

SUSTAINABILITY REPORT 2019

CHANGE & SHARE



VISION

Leading Integrated
Petrochemical Complex
in Asia

MISSION

Strive for operational excellence
Aspire towards high performance organization
Be responsible for community, society and environment
Create value-added products
Foster innovation and new business

CORE VALUES



INDIVIDUAL OWNERSHIP

Having an entrepreneurial spirit or mindset



SYNERGY

Working together to reach
common goals



RESPONSIBILITY FOR SOCIETY

Growing with a sense of responsibility to society
and the environment, committed to responding to
our stakeholders' needs



PERFORMANCE EXCELLENCE

Setting challenging targets, working
hard to achieve a better result through
continuous development and improvement



INTEGRITY AND ETHICS

Believing in working with honesty with transparent
management and good governance



INNOVATION

Increasing capabilities and skills to
create innovation based on knowledge
about products, services, operations,
and processes



TRUST AND RESPECT

Building trust and confidence among customers,
employees, suppliers, and stakeholders

STRATEGIC GOALS

1st Quartile ROIC
in Petroleum &
Petrochemical Industry

Becoming a "top-quartile"
petrochemical company in
terms of a return on
invested capital (ROIC).

STRONG

ROIC

BIG

REVENUE
& EBITDA

**5% pa Revenue Growth with 10%
pa EBITDA Growth**

Achieving 5% annual revenue growth
and 10% annual EBITDA growth

**Member of DJSI Emerging
Markets Universe**

Maintaining a member status of the
Dow Jones Sustainability Indices (DJSI) in
Emerging Markets category of Oil and
Gas Refining and Marketing.

LONG

DJSI

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Message from the President

IRPC faced many challenges throughout 2019. In addition to the US–China trade war, there were also tension in the Middle East that slowed down demand and narrowed our petrochemical spreads. These macro and market factors put a strain on our operations. Nonetheless, our sustainable management continued with a focus on projects that would minimize the effects of economic volatility and prepare us for future growth. As a good corporate citizen, we gave due consideration to our impact on the environment, communities, and society, striving to satisfy the expectations of all stakeholders.

At IRPC, our business direction and strategic plans helped us maintain competitiveness and prepared us for impending changes. This past year we focused on expanding our domestic market, enhancing the efficiency of our plants, lessening our reliance on Middle Eastern crude oil, working with our customers to innovate high value-added products, and seeking new international partners. At the same time, we also bolstered the competence of our people, including executives and employees at all levels, while embedding the IRPC DNA corporate culture. Moreover, many of our on-going investment projects began in 2019, such as ABS powder production capacity expansion, refinery efficiency enhancement, Euro V diesel production, and floating solar power project. Upon completion, these endeavors will not only generate growth but also minimize our impact on the environment. For instance, by reducing green house gas emission from fuel combustion, we will play a part in mitigating environmental problems, such as the PM 2.5 air pollution and climate change.

Understanding our impact on the environment and surrounding communities, we prioritized the reliability of our operations. We worked hard to prevent unplanned shutdowns and ensure green turnarounds. Additionally, we started a pilot project that enabled us to be zero plastic waste production, using circular economy principles, with the help of the National Research Council of Thailand and Kasetsart University. This project is a total solution, underlining our commitment to lead Thailand into a zero plastic waste society. Moreover, we successfully developed an eco-friendly polymer that met our customers' demands: the POLIMAXX-branded pararene is 100% recyclable and made from 20% natural materials.

The quality of life and well-being of people living around IRPC is important to us. The Board of Directors has

allocated 3% of the average net profits of the past three years for community, educational, and social projects, the first of which started back in 2018. The Lam Sai Yong Model project, for instance, is aimed at solving problems of water shortages for farmers. It first started in Buriram Province but has since grown to include Uttaradit Province, Sisaket Province, and Udon Thani Province. The Prostheses Project has been active for the past nine years, allowing people with disabilities to live a less disadvantaged life and enhancing their career opportunities. Furthermore, we have been exemplary in our respect for human rights, which are the fundamental rights of our stakeholders. Our conduct has garnered a Human Rights award from Rights and Liberties Protection Department, Ministry of Justice.

Despite the challenges we faced, the dedication and co-operation of our dedicated employees, our respect for the environment, and our care for all stakeholders have brought us multifaceted success. I would like to express my thanks to every stakeholder who has trusted and supported IRPC. I am confident that IRPC will move forward with strength as an organization committed to sustainable growth and contributing to the Sustainability Development Goals.



Mr. Noppadol Pinsupa
President





Employee
Volunteering hours
30,560
Hours



**Zero Waste
to Landfill**

IRPC Business

IRPC Public Company Limited is the first fully integrated petrochemical complex in Southeast Asia, located in Rayong province. Currently operates variety of petrochemical plants which produced from propylene and naphtha as main material from petroleum business and the remaining use also available for distribution. IRPC main business is focusing on petrochemical production and development and also gain more added value from service expertise, for example, plant and machinery maintenance service, system installation and IT training, laboratory testing and analysis service, engineering service, and logistics service, etc.

Note: *Sales revenue includes revenue from the petroleum business (including excise fees), the petrochemical business, electricity and utilities, tank servicing fees, port fees, and others.



Ports and Storage Tanks

IRPC operate deep sea ports which comprises of Bulk & Container Terminal (BCT) and Liquid & Chemical Terminal (LCT) providing services for domestic and international freight forwarding, as well as 300 storage tanks for petroleum and petrochemical products. these infrastructure and facilities are internationally standardized.

Petroleum Business

IRPC's refinery has the third-highest refining capacity in Thailand. Its petroleum products include liquified petroleum gas (LPG), naphtha, benzene, diesel, and fuel oil. Furthermore, IRPC also has a lube base oil plant and asphalt plant with the highest capacity in Thailand. IRPC is also a producer of raw material for vehicle tires and rubber process oil, which have been internationally recognized and certified for quality under the brand Terramaxx.

Petrochemical Business

IRPC is a manufacturer of upstream petrochemicals-namely, olefins and aromatics. These products are used as feedstocks for downstream petrochemical manufacturing, which includes polyolefins (HDPE and PP) and polystyrene plastics (ABS, SAN, EPS, and PS). All these are supplied to plastic manufacturers for finished plastic products both domestically and internationally under the brand POLIMAXX.

Asset Management

IRPC manages a total of 12,000 rai of land in Rayong and other provinces. This includes lands earmarked for other state-sponsored investment projects. These properties fall under three categories:

- 1) IRPC Industrial Park,
- 2) WHA Estate Industrial Estate Rayong (WHAIER),
- 3) A large plot of land with development potential in Chana District in Songkhla Province.



Electricity and Utilities Business

IRPC provides infrastructure and public utilities, including power, steam, water, wind and centralized waste water treatment system. Related services such as plant and machinery maintenance service, system installation and training, laboratory testing and analysis service, engineering service, logistics, and asset management are all tailored to fully support business operations with the same standards as general industrial estates.

Production capacity and process chart information. Please read more in details in Annual Report page 151-157



BUSINESS MODEL

INPUT

BUSINESS STRATEGY



Operating Cost THB 236,569 Million
Equity THB 83,402 Million

INNOVATION AND PRODUCT DEVELOPMENT



R&D Investment THB 323 Million
13% of R&D employees with PhD.
to total R&D employees

HUMAN RESOURCE MANAGEMENT



Total 5,467 Employees
Employee training hours 42 hours
per person per year
Human Capital Development expenses
THB 96 Million

SUPPLY CHAIN MANAGEMENT



Property, Plant and Equipment
THB 121,069 Million
21.46% Spending on purchasing of
products and services from suppliers
and contractors in Rayong
of total general procurement expense

SOCIAL WELL-BEING



Corporate Governance
Business Ethics
Human Rights
Budget for living quality improvement of
Community and Society THB 288 Million

CARING FOR THE ENVIRONMENT



Crude Oil consumption
9.38 million Tons
Water consumption 36 million m³
Energy consumption 58 million GJ

VALUE-CREATING PROCESS

Create Value with Corporate Strategy...

Power of **GROWTH**

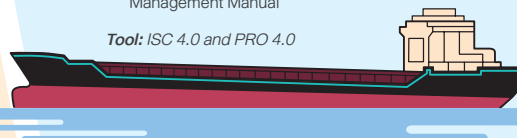
Power of **DIGITAL**

Power of **PEOPLE**

Supply Chain Management

- IRPC Supplier Code of Conduct
- IRPC Purchaser Code of Conduct
- IRPC Sustainable Procurement Management Manual

Tool: ISC 4.0 and PRO 4.0



Management Commitment



Customer Relationship Management

- CRM Procedure Manual

Tool: B2B / Big Data Analytics / Market and Competitor Intelligence Dashboard / Control Tower: Logistics and Client Excellence



Community Well Being

- Community Development and Community Relation Manual

Human Right

- Human Right Policy

OUTPUT / VALUE CREATED

Operational Eco-Efficiency

- Operational Excellence
- E4E Project

Asset integrity and Occupational Health and Safety

- Process Safety Management
- Occupational Health and Safety Management

Climate Change

- Climate Strategy
- Water Management for sustainability

Tool: EKON\$ / idMS

Leading Integrated Petrochemical Complex in Asia

Innovation, Product stewardship and Specialty Products

- Innovation Framework

Tool: EKON\$ / R&D Digital Dashboard

SHAREHOLDER / INVESTOR



Revenue THB 239,315 Million

EBITDA THB 5,940 Million

Payments to providers of capital
THB 1,837 Million

CUSTOMER / CONSUMER



Petroleum & Petrochemical Product 12 Million Tons

Customer Satisfaction 91 %

Additional Profits from R&D THB 150 Million

EMPLOYEES



Employee Engagement 82%

Employee wages and benefit THB 10,171 Million

Total Recordable Injury Rate 0.18 case
per million hour worked

SUPPLIER



100% of new Suppliers were screened using
Environmental, human rights, and labor practices
criteria.

Supplier Satisfaction 94%

No accident from product transportation

COMMUNITY AND ENVIRONMENT



Community Satisfaction 91 %

THB 74 Million to support social enterprise

30,560 of Employee Volunteered Hours

Taxes paid to government THB 21,568 Million



THB 311 Million to Environmental
protection expenditures and investment

GHG Emission (Equity basis) 4.619 Million tCO₂e

Amount of waste reduced by 8%
with year 2018

Corporate Governance, Business Ethics, and Compliance

IRPC adheres to operating its business to achieve the company's vision under corporate governance, ethics, and transparency to foster confidence amongst stakeholders, as well as drive the business while keeping in mind its social and environmental responsibilities. These principles are driving IRPC towards more sustainable growth.

IRPC encourages our Board of Directors, Executives, and all of our employees to comply with its Corporate Governance Handbook. We mold our policies and practices to be in line with PTT Group way of conduct and we instill them in our subsidiary companies and joint venture where IRPC has management control, aligning standards among stakeholders throughout the value chain. This helps to reduce business risks and build trust amongst all stakeholders.

Corporate Governance

IRPC has charted its good governance approach to correspond with the United Nations Global Compact (UNGC), Guidelines of the Stock Exchange of Thailand and the ASEAN Corporate Governance Scorecard. The company has adopted a Corporate Governance Policy (CG Policy), published a CG Handbook, and required members of the Board of Directors, Executives, and employees, as well as its subsidiaries to acknowledge and enforce the CG policy. IRPC focuses on cultivating awareness of strong business ethics and a code of conduct of good governance. In 2019, some of IRPC's efforts to follow principles of good corporate governance can be described below:

Assessment results from the Corporate Governance Report: CGR, done by the Thai Institute of Directors (IOD) and the Stock Exchange of Thailand (SET) gave IRPC a rating of "Excellent" and put us in the Top Quartile for listed companies with market capitalizations of more than THB 10 Billion.



Policy Revision

- Updated CG Policy by applying Good Corporate Governance Principles 2017 (CG Code) as defined by the Securities and Exchange Commission.
- Updated Diversity Policies that oversee the Board of Directors and our workforce to promote equality among those of different ages, sexes, races, religions or other beliefs. This extends to allowing individuals to participate in labour union activities or other activities outside the workplace.
- Revising our Corporate Governance Handbook, ensuring it complies with the Stock Exchange of Thailand's principles of good corporate governance for listed companies, ASEAN CG Scorecard, Anti-Corruption practices as well as relevant international guidelines, which will be completed in 2020.

Strengthening from Inside

- Our President emphasize on raising awareness of good corporate governance by setting a strong Tone From the Top, both in Management Committee meetings for the executives as well as in CEO Town Hall for all employees. This includes communicating about various topics such as Conflicts of Interest, No Gift Policy, and CG Policy.
- Employees took our "Ethics In You" online course. 2,461 participants scored an average of 85% on the course quiz.
- Communicated No Gift Policy to all our employees in any occasion internally and externally.
- Published a CG News, Do - Don't practice guideline for our employees.

Change and Share with Stakeholders

- IRPC CG Day 2019 was held under the theme of "The Creation of TRUST: SUSTAINABILITY FOR ALL". It aimed to contribute employees, suppliers and customers better understand the importance of business and human rights. There were 180 participants in the event.
- PTT Group CG Day 2019 was held under the theme of "Digitalization: Challenge for the Governance" to show commitment in transitioning to be a CG 4.0 organization through the use of technology, creativity and morality. We invited 17 of our critical suppliers and customers to attend the event, with an expectation to expand good corporate governance among business partners throughout the IRPC supply chain.

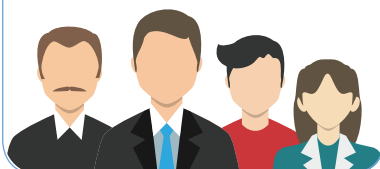
Structure and Diversity of Board of Directors

IRPC stresses maintaining an effective management structure and well-qualified Board of Directors, to maximize value for our Company and its stakeholders. The Nomination and Remuneration committee has been established to screens appropriate candidates and tables a list to the Board before submission to the shareholders' meeting for consideration and approval. This committee takes into account a candidate's education background, knowledge, and experiences. Equal opportunity is provided regardless of gender, age, ethnicity or religion. An appropriate level of remuneration for the Board of Directors, approved by shareholders, is set to ensure that the organization has well-qualified and motivated Board Members.

Board of Directors Snapshot (Data as of Dec, 2019)

Composition of Board of Directors (person)

Executive Director **1**
Non-executive Director **14**



Average Age of Board Members (years)

59



Percentage of Independent Directors in Board of Directors (%)

53



Percentage of Women Directors (%)

7



Average Board of Directors Meeting Attendance (%)

96



Average Board Tenure (years)

3



Experience of Members of the Board of Directors (person)

Energy, Petroleum
and Petrochemical



13

Corporate Governance
and Social Responsibility



15

Environmental



2

Accounting, Auditing and
Internal Auditing



1

Civil and Commercial Law,
Criminal Law,
International Law
and Public Law



1

Human
Resources



1

Economics, Finance,
Banking and Capital
Markets



2

National Security,
Politics and Government



2

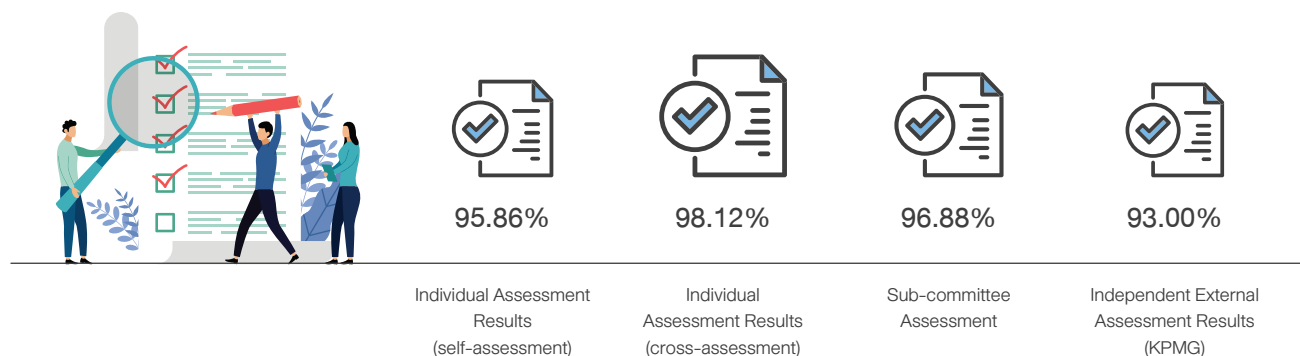
Political Science
for Social
Development



3

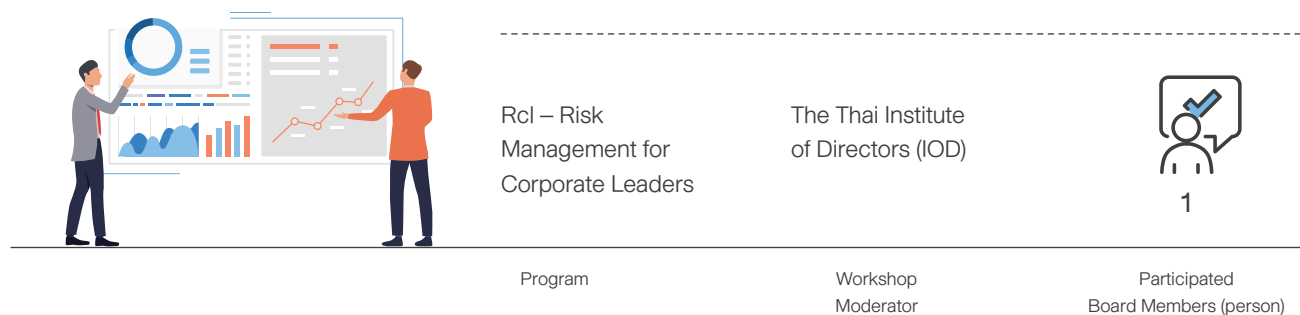
Evaluating the Performance of the Board of Directors

Annual performance assessment for the Board of Directors are performed to ensure the Board is being highly efficient and that adjustments are made to increase efficiency going forward. In addition to this, external audits are done every 3 years which the most recent assessment was conducted by KPMG Poomchai Business Advisory Ltd. in 2019.



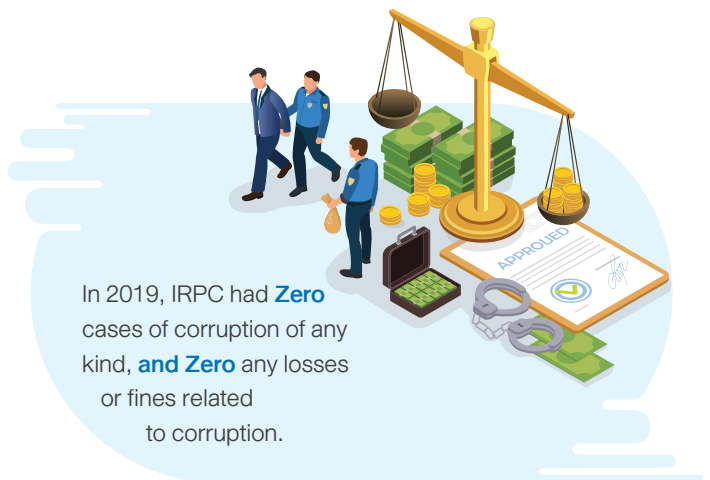
Capability Development of the Board of Directors

IRPC encourages the Board of Directors to attend training in order to improve their capability. In the year 2019, there are training for the development of the Board of Directors as follows:



Anti-Corruption

IRPC and its subsidiaries continue our anti-corruption practices, being certified as a member of the Thailand's Private Sector Collective Action Coalition Against Corruption (CAC) of the Anti-Corruption Organization (Thailand) since 2014. In addition, a risk assessment of all forms of corruption has been conducted. Guidelines have been established to reduce any risks found. Our Anti-Corruption Policy and Guideline are communicated throughout the organization, from top-level executives down to employees. In 2019, some of IRPC's anti-corruption performance can be summarized below:



In 2019, IRPC had **Zero** cases of corruption of any kind, **and Zero** any losses or fines related to corruption.

Policy Revision

- Revised the Anti-Corruption Policy in order to align with criteria of the IOD/CAC, as well as with the PTT Group Way of Conduct's section on Corporate Governance and Anti-Fraud and Corruption.

Strengthening from Inside

- Maintained our membership in Thailand's Private Sector Collective Action Coalition Against Corruption (CAC).
- Prepared an online report of Conflicts of Interests, requiring executives and all levels of the employee to disclose any potential Conflicts of Interests. This is the fifth such report, beginning in 2015 and achieving 100% target.

