



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

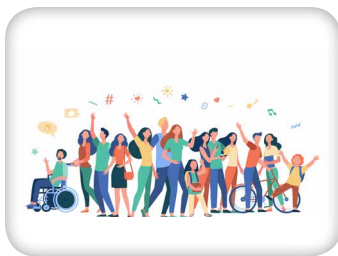


# Sustainability Report 2022

# รายงานความยั่งยืน 2565



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# Message from the Chief Executive Officer

In terms of internal management, the Company continues to place importance on developing personnel and promoting practices to achieve **Environmental, Social, and Governance (ESG) excellence.**



## Dear Stakeholders,

In 2022, the global economic situation in Asia and Thailand has been affected economically by the Covid-19 pandemic, which has not yet recovered, and has been further affected by the war between Russia and Ukraine. As a result, the global economy is in trouble, with skyrocketing oil prices, increased production and service costs, fluctuations in the value of the baht against the US dollar, and rising inflation. These elements increase the cost of conducting business. Some entrepreneurs both domestically and internationally have had to delay their expansion due to concerns about risks, which has an impact on manufacturers in the supply chain. Consumers themselves have had to be careful about their spending. As a result, the Thai economy grew by only 2.6% in 2022.

QTC is one of the companies inevitably affected by both situations. The cost of main raw materials for production that need to be imported is higher, including the cost of silicon steel, copper, and transportation costs. Furthermore, the exchange rate fluctuations have resulted in higher financial and production costs, while the expansion of the industrial sector and the construction of the real estate sector both domestically and internationally, as well as government investment, is still slow, thus making it quite competitive in the transformer market, which is the main business of QTC.

However, QTC has done everything with care through risk management processes and has received cooperation from employees, management team professionalism and the trust of all stakeholders who have always remained confident in our brand and services. The performance as of the end of the year (for separate businesses) includes 1,164.57 million baht in revenue from sales and services, an increase of 12.14% from 2021. The net profit decreased from 2021 by 0.69%, or a net profit ratio of 8.38% to total sales. The performance in terms of comprehensive income includes 1,216.45 million baht in revenue from sales and services, a growth of 3.79% from 2021, and the net profit decreased from 2021 by more than 80% due to adjustments to impairment losses of land, plant and equipment, electrical network connection services, and electricity sale contracts. This includes the write-off of deferred tax assets in the financial statements.



With no signs of when the Russian-Ukraine war will end and whether additional sanctions will be imposed by the US and its allies, which, if prolonged, will inevitably affect the global economy, 2023 will be another challenging year for QTC. However, we will remain committed to developing transformers, which is the Company's core business, to have electrical quality and properties comparable to or above international standards, focusing on products that can reduce electricity consumption, greenhouse gas emissions and electricity costs for customers in the long run, while providing other electrical energy equipment to meet the needs of customers in a comprehensive way. The group expects to remain strong and continue to grow by more than 10% from 2022.

In terms of internal management, the Company continues to focus on human resource development and promoting practices to achieve **environmental, social, and governance (ESG) excellence**.

**E: Environment:** The Company promotes the creation of a "Green Culture" in the organization through various work processes and innovations to reduce environmental impacts. The Company has set targets to achieve carbon neutrality by 2035 and net zero emission by 2050. It is crucial that we change our behaviors, improve work processes, machinery and vehicles, and increase the use of clean energy, etc., to achieve goals and for the future of future generations in the right to live under a good environment.

**S: Social:** The Company has continuously promoted the creation of a "Safety Culture". In 2022, the number of accidents decreased by more than 22% from 2021 due to the strict implementation of safety measures along with various accident-reducing promotion measures. The Company has maintained its zero-accident target and continues to give importance in community development. In 2022, the Company held the "Communities Meet QTC" activities, where community representatives and local government agencies participated in discussions aimed at finding needs that benefit the communities and society. From the discussions, there are projects that are in the capacity of QTC to support, mainly in the education sector, that will be implemented together and continued in 2023.

**G: Governance:** The Company promotes best practices and attaches great importance to this area. Every executive must be a role model, and all employees must be in strict compliance with the established code of conduct, which is a joint commitment. Every operation must be transparent and accountable to build trust for all stakeholders. We realize that focusing on and taking action in all three areas of ESG (environment, social, governance) simultaneously with responsibility will result in the Company's sustainable growth.

Finally, on behalf of the Board, executives and employees, I would like to thank our shareholders, customers, partners, general community members, and all stakeholders who have always supported and encouraged the Company. We pledge to carry out our vision, mission and sustainable development framework, and are committed and dedicated to developing processes, tools, machinery and human resources in order to remain securely and sustainably standing in the midst of economic and social changes.



(Mr. Poonhiphat Tantanasin)

Chief Executive Officer

# Awards for Success



3Rs Awards and Zero Waste Achievement Awards for 2022:  
Department of Industrial Works (DIW)



Best Investor Relations Awards, SET Awards 2022:  
Stock Exchange of Thailand



Award in the "Excellence Category", Model Organization  
in Thai Capital Market for Disability 2022:  
Securities and Exchange Commission



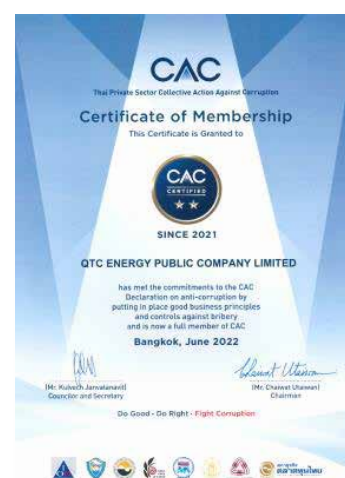
Sustainability Disclosure Awards for 2022:  
Taipat Institute



Carbon Footprint for Organization Certificate  
No. TGO CFO FY22-07-078:  
Thailand Greenhouse Gas Management  
Organization (Public Organization)



Level-4 Green Industry Certificate  
(Green Culture) GI(E)4-046/2565:  
Ministry of Industry



Certificate of Membership  
Thai Private Sector Collective action Against  
Corruption : CAC

# About QTC

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

## Business Type

### Manufacturing and Distribution of Transformers and Related Products

QTC Energy PCL operates in the business of manufacturing and distributing transformers according to 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 five following types:

#### 1. Oil Type Transformer

##### 1.1 Hermetically Sealed Oil Type Distribution Transformer)



With a maximum capacity of 3,000 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 with a maximum capacity of 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.



## 1.3 Power Transformer

Power transformers are used to reduce voltage of 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.



## 1.4 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.

Furthermore, the Company manufactures special made-to-order transformers according to functions and properties needed by customers such as earthing transformers, unit substations and pad mounted transformers, etc.



Earthing Transformer



Unit Substation



Pad Mounted



## 2. Dry Type Transformer

### 2.1 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.



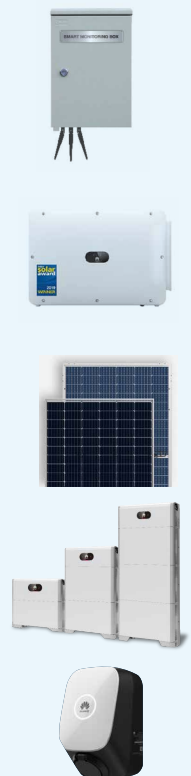
### 2.2 Dry type transformer class F & H

Class F & H dry type transformers or isolating transformers are for converting low-voltage electricity such as from 380V to 220V to distribute electricity to imported machines. Due to low voltage, wire coils of this dry type transformer have no need to be cast with resin and a special type of insulation capable of enduring high temperatures is used. Insulation for this dry type transformer is usually Class F transformer with an insulation temperature of 155 Celsius degrees. Therefore, this type of transformers is usually called "Dry Type Transformer Insulation Class F". However, insulation capable of resisting higher temperatures is sometimes necessary such as Class H insulation with a temperature value of 180 Celsius degrees, etc. This type of transformers can be installed indoors.

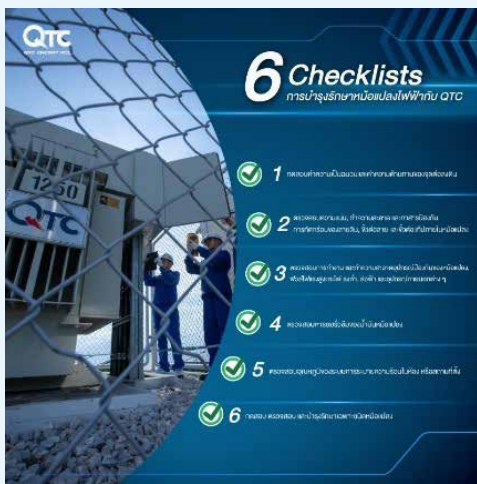


**In addition to producing transformers, the Company also offers other products as follows:**

1. **Smart Monitoring Box** : This smart monitoring system is a smart system 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. This smart monitoring system can be installed on every QTC transformer model.
2. **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.
3. **PV Panel** : PV panels convert solar energy into electricity for solar roofs, solar farms and floating solar panels. QTC was appointed as a distributor by LONGI Solar Technology Co., Ltd. to distribute under the LONGI brand, and by Trina Solar Co., Ltd. to distribute under the Trina brand.
4. **Solar Battery** : Solar batteries are used for storing electricity generated from solar energy (solar cells), and the stored electrical energy is used for home appliances.
5. **EV Charger** : It is an electric car battery charger. alternating current voltage (AC) for installation in residential houses, size 7-22 kW. QTC has been appointed as a distributor from Huawei Technologies (Thailand) Co., Ltd., distribute under the brand Huawei.







## Services

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.



Consultancy



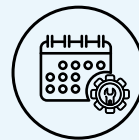
Installation



Testing



Repair and  
Maintenance



Scheduled  
Maintenance



Transformer  
Rental



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



ISO/IEC17025 Standard Testing Laboratory



Coiling & Steel Cutting & Body Manufacturing

## Renewable Energy Generation 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. generates 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.



## Product Distribution Representative Business

QTC Marketing Co., Ltd. (QTCM) operates in the business of being a distribution representative for electric and energy equipment with offices located at 2/2, Soi 2/2 Soi Krungthep Kritha 8, Intersection 5, Krungthep Kritha Road, Hua Mak, Bang Kapi, Bangkok, 10240, Tel. 02-379-3089-92, Fax: 02-379-3097



## QTC's Customers

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.



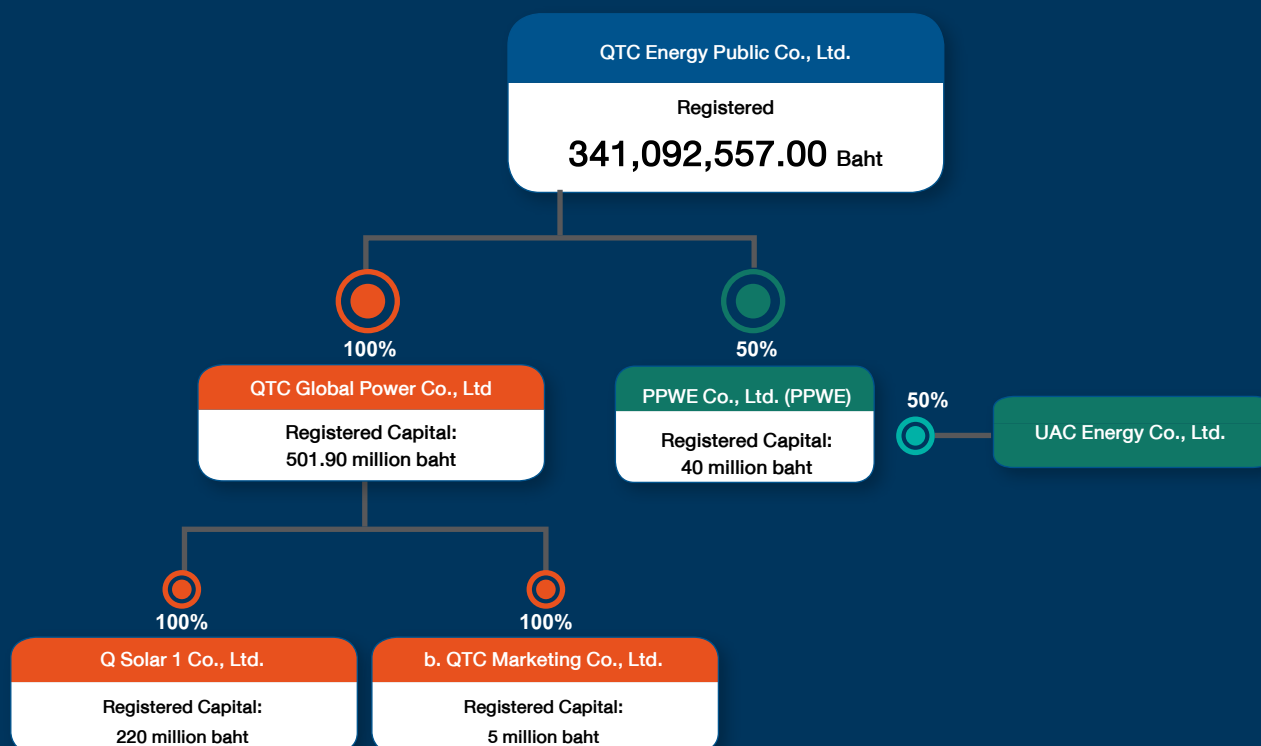
- QTC is a distributor of solar inverters under the Huawei brand and the Hitachi brand.
- QTC is a distributor of PV panels under the LONGI brand and the Trina brand

## Organization Membership



# Shareholding Structure

## Shareholding Structure



The Company has one subsidiary and one joint venture consisting of:

1. 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 501.90 million baht. QTC holds 100% of shares.
  - 1.1 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 known as L Solar 1 Co., Ltd. Name change was registered on 31 August 2018).
  - 1.2 QTC Marketing Co., Ltd. (QTCM) is engaged in the business of being a distribution representative of electric and energy equipment. The company was founded on 10 November 2021 with registered capital of 5 million baht. QTC Global Power holds 100 percent of shares.
2. PPWE Co., Ltd. (PPWE) is a joint venture engaged in the energy business. The company was founded on 12 January 2016 with registered capital of 40 million baht. QTC holds 49.98% of shares, and UAC Energy Co., Ltd. holds 49.98% of shares.



# Board of Directors



9

7

6

5

2

1

3

4

8

10

**1. Mr. Krirkkrai Jirapaet**

Chairman, Board of Director

**2. Mr. Norachit Sinhaseni**

Director

**3. Mr. Natthaphon Lilawatthanun**

Director

**4. Dr. Kamol Takabut**

Director

**5. Mrs. Wasara Chotithammarat**

Director

**6. Mr. Suroj Lamsam**

Director

**7. Mr. Preedee Ngamsantikul**

Director

**8. Dr. Apichart Sramoon**

Director

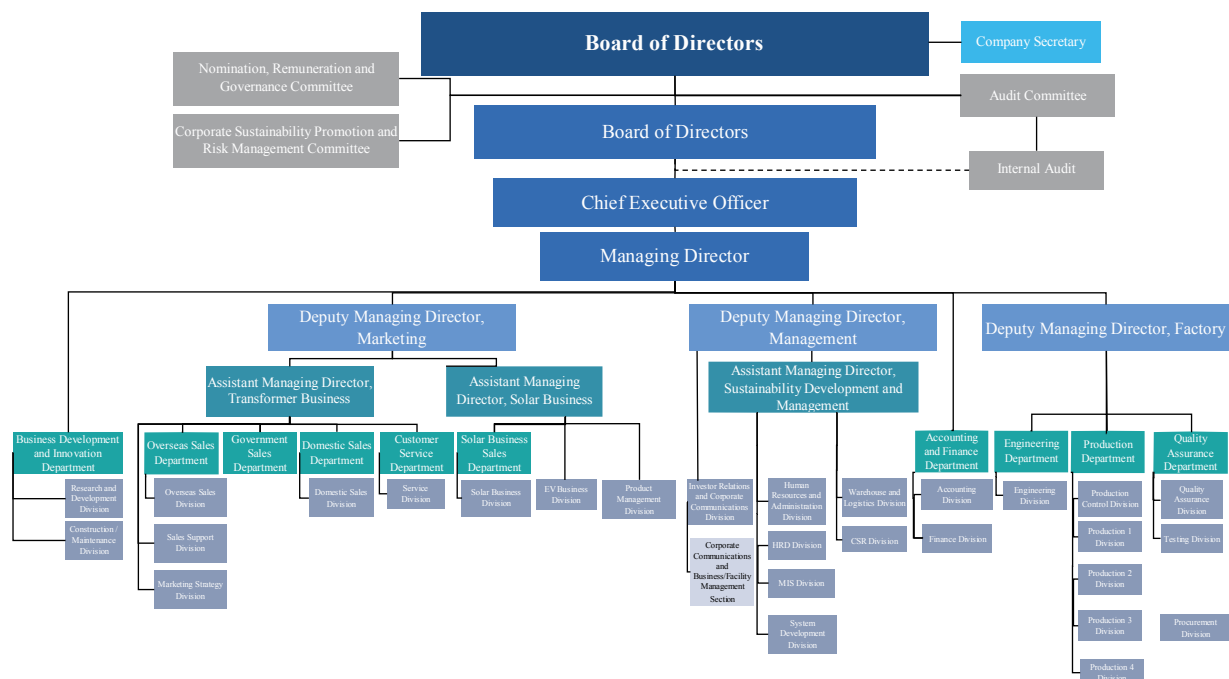
**9. Mr. Poonphiphat Tantanasin**

Director

**10. Mr. Ruangchai Kritsnakriengkrai**

Director

# Governance Structure



Board of Directors



9 Employees,



1 Employees

No. of High-level Executives  
L12 - UC



Local Community



The number of high-level executives who are locals make up 50% of all high-level executives.

QTC Energy PCL "QTC"



179 Employees



85 Employees

QTC Global Power Co., Ltd.  
QTCGP



2 Employees

Q Solar 1 Co., Ltd.  
Q SOLAR 1



11 Employees,



6 Employees

QTC Marketing Co., Ltd.  
QTCM

PPWE Co., Ltd.  
PPWE

(Joint Ventures)



The total number of employees in the organization as of 31 December 2022 is 283 employees.



190 Employees / 67.14%

93 Employees / 32.86%

Level 9-UC: 33 Employees



17 Employees / 51.52%

16 Employees / 48.48%



Level 7-8: 15 Employees



9 Employees / 60.00%

6 Employees / 40.00%



Level 1-6: 235 Employees



164 Employees / 69.79%

71 Employees / 30.11%



Security Guards



Housekeepers

Non-Company Employees



# Moving Forward with Determination and Vision



## Quality of DETAILS

DETAILS are the most important key of our operations and they are in every part of QTC from personnel, thinking methods, working methods, technologies, factories, products, including society and environment.

## Vision

“To be a manufacturer, distributor, and service provider of integrated technology with world-class standard in power industry with good governance, social and environmental responsibilities.”

## Mission

1. Being the leader of manufacturing, distributing, and providing services of high-quality integrated technology solutions for businesses in power industry
2. Developing products, process, and services to create added value in the value chain
3. Developing human capital to create good and smart people
4. Operating businesses based on good governance principle and paying attention to community, social and environmental responsibilities
5. Building sustainable business growth in long-term to gain confidence and trust from all stakeholders

## Work Philosophy

QTC is firmly committed to operating its business based on 3 principles as follows:

1. Ethical, moral, and transparent management
2. Provision of products and services meeting international quality and standards
3. Emphasizing on corporate social and environmental responsibility and human freedom rights

However, The Company reviews visions and missions annually. Visions and missions were reviewed and approved by the Board of Directors on 15 December 2022 in order for visions and missions to be consistent with current economic conditions.

## 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 Sustainability Promotion and Risk Management Committee governs performance in line with sustainable development policies by covering issues in the sustainability management framework and expanding results to subsidiaries. The Corporate Sustainability Promotion and Risk Management Committee assesses the organization's economic, social, environmental and ethical risks along with preparing guidelines for preventing that risk. The Corporate Sustainability Promotion and Risk Management Committee reports to the Board of Audit and the Board of Directors.
- 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.



# QTC Values for Sustainability



# QTC & Sustainability

The QTC Sustainability Framework integrates the Quality of Details corporate value to drive work to be consistent with the organization's contexts according to the Q+R=S sustainability equation (Quality + Responsibility = Sustainability). This was carried out by the Corporate Sustainability Promotion Committee, which consists of executives at the department level and up from various branches of work with roles and duties to monitor performance according to policies and promote operations.

Specification of 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 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:

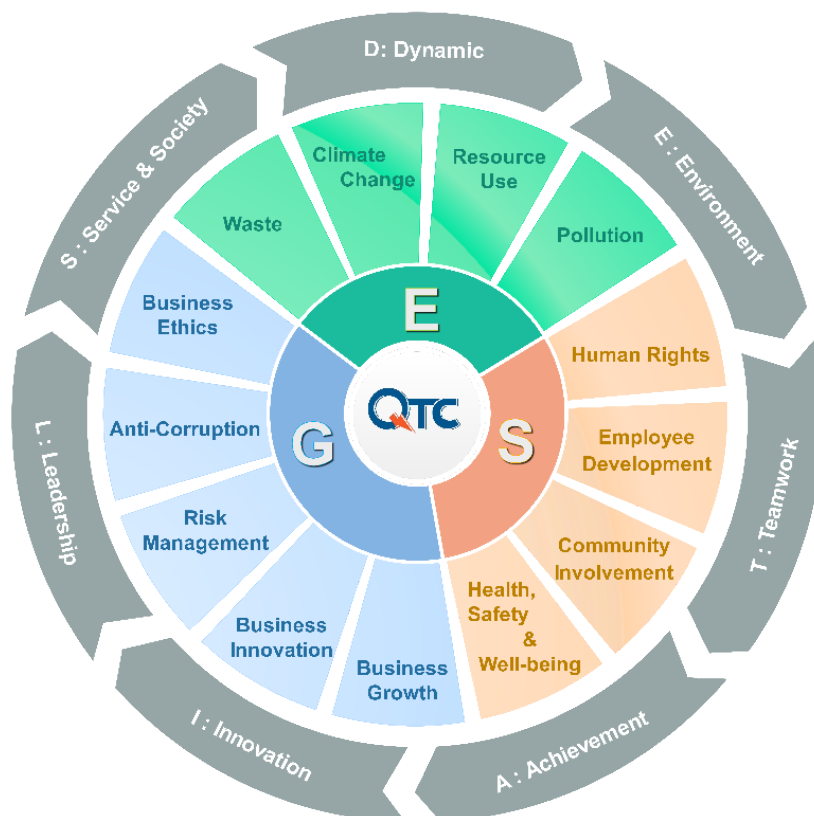
## QTC Sustainability Framework

$$\text{Quality} + \text{Responsibility} = \text{Sustainability}$$

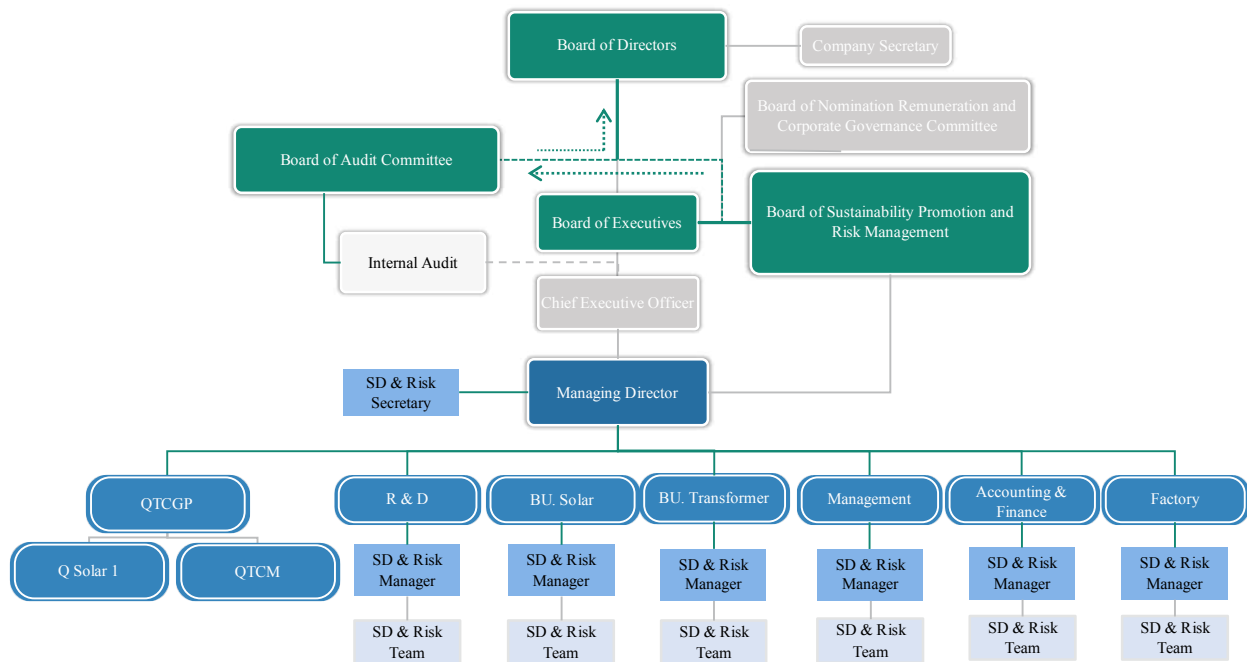


Quality and Responsible

People, Processes, Machines, Goods and Services



## Operating Structure of the Sustainability Promotion Committee



### Roles and Duties in Brief

<b>Board of Directors</b>	☞ Specify sustainable development policies and goals.
<b>Corporate Sustainability Promotion and Risk Management Committee</b>	☞ Oversee work.
<b>Sustainability Promotion Work Group</b>	☞ Specify strategies.
<b>All Subsidiaries</b>	☞ Manage according to goals under the sustainable development framework.
	☞ Review and identify stakeholders, and assess impacts.
	☞ Consider impacts and sustainable development issues, prepare development guidelines to reduce or prevent impacts and take care of stakeholders properly.
	☞ Review sustainability policies, goals, issues and present corrective guidelines to be modern and suitable for situations.
	☞ Specify work plans and assign sustainable development work in practice.
<b>Sustainability Promotion Work Group</b>	☞ Specify work plans.
	☞ Review operational-level impacts and present to the Corporate Sustainability Promotion and Risk Management Committee.
	☞ Work according to plans and prepare annual sustainability report.
<b>All Subsidiaries</b>	☞ Manage according to the sustainable development framework.
	☞ 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 focused on creating balanced quality in three areas, namely, economic, social and environmental quality under international practices consistent with sustainable development goals (SDGs) related to the business. The practice guidelines for implementation are as follows:

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 by carrying out business activities according to the United Nations Guiding Principles on Business and Human Rights (UNGPs) and relevant sustainable development goals (SDGs) while respecting local traditions in the area 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. Place importance on climate change by promoting efficient use of resources, controlling and reducing greenhouse gas emissions along with reducing and controlling air, water and soil pollution from operations of the Company, affiliates and trade partners, which may cause social and environmental impacts.
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. Commit to comprehensive risk management in line with international standards in order to boost likelihood of success and minimize chances of failure or loss.
9. 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.

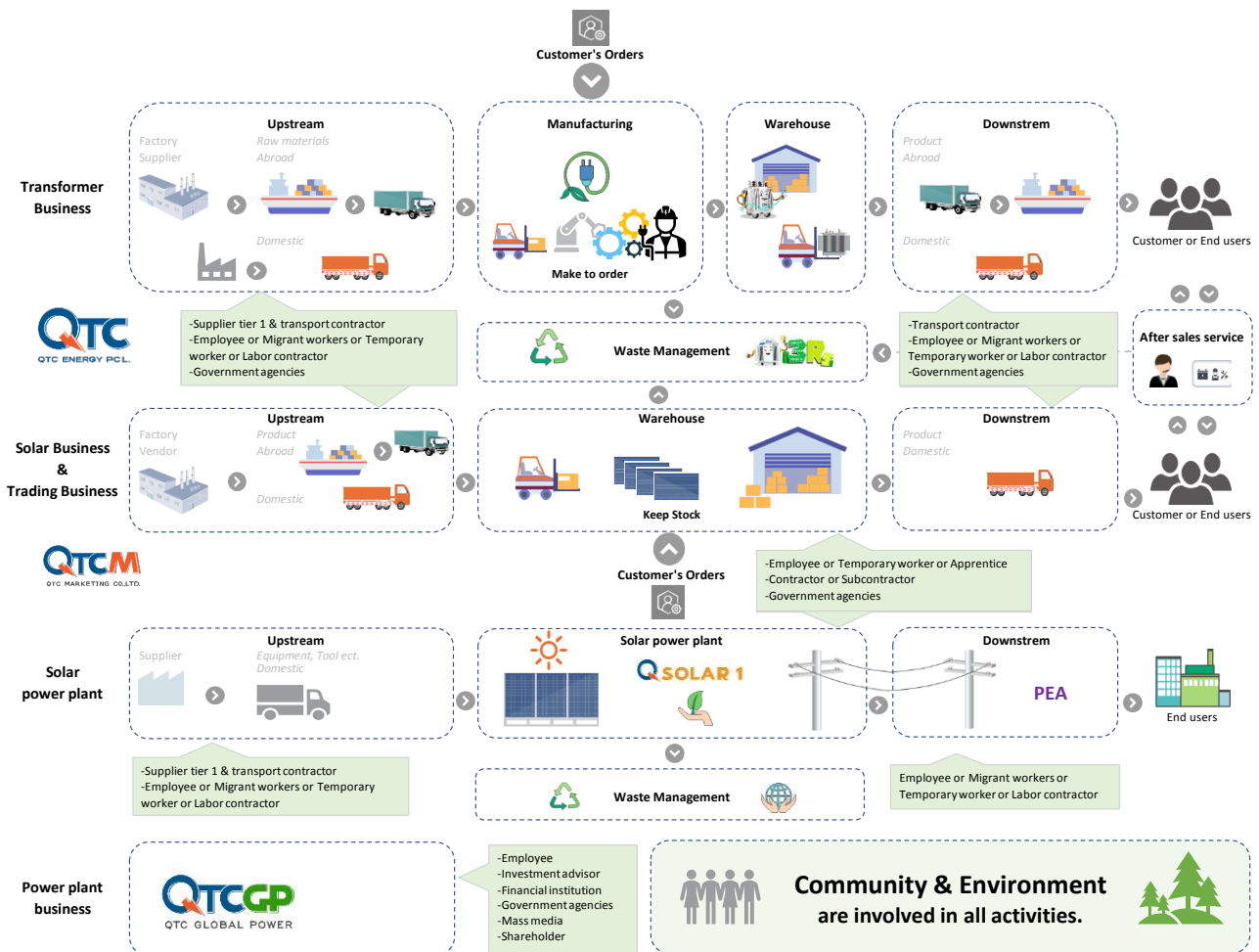
The activities under the sustainable development policies contain indices for monitoring and evaluating the effectiveness of the Company’s activities and activities of every company in the group, covering environmental, social, and governance aspects, or ESG. They provide essential information that reflect the roles and responsibilities of the business toward stakeholders, and set 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.



## Context of Organization and Stakeholders of QTC

The organization's context is reviewed once a year by the Corporate Sustainability Promotion Committee, which reviews all activities in QTC's business, including all subsidiaries and joint ventures in which QTC has more than 50% management power, covering economic, environmental, social and governance dimensions, as well as the value chain. In 2022, QTC has considered increasing the number of new qualified suppliers in order to increase the channels for sourcing quality raw materials into the production process in a timely manner, and has considered increasing electrical energy products from both domestic and international vendors to create revenue channels in the business. In addition, the Company's human rights and personal data control policies and practices have been updated in all business activities, as well as the code of conduct and guidelines for QTC partners, to comply with relevant policy changes. QTC's stakeholders in the value chain are as follows:

### Value Chain of Business

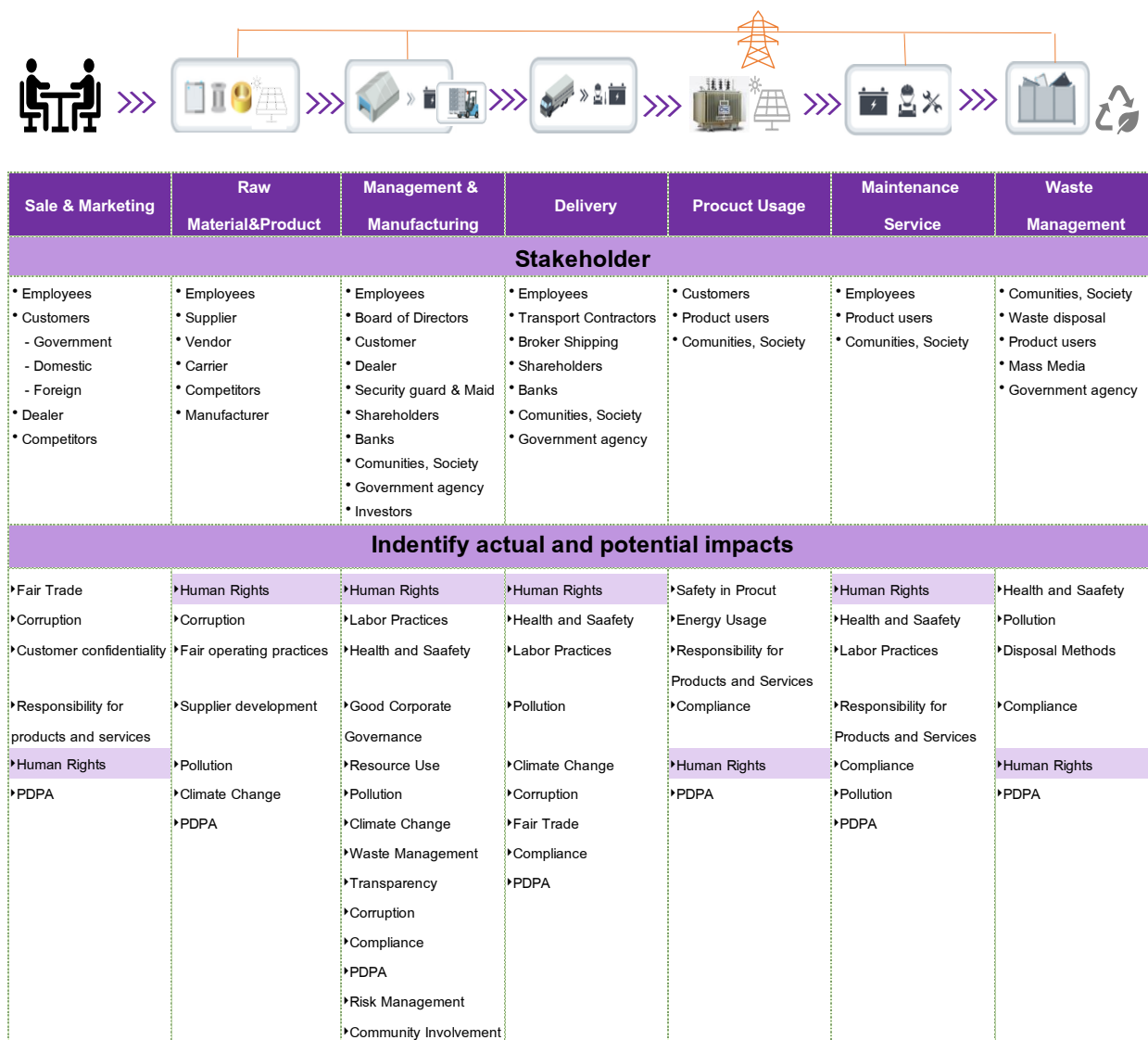


## Identification of Stakeholders and Impacts

After reviewing the context of the organization, the Corporate Sustainability Promotion Committee reviews impacts in the process throughout the entire value chain, covering all business activities to identify stakeholders and significant issues through processes aimed at identifying work hazards, assessing environmental impacts from work processes and product life cycles, assessing human rights impacts and risks, and brainstorming with participation from employees and every stakeholder group.

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 recommendations from communities and trade partners, held onsite meetings with community or organization leaders, and held meetings with customers and trade partners to hear suggestions. 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. In 2022, the stakeholder groups involved remained the same. However, the number of stakeholders has grown along with the organization's growth.



Chart showing the identification of stakeholders in the process and impact issues







## Work with Stakeholders' Expectations/Concerns

The results from identifying stakeholders in the business value chain and analysis of the significance of potential impact on stakeholders will lead to stakeholder expectations/concerns via many channels such as direct inquiries, meetings, data collection and legal requirements, etc., resulting in methods for responding to stakeholder expectations/concerns with coverage of every group as follows:


**Table Showing the Connection Between Stakeholders' Expectations/Concerns and the Organization's Response**




Stakeholders		Expectation/Concern Survey Methods	Expectations/Concerns	The Organization's Response
<b>Employees</b> 	Regular Employees	<ul style="list-style-type: none"> <li>Monthly meeting of executives and employees.</li> <li>Suggestion activities, KAIZEN, QCC.</li> </ul>	<ul style="list-style-type: none"> <li>Appropriate salary raises.</li> <li>Appropriate welfare.</li> <li>Work safety.</li> </ul>	<ul style="list-style-type: none"> <li>Safety management pursuant to ISO45001 standards.</li> <li>Environmental management pursuant to ISO14001.</li> </ul>
	Temporary Employees	<ul style="list-style-type: none"> <li>Listening to employee opinions and complaints.</li> <li>Monthly Welfare Committee meetings.</li> <li>Monthly Safety Committee meetings.</li> <li>Annual employee happiness surveys.</li> <li>Annual corporate affection and attachment surveys.</li> <li>Quarterly corporate risk assessments.</li> <li>Annual safety risk assessments</li> <li>Annual environmental impact assessments.</li> <li>Complaint box.</li> </ul>	<ul style="list-style-type: none"> <li>Pleasant work environment.</li> <li>Equality and opportunities for advancements.</li> <li>Plans for skill and knowledge training.</li> <li>Good living conditions.</li> <li>Gender equality.</li> <li>Personal data security.</li> </ul>	<ul style="list-style-type: none"> <li>Provident Fund.</li> <li>Strict adherence to employment policies.</li> <li>Health promoting workplace project.</li> <li>Organizational health for sustainable happiness project.</li> <li>Fair and accountable wage payment and performance assessment systems.</li> <li>Career path knowledge management development.</li> <li>Compliance with human rights policies.</li> <li>Compliance with personal data control policies.</li> </ul>
<b>Educational Institutions</b> 	Student Interns	<ul style="list-style-type: none"> <li>Inquiries and listening to the expectations of students and professors who wish to officially train.</li> </ul>	<ul style="list-style-type: none"> <li>Gain knowledge and skills in the careers for which they are studying.</li> </ul>	<ul style="list-style-type: none"> <li>Have students train in agencies suitable for the career for which they are studying and periodically evaluate their performance.</li> </ul>
	Professors from Educational Institutions		<ul style="list-style-type: none"> <li>Safety and good environment while job-training.</li> <li>Gender equality.</li> <li>Personal data security.</li> </ul>	<ul style="list-style-type: none"> <li>Provide additional training on procedures as with the organization's employees.</li> <li>Safety management pursuant to OHSAS18001.</li> <li>Environmental management pursuant to ISO14001.</li> <li>Compliance with human rights policies.</li> <li>Compliance with personal data control policies.</li> </ul>

Stakeholders		Expectation/Concern Survey Methods	Expectations/Concerns	The Organization's Response
<b>Board of Directors</b>  	Company Directors	<ul style="list-style-type: none"> <li>Board of Directors' meetings.</li> <li>Board of Audit meetings.</li> <li>Nomination Committee meetings.</li> </ul>	<ul style="list-style-type: none"> <li>Correct compliance to laws and ethical principles.</li> <li>Transparency and accountability.</li> <li>Business success.</li> <li>Control of Board members' personal data.</li> </ul>	<ul style="list-style-type: none"> <li>Good business governance in compliance with policies and strict enforcement.</li> <li>Strict compliance with anti-corruption policies.</li> <li>Compliance with personal data control policies.</li> <li>Report performance.</li> </ul>
	Shareholders/ Investors  	<ul style="list-style-type: none"> <li>Annual meetings of shareholders.</li> <li>Quarterly performance announcements.</li> <li>Financial analysts' meetings.</li> <li>Registered companies meet investors.</li> <li>Invitations for investors to visit factories.</li> </ul>	<ul style="list-style-type: none"> <li>Good wages.</li> <li>Good governance over activities.</li> <li>Stable business and continuous growth.</li> <li>Correct, complete, up-to-date and transparent company information.</li> <li>Good risk management system.</li> <li>Good audit and control system.</li> <li>Equal opportunities.</li> <li>Control of personal data of shareholders, investors and analysts.</li> </ul>	<ul style="list-style-type: none"> <li>Transparent, fair and accountable business governance.</li> <li>Appropriate dividend payment.</li> <li>Transparent disclosure of information.</li> <li>Strategic business plan preparation.</li> <li>Thorough risk management.</li> <li>Strict compliance with human rights policies and practices.</li> <li>Strict compliance with personal data control policies and practices.</li> </ul>
<b>Customers</b>  	Government Customers	<ul style="list-style-type: none"> <li>Meet-ups with customers/retailers.</li> <li>Product exhibitions.</li> </ul>	<ul style="list-style-type: none"> <li>Receive accurate technical product and service information.</li> <li>Appropriate product and service prices.</li> </ul>	<ul style="list-style-type: none"> <li>Good corporate governance that is transparent and verifiable.</li> <li>Strict compliance with anti-corruption policies and practices.</li> </ul>
	Private Customers  Foreign Customers  Domestic Retailers  Foreign Retailers	<ul style="list-style-type: none"> <li>Customer/retailer satisfaction surveys.</li> <li>Technical knowledge provision to customers/retailers.</li> <li>Opportunities for customers/retailers to observe production processes.</li> <li>Joint activities with customers/retailers.</li> </ul>	<ul style="list-style-type: none"> <li>Transparent price competition.</li> <li>Receive quality products and services.</li> <li>Fair compliance of agreements.</li> <li>Option to choose energy-conserving products.</li> <li>Warranty for products and services.</li> <li>Customer confidentiality preservation.</li> </ul>	<ul style="list-style-type: none"> <li>Quality management pursuant to ISO9001.</li> <li>Total Quality Management to improve product and service processes.</li> <li>CRM system.</li> <li>Strict compliance with personal data protection policies and practices.</li> <li>Strict compliance with human rights policies and practices.</li> <li>Product certification pursuant to laboratory standard ISO17025.</li> <li>Development of energy-conserving products by R&amp;D team.</li> <li>Open factories for visits to observe production processes.</li> </ul>
	PEA (Power Purchaser)	<ul style="list-style-type: none"> <li>Contract terms.</li> </ul>	<ul style="list-style-type: none"> <li>Full electricity distribution according to contract terms.</li> <li>Energy technology knowledge sharing.</li> </ul>	<ul style="list-style-type: none"> <li>Visits to observe electricity generation to build confidence.</li> <li>Modify and maintain electricity generation equipment for maximum efficiency.</li> <li>Strict compliance with anti-corruption policies and practices.</li> </ul>

Stakeholders		Expectation/Concern Survey Methods	Expectations/Concerns	The Organization's Response
	Solar Business Customers	<ul style="list-style-type: none"> <li>• Meet-up and communicate with customers.</li> <li>• Product exhibitions.</li> <li>• Customer satisfaction surveys.</li> <li>• Technical knowledge provision to customers.</li> <li>• Visits to warehouses.</li> </ul>	<ul style="list-style-type: none"> <li>• Receive accurate technical product and service information quickly and accurately according to needs.</li> <li>• Appropriate and competitive product and service prices.</li> <li>• Products have quality consistent with needs.</li> <li>• Punctual delivery.</li> <li>• Effective pre-post sale services.</li> <li>• Ability to solve problems for customers.</li> <li>• Fair compliance with agreements.</li> <li>• Warranty for products and services consistent with agreements.</li> <li>• Customer confidentiality preservation.</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare product catalogs, operation manuals and other documents with accurate technical information.</li> <li>• Plan effective work process management/control to minimize costs.</li> <li>• Plan vendor management/control to be consistent with agreements.</li> <li>• Create the Technical Support Team.</li> <li>• Prepare media related to the product without exaggerating in advertisements.</li> <li>• Manage deliveries, customer service and warranties under ISO9001 standards.</li> <li>• Strict compliance with human rights policies and practices.</li> <li>• Strict compliance with personal data protection policies and practices.</li> <li>• Strict compliance with anti-corruption policies and practices.</li> </ul>
	Trade Competitors	<ul style="list-style-type: none"> <li>• Meetings and conversations.</li> <li>• News and information.</li> <li>• Group member meetings.</li> <li>• Marketing activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Fair and transparent trade competition.</li> <li>• Exchanges of information about products, raw material sources and tools and machinery used in production.</li> </ul>	<ul style="list-style-type: none"> <li>• Compliance to ethics principles to operate business fairly and transparently.</li> </ul>
	Trade Partners	<ul style="list-style-type: none"> <li>• Annual deliverer and contractor evaluations.</li> <li>• Production process and raw material quality inspections and discussions for improvement.</li> <li>• Meeting to clarify and talk with main supplier groups.</li> </ul>	<ul style="list-style-type: none"> <li>• Receive accurate information quickly and according to time conditions.</li> <li>• Fair compliance with agreements and payment terms.</li> <li>• Fair and transparent price competition.</li> <li>• Knowledge provision and raw material production process improvement.</li> <li>• Personal data control.</li> </ul>	<ul style="list-style-type: none"> <li>• Strict compliance with procurement policies and protocol.</li> <li>• Development of trade partners through recommendations, knowledge provision, understanding about developing raw materials to be better than standard specifications.</li> <li>• Compliance with anti-corruption policies and promotion of implementation.</li> <li>• No-gift policy.</li> <li>• Code of conduct for QTC's suppliers.</li> <li>• Strict compliance with personal data control and practices.</li> </ul>



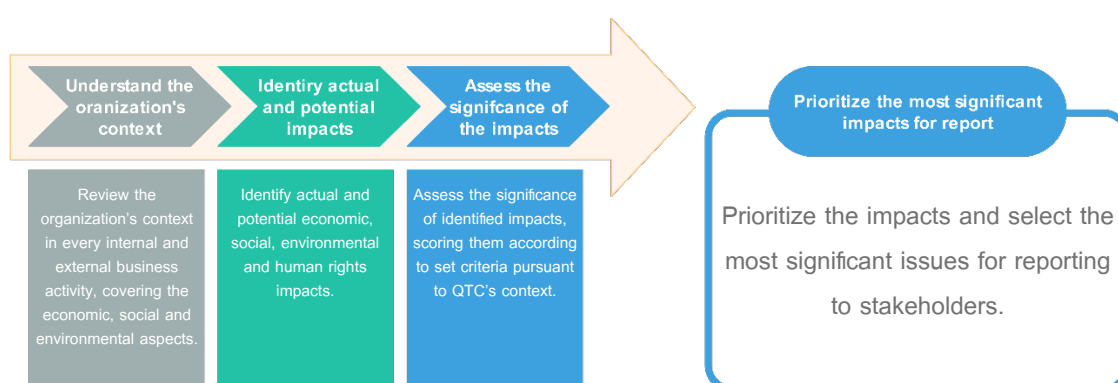
Stakeholders		Expectation/Concern Survey Methods	Expectations/Concerns	The Organization's Response
	Vendors	<ul style="list-style-type: none"> <li>• Inquire about goals of brand owners/product manufacturers.</li> <li>• Attend meetings.</li> <li>• Participate in activities organized by the brand owner/product manufacturer.</li> <li>• Participate in trainings and testing according to the product owner's criteria.</li> </ul>	<ul style="list-style-type: none"> <li>• Achieve goals of the brand owner/product manufacturer.</li> <li>• Create brand awareness in Thailand.</li> <li>• Build good relationships between the brand owner/product manufacturer and sales representatives.</li> <li>• Personal data control.</li> </ul>	<ul style="list-style-type: none"> <li>• Specify sales goals to be consistent with the brand owner.</li> <li>• Create a solar business sales team separate from the transformer business.</li> <li>• Create a specific technical team to support the solar business.</li> <li>• Jointly organize sales promotion activities.</li> <li>• Train sales employee on product knowledge.</li> <li>• Share sales data to the product owner.</li> <li>• Strict compliance with anti-corruption policies and practices.</li> <li>• Strict compliance with personal data protection policies and practices.</li> </ul>
	Service Providers	<ul style="list-style-type: none"> <li>• Meeting to talk about reports on issues and obstacles.</li> <li>• Clarification meetings.</li> </ul>	<ul style="list-style-type: none"> <li>• Fair compliance with payment terms and conditions.</li> <li>• Clear scope of operation.</li> <li>• Knowledge provision and development of service providers to the Company's satisfaction.</li> <li>• Good treatment of service provision staff.</li> <li>• Personal data control.</li> </ul>	<ul style="list-style-type: none"> <li>• Strict compliance with procurement policies and protocol.</li> <li>• Provide training on the work and procedures according to the Company's policies.</li> <li>• Compliance with anti-corruption policies and promotion of implementation.</li> <li>• No-gift policy.</li> <li>• Code of conduct for QTC's suppliers.</li> <li>• Strict compliance with personal data control policies and practices.</li> </ul>
	Waste Disposers	<ul style="list-style-type: none"> <li>• Exchanges of knowledge about legal specifications and correct practices.</li> <li>• Going onsite to evaluate and hear opinions.</li> </ul>	<ul style="list-style-type: none"> <li>• Strict compliance to agreements.</li> <li>• Correct actions pursuant to the law.</li> <li>• Fair selection consideration.</li> <li>• Personal data control</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor and inspect actions of disposers.</li> <li>• Evaluate waste disposers' performance.</li> <li>• Strict compliance with anti-corruption policies and practices.</li> <li>• Strict compliance with personal data control policies and practices.</li> </ul>
	Creditors	<ul style="list-style-type: none"> <li>• Meetings and discussions.</li> <li>• Quarterly performance announcements.</li> <li>• Shareholder meetings.</li> </ul>	<ul style="list-style-type: none"> <li>• Ability to comply with contract terms and agreements.</li> <li>• Transparency in operations.</li> <li>• Personal data control</li> </ul>	<ul style="list-style-type: none"> <li>• Strict compliance with terms and agreements in contracts.</li> <li>• Strict compliance with anti-corruption policies and practices.</li> <li>• Strict compliance with personal data control policies and practices.</li> <li>• Business visits and tours.</li> </ul>

Stakeholders		Expectation/Concern Survey Methods	Expectations/Concerns	The Organization's Response
<b>Trade Accounts Receivable</b>	Trade Accounts Receivable from Sale of Goods, Services, Electricity and Other	<ul style="list-style-type: none"> <li>Meetings and discussions.</li> </ul>	<ul style="list-style-type: none"> <li>Compromise and leniency.</li> <li>Personal data control.</li> </ul>	<ul style="list-style-type: none"> <li>Negotiations.</li> <li>Trade account management policies.</li> <li>Legal action.</li> <li>Strict compliance with personal data protection policies and practices.</li> </ul>
<b>Mass Media</b> 	Newspaper Television Radio Magazine Online Media	<ul style="list-style-type: none"> <li>Meetings with mass media at different occasions.</li> </ul>	<ul style="list-style-type: none"> <li>Accurate and fast news and information on business progress.</li> <li>Personal data control.</li> </ul>	<ul style="list-style-type: none"> <li>Meet and visit with mass media at least once a year.</li> <li>Invite mass media to visit the business.</li> <li>Strict compliance with personal data protection policies and practices.</li> </ul>
<b>Government Agencies</b> 	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"> <li>Meetings and explanations of government agencies.</li> <li>Business inspections and visits.</li> <li>Conditions pursuant to the law.</li> <li>News and information.</li> </ul>	<ul style="list-style-type: none"> <li>Ability to comply with related laws.</li> <li>No social and environmental effects.</li> <li>Development of the organization's ability to participate in modifying environmentally-friendly production processes to reduce impacts.</li> <li>Cooperate with the government sector to provide information for use in development.</li> <li>Support government sector projects with benefit for the greater good.</li> </ul>	<ul style="list-style-type: none"> <li>Comply with rules and regulations prescribed by the law in every area.</li> <li>Complete and punctual tax payments of every type.</li> <li>Develop processes to seek opportunities for improvement and reduce environmental impacts.</li> <li>Transparent disclosure of information.</li> <li>Report information according to legal specifications.</li> <li>Annual reports.</li> </ul>
<b>Community and Society</b> 	<b>Communities Around the Factory</b>  <b>Communities Around the Power Plant</b>  <b>General Society</b>	<ul style="list-style-type: none"> <li>Organizing activities with communities/society.</li> <li>Participation on community and social development.</li> <li>Annual public hearing activities where communities meet with QTC.</li> <li>Annual public hearing activities where communities meet with the power plant.</li> <li>News and information.</li> </ul>	<ul style="list-style-type: none"> <li>Friendliness to one another.</li> <li>Support for community activities.</li> <li>Support for products made by disabled persons in the community.</li> <li>Support for activities in social businesses.</li> <li>No negative safety and environmental impacts on communities and society.</li> <li>Transparency in operations.</li> <li>Compliance with human rights and anti-corruption principles.</li> </ul>	<ul style="list-style-type: none"> <li>Support public activities.</li> <li>Create volunteer employees to participate in public activities.</li> <li>Environmental management with ISO14001 standards.</li> <li>Energy management with ISO 50001 standards.</li> <li>Safety management with ISO45001 standards.</li> <li>Human rights policies and support for practice.</li> <li>Anti-corruption policies and support for practices.</li> <li>Suitable procurement of products from disabled persons in the community for the Company's operations.</li> <li>Indirect investment in social businesses.</li> <li>Annual performance reports at association activities and other media.</li> </ul>

# Selection of Key Sustainability Topics

After identifying the stakeholders and assessing the impacts, as well as determining the expectations and concerns of stakeholders regarding the Company's business activities and methods used by the Company to respond to such expectations or concerns, the Corporate Sustainability Promotion Committee prioritizes the impacts to screen for the most significant impacts for reporting to the stakeholders.

