

Sustainable Development

BCPG Group realizes business ethics and responsibility to create and fortify sustainable development in line with the UN Sustainable Development Goals (SDGs), five of which directly correspond to strategies and activities pursued by the group.



SDG
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Affordable and Clean Energy

Clean energy is the core business of BCPG Group. All investment in businesses under the Company's mission are designed for development of affordable and clean energy for all people in society and direct promotion of a higher share of clean energy of the overall energy consumption. Moreover, maintenance of high operating efficiency directly supports the intention of SDG 7 on increasing energy consumption efficiency (7.2) and sharing of expertise and resources of the Group with communities and society, such as donation and installation of solar panels in remote communities for them to gain access to affordable and clean energy (7.1).

BCPG's businesses involve the hiring of employees of the Company, joint ventures and contractors, involving directly the economic growth at both small-scale community level and the larger scale of the national level. The Group is fully committed to being a responsible corporate citizen with full respect for and compliance with the human rights of employees, workers of joint ventures and contractors (SDG 8.5, 8.7 and 8.8), as well as to the maximum efficiency of resource utilization of work processes (SDG 8.5). Meanwhile, the Group recognizes the value of and actively promotes the development of the local economy through employment and professional training as well as development of people in the community (SDG 8.5) and continuously develops technology and innovation to increase the effectiveness of the local and the national economy (SDG 8.2), focusing on economic development with zero negative impact on the environment (8.4).

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Decent Work and Economic Growth

SDG
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Industry, Innovation and Infrastructure

The identity of the Group is an innovative organization able to effectively deploy technology and creativity for business development. With this identity, BCPG Group tirelessly focuses on and promotes investment on innovations to support the development of infrastructure relying on clean and reliable energy (SDG 9.4 and 9.5).

SDG
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Sustainable Cities and Communities

One of the Group's missions is the deployment of renewable energy and innovations to develop and nourish sustainability with a renewable or circular economy concept. Modern consumers can generate and consume their own power, as well as exchanging among consumers optimizing energy consumption, especially whenever energy surplus becomes available. This changing energy platform is the beginning of the development of a Smart Community, of which high-potential infrastructure of clean energy is the critical part to cope with future settlement of human beings capable of encountering changes to become sustainable (SDG 11.3, 11.5 and 11.6).

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Climate Action

Generating power from renewable sources to replace energy from fossil fuels is crucial to the reduction of greenhouse gas emissions. The businesses of the Group are therefore significantly involved in the efforts to mitigate impacts of climate change (SDG 13.3). Besides, under the vision to become a leading business organization in renewable energy with sustainable and uninterrupted operation, the Group needs to manage its operations with appropriate risk management of climate change to protect its clean-energy businesses which might be impacted by climate fluctuation from time to time (SDG 13.1 and 13.3).



Sustainable Business Development Policy

To strive for a sustainable corporate culture and achieve its SDG targets, BCPG Group has launched a sustainable business development policy, including operation framework, data collection and work planning. The policy focuses on creation of values in three dimensions: economic value or Growth, social value or Good, and environmental value or Green, all under the foundation of good governance. The policy, approved on April 17, 2018, contains the following details.



Sustainable Business Development Policy of BCPG Public Company Limited

- **Good corporate governance**

Operate and manage businesses with transparency and good governance, a stringent anti-corruption policy and comprehensive risk management of the entire value chain.

- **Collaboration with all sectors to promote sustainable development**

Collaborate with government agencies, business entities, communities and civil society to promote sustainable development through the encouragement of law and regulation formulation for raising public awareness, particularly on environment and energy conservation.

- **Enhancing community energy security**

Promote and support development of the local economy and community development with a focus on shared value creation through assistance on providing community accessibility to sustainable and reliable energy sources.

- **Minimizing all environmental impacts**

Minimize all environmental impacts of the businesses and integrate the move with the principle of circular economy to reduce resource consumption and waste.

- **Responses to customers' needs and protection of customers' private data**

Manage responses to customers' needs with the highest possible efficiency, protect individual data privacy including online with state-of-the-art technology and the best possible data security systems.

- **Creative business growth with environmentally friendly innovations**

Consistently develop businesses with creative green innovations and technology compatible with the business strategy of maximizing value.

- **Developing organizational capability throughout the value chain**

Increase organizational competitiveness and sustain growth through training and development of employees, promotion of business partnership and development of competitive advantage for BCPG's joint ventures and contractors across the value chain.