Change and Share with Stakeholders

- Promoted and supported the awareness on the importance of Anti-Corruption. In 2019, this encouraged 15 of our critical suppliers to prepare CAC or CAC SME Certifications. As a result, IRPC was one of five private organizations that received the CAC Change Agent Award from the IOD.
- Attended the "National Anti-Corruption Day 2019", organized by the Anti-Corruption Organization (Thailand). This year's concept was "Fight Against Corruption" and focused on fundamental business practices, professionalism, transparency, and how to operate under principles of good governance and social responsibility.
- Participated in "International Anti-Corruption Day (Thailand)", organized by the National Anti-Corruption Commission under the concept of "Zero Tolerance, Thais do not tolerate corruption." Efforts were made to shine a spotlight on the power of creating a transparent society, not tolerating corruption, and providing support for a place for honesty within Thai society.



Business Ethics

IRPC conducts its business operations in a way that is equal and ethical to its stakeholders. Best Practices have been established for principles of Corporate Governance for the Board of Directors, executives, and employees to strictly abide. They cover human rights, labour practices, engagement with the community, environmental responsibility, health, safety, accepting and giving gifts and assets, along with any other benefits, confidentiality, buying and selling securities, the use of information and communication technology, and intellectual properties.

Best Practices are also available on topics related to the customer relation management. They include Corruption and bribery, Discrimination, Confidentiality of information, Conflicts of interest, Antitrust and anti-competitive practices, Money-laundering and insider trading, the Environment, Health and Safety, and Whistleblowing. This is done to ensure legal compliance and to establish a framework for our suppliers customers and business partners. It allows us to better treat all our suppliers equally, in a transparent and fair manner, strengthening good relationships and promoting partnership for sustainability.

100%

of Companies of which IRPC owns more than a 50% stake adopt IRPC Ethics and Code of Conducts.



100%

of Companies of which IRPC owns less than a 50% stake adopt either IRPC Ethics and Code of Conducts or an equivalent.



100%

of our employees have signed to acknowledge IRPC Ethics and Code of Conducts.



100%

of new employees have taken training on Business Ethics



22

Business Units audited by Internal Audit Department



2019 Target was 21 Units

100%

of Business Units with High Risks of Corruption has Corruption Prevention Mitigation Plan



Corporate Compliance

Regulatory Compliance serves as part of the foundation of the Company's working procedures. IRPC has formulated policies and guidelines that not only uphold our dedication to compliance, but also improves our efficiency. These are communicated to all employees throughout the organization. In addition, IRPC has adopted the ISO 19600:2014 Compliance Management System. This has allowed us to improve our policies, guidelines and regulatory controls to

increase organizational performance. System reviews have been made a part of our annual performance reviews. These enable us to prevent or reduce the risk of non-compliance with laws, rules, regulations as well as any international operating standards. We aim to be an organization of Zero Non-Compliance. In 2019, some of IRPC's Compliance activities have included the following:

IRPC CG Roadshow and Corporate Compliance Academy were held under the concept of “The Gift of GRC” to promote business integrity and ethics and to bring about maximum efficiency. During the event, IRPC's management discussed “The Gift of GRC,” which involves people, processes, and technologies. In addition, a speaker from Baker and McKenzie gave a lecture on “The Personal Data Protection Act” for the benefit of working in the age of big data.



Policy Revision

- Revised our operating procedures to comply with rules set by IRPC Public Company Limited and the IRPC Group (Compliance Framework Policy of the IRPC Group). All important issues were updated to be in accordance with international standards. Our aim is to operate efficiently and sustainably, so to build confidence amongst our stakeholders.
- Our Board of Directors have established an IRPC Corporate Compliance Framework, to serve as a guideline for Company Compliance.

Strengthening from Inside

- Organized a Foundation & Basic Compliance seminar for department and section managers.
- Facilitated Compliance knowledge sharing throughout the organization.
- Created a new outlet for Compliance News (CC News), GRC News and Ai Oun Journal.
- Furthered the development of our E-Compliance, whereas now it includes an E-Library and a Compliance Self-Assessment.

Change and Share with Stakeholders

- Hosted a PTT Group Compliance Club for knowledge sharing as well as to strengthen cooperation between companies in the PTT Group.
- Advised and hosted lectures for the IRPC Technology College staffs on Anti-Corruption Compliance.

IRPC hosted the 15th Principals Meeting of the South East Asia Parties Against Corruption SEA-PAC. The theme was “Promoting Anti-Bribery Culture in ASEAN Business”. A delegation from SEA-PAC and guests, a total of 70 people, were invited to attend this conference. This highlighted the good cooperation that IRPC was showcased to have influence in, in combating unethical business practices of all kinds. It also showcased the Company's administrative abilities and highlighted the good reputation the Company maintains and also ready for the all ASEAN and international level of showcase.



A Corporate Compliance Risk Assessment of executive managers revealed a score of

94.85%



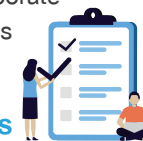
All new employees (100%)

completed training titled Corporate Compliance.



A total of employees who response on Corporate Compliance awareness

1,573 persons



A total of employees who joined a Compliance course was

917 persons



Complaints Management

IRPC has many communication channels in place to accept suggestions and recommendations and to deal with whistleblowing reports about any activity or suspicion of an activity performed by an IRPC Employee or an IRPC authorized person that violates the law or code of conduct or corporate governance or any corruptive behavior or inappropriate conduct of any person at any corporate echelon including Board of Directors, Executive Management and employees of IRPC and the IRPC Group, as well as any party involved in IRPC's business. Additionally, the Anti-Corruption Policy, which applies to IRPC and its

subsidiaries, clearly defines whistleblowing channels and protection for whistleblowers and witnesses. It also specifies ensuing investigative and remedial procedures to ensure impartiality and transparency. Disciplinary action ranges from a verbal warning to termination, depending on the severity of the wrongdoing. The company will endeavor to determine preventive measures as well. Reports of the investigation will be sent to the whistleblower, relevant departments, the Corporate Governance Committee, and the Board of Directors.

Whistleblowing Channels



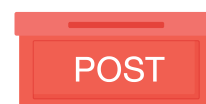
E-mail:

auditor@irpc.co.th



Mail:

Chairman of the Audit Committee
555/2 Energy Complex, Building B, Floor 6
Vibhavadi Rangsit Rd., Chatuchak,
Chatuchak, Bangkok 10900



P.O. Box:

P.O. Box 35,
Sun Tower Post Office,
Bangkok 10900

The investigative procedure begins with Office of Internal Audit. This department is directly responsible for supervising the investigation and monitoring its progress. It also prepares a detailed report of all violations of the Code of Conduct to be submitted to the Audit Committee and the Board of Directors every month and every quarter, respectively. In practice, Corporate Internal Audit has the power to determine whether each whistleblowing submission has grounds. If the submission is of sound reason, Corporate Internal Audit will set up an investigation panel. If the accused is found guilty, they will be subject to the corresponding disciplinary action. All whistleblowers and witnesses will be afforded protection.



As a consequence, disciplinary action was taken fairly and transparently against each violation case, however, there was no complaint found related to corruption or fraudulent and no significant damage found. The cases relevant to non-compliance and/or to Code of Conduct were assigned to Internal Audit and relevant business units for verification and the reports were made to the Audit Committee and the Board of Directors as well as the related party in a sequence specified in Complaint Management Procedure. Furthermore, these will also be communicated to the responsible functions in order to set up the preventive mitigation and for annual audit planning.

Information related to Corporate Governance, Business Ethics, and Compliance can be found on our website at: <http://www.irpc.co.th/th/sustainable.php>

Sustainability at IRPC

IRPC is committed to striking a balance between business operations and the sustainability of the economy, society, and the environment. We also make great efforts to continuously innovate in our products, services, and production processes. Employees are our valuable resources, and we encourage them to develop their skills, knowledge and abilities, strengthening IRPC and the values that we hold. Our social and environmental initiatives build trust with our stakeholders in IRPC's business operations.

IRPC established a Sustainability Management Office in 2014, which reports directly to the president. Its role is to manage the organization's sustainability strategy, covering the economy, society, the environment, and good corporate governance. The management committee is chaired by the president and has the highest authority over issues related to sustainability. In 2015, IRPC established a sustainability management policy. It has since been reviewed on an annual basis, and in 2019, it was revised to comply with all applicable laws and regulations in all countries of operations.

Sustainability Management Excellence





IRPC's sustainability management continues to develop every year. Last year, a data platform, under an "Environmental Management Accounting (EMA)" Project, was initiated and developed in accordance to international approach as scientific-based data linking to business economics and governance control. This integral based data linked to investment cost accounting will ensure effectively financial analysis and help to mitigate risks and to take opportunities in a quick and efficient manner. In addition, it allows external audits to verify the management system set by our management committees, helping to build confidence among various stakeholders.

As for the sustainability management guidelines for the next three to five years, if our vision is to remain a leading integrated petrochemical industry in Asia, we should clearly identify which projects we should do prioritization for investment and call to action. In particular any opportunities need to have undergone science-based data analysis through market research institutes, using global indicators as benchmarking. These findings should be used in making sure that strategic and action plans are in line with investment plans. They should cover plans for research and development, as well as take into account effective human resources. Together, these can be put into focus as 4-dimensional approach:-

- Approach 1: To fascinate development in line with climate change measures and business opportunity; We should well prepare to accept the changes that are likely to come along with climate change, which will have an effect on the company's industrial business. Such changes might include limited water resources or lower water quality in the Eastern region of Thailand. Projects must account for this by having a water source backup plan, as well as a plan to manage the quality of water they have access to.
- Approach 2: To take Climate Change Action & Environment Measures; Promoting the research and development of alternative energy sources in order to turndown steam and electricity use from coal-fired power plants towards investments made in NG expansion power plant or in the floating solar power that cover the surface of the reservoir.
- Approach 3: To call to action for Business Opportunity & Plastic Waste Mitigation; The public commitment has been announced by our CEO, Noppadol Pinsupa, since December 16, 2019 to express our intentions to be a leader in the plastics business and are ready



Dr. Awrapin Ketratanakul
Executive Vice President, Sustainability Management Office
(In the position until December 30, 2019)

to pioneer to launch action and technology to manage our plastic waste to zero over the next three to five years, so called as, ECO Solution Model will create as value chain from one factory to the others and most of them would turn to be our business partners starting as supply chain to converters or customers extending to end-consumers. These value-added plastics and their process will be assessed, validated and accredited against to world recognition guidelines or standards as well. We aim to create more of a "circular economy within the petrochemical industry value chain".

- Approach 4: To co create Human Well Being & Capacity Program; to set up people management to the platform and develop to gather people knowledge and digitally transform to e-library system. Our professional engineers and skilled members of IRPC Technological College are ready to build both technical and non-technical capacity of people to serve the requirement of Business growth as long-term plan as well as to contribute to share and transfer technical knowledge to the nearby community we do engage with to help people have better living including water management and waste disposal. This is being conducted as a part of the "Human well-being and capacity building in the drastically change of environment and society"



Stakeholder Engagement


IRPC's forwarding its business operation in sustainable manner encompassing by balance stakeholder expectation. Therefore, the stakeholders engagement procedure have been conducted in order to understand stakeholders views, interests, expectation, and concerns on our business operation. The engagement results will be determined and scrutinized resulting in materiality issues using as corporate strategy input.

Stakeholder groups and engagement process can be found at the website link below: <https://www.irpc.co.th/sustainability-management/stakeholder-engagement/>



Results of Stakeholder Engagement

Stakeholders	Identified Issues	Management Approach
 Shareholders / Investors	<ul style="list-style-type: none"> • Balance on economic, social, and environment • Improve business operation in sustainable manner 	<ul style="list-style-type: none"> • GDP Strategy • CSR Strategies • Quality, Security, Safety, Occupational Health, Environment, and Energy Management Policy
 Employees	<ul style="list-style-type: none"> • Corporate Strategy execution • Employees and stakeholder satisfaction • Employees engagement • Human capital development 	<ul style="list-style-type: none"> • Human Capital Development through GDP Strategies • Human Resources Excellence Strategy
 Customers / Consumers	<ul style="list-style-type: none"> • Corporate target achievement • Operate effectively and efficiently for sustainable growth • Product development base on customers/ consumers requirement • Product development base on waste minimization and climate change impact awareness, for example, developing recyclable speciality product 	<ul style="list-style-type: none"> • Customer Relationship Management • Innovation Excellence Strategy • Circular Economy Management

Stakeholders	Identified Issues	Management Approach
 Suppliers	<ul style="list-style-type: none"> Suppliers awareness raising on ESG aspects Stakeholder engagement and satisfaction throughout the value chain Networking 	<ul style="list-style-type: none"> Integrated Supply Chain Management
 Community, Society and Environment	<ul style="list-style-type: none"> Community and Environmental Development Program Community Communication and Engagement 	<ul style="list-style-type: none"> CSR Strategies Quality, Security, Safety, Occupational Health, Environment, and Energy Management Policy.

Materiality Assessment

IRPC take issues that are material to stakeholders from government regulations and private organizations both domestic and international such as SASB, SustainAbility, World Economic Forum, UN Sustainability Development Goals, and NSTDA into considerations together with corporate risks, sustainability management policy, and business direction as well as materiality assessment results from past years to address and prioritize new material issues that may have impacts on the sustainable business operations. these processes were done in line with GRI Reporting Principles for Defining Report Content. For 2019 Materiality Assessment result, please go to page 106-109.

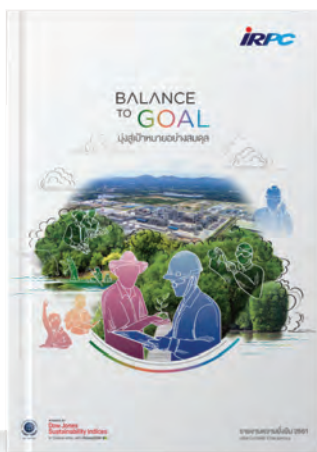


Sustainability Disclosures

In an effort to show transparency and earn the trust of our stakeholders, we report on our sustainability targets and whether or not we have been able to achieve them. These targets are set to balance economic, social, and environmental factors. They are disclosed in a Sustainability Report, in accordance with the Principles for Defining Report Content issued by GRI Standards. It measures sustainability context, materiality, completeness, stakeholder inclusiveness and also conforms to the Principles for Defining Report Quality. Other measures include accuracy, balance, clarity, comparability, reliability and timeliness. This report is issued to meet international standards. Additionally, the report is verified externally for alignment with GRI standard to ensure confidence to stakeholders that information disclosed in this report is accurate

Sustainability Assessment

IRPC's Sustainability management framework has enabled us to maintain good corporate governance at both the policy level and at the operational level. Our transparency in disclosing information to the public not only assists in making our operations run more efficiently but also helps us gain the trust from our stakeholders and has been useful in facilitating internal and external audits. In 2019, IRPC participated in the Sustainability Awards conducted by the Stock Exchange of Thailand. We were selected as one of four companies with market capitalizations of over THB 100 Billion to receive a Sustainability Awards of Honor. We have also been announced as a member of the Dow Jones Sustainability Indices under the Emerging Market category of Oil and Gas Refining and Marketing sector for six years in a row, and was ranked Silver Class in 2020 Sustainability Yearbook. These successes are evidents of IRPC's commitment to sustainable business operations



MEMBER OF
**Dow Jones
 Sustainability Indices**
 In collaboration with  **SAM**
 a RobecoSAM brand



Risk and Crisis Management

At IRPC, we attach great importance to our risk and crisis management. Our objective is limiting the level of business, societal, and environmental risks to an acceptable level. Systematic and effective risk and crisis management enables us to identify and manage risks with optimal resource utilization, helping us to achieve both our Short- and long-term goals. It is also in line with the guidelines we have laid out to ensure environmental, social, and corporate sustainability.




MANAGEMENT APPROACH

IRPC's risk governance structure consist of Risk Management Committee (RMC) which is responsible for establishing policies and recommending appropriate and effective risk management strategies on various parts of the business. The Risk Management and Internal Control Committee (RMCC) is responsible for overseeing that risk management is being executed in accordance with company policy. The Corporate Risk Management Division is responsible for analyzing, monitoring, and reporting on the internal risk performance of the organization. The Audit Committee is responsible for reviewing the effectiveness of efforts detailed in risk management and internal controls reports. Additionally, we have applied the international-standard COSO Enterprise Risk Management Framework to our risk management approach. This has helped promote a good risk management culture within the organization, assuring internal and external stakeholders that risk can be managed both efficiently and effectively.

The company also maintains a Risk Management Policy and an Enterprise Risk Management Manual that outlines guidelines for operations and communication of our employees to be in a way that conforms with the organization's risk management system, business continuity management system, and internal control systems. This is done in compliance with international standards ISO 31000 (Risk Management), ISO 22301 (Business Continuity Management), Operational Excellence Management System (OEMS), and Internal Control Integrated Framework.

IRPC's risk management plan is set alongside our organization's strategic plan, and it gives great consideration to both short-term and long-term business risks and opportunities. These include but are not limited to price volatility risk, operational risk, capital project risk, organizational capability risk, policy and regulatory risk, and IT security and crime risk. Appropriate risk appetite and risk management are part of the key metrics we set in our organization's business plan. Risk management plans are reviewed on a quarterly basis. In addition, key risk indicators are monitored to help alert us in the likelihood of a risk event occurring.

Key Risks Related to Sustainability

Key Risks and Business Impacts	Risk Mitigation Measures
<p>Plant Reliability</p> <p>Impact on the Business Disruption of production processes can result in business discontinuity, lost business opportunities, and a rising impact on production costs.</p> 	<p>Ensure that an efficient management system is in place to support smooth production processes. Prevent unplanned shutdown in advance through the implementation of a Zero Unplanned Shutdown program. Any issues that arise are stripped down to their root causes and addressed to prevent any recurrence. Guidelines are set to assist prevention and monitoring through the incident analysis system. In addition, thorough inspections of plant machinery and equipment are conducted during the Plant Health Check. We look at specific risk points as well as make holistic evaluations.</p>
<p>Safety</p> <p>Impact on the Business Disruptions can affect the company's performance and significantly affect the confidence of our stakeholders.</p> 	<p>Our Operational Excellence plan promotes a safety culture through various policies. Additionally, strict safety inspection teams monitor issues. In the event of an accident, a committee will be established to ascertain the root cause and distribute learnings to employees to prevent the occurrence of similar accidents happening in the future. In our company's operations, we've reduced accident rates to our target metric, making it comparable to leading companies in our industry. Additionally, we have a goal of reducing accidents every year.</p>
<p>Community Engagement</p> <p>Impact on the Business Any damage to IRPC's reputation or image may lower trust in us from our communities, as well as negatively affect the confidence of the company's stakeholders.</p> 	<p>Foster understanding and good relationships to gain the trust of surrounding communities. It is important to maintain a good image with the public. IRPC follows community and social management guidelines in its business processes, so called CSR in Process. Additionally, we prepare a Social Impact Assessment (SIA) and a Social Return on Investment (SROI) evaluation. To share information about operations and their social sustainability, we hold Open House Activities. Furthermore, we operate a Field Coordination Center and have established a Community Health Promotional Fund. We also co-host emergency drills with communities and government agencies at the local and national levels.</p>

Emerging Risks

Key Risks and Business Impacts	Risk Mitigation Measures
<p>EV Car Technology</p> <p>Changes in consumer behavior, including a tendency for governments to promote the transition from gasoline to electric vehicles faster than expected, is a risk to IRPC's business.</p> <p>Impact on the Business</p> <p>The company's revenue could drop from a decreasing number of sales of petroleum products, especially gasoline. This is because the costs and expenses of operating electric drivetrains will be less than that of cars with internal combustion engines. We predict this will increase the tendency of consumers to use electric cars more in the future.</p>	<ul style="list-style-type: none"> • Conduct long-term strategy in order to shift from petroleum products to specialty petrochemical products. • Consider using heavy naphtha and aromatics as a component in gasoline to improve the makeup of Paraxylene to increase the value and opportunities available in the specialty petrochemical business. 
<p>Climate Change Risks</p> <p>Natural disasters are anticipated to become more violent and frequent in the future, including droughts and flooding. One of the major causes is from refinery and power plant, these could be a risk for IRPC's business.</p> <p>Impact on the Business</p> <p>Business opportunities will be impacted by tighter government regulation such as carbon taxing. These risks will also impact IRPC's image and could bring resistance from communities and related government agencies.</p> 	<ul style="list-style-type: none"> • Establish measures to reduce the greenhouse gas emission intensity, such as increasing energy efficiency in production processes by using the ISO 50001 standard and setting a target to reduce fuel combustion emissions by 2% annually. • Voluntarily prepare an assessment of the organization's carbon footprint, using guidance from the Carbon Footprint Organization (CFO), the Department of Industrial Works, and the Thailand Greenhouse Gas Management Organization (Public Organization) to find ways to reduce greenhouse gas emissions. • Promote the use of alternative energy, such as using electric shuttle buses for transportation of PTT Group staff and use solar cells to generate electricity. We can also reduce the effects of drought or flooding by creating a sustainable water management plan.