## Key Topic Determination Process



- 1. Key Topic Identification and Impact Assessment:** Considerations are made regarding the source information, beginning from the organization's context, and information from stakeholders inside and outside the organization on issues given importance to by each group of stakeholders or expectations or concerns about positive and negative impacts in economic, social, environmental and human rights aspects using environmental, safety, human rights and other assessment processes.
  - **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/concerns for employees and the organization to be designated as key topics.
  - **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, assessment of human rights impacts in the value chain, development plan of the government and relevant government agencies. Information was collected on opinions, expectations/concerns and recommendations by interviews, questionnaires, official and unofficial discussions and analysis of information about expectations/concerns to designate as key topics.

2. **Prioritization of Issues:** Such key topics are weighed by using assessment and weighing methods according to the criteria set by the Company, taking into account the key topics divided into five score ranges according to the level of significance. The “Significant”, “Very Significant”, and “Most Significant” levels are then reported.

Level of Significance	Least Significant	Minimally Significant	Significant	Very Significant	Most Significant
Score Range	1-2	3-4	5-6	7-8	9-10

3. **Review of Significant Issues:** QTC’s review of key sustainability topics was done. In 2022, there were additional key topics, namely, ethics-transparency, legal compliance, personal data control, and anti-corruption, which were originally included in the report under governance. However, in 2022, there was an agreement to separate such key topics for evaluation and clearer definition. This is a result of the expectations and concerns of stakeholders which give these topics more importance, and stricter enforcement of laws. Regardless, the additional key topics were grouped under the main topic “Governance” for consistency in the report’s content. The key topics in the GRI Sector Standards were reviewed, and it was found that QTC’s business activities are not in the category of industries that can include the key topics in the report. These key topics have been approved by the Board. In any case, the Company does not yet have a plan to use a third-party agency to verify its assessment process.

## Key Sustainability Topics

Least Significant	Minimally Significant	Significant	Very Significant	Most Significant
	<ul style="list-style-type: none"> <li>● Biodiversity</li> <li>● Fair Business Competition</li> </ul>	<ul style="list-style-type: none"> <li>● Role in Social-Community Development</li> <li>● Climate Change</li> <li>● Trade Partner Development</li> <li>● Anti-Corruption</li> </ul>	<ul style="list-style-type: none"> <li>● Innovation Promotion</li> <li>● Sustainable Use of Resources</li> <li>● Personal Data Control</li> <li>● Environmentally Friendly Production Processes</li> <li>● Legal Compliance</li> </ul>	<ul style="list-style-type: none"> <li>● Ethics-Transparency</li> <li>● Human Resource Development and Employee Care</li> <li>● Business Growth</li> <li>● Employment and Human Rights</li> <li>● Responsibility for Products and Services</li> <li>● Employee Safety and Health</li> <li>● Waste and Scrap Material Management</li> <li>● Risk Management</li> </ul>

● Good Governance    ● Strong Economy    ● Environmental Consciousness    ● Social Responsibility

## Key Sustainable Development Topics

Key Topic Group	Key Topic/Reported Material	Page	Scope of Impact			
			Economy	Environment	Society	Human Rights
Corporate Governance	Ethics-Transparency	33				
	Anti-Corruption	39				
	Personal Data Control	41	😊 😞	😞	😊 😞	😊 😞
	Legal Compliance	41				
	Organizational Risk Management	43				
Business Growth	Economic Results	56	😊 😞	😊 😞	😊 😞	😊 😞
	Other Business Investment	58				
	Value Distribution to Stakeholders	59				
Innovation Promotion	Organizational Innovation Promotion Process	62	😊 😞	😊 😞	😊	😊 😞
	Process-Level Innovation Promotion	63				
	Individual-Level Innovation Promotion	66				
Responsibility for Products and Services	Work Standards	70				
	Product Standards	71	😊 😞	😊 😞	😊 😞	😊 😞
	Electrical Testing Standards	73				
	Customer Care	75				
Trade Partner Development	Trade Partner Care	79	😊, 😞	😊, 😞	😊, 😞	😊, 😞
Waste and Scrap Material Management	Production Waste and Scrap Material Management	84	😊, 😞	😊, 😞	😊, 😞	😊, 😞
Environmentally Friendly Production Processes	Pollution Control	95	😊	😊	😊	😊
	Green Procurement	98	😞	😞	😞	😞
Climate Change	Carbon Footprint of Organization (CFO)	103				
	Greenhouse Gas Emission Reduction Project	107	😊 😞	😊 😞	😊 😞	😊 😞
	Environmentally Friendly Products	111				
Sustainable Use of Resources	Energy Consumption	115	😊	😊	😊	😊
	Water Consumption	120		😞	😞	😞
	Raw Material Consumption for Production and Services	122				
Employee Safety and Health	Safety	126	😊	😊	😊	😊
	Health	137	😞	😞	😞	😞
Employment and Human Rights	Employment	144	😊, 😞	😊	😊, 😞	😊, 😞
	Human Rights	148	😊, 😞	😊, 😞	😊, 😞	😊, 😞
Human Resource Development and Employee Care	Human Resource Development	156	😊, 😞	😊, 😞	😊	😊, 😞
	Employee Care	163	😊, 😞	😊, 😞	😊	😊, 😞
Role in Social-Community Development	Participation in Community Development	173	😊	😊	😊	😊
	Social Investment	176	😞	😞	😞	😞
	Social Activities	177				

## 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 environmental, social and governance, or ESG, work effectiveness leading to the objective of extensive implementation by executives and employees under QTC's sustainability equation of Quality + Responsibility = Sustainability". The Company's main strategies for sustainable development are as follows:





# QUALITY OF DETAILS

Quality of Service Creates Sustainable Energy

## Super Low Loss Transformer



- Reduce Greenhouse-gas emissions
- Reduce No load losses > 80%
- Short Circuit Withstand from CESI Italy
- ROI 3-5 years

## Dry Type Cast Resin Transformer



- Maximum Capacity 140%
- Cooling system
- Resistant to cracking and burns
- Low Maintenance Cost

## Oil Type Transformer



- No Limitation in Insulation
- Safety with Environment
- Low Fire Risk
- Reduce Cost Maintenance

## Smart Transformer Monitoring System



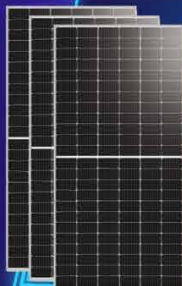
- Real time online monitoring & alert
- Auto GPS Location
- Data record on cloud
- Monitoring report
- Peak History

## Huawei Inverter (Distributor)



- Inverter Touch Free
- Product Warranty 5 - 10 years
- High Efficiency > 98.6%

## LONGi Solar Panel (Distributor)



- Gallium-doped Wafer & Smart Soldering
- Product Warranty 12 years
- Hi-Mo5 Technology
- Efficiency Warranty 25 years

## Trina Solar Vertex (Distributor)



- Biggest Cell M12 210mm.
- Product Warranty 12 years
- 1/3 Cut Technology with Multi Busbar
- Efficiency Warranty 25 years

For more information








## Good Governance

# Corporate Governance

Corporate governance is important to companies listed in the Stock Exchange of Thailand. Because the Company raised funds from the public as capital for business operations, the Company has shareholders as co-owners. However, shareholders who own the business do not manage the business in person and appointed directors to manage the business. Therefore, the Company needs to govern the business systematically to ensure that the business operates for the long term benefit of shareholders with consideration given to stakeholders from every group, which will bring about the Company's sustainable growth.

QTC recognizes the importance of good governance with coverage of the economic, social and environmental aspects in order to build confidence and value for the organization, shareholders and stakeholders according to the organization's objectives with long term sustainability and compliance with the law, rules, and principles with accuracy, transparency and accountability. QTC has the Board of Directors to represent shareholders in governance while the Nomination, Remuneration and Corporate Government Committee and the Board of Audit composed of independent directors reviews governance processes. Furthermore, the Company has strong internal audit processes covering the entire organization and work units that monitor changes in laws and regulations related to the business along with assessing compliance with the law in order to modify practice guidelines to be consistent and reduce risks from ethical violations or non-compliance with the law, which may have effects on stakeholders and QTC's business operations

From the identification and evaluation of both positive and negative impacts on key topics for stakeholders and QTC's sustainability, covering the economic, environmental, social and human rights aspects, the results are summarized in brief as follows:

Key Topics	Economic	Environmental	Social	Human Rights
	 Impact	 Impact	 Impact	 Impact
<ul style="list-style-type: none"> <li>▪ Ethics-Transparency</li> <li>▪ Anti-Corruption</li> <li>▪ Legal Compliance</li> <li>▪ Personal Data</li> <li>▪ Organizational Risks</li> </ul>	<p>😊 Operate according to the law. Pay taxes on time.</p> <p>😊 Create fair competition. Raise national-level transparency.</p> <p>😞 Legal loopholes may be used in corruption or compliance may be neglected.</p> <p>😞 There may be delays in response to customer demands due to strict inspection processes.</p>	<p>😊 -</p> <p>😞 Resource consumption increases from operations in electricity, fuel, etc.</p>	<p>😊 Confidence and trust from employees, society, and communities.</p> <p>😞 There may be social resistance if compliance is neglected.</p>	<p>😊 There is equality in the perception of or access to essential information.</p> <p>😞 Legal loopholes may be used to exploit or violate human rights.</p> <p>😞 The Company may be at risk of being accused of indirectly violating human rights.</p>


The Company has taken careful steps to improve its work processes in accordance with international and legal practices to minimize or prevent negative impacts by establishing policies for managing various aspects of the work and clear operational goals as follows:


**Objective:** To ensure that the Company complies with all international and necessary laws, rules, regulations and practice guidelines in order to meet shareholder and stakeholder expectations/concerns.

- Management:**
- Review and modify the good governance policy, business ethics, the anti-corruption policy, the personal data control policy, the human rights policy, including other related policies and practice guidelines to be up-to-date on an annual basis along with providing training for executives and employees when any changes occur. Monitor, check, follow-up on work and report performance under the Board of Director's governance in order for corporate governance effectiveness to be comparable to leading organizations at the national and global levels.
  - Establish corporate risk management policy and establish a corporate risk management committee to assess risks that may affect business operations, as well as establish various measures to help manage opportunities and control risks under the risk management process in accordance with international standard COSO-ERM.

 **1 :** To become a model organization in the area of management with good governance and ethics.

 **:** 

 **2 :** There must be zero cases of governance principle and business ethics violations, and corruption.

 **:** In 2022, the goal was achieved. There were zero cases.



## Ethics and Transparency

The Company gives importance to good governance as it considers it an important mechanism for developing an effective, transparent and accountable management system, which will help build trust and confidence among shareholders, investors, stakeholders and all related parties. The Company has established a written good corporate governance policy, and compiled and adapted rules, regulations and guidelines from the Securities and Exchange Commission of Thailand and the Stock Exchange of Thailand to the Company's business ethics practices to use them as the standard for business operations in a material way to create value and competitiveness and promote the Company's long-term sustainable growth.

To ensure strict implementation by the Company's directors, executives, employees and related stakeholders, the Board requires at least one review of the good corporate governance policy and business ethics per year and assigns the responsibility to the Nomination, Remuneration and Governance Committee, which comprises no less than three directors and executives. More than half of the total members of the Nomination Committee must be independent directors, and the Chairman of the Nomination Committee must be an independent director to monitor the performance and report to the Board.

Corporate Governance Policy: <https://investor.qtc-energy.com/th/corporate-governance/corporate-governance-policy>

Business Code of Conduct: <https://investor.qtc-energy.com/storage/download/corporate-governance/20211220-qtc-codeofconduct-th.pdf>



**Mr. Norachit Sinhaseni**  
Chairman of the Nomination  
Committee



**Mr. Kamol Takabut**  
Director



**Mr. Preedee  
Ngamsantikul**  
Director



**Mrs. Wasara  
Chotithammarat**  
Director



**Mr. Poonphiphat Tantanasin**  
Director

### **Nomination, Remuneration and Governance Committee**

The Company has designated the Audit Committee consisting of three independent directors who are knowledgeable, skilled, experienced and qualified according to the requirements of the Stock Exchange of Thailand the role and responsibilities in reviewing the internal control system and internal audit system as well as the corporate risk management system to ensure that the conduct of directors, executives and employees is in accordance with good corporate governance policy and in accordance with business ethics, policies and related laws. These responsibilities also include receiving complaints or whistleblowing from the general public if they see any misconduct committed by the Company's directors, executives and staff.



**Mr. Nattharphon  
Lilawattahanun**  
Chairman of the Audit  
Committee



**Mr. Kamol Takabut**  
Director



**Mrs. Wasara  
Chotithammarat**  
Director

### **Audit Committee**



## Performance in 2021

- The Nomination, Remuneration and Governance Committee worked with an internal work group to review and revise the business code of conduct, good governance policy, human rights policy, and sustainable development policy to be consistent with international practices, and has proposed the revision to the Board. The revisions were approved and became officially effective and has been published on the Company's website (<https://qtc-energy.com/th/>). In 2022, the Nomination, Remuneration and Governance Committee met onsite three times to recruit, select and nominate suitable individuals for director and high-ranking executive positions along with considering remuneration for directors according to specified criteria.
- The Audit Committee conducts audits of corporate governance and anti-corruption operations in the organization along with an internal audit cycle covering all work processes by an independent external auditor, Kandit Advisory Services Co., Ltd. The audit results are reported directly to the Audit Committee. In 2022, the Audit Committee held five online meetings to monitor, audit and evaluate the results. The audit conducted by the external auditor found no significant issues related to corporate governance and corruption.
- The Company disseminated the No Gift Policy during the New Year festival of 2023 via the Company's website and the Thai CAC Facebook page, and communicated the policy to QTC's domestic and overseas trade partners and all subsidiaries by email: [sustainability@qtc-energy.com](mailto:sustainability@qtc-energy.com)



- The Company received the SET Awards 2022 for Business Excellence in the Best Investor Relations Awards category with a market capitalization not exceeding 3,000 million baht. The awards were organized by the Stock Exchange of Thailand in collaboration with the Money and Banking Magazine. The event was honored by Dr. Pakorn Pitathawatchai, Director and Manager of the Stock Exchange of Thailand, who handed out awards to recognize distinguished organizations in terms of investor relations activities and to place importance on the participation of organizations under the "Superior Long-term Performance" sustainable business development approach at the Stock Exchange of Thailand.



- The Company supported directors and high-ranking executives to have skills, knowledge and abilities to benefit effective corporate governance.

First – Last Name	Course	Institute
<b>Ms. Wasara Chotithammarat</b> <ul style="list-style-type: none"> <li>• Board Director</li> <li>• Nomination, Remuneration and Governance Director</li> <li>• Audit Director</li> </ul>	<ul style="list-style-type: none"> <li>• ELP-Ethical Leadership Program</li> </ul>	IOD
<b>Ruangchai Kritsnakriengkrai</b> <ul style="list-style-type: none"> <li>• Board Director</li> <li>• Executive Director</li> <li>• Managing Director</li> </ul>	<ul style="list-style-type: none"> <li>• Hot Issue for Directors</li> <li>• Risk Management Program</li> <li>• Executive Energy Program</li> </ul>	IOD IOD FTI
<b>Mr. Kitti Achariyaboonyong</b> <ul style="list-style-type: none"> <li>• Executive Director</li> <li>• Deputy Managing Director</li> </ul>	<ul style="list-style-type: none"> <li>• Strategic Board Master Class</li> <li>• Advanced Master of Management (AMM), Class 9</li> <li>• Strategy Essential Summit</li> <li>• Executive Energy Program</li> </ul>	IOD NIDA TNI AND ASSOCIATES FTI
<b>Miss Sasikarn Tantanasin</b> <ul style="list-style-type: none"> <li>• Managing Director, QTCGP</li> </ul>	<ul style="list-style-type: none"> <li>• TOP X รุ่นที่ 1 Expose-Expand-Export</li> </ul>	บ.บคด
<b>Mr. Phot Wongkham</b> <ul style="list-style-type: none"> <li>• Assistant Managing Director, Transformer Business</li> </ul>	<ul style="list-style-type: none"> <li>• The Supervisory Grid Public 20222</li> <li>• Director Certification Program</li> </ul>	Grid The Power to Change IOD
<b>Mr. Nipat Chingchamikorn</b> <ul style="list-style-type: none"> <li>• Assistant Managing Director, Solar Business</li> </ul>	<ul style="list-style-type: none"> <li>• Director Certification Program</li> </ul>	IOD

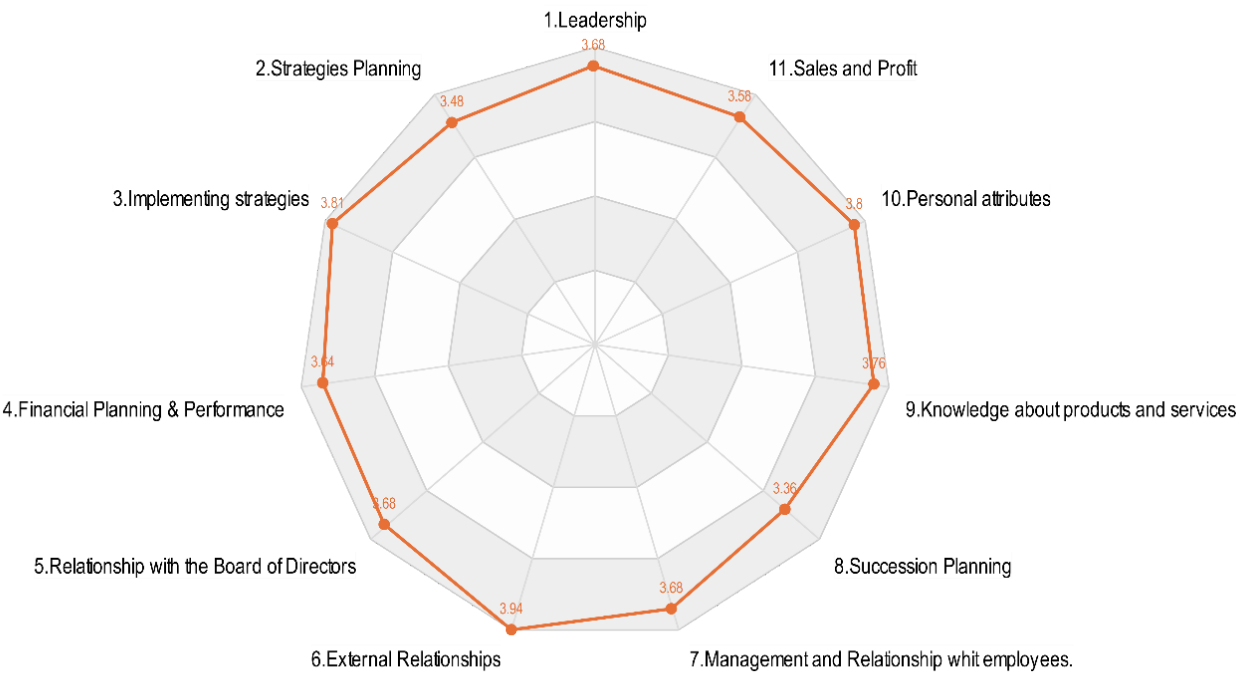


# Performance Assessment

The Board of Directors requires performance of the Board of Directors and the ability to perform duties of the Chief Executive Officer to be assessed annually. In 2022, assessments had the following results:

- 1. The Chief Executive Officer's performance assessment was conducted with reference to the self-assessment forms for boards of directors of the Corporate Governance Center, Stock Exchange of Thailand, of December 2011: Eleven sections were modified. Eight directors performed independent assessments of the Chief Executive Officer's performance in 2022. Scores were averaged from a full score of 4 points.

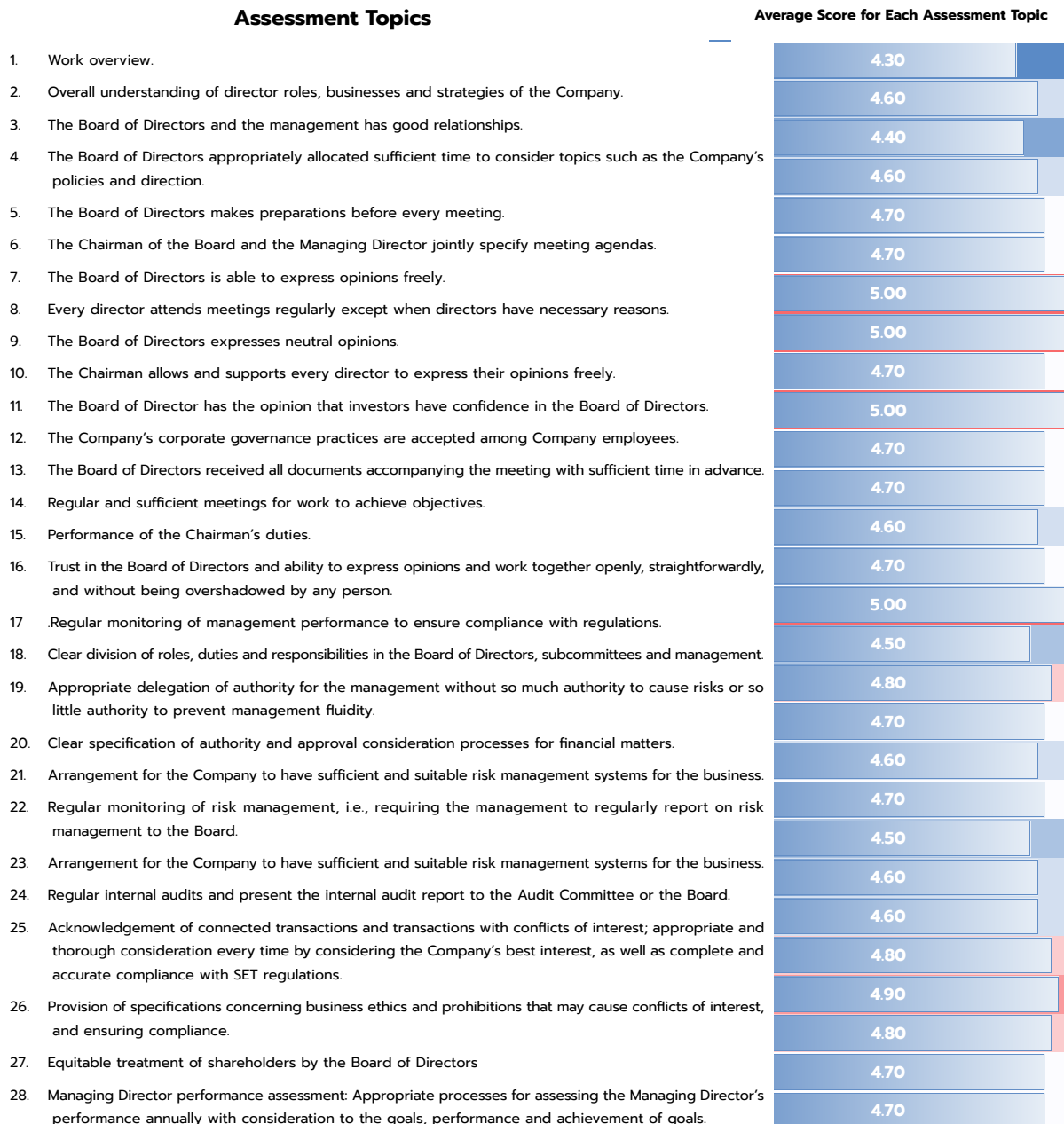
Graph of Results from Assessment of the Chief Executive Officer's Performance in 2022



Full Score: 4 points. Mean Score: 3.71 points. The score is at an excellent level.

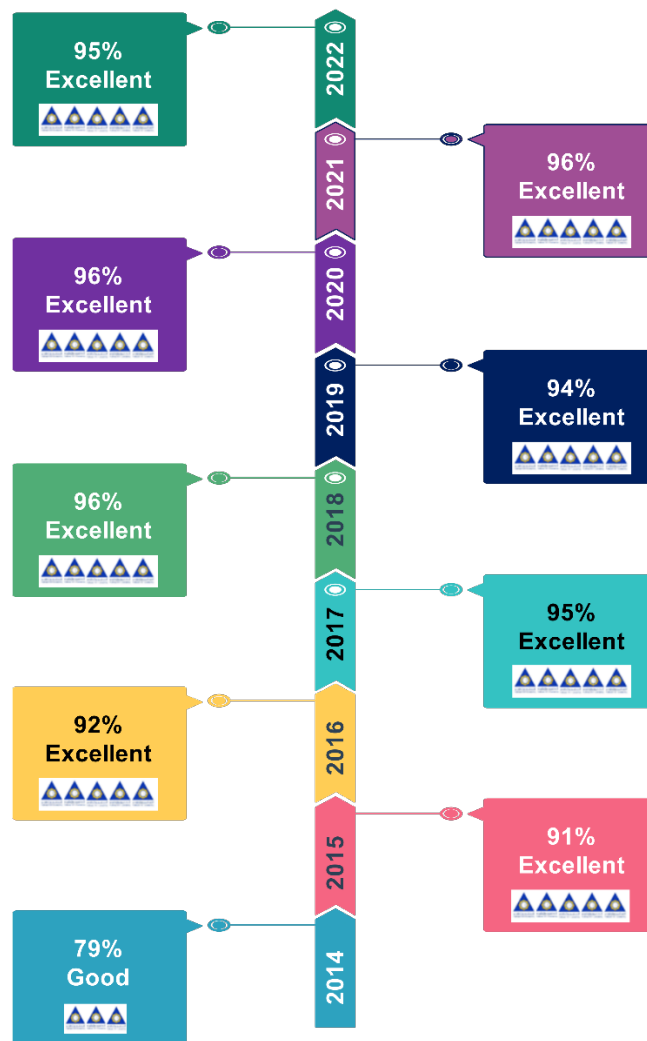
2. The Board of Directors was assessed with reference to the self-assessment forms for boards of directors of the Corporate Governance Center, Stock Exchange of Thailand, of 2015, to appropriately modify 28 questions. All 10 directors completed self-assessments of performance in 2022 and scores from each question were averaged from a full score of five points.

### Graph of Self-assessment Results of the Board of Directors of 2021

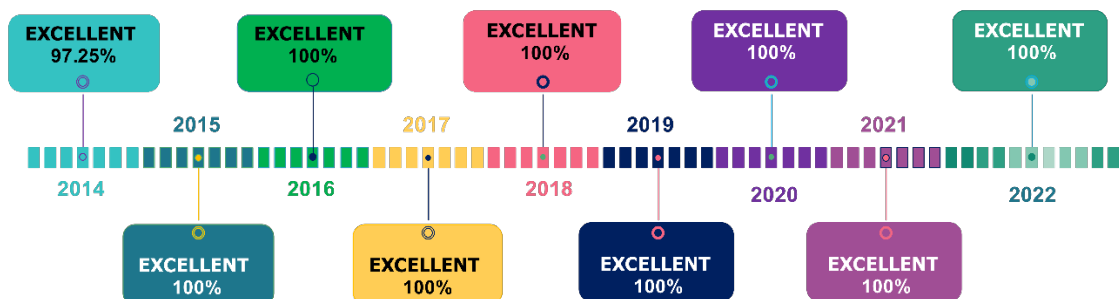


**Full Score: 4 Points. Average Score: 3.70 Points. Scores are at an excellent level.**

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



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





## Anti-Corruption

QTC has an ideology of conducting business under good corporate governance by adhering to good corporate governance principles and business ethics by using the fair business competition strategies with the best quality of products. In addition, the Company recognizes that corruption is a serious threat that undermines fair competition and damages the economic and social development and violates human rights at the national level.

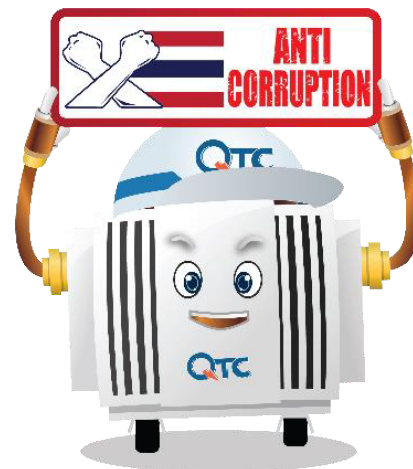
In order to ensure that the Company has good and accountable anti-corruption practices, the Company has prepared an anti-corruption policy in writing and a manual of relevant practices to guide personnel at all levels under the supervision of QTC to adhere to operational norms as part of the Company's business ethics by committing to promoting them as a part of the organization's "zero tolerance of corruption" culture and values.

Anti-corruption Policy :

[https://qtc-energy.com/wp-content/uploads/2021/01/Anti-Corruption\\_Policy\\_Th\\_2564.pdf](https://qtc-energy.com/wp-content/uploads/2021/01/Anti-Corruption_Policy_Th_2564.pdf)

Anti-corruption Policy Compliance Guideline :

[https://qtc-energy.com/wp-content/uploads/2021/08/Anti\\_Corruption\\_Bochur.pdf](https://qtc-energy.com/wp-content/uploads/2021/08/Anti_Corruption_Bochur.pdf)



## Performance in 2022

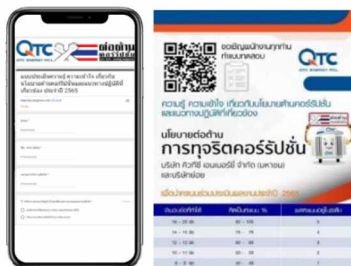
- The Company received a certificate through the certification process to become a member of the Thai Private Sector Collective Action Against Corruption (CAC), which the Company has renewed for the first time and is effective from 21st March 2022 to 31 March 2025, at the CAC Certification Ceremony 2022 under the theme "Disrupt Corruption with Power of Business Unity" held online via Zoom.



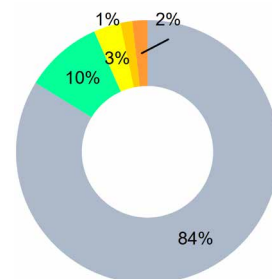
- The Company audited cases with potential conflicts of interest in 2022. Audit results showed no director, executive or employee with conflicts of interest.
- In 2022, no government employees were hired to be the Company's employee or consultant in compliance with the anti-corruption policy.

## Training and Education

### Individual-Level Indicators



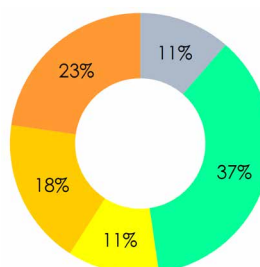
The Company raises awareness and understanding of anti-corruption policies as part of individual KPIs, which affects the Company's annual performance evaluation. Therefore, HR organizes annual refresher training and tests the understanding of 100% of employees through an online system. The results are as follows:



Graph Showing Assessment Results

### New Employee Training

The Company designates anti-corruption policies and practices as mandatory courses. All new employees must pass the training and comprehension tests. In 2022, there were 32 new employees and eight student interns who completed 100% of the training. Those who received test scores lower than 60% be retrained and retested to boost their comprehension and ensure correct implementation.



Employee Test Results 1



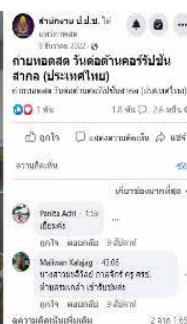
### Activities to Promote Understanding



An anti-corruption booth was organized to educate employees about Thailand's corruption situation at the Company's 5S Safety & Happy Workplace 2022 on 18 – 16 August 2022.

## Campaigning Against Corruption

The Company participated in activities on International Anti-Corruption Day 2022 under the concept of «Zero Corruption Tolerance: Unite Thailand Against Corruption» by joining forces using the new-normal method of viewing the event online via the Facebook Live of the Office of the National Anti-Corruption Commission on 9 December 2022, and expressing its anti-corruption intentions via the Company's official Facebook and Line accounts.



# PDPA



The Company recognizes that personal data is extremely important because personal data, such as name, surname, address, telephone number, email address, and ID card number, and sensitive personal data, such as race, religion, gender, etc., or any other similar information as specified by law of all QTC stakeholders can be processed in a variety of ways, both to create benefits and abused in ways that cause damage to the data subject, or used for unlawful exploitation. Therefore, the Company gives importance to this by announcing its personal data protection policy and preparing related guidelines, improving work processes in accordance with the Personal Data Protection Act, B.E. 2562 (2019), providing training and understanding to employees, and publishing the personal data protection policy via the Company's website.

- **Training for Directly Related Operators:** 100%
- **Training for General Staff/Student Interns:** 81.85%
- **To Be Trained in 2023:** 18.15%



PDPA Policy : <https://qtc-energy.com/wp-content/uploads/2022/05/การคุ้มครองข้อมูลส่วนบุคคล-Privacy-Notice.pdf>

**In 2022, there were no violations or complaints according to the Personal Data Protection Policy.**

## Legal Compliance


The assessment of legal compliance is a major risk for the Company due to the frequent changes in the requirements of the law and in order to prevent mistakes in business operations. Hence, the Company has established operational procedures for the assessment of legal compliance to cover business activities, determine the responsible team, and prepare a register of controlling laws in the Document Control Center. In 2022, regulations and laws related to business operations are as follows:


- Regulations and laws directly related to business operations and which are complied with: 292 issues.
- Requirements and laws used as references: 145 issues.
- Requirements and laws directly related to business operations and are in the process of being implemented in accordance with the timeframe required by law: Three issues. Clear operational plans have been established.

**In 2022, operations were in compliance with the law.**


## Whistleblowing or Complaint Channels

If any related stakeholder has questions or has seen any acts that suggests that a director, executive or employee of the Company or any of its subsidiaries may have a behavior that is a violation or noncompliance with the laws, regulations, requirements, code of conduct or governance policies of QTC or the anti-corruption policy or personal data protection policy, etc., you may inquire about the acts, report on clues or file a complaint, along with the details and evidence, via the following channels:


**Whistleblowing or Complaint Channels**




Mail addressed to:  
Audit Committee of QTC Energy Public Company Limited  
2/2 Soi Krungthep Kritha 8, Intersection 5, Krungthep Kritha Rd., Huamark, Bangkok, 10240




Email:  
[audit@qtc-energy.com](mailto:audit@qtc-energy.com)


**Channels for Consulting/Inquiring about Related Policies or Guidelines**



Email:  
[sustainability@qtc-energy.com](mailto:sustainability@qtc-energy.com)




Telephone: 038-891-411-4, Ext. 111




Company Website:  
[www.qtc-energy.com](http://www.qtc-energy.com)



## Performance in 2022



**External Stakeholders**  
The Audit Committee has not received any complaints or clues in all cases.



**Internal Stakeholders**  
A violation of the Company's regulations and business ethics at the operator-level was detected: One production misappropriated copper wire scraps for sale. The Company has strictly followed its legal rights and has trained and raised awareness with other employees for them to understand and recognize the consequences and prevent the recurrence.



## Risk Management

Risk management is one of the most important and necessary issues for successful business operations because economic changes, technological advances, social and environmental changes including crises may occur at any time. Controlling risks to prevent impacts on business is increasingly difficult because risks are external factors, causing the Company to have to adapt and reduce expected future risks in order to make operations and performance consistent with goals. Assessments to reduce risk create opportunity for sustainable business growth.

QTC recognizes that working to achieve business goals, uphold obligations according to the organization's vision to become a world class company and create confidence for stakeholders has challenges under economic, social and environmental evolutions, which may directly or indirectly create good opportunities or negative impacts on business operations. Therefore, QTC places importance on corporate risk management in every area covering economic, environmental, social and human rights dimensions under the governance of the Corporate Sustainability Promotion and Risk Management Committee, the Audit Committee and the Board of Directors.

Corporate Risk Management Policy <https://qtc-energy.com/th/risk-management-policy2/>

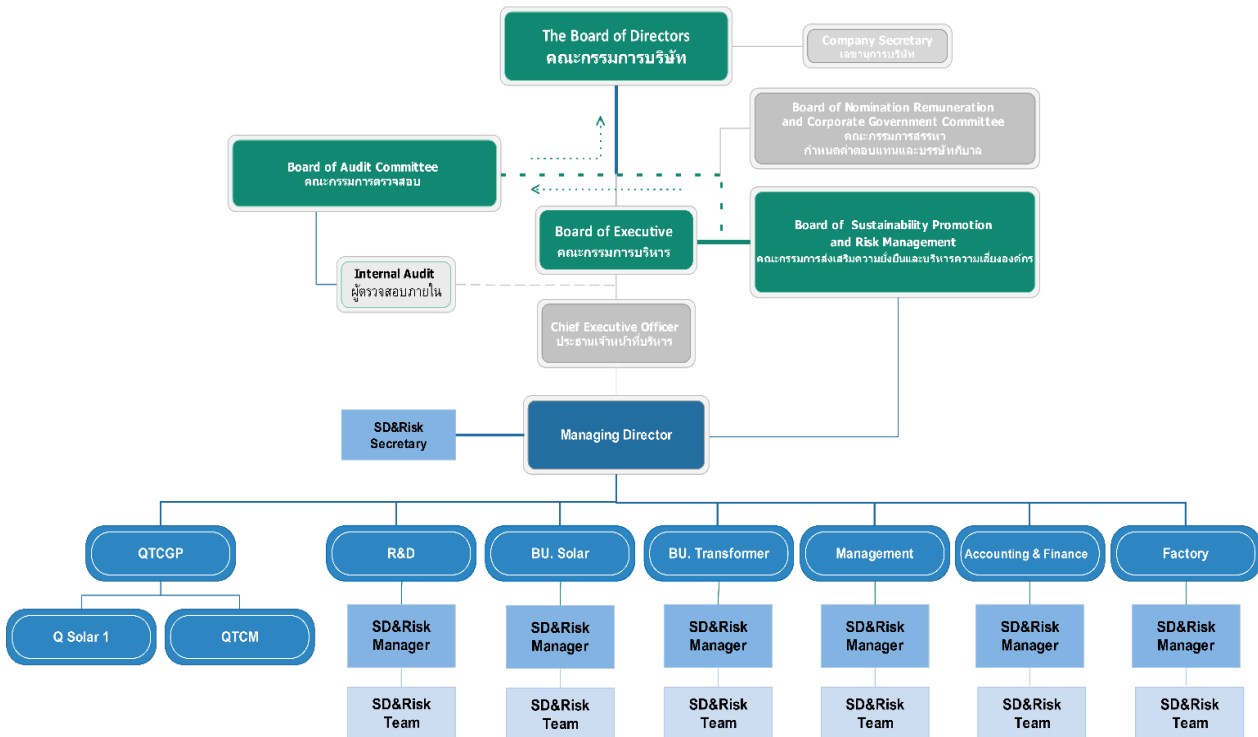
## Corporate Risk Management Process

The Company prepared a corporate risk management handbook as clear practice guidelines according to ERM-COSO risk management standards by requiring risks to be reviewed by surveying the organization's environment or contexts in changed situations and following designated processes and steps under the responsibility of the Corporate Sustainability Promotion and Risk Management Committee along with reporting to the Board of Audit and directors on a quarterly basis.





## Corporate Sustainability Promotion and Risk Management Committee Structure



## Performance in 2022

- The Risk Management Committee organized four risk management processes in 2022 at specified times.
- The Company has five aspects and 14 issues regarding risks with significance for the organization's objectives.

Details on significant risks are as follows:



## • Significant Risks

### 1. Strategic Risk

Risk Topics	Measures & Performance
<p>Dependence on Major Customers in the Transformer Business</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 control and mitigate risks:</p> <ul style="list-style-type: none"> <li>• The Company has agencies and persons directly responsible for government sales in addition to specifying clear roles and duties.</li> <li>• The Company modified manufacturing standards and related management procedures to reduce costs under international quality standards and with responsibility.</li> <li>• The Company expanded overseas markets with OEM manufacturing in Australia and Japan (brands cannot be cited). This is a trade secret.</li> <li>• The Company appointed foreign sale representatives under the QTC brand to increase sale channels.</li> <li>• The Company developed super low loss and smart transformer products to create new different options for customers.</li> <li>• The Company expanded the customer base in the transformer maintenance services group.</li> <li>• The Company added the sale of electrical clean energy products (as a distributor).</li> <li>• The Company restructured the organization to allow itself to respond more efficiently to the diversified needs of more customers.</li> </ul> <p><b>Operations in 2022:</b> The net profit from operations (separate business) was 8.38%. For more details, see the "Economy" topic and the financial report in 56-1 One Report.</p>
<p>Investment in Other Businesses</p>	<p>To distribute risk of investment in energy businesses connected to the transformer business through the work of QTC Global Power Co., Ltd. (GTCGP), a subsidiary, and the energy business in which most of QTC's personnel have no expertise, the Company has the following risk prevention measures:</p> <ul style="list-style-type: none"> <li>• The Company hires outside specialist consultants to study information of projects in which the Company will invest by covering economic, social and environmental aspects.</li> <li>• Any investments in other businesses must be approved by the Board of Directors and shareholders' decisions.</li> </ul> <p><b>Operations in 2022:</b> There are four EV charging station projects with PPWE.</p> <ul style="list-style-type: none"> <li>• Two stations are underway.</li> <li>• Two stations are open for service: Si Phalang Non Sung Caltex Gas Station and Wiphat Rungrueang Caltex Gas Station. However, there were issues in the systems, so they are currently temporarily closed for maintenance.</li> </ul>

## 2. Financial Risk

Risk Topics	Measures & Performance
<p><b>Exchange Rate and Raw Material Price Fluctuations</b></p>	<p>Because 60 percent of the value of main raw materials used in manufacturing transformers need to be imported from abroad and 20-30 percent of transformer sales were from exports and foreign currency exchange rates and prices of raw materials such as copper and silicon fluctuate according to global economic conditions and major world situations, the Company has the following risk prevention measures:</p> <ul style="list-style-type: none"> <li>• Policies to purchase/sell foreign currency in forward contracts.</li> <li>• The Company closely monitors changes in prices of main raw materials such as copper, silicon and transformer oil. The Company also reserves raw materials in advance if the Company sees trade advantages.</li> </ul> <p><b>Operations in 2022:</b> the baht currency weakened gradually from the beginning of the year because of the Covid-19 situation. At the end of the year, the baht currency appreciated in value. As a result, the Company had 2.48 million baht in profit from exchange rates and 0.23 million baht in profits from exchange rates-forward contracts.</p>
<p><b>Debtor Management Risks</b></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 the following control and prevention measures:</p> <ul style="list-style-type: none"> <li>• The Company sets allowances for doubtful accounts (as accounting expenses recorded under management expenses) or measurement of expected credit loss, for which the Company uses the simplified approach throughout the debt age, and losses are recognized from the recognition of the trade receivables and assets arising from contracts.</li> <li>• The Company adjusts the policy on offering credit to customer by clearly specifying criteria in assessing credit offers to customers.</li> <li>• If customers fail to meet the criteria for credit, the Company sells in cash.</li> <li>• The Company has a policy to accelerate and follow up on overdue debts of more than one year by creating contracts for payment in installments.</li> </ul> <p><b>Operations in 2022:</b> The Company is able to control the debt repayment period, reducing it to 60 days, which is a continuing trend from 2021 and 2020. In 2022, the net trade receivables (before expected credit loss deductions) amounted to 205.00 million baht, increasing from 166.43 million baht in 2021 by 23.51%; the overdue receivables of more than one year increased from 2021 by 7.76 million baht; and the expected credit loss increased from 2021 by 1.58 million baht.</p> <p>Due to the economic conditions which was impacted by Covid-19, the premium customers' liquidity has been affected, causing the inability to repay short-term debts. This includes debtors with outstanding debts of over one year which cannot be repaid according to contract with the Company. Additionally, the economic conditions increased the number of over-one-year debtors in 2022, some of whom have closed their businesses. The Company continues to accelerate the collection of outstanding debts of over one year, with 2.58 million baht being collected in 2022.</p>

### 3. Operational Risk

Risk Topics	Measures & Performance
Occupational Health and Safety	<p>Employee working conditions are related to 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"> <li>• Safety management with ISO 45001 standards.</li> <li>• Appropriate work safety and PPE standard specifications and periodic machine maintenance.</li> <li>• Electrical system and building certification by outside experts.</li> <li>• Automatic fire alarm system installation.</li> <li>• Fire suppression and fire evacuation drills.</li> <li>• Safety awareness building with KYT activities.</li> <li>• Safety week activities to provide knowledge and raise awareness among employees and communities.</li> <li>• Safety committees (SCs) elected by employee representatives consider work safety guidelines.</li> <li>• Health promotion projects to reduce, abstain and quit smoking and drinking along with vaccination benefits based on epidemic situations.</li> </ul> <p><b>Operations in 2022:</b> The number of accidents dropped from 2021 by 28 percent. The Company did not achieve the goal to have zero accidents. Details, preventive and corrective measures can be followed up on in the sustainability report under “Employee Health and Safety”.</p>
Departures of Engineers and Skilled Technicians in Significant Positions	<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 control and prevention measures:</p> <ul style="list-style-type: none"> <li>• Appropriate employee wage and benefit restructuring by comparing with the same industry.</li> <li>• Modify assessment systems and pay fair wages.</li> <li>• Individual personnel development along IDP career paths.</li> <li>• Prepare key KM of the Company and create an online center of learning.</li> </ul> <p>Create organization happiness following the Happy 8 guideline.</p> <p><b>Operations in 2022:</b> The skilled technician resignation rate was 1.53% and the total employee resignation rate was 11.24% (8.45% decrease from 2021).</p>
Dependence on Main Executives in Business Operations	<p>Most of the Company’s management has experience in transformers and product brands, which creates confidence among stakeholders. In the future, any changes concerning the organization’s leaders may affect confidence among major stakeholders such as shareholders and employees. Therefore, the Company has the following preventive measures:</p> <ul style="list-style-type: none"> <li>• The Company prepares succession plans and selects successors.</li> <li>• Promote leadership and develop successor skills according to the career path.</li> <li>• Promote marketing by using product brands and factory standards as guidance.</li> </ul> <p><b>Operations in 2022:</b> The Company sent personnel in important positions to develop additional necessary skills and knowledge in accordance with the succession plan development guidelines. For details, see “Career Path Development and Succession Plan”.</p>

Risk Topics	Measures & Performance
<b>Hazardous Waste and Scrap Material Management</b>	<p>In the manufacturing process 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 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"> <li>• The Company petitioned for approval to register disposal companies from the Department of Industrial Works by type of waste.</li> <li>• Teams evaluate areas and disposal methods in disposal companies' areas.</li> <li>• The Company controls transportation and containment to prevent spills and leakages before leaving the factory.</li> <li>• The Company uses the 3Rs principle to sort waste that can be sold and waste that cannot be sold.</li> <li>• The Company organizes the Zero Landfill project to deliver landfill waste to power plants.</li> </ul> <p><b>Operations in 2022:</b> The Company was able to bring 100% of landfill waste into the electricity generation process with 100% zero landfill with no complaints on environmental impact from managing the hazardous waste and scrap materials from production. Performance can be monitored via the Sustainability Report 2022 under "Production Waste and Scrap Materials".</p>

#### 4. Compliance Risk

Risk Topics	Measures & Performance
<b>Non-compliance with Laws</b>	<p>The transformer manufacturing business is an industrial factory that manufactures, repairs, distributes and provides services for domestic and foreign government agencies and private organizations. Therefore, the Company must comply with many laws and specifications. Laws or specifications change with time. To prevent business mistakes, the Company specified the following preventive measures:</p> <ul style="list-style-type: none"> <li>• The Company specified persons responsible for monitoring, collecting and assessing consistency of laws and trade specifications from appropriate channels such as the Royal Thai Government Gazette and notifications.</li> <li>• The Company prepared work steps, assessed consistency of the law and specifications as practice guidelines covering the entire organization.</li> <li>• The Document Control unit prepared a registry of associated laws and trade specifications in addition to reporting to the Risk Management Committee on a quarterly basis.</li> </ul> <p><b>Operations in 2022:</b> The Company had no issues of non-compliance with the law. However, the Company is making improvements on some issues for compliance with the law. These issues are cases where laws were revised and the Company has time to make revisions pursuant to the law. Additionally, support plans have been made.</p>



Risk Topics	Measures & Performance
Corruption	<p>The transformer manufacturing business is an industrial factory with manufacturing, repair, distribution and services. The Company's work must be under specifications and laws. In addition, the Company contacts, coordinates, pays fees, pays taxes and trades with government agencies, which may create gaps for corruption. The Company specified the following control and prevention measures:</p> <ul style="list-style-type: none"> <li>• The Company specified anti-corruption policies and related guidelines to be used in the Company and every subsidiary.</li> <li>• The Company trains and educates employees by specifying necessary courses in trainings. Employees are required to pass training (100%) and have understanding assessment results higher than 80%.</li> <li>• The Company became a member of the Thailand Collective Action against Corruption (CAC).</li> </ul> <p><b>Operations in 2022:</b> There were no events, complaints or whistleblowing of wrongdoings.</p>
Human Rights and Personal Data Protection	<p>QTC Energy's business has several subsidiaries. Business activities include manufacturing, trading, and investing in various projects, each of which creates a business value chain from upstream, midstream to downstream. Many stakeholders are involved in this value chain. In addition, due to the organization's vision which demonstrates environmental and social responsibility and good governance, as well as the wish to become a world-class organization, the Company gives importance to social issues that are of global interest and concern: «Human Rights» and «Personal Data Protection». The Company has conducted a comprehensive risk and impact assessment and established control and prevention measures as follows:</p> <ul style="list-style-type: none"> <li>• Published human rights and personal data protection policies.</li> <li>• Established guidelines that comply with the human rights policy and personal data protection policy and strictly enforced it.</li> <li>• Provided training for employees and related stakeholders.</li> <li>• Conducted human rights due diligence (HRDD) audits in the business value chain in accordance with the United Nations Guiding Principles on Business and Human Rights, as well as assessed human rights risks and impacts to prevent accusations of involvement in rights violations, which tend to occur when a company knows or should know when a business ally or partner is in violation of human rights, which would mean that the company is indirectly involved with the rights violation.</li> </ul> <p><b>Operations in 2022:</b> There were no human rights violations and no personal data leaks. For more details, see «Employment and Human Rights» and «Personal Data Control: PDPA».</p>

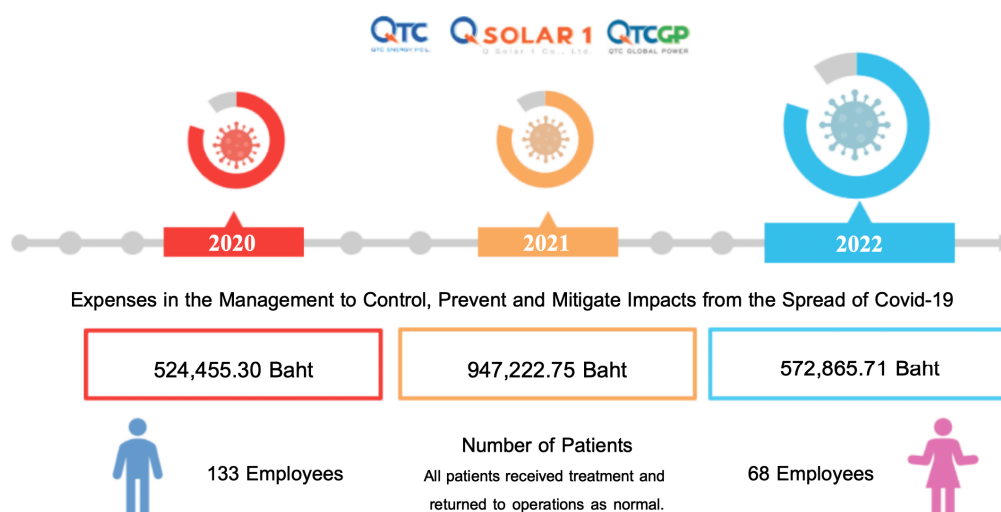
## 5. Business Continuity Risk

Risk Topics	Measures & Performance
<b>Emergencies</b>	<p>Emergencies are risks from disasters such as flooding at the Bangkok main office, fires at the main office or the Rayong factory or any subsidiary. The Company laid down the following preventive measures and emergency preparations:</p> <ul style="list-style-type: none"> <li>• The Company prepares fire prevention and suppression plans and holds drills every year.</li> <li>• The Company prepares data recovery plans and practices plans on an annual basis.</li> <li>• The Company purchases insurance policies with coverage of risks.</li> </ul> <p><b>Operations in 2022:</b> The Company had no emergencies with effects causing business interruptions in the Company and subsidiaries. Furthermore, the Company followed measures strictly and consistently.</p>
<b>Cyber Threats</b>	<p>Cyber threats are likely threats to business operations that may occur and cause damage to key business information. The Company specifies cyber security policies and prepares strict and thorough risk prevention guidelines in addition to educate employees and create understanding with employees along with preparing backup plans in case of emergency.</p> <p>Cyber Security Policy:</p> <p><a href="https://qtc-energy.com/wp-content/uploads/2023/03/it-security-policy.pdf">https://qtc-energy.com/wp-content/uploads/2023/03/it-security-policy.pdf</a></p> <p><b>Operations in 2022:</b></p> <ul style="list-style-type: none"> <li>• The Company tested employee understanding by creating phishing mails to trap employees and retest 100 percent of employees. During 2022, no phishing mails from outside sources entered the system, and no other cyber threats entered QTC's system.</li> <li>• The Company tested a cyber threat emergency scenario. The drill and the data recovery time went as planned.</li> </ul>



Risk Topics	Measures & Performance
Covid19- Pandemic	<p>Activities in the business of the Company and subsidiaries range from sales, procurement, production, delivery, marketing communication, customer support, meetings with internal and external agencies, etc. These activities have need for face-to-face communication or coordination with outside persons or groups such as customers, deliverers, contractors, mass media, etc., who may infected with Covid-19. The Company enacted the following preventive and corrective measures:</p> <ul style="list-style-type: none"> <li>• The Company created the Covid-19 Management Committee with the Managing Director as the Chairman and created essential crisis management roles and duties.</li> <li>• The Company prepared infection prevention measures covering all stakeholder groups in the Company and every subsidiary by considering advisories from the Department of Disease Control, the Central Covid-19 Operation Center and the Provincial Covid-19 Operation Center to screen, use face masks, use social distancing, work at home, etc. The Company made specifications in a manual.</li> <li>• The Company communicated and raised awareness for employees about Covid-19.</li> <li>• The Company promotes employee vaccination by providing additional vaccines.</li> <li>• The Company prepared measures to support employees such as by helping with lunch costs, distributing face masks, hand sanitizer gel, providing transportation for employees from home to the work place in the case of employees who use public transportation and paying for internet costs of employees who work from home because employees were impacted by preventive measures specified by the Company, which may lead to limitation of employee rights.</li> <li>• The Company raised awareness for customers, suppliers, contractors and outside persons about the Company's infection prevention measures, and supported replacing face-to-face meetings with communication technology.</li> <li>• The Company added more marketing communication content in online media to reach every customer group rather than holding face-to-face meetings.</li> <li>• The Company prepared emergency plans to cover every work process if the Company needs to stop the business temporarily.</li> </ul> <p>Download the Covid-19 manual at <a href="https://qtc-energy.com/th/risk-management/">https://qtc-energy.com/th/risk-management/</a></p> <p><b>Operations in 2022:</b> Additional employees were infected with Covid-19, however, no severe symptoms were reported. The situation was controlled efficiently and the Covid-19 Management Committee was dissolved, closing this risk as a normal condition in November 2022, while requiring compliance with set standards.</p>

#### Data on Compliance with Measures to Prevent the Spread of Covid-19





## Strong Economy

# Business Growth



Business growth is a demonstration of the organization's ability to effectively manage resources while recognizing the importance of society and the environment under corporate governance and effective risk management, having new and unique innovations different from competitors, being able to use opportunities in risks as a business advantage with economic value, being able to create sales, make profit and pay appropriate returns to shareholders and other stakeholders. These are an important factor in investors' analysis of assets to select companies for investments in addition to building confidence, loyalty and trust in the Company among shareholders, employees and other stakeholders. Therefore, the Company needs to prioritize and maintain visions, obligations and create balance between profit, corporate governance and care for society and the environment, which has effects on sustainable business growth.