- **Respect for diversity and safeguarding of human rights**

Strive to become a reputed organization that embraces diversity and operates with zero discrimination.



Key Operating Performance on Sustainability

BCPG Group's activities for SDGs include those directly related to the businesses and those specific to communities and the civil society.

Shared Value Creation Activities



1. Sansiri Backyard @T77, Green Community Project for residential accommodation under Project T77
2. Thailand's first solar-powered bus stop signboard with wireless chargers for cellphones
3. Solar-powered trash bin

1. Green Community Project with BCPG Alliances

Through its alliances with Sansiri Public Company Limited and related government authorities in 2018, BCPG piloted the world's largest power trading from clean energy in real-time under the Blockchain platform at Sansiri's Project T77. Continuous monitoring and learning have been closely evaluated for further improvement and for business expansion and advanced innovations for the T77 community toward a sustainable community and a full-scale Green Community. Additional solar panels were added in 2019 on the rooftop of My Backyard Farm & Café building, a new building launched under the Sansiri Backyard@T77 project. Bangkok's first innovative bus stop signboards were installed with a solar power system to provide wireless chargers for cellphones. Delivery of a solar trash bin to the T77 community was also made. The bin can help reduce the volume of garbage by using power generated from solar cells installed on the lid, thus improving efficiency for the biodegradation process and increasing the volume of the bin.



By switching to clean energy under Project T77 and using new solar panels at My Backyard Farm & Café Building, solar-powered bus stop signboards and other consistently high efficiency projects, BCPG has successfully replaced the use of fossil fuels with clean energy by up to 20% of the total energy consumption, equivalent to an installed power capacity of 432 kWh within Project T77 throughout 2019.



Development of technology and innovations for sustainable and effective farming for My Backyard Farm & Café



Installation of solar-powered bus stop signboards and real-time power switching/trading to clean energy under the Blockchain system.



Continuous promotion of a sustainable city and extension of community development from Green Community innovation at Project T77 and development of Project T77 as a template for future community development projects.



Reduction of greenhouse gas emissions by switching from fossil fuels to clean energy by up to 20% in areas of Project T77, equivalent to 340 metric tons of carbon dioxide equivalent, and by replacing landfills with the solar-powered trash bin project.



Smart University conceptual design with Chiang Mai University

2. Smart University Project, Chiangmai University

The success of power exchange at Project T77 significantly encouraged BCPG Group to move forward with the same blueprint, including the signing of a cooperation framework agreement on solar rooftop power generation with Chiangmai University under the Smart University Project in 2019. Under the agreement, BCPG Group is entitled to invest, develop, install, and manage the entire power generation system and energy storage system for 20 years with maximum possible clean energy efficiency technologies such as Blockchain, Artificial Intelligence (AI), Internet of Things (IOT), and Vehicle-to-Grid, gearing toward development of the circular economy within the university compound. Besides, BCPG Group, in conjunction with Bangchak Initiative and Innovation Center (BiiC), has extended support to Chiangmai University students with good potential to advance their creativity to become start-ups.



Increasing potential of clean-power generating capacity with the installation of solar rooftops on more than 150 buildings within Chiangmai University, capable of replacing power generated by fossil fuels by 16.3% of the total, equivalent to 12 MW, with application of power exchange technology to ensure zero surplus power in the system, resulting in the highest possible energy consumption efficiency.



Providing support to university students on their start-ups, resulting in the development and advancement of skills and creation of innovation.



Innovations of Vehicle-to-Grid and Blockchain provided clean-power exchange in real-time.



The Smart University Project, initiated with an objective to transform Chiangmai University into a Smart University and a pioneering university in clean energy, a stepping stone to transform the city of Chiang Mai to become a Smart City in the future.



The 16.3% replacement of fossil fuels with clean energy within the Chiangmai University Compound resulted in the reduction of greenhouse gas emissions equivalent to 9,615 metric tons of carbon dioxide equivalent.



"A Beginner's Guide to Solar Power System" seminar for education on solar panel application for the public, business partners and BCPG employees.

3. Circular Economy for PV Network Project

Recognizing challenges facing clean-energy consumption due to a lack of basic knowledge on the use of solar panels, BCPG Group jointly with Faculty of Engineering, Chulalongkorn University, organized training for the public, staff of BCPG and its business partners to increase their knowhow on the use and maintenance of solar panels to optimize work efficiency during their life cycles and how to manage outdated equipment appropriately. The 2019 training program was organized under the "A Beginner's Guide to Solar Power System" theme, facilitated and lectured by Associate Professor Dr. Somchai Rattanathamphap of the Department of Electrical Engineering and Associate Professor Dr. Pichaya Rachdawong of the Department of Environmental Engineering, Faculty of Engineering, Chulalongkorn University. BCPG intends to organize this training at least annually.



