



*Sustainable Energy  
Returns To Society*

# SUSTAINABLE DEVELOPMENT REPORT 2018



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# SUSTAINABLE DEVELOPMENT REPORT 2018

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# Message from the Managing Director



In 2018, the company has been cooperating with government sector and local communities striving for the best society's long term benefit. The examples of actions taken are monitoring the progress in the bamboo planting project in Baan Huaiwad community, Thung Phueng, Chae Hom District, Lampang Province and launching many other collaborative activities. The extension of activities is included "Sahapat group public-private collaboration" project. The project objectives are creating sustainable jobs and revenue for local people. The project is supported by both government and private educational institutions to conduct a research and suggest to action plan to support local communities in Nan Province. The project model is setting up an enterprise to produce and market the products made from bamboo parts. The products are aimed to help the deforestation problem in Nan area. With the collaboration of stakeholders, the operation has successful development and became a long term project starting from 2019.

The sustainability development for the company is complying with the 8 principles of good corporate governance. The company supports the subsidiaries to certify as members of Thailand's Private Sector Collective Action Coalition against Corruption (CAC).

The company's attempt to focus on every dimension for sustainability was proven by the good score in sustainability evaluation. The company has been being rated 4 stars and selected as a sustainable stock in Thailand Sustainability Investment 2018 (THSI). The Board of Directors has a clear stand and goal on creating all stakeholders' awareness and engagement to drive the organization forward to the best practice of social responsibility and sustainability.

A handwritten signature in black ink, appearing to read 'Viroj'.

(Mr. Viroj Theeravatvatee)

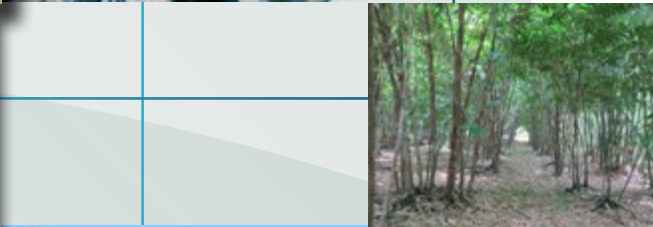
Managing Director

The Chairman of Social Responsibility Committee





# SAHACOGEN SUSTAINABLE DEVELOPMENT







## About This Report

This sustainable development report will be annually published separately from the company annual report. The sustainable development report is made to present the company's operation in the area of social responsibility based on the policy from the Board of Directors. The Corporate Governance Code (CG Code), Risk Management and Corporate Social Responsibility activities in 2018 are also included in the report to comply with Global Reporting Initiatives Version 4 (GRI 4) standard. The content covered was the operation by Sahacogen (Chonburi) PCL and subsidiaries.

The scope of this report shows the operation in the areas of economy and environment issues. The report focuses the actions with stakeholders mainly in the business operation especially CSR in process activities. The report also covers the actions based on the policy of collaboration with government sector and local communities. The anti-corruption actions based on the policy of Thailand's Private Sector Collective Action Coalition Against Corruption (CAC) with the clear results are also presented in report.

The report is prepared in printed version and electronic version (e-book). The company also publishes this report through website at HYPERLINK "<http://www.sahacogen.com>" [www.sahacogen.com](http://www.sahacogen.com) to provide the accessibility to information for all stakeholders. The company is opened to suggestion and questions. The contact is Social Responsibility Unit, Sahacogen (Chonburi) PCL. The address is 636 Moo 11 Sukaphiban 8 Road, Tambol Nongkharm, Amphor Si Racha Chonburi 20230. The telephone number is 038-481-555 or E-mail: [pr-csr@sahacogen.com](mailto:pr-csr@sahacogen.com).







# Sahacogen and Affiliates

Sahacogen & Affiliates, operating energy business under Saha Group, includes Sahacogen (Chonaburi) Public Company Limited and its subsidiaries; Sahacogen Green Company Limited, Sahagreen Forest Company Limited and Sahagreen Energy Company Limited.

Since 1999, the first cogeneration combined cycle power plant was established in Saha Group Industrial Park, Sriracha, Chonburi province. The plant had installed capacity of 122 Megawatts of electricity and 40 tons of steam per hour, using natural gas as a main fuel. 90 Megawatts of electricity is distributed to Electricity Generating Authority of Thailand (EGAT) under the Small Power Producers (SPP) program. It also supplies electricity and steam to Saha Pattana Inter-Holding Public Company Limited. Sahacogen registered as a public company on October 4, 2002 and expanded capacity to 174 Megawatts of electricity and 81 tons of steam per hour since 2004.

Due to the growing electricity usage from factories in Saha Group Industrial Park, Sriracha, the Company decided to expand of our third phase (III Project) combined-cycle cogeneration power plant. The power plant has the net capacity of 28.7 Megawatts (MW) of electricity and 15 tons of steam per hour. The project is completed and started commercial operation (COD) on November 20, 2018. Consequently, the total cogeneration capacity of the Company is now 214 MW of electricity and 96 tons of steam per hour.

Regarding business expansion, Sahacogen & Affiliates focus on renewable energy coupled with social business enterprise depending upon community, social and environmental responsibility.

The success of the renewable energy development and fast-growing tree plantations motivated Sahacogen to develop power plant project using eucalyptus bark and branches from the paper pulp production process of paper business of Siam Cement Group and other agro residues. Sahagreen Forest Company Limited was established for developing power plant with installed capacity of 7.5 Megawatts located in Prankratai district, Kamphaengphet province, The plant has started commercial operation since December 2012 distributing electricity to the PEA VSPP program.

The company has been focusing on moving towards green energy businesses. In 2017, the company had made a jointed-investment 21% in Impact Solar Co., Ltd. which is in solar rooftop business.

# Sahacogen Business Structure

Sahacogen group's business expansion will be based on the Board of Directors's will to put the emphasis on the local communities engagement and environment.



## Sahacogen (Chonburi) Public Co., Ltd.

Since : 1996

Location : Chonburi province

Type of fuel : Natural gas

Capacity : 214 MW of electricity, 96 TPH

Production Process : Cogeneration Combined Cycle



100%



## Sahacogen Green Co., Ltd.

Since : 2006

Location : Lamphun province

Type of fuel : Biomass

Capacity : 9.6 MW of electricity, 25 TPH

Production Process : Cogeneration

75%



## Sahacogen Forest Co., Ltd.

Since : 2008

Location : Khampangphet province

Type of fuel : Biomass

Capacity : 7.5 MW of electricity

Production Process : Thermal Power Plant

21%



## Impact Solar Co., Ltd.

Since : 2016

Type of fuel : Solar

Capacity : 30 MW of electricity

Production Process : Rooftop

100%



## Sahacogen Energy Co., Ltd.

Since : 2012

Location : Prachinburi province

Type of fuel : Biomass Pellets



# The compass to the sustainability

The company has a clear vision of being the power producer for sustainability, with the stakeholders cares. The company has set vision, mission and core values as stated below.



# Materiality Identification for the business

The Board of Directors and management have brain-storm sessions to identify risk and sustainability of the business; the business important issues; stakeholders prioritization, annual strategy. The business materiality has the direct relationship with the strategy for sustainability. The connectivity can be shown in the chart.







## The social responsibility for sustainable development

The company social responsibility policy has 2 groups of action.

Group 1: The compliance and business ethics compose of the corporate governance, human rights, laborforce fair treatment, and anti-corruption. The strategies are system development, growth mindset development and monitoring.

Group 2: The sustainability in economic, social and environmental aspects compose of social development, business ethics, environment and energy saving, innovation dissemination. There are 2 strategies for implementation.

1) CSR in process is combining all policy into activities within the business process. The combination of activities is aimed for the continuity of process, monitoring and budget allocation.

2) Partnership is the creation of the collaboration among partners.





## Corporate Social Responsibility Policy

# CSR POLICY

1

### Good Governance

Sahacogen does business in accordance with the good corporate governance principles, ethics, moral, social benefits and stakeholders' fair treatment. The company also focuses on increasing its values and supporting the company sustainable growth.

2

### Anti Corruption

Transparency, integrity and justice are the essence of Sahacogen's business operation. Illegal and immoral practices are not acceptable.

3

### Human Rights

Sahacogen supports the human rights protection. All stakeholders and other people will be equally treated regardless of gender, skin color, race, religion, personal belief.

4

### Labor Practices

Sahacogen provides fair employee benefits and welfares according to the labor laws and occupational health and safety management principles.

5

### Consumers and Suppliers

Sahacogen is continually developing the operational system to efficiently deliver good quality products and services to customers. We treat our suppliers with fair trades. Moreover, we are focusing on building long term relationships with customers and suppliers.

6

### Environment

Sahacogen promotes the resources management for sustainability. We ensure the compliance in environmental friendly procedures to reduce the risk and negative effects from our operation. We also help to preserve the local ecology systems and communities environment to be sustainable.

7

### Community Involvement and Development

Sahacogen supports the local development in terms of education, economy and living quality. We encourage our staff to regularly participate in public benefit and local traditional activities.

8

### Innovation and Dissemination

Sahacogen gives collaborative supports to local communities and local educational institutions to conduct studies in raw material productivity improvement, using by-products in creating new inventions, and also practically promote such ideas and practices to the local communities





# Corporate Social Responsibility Committee

## (Corporate social responsibility Committee)

The Corporate Social Responsibility Committee is composed of directors, management or other people with experiences in related fields. The number of the committee is 3 persons with the term of 1 year. The nomination will be annually approved by the Board of Directors after the annual general shareholders meeting.

### Members of Corporate Social Responsibility Committee for the year 2018

1. Mr. Viroj	Theeravatvatee	Chairman
2. Mr. Apipong	Vischuveskamin	Committee
3. Mr. Teerayuth	Kaewcoon	Committee
4. Mr. Thanawat	Kamsri	Committee
5. Mr. Wattana	Suninlahong	Committee
6. Mr. Pornsak	Chuamuangphan	The secretary to the committee

### The responsibilities of the Social Responsibility Committee

1. Set the policy and implement the social responsibility activities.
2. Consider and select the activities to serve the social responsibility policy.
3. Consider and approve the strategy and activities to achieve the goals and social responsibility policy.
4. Consider the operating plan and budget for social and environment activities.
5. Monitor the implementation of actions and assess the achievement as well as the quality of the projects.
6. Propose and suggest the corporate governance policy, business ethics and code of conduct for employees.
7. Act on behalf of the Board of Directors' delegation of authority.

# Adherence to the United Nations Global Compact

## The 10 Principles

## Sahacogen's Operation

### Human Rights

1. Business should support and respect the protection of internationally proclaimed human rights.
2. Business should make sure they are not participating in activities abusing human rights.

