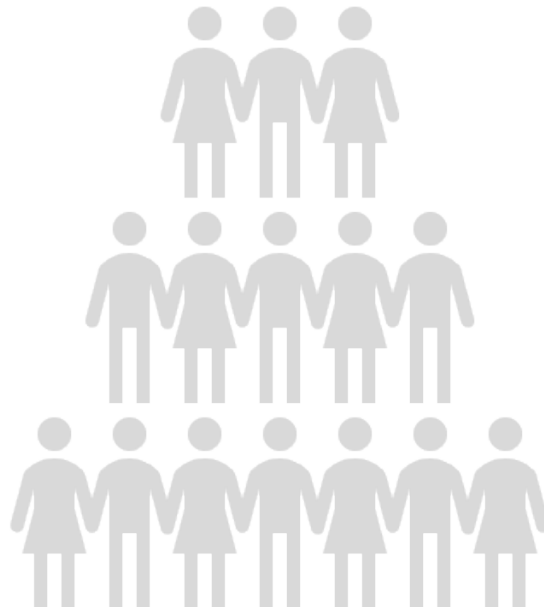
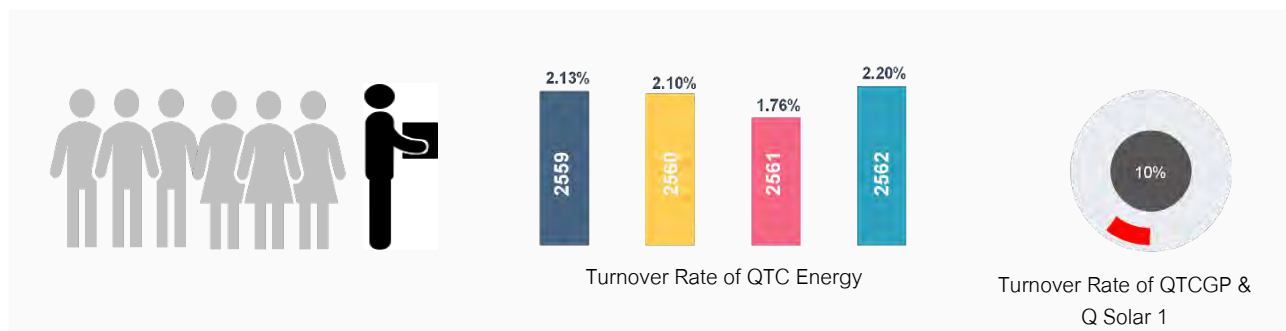


Table of Proportion of New Employment and Employment Termination

Item	QTC Energy								QTCGP & Q Solar 1	
	2016		2017		2018		2019		2019	
	Quantity (Person)	%	Quantity (Person)	%	Quantity (Person)	%	Quantity (Person)	%	Quantity (Person)	%
Number of Employees at the end of the year	208		209		245		265		30	
New Employees										
Male	24	63.16	40	62.50	58	73.42	81	92.05	4	80
Female	14	36.84	24	37.50	21	26.58	7	7.95	1	20
New Employees										
Age 18-35 Years	38	100.00	55	85.94	67	84.81	79	89.77	3	60
Age 36-50 Years	0	0.00	9	14.06	10	12.66	9	10.23	1	20
Age over 50 Years	0	0.00	-	-	1	1.27	-	-	1	20
Employment Termination based on Gender										
Male	37	67.27	34	62.96	31	65.96	59	89.39	2	66.67
Female	18	32.73	20	37.04	16	34.04	7	10.61	1	33.33
Employment Termination based on Age Range										
Age 18-35 Years	53	96.36	43	79.63	29	61.70	60	90.91	2	66.67
Age 36-50 Years	1	1.82	10	18.52	16	34.04	6	9.09	1	33.33
Age over 50 Years	1	1.82	1	1.85	2	4.26	0	0	0	0
Rate of Employee Resignation per Year %	2.13		21.0		1.76		2.2		10	

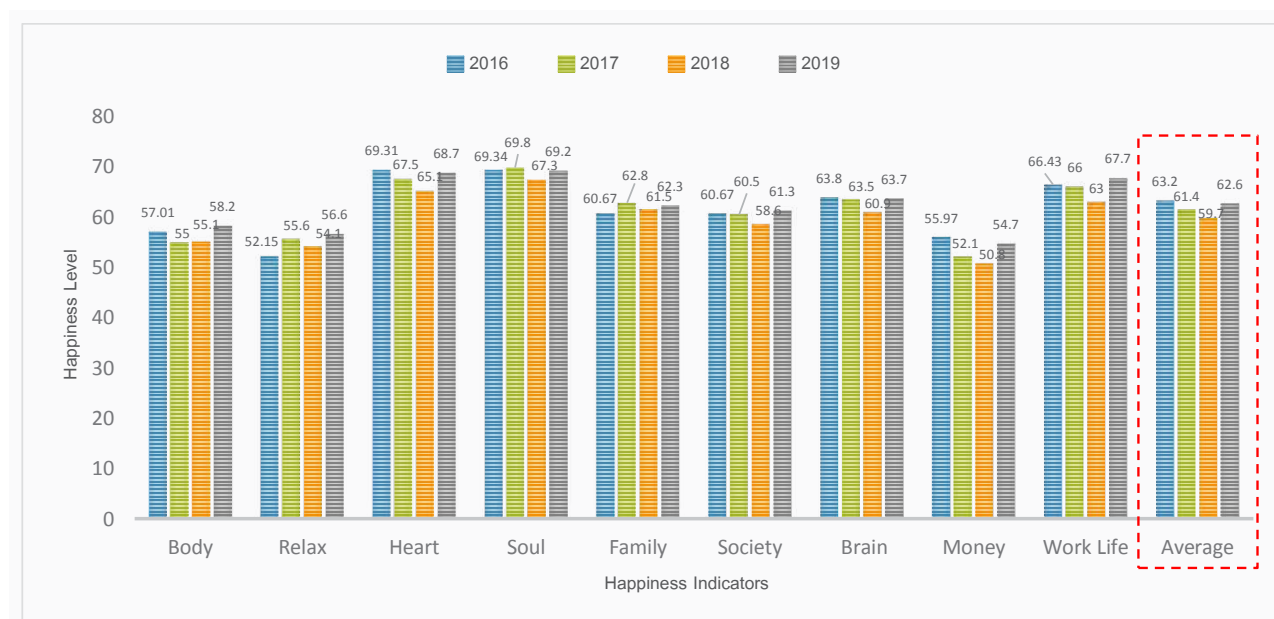


In 2019, there was the highest turnover rate of QTC Energy's employee in the past 4 years. Most of them were employees at Level 1-4 with less than 4 months of term of service. They were a group of new employees who work for a short term and change their mind to resign from the Company. However, the Company established the following improvement approaches;

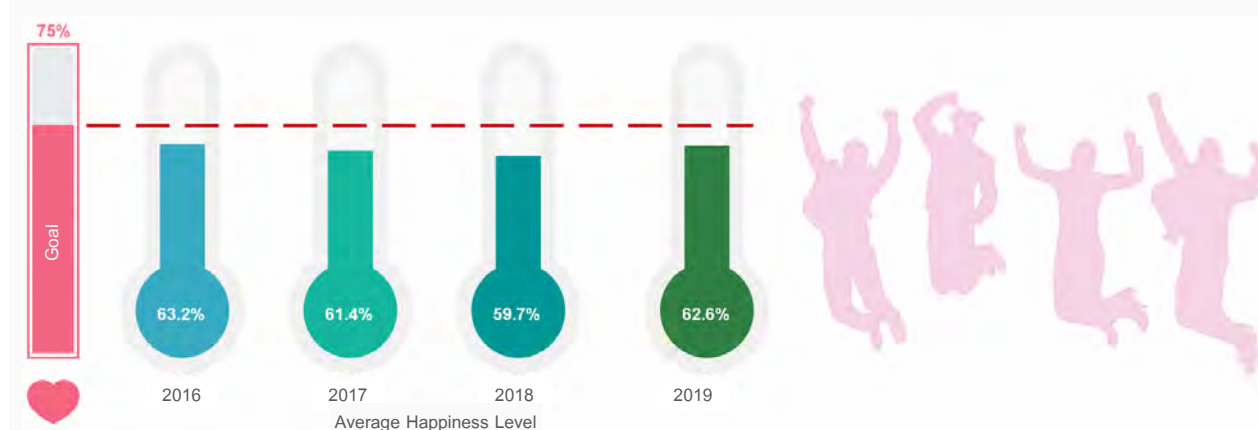
- Create a mentoring system to allow mentors to give advice and coach new employees closely during the probationary period
- Create a learning record for new employees to record and receive complete mentorship from mentors
- Provide knowledge in a form of simple learning to new employees so that they can learn more
- Encourage new employees to have more engagement in activities of meeting between executives and employees

Happiness Level of Individuals in Organization

The Company has continued measuring the happiness level of employees since 2016 by using the Happinometer tool. In 2019, the survey data was submitted (Survey in November, 2019) to the Thailand Centre for Happy Worker Studies, Institute for Population and Social Research, Mahidol University, in order to analyze the result of happiness in various dimensions, including satisfaction, employee engagement, and life balance of employees and to prepare the detailed summary report. The Company will apply them as a guideline to develop and enhance the happiness level of employees in the future.



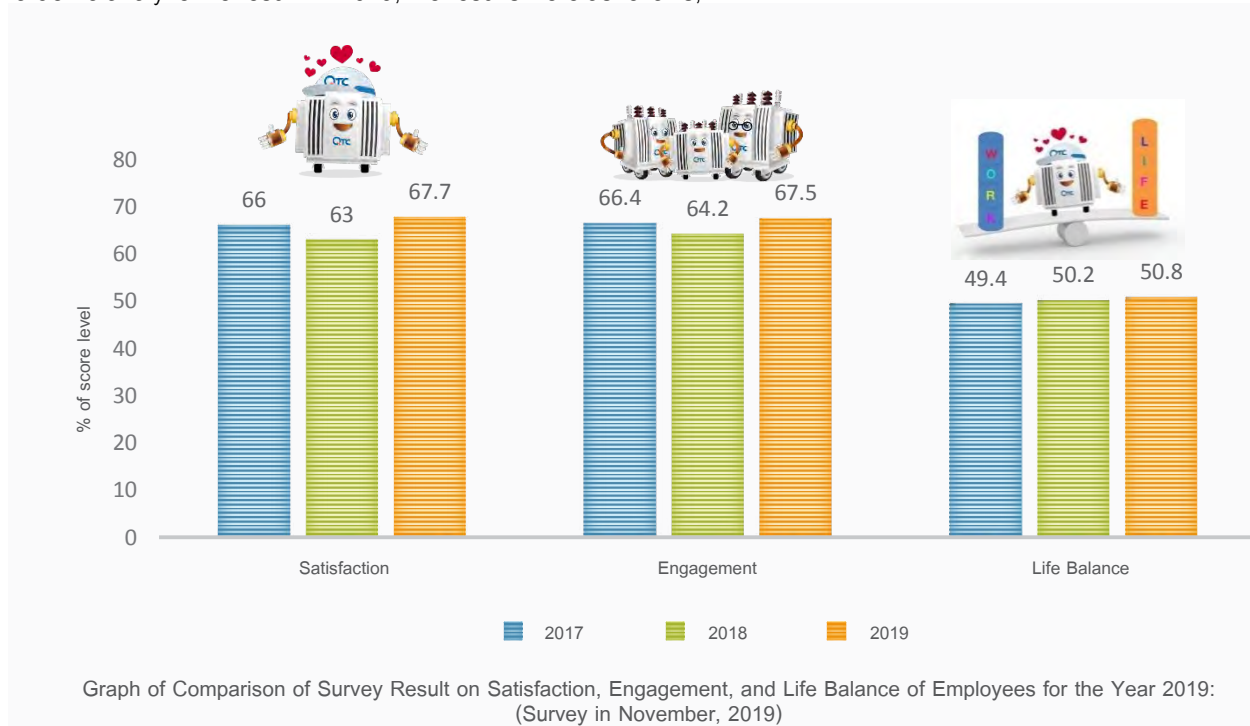
Graph of Comparison of Average Scores of Happiness based on Dimension (Organization Overview)
for the Year 2019: (Survey in November, 2019)



According to the overall happiness evaluation of 200 employee representatives out of 265 employees (only QTC Energy's employees), it was found that the average happiness level was 62.6%, which was in the "happy" level, slightly higher than that of the year 2018. The Company has performed the improvement according to the evaluation results in 2018, promoted activities and provided knowledge to employees. If each dimension is taken into consideration, it can be seen that the evaluation results are higher than those in 2018 in all dimensions. However, it has not achieved the goal of 75%. In 2020, the Company will expand the comprehensive happiness evaluation results in its subsidiary to cover all groups of employees.