Increasing individual capacities of employees and the general public in the consumption of renewable energy.



Providing occupational skill training to 60 personnel from BCPG Group and its business partners, including Sansiri, SC Asset, and students of the Faculty of Engineering, Chulalongkorn University, along with representatives of schools in remote and rural areas in 2019 under the Project Energy for Everyone, possibly leading to increasing hiring of a skilled workforce.



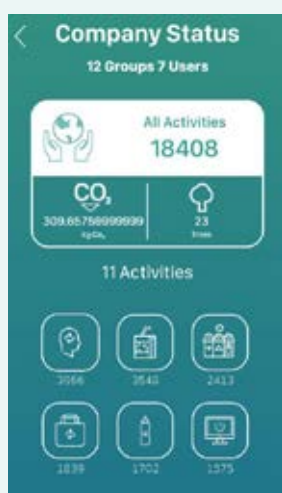
Increasing individual capacities of employees and the general public for maintenance capability of infrastructure related to renewable energy.



Promotion of solar rooftops, leading to development of sustainable cities and communities.



Increasing capacities of employees and the general public in the consumption of renewable energy, which is crucial to the reduction of greenhouse gas emissions.



4. LiFE for BCPG Project

Convinced that people are the biggest assets of the Company, BCPG Group gives a high priority to building and nurturing an organizational culture on sustainability to drive and enhance an understanding of the vision of the Group as well as the ability for employees to apply to work and to personal lives. The Group introduced in 2019 a "LiFE for BCPG" mobile application for employees to more readily manage their lives with a 'low-carbon footprint' and 'the least impact on the world' lifestyles, with extra points collected in the application.

LiFE for BCPG mobile application for employees to more readily manage their lives with a 'low-carbon footprint' and 'the least impact on the world' lifestyles.



The Company expects that the promotion of the 'low carbon' concept for employees' daily life would lead to more environmentally friendly business activities and lower natural resource exploitation by employees.



Increasing employees' awareness of climate change and successfully reducing the emission of carbon dioxide equivalent to 309.65 kilograms within six months and to the planting of 23 trees.

5. Other Power Projects

Under its commitment to a pursuit of clean-energy businesses to meet national energy demand while pursuing low-carbon society with less reliance on fossil fuels, BCPG Group launched a 9-MW power project “Lomligor Wind Farm” in 2019 at Pak Phanang district, Nakhon Si Thammarat province, as part of its long-term goal to sustain its domestic renewable power projects.



Increasing clean-energy power capacity by 9 MW from new development project.



Employment of locals in the vicinity of operating areas, including 75 local community workers in 2019.



Generation of 200.9 MW of domestic clean energy, equivalent to reduction of greenhouse gas emissions of 165,636 tons of carbon dioxide equivalent.

Major awards and recognition in response to BCPG’s successes in 2019 were granted by Thailand Greenhouse Gas Management Organization (Public Organization) (TGO) to six projects with a total installed generating capacity of 30.9 MW, registered under the Thailand Voluntary Emission Reduction Program (T-VER) in TGO’s annual award ceremony:

- 1) Ground-mounted solar farm power project for government agencies and agricultural cooperatives, Wiset Chai Chan district, Ang Thong province.
- 2) Ground-mounted solar farm power project for government agencies and agricultural cooperatives, Bang Ban district, Phra Nakhon Si Ayutthaya province.
- 3) Ground-mounted solar farm power project for government agencies and agricultural cooperatives, Bang Pa-in district, Phra Nakhon Si Ayutthaya.
- 4) Ground-mounted solar farm power project, The War Veterans Organization of Thailand under the Royal Patronage of HM the King, Tha Muang district, Kanchanaburi province.
- 5) Ground-mounted solar farm power project, The War Veterans Organization of Thailand under the Royal Patronage of HM the King, Phra Phutthabat district, Sara Buri province.
- 6) Project Lomligor Wind Farm, Pak Phanang district, Nakhon Si Thammarat province.



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Community and Social Support Activities

Besides business activities under the sustainable development goals, BCPG Group has allocated resources to constantly support community and civil society development through activities under the “Breath of the World” community development concept, including activities in three categories.