### Labor

3. Business should uphold the freedom of employees' association and their rights to claim for group negotiation.
4. Business should eliminate all forms of forced and compulsory labor.
5. Business should stop abolition of child labor.
6. Business should stop discrimination in respect of employment and occupation.

### Environment

7. Business should support a precautionary approach to environment challenges.
8. Undertake initiatives to promote greater environmental responsibility.
9. Encourage the development and diffusion of environmentally friendly technologies

### Anti-Corruption

10. Business should work against corruption in all forms, including extortion and bribery.

- The code of conduct defines "human rights" according to its corporate governance policy.

- Equal opportunity employer: avoids discrimination based on gender, skin color, race, religion, personal belief, age, disability, or other characteristics not relevant to the job scope.

- Provides communication channels for employees who want to petition claims of inequitable treatment or infringement on human rights. All claims are processed fairly.

- Under the legal framework, all employees will be treated with respect, dignity and all basic rights in the workplace.

- All employees will be given an equal opportunity for growth and promotion through encouraged training and exchange of knowledge.

- Compensation is based on an employee's knowledge, competence, position, responsibility and performance. The performance evaluation will be conducted fairly.

- A Welfare Committee will be established to consider welfare benefits for employees at all levels. This includes medical treatment, provident funding, and welfare extending to family members.

- All facilities will operate under a safe, hazard-free environment.

- Strictly prohibits forced labor, child labor, and illegal labor in all manners of business.

- The company defines the organization's vision as "Continuous and Sustainable Organization Development" focusing on business operation in compliance with sustainable growth, responsibility to society and environment.

- Setting Company's mission to adhere to good governance with respect to society, counter parties and employees; and also respond to any concerns regarding safety, occupational health hazards and environment concerns.

- The CSR Committee, Safety Health Occupation Committee, and the Safety Committee will conduct compliance regularly.

- Information will be transparent, accurate, in plain language, and will be disclosed in a timely manner. Feedback and impacts on nearby communities will be handled in a timely manner.

- Build and cultivate CSR and environmental awareness to employees at all levels. Resources will be used efficiently and sustainably.

- Support the development and the use of environmental friendly technology.

- Policies are required to comply with the law. Anti-corruption, giving and receiving gifts, entertainment, and support/donations must be in line with policies and disclosed to management.

- Promote the organization culture to act with integrity.

- Management controls and internal audits will operate efficiently and effectively.

- Organization and presentation of financial reports must be accurate and transparent.

- Establish communication channels for issues relating to corruption. Ensure safety, anonymity, and protection for anyone who comes forward. Audit Committee will investigate all cases in a transparent and equal manner.

# Supply Chain Management

The power and steam production process is managed under “Green Energy” theme. The social responsibility and mutual benefit are the core ideas embedded in all steps along the value chain starting from research and development, production and delivery.

## Green Energy supply chain management





# STAKEHOLDER ENGAGEMENT

SAHACOGEN & AFFILIATES have realized on the accountability and the right of the stakeholders in various groups, both externally and internally, including government sectors, related offices throughout the responsibilities to social, community and environment. The company also concerns on business growth, mutual benefits which lead to sustainable growth. The code of business ethics has been defined to be confident that all stakeholders will be treated equally and fairly. In case of disadvantage, the company and stakeholder parties shall find the solutions appropriately and beneficially to all parties. The company has provided communication channels for stakeholders' mutual publication and communication in order to receive requirements and expectations of the stakeholders and response them immediately, which can be described as follows.

Stake-holders	Means of Communication	Expectations	Policies and Actions
<b>Shareholders</b> <ul style="list-style-type: none"> <li>• Majority</li> <li>• Minority</li> </ul>	<ul style="list-style-type: none"> <li>• Annual Report</li> <li>• Sustainable Development Report</li> <li>• Shareholders' Meeting</li> <li>• Company Visit</li> <li>• Opportunity Day</li> <li>• Saha Group meet Analyst and Investor</li> <li>• Telephone/Facsimile</li> <li>• Web Site/E-mail</li> </ul>	<ul style="list-style-type: none"> <li>• Return on Investment</li> <li>• Sustainable Growth</li> <li>• Financial Stability</li> <li>• Transparent Management</li> <li>• Shareholders equally treat ment</li> </ul>	<ul style="list-style-type: none"> <li>• The ownership rights of shareholders are equitably and fairly respected.</li> <li>• Operations are undertaken in accordance with the principles of good corporate governance, which will foster the trust and confidence of shareholders and eventually lead to sustainable growth.</li> <li>• The Company's businesses are continually developed to ensure proper returns to shareholders.</li> <li>• The significant information which effected or potentially affected shareholders' interests shall be reported, including any information pursuant to the accounting period or situation reports in compliance with the relevant laws and notifications. However, no action shall be taken to restrict shareholders' access to the Company's information.</li> <li>• A report of the Board of Directors' responsibility for the financial statements in the Annual Report shall be</li> <li>• Minority shareholders shall be given an opportunity to propose matter for inclusion in the meeting agenda and/or to nominate persons for election as the Directors in the Annual General Meeting of Shareholders.</li> <li>• Shareholders are given an opportunity to submit questions relevant to the meeting prior to the shareholders' meeting.</li> <li>• Shareholders' meeting notices in both Thai and English are published on the Company's website at least 30 days prior to the shareholders' meeting day as information for shareholders to preview information prior to meetings.</li> <li>• Shareholders' meeting shall be facilitated. The date, time, venue, and procedures must not pose an obstacle to the shareholders' attendance of the meeting. Shareholders who are not able to attend in person must have the opportunity to grant a proxy to other persons to attend the meeting and vote on their behalves.</li> </ul>



Stake-holders	Means of Communication	Expectations	Policies and Actions
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### Business Partners

- Supplier
- Contractors
- Joint venture partners

- Annual Report
- Sustainable Development Report
- Green Energy Magazine
- Seminars
- Meetings
- Telephone/Facsimile
- Web Site/E-mail

- Transparent purchasing procedures and fair competition
- Trade negotiations based on mutual benefit
- Adhering to terms and conditions of the trade agreement
- Punctual payment
- Treating contractors with respect in human rights and adhering to labor laws

- The Company has a system for screening business partners in the value chain who operate businesses in compliance with the law, safety and occupational hygiene standards, and friendliness to the environment.
- Business partners are treated on the basis of fair competition, equality and mutual respect.
- The confidentiality or communications of business partners are maintained and not exploited for wrongful gains of oneself or of others.
- Relationships and good understandings are fostered. Knowledge is exchanged. Developments and value adding to goods and services are jointly undertaken to promote mutual growth.
- The Company adheres to trade agreements and makes proper data. In the event that an agreement cannot be complied with, the Company will expeditiously engage in early negotiations with business partners in order to reach a mutual remedy and loss prevention solution.
- The Company does not demand, receive or consent to the receipt of properties or any other benefits outside trade agreements.





Stake-holders	Means of Communication	Expectations	Policies and Actions
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## Employees

- Sahacogen Newsletter
- Welfare Committee
- Employee Survey
- Family Day
- Annual Seminar
- Health Activities
- Religious Activities
- Orientations
- Telephone/Facsimile
- Intranet/E-mail

- Appropriate compensation and welfare
- Career stability and happy workplace
- Career path and potential development
- Fairness and equality
- Safety and Hygiene

- Human dignity and fundamental rights of employees are respected at work. Employee data or confidential information is not disclosed or transmitted to third parties or unrelated persons.
  - Employees are treated in accordance with the provisions of law, regulations and articles governing the Company's operations.
  - Employment equality is promoted. There is no discrimination on the grounds of gender, skin color, race, religion, age, disability or other status that is not directly related to the works.
  - Training and knowledge exchange are sponsored and promoted to encourage learning and skill development throughout, strengthen career security and offer opportunities for advancements pursuant to each person's competence.
  - Employee participation in the determination of the Company's direction and development are promoted.
  - Fair compensation is given as suitable for the knowledge, skill, duties, responsibilities and performance.
  - Appropriate welfare and benefits are given to employees, e.g. medical expenses, provident fund, etc.
  - The communication channels are provided for employees to communicate suggestions and complaints pertaining to work. These suggestions are considered and remedies will be determined in the interest of all parties and in view of the creation of good working relations.
- Facilitate necessary for work operations are provided and working conditions are maintained with due regard to safety and occupational health as a means of promoting and raising the quality of lives of employees.
- Employees of all levels are encouraged to participate in social responsibility activities.
  - An organizational culture and consciousness of employees at all levels shall be promoted to encourage cooperation and responsibility for the efficient and sustainable management of the environment and utilization of resources.
  - Knowledge promotion and environmental training shall be extended to employees.
  - Environmental management system shall be promoted, from the economical use of resources to the sustainable treatment and rehabilitation, replacement, monitoring and prevention of impact on natural resources.

Stake-holders	Means of Communication	Expectations	Policies and Actions
<b>Community and Society</b> <ul style="list-style-type: none"> <li>Nearby community/ Society</li> <li>Remote community/ Society</li> </ul>	<ul style="list-style-type: none"> <li>Green Energy magazines</li> <li>Participating in traditional community activities</li> <li>Open-house activities</li> <li>Community Relation activities and projects</li> <li>Billboards indicating air quality</li> <li>Telephone/Facsimile</li> <li>Web Site/E-mail</li> </ul>	<ul style="list-style-type: none"> <li>Safety and a healthy environment</li> <li>Participating and being responsible for societies and communities</li> <li>Supporting community activities</li> <li>Creating income and enriching the economy of the communities</li> </ul>	<ul style="list-style-type: none"> <li>A business which could lead to a deterioration of society shall not be undertaken and the rights of others in the community and society shall not be violated.</li> <li>A Consciousness of responsibilities towards the community and society as a whole shall be instilled continuously for the benefit of the Company and all levels of employees.</li> <li>A The guidelines shall be provided for the prevention and remedy of impact on the community and society as a consequence of the Company's operations.</li> <li>A The preservation of local culture and traditions shall be promoted.</li> <li>A Cooperation shall be entered into with various agencies for the development of communities.</li> <li>A Public benefit activities shall be sponsored</li> <li>A Incomes shall be generated and the community economy shall be promoted through employment of community members and the use of community products.</li> <li>A Good relations shall be fostered between the Company and the community and society on the basis of propriety, transparency and fairness</li> </ul>

<b>Government</b> <ul style="list-style-type: none"> <li>Ministries, Departments and Office</li> <li>Government provincial/ District Offices</li> <li>Local Administration Office</li> </ul>	<ul style="list-style-type: none"> <li>Annual Report</li> <li>Sustainable Development Report</li> <li>Environmental Monitoring Report</li> <li>Green Energy Magazine</li> <li>Open-house Activity</li> <li>Company visit</li> <li>Report information related to regulations</li> <li>Relevant meetings</li> <li>Telephone/Facsimile</li> <li>Web Site/E-mail</li> </ul>	<ul style="list-style-type: none"> <li>Adhering to law and regulations</li> <li>Effective Environmental Management</li> <li>Community and Social Responsibility</li> <li>Collaborate to provide Information and support the sectors' activities</li> </ul>	<ul style="list-style-type: none"> <li>Knowledge and understanding of the laws governing operations are acquired and no activities are undertaken which would be inconsistent with the law.</li> <li>Proper action shall be taken when conducting transactions with an official or agency of the state.</li> <li>Good relations are fostered between the company and the government sectors within suitable bounds.</li> <li>Relevant laws and business traditions are observed in each country or locality.</li> </ul>
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## Operating Business under Corporate Governance

### Good Corporate Governance










Sahacogen Group emphasizes the importance of Good Corporate Governance system, runs business with transparency, honesty, responsibility as assigned, capacity of competition and fairness with realated parties in order to enhance prosperity, economical values and opulence towards shareholders in accordance with the Good Corporate Governance Principles of the Stock Exchange of Thailand and subject to the basis of sufficiency economy, that is; sufficiency, reasonability and good immunity which requires knowledge, carefulness and discretion for planning and operating. In the same time, the company enhance all executives and employees' the awareness of morality, honest, diligence, impatience, sharing and intelligence to work as well as readiness to the changing economical, political, cultural and social situations for the benefits in a balance and sustainable way.