Based on both positive and negative impact assessment covering economic, environmental, social and human rights aspects, the following risks and opportunities were found:

Key Topics	Economic	Environmental	Social	Human Rights
	Impact	Impact	Impact	Impact
<ul style="list-style-type: none"> <li>Business Growth</li> </ul>	<ul style="list-style-type: none"> <li>Strengthen the nation's economic system.</li> <li>Create income through taxes for the government sector from the organization's profits.</li> <li>Opportunity to invest in other businesses.</li> <li>Risks from the economic conditions or emergencies may result in failure to meet goals.</li> <li>There may be loopholes for corruption due to increased competition.</li> </ul>	<ul style="list-style-type: none"> <li>The environment is protected through the promotion of eco-friendly product sales.</li> <li>The development of work processes using technology to reduce travelling and environmental impact.</li> <li>Resource consumption may increase from business growth. (Electricity, fuel, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Distribution of value to all stakeholders in the business chain with higher proportions.</li> <li>There may be problems or nuisance to surrounding communities from business growth, which require increased transportation.</li> </ul>	<ul style="list-style-type: none"> <li>Create jobs and opportunity for laborers in local communities and the supply chain.</li> <li>There may be discrimination from the selection of laborers in local communities.</li> <li>Accessibility to Company products and services by some groups of people or communities which may have to go through contractors, causing increased prices.</li> </ul>



The Company has carefully implemented business growth, assessing impacts, risks and opportunities in all aspects, because it realizes that every baht spent belongs to the shareholders, and it strives to generate the best returns for shareholders and those involved in the business chain in a fair and transparent manner by establishing policies for managing various tasks and clear operational goals as follows:

**Objective:** To create sustainable business growth.

**Management:** Strategic planning according to business paths, appropriate strategizing, effective corporate risk management, increase competitiveness with quality products and services including responsibility

Promotion of research and development to innovate products, services and production processes and expansion of investment in other businesses or new products to increase income and build financial strength.



**1 :** Total sales and services growth goal of at least ten percent per year in the transformer business.



**:** In 2022, total income from sales and services grew from 2021 by 12.14 percent. The goal was achieved.



**2 :** Income from new energy product sale (with QTC as the distributor) growth of at least 200 percent per year in the solar business.



**:** Income from new energy product sales grew from 2021 by 45.38 percent. The goal was not achieved.



**3 :** Net profit (consolidated financial statement) no less than 12 percent.



**:** Net profit (consolidated financial statement) in 2022 was 1.28 percent. The goal was not achieved.

## Significant Performance in 2022

- QTC signed a cooperation agreement for the production and quality testing of bio transformer oil in an official collaboration with Bangchak Biofuel Company Limited (“BBF”), a subsidiary in the BBGI Group, and SCG Chemicals Public Company Limited (“SCGC”). QTC is ready to put bio transformer oil into practice into actual use in transformers for selling to customers who are interested in environmentally friendly transformers at a special price. These are expected to be ready for production and sale in mid-2023.



- QTC joined UAC in opening charging stations under the joint venture company PPWE, launching “Super-Fast” EV charging stations of PPWE PLC, a joint venture between UAC Global PLC (“UAC”) and QTC Energy PCL (“QTC”) at Non Sung Caltex Gas Station and Wiphat Rungmueang Caltex Gas Station in Nakhon Ratchasima.



# Economic Results

Financial	2020	2021	2021 (Restated)	2022
Revenues from sales and services	1,019.49	1,171.99	1,171.99	1,216.45
<b>Total revenues</b>	<b>1,040.45</b>	<b>1,185.03</b>	<b>1,185.03</b>	<b>1,236.70</b>
Cost of sales and services	(706.47)	(878.37)	(875.42)	(1,068.08)
<b>Gross margin</b>	<b>330.77</b>	<b>305.05</b>	<b>296.57</b>	<b>148.37</b>
Selling and administrative expenses	(146.50)	(145.47)	(189.27)	(147.94)
Profit before interest and income tax	187.48	161.19	106.94	19.21
Net profit	157.53	127.22	88.36	15.84
Comprehensive income for the year	157.68	130.53	91.67	16.74
Net earnings per share	0.462	0.373	0.259	0.046
Dividend per share	0.40	0.20	0.20	0.20*
	(341,092,557)	(341,092,557)	(341,092,557)	(341,092,557)
Total assets	1,935.66	1,986.93	1,885.60	1,847.12
Total liabilities	243.48	250.97	250.97	263.87
Shareholders' equity	1,692.19	1,735.96	1,634.63	1,583.25

Remarks:

\* Pending for an approval from the 2023 Annual General Meeting of Shareholders

\*\* The corporate group found that value of lands, buildings and equipment, electrical network connection service fee, power purchase agreement, and deferred tax assets was incorrect.

Therefore, errors of last year's Financial Statement were corrected. The corporate group retroactively updated last year's Financial Statement as comparative data for reflecting correctness of those assets' value through updating impairment loss on lands, buildings and equipment, electrical network connection service fee and power purchase agreement in consolidated Financial Statement as well as amortizing deferred tax assets

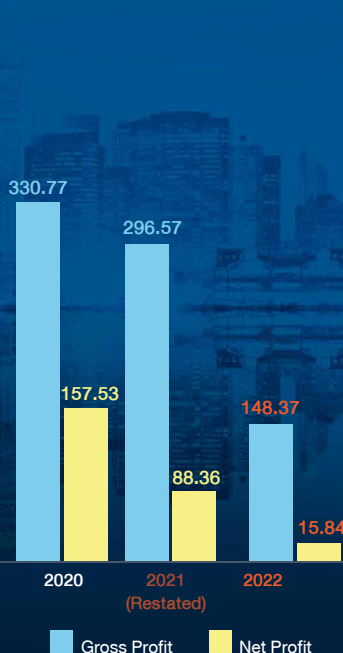
**Total Income**

(unit: million baht)



**Gross Profit / Net Profit**

(unit: million baht)



**Total Assets,**

**Total Liabilities, Shareholders' Equity**

(unit: million baht)

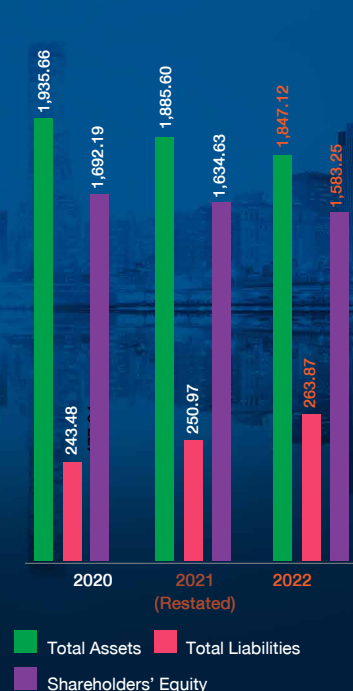


Table Showing Economic Results with Comparison of 2020 - 2022

Item	2020		2021		2021 (Revised)*		2022	
	Separate Statement	Consolidated Statement	Separate Statement	Consolidated Statement	Separate Statement	Consolidated Statement	Separate Statement	Consolidated Statement
Income from Sales and Services (million baht)	872.82	1,019.49	1038.62	1171.99	1,038.62	1,171.99	1,164.57	1,216.45
EBITDA (million baht)	212.35	213.29	133.16	189.75	161.58	149.93	152.06	101.55
Net Profit (Loss) (million baht)	178.13	157.53	94.25	127.22	94.25	88.36	97.61	15.84
Accrued Profit (Loss) (million baht)	120.05	141.72	126.82	181.89	126.82	80.56	157.12	29.18
Net Profit per Share (baht)	0.52	0.46	0.28	0.37	0.28	0.26	0.29	0.05
Rate of Asset Returns (%)	9.87	8.31	5.04	6.49	5.04	4.70	5.15	0.85
Rate of Shareholder Returns (%)	11.19	9.46	5.77	7.42	5.77	5.41	5.90	0.98

See more details in the One Report 2022 under "Financial Report".

Sales &amp; Service Income Graph Sorted by Income Type (Only QTC Energy) Comparing 2020-2022



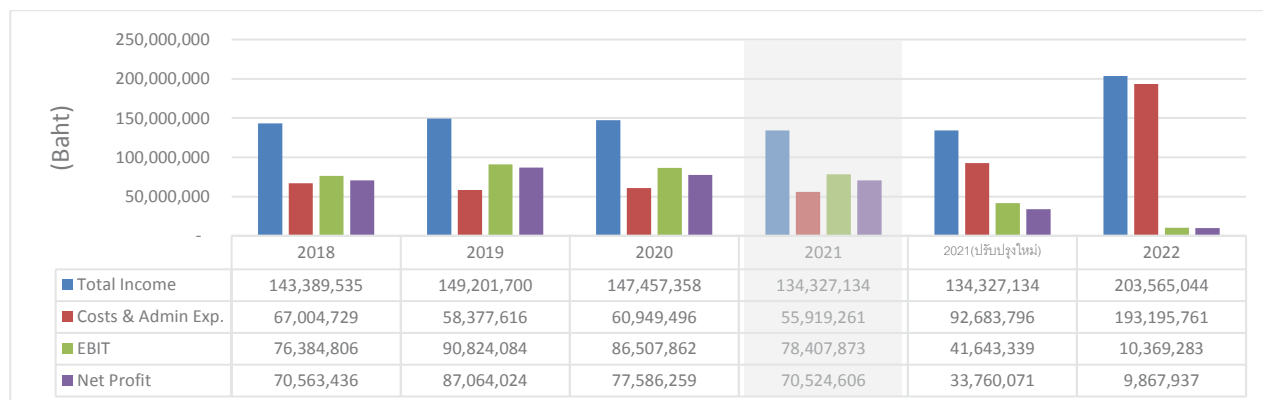
#### Additional Clarification from the Table \*

In 2022, the group found that there were inaccuracies in the value of land, plant and equipment, and fees for electrical network connection, power sale contract and deferred tax assets. Therefore, the Company corrected the errors in the previous year's financial statements. The Group has retrospectively adjusted the financial statements of the previous year as comparative data to reflect the accuracy of the value of such assets by revising the impairment losses on land, plant and equipment and fees for electrical network connection, power sale contract and deferred tax assets

According to the Table Showing Economic Results and the Sales & Service Income Graph (only QTC Energy, QTC Energy overall grew from 2021 by 12.14 percent while income from bidding in the government sector declined by 96.32 percent because the Provincial Electricity Authority (PEA) in 2022 gave the opportunity for SMEs to bid. Hence, the Company instead had Q Solar 1 join in the bidding for work with the PEA, with QTC as the manufacturer. (The consolidated income statements shows an increase in income from transformer sales to the government sector by 30.95 percent from 2021.) Income from domestic private sector sales grew by 52.08 percent, partly from sales to Q Solar 1, and foreign private sector sales decreased by 11.89 percent due to a slowdown in orders from overseas customers. In addition, income from services and raw material sales grew by 4.99 percent while new product sales in the solar business, such as PV panels, inverters, EV chargers and other energy-related equipment, enabled an income growth of more than 45.38 percent from 2021.

2022 was a difficult year for business operations in the COVID-19 pandemic, which continued its effects from 2020 and 2021, as well as the Russo-Ukrainian War. This had an impact on the global economic system, causing raw material costs to increase due to imports of main raw materials. The instability of the baht currency continued until the end of the year when the baht's value strengthened. As a result, the Company received 2.48 million baht in profits from currency exchange rates and 0.23 million baht in forward contracts, causing performance in the separate income statements to have net profit increase from 2021 by 3.56 percent, or a net profit ratio (separate income statement) of 8.38 percent.

## Graph of Economic Performance (Only Q Solar 1) Comparing 2018 - 2022



According to the graph, in 2022, Q Solar 1 Co., Ltd. had income from power sales to the Provincial Electricity Authority and other income at a total value of 203.56 million baht, a increase of 51.54 percent from 2021, divided into 47.34 million baht in income from electricity sales, 155.33 million baht in income from transformer sales to the PEA, and 0.89 million baht in other income.

If considering only the 47.34 million baht in income from electricity sales, which is a decrease from 2021 due to the expiry of the contract to receive adder rates for electricity according to government policy at eight baht per kWh. Since 3 December 2021, Q Solar 1 has sold electricity to the PEA at the price of 3.50 baht (average) +/- according to the FT value, and due to the clarifications in Box 1 above, by the end of 2022, Q Solar had a net profit of only 9.87 million baht.

Q Solar 1 Co., Ltd. received BOI investment support under Promotion 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 50 percent of juristic person tax for five years from 2 December 2019 and to 1 December 2024.

## Investment in Other Businesses

In 2022, Phase One of the “Super Fast” EV charging stations launched two stations or four chargers under PPWE, a joint venture between UAC Global PLC (“UAC”) and QTC Energy PCL (“QTC”) at Non Sung Caltex Gas Station and Wiphat Rungrueang Caltex Gas Station in Nakhon Ratchasima. Currently, the demand-charge charged by PEA is very expensive, so the stations are temporarily closed to apply for permission to purchase electricity at a lower rate (for EV charging stations under low priority management) and the stations are expected to be completed and reopened by April 2023.





## **Distribution of Value to Stakeholders**

	QTC Energy	QTCGP & Q Solar 1
Distribution of Value to Shareholders	(Baht)	(Baht)
Dividends to Shareholders	68,218,511.40	
Dividends Per Share	0.2	
<b>Personnel Investment</b>		
Employees*	128,973,745.00	
Executives and Managing Directors in Subsidiaries	23,761,260.00	
Board of Directors (only independent directors)	9,984,999.00	
<b>Social Investment</b>		
Donations and Financial Support	1,256,304.00	89,998.00
Support for Social Enterprises (SE) (Indirect)	-	-
Activities for Society	611,143.14	35,400.00
Funds for Promoting and Improving Quality of Life among Disabled Persons	342,735.00	-
<b>Environmental Investment</b>		
Internal Environmental Management Cost	485,400	105,900.00
Waste and Other Management Cost	415,877.40	12,030.00
<b>Sharing of Value with Business Partners</b>		
Domestic Procurement (Raw Materials)	374,734,547.65	-
Overseas Procurement (Raw Materials)	88,666,150.98	-
Power Plant Equipment Procurement and Maintenance	-	2,786,390.94
Product Procurement from Disabled Persons in Communities	30,150.00	-
<b>Other Economic Value</b>		
Financial Cost (Interest)	525,076.72	444,510.33
Taxes Paid to the Government**	3,399,074.52	138,653.17

Table Showing Comparison of Sharing of Value to Stakeholders

Stakeholder Groups	Unit	Consolidated Statement		
		2020	2021	2022
Business Partners	(million baht)	390.90	600.09	466.22
Directors, Executive Directors and Employees*	(million baht)	159.06	167.07	162.72
Dividends for Shareholders	(million baht)	136.44	68.22	68.22
Dividends per Share	(baht)	0.40	0.20	0.20
Financial Institutes (Interest)	(million baht)	2.32	1.26	0.97
Community & Society	(million baht)	1.37	0.93	1.99
Environment	(million baht)	0.90	0.97	1.02
Quality of Life Promotion and Improvement for Disabled Persons.	(million baht)	0.34	0.34	0.34
Government Sector (Taxes)**	(million baht)	27.29	18.24	3.54






\* Salaries, wages, benefits, social security funds, the Provident Fund, monthly wages, annual wages and meeting gratuities (not including seminar and skill development costs).

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

Rapid changes in digital technology, changes in industrial manufacturing processes with a greater focus on use of automated systems to replace humans including climate change have caused changes in social behaviors when considering purchases of quality, modern, simple-to-use products with fast delivery and caused effects on social expectations for business standards that give more consideration to environmental and social impacts.

Therefore, various changes have inevitably caused undeniable significant impact on the business environment inside and outside the company and changes became a concern for shareholders about the ability to manage changes which may have effects on the Company's economic status. Therefore, directors and executives must recognize the importance of changes and promote innovative thinking for employees at every level in the organization to participate in new creates and adapt to changes systematically and consciously with continual development of products, work processes and services. The Company consistently begins with small things by considering business directions to create added value for customers and stakeholders in society and the environment along with creating positive effects on the Company's employees and financial results.

Based on impact assessment, both positive and negative, covering economic, environmental, social and human rights aspects, the following risks and opportunities were found:

Key Topics	Economic	Environmental	Social	Human Rights
	 Impact	 Impact	 Impact	 Impact
<ul style="list-style-type: none"> <li>■ Innovation Promotion</li> </ul>	<p>😊 Create eco-friendly economic growth at the national level.</p> <p>😞 There may be violations of intellectual rights and patents, etc., if not carried out carefully.</p>	<p>😊 Reduce direct and indirect environmental impact from new innovations to reduce environmental impact.</p> <p>😞 There may be increased consumption of other resources from research and development.</p>	<p>😊 Create cooperation to promote the development-capitalization of innovations from government agencies and related allies.</p> <p>😞 -</p>	<p>😊 Create opportunities to access new eco-friendly products.</p> <p>😊 Equality in presenting improvement ideas.</p> <p>😊 Distribution of income to related stakeholders.</p> <p>😞 There may be discrimination or blocking of new ideas by those involved.</p>

The Company is committed and gives importance to promoting innovation in the organization, including products, production processes, as well as various stages of work processes to promote and develop the skills, knowledge, and abilities of employees to have innovative ideas and develop further. The management guidelines are as follows:

**Objective:**

1. To strengthen the organization and prepare for changes.
2. To promote creative thinking skills among employees at every level.

**Management:** Create a product and production process research and development work unit, a KAIZEN promotion team and create motivation for modification or innovation ideas along with managing the organization's risks.

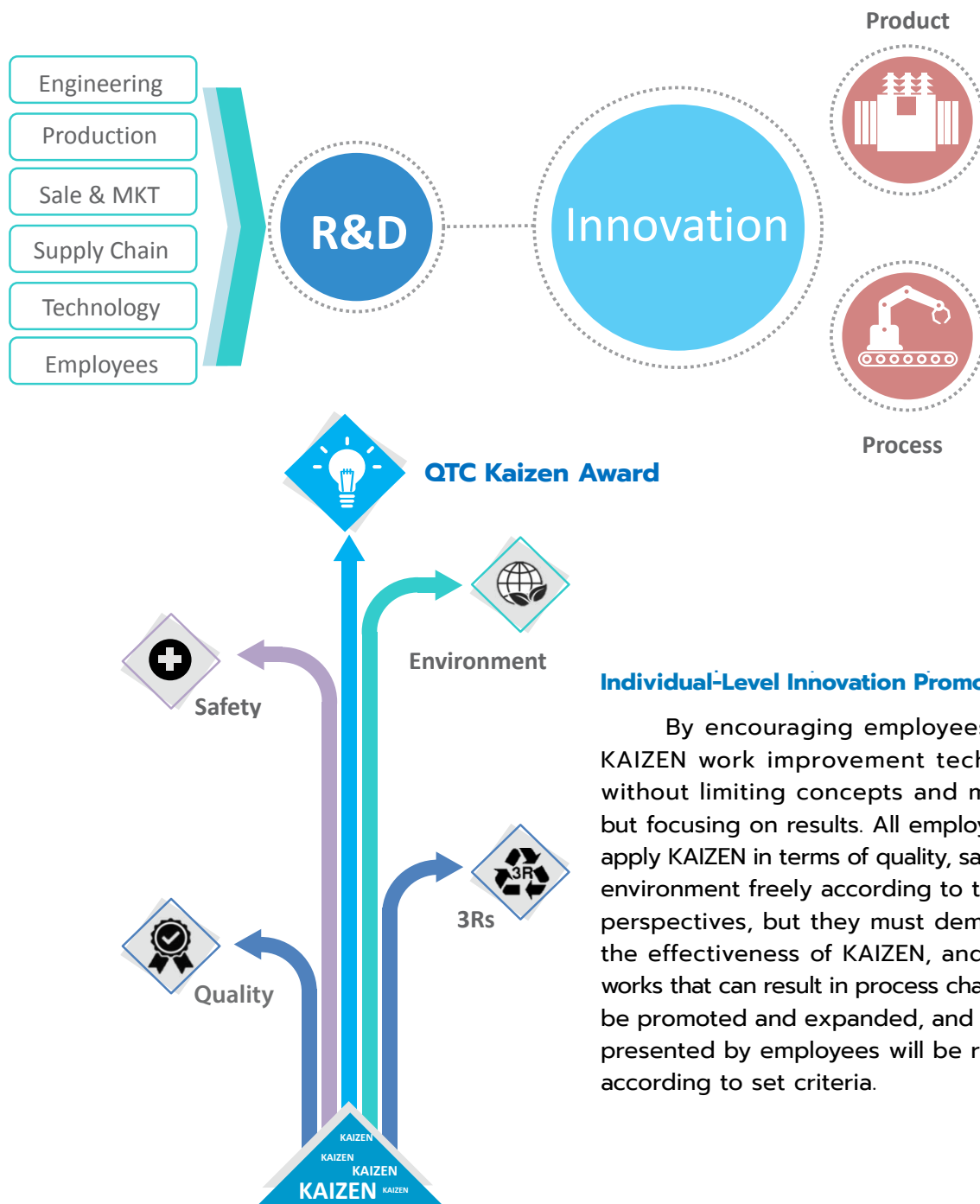
-  **1 :** Have at least two articles on research and development results at the process level to create opportunities and reduce waste.
-  **:** In 2022, the Company had five research and development projects on processes. The Company spent a budget of 8.7 million baht.
-  **2 :** Income growth from distribution of products from product research and development results at more than two percent per year.
-  **:** In 2022:
  - Smart monitoring box sales growth increased from 2021 by 84.27 percent.
  - Super low loss transformer sales decreased from 2021 by over 50 percent. (See results under "Climate Change" on the topic of Super Low Loss Eco-friendly Products.)
-  **3 :** Three KAIZEN articles on personal improvement per person per year.
-  **:** Employees made modifications to work on > 3 issues or 73 percent of employees in the target group.  
 Employees made modifications to work on < 3 issues or 3 percent of employees in the target group.  
 (For employees who did not achieve the goal, the KAIZEN promotion team will improve skills according to work plans in 2023)



## Innovation Promotion Process in the Organization

### Process-Level Innovation Promotion

This is carried out by research and development teams with a focus on developing product and production process innovations in order to meet customer needs and expectations which change with the environment, situation or new rules.



## Process-Level Innovation Promotion

Innovation in the organization at the process level considers risk assessment from changes in external and internal factors and may have effects on changes to customer and social expectations, which may impact the Company's sustainable business operations. The Company had changes with significance for innovation in the organization in the following three areas:

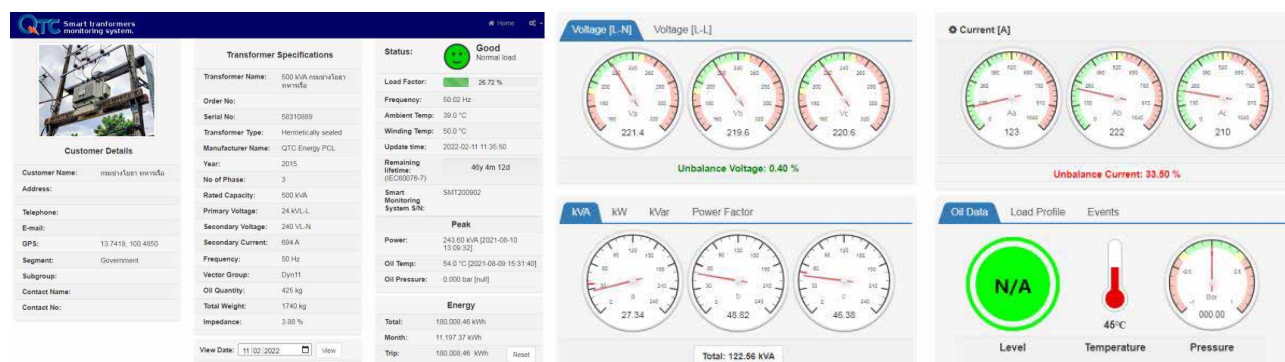
1. Production technology changes.
2. Information technology changes.
3. Climate change.

In 2022, the Company had five major research and development projects, spending an operating budget of 8.7 million baht. The projects included two joint venture innovative projects with external organizations, and three innovative internal process projects. The projects presented in this report are a follow-up of projects from the previous year and examples of significant projects that can be published in 2022.

### • Smart Transformer Monitoring Development Project

In 2022, the Smart Transformer Monitoring System is in the process of developing the next version to be able to support the standard used by the PEA (the progress of the development cannot yet be published). However, in 2022, the Company promoted innovative product Smart Transformer Monitoring sales, which grew from 2021 to 84.27 percent. Due to being impressed with QTC's Smart Transformer Monitoring System, in 2022, there were up to three repeat customers who purchased the product to install on their transformer. This is a good sign that customers have started to see the benefits of Smart Transformer Monitoring, making the investment worthwhile.

Smart Tr. Sales	2019	2020	2021	2022
Value (baht)	301,000	714,000	483,000	890,000
Quantity (machines)	5	8	7	12

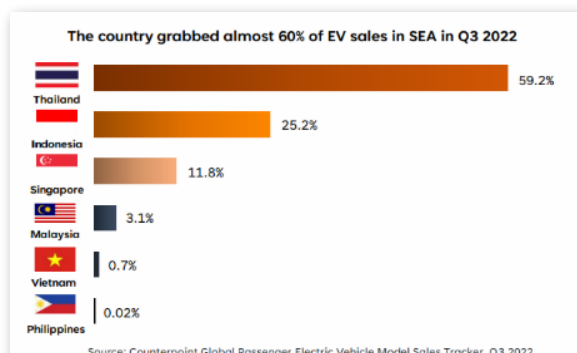




## • EV Fast Charger Project

The government's 30@30 policy to promote the use of electric vehicles (EVs) in Thailand has led to a widespread flow of EV purchases and uses. Between January and October 2022, there were 15,423 EV registrations with the Department of Land Transport, which is more than the previous 10 year's registrations combined. Sales in Thailand are the No. 1 highest in Southeast Asia at 59.2 percent.

As a result of this situation, QTC saw a business opportunity to become an EV Fast Charger manufacturer to replace expensive (1.5-2.0 MB) imports because it can effectively control the production and quality of products and after-sales service. It is also a way to help the supply chain of the domestic electronic components manufacturing industry. In 2022, QTC designed and manufactured one 120-kW prototype with two CCS Type-2 chargers. For the interior power module, the Company opted to use the globally accepted Huawei brand. For the platform system, the services of Elexa by EGAT is selected for stability and speed. The prototype was sent to be tested at the laboratories of the Electrical and Electronics Institute (EEI) based on IEC61851 and Protocol OCPP 1.6. The goal is to make QTC's chargers compatible with all vehicle models sold in Thailand. At present, QTC's chargers have passed the necessary tests and have been sold to PPWE Co., Ltd. for installation at PPWE charging stations in Nakhon Ratchasima on 20 October 2022.



## • Bio-Transformer Oil Development Project

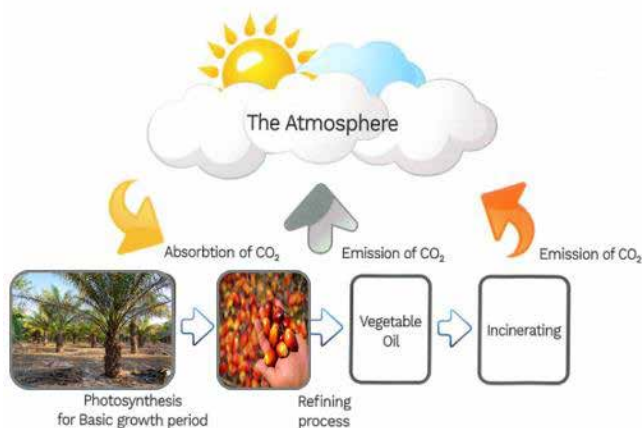
Transformer oil is an important raw material imported from abroad. It encapsulates the coil and iron core in the tank, provides electrical insulation, and cools the interior, transferring heat into the tank's heat sink. Generally, transformer oil is mineral oil with an ignition point of about 170 °C, and cannot be installed in buildings or environmentally sensitive areas (solar-floating, offshore) because it has a low ignition point and is toxic and non-biodegradable. If a transformer is to be installed in such areas, the oil type must be changed to one with a high ignition point (> 300 °C) which are usually plant-based, such as canola and soybean, and also have dielectric breakdown voltage properties and prices that are higher than mineral oil.

From the promotion measures of the National Palm Oil Policy Committee to stimulate the demand for bio-transformer oil in Thailand, QTC has a collaborative project with BBGI and SCGC to produce bio-transformer oil from palm oil. The collaboration is as follows:

- SCGC specializes in researching and formulating chemical ingredients to obtain oils that meet the standards.
- BBGI has the potential to supply palm oil, which is the main raw material, by applying SCGC's knowledge to set up a production line in the form of a large-scale refinery and packaging the product for sale to QTC at a special price or for sale to other transformer manufacturers at a reasonable price.
- QTC has knowledge about transformers, testing and using transformer oil. The bio-transformer oil obtained from the experiment will be tested with the transformers to confirm that the results from the invention in the laboratory can be put into practice. Additionally, QTC will produce transformers that use bio-transformer oil and send them to be tested for product certification by external testing laboratories meeting international standards.

Preliminary testing of BBGI and SCGC's oil properties showed that it is comparable to current market producers (FR3, Midel, Dongnam Petroleum) and has the advantage of similar viscosity to mineral oil. The oil can be used to replace mineral oil immediately without the need to design transformers with different characteristics from the existing standard. When applied to 50kVA transformers, the oil passed all routine, impulse and temperature rise tests. For the oil produced in the pre-marketing phase, QTC will be the first customer to purchase it for application and sale to customers who are interested in environmentally friendly transformers at a special price. The oil is expected to be ready for production and sale in mid-2023.

### Life Cycle of Vegetable Oil



**Bio-transformer Oil Application Test with a 50kVA Transformer**

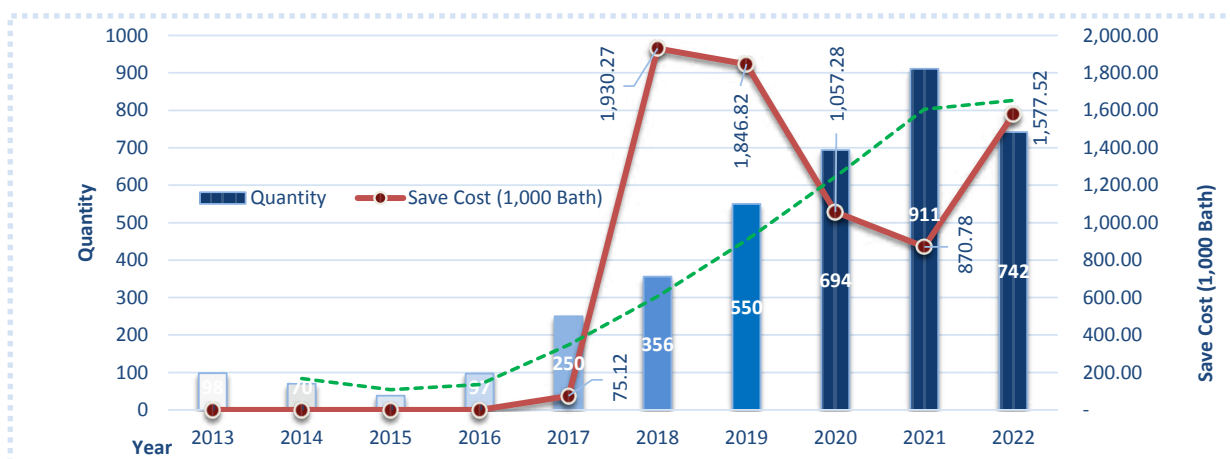
## Individual-Level Innovation Promotion

QTC implemented KAIZEN and promoted involvement in operations from employees at every level since 2013 with continual modifications to the promotion process. Currently, the Company supports employees to complete KAIZEN in employees' work first because employees will have the most knowledge of employees' work. Education on KAIZEN and practicing thinking, analysis, experimentation skills with budget and time support for KAIZEN is important in pushing employees to dare to think and do many KAIZENs, which can reduce waste, work time, improve work quality and create satisfaction for internal and external customers. Therefore, employee KAIZEN can support and promote effective work process development and cost reduction.

In 2022, modifications were made to 742 KAIZEN works. The Company provides rewards for results for a total of 105,200 baht and saved 1,577,520 baht from modifications made to employees' work.

### Value for QTC Benefits for the Company from Supporting Employee KAIZEN

- Strength at the operational level and ability to continually adapt and improve.
- Added value for quality products and services while reducing work time.
- Pride when the Company sees the value of employees and praises employees.



Graph of Statistics Showing Amount of Savings from KAIZEN Modifications in 2013 – 2022

### Value for Employees: Benefits for Employees from KAIZEN Modifications

- Good work environments under safety standards.
- Employees are able to work effectively with less fatigue.
- Higher income from KAIZEN results.
- Increased knowledge and ability from KAIZEN modifications.
- Pride when the Company sees the value of employees and praises employees.



## QTC Kaizen Award 2022

In 2022, the Company held the “QTC KAIZEN AWARD 2022” contest after omitting it for two years due to the COVID-19 pandemic to provide a platform for employees to produce their or their work group’s KAIZEN workpieces. Twelve KAIZEN workpieces made the final round. The awards were considered by the Company’s panel of experts with clearly defined benchmarks.

The employees’ 12 KAIZEN workpieces that made the final round, as well as the other 730 workpieces, can clearly add value to the employees and the organization.



## QTC Kaizen Award 2022 Results

Award Type	Name	Name of Workpiece
Best Kaizen	Ekkachai Sipphenwan	Office Work Technology: Online Training Record
	Phisek Chimnok	Office Work Technology: System for Borrowing-Returning Equipment
		Office Work Technology: Update Work Status with Asana
	Wihan Khongsiangsa & Somsak Soimaen	Production: Jig for Thermometers
	Rungrot Sidatma & Suthichai Duangkankha	Production: Jig for Gripping Parts
	Wiraphong Saomueang & Sumet Ninsonthi	Production: Device for Vacuuming Smoke and Welding Odors
	Rungrot Sidatma & Wutthichai Kasap	Production: Device for Repairing Dents
	Somyot Thapthimthong & Lakkhana Phanhasen	Environment: Cloth Cover for Assemblies to Reduce Global Warming
Outstanding	Withun Klinkeson & Wanchai Uila	Production: Table for Placing Metal Sheets to Reduce Sore Muscles
	Wihan Khongsiangsa & Somsak Soimaen	Production: Jig for Tubes
	Itsariyathap Khiaowichit & Pawitchaya Chansanit	Office Work Technology: Excel Link 3D to Reduce Amorphous Filling Setting Time
Recognition	Phatwarin Chiraphongmetha	Office Work Technology: Improvement of Vehicle Orders and Product Request Forms Using Excel Formulas
Star KAIZEN	Siriphon Phochai	Submitting the highest number of KAIZEN workpieces.



# Responsibility for Products and Services



Transformers are a main piece of equipment in power transmission systems used for transferring electricity connected between high voltage and low voltage systems. Transformers can convert voltages or electricity currents, depending on designs and functions, to be consistent with objectives. Errors in design or substandard production may have effects on the safety of workers who are company employees and ordinary people and may cause economic impacts on customers and users. Furthermore, errors in design or substandard production may cause impacts on product brand image, resulting in loss of confidence in products among customers and negative advertisement by word-of-mouth.

Therefore, the Company needs to prioritize good and effective design standards, production standards and service standards in order to produce good results in the area of product quality, safety and display of labels related to main transformer properties for correct use. Furthermore, the Company recognizes the importance of maintaining confidential information belonging to customers and providing accurate and real technical information through advertisements, public relations and seminars in order to build confidence among customers, create good image for product brands and attachment to the Company's products and services.

Based on impact assessment, both positive and negative, covering economic, environmental, social and human rights aspects, the following risks and opportunities were found:

Key Topics	Economic	Environmental	Social	Human Rights
	Impact	Impact	Impact	Impact
<b>Responsibility for Products and Services</b>	Customers have confidence, trust and satisfaction. Good product quality without application issues. Image of product brand.	Eco-friendly and worthwhile energy consumption.	Safety in application and/or safe for the general public who may have to live near transformers.	The right of customers and the general public to be protected from product use in case dangers occur from the use of Company products.
	If the product quality is bad and issues occur during use, there will be economic impacts to customers, e.g., the inability to product products, having to cut the power, etc.	Transformer oil leaks may occur during use or service, environmentally impacting the soil or water.	Transformers may accidentally explode, causing damage to the lives and properties of the general public.	It may cause annoyances or concerns for the general public due to the humming of transformers during use.


The quality of products and services is of utmost importance since transformers are specialized products that are used in conjunction with lethal levels of voltage. Therefore, the design must include maximum safety, according to or better than the standard, so every process and step must be taken with caution and responsibility before handing over to the customer. The management guidelines and work standards are clearly defined as follows:

**Objective:** To produce quality and safe products for users and create customer satisfaction.

**Management:** Manage various areas with international standards (International Organization for Standardization) and total quality management (TQM); design, manufacture and test under product standards and customer specifications, and ISO9001 and ISO/IEC 17025 systems; manage customer relations to create awareness of news and information and customer attachment along with surveying customer satisfaction and making continual improvements.


 **1 :** Zero danger to transformer users due to substandard product quality.


 : In 2022, no dangerous events occurred to users of QTC transformers.


 **2 :** Customer satisfaction > 90%.

 : Customer satisfaction in 2022 was at 94 percent.


 **3 :** Manage 100 percent of customer complaints.

 : In 2022, the Company had 13 customer complaints and was able to successfully respond to 100 percent of complaints.

 **4 :** Provide transformer testing and maintenance services for more than 90 percent of transformers within the warranty period.

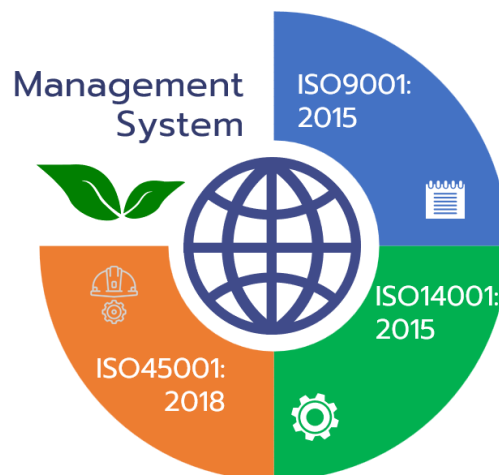
 : In 2022, the Company was able to achieve this at 89.25 percent. The Company did not achieve the goal.

 **5 :** Zero complaints of leaks of customers' personal data.

 : In 2022, the goal of zero cases was achieved.



The Company implemented international standards in the organization by considering domestic and foreign customer needs from law enforcement and specifications along with considering the organization's consent to improve personnel ability, build confidence among customers and stakeholders in addition to increasing opportunities to compete. The standards applied include requests for accreditation from agencies trusted at the national and world levels and references for appropriate application without accreditation. The list of standards is as follows (not including accounting standards and product quality control standards):



**Table of Work Standards for Which System Accreditation Was Requested**

No.	Accredited Standards	Evaluation Frequency	Accrediting Agency	Accreditation No.
1	ISO14001:2015	Once per Year	SGS-NAC	TH08/1236
			SGS-UKAS	TH08/1235
2	ISO45001:2018	Once per Year	SGS	TH08/1237
3	ISO9001:2015	Once per Year	SGS-NAC	TH00/2729
			SGS-UKAS	TH00/2728
4	ISO/IEC17025	Once per Year	TIS	18035/0659
5	Green Industry Level 4	4 Years/Time	Ministry of Industry	GI(E) 4-046/2565

**Table of Standards Used for Reference**

No.	Reference Standards	Remarks
1	ISO26000	Used as reference for practice guidelines in the area of corporate social responsibility
2	ISO14064	Used as reference for guidelines in preparing reports on greenhouse gases and requesting annual accreditations.
3	ISO50001:2011	Used as reference for guidelines in energy management.
4	COSO-ERM	Used as reference for corporate risk management guidelines.
5	5S	Used as reference for work basics.

QTC transformers are designed, manufactured and tested under IEC standards, TIS 384-2543 standards and customer standards or standards of trading partners' countries such as ANSI, IEEE and JIS, etc. Furthermore, the Company sends transformers to be tested in the Short Circuit Performance Test in order to gain accreditation for QTC transformer quality from abroad such as to KAMA in the Netherlands and GFH Engineering & Test GmbH in Germany. In addition, the Company uses Green Label requirements for transformer products (TGL-117-16) as a manufacturing standard and requested permission to use the Green Label for transformer products from the Thailand Environment Institute, License No. GL2019/042.

**Table of Standards Used as References 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	มอก.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 BE. 2556 (A.D. 2013)
IEC 60076-5	IEEE C57.110			DIN 7168			
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							

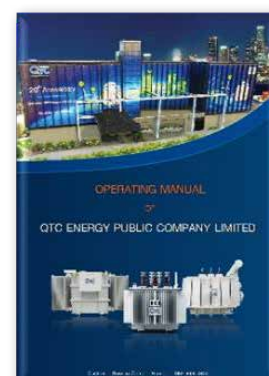
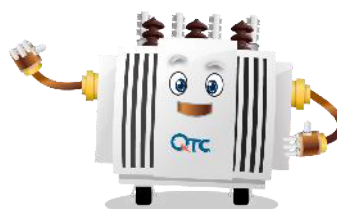
QTC recognizes the importance of design, manufacturing and testing standards by referring to international standards in order to ensure that QTC transformer products have quality and safety for people in society when used along with helping to reduce environmental impacts as much as possible.