- **Breath of the Waters:** Promotion of campaigns and activities on water resource conservation. Outstanding activities in 2019 include the following:

Charity Run: Two activities supported by BCPG Group in 2019: (1) “Rayong 2019 – Run for Rangers and Marine Life 2”, a charity run to add to the welfare fund for rangers of the Ministry of Natural Resources and Environment and that for marine officials of the Department of Marine and

Coastal Resources, taking place at Laem Charoen beach, Rayong province, and (2) “Run for the Ocean”, a charity run to collect funds to support activities to conserve marine natural resources and the environment, including sharing knowledge and research, conducted by the Faculty of Fisheries, Kasetsart University, Bangkok Campus.

Rejuvenating the Oceans: The “Rejuvenating the Oceans” youth camp organized by BCPG and EEC Thailand at Ang Thong National Marine Park, Surat Thani province, nurtured youths to be fully aware of and duly cherish marine natural resources via recreational activities. Participants included students and teachers of Ban Bang Raet School, in the vicinity of BCPG’s Lomligor Wind Farm, Pak Phanang district, Nakhon Si Thammarat province.



1. The “Rejuvenating the Oceans” youth camp attended by students and teachers of Ban Bang Raet School, in the vicinity of BCPG’s Lomligor Wind Farm, Pak Phanang district, Nakhon Si Thammarat province.
2. Activities to improve children’s playground and kitchen, Chainarong Vithaya School, Dan Khun Thot district, Nakhon Ratchasima province
3. Activities to fabricate saltlicks and plant bamboo food for elephants at Khao Krapod Park Ranger Unit, Dong Yai Wildlife Sanctuary, Buriram province
4. Sponsorship of BCPG Junior Golf Open 2019
5. The “Take Kids to the Sea” project for children of the Thai Child Rights Foundation around Sattahip district, Chon Buri province
6. Workshop of “Let’s build our dream Pai to sustainability” at Pai district, Mae Hong Son province, for public exchange of opinions to develop Pai in a sustainable way

- **Breath of the Wilds:** Promotion of activities on the conservation of forest resources. Outstanding activities in 2019 include the following:

Volunteer activities on the occasion of the royal birthday in 2019: Attended as an active member of peacock’s crest plantation for the environmental development program on the occasion of the birthday anniversary of HM the King in 2019.

Saltlicks for the Wildlife in the World Heritage Site: An activity for BCPG Group’s employees to fabricate saltlicks and plant bamboo trees as food

for elephants at Khao Krapod Park Ranger Unit, Dong Yai Wildlife Sanctuary, Buriram province. BCPG operates solar power plants in Prakhon Chai and Nong Ki districts of the same Northeastern province.

- **Breath of the Souls:** Activities for society, including no New Year gifts from the Group, designed to minimize the use of resources and donate the allocated budget to authorities in charge of the protection of natural resources, such as the Forest and Marine Ranger Foundation, as a welfare fund for rangers; activities to improve the quality of life,

such as solar panel installation to generate light for government offices or academic institutions in remote areas; activities to promote a low-carbon footprint; and promotion of community development in education, religion, and cultural development. Outstanding activities in 2019 include the following:

Access to Energy:

Floating PV solar farm, Kasetsart University Museum of Fisheries (Natural History), Faculty of Fisheries, Kasetsart University: Donation and installation of 120 floating PV solar panels at Kasetsart University Museum of Fisheries with a generating capacity of 39 kW to deliver power to the museum, the world's first museum with zero net energy consumption by using self-generated renewable energy and spare surplus power for adjacent buildings. The generated power also serves research studies on freshwater organisms dwelling underneath the solar panels and long-term water quality data collection, which are highly valuable as references for future floating PV solar farm in Thailand, especially for agriculture.

Education and Youths:

Development of quality of life for students in operating areas: Sponsoring of improved infrastructure in schools such as children playgrounds, toilets, and kitchens in BCPG's operating areas, including Wat Yom School, Wat Suthirujiraram School, Wat Khanon Ban Krot School, Wat Choeng Lane School, Wat Bhoti Taeng School, and Wat Bode Sompornchai School in Phra Nakhon Si Ayutthaya province, Bang Rang Sadao School in Kanchanaburi province, and Chainarong Vithaya School in Nakhon Ratchasima province.

Donation of consumables to Pattaya Orphanage: Donation of consumables such as dresses, diapers and toys for infants and children at Pattaya Orphanage.