The Board of Directors has approved the good corporate governance principles on February 19, 2003. Moreover, they have been reviewed properly and revised appropriately to the current situation in accordance with the "Principles of Good Corporate Governance for Listed Companies 2012". This harmonizes with the ASEAN Corporate Governance Scorecard (ASEAN CG Scorecard) measuring instruments of indices of the level of corporate governance of ASEAN listed Company. The details are as follows;

1. Corporate Governance Policies
2. 8 Principles of of Corporate Governance
3. Business Ethics
4. Code of Conduct for Company directors, executives and employees

Moreover, handbook has been created and communicated to directors, management, and employees, as well as disclosed in the annual registration statement (Form 56-1), and on the Company's website at [www.sahacogen.com](http://www.sahacogen.com).

The company realizes and focuses on the importance of developing Good Corporate Governance consistently in order to become a valuable organization towards society under the balance between performance and responsibility towards stakehold-ers including society and environment for sustainable growth in a longterm. The company has been evaluated as an "excellent" company in terms of Good Corporate Governance for 2018.

Year	Average score of Listed companies (%)	SCG (%)	Score
2018	81	88	   
2017	80	88	   
2016	79	88	   





## Risk Management

The Board of Directors of Sahacongen (Chonburi) Public Company Limited realizes the importance of various risk factors which affect the company's business operation. Consequently, the Board assigned the Corporate Governance and Risk Management Committee to be responsible for the supervisory tasks in terms of the organization's Corporate Governance and risk management practices in a systematic manner. The Risk Management Policy is described as below

1. To keep the balance of risk and reward from business operation in order to ensure that the operational goals and stakeholders' expectation are achieved under risk levels accepted by the executives
2. To set strategy in line with risk levels which the Board of Directors considers as acceptable
3. To support the risk management to become a part of organizational cultures, which is necessary to operate it effectively and efficiently by all executives and employee
4. To handle risks impacting on the company's objectives and strategy immediately and continually
5. To establish risk management guidelines according to anti-corruption policies

The Corporate Governance and Risk Management Committee sees the recognition of the fast changing economic, social and environment situations all the times, Therefore, the risk management team was appointed to be responsible for each business operation in order to evaluate and analyze risks possibly affecting the organization as well as subsidiaries and other projects in both internal and external risk factors, to set priorities for the risk management plan and engage in regular follow-up on the implementation of such plans. At the same time, the Committee presented regular updates to the Board of Directors on the progress and developments regarding said plans continually. The company manages risk factors which are likely to have impacts on the company's operations as follows;



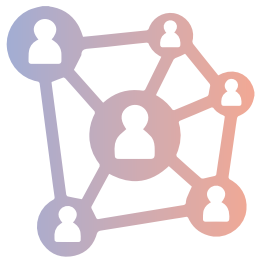
### Economic Risk

#### Risk:

Global-scale volatility of oil price has a direct effect on selling electricity and steam, the amount of energy demand, main raw material prices, and exchange rate, as well as, the impact of Government policy changes on business development.

#### Risk Management:

- Set business strategies and investment plan in alignment with economic conditions
- Identify and analyze risks affecting business goals
- Prepare proactive plans for uncertain and unstable economic / business environment
- Oversee and keep track of the progress



## Social Risk

### Risk:

Energy business, especially electricity generation, gives a great concern to society. Then, it is a tendency to be objected or opposed to operating power plant, which is considered as a serious impact on safety, health, environment, community and society. Being accepted and trusted by the community and society is the key factor for long-term business development.

### Risk Management

- Set guidelines and prepare proactive plans in order to protect and minimize impact on safety, health and environment as well as the quality of life of both employees and nearby communities.
- Strengthen the compliance with Corporate Social Responsibility Policy, and monitor such progress. Besides, carry out the community relations to consistently foster mutual understanding and communication.



## Environmental Risk

### Risk:

Sahacogen and Affiliates give precedence to the compliance with laws and regulations relating to effects on environment and safety standards. We have a certain unit that keeps track to any change in laws, rules and regulations so that the company will have prompt response with such changes and reduce environmental risk.

### Risk Management

- Using environment management system (ISO 14001) and occupational health and safety management system (OHSAS 18001 & TIS 18001) to manage health, environment and society operations.
- Comply with the environment, safety and energy conservation policy.
- Comply with the group's manual regarding to environment, safety and health as a working guideline and to monitor the process of implementation. In addition, providing training sessions, practices, creating emergency plan, testing tools and warning system, and strictly comply with the operating manual.
- Duly file performance reports relating to the methods of effect reduction and deliver the results to the Office of Natural Resources and Environmental Policy and Planning, Office of the Energy Regulatory Commission, Department of Industrial Works and Industry Office and other related institutions





## การต่อต้านทุจริตคอร์รัปชัน

Sahacogen & Affiliates have intent to combat all forms of corruption. Consequently, the Anti-Corruption Policy has been established. Awareness of the good corporate governance principles is to be enhanced among directors, executives and employees. The anti-corruption policy is also a part of the risk management plan for risk assessment in every unit. In this regards, the internal audits acts as an assessor. The Company also provides it to new employees, has communication channel for publizing the code of conduct and anti-corruption policy. Guidelines and practices for the operation of Anti-Corruption in the organization as below;



The Board of Directors has given the resolution for the Company to sign a declaration of intent to join Thailand's private sector Coalition against Corruption (CAC) and establish the anti-corruption policy on February 18, 2015, with the aim to foster clean business practices. The plan for risk management about corruption is supported to prevent fraud and corruption practices in the organization and stakeholders.

01



The management and all employees are to raise awareness of anti-corruption policy by providing such information via various channels as well as organizing seminars and workshops to employees for enhancing and maintaining anti-corruption awareness.

02



The management and all employees are prohibited to accept gifts from business partners and to meet the achievement of work in a fraudulent way.

03



The Company's Business Ethics require all employees to have the duty to interact honestly, responsibly and with integrity towards public and themselves. They are prohibited to use their positions to obtain benefits for themselves or other parties, which is stated publicly in "Code of Conduct" handbook.

04



The internal audit of the Company is required to assess, analyze, evaluate and keep track of the risk of corruption and internal control system. If such corruption is found, the internal audit must inform directly to the Audit Committee. After that, the Audit Committee will report to the Board of Directors.

05



There are channels for employees, related persons and informants to provide notices of causes for suspicion with confidence of protection.

06

Furthermore, the company has a policy to strengthen anti-corruption awareness among business partners and all stakeholders via appropriate communication channels. The systematic protection has been applied to ensure the operational objectives, or joining anti-corruption networks. These are the intention to drive the anti-corruption and integrity enhancement.

The Company received the certification from Thailand's Private Sector Collective Action Coalition against Corruption (CAC) on October 14, 2016. Sahacogen Green Co., Ltd. and Sahagreen Forest Co., Ltd. (the subsidiaries) have also been certified with CAC on February 12, 2018.

Sahacogen and Affiliates have been complying with the anti-corruption policy. Many activities were launched such as joining to Thailand's Private Sector Collective Action Coalition against Corruption (CAC), holding seminars and training for managements and employees' awareness to anti-corruption concepts.

The company's managements and employees joined the event on the "Anti-corruption Day" on September 6, 2018 at BITEC exhibition hall, BITEC Bangna. The event was the gathering of members from Thailand's Private Sector Collective Action Coalition against Corruption (CAC), representatives from government sector and private sector. The event objectives were to create awareness, to urge for actions to ban corrupted actions and to protect the country's benefit from corruptions.



## Whistleblowing

In case that employees and stakeholders have any concern or suspicion in regard to frauds, corruptions, illegal practices, these shall be reported as follow;

1. Verbal complaints or letter submitted to the complaint receiver
2. Suggestion box
3. By postal mail to Sahacogen (Chonburi) Public Company Limited: 636 Moo 11, Sukhaphiban 8 Road, Nongkharm, Chonburi 20230

Contacts	Telephone	E-mail Address
Chairman of the Board of Director	038-481555 Ext. 202	directors@sahacogen.com
Chairman of the Audit Committee	038-481555 Ext. 203	auditcommittee@sahacogen.com
Chairman of the corporate Governance and Risk Management Committee	038-481555 Ext. 260	riskcommittee@sahacogen.com
Chairman of the CSR Committee	038-481555 Ext. 290, 291	pr-csr@sahacogen.com
Managing Director	038-481555 Ext. 200	viroj@sahacogen.com
The Company Secretary	038-481555 Ext. 200, 282	pannee@sahacogen.com
Investor Relations	038-481555 Ext. 200, 282	investorrelation@sahacogen.com
Human Resource & Administration	038-481555 Ext. 242, 243	hadmin@sahacogen.com

The company will keep relevant information secret and take into account the safety of the complainant, except legal requirements of disclosure.



# "Economic Performance"





# Economic Performance

In 2018, Sahacogen group operating performance and the revenue distribution to stakeholders can be summarized below.

Performance Summary and Financial Highlights	2018
Sales	4,198,654
Other Revenues	9,187
Total Revenues	4,207,841
Cost of sales	3,656,661
Other expenses	326,288
Cost of Sales and Expense	3,982,949
Profit (Loss)	224,892

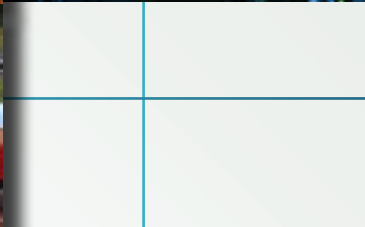
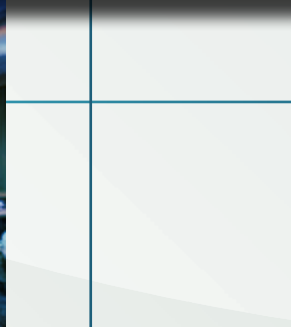
## Cost to income distribution to stakeholders.