Key Risks and Business Impacts

Risk Mitigation Measures

Single-used Plastic Banned

Governmental and private sector initiatives, both inbound and abroad, have taken aim at cancelling or reducing single-use plastics. A recent notable example of this was China's plans to achieve reduction in single-use plastics by the year 2025.

Impact on the Business

Revenue could be impacted directly from the reduced sales of the company's polymer products. Additionally, the reputation and the image of the company could suffer due to increased scrutiny from social campaigns to reduce the use of single-use plastic bags today.

- The company has assessed the risk of the obsolescence of single-use plastic products both domestically and abroad. We are ready to divert the use of certain plastic products into specialty products. An example would be HDPE plastic, which we currently use in plastic bags but can repurpose it into piping for use in the construction industry. In addition, we will conduct a risk assessment for other types of plastics that might be banned in the future as well.



Digitization Technology Transformation

Digital technology has assumed a much more influential role in client trading as well as financial transactions, and it will continue to become more influential going forward. This should increase competition within the petrochemical industry.

Impact on the Business

IRPC will lose its ability to be competitive if we are unable to adjust our business model in time. However, if we can quickly adapt, this should become an opportunity for our business to increase sales via online channels, as we anticipate that these channels will be more convenient, faster, and cheaper for clients.

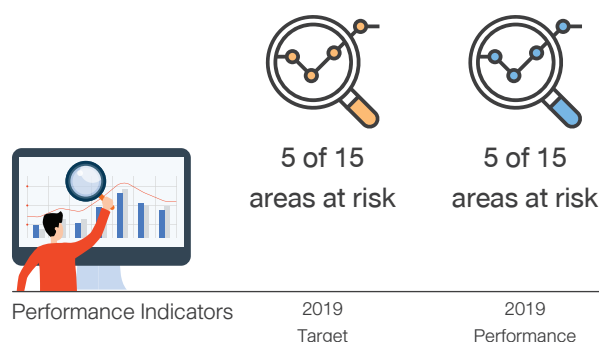
- The Company has built and developed a plastic e-commerce platform through a joint venture with a company that specializes in digital technology. PLASTKET.com is Thailand's and ASEAN's first AI-enabled plastic e-commerce platform that specializes in the sale of plastics, plastic resin, and semi- and fully finished plastic products. It was launched in February 2020.



Determining the Level of Organizational Risk

We have determined that we smoothly and efficiently met our target of the number of organizational risks in 2019 kept within our risk tolerance level. Additionally, to ensure risk management is implemented throughout IRPC, we also actively tracked the number of areas that implement the risk management framework as a key performance indicator for our organization's risk management. This was supported by enlisting the help from executives and communicating our objectives during meetings, setting a common goal across all our different departments.

Number of Risks Managed to the Level of Risk Appetite



Crisis Management and Business Continuity Management

IRPC places great importance on business continuity management and has adopted the ISO 22301 (Business Continuity Management) standard. Business continuity plans are put together to help the company continue to operate during times of adversity. Annual business continuity management practice drills are organized, at the direction of the president. All parties involved in the plan must participate in unison so they may be able to get a thorough understanding of their role and responsibility at

such a time. In 2019, the drill involved setting off explosives in a petrochemical plant, causing a fire that would have consequence on plant shut down and rehabilitation for many months. The results of the training drill were satisfactory and further analyzed to find opportunities to improve crisis management in the areas of personnel readiness, location readiness, and the availability of adequate resources and communication systems, so as to facilitate a prompt return to normal conditions.

Risk Culture

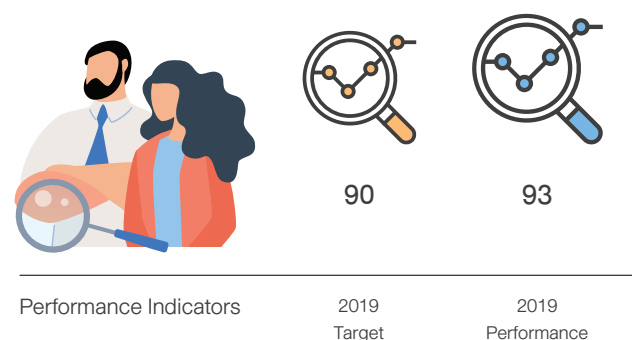
Throughout 2019, IRPC organized regular activities to support the adoption of risk culture. This included compulsory training in risk management for risk managers throughout the company. Workshops were organized with various departments. Risk management indicators were defined and linked to financial rewards for corresponding executives. We integrated communication from Governance, Risk Management, and Compliance to enable better risk management efficiency. In addition, IRPC has upcoming plans to communicate and organize activities for Intensive GRC. In 2020, a working group will be established to put together information and activities around working process integration. These efforts are expected to bear results by 2022.

To assess the success of risk culture, IRPC has prepared a risk control self-assessment for executives to complete each year to measure the level of risk perception within the organization. IRPC has set a target to achieve for self-assessments of risk to 98% in 2020.

Corruption Risks

In 2019, IRPC did an assessment of corruption-related risks in high-risk areas such as procurement, payment processing, project management, and government licensing applications. The result showed that every high-risk work process was executed in full accordance with its own relevant risk management plan, and that there were no significant corruption risks in the last year.

Risk Control Self-Assessment: RCSA (%)

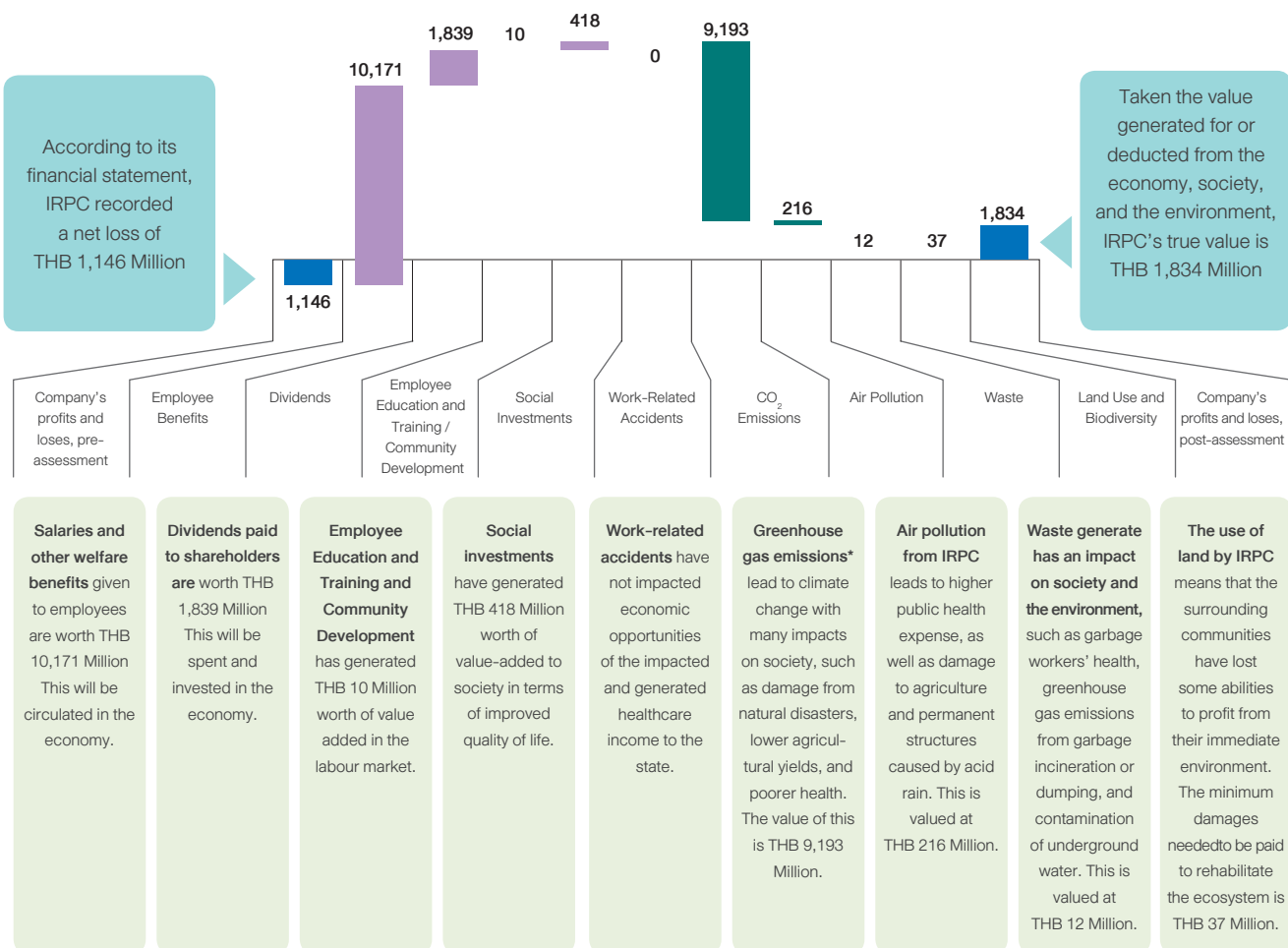


IRPC's True Value Assessment

This is the second year that IRPC has evaluated the social impacts of its business operations. We used the KPMG's True Value Methodology to determine the positive and negative externalities that our operations have had economically, socially, and environmentally.

This assessment has enabled IRPC to understand the true money value of our operational impacts. It also helps us identify opportunities for improvement that may help reduce the negative impacts or risks. It also becomes a factor when conducting financial planning or giving consideration to investing in future initiatives.

IRPC's True Value Assessment



Remark: The scope of the study only covers IRPC's operations in 2019. (It excludes IRPC's customers and supplier.)
 The reference for the impact of emission is US.PEA 2018 Social Cost (61 USD/tCO₂e at 2.5% Discount Rates)
http://www.epa.gov/sites/production/files/2016-12/documents/social_cost_of_carbon_fact_sheet.pdf
 The company recorded a net loss in 2019 and was not required to pay income taxes.



FINANCIAL CAPITAL

Strategy for
Sustainable Growth



IRPC drives the GDP strategy to seek strategic opportunities by expanding investment projects for business growth, organization development to be advanced with digital technology and human resource development to drive the organization. To the future, business operations are based on good corporate governance, create well-being for society and reduce the impact on the environment respond to balanced stakeholder expectations to achieve the goal to be the Leading Integrated Petrochemical Complex in Asia.

Business Strategy



IRPC have determined direction and operated under GDP strategy, consisting of 3 main powers: Power of Growth, Power of Digital and Power of People, while maintaining balance of environment, society and good governance in order to fuel the pursuit of becoming the Leading Integrated Petrochemical Complex in Asia.

INITIATIVES



Power of Growth

EVEREST FOREVER (E4E)

Moving forward with the excellence of Project EVEREST, aiming to improve efficiency and generate the additional profits (EBIT) from the current businesses throughout the organization, including strengthen organizational health, maintain business competitiveness in the areas of operation, integrated supply chain, commerce, procurement, human resources and corporate.



Innovation Excellence

IRPC seek to develop high value added products. With our innovative excellence, we focus on products on key business areas. For more information, go to Page 40



Galaxy

IRPC build upon a partnership model with an aim to expand business and increase EBIT by seeking to capture growth opportunities in the future via business synergy through investments, joint ventures, mergers and acquisition.



MARS (Maximum Aromatics Project)

IRPC aim to expand the scope of investment for ongoing business growth by focusing on increasing the production capacity of high value aromatics in order to enhance business competitiveness. The Paraxylene production project, currently under studying the Front End Engineering Design: Feed phase, will add value to the raw materials used in production line by applying the high technology. Upon completion, we will be able to increase the production ratio of our petrochemical products from 17% to 27%. It is expected to commercially operate by 2025.



Power of Digital



IRPC synergize and apply modern technology into our business to enhance our operational efficiency and transform to digitization under IRPC4.0 program, consisting of: PRO4.0 - Improving procurement system towards “Lean Procurement” to eliminate operational redundancies and increase competitive advantage; ISC4.0 - Optimizing purchasing decisions of raw materials and production plan based on customer behavior and availability of raw materials in the value chain; OPS4.0 - Enhancing operational efficiency of our plants through Smart Operation (AI) that assists in production planning; CCM4.0 - Improving sales and marketing with customer centric digital system to achieve customer’s expectations in timely manner; and ERP4.0 - Establishing organizational IT structure to support corporate-wide digitization. In 2019, 23 out of 27 subprojects have been completed. It is expected to complete all of them by mid-2020.



Power of People



IRPC strive to improve human resource management system and reshape organizational structure to suit new way of working. With corporate values as a foundation, we aim to raise the potential human resource through leadership development programs and recruitment programs. In doing so, it helps create good corporate culture and gets human resources ready for our future growth.

Apart from GDP strategy, IRPC have a few other prominent projects such as Ultra Clean Fuel Project (UCF) Project, Refinery and Diesel Efficiency Enhancement Study Project, ABS Expansion Project and Floating Solar Power Project.



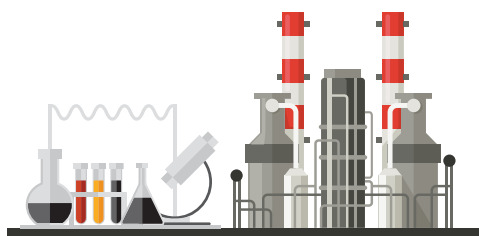
Low Sulfur Fuel Oil Production Project

International tankers are the source of sulfur dioxide (SO₂) harmful to organism and ecosystem. The SO₂ emission from tankers is 3,500 times higher than from European diesel cars, causing premature death by heart disease and lung cancer. Therefore, International Maritime Organization or IMO will enforce IMO 2020 to all tankers around the world; high sulfur fuel oil (HSFO) must be replaced by low sulfur fuel oil (LSFO), effective from 1st January 2020 onward. We, as the sole LSFO refinery in Thailand, have the advantage on quality and stable cost, resulting in us being the first refinery to supply this product to the market before the effective date.



Ultra Clean Fuel Project (UCF)

IRPC aim to enhance the efficiency of refinery and diesel in UCF project to meet Euro V requirements and support the government measure to reduce sulfur emission from 50 ppm (Euro IV standard) to 10 ppm and increase the competitiveness due to higher demand on low diesel sulfur in both domestic and regional (AEC) markets. This project, currently under the FEED phase, will also strengthen the business operation along with social and environmental responsibility. It is expected to commercially operate by 2023.



ABS Expansion Project

IRPC aim to enhance the polymerization unit and increase the production capacity of ABS powder by 6,000 tons per year in order to produce premium ABS as one of the value-added products. It is expected to commercially operate by Q2 of 2020.



For more information on Floating Solar Power Project, go to Page 88



PERFORMANCE



EBIT
of E4E Project
(USD Million)



409



388



29.5



Accumulated EBITDA
of IRPC 4.0
(USD Million)



50.3



58.3



100

Performance Indicator

2019
Target

2019
Performance

2020
Target



MANUFACTURED CAPITAL

Sustainable Supply Chain



We make great effort to manage our integrated supply chain efficiently, with consideration given to the environment, effects on society, and principles of good corporate governance. We aim to meet all expectations of our stakeholders in all processes throughout the supply chain, We apply the use of technology to build a stable and effective foundation. We also work to develop the potential of our partners and customers so that we can grow sustainably side-by-side.

Supply Chain Management

Efficient integrated supply chain management is one of our key strategies for sustainable business operation. IRPC take into account environment, society, good governance, and stakeholders' expectations throughout the supply chain from the procurement, supplier selection and management, relationship management, logistic management, ESG risk management (environment, society and governance), to customer relationship management, etc. for the uninterrupted and efficient business operation. Furthermore, We have adopted the benefits and strength of digital technology to support and enhance our supply chain management as well as to improve suppliers' potential so that our suppliers and IRPC can, together, sustainably grow while efficiently addressing the requirements of our customers.

Raw Material and Crude Procurement

MANAGEMENT APPROACH

Raw material procurement is a crucial process to our operation. The efficient management can ensure no impact from any circumstances which may affect the crude and raw material procurement and cause business interruption. IRPC have planned the long-term and spot procurement of crude and raw materials to meet our requirements as well as risk management regarding price and cost of raw materials and inventory, and crude and raw material logistics.

For more information on supply chain management, please visit <https://www.irpc.co.th/economic-dimension/supply-chain-management/>



Project ISC4.0
generated benefits
more than
THB 300 Million



INITIATIVES

IRPC have been developing the system under Project ISC4.0, for analyzing the customer behavior and availability of raw materials in our supply chain management, consisting of: 1) Crude Selection Model & Approach - a digital tool that assists in the crude selection, providing higher accuracy and time saving as well as increasing the bargaining power and reducing logistic cost; and 2) Control Tower Decision-Making, bringing End-to-End Visibility into supply chain management for timely decision making.

Furthermore, IRPC cooperated with the PTT Group for the Petrochemical and Refining Integrated Synergy Management (PRISM) project to manage crude transportation so that trips have a full hull for the most efficient transportation.

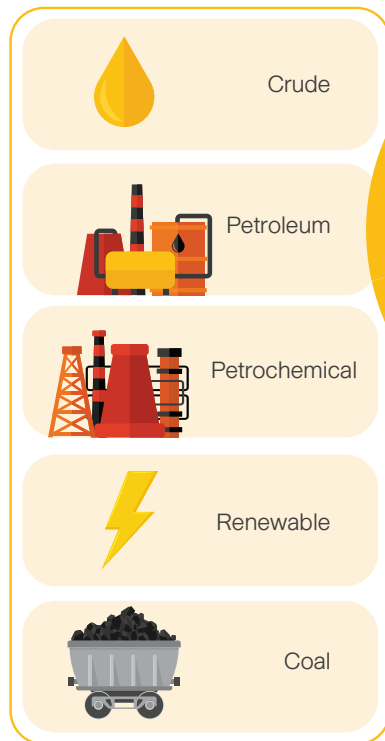
Reduce crude logistic cost more than

from PRISM

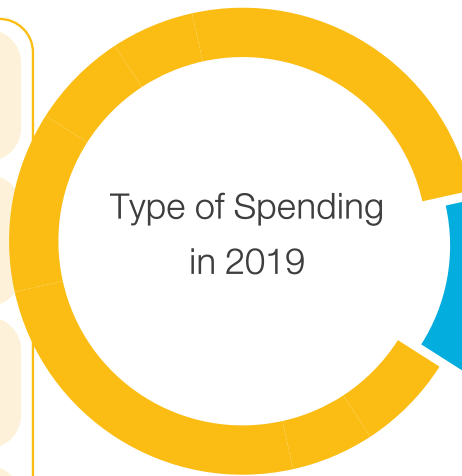
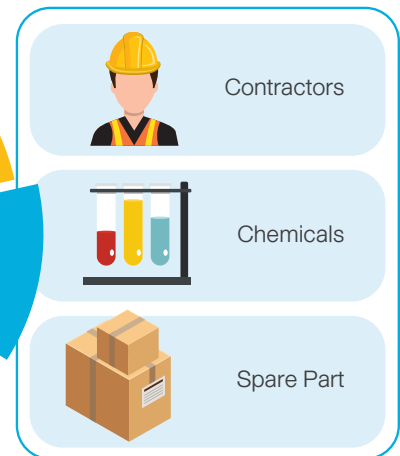
**THB
3.8
million**



Crude and Raw Material 93%



General Procurement 7%



General Procurement Management

MANAGEMENT APPROACH

IRPC prioritize and focus on development of sustainable procurement management which is one of the major strategies of Procurement Department. Therefore, the system has been continuously developed by adapting digital technology to support the operational process for efficient performance of our users and suppliers. The suppliers can modify their own information in the system and update their products and services for more transaction between us and our suppliers. This also creates a channel for the suppliers to communicate and comply with our sustainable procurement guideline. Furthermore, ESG risk assessment was conducted on all tier 1 suppliers to jointly improve the potential in sustainable business operation. We conducted supplier satisfaction survey for analyzing and enhancing the efficient operational process.