**Table of Showing Standards of Licensed Products**

Product Model	Licensed Product Standards	License No.
Oil-type transformer 3Ph < 250kVA 50Hz Voltage > 12kV < 24kV	<b>TIS.384-2543/TIS84-2000</b>  <b>TIS. 384-2543</b>	1248-335/384
Oil-type transformer 3Ph > 250kVA < 1000kVA 50Hz Voltage > 12kV < 24kV		"
Oil-type transformer 3Ph > 1000kVA < 2000kVA 50Hz Voltage > 12kV < 24kV		"
Oil-type transformer 3Ph < 250kVA 50Hz Voltage > 24kV < 36kV		1249-336/384
Oil-type transformer 3Ph < 250kVA 50Hz Voltage < 12kV		1250-337/384
Oil-type transformer 3Ph > 250kVA < 1000kVA 50Hz Voltage < 12kV		"
Oil-type transformer 3Ph < 250kVA 50Hz Voltage 12/24kV		"
Oil-type transformer 3Ph > 250kVA < 1000kVA 50Hz Voltage 12/14kV		"
Oil-type transformer 1Ph < 50kVA 50Hz Voltage > 12kV < 24kV		1251-337/384
Oil-type transformer 1Ph < 50kVA 50Hz Voltage 33kV		"
Oil-type transformer 1Ph < 50kVA 50Hz Voltage < 12kV		1447-373/384
Oil-type transformer 1Ph > 50kVA < 167kVA 50Hz Voltage < 12kV		"
Oil-type transformer 1Ph > 50kVA < 167kVA 50Hz Voltage > 12kV < 24kV		"
Oil-type transformer 1Ph < 50kVA 50Hz Voltage 12/24kV		"
Oil-type transformer 1Ph > 50kVA < 167kVA 50Hz Voltage 12/24kV		"
Oil-type transformer 3Ph > 1000kVA < 2500kVA 50Hz Voltage < 12kV		1460-373/384
Oil-type transformer 3Ph > 1000kVA < 2500kVA 50Hz Voltage > 12kV < 24kV		"
Oil-type transformer 3Ph > 250kVA < 1000kVA 50Hz Voltage > 24kV < 36kV		"
Oil-type transformer 3Ph > 1000kVA < 2500kVA 50Hz Voltage > 24kV < 36kV		"
Oil-type transformer 3Ph > 2500kVA < 7500kVA 50Hz Voltage < 12kV		2199-403/384
Oil-type transformer 3Ph > 2500kVA < 7500kVA 50Hz Voltage > 24kV < 36kV		"
Oil-type transformer 3Ph > 2500kVA < 7500kVA 50Hz Voltage > 12kV < 24kV		2212-405/384
Distribution transformer, 30kVA 1Ph 19,000-480/240V, Model 23001912	<b>PEA-PC-001</b> <b>PEA-TRAN-001</b> <b>PEA-FI-001</b> <b>RTRN-035/2561</b> 	PEA-TRAN-18/2565
Distribution transformer, 50kVA 3Ph 22,000-416/240V, Model 25002257		PEA-TRAN-19/2565
Distribution transformer, 100kVA 3Ph 22,000-416/240V, Model 31002273		PEA-TRAN-20/2565
Distribution transformer, 250kVA 3Ph 33,000-416/240V, Model 32503330		PEA-TRAN-21/2565
Distribution transformer, 30kVA 1Ph 22,000-480/240V, Model 23002221		PEA-TRAN-22/2565
Distribution transformer, 160kVA 3Ph 22,000-416/240V, Model 31602242		PEA-TRAN-23/2565
Distribution transformer, 50kVA 3Ph 33,000-416/240V, Model 25003322		PEA-TRAN-24/2565
Distribution transformer, 100kVA 3Ph 33,000-416/240V, Model 31003328		PEA-TRAN-25/2565
Distribution transformer, 160kVA 3Ph 33,000-416/240V, Model 31603322		PEA-TRAN-26/2565

**Catalogs of Products and Services and Technical Information about Products**

Can be downloaded at <https://qtc-energy.com/download/>



## Display of Product Labels and Brands

QTC transformer products are required to display to following basic product labels, TIS standards and brands:

### Brand Symbols and Certified Product Standards

QR Code QR Code QR Code QR Code  
Showing Certified Product Numbers



Examples of Product Label and Brand Installation

Ø 3 mm

10 mm

QTC Energy Public Company Limited Thailand

Oil Immersed Hermetic Transformer (SHORT CIRCUIT WITHSTAND)

Rated Capacity	100 kVA	Pri. Voltage	22000 V
Phase	3 Ph	Sec. Voltage	416 / 240 V
Frequency	50 Hz	Pri. Current	2.62 A
Cooling Type	ONAN	Sec. Current	138.79 A
Conductor (LV/HV)	Copper foil Copper Winding	Temp. Rise	50 / 55
Oil Quantity	195 ℓ	Drain Oil Qty.	2.0 ℓ
Untank Weight	485 kg	Impedance	4.06 %
Total Weight	762 kg	Year	2019
Rated Short-circuit withstand current	3.47 kA r.m.s.	Item Code	31002273
Contract No./Po. No.		Serial No.	62311505
PEA. No.		Ins. Class	A

Conform to IEC 60076, TIS 384 Standard

HV. Side		LV. Side	
Pos	Connect	Terminal	Voltage
1	3-4	a to b	
2	2-4	b to c	416
3	2-5	c to a	
4	1-5	a b c	240
5	1-6	to n	

Connection Diagram

Vector Diagram

Vector Group Dyn11

Desg 1000038455

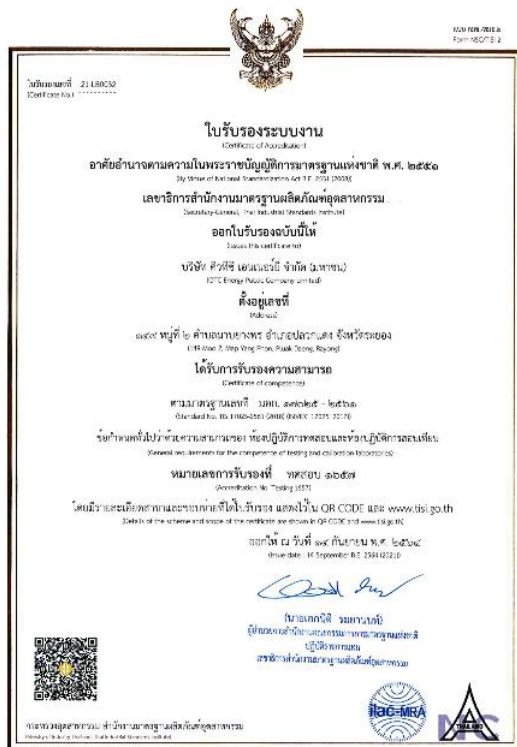
Sample of Nameplates Showing Significant Electricity Information

## Electricity Testing Standards

QTC has a policy to certify product quality by testing electrical properties at 100 percent along with issuing QR codes for transformer test results according to serial numbers. QTC's testing laboratories are accredited for testing laboratory capacity according to TIS 17025-2548 (ISO/IEC17025), Accreditation No. Test 1657. In addition, the Company allows product owners to view product test results for Factory Acceptance Tests (FAT) in order to perform acceptance inspections and create confidence that customers will receive transformers with the highest quality according to expectations. The Company created the FAT VDO conference system through the MS Team. This new innovation was created as a result of the COVID-19 pandemic since 2020. Currently, the Company continues to provide Factory Acceptance Test (FAT) services via VDO conferences to customers who own products to reduce travelling.







And to upgrade the testing laboratory's capability to world-class standards and build confidence in test results. In 2022, the Company invested in building an additional electrical test room, a shield room with a Faraday cage, to be used for sound level and partial discharge testing, with an investment of more than 1.6 million baht. Currently, the construction has been completed, is ready for use and can now test transformer products from external customers. Additionally, the Company will expand the scope of IEC/ISO17025 testing laboratory certification to cover sound level and partial discharge testing in the future.



The Company recognizes the importance of customer needs and the Company is committed to meeting customer needs in order to solve problems from the Company's products and services via customer complaint acceptance channels and customer satisfaction survey channels in order to make modifications and improvements to issues in customers' interests and concerns along with giving importance to communication and advertisement with accurate technical information through major marketing channels such as the Company's official Line Application account, Facebook and Catalog, etc. In addition, the Company hosts seminars to provide knowledge about products by giving consideration to customer privacy and confidentiality.

## Performance in 2022

After the Covid-19 pandemic started to be controllable in 2022, the Company started conducting active marketing by joining booth exhibitions and hosted a nationwide roadshow to meet with customer groups and hold various marketing activities such as the following:

### QTC Smart Energy Roadshow

(#Northern #Southern #Northeastern #Central #Eastern)



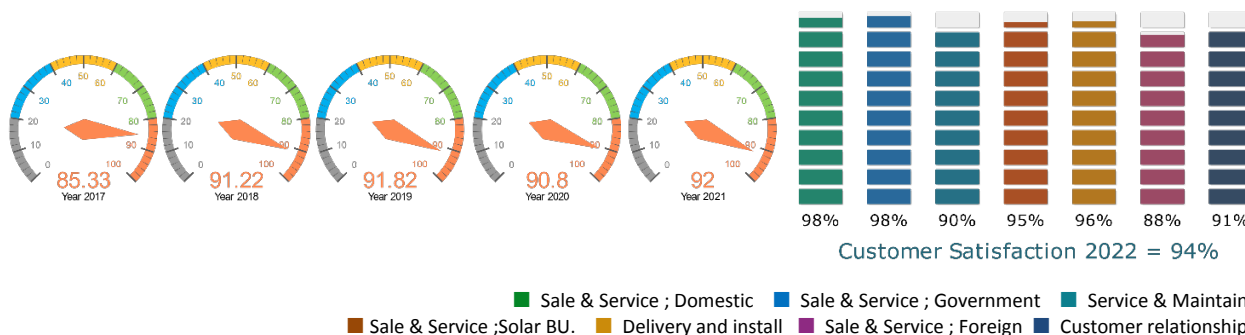


## Examples of Booth Exhibition Activities and Seminars in 2022



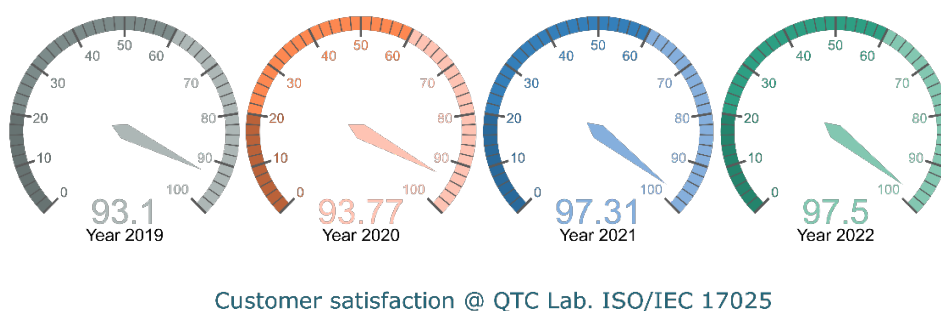
For marketing activities for the “QTC Smart Energy Roadshow”, the total cost of the project was 214,869 baht and the sponsorship of the event amounted to 563,169 baht by LONGI & Huawei. The cost of booth activities and seminars nationwide amounted to 230,000 baht.

- **The Company surveys customer satisfaction annually.** The Company must receive no less than 70 percent of survey forms back and, of the replies, satisfaction must reach the target goal of no less than 90 percent. The Company's performance in 2022 achieved the goal at 94 percent.



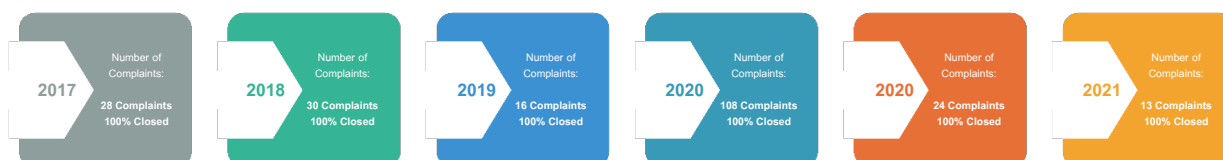
- ★ Overall customer satisfaction survey results achieved goals, except for foreign customer satisfaction. On the issues of communication, the Company will continue to improve on this issue to improve satisfaction levels.

- **Customer satisfaction toward ISO/IEC17025 laboratory testing services. Goal > 90%.**



- ★ From performance in 2022, 63 customers entered the FAT VDO Conference system and 38 customers came onsite. Results from satisfaction assessment were at 97.50 percent. The Company achieved the goal.

- **Ability to Manage Customer Complaints in the Area of Goods and Services – Performance Goal: 100%**



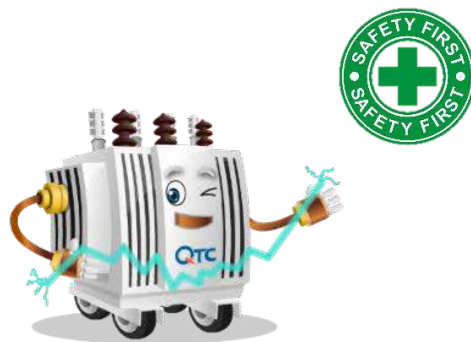
- ★ Concerning performance in 2022, the Company had 13 complaints from customers, a reduction from 2021 by 45.83 percent. 100% of the complaints were resolved according to target, and the Company received **no complaints concerning leaks of customer personal information.**

- **Ability to Provide Inspection Services: The Company maintained transformers within the warranty period and achieved more than 90 percent of the goal.**



★ Performance in 2022 showed 1,312 transformers within the warranty period. The Company was able to work according to customer confirmations for 1,171 transformers and failed to work according to plans with 141 transformers, or 89.25 percent, because some customers could not cut their power to receive checking services as scheduled and, therefore, there are accumulated postponed appointments. However, the failed servicing attempts from 2022 will be carried out by the Company in 2023.

<p>Goal:</p> <p>0</p> <p>In All Cases</p>	Verified Non-compliance with Product Information and Labeling Requirements	✓
	Verified Non-compliance with Marketing Communications	✓
	Verified Breach of Customer Privacy and Leak of Customer Data	✓
	Verified Unsafe Incidents from the Use of Transformer Products and Services	✓



# Trade Partner Development



Currently, many diverse needs of customers or new legal rules and regulations or environmental changes have affected competition among manufacturers in order to be able to adapt to and meet the needs of customers and stakeholders effectively. Customers who place importance on sustainable development place importance on stakeholders throughout the value chain with direct impacts on the Company in meeting the needs of every customer group. Therefore, the Company needs to recognize the importance of improving supplier capabilities with sustainability and coverage of economic, social and environmental dimensions in order to enable the Company to register vendors with major customers and enable QTC's suppliers to be able to control production with quality, punctual development and management with good governance.

QTC categorizes suppliers into the following five main groups: 1. Suppliers who produce and deliver raw materials from abroad, 2. Suppliers who are domestic raw material producers/deliverers, 3. Courier service providers, 4. Construction contractors, and 5. Buyers of general materials. The groups of suppliers prioritized by the Company as a goal for development are the group of domestic raw material producers/deliverers, group of courier service providers, and group of construction contractors, most of whom are SMEs without capital for investing in standard systems and requesting accreditation according to policies and guidelines for assessing supplier capabilities. Therefore, the Company has a mission to improve capabilities of the aforementioned group of suppliers to be able to effectively meet the needs of QTC and QTC customers. In addition, the Company is concerned about the internal actions of partner organizations regarding labor, human rights, corruption, and environmental care and prioritization. If suppliers neglect to comply with the Supplier Code of Conduct, it may have negative social and environmental impacts, and the Company may be viewed as having participated in such actions, creating significant risks of the Company receiving order cancellations from customers and facing trade barriers.

Based on impact assessment, both positive and negative, covering economic, environmental, social and human rights aspects, the following risks and opportunities were found:


Key Topics	Economic	Environmental	Social	Human Rights
	Impact	Impact	Impact	Impact
<ul style="list-style-type: none"> <li>Trade Partner Development</li> </ul>	<p> SME trade partners are developed and encouraged to produce quality products, creating income in the supply chain. The Company receive quality raw materials on time at a suitable cost.</p> <p> Trade partners sell raw materials to other competitors. Trade secrets may be leaked.</p> <p> Possible trade barriers.</p>	<p> Reduced environmental impact from trade partner development.</p> <p> Trade partners' operations may knowingly or unknowingly cause direct or indirect environmental impact.</p>	<p> Create jobs, careers and income for communities in the trade partners' areas.</p> <p> Corruption may occur in the trade partners' work system with government agencies.</p>	<p> Opportunity for labor development.</p> <p> Forced labor or child labor may be used.</p> <p> The Company may be accused of indirect involvement with human rights violations.</p>

Based on the above impacts, the Company has clearly defined management guidelines and working standards as follows:

- Objective:**
1. To reduce the risk of production interruptions from shortages of key raw materials.
  2. To build economic strength for SME suppliers in Thailand.
  3. To deliver quality goods on time and create satisfaction in customers.
  4. To promote good social and environmental practices.


**Management:** The Company prepares the procurement policy, the QTC Supplier Code of Conduct to cover ethical issues in business, human rights, labor rights, safety, resistance against corruption, communication and assessment of supplier capabilities according to business ethics, supplier registration and prepares plans for improving key SME suppliers along with managing with ISO9001 standards and conducting human rights due diligence (HRDD).

 1 : Procure raw materials to have quality > 95%

 : In 2022, the Company achieved 99.20% of the goal. For the remaining 0.80%, it was found that there were quality issues with the supplies from trade partners, so they were returned to the manufacturer to claim them and advice was given about raw material quality and delivery inspection methods.


 2 : > 95% of raw materials are delivered on time.

 : In 2022, the Company achieved 99.75% of the goal. There were five times when the work failed to be delivered on time.

 3 : Communicate and recommend guidelines in the QTC Supplier Code of Conduct to 100% of suppliers.

 : In 2022, the Company continued to work with new suppliers and achieved 100% of the goal.

 4 : Improve at least one target SEM supplier in Thailand per year.

 : In 2022, the Company invited 14 major trade partners to attend a meeting to clarify about the goals and growth direction of the Company, as well as requested cooperation from trade partners in complying with agreements on quality, environmental and human rights practices. The Company was eager to give advice and consultations about various guidelines.



## Performance in 2022

- Revised the QTC Partner Code of Conduct No. 1/2565 due to the addition on the importance of the human rights policy, and communicated this to all existing and new trade partners with whom QTC traded with in 2022.



## QTC Supplier Code of Conduct ▼

<https://investor.qtc-energy.com/storage/download/corporate-governance/20180613-qtc-coc-for-suppliers-th-02.pdf>

- In 2022, the Company organized the “Suppliers Meet QTC” activity within the 2022 “Communities Meet QTC” event on 27 September 2022 where 14 major partners attended the clarification meeting on the Company’s policy and growth direction. Mr. Poonphiphat Tantanasin, the CEO, presided over the clarification meeting, whereby the Company provided an opportunity for suppliers to offer opinions and ask questions about various problems, including recommending guidelines in accordance with QTC’s Supplier Code of Conduct to create mutual understanding and cooperation in delivering quality raw materials on time with environmental and social responsibility and give importance to human rights. All suppliers were willing to participate in raw material development and management in accordance with QTC’s guidelines.



**Photos of the “Suppliers Meet QTC” Activity of the Clarification Meeting in 2022**

- HRDD was conducted in suppliers by using Audit Item No. 4 concerning significant human rights risks to organizations with business relationships. In 2022, the audit was carried out on four key suppliers who produce raw materials and supply them to the Rayong factory, four suppliers who are raw material distributors, three construction contractors, three transportation service suppliers, and two security service and housekeeping service providers, accounting for 23.50% of the 64 target key suppliers (domestic). The Company found no human rights violations in all 16 organizations, but found minor risks and has advised on guidelines to prevent unintentional human rights violations and recommended that the suppliers apply QTC’s audit form to their activities in the future.

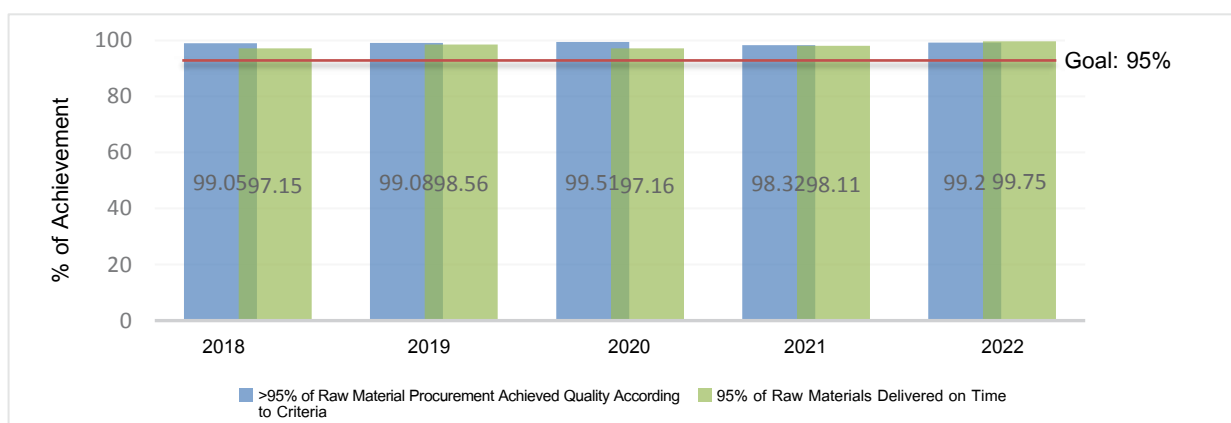


- The Company assessed 236 suppliers/deliverers (producers and deliverers of raw materials with effects on quality) according to the criteria for selecting/assessing deliverers and the QTC Supplier Code of Conduct, which compiles issues of quality, delivery, social-human rights and environmental practices. Suppliers with passing scores will be registered as quality suppliers. In 2022, there were a total of 224 suppliers who passed the criteria, consisting of 86 new suppliers, with an average score of 86.51%. The Company's performance was as follows:

- Suppliers/deliverers who met the criteria at Level A = 201 suppliers
- Suppliers/deliverers who met the criteria at Level B = 20 suppliers  
(Suppliers cooperated with QTC to prepare plans for improvements on product quality control issues)
- Suppliers/deliverers at Level C = 1 supplier
- Suppliers/deliverers at Level D = 2 suppliers  
(The Company did not have cooperation from the supplier to jointly prepare development plans.

### 86 new suppliers passed the social and environmental assessment criteria.

- Performance According to Main Goals of the Procurement Process



- Domestic Procurement Value of Products and Services

Operating Year	Total Procurement Value (Baht)	Local Purchase Value (Rayong)		Purchase Value Outside the Area	
		Value (Baht)	Proportion (%)	Value (Baht)	Proportion (%)
2020	433,586,552.81	26,048,185.38	6.01%	407,538,367.43	93.99%
2021	618,317,867.95	41,634,264.11	6.73%	576,683,603.84	93.27%
2022	634,930,272.90	38,365,767.33	6.04%	596,564,505.57	93.96%



# Environmental Responsibility

# Management of Waste and Scrap Material from Production



Toxic or hazardous waste from industrial factories or industrial waste remains a national problem requiring urgent correction to reduce impact on people in society and the environment. Hazardous waste from industrial factories should be disposed of by licensed waste disposal plants which are accredited with standards by the Department of Industrial Works (DIW). However, in the cycle of disposing of hazardous waste created by industrial factories, industrial waste usually does not reach factories capable of proper disposal, resulting in leaks and improper disposal. Hazardous waste disposal plants may have income from waste disposal and want to have low operating costs, causing waste disposal plants to improperly dispose of hazardous waste by burying in landfills for non-hazardous waste to lower expenses or dispose of liquid hazardous waste in rivers, streams, swamps, canals, lakes or the sea in order to not create disposal expenses. These actions will lead to severe impacts on the environment and people in the future. Furthermore, improper waste disposal may cause impacts on the reputation and brand of the hazardous waste creator, even though the hazardous waste creator did not break the law.

Based on impact assessment of the management process for waste and scrap material from production, both positive and negative, covering economic, environmental, social and human rights aspects, the following risks and opportunities were found:

Key Topics	Economic	Environmental	Social	Human Rights
	Impact	Impact	Impact	Impact
<b>Management of Waste and Scrap Material from Production</b>	Create income in the economic system of the waste and scrap material disposal process according to the law. (Disposal and transportation service providers.)	The environment is protected through good management.	Confidence and trust of stakeholders, society and communities from good waste disposal management without impact on communities.	Exchange of knowledge and non-hazardous scrap material from production for communities, schools, students or the underprivileged to use in their homes and to sell to earn income for their families.
	There may be loopholes for corruption if legal compliance is neglected.	Waste may be secretly disposed of illegally, impacting the environment.	Waste may be secretly disposed of illegally, impacting the health of community members.	Rights violations may occur in resource consumption or health or some group's way of life if waste is secretly disposed of in a way that pollutes the soil, water and air.


Due to the abovementioned impacts, the Board of Directors and executives are concerned and recognize the importance of managing hazardous and non-hazardous waste and disused materials from production. Furthermore, this issue is given attention by stakeholders in the community who have concerns regarding how good factory management processes are and if there will be any impact on community members' lifestyles. The Company promises to work correctly to be above criteria and standards specified by the law because the Company is well aware that the aforementioned issue is a significant risk to the Company's reputation and sustainability. Hence, the Company has established the objectives, management standards, and operational goals as follows:


**Objective:** 1. To create a green culture.

2. To ensure that management of waste from production processes are in compliance with legal specifications.

3. To demonstrate responsibility for in the life cycle of QTC transformer products.


**Management:** Environmental management with ISO14001 standards, environmental policies, laws, zero landfill guidelines, sort waste with the 3Rs principles, select, check and follow-up on waste disposal service providers along with preparing for waste management emergencies.

 1 : Volume of waste produced in the production process per MVA production unit does not exceed 10% of Base Year 2018 (no more than 0.05 ton/MVA).

 : In 2022, the Company did not achieve the goal and had a waste increase 52.95% from the base year (0.7 ton/MVA). In 2022, an additional analysis was conducted on the proportion of waste to the tons of production for the year to be used as reliable comparative data in the future. (=0.02 ton/tons of production)

 2 : Create a green culture to sort waste toward the goal of having zero waste to landfill.

 : In 2022, the Company achieved the "Zero Waste to Landfill" goal.

 3 : Complaints or negative news about improper disposal or dumping of hazardous waste from factories.

 : In 2022, the Company had no environmental complaints or negative news.

## Waste-producing Processes



## Image Showing the Sorting and Disposal of Scrap Materials from Operations

Disposal by External Waste Disposal Companies



(Recycle/Reuse)  
Energy Recovery



Landfill



Incineration

Used Cartridges, Paper Waste, Plastic Waste, Solid Waste from General Consumption

Scrap Copper, Scrap Steel, Contaminated Garbage, Contaminated Containers, Plastic Waste, Scrap Insulator Assembly, Paper Cores, Sawdust, Deteriorated Paint, Old Transformer Oil, Scrap Insulation Wood, Scrap Insulation Paper, Used Silica Gel, Grindstone Blades, Welding Dust

Scrap Wood, Packaging Waste, Pallets

Old Light Bulbs, Used Batteries, Old Engine Oil, Grease, Electronic Waste

Used Transformer Oil, Contaminated Garbage, Silica Gel

Deteriorated Solar Panels

Due to waste management risks that may affect the Company's reputation and stakeholders' trust, the Company has established a waste material management system with the 3Rs principle to ensure compliance with the standards and laws by identifying the processes that generate waste, systematically sorting and storing waste, identifying waste type and disposal methods for large volumes of waste will be taken into account to find improvement opportunities to reduce waste volume at the source. The disposal methods with the least environmental impact will be considered for disposal of materials no longer in use and carried out by external waste disposal companies licensed by the Department of Industrial Works, Ministry of Industry.



## Waste Disposal Service Provider Selection

Selection of waste or disused material collection, transportation, treatment and disposal service providers is the main mission of the Systems Development Division and the Corporate Social Responsibility Division, which must select, request approval and randomly inspect disposal service provider factory areas and monitor operations of disposal service providers from transportation to treatment to ensure that disposal service providers follow steps permitted by the Department of Industrial Works (DIW) and decrees of the Map Yang Porn Sub-district in 2022.

### List of QTC's Waste or Disused Materials Collection, Transportation, Treatment and Disposal Service Providers in 2022

<p><b>01</b></p> <p><b>Akkhie Prakarn Public Co., Ltd.</b></p> <ul style="list-style-type: none"> <li>Collected and Disposed of: Empty spray cans, lead- and copper-contaminated water, deteriorated solar panels, used degraded paint, used grease, used cartridges, oil-contaminated water, oil filters, grindstone scraps, used thinner from washing paint spraying containers, dust and powder from welding/grinding/cutting work, used silica gel</li> <li><b>Disposal Method:</b> 075 (incineration in an incinerator specifically for hazardous waste)</li> <li><b>Transportation Provider:</b> Akkhie Prakarn PCL, DIW-T-085800068</li> </ul>	<p><b>02</b></p> <p><b>Eastern Seaboard Environmental Complex Co., Ltd.</b></p> <ul style="list-style-type: none"> <li>Collected and Disposed of: Contaminated materials, contaminated garbage, used grease, oil-contaminated water, empty spray cans, contaminated containers, expired light bulbs, electronic waste ceramic cups,</li> <li><b>Disposal Method:</b> 042 (used to make mixed fuels) and 049 (reuse by other means), 071 (sanitary burial in landfills specifically for non-hazardous waste)</li> <li><b>Transportation Provider:</b> Waste Management Siam Co., Ltd., DIW-T-050200708 Discovery Logistics Co., Ltd., DIW-T-060200664 Phaisan Siri Transport Co., Ltd., DIW-T-150200103</li> </ul>	<p><b>03</b></p> <p><b>Sapphaisan Factory Company Limited</b></p> <ul style="list-style-type: none"> <li>Collected and Disposed of: Scrap paper (cardboard/general paper), plastic covering waste, aluminum scraps, pure copper scraps/contaminated copper scraps, thick steel scraps, silicon steel scraps, paper cores, lathing scraps, gas waste, plastic cores</li> <li><b>Disposal Method:</b> 011 (sort for redistribution)</li> <li><b>Transportation Provider:</b> Phaisan Siri Transport Co., Ltd., DIW-T-150200103</li> </ul>
<p><b>04</b></p> <p><b>Thong Wattana Waste Management Company Limited</b></p> <ul style="list-style-type: none"> <li>Collected and Disposed of: Contaminated containers, electric wires, paper scraps (including cardboard), wood scraps (including sawdust), plastic scraps, 15-liter plastic barrels, paper cores</li> <li><b>Disposal Method:</b> 011 (sort for redistribution), 049 (reuse by other means)</li> <li><b>Transportation Provider:</b> Thong Wattana Waste Management Co., Ltd., DIW-T-064800055</li> </ul>	<p><b>05</b></p> <p><b>Choksahaphat &amp; Supply Company Limited</b></p> <ul style="list-style-type: none"> <li>Collected and Disposed of: Glass scraps, paper scraps, wood scraps, plastic scraps, copper scraps, steel scraps, electrical wiring, lathing scraps.</li> <li><b>Disposal Method:</b> 011 (sort for redistributions)</li> <li><b>Transportation Provider:</b> Choksahaphat &amp; Supply Co., Ltd., DIW-T-160900717</li> </ul>	<p><b>06</b></p> <p><b>N &amp; J Inter Trade (555) Company Limited</b></p> <ul style="list-style-type: none"> <li>Collected and Disposed of: Used oil (used transformer oil not containing PCB), used lubricant oil.</li> <li><b>Disposal Method:</b> 042 (used to make mixed fuels)</li> <li><b>Transportation Provider:</b> N &amp; J Inter Trade (555) Co., Ltd., DIW-T-182800029</li> </ul>
<p><b>07</b></p> <p><b>Lydia Oil (Thailand) Company Limited</b></p> <ul style="list-style-type: none"> <li>Collected and Disposed of: Used oil (used transformer oil not containing PCB), used lubricant oil.</li> <li><b>Disposal Method:</b> 042 (used to make mixed fuels)</li> <li><b>Transportation Provider:</b> Lydia Oil (Thailand) Co., Ltd., DIW-T-200900108</li> </ul>	<p><b>08</b></p> <p><b>Professional Waste Technology (1999) Public Company Limited</b></p> <ul style="list-style-type: none"> <li>Collected and Disposed of: Batteries, oil-contaminated fabric scraps and sawdust, glue scraps.</li> <li><b>Disposal Method:</b> 042 (used to make mixed fuels), 073 (safe burial in landfills after stabilization or solidification)</li> <li><b>Transportation Provider:</b> Mr. Wiriya Khumchoen, DIW-T-163000011</li> </ul>	<p><b>09</b></p> <p><b>AK Mechanical and Recycling Company Limited</b></p> <ul style="list-style-type: none"> <li>Collected and Disposed of: Plastic scraps, 15-L plastic barrels, used silica gel, contaminated garbage, glue scraps, used degraded paint, used grease, oil-contaminated water, oil filters.</li> <li><b>Disposal Method:</b> 042 (used to make mixed fuels)</li> <li><b>Transportation Provider:</b> AK Mechanical and Recycling Co., Ltd., DIW-T-095800108</li> </ul>

**\*Transportation and disposal of waste (garbage) is done in Thailand and not transported for disposal abroad**

**\*Operations of the Company and Disposal Service Providers in 2022 are compliant with legal requirements**



## Checking and Monitoring Disposal Service Providers

In 2022, the Company inspected six disposal companies' facilities to ensure that the service providers comply with the law and their licenses as follows:

Waste Disposal Company	Factory Type	Area	Inspection Method
Choksahaphat & Supply Co., Ltd.	105	Chonburi	Onsite
Lydia Oil (Thailand) Co., Ltd.	106	Chonburi	Onsite
Sapphaisan Factory Co., Ltd.	105	Bo Win	Onsite
Thong Wattana Waste Management Co., Ltd.	105,106	Map Yang Phon	Onsite
Akkhie Prakarn Public Co., Ltd.	106	Samut Prakan	Online
Waste Management Siam Co., Ltd. (WMS)	106	Bo Win	Online



## Performance

**Table E1 – Volume of Disused Materials from Production in 2020-2022**

Disposal Method Volume (Ton)			2020	2021	2022
			Volume (Ton)	Volume (Ton)	Volume (Ton)
Compliance With 3Rs: Environmentally Friendly Disposal Methods	Recycle/Reuse (Disposal Code: 01/03/04/05/08)	011 Sort for Redistributions	220.28		224.08
		033 Return to Seller for Repackaging or Reuse			0.08
		042 Used to Make Mixed Fuels	27.56	265.83	13.31
		049 Reuse by Other Means	18.00	19.70	30.08
		044 Used as a Substitute Raw Material in a Cement Kiln	-	0.14	
Volume of Remaining Waste to be Disposed of That May Impact the Environment	Incinerator (Disposal Code: 074/075/076)	075 Incineration in an Incinerator Specifically for Hazardous Waste	18.20	18.20	24.42
	Landfill (Disposal Code: 071/072/073)	071 Sanitary Burial in Landfills Specifically for Non-Hazardous Waste	-	3.54	0.09
		073 Safe Burial in Landfills after Stabilization or Solidification	3.54	0.09	0.06
	Other	Specify	-	-	-
Total Volume (Ton)			287.57	207.40	301.24
Transportation and Disposal Expenses from the Production Process (Million Baht)			0.38	0.40	0.42
Income from Disposal Method 011 (Million Baht)			5.37	10.26	14.38

From Table E1, changes were made to the units in the report as follows: The unit for quantity was changed from “kg” to “ton” by dividing the original values by 1,000; and the unit for expenses and income was changed from “(thousand baht)” to “(million baht)”.

It can be seen that the total amount of waste materials from the production process in 2022 increased by 4.75% from 2020 and 45.50% from 2021. This is due to the clearing of large volumes of expired materials in the Disposal Code 011 in 2022 which were sold to create income. In addition, in 2022, the tank painting process was changed to a paint pouring system in each production cycle. If few workpieces enter the paint pouring process, it creates leftover paint that can no longer be used, producing large volumes of waste that need to be disposed of. The issue has been considered by the Executive Committee to improve the painting process and production plan to be consistent in 2023 in order to make the use of paint volume in the production cycle as cost-effective as possible, and reduce production costs and waste from processes.

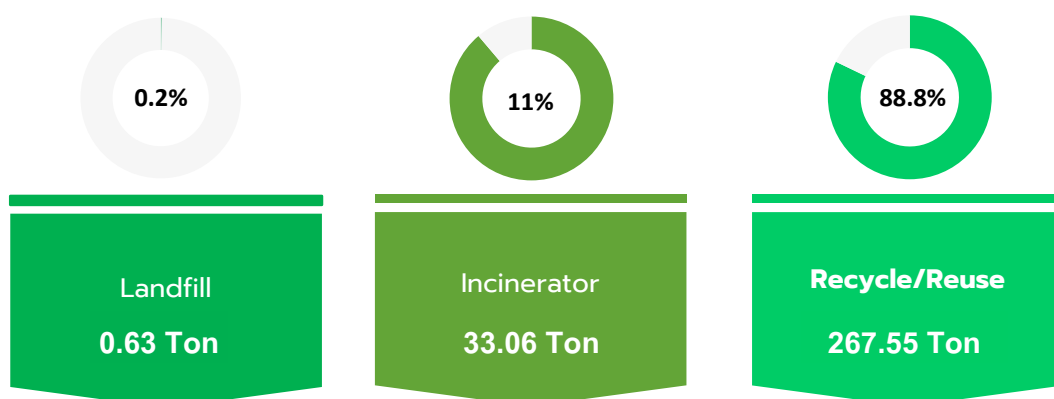
- **Zero waste to Landfill**

The Company gives importance to and supports waste separation operations with the principle of 3Rs and the selection of appropriate disposal methods to minimize environmental impacts with the goal of achieving zero waste to landfill. Wastes that are unable to be disposed of using other methods are added to landfills according to the exceptions in the “Zero Waste to Landfill Project” conditions. These wastes were disposed of by disposal companies licensed by the Department of Industrial Works to ensure proper landfill disposal methods.

In 2022, the Company participated in the project “Enhance Waste Management Efficiency for Industries with Waste Trafficking Issues by Using 3Rs and KAIZEN Principles (Under the Cost of Industrial Waste Management)”. The Company’s key achievements in the project include the Company’s work team receiving more efficient waste management knowledge and skills to reduce downstream environmental impact. Moreover, the workteam also achieved the project’s goals by receiving rewards from the 2022 “3Rs Awards” and “Zero Waste Achievement Awards” from the Department of Industrial Works with the awards being presented by Mr. Sahawat Sopha, Deputy Director-General of the Department of Industrial Works.



**2022 “3Rs Awards” and “Zero Waste Achievement Awards”**

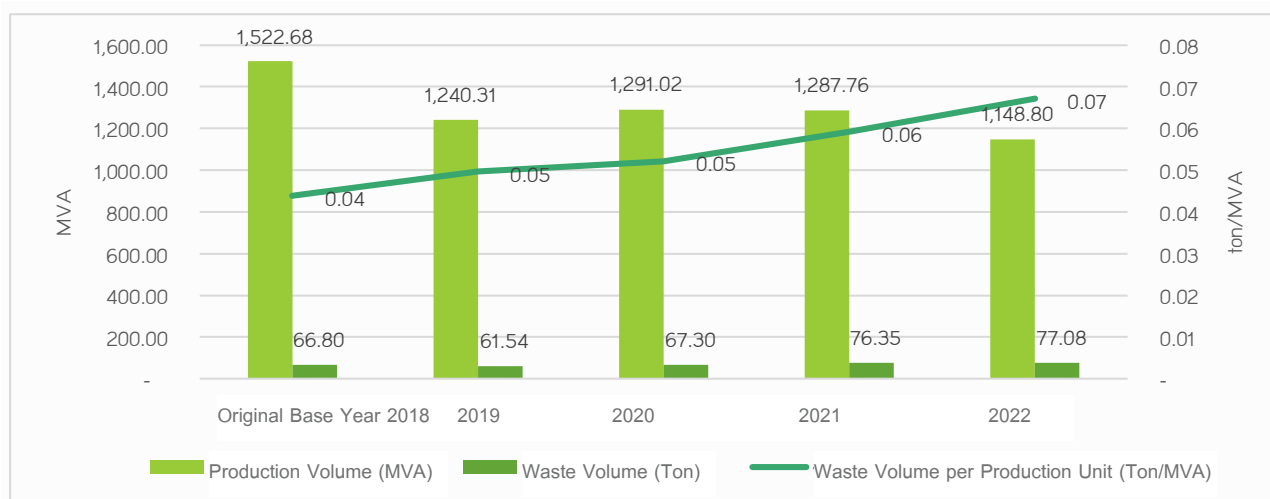


From Table E1 and Graph E3, the volume of non-landfill materials, after sorting using the recycle/reuse and incineration methods, was about 0.63 tons. About 0.57 tons of this were ceramic waste disposed of by landfill according to sanitation principles, and about 0.06 tons were battery waste disposed of by landfill after stabilization or solidification. Both of these landfill waste types were exceptions to the zero-landfill conditions. Therefore, in 2022, the Company was able to achieve the “Zero to Landfill” goal.

## • Waste Volume Per Production Unit

**Table E2 Showing Creation of Disused Waste per Production Unit (MVA) (Only Disposal Methods 042, 044, 049, 071, 073 and 075)**

Item	Year of Operation				
	2018 (Original Base Year)	2019	2020 (New Base Year)	2021	2022
Production Volume (MVA)	1,522.68	1,240.31	1,291.02	1,287.76	1,148.80
Prefabricated Transformer Weight (Tons of Production)			-	-	3,909.42
Waste Volume (Ton)	66.80	61.54	67.30	76.35	77.08
Waste Volume per Production Unit (Ton/MVA)	0.044	0.050	0.05	0.06	0.07
Waste Volume per Ton of Production (Ton/Ton of Production)	-	-	-	-	0.02



**Graph E2 Showing Waste Volume per Production Unit (Ton/MVA)**

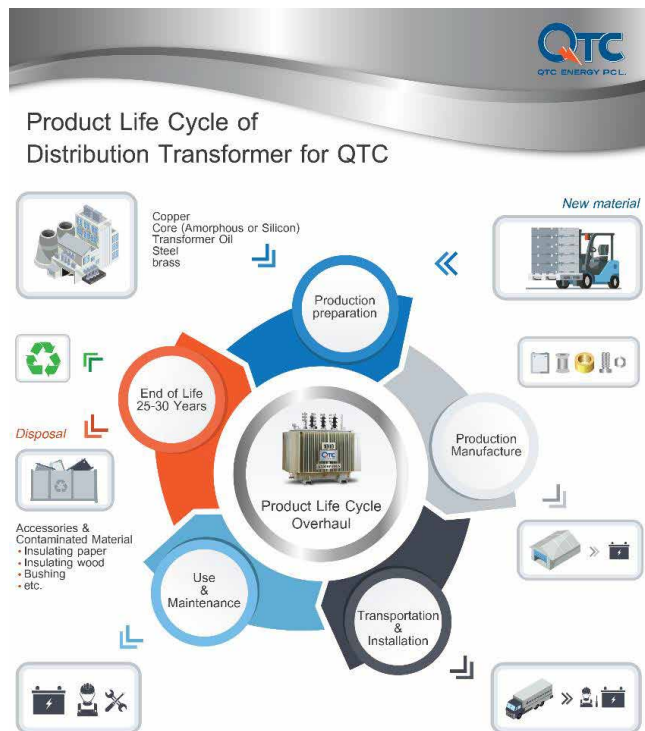
From Table E2 and Graph E2, the figures shown in the previous year's report have been adjusted. The unit for production volume was changed from "kVA" to "MVA" by dividing the original values by 1,000; and the unit for waste volume was changed from "(kg)" to "(ton)".

The performance *in 2022 did not achieve the goal. Waste volume per production unit (ton/MVA) increased from Base Year 2018 by 52.95%*. This is the result of the paint pouring process as described earlier in Table E1, and the key fluctuating variable is the MVA production unit because the factory's production method is the make-to-order method. In some years, a large number of machines may be produced but the number of MVAs may be low. The amount of raw materials used waste volume produced may vary according to the number of machines or MVAs produced. Therefore, in 2022, the data on the weight of finished transformers produced in the year was collected, using the "tons of production" measurement unit. Such weight is derived from the actual amount of raw materials used in production, which should be more reliable than the comparison of EA or MVA units. This is to develop stable and reliable indicators in the future.

In 2022, the waste volume per ton of production was 0.02 tons/tons of production, or in the production of transformers that use 1.02 tons of raw materials, the weight of the transformer will be one ton and the waste volume will be 0.02 ton, or 1.96%. The Company will use this data as the basis for considering new indicators in 2023.

- **Disposal of Expired Transformer Products**

### Return Policy for Product Remains



After the end of life of the transformers, the transformers can be returned back to QTC for proper disposal and recycled. The disposal of the transformers is free of charge.

The disposal shall be requested and granted by the owner of the transformers in writing. The customer shall arrange to transport the transformers to QTC Factory in Rayong province, at their own expenses.

**In 2022, no expired transformers were sent for disposal at QTC's Factories in Rayong.**

### Management of Disused Solar Panels

In 2022, Q Solar 1 did not send solar panels for disposal. Because BOI rights are in use, disused material storage rights are extended pursuant to the law. Additionally, damaged solar cells in QTC's solar business have not been sent for disposal because they are items that must wait to be claimed by the manufacturer first.



# Environmentally-friendly Production Processes



When speaking of important environmental issues other than waste from industrial factories, the Company cannot avoid the topics of air pollution and water pollution from fuel combustion and production processes of industrial factories, which are major causes of impacts on air and water quality and impacts on health and hygiene of people in society, communities and the environment. If operations in any industrial factory did not consider the aforementioned impacts and did not recognize the importance of control processes in compliance with standards of the law, that industrial factory may encounter resistance from community members and be unable to operate business in the area smoothly or have business licenses suspended or have businesses closed under laws enforced by government agencies.

QTC is aware of potential impacts on operators in the Company, the surrounding community members and environment, which may lead to negative impacts on human rights and the lifestyle of communities surrounding the Company and may impact the organization's business in the future. Therefore, the Board of Directors and executives recognize the importance of management in production processes, selection of energy-conserving machines and tools for production without creating environmental impacts. The Company has systems to effectively prevent or hold pollution. In addition, the Company checks and monitors pollution according to legal requirements in the Company and subsidiaries.

Based on impact assessment of the production process, both positive and negative, covering economic, environmental, social and human rights aspects, the following risks and opportunities were found:

Key Topics	Economic	Environmental	Social	Human Rights
	Impact	Impact	Impact	Impact
<b>Environmentally-friendly Production Processes</b>	Promotes the development of Industry 4.0 according to state policy.	The environment is protected through good management and good ecosystem.	The confidence and trust of stakeholders, employees and surrounding communities.	Employees and surrounding communities have good health and are unaffected by pollution in the production process.
	Increases competitive potential in international and domestic markets where customers prioritize the environment.			
	Old technology and machines may become non-income-generating assets and a burden for disposal in the future.	Air, water or soil pollution may occur if the production process is not well controlled, creating impact on the ecosystem.	There may be social resistance if neglected to comply.	The health of employees or surrounding communities may be unknowingly harmed through contact or inhalation of pollution from the production process without good management.





As a result of such effects, the Board of Directors and executives give importance to improving every step of the production process to ensure safety for operating employees, visitors and surrounding communities, as well as the ecosystem. Most importantly, operations must comply with or be better than environmental laws because the Company recognizes that such impacts pose significant risks to its reputation and sustainability. Hence, the Company has established the objectives, management standard and operational goals as follows:

**Objective:** 1. To ensure control of pollution from production processes in compliance with legal requirements.


2. To develop work processes and production processes in order to reduce environmental impacts, directly and indirectly.


**Management:** Environmental management with ISO14001 standards, environment policies, related laws, measurement of standard values specified by law and green procurement with consideration given to product quality and environmental impacts from products.


 1 : Environmental measurements of pollution sources have scores meeting standard specified by law.

 : In 2022, environmental measurements met standards prescribed by law

 2 : Value of Green Label materials and equipment used increases by at least five percent per year.

 : In 2022, green procurement value was 747,390.93 baht, an increase of 20.24 percent from 2021. The Company achieved the goal.

 3 : Complaints from the community in case of pollution impacts from activities of the Rayong factory.

 : In 2022, the Company had no complaints from the community (certified by Map Yang Phon TAO)

## Environmental Management Systems

The Company implemented ISO14001: 2015 environment management standards and asked to be certified by an outside auditor once per year. QTC Energy asked to be certified for systems by SGS (Thailand) Limited. Q Solar 1 asked to be certified for systems by Intertek Certification Limited.



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



ISO14001: 2105 (UKAS) Standard Certification Document: Q Solar 1

Environmental Policy: <https://qtc-energy.com/th/energy-policy/>

## 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 temperature of weld works. In these usages, water is stored for repeated usage throughout the entire year and then transported for proper disposal. As for the rinsing of contaminated equipment of the company, the company provides water containers for storing contaminated water and transports them for disposal outside according to 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 QTC Energy's Factory Wastewater Quality Test Results at the Final Point (2020-2022)**

Tested Parameters	Test Results						Standard	Unit
	1/20	2/20	1/21	2/21	1/22	2/22		
	24/3/20	20/10/20	10/5/21	24/11/21	6/6/22	3/10/22		
BOD <sub>5</sub>	3	4	9	3	7	5	20	mg/l
Oil and Grease	Not Detected	Not Detected	4.9	Not Detected	4.0	Not Detected	5	mg/l
PH	7.26	7.23	7.48	6.67	7.23	7.16	5.5-9.0	-
Sulfides	<0.5	<0.5	<0.5	Not Detected	<0.5	<0.5	1	mg/l as H <sub>2</sub> S
Suspended Solids	9	19	21	17	45	19	50	mg/l
Temperature	32	27	33	28	32	30	40	°C
Total Dissolved Solids	77	<65	<65	Not Detected	Not Detected	Not Detected	3000	mg/l
Total Kjeldahl Nitrogen	1.7	2.0	1.6	Not Detected	Not Detected	1.3	100	mg/l as H <sub>2</sub> S

**Table Showing QTC Energy's Bangkok Office Wastewater Quality Test Results at the Final Point (2020-2022)**

Tested Parameters	Test Results						Standard	Unit
	1/20	2/20	1/21	2/21	1/22	2/22		
	17/3/20	25/11/20	27/8/21	1/12/21	30/5/22	6/10/22		
BOD <sub>5</sub>	8	4	4	7	4	3	40	mg/l
Oil and Grease	<2.5	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	20	mg/l
PH	7.19	7.16	7.07	6.81	3.2	6.93	5.0-9.0	-
Sulfides	0.7	<0.5	<8	0.7	Not Detected	0.6	3	mg/l as H <sub>2</sub> S
Suspended Solids	<8	10	<0.5	16	10	Not Detected	50	mg/l
Temperature	30	30	28	28	30	29	N/R	°C
Total Dissolved Solids	272	446	159	356	350	486	500	mg/l
Total Kjeldahl Nitrogen	29.3	19.5	2.4	14.4	5.9	2	40	mg/l as H <sub>2</sub> S

Q Solar 1 generates solar energy to sell to the Provincial Electricity Authority. Water is used to clean 86,688 solar panels for 20 times per year, for agriculture at a center for studying the Sufficiency Economy Philosophy and for cleaning in daily life. The Company's water is from ground water and reservoirs for holding water to use during dry seasons. When rainwater or overflow is drained from reservoirs, the water is released into public canals. Therefore, Q Solar 1 gives importance to consistent wastewater quality control, installs aerator systems to increase oxygen for water in reservoirs and tests water quality once per year. The Company uses services of Smile Laboratory Company Limited, Private Analytical Laboratory Registration No. Wor. 286.

**Table Showing Wastewater Quality Test Results of Q Solar 1 (2020-2022)**

Tested Areas	Tested Parameters	Test Results				Standard	Unit
		1/20	2/20	1/21	1/22		
		16/7/20	3/9/20	21/7/21	21/7/22		
Wastewater from Water System	Acidity and Alkalinity (pH)A	2	-	<2	7	5.5-9.0	-
	BOD	ND.	-	<5	ND.	20	mg/l
	COD	7.1	-	7.1	7.3	120	mg/l
	Total Suspended Solids (TSS)A	<40	-	<40	<40	50	mg/l
	Oil & Grease	4	-	<2.50	13	5	mg/l
Wastewater from the Lodgings' Cesspool	Acidity and Alkalinity (pH)A	4	-	<2	6	5.5-9.0	-
	BOD	Not Detected	-	Not Detected	<5	20	mg/l
	COD	7.2	-	7.0	7.2	120	mg/l
	Total Suspended Solids (TSS)A	<40	-	<40	<40	50	mg/l
	Oil & Grease	7	-	11	<2.5	5	mg/l
Wastewater from the Office Building's Cesspool	Acidity and Alkalinity (pH)A	6	-	<2	<2	5.5-9.0	-
	BOD	<5	-	Not Detected	<5	20	mg/l
	COD	7.2	-	7.2	7.1	120	mg/l
	Total Suspended Solids (TSS)A	213	<40	<40	<40	50	mg/l
	Oil & Grease	38	-	7	13	5	mg/l

## 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. Air quality test results at the end of stacks when working was consistent with legal requirements. Test results were as follows:

**Table Showing Comparison of Air Measurement Results in Stacks for QTC Energy (2020-2022)**

Tested Areas	Tested Parameters	Test Results							Standard	Unit
		1/20	2/20	1/64	2/21	3/21	1/22	2/22		
		23-3-20	20-10-20	09-04-64	30-04-21	24-11-21	06-06-22	3-10-22		
Wood Cutting Room Sawdust Vacuuming Duct	Particulate	1.30	1.69	0.95		1.87	0.39	0.46	400	mg/m <sup>3</sup>
Spray Booth Stacks MC 139 Factory 6	Particulate	2.57	6.56		4.66	2.98	14.7	2.36	400	mg/m <sup>3</sup>
	Xylene				Not Detected	Not Detected	Not Detected	Not Detected	200	ppm
	Total VOCs	23.2	69.0		152.0	121.0	6.75	110.0	-	ppm
Spray Booth Stacks MC 199 Factory 6	Particulate	2.54	1.61		0.84	7.67	1.22	0.49	400	mg/m <sup>3</sup>
	Total VOCs	28	835		135	242	112	70.5	-	ppm
	Xylene				Not Detected	4.25	Not Detected	0.51	200	ppm
Spray Booth Stacks (Installation)	Particulate	1.55	3.94	3.43		2.25	0.59	7.95	400	mg/m <sup>3</sup>
	Xylene			0.65		0.26	Not Detected	Not Detected	200	ppm
	Volatile Organic Compounds	29.2	101	111		268.0	94.0	70.0	-	ppm
Plasma Cutter Stacks, Factory 4	Particulate	29.1	15.2	19.3		35.2	61.3	24.4	400	mg/m <sup>3</sup>
	Oxide of Nitrogen as Nitrogen Dioxide	Not Detected	Not Detected	<1		27	6	9	-	ppm
Laser Cutter Stacks, Factory 4	Particulate						7.23	4.70	400	mg/m <sup>3</sup>
	Oxide of Nitrogen as Nitrogen Dioxide						< 1	Not Detected	-	ppm
Oven Stacks (Vacuum)	Oil mist	167.0	46.8	212.0		3.87	0.34	438	-	mg/m <sup>3</sup>
	Oxide of Nitrogen as Nitrogen Dioxide	Not Detected	1	Not Detected		Not Detected	Not Detected	Not Detected	200	ppm
Oven Stacks (Transformer Repair)	Oil mist	0.37	29.6	0.25		3.10	78.80	96.00	-	mg/m <sup>3</sup>
	Xylene					Not Detected	Not Detected	Not Detected	200	ppm
	Oxide of Nitrogen as Nitrogen Dioxide	Not Detected	Not Detected	<1		Not Detected	<1	Not Detected	200	ppm
Transformer Moisture Vacuuming Stacks	Oil Mist	0.52	0.14	0.16		7.89	0.27	0.41	-	mg/m <sup>3</sup>
Power	Oxide of Nitrogen as Nitrogen Dioxide	Not Detected	Not Detected	<1		Not Detected	Not Detected	Not Detected	200	ppm

Remarks: Q Solar 1 had no activities that caused air pollution.