Partners	Employment	Local and State	Financial	Shareholder
				
3,690,592,118 Bath	112,096,217 Bath	10,617,932 Bath	169,832,693 Bath	114,600,000 Bath





# Corporate Social Responsibility

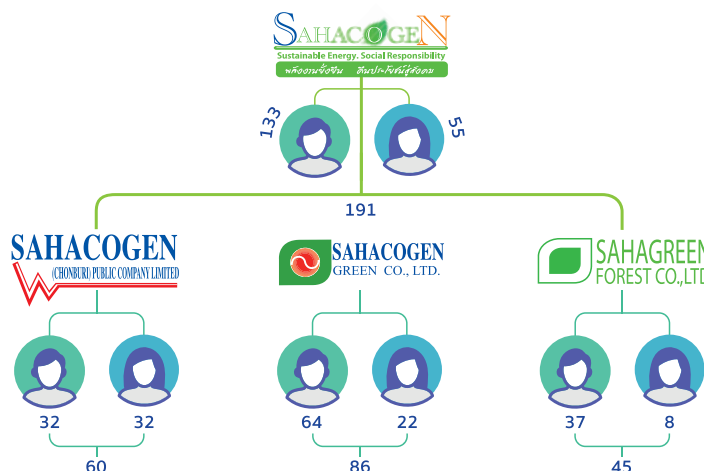




# Labor Practices & Human Rights

## • Employment

Sahacogen group has a standardized and fair employee selection system. The application process includes a written exam and an interview to evaluate the candidates' competencies and organizational fit. Candidates are also required to take a health examination before starting work. The employee classifications according to company affiliates are as follow



## Employment Rate for 2018

Company	Number of Employee	Resign	%	New hire	%
Sahacogen (Chonburi) PCL / Sahagreen Energy Co., Ltd.	60	5	8.20	3	5.17
Sahacogen Green Co., Ltd.	86	6	6.98	9	10.47
Sahagreen Forest Co., Ltd.	45	2	4.44	2	4.44
<b>Total</b>	<b>191</b>	<b>13</b>	<b>6.80</b>	<b>14</b>	<b>7.32</b>

## • Human Rights and Labour Practices

The company respects human rights, the policy and practices are described below;

- There shall be no activities or support of activities which violate human rights.
- There are no limitations to independence or differences in ideology, gender, race, religion, politics or other matters. The expression of opinions which could cause conflicts or divisions should be avoided.
- Channels shall be provided for employees or persons who believe that their personal rights have been violated or that they have been treated unfairly to file a complaint to the company. Such complaints shall be given attention and process fairly.
- The company requires employees and contractors to be not less than 20 years of age. The company does not hire child labor, support forced labor, and practice gender discrimination.
- Incoming staffs shall undergo trainings, and contractors must attend training sessions prior to the actual works to create awareness, understanding of safety, energy, corporate objectives, and regulations.

- The company also requires the establishment of a benefit committee, allowing employees to participate in the creation of regulations, privileges, and benefits beyond the minimum requirements of the law. This reflects the company's dedication to take the best care of its employees.



## Human Rights



## • Managing Salaries, Wages, and Benefit

Sahacogen is dedicated to provide salaries and compensation to employees based on principles of justice, corresponding to their job responsibilities and competencies. The opportunity is equivalent for all genders. The compensation are also competitively adjusted in the industry to attract talented individuals to join the firm while motivating current employees to continuously improve their performances. The company also has clear KPIs for evaluating employee performance, creating mutual understanding between supervisors and employees while leading to improvement of work and human resources.

Sahacogen provides benefits for employees and their families beyond the minimum requirements of the law. The benefits are adjusted to best fit with the social, economic, and business landscapes. The adjustment includes the increase of allowances for health insurance for the employees and their families, shift wages, accommodation costs, transportation costs, premium for working at other provinces; and long term service reward for employees work for 10 and 20 years. The adjustment serves to boost employee morale and a strong relationship with the organization.



## • Fringe Benefit and Supporting the Employees

Sahacogen and affiliates have the strong policy in fringe benefits to our managements and employees. The details are as listed here "SAHACOGEN HAPPY FAMILY"



### Happy Health

- In terms of health welfare, we provide life insurance and health insurance packages for employees and their family members.
- We have annual health checkup service. Internal knowledge sharing relating to health care are organized consistently. For example, we provide first aid training and negative effects from drugs seminar. Additionally, medical supplies and medicines are available for employee upon requests.

### Happy Heart

- "Warm Hug and Smile by Sahacogen" project is for helping socially disadvantaged people. This project has been annually held by giving financial supports, foods and necessary items to orphans, people with disabilities and elder people in the welfare foster homes.
- Blood donation project collaborated with the Thai Red Cross Society has been held monthly.
- Sahacogen shows our cares and concerns to employees who are sick or during their sick leave. We have our representatives to visit them at their house or hospital.





## Happy Brain

- Sahacogen continuously provides employees trainings and seminars. We have both internal trainings and also sessions with external speakers. We aim to develop our employees' knowledge and competency in all functions.
- We encourage our employees to study in higher level or study foreign languages.

## Happy Soul

- "Charity for Religion" project is to support the Buddhism and encourage employees to be merciful. We have activity for offering foods for monks and also on Buddhism holy days.
- We have activities to make merit in temples throughout the year e.g. cleaning temples, offering big candle to be used in the temple during the raining season (lent), and trees planting.
- Songkran Festival celebration is normally held by allowing employees to pour water on the Buddha statue, pour water to executives (elder people) for blessing. All this activities are done according to Thai traditions in order to preserve our Thai heritage.



## Happy Family

- Sahacogen have made an agreement with Government Housing Bank to offer low interest housing loan for employees. We aim to support our employees of having a house and building up their family.
- Provident fund and social security fund are provided according to laws. We also offer patronizing money for life events e.g. wedding ceremony, ordination ceremony, house warming ceremony and funeral.
- Sahacogen Family Day" is held to strengthen the

relationship and building up the tighten bonds among employees' family members. Sahacogen believes that good family is the basic factor in creating quality people. We organize activities on the "Family Day", for example, are Sahocogen kids contest, family portraits contest, sport activities. New Year's Eve party is held for employees and their family every year

## Happy Society

- "Sahacogen Anti-Drug" Project is the effort to stimulate employees' concerns about negative effects from using drugs. The "White Factory" event is held to support this project with various activities such as exhibitions, anti-drugs slogan contest, drug detection testing.
- "Sahacogen Helping Mind for Goodness" Project promotes our organization culture in encouraging employees do good deeds to themselves, their families, organization, and society. The trophies are awarded to employees who are outstanding in doing volunteer activities and to inspire other people of doing so.



## • Employee benefits

The company pays attention to “employee benefits” to ensure employees work happily, create bonds and loyalty to the organization. The company believes happy employees can deliver higher efficiency that will reflect the company’s performance in long term.

The summary of welfare and support allowance provided to employees in 2018							
SAHACOGEN <small>(PUBLISHED PUBLIC COMPANY LIMITED)</small>		SAHACOGEN <small>GREEN CO., LTD.</small>		SAHAGREEN <small>FOREST CO., LTD.</small>			
Welfare & Support Allowance	Number of Employees	Amount (Baht)	Number of Employees	Amount (Baht)	Number of Employees	Amount (Baht)	Total
Funeral	1	10,000	3	30,000	-	-	40,000
Marriage	-	-	3	15,000	1	5,000	20,000
Maternity	-	-	5	25,000	-	-	25,000
Ordination	-	-	-	-	-	-	-
Tooth care	17	28,730	13	18,786	3	10,850	58,366
glasses	24	88,540	29	109,944	3	15,900	214,384
Illness	8	7,000	5	5,000	2	-	12,000
<b>Total</b>	<b>50</b>	<b>134,270</b>	<b>58</b>	<b>203,730</b>	<b>13</b>	<b>31,750</b>	<b>369,750</b>

## Human Resource Development

Sahacogen put the emphasis on human resource as the key driver to success. The staff skills development is the key to develop based on the organization’s goals, direction and policy.

Sahacogen group focuses on enhancing employees’ capabilities at all levels. The development plan can be divided into 4 main groups.

- 1) Basic knowledge trainings are courses that focus on providing basic information that is useful for the new employees. The examples are rules, workflow and procedure, quality management, safety standard, occupational health and environment.
- 2) Common skills trainings are useful for employees in every function. The training topics will cover ethics, morality, honesty, ability to work as a team, communication skill, and decision making skills.
- 3) Core value enhancement courses are aiming to create corporate culture set the guideline for code of conduct among employees. The example of the topic covered in this group are positive thinking, innovative ideas, working as a team, entrepreneurship and proactive work style.
- 4) The knowledge and skills development based on job position.






# Human Resource Development Policy

## 1. Trainings

Human resource is the main factor leading to success. The company and affiliates give priority to human resource management including continuous human resource development to drive up efficiency in accordance with company's direction. The company sets development goal based on the competency and also develop basic training courses called "Training Roadmap: TRM" for each function. The training courses have 3 main topics which are

- 1) The standard courses, based on rules or required by law
- 2) Managerial courses, related to basic skills needed in operation field
- 3) Specific courses, based on needed in each position

### Training courses for the company and affiliates in 2018

Topic				Total
<b>Planned (Course)</b>				
Planned (Course)	60	62	48	170
Actual (Course)	48	33	42	123
%	80.00	53.23	87.50	72.35
<b>Number of participants (person)</b>				
Female	43	69	45	157
Male	35	24	24	86
Total	78	93	69	243
<b>Training hour</b>				
Hour	1,852	1,164	2,083	5,099

In 2018, the company and affiliates continuously launches training and seminar programs through out the year. There are 170 courses successfully run comparing to 123 courses planned which is equivalent to 72.35 percent.

There are 243 people participated in the training programs. They number of participants divided by gender are 157 people as female participants and 86 as male participants. The total number of training hour is 5,099 hours which is on average 5.73 hour per person per year.