Satisfaction, Engagement, and Life Balance

The Company conducts the measurement of satisfaction level, engagement and life balance of employee, including the measurement of the happiness level of employees by using the extension tool of Happinometer, and submits the data to the Thailand Centre for Happy Worker Studies, Institute for Population and Social Research, Mahidol University, in order to analyze the result. In 2019, the results were as follows;



According to the graph of the comparison of the survey result on satisfaction, engagement, and life balance of 200 employee representatives out of 265 employees, it was found that satisfaction, employee engagement, and life balance of employees increased slightly from the year 2018, which was in the “high” level (scores between 50-74.99). The goals in all aspects were 75%, which still have not achieved the goal. The Company still further considers the improvement of internal communication and team work.



Photos of Survey of Happiness of Employees to Submit Data to Institute for Population and Social Research, Mahidol University

Activity of Promotion of Happy Workplace Creation

The Company continues promoting activities in order to encourage employees to have positive attitudes towards themselves, colleagues, organization and society. Most activities are ongoing projects from last year to ensure continuity and sustainability.

“Happy Money, Good Life, No Debt, Free of Poverty” Project

From the previous year, a club called “Agriculture Lovers, Vegetables Plantation, Free Consumption with Savings” was established. Its operations were conducted in an area of approximately 1 Rai at the back of the Company. In 2019, it was expanded to a small empty area in the factory area where employees were able to supervise it more closely. The operations were still involved in vegetables and fruits plantation that produce products in a short term in order to share with employees. In addition, employees were still able to harvest products for consumption and cooking in daily life. This could help them save the expenses on buying vegetables and expenses on traveling to the market. Moreover, leftovers were used to ferment and make natural fertilizers, which could be used to nourish the soil for vegetables plantation in plots without using chemicals. As a result, it can be said that products are 100% organic vegetables.



Activity of Promotion of Happy Workplace Creation

Activity of Morality and Ethics Promotion for the Year 2019

The Company still pays attention to and promotes the practices of employees with morality and good ethics so that they can be a “good people” and take responsibility for themselves and surrounding people through activities, for example,

“Being a good people with positive thinking and good deeds, having concentration on works, and perfectly handling with problems”

Happy Soul



Photos of Annual Merit Making Activity of QTC Energy

Photos of Dharma Lecture by
Phra Maha Sompong @ Q Solar 1

Photo Contest Activity to Promote Family Institution for the Year 2019

“Don’t care about other people than your family.
Don’t spoil yourself and forget that your family is also
important.”

“Happy Family”



“Happy family”
Sumet Ninsonthi



“Love mom the most because she is my
most beloved one.”
Bunnapa Kongsirirat



“Love dad the most because he is my
most beloved one”
Chorphaka Kanphaipheun

Employee Value Promotion for the Year 2019

In 2019, the Company granted honorable certificates to 4 employees who performed good deeds as a model. There were no cases showing that employee lost their properties and did not get them back. In addition, the award was given to 3 employees who have completed 10 years of service.

QTC Praised Good People.



Boonsong Plodplid



Aon lamchiam



Patimakorn Singkaew



Wittaya Phanthama

10 Years of QTC



Thanaphat Mingsakun



Patthaphan Panyo



Withun Klinkaysorn



Annual Recreation Activity for the Year 2019

Amount of “happiness” does not depend on the amount of “good things” we receive, but it depends on our “perspective” towards “those things”.

“Happy Relax”



ปริมาณของ “ความ
แต่อยู่ที่

Annual Company Outing

In 2019, the Company arranges the budget for annual group outing to promote team work and happily living together. In addition, additional activities were organized by volunteering employees. They participated in the sea grass planting on Mun Island in Rayong Province. There were 113 employees participated in the activity held during June 8-9, 2019 at The Toy Art Resort, Klaeng District, Rayong Province The total budget was 448,610 Baht.



Photos of Annual Company Outing in 2018

New Year's Eve Activity

In 2019, the Company held the New Year's Eve activity in the form of Sport Day activity by renting an outdoor location near the factory to organize the sports competition and a party during the daytime on December 26, 2019 at the Khamchu Stadium. There were 271 participants and the operating expenses were 641,501 Baht.



Satisfaction Survey Results of Participants



Corporate Social responsibility

Love, Unity, Compliance with Specified Rules, Generosity to Colleagues,
Communities and Society, “Starting from Ourselves”

Happy Society



The Company still pays attention to issues on corporate social responsibility by applying practices based on ISO26000 standard to the context of the organization. Currently, the Company has appointed personnel responsible for the management of corporate social responsibility as stipulated by laws. The use of the budget for operations of corporate social responsibility will be approved for the annual budget from the Board of Directors so that the operations are flexible and in accordance with the economic situations of the Company. In addition, transparency of operations is inspected by auditors. There are 2 operations on corporate social responsibility as follows; participation in community development and social activities and social investment and social activities. The objective is to build the credibility of stakeholders.

“To build credibility of stakeholders” is still an important strategy that the Company has applied to operations through various activities with external stakeholders in community area so that people in the community are confident that the Company will not cause trouble and be ready to jointly develop areas for public benefits. Important activities that have been carried out continuously every year include “Community Forum with QTC”, which is to open the factory and allow community leaders, villagers and other stakeholders in areas to listen to the operating results of the Company in the past year and performances from the issues suggested by the community in the previous year, as well as listen to new suggestions of the community on the issue that QTC can support. **The goals of the operation are as follows;**

Goals



- The number of projects successfully participated in community development is more than 80% (Projects proposed by the community).
- Zero complaints from the community regarding the impact from the Company’s business operations

Performances



- There are three 100% successful projects proposed by the community.
- No complaints from the community



Community Forum with QTC 2019

In 2019, the Company organized the activity of “Community Forum with QTC” on September 9, 2019. It was organized in the form of an exhibition of social and environmental performances and a small group meeting. In addition, Professor Saneh Srisuwan was invited to give a lecture on “Building Good Health by Yourself” to forum participants. There were 120 participants in the forum. The operating budget was 62,068 Baht. The topics of the forum to be carried out in 2020 are the organic vegetables plantation project for students in the community to consume for lunch and the science camp project.



Photos of “Community Forum with QTC” 2019 Activity

Q Solar 1 Open House, Creating Community Relationship

Q Solar 1 Company Limited, a subsidiary of QTC Energy, is aware of the importance of management and disclosure of environmental information and social responsibility. In 2019, the Community Forum with QTC approach was applied and optimized to the context of the organization by holding the activity of “Q Solar 1 Open House, Creating Community Relationship” for the first year. All stakeholders around the power plant were invited to visit and observe operations of the power plant operation. Environmental performance and operations on corporate social responsibility were reported. They also exchanged ideas with senior executives. In addition, Phra Maha Sompong Talaputto was invited to give dharma speech. Social Health Enterprise (SHE) Team also provided the services of physical massage and manipulation and physiological arrangement to all participants. There were 98 participants who were villagers around the power plant on June 16, 2019. The total operating budget was 99,294 Baht.



“Volunteer Service for Protecting Religious Places” Project

“Volunteer Service for Protecting Religious Places” Project in honor of the auspicious year of the royal coronation ceremony and honoring Her Majesty Queen Suthida Bajrasudhabimalalakshana is a project that has been approved by the Royal Volunteer Spirit Center 904 WorPorRor. (SorAor.JorAorSor. 904 WorPorRor.). Its objectives are to enhance safety, minimize risks that may cause a fire from the electrical system, buildings and constructions, and prevent loss of life and property of important religious places in provinces according to the project implementation guidelines of the Ministry of Industry in response to the “Volunteer Service for Protecting Religious Places” Project. Regarding the inspection of the safety of electrical system in the premises of Rayong Province, QTC, which has experts in electrical system, participated in the Project and took responsibility for 4 temples in Map Yang Phon Sub-District. A working group of 5 persons was assigned for the implementation. One of these persons was a professional engineer who was authorized to sign as an electrical system inspector according to the law. The budget for procurement of electrical equipment for improvements was 20,000 Baht. The operations were as follows;

- | | |
|----------------------------------|-----------------------------------|
| 1. Wat Map Toei | Implemented on September 24, 2019 |
| 2. Wat Map Yang Phon | Implemented on September 25, 2019 |
| 3. Wat Rat Assadaram (Saphansee) | Implemented on September 25, 2019 |
| 4. Wat Huay Prab | Implemented on September 25, 2019 |



According to the electrical system inspection, if there are any problems that can be resolved, the team will take action immediately. Suggestions for improvement are also provided, including the evaluation and inspection form signed and certified by the professional engineer, to Rayong Provincial Industry Office and 4 temples. In some improvement issues requiring high budgets, the Company will propose executives to further prepare the temple renovation project in 2020

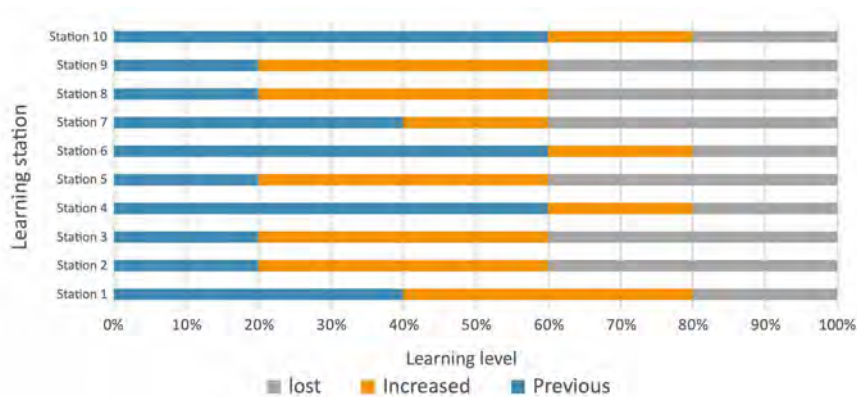
“Science and Technology Camp” Project

It is a project originated from the Forum 2018. Mampangphong Witthayakhom School, which is the only opportunity expansion school for students in Grade 1-3 in Mampangphong District, requires students to have the opportunity to learn and experience the practical learning of science and technology. The School saw that QTC had knowledgeable and skillful personnel and could support students' learning through the Science Week Activity in 2019. Therefore, QTC sought for cooperation from educational institutions. The Company cooperated with a group of professors and students of the Department of Electrical and Computer Engineering at King Mongkut's University of Technology North Bangkok to organize a science and technology learning camp in order to create fun learning and experiences that can connect scientific principles to daily life. This activity was held on August 16, 2019 at Mampangphong Witthayakhom School, Map Yang Phon Sub-District, Pluak Daeng District, Rayong Province, with 3 professors, 15 students and 2 QTC employees. There were 340 students participating in this activity. The operating budget was 29,012 Baht. There were 10 learning stations as follows;

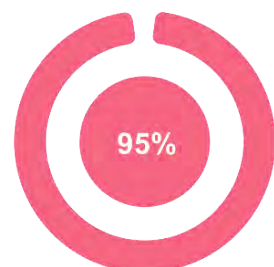
1. Hanoi Tower Station
2. Gyroscope Station
3. Tangram + 3D Station
4. Magnetic Station
5. Tesla Coil Station
6. Pulley and Beam Station
7. Jumping Ring Station
8. Van Der Graaf Station
9. Plasma Ball Station
10. Microscope from Phone Station (Tin World)



Evaluation of Knowledge and Understanding of Students Participating in Activity



Satisfaction of Activity Participants



“Promotion and Development of Life Quality of Disabled” Project

In 2019, the Company still participated in “Promotion and Development of Quality of Life of Thai people with Disability” Project by providing vocational trainings, courses, animal husbandry (Laying hen) and breeder supporting, including greenhouses to 2 disabled persons. The Company used the subsidy for vocational trainings in the amount of 219,000 Baht through the implementation of the Project which was responsible by the Thai Chamber of Commerce. The operating results in 2019 were as follows;