Copying Machine Rental  
Trademark: RICOH  
Trademark: FUJI XEROX  
Procurement Value: 640,118.78 baht

70-Gram Copying Paper  
Trademark: One Green  
Trademark: Shih-Tzu  
Procurement Value: 94,999.50 baht



Eraser Product, Model ZL102-W  
Trademark: PENTEL  
Procurement Value: 4,205.04 baht

AAA Alkaline Batteries, LR03T Model, and AA Batteries, LR6T Model  
Trademark: PANASONIC  
Procurement Value: 8,067.60 baht

**Table with Summary of Green Procurement Value in 2019-2022**

Item	Trademark	Green Procurement Value			
		2019	2020	2021	2022
70-Gram Copying Paper	Shih-Tzu	66,346.00	52,155.60	-	11,008.67
70-Gram Copying Paper	One Green	-	-	48,956.50	83,990.83
Eraser Product, Model ZL102-W	PENTEL	6,786.12	2,454.58	3,800.64	4,205.04
AAA Alkaline Batteries, LR03T Model, and AA Batteries, LR6T Model	Panasonic	-	190,920	6,454.08	8,067.60
Rented Copying Machines	RICOH	104,040	227,200	488,941.43	575,574.36
Rented Copying Machines	Fuji Xerox	-	190,920	73,435	64,544.42
<b>Total Value</b>		<b>177,172.12</b>	<b>472,730.18</b>	<b>621,578.65</b>	<b>747,390.93</b>

**Green Procurement Value in 2022 increased from 2021 by 20.24 percent or 125,803.28 baht.**

# Climate Change



The Company accepts climate change as a global environmental problem in terms of causes and effects with origins from greenhouse gas emissions from human economic activities to create prosperity and good living conditions for over a hundred years. Development caused energy consumption and carbon dioxide emissions in the atmosphere. Every country had a part in climate change, causing the world's temperature to rise and causing impacts on the overall environment worldwide. As polar icecaps melt, countries in the tropical zone will have more crises from heat and droughts.

From 2021 and after, every country must reduce greenhouse gas emissions in line with the Paris Agreement. Every country is able to do this freely because of differences in each country's ability, capacity and readiness including different geographic limitations and climate.

Although Thailand emitted less than one percent of the world's greenhouse gases, this likelihood is rising. To reduce potential impacts and comply with the Paris Agreement, the Thai government set a goal to achieve carbon neutrality by 2050 and achieve net-zero goals by 2065.

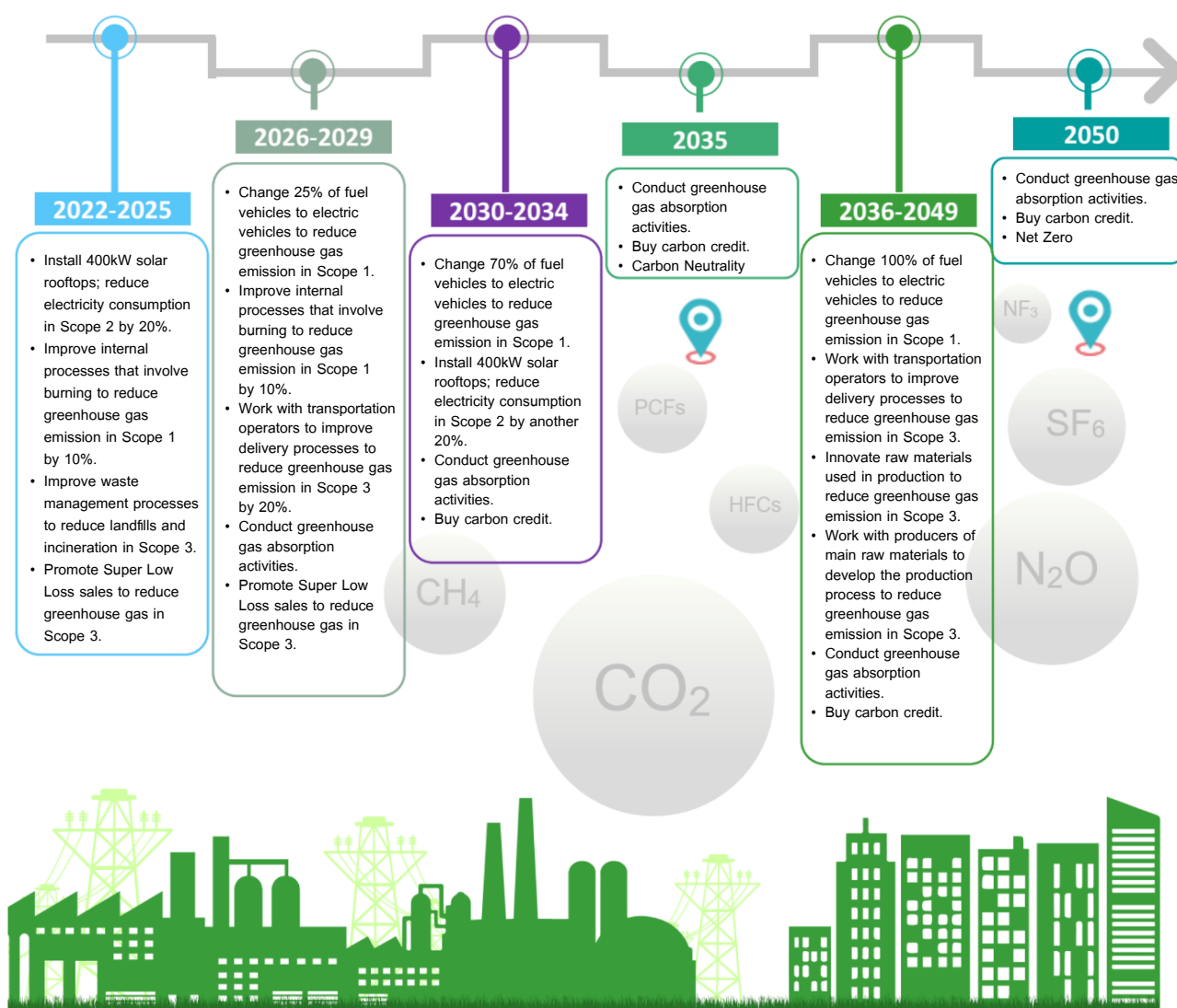
QTC recognizes current environmental impacts and severity of future impacts as part of Thai society and an organization contributing to greenhouse gas emissions in the atmosphere, albeit a small part. However, QTC has given importance to this issue and is making efforts to reduce greenhouse gas emissions by developing manufacturing processes and modifying behaviors to use energy cost-effectively, researching and developing products capable of reducing greenhouse gases from use. These efforts build value for the organization and stakeholders while contributing to the effort to reduce greenhouse gas emissions according to Thailand's goals.

Based on impact assessment of climate change, both positive and negative, covering economic, environmental, social and human rights aspects, the following risks and opportunities were found:

Key Topics	Economic	Environmental	Social	Human Rights
Impact	Impact	Impact	Impact	Impact
<ul style="list-style-type: none"> <li>Climate Change</li> </ul>	<p>😊 Eco-friendly product development, greenhouse gas emission reduction. Ability to create income in domestic and international economic systems.</p> <p>😊 Participation in driving the country toward carbon neutrality and net zero, creating confidence at the global level.</p> <p>😞 High investment in product and work process development.</p>	<p>😊 Atmospheric greenhouse gas is reduced through increased eco-friendly product sales.</p> <p>😞 Greenhouse gas amount may increase from changes in processes or new innovations if not carefully assessed.</p>	<p>😊 Confidence and trust from stakeholders, employees and surrounding communities.</p> <p>😞 There may be social resistance if proper operation is neglected.</p>	<p>😊 Overall reduction of risks and severity of climate change impacts on the organization, society, communities and environment.</p> <p>😞 Impact from droughts, flooding, hot climate, etc., from climate change.</p>









## Carbon Neutrality & Net Zero Goal Achievement Plan



From the impacts and targets to reduce greenhouse gas emissions in Thailand, the Board of Directors and executives give importance to being a part of the global population that contributes to reducing greenhouse gas emissions by improving work processes, replacing machinery to reduce electrical energy consumption, switching to electric vehicles to reduce fuel consumption, and installing solar rooftop systems to reduce energy consumption from power lines. All of these things require the establishment of clear goals and long-term operation plan. In 2022, the Company changed the scope of greenhouse gas emission calculation to include the calculation of the scope of operations of the Bangkok Office covering the entire organization. Therefore, it is necessary to cancel the original base year and adapt the operation plan to be consistent with the organization's key goals.

- Objective:**
1. To have processes for collecting and analyzing data for preparing greenhouse gas emission reports.
  2. To develop the organization's personnel to have awareness of impacts from climate change.
  3. To reduce greenhouse gas emissions in the atmosphere.
  4. To create business opportunities from climate change

**Management:** Environmental management with ISO14001 standards, ISO1464-3 standards, TGO greenhouse gas report criteria and policies on the environment, energy and organization carbon footprint.

-  **1 :** Greenhouse gas emissions for three types of gases dropped from the base year by five percent.
-  **:** In 2022, the use of Base Year 2019 is cancelled as the calculation includes the Bangkok Office and Rayong Factory which have different databases. Therefore, it is not suitable for comparison. In 2022, the entire organization's total greenhouse gas for Scope 1+2+3 = 577,131 tonCO<sub>2</sub>eq.
-  **2 :** Greenhouse gas emissions for Type 1 and Type 2 greenhouse gases per MVA dropped by five percent from the base year.
-  **:** In 2022, the use of this indicator is cancelled as the calculation includes the Bangkok Office and Rayong Factory which have different databases. Therefore, it is not suitable for comparison.
-  **3 :** Promotion of sales of environmentally-friendly products to grow by more than five percent per year.
-  **:** In 2022, sales for super low loss transformers decreased by more 50 percent from 2021. The Company failed to achieved the goal. Green Label products are discontinued for transformers as the standards of the PEA and MEA are used instead.

**The progress of the goal to achieve Carbon Neutrality by 2035  
and Net Zero by 2050 will be reported in 2023.**

- **Carbon Footprint for Organization Report Preparation Process.**

The Company began preparing the Carbon Footprint for Organization Report (CFO report) since 2015 and the Company continued work with a scope covering activities at the Rayong factory and an objective to be reviewed and certified for organization carbon footprint at the Limited Assurance Level with a reliability of 95 percent by using ISO14064-3 standards and TGO greenhouse gas reporting criteria as references and guidelines in greenhouse gas management. The gases monitored were CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, SF<sub>6</sub> and NF<sub>3</sub>. In addition, the Company appointed the organization's carbon footprint work group to perform the following duties:

	Collect data on volume of use according to items specified in greenhouse gas reporting criteria.	
	Calculate and analyze results on a quarterly basis.	
	Make performance reports to the Board of Directors on a quarterly basis.	
	Prepare reports on greenhouse gas emissions based on TGO criteria on an annual basis.	
	Request certification of results from an outside reviewer on an annual basis. Report to the MRB Committee to prepare greenhouse gas emission reduction plans on an annual basis.	
	Register the organization's carbon footprint on an annual basis.	
	Disseminate greenhouse gas emissions data to employees in the organization and communicate it in the sustainability report.	





**Table C1 Showing the Organization's Greenhouse Gas Emissions in 2015 – 2022**

Year		GHG Emission (ton CO <sub>2</sub> eq.)				
		Scope 1 (ton CO <sub>2</sub> eq.)	Scope 2 (ton CO <sub>2</sub> eq.)	Scope 3 (ton CO <sub>2</sub> eq.)	Total Emission Scope 1+ 2 (ton CO <sub>2</sub> eq.)	Total Emission Scope 1+2+3 (ton CO <sub>2</sub> eq.)
Site Factory Only	2015 (Old Base year#1)	426	899	63	1,325	1,388
	2016	401	672	68	1,073	1,141
	2017	391	907	57	1,298	1,355
	2018 (Old Base year #2)	328	909	64	1,237	1,301
	2019	282	908	50	1,190	1,240
	2019 Re-calculation of Base year #3 (AR5)	284	780	50	1,064	1,113
	2019 Re-calculation of Base year #3.1 (AR5)	282	775	50	1,057	1,107
	2020	276	745	55	1,021	1,076
	2021	253	863	698,295	1,116	699,411
New	2022 (Site Office-BKK & Factory-RY) New Base Year	315	904	575,912	1,219	577,131
Types of GHGs included :		CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, HFCs, PFCs, SF <sub>6</sub> , NF <sub>3</sub>				

In 2022, the calculation of greenhouse gas emissions in all business activities of QTC (Bangkok Head Office and Rayong Factory) was carried out. This was the first year that combined the calculations, therefore, the Corporate Carbon Footprint Committee proposed that the Board of Directors cancelled the use of the original base year and to use 2022 as the new base year for making the greenhouse gas emission reduction plan to achieve carbon neutrality by 2035 and Net Zero by 2050 due to insufficient data in the previous year. Therefore, in this reporting cycle, it is not possible to compare greenhouse gas emissions in 2022 with Base Year 2019 (2019 Re-calculation of Base year #3.1 (AR5)) or with 2021.



**Table C2 Showing GHG Emission Intensity (Scope 1+2)**

Year		Total Emission Scope 1+ 2 (ton CO <sub>2</sub> eq.)	Capacity (Unit)	GHG emissions intensity ton CO <sub>2</sub> eq./Unit	Capacity (MVA)	GHG emissions intensity ton CO <sub>2</sub> eq./ MVA	Revenue (Million baht)	GHG emissions intensity ton CO <sub>2</sub> eq./ Million baht
Site Factory Only	2015 (Old Base year#1)	1,325	3,728	0.3554	1,791.85	0.7395	-	-
	2016	1,073	2,341	0.4584	1,136.98	0.9437	-	-
	2017	1,298	4,162	0.3119	1,659.53	0.7821	-	-
	2018 (Old Base year #2)	1,237	3,602	0.3434	1,522.68	0.8124	-	-
	2019	1190	1,693	0.7029	1,240.31	0.9594	-	-
	2019 Re-calculation of Base year #3 (AR5)	1,064	1,693	0.6285	1,240.31	0.8578	-	-
	2019 Re-calculation of Base year #3.1 (AR5)	1,057	1,693	0.6243	1,240.31	0.8522	-	-
	2020	1,020	1,686	0.6050	1,291.02	0.7901	-	-
	2021	1,116	1,878	0.5942	1,287.76	0.8666	-	-
New	2022 (Site Office-BKK & Factory-RY) New Base Year	1,219	2,388	0.5105	1,148.80	1.0611	1,164.57	1.0467

Table C2 cannot not show the comparison of GHG emissions intensity per production unit for 2022 against the old base year due to the previously mentioned reason. However, in 2022, the consideration of the GHG emissions intensity was considered against the income (million baht) to consider the GHG emissions intensity against a suitable unit because the Company, in 2022, conducted marketing to promote increased solar product sales and continued growth using resources for joint management in the transformer business and transformer services, such as activities in Scope 1, including warehouse management, internal transportation, use of Company cars; Scope 2, joint electrical energy consumption; and Scope 3, upstream and downstream transportation, and joint service usage. The use of production units from only the transformer business to find the GHG emissions intensity, therefore, is unlikely to generate suitable and reliable data. In 2023, the Company will consider using GHG emissions intensity indicators such as GHG (tonCO<sub>2</sub>eq./Revenue (Baht)) and will use 2022 as the new base year.

## GHG imissions intensity (Scope1+2) : 2022



Certificate of Corporate Greenhouse Gas Emissions in 2022 from 1 January 2022 to 31 December 2022, No. TH-IE-23-5006108-001, Reviewed and Certified by SGS (Thailand) Company Limited



The full Greenhouse Gas Verification Statement can be downloaded from

<https://qtc-energy.com/wp-content/uploads/2021/03/5-CFO-2.pdf>

Regarding the Corporate Carbon Footprint Report of 2021, the Company asked to be accredited by the Thailand Greenhouse Gas Management Organization (Public Organization) (TGO) in 2022, Accreditation No. TGO CFO FY22-07-078 (Verification Period: 01/01/2021 – 31/12/2021).





# Q Projects for Reducing Greenhouse Gas Emissions

## • Solar Energy Tuk-Tuk Project

The Project started and prototypes were created in 2020. At present, five solar energy tuk-tuks and one four-wheel solar energy vehicle have been built to be used in checking solar panels and control box functions daily. In emergencies or abnormal situations where the control center needs to check and make corrections urgently in an area of more than 200 rai, the inventions in the project can be used. Results from the project are as follows:

**Table Showing Greenhouse Gas Emissions from Diesel Fuel Consumption for Vehicles Used in Q Solar 1 Power Plant**

Year of Operation	Amount of Diesel Fuel (Liter)	Amount of GHG Emission (Ton Co2 eq)	%of Change
Base Year 2019	4,448.58	12.19	0
2020	3,352.16	9.19	-24.65%
2021	1,702.34	4.67	-61.73%
2022	808.18	2.21	-75.89%

From the table, it can be seen that diesel fuel consumption in 2022 decreased by about 81% from Base Year 2019, which means a reduction in the combustion of diesel oil, which will generate greenhouse gases of 81.83% from Base Year 2019. The payback period of the construction of solar energy vehicles is 3.5 years.

The amount of diesel fuel used in 2022 still amounted to 808.18 liters because in some internal activities, it is necessary to use diesel engines such as fire trucks, cars and large trucks.

In addition, Q Solar1 has been expanding commercial sales of solar tricycles since 2021, with a total sale of 15 units valued at more than 200,000 baht.





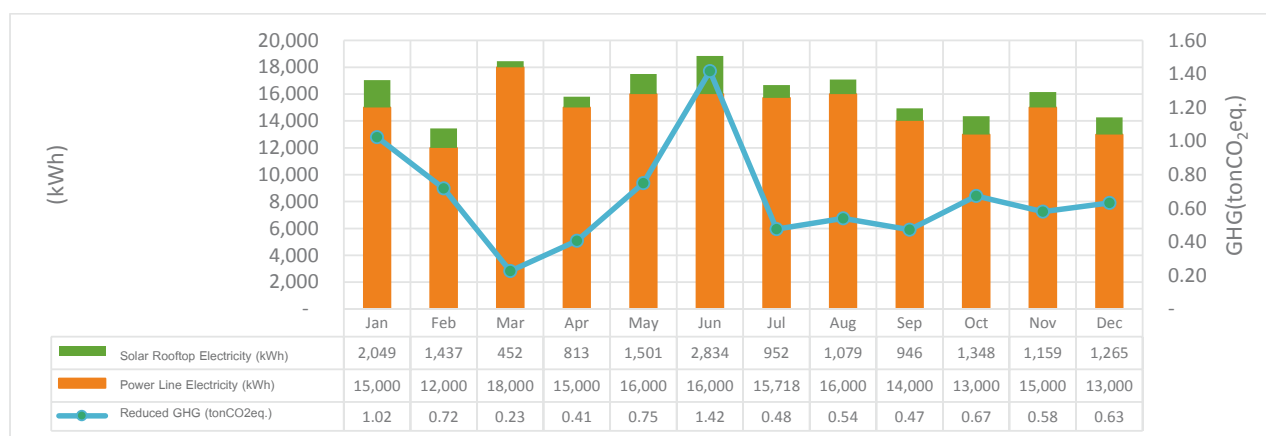
- 12kW Solar Rooftop Installation Project at the Bangkok Office**

From the project to install a 12-kW solar rooftop at the Bangkok office at the end of 2020 as a center of learning for engineers, sales employees and service technicians about maintenance techniques. The Company installed the system on grid in the MDB for use in the office during daytime, the results are as follows:

**Table Showing the Amount of Electricity Generated from the 12kW Solar Rooftop at the Bangkok Office**

Topics to Consider	Year of Operation					
	2020		2021		2022	
	Electricity (kWh)	GHG (ton-CO <sub>2</sub> eq.)	Electricity (kWh)	GHG (ton-CO <sub>2</sub> eq.)	Electricity (kWh)	GHG (ton-CO <sub>2</sub> eq.)
Electricity from MEA Power Lines	204,000	102	177,000	88	178,718	89
<b>Electricity Generated from Solar Rooftop</b>	<b>0</b>	<b>-</b>	<b>10,841</b>	<b>-</b>	<b>15,835</b>	<b>-</b>
Total Electricity Consumption Demand	204,000	102	187,841	88	194,553	89

**Graph Showing Comparison of Electricity Consumption from MEA Power Lines and from the 12kW Solar Roof Top in 2022 at the Bangkok Office**



According to the table, in 2022, the Bangkok Office used 178,718kWh of electricity from MEA power lines, while the capacity to generate electricity from the 12kW solar rooftop was 15,835 kWh, resulting in an 8.14% difference in energy consumption from MEA power lines from the total electricity demand of the Bangkok Office of 194,553kWh. This allowed the greenhouse gas emissions from electricity consumption (Scope 2) to be reduced by 7.92 tonCO<sub>2</sub>eq. and the electrical fees to be reduced by about 79,000 baht.

However, the analysis of power generation capacity data of the 12kW solar rooftop in 2022 from the above graph, the goal have not been achieved. There are environmental issues and deficiencies that need to be studied and developed further to establish a learning center for the work team and to pass on the acquired knowledge to customers correctly in the future.

- **400kW Solar Rooftop at Rayong Factory**

From the inspection of Rayong Factory's electricity consumption, it was found that the average electricity consumption was 137,000kWh/month, equivalent to an average electricity fee of 550,000 baht/month or an average GHG emission of 68.4863 tonCO<sub>2</sub>eq./month. As a result of recording GHG emissions to report on GHG emission volumes and apply for certification since 2015, the Company can see opportunities for improvement to reduce electricity consumption and reduce GHG emissions in Scope 2 according to the organization's Carbon Neutrality and Net Zero goals. Currently, the Company is an official distributor of LONGI: PV Panel and HUAWEI: Inverter. Therefore, the solar rooftop system should be installed with various technologies to serve as a major center for educating and developing the skills of the engineering and after-sales service teams according to the 12kW Solar Rooftop Project at Bangkok Office.

For the above reasons, the Company has created a project to install a 400kW solar rooftop valued at 13 million baht to apply for investment promotion by applying for the right according to Announcement No. 9/2560, Section 2 "Investment Promotion Measures for Saving Energy, Renewable Energy Consumption or Environmental Impact Reduction" from the Board of Investment (BOI), Investment Promotion Certificate No. 65-0471-1-07-1-0.

In 2022, the installation of the 140kW Solar Rooftop Phase 1 system on the roof area of Factory 1 building by Grid Connect Energy Co., Ltd., the contractor, took about four months to construct and install. The project was delivered on 19 December 2022, and the system is ready to generate electricity and measured as being fully functional.

According to the results of PVsyst, the project in Phase 1 will be able to generate 190,100 kWh/year of electricity. The project can reduce energy consumption from PEA power lines by 11.4% and reduce GHG emissions in Scope 2 by 95 tonCO<sub>2</sub>eq./year. In 2022, the system was able to generate electricity to the maximum installed capacity. The project's Phase 1 required an investment of over 6.7 million baht for the entire system. (The application for subsidized funding according to patent has not been filed.) The Company is ready to enter Phase 2 of the 140kW project to increase the electricity generation capacity. This phase is expected to be able to generate electricity in Quarter 3/66.



Bird's Eye View of Solar Rooftop #1 Installation  
at Factory Building 1

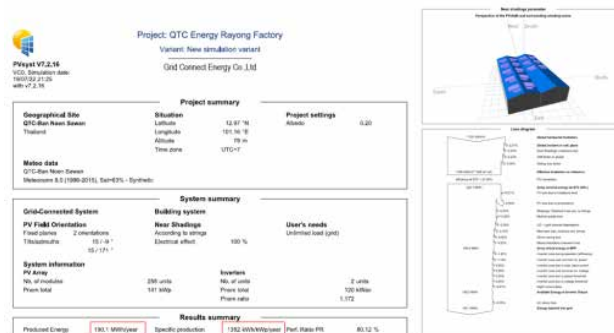


Image of PVsyst Program Calculations



Inspection of Installation and control system on 19 December 2022

- ### 3-ton Electric Forklift

As the Company recognizes its responsibility toward the environment and climate change in line with the Carbon Neutrality and NetZero goals in 2022, the Board of Directors considered purchasing 3-ton electric forklifts to replace 3-ton diesel combustion engine forklifts for outdoor use under normal conditions similar to using 100% diesel engine forklifts to reduce GHG emissions from diesel fuel consumption, GHG emissions from combustion, noise and odors disturbing operators. The Company has purchased TOYOTA Model 8FD30 Counter Balance Battery, which is a model that efficiently withstands water particles from outdoor use and has SAS stability control to ensure the stability of the vehicle both when turning and lifting. The vehicle has qualifications that match the functions required. Performance is as follows:



**TOYOTA 8FD30 Electric Forklift in Real Use**

**Table Showing the Comparison Between Diesel Fuel Consumption by Forklifts and Production**

Items	Compared Years of Operation		
	2020	2021	2022
Diesel Fuel Consumption for Forklifts (Liter)	9,593.46	11,370.20	10,853.90
Production Volume (Unit)	1,686.00	1,878.00	2,388.00
Proportion of Diesel Fuel Consumption for Forklifts (Liter)/Production Unit	5.69	6.05	4.55
Proportion of GHG Emissions from Mobile Combustion Forklift Activities (tonCO <sub>2</sub> eq.)/Production Unit (Unit)	0.0156	0.0166	0.0125

From the aforementioned table, it can be seen that in 2022, the introduction of 3-ton electric forklifts to replace 3-ton diesel engine forklifts in October 2022 resulted in a decrease in diesel fuel consumption for forklifts while still supporting normal transportation needs. The proportion of diesel consumption for forklifts per production unit in 2022 decreased by 20.12% from 2020 and by 24.93% from 2021. This also allowed the reduction of the proportion of GHG emissions from forklift activities to production unit. Therefore, switching diesel combustion engine forklifts to electric forklifts is another way for the Company to achieve carbon neutrality and net zero goals in the future.

At present, the Company has a need to use six forklifts for lifting and moving cargo, with sizes ranging from 3 tons to 15 tons according to the type and nature of use. In the future, the Company will consider using electric forklifts with suitable models and specs for work to replace existing ones.

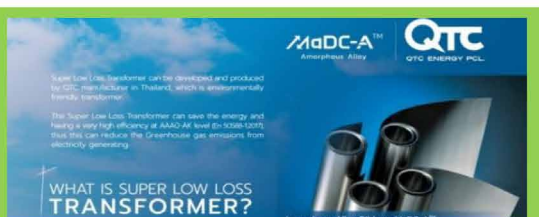
## Environmentally Friendly Products

### Super Low Loss Transformers



These transformers are researched and developed by the QTC engineering teams and a trade ally, Hitachi Metals, Ltd., since 2008 from the Company's vision and mission to be committed to manufacturing quality products while recognizing the importance of the environment including changes in the world caused by **climate change**. People in the world's societies are beginning to place importance on changing consumption behaviors to reduce environmental impacts and greenhouse gas emissions into the atmosphere.

### Super Low Loss Transformer



QTC sees opportunities in these changes. Therefore, QTC has the concept of manufacturing transformers capable of using energy in the system at full efficiency to significantly reduce energy loss and greenhouse gas emissions from electricity use in order to provide an option for customers who recognize the importance of environmental impacts.

**"Super Low Loss Transformer"** received funding from the National Innovation Agency (NIA) to install production lines at the Rayong factory and marketing for commercial distribution officially began in 2018. For over ten years in the product's development, QTC continued to push for super low loss transformers to become an option for users to reduce environmental impacts and create benefits for users. **"Save The World Save Your Money"**

In 2022, super low loss (SLL) transformer sales were decreased from 2021 by over 50 percent with 252 transformers sold only domestically at a total value of 37 million baht, which is a good sign that domestic transformer users are starting to recognize the importance.

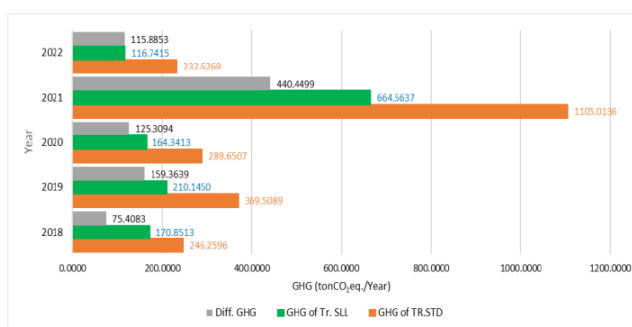
#### Value for QTC: Extra Income, Make a Difference

Year	Quantity (EA)	Selling value (MB.)	%Growth
2018	22	11	0
2019	29	22	100.00%
2020	24	16	-27.27%
2021	442	79	393.75%
2022	252	37	-53.16%



#### Value for the Environment

Tr.SLL have 40% less greenhouse gas emissions from electricity use than standard transformers (Tr.STD)



Graph Comparing GHG Emissions per Year between Tr.SLL and Tr.STD from the Sales

#### Value for Customers

With unique properties, super low loss transformers (Tr.SLL.) can reduce energy loss in the steel core by as much as 70 percent when compared to standard transformers, thereby saving electricity cost by 30 percent and reaching the cost-efficiency point in 3-5 years.





ที่ รย ๗๒๔๐๔/ ๓๕๔



ที่ทำการองค์การบริหารส่วนตำบลมายางพร  
ถนนปลวกแดง-หัวยปราบ รย ๒๑๑๔๐

๑๓ กุมภาพันธ์ ๒๕๖๖

เรื่อง ขอร้องเรียนด้านสิ่งแวดล้อม

เรียน กรรมการ/ผู้จัดการ บริษัท คิวทีซี เอนเนอร์ยี จำกัด (มหาชน)

อ้างถึง หนังสือ บริษัท คิวทีซี เอนเนอร์ยี จำกัด (มหาชน) ที่ CSR๒๓๐๐๑ ลงวันที่ ๑๙ มกราคม ๒๕๖๖

ตามอ้างถึง บริษัท คิวทีซี เอนเนอร์ยี จำกัด (มหาชน) ประกอบกิจการเกี่ยวกับการผลิตหม้อแปลงไฟฟ้า โรงงานตั้งอยู่เลขที่ ๑๔๙ หมู่ที่ ๒ ตำบลมายางพร อำเภอปลวกแดง จังหวัดระยอง ได้ขอสอบถามข้อมูลเกี่ยวกับข้อร้องเรียนที่เกิดจากการดำเนินงานของบริษัทฯ เพื่อเป็นข้อมูลประกอบการประเมินการบริหารจัดการด้านสิ่งแวดล้อม นั้น

องค์การบริหารส่วนตำบลมายางพร ได้ตรวจสอบข้อมูลการรับเรื่องร้องเรียนในระหว่างวันที่ ๑ มกราคม - ๓๑ ธันวาคม ๒๕๖๕ แล้วพบว่า ไม่มีข้อร้องเรียนที่เกิดจากการดำเนินกิจการของบริษัท คิวทีซี เอนเนอร์ยี จำกัด (มหาชน)

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

*Sorapong*

(นายรุ่งเพชร กำเหนิดทอง)

รองนายกองค์การบริหารส่วนตำบลมายางพร

นายกองค์การบริหารส่วนตำบลมายางพร



ฝ่ายบริหารงานสาธารณสุข

กองสาธารณสุขและสิ่งแวดล้อม

โทร. ๐ ๓๘๐๒ ๖๘๒๘ ต่อ ๑๑๕

โทรสาร ๐ ๓๘๐๒ ๖๘๒๙

**“ยึดมั่นธรรมาภิบาล บริการเพื่อประชาชน”**



# Sustainable Use of Resources



Natural resources are used by humans for basic living. However, because humans need many amenities, natural resources are used for commercial benefits and business activities such as use of fossils for fuel production, use of water for food and beverage production, coal excavation for electricity generation, cutting trees for furniture and use of other natural resources to create equipment, tools, instruments and clothing, etc. If these activities use natural resources in a wasteful manner without using resource for full benefits, natural resources will become gradually depleted and unable to replenish to meet human needs, which may have future impacts on the future because of imbalance in nature, causing disasters such as floods, degraded soil, droughts and famines, etc.

QTC 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. The production of transformers uses raw materials, each of which is naturally created from various resources such as copper, iron, trees, oil, etc. 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 various resources with awareness that resources such as electricity or oil or raw materials used in production which came from converting natural resources into energy, raw materials and products, and cost-effective use will help to extend use of that resource for mutual social benefits and cut the Company's costs.


Based on impact assessment of resource consumption including electricity, fuel, water and raw materials for production, both positive and negative, covering economic, environmental, social and human rights aspects, the following risks and opportunities were found:


Key Topics	Economic	Environmental	Social	Human Rights
	Impact	Impact	Impact	Impact
<ul style="list-style-type: none"> <li>Sustainable Use of Resources</li> </ul>	Circular economy is created in the supply chain from soring iron, copper and transformer oil for recycling.	The resources last longer.	Confidence and trust from stakeholders, employees, society and surrounding communities.	Surrounding communities are not encroached upon and can use the resources, such as water, together with the organization.
	–	Natural resources such as underground water may be depleted if overdrawn, causing droughts and sinkholes.  Mineral resources are upstream materials for producing main raw materials that are destroyed from unsustainable use, and cannot be reused.	There is social resistance if good practices are neglected or if there is a lack of accountability.	Surrounding communities may compete for underground water resources, affecting access to water sources by community members.


Due to the concerns of stakeholders and the organization from such impacts, the Company places importance on the worthwhile consumption of resources such as electricity, fuel oil, water, and raw materials for production by improving the transformer design process to calculate for the worthwhile consumption of raw material, minimization of waste from the production processes, management of the warehouse to prevent damage to raw materials by using the FIFO system, and cost-effective use of electricity, fuel oil and water as necessary. The goals are as follows:


**Objective:** 1. To use resources for maximum cost-efficiency.  
2. To reduce business operation costs.

**Management:** Quality management with ISO9001 standards, energy management with ISO50001 standards (implemented without requesting accreditation) and ISO14001 standards including the organization's environment, energy and corporate carbon footprint policies.


 1 : Non-renewable energy consumption (factories) per MVA production unit of no more than five percent from Base Year 2019. (Target value not exceeding 1320kWh/MVA.)

 : In 2022, the Company did not achieve the goal. The energy consumption was 1424kWh/MVA.

 2 : Diesel use for transportation per MVA production and service unit of no more than five percent from Base Year 2019. (Target value not exceeding 13.20 liters/unit.)

 : In 2022, the Company did not achieve the goal. The diesel consumption was 14.43 liters/unit.

 3 : Water and groundwater use by the Company in every area where the Company is located is reduced by five percent from Base Year 2019.

 : In 2022, the Company had the following performance:

Use of water from the Metropolitan Waterworks Authority by the Bangkok office increased by 3.87% from Base Year 2019. The Company did not achieve the goal.

Use of groundwater by the Rayong Factory declined by 4.11% from Base Year 2019. The Company did not achieve the goal.

Use of groundwater by the Q Solar 1 power plant declined by 29.58% from Base Year 2019. The Company achieved the goal.

## Energy Use

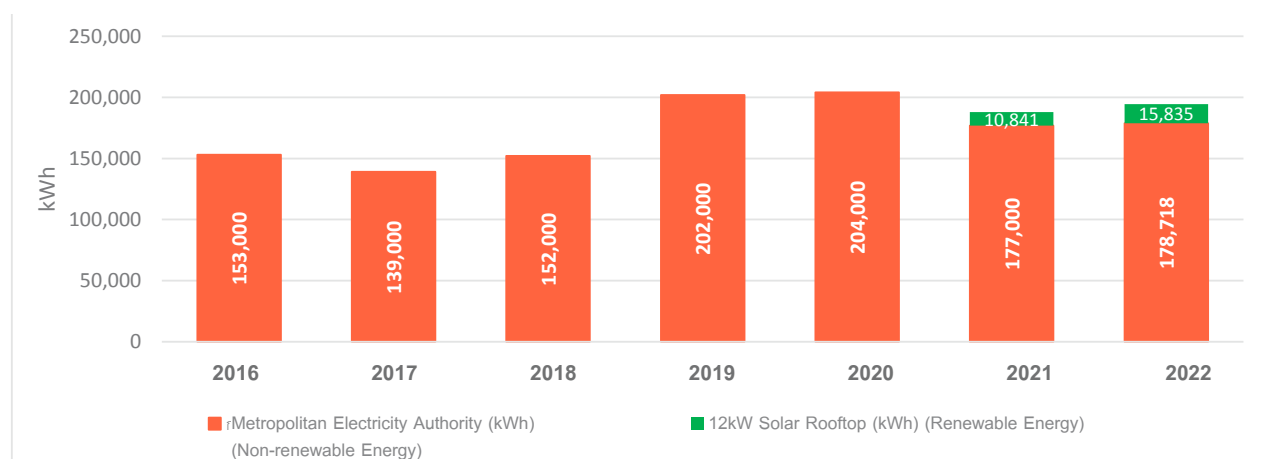
Processes in manufacturing activities, service provision, office work and electricity generation of QTC, QTCGP and Q Solar 1 use energy from the following two parts:

### 1. Electricity

TC's factory does not fit the criteria for energy conservation pursuant to the law. The Company uses electricity purchased from two outside sources consisting of electricity from the Metropolitan Electricity Authority for use in the main office in Bangkok and electricity from the Provincial Electricity Authority for use in the factory in Rayong.

**Table and Graph EN1 Showing Amount of Electricity Used in the Bangkok Office**

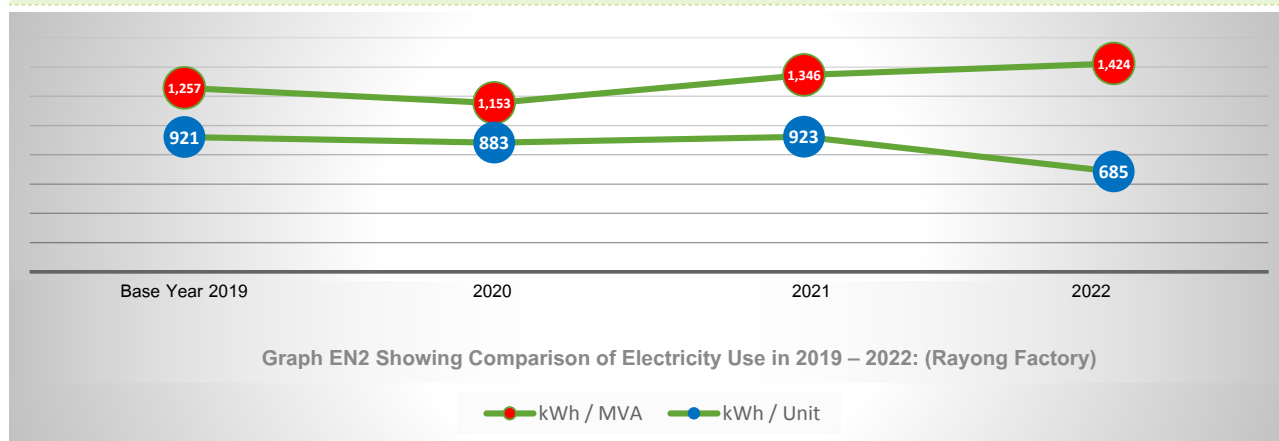
Item	QTC Energy, Bangkok Office						
	2016	2017	2018	2019	2020	2021	2022
Metropolitan Electricity Authority (kWh) (Non-renewable Energy)	153,000	139,000	152,000	202,000	204,000	177,000	178,718
12kW Solar Rooftop (kWh) (Renewable Energy)	-	-	-	-	-	10,841	15,835



According to Table and Graph EN1, Bangkok Office's electricity consumption in 2022 slightly increased from 2021, with 92% of electricity consumption from MEA (non-renewable energy) and 8% from Solar Rooftop (renewable energy). The increase of electricity consumption from 2021 was due to office operations in 2022 entering 100% normal conditions. The WFH method is no longer used and there are more office personnel. More air conditioning, water pumps and office supplies are used. As a result, electricity consumption increased in line with business activities.

**Table EN2 Showing Efficiency of Electricity Use at the Rayong Factory**

Item	QTC Energy, Rayong Transformer Manufacturing Factory			
	Base Year 2019	2020	2021	2022
Provincial Electricity Authority (kWh) (Non-Renewable Energy)	1,558,904	1,489,120	1,733,672	1,635,544
140 kW Solar Rooftop (kWh) (Renewable Energy)	-	-	-	8,090
Production Volume (MVA)	1,240	1,291	1,288	1,149
Production Volume (unit)	1,693	1,686	1,878	2,388
kWh/MVA	1,257	1,153	1,346	1,424
kWh/Unit	921	883	923	685

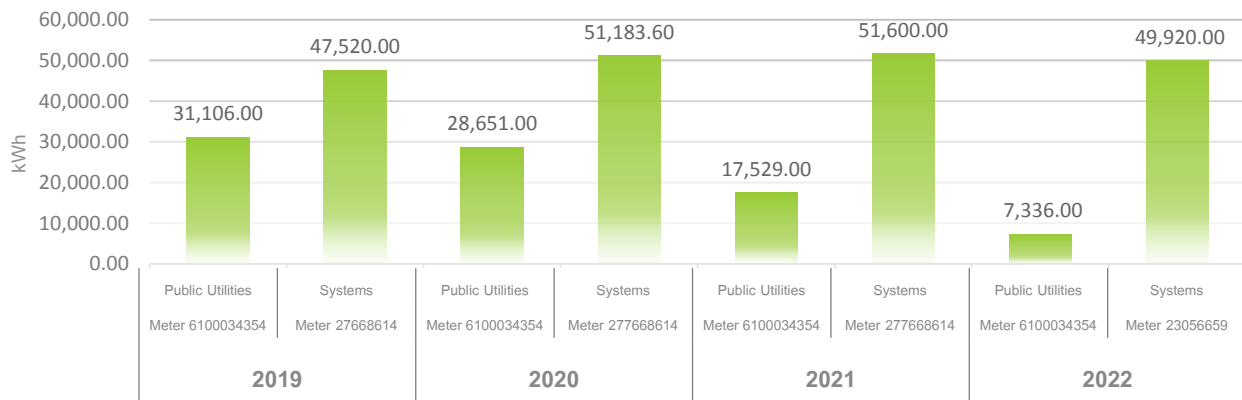


In Table EN2 and Graph EN2, electricity use by the Rayong factory in 2022 can be seen to be higher than Base Year 2019. The proportion of consumption of electricity from the PEA was 99.51% and electricity from Solar Rooftop (renewable energy) 0.49%. Consumption of electricity from the PEA increased by 4.92% from Base Year 2019, which is within the target value of no more than 5%, due to the use of electricity of 8,090kW from the solar rooftop at the end of 2022. The proportion of electricity consumption per MVA production unit increased from Base Year 2019 by 13.27%, which exceeds the target value of no more than 5% increase or 1320kWh/MVA. The goal was not achieved due to 2022 having lower MVA production units than Base Year 2019 by 91.51 MVA, and higher production units than Base Year 2019 by 695 units, causing the electricity testing process to require higher energy consumption because 100% of units were tested. As a result, the proportion of electricity consumption per MVA production units and units is unstable, varying according to the MVA size and number of units produced. In some years, the MVA size may be very large but with a low number of units, or the MVA size may be small but with a high number of units. All of this depends on customers' orders for each year.

In any case, the Company continues to seek opportunities to improve and select the most suitable indicators. In 2023, the Company was able to use 140kW solar rooftops to help reduce non-renewable electricity consumption (PEA) by about 15%.

**Table EN3 Showing Efficiency of Electricity Use at Q Solar 1**

Item	Q Solar 1 Solar Energy Generation							
	2019		2020		2021		2022	
	Meter 6100034354	Meter 27668614	Meter 6100034354	Meter 277668614	Meter 6100034354	Meter 277668614	Meter 6100034354	Meter 23056659
	Public Utilities	Systems	Public Utilities	Systems	Public Utilities	Systems	Public Utilities	Systems
Provincial Electricity Authority (kWh) (Used) Non-Renewable Energy	31,106	47,520	28,651	51,183	17,529	51,600	7,336	49,920
Production Volume (MWh) (Sold) Renewable Energy	13,201.80		13,130.58		12,895.08		12,770.88	



**Graph EN3 Showing Amount of Electricity Used by Q Solar 1 in 2019 - 2022**

Table EN3 and Graph EN3 show the efficiency of electricity use by the Q Solar 1 power plant with two separate meters for public utilities and offices. In 2022, additional solar panels were installed to generate electricity and replace part of electricity from the PEA, causing electricity use to drop by 58.15 percent from 2021. The meter for systems controlling electricity generation from solar energy at night showed electricity use to decrease by 3.26 percent. This amount of electricity consumption resulted from environmental factors in cases where the sun rises late or when there is heavy cloud cover or heavy rain and the Company was unable to generate electricity. The electricity from the meter would then be distributed into the system to support control systems. There were no system shutdown problems occurring at night as the electricity meters distributed electricity at all times of the night as can be seen from reductions in the amount of electricity generation for each year. Therefore, the amount of electricity use for electricity meters fluctuates in the opposite direction of the amount of electricity generated in each year.

Because electricity used by Q Solar 1 was not high or significant, goals were not set to reduce electricity use. However, the Company supported teams to use knowledge and resources to develop systems and use electricity cost-effectively.



## 2. Thermal Energy-Fuel

Diesel and benzene (gasoline) are used for transportation outside the Company, services, transportation inside the Company, employee shuttles and office cars. In 2022, the Company used fuel according to the following table:

**Table EN4 Showing the Amount of Energy Used by QTC (Non-renewable Energy)**

Item	QTC Energy			
	Base Year 2019	2020	2021	2022
Diesel (Internal/External Delivery, Services) (Liters)	74,638	76,588.91	70,647.00	76,577.11
Benzene (Company Cars According to Position) (Liters)	32,595	27,001.45	24,036.17	28,840.79
Number of Transformers Produced (Units)	921	883	923	685
Number of Transformers Receiving Maintenance Service (Units)	5,019	4,876	4,298	4,621
Proportion of Diesel Consumption (Liters)/Production and Service Unit (Unit)	12.57	13.30	13.53	14.43

According to Table EN4, in 2022, the original indicators have been revised for measuring the concentration of diesel consumption/MVA production unit after determining that they were not reasonable due to diesel consumption, including for on-site transformer maintenance services. As a result, the new indicators have been recalculated using the concentration of diesel consumption (liters)/transformer production and service unit (unit). Recalculation was done using Base Year 2019 with the target of diesel consumption (liters)/production and service unit (unit) not exceeding 5% from Base Year 2019. Performance in 2022 had the diesel consumption proportion at 14.43 liters/unit, which did not meet the target value of not exceeding 13.20 liters/unit.

**Table EN5 Showing the Amount of Fuel Used by Q Solar 1 (Non-renewable Energy)**

Item	Q Solar 1			
	2019	2020	2021	2022
Diesel (For Trucks, Cars)	4,448.58	3,352.16	1,702.34	808.18
Benzene (For Grasscutters, Water Pumps)	2,760.68	3,881.96	3,153.26	2,388.92
<b>Total Fuel Use</b>	<b>7,209.26</b>	<b>7,234.12</b>	<b>4,855.60</b>	<b>3,197.10</b>

From Table EN5, diesel fuel use in 2022 can be seen to have been reduced by 52.53 percent because Q Solar 1 has replaced nearly 100% of the vehicles used for checking or working in the power plant with solar energy vehicles, resulting in significantly reduced diesel fuel consumption.

Benzene use by grass cutters and water pumps in 2022 was reduced by 24.24 percent due to external factors around the power plant. Particulates in the air that landed on solar panels reduced electricity generation capacity, causing solar panels to have to be cleaned frequently. In 2022, a solar panel cleaning kit was developed that uses a high-pressure water hose to spray into the panel cleaning device. The water was released together with a polishing brush. This reduces the use of manual labor and reduced the use of large volumes of water, in addition to being able to reduce benzene consumption by water pumps.

No goals were set for fuel use because the amount of fuel used was small and insignificant.

## Declaration of Intention of the Energy Conservation Network “Energy Beyond Standards”



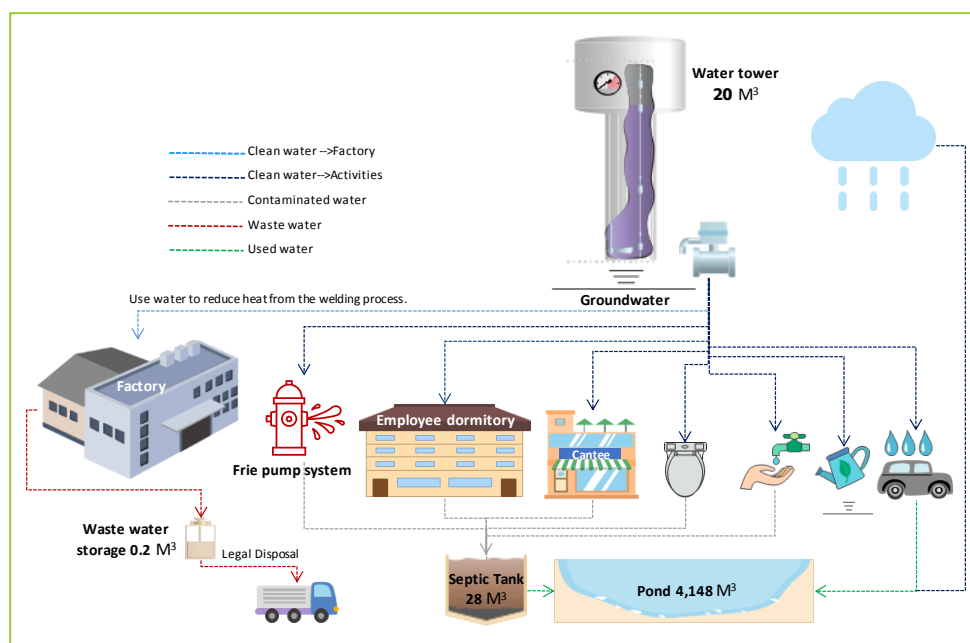
With a commitment to the worthwhile consumption and maximization of the benefits of limited resources in order to reduce future impacts on the environment and society, the Company has joined 70 leading organizations, both public and private, in declaring their intention to become an energy conservation network in the “Energy Beyond Standards” event to continue to stimulate the trend of energy conservation to achieve tangible results and create a model for energy-efficient organizations. Mr. Supattana Pongmamee (right), Deputy Prime Minister and Minister of Energy, presided over the meeting at The Synergy Hall on the 6th floor of the Energy Complex Building C on 6 December 2022.



### • Water Management of Factory in Rayong

QTC's factory is located in an area without natural and public water sources. Groundwater had to be used for consumption. No water was used in the transformer manufacturing process. The main office in Bangkok used water from the Metropolitan Waterworks Authority.