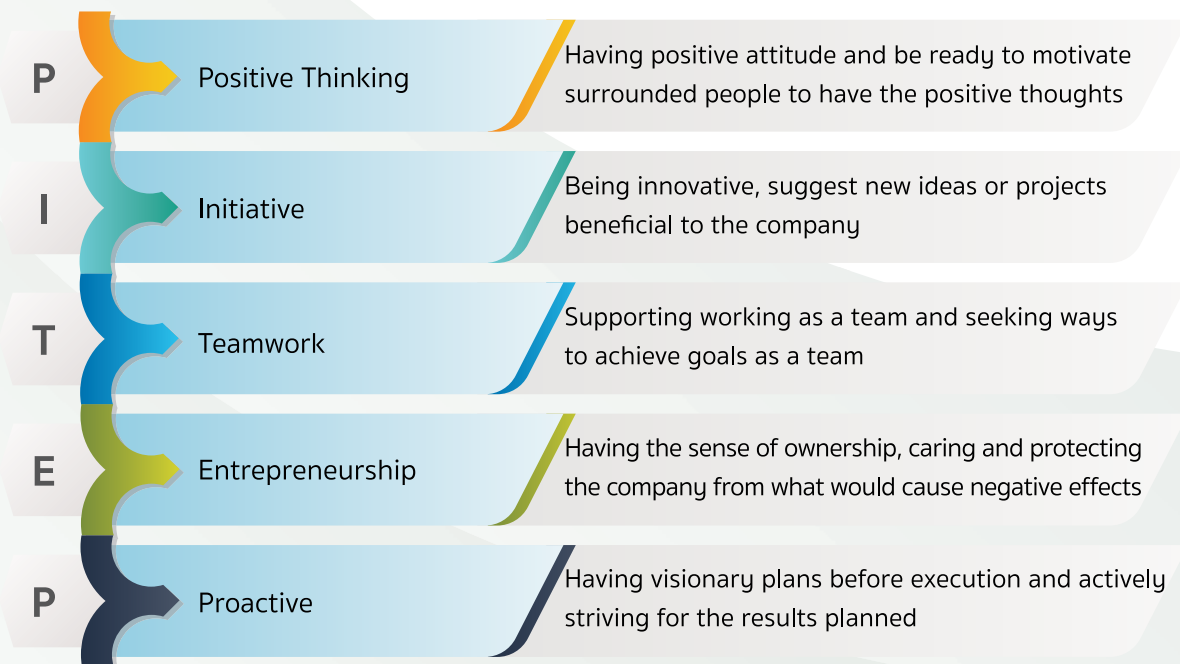
## 2. Employees development

Staff in different functions has expertise in their area of responsibilities. The company supports training and knowledge sharing within the organization. The company also provides training session held by external speakers. The staff attended external training session is assigned to bring back and share content with colleagues and boss in knowledge sharing format.

In 2018, the company hosted more than 20 knowledge sharing session by internal speakers. The topic examples are Cashier and financing system improvement; Land tax, value added tax (VAT), and related taxes; Skill Development Promotion Act and E-Service system; Network & Internet Security for IT; Warehouse management, logistic and bio-mass quality, etc.

## 3. Corporate Core Values

Sahacogen group has “PITEP” core values as the core ideas to create corporate culture and group company identity.



The human resource management within the framework of “PITEP” aims to push the organization forward with clear goals. The clear organization goals lead to the vivid team and individual targets with clear measurement methods and indicators. In the past year, the company promoted “PITEP” core value through announcement board, intranet system, the company’s annual report and Form 56-1.

# 4. Knowledge management

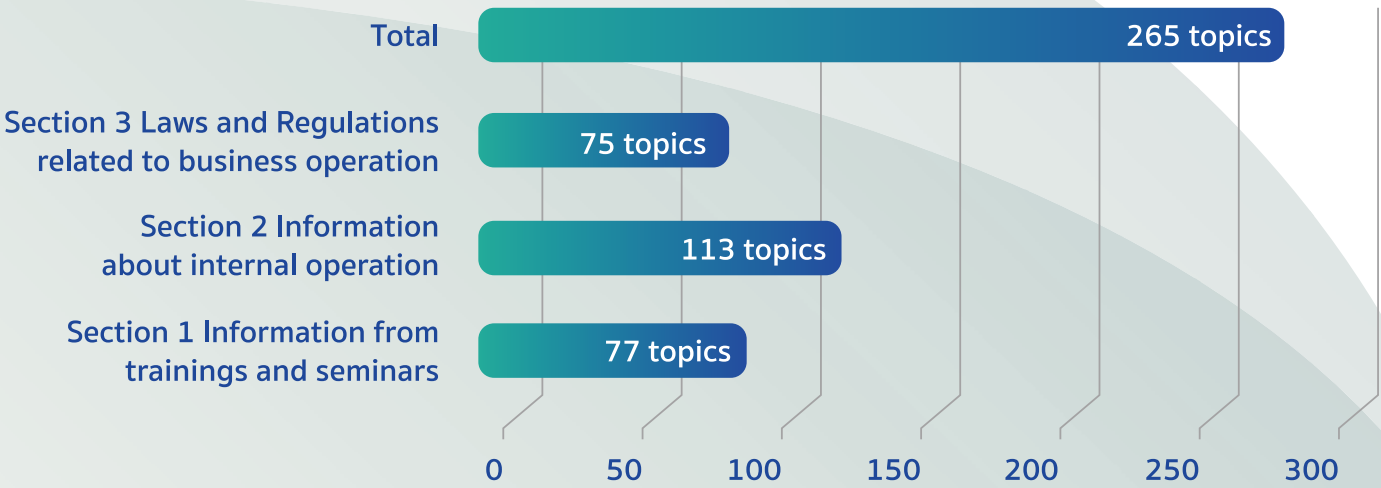
The company also pays attention to the development for individuals self-learning and self-developmen. The information technology system has been adopted to enhance learning efficiency and promoting knowledge sharing culture within the organization. All employees are free to access and add new topics of knowledge relating to work in to the database. The centralized system called “Share & Show” is easy to access.

The company has set knowledge management system (KM) within the organization to support continuous self-learning process. The Alfresco program allows employees to search and access to database easily.



In 2018, the company distributes information through this internal knowledge sharing system 265 topics which includes

- Section 1 Information from trainings and seminars 75 topics
- Section 2 Information about internal operation 113 topics
- Section 3 Laws and Regulations related to business operation 77 topics







# Safety Commitment

## Quality, Safety, Hygiene, and the Environment (QSHEE)

Sahacogen sees the importance of safety, hygiene, and the working environment. The company is therefore dedicated to create a safe working environment for staffs, employees, and other personnel while preserving the natural environment and being responsible for the safety of surrounding communities. The company's security and hygiene management strictly adheres to the law and regulations, organizing a safe environment for work while encouraging employees to see the importance of safety.

## Quality, Safety, Hygiene, and the Environment Policy

1. Communicate, foster, and support employees to enhance their skills with the awareness of quality, safety, harmless actions to the environment, as well as energy conservation.
2. Monitor and oversee the SHEE practices, energy conservation and management in compliance with laws and related regulations.
3. Support appropriate and sufficient resources to meet the operational objectives of SHEE policy, as well as promote the reasonably effective energy and resource consumption on a regular basis.
4. Protect stakeholders from danger, injuries, or illness from work. Reduce risks from the moderate level onwards that may negatively affect stakeholders and corporate assets.
5. Improve and develop the SHEE system consistently.

## Safety and Hygiene Practices: 2018

o The Safety, Health, and Environment working team has been appointed to be the representative of the employees. The working team can suggest practices to promote working safety environment. The team shall monitor and evaluate the implementation of safety practice within work place. The committee is composed of the chosen employees with the term of 2 years.

o Sahagreen Forest Co., Ltd. has certified as a participant in the preventive practice for safety and hygiene activities categorized as a medium and small risky businesses (Silver). The activity was held in Kampanetch.



o The company has regularly publicized information on safety, hygiene and environment to employees and workers via monthly magazine, intranet system, notice boards, email and sound public address system.

o Safety Talk An activity where employees care for one another by exchanging ideas and recommendations on safety in the workplace and daily life, warning each other of behaviors that may lead to danger.



o Safety Day & Safety Week: An annual activity for safety and environmental preservation, equipping employees of knowledge and encouraging organizational participation for fostering safety.

o Big Cleaning Day and 5s Action Plan is stipulated to carry out once a week in order to instill the eco-conscious and safety mindset and behaviors in the workplace among employees themselves





- o Organize safety training sessions such as First Aid & CPR, crane operations, and education on occupational hazard by medical personnel, Basic Fire Fighting Training, Safety in working with Chemicals, Emergency Response, Safety for working in the confined space, etc.

- o The company held activities to promote the safety awareness among employees and contractors. The example are picture contest of risky work spots, promoting the engagement and contribution in setting a safety working guideline, alcohol check, training session before allowing the contractors to access the working site.



- o Providing health checkups for employees based on their level of risk exposure, both before commencing work and during the annual checkup.

- o Organizing emergency drills such as fire drills twice a year

- o Chemical leak-age drills and waste leak once a year

- o The company has installed receptors to monitor the environment quality within workplace and nearby communities. The results were sent to the related unit twice a year.

The company sets Zero Accident Program to prevent accidents in the workplace and to reduce and minimize the statistics of accidents to zero by systematically planning and managing the quality, security, hygiene and environment practices.

The company has been complying with labor laws and human rights. During the year 2018, there was no dispute regarding to human capital issue.



The company has been complying with labor laws and human rights. During the year 2018, there was no dispute regarding to human capital issue.



# Social Responsibility

Throughout the year 2018, Sahacogen & Affiliates places value on fair treatment of stakeholders to step forward for leadership among small power producers and other related businesses. The community involvement and development have been conducted in various aspects as follow;

## Community Involvement and Development

Details	Amount of Contribution Activities	Budget (Baht)
Education	17	174,736
Sport	15	89,116
Quality of life	17	11,201,475
Environment	9	1,068,877
Religion, Culture and Tradition	44	154,277
Public Interest	24	252,655
<b>Total</b>	<b>126</b>	<b>12,941,136</b>

## Education

Education is the foundation to the development. Sahacogen has been supporting kids in communities by spending budgets in many projects. The example of the projects are educational budget patronization, knowledge sharing to youths, drawing and painting competition, children day, vegetable planting activity, item give away for kids, calendar donation for the blinds.



## Sport

To foster a positive relationship between Sahacogen group and the community, government offices, local authorities, customers and partners while supporting the effective use of time, Sahacogen organized sports activities every month. These include football matches for the youth and community members residing near the power plants, Sahagreen Forest Cup for traditional sports, and sports for building lasting relationships with customers. The company also donated sports equipment to nearby communities while supporting sports competitions to protect the community members from turning to the use of narcotics since 2012-present.



## Enhancing Quality of Life

It has been 9 years, Sahacogen and Affiliates supports the health care activities with collaboration from the Provincial Public Health Offices. We offer free of charge health check up services on the mobile buses to the villages.

In 2018, the health care mobile service were conducted 18 times in 28 areas. There were over 5,000 people coming for health check up.