Table of Evaluation of Project's Achievement

First name-Last Name	Income of Disableds Prior to Project Participation	Costs from Laying Hen Husbandry of Disableds/ Month	Income from Laying Hen Husbandry of Disableds/ Month	Income After Deducting Expenses /Month
1. Mr. Boonchuay Thongchin - Physical Disability - 4 Moo.2, Ban Nong Bua Khai, T.Rang Bua, A.Chom Bueng, Ratchaburi Province, 70150	- Income from elderly allowance of 600 Baht - Income from disabled allowance of 800 Baht Total Income of 1,400 Baht/ Month	-Cost of 50 hens = 12,500 Baht -Cost of hen feed = 12,500 Baht - Cost of materials for henhouse and hen husbandry equipment for hen husbandry, vitamins for hens = 12,000 Baht Total Cost of 37,000 Baht/ 6 Months =6,166 Baht/Month	July-2019, Income of 250 Baht August-2019, Income of 2,500 Baht September-2019, Income of 2,500 Baht October-2019, Income of 2,700 Baht	-Cost of hen feed per 1 day, Feed used of 3.5 kgs a day with 16.67 Baht/kg, $16.67 \times 3.5 = 58$ Baht/Day Income from egg sales-40 eggs/day $\times 2.8 = 112$ Baht Income from egg sales per day = 112 Baht – 58 Baht = Profit of 54 Baht/Day Egg sales – 112 Baht $\times 30$ Days = 3,360 Baht/Month Cost of hen feed = 58 Baht $\times 30$ Days = 1,740 Baht/Month Profit: 3,360-1,740 = 1,620 Baht/Month
2. Ms. Nakanya Kongtha - Physical Disability - 4 Moo.1, Ban Rang Dok Ao, T.Rang Bua, A.Chom Bueng, Ratchaburi Province, 70150	- Income from disabled allowance of 800 Baht Total Income of 800 Baht/ Month		July-2019, Income of 274 Baht August-2019, Income of 3,645 Baht September-2019, Income of 3,690 Baht October-2019, Income of 5,296 Baht	

The Company visited the area to survey the achievement of the Project. The results can be clearly seen as detailed in the table. Such operation was a substitute for the payment of contributions to the Fund for Promotion and Development of Life Quality of Disabled for the year 2019 according to the Persons with Disabilities' Quality of Life Promotion Act. In 2020, the Company will continue supporting through the Project as the obtained results are valuable and tangible.



Procurement Project in Community

Ban Manut Lor (Business relating to person with disabilities)

It is an ongoing project based on the discussion of the year 2017-2019. The Company continues promoting products from the disabilities groups in the “Ban Manut Lor” community by purchasing remnant of cloth products for the purpose of wiping and cleaning. However, the number of purchase orders decreased because the Company had a policy to reduce the use of remnant of cloth in order to minimize the quantity of contaminated waste. In 2019, the amount of purchase orders was 23,400 Baht.



Processed Products in Community

In 2019, the Company procured preserved pineapple paste, which was the processed product of a housewife group in Map Yang Phon Sub-District, in order to be used as a birthday gift set for all employees and to promote the careers of people in the community. In 2019, the purchase orders amounted to 23,520 Baht.



Project of Electricity Poles and Power Cables Improvement and New Meter Transfer in Ban Bo Thong Community

According to the discussions between community leaders and Q Solar 1 executives, it was found that there were some electricity poles using bamboo and wooden poles at the low level along the route from the main road to the village and the power plant, which may cause hazard to passersby. In addition, regarding the entrance and the exit for trucks traveling to the power plant, power cables must always be lifted to avoid the roof of trucks. According to such problem, it was mutually agreed that the power line system of the Q Solar 1 power plant would be renovated. The power plant would be responsible for all operations and expenses themselves at its own cost for benefits of people in the community and the power plant. The power plant coordinated with the Prachinburi Provincial Electricity Authority to reinstall poles and transfer power cables and meters of villagers. Such operation completed and the total budget was 99,738.98 Baht.



Regarding the investment for society, QTC has assessed and realized that the Company has not been ready to conduct the investment for society directly or make it become one of the Company's businesses. As a result, the Company has established guidelines for social investment by purchasing products and using services from businesses for society. In 2019, the operations were as follows;

- **Social Health Enterprise (SHE):** The Company invested in this enterprise by purchasing the services of physical massage and manipulation and physiological arrangement for providing the services of physical massage and manipulation to people in the community, customers, employees and other stakeholders in order to build good relationship instead of giving away souvenirs. In 2019, the total operating expenses of QTC Energy and Q Solar 1 were 56,630 Baht.



Services of physical massage and manipulation, Forum 2019



Services of physical massage and manipulation, Q Solar 1 Launch Event



Services of physical massage and manipulation, MAI Forum 2019

- **Sohgood Social Enterprise Company Limited** operates the business of selling foods made from organic vegetables and fruits. It aims to help farmers sell organic products and herbs, which are certified by standards, under the "SohGoood" trademark. All products have a QR Code. Just scan it and information of a farmer who plants the product and the area where it is planted will be shown. QTC helped support "Sun-dried Banana" products and used them as a souvenir for customers and general individuals in the seminar and various activities of the Company instead of making a gift. The total amount of purchase



Social Activity

Regarding activities or donations or sponsorships, the Company has applied the method to consider priorities, analysis on necessity, reasons for requesting activities or donations, including consideration of the ability of the Company in organizing activities or donations or sponsorships under the anti-corruption policy and the specified budget. Important activities and donations in 2019 were as follows;

“QTC Love Children’ 62” Activity

It was an activity that the Company held regularly every year. It was held circularly at schools in the community as specified by Map Yang Phon Sub-District Administration Office. In 2019, it was held on Saturday, January 12, 2019 at Ban Map Yang Phon School, Map Yang Phon Sub-District, Pluak Daeng District, Rayong Province. The budget for the activities was 32,188 Baht. There were 5 QTC employees volunteering to take care of children.



Photos of “QTC Love Children’ 62” Activity at Ban Map Yang Phon School

Tesla Coil Donation: Sansara Camp

The Company donated Tesla coil for using in a volunteer camp which offered opportunities to students in remote areas to experience and learn about science and technology. It was operated by a group of professors and students of King Mongkut’s University of Technology North Bangkok under the Sansara Project. In 2019, Sansara Volunteer Camp @ Nam Nao 11.0 was organized at Ban Huay Ya Khrua School, Nam Nao District, Phetchabun Province. The procurement budget was 45,000 Baht. CSR team was the Company’s representative for such donations on December 13, 2019.



Photos of Tesla Coil Donation to Sansara Camp @ Nam Nao 11.0

Activities in Ruamjai Pheenong Soo Thongthin Project: “Providing Learning to Children in Ban Pang Nam Thu”

It was the activity that the Company provided continuous sponsorship. Such activity derived from the unity of employees having similar birthplaces to create activities for hometown development. They requested sponsors from the Company and colleagues in the Company to carry out the activities for achieving the goals. This activity aimed to train employees' skills in project management and create participation, unity, generosity, including awareness on social responsibility.

In 2019, Mr. Samran Khankaew, a steel core production employee and his team, established the “Providing Learning to Children in Ban Pang Nam Thu” Project in Doi Saket District, Chiang Mai Province. There were 31 QTC volunteer employees participating in the activities as follows;

1. Providing 3 sets of 55-inch TVs with equipment for using in distance learning by satellite
2. Painting 2 school buildings and canteens
3. Fixing the school's water supply system, changing faucets and damaged equipment

The budget was divided into 2 parts.

Part supported by the Company based on the policy	42,280 Baht
Part donated by executives and employees	52,759.25 Baht



ที่ รย ๗๒๔๐๔/ ๒๕๕



ที่ทำการองค์การบริหารส่วนตำบลมายางพร
ถนนปลวกแดง-หัวยปราบ รย ๒๑๑๔๐

๒๕ มกราคม ๒๕๖๓

เรื่อง ขอร้องเรียนด้านสิ่งแวดล้อม

เรียน กรรมการ/ผู้จัดการบริษัท คิวทีซี เอนเนอร์ยี จำกัด (มหาชน)

อ้างถึง หนังสือบริษัท คิวทีซี เอนเนอร์ยี จำกัด (มหาชน) ที่ CSR ๒๑๐๐๐๑ ลงวันที่ ๖ มกราคม ๒๕๖๓

ตามที่อ้างถึง บริษัท คิวทีซี เอนเนอร์ยี จำกัด (มหาชน) ใบอนุญาตประกอบกิจการเลขที่ จ ๓-๗๑-๑/๔๐ รย โรงงานตั้งอยู่เลขที่ ๑๔๙ หมู่ที่ ๒ ตำบลมายางพร อำเภอปลวกแดง จังหวัดระยอง ดำเนินกิจการเกี่ยวกับการผลิตหม้อแปลงไฟฟ้า ได้สอบถามข้อมูลเกี่ยวกับข้อร้องเรียนด้านสิ่งแวดล้อมที่เกิดจากการดำเนินงานของบริษัทฯ ในระหว่างวันที่ ๑ มกราคม ๒๕๖๒ ถึง ๓๑ ธันวาคม ๒๕๖๒ นั้น

ในการนี้ องค์การบริหารส่วนตำบลมายางพร ได้ตรวจสอบข้อมูลแล้วพบว่าในระหว่างวันที่ ๑ มกราคม ๒๕๖๒ ถึง ๓๑ ธันวาคม ๒๕๖๒ บริษัท คิวทีซี เอนเนอร์ยี จำกัด (มหาชน) ไม่มีข้อร้องเรียนด้านสิ่งแวดล้อมจากชุมชนรอบข้างแต่อย่างใด

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายชาติรี เงินท้วม)

นายกองค์การบริหารส่วนตำบลมายางพร

กองสาธารณสุขและสิ่งแวดล้อม

โทร. (๐๓๘) ๐๒๖ ๘๒๘ ต่อ ๑๑๕

โทรสาร (๐๓๘) ๐๒๙ ๐๐๐

“ยึดมั่นธรรมาภิบาล บริการเพื่อประชาชน”

QTC พร้อมเคียงข้างตลอดเวลา
ดูแลหม้อแปลงไฟฟ้า 24 ชม.



QTC
QTC ENERGY PCL.

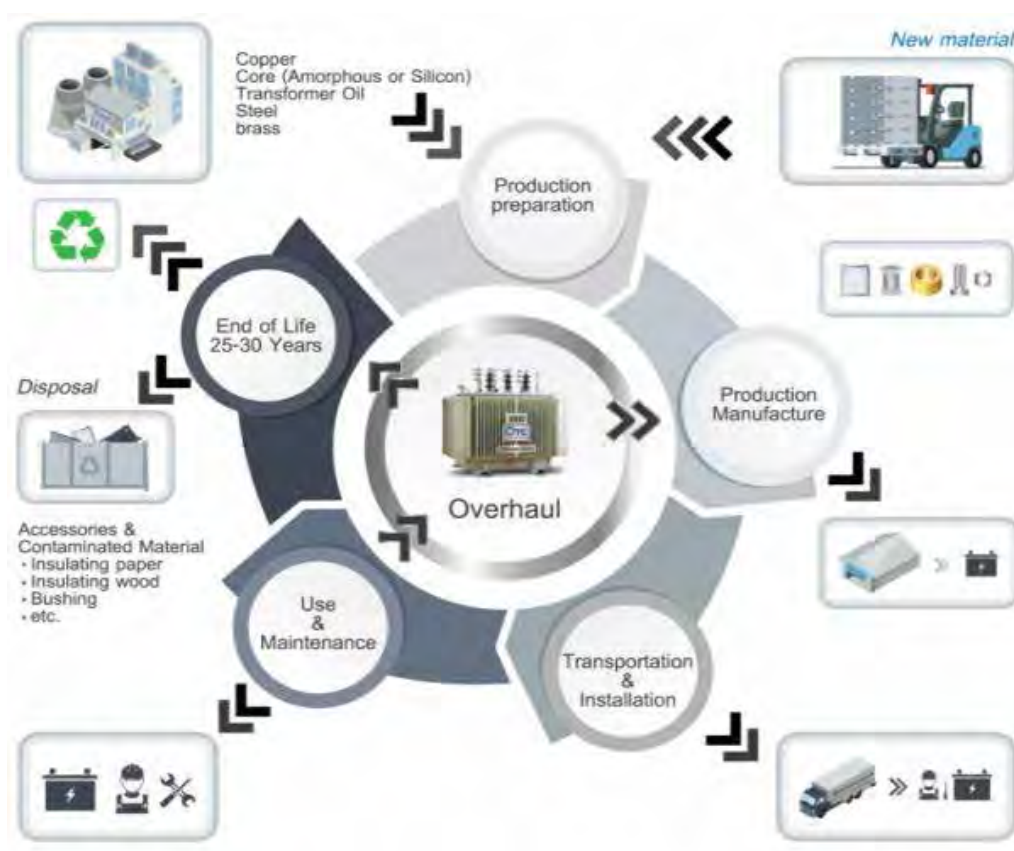


The Company places importance on environmental impacts directly and indirectly caused by the Company's business operations. The Company applies a "Build Sustainable Green Culture" strategy in the organization by designating environment, energy and organization carbon footprint policies http://qtc-energy.com/?page_id=813 by applying ISO 14001 environmental management standards, energy management with ISO50001 energy management standards, greenhouse gas management with ISO14064-3 standards and Thailand Greenhouse Gas Management Organization (Public Organization) standards (TGO) including specifications of related laws. The Company also supports modifying work processes to reduce environmental impacts and creating a sustainable green culture.