IRPC adapt the following digital technology to support the operation under the Project PRO4.0: 1) Demand Planning Platform, collecting demands for products from all departments with better accuracy, speed and sufficiently detailed for procurement planning, 2) Spend Cube Analysis, enhancing the efficiency of procurement and lowering the cost of products, 3) Process Workflow Redesign, improving the purchasing process to be more efficient and faster, 4) Supplier Relationship Management (SRM) managing suppliers' information including that of products or services available for us and that from the potential supplier evaluation.

For more information on tier 1 supplier selection, please visit
<https://www.irpc.co.th/economic-dimension/supply-chain-management/>



INITIATIVES

Supplier ESG Seminar

In order to comply with our sustainability guideline, IRPC carried a seminar on Supplier ESG Risk Assessment where the participating suppliers were screened for ESG self-assessment questionnaire completion. The outcome was expected to equip our suppliers with understanding before the on-site audit. This seminar was a part of a collaborative project between the companies in PTT Group to facilitate information sharing among suppliers on environmental, social and good governance. The seminar did not only reduce operating cost of PTT Group but also creates good relationships with suppliers which lead to joint sustainable growth and development. 19 suppliers participated in this seminar.



IRPC CG Day 2019

IRPC organize CG Day annually. In 2019 it was on 19th September under the name “IRPC CG Day 2019 The Creation of Trust: Sustainability For All”. We invited our suppliers and customers to this event to share knowledge of good governance and sustainable management, as well as to create the awareness of good corporate citizenship in 4 aspects (human rights, labor, environment and anti-corruption) as the power to drive the business with sustainable excellence.

A salon under the topic of “Sustainable Value Chain & Human Rights” was held as well as 2 lectures: Human Rights and Good Governance” and “Business Sector and Anti-Corruption”. There were 180 participants: 49 suppliers, 28 customers, 92 executives and employees from IRPC and PTT Group.

Furthermore, IRPC wish to support our suppliers to participate in Thailand's Private Sector Collective Action Coalition Against Corruption (CAC) to set an example as anti-corruption company and emphasize the transparent business operation throughout the supply chain.

PERFORMANCE

IRPC organized the training for the employees in Procurement Department and training for suppliers regarding relevant systems under Project PRO4.0. The current suppliers in our Approved List can register to update their information, providing more precise information on their products and services. We also organized the training on ESG knowledge and understanding, covering the human rights and anti-corruption in order to comply with our sustainability guideline and international guideline before the on-site audit. Every employee in Procurement Department participated in this training.

With Spend Analysis and tier 1 supplier classification: critical tier 1 supplier and ESG high risk tier 1 supplier, we can ensure the strict compliance with our Supplier Code of Conduct for sustainable business operation. We conduct on-site audit with both supplier classes annually and every 3 years.

IRPC has supported on procurement of local goods and services in order to expand and promote local economic. IRPC also builds up employment in local community, Rayong in 2019 as 21.46% of the total general procurement expense.

IRPC conducted the supplier satisfaction survey annually to get feedback from the suppliers for operational improvement. In 2019, we attained the supplier satisfaction survey score of 94.00%, well above the target of 90.00% with the comment that we should improve the notification process to the unselected suppliers after the bidding for their improvement.

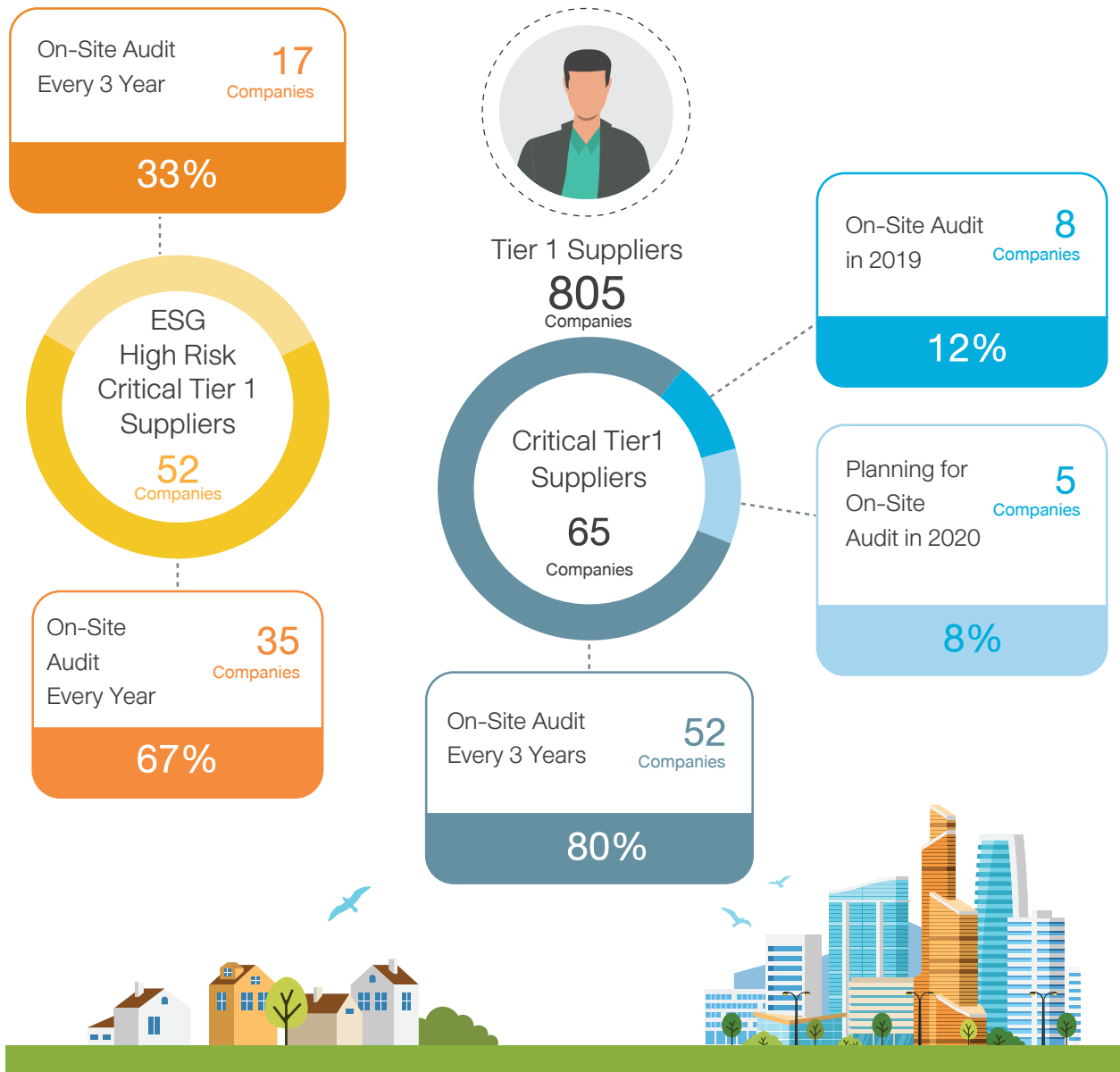
Local Procurement in Rayong

21.46%

of total procurement expense.



Built after the success of Project EVEREST, IRPC initiated Project EVEREST FOREVER (E4E) strive for procurement excellence, consisting of various aforementioned projects. In 2019 we could reduce the cost of THB 849 Million.



Logistic Management

MANAGEMENT APPROACH

IRPC's logistic management includes docking process with various measures for safe crude loading. The tankers must be inspected and assessed before docking to ensure the compatibility and safety to the wharf. Introduced by Oil Companies International Marine Forum (OCIMF), Ship Inspection Report Program (SIRE) is a tanker risk assessment tool to specifically address concerns on safety for human and environmental protection by applying best practice. To indicate safety and pollution prevention issues, the tanker owners require to fill in the SIRE Vessel Inspection Questionnaire (VIQ) to address safety and emission issues. Certifications and other important documents needs to be inspected as well as the crews in order to ensure that they have adequate communication skills and experience and received necessary training. Moreover, safety management measures must be in place, e.g. life saving and fire extinguishing equipments must be ready to use in case of emergency, constant system inspection is required to reduce errors and ensure the functionality in the area which might cause long-term effects.

Apart from maritime logistics, IRPC have the efficient land logistic management in terms of quantity and quality. With GPS tracking system, we deliver our products in timely manner, safely and eco-friendly. Furthermore, we collaborate with PTT Group and GLM Group (Group Logistics Management) to reduce fuel usage during transportation. Transporting the plastic around 90,000 tons per month, we also have a safety driving campaign for our drivers to ensure more than 90% of our plastic customers.



INITIATIVES

Oil Spill Prevention and Response Drill

With the objectives to test the fire extinguishing equipment and system, review and develop the employees' skill in case of emergency, IRPC exercise the oil spill prevention response drill annually to foster confidence among surrounding communities, satisfy relevant authorities, strictly comply with our regulations and protect environment, community and society. We also collaborated with relevant authorities to exercise a response drill to water pollutant prevention and elimination in 2019 under the code ROSE'19 (Rayong Oil Spill Response Exercise) in RIL Industrial Estate. The participants consisted of Royal Thai Navy, local port entrepreneurs in Map Ta Phut Industrial Estate, Oil Industry Environmental Safety Group Association (IESG) and public agencies.



IRPC participated in Crisis Management Exercise 2019 (C-MEX 19) organized by Thai Maritime Enforcement Coordinating Center (Thai-MECC), aiming to promote better understanding in conducting joint maritime operations among concerned agencies as well as coordinate the maritime threat and security management, training, Command Post Exercise (CPX) at Defense Energy and Petroleum Training Center, Rayong, and Field Training Exercise (FTX) simulating the elimination of oil spill at the sea surface at Map Ta Phut Industrial Estate Port. This complied with the Eastern Economic Corridor Development Plan of the government and maritime victim rescue training.

Safety Driving Program

IRPC focus on safe logistics and raise the safety awareness by following various safety measures such as route risk assessment, preparation of safety management manual for land logistics, defensive driving training, etc. in order to prevent the loss of life and property as well as the spill in public area.

Fuel Saving with PTT Group

IRPC's Product Logistics Department collaborated with PTT Group to organize the PTT Group Fuel Saving Program, collecting, analyzing and reporting the fuel usage of our logistic contractor in order to promote and lower their fuel usage and greenhouse gas generation.

PERFORMANCE

Zero

Significant Oil
& Chemical Spill



Zero Accident
during
the Transportation

99.86%

On Time Delivery



Customer Relationship Management

MANAGEMENT APPROACH

Customers are considered one of IRPC's key stakeholders. The good customer relationship management leads to the ability to meet their requirements quickly and efficiently. We prioritize their feedback and create the relationship throughout the life cycle (current, new and future customers) by providing communication methods for the convenience and accuracy. The suggestions and complaints from the customers are a part of information for analysis and address

new solution and marketing strategies. We also share and learn from our customers through meetings and activities in order to communicate the current situations of the market which the customers can prepare measures for the changing situations. In 2019, we have developed CCM4.0, one of the strategies in IRPC4.0, applying digital technology to enhance our process, and improve efficiency in delivering added values to customers.



INITIATIVES

Customer Relationship Activity

On 1st March 2019, IRPC organized the observation and appreciation activity in Rayong to meet our domestic dealers and give a tour to our polypropylene plant, commercially producing the plastic since 2017, and calibration laboratory in Application Laboratory Center, accredited by ISO/IEC 17025:2005. This showed our priority to internationally standardize the calibration service of Maintenance Department in order to build confidence among and satisfy our customers, both internal and external as well as to support our business operations.



IRPC Growing Up Glowing Bright Together Seminar

IRPC organized a seminar "IRPC Growing Up Glowing Bright Together" on 18th-21st March 2019 for our customers and traders from more than 30 countries around the world to provide the information on market and our latest petrochemical products. During the seminar, they made the boundary buoys and transplanted coral for natural rehabilitation with Reef Guardian Thailand at Bulon Island, Satun. This activity aimed to communicate the current global situation and our operation in order to foster confidence, create good relationship and express our gratitude to their trust in our products and services.



Petrochemical Product and Innovation Exhibition

IRPC exhibited petrochemical and plastic products and innovation at K Fair 2019 on 16th-23rd October 2019 participated by manufacturers, plastic entrepreneurs, business partners and leading institutions. Our exhibited products were such as PPC, solar floating, special pipe, UHMW-PE and green ABS. Organized every 3 years to exhibit products and innovation in growing plastic industry, this exhibition is our opportunity to gain new and future customers.



Collaboration to Address Customer's Concern

Regarding Scratches Caused by Recycled Plastic

This past year, IRPC's Executives and employees communicated circular economy principles and consumer's preference for eco-friendly products to its customers, creating an interest in using recycled polymers as feedstocks. So far, recycled polypropylene and recycled polystyrene can be produced into products for sale. In addition, IRPC's technical specialists impressed customers by providing a solution for none IRPC's product to the customer's problem, where recycled Polyethylene Terephthalate (PET) was used for tree pots and left flow mark on the product.

INITIATIVES

IRPC assessed the success of our customer relationship management through customer satisfaction survey, classified into 3 business units petrochemical business; petroleum business; and port and asset business.



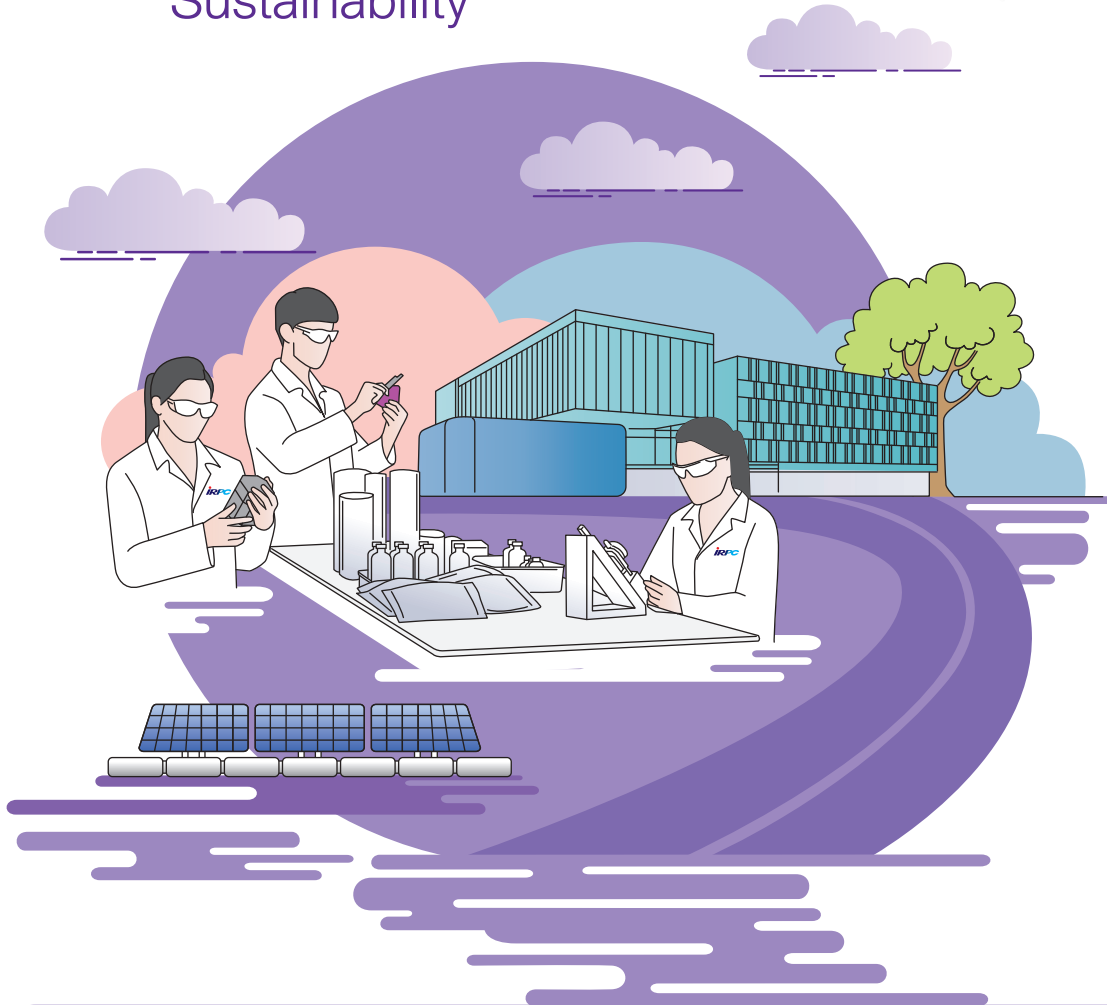
We also responded to their requirements and concerns, mostly regarding the quality of products and services. We seriously addressed their issues by enhancing our production process, inspecting and maintaining our machinery and equipment, conducting the quality assurance before delivery, improving and maintaining the trucks as specified by relevant laws, and having the meeting with our customers to address the issues.

However, we have not found any cases violating the laws and regulations related to our products and services in terms of occupational safety and health, product labelling, personal data protection and marketing communication.



INTELLECTUAL CAPITAL

Innovations for
Sustainability



Research and Innovation Developments that meet ever-changing needs of consumers as well as society that is convenient and environmental conscious. IRPC is determined to develop environmentally-friendly products for society well-being. We will achieve this by adhering to best practices and circular economy principles, which reduce waste from our production processes and lowers our environmental and social impacts.

To be an organization of innovation, we must be able to sustainably create added value for all of our stakeholders and IRPC.

Innovation and Product Development

The product research and development will increase competitiveness of the organization to be in the same league as global leading companies. The application of digital technology and artificial intelligence (AI) to production and operation creates the agility and increases the efficiency and EBIT to the business. Importantly, the products truly reflect the requirements of the consumers.

MANAGEMENT APPROACH

IRPC strengthen our R&D and innovation to increase the competitiveness and sustainably grow throughout the value chain. In 2019, our internal reorganization with Senior Executive Vice President appointed for each department in line with our business direction and global change has been our fundamentals and increased our innovative capability.

IRPC have implemented our Innovation Excellence strategy for our sustainable growth, focusing on 8 strategic innovation frameworks, to which Analytical Lab Excellence has been

added. Our analytical laboratories have been accredited by ISO/IEC 17025:2005 and registered in the category of private analytical laboratory for environmental sample testing.

For our product innovation, still focusing on value added products or specialty products and green products which meet the requirements of the current and future consumers, we aim to elevate our innovative capability to be competitive with global leading companies by 2025.

IRPC prioritize highly importance on R&D and innovation in order to add high-value to petroleum and petrochemical products. Innovation also play a key factor to help us meet the changing requirements of the consumers following the global change in terms of disruptive technology and urbanization that convenience and rapidity are necessary for living. Furthermore, we have applied circular economy concept for our sustainable growth and environmental impact reduction, for example, bio-based product development, 7Rs (Reduce, Reuse, Recycle, Repair, Refuse, Return and Rethink), etc. Our bio-based products are made of tapioca starch and natural rubber as the support to agricultural sector which is a crucial to the economy of the country.