"Run 4 U" Run for Children: Support to the "Run 4 U Run for Children" charity run for Sermkla Foundation to help support underprivileged children.

"Take Kids to the Sea": Support to the trip for children of the Thai Child Rights Foundation to Sattahip district, Chon Buri province, under the "My dream destination, once in a lifetime" project of the Ministry of Tourism and Sports.

BCPG Junior Golf Open 2019: Sponsorship of the BCPG Junior Golf Open 2019 tournament to promote and support young golfers to become professional players through international standard tournaments.

36th Pakphraek Games: Lomligor Company Limited, a subsidiary of the BCPG Group, provided sport uniforms and meals to athletes from a group of schools located in the operating area of the Lomligor wind farm, including Ban Bang Raet School, Wat Chaeng School, and Kanchanaram School to participate in the 36th Pakphraek Games.

Scholarships marking the 30th anniversary, School of Accountancy, Sripatum University: Providing scholarships to needy students with outstanding academic records and good behavior.

Disaster rehabilitation:

Greenroof Project: BCPG and Bangchak Corporation Public Company Limited collected empty beverage paper boxes from employees and recycled them to manufacture greenroof for donation to the Friends in Need (of "PA") Volunteers Foundation, Thai Red Cross, under the Greenroof Project to help support the needy and underprivileged to replace damaged roofs.

Financial assistance to the victims of Podul: Donated Baht 100,000 to the Friends in Need (of "PA") Volunteers Foundation, Thai Red Cross, to help victims of the Podul tropical storm.

Volunteers under the Royal Patronage: Executives and employees of BCPG, on behalf of the Bangchak Group of Companies, jointly took oaths and received volunteer caps and scarfs under the Royal Initiative Volunteers 904 to participate in the "Good Deeds from Our Hearts" program initiated by HM the King to perform good deeds for society and the nation.

Others:

Let's build our dream Pai to sustainability: Organized a "Let's build our dream Pai to sustainability" workshop to exchange information and thoughts among representatives from the government, private and community sectors to jointly maintain Pai toward sustainability at Pai district, Mae Hong Son province. The workshop provided systematic planning and pragmatic work activities.

National Day of the Elderly, Annual Songkran Festival 2019: Organized lunch and donated consumables to 75 members of the elderly at Wai Wattananivas (Pak Nam Elderly House) at Samut Prakan Municipality.

Key operating performance in 2019

Corporate Governance

Cases of corruption and corrupt practices

0 case



Total recordable injury rate

0 case



Risk Management

Ratio of operating area assessed of natural disaster risks that could impact operations

100 %



Innovation and Technology

Alliances engaged for innovation projects



Sansiri Public Company Limited
(Project T77)

Chiangmai University
(Smart University Project)

Public Policy and Regulatory Advocacy

Activity engaged to pursue policy for clean energy

Project
**ERC
Sandbox**

Employee Readiness

Average hours of training to enhance knowledge, skills and proficiency, as well as operating efficiency of employees

55 hours



Climate Change

Company's greenhouse gas emission rate

1,545 tons

Thailand 1,465 tons
Japan 80 tons



Ratio of employees using LiFE for BCPG application to manage their 'low-carbon footprint' lifestyles

70 %



Circular Economy

Total units of clean energy exchanged among consumers (only in Project T77)

0.9 megawatts

Clean energy generated, equivalent to greenhouse gas emissions



1,160,580 tons

Thailand	165,636	tons
Japan	6,745	tons
Laos	34,668	tons
Philippines	22,372	tons
Indonesia	931,159	tons

Accessible, Reliable, and Clean Energy

Number of people with access to energy

Project T77

10,000 people

Smart University (Chiangmai University)

40,000 people



Total units of clean energy generated

1,651.0 gigawatt hours



Solar

304.6 gigawatt hours

Thailand 286.6 gigawatt hours

Japan 18.0 gigawatt hours



Hydro

72.0 gigawatt hours



Wind

54.0 gigawatt hours

Thailand 10.0 gigawatt hours

Philippines 44.0 gigawatt hours



Geothermal

1,220.4 gigawatt hours

Contribution to Local Economy

Employment of labor in the vicinity of operation

75 persons
operators and technicians



Rate of employees who participated in programs for community and civil society



100 %

Diversity and Inclusion

Number of females in senior management

17 people

Total workforce 120 people

Employee 113 people

Senior management 7 people



Information and Cyber-Security

Cases of information leaked



0 case