Return Policy for Product Remains

"When QTC transformers are expired, customers can return transformer remains to QTC's production factories to enter the separation process and product remains will be sent for proper disposal at no expense to customers. However, the Company requires written consent from customers because QTC transformers are considered the legal property of customers and customers must deliver QTC transformers to the QTC production factories in Rayong in person."

QTC Transformer Product Life Cycle



In 2019, no expired transformers were sent for disposal at QTC's Factories in Rayong

Waste and Disused Material Management: Waste

The Company places importance on managing waste created by employees' consumption and from construction contracting work or equipment installation including the Company's production and service processes. The Company has clear waste sorting processes, a waste sorting facility that meets safety standards. Furthermore the Company has procedures in place for mitigating emergencies specifically involving waste management. The Company also pays attention to selecting only waste disposal companies licensed by the Department of Industrial Works. In addition, the Company regularly monitors and checks the performance of the waste disposal company, because waste and disused material management is considered an issue of interest for stakeholders and a risk for the organization's reputation. Thus, waste management must be accurate in compliance with the law and caution must be exercised in operations with the following performance goals:

Goals



- Reduce the volume of disused materials from production sent for disposal by one percent from 2018.
- Zero waste sent for disposal by landfill.

Performance



- The volume of disused materials from production sent for disposal was reduced by 29.40 percent from 2018.
- The Company successfully sent zero waste to landfills (100%).



List of Waste and Scrap Collection, Transportation, Treatment and Disposal Operators of QTC in 2018

Thai Hsing Hydrocarbon Co., Ltd.

Disposal:	Used transformer oil without PCB elements.
Method:	049, Recycle for other uses.

Akkhie Prakarn PCL.

Disposal:	Contaminated containers, used inkwells, contaminated garbage, degraded paint, wastewater from washing paint spraying containers, lead- and copper-contaminated wastewater, used grease, particles from welding/sharpening/cutting, oil-contaminated water, construction waste, used silica gel and oil filters.
Method:	075, Incineration in special incinerators for hazardous wastes.

Professional West Technology (1999) PCL.

Disposal:	Cup scraps, batteries.
Method:	073, Safe land-filling after stabilization or compacted into solids.
Disposal:	Glue scraps, cloth scraps and sawdust contaminated with oil, silica gel.
Method:	042, Make mixed fuel.

Chok Sahaphat & Supply Co., Ltd.

Disposal:	Wood, electrical cables and waste which can be incinerated such as RDF, plastic packages, copper, steel, paper and lathe.
Method:	011, Sort for redistribution.

One More Link Co., Ltd.

Disposal:	Empty spray cans, used light bulbs, chemical-contaminated wastewater, expired light bulbs.
Method:	049, Reuse by other means.
Disposal:	Sharpening stones.
Method:	Alternative material in cement incinerators.

Eastern Seaboard Environmental Complex Co., Ltd.

Disposal:	Contaminated containers, contaminated materials, used grease, oil-contaminated water, empty spray cans, expired light bulbs, mixed sawdust, electronic waste.
Method:	049, Reuse by other means, 042, Make mixed fuel.
Disposal:	Sharpening stones.
Method:	044, Alternative material in cement incinerators.

Thong Wattana Waste Management Co., Ltd.

Disposal:	Scrap paper (including cardboards), wood scraps (including sawdust), plastic scraps, 15-liter plastic barrels, paper cores, wires, contaminated containers.
Method:	049, Reuse by other means. 011, Sort for redistribution.

TKSP Oil Co., Ltd.

Disposal:	Used transformer oil without PCB elements.
Method:	049, Recycle for other uses.

"Waste (waste) transportation and disposal is performed in Thailand and not transported overseas for disposal".

"The operations of the Company and disposal service providers in 2019 were compliant with legal specifications and incurred no fines".

Disused Material Disposer Evaluation

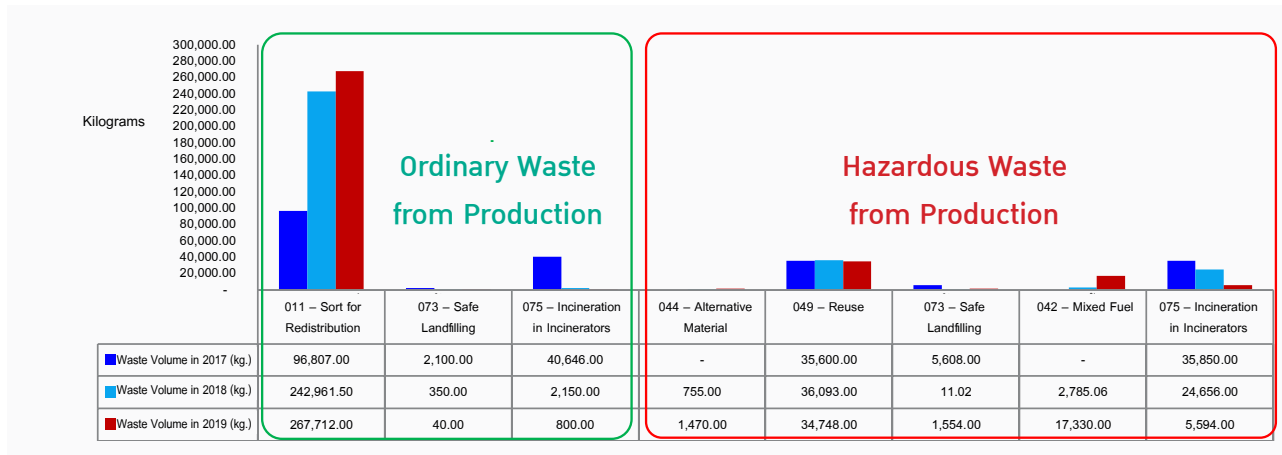
In 2019, the Company evaluated disused material disposers to register two new disused material waste disposers consisting of:

- **Thong Wattana Waste Management Co., Ltd.**
Factory Registration No. 3-105-42/48 Ror. Yor.
Disposer's No. DIW-D-064800030
- **TKSP Oil Co., Ltd.**
Factory Registration No. 3-106-27/53 Chor. Bor.
Disposer's No. DIW-D-100900034



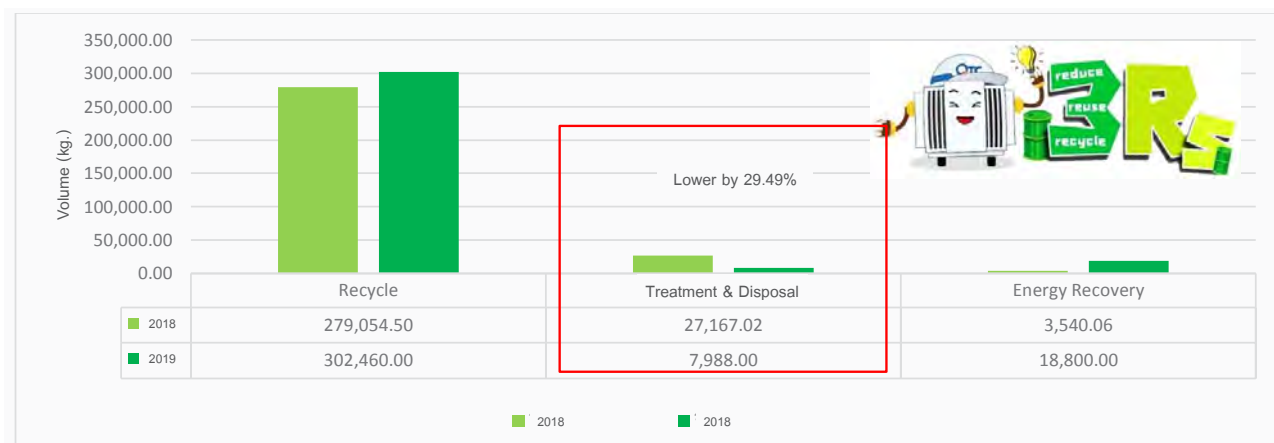
Table Showing Volume of Disused Materials from Production in 2017 – 2018

Waste Type	Disposal Method Code	Disposal Method	2017			2018			2019		
			Waste Volume (kg.)	Expenses (Baht)	Income (Baht)	Waste Volume (kg.)	Expenses (Baht)	Income (Baht)	Waste Volume (kg.)	Expenses (Baht)	Income (Baht)
Ordinary Non-hazardous Waste	011 Sort for Redistribution	Sort for redistribution.	96,807.00	379,741.66	5,922,198.04	242,961.50	359,676.40	7,247,973.39	267,712.00	348,152.00	7,094,271.41
	073 Safe Land-filling	Safe land-filling after stabilization or compacted into solids.	2,100.00			350.00			40.00		
	075 Incineration	Incineration in special incinerators for hazardous wastes.	40,646.00			2,150.00			800.00		
Hazardous Scrap Materials (Waste)	044 Alternative Raw Material	Alternative raw material in cement incinerators.	-			755.00			1,470.00		
	049 Reuse	Recycle for other uses.	35,600.00			40,688.00			34,748.00		
	073 Safe Land-filling	Safe land-filling after stabilization or compacted into solids.	5,608.00			11.02			1,554.00		
	042 Mixed Fuel	Make mixed fuel.	-			2,785.06			17,330.00		
	075 Incineration	Incineration in special incinerators for hazardous wastes.	35,850.00			24,656.00			5,594.00		
Total Waste Volume for the Year			216,611.00			314,356.58			329,248.00		



Graph Comparing Volume of Disused Materials from Production in 2017-2018

According to the table and graph comparing disused material volumes from production from 2017 to 2019, waste management can be seen to be more effective. The Company was able to sort disused materials and sell (recycle) disused materials for 23.41 tons more than 2018. In addition, the Company was able to sort 15.26 tons more disused materials for disposal by making mixed fuels (energy recovery) and the Company sent 19.18 tons less disused materials for treatment and disposal than 2018, causing treatment and disposal expenses to be 3.26 percent less than 2018 or a reduction of 11,724.40 baht.



Graph Comparing Disused Material Management in 2018 – 2019

From the graph, in 2019, disused material management from production based on the 3Rs can be seen to be better than 2018. Only 7,988 kg of disused materials were sent for treatment and disposal, a reduction from 2018 by 29.49 percent, which exceeded goals.



Zero Waste to Landfill

Concerning management of disused materials disposed by safe landfilling, in 2019, the Company was able to comply with the Zero Waste to Landfill criteria at 100 percent. The Company sent 1.60 tons of disused materials exempt from disposal by landfilling according to criteria. Landfilling was carried out by Professional Waste Technology (1999) PCL and Eastern Seaboard and Environmental Complex Co., Ltd.