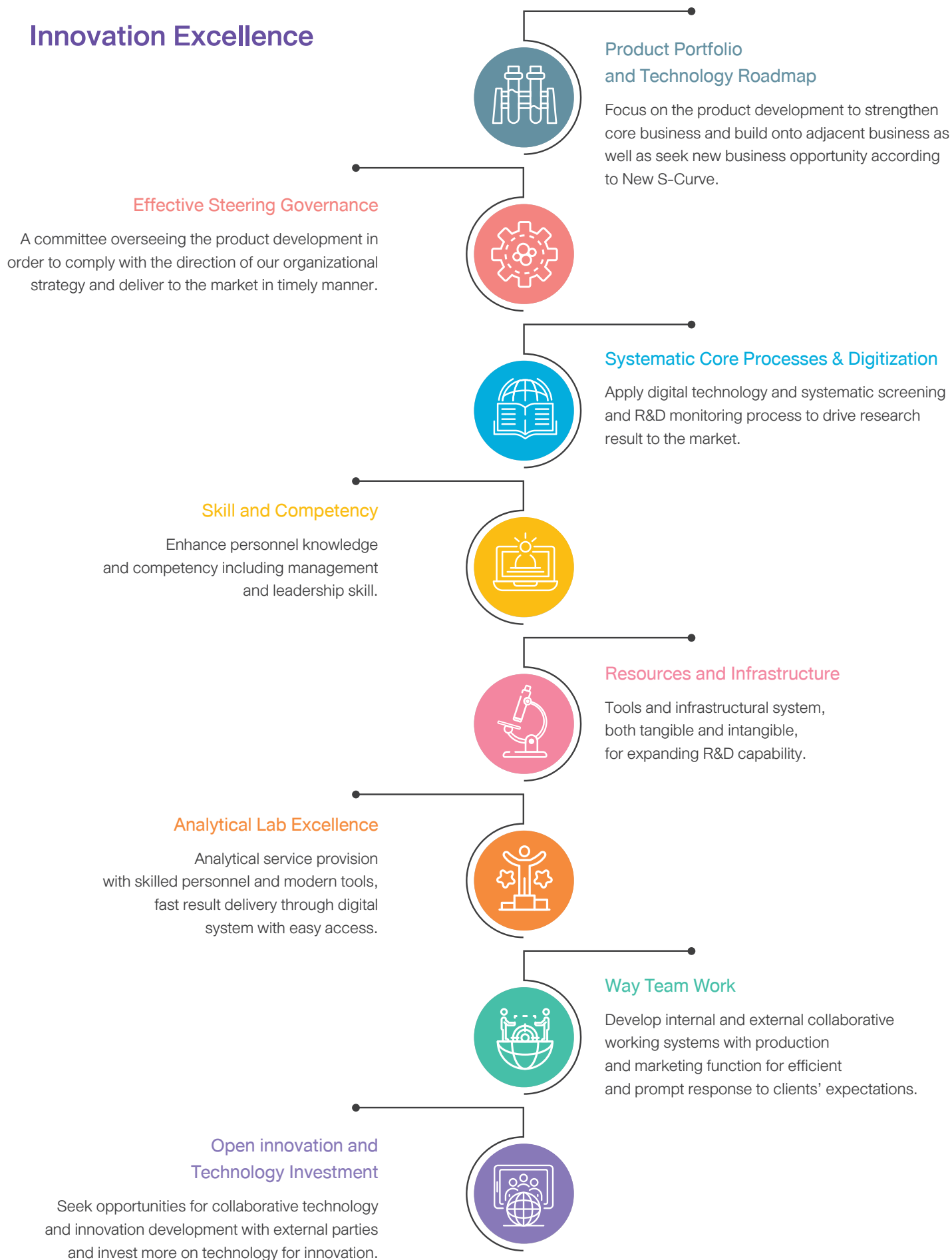
For the products supporting renewable energy, we have developed the material which is a component in lithium battery such as acetylene black, and a petrochemical product for solar panel buoys.

Furthermore, our products have been developed for society. Our petrochemical product with special feature is suitable for prosthetic legs and knees. I believe that with our highest priority to R&D and skilled personnel, we can become a sustainable organization of innovation.



Mr. Vichit Nittayanonte
Senior Executive Vice President
Innovation and Operation Excellence
(In the position unit December 30, 2019)

Innovation Excellence



INITIATIVES

Apart from the innovations which add value to products and reduce production cost, IRPC also prioritize the innovations which reduce environmental impact and support better living quality of community and society through various R&D projects.

PS Grade RMM151

Dirty polystyrene chunk can be collected from the system cleaning before the production, during the emergency and before the production process adjustment. Previously this dirty polystyrene chunk would be shredded and sold as unusable material or dirty polystyrene shred which has low value. Our R&D team have applied circular economy concept to add value to it by sorting out waste before recycling with innovation. The equally premium polystyrene has been produced with suitable quality for molding and strong feature which meets the requirements of the customers who want 100% recycled petrochemical product. This RMM151 recycled polystyrene is the raw material for luxurious watch box production.



HDPE Grade P301GR

IRPC have policy and plan to apply renewable energy to production process due to more heat from solar energy and optimal area management around the pond. We, therefore, studied and developed the floating solar power plant project as well as premium P301GR HDPE or high-density polyethylene for making grey buoys. This kind of petrochemical product is heat-resistant, toxic-free, durable, recyclable as well as reduce importing costs and electricity generating costs from using fossil fuels.



PP Grade 3340H

IRPC Innovation Center researched and developed 3340H Polypropylene and enhanced molding process for production of transparent prosthetic leg sockets for Prostheses Foundation of Her Royal Highness the Princess Mother. This kind of socket is more transparent than 2500H polypropylene they are using, which is easier for inspecting the compatibility, reduces adjustment time and production cost. More importantly, it promotes better living quality for the disables.



ASPHALT Grade AC40/50

Due to the expansion of urban area, the road traffic becomes denser. IRPC Innovation Center researched and developed asphalt cement with AC40/50 penetration grade which is stronger, smoother, heat-resistant and durable, increasing safety for road users during their journey. We are the first company launching this product in Thai market.



In order to be competitive and achieve our Innovation Excellence, IRPC invested more than THB 700 Million in modification and expansion of our old R&D Building and Application Laboratory Building as well as construction of IRPC Innovation Center as a center of our innovation R&D to be compatible with the standards of World-Class Fast Follower and able to welcome R&D personnel and tools in the future. It is expected to open in March 2020 as planned.



PERFORMANCE

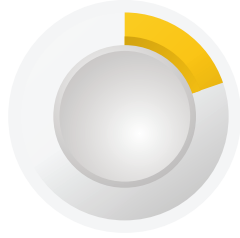
The innovation and product development is one of the key strategies of IRPC. By applying customer-centric approach and modern technology to meet the customers' requirements, we strive toward the Innovation Excellence and proceed forward on talent attraction and R&D budget allocation. We have set our 10 year roadmap and annual target until 2025. We plan to invest 3% of petrochemical sale revenue in R&D in order to add value and generate sale revenue of new products at 25% of petrochemical sale revenue, and such new products must have EBIT at 25% of the sale price. We also plan to increase the R&D personnel with Ph.D. graduation to 30% of all R&D personnel.

In 2019, we invested in research and development totaling THB 323 Million or 0.7% of petrochemical sale revenue. The products research projects successfully launched into the market resulted in EBIT of THB 150 Million while projects currently under the development are valued at THB 353 Million



New product sale revenue is

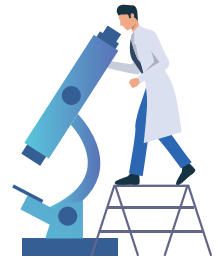
19%



to all Petrochemical Products

R&D personnel with Ph.D. graduation is

13%



of all R&D Personnel

Incremental margin
of New product

16%



of product selling price

R&D Performance
Effectiveness



1.1 Times

From Additional Profit of New Product aged 3 Year
per R&D Investment in each Year



Performance Indicator

Total Revenue from
Petrochemical Products
(THB Million)



57,211



43,789



43,677

Revenue from
Specialty Products
(THB Million)



29,750



24,809



25,333

Ratio of Revenue
from Specialty Products
to Total Revenue from
Petrochemical Products
(%)



52



57



58

2019
Target

2019
Performance

2020
Target

Note: Due to the trade war between USA and China, the global economic growth has decelerated while the crude price has fluctuated due to the geopolitical stress in Middle East, our petrochemical sale revenue in 2019 did not achieve the target (low value as a result of low demand and supply). Consequently, we have to review our 2020 target following the policy focusing on specialty product sales.

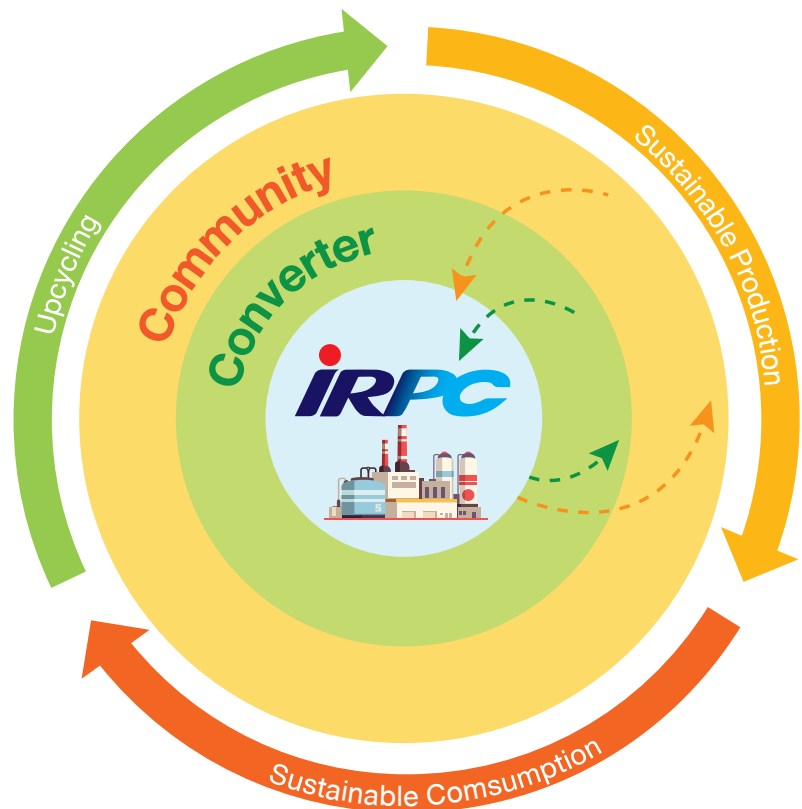
Circular Economy

As a result of world crisis, global warming in particular, the business operation must be conducted with social and environmental responsibility. The limited natural resources have been used to produce everyday items which turn into waste once useless. Nowadays waste, especially waste in the ocean, becomes a major global problem, affecting both terrestrial and aquatic lives and causing impact on human around the world. IRPC have been concerned and aware of this environmental problem from plastic waste. We, therefore, endeavor to optimize natural resources, address global warming problem and promote sustainable plastic waste reduction, complying with circular economy concept, and governmental policy by preparing Plastic Waste Management Roadmap 2018-2030 with the goal of 100% plastic waste recycling by 2027.

MANAGEMENT APPROACH

Eco-Solution Model

IRPC have applied the eco-solution model following circular economy concept for closed loop management with efficient recycling process. The plastic waste platform was built to collect plastic waste data from our plants and the customers', providing easy access to the data and efficient plastic waste management. It also helps saving cost and resources as well as add value to the plastic waste. Furthermore, we collaborated with National Research Council of Thailand and Kasetsart University to promote zero plastic waste with the objective to manage plastic waste from the origin with no waste polymer for disposal in every supply chain from the beginning to the end. We are the first company in Thailand who has been certified Zero Plastic Waste in Production Process which will elevate plastic industry of the country and become the model for other ASEAN countries in the future.



INITIATIVES

IRPC have the policy to reduce waste from production process by applying innovation to enhance the quality of recycled products to be compatible with premium products and add value to such waste. In 2019, we produced RMM151 recycled polystyrene by recycling dirty polystyrene. This potential waste from production process becomes a new product for sales (for more information, go to Page 43). Furthermore, under the brand POLIMAXX, we have PK150B20 pararene, bio-based polystyrene made of 20% natural materials to reduce oil-based materials in production process and used to produce single-used utensils such as spoons, forks, glasses, etc. We can not only create more business opportunities, generate more revenue and reduce waste disposal cost, but also efficiently maximize the resources. Besides this, IRPC is planning to bring one-time used plastic from these general restaurants back to recycle process and create a close loop system, resulting in the process of plastic reuse in the future.

Apart from product R&D, IRPC signed the purchase agreement of pyrolysis oil produced from feeding plastic waste into Pyrolysis process, whose quality is equivalent to natural crude, this petroleum substitute plays a role in our plan to constantly provide energy to the country, reduce environmental impact and sustainably address plastic waste problem by recycling it.



The pyrolysis oil from plastic waste reduced the amount of plastic waste around

460–560
tons per month.





HUMAN CAPITAL

Human Resource Management for Sustainable Growth



Employees make up an important foundation that drives the organization's operation towards continued success. We are developing the potential of our personnel through the GDP strategy under the Power of People strategic pillar. Core value, iSPIRIT is important for modern work, requiring flexibility while improving quality. Human resource management is done from all angles, including leadership development and occupational health and safety management.

Human Resource Management

IRPC's valuable employees are the fundamentals to driving the organization towards continuous and successful growth. Therefore, we aim to develop their potential as well as their living quality by cultivating the core organizational value of iSPIRIT, focusing on Individual ownership, Synergy performance excellence, Innovation, Responsibility for society, Integrity and ethics, and Trust and respect. We are well aware of retaining quality employees, develop both of their competencies and attitude at the same time, and build on their engagement with the idea of "IRPC is a home of everyone." We, thus, drive our human resource management to elevate our organization to be recognized in international level and by employee and stakeholders from every sector, and become an employer of choice for potential candidates.

MANAGEMENT APPROACH

IRPC have improved and promoted employees' competencies through the GDP strategy's Power of People, consisting 4 pillars: 1) Effective and Agile Organization Development; 2) Inspirational Leadership Development; 3) Succession Management; and 4) Digital Technology Application to Human Resource Management.



INITIATIVES

IRPC have applied digital technology to drive our strategy on human resource management; to support the human resource management in terms of competency development, performance management, efficient recruitment of potential candidates and attitude development in order to promote the behavioral development of our employees to comply with our core value as a key factor of business growth.

Pillar 1

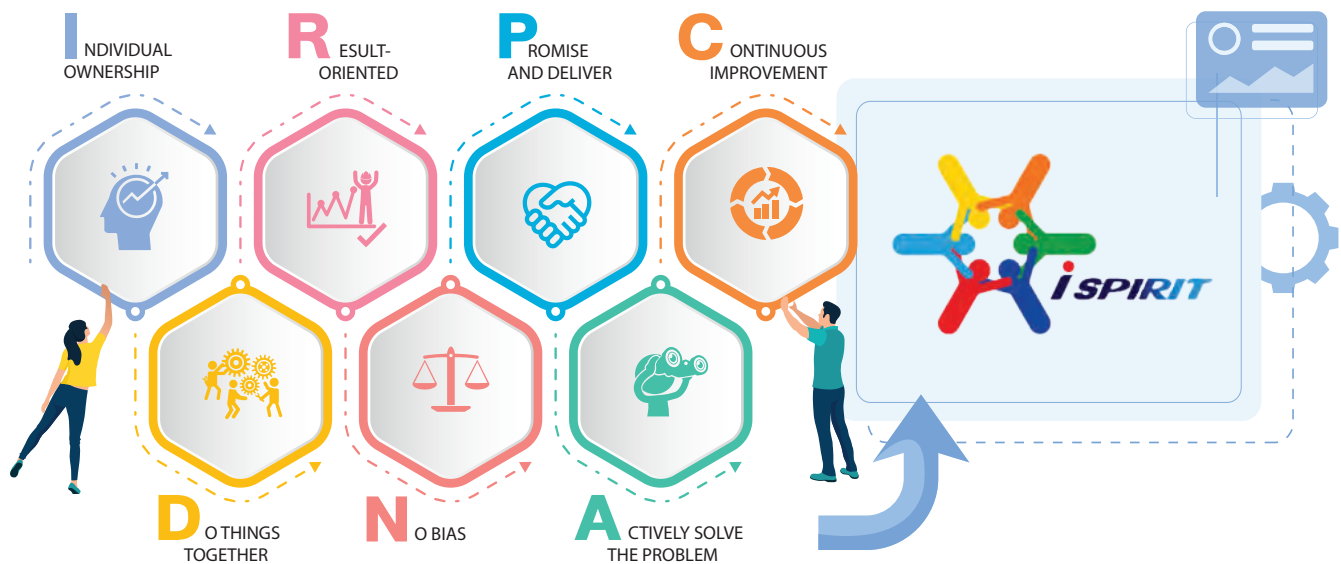
Effective and Agile Organization Development

IRPC strive to strengthen the organization's competency and agility following Agile Organization practice in order to efficiently manage organizational structure and manpower by adopting organizational restructuring plan and applying digital technology to the operational process to enhance agility in business operation and response to the customers' requirements.

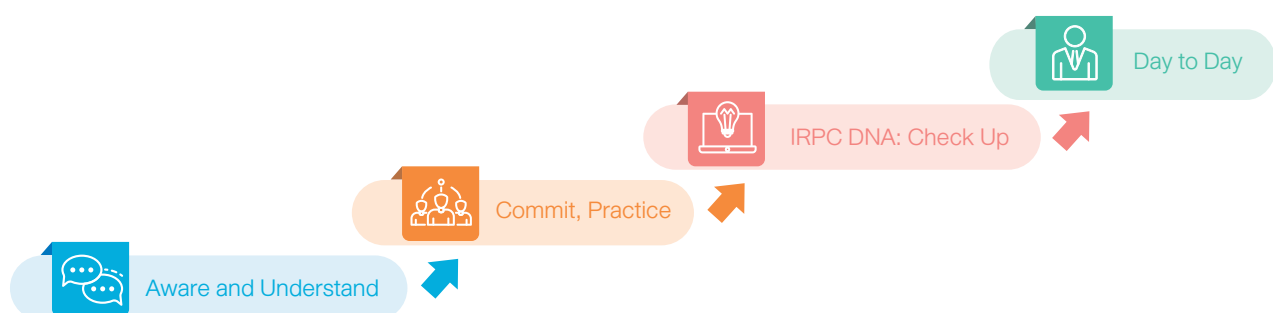
Pillar 2

Inspirational Leadership Development

IRPC have cultivated iSPIRIT, our core value by promoting executives and supervisors to act as role model for the employees to encourage competency development and behavioral changes.

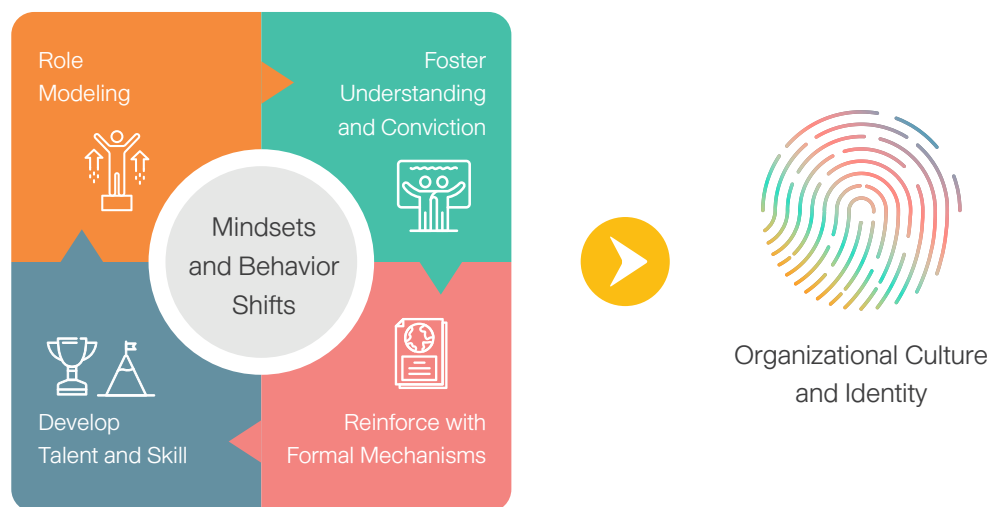


Leadership Excellence through inspirational role models to our employees, IRPC have applied Influence Model concept, consisting of role modeling, cultivating understanding and conviction, reinforcing with formal mechanism, and developing talent and skill. In addition, the corporate culture must be developed alongside through encouragement of desirable behaviors by executives and supervisors under Core Value IRPC DNA project.



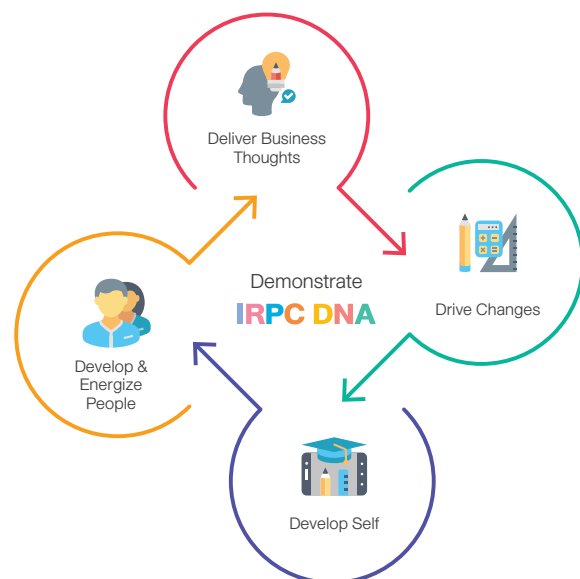
IRPC have applied Influence Model concept to create the awareness and understanding of our core value as well as set IRPC DNA target through regular monitoring process. A toll has been used to survey the employees' behavior and we encouraged their participation by inviting an IRPC DNA Change Agent appointed by each department to participate in an activity called Away Day to brainstorm the methods

to develop IRPC DNA and create productive working environment and joint expression among departments. As at now, we have determined 4 elements: I - Individual Ownership; D - Do Things Together; R - Result-Oriented; and C - Continuous Improvement. They reflect iSPIRIT as our core value and employees' intention to strive the organization toward success.