**Image of Underground Water Consumption Activities of QTC's Factory in Rayong**



**Table EN6 Showing Volume of Water Used in 2019-2022**

Item	QTC Energy			
	Base Year 2019	2020	2021	2022
Metropolitan Waterworks Authority (cubic meter)	879	909	883	913
Rayong Factory's Drawing of Groundwater (cubic meter)	9,374	8,550	8,948	8,989
<b>Total (cubic meter)</b>	<b>10,253</b>	<b>9,459</b>	<b>9,831</b>	<b>9,902</b>

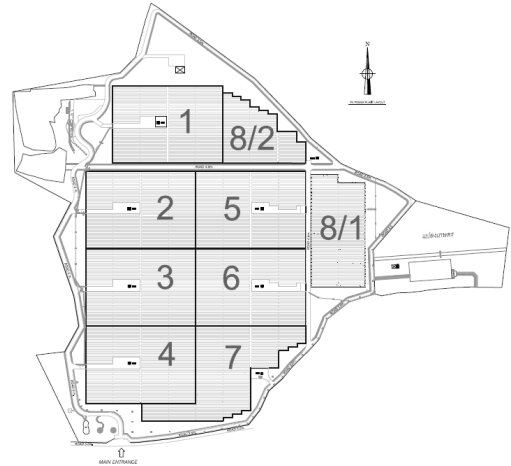
From Table EN6, performance in 2019-2022 can be summarized as follows:

1. Volume of water from the Metropolitan Waterworks Authority used by the Bangkok office in 2022 increased from Base Year 2019 by 3.87 percent from Base Year 2019. The Company did not achieve the goal as there was a 5% increase in personnel from 2019.
2. Volume of groundwater used by the Rayong factory in 2022 declined from Base Year 2019 by 4.11 percent. The Company did not achieve the goal of 5% from Base Year 2019.

## • Water Management by Q Solar 1

Q Solar 1 has an area of more than 200 rai in the community of Ban Bo Thong, Kabinburi, Prachinburi, and needs to use water for benefits in two areas

1. Use of water for public consumption and to clean 86,688 solar panels in order to maximize electricity generation efficiency. Solar panels were used for 20 times per year and needed 6,500 cubic meters of clean groundwater per year to remove heavy metals and stains before operations.
2. Use of water to irrigate trees and for activities in agricultural plots of the Sufficiency Economy Philosophy Center. In this part, water does not need to be treated water. Therefore, QTC dug three ponds to hold water in the rainy season to use in dry seasons with a capacity for storing 149,996 cubic meters of rainwater per year. The remaining water is gradually drained into public canals. This can reduce groundwater pumping and have an added benefit from slowing potential floods from rainwater from areas where solar panels are installed to communities around the power plant.



**Table EN7 Showing Groundwater and Natural Water Extraction Storage Volume in 2019-2022 (Q Solar 1)**

Item	Year of Operation			
	Base Year 2019	2020	2021	2022
Q Solar 1 Groundwater (cubic meters)	6,494	6,222	5,862	4,573
Natural Water Storage Pond (Pond 1) (cubic meters)	>101,076	>101,076	>101,076	>101,076
Natural Water Storage Pond (Pond 2) (cubic meters)	>42,972	>42,972	>42,972	>42,972
Natural Water Storage Pond (Agricultural Plot) (cubic meters)	>5,948	>5,948	>5,948	>5,948

According to the Table and Graph EN7, the volume of ground water used by the Q Solar 1 power plant in 2022 was lower than Base Year 2019 by 29.58 percent. The Company achieved the goal of reducing by five percent due to the development of the panel cleaning kit that allows the release of high-pressure water along with spinning the polishing brush without having to spray large volumes of water through a hose. As a result, the water consumption is significantly reduced.

**All three of the Company's areas did not have a wastewater treatment system. Thus, the Company has no projects to reuse treated water but uses measures to conserve water and use water efficiently.**



## Use of Raw Materials for Production and Service Provision

The QTC Factory in Rayong manufactures distribution transformers and provides transformer maintenance and repair services. Some materials were imported from abroad while some materials were procured in Thailand. Some raw materials can be reused after being recycled in a processing plant and cannot be reused immediately due to effects on transformer quality. Some raw materials cannot be reduced and have to be disposed of as waste. Data on the weight of raw materials used in production was collected. Some items can be calculated in weight units and other units needed to be converted by using the following methods:

Raw materials with counting units that are not weight units such as meters, sheets, pieces, sets and liters, etc., will be sampled for one weighing unit and converted into kilograms before use to calculate pieces for production or be converted by using an international metric to convert the value in kilograms.

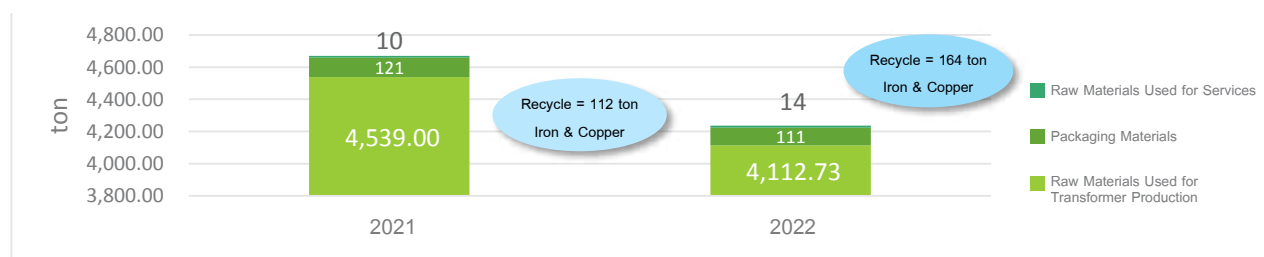
When transformers are designed, transformer weight is calculated by using the weight of raw materials to calculate weight in kilograms according to the standard design and production formulas are issued to requisition raw materials specified in designs. The list of raw materials requisitioned and production formulas may have a deviation of + 5%.

Packaging done in some orders according to must customer agreements are packages for export and biddings. Calculations of the weight of materials used from the production order design has a deviation of + 5 percent.

Most raw materials used in providing services were transformer oil and other accessories, which are converted in kilograms.

**Table and Graph EN8 Showing Volumes of Production, Services and Raw Materials/Materials in 2021-2022**

Item	2021			2022		
	Counting Unit			Counting Unit		
	Unit	Capacity (MVA)	Weight (Ton)	Unit	Capacity (MVA)	Weight (Ton)
1. Volume of new Transformers Manufactured and Repaired Transformers.	1,878	1,288	4,391	2,388	1,149	3,909
2. Volume of Maintenance Services	4,269	N/A	N/A	4621	N/A	N/A
3. Volume of Raw Materials Used in Production	N/A	N/A	4,539	N/A	N/A	4,113
4. Volume of Raw Materials Used for Packaging	1,531	N/A	121	1,139	N/A	111
5. Volume of Raw Materials Used for Services	N/A	N/A	10	N/A	N/A	14
6. Volume of Materials Sent for Recycling to Process into Starting Raw Materials (Copper and Steel)	N/A	N/A	112	N/A	N/A	164



In 2021 and 2022, the Company did not establish goals regarding the proportion of raw material consumption per production unit as the production of transformers use fluctuating amounts of raw materials according to customers' specs which depend on the design of each order of transformers. Therefore, the Company cannot yet determine the list of appropriate indicators.





# Social Responsibility

# Employee Health & Safety



Every industrial factory has tools, machines, or chemicals necessary for production and raw materials that may be heavy, sharp or hazardous liquids, depending on the products produced by that factory. Human labor is necessary for using the aforementioned tools, machines, chemicals or raw materials to produce products for the business owner. There is high likelihood that work performed by people and tools, machines or chemicals will have risk of accidents causing minor injuries or death to employees or hazards that may cause employees to become sick and die. If factories and business owners have no appropriate accident prevention measures, if employees do not see the importance or recognize dangers from accidents and if severe accidents occur to any factory, there will be impacts on that factory's business operations to the point of temporary business interruptions, damage to corporate image or brands and distrust among stakeholders because many laws protect labor welfare in the areas of safety and many other laws are involved in industrial factory operations.

Assessment of issues important to stakeholders and QTC found employee safety and health to be the most important sustainability issue and a risk requiring strict control. The Company's directors and executives are aware of risks with potential impacts on employees and the Company's business. Therefore, the Company sees the importance of this issue and is committed to create safety for the work of employees and stakeholders in order to prevent accidents, injuries, illnesses and the Company makes efforts to discover, remove or control lack of safety and create a culture of safety in the organization.

Based on impact assessment of the all steps of the work process, both positive and negative, covering economic, environmental, social and human rights aspects, the following risks and opportunities were found:

Key Topics	Economic	Environmental	Social	Human Rights
	Impact	Impact	Impact	Impact
<ul style="list-style-type: none"> <li>Employee Health and Safety</li> </ul>	Increase competitive potential with safe and healthy workers.	Good working environment.	Good employee safety and health affects family members.	All employees have equal opportunity for occupational safety with proper PPE and a good environment.
	Reduce medical expenses and			
	Economic burdens may arise for local communities in the future if employees are paralyzed from accidents.	More resources may need to be consumed in operations (electricity, water, etc.)	Serious accidents may happen to employees, e.g., loss of organs or life, if not properly controlled. This may affect family and community members.	Discrimination may occur in some employee groups in PPE use if not properly controlled.
	Production may need to cease due to serious accidents.			

According to the aforementioned impacts, the Board of Directors and executives are concerned and give importance to the implementation of occupational safety, health and environment management. In addition, such impacts are a major concern for employees, their families, and other relevant stakeholders. If an employee of the Company has suffered a serious accident or illness from work, it will not only affect the Company's operations, but will also affect the employee, their family and the surrounding society significantly. Therefore, the Company has set management standards and operational goals as follows:

**Objective:** 1. To create a culture of safety in the organization.

2. To prevent risk of factors that may cause accidents or employee health problems

3. To modify work environments to be suitable and support employees' physically and psychologically when working.

**Management:** Management of safety, occupational health and work environment with ISO45001:2018 standards, designation of safety policies and goals to create guidelines, health promotion policies and organization health along with providing necessary personnel in the area of safety in addition to promoting procurement of personal protective equipment (PPE), modifying work environments to facilitate work and supporting activities that promote a culture of safety in the organization.

 **1 :** Zero accidents from work.

 : In 2022, the Company had 18 accidents and did not achieve the goal.

 **2 :** Zero health problems or illnesses from work.

 : In 2022, no employees who were injured/sick because of work. The Company achieved the goal.

 **3 :** 100 percent of employees in the target group were trained in work safety courses.

 : 92.07 percent of employees in the target group in 2022 were trained. The Company did not achieve the goal.

Employee work safety is the most important issue for every employee at every level including other stakeholders involved. In 2020, the Company continued to make work safety a risk that must be controlled along with building a culture of safety to create the most benefit for employees.



Safety, Occupational Health and Work Environment Policy: <https://qtc-energy.com/th/safety-policy/>

## Standard Systems

The Company managed from safety, occupational health and work environment management system by implementing ISO45001:2018 standards and the Company was accredited for standards on an annual basis by SGS (Thailand) Company Limited. The Company made the following clear personnel and framework specifications:



ISO45001:2018

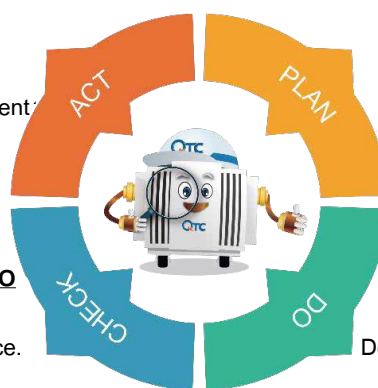
### Occupational Safety, Health and Environment Management Framework

#### **All Employees**

Take real action.  
Report issues/prevent recurrence.  
Monitor results.

#### **Supervisors/SC/SO**

Inspect safety.  
Control performance.  
Inspect the environment.



#### **Executives**

Establish policies.  
Establish goals.  
Review performance.

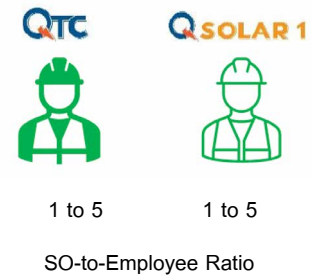
#### **Supervisors/Operators**

Assess risks.  
Determine methods/plans.  
Train, raise awareness.

The Company requires safety to be evaluated and reviewed at least on an annual basis to select significant issues to prepare risk control and mitigation plans. Significant safety risks consist of fires, chemical leaks and use of forklifts to mo

The Company sent personnel to be trained and appointed as safety officers at various levels to perform duties required by law with the following safety officer-to-employee ratio:

Level	QTC Energy		Q Solar 1 Amount (person)
	Services & Bangkok Office Amount (person)	Rayong Factory Amount (person)	
Supervisor SOs	11	15	1
Technical SOs	-	-	1
Professional SOs	-	2	-
Executive SOs	15	14	1



#### Safety Committee (SC) Members in 2021-2022 (from elections in 2020)

First-Last Name	Position	Remarks
1. Mr. Charoensak Sarawong	Committee Chairman	Appointed
2. Mr. Somyot Taptimtong	Director	Appointed
3. Mr. Sichain Tawongchai	Director	Appointed
4. Mr. Tanwa Pumraya	Director	Elected
5. Miss Yupawadee Nontapab	Director	Elected
6. Miss Wilaiwan Nakoon	Director	Elected
7. Miss Arunroj Intasiri	Director/Secretary	Appointed

Calculated as 2.65 percent of all employees on the Committee.

The roles and duties of the Safety Committee are in compliant with the Ministerial Regulations on Specification of Standards for the Management of Safety, Occupational Health and Environments in Working of B.E. 2549 (A.D. 2006). Executives at every level recognize the importance of this issue and provided support including time, supporting tools, personnel and the budget necessary for proper use in safety management. A high ranking executive was appointed to be the Chairman of the Safety Committee to closely monitor safety, follow-up and report performance to the Executive Committee on a monthly basis along with reporting performance to the Board of Directors on a quarterly basis.





## Incentivization

In 2022, the Safety Committee (SC) prepared safety plans to reduce the number and severity of accidents to be less than 2021 by more than 50 percent. Plans included activities in various areas such as campaigning for employees to participate in safety risk assessment, plans to modify workplace strategies, ergonomic modification plans to modify work spaces to suit work postures in order to reduce accidents and fatigue from work, and plans to incentivize every employee to participate in reducing accidents. In 2022, the number of accidents was 28% lower than 2021, and there were areas without any accidents and the areas with accidents were fewer than in 2021. To boost morale and participation of employees, the Company give awards and prize money. All areas that received honorary plaques were designated as safety role model areas. The following areas should be praised:

### 1. Areas with the Fewer Accidents Than in 2021

- Tank areas had the number of accidents reduced by 50% from 2021.
- Steel core areas had the number of accidents reduced by 50% from 2021.
- Delivery areas had the number of accidents reduced by 50% from 2021.

### 2. Areas with Zero Accidents in 2022

- Service Areas
- Amorphous Metal Areas
- Coiling Areas
- Maintenance Areas
- Quality Assurance Department Areas.
- Oil Baking and Filling Areas
- Amorphous Steel Core Areas.

Total Prize Money in All Areas: 59,800 baht



## Transfer of Knowledge into Practice

In transferring knowledge and improving employee skills related to work safety, the Company used multiple channels to work such as by training in specified necessary courses, KYT activities and safety talk, practicing to learn, sharing first-hand accident experiences, and using videos or public relations documents to help employees including outside persons who work in the Company to have awareness of safety, generosity and help to prevent accidents to themselves, colleagues and the Company's property. In 2021, the Company organized eight major practical training courses and spent 126,100 baht in operations as follows:

1. Training of supervisors, controllers, signal givers, and crane holders of Eastern Training & Consultant Co., Ltd. on 23 - 24 Feb 2022.

- Target group: 29 new employees on the training list. 27 employees attended the training, or 93.10%.
- Objective: To provide employees with knowledge and correct working methods so they can be safely applied to work with cranes.
- Budget: 34,000 baht



2. Refresher training of crane operation safety for crane operators, signal givers, and crane holders of Eastern Training & Consultant Co., Ltd. on 4 Mar 2022.

- Target group: 65 previously trained crane operators who need refresher training every two years and are on the training list. 54 employees attended the training, or 83.08%.
- Objective: To review roles and duties in working with cranes safely and to raise awareness about safety in working with cranes.
- Budget: 24,000 baht



3. Electrical Safety & CPR Training conducted by Eastern Training & Consultant Co., Ltd. on 27 September 2022.

- Target group: 34 employees who are on the training list. 33 employees attended the training, or 97.06%.
- Objective: To educate employees on electrical hazards and prevention principles, so they understand the principles of first aid and rescue and are able to help victims of electrical hazards.
- Budget: 25,000 baht



4. Safety training courses in working with chemicals on 20 October 2022 at KM Room, Factory Building 1.

- Target group: 24 employees working with chemicals. 21 employees attended training, or 87.50%.
- Objective: To educate employees working with chemicals to have knowledge and understanding of the signs or labels to identify hazardous chemicals.
- In-house training conducted by a professional SO.





5. Training courses on safety in working with equipment and machines in the wood cutting room.

- Target group: Employees using equipment and machines in the wood cutting room. 25 employees attended the training, or 100%.
- Objective: To educate employees who use equipment and machines in the wood cutting room about the dangers and prevention, enabling them to inspect the machine before starting work correctly and safely.
- In-house training conducted by a supervisor and a professional SO.



6. Basic fire training (Rayong Factory) conducted by the Map Yang Phon Disaster Prevention and Mitigation Department on 15 November 2022.

- A total of 49 employees attended the training in 2022, or 98%.
- Budget: 11,100 baht



7. Fire training and fire evacuation drill (Rayong factory) conducted by the Map Yang Phon Disaster Prevention and Mitigation Department on 17 November 2022.

#### Training Summary

- 162 evacuees (100% on the fire evacuation date).
- Fire evacuation time: Five minutes from the first to the last person.
- The response time for the external fire brigade is nine minutes.
- Budget: 12,000 baht



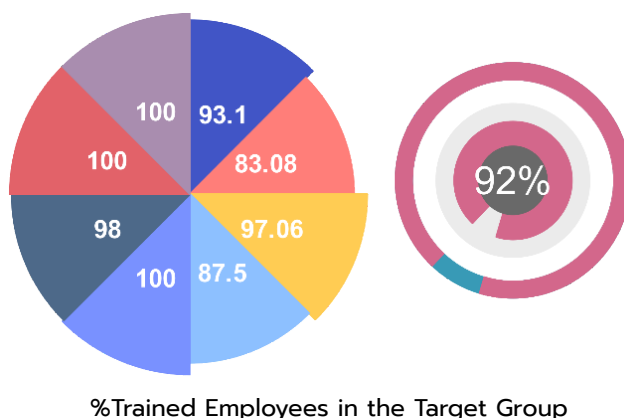
8. Fire training and fire evacuation drill (Bangkok Office) conducted by the Huamak Disaster Prevention and Mitigation Department, Fire and Rescue Unit 4, on 22 November 2022.

#### Training Summary

- 31 evacuees (100% on the evacuation date).
- Fire evacuation time: Three minutes from the first to the last person.
- The response time for the external fire brigade is three minutes.
- Budget: 20,000 baht



## Safety Training Goals for Employees in the Target Group



In 2022, eight safety training courses were held. The number of targeted employees attending the training accounted for 92.07%, which failed to meet the goal as the employees were busy or resigned. For the mandatory courses for occupational safety, employees who did not pass the will not be able to perform their duties in that field. They would have to be trained in the next year. However, employees who lack additional training to develop their job skills are not employees with direct duties.

## Enforcement of Regulations



The Company has strict measures for enforcing safety rules and regulations. According to accident reports from past to present, most accidents are caused by human negligence in not wearing personal protective equipment before working or removing personal protective equipment when there is no one watching. This is because of lack of awareness of danger that may happen at all times. Executives and supervisors have the duty to understand and give warning according to the system in addition to disciplining employees.

In 2022, safety rules were strictly enforced and seven warning forms were issued for unsafe work to employees who worked without consideration for personal safety, the safety of colleagues and the Company's property. Strict enforcement of safety regulations has resulted in a continuous reduction of the number of accidents in 2022 from 2021.

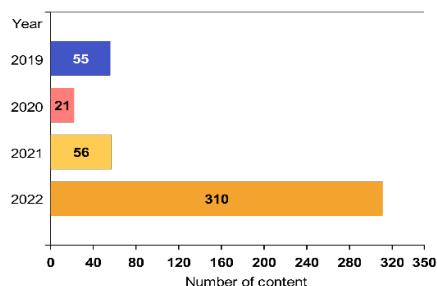
## Build Participation

Support for KAIZEN and writing near-miss reports promoted employee participation in presenting concepts and eliminating lack of safety before accidents. In 2022, employees sent 310 safety KAIZEN articles out of 742 KAIZEN articles and 36 near-miss reports were sent.

Statistics on Participation in Writing Near-miss Reports

Year of operation	Number of content	Level of severity		
		RED	YELLOW	GREEN
2019	275	45	109	121
2020	29	7	10	12
2021	36	17	14	5
2022	36	9	16	11

Statistics on Participation in Preparing Safety KAIZEN



### “5S Safety and Happy Workplace 2022” with emphasis on “Safety Next Normal”

In 2022, the Company held safety and participation promotion activities, after skipping for 2 years due to the COVID-19 pandemic, with the “5S Safety & Happy Workplace 2022” on 16-18 August 2022 at Faraday Meeting Room in Rayong Factory. The event offered many educational, awareness-raising and participation promotion activities. The total budget was 68,271.96 baht.



## Safety Model People in 2022



## Tests and Measurements in the Areas of Safety, Occupational Health and Work Environments

The Company regularly measures and tests work environments to monitor risk factors for employee health. Results from tests and measurements in 2022 are as follows:

Table Showing Sound Measurements in Work Areas

Area	Test Point	Test Results						Standard	Unit
		2020		2021		2022			
		20/3/20	30/6/20	10/5/21	11/6/21	15/6/22	03/10/22		
Factory 3	Unicoil Metal Cutting Machine	79.9		74.6		78.1		85	dB( A)
Oil Baking & Filling	Tanking	76.2		74.9		74.9		85	dB( A)
Amorphous Steel Core	Amorphous Steel Cutting Machine			73.1			73.2	85	dB( A)
Assembly	Wood Cutting Room	80.6		80.5		82.7		85	dB( A)
Steel Core	Workshop	82.0		85.4		80.6	86.3	85	dB( A)
Assembly	Workshop	75.9		76.7		76.7		85	dB( A)
Equipment Installation	Spray Booth	77.3		73.5		77.1		85	dB( A)
Coiling Building	Coiling Machine	71.0		69.0		74.7		85	dB( A)
Coiling Building 2	Coiling Machine			71.0		87.5	70.8	85	dB( A)
Paper Cutting Room	Paper Cutting	77.0		74.9		73.9		85	dB( A)
Factory 4	Chassis Assembly and Welding	95.7		87.5		83.3		85	dB( A)
Factory 4	Plasma Cutting Machine	85.7		84.5		82.6		85	dB( A)
Factory 5	Chassis Welding and Assembly	92.0		85.1		79.2		85	dB( A)
Factory 5	Robot Chassis Welding and Assembly	88.3		83.8			65.3	85	dB( A)
Factory 5	Steel Pellet Shooting Area	89.3			82.3	83.5		85	dB( A)
Factory 5	Automatic Steel Pellet Shooting Area	88.6		86.7		86.5		85	dB( A)
Factory 6	Spray Booth	81.6		75.9		87.4		85	dB( A)
Factory 6	Spray Booth (Large)	85.3	81.3	81.3		83.8		85	dB( A)

In 2022, the results from two tests and measurements of noise disturbance in work areas showed four areas to have higher sound levels than legal requirements, which have been designated as danger areas for workers. Workers who will enter the area are required to wear PPE specified in hearing conservation plans. The Company is looking for opportunities to make modifications in order to further reduce sound levels



### Results from Measuring Noise Disturbance outside Factories in 24 Hours (Community)

Parameter	Area	Test Results			Standard	Unit
		2020	2021	2022		
		23-24/3/20	19-20/5/21	15-16/6/22		
General Volume Level (Leq 24hr)	Employee Dormitory	68.4	65.4	65.6	70	dB( A)
General Volume Level (Lmax)	Employee Dormitory	90.2	91.1	88.9	115	dB( A)

### Test Results of the Environment for Working with Chemicals

Parameter	Area	Test Results					Standard	Unit
		2020		2021	2022			
		20/3/20	30/6/20	10/5/21	15/6/22	3/10/22		
Steel Core: Steel Cutting/ Slitting Factory 3	Iron Dust	Not Detected		Not Detected	Not Detected		10	mg/m³
	Total dust	Not Detected		<0.20	Not Detected		15	mg/m³
Steel Core: Steel Arrangement Factory 3	Acetone	Not Detected		Not Detected	Not Detected		1,000	ppm
	Xylene	Not Detected		Not Detected	Not Detected		100	ppm
	Toluene	1.52		Not Detected	<0.25		200	ppm
	Total dust	Not Detected		0.25	0.34		15	mg/m³
Steel Core: Steel Arrangement Factory 1	Xylene			Not Detected	Not Detected		100	ppm
	Toluene			0.43	Not Detected		200	ppm
	Acetone			Not Detected	Not Detected		1,000	ppm
	Total dust			0.25	Not Detected		15	mg/m³
Steel Core: Work Shop	Xylene	Not Detected		Not Detected	Not Detected	Not Detected	100	ppm
Steel Clamp Paint	Toluene	0.32		<0.25	Not Detected	Not Detected	200	ppm
	Acetone	Not Detected		Not Detected	Not Detected	Not Detected	1,000	ppm
Steel Score: Work Shop	Iron Dust	Not Detected		<0.007	<0.007	<0.007	10	mg/m³
Steel Cutting Machine/Drill Press	Iron Fume			<0.007	<0.007	<0.007	10	mg/m³
	Total dust	Not Detected		0.34	Not Detected	<0.20	15	mg/m³
Coiling: Coiling	Total dust				Not Detected		15	mg/m³
	Copper Fume	Not Detected		Not Detected	Not Detected		0.1	mg/m³
Coiling: Coiling 2	Copper Fume			Not Detected	Not Detected		0.1	mg/m³
	Respirable Dust			<0.15	0.34		5	mg/m³
Coiling: Paper Cutting Room	Total dust	Not Detected		0.42	0.51		15	mg/m³
	Respirable Dust	Not Detected		Not Detected	Not Detected		5	mg/m³
Assembly: Copper Core Welding	Copper Fume	Not Detected		<0.007	Not Detected		0.1	mg/m³
	Total dust	Not Detected		<0.20	Not Detected		15	mg/m³
Assembly: Workshop	Copper Fume	Not Detected		Not Detected	Not Detected		0.1	mg/m³
Welding/Low Power Core Polish	Iron Fume	<0.007		Not Detected	Not Detected		10	mg/m³
	Carbon Mon-oxide	1		Not Detected	Not Detected		50	ppm
Assembly: Wood Cutting Room	Total dust	<0.20		0.51	Not Detected		15	mg/m³
	Respirable dust	Not Detected		0.17	Not Detected		5	mg/m³

Parameter	Area	Test Results					Standard	Unit
		2020		2021	2022			
		20/3/20	30/6/20	10/5/21	15/6/22	3/10/22		
Installation: Spray Booth	Total dust	Not Detected		0.34	<0.20		15	mg/m³
	Xylene	7.73		0.40	Not Detected		100	ppm
	Toluene	12.4		0.44	Not Detected		200	ppm
Transformer Repair	Total dust	Not Detected		<0.20	Not Detected		15	mg/m3
	Oil Mist	Not Detected		0.15	0.13		5	mg/m³
Chassis: Welding & Assembly	Total dust	Not Detected		0.77	< 0.20		15	mg/m³
Factory 4	Carbon Mon-oxide	1		Not Detected	Not Detected		50	ppm
	Iron Fume	<0.007		0.011	Not Detected		10	mg/m³
Chassis: Plasma Cutting Machine	Carbon Mon-oxide	1		Not Detected	Not Detected		50	ppm
Factory 4	Iron Fume	<0.007		<0.007	Not Detected		10	mg/m³
	Total dust	Not Detected		<0.20	<0.20		15	mg/m⁴
Shot Peening Room (Internal)	Iron Fume	0.067			<0.007		10	mg/m³
	Iron Dust	0.069			3.90		10	mg/m³
	Respirable Dust	Not Detected			3.86		5	mg/m³
	Oxygen	20.9			21.1		19.5 - 23.5	%
Shot Peening Room (External)	Iron Dust	<0.007			0.050		10	mg/m³
	Total dust	Not Detected			Not Detected		15	mg/m³
Amorphous	Total Hydrocar-bon			10.4		26.00	N/A	ppm
	Total dust			<0.20		Not Detected	15	mg/m³
	Bis-phenal A			Not Detected		Not Detected	5	mg/m³
Factory 5 Chassis	Carbon Mon-oxide	1		Not Detected	Not Detected		50	ppm
Welding & Assembly	Iron Fume	0.041		0.052	0.008		10	mg/m³
	Total dust	<0.20		0.51	Not Detected		15	mg/m³
Factory 5 Chassis:	Carbon Mon-oxide	1		Not Detected	Not Detected		50	ppm
Robot Assembly	Iron Fume	<0.007		<0.007	Not Detected		10	mg/m³
	Total dust	Not Detected		0.51	<0.20		15	mg/m³
Factory 6 Chassis:	Toluene	1.11		3.12	Not Detected		200	ppm
Spray Booth	Xylene	Not Detected		8.09	Not Detected		100	ppm
	Total Dust	Not Detected		<0.20	Not Detected		15	mg/m³
Factory 6 Chassis:	Toluene	17.2		5.08	0.56		200	ppm
Spray Booth (large)	Xylene	22.8		4.27	5.33		100	ppm
	Total Dust	20	6.07	0.34	Not Detected		15	mg/m³
Factory 6 Chassis:	Toluene	1.44		9.93	0.96		200	ppm
Painting	Xylene	Not Detected		9.63	65.00		100	ppm
	Total Dust	Not Detected		<0.20	Not Detected		15	mg/m³
Factory 6 Chassis:	Toluene				Not Detected		200	ppm
Automatic Painting	Xylene				Not Detected		100	ppm
	Total Dust				Not Detected		15	mg/m³

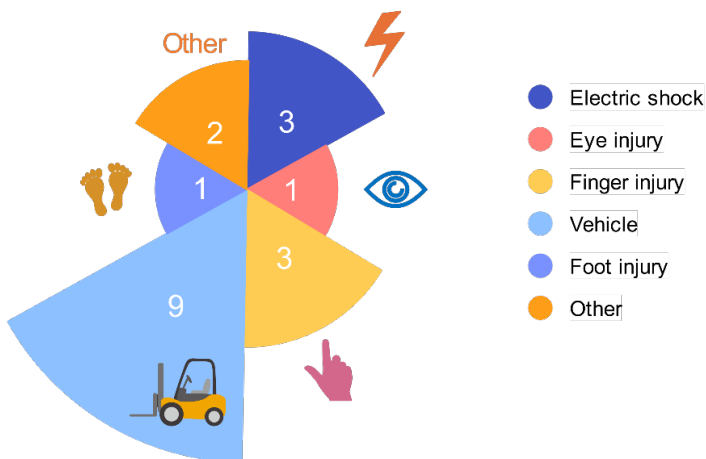
## Statistics on Accidents

In 2022, the Company had a goal to reduce the number of accidents to be less than 2021 by 50 percent. However, the Company was able to reduce the number of accidents to only seven accidents or 28 percent. However, the Board of Directors still gives importance to and maintains the Zero Accident target. In 2022, additional accident statistics have been shown in Q Solar 1 Co., Ltd.

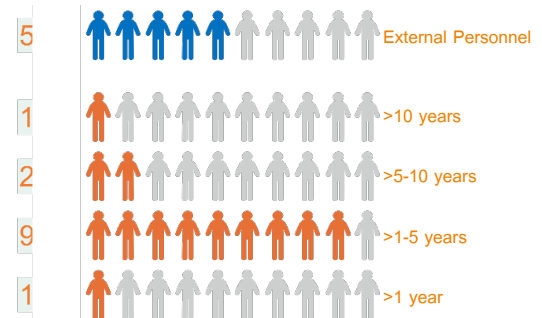
**Table Comparing Work Accident Statistics (2013-2020) only QTC**

Severity/Damage	No. of Accidents/Year					
	QTC			QTCGP, Q Solar1		
	2020	2021	2022	2020	2021	2022
Property Damage	17	18	14	-	-	-
Minor Injury – No Work Interruption (time)	18	4	2	-	-	-
Severe Injury Resulting in Interruptions (time)	1	3	2	-	-	1
Total Injuries (time)	36	25	18	-	-	-
Total Number of Work Days Lost due to Work Accident (day)	19	10	16	-	-	17

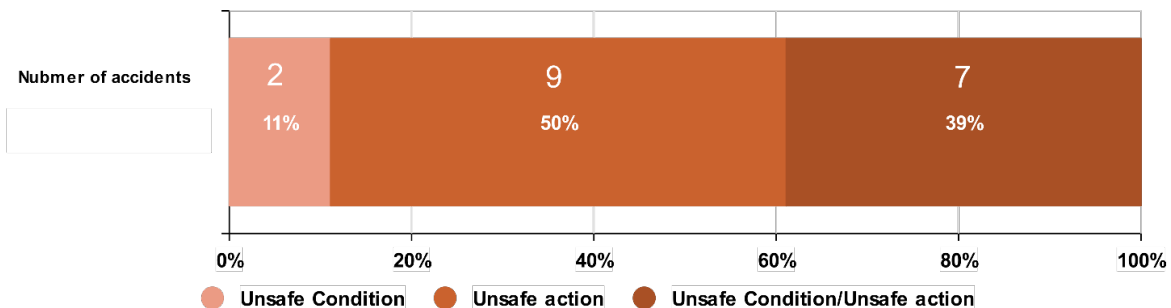
**Accidents Sorted by Hazard Characteristics: 2022**



**Accidents Sorted by Employment Period: 2022**



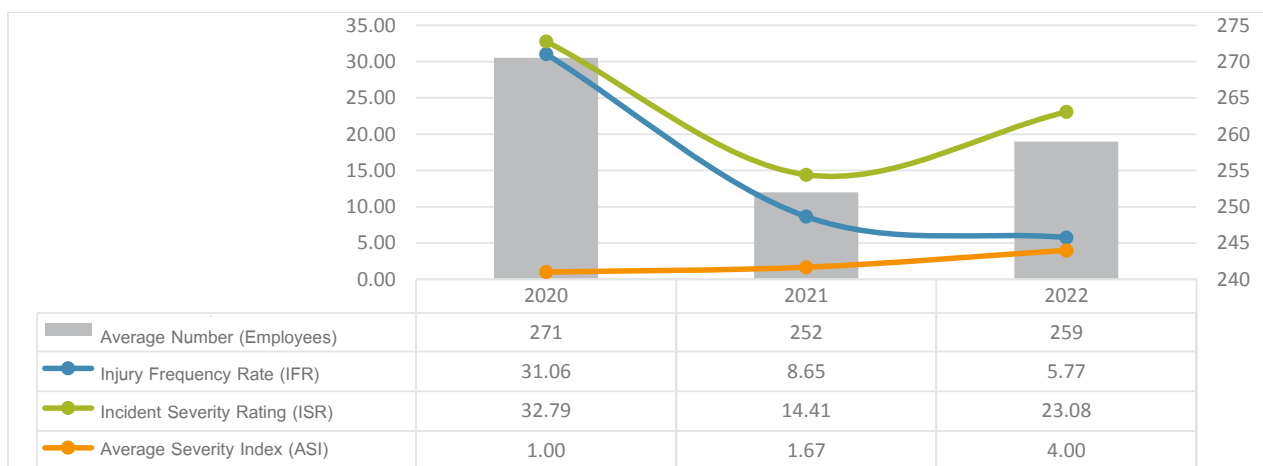
**Accidents Sorted by Cause: 2022**



According to investigations of accidents and based on the graph of accidents by causes, accidents in 2022 are caused by unsafe employee actions (50%), unsafe work conditions (11%) and unsafe actions in areas with unsafe work conditions (39%). Furthermore, from the image of accidents by characteristics of danger, nine vehicle accidents can be seen to have occurred with property damage for the Company, six of which were due to external personnel (contractors, transportation operators, raw materials delivery) and the damage was valued at 669,990.21 baht. The Company was able to claim the full amount for the damage. As for internal accidents involving employees, the damage was valued at 42,129.95 baht. Overall, the number of accidents and damage in 2022 had a downward trend. However, the severity increased. This can be seen from the number of accidents where work was halted for QTC and Q Solar 1 involving three employees with a total of 33 days off.

The employment period of nine employees who had an accident was mostly 1-5 years. On this issue, the Safety Committee (SC) will make appropriate plans to retrain employees and prepare control plans to reduce risks, support operations, and organize retraining in 2023.

**Graph Showing Comparison of Statistical Data on Safety According to ANSI Standards in 2020-2022**



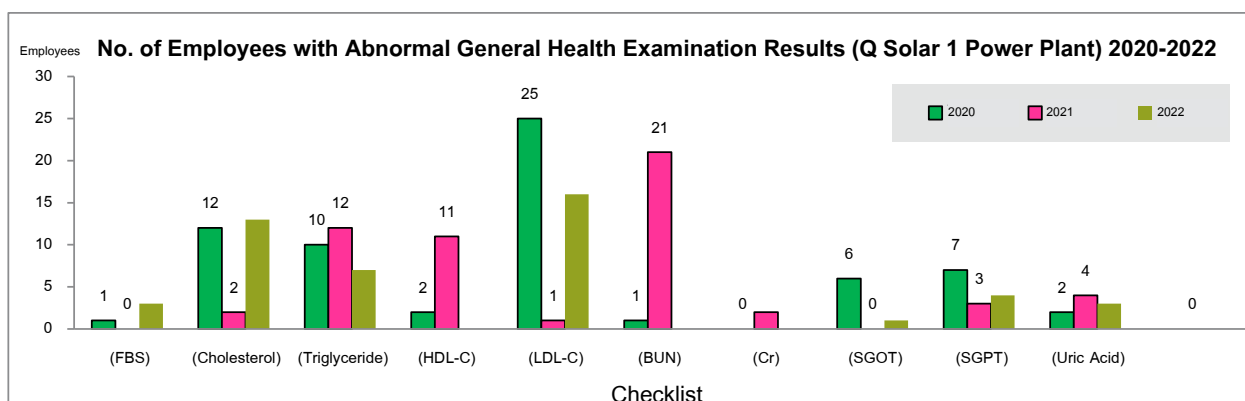
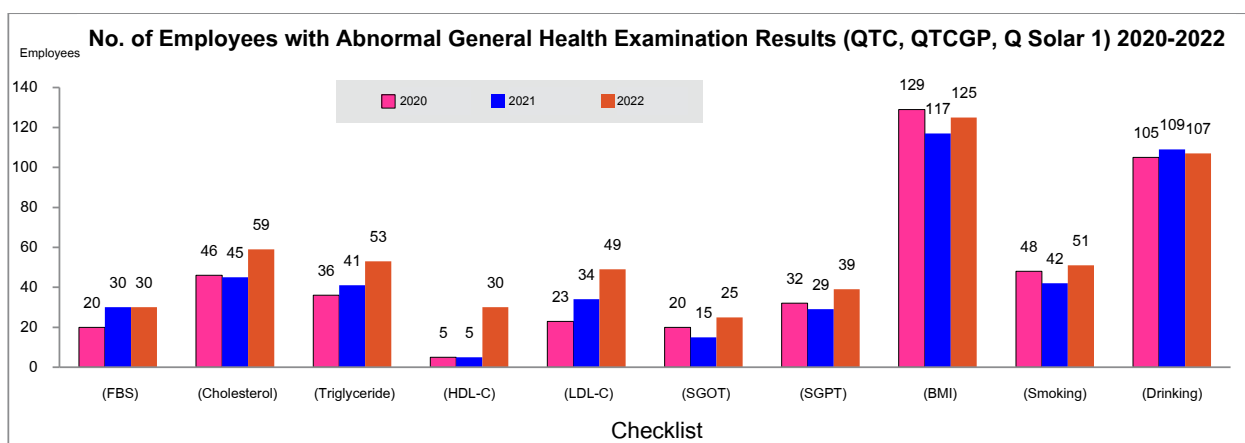
- The injury frequency rate in 2022 decreased from 2021, with four employees injured, which is two employees fewer than in 2021. The IFR for 2022 is 5.77, down by 33.29% from 2021.
- The severity level in 2022 was higher than in 2021 due to employees taking a total of 16 days off work due to work accidents, resulting in an ISR statistic of 23.08, an increase of 60.11% from 2021.
- The ASI in 2022 was 4.00, an increase of 2.4 times from 2021 due to two employees being injured to the point where they had to take time off. The maximum number of days off for the injured employees was 13 days.



Employees' good health is an important factor enabling employees to perform duties and responsibilities effectively. The Company announced policies to promote health and organization happiness <http://qtc-energy.com/th/hpe-policy> in addition to organizing work areas to have an attractive and clean environment covering issues in the areas of lights, sounds, heat, chemicals, consumption and quitting alcohol, smoking and substance abuse, etc. Furthermore, the Company organizes annual health examinations and continually monitors results.

## Annual Health Examinations

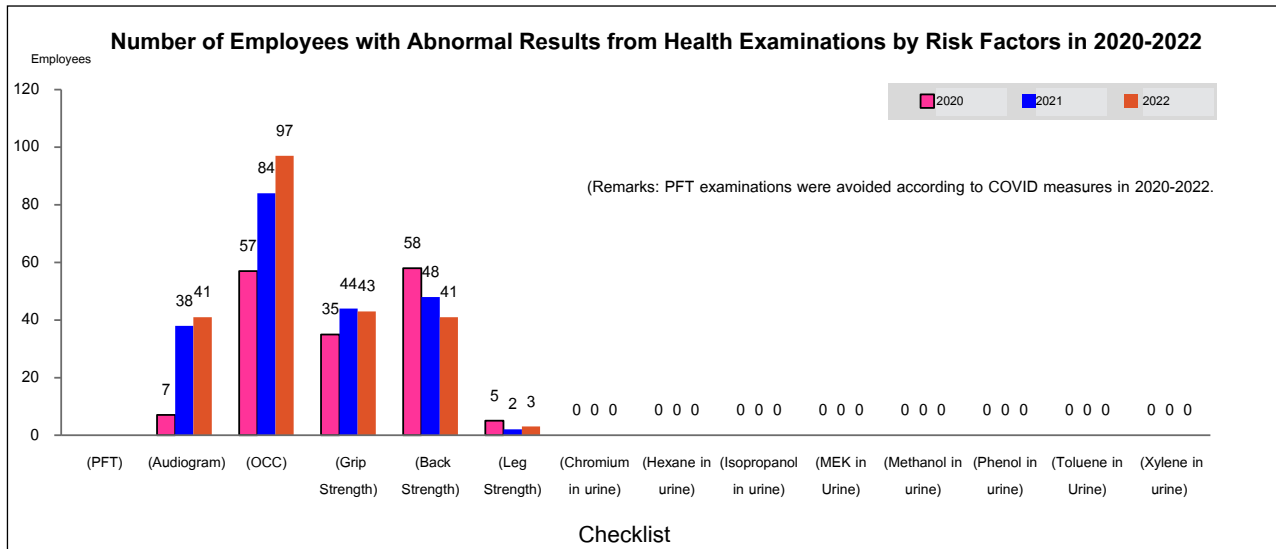
The Company arranges for employees to receive health examinations once a year at the Bangkok office including QTCGP and the factory in Rayong. In 2022, the Company used two medical facilities, namely, Phayathai Sriracha Hospital and Samitvej Srinagarindra Hospital. Examinations at Q Solar 1 were performed by Chularat 304 Inter Hospital. The Company arranged for doctors of vocational medicine to survey work environments in order to determine health examination programs according to risk factors. The health examination program's coverage is in compliance with the law and has additional provisions for employees according to age and gender of risk. In 2022, a budget of 663,560 baht was spent for the three companies under strict COVID-19 prevention measures. Lung capacity tests were canceled because the Association of Occupational and Environmental Diseases of Thailand asked for cooperation the hospitals in not checking lung capacity by spirometry, which creates aerosols from the respiratory system and significant risk of infection.





From the graphs, employees of QTC, QTCGP and Q Solar 1 with abnormal general health examination results were found to have increased slightly from 2021. The group included older people. This will be an important issue in 2023 that the Company must accelerate to create understanding and encourage employees to exercise and take care of their own health more.

## Health Examinations by Risk Factor



Health check-up based on occupational risk factors in 2022 found an increase in risks from 2021 as follows:

- **Audiogram:** 41 people are exposed to loud noises throughout the 8-hour work day, 14 of whom are monitored for occupational illness by recording hearing test results compared to baseline on their employment start date and monitoring changes in the following year.
- **Occupational Health-Visual Acuity:** The most common abnormality found is depth perception (3D vision). It is caused by blurry vision in one or both eyes. The second most common abnormalities found are far- and near-sightedness. Prevention methods for visual problems include improving the environment in terms of adequate lighting, eliminating and reducing glare that can cause eye discomfort, and providing light-reducing visors and radiation protection glasses to welders.



**Images of Annual Health Examinations in 2022 under COVID-19 Prevention Measures**

## Work-related Illnesses

Statistics on Work-related Illnesses in 2020-2022

Item	No. of Illnesses/Year					
	QTC			Q Solar 1		
	2020	2021	2022	2020	2021	2022
Work-related Illnesses (employees)	2	1	-	-	-	-
No. of Work Days Lost Due to Work-related Illnesses (days)	3	4	-	-	-	-

In 2022, no employees had any work-related illnesses.

## Health Consultation

Statistics of health consultation services by registered nurses at the factory in 2022 show that three employees sought advice from the nurses on abnormal health examination results such as abnormal creatinine and abnormal triglyceride levels.



In addition, in 2022, the Company invited an external lecturer and skilled registered nurse, Mr. Piya Wongthaicharoen, to come educate about “kratom, cannabis and hemp” as it recognizes the impact on employee health even though these are no longer prohibited drugs by law. The Company gave the opportunity for employees to ask questions about their health problems at the same time on 18 August 2022.



Lecture Atmosphere



## Health Promotion Project

### QTC Fun & Fit Season 4: “Walk-Run for Children’s Full Bellies”



**Prioritize the Health of People in the Organization.**

The health of people in the organization is important. Exercise can promote strong health. The Company has an ongoing project since 2015 and has set a budget to encourage employees to exercise according to their preferences and aptitudes continuously in various sports clubs, such as football, sepaktakraw badminton and petanque clubs, etc.

In 2022, the Company set a budget to promote personalized exercise, which can be done anywhere, anytime, as a continuation of the project from 2020 under the “QTC Fun & Fit Season 4: Walk-Run for Children’s Full Bellies” activity. This project not only boosts the employees’ health, the Company also will also contribute 10 baht per KM. The combined contributions will be donated to three schools in the community to fund lunch for children.



Ban Map Yang Phon School  
2,896 KM = 28960 baht  
Contributions = 13,040 baht  
Total: 42,000 baht



Ban Huay Prab School  
3,054.20 KM = 30,542 baht  
Contributions = 11,958 baht  
Total: 42,5000 baht



Ban Map Toei School  
2,439.90 KM = 28960 baht  
Contributions = 17,101 baht  
Total: 41,500 baht

### QTC League cup 2022

In 2022, the company returned to organize the traditional football competition QTC League Cup, which has not been held due to Covid-19. The event was held on 1 October 2022 at Khamchu Stadium. There were five football teams and more than 100 employees participated in the event. Other than encouraging employees to exercise, the event also reinforces employee relationships, and promotes sportsmanship so that people know how to lose, win and forgive. The operating budget was 73,341.50 baht.

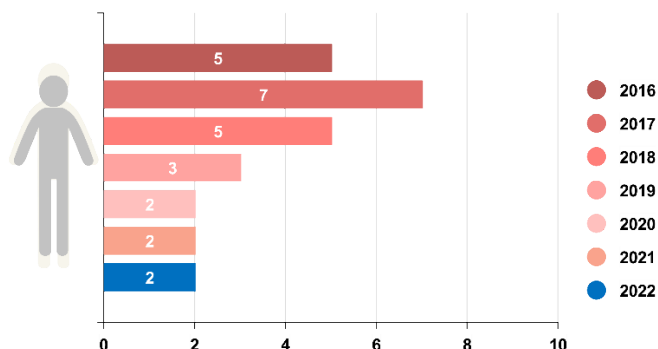




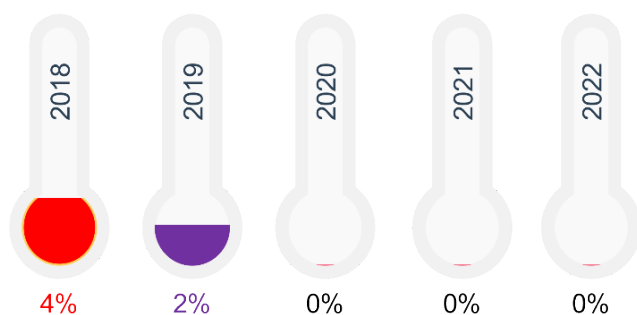
## White Factory Project

The Company continues to place importance on actively preventing and suppressing substance abuse due to awareness that threats from substance abuse will have effects on employees' health, relationships with coworkers, families, communities and the Company. The Company continually organizes random tests for narcotic substances without giving notifications in advance in line with policies and strictly enforces rules and regulations by having police officers (Pluak Dang Police Station) perform 100 percent inspections. The Company found two employees with narcotic substances. Both employees accepted therapy and to change behaviors. Both employees will retain employee status. The Company had 17,276 baht in expenses in 2022.

Statistics on Narcotic Substance Detections in the White Factory Project in 2016-2022



Influenza Rates among Employees for the Year



## Influenza Rates among Employees for the Year

The influenza vaccination project is aimed at promoting employee health and reducing illness caused by health risks. The project was carried out since 2019. Results in the past were unable to prevent influenza at 100 percent according to medical principles. However, some risks were reduced.



Therefore, the Company made influenza vaccinations a part of the annual health examination program and requires vaccinations to be by employee consent at no cost. In 2022, vaccinations were carried out by MYP Healthcare Co., Ltd. with a budget of 102,560 percent and 94.1 percent of employees consented to be vaccinated. In 2022, no employees had influenza. This may be because of COVID-19 prevention measures by wearing face masks at all times and by regularly cleaning hands.

# Employment and Human Rights



Human resources (labor) are an important factor for success in every business operation. Human capital can be continually developed to have improved capacity as organization resources that cannot be owned. Business owners must place importance on labor practices prescribed by law or higher. Business owners must provide care, improve capacity and provide fair and equitable opportunities in addition to respecting labor rights and human rights, etc., in order to possess and maintain good and talented human resources or workers in the organization in order for that organization to be able to continue to benefit from human resources in which the organization invested to improve capabilities with cost-effectiveness and efficiency.

Evolution of modern information technologies has made the world smaller. People in society can communicate with people who they know and who they do not know quickly via many social media. People can learn and self-improve freely on the internet in addition to being able to build career choices based on preference and expertise. These are risks for any organization that does not place importance on human resources or labor, which may create labor dissatisfaction, criticisms on social media or labor disputes, leading to damage to the product brand and the organization's reputation or cause workers to not want to work, resign and change jobs, resulting in losses of the organization's capital.