Images of Disused Materials Being Landfilled Based on Zero Waste to Landfill Exceptions

Disused Solar Panel Management

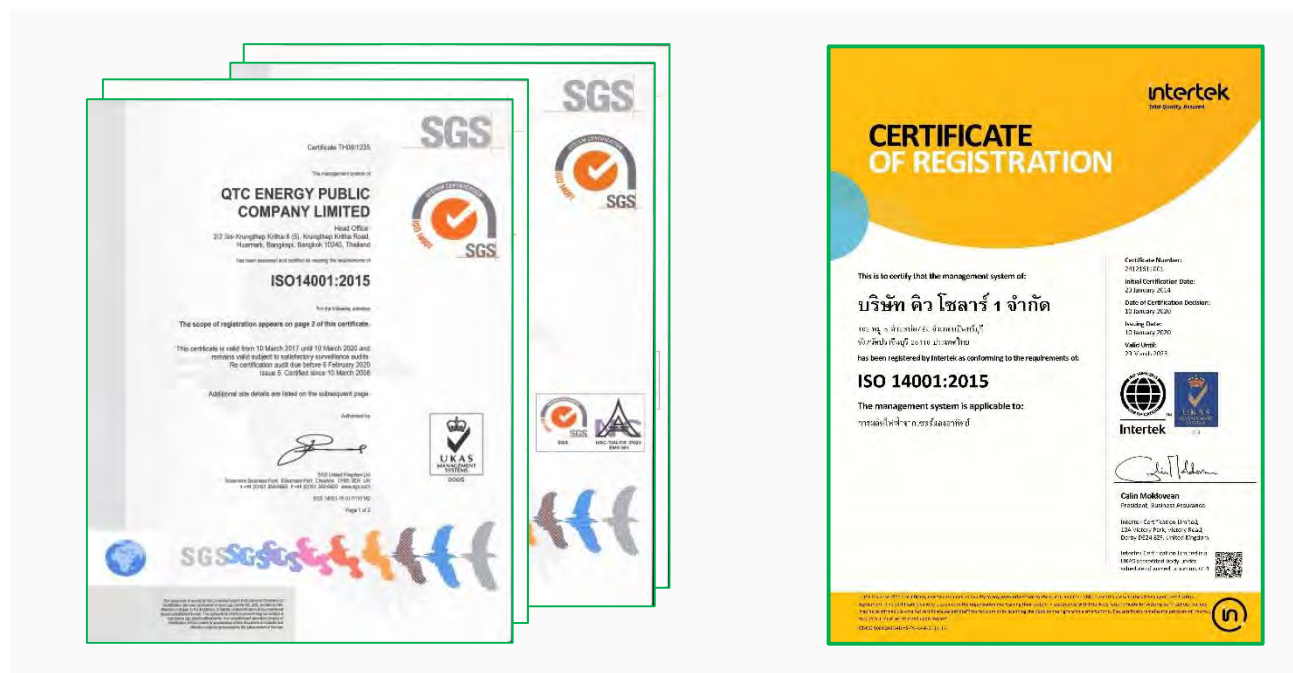
In 2019, Q Solar 1 Co., Ltd. did not send solar panels for disposal, because BOI rights were exercised, causing the Company to extend disused material storage time extension pursuant to the law.

Environmentally-Friendly Production Processes and Products

The Company places importance on environmental impact from the production and service processes of the Company and subsidiaries. The Company implemented the ISO14001 environment management system and made continual developments covering every production, service and office work process. In addition, the Company applied for accreditation to build confidence among stakeholders that the Company and subsidiaries will control and eliminate processes with potential impact on the environment, society and communities with the following performance goals:

Goals	Performance
<ul style="list-style-type: none"> Procure at least two items of Green Label office supplies to replace old supplies in 2019. Environment test results related to business processes are consistent with legal requirements. 	<ul style="list-style-type: none"> The Company was able to procure three Green Label office supply items to replace old materials. Environment test results (water quality, air quality) meet legal requirements.

The ISO14001 environment management system is evaluated by an external auditor once per year. QTC Energy tested systems and asked to be accredited by SGS (Thailand) Limited. Q Solar 1 tested systems and asked to be accredited by Intertek Certification Limited.



ISO14001:2105 (UKAS & NAC)
Standard System Accreditation Document
QTC Energy

ISO14001:2105 (UKAS)
Standard System Accreditation Document
Q Solar 1

Green Procurement

The year of 2019 was the first year when the Company began to have policy to procure environmentally-friendly production materials and office supplies. The Company considered and selected products with the Green Label to support manufacturers who give importance to reducing environmental impacts and build awareness among employees for all employees to see that every person and every process can directly and indirectly reduce environmental impacts. In 2019, the Company procured office supplies with the Green Label to replace three items of old supplies valued at 177,172.12 baht consisting of:



Item	:	70-Gram Copying Paper
Office Supply Code :	:	0016
Trademark	:	Shih-Tzu
Procurement Value	:	66,346.00 baht



Item	:	Eraser Product, Model ZL102-W
Office Supply Code :	:	0038
Trademark	:	PENTEL
Procurement Value	:	6,786.12 baht



In the area of rental copying machines in 2019, the Company changed copying machines to use RICOH copying machines with the Green Label in place of four old machines. Green label machine rent value was 104,040 baht.

Wastewater Quality

QTC's manufacturing factory is located in a place without public water resources, whether natural or via plumbing. Hence, water usage is only possible through extraction of ground water. Nevertheless, no water is used in the manufacturing process of electrical transformers. Water is used only for the cooling circulation of the vacuum oven system and reducing the temperature of weld works. In this usage, water is stored for repeated usage year-round and then transported for proper disposal. As for the rinsing of the Company's contaminated equipment, the Company provides water containers for storing contaminated water and transports them for disposal outside on schedule. Hence, discarded water is water resulting from washing in bathrooms and kitchens and car washing only. Used water is collected in wells dug inside the Company to water trees. The Company measured factory wastewater quality regularly for at least twice a year by using Chemlab Services (Thailand) Co., Ltd., a company accredited with ISO/IEC17025 standards, Accreditation Number Testing-0064.

Table Showing Factory Wastewater Quality Test Results at the Final Point (2016-2018)

Tested Parameters	Test Results								Standard	Unit
	1/2016	2/2016	1/2017	2/2017	1/2018	2/2018	1/2019	2/2019		
	8/6/16	24/11/16	16/6/17	20/12/17	09/6/18	20/12/18	30/7/19	6/12/19		
BOD₅	7	16	4	7	7	6	7	<2	20	mg/l
Oil and Grease	<1.5	2.1	4.6	<1.5	Not Detected	<2.5	Not Detected	Not Detected	5	mg/l
PH	7.76	8.82	7.26	6.61	7.17	7.13	7.94	7.74	5.5-9.0	-
Sulfides	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	Not Detected	<0.5	1	mg/l as H ₂ S
Suspended Solids	20	21	10	10	15	22	74	31	50	mg/l
Temperature	38	32	31	23	32	28	34	27	40	°C
Total Dissolved Solids	87	Not Detected	Not Detected	59	Not Detected	121	316	68	3000	mg/l
Total Kjeldahl Nitrogen	<1.0	1.3	<1.0	1.6	1.9	5.4	5.7	10.6	100	mg/l as H ₂ S

Table Showing Wastewater Quality Test Results of Q Solar 1 in 2019

Test Area	Analysis Index	Analysis Result	Standard Value	Unit	Standard Criteria Comparison
Wastewater from Water System	Acidity and Alkalinity (pH)A	7.3	5.5-9.0	-	Passed
	BOD	2	20	mg/l	Passed
	DOC	<40	120	mg/l	Passed
	Total Suspended Solids (TSS)A	3	50	mg/l	Passed
	Oil & Grease	<5	5	mg/l	Passed
Wastewater from the Lodgings' Cesspool	Acidity and Alkalinity (pH)A	7.5	5.5-9.0	-	Passed
	BOD	6	20	mg/l	Passed
	DOC	<40	120	mg/l	Passed
	Total Suspended Solids (TSS)A	4	50	mg/l	Passed
	Oil & Grease	ND.	5	mg/l	Passed
Wastewater from the Office Building's Cesspool	Acidity and Alkalinity (pH)A	7.4	5.5-9.0	-	Passed
	BOD	5	20	mg/l	Passed
	DOC	92	120	mg/l	Passed
	Total Suspended Solids (TSS)A	16	50	mg/l	Passed
	Oil & Grease	ND.	5	mg/l	Passed

Air Quality

QTC's electrical transformer production processes involve stages that have to release air outside. Hence, the company has installed a modern preliminary prevention system in related production processes to minimize the release of pollution to outside atmosphere and conducts regular air quality inspection twice per year using Chemlab Services (Thailand) Co., Ltd., a company with ISO/IEC17025 standard accreditation, Accreditation Number Testing-0064. The processes related to air pollution emissions in 2019 were modified and added with ventilation stacks for work suitability and safety. Air quality test results at the end of stacks when working were consistent with legal requirements. Test results were as follows:

Table Showing Comparison of Air Measurement Results in Stacks for QTC Energy (2016 – 2019)

Area	Parameters	Test Results									Standard	Unit
		1/16	2/16	1/17	2/17	1/18	2/18	1/19	2/19	3/19		
		1/6	23/11	15/6	20/12	5/6	11/12	23/7	24/9	17/12		
Wood Cutting Room Sawdust Vacuuming Duct	Particulate	<0.1	2.82	1.2		8.68	1.01	0.82		1.83	400	mg/m ³
Spray Booth Stacks	Particulate	4.49	2.59	4.11	1.97	1.92	11.3		0.97		400	mg/m ³
MC 139 Factory 6	Xylene	<0.25	0.73								200	ppm
	Total VOCs	32.2	28.2	1.77	6.97	2.69	18.5		33.2		-	ppm
Spray Booth Stacks	Particulate						0.24		6.29		400	mg/m ³
MC 199 Factory 6	Total VOCs						3.85		61.3		-	ppm
Spray Booth Stacks (Installation)	Particulate	4.73	0.38	2.1		94.9	8.12	17.7		111	400	mg/m ³
	Xylene	1.06	0.38								200	ppm
	Volatile Organic Compounds	28.7	4.54	3.69	0.21	3.02	9.46	18.9		643	-	ppm
Plasma Cutting Machine Stacks, Factory 4	Particulate	2.05	42.5	22.7	54.1	3.31	10.1			33	400	mg/m ³
	Oxide of Nitrogen as Nitrogen Dioxide	<1	Not Detected	12	3	11	1			<1	-	ppm
	Carbon Monoxide	4	<1	3		Not Detected					870	ppm
	Oil mist				433						-	mg/m ³
Oven Stacks (Vacuum)	Particulate				23.2						400	mg/m ³
	Oil mist	0.391	355	278	7.52	107	342	150		78	-	mg/m ³
	Carbon Monoxide	2	19								690	ppm
	Oxide of Nitrogen as Nitrogen Dioxide	<1	Not Detected	<1		Not Detected	Not Detected	3		Not Detected	200	ppm
Oven Stacks (Transformer Repair)	Oil mist	0.513	306	12.2	2.08	Not Detected	22.1	4.19		68.8	-	mg/m ³
	Xylene	<0.25	Not Detected		-						200	ppm
	Oxide of Nitrogen as Nitrogen Dioxide	<0.25	Not Detected		<1						200	ppm
Transformer Moisture Vacuuming Stacks (Power Plant)	Oil Mist									949	-	mg/m ³
	Oxide of Nitrogen as Nitrogen Dioxide									<1	-	ppm

Environmentally-Friendly Products

As a manufacturer of transformers which are products that use electricity directly with effects on greenhouse gas emissions from activities and use of electricity in the industrial sector and the household sector, QTC recognizes the importance of developing transformer products continually to maximize energy consumption efficiency, reduce electricity waste, expenses and indirect greenhouse gas emissions from electricity production.

On the issue of sustainability, environmentally-friendly products are an important issue for QTC in order to create opportunities for competition. This is of moderate importance for stakeholders because some customers have not placed much importance on this issue. However, the Company continues to develop energy-saving transformer products and continually promote sales along with developing products under Green Label standards and requesting permission to use the Green Label in order to create choices for customers to use environmentally-friendly products and save energy expenses (Save the World, Save Your Money). In 2019, the Company had the following performance goals:

Goals	Performance
<ul style="list-style-type: none">Promote environmentally-friendly product sales to have economic value no less than 50 million baht.	<ul style="list-style-type: none">Super Low Loss Product Sales > 22 million baht.Green Label Product Sales > 37 million baht.