Competency Development

IRPC realize and prioritize competency development, especially leadership as we believe that leaders are the key factor to positively create the competitiveness. We have applied a learning mode; called Training : Coaching : Experience (10:20:70) to encourage competency development and behavioral changes in every level of our organization. Furthermore, the leader's competency is important for the success in management, progress and succession. Therefore, we have adopted 5D model for leadership development, consideringnt internal and external factors.



Learning Management System

Since 2018, IRPC have created the self-learning system to response to changing lifestyle. We launched a learning application, providing various knowledge to employees in every level to learn at anywhere and anytime, and the supervisors can monitor the learning of their staffs. In 2019, we developed Learning Management System or LMS, a web-based learning management software providing access to contents and activities. Its other features are the communication between teacher and learner through various channels and data collection for teachers to analyze, monitor and assess learning results for each subject. It was also designed to build competency and knowledge of employees in 4 aspects: Technical and Functional competency, Leadership competency, Organization Knowledge, and Learning competency.

Pillar 3

Succession Management

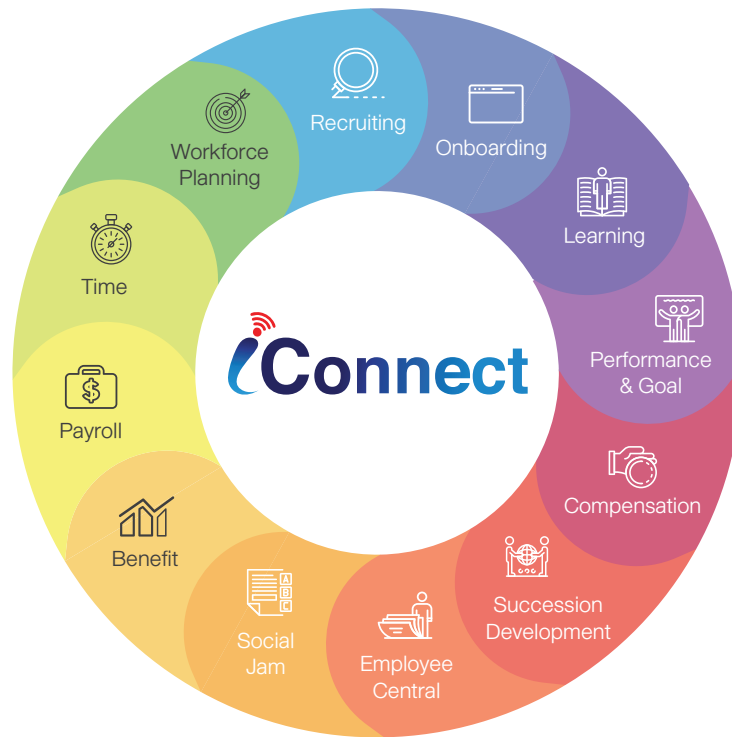
IRPC prioritize the management by proficient personnel for continuity purpose in order to prevent the business impact as a result of entering aging society by a group of our employees. Therefore, our strategy on human resource management has been adjusted by determining the executives' role in succession as well as appointing Management Development Committee (MDC) and Leadership Development Committee (LDC) to review manpower, succession plan and recruitment process in every level as the proper preparation for the soon-to-be-retiring employees for future implementation. With annual monitoring, we have developed the competency standard and take account of other necessary factors for sustainable succession, such as professional learning course for potential employees with good performance, replacement plan, etc. Furthermore, we take account of 360° assessment, Leadership Competency Assessment, Leadership Potential Assessment and past performance of the employees for classifying successor candidates and annually review successor planning process.

Pillar 4

Digital Technology Application to Human Resource Management

With GDP strategy's Power of Digital and the recognition of agility to human resource management, digital technology can act as a tool to drive our strategy and promote our image as a modern organization in order to elevate the competitiveness. IRPC have applied digital technology to human resource management to promote value adding to the business, products and services innovation by supporting the modernity, rapidity and security of digital infrastructure development throughout the organization as well as to promote the innovation capability of the employees in terms of mindset, knowledge, skills, and behavior.

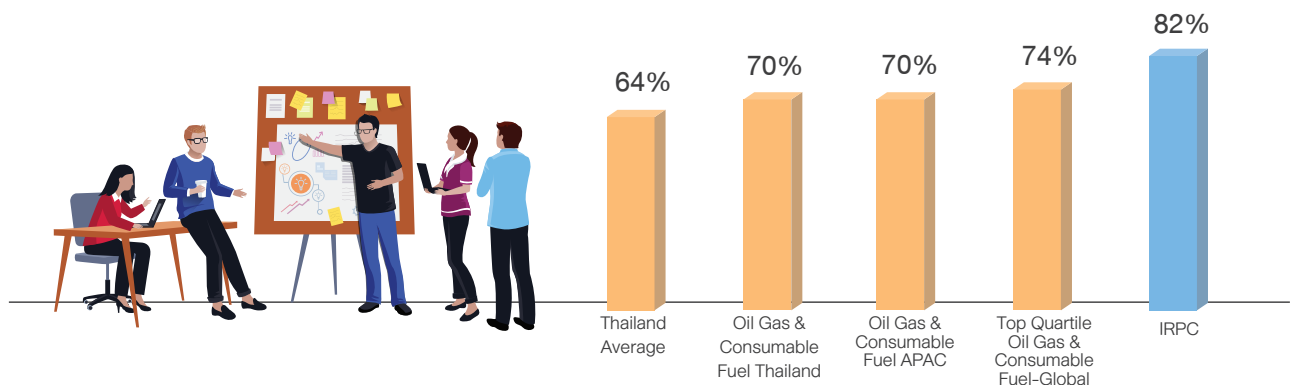




In addition, we launched an application called iConnect or IRPC HR Digital Platform for integrated and efficient human resource management, providing access to the users at any time anywhere and any device on Cloud platform with any operation system. This application supports the human resource management in various aspects, such as recruitment, performance management, compensation management, competency development, skill learning, news update and data analysis for planning strategy and support human resource planning.

PERFORMANCE


Following our strategy on human resource management, IRPC realize that highly engaged employees are the power to drive our organization to successfully grow and be competitive. A global consulting firm has been hired to annually assessed and analyzed the engagement, the result of which has been used to improve the employee engagement and reduce the factors which might affect the engagement. In 2019, 95% of the employees participated in the assessment and the engagement score was 82%. Once compared with other domestic and international peers in the oil & gas industry, our score was higher than top quartile companies, reflecting the result of the improvement employee engagement factors.



Local and Oversea Employee Engagement Benchmarking

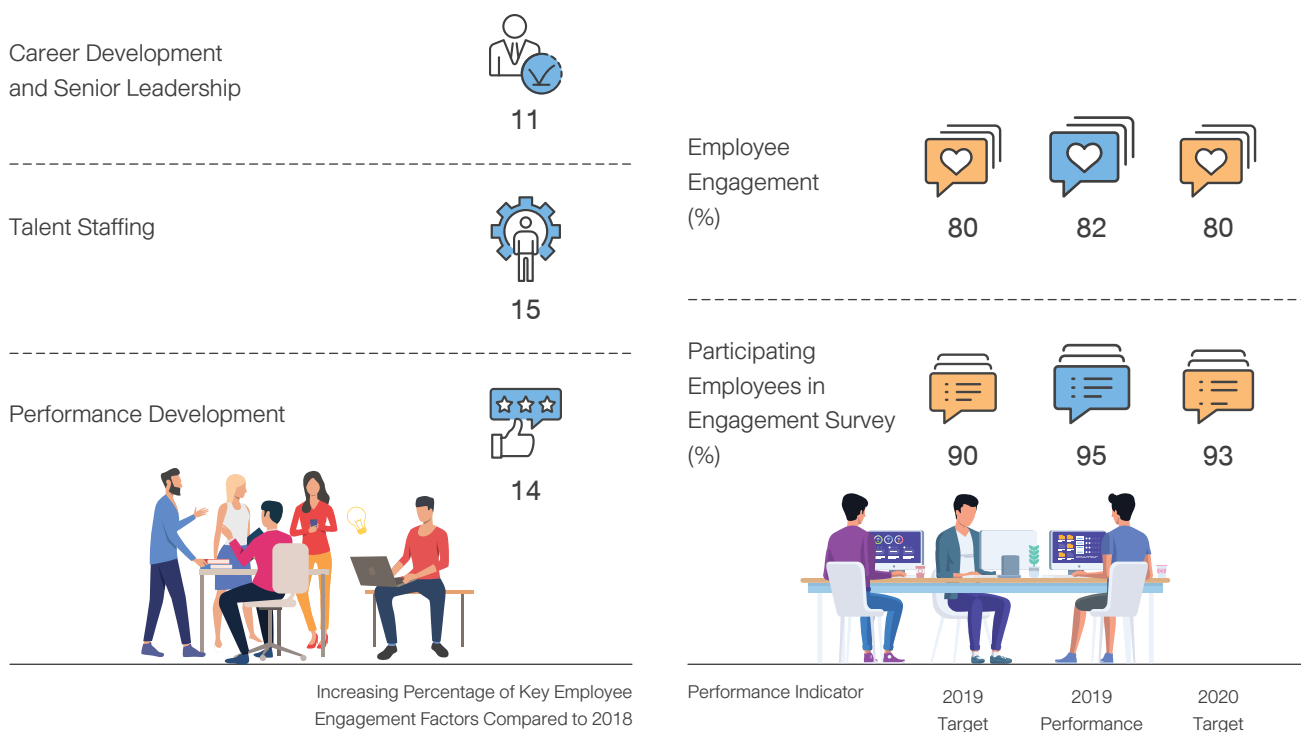
To promote more employee engagement, IRPC conducted an in-depth analysis of the causes affecting the assessment of employee engagement in order to integrate the human resource management system, increase the efficiency of business operation, promote the agility and support the business expansion by promoting a senior executive in each department to act as a role model to encourage the employee engagement as well as to create the 2-way communication in order to inform the employees of the business direction and to give direct access to the supervisor. This also covered the employee inspiration, performance enhancement and career development.

In 2019, IRPC have assessed and analyzed the employee engagement factors which might affect the business operation. The key employee engagement factors have been reviewed and improved, such as career development and senior leadership, talent staffing, performance management, etc.

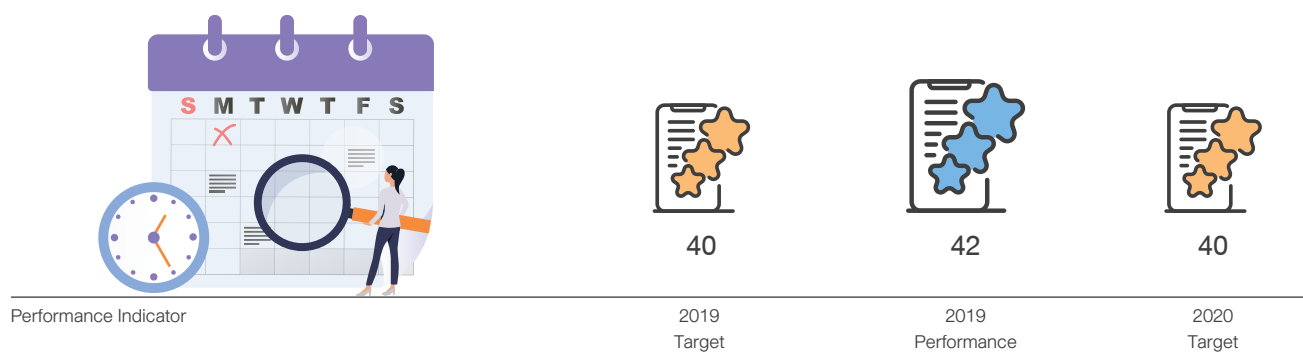


Engagement Factor	Improvement
Career Development and Senior Leadership	<ul style="list-style-type: none"> Design learning system development plan from different institutions Increase communication efficiency, such as career path. Prepare successor development plan
Talent Staffing	<ul style="list-style-type: none"> Appoint MDC and LDC to review succession plan and competency development plan
Performance Development	<ul style="list-style-type: none"> Communicate organizational mission and vision Compensation management Provide comment and suggestion to employee through performance review

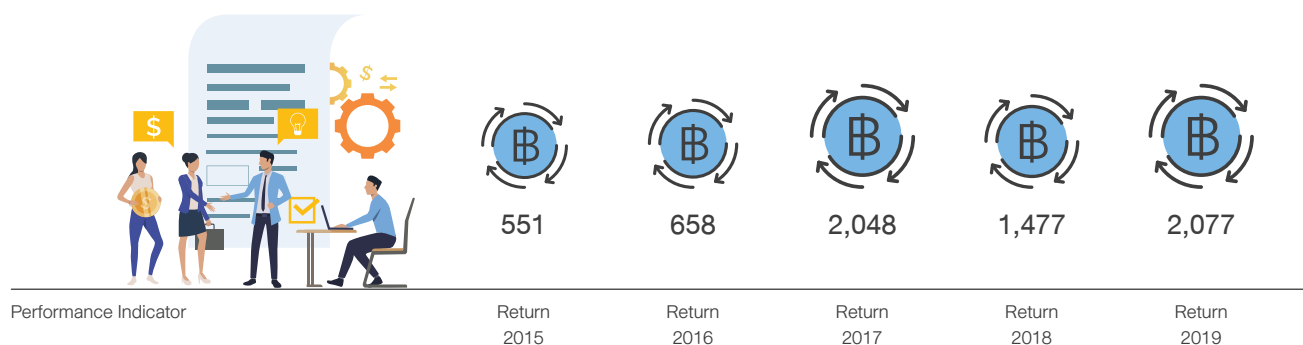
According to the said improvement, the percentage of employee engagement in 2019 was higher than that in 2018.



Average Training of Employee (hour per employee per year)



Return on Investment Human Resource Development (THB Million)



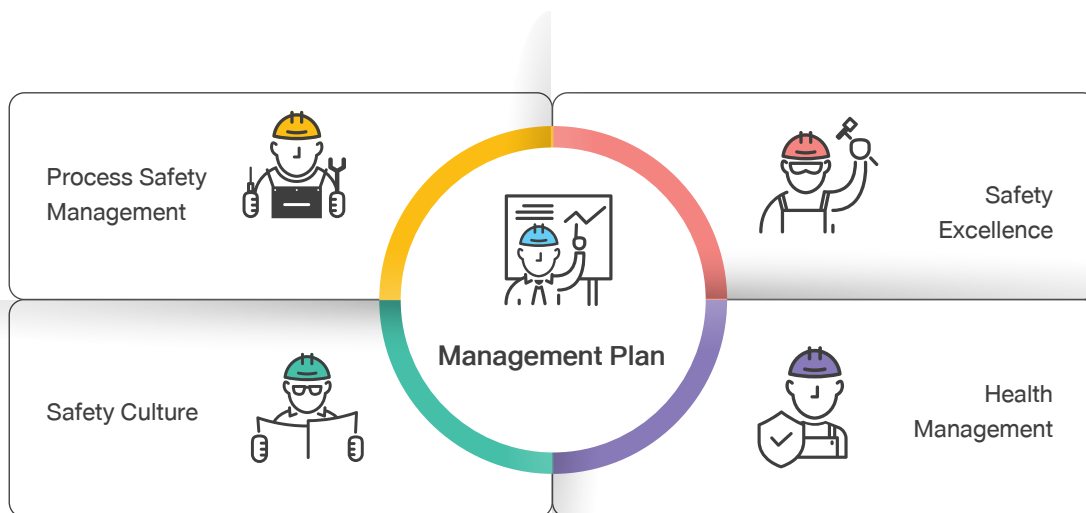
Occupational Health and Safety

By the recognition of occupational health and safety management is the most key factor of our petrochemical business for maintaining the operation reliability, including impacts prevention to the surrounding communities. Therefore, we strongly strive for minimize the risk of occupational health and safety to our employees, contractors and properties.

MANAGEMENT APPROACH

IRPC have standardized our occupational health and safety management, focusing on competency development and safety awareness of our employees and contractors by integrating digital technology into processions improvement in order to facilitate the information access and enhance the occupational health and safety data interpreted efficiently for all employee to make decision prudently. This also promotes positive working environment by sharing knowledge of occupational health and safety to create safety culture and enhance the availability and reliability of production's equipment to achieve Safety Excellence organization. Our strategy consists of 4 pillars; Process Safety Management, SHE Excellence, Safety Culture and Health Management.

We appreciates to launch Role Model practice to drive our organization and appointed Occupational Health and Safety Management Committee driving by Vice President and above who functions to notify the policy, issues occupational health and safety goal and direction,guide to implementation principle and review the performance in order to maintain continuous improvement in work place safely and follow international safety standards.



Strategic Business Growth Projects



Pillar 1 Process Safety Management

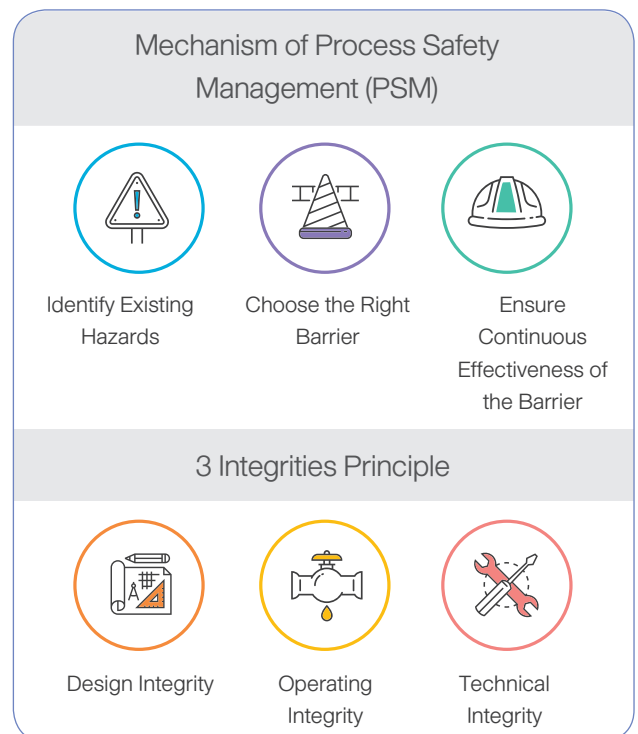
IRPC prioritize the occupational safety culture by campaigning and cultivating zero unplanned shut down concept to drive the uninterrupted development. The plant reliability is the KPI for corporate. In addition, we aware to review the process safety events by indicating 4 factors; machinery and equipment, technology design, production and economy for integrated interpretation to upgrade the reliability in production. The comparison with PTT Group indicated that we remained our reliability at 99.1%

Furthermore, IRPC have applied digital technology to monitor the maintenance, resulting in loss control of property and production.

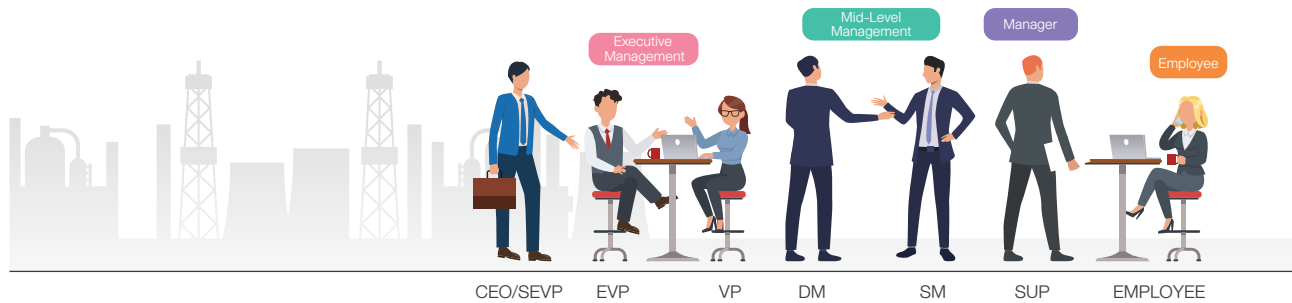
In 2019, IRPC launch IRPC Behavior Safety Management (BSM) Platform to behavioral management in order to reflect the safety behavior of our employees and promote production excellence and safety culture. Our employees have been encouraged to express the safety behaviors in terms of general behavior, working behavior adjustment and self-caution. They have also applied 3 integrities Principle to the production process.