QTC recognizes the importance of labor and respect for universal human rights, both within the organization, where the organization can easily and thoroughly control its practices, and outside the organization in the value chain, which is complex and difficult for the organization to control and challenging for business operations. If the Company neglects to comply with labor laws or allows human rights violations in the organization or in the value chain of the business, it will affect the sustainability of the organization because an organization cannot be sustainable if it relies solely on business excellence. Gaining trust and support from all groups of stakeholders resulting from good practices without encroachment, and respect of other people's rights is important pillar on which the business can sustainably grow. Impact assessment, both positive and negative, covering economic, environmental, social and human rights are as follows:

Key Topics	Economic	Environmental	Social	Human Rights
	Impact	Impact	Impact	Impact
<ul style="list-style-type: none"> <li>Employment</li> </ul>	<ul style="list-style-type: none"> <li>Creates income in the economic system, filing of personal income tax.</li> <li>Strikes may occur, halting business.</li> </ul>	<ul style="list-style-type: none"> <li>-</li> <li>Increased resource consumption. (Electricity, fuel, water, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Creates jobs and income.</li> <li>Participation in community development</li> <li>The Company's migrant workers may cause friction in local communities.</li> </ul>	<ul style="list-style-type: none"> <li>Receives equal opportunity according to international practices and Company policy.</li> <li>Discrimination may occur with some employee groups if not well controlled.</li> </ul>
<ul style="list-style-type: none"> <li>Human Rights</li> </ul>	<ul style="list-style-type: none"> <li>Trust and confidence in business operations.</li> <li>Potential accusation of involvement in indirect human rights violations, facing trade barriers.</li> </ul>	<ul style="list-style-type: none"> <li>Environmental impacts are supervised.</li> <li>Increased resource consumption may be necessary.</li> </ul>	<ul style="list-style-type: none"> <li>Co-existence in society and communities with trust.</li> <li>Social resistance may occur if the Company directly or indirectly violates human rights.</li> </ul>	<ul style="list-style-type: none"> <li>Human rights in the value chain are checked and protected.</li> <li>Human rights violations in the value chain may occur, meaning the Company is indirectly involved in the violation.</li> </ul>



**Objective:** 1. To have human rights operations inside and outside the organization, as well as throughout the business value chain, that comply with labor laws and international human right principles.

2. To reduce or avoid risks of impact to human rights in the business value chain.


3. To ensure that the Company is not accused of involvement in rights violations, which tend to happen if the Company knows or should know that its business allies or partners are violating human rights, which means that the Company is indirectly violating rights.

**Management:** Announcement of human resource management policies, human rights policies, human rights due diligence (HRDD) audit regulations and assessment of human rights risks and impacts, Company regulations on work rules and regulations (employee manuals), compliance with laws concerning labor and provision of channels for complaints and audit processes.

 1 : Zero complaints about labor.

 : In 2022, the Company had no complaints.


 2: Conduct HRDD in 100% of the business value chain by 2024.

 : In 2022, HRDD was conducted in 23.53% of the business value chain for trade partners, and in 33.3% of the factory area. As for other aspects according to the audit framework, 100% was conducted.

 3: 100% of employees and directly related employees are trained on human rights policies and other related policies.

 : In 2022, 81.5 of employees were trained. The Company did not achieve the goal.

 4: Zero incidents of human rights violations inside and outside the organization throughout the value chain.

 : In 2022, there were no complaints about human rights violations, both inside and outside the organization.

Human Rights Policy: <http://qtc-energy.com/th/humans-right-policy/>

Human Rights Due Diligence (HRDD) Practices: [https://qtc-energy.com/wp-content/uploads/2023/03/HRDD\\_RISK-QTC.pdf](https://qtc-energy.com/wp-content/uploads/2023/03/HRDD_RISK-QTC.pdf)

The Company gives importance to fair employment with wages no less than the minimum wage prescribed by law. In addition, the Company provides appropriate and necessary benefits for employees in addition to providing equal recruitment opportunities with no discrimination against ethnicity, religion and gender in line with the human resource management policy: <https://qtc-energy.com/th/human-resource-management-policy/>. In 2022, the number of employees at the end of the year for all three companies was 1.07 percent less. Ratios of employment and wages were as follows:

**Table Showing Employment Ratios**

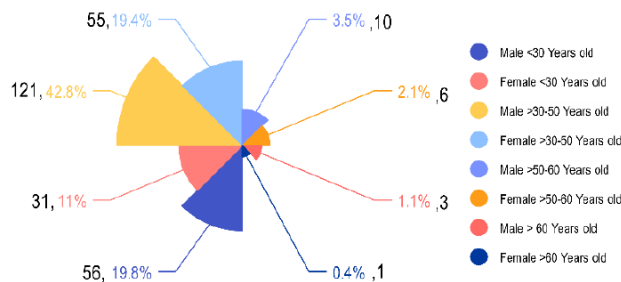
Employment Conditions as of 31 December	QTC Energy						QTCGP & Q Solar 1					
	2020		2021		2022		2020		2021		2022	
	Number (employee)	Percent	Number (employee)	Percent	Number (employee)	Percent	Number (employee)	Percent	Number (employee)	Percent	Number (employee)	Percent
<b>By Gender</b>												
Male	167	66.27	176	67.95	179	67.80	20	74.07	14	66.67	11	57.89
Female	85	33.73	83	32.05	85	32.20	7	25.93	7	33.33	8	42.11
<b>By Level</b>												
L12 - UC	5	1.98	8	3.09	8	3.03	2	7.41	2	9.52	2	10.53
Male	4	80.00	6	75.00	6	75.00	1	50.00	1	50.00	1	50.00
Female	1	20.00	2	25.00	2	25.00	1	50.00	1	50.00	1	50.00
L9 - L11	23	9.13	18	6.95	23	8.71	1	3.70	1	4.76	-	-
Male	10	43.48	7	38.89	10	43.48	1	100.00	1	100.00	-	-
Female	13	56.52	11	61.11	13	56.52	-	-	-	0.00	-	-
L7 - L8	19	7.54	19	7.34	15	5.68	-	-	-	-	-	-
Male	11	57.89	11	57.89	9	60.00	-	-	-	-	-	-
Female	8	42.11	8	42.11	6	40.00	-	-	-	-	-	-
L1 - L6	205	81.35	214	82.63	218	82.58	24	88.89	18	85.71	17	89.47
Male	142	69.27	152	71.03	154	70.64	15	62.50	12	66.67	10	58.82
Female	63	30.73	62	28.97	64	29.36	9	37.50	6	33.33	7	41.18
<b>By Age</b>												
<30 years old	167	66.27	90	34.75	83	31.44			5	23.81	4	21.05
Male			61	67.78	55	66.27			2	40.00	1	25.00
Female			29	32.22	28	33.73			3	60.00	3	75.00
>50-30 years old	75	29.76	153	59.07	166	62.88			12	57.14	10	52.63
Male			107	69.93	114	68.67			9	75.00	7	70.00
Female			46	30.07	52	31.33			3	25.00	3	30.00
>60-50 years old	8	3.17	13	5.02	11	4.17			4	19.05	5	26.32
Male			5	38.46	7	63.64			3	75.00	3	60.00
Female			8	61.54	4	36.36			1	25.00	2	40.00
> 60 years old, Hired After Retirement	2	0.79	3	1.16	4	1.52			-	-	-	-
Male			3	100	3	75.00			-	-	-	-
Female			-	0	1	25.00			-	-	-	-
<b>By Area</b>												
Bangkok Office												
Male	31	12.3	32	12.36	31	11.742	1	3.7	1	4.76	1	5.26
Female	31	12.3	32	12.36	34	12.879	1	3.7	2	9.52	3	15.79
Rayong/Prachinburi Factory												
Male	54	21.43	144	55.6	148	56.061	5	18.52	13	61.9	10	52.63
Female	136	53.97	51	19.69	51	19.318	20	74.07	5	23.81	5	26.32
<b>Total Employees at End of Year (employees)</b>	<b>252</b>		<b>259</b>		<b>264</b>		<b>27</b>		<b>21</b>		<b>19</b>	

## Graph Showing Employment Ratios in 2022

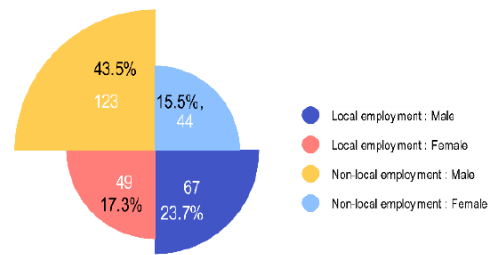
### Employment Ratio by Gender



### Employment Ratio by Gender - Age Range



### Employment Ratio Inside and Outside the Area by Gender



100% of employees and executives of the Company have Thai nationality.

### Table Showing Ratios of Wages and Remuneration

Employment Conditions as of 31 December	QTC Energy						QTCGP & Q Solar 1					
	2020		2021		2022		2020		2021		2022	
	Number (employee)	Percent	Number (employee)	Percent	Number (employee)	Percent	Number (employee)	Percent	Number (employee)	Percent	Number (employee)	Percent
<b>By Gender</b>												
Male	90.49	65.34	93.57	65.67	92.59	66.38	6.92	81.58	6.85	66.24	5.06	59.79
Female	48.01	34.66	48.91	34.33	46.90	33.62	1.56	18.42	3.49	33.76	3.41	40.21
<b>By Level</b>												
Level 9 – UC	48.87	35.29	53.37	37.46	51.63	37.02	-	-	-	-	-	-
Levels 7 – 8	13.37	9.65	12.77	8.96	10.63	7.62	-	-	-	-	-	-
Levels 1 – 6	76.26	55.06	76.34	53.58	77.23	55.37	-	-	-	-	-	-
<b>Total Employees at End of Year (employees)</b>	<b>138.5</b>		<b>142.48</b>		<b>139.49</b>		<b>8.48</b>		<b>10.34</b>		<b>8.47</b>	

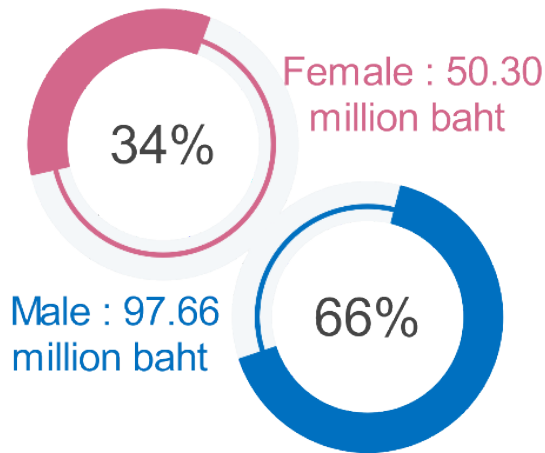
### Table of Wages for Executives and Employees

Year of Payment	Executives and Managing Directors in Subsidiaries		Employees	
	Amount (million)	Percent	Amount (million)	Percent
<b>2020</b>	20,574,754.00	14.00	126,402,882.00	86.00
<b>2021</b>	25,499,952.00	16.69	127,319,161.00	83.31
<b>2022</b>	22,923,820.00	15.49	125,035,661.00	84.51

Remarks: - These wages and remunerations do not include other privileges provided by the Company such as training and development costs, support for activities or recreation, etc., and other expenses paid by the Company to employees in compliance with the law.

- **Payment of Wages: Wages are paid once per month on the last work day of the month by making transfers into employee bank accounts.**

## Graph of Wages for Executives and Employees for 2022



### Graph of Wages for Executives and Employees for 2022

Excutive level : 22,923,820 baht

15.5%

84.5%

Operational level : 125,035,661 baht

Average Wages for Male Employees: 513,977.26 baht/person/year

Average Wages for Male Employees: 540,901.09 baht/person/year

Female/Male Employee Wage Ratio: 1.05 : 1

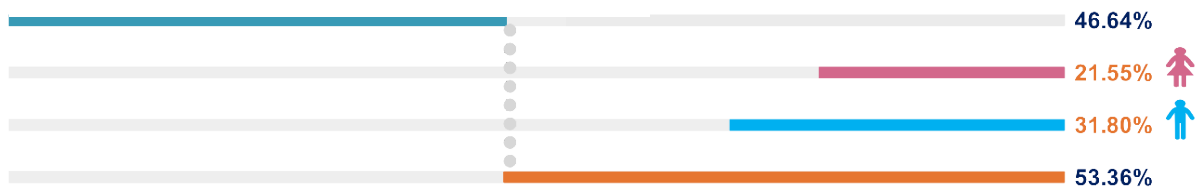
**In 2022, female employees received about 5.24 % higher average wages than male employees.**

**Table Showing Provident Fund Membership of the Group (QTC Energy, QTCGP, Q Solar 1)**

Item	Year		
	2020	2021	2022
Total Number of Employees at the End of the Year (Persons)	279	280	283
Number of Employees Who Are Members of the Provident Fund (Persons)	132	144	151
Proportion of Employees Contributing to the Fund (%)	47.31%	51.43%	53.36%
Amount Contributed by the Company to the Provident Fund (Baht)	2,835,772.00	2,981,809.00	3,137,081.00

### Graph Showing the Proportion of Employees Who Became Members of the Fund in 2022

Employees Not Contributing to the Provident Fund for All Three Companies



Employees Contributing to the Provident Fund for All Three Companies

**Table of Minimum Wage by Organization Location**

Organization Location	Minimum Starting Wage (not including other benefits)	Minimum Wage Prescribed by Law
Bangkok Office (monthly)	htnom/thab 095,01	htnom/thab 095,01
Rayong Factory	htnom/thab 026,01	htnom/thab 026,01
Q Solar 1 Power Plant (monthly)	htnom/thab 005,01	htnom/thab 002,01
Q Solar 1 Power Plant (daily)	yad/thab 043	yad/thab 043

**Entry-level Wages and Benefits**

Items	L1 - L6	L7 - L8	L9 - UC	
			Section	Department
Starting Wages (Not Including Experience): Baht	10,620 – 25,000	According to Wage Structure		
Traveling Costs	☉	☉	☉	-
Cost of Living	☉	☉	-	-
Controlled Engineering Profession Certificate Cost	Only Certified Engineers		-	-
Risk Cost	Only High-Risk Positions		-	-
Chemical Fees	Only Employees with Chemical-Related Work			
Hard Work Fees	Only Steel Core and Warehouse Employees			
Shift Fees	Only Late-Shift Employees	-	-	-
Diligence Allowance	☉	☉	-	-
Accident Insurance	☉	☉	☉	☉
Telephone Fees	-	Some Positions	☉	☉
Office Car	-	-	-	☉
Children's Scholarship (if any) According to Terms	☉	☉	-	-
Provident Fund (%15 from employees at most. The Company contributes %6-3 according to terms)	☉	☉	☉	☉
Funeral Assistance for Employee Relatives	☉	☉	☉	☉
Funeral Assistance for Employees	☉	☉	☉	☉
Wedding Assistance (One-time Payment)	☉	☉	☉	☉
Assistance for Childbirth Expenses	☉	☉	☉	☉
Medical Expenses at No More Than One Times Salary/Person/Year	☉	☉	☉	☉
Dental Procedure Cost (1,000 Baht/Year)	☉	☉	☉	☉
Skill Fee	☉	☉	-	-
Food Cost for Overtime Work	☉	☉	-	-
Reward for Not Taking Leave	☉	☉	-	-
Transportation Cost	☉	☉	☉	-
Dormitory	☉	☉	☉	☉
Annual Vacation	☉	☉	☉	☉
Reward for Work Life at 10 Years and 20 Years	☉	☉	☉	☉
Uniform Cost	☉	☉	☉	☉
Cost of Maternity Clothes (only pregnant employees)	☉	☉	☉	☉
System Maintenance Cost	Only Test Laboratory Workers		-	-
Daily Food Cost	Only L1 Employees	-	-	-
Type 2 Driver's License	Only Drivers	-	-	-
Meeting Allowance	Only Safety Committee/Welfare Committee Members		-	-
Reward for Kaizen Work	☉	☉	☉	-
Reward for Photo Contest/Articles	☉	☉	☉	-
Commission/Rewards from Sales	☉	☉	☉	☉
Bonus	☉	☉	☉	☉



The Company has established a comprehensive human rights due diligence (HRDD) process to identify, prevent and mitigate any human rights impacts that arise or may arise from the Company's business operations under the recommendations of the UN Guiding Principles on Business and Human Rights (UNGP) and the National Human Rights Commission. It is expected that any business that is related in its value chain will operate in accordance with the Company's human rights policy. In addition, the Company strictly promotes human rights practices within the organization. This is done through established codes of practice and various channels of activities so that all employees are informed about their legal rights and respect each other's rights. The employees are given the opportunity to express their opinions or gather under the rules and regulations stipulated by law. The measurement of human rights performance within the organization is determined by the complaints or disputes about human rights violations of employees.

The Company has considered the scope of human rights risks and impacts from the vision and mission of the Company covering its subsidiaries under the UNGP, which can be summarized as follows:

#### Scope of Human Rights Risks and Impacts of QTC



##### Employee Rights

- Employment Status
- Discrimination
- Employee Privacy
- Health and Safety
- Freedom of Assembly



##### Community and Environmental Rights

- Standard of Living
- Cultural Inheritance
- Impact from Pollution
- Community Health and Safety
- Access to Water and Natural Resources
- Waste and Hazardous Waste



##### Customer and Distributor Rights

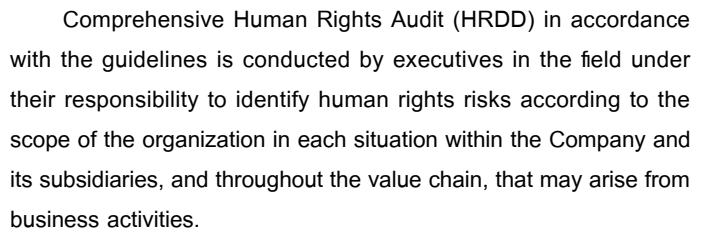
- Health and Safety
- Information and News Accuracy
- Customer Data Security



##### Business Ally Management (Trade Partners, Contractors)

- Employment Status
- Labor Protection
- Health and Safety
- Stability and Security

Comprehensive Human Rights Audit (HRDD) in accordance with the guidelines is conducted by executives in the field under their responsibility to identify human rights risks according to the scope of the organization in each situation within the Company and its subsidiaries, and throughout the value chain, that may arise from business activities.



### Example of the HRDD Form of the Company and Its Affiliates

<p><b>สัญลักษณ์ :</b></p> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">               ความเสี่ยง  </div> <div style="text-align: center;">               ปฏิบัติตามนี้  </div> <div style="text-align: center;">               ทัศนคติผู้ช่วยขาย  </div> <div style="text-align: center;">               ขอความยินยอมเพื่อสมัครใจ  </div> </div> <div style="display: flex; justify-content: space-between; align-items: center; margin-top: 5px;"> <div style="text-align: center;">               ความเสี่ยงสูง         </div> <div style="text-align: center;">               ทำข้อมูลเพิ่มเติมก่อน         </div> <div style="text-align: center;">               ให้ทุกคนมีส่วนร่วม         </div> <div style="text-align: center;">               ประเมินความเสียงที่ผู้เกี่ยวข้อง         </div> </div>	<p><b>การถือครองที่ดิน :</b> การตรวจสอบที่ดินหรือเอกสารสิทธิในที่ดิน ย่อมมีผลเป็นนาบทยที่จะมีข้อมูลเกี่ยวกับประวัติการถือที่ดินดังกล่าว ความจำเป็นในการจนตรึงที่ดินกระบวนการ เกี่ยวกับจังหวัดของสถาบันฯ ต่อไปนี้</p> <p>1. มีหรือที่อาศัยอยู่ภายในบริเวณพื้นที่โครงการหรือไม่ (ในกรณีที่เป็นส่วนต่อขาย มีกรณีใช้ที่ดินบริเวณพื้นที่โครงการหรือไม่)</p> <p><input type="checkbox"/>  ไม่มี <input type="checkbox"/>  มี <input type="checkbox"/>  ปฏิบัติตามนี้ <input type="checkbox"/>  ทำข้อมูลเพิ่มเติมก่อน <input type="checkbox"/>  ทัศนคติผู้ช่วยขาย <input type="checkbox"/>  ขอความยินยอมเพื่อสมัครใจ</p> <p>2. มีผลประโยชน์ใดบ้างกับที่ดินฯ ที่ส่งผลเชิงลบต่อผู้ที่มีสิทธิประโยชน์ในที่ดินนั้นหรือไม่(ในกรณีที่เป็นส่วนต่อขายมีผลประโยชน์ใดบ้างเขียนในที่ซึ่งจะส่งสถาบันประกอบฯ)</p> <p><input type="checkbox"/>  ไม่มี <input type="checkbox"/>  มี <input type="checkbox"/>  ปฏิบัติตามนี้ <input type="checkbox"/>  ทำข้อมูลเพิ่มเติมก่อน <input type="checkbox"/>  ทัศนคติผู้ช่วยขาย <input type="checkbox"/>  ขอความยินยอมเพื่อสมัครใจ</p> <p>3. ผู้ที่อาศัยอยู่บนที่ดินนั้นมีความจำเป็นต่ออะไรอยู่ภายในโครงการสถานประกอบกิจการหรือไม่ (ในกรณีที่เป็นส่วนต่อขายตอบที่ส่งร่างสถานประกอบกิจการเป็นผู้ที่อยู่อาศัยเดิมคืออาศัยอยู่หรือไม่)</p> <p><input type="checkbox"/>  ไม่มี <input type="checkbox"/>  มี <input type="checkbox"/>  ปฏิบัติตามนี้ <input type="checkbox"/>  ทำข้อมูลเพิ่มเติมก่อน <input type="checkbox"/>  ทัศนคติผู้ช่วยขาย <input type="checkbox"/>  ขอความยินยอมเพื่อสมัครใจ</p> <p>4. ผู้ที่มีส่วนได้ส่วนเสียอื่น มีสิทธิในสิทธิเชิงพาณิชย์บนที่ดินหรือไม่ หรือเช่าที่ดินเพื่อเก็บเกี่ยวทรัพยากรจากหรือไม่</p> <p><input type="checkbox"/>  ไม่มี <input type="checkbox"/>  มี <input type="checkbox"/>  ปฏิบัติตามนี้ <input type="checkbox"/>  ทำข้อมูลเพิ่มเติมก่อน <input type="checkbox"/>  ทัศนคติผู้ช่วยขาย <input type="checkbox"/>  ขอความยินยอมเพื่อสมัครใจ</p> <p><b>คุณภาพ ความเหมาะสมและการเข้าถึงแหล่งน้ำและทรัพยากรธรรมชาติ</b></p> <p>5. การก่อสร้างสถานประกอบกิจการ หรือการเปิดใช้ของสถานประกอบกิจการเดิมบนพื้นที่ที่จะส่งผลกระทบเชิงลบต่อการเข้าถึง คุณภาพ หรือปริมาณแหล่งน้ำในชุมชนหรือไม่</p> <p><input type="checkbox"/>  ไม่มี <input type="checkbox"/>  มี <input type="checkbox"/>  ปฏิบัติตามนี้ <input type="checkbox"/>  ทำข้อมูลเพิ่มเติมก่อน <input type="checkbox"/>  ทัศนคติผู้ช่วยขาย <input type="checkbox"/>  ขอความยินยอมเพื่อสมัครใจ</p> <p>6. การก่อสร้างสถานประกอบกิจการหรือเปิดกิจการของสถานประกอบกิจการเดิมบนพื้นที่ที่จะส่งผลกระทบเชิงลบต่อการเข้าถึง คุณภาพหรือปริมาณทรัพยากรในชุมชนหรือไม่</p> <p><input type="checkbox"/>  ไม่มี <input type="checkbox"/>  มี <input type="checkbox"/>  ปฏิบัติตามนี้ <input type="checkbox"/>  ทำข้อมูลเพิ่มเติมก่อน <input type="checkbox"/>  ทัศนคติผู้ช่วยขาย <input type="checkbox"/>  ขอความยินยอมเพื่อสมัครใจ</p>
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<div style="display: flex; justify-content: space-between; align-items: center;"> <span>▼ การประเมินผล</span> <span>Ⓢ ปฏิบัติตาม</span> </div> <div style="display: flex; justify-content: space-between; align-items: center; margin-top: 5px;"> <span>▼ การประเมินผล</span> <span>☑ หากผู้ประเมินเห็นด้วย</span> </div>	<div style="display: flex; justify-content: space-between; align-items: center;"> <span>▼ การประเมินผล</span> <span>Ⓢ ปฏิบัติตาม</span> </div> <div style="display: flex; justify-content: space-between; align-items: center; margin-top: 5px;"> <span>▼ การประเมินผล</span> <span>☑ หากผู้ประเมินเห็นด้วย</span> </div>
<b>การดำเนินงาน</b>	
1. ผู้กำกับฯ ให้ข้อมูลเกี่ยวกับกำลัง และ ค่าตอบแทนในการทำงานที่บริษัท หรือหน่วยงานของตนเองหรือไม่ <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ	11. บริษัทมีการตรวจสอบหรือดูแลผู้ให้ข้อมูลที่ส่งข้อมูลลูกค้าไว้ในรูปแบบต่าง ๆ เช่น สหกรณ์การเกษตร หรือกลุ่มเป็นธนาคาร เพื่อให้ลูกค้าได้ร่วมเป็นเจ้าของและ แลกเปลี่ยนข้อมูลเกี่ยวกับงานเกี่ยวกับทางธุรกิจ <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ
2. มีข้อมูลจำนวนเงินตามหลักเกณฑ์การ และ ลูกค้าซึ่งมีกฎระเบียบและเงื่อนไขในสัญญาหรือไม่ <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ	12. บริษัท มีการทบทวนการให้บริการตามแผนปฏิบัติงานและงานและ ต้นทุนของสหกรณ์หรือไม่ <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ
3. บริษัท มีการจ่ายค่าจ้าง และ ค่าตอบแทนการทำงานนอกเหนือจากค่าจ้างตามที่บันทึกไว้ในสัญญา ในอัตราที่ไม่ต่ำกว่ากฎเกณฑ์ที่กำหนดหรือไม่ <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ	<b>ความเป็นมิตรของลูกหนี้</b>
4. บริษัทฯ จัดให้มีการประชุมกับลูกค้าเป็นประจำเพื่อรับ เพื่อรับฟัง ข้อคิดเห็นและตอบข้อซักถามหรือ ที่อาจจะเกิดขึ้นในการประกอบการทำงานหรือไม่ <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ	13. ข้อมูลระบบของลูกหนี้ซึ่งใช้ให้บริการเป็นสมาชิกระบบรวมไปถึงถูกใช้เพื่อวัตถุประสงค์การใช้กับงานที่นอกเหนือหรือไม่ <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ
<b>ผลการดำเนินงานขององค์กรและลูกค้า</b>	
5. ลูกค้ามีความกระปรี้กระเปร่าในความสัมพันธ์และได้รับประโยชน์จากการ ความปลอดภัยในชีวิตหรือไม่ <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ	14. ข้อมูลเกี่ยวกับลูกค้าเกี่ยวกับลูกค้า รวมทั้งข้อมูลด้านสุขภาพของลูกหนี้ เพื่อการเลือกปฏิบัติในการให้บริการหรือไม่ <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ
<b>วัฒนธรรมการดำเนินงาน</b>	
6. ลูกค้าสามารถเข้าถึงข้อมูลต่าง ๆ เช่น ข้อห้าม หรือ ขอบเขต และ เงื่อนไขของการกู้ยืมเงินได้โดยไม่เสียค่าใช้จ่ายหรือไม่ <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ	15. บริษัทฯ ไม่มีการเพิกถอนเงินกู้ยืมที่ผิดเงื่อนไขโดยไม่มีเหตุอันควร หรือการใช้บังคับข้อบังคับหรือที่ลูกค้าได้สมัครหรือไม่ <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ
7. บริษัทฯ มีนโยบายที่เป็นกลางเกี่ยวกับลักษณะไม่มีการเลือกปฏิบัติในการจ้างงานบุคคล จากความแตกต่างในเรื่องเชื้อชาติ ภาษา เพศ สถานะทางสังคม ความพิการ การนับถือศาสนา การแสดงความคิดเห็นส่วนบุคคลหรือไม่ <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ	16. บริษัทฯ มีการนำการป้องกันและปัญหา ความรุนแรง การคุกคามทางเพศ หรือการเลือกปฏิบัติแบบต่าง ๆ ในสถานที่ทำงาน เพื่อให้เกิดลูกค้าอยู่รอดปลอดภัยในชีวิตและลดข้อขัดแย้งความรุนแรง โดยการดูแลความปลอดภัยทาง ทางกาย อารมณ์ หรือความพิการหรือไม่ <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ
8. บริษัทฯ มีการเลือกจ่ายค่าจ้างให้แก่ลูกปฏิบัติ โดยตรงและยุติกลุ่มอื่น ผู้พิการ หรือกลุ่มผู้ด้อยโอกาสหรือไม่ <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ	17. บริษัทมีการปรับเงื่อนไขหรือเงื่อนไขและข้อเสนองานเกี่ยวกับ ปัญหาจากการคุกคามและการเลือกปฏิบัติระหว่างการทำงานหรือไม่ <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ
<b>ความรับผิดชอบต่อสังคม</b>	
9. บริษัทฯ มีการจ้างลูกจ้างอย่างน้อย 1 คน ต่อลูกค้าผู้ให้บริการทางการเงิน 100 คน หรือเงินเข้าของสหกรณ์และเพิ่มจำนวนการฝึกอบรมการเป็นอาสาสมัคร <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ	18. บริษัทฯ ไม่มีการจ้างแรงงานเด็กอายุต่ำกว่าสิบห้าปี <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ
10. บริษัทฯ มีการให้โอกาสลูกค้าได้รับบริการที่ปลอดภัยและเพิ่มศักยภาพอย่างเหมาะสม <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ	19. บริษัทฯ มีการจ้างแรงงานหญิงในการทำงานและสิทธิความเป็นสมาชิกตามกฎกระทรวง <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ
20. บริษัทฯ ไม่มีการให้เงินไปรับประโยชน์จากการขายสินค้าหรือเงินค่าตอบแทนในการให้บริการที่ การคุกคามเช่นเดียวกับการละเมิด การค้ามนุษย์ หรือการฉ้อโกงหรือไม่ <input type="checkbox"/> ใช่ <input type="checkbox"/> ไม่ใช่ <input type="checkbox"/> ไม่รู้ <input type="checkbox"/> ไม่สนใจ	

## Results of Comprehensive HRDD

In 2022, the Company established guidelines for comprehensive human rights audits related to business, and assessed human rights risks and impacts to be consistent with the human rights policy in order to officially enforce them. The goal is to conduct an audit throughout 100% of the business value chain by 2024. Performance in 2022 is as follows:

1. Checklist 1: Major Risks in Factory Construction/Operating Areas/Business Expansion/Mergers
  - 100% of the operation was carried out. No human rights violations were found. Risks have proper preventive measures.
2. Checklist 2.1: Significant Human Rights Risks to Regular Employees
  - 100% of the operation was carried out. No human rights violations were found. Risks have proper regulations and preventive measures. In addition, the Company has considered adjusting welfare and regulations to cover the human rights of LGBT employees, which will be effective in 2023.
3. Checklist 2.2: Significant Human Rights Risks to Temporary Employees
  - 100% of the operation was carried out. No human rights violations were found. Risks have proper regulations and preventive measures. In addition, the Company has considered adjusting welfare and regulations to cover the human rights of LGBT employees, which will be effective in 2023.
4. Checklist 2.3: Significant Human Rights Risks to Wage Contractors
  - In 2022, there were no wage contractors in the Company and its affiliates.
5. Checklist 2.4: Significant Human Rights Risks to Migrant Workers
  - In 2022, there were no migrant workers in the Company and its affiliates.
6. Checklist 3: Significant Human Rights Risks to Communities and Societies Surrounding Areas of Operation
  - In 2022, an audit was conducted within the community where the Rayong factory is located. No human rights violations were found. For risk issues that concern the community, the Company has established appropriate policies, operating standards, and preventive and mitigation measures for potential impacts.
  - No audit has been conducted within the community where the Q Solar 1 power plant is located, and an audit will be conducted in the area of the Bangkok Office in 2023.
7. Checklist 4: Significant Human Rights Risks to Other Organizations with Business Relationships
  - In 2022, the Company conduct an audit on four main suppliers of raw materials to Rayong Factory, four raw material distributors, three construction contractors, three transportation service providers, and two security and housekeeping service providers, representing 23.50% of the 64 major trade partners (domestic). No human rights violations were found in any of the 16 organizations. However, minor risks were found and the Company has recommended guidelines on preventing unintentional human rights violations as well as advised the trade partners to use QTC's audit form in their activities in the future.
8. Checklist 5: Significant Human Rights Risks to Customers

In 2022, the Company conducted an audit on sales and service policies and various regulations according to the sales checklist in 2022. 100% of the audit was carried out separately on the transformer, solar and electricity sale businesses, with no human rights issues against customers found.

## Human Rights Knowledge Promotion

The Company encourages all employees to understand and behave with respect to the rights of others, including relevant regulations, practices, and policies, which are prescribed as mandatory training courses for all job positions. In 2022, human rights practices and personal data controls were revised, and the review of all relevant knowledge and understanding were prepared. The results are as follows:

Training for executives directly involved:	100%
Training for general staff/student interns:	81.85%
Training to be held in 2023:	18.15%



In addition, the Company has trained seven security officers from Security Mangmeesup Inter Guard Co., Ltd., four housekeepers responsible for cleaning and receiving customers from Siam Pattaya Cleaning & Services Ltd., Part., and two independent housekeepers on human rights and personal data protection practices.

**100% of security guards and janitors have received human rights training.**

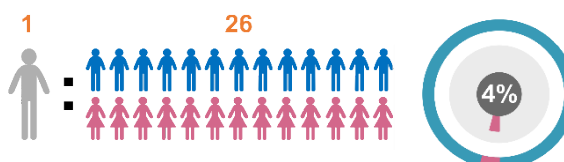
## Benefits Committee

The Company created an elected Benefits Committee with the role and duty of representing employees of the Company and all subsidiaries in order to present opinions for improving environments, public utilities and benefits specified by law to the Company. Employee representatives (Human Resources Division) participated in meetings on a quarterly basis. If the work of the Benefits Committee was approved by the Executive Committee and the Board of Directors, effects will cover every subsidiary. The current Benefits Committee has a term of two years (2021 – 2022) and consists of the following persons:

Benefits Committee					
Rayong-Prachinburi Factory			Bangkok Prachinburi Main Office		
First – Last Name	Representative of	Position	First– Last Name	Representative of	Position
1. Mr. Poonpon Sutacha	Production Dept.	Chairman	6. Miss Emika Suratonkoset	Marketing Strategy Section	Chairwoman
2. Mr. Tinpattara Laiprakone	QA Dept.	Committee Member	7. Miss Oratai Yasan	Sales Support Section	Committee Member
3. Mr. Subanpot Marapan	Production Dept.	Committee Member	8. Miss Pattaranit Makpoonponsrikun	Accounting & Finance Dept.	Committee Member
4. Mr. Watcharin Pansiri	Production Dept.	Committee Member	9. Mr. Poomarin Jongtiratam	Customer Service Div.	Committee Member
5. Mr. Pongkawe Naopotong	Production Dept.	Committee Member/ Secretary	10. Miss Chanisa Boonprasert	Solar Business Dept.	Committee Member
			11. Miss Sawitree Nakjan	Investor Relations Section	Committee Member/ Secretary

Ratio of Benefits Committee to All Employees Including Every Subsidiary

**No Joint Negotiation Agreements**



In 2022, the Executive Committee reviewed the Benefits Committee's proposal to adjust travel benefits from 500 baht to 800 baht due to the rising oil prices. The Executive Committee approved the increase of travel benefits from 500 baht to 700 baht, effective as of 1 January 2023.

## The Mothers' Corner Project

The Company continues to support mothers to use “mothers’ corners” to allow mothers to use breast pump services and refrigerate breast milk for infants to allow infants to receive mothers’ milk for as long as possible. This connects infants’ opportunity for good and quality upbringing (mothers can ask supervisors to use services at any time to pump breast milk). Services are provided from 8:30 a.m. – 4:30 p.m. of every business day. In addition, the Company arranges for nurses to provide key information regarding lactogenesis and childcare.

**Table of Female Employees Who Took Maternity Leave**

Year	2020		2021		2022	
	QTC	QTCGP&Q Solar1	QTC	QTCGP&Q Solar1	QTC	QTCGP&Q Solar1
Employees Who Took Maternity Leave (employees)	5	-	3	-	3	2
Employees Who Returned to Work (employees)	4	-	4	-	1 (2 employees took leave including in 2023)	1 (1 employee took leave including in 2023)

**Remarks: The employee who took leave in 2020-2021 returned to work in 2021.**

### “Breastfeeding Corner”



Consultation with Factory Nurses and First Time Mothers

### Babies of QTC in 2022

Baby Grit of Mother Poen



Baby Big Chan of Mother Jane



Baby Model of Mother Nok



Baby Physics of Mother Cat



Baby Piano of Mother Pop



Images of the babies are published in this SD Report with consent from their mothers.

## Scholarship Project for Employees' Children

In 2022, the Benefits Committee considered 65 scholarship applications for employees' children according to specified conditions. Scholarships are divided into the following three levels:


1	Preschool	16 Scholarships	@1,000 baht	16,000 baht
2	Primary Education	37 Scholarships	@1,500 baht	55,500 baht
3	Secondary Education	13 Scholarships	@2,000 baht	26,000 baht
<b>Total</b>				<b>97,500 baht</b>







## Complaint or Whistleblowing Channel

- Every employee can complain or report incidents to the Human Resources Department or executives according to the chain of command if they find that they have not been treated fairly, or were treated unfairly, or when personal rights have been violated, or when they have seen actions of a person in the organization that violate the rights of others, through complaint channels specified in Section 7 of the Employee Manual on Complaints and Complaint Consideration. If employees have concerns that employees will not receive justice, employees can report complaints to the Audit Committee directly via another channel.
- Outside individuals or stakeholders may make complaints or demands directly to the Board of Audit.


**Whistleblowing or Complaint Channels**



Mail addressed to:  
Audit Committee of QTC Energy Public Company Limited  
2/2 Soi Krungthep Kritha 8, Intersection 5, Krungthep Kritha Rd., Huamark, Bangkapi,  
Bangkok, 10240



Email:  
[audit@qtc-energy.com](mailto:audit@qtc-energy.com)


**Channels for Consulting/Inquiring about Related Policies or Guidelines**



Email:  
[sustainability@qtc-energy.com](mailto:sustainability@qtc-energy.com)



Telephone: 038-891-411-4, Ext. 111



Company Website:  
[www.qtc-energy.com](http://www.qtc-energy.com)

<b>Goal:</b>  <b>0</b>  <b>In All Cases</b>	Verified Non-compliance with Product Information and Labeling Requirements	✓
	Verified Non-compliance with Marketing Communications	✓
	Verified Breach of Customer Privacy and Leak of Customer Data	✓
	Verified Unsafe Incidents from the Use of Transformer Products and Services	✓

# Human Capital Development & Employee Care



People are the organization's capital that can create added value. People are the organization's intangible assets and an asset for the organization with no depreciation. Therefore, people are a vital factor in pushing the organization to achieve success and goals, depending on the organization's ability to use knowledge, capabilities, skills or expertise including experience of each member in the organization. An organization with people who have diverse abilities that can combine that diversity to create capacity for the organization will have capabilities and advantage over competitors because people are the organization's important human capital.

An organization that has capable and talented people able to create advantage over competitors is difficult to create and takes time to develop. However, it is more difficult to retain talent in the organization because every organization is recruiting talented and capable people in the labor market to drive work and achieve organization goals. This labor competition creates risks for organizations which invested in developing talent but were unable to retain talent. Therefore, in addition to developing talent and ability, providing care, attention, seeing human value and supporting people to be good and generous with others while having a volunteer mind will create talented and good people attachment to the organization considered as the highest profit of that organization.

Based on impact assessment of the all steps of the work process, both positive and negative, covering economic, environmental, social and human rights aspects, the following risks and opportunities were found:

Key Topics	Economic	Environmental	Social	Human Rights
	Impact	Impact	Impact	Impact
<b>Human Capital Development</b>	The laborers are more skilled and able, allowing for competition and the strengthening of the economic system.  The buying or competition for skilled laborers or resignation of employees who cost a lot to develop.	Promotes the creation of a green culture.  Increased resource consumption. (Electricity, water, fuel, etc.)	Creates good people, develops skilled people into good people and creates skilled people in society.  -	Receives equal opportunity in line with international practices and the Company's policies.  Discrimination may occur in some employee groups if not properly controlled.
<b>Employee Care</b>	The laborers are more skilled and able, allowing for competition and the strengthening of the economic system.  The buying or competition for skilled laborers or resignation of employees who cost a lot to develop.	Promotes the creation of a green culture.  Increased resource consumption. (Electricity, water, fuel, etc.)	Creates good people, develops skilled people into good people and creates skilled people in society.  -	Receives equal opportunity in line with international practices and the Company's policies.  Discrimination may occur in some employee groups if not properly controlled.

One of QTC's five main missions is to develop human capital, create good and talented people. This is a challenge for the organization to use human capital with significant capacity for business competition and a risk for the organization from potential loss of human capital due to current labor competition. Therefore, the Company's directors and executives place importance on developing good and talented human capital at the same time, causing every member of the organization to see QTC as a second home and be ready to grow together with sustainability. The objectives and goals are as follows:

**Objective:** 1. To build the organization's competitive capacity with human capital.

2. To create organization happiness for the organization to become strong and for employees to have good life balance.

**Management:** Human resource management policy, human rights policy, organization happiness policy and driving the organization with Happy Workplace: Happy 8 + 1.

 **1 :** Increase personal ability and reduce GAP in the entire organization by 50 percent per year.

 : In 2022, the Company achieved 63.15 percent of the goal. The Company achieved this goal.

 **2 :** Create at least five significant KM issues for the organization with employee participation.

 : In 2022, the Company achieved seven issues. The Company achieved the goal.


 **3 :** Resignation rate lower than 20 percent.

 : In 2022, the Company had a resignation rate of 11.74 percent. (All three companies achieved the goal.)

 **4 :** Happiness among organization members is higher than 75 percent.

 : In 2022, employee happiness was at 71.45 percent. The Company did not achieve the goal.

 **5 :** Attachment to the organization higher than 80 percent.

 : In 2022, scores for attachment to the organization were at 64 percent. The Company did not achieve the goal.

## Training & Development



### Development of Knowledge and Skills for Growth According to Position and Organizational Structure

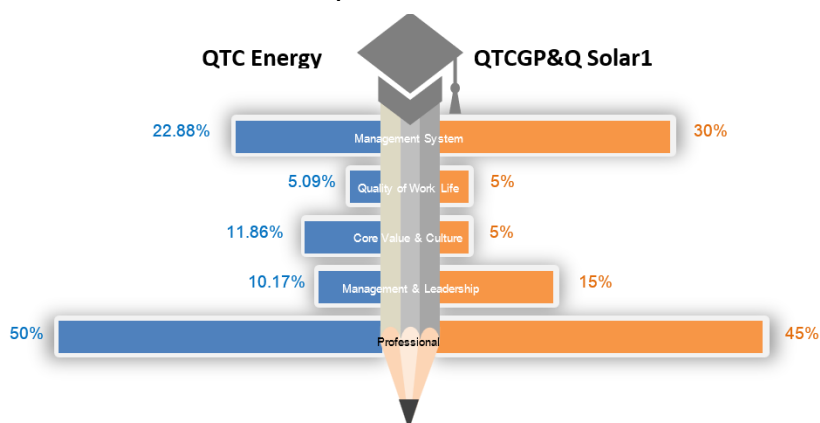
As the Covid19- situation is has eased, the Company was able to develop personnel according to the Individual Development Plan (IDP) and achieve more goals.

The Company places importance on and is committed to improving employee skills, knowledge and abilities according to the sustainability equation of  $Q + R = S$  by applying the strategy of improving people comprehensively to create good and talented people by establishing an IDP according to the core competency plan in line with goals at the organization level, disseminating it into the performance management system and career paths of employees. This is to systematically enhance employees' competencies in line with the organization's core competencies and organizational knowledge for learning at any time.

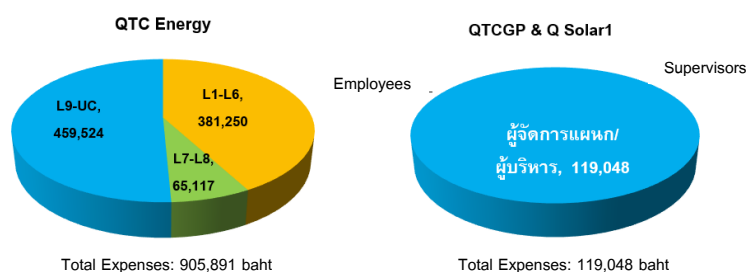
**Table Showing the Number and Proportion of Training Hours**

Employee Status	QTC Energy						QTCGP & Q Solar 1					
	2020		2021		2022		2020		2021		2022	
Sorted by Level	Total Training Hours	Average/ Person/ Year	Total Training Hours	Average/ Person/ Year	Total Training Hours	Average/ Person/ Year	Total Training Hours	Average/ Person/ Year	Total Training Hours	Average/ Person/ Year	Total Training Hours	Average/ Person/ Year
L9-UC	1,260	45.96	647	23.96	654.50	21.82	-	-	36.00	12	72	36
L7-L8	1,264	63.73	373	18.65	498.50	29.32	-	-	-	-	-	-
L1-L6	5,606	26.29	2,354	11.48	4,970	23.55	-	-	642.00	30.57	237	13.94
Sorted by Gender												
Male	5,749.50	32.62	2,233	13.14	4,003	22.74	700	35	444	23.37	171	15.55
Female	2,380.50	28.26	1,141	13.91	2,120	25.85	120	17.14	234	46.80	106	13.25
<b>Total Training Hours for the Year (hours)</b>	<b>8,130</b>		<b>3,374</b>		<b>6,123</b>		<b>820</b>		<b>678</b>		<b>309</b>	
<b>Average Employees per Year (employees)</b>	<b>261</b>		<b>254</b>		<b>258</b>		<b>27</b>		<b>24</b>		<b>16</b>	
<b>Training Expenses (baht)</b>	<b>1274711.07</b>		<b>490,008.00</b>		<b>905,891.00</b>		<b>68,700.00</b>		<b>15,000.00</b>		<b>119,048.00</b>	

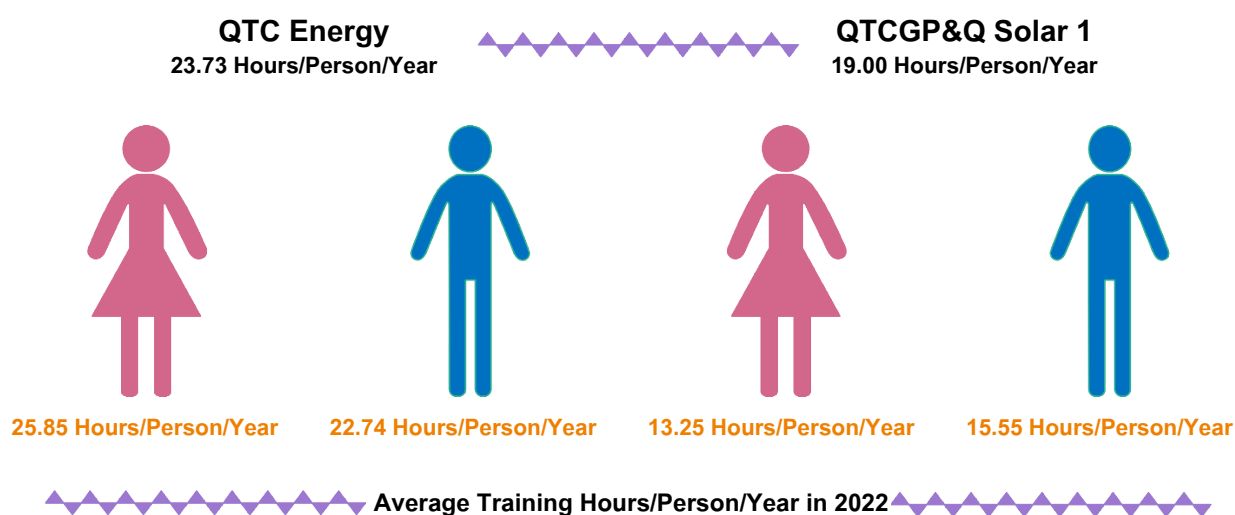
**Graph Showing Proportions of Various Training Courses Necessary for Operations in 2022**



**Graph Showing Employee Training Expenses in Various Levels in 2022**



According to the Table of the number and proportion of the training hours for 2022 and the graph, it can be seen that training hours in 2022 increased from 2021 by 81.48%, with an average of 22.74 training hours/male employee/year and 25.85 training hours/female employee/year (QTC Energy only) as a result of the easing of COVID-19 prevention measures, allowing the Company to conduct inhouse and public training. For QTCGP and Q Solar 1, the number of training hours is lower than 2021 by 54.42%, with an average of 15.55 training hours/male employee/year and 13.25 female employees/year. The cost of the training incurred only at the management level due to the public-type training, while employees received inhouse training which incurred no cost.

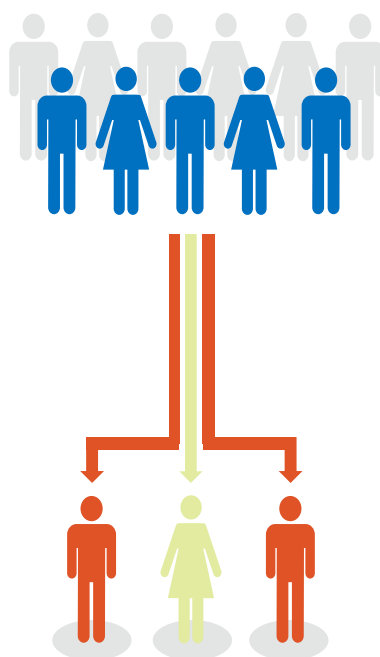




# Individual Development Plan (IDP)

From training in the Leadership Development Program in the project to make a succession plan in 2019, HRD continuously prepared a course for improving executive skills at the manager level and up in order to have management skills in the Management Development Program. In 2022, the Company sent three successors to attend long-term executive training courses and the operation was in accordance with the Company's succession plan. 100% of the successors have been developed, but details cannot be disclosed because they are sensitive information in the organization.

## Succession Plan



## Timeline Development



# Improve Knowledge & Skills to Reduce GAP

The Company is committed to personnel development in accordance with the IDP and individual career paths. Each year the skill matrix is assessed by affiliated supervisors with HRD and various skill topics with gaps are gathered to provide knowledge, training, and additional job performance skill development for employees which directly affects the quality of products and work processes.