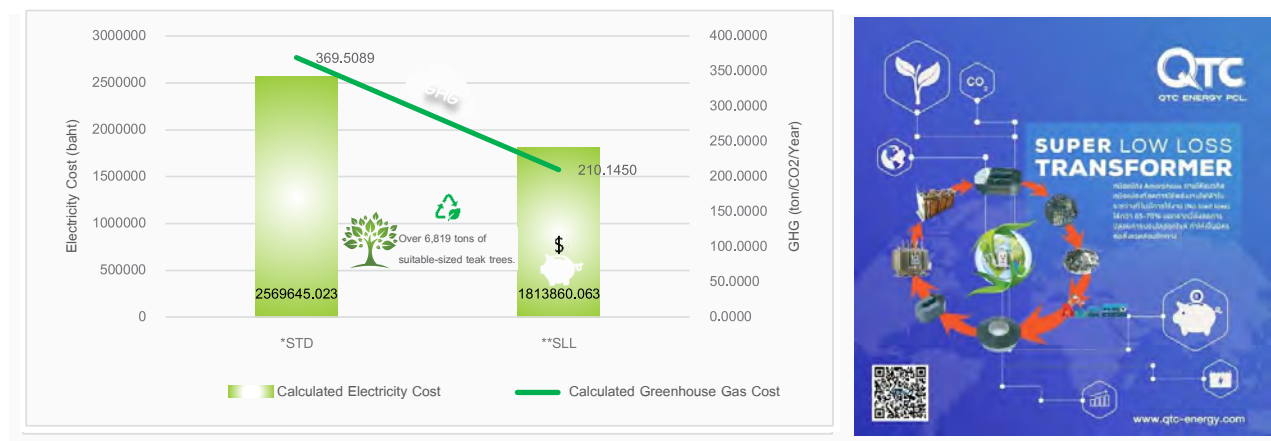
Super Low Loss Transformer

The Company continues to move forward and promote sales of AMDT transformer products or products under the new name of Super Low Loss Transformers. Super Low Loss Transformers are the culmination of transformer product research and development efforts since 2008 with funding support from the National Innovation Agency (NIA) in 2017. Commercial distribution began in 2018.

In 2019, the Company sold 29 Super Low Loss Transformers valued at over 22 million baht, an increase from 2018 by more than 50 percent. The Company created value for customers and reduced environmental impacts according to the following content:

Sales in 2019		KW/Year			Calculated Greenhouse Gas Emissions (ton/CO2/Year)			Calculated Electricity Cost for Users (baht)		
Unit	kVA	*STD	**SLL	diff	*STD	**SLL	diff	*STD	**SLL	diff
29	34,115.00	734,184	518,246	215,939	369.5089	210.1450	159.3639	2,569,645	1,813,860	755,785

Graph Comparing Value from Standard Transformers and Super Low Loss Transformers Received by Customers



From the table and graph, use of QTC's Super Low Loss Transformer products in 2019 was able to build direct value for customers by reducing electricity costs by 755,785 baht/year. In addition, QTC was able to create indirect environmental value by reducing greenhouse gas emissions from electricity consumption by more than 159 ton/CO2/Year or the equivalent of greenhouse gas absorption by 5,819 teak trees of a suitable size.

- Remarks:
1. Calculation load profile used a 50-percent load of transformers for eight hours (normal working hours) and a 50-percent load of transformers for 16 hours.
 2. Reference Electricity Cost: 3.5 baht/unit.
 3. Teak tree type of very suitable area characteristics = 21.6 CO2/tree/year. Reference: http://forest.rayongmodel.com/?page_id=277.
 *STD refers to standard transformers.
 **SLL refers to Super Low Loss Transformers.



Green Label Transformer

The Company remains committed to the ideal of delivering maximum value to customers via transformer products. In 2019, the Company modified transformer designs and changed to use raw materials without environmental impacts (standard transformers) in order to have qualifications meeting Green Label standards. The Company petitioned for approval to use the Green Label for six transformer products from the Thailand Environment Institute (Certificate Number: GL2019/042) and the Company was able to distribute 277 Green label transformers, creating a value of over 37 million baht.



Mr. Ruangchai Krissanakriangkrai, Managing Director (Right), accepted the Green Label certificate for transformer products from Mr. Prasert Boonsampan (Left), Chairman of the Thailand Business Council for Sustainable Development, and Mrs. Nisakorn (Kositrat) (Center), Executive Chairwoman, Thailand Environment Institute, at Vibhavadi Ballroom A, Centara Grand at Central Plaza Ladprao, on 1 October 2019.

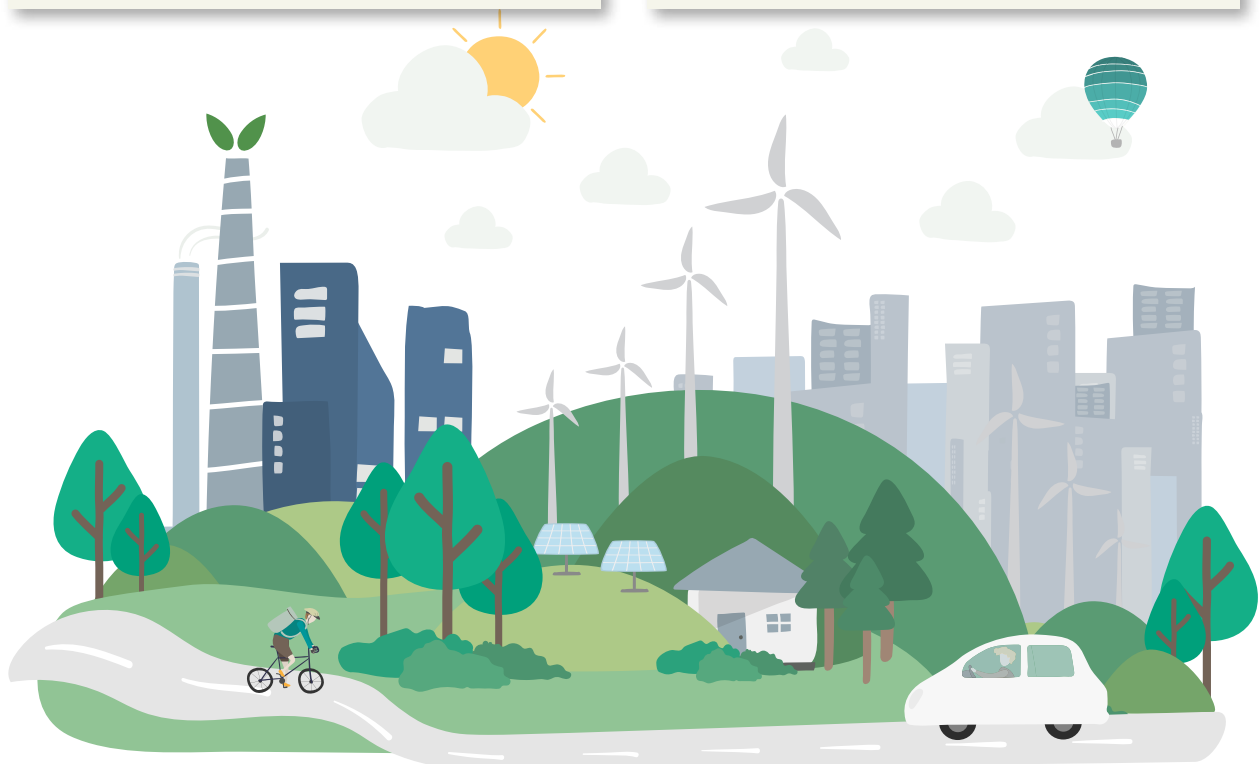
Climate Change

The Company began preparing the organization's greenhouse gas emissions report in 2015 and continued operations specifically with the factory in Rayong for the purpose of being reviewed and accredited for a corporate carbon footprint at the Limited Assurance Level with a reliability level of 95 percent. The Company used ISO14064 standards and referred to greenhouse gas reporting criteria of the TGO as greenhouse gas management guidelines with SGS (Thailand) Co., Ltd. reviewing and certifying results. In addition, the corporate registered carbon footprint with the Thailand Greenhouse Gas Management Organization (Public Organization). Monitored gases consisted of CO₂, CH₄, N₂O, HFCs, PFCs, SF₆ and NF₃.



In 2019, the Company changed base year calculations from using 2015 as the base year to using 2018 as the base year due to significant changes and modifications to production processes. Production processes in 2018 were most similar to 2019. The Company had the following performance goals:

Goals	Performance
<ul style="list-style-type: none"> Control greenhouse gas emissions per MVA production unit (electricity power) to be more than ten percent from 2018. 	<ul style="list-style-type: none"> Greenhouse gas emissions per MVA production unit (electricity power) = 0.9586 ton CO₂ eq. and were higher than 18.07 percent.



Regarding the Greenhouse Gas Emissions Report of 2018, the Company asked to be accredited in 2019, Accreditation No. TGO CFO FY19-4-029 (Verification Period: 01/01/2018 – 31/12/2018). The Company, represented by Mr. Poonphiphat Tantanasin, Chief Executive Officer, accepted the certificate and registration from Mr. Thanetphon Thanaboonyawat, Secretary to the Minister of Natural Resources and Environment at the Hundred Hearts Unite to Reduce Global Warming event of 2019 hosted by the Thailand Greenhouse Gas Management Organization (Public Organization) at the Berkeley Hotel Prathunam, on 19 September 2019.



Certificate Number:
TGO CFO FY19-4-029

องค์กร rganization

THAILAND GREENHOUSE GAS
MANAGEMENT ORGANIZATION
(Public Organization) TGO

CERTIFICATE

Awarded to

QTC Energy Public Company Limited

Company address verified : 149 Moo2, Pluakdaeng-Huai Prap Road,
Tambol Mabyangpoin, Amphur Pluakdaeng, Rayong, 21140

Thailand Greenhouse Gas Management Organization certifies that
the quantity of Greenhouse Gas of the above organization has been verified
by SGS (Thailand) Limited
and found to be in accordance with the requirements of the standard detailed below.

Standard

TGO Guidance of the Carbon Footprint for Organization

Verification Period : [01/01/2018 - 31/12/2018]

Total Greenhouse Gas Emission (Scope 1,2) 1,236 tonnes of CO₂eq/year

Direct GHG emissions	327.60	tonnes of CO ₂ eq
Energy Indirect GHG emissions	908.66	tonnes of CO ₂ eq
Other Indirect GHG emissions	64	tonnes of CO ₂ eq

The agreed level of assurance is: Limited at materiality of 5%

Registration Date: 30 April 2019

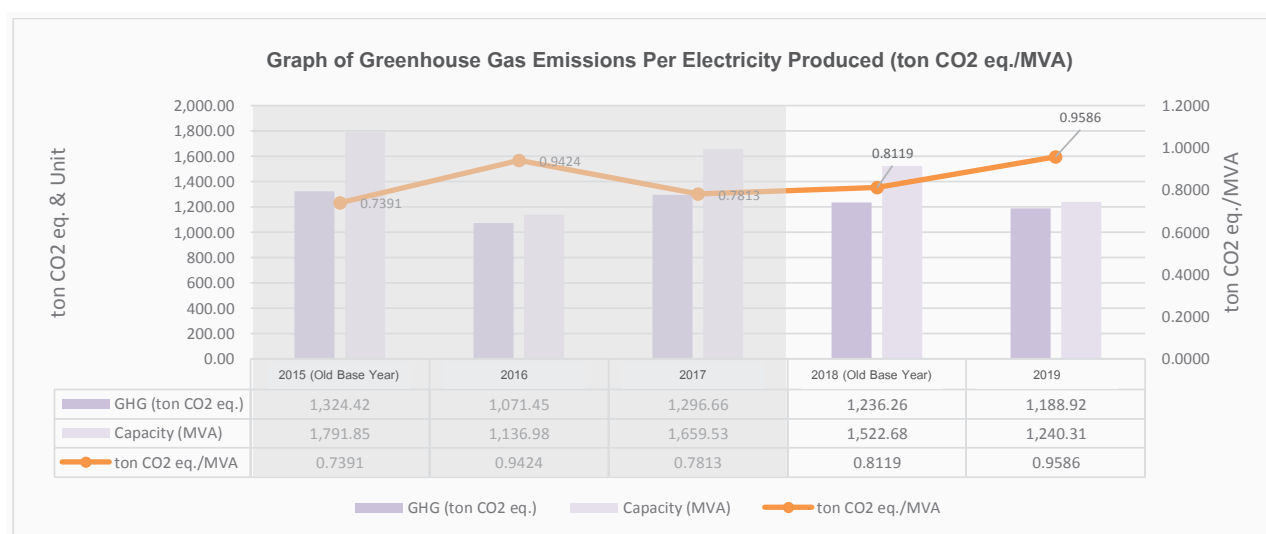
P. Prasertsuk

Mrs. Prasertsuk Patoonsittichai
Executive Director
Thailand Greenhouse Gas Management Organization (Public Organization)