### • Occupation for better living of community nearby

The company supports community members to have supplement occupations by supporting activities for housewives and elders so that they can generate extra income to households. The examples of activities are Thai sweets cooking classes, drinking water, herbal medicines, sandalwood flowers making, Sriracha Chili Sauce, etc.







## • Village Health Volunteer Development Project (VHV)

Sahacogen has been collaborating with local hospitals and local administrative offices to educate the youths about basic health concerns, first aids and basic medical sciences in “Village Health youth Volunteer or VHV” project. In 2018, there were trainings in many topics provided for the youth volunteers such as “Youth volunteers and the local community development” and “First aids in emergency situations”. The project has been conducting for 8 years. There are around 30 youth volunteers joined the project per year. Currently there are 8 classes of members or around 200 people.



## • Power Development Fund

The Power Development Fund has been established by the resolution of the Energy Regulatory Commission Committee, Ministry of Energy. This fund is to develop the quality of life and localities around power plants. Sahacogen & Affiliates gives contribution to the Power Development Fund based on the power capacity and type of power generation. In addition, Sahacogen Green has set up the development fund for communities around the biomass procurement center in Lamphun, which is the source of fuel generating power for the biomass power plant. The contribution of the fund is 100,000 per year. This will help develop communities and quality of life.

In 2018, Sahacogen and affiliates donates money for local communities amounting 11,685,887 Baht. The example of projects are constructing new building and providing health care items for a hospital in Wiang Yong, Lamphun District, in Lamphun Province; and developing the water system for villages. The employees also participate in meetings to suggest ideas in running projects.

## Religion, Culture, and Local Traditions

Religion, culture and local traditions heritage fundamentally helps in strengthen the relationship among people in communities. To preserve and maintain various specific cultures as a traditional heritage for next generation, Sahacogen & Affiliates promotes activities in communities nearby the power plants in collaboration with all sectors. Throughout the year 2018, the organization of religious activities were “Buddhist Lent Day”, “End of Buddhist Lent Day”, and traditional activities in Chonburi were “Songkran Festival”, “Loy Krathong”, “Buffalo Racing”, “Seafood Festival”, “Ritual of Rice Goddess Worship, Mae Phosop”, and “Rice Harvest Tradition”. Moreover, the traditional activities in Lamphun and Kamphaengphet also proceeded. The former were “Bathing Relic”, “Poi Luang Ceremony”, and “Water Angel Worship”. The latter were “Religious Festival: Ngan Bun Klang Ban” and “Nop Phra Len Phleng Festival”



## Social Benefit and Charitable Activities

In 2018, Sahadogen support the charitable activities in various projects. The total 24 projects worths THB 250,000. The examples are bags donation for Prankratai Hospital, Kamphangpetch Province to replace plastic bags usage; building and playground improvement for schools nearby power plants; providing drinking water for local communities, etc.

### • Drinking water supply for local communities

The company provides drinking water for offices and local communities nearby the power plants. The donation is aiming for helping food victims and underprivileged people. In 2018, the supply of drinking water from the company was 81,000 cups and 10,500 bottles. The donation was made to 69 local government offices and 136 communities.



### • Smiling Together

Sahacogen organized a happy and warm-hearted activity for the fifth year. The objectives are promoting giving mindset and engagement of employees in contributing to society.

In 2018, Sahacogen together with Lion (Thailand) Co., Ltd. and the office of public healthcare and environment, Lamchabang district hosted the happy and heart-warming giving for the elders' activity at the school for elder people in Banrainueng, Bueng sub-district, Chonburi Province. The activity contained a sharing session about oral and dental care and also the first aid in emergency situation. There were 130 participants attended the event.





# "Environmental Management"



# Environmental Management

Sahacogen & Affiliates have defined environmental objectives committed to continual develop the environmental management system to ensure the effectiveness and meet the international standard, as well as running business with environmental and social responsibility.

## • Adhering to Environmental Regulations and Laws

Sahacogen ensures that its business practices adhere to all related laws and regulations. Especially, Sahacogen operates its power plants in compliance with the environmental measures as specified in the Environmental Impact Assessment (EIA) for the power plant of Sahacogen (Chonburi) PCL and the Initial Environment Examination (IEE) for the biomass power plants of Sahacogen Green and Sahagreen Forest. This requires the environmental quality measurements and reports in every six months. Sahacogen and affiliates has set its business operation policy adhering environmental-friendly business practices (Green Business Practices), as well as related laws and regulations.

## • Environmental Management Related to the Power Generation Process

### • Water Management

Sahacogen places the importance of the effective water management throughout all production processes, from the source of water for production input until the preservation of the environment after production process. The company therefore strictly adheres to regulations of water management and considers the impacts of water consumption to the nearby communities. On the other hand, Sahacogen also plans to prevent the risk of water shortage which may interrupt the power plant operations. The water management practices of Sahacogen are as followings:

The power plant of Sahacogen (Chonburi) PCL and the biomass power plant of Sahacogen Green are located in industrial area, using raw water from sources designated for industrial use without affecting the water supply of the nearby communities. Waste water from production process is sent to the neutralization basis for quality improvement before recycling to water the green area of power plant. While the remaining water is discharged to the waste water treatment facilities of Saha Group Industrial Park under the controlled quality which the discharged temperature is not greater than 40 Degree Celsius according to the regulations.

Moreover, Sahacogen also implemented the RO Rejected Water Recycle Project to recycle the rejected water for reusing in production process. This help to save water supply and reduce the waste water's expenses.

## RO Rejected Water Recycle in 2016-2018 (m3/year)





The biomass power plant of Sahagreen Forest created a reservoir on a 40 Rai plot of land, capable of holding approximately 370,000 m<sup>3</sup> of water. This volume is sufficient for the entire-year consumption for electricity generation. The reservoir consists of an incoming pond for sediment and a main pond for use. This ensures that the water has low levels of suspension and a stable quality, reducing the chemicals usage and the volume of waste water from the production process. Sahagreen Forest also planted trees around the reservoir as a green belt for protecting the wind, lowering the amount of water loss and supporting the use of waste water without affecting the water used for agricultural and consumption purposes of the surrounding communities. Waste water from production is released into the sewage water holding pond for keeping temperature and quality according to the regulations before recycling to water the green area of power plant without discharging to external area or “Zero Discharge”

The company also assesses the water quality and temperature strictly according to the regulations. This ensures that the water quality meets the standards, protecting and minimizing environmental impacts. Saha green also consistently examines the ecosystem around its power plant.

## Water Management

### Water used for Production Year (m<sup>3</sup>)

#### Sahacogen (Chonburi) PLC.

- Waste water treatment facilities of the industrial park
- Green Area
- Ro Rejected Water Recycle

2016

1,808,336

2017

1,779,687

2018

1,787,015

#### Sahacogen Green Co., Ltd.

- Waste water treatment facilities of the industrial park
- Green Area

287,123

301,452

251,064

#### Sahagreen Forest Co., Ltd.

- Zero Discharge
- Green Area

341,342

340,822


98,906



## • Air Emission Management

The company strictly follows the regulations of air pollution measures. The emission monitoring system is installed at the stacks of the power plant for measuring the amount of TSP, SO<sub>2</sub>, and NO<sub>2</sub> emitted to the atmosphere. The results indicated that the amounts of those pollutants are within the legal limits. Moreover, the company also installed the emission monitoring system in the communities' area nearby the power plant, composing environmental monitoring reports in every 6 months for the related sectors and public to ensure that the air qualities are according to the standards and regulations. The Electrostatic Precipitators (ESP) with 99.5 % of particulate-collecting efficiency were installed at the biomass power plant of Sahacogen Green and Sahagreen Forest to prevent the dust pollutions. This makes the quality of the air emitted from the power plant's stacks will be according to the standards and regulations, as well as safety and environmental friendly.

## Air Quality Measuring at Power Plants of Sahacogen and Affiliates in 2018

Power Plant 	Average Results (Min-Max)	Legal Standards
<b>Sahacogen (Chonburi) Power Plant (Natural Gas)</b>		
- Total Suspended Particulate (TSP)	0.02-4.39	< 60
- Sulfur Dioxide (SO <sub>2</sub> )	0.04-0.29	< 18
- Nitrogen Oxide (NO <sub>2</sub> )	7.29-92.70	< 110
<b>Sahacogen Green Biomass Power Plant</b>		
- Total Suspended Particulate (TSP)	15.5-37.1	< 120
- Sulfur Dioxide (SO <sub>2</sub> )	< 1.3	< 60
- Nitrogen Oxide (NO <sub>2</sub> )	65.2-96.1	< 200
<b>Sahagreen Forest Biomass Power plant</b>		
- Total Suspended Particulate (TSP)	10.9-52.5	< 120
- Sulfur Dioxide (SO <sub>2</sub> )	< 1.3	< 60
- Nitrogen Oxide (NO <sub>2</sub> )	19.4-52.5	< 200




## • Noise Pollution Management

- Appropriate design and install the machines and equipment that may cause the noise pollution including e planning inspection and preventive maintenance. Plant bushy trees surrounding the power plant as green belt for buffering sound and wind that help to control noise level within the standards and regulations.

- Designate 3 check-points for measuring the noise level; the sources of noise in the power plant, the control room of the power plant and the boundaries of the power plant. The noises are controlled within the standards and regulations, with routine measuring the noise level in every 3 months.

- Provide ear muffs for employees to wear when working in areas with noise level exceeding 80 Decibels. Employees are required to wear the ear muffs when working in that areas which warning signs were installed to remind them of this regulation.

## The results of noise measurement in power plants of Sahacogen & Affiliates in 2018

Power Plants 	Average Results (Min-Max)	Legal Standards
<b>Sahacogen (Chonburi) Power Plant</b>		
The results of noise measurement in general (Leq 24 hr)		
- Power plant's fence line on the side of office building	58.0-59.3	90 bBA
- Ban Rai Nueng	56.0-59.0	90 bBA
<b>Sahacogen Green Biomass Power Plant</b>		
The results of noise measurement in general (Leq 24 hr)		
- Nong Pla Kho Temple	50.9-58.5	70 bBA
- San Luang Temple	47.1-59.7	70 bBA
The results of noise measurement in workplace (Leq 12 hr)		
Personal noise dosimeter (Leq 12 hr)	77.0-82.7	87 bBA
<b>Sahagreen Forest Biomass Power Plant</b>		
The results of noise measurement in general (Leq 24 hr)		
- Baan Huay Nam Sai School	52.1-55.8	70 bBA
- Si Chum Phorn Wachirawat Temple	49.8-61.8	70 bBA
The results of noise measurement in workplace (Leq 12 hr)		
Personal noise dosimeter (Leq 12 hr)	81.0-82.0	87 bBA



## • Waste Management

Sahacogen is dedicated to manage wastes according to the legal standards and the policies of each power plant. Wastes are divided into two categories: hazardous waste and non-hazardous waste. The company's waste management practices are as followings:

1. Hazardous wastes are those that can be harmful to an environment, such as transformer oil, lubricants and chemical containers. These wastes are disposed according to the approved procedures to the agencies authorized by the Department of Industrial Works.