Process Safety Management (PSM)

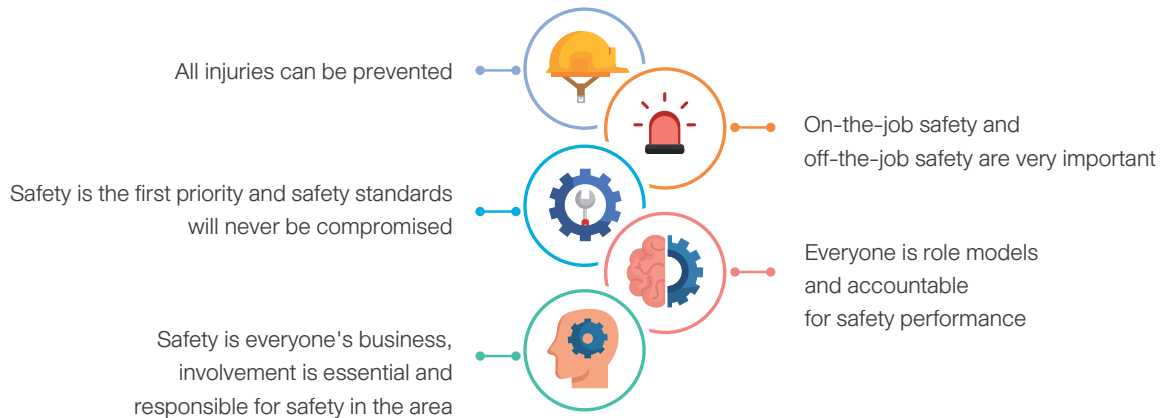


Be Brave to Give Advice / Honest Complimentary
Open Mind / Listen & Give advice / Self-admiration



IRPC is aware of social and environmental responsibility in business operation that safety is one of the key factor. Under the concept "Open Mind & Talk Together", Project iCAREs has been campaigned to the employees to positively change their attitude and be more openminded with 360° working behavioral practice between supervisor and employees and among employees, demonstrating good working behaviors, reviewing and motivating the learning for continuous enhancement. This project resulted in the employees' awareness of undesirable incidents and accidents with significant precaution.

iCAREs Principles



One Day Safety at Work

IRPC recognize the importance of safe working environment and the executives expect to cultivate safety culture to our employees. One Day Safety at Work is a practice with the goal of zero accident. Our employee always implement following formal and informal procedure manual that be monitored and advised daily by their supervisors. Regarding work readiness, the supervisors have to clarify the job role of their staffs including work skill, physical conditions and experience. A meeting becomes a tool to create the participation, monitor and address issues. In addition, the top management regularly visits for on-site inspection to suggest and recommend to prevent unexpected incidents. This helps the management to realize the actual problems and address them efficiently.

Watch One Day Safety at Work video at:



Goal Zero

IRPC has promoted the production reliability by campaigning Goal Zero Accident since 2016, increasing the number of zero accident days consistently during the campaign. TRIR (Total Recordable Incident Rate) of our employees and contractors significantly decreased in 2019 and beyond our target by 60%, resulting in impacts mitigation to employees and contractors as well as business operation.



Pillar 2 Safety Excellence

SHE Excellence Award

To achieve Safety Excellence, not only focusing on safety, IRPC also prioritize the production efficiency and business returns: sustainable production process, safe working environment, cost control and energy consumption saving. The process assessment by an independent third party has been regularly conducted for continuous enhancement. With the combination of the aforementioned BSM, we carried out the safety inspection and audit to create the positive working attitude by contractor safety network, aiming for internal and external excellent process. A Safety Man has been appointed to monitor each area while Safety Excellence Award has been given to motivate the compliance with safety standard by taking into account the safety behavior, safety risk management, emergency preparation, incident control and standard procedure.

IRPC conducted the Safety Excellence Assessment to review and improve the process in order to prevent and reduce the potential risks as well as motivate occupational health and safety. Designed by integrating the various management systems, such as ISO 45001, Process Safety Management (PSM) and Operation Excellence Management System (OEMS), the assessment covers different elements of occupational health and Safety, plan and Implementation, work place environment management, emergency preparation,

safety training incident control, etc. Since 2015, there have been more participants in Safety Excellence Award.

Best Practice Sharing Day is an annual activity which encourages the application of knowledge to further development. In 2019, almost 300 topics was shared and applied within IRPC, resulting in cost saving by THB 3,000 million per year. Such shared knowledge was developed in KM System.

Pillar 3 Safety Culture

IRPC strongly believes that safety culture promotes the excellence within an organization. The policy on occupational health and safety must be defined and actively implemented, especially by our management. The Safety Culture procedure is prepared for implementation in order to lead our organization to zero accident, while the safety management system was developed to promote the safety culture throughout the organization.



IRPC intentions to build employee engagement and safety responsible to all employees. Therefore, we launched digital platform for friendly access both supervisors and their staffs to monitor and suggest or recommend working roles promptly. Meanwhile, safety culture will be embedded in each function via this application

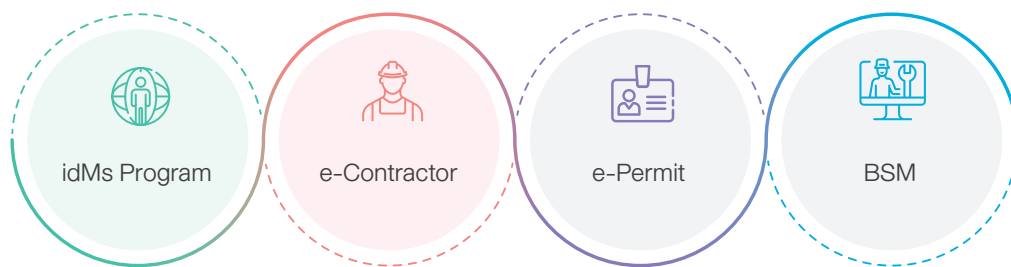
In 2019, 87.4% of IRPC's employees participated in the safety culture assessment, reflecting our leadership. Our executives and supervisors were accountable to manage incidents and sharpen policy and goal, including place emphasis on occupational health and safety investment. Moreover, the meetings are held to creative safety mindset on working which is conveyed to safety culture. We also recognize the good or best safety manner resulting in the trend of Safety Culture is continuous higher.

Safety Culture Level



Digital Technology Application

IRPC have improved the occupational health and safety by digital technology application in order to facilitate the operations and enhance the efficiency of data management, making the analysis and assessment more effective. Every employee and contractors can conveniently access any information via the internet and intranet systems in order to minimize work complications. Thus, all employees can focus on their main assignments. The digital systems have utilized for occupational health and safety including its management, Our safety website provides management programs concerned safety of both employees and contractors such as, incident management program (idMs Program), contractor management program (e-Contractor), work permission program (e-Permit), and Behavior Safety Management program (BSM).



Employee Health Promotion

IRPC values the healthy and hygiene working environment for all employees that impacts to our strengthen business to grow strongly along with the society and communities well being. IRPC, therefore, organize annual health check-up for all employees also added more check-ups for the potential risky job roles. We, moreover, have held continuously health support events.

In 2019, IRPC 4Gs Healthy Together: Reduce Fat, Reduce Illness, 2019 was organized, aiming to encourage all employees to care for their personal health with executives as role models.



The project promotes employees' quality of life by focusing on the body mass index (BMI) which reflects the employees' health as the key to readiness to work. We selected the employees with the BMI index of over 30 to participate in the program. The employees were advised with health care suggestion, diet advice for healthy body and appropriate weight so that they can work actively. They will also be able to work in confined space. The result is 87% of employees lost their weight, resulting in the higher number of employees with normal BMI.

The trends of the employees' BMI is decreased from "IRPC 4Gs Healthy Together: Reduce Fat, Reduce Illness, 2019"





Executive management are determined to build a proactive safety culture for the whole organization, by inspecting the working areas by themselves, according to the project called “Safety Walk & Talk”. The project is initiated for exchanging opinions based on facts between executive and employees, resulting in propelling safe working procedures and environment. With the project, employees change their mindset and open to opinions. This also strengthen the engagement between the executives and employees.

PERFORMANCE

Safety Culture Performance Evaluation

Safety Culture
Evaluation (*)
(Score)



3.56

2015



3.88

2017



4.03

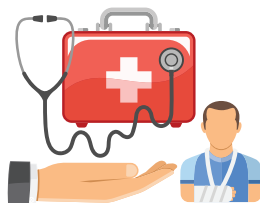
2019

*The highest safety culture rate = 5 - habitually

Life Saving Rules

To reduce accidents that usually happen during work, IRPC improve the working environment along with transformation employees' working behavior by posting “Saving Rules” posters to remind and encourage employees to be careful. These also include details and correct working process for safety and avoiding future accidents. The message in the posters has contributed to the reduction of accidents during the past years because the employees habitually have followed the correct working process.

Number of
Accidents
(Case)



33

2017



21

2018



21

2019

Employees BMI Incline Trend
from IRPC 4 Gs Healthy Together Project 2019



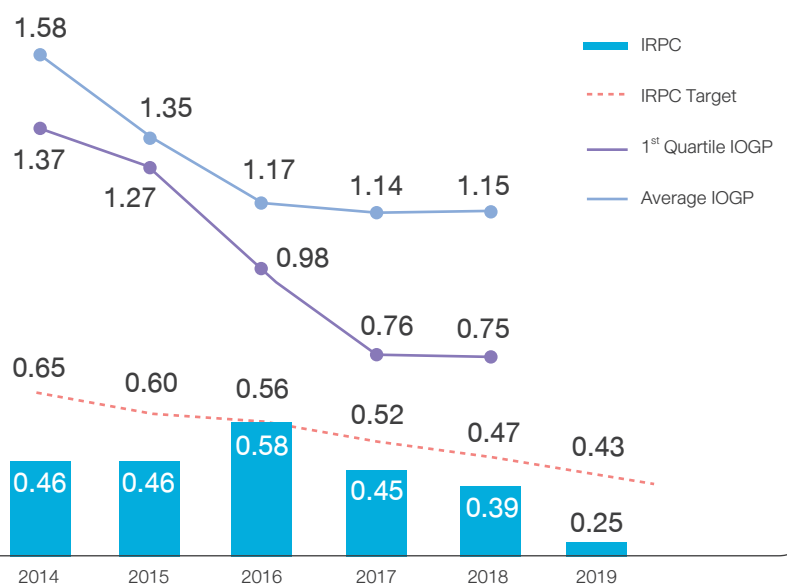
TRIR
(case per one million hours worked)



Performance Indicator	All Worker (including Employee, Outsource and Contractor)		
	0.43	0.25	0.38
Employee			
	0.43	0.18	0.38
Outsource and Contractor			
	0.43	0.35	0.38
		2019 Target	2019 Performance
		2020 Target	

TRIR Statistic Trend benchmarking
with International Association
of Oil & Gas Procedure; IOGP

Trend of TRIR's IRPC
is continuously decline and
gain better than average and
1st Quartile of IOGP



The National Award for the Organization
with Accident Reduction Campaigns
(Zero Accident Campaign 2019)

- IRPC Bangkok Office
- IRPC Ayutthaya Oil Depot
- IRPC Chumphon Oil Depot



The Award for the Exemplary Organization
in Safety, Occupational Health and Working
Environment 2019

- EBSM Plant
- PS Plant
- BTX Plant
- Condensate Restitite Transformation Plant
- IRPC Ayutthaya Oil Depot
- IRPC Chumphon Oil Depot
- IRPC Public Company Limited





SOCIAL & RELATIONSHIP CAPITAL

Continuing to Create
Value for Sustainable Society



We are committed to creating value for the community and society that we serve. We aim to improve the quality of life of our stakeholders by promoting education for youth and senior citizens. Our various programs help build relationships with communities and demonstrate how we respect human rights in our business operations. It showcases our intentions to grow together with the communities we serve.

Community Well-Being

The communities surrounding IRPC Industrial Zone are one of IRPC's key stakeholders. Through the application of CSR concept to business operation, we have carried many projects focusing on life quality improvement of the communities, educational health promotion, and environmental conservation to support the quality living of the communities surrounding IRPC Industrial Zone and society as well as reduce the social impact from the business operation as we strongly believe that everyone can grow together sustainably. These CSR projects have been assessed under London Benchmarking Group (LBG Framework) for our future CSR-related decision making.



Inputs

What's contributed?

How

Cash, Time, In-Kind, Management Costs

Why

Charitable Gifts, Community Investment, Commercial Initiatives in the Community

What

Issue Addresses (Education, Health etc.)

Where

Location



Outputs

What happens?

Community Outputs

Number of People Affected, Activities Held, etc.

Business Outputs

Media Coverage, Awareness Among Customers, Employees etc.

Leverage

Additional Funds Raised



Impacts

What changes?

Community Impacts

Change in Beneficiaries, Organizations and/or Society

Business impacts

Change in Business Performance

Source : London Benchmarking Group Framework

MANAGEMENT APPROACH

IRPC have the CSR strategies by setting CSR budget at 3% of average net profit from the past 3 years. Categorized into 3 types: community projects, educational projects, and social development projects. The CSR projects aims to develop the communities surrounding IRPC Industrial Zone.

Community

1%

Education

1%

Society

1%



INITIATIVES

IRPC's social development projects aims to develop the communities surrounding IRPC Industrial Zone and society

Community Projects

In 2019, IRPC carried out the following projects to enhance the livelihood of people in the community in term of sanitation and living quality



Community Health Promotional Fund

Reaching the third year, the Community Health Promotional Fund has promoted, prevented, treated and recovered health of the people living near IRPC Industrial Zone. The community is given an opportunity to manage the fund by themselves under supervision of public health specialists and the progress report must be submitted every 2 months. In 2019, 31 projects proposed by the communities were approved by the Fund Committee, such as healthy food selection training (Rayong Municipality), medical supplies procurement for Ban Laeng, dental supplies procurement for Ban Nong Tabaek Health Promoting Hospital, medical equipment and supplies for bedridden patient service at Village No. 7, Choeng Noen, etc.



Pun Nam Jai Clinic

In 2019, the clinic served 4,111 patients, mostly with diseases related to bone and muscle, blood pressure, digestive system and respiratory system. The patient's data will be submitted to Rayong Hospital for database entry.



Pun Nam Jai Clinic served

4,111
patients

around IRPC Industrial Zone



Mobile Clinic

IRPC have provided a mobile medical service unit for health check-ups and general medical services once a month. In 2019, the clinic served 2,051 patients from the communities surrounding IRPC Industrial Zone: Ban Laeng, Taphong, Na Ta Khwan, Choeng Noen, and Rayong Municipality. The patient's data will be used for planning of medical follow-ups in the next year, including the follow-ups for those who need specialized medical treatment.



Apart from the aforementioned projects, IRPC carried out other following CSR projects:

Volunteer for Community Development

IRPC have created the opportunity for our voluntary employees to apply their knowledge to develop the communities surrounding IRPC Industrial Zone. Various activities were organized by us and the communities, such as building development, water supply system, language courses for elderly students, etc. The key objectives were to: encourage our employees to be public-spirited, create the collaborating network; and cultivate CSR DNA. In 2019, 26,960 volunteer hours were counted.

Open House

IRPC Open House is organized once a year to provide the opportunity to all stakeholders to appreciate our business operations and environmental management. In 2019, we conducted a salon on environmental management in IRPC Industrial Zone of our current initiatives and trips to the 15 plants under EIA Mitigation Measure Project and the deep-sea port 22 times with 829 visitors, including teachers, students, elderly group and state enterprise representatives.

Community Satisfaction (%)



Educational Projects

IRPC have carried the following CSR projects focusing on educational development for people of all ages.

Community Center Learning

IRPC's Community Learning Center is established to be a center for promoting, learning and developing environment, occupation and economy in a community as well as the meeting place to strengthen the relationship among members of the same or even different communities, and between communities and IRPC. In each month the activities would be rotated and in 2019, 15,675 people participated in the weekend activities and 19,737 people used the meeting room while 24 life quality development was organized. Furthermore, Project "Dreams Come True" provided intensive courses in science, mathematics and English to 6th graders for their admission to secondary education.

Scholarships for the Community

IRPC have provided educational opportunities through the Scholarships for the Community Project. In 2019, 279 scholarships worth THB 608,000 were given to the qualified youths who lived around IRPC Industrial Zone in all educational levels with good grade and behavior but lack of monetary resource.



Mueang Rayong Elderly School

As Thailand has entered aging society since 2005 with elderly population at 10.4%, the subsequent problems can occur, such as abandonment, solitude due to retirement, health deterioration, etc. The challenge is how to improve their life quality. Well aware of this social impact, IRPC focus on lifelong learning promotion, educational management and elderly's life quality improvement for Mueang Rayong Elderly School and Nong Chok Convent Elderly School by designing courses and activities on topics significant to livelihood of the elderly, improve knowledge and life skills for their physical and mental resilience. This is an opportunity for the elderly to participate and apply earned skills and knowledge to enhance their employability or build their own business, generating income for themselves and their families. In 2019, 16 learning development activities were organized, including recreational activities, such as cooking, making herbal shampoo, Thai traditional medicine for self-care, natural agriculture study, etc. 93 elderly students participated.



Social Development Projects

IRPC has been committed to elevating the quality of life, reducing inequality, and contributing to society in a sustainable manner. The company has combined innovative products of good quality and standards with the know-how of its employees to create solid social foundations and promote people's self-reliance through the following projects:



IRPC Prostheses Project

Since 2011 IRPC have donated plastic to Prostheses Foundation of Her Royal Highness the Princess Mother for the production of prosthetic legs and necessary equipment for people with disability. This product, 3340H PP or polypropylene, is translucent and suitable for prosthetic leg sockets, reducing the adjustment time. In addition, we have also expanded our help to international level. Equipped with prosthetic leg, these

people can take care of themselves, enhance their employability and generate income, resulting in less social disparity. Regarding our impact, our participating employees have been cultivated with good conscience while the entire organization has gained better reputation and recognition as well as business opportunity for this product to generate revenue in the future.



Inputs

How

In-Kind Giving

- Donation of Product
20 Tons per Year
- Employees' Times
- Cash Contribution
- Equipment

Why

Charitable Gifts and Product Development to Serve the Need of Users

What

To Improve Living Quality of Disable People and Create Business Opportunities

Where

Thailand, ASEAN Countries, Senegal



Outputs

Community Outputs

Number of Patients Reached

Business Outputs

- Number of Employees Engaged
- New Products

Leverage

- Business Collaboration and Partnership



Impacts

Community Impacts

- Reduce Inequality Gap
- Increase Opportunity and Improve Living Quality for Disable People

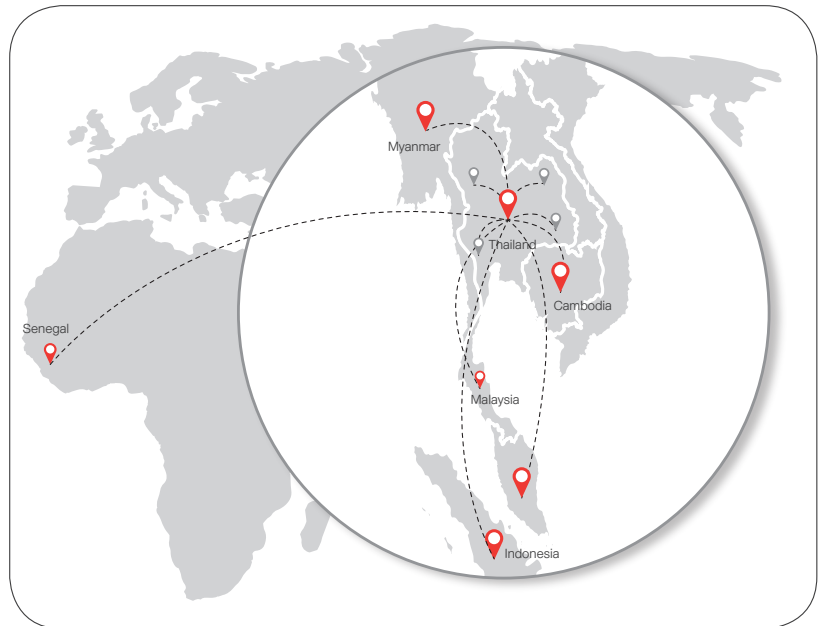
Business Impacts

- Business Reputation
- Business Opportunity for New Product
- Increase Employees' Skills

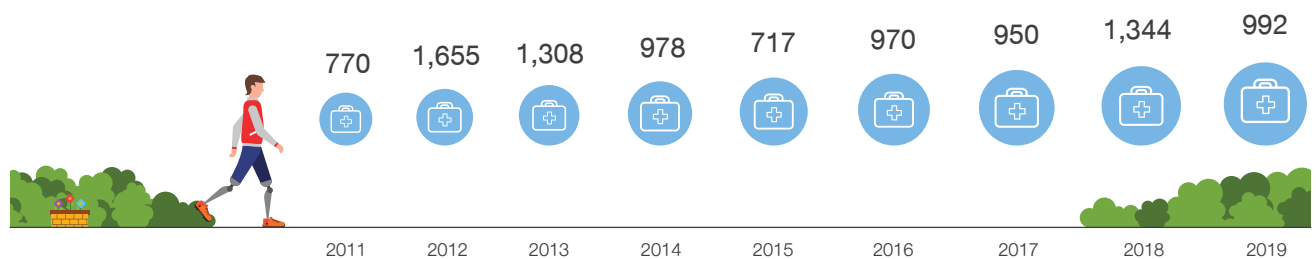


In 2019, IRPC donated 28 tons of 3340H PP, valued at THB 1,243,340, and plastic shedder for prosthetic leg production in the form of THB 613,854 cash to the foundation (THB 268,800 for container truck modification and THB 345,054 for related expenses). This project also gave the opportunity to our voluntary employees to participate, equal to 312 volunteer hours.