Table Showing the Organization's Greenhouse Gas Emissions

Year	Volume of Greenhouse Gas Emissions (Ton CO2 eq.)				
	Scope 1 (Ton CO2 eq.)	Scope 2 (Ton CO2 eq.)	Scope 3 (Ton CO2 eq.)	Total Emission Scope 1 + 2 (Ton CO2 eq.)	Total Emission Scope 1 + 2 + 3 (Ton CO2 eq.)
2015 (Base Year) Old	426	899	63	1,325	1,388
2016	401	672	68	1,073	1,141
2017	391	907	57	1,298	1,355
2018 (Base Year) Current	328	909	64	1,237	1,301
2019	282	908	50	1,190	1,240
% of Changes between Base Year 2018 & 2019	-14.02%	-0.11	-21.88	-3.80	-4.69%
Type of GHGs Included	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ , NF ₃				




According to the table and graph of greenhouse gas emissions per electricity production (ton CO2 eq./MVA) in 2019, greenhouse gas emissions per electricity production unit were 18.07 percent higher than 2018 because transformer production capacity per unit was 53 percent less than the base year of 2018 while having electricity power 18.54 percent less than the base year of 2018 (fewer but larger transformers). In manufacturing large transformers, more electricity is used while production costs for other resources were lower, causing greenhouse gas emissions in Scope 2 to be slightly lower than 2018.

Greenhouse gas emission per MVA (electricity power) was higher than 2018 by 18.07 percent. The Company failed to achieve the goal (no more than 10%).

The organization's greenhouse gas emission certificate of 2019 from 1 January 2019 to 31 December 2019, Certificate No. TH-ENV-2020-5200811-001, was reviewed and affirmed by SGS (Thailand) Co., Ltd.



Download the full version of the Greenhouse Gas Verification Statement at:

 <http://qtc-energy.com/wp-content/uploads/2018/03/03.pdf>

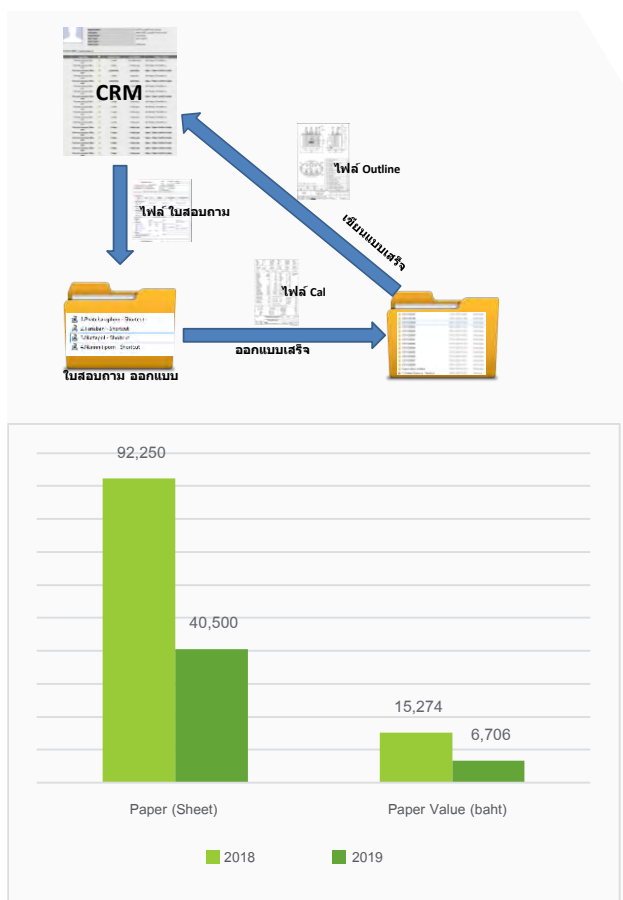
Corporate Carbon Footprint Reduction Activities

The Company continues to support employees to improve work with KAIZEN by considering modifications covering every issue including quality, safety, energy and environment. In 2019, the Company had KAIZEN reflecting corporate carbon footprint reduction activities with effects causing Scope 1 and Scope 2 greenhouse gas emissions to be lower than 2018. The following are examples of KAIZEN expanded into regular work practices:





Paperless Work to Reduce Paper Use

Problem: Many activities were on the production inquiry form work received by the Engineering Department from the Sales Department through the CRM system in each year. Database files were created for production inquiry forms to check inquiry form information. However, documents were also printed and sent to other agencies involved in paper form. These documents contained the same data stored in the database and printed documents are stored in folders as before, causing waste of storage space and creating a large amount of unused paper that cannot be disposed of and redundant work procedures.

Solution: Mr. Nattawut Nintet, Head of the Research and Development Section, analyzed problems and planned new work guidelines with approval from the work owner with the objective of reducing work redundancy, paper use and document storage space. Mr. Nattawut wrote an Excel program to link functions to the CRM system and design data from MTD to send paperless documents to associated persons with document approval similar to when using paper. Data was stored as electronic files.



Graph Comparing Paper Use and Value Returned

- Result :
-  Fewer redundant work procedures.
 -  More storage space for important documents from cancelling document storage.
 -  Reduced paper use in this work process by 56 percent.
 -  Reduced expenses from lower paper cost by 56 percent.



"I had the opportunity to use my ability to improve and develop my friends' work processes to be easier, faster and more cost effective. I'd like to thank my supervisor for giving me the opportunity to learn and improve and I would like to thank my fellow employees for giving me this opportunity and accepting my work. I'm happy to share my knowledge and keep helping with improvements."



Nattawut Nintet
Head of the Research
and Development
Section

Resource Utilization

The Company is a juristic person engaged in the energy business. Transformers are used with electricity. When manufacturing transformers, electricity is needed for manufacturing and testing at the highest ratio when compared to other resources. Furthermore, fuel is used to transport products and raw materials in addition to making business contacts. Moreover, Q Solar 1, the Company's subsidiary that generates electricity from solar energy, needs to use main electricity to support the solar energy generation process. In addition to electricity and oil, water is used for consumption and management. Therefore, the Company places importance on cost-effective use of electricity, oil and water with awareness that resources such as electricity or oil came from converting natural resources into energy and cost-effective use will help extend use of that resource for mutual social benefits. The Company had the following operation goals:

Goals	Performance
 <ul style="list-style-type: none">• Use electricity per MVA production unit at no more than ten percent from 2018.• Use diesel for transportation per MVA production unit at no more than ten percent from 2018.• Use water at no more than ten percent from 2018.	 <ul style="list-style-type: none">• Use of electricity per MVA production unit was at 1,256.87 kWh/MVA, an increase from 2018 by 22.6 percent.• Use of diesel for transportation per MVA production unit was at 60.18 liters/MVA, a reduction from 2018 by 4.19 percent.• Use of water was at 10,253 cubic meters, a reduction from 2018 by 5.68 percent.

In the area of performance goals of Q Solar 1, goals were not specified in 2019. However, performance numbers were collected for considering goals in the next year.



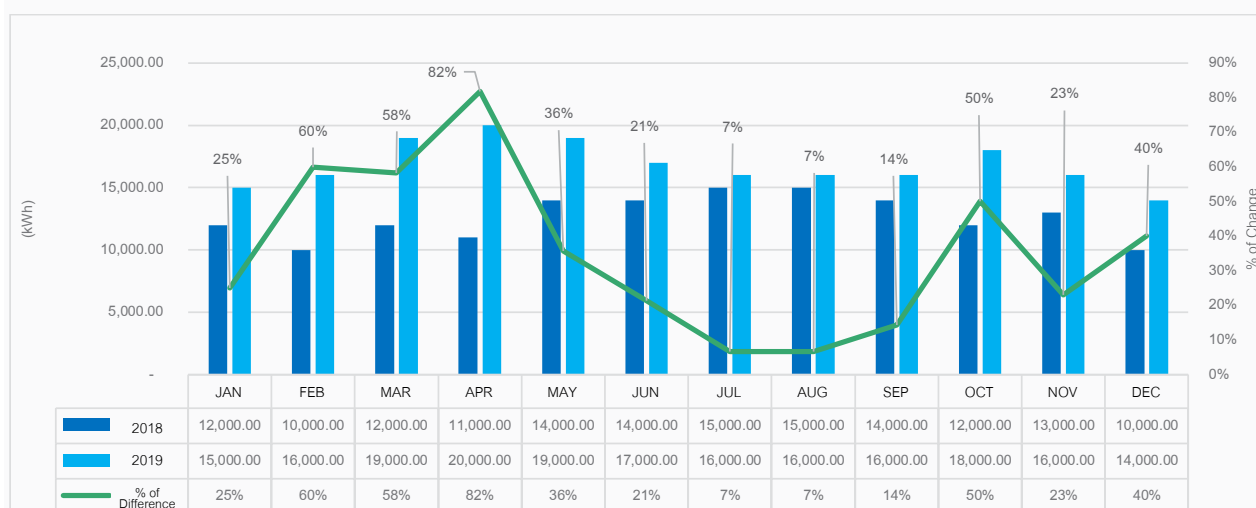
The Company's and subsidiaries' production, service, office and electricity generation activities were primarily comprised of the following two types of energy:

1. 1. Electricity (Non-Renewable)

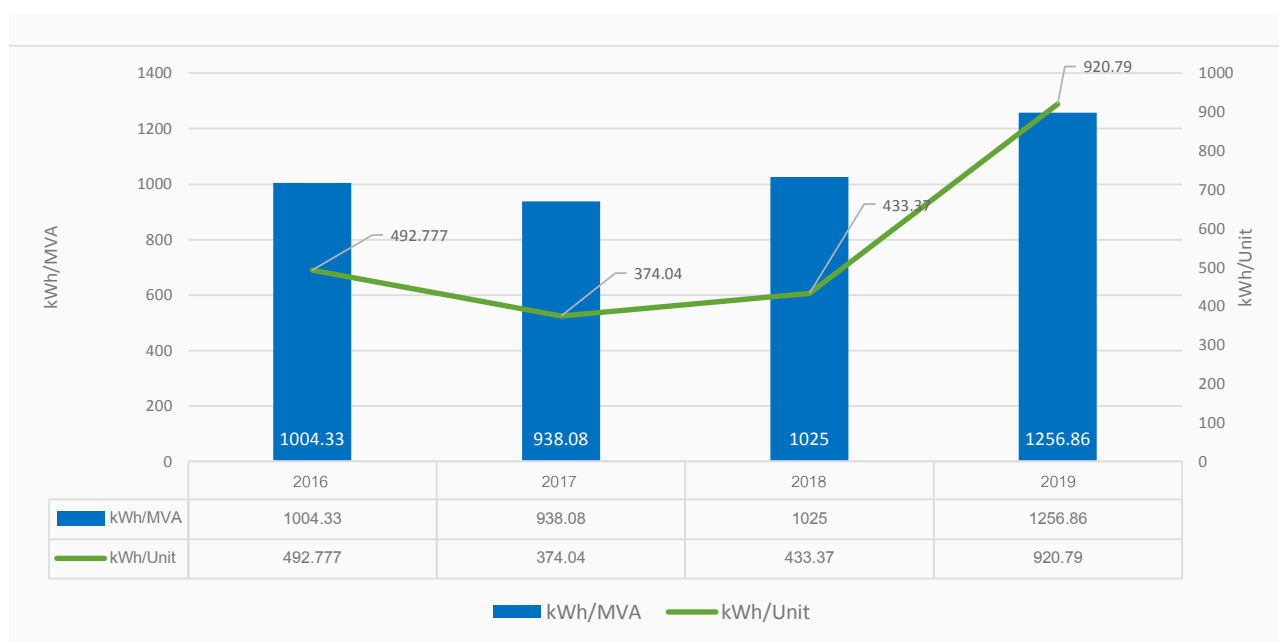
QTC's factories do not meet criteria for energy conservation in compliance with the law. In addition, QTC uses electricity purchased from two external sources consisting of the Metropolitan Electricity Authority in the main office in Bangkok and the Provincial Electricity Authority in the Rayong factory.