2. Non-hazardous wastes are general wastes such as leftovers, wood, paper, wires, plastic bags, and construction materials. These wastes are classified before disposing to bury according to the standards and regulations or appropriately recycling. The waste bank project was established to purchase recyclable wastes from employees in order to foster employees to utilize resources effectively.

Moreover, biomass ashes from combustion process of the biomass power plant of Sahacogen Green and Sahagreen Forest are utilized for agricultural benefits and brick production. These resources are distributed to communities as part of the company's CSR campaign, adding value to non-hazardous wastes for optimal utilization.

## • Potential Utilisation of Biomass Ashes

Biomass Ashes" arise from the power generating process of biomass power plant. Biomass ashes are alkaline conditions and contain essential nutrients for plants, suitable for agriculture as soil improvement materials. This interests many people in using biomass ashes to increase their own production output such as groups of bamboo-growing, rice-farming, longan-planting, and planting-soil development. Moreover, these ashes are suitable for constructing material components such as light-weight bricks. In association with educational institutes in local areas, the company develops the biomass ashes usage, creates employment to produce those bricks, which has been conducting since 2013 to the present..

Operating Result of Biomass Ashes Utilisation in 2016-2018	Numbers	Volume (Tons)	Value (Baht)
2016	24	7,690	494,465
2017	25	6,376	839,720
2018	30	4,771	472,130

The public-private coalition project teaching how to plant home-grown vegetables aims to promote the use of ashes from biomass. The ashes could be used as the component in soil for planting. In 2018, the company visited and taught children in Wat Pa Dad School, Moo 2, Wiangyong village, Muang district, Lamphun Province. The biomass ashes were used in the soil for vegetable planting. The products from the plants then were cooked as school lunch. More than 100 people attended the activity.



## • Waste Bank for Environment Project

Waste Bank for Environment Project has been set up to motivate and enhance the eco-conscious awareness among employees. Waste must be categorized both in office and plant, as well as the employees can bring their waste from home for donation or exchange before the company sells those waste to purchaser for recycling. This is another way to save the world which revenue from selling waste will be used for organizational activities and donation.





## • Value-Added Biomass Project

Sahacogen & Affiliates have intent to develop integrated alternative energy business using biomass for power generation. This fosters the participation and benefits to society with income distribution towards communities by purchasing agro residues from them. With the awareness of social responsibility and sustainability, this also helps to reduce air pollution problem occurring from crop residue burning without control and greenhouse gas emissions.

The procurement and processing biomass center has been established in 2010 to purchase biomass and agro residues in order to add biomass value and achieve the distributive policy for community benefits.

The value-added biomass project is generating financial, social and environmental impact. The project promotes revenue distribution to local communities, creating occupation, decrease the burning activities, reducing smog and CO<sub>2</sub> emission.

In 2018, the company bought the residual parts of the agricultural products 258,436 tons in total. The buying of agro-residues helps reduce the burnt-off amount of corn residues of 58,400 Rais/year or sugar cane residues of 7,000 Rais/year.

## Value-Added Biomass Project

Biomass type	Weight (ton)	Value (Baht)
Chopped wood	141,033	155,240,727
Wood Scraps	47,641	36,031,225
Chaff	34,375	39,148,248
Corn cobs	20,442	20,441,870
Other biomass	14,945	17,477,418
<b>Total</b>	<b>258,436</b>	<b>268,339,488</b>





# Energy Management

Sahacogen focuses on the energy saving attempt. The policy was set to create awareness for energy saving among management and employees. The energy management committee is set to implement and monitor the activities such as doing reports of energy consumption, excursion trips, information announcement and activities with employees. The examples of activities are energy day, picture contest, energy saving motto selection and reduction of consumption campaign, etc.

In 2018, the energy saving projects were launched with the supports from staff and managements. The reduction in energy consumption was achieved.

## Steam trap in steam distribution system maintainance

**Description:** Replacing new steam trap components to reduce the steam leakage from the steam distribution system.

**Venue:** The power plant of Sahacogen (Chonburi) PCL.

Topic	Amount	Unit
1. Targeted quantity of heat power	3,616,125	MJ
2. Result of reduction	453,277	THB/year

## Steam turbines efficiency improvement

**Campaign:** Improving the efficiency of steam turbines by reducing the pressure in condenser. The company can save the amount of steam in electricity production process.

**Venue:** Biomass Cogeneration Plant, Sahacogen Green Co.,Ltd.

Details	Mega Joule/year	Baht/Annum
Energy usage before implementation	1,510,760,900	195,530,307
Energy usage after implementation	1,479,574,165	191,493,962
Energy saved	31,186,735	4,036,345
Investment		150,500
Quantity target		2%
Energy saving result		3%

## Installation of clear roof and lightbulbs change

**Campaign:** Changing the roof from metal sheet to be transparent material sheet together with the change lightbulbs type from ballast type to non-ballast type.

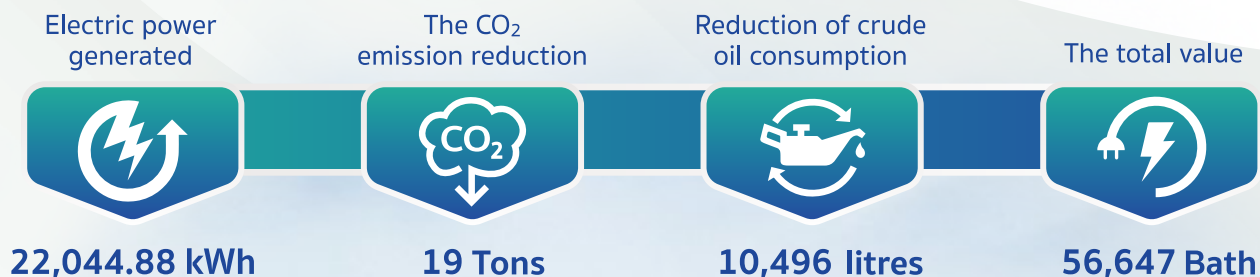
**Venue:** Sahagreen Forest Co., Ltd.'s biomass power plant

Details	kW	kWh/ Annum	Baht/ Annum
Quantative Target	76.66	37,117	168,513
Before the revamp process	76.66	37,117	168,513
After the revamp process	23.33	5,598	25,418
Energy saving	53.33	31,519	143,094
Capital investment			41,680
Payback period			3.49 Month

## Solar Power Generating Project

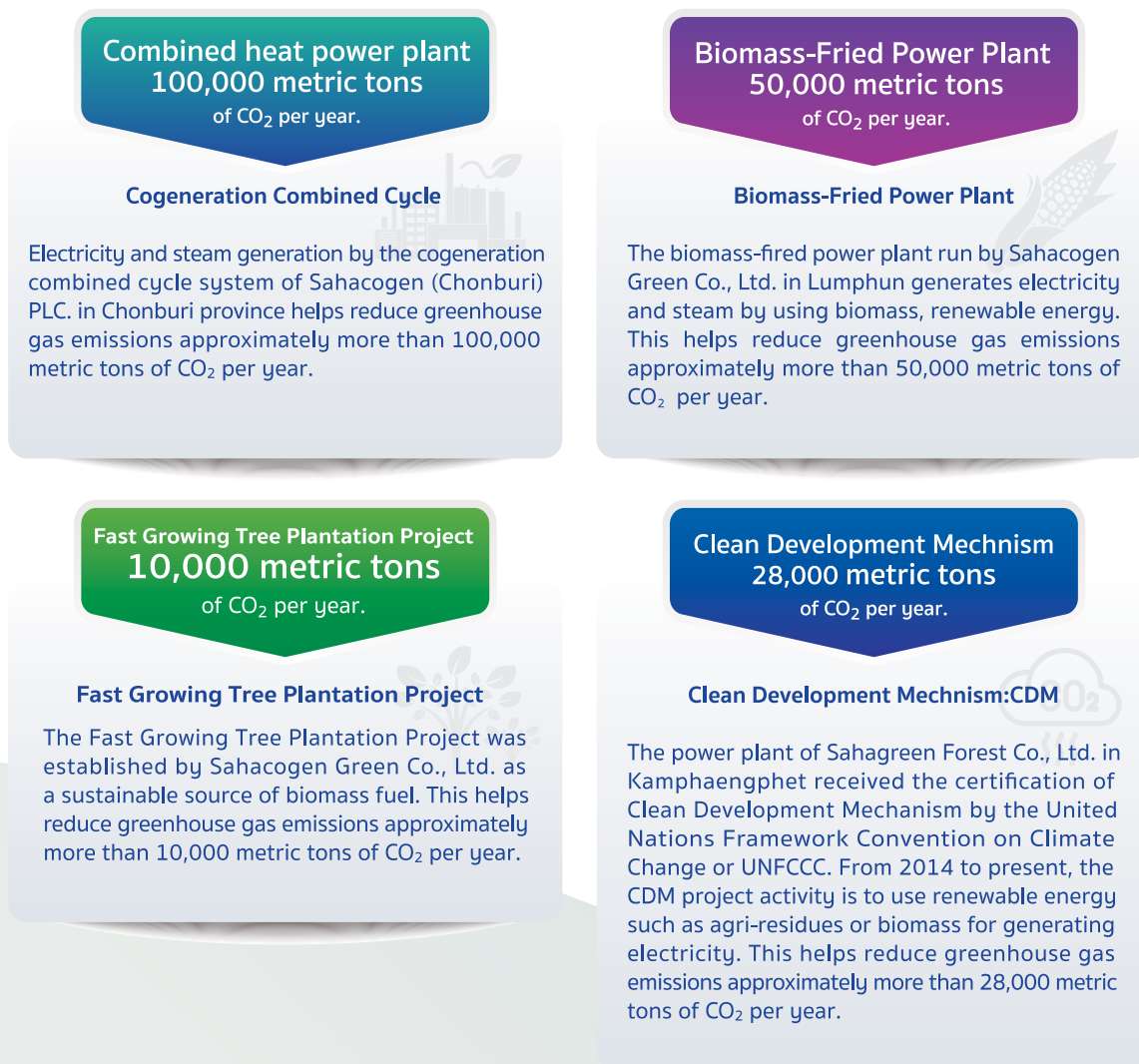
The solar power project was setup to produce electricity used in office by installing solar cells on the car park rooftop of Sahacogen (Chonburi) PCL. The electricity cost has been reduced from the power generation starting from March 5, 2008 to present.