## Human Resource Development and Career Opportunity Framework of the Company

Personnel Group	Professional	Management & Leadership	Core Value & Culture	Quality of Work Life	Management System
Top Management		<ul style="list-style-type: none"> <li>Strategic Leadership</li> <li>Change Leadership</li> <li>Motivation</li> <li>Visioning</li> </ul>	<b>Service &amp; society</b> <ul style="list-style-type: none"> <li>Pay Attention to Service</li> <li>Love the Work</li> <li>Social Responsibility</li> <li>Participate in Organizational Activities</li> </ul>		
Middle Management		<ul style="list-style-type: none"> <li>Strategic Leadership</li> <li>Networking</li> <li>Presentation Skill</li> <li>Business Knowledge</li> <li>Management System</li> </ul>	<b>Teamwork</b> <ul style="list-style-type: none"> <li>Accept the Team's Work</li> <li>Assist with Work in the Unit</li> <li>Listen to the Team's Opinions</li> <li>Safety Awareness</li> </ul>		
First Line Management	<ul style="list-style-type: none"> <li>Technical Training Need</li> <li>Quality Objective Plan</li> <li>Quality Plan</li> </ul>	<ul style="list-style-type: none"> <li>Performance Management</li> <li>Leadership</li> <li>Coaching</li> <li>Performance</li> <li>Presentation Skill</li> <li>Management System</li> </ul>	<b>Achievement</b> <ul style="list-style-type: none"> <li>Understand the Organization's Direction and Goals</li> <li>Strive to Succeed</li> <li>Prioritize Health</li> <li>Be a Good, Ethical Person</li> </ul>	<ul style="list-style-type: none"> <li>Happy Workplace</li> <li>Ethical Organization</li> </ul>	<ul style="list-style-type: none"> <li>ISO 9001</li> <li>ISO 14001</li> <li>ISO 45001</li> </ul>
Senior Specialist	<ul style="list-style-type: none"> <li>Technical Training Need</li> </ul>	<ul style="list-style-type: none"> <li>Expertise</li> <li>Decision Making</li> <li>Counseling</li> <li>Problem Solving</li> <li>Management System</li> </ul>	<b>Dynamics</b> <ul style="list-style-type: none"> <li>Constantly Improve and Develop Yourself</li> <li>Be Ready for Changes</li> <li>Enthusiasm</li> </ul>		
Specialist		<ul style="list-style-type: none"> <li>Expertise</li> <li>Counseling</li> <li>Problem Solving</li> <li>Management System</li> </ul>			
Senior Operation		<ul style="list-style-type: none"> <li>Team leadership</li> <li>Performance</li> <li>Management System</li> </ul>			
Staff		<ul style="list-style-type: none"> <li>Teamwork</li> <li>Functional Skill</li> <li>Problem Solving</li> <li>Counseling</li> <li>Management System</li> </ul>			
Operation		<ul style="list-style-type: none"> <li>Teamwork</li> <li>Functional Skill</li> <li>Problem Solving</li> </ul>			



In house training



Public training



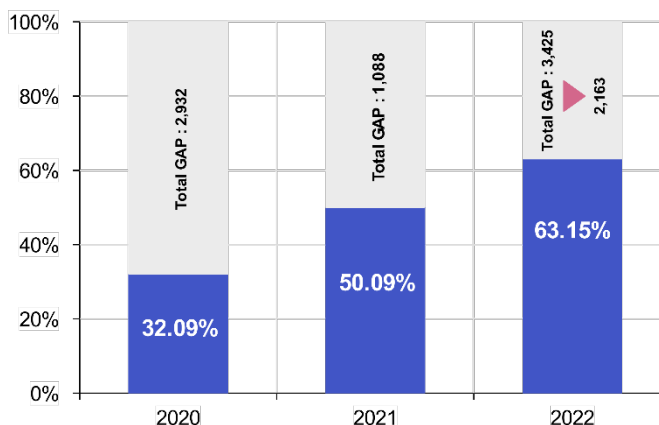
Technical training



Coaching



In 2022, the Company conducted a gap assessment from the operations group to the first-line management group, and developed skills according to the career path development framework through various channels of training courses, such as online training courses where employees can learn on their own, face-to-face courses, inhouse and public training courses, coaching and technical courses. In 2022, the gap was reduced by 63.15% from the goal of  $\geq 50\%$ .



## Skill Competition to Develop Job Skills



To upgrade the skills of employees in the welding field to be able to produce quality work that meets the welding quality standards of the American Welding Society (AWS), the Company sends technicians to develop their skills at the Rayong Institute for Skill Development continuously. In 2022, the Company held an internal welding competition and invited Mr. Bunnai Konglom, a Chor. 3 skill development instructors from the Rayong Institute for Skill Development, to join the panel to consider workpieces, with Mr. Poonphiphat Tantanasin, the CEO, presenting the awards to boost team morale. This is to incentivize the maintenance of work standards and promote career advancement for the employees' fields, creating unity and exchange of knowledge and skills.

The results from the operation in 2022 will be expanded to the skills of employees in other fields.







## Labor Development in the Education Sector

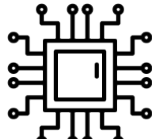


The Company places importance on the development of the Company's personnel and external stakeholders by accepting students who are interested in all fields of study for internship with the Company's units that have job characteristics that are line with the courses they are studying at each institution. The Company provides qualified main instructors and mentors for each field of study to pass on their experiences, instructions for correctly working with modern equipment, machines and programs used in work, theoretically and practically, as a way to build good industrial discipline and behaviors from the first day of training. The training involves education on work safety, related Company policies, and international standard systems. The students will be treated in the same way as Company employees throughout their internship. Students will learn by actually working to prepare them for working in the future with QTC or another domestic organization. It is a way to boost Thailand's labor competitiveness, create quality people in society and promote loyalty to the QTC.



Students from Rajamangala University of Technology Phra Nakhon  
Interning from 30 May 2022 to 15 July 2022

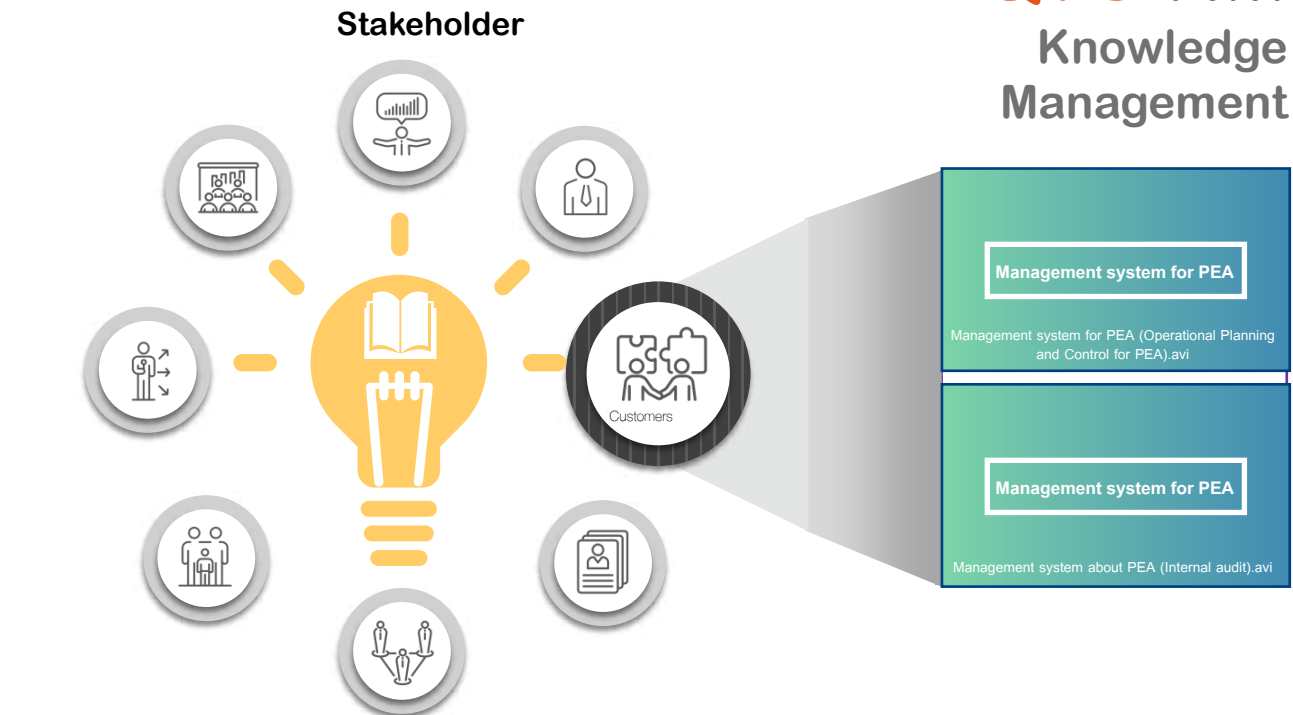
## Internship Courses in 2022



- Accounting
- Production and Robotics Engineering
- Industrial Electronics
- Industrial Business and Logistic Management

# QTC KM

## Knowledge Management

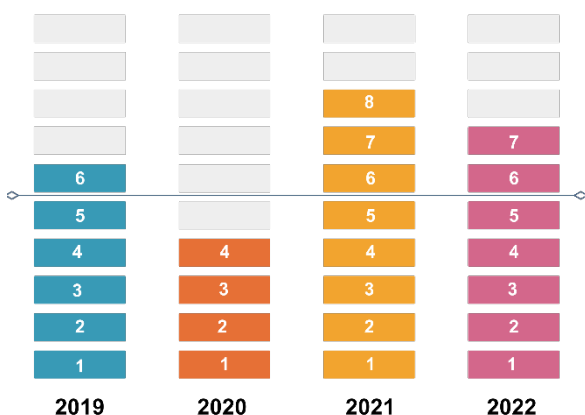


In order to pass down the “tacit knowledge” of personnel gained through experience, talent or intuition to understand things including work skills, to new generations and to educate employees in the organization, HRD has collected, created, and distribute the organization’s knowledge to the entire organization to capitalize on and use the knowledge, in addition to creating a learning culture in the organization. Knowledge is collected from personnel or documents and developed into a system so that everyone in the organization can access it and develop themselves and use the knowledge in their performance to create knowledge efficiency and effectiveness.

In 2022, the Company has increased the knowledge in customers’ work related to the production process so that employees can learn and be able to operate and produce products that meet the needs and requirements of customers for sustainable growth together with customers. KM topics have been conducted, including three production technique topics, two logistics topics, and two customer process knowledge topics.

### Organization and Consolidation of Corporate KM

#### 5 Goals per Year





## Employee Care

The Company is aware that employees are an important resource in driving the organization toward goals, paying attention to work and creating happiness in employees' lives. The Company has an important mission to provide support in the area of personnel, time and necessary resources under the happy workplace policy at <https://qtc-energy.com/th/happy-workplace-policy/>. The Company moves projects to provide knowledge and understanding through supporting activities as appropriate choices for each person. The Company's goal is to create sustainable happiness and work-life balance including attachment to the organization and lower resignation rates.

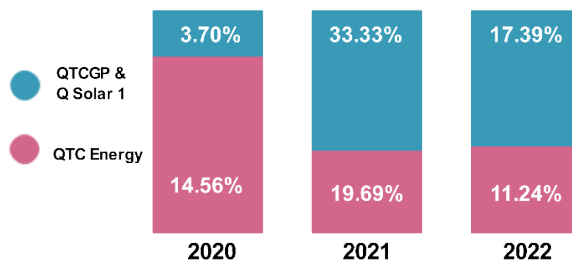


"Happy Work Life"

**Table Showing Ratios of New Entries and Dismissals**

Item	QTC Energy						QTCGP & Q Solar 1					
	2020		2021		2022		2020		2021		2022	
	Number (employee)	Percent	Number (employee)	Percent	Number (employee)	Percent	Number (employee)	Percent	Number (employee)	Percent	Number (employee)	Percent
<b>No. of Employees at End of Year</b>	<b>261</b>		<b>254</b>		<b>258</b>		<b>27</b>		<b>24</b>		<b>23</b>	
<b>New Employees</b>												
Male	21	84	45	79	22	68.75	-	-	-	-	1	100
Female	4	16	12	21	10	31.25	-	-	1	100	-	-
<b>New Employees</b>												
18-35 years old	21	84	52	91	31	96.87	-	-	1	100	1	100
36-50 years old	4	16	5	9	1	3.13	-	-	-	-	-	-
50-60 years old	-	-	-	-	-	-	-	-	-	-	-	-
> 60 years old (Retired)	-	-	-	-	-	-	-	-	-	-	-	-
<b>Dismissed Employees by Gender</b>												
Male	34	89.47	36	72	20	68.97	1	100	6	75	4	100
Female	4	10.53	14	28	9	31.03	-	-	2	25	-	-
<b>Dismissed Employees by Age</b>												
18-35 years old	32	84.21	42	84	23	79.31	1	100	3	37.50	1	25
36-50 years old	6	15.79	8	16	6	20.69	-	-	1	12.50	3	75
50-60 years old	-	-	-	-	-	-	-	-	4	50	-	-
> 60 years old (Retired)	-	-	-	-	-	-	-	-	-	-	-	-
<b>Average Dismissed Employees per Year (employees)</b>	<b>14.56</b>		<b>19.69</b>		<b>11.24</b>		<b>3.70</b>		<b>33.33</b>		<b>17.39</b>	

**Graph Showing Resignation Statistics for 2020-2022**



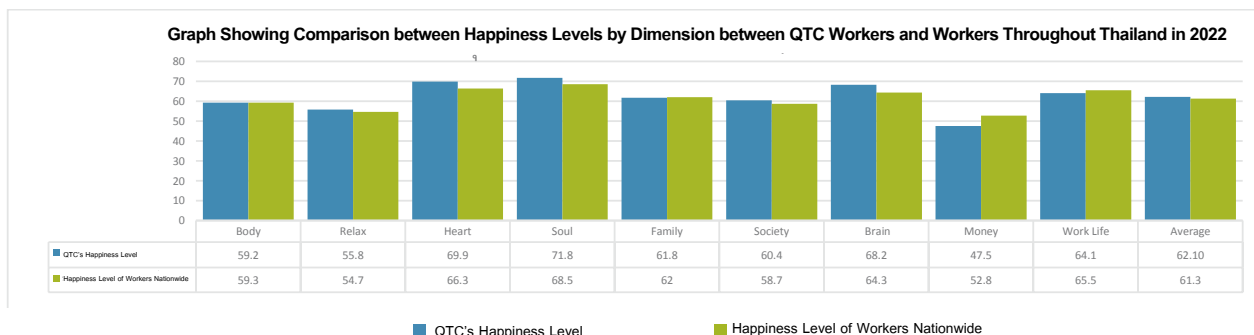
In 2022, the resignation rate for only QTC was 11.24%, while QTCGP&Q Solar 1 had a resignation rate of 17.39%. The total resignation rate in the Company Group was 11.74%. The Company achieved the goal (of not exceeding 20% per year).

## Happiness in the Organization

The Company measured happiness of QTC Energy employees continually since 2016 by using the Happinometer in an online format. In 2022, a survey was conducted in November 2022 with 128 respondents out of 258 employees and data was sent to the Thailand Centre for Happy Worker Studies, the Institute for Population and Social Research, Mahidol University, in order to study and determine happiness in various dimensions with preparing detailed summary reports as follows:



Results from surveying overall employee happiness among 128 representatives of 258 employees (only QTC Energy) showed employee happiness to be at an average of 61.10 percent, which met the criteria for “Happy”. This was a slight improvement from 2021 without achieving the goal of 75 percent. As for the results of a survey on the happiness level of workers nationwide in 2022, when compared to the happiness level of QTC workers, it was found that the average happiness level of QTC workers is only slightly higher than the happiness level of workers nationwide. A significant dimension is the “Happy Money” dimension, which is in line with the economic situation in 2022, and the “Work Life” dimension, which the Company will use to improve the happiness of people in the organization.



## Employee Attachment to the Organization

Based on the results of the employee attachment assessment in 2021, there were five areas of opportunity for improvement, including compensation, career advancement, praising and direct supervisors. The Company has used all five issues to formulate plans for the employee attachment development projects, which was implemented throughout 2022. Major projects include the following:

- “Good Saving, No Debts, No Poverty” to help solve the problem of expenses that are not balanced with income. The root of the problem is the compensation factor. Employees welcomed the program and willingly joined. Total project savings amounted to 133,700 baht.



- “Employee of the Month” to promote employees with good performance and “good people” and employees who are capable of performing their duties responsibly and with attention. “Talented” people were praised. The selection criteria were publicly announced. There may be more than one “employee of the month” per month. The root of the problem is the factor of giving importance to praise.



- “Opening Your Mind and Listen, Sipping Morning Coffee with HR” and “Black Box for Receiving Complaints” to encourage employees to have a platform to exchange ideas and workplace issues freely. The root of the problem is the misunderstanding between employees and supervisors and executives.

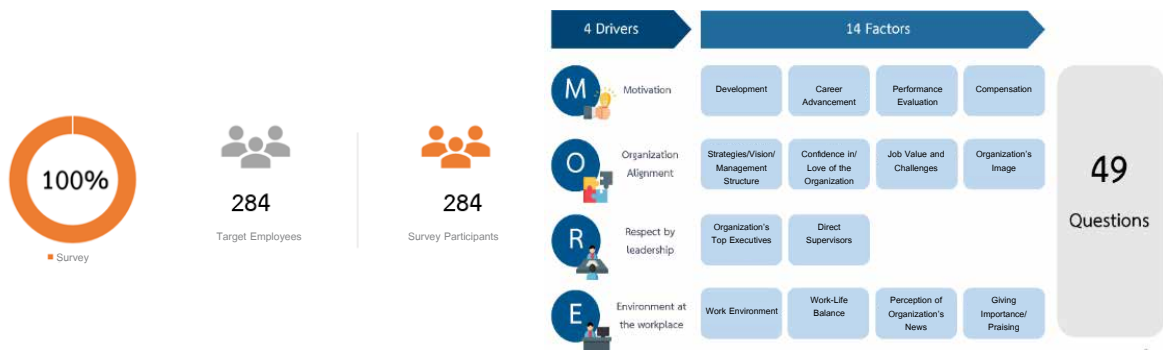


- Distribution of organizational goals to evaluate performance. The root of the evaluation of work that still has opportunities for improvement in terms of goals, indicators and agreement and understanding in measuring results together. As a result, the performance evaluation scores in 2022 increased from 0.8 points in 2021 to 0.9 points.

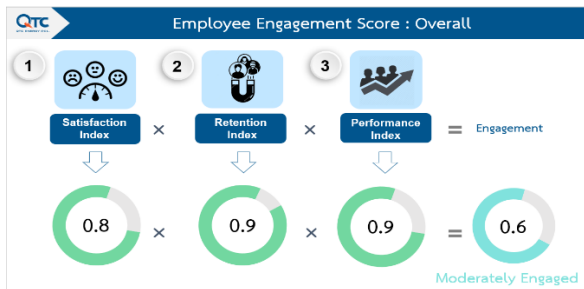


- As a result of the implementation of the project plan, the engagement score in 2022 has increased significantly, with 284 target employees covering QTC Energy, QTCGP and Q Solar 1 answering 100% of the survey questions divided into 4 drivers (MORE) and 14 factors for a total of 49 + 2 questions, using an application developed by Human Achievement Service Co., Ltd.

### Employee Attachment to the Organization in 2022



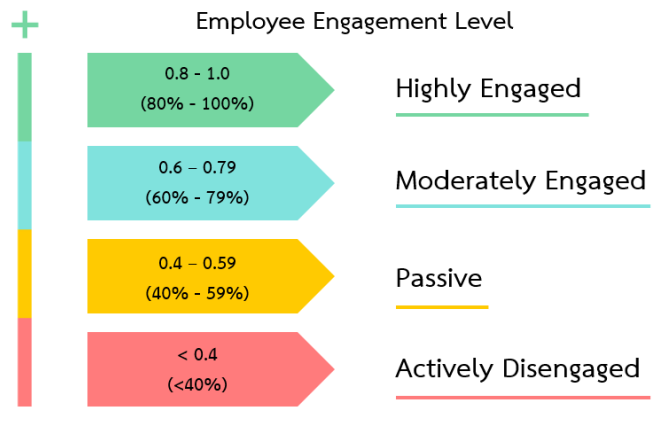
### Summary of Results from Attachment Assessment



Score Group	Year of Operation	
	2021	2022
Satisfaction Index	0.8	0.8
Retention Index	0.9	0.9
Performance Index	0.9	0.9
Total	0.5	0.6

According to table employee engagement assessment for 2022 for the entire organization, all 3 areas received a score of 0.6 or 64 %, which was “Moderately Engaged”, compared to the score of 0.5 or 58% in 2021, which was “Passive”. This resulted from the employee engagement efforts as reported above.

However, the score has not achieved the goal of >80%. The Company will use the factors found for improvement and continue to implement the project.





## Organization Happiness Support Activities

The Company continues to promote activities to support employees in having positive attitude toward employees, colleagues, the organization and society. Most activities were activities in projects continuing from the previous year for consistency and sustainability.

### “Happy Money, Good Living, No Debts, No Poverty” Project

The Company continues to encourage its employees to live sufficiently and to make their time off from work useful and earn extra income for themselves. In 2022, the employees expanded their vegetable garden at the dormitories to their houses. Employees grow their vegetables at home and exchange and sold them to the kitchen employees to help reduce the cost of buying vegetables in the market and ensure that the vegetables are chemical-free. Moreover, the employees give their friends the opportunity to visit their gardens to share knowledge and to promote good relationships among co-workers.



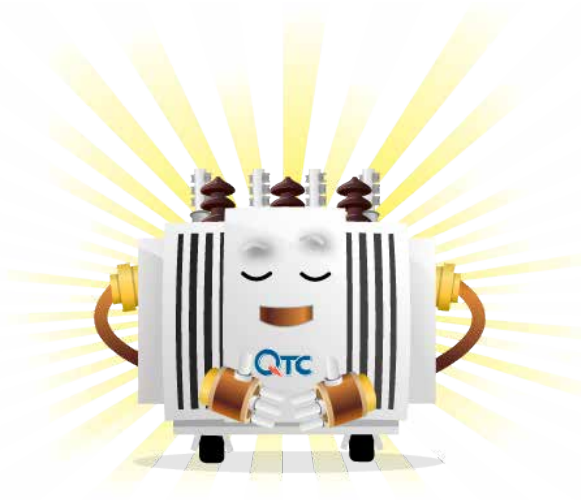
### Happiness from Good Money Allocation



### Morals & Ethics Promotion Activities in 2021

The Company continues to place importance on and promote moral and ethical actions among employees in order for employees to be good, responsible to themselves and surrounding persons through the following activities:

### Happiness from Having Ethics Regarding Oneself and Others





# Photograph Competition to Support the Family 2025

"Happiness in a Warm Family"



## Winners of 2022



ความรัก ความห่วงใย การก่อศุขให้ครอบครัวสมบูรณ์

"A Warm Family"  
Raphiphon Suphisa



"I Love My Mother the Most  
Because She's My Best Love"  
Arisa Banglap



"I Love My Father the Most  
Because He's My Best Love"  
Saniya Sailun

## Employee Value Promotion 2022

In 2022, the Company awarded certificates to employees who worked for twenty years and employees who worked for ten years. Certificates were awarded to employees during the 2023 New Year's activities. The following persons received awards:

No.	First Last Name	Position	Level	Award	No.	First-Last Name	Position	Level	Award
1	Mr. Somchai Muakphimai	Assembly Employee	4	20 years	13	Mr. Phot Wongkham	Assistant Managing Director	12	10 years
2	Miss Chalalai Phaengmi	Coiling Employee	3	20 years	14	Mrs. Thipwimon Thawonchat	CSR Manager (Senior)	10	10 years
3	Miss Watchari Wararat	Assembly Employee	1	20 years	15	Mr. Anucha Saribun	Warehouse Employee	2	10 years
4	Mr. Ruangchai Kritsnakriengkrai	Managing Director	-	10 years	16	Mrs. Chutima Wichainet	Engineering Support Employee	2	10 years
5	Miss Surirat Chaikhamaeng	Coiling Employee	2	10 years	17	Mr. Natthawut Ninthet	Research and Development Chief	7	10 years
6	Miss Supharat Khuanmai	Coiling Employee	1	10 years	18	Miss Kanokwan Sutsitha	Administrator		10 years
7	Mr. Suksan Munsan	Installation Technician	2	10 years	19	Mr. Chamnong Singkha	Security Deputy Chief		10 years
8	Mr. Niphon Baophandung	Coiling Employee	2	10 years	20	Mr. Sanong Namnu	Security Officer		10 years
9	Mr. Witthaya Phanphama	Amorphous Steel Core Employee	2	10 years	21	Miss Oraphan Chaengsa-ad	Gardener		10 years
10	Mrs. Pawina Chaidi	Procurement Chief (Senior)	8	10 years	22	Mrs. Nipha Phaphak	Gardener		10 years
11	Miss Nathaphon Chitamaha	Cost Accountant	5	10 years	23	Miss Phiraya Malison	Gardener		10 years
12	Mrs. Wipha Rueangrit	HR Manager (Senior)	10	10 years	24	Mr. Sommai Philali	Security Officer		10 years



## Recreation Activities in 2022

### Annual Vacation



Happy Relax

**“Rest, if you’re stressed.  
Learn how to relax.”**



### The Long-Awaited Trip to Enjoy Travelling and Reforestation on Mother’s Day

In 2022, the Company organized the annual vacation trip after a two-year hiatus during the Covid-19 pandemic. The regular tourism activities still use the same conservation format to share benefits with the society and environment. “The Long-Awaited Trip, Enjoy Travelling and Reforestation on Mother’s Day” activity is an activity where employees volunteer to participate in mangrove planting activities at the Sirindhorn International Environmental Park, and enjoy fun activities while relaxing in nature at Fuengfah Sangmanee Resort, Kaeng Krachan, Phetchaburi. 123 Employees attended various activities, spending a total budget of 517,239 baht.



### New Year’s Eve, New Year’s Trip, Annual Vacation



The Company organized the “New Year’s Eve Activities to Welcome 2023” under COVID-19 prevention measures to allow employees to relax and resume activities together after a two-year hiatus. At the event, various awards were given to employees who performed during the year, and there were activities for employees to enjoy to create unity and good relationships. The gathering was also an opportunity to review policies and changes during the year for the employees’ acknowledgement. In addition, employees who attended the event were eligible to win cash prizes worth more than 490,000 baht, a total budget of 675,172.22 baht was spent.



















# Role in Social-Community Development



## "Happiness from a Good Society"

In the past, most capitalist businesses were understood to work for profit without concern for social and environmental impacts with larger businesses causing greater impacts such as use of natural resources for production without concern for impacts on community members who share resources, causing community members to not accept and resist businesses, which may ultimately cause businesses to close. Currently, corporate social responsibility (CSR) plays major role in determining short-term and long-term business strategies in order to create sustainability for organizations, people in society and the environment as an expression of responsibility for direct or indirect impacts from business operations on society, communities and the environment. Corporate social responsibility may require investments in the short term and may give returns to the organization in other forms such as acceptance and support from communities, resulting in a license to operate. If an organization can cooperate with the community to develop the organization and communities, including the environment, to grow with responsibility, the organization will gain a license to grow. Therefore, CSR or corporate social responsibility is important in creating sustainability for the organization.


Based on impact assessment of the all steps of the work process, both positive and negative, covering economic, environmental, social and human rights aspects, the following risks and opportunities were found:

Key Topics	Economic	Environmental	Social	Human Rights
				
	Impact	Impact	Impact	Impact
■ Social Responsibility	<div> Trust and acceptance by society to conduct business activities.</div> <div> Reduces community burdens or state subsidy for the underprivileged which may not be enough.</div> <div> High social investment costs.</div>	<div> Promotion of or participation in environmental responsibility in the community.</div> <div> Environmental impacts may occur from social activities.</div>	<div> Good, inviting society and community with understanding and generosity toward each other.</div> <div> Social resistance may occur if not accepted by the community.</div>	<div> Receive equal opportunity.</div> <div> Discrimination may occur in some groups if not properly controlled.</div>

QTC recognizes the importance of corporate social responsibility because the Company believes corporate social responsibility is not only an expression to create a good image for product brands or the Company, but a real effort beginning with CSR in process and expanding into CSR after process by appropriately applying ISO26000 standard practice guidelines to the contexts of QTC and every subsidiary. The Company prepared corporate social responsibility personnel and allocated operating budgets with appropriate approval from the Board of Directors. The Company uses the strategy to build trust from stakeholders to ensure that every business process of the Company that causes social and environmental impacts is controlled and modified to reduce impacts as much as possible along with building participation in developing communities and the environment in every area based on capabilities of the organization and personnel by prioritizing participation in community development and social investment to create sustainability.

**Objective:** To gain trust and support from stakeholders in communities where the Company or subsidiaries are located.


**Management:** ISO26000 corporate social responsibility standards, ISO14001 environment management standards, sustainable development policy, the Corporate Sustainability and Risk Management Committee and “Communities Meet QTC” activities.

 1 : Zero complaints from communities due to impacts from business operations of the Company or subsidiaries.

 : In 2022, the Company had no complaints from communities or society.

 2 : At least one community development project for public benefit per year.

 : In 2022, one community development project for public benefit was launched. The Company did not achieve the goal.

 3 : Approval in public hearings from stakeholders in communities in cases with need for transparent public hearings in compliance with the law.

 : In 2022, the Company and every subsidiary had no need to hold public hearings.

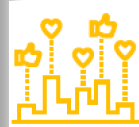
## QTC Meets Communities

After the easing of the COVID-19 situation and everyone returned to their normal routines, the Company held the “QTC Meets Communities” again on 27 September 2022. Mr. Poonphiphat Tantanasin, the CEO, opened his own house to welcome community representatives from local government agencies, schools and hospitals and community leaders to exchange ideas for jointly developing the Map Yang Phon community for sustainable growth. The Company used this opportunity to report on the environmental, social and governance performance to the attendees, and also inquired about their concerns. A total budget of 28,305 baht was spent.

From the discussion, the community proposed that the Company sponsor local youth development projects such as:

- The community wanted the Company to give schools opportunities to bring students to study about work for learning and to inspire them with real experience, starting with elementary students.
- The QTC upcycling project from waste materials (paper) to craft dolls and sell them as income for students. The community asked for QTC to train students and help them find marketing channels.
- Science Camp Project: The community requested that the Company sponsor a science camp at schools since the Company has personnel with good knowledge, skills and educational network. This is to encourage students to seek new experiences and have equal opportunities to students in large urban areas.

In all these issues, the Company is willing to cooperate and support in all aspects related to education by tasking the CSR Unit with the responsibility in coordinating and preparing projects with schools in the future.



At the end of 2022, the CSR team started the first project, “Upcycling Dolls from Waste Paper”, by visiting “Ban Map Toei” and “Ban Map Yang Phon” schools to prepare various equipment for teaching (the Company invested in all the equipment). The schools arranged special periods for students who were interested in participating in the training. The Company is willing to buy paper doll key chains from students at the price of 15 baht each, which will start from January 2023 onward. Paper dolls obtained from the students will be used by CSR in employee birthday activities in the organization. Moreover, the Company also helped to communicate about marketing via social media channels so that students can sell directly to interested external outside buyers as well.



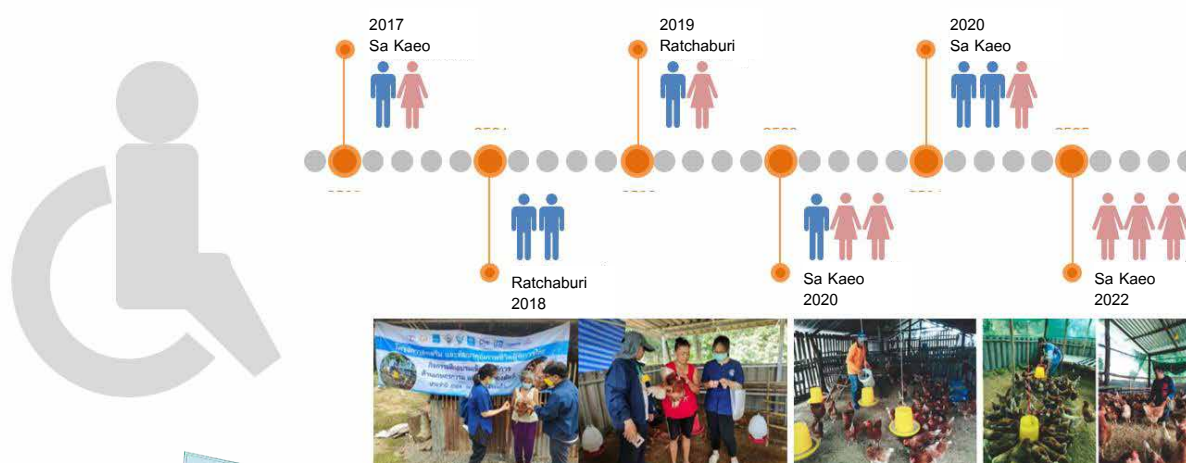


## Participation in Community Development

### Quality of Life Promotion and Development Project for Thai Disabled Persons

In 2022, the Company participated in the Quality of Life Promotion and Development Project for Thai Disabled Persons by providing vocational training in the animal husbandry course (egg chickens) and providing egg chickens and structures for three disabled persons. The Company spent 342,735 baht to provide vocational education. Project operations were under the responsibility of the Thai Chamber of Commerce. The Company has continuously conducted vocational training for persons with disabilities under Section 35 for a period of six years, with a total of 15 persons with disabilities under the project and with a total contract value of 1,679,730 baht.

**Image Summarizing the Number of Persons with Disabilities Sorted by Gender for Each Province Supported by the Company**



### Outstanding Sustainability Model Organization in the Thai Capital Market for Supporting Persons with Disabilities



**Mr. Poonphiphat Tantanasin**, the CEO, received an award for “Outstanding Sustainability Model Organization in the Thai Capital Market for Supporting Persons with Disabilities in 2022. The event was organized by the SEC Office in collaboration with the Ministry of Labor, Department of Skill Development, Department of Employment, Department of Empowerment of Persons with Disabilities, and Disabilities Thailand. The event was presided over by Mr. Boonchob Suttamanuswong, Permanent Secretary of the Ministry of Labor, who presented the award to reinforce the policy of prioritizing and driving human rights in the Thai Capital Market sector at the Grand Ballroom, Grand Hyatt Erawan Hotel, on 21 November 2022.

In 2022, the Company participated in the launch of the project to improve the quality of life for persons with disabilities and presented certificates for passing training to all three persons with disabilities, with Ms. Suripon Mitthamma, Assistant Managing Director for Corporate Sustainability Development and Administration on 24 December 2022 at Ban Dan, Aranyaprathet, Sa Kaeo. In 2023, the Company sponsored one additional person with disability to raise egg chickens, which is more than legally required under Section 35, with the target area being in Ratchaburi.



#### People with Disabilities Sponsored with Egg Chickens in 2022



Mrs. Suphanni Thaman Age: 38 years old

Person with Intellectual Disability

Living in Tun Village, Ban Dan, Aranyaprathet, Sa Kaeo



Mrs. Boonyong Salumlumguan Age 46 years old

Person with a mobility or physical disability

Living in Tun Village, Ban Dan, Aranyaprathet, Sa Kaeo

#### Example of a Successful Person with Disability

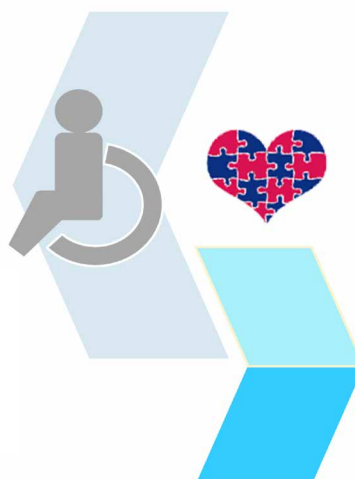
Mrs. Phim Chitphon, aged 70 years, is a person with mobility or physical disability living in Tun Village, Ban Dan, Aranyaprathet, Sa Kaeo. Before joining the project, her main income was her senior citizen's benefits of 700 baht per month and disability benefits of 600 baht per month. After joining the egg chicken farming program, Mrs. Phim said, "I have more knowledge and my living has improved." By joining the egg chicken farming program and studying farming methods from people with first-hand experience, Mrs. Phim has been earning about 3,000 baht per month from selling chicken eggs. Moreover, her physical condition has noticeably improved due to eating more chicken eggs and exercising from having to care for chickens every day.



**Consent for has been given for the disclosure of the pictures and addresses of the disabled persons under the care of the Company by the disabled persons participating in the project.**



## Procurement Projects to Support Disabled Persons



### Special People's Home Social Enterprise

This project is an ongoing project from discussions in 2017. The Company continued to support goods from disabled persons in the Wheelchair Home community, which has registered as an enterprise called "Special People's Home Social Enterprise", offering a variety of products. In 2022, the Company continues to support products such as the following:

- Cleaning cloths: 1,675 kg valued at 30,150 baht.
- Thongmuan for employees' birthday presents: 283 containers valued at 10,989 baht.



### Minburi Rehabilitation Center for Special Children

The Company coordinated with the Ku Pai Rom Sai Foundation to order Indian rubber tree products from parents of children with autism at the Minburi Rehabilitation for Special Children by sending monthly payments throughout 12 months. The products are given as gifts for employees in their birth month. In 2022, a total of 283 trees were purchased for a total of 28,300 baht.

## Q Solar 1 Opens the Power Plant for Students to Visit and Learn



On 16 August 2022, Q Solar 1 opened a power plant for visits by students in a field trip project to view places of operation. From Kabinburi Vocational Education Institute, over 40 students visited to learn about solar cell function and solar energy technology. Mr. Chanwut Meeploi, Managing Director, welcomed and educated the students.

## "Unite Local Brothers and Sisters" Project in 2022



This is an activity that is held continuously every year (except in 2020 – 2021 due to Covid-19 cases near the factory). Employees who live locally wrote about the project and proposed it to the Company to request a CSR budget for the year for developing their hometown, creating pride for employees who are part of QTC and bringing good opportunities to the community. In 2022, the "Do Good for the Little Ones" by Ms. Chuthamani Rotchansaeng, a chassis employee and founder of the project, received a budget along with 20 volunteers to pour concrete in front of the preschool, strip insulation, spray anti-rust paint on the roof of the meeting hall building, paint the school building and repair electrical equipment at Ban Noen Din Daeng School in Tha Mai, Tha Mai, Chanthaburi, on 3 – 4 December, spending a total budget of 37,260.50 baht.



## Social Investment

Regarding investments for society, in 2022, no actions were taken due to the COVID-19 pandemic.





## Activities for Society

### Donations

**Monetary Donation:** The Company donated 100,000 baht on 22 June 2022 to support the construction of an outpatient building extension for the extended OPD of Chula Hospital to the Thai Red Cross Society to accommodate more patients.



### Relief Bags for Covid-19 Patients in the Map Yang Phon Community

In early 2022, there was another breakout of a new COVID-19 strain, causing an increase in community infections. Therefore, the Company has donated relief bags to the Map Yang Phon SAO to distribute to relieve the suffering of the people in the area, and helped assemble beds for field hospitals in the community to accommodate patients.

### Project to Conduct Public Emergency Drills within Educational Institutions

The Company communicated knowledge about fire evacuation to students in the Project to Conduct Public Emergency Drills within Educational Institutions together with local government agencies at Map Yang Phon Witthayakhom School on 17 August 2022.





## Community Reforestation Project



The Company participated in reforestation activities with the Map Yang Phon SAO in the community reforestation project aimed at increasing green space in the industrial district and Map Yang Phon Communities on 26 August 2022.



## Echoes from Community Representatives



*“QTC has always been an organization that supports society and education agencies to develop into sustainable quality youth. Thank you for your continued support of Map Yang Phon Witthayakhom School.”*

*Mr. Phalanop Buranchai*

*Principal of Map Yang Phon Witthayakhom School*

In 2022, there were no complaints from the community and society.

# GRI Content Index

## About This Report

QTC has reported in accordance with the GRI Standards: 2021 by specifying organization content and data, management guidelines and key sustainability issues in 2022 with coverage of economic, environmental, social and human rights performance along with considering association to every stakeholder group under these criteria and reporting scope:

<b>Period of Report</b>	: 1 January 2022 to 31 December 2022
<b>Report Cycle</b>	: Annual
<b>Names of Companies and Subsidiaries</b>	: QTC Energy Public Co., Ltd. QTC Global Power Co., Ltd. Q Solar 1 Co., Ltd.
<b>Report Quality Assurance</b>	: This report's significant contents were reviewed by the Corporate Sustainability Promotion and Risk Management Committee 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.
<b>Previous Report</b>	: Sustainability Report 2021, QTC Energy Public Co., Ltd. <a href="https://qtc-energy.com/wp-content/uploads/2022/04/QTC-SD-Report-2021-thai-Final.pdf">https://qtc-energy.com/wp-content/uploads/2022/04/QTC-SD-Report-2021-thai-Final.pdf</a>
<b>Inquiry</b>	: To inquire for more information or make proposals, contact the Corporate Sustainability Development Department, QTC Energy Public Co., Ltd. Email: <a href="mailto:sustainability@qtc-energy.com">sustainability@qtc-energy.com</a> Tel: 038-891-1411-3 ext. 111 or 084-362-8633

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



# GRI Content Index

Statement of use	QTC Energy PCL. has reported in accordance with the GRI Standards for the period 1 January 2022 to 31 December 2022.
GRI 1 used	GRI 1: Foundation 2021
Applicable GRI Sector Standard(s)	No sector guidelines apply.

## General disclosures

GRI STANDARD/ OTHER SOURCE	DISCLOSURE	LOCATION		OMISSION
		SD Report	56-1 One Report	
<b>GRI 2: General Disclosures 2021</b>	2-1 Organizational details	p.5-9		
	2-2 Entities included in the organization's sustainability reporting	p.12,179		
	2-3 Reporting period, frequency and contact point	p.179		
	2-4 Restatements of information			There are no restatements of information in this report
	2-5 External assurance			Did not seek certification from a third party.
	2-6 Activities, value chain and other business relationships	p.18		
	2-7 Employees	p.12,144-145		
	2-8 Workers who are not employees	p.12		
	2-9 Governance structure and composition	p.12	p.64	
	2-10 Nomination and selection of the highest governance body		p.73-74	
	2-11 Chair of the highest governance body		p.70	
	2-12 Role of the highest governance body in overseeing the management of impacts	p.44	p.74-75	
	2-13 Delegation of responsibility for managing impacts	p.43-44		
	2-14 Role of the highest governance body in sustainability reporting	16		
	2-15 Conflicts of interest		p.87-88, p.90-93	
	2-16 Communication of critical concerns	p.20-24,26		
	2-17 Collective knowledge of the highest governance body	p.35	p.6-12	
	2-18 Evaluation of the performance of the highest governance body	p.36-37		
	2-19 Remuneration policies		p.201	
	2-20 Process to determine remuneration		p.73-74	
	2-21 Annual total compensation ratio	p.59	p.85-86	

GRI STANDARD/ OTHER SOURCE	DISCLOSURE	LOCATION		OMISSION
		SD Report	56-1 One Report	
	2-22 Statement on sustainable development strategy	p.28		
	2-23 Policy commitments	Our policy commitments: <a href="https://qtc-energy.com/th/sustainability-policy/">https://qtc-energy.com/th/sustainability-policy/</a>		
	2-24 Embedding policy commitments	p.31,53,60, 68,79,84,92, 99,113,124, 142,148,154, 170		
	2-25 Processes to remediate negative impacts	<a href="https://qtc-energy.com/wp-content/uploads/2021/10/01-Anti_Corruption.pdf">https://qtc-energy.com/wp-content/uploads/2021/10/01-Anti_Corruption.pdf</a>		
	2-26 Mechanisms for seeking advice and raising concerns	<a href="https://qtc-energy.com/wp-content/uploads/2021/10/01-Anti_Corruption.pdf">https://qtc-energy.com/wp-content/uploads/2021/10/01-Anti_Corruption.pdf</a>		
	2-27 Compliance with laws and regulations	p.41		
	2-28 Membership associations	p.9		
	2-29 Approach to stakeholder engagement	p.18-24		
	2-30 Collective bargaining agreements	p.151		Not applicable
Material topics				
GRI 3: Material Topics 2021	3-1 Process to determine material topics	p.25-26		
	3-2 List of material topics	p.26		
Economic performance				
GRI 3: Material Topics 2021	3-3 Management of material topics	p.53-54		
GRI 201: Economic Performance 2016	201-1 Direct economic value generated and distributed	p.56-59		
	201-2 Financial implications and other risks and opportunities due to climate change	p.107-111	p.23	
	201-3 Defined benefit plan obligations and other retirement plans	p.146	p.80	
	201-4 Financial assistance received from government	p.58		
Market presence				
GRI 3: Material Topics 2021	3-3 Management of material topics	p.142-143		
GRI 202: Market Presence 2016	202-1 Ratios of standard entry level wage by gender compared to local minimum wage	p.144-145,147		
	202-2 Proportion of senior management hired from the local community	P.12		
Indirect economic impacts				
GRI 3: Material Topics 2021	3-3 Management of material topics			
GRI 203: Indirect Economic Impacts 2016	203-1 Infrastructure investments and services supported	p.58		
	203-2 Significant indirect economic impacts	p.2-3,57-58		
Procurement practices				
GRI 3: Material Topics 2021	3-3 Management of material topics	p.79		

GRI STANDARD/ OTHER SOURCE	DISCLOSURE	LOCATION		OMISSION
		SD Report	56-1 One Report	
<b>GRI 204: Procurement Practices 2016</b>	204-1 Proportion of spending on local suppliers	p.82		
<b>Anti-corruption</b>				
<b>GRI 3: Material Topics 2021</b>	3-3 Management of material topics	p.31-32		
<b>GRI 205: Anti- corruption 2016</b>	205-1 Operations assessed for risks related to corruption	p.39		
	205-2 Communication and training about anti-corruption policies and procedures	p.40		
	205-3 Confirmed incidents of corruption and actions taken	p.42		
<b>Materials</b>				
<b>GRI 3: Material Topics 2021</b>	3-3 Management of material topics	p.113-114		
<b>GRI 301: Materials 2016</b>	301-1 Materials used by weight or volume	p.122		
	301-2 Recycled input materials used	p.122		
	301-3 Reclaimed products and their packaging materials	p.122		
<b>Energy</b>				
<b>GRI 3: Material Topics 2021</b>	3-3 Management of material topics	p.113-p.114		
<b>GRI 302: Energy 2016</b>	302-1 Energy consumption within the organization	p.115-116		
	302-2 Energy consumption outside of the organization	P.115-p.118		
	302-3 Energy intensity	P.116		
	302-4 Reduction of energy consumption	p.107-110		
	302-5 Reductions in energy requirements of products and services	p.111		
<b>Water and effluents</b>				
<b>GRI 3: Material Topics 2021</b>	3-3 Management of material topics	p.113-p.114		
<b>GRI 303: Water and Effluents 2018</b>	303-1 Interactions with water as a shared resource	p.120-121		
	303-2 Management of water discharge-related impacts	p.95-96		
	303-3 Water withdrawal	p.120-121		
	303-4 Water discharge	p.120-121		
	303-5 Water consumption	p.120-121		
<b>Emissions</b>				
<b>GRI 3: Material Topics 2021</b>	3-3 Management of material topics	p.99-101		
<b>GRI 305: Emissions 2016</b>	305-1 Direct (Scope 1) GHG emissions	p.103		
	305-2 Energy indirect (Scope 2) GHG emissions	p.103		
	305-3 Other indirect (Scope 3) GHG emissions	p.103		
	305-4 GHG emissions intensity	p.104		
	305-5 Reduction of GHG emissions	p.107-111		



GRI STANDARD/ OTHER SOURCE	DISCLOSURE	LOCATION		OMISSION
		SD Report	56-1 One Report	
Waste				
GRI 3: Material Topics 2021	3-3 Management of material topics	p.84-85		
GRI 306: Waste 2020	306-1 Waste generation and significant waste-related impacts	p.86		
	306-2 Management of significant waste-related impacts	p.87-88		
	306-3 Waste generated	p.88		
	306-4 Waste diverted from disposal	p.89		
	306-5 Waste directed to disposal	p.88		
Supplier environmental assessment				
GRI 3: Material Topics 2021	3-3 Management of material topics	p.79		
GRI 308: Supplier Environmental Assessment 2016	308-1 New suppliers that were screened using environmental criteria	p.82		
	308-2 Negative environmental impacts in the supply chain and actions taken	p.81		
Employment				
GRI 3: Material Topics 2021	3-3 Management of material topics	p.142-143,154-155		
GRI 401: Employment 2016	401-1 New employee hires and employee turnover	p.163		
	401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees	p.147		
	401-3 Parental leave	p.152		
Occupational health and safety				
GRI 3: Material Topics 2021	3-3 Management of material topics	p.124-125		
GRI 403: Occupational Health and Safety 2018	403-1 Occupational health and safety management system	p.126-127		
	403-2 Hazard identification, risk assessment, and incident investigation	p.126		
	403-3 Occupational health services	p.137-138		
	403-4 Worker participation, consultation, and communication on occupational health and safety	p.131-132		
	403-5 Worker training on occupational health and safety	p.129-130		
	403-6 Promotion of worker health	p.139-141		
	403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	p.128,132-134, p.137-138		
	403-8 Workers covered by an occupational health and safety management system	p.135-136		
	403-9 Work-related injuries	p.135-136		
	403-10 Work-related ill health	p.139		

GRI STANDARD/ OTHER SOURCE	DISCLOSURE	LOCATION		OMISSION
		SD Report	56-1 One Report	
Training and education				
GRI 3: Material Topics 2021	3-3 Management of material topics	p.154-155		
GRI 404: Training and Education 2016	404-1 Average hours of training per year per employee	p.156-157		
	404-2 Programs for upgrading employee skills and transition assistance programs	p.158-161		
	404-3 Percentage of employees receiving regular performance and career development reviews	p.158		
Diversity and equal opportunity				
GRI 3: Material Topics 2021	3-3 Management of material topics	p.142-143		
GRI 405: Diversity and Equal Opportunity 2016	405-1 Diversity of governance bodies and employees	p.12		
	405-2 Ratio of basic salary and remuneration of women to men	p.144-146		
Forced or compulsory labor				
GRI 3: Material Topics 2021	3-3 Management of material topics	p.142-143		
GRI 409: Forced or Compulsory Labor 2016	409-1 Operations and suppliers at significant risk for incidents of forced or compulsory labor	p.148-151,153		
Security practices				
GRI 3: Material Topics 2021	3-3 Management of material topics	p.142-143		
GRI 410: Security Practices 2016	410-1 Security personnel trained in human rights policies or procedures	p.151		
Local communities				
GRI 3: Material Topics 2021	3-3 Management of material topics	p.170-171		
GRI 413: Local Communities 2016	413-1 Operations with local community engagement, impact assessments, and development programs	p.172-178		
	413-2 Operations with significant actual and potential negative impacts on local communities	p.170		
Supplier social assessment				
GRI 3: Material Topics 2021	3-3 Management of material topics	p.79		
GRI 414: Supplier Social Assessment 2016	414-1 New suppliers that were screened using social criteria	p.82		
	414-2 Negative social impacts in the supply chain and actions taken	p.81		
Customer health and safety				
GRI 3: Material Topics 2021	3-3 Management of material topics	p.68-69		
GRI 416: Customer Health and Safety 2016	416-1 Assessment of the health and safety impacts of product and service categories	p.68		
	416-2 Incidents of non-compliance concerning the health and safety impacts of products and services	p.78		

GRI STANDARD/ OTHER SOURCE	DISCLOSURE	LOCATION		OMISSION
		SD Report	56-1 One Report	
Marketing and labeling				
GRI 3: Material Topics 2021	3-3 Management of material topics	p.68-69		
GRI 417: Marketing and Labeling 2016	417-1 Requirements for product and service information and labeling	p.70-74		
	417-2 Incidents of non-compliance concerning product and service information and labeling	p.78		
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Customer privacy				
GRI 3: Material Topics 2021	3-3 Management of material topics	p.68-69		
GRI 418: Customer Privacy 2016	418-1 Substantiated complaints concerning breaches of customer privacy and losses of customer data	p.78		



คุณภาพแห่งความปรารถนา  
**QUALITY OF DETAILS >>**  
D - DYNAMICS E - ENVIRONMENT  
T - TEAMWORK A - ACHIEVEMENT  
I - INNOVATION L - LEADERSHIP S - SERVICE

**บริษัท คิวทีซี เอนเนอร์ยี จำกัด (มหาชน)**

เลขที่ 2/2 ซ. กรุงเทพกรีฑา 8 แขวง 5

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