Table Showing Electricity Consumption Efficiency

Item	QTC Energy				Q Solar 1
	2016	2017	2018	2019	2019
Metropolitan Electricity Authority (kWh)	1,153,576.00	1,556,768.00	1,561,008.00	1,558,904	78,626
Provincial Electricity Authority (kWh)	153,000.00	139,000.00	152,000.00	202,000	-
Transformer Production					Electricity Generation (Renewable)
Production Volume (MVA)	1,148.60	1,659.53	1,522.68	1,240.31	-
Production Volume (Unit)	2,341.00	4,162.00	3,602	1,693	-
Production Volume (MWh)	-	-	-	-	13,201.8
kWh/MVA	1,004.33	938.08	1,025.17	1,256.87	-
kWh/Unit	492.77	374.04	433.37	920.79	-
kWh/MWh	-	-	-	-	5.96



Graph Comparing Electricity Use (kWh) between 2018 and 2019



Graph Comparing the Rayong Factory's Electricity Efficiency between Four Years

Electricity use by factories in 2019 was lower than 2018 due to lower production capacity. However, average energy efficiency for the year per production unit was lower than 2018 by 22.6 percent. The Company failed to achieve the goal of no more than ten percent from 2018 because transformer production capacity per unit was 53 percent less than 2018 while electricity generation (MVA) was less than 2018 by 18.54 percent (fewer but larger transformers). In manufacturing large transformers, more electricity is used while other production resource costs were lower. The Company's performance failed to achieve the goal.

Concerning data on electricity use from the Provincial Electricity Authority by Q Solar 1, two electricity meters were installed to separate use by the office from electricity generated by solar energy and use to support the system for electricity generation from solar energy. In 2019, Q Solar 1 did not specify goals for considering energy efficiency.



2. Thermal Energy-Fuel (Renewable)

Diesel and benzene (gasoline) are used for transportation outside the Company, services, transportation inside the Company, employee shuttles and office cars. In 2019, the Company used fuel in the following table:

Table Showing the Amount of Fuel Used

Item	QTC Energy				Q Solar 1
	2016	2017	2018	2019	2019
Diesel	110,765	107,332	95,634	74,638	-
Benzene	29,276	27,584	27,486	32,595	-
Total (Liter)	140,041	134,952	123,121	107,233	-
Production Volume (MVA)	1,148.6	1,659.53	1,522.68	1,240.31	-
Liter (Diesel)/MVA	96.44	64.68	62.81	60.18	-

Thermal energy use in 2019 was 15,888 liters lower than 2018 because production capacity and deliveries were fewer than 2018. Efficiency of diesel use for transportation per production volume (MVA) in 2019 improved and enabled reduction of energy use per production unit (MVA) by 4.19 percent better than the goal of no more than 10 percent from 2018.

Numbers for thermal energy use (fuel) of Q Solar 1 in 2019 were not completely used and the Company will collect data intensively starting from 2020.

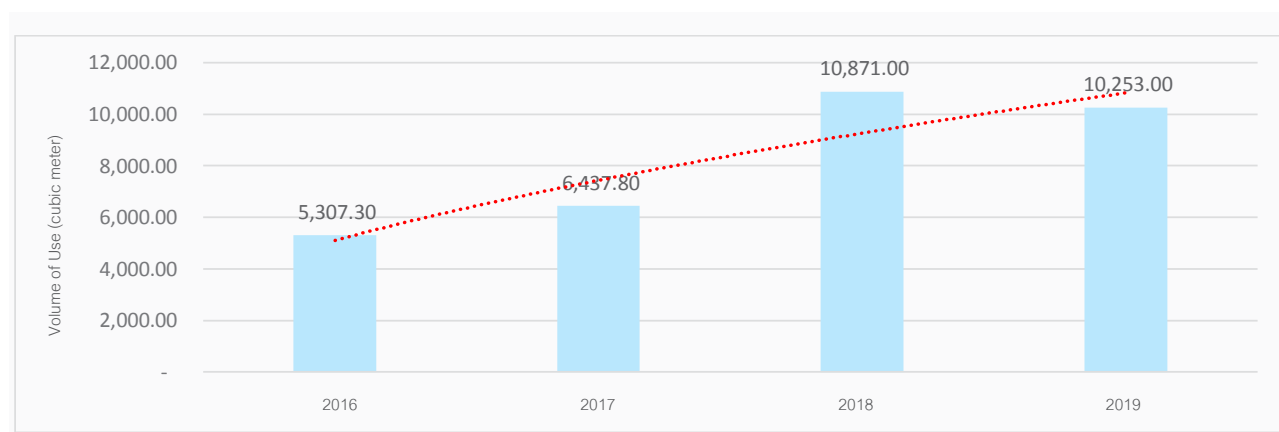


QTC's factories are located in an area that does not have public water sources, whether natural or from plumbing. Ground water is extracted for usage only. No water is used in the electrical transformer production process. Water is supplied to the Bangkok main office by the Metropolitan Waterworks Authority.

The Company's subsidiary, Q Solar 1, uses groundwater and dug a reservoir to store water in the rainy season for agricultural plots and other activities in the dry season in order to reduce groundwater use.

Table Showing Volume of Water Used

Item	QTC Energy				Q Solar 1
	2016	2017	2018	2019	2019
Metropolitan Waterworks Authority (cubic meter)	803	1,264	1,521	879	-
Surface Water (cubic meter)	4,504	5,174	4,829	-	-
Groundwater (cubic meter)	-	-	4,521	9,374	6,494
Total (cubic meter)	5,307	6,438	10,871	60.18	6,494



Graph Comparing Total Volume of Water Used (QTC Energy) (cubic meter) Per Year

Performance in 2019 showed the volume of water use to have declined from 2018 by 618 cubic meters or 5.68 percent. This was better than the goal of no more than ten percent. Q Solar 1 did not have goals specified in 2019 and numbers were collected to determine goals for the next year.

The Company does not have a wastewater treatment system to reuse water but the Company monitors and tests wastewater from the final well to meet legal requirements and not create environmental impacts.



Biodiversity

The issue of biodiversity is not an issue given importance by stakeholders and QTC because factory locations do not cause ecological effects. Nevertheless, the Company will continue to maintain efforts in improving environments within the Company's area of responsibility to reduce environmental impacts and global warming through the following projects:

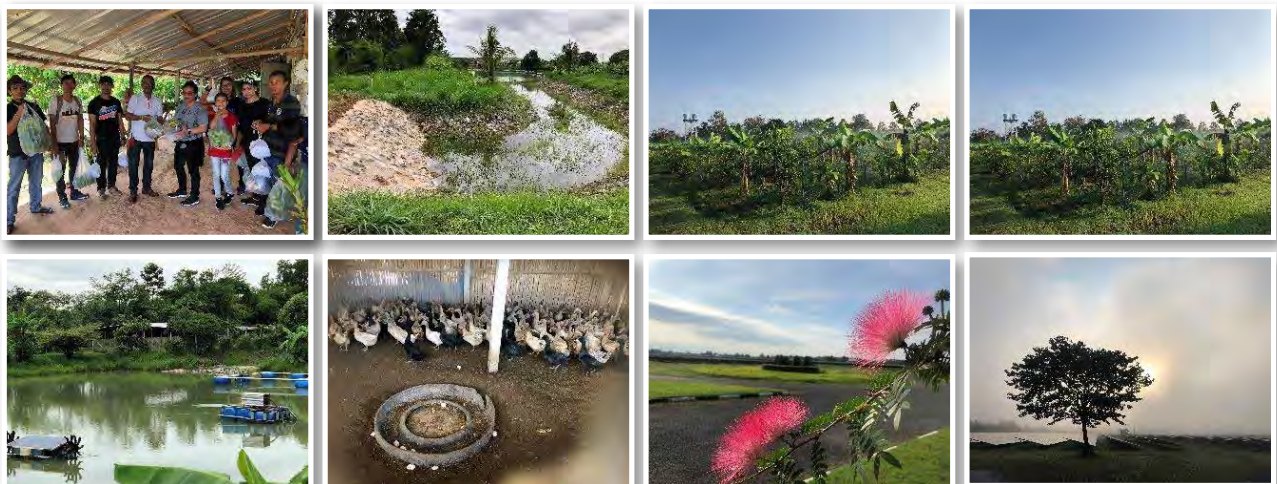
Tree-planting in the Factory

Since the factory is located on land that does not have water sources or forest and is required to drill a well to extract ground water for use, which can decrease ground water quantities, in order to maintain natural balance, the Company has launched a project to plant trees in the factory grounds to restore the environment surrounding the factory and increase moisture to the soil and underground water sources in 2013. At present, there are over 751 trees planted by employees, and they continue to grow according to expectations. In addition, the natural water collection pond that was dug at the center of the planting area continues to hold a significant amount of water employees can use to raise fish, grow aquatic plants and prepare food. At present, the area cannot yet be opened to the surrounding communities for utilization, since the forest that was planted is not fully mature.



Sufficiency Economy Learning Center

The Sufficiency Economy Learning Center was established at Q Solar 1 with the objective of rehabilitating soil damaged by landfilling to install solar panels by planting cover crops, garden vegetables and fruits. Soil conditions are adjusted by composting, raising earthworms for fertilization and raising ducks, chickens and fish based on sufficiency economy guidelines. Soil conditions are currently rehabilitated and capable of producing to distribute to employees and community members. Furthermore, the center is open for outside persons to learn and study operations. In the area of planting large trees to add shade, the Company was able to do this only outside the solar panel area because trees may block sunlight, which is a major resource in electricity generation.



Seaweed Planting to Restore Marine Balance for Koh Mannai



‘QTC’ and ‘Q Solar 1’ Join the activity on **World Oceans Day**

Mr. Kitti Atcharyaboonyong, Deputy Managing Director of Marketing, QTC Energy PCL, a transformer manufacturer, distributor and service provider, Mr. Chanwut Meephloy, Managing Director, Q Solar 1 Co., Ltd., and company employees delivered solar energy air filling machines for use in conserving and rehabilitating maritime resources with Mr. Suthep Chuala-ong, Director, Marine and Coastal Resources Research and Development Center, Eastern Gulf of Thailand, as the recipient. In addition, the companies planted over 7,300 seaweed plants and released sea turtles into nature on the occasion of World Oceans Day at the Sea Turtle Conservation Center, Koh Mannai, Rayong.



About This Report

This sustainability report was prepared under GRI standards with content consisting of organization information, management guidelines and significant topics and issues related to sustainability in 2019 covering economic, social and environmental performance. Association with all stakeholders was considered based on the following criteria and scope of report:

Level of Information Disclosure: Core Option Indicators

Period of Report: 1 January 2019 to 31 December 2019

Report Cycle: Annual

Names of Companies and Subsidiaries: QTC Energy Public Co., Ltd.
QTC Global Power Co., Ltd.
Q Solar 1 Co., Ltd.
PPWE Co., Ltd.

Report Quality Assurance: This report's significant contents were reviewed by a team responsible for each issue consisting of high-ranking executives and the report was presented to the Board of Directors for consideration of approval to present information to the public. The Company has no policy for the report and key performance indicators to be certified by external agencies.

Previous Report: Sustainability Report 2018, QTC Energy Public Co., Ltd.

Inquiry: To inquire for more information or make proposals, contact the Corporate Sustainability Development Department, QTC Energy Public Co., Ltd.
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Tel: 038-891-1411-3 ext. 101 or 084-362-8633

Please express your opinion toward the value of this report by scanning the QR code.



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