### Project results 2018



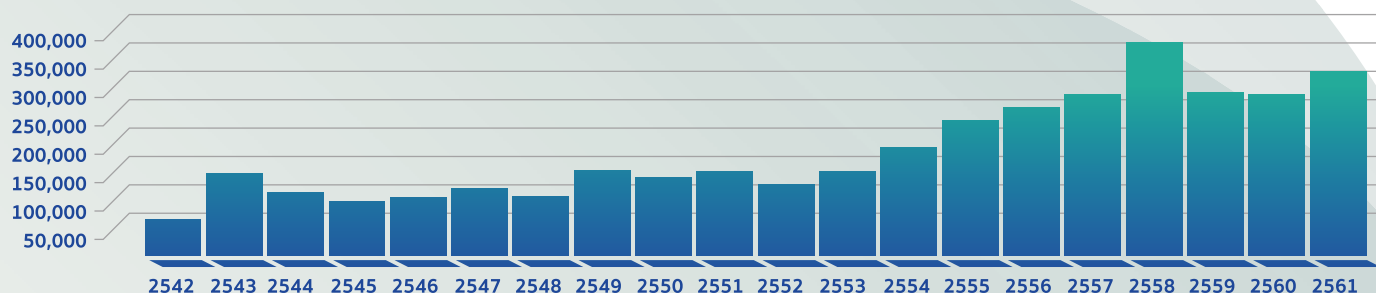
# Green House Gas Emission

As the commitment of Sahacogen & Affiliates, the business operations must be harmonized with environmental conservation awareness as “Environmental & Social Benefits”. The goal has set up to reduce green house gas emissions from power generating process, fast-growing trees for energy project, plantation activities, alternative energy development and other helpful practices to reduce the greenhouse gas emissions.



In 2018, Sahacogen and Affiliates’s business operation mutually helps reduce the greenhouse gas emissions approximately 304,767 tons of CO<sub>2</sub> equivalents per year. The accumulating amount of reduction is i3,313,624 tons of CO<sub>2</sub> reduction per year in total for the pass 20 years since we started the operation.

## GHG Reduction & Absorbtion by Sahacogen (Ton CO<sub>2</sub> /Year)





## • Fast-growing trees for energy Project

The fast-growing trees which the company selects to cultivate are Acacia Mangium, Leucaena, Eucalyptus, Mahogany, Samanea Saman and so on. It is a sustainable renewable energy source to prevent a lack of biomass fuel as raw material to generate power of Sahacogen & Affiliates' alternative energy business and also adding green areas and reducing global temperature.

Starting from 2007, the accumulation of fast-growing trees aging 1-5 years has been cultivated in 5,838 rais in Lamphun and Lampang province. There are 3,852 rais of company's own land; 1,405 rais of rental land; 581 rais of joint-venture land; The total of fast-growing trees planted are 1,558,756.

## Performance of fast- growing tree for energy 2018

Year	Plantation area (Rai)	Fast- growing tree (Tree)
2016	6,388	1,705,652
2017	5,952	1,589,293
2018	5,838	1,558,756

## • Communities Green Area Project

ahacogen has plant propagation center to distribute seedlings to communities, agencies and other people. This will lead to more green area comprising various plant species such as rare tree species, native tree species, decoration plants, economical tree species and multi purposed tree species. This project was initiated in 2012 and has been continued since then. The statistics of young plant distribution were more than 60,000 trees, helping expand green area more than 300 rais of land.

In 2018, the company donates more than 2,000 young plants to support planting projects with community.

- o The project in Lamphoon Province
- o The project in Kampanpetch Province
- o The bamboo planting project in Lampang Province





# The Biodiversity and the Support to Sustainable Development Goals : SDGS

Sahacogen (Chonburi) Public Company Limited, subsidiaries and the other operating units such as the trading center of biomass, fast-growing cultivation sites are located in Sahagroup industrial park and the area allocated for industrial businesses, factories and agricultural businesses. The factory sites are developed specifically for factory building. The environmental impact assessment did not show any forest area covered. The wildlife animal was not found in the area. The the factory building and business operation will cause the environmental impact to the aquatic and on-land biological resources at the low level.

The social responsibility management of the company is complying with the policy of the government that supports the collaboration between public and private sectors. The forest management office number 3 (Lampang), an office under the Forest Department, Ministry of Natural Resources and Environment, launched a bamboo planting project to help create sustainable revenue sources for local community in Tungpueng sub-district, Jaehom district, Lampang Province. The pilot project covers the area of 1,000 rais based on the policy to improve the deforested area. The areas for agricultural activities are provided together with the bamboo sprouts.

The planting areas provided by the government as well as the supports in terms of training sessions about planting bamboo plants as a sources of foods and to generate revenue for people in local communities. Moreover, the bamboo planting also helps reduce the deforestation. The bamboo parts can be used in various ways. The soil fertility can also be improved and enhance the ecology variety. The project running supports the goal to comply with the united nation goals of sustainability development in economy, society and environment. The poverty reduction, the development of food supplies and nutritions; the sustainable agricultural activities; civilliance's well-being; good water supply and irrigation system; the protection and sustainable usage of the aquatic, on-land, forest resouces; and the support to bio-diversity.

In 2018, Sahacogen (Chonburi) PCL and subsidiaries hosted the activities in the scope of this project for the total value of THB 1,026,667.



# Innovation of Environmental Friendly Energy

The company tries to create more value for the residual parts of the agricultural products or biomass. The use of residual items also helps air pollution problems by reducing burning activity. The company supports the use of wood scraps and bamboo parts from factories producing chopsticks, toothpick, grill meatball stick, handcrafts, and furniture. The innovation is producing “comopressed charcoal” as the fuel sources in household and restaurants. The charcoal is marketed under “Lamboochar” brand.

Lamboochar uses the raw material from factories and bamboo from the planting project supported to the local communities. The charcoal is cocompressed in to black stick with 5 centemetres diameter and 10 centemetres length. The heat power is 5,500 kcal per kilogram. The burning out time is over 2 hours. The qualification of the charcocal is free from dirt and soil. Lamboochar yields constant heat level, no smoke and no much ash. The creation of Lamboochar is the innovation that is good fro health and environment. The raw materials from natural resources will be fired and pressed with the modern technology. The production of Lamboochar is under to corporative support from bio fuel and bio energy center, the faculty of Science, Chulalongkorn University in Saraburi Province.





# Communication and Dissemination

In 2018, Sahacogen publicized knowledge on its business innovation through the following media:

## Organizational Communication

Communication is an instrument fostering relationship and help understanding between employees. Thus, the company emphasizes the organizational communication to inform all employees about policies, guidelines, and information from the management in the same direction. There are many communication channels such as monthly magazines, SCG news, e-mail, intranet system (<http://myscg/intranet/>), website [www.sahacogen.com](http://www.sahacogen.com), notice boards, and audio network system, etc.

## External Communication

### SAHAGROUP FAIR

Sahacogen joined the exhibition event in Sahagroup fair No.22 at BITEC exhibition hall, Bangna, Bangkok. The company booth depicted the projects details such as the government-private sector collaboration project, bamboo planting project, charcoal project from residual part of bamboo trees called "LAMBOOCHAR".

### Government-private collaboration project to grow rice

Sahacogen Green joined the exhibition event to promote the bamboo planting project. The project helps local community to have bamboo growing activities to generate revenue for household and use the residual part of the agricultural items to create added value items. The project has been running in Lamphun Province.



### Lamphun clean city

Sahacogen Green joined the exhibition event to welcome the prime minister Prayuth Chan-ocha and team. The exhibition showed the LAMBOOCHAR project details. The project is an example of the garbage usage for making value added items. The project also promoted the garbage categorizing to help the cleanliness issue in Lamphun Province.



The Bamboo planting project was promoted through many channels such as VDO, Government and private collaboration project, Thairath newspaper, Komchatluek newspaper, Prachachatdhurakij newspaper, online channels.

## Printing Media

In 2017, Sahacogen & Affiliates had publicized articles and information about energy and activities between Sahacogen and communities on specific, monthly and quarterly printing media;

Suelamphun Newspaper (Lamphun)

Lamphun News Newspaper (Lamphun)

Chonburipost Newspaper (Chonburi)

Tung Setthi Newspaper (Kampaeng Phet)

Green Energy Magazine



## Open House for the education of sustainable energy

Sahacogen & Affiliates welcomes all government agencies, educational institutes, department of local administration, and other people both domestic and overseas for visiting the power generating process to enhance their knowledge and experiences. In 2018, there were 24 visiting groups, more than 1,000 people. The accumulative numbers of visitors during 2009-2018 are more than 300 groups or 10,000 people.





## Awards

An achievement in corporate social responsibility practices of Sahacogen & Affiliates had been awarded by numerous organizations for its transparent management, as well as socially and environmentally responsible business practices. The company has been receiving awards. The example are listed below.



Thailand Energy Awards 2013 and 2015



CSRI Recognition Awards 2013 and 2014



Thailand Green Design Awards 2015



Sustainability Investment 2015



Local community energy for community Award



Green Industrial Plant Award



ASEAN Energy Awards 2013



Outstanding Corporate Social Responsibility Awards 2014



Investors' Choice Awards 2014 and 2016



Crown Standard CDM Project



Good Corporate Governance Award



Forest Stewardship Council (FSC)

In 2018, the company has been certified and awarded in the scope of business transparency, green energy and environment friendly.



Thailand Sustainability Investment 2018



The dedicator to the Engineering Institute of Thailand Under H.M. The King's Patronage Award



Certification of Thailand's Private Sector Collective Action Coalition against Corruption (CAC)



Certification of safety and Health Prevention Measures For small and medium enterprises. Sliverv level achievement.

The assessment of the quality on holding the Annual General Shareholders' Meeting 2018 by Thai Investor Association. The company received full score of 100 in the level of "excellent" for the 9th consecutive year. (2010-2018)



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## พลังงานยั่งยืน ต้นประสิทธิ์ผู้สังคม



**SAHACOGEN**  
(CHONBURI) PUBLIC COMPANY LIMITED



www.sahacogen.com



สำนักงานสาขา กรุงเทพฯ

ที่อยู่สำนักงาน 589/86 ชั้น 16  
อาคารเซ็นทรัล ซิตี้ บางนา ถ.บางนาตราด  
(กม.3), บางนา, กรุงเทพฯ 10260  
โทรศัพท์ 02-7456686  
โทรสาร 02-3994731



สำนักงานใหญ่ ศรีราชา

ที่อยู่สำนักงาน 636 หมู่ที่ 11 ถ.สุขาภิบาล 8  
ต.หนองขาม อ.ศรีราชา  
จ.ชลบุรี 20230  
โทรศัพท์ 038-481555  
โทรสาร 038-481551