We delivered and repaired prosthetic legs to 992 disabled persons in 2019, 9,684 in total since 2011.



No. of Disabled Persons received Prosthetic legs.



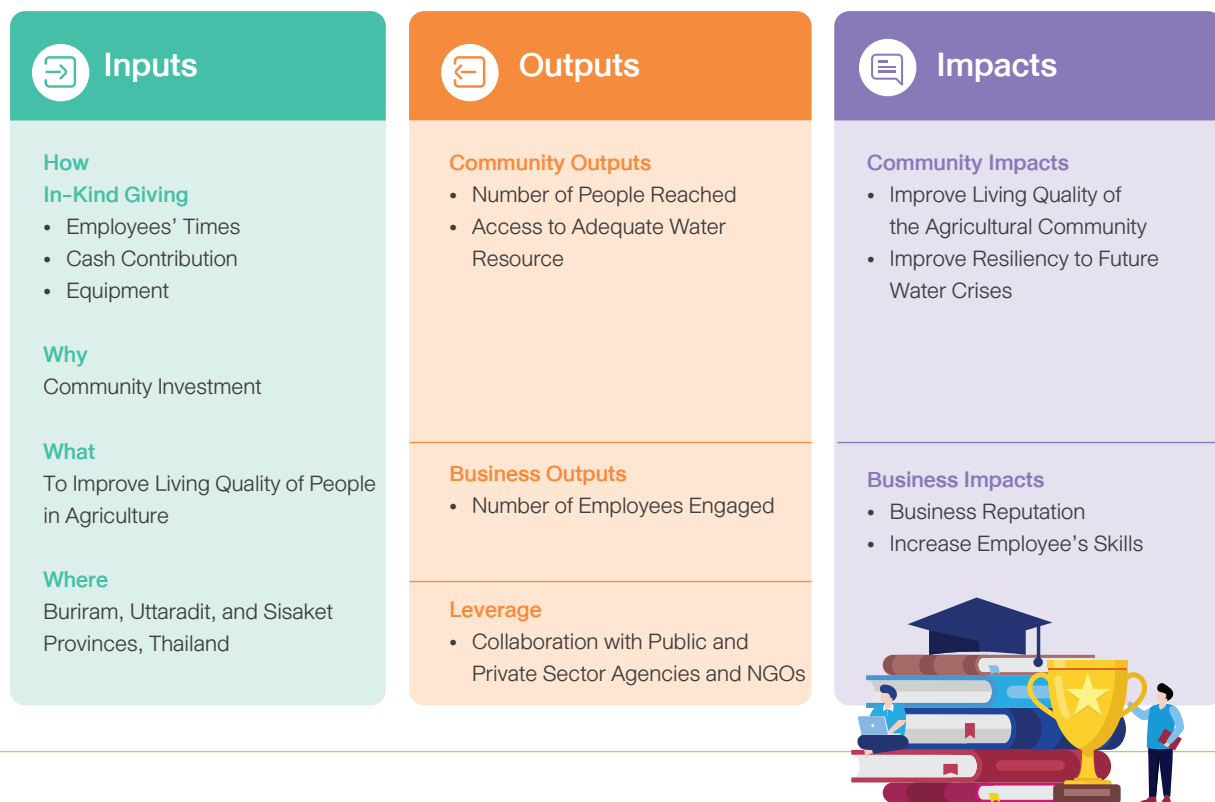
Lam Sai Yong Model

Since 2014, Lam Sai Yong Model aims to enhance the potential of agricultural community to address water scarcity and elevate the living quality of agricultural communities in remote area, becoming the strong foundation in Thai agricultural sector. The success of Lam Sai Yong Model in Lam Sai Yong, Nang Rong, Buriram, has resulting replication and implementation in Uttaradit and Sisaket. In 2019, IRPC implemented this model in other 2 areas.

1) Disabilities Empowerment Center for Udon Thani Diocese, Si Watthanam Village, Ban Muang, Ban Dung, Udon Thani - We transformed 200 rai area to the systematic agricultural area with of 2 27,000 cubic meter reservoirs functioning as retention basins for rainwater and natural flood in rainy season. IRPC also installed the solar power generator and water pump, 12 water tanks and towers, and 470 meter long pipe for water distribution.

2) Non Village (Village No. 1 and 2), Non Non Tai Village (Village No. 6) and Non Non Tok Village (Village No. 11), Non Non, Warin Chamrap, Ubon Ratchathani - We dredged and expanded 2,470 meter long canal with water retaining capacity of 15,000 cubic meters, and 1,207 meter long canal branches with water retaining capacity of 60,000 cubic meters. 4 crosswalks and underpasses were also built. Covering 1,500 rai area, this project is expected to provide water to 542 households or 2,314 people and generated income of THB 20,000-30,000 per rai per year.

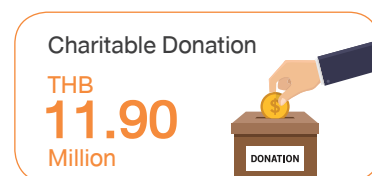
In 2019, our voluntary employees participated in this project, equal to 3,288 volunteer hours. They could apply their skills, such as water management, civil engineering and electric engineering to address the problems which might occur in the project. In addition, this project helped us gain more recognition, acknowledgement and reputation.



Inputs



Type of Philanthropic Activities



Respect for Human Rights

IRPC value the importance of human rights and respect all individuals involved through our entire business structure. Our businesses are established in various regions and as a result, creating complex and delicate structures which they are consequentially affect various interested parties, both internal and external. We have established our business guidance with regards to our human rights policy, subject to the nation's human rights law as well as an International framework. IRPC established risk management policy and procedure to encounter breach of human rights including recovery plan to compensate an individual whom his or her right has been breached. Moreover, IRPC value a further opinion from workforce, community and other interested parties and carry out a productive discussion in order to share common understanding and create mutual benefit. human rights are delicate subject which can be associated to other issues which may cause an unexpected business disruption. We considered human rights as a high risk factor and it is embedded in our business nature. Our policy and procedure are entrenched in our operational process and services which will create confidence that individual will be treated with respect and also creates respectable culture within organization. Moreover, we can adopt and apply human rights policy in different perspective including the workforce performance, trade parties' fairness and other related parties through the entire business structure in order to create confidence, trust, loyalty and relationship between us and stakeholders

MANAGEMENT APPROACH

IRPC aims to becoming a role model organization to operate in adherence to human rights principles and create a network to promote UN Guiding Principles on Business and Human Rights: (UNGP) We also thrive to manage and embed human rights policy and procedure to cover all areas of operation. In order to achieve these goals, we have developed our human rights management procedure in respect of the Human Rights Impact Assessment and Management's handbook (HRIAM) issued by International Finance Corporation (IFC), UN framework in regards to the corporate risk management and PTT Group Human Rights Management Framework.

IRPC extends governance to subsidiaries and business partners, whom IRPC has operational control over as well as collaborate with stakeholders throughout the value chain. Additionally, sustainable procurement manual has been revised to expand our respect to human rights practice to cover 2nd tier suppliers to mitigate risks that involve violation of human rights in our value chain



IRPC's Human Rights Management Procedure

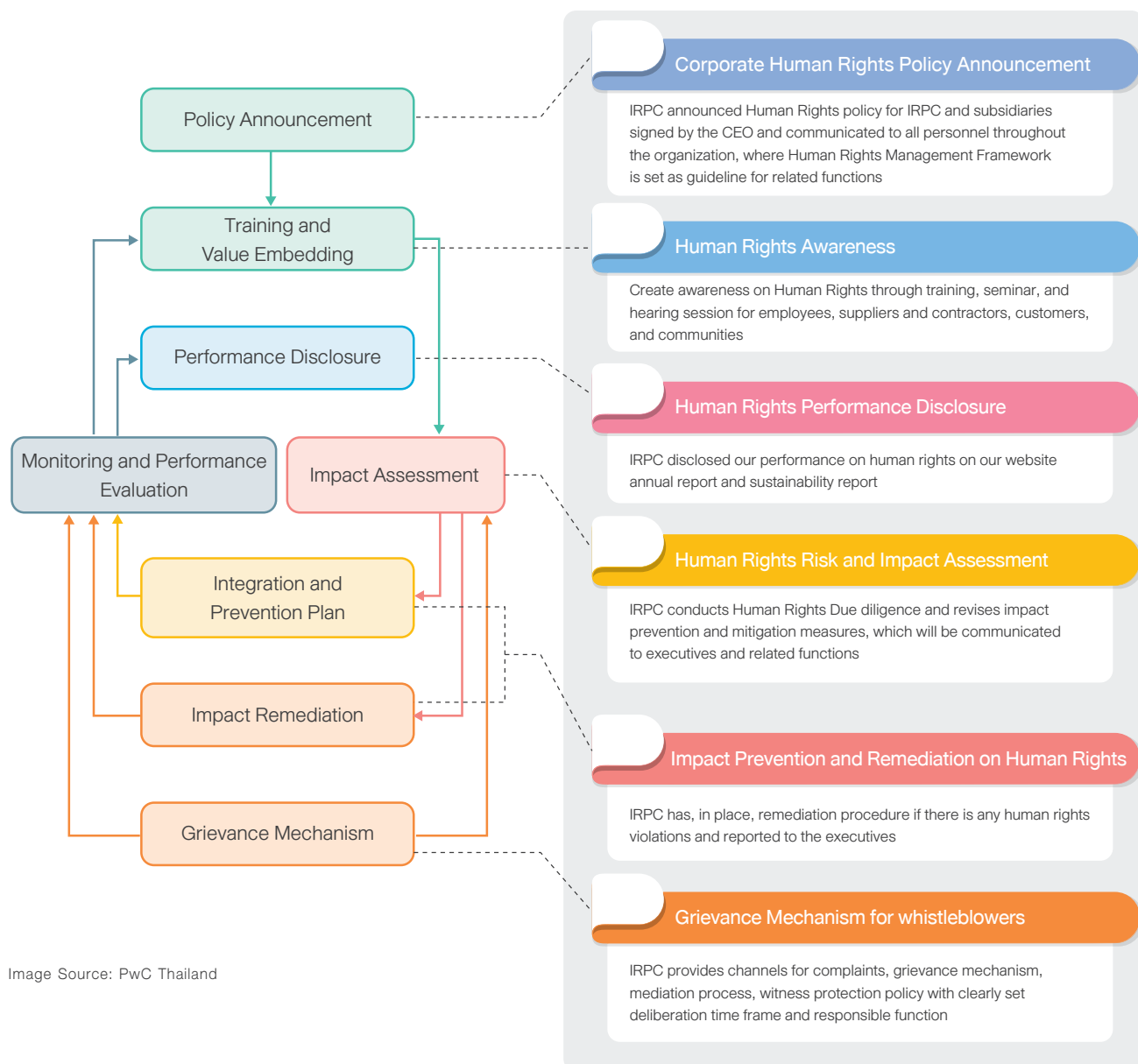


Image Source: PwC Thailand

Human Rights Policy

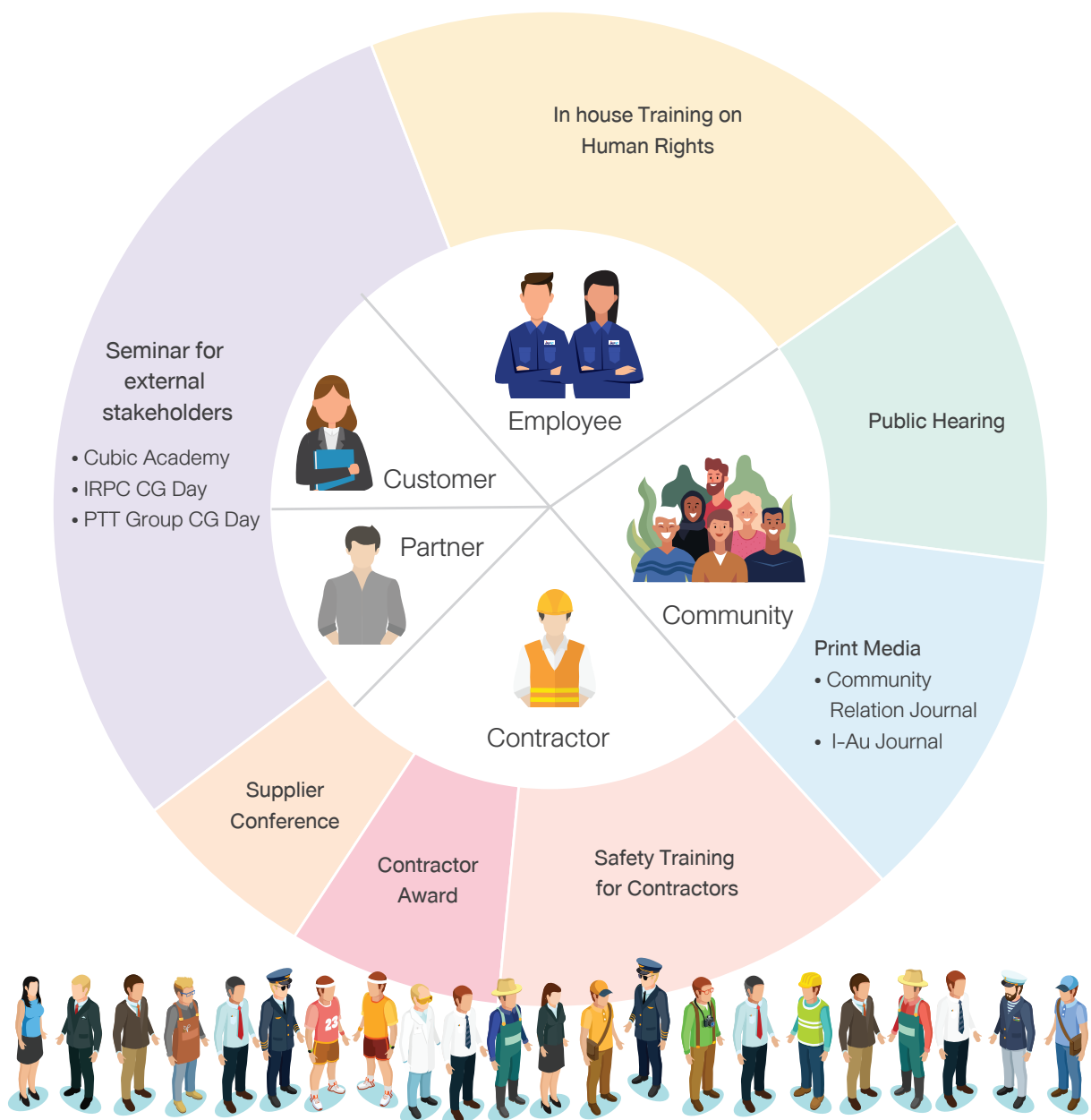
In 2017, IRPC's Human Rights Policy was announced in compliance with legal regulations and the United Nation Universal Declaration of Human Rights (UDHR) International Labor Organization (ILO), UN Guiding Principles on Business and Human Rights, ILO Declaration on Fundamental Principles and Rights at Work, which cover Labor Rights, Women and Children Rights, Human Dignity including freedom and equality for an individual who is protected under Thai law and international law in order to control and avoid any human rights related violations from business

operations throughout the supply chain as well as remain responsible and build confidence on respect to human rights by introducing practical guideline to the board of directors, the executives, and employees at all level to adhere to.

Further details in regards to the human rights policy, please visit our website <https://www.irpc.co.th/social-dimension/human-rights/>

Human Rights Awareness

IRPC has been dedicated to raising human rights awareness. On various occasions the President has announced to employees and other stakeholders the company's policy and commitment to operating a business that respects human rights. Furthermore, IRPC has provided human rights training to its employees, partners, and customers to promote a better understanding of its human rights policy and guideline as well as make aware of human rights related impacts that may occur in order to prevent violations from the business operations. This helps create awareness throughout the supply chain.



Human Rights Risk Assessment

In 2019 IRPC continued its comprehensive human rights risk assessment by reviewing salient issues through a process of corporate human rights risk assessment. This review applied to the entire supply chain, which included the businesses of IRPC and the IRPC Group, businesses that IRPC had and did not have a controlling stake, and major trade partners. All locales were subject to this assessment, including the industrial park and all five oil depots in Chumphon, Ayutthaya, Phra Pradaeng, Rayong, and Mae Klong. (Risk factors are required to be re-examined annually.) Meanwhile, trade partners' human rights and labor rights performance, according to the sustainable procurement handbook, was taken into account when assessing the human rights risks of IRPC's trade partners.



Based on the review, no salient issues were found. All relevant risk factors, such as work conditions, health and safety impacts on communities, and air quality and waste, were found to be at an acceptable level. Nonetheless, IRPC still issued mitigation and remedial measures, such as work regulations, policy for Quality, Security, Safety, Occupational, Health, Environment and Energy Management (QSSHE), and the mobile clinic, to further ensure that the management of its human rights would be efficient and that it would be able to maintain human rights risks within its risk tolerance level.

Furthermore, IRPC has incorporated the respect for human rights into the public hearing process of every new investment project. In doing so, IRPC assures communities that their voice and concerns about the environment and their health would be a priority for IRPC. IRPC promises to conduct appropriate impact assessments and prepare suitable preventive and remedial measures.



Grievance Mechanism

IRPC values the voice of every stakeholder and provides many channels for reports about any act that violates good corporate governance principles and Code of Conduct. Details of these whistleblowing channels appear under Corporate Governance and Compliance on page 8.



INITIATIVES

Employment for Disabilities

IRPC is committed to build an equitable society through empowering people with disabilities to be able to generate incomes and live equally as citizens of the society. IRPC offers employment and provide assistants for those with disabilities by promoting career opportunities in line with the National Commission for Vocational Promotion and Development of the Quality of Life of the Disabled's 2015 regulations through several programs, for example, permanent employment, contract employment, and other career promotion, e.g. convenient stores, cow farming, massages, laundry. Together with the Rainbow Foundation, Rayong Association of Person with Disabilities and Rayong Center for Services for Persons with Disabilities, IRPC has helped 53 people through these collaborative programs. As a result, people with disabilities have become people with abilities to work and earn incomes to support their families and become self-reliance with better living quality.



75%

of Employees
are Members of Labor Union



100%

Complaints /
Suggestion
were taken into
consideration
and solved

Good Labor Practices

IRPC fully supports its employees' freedom to form a union, according to its Employee Relations Policy. In addition, the President encourages regular discussions between supervisors and employees in their reporting line to foster an understanding of employee welfare benefits, career growth opportunities, and business directions. There are also informal meetings, such as the CEO Town Hall and the quarterly chats with leaders of the labor unions, to foster good professional relations. There are currently seven labor unions. About 75% of IRPC's employees are members of these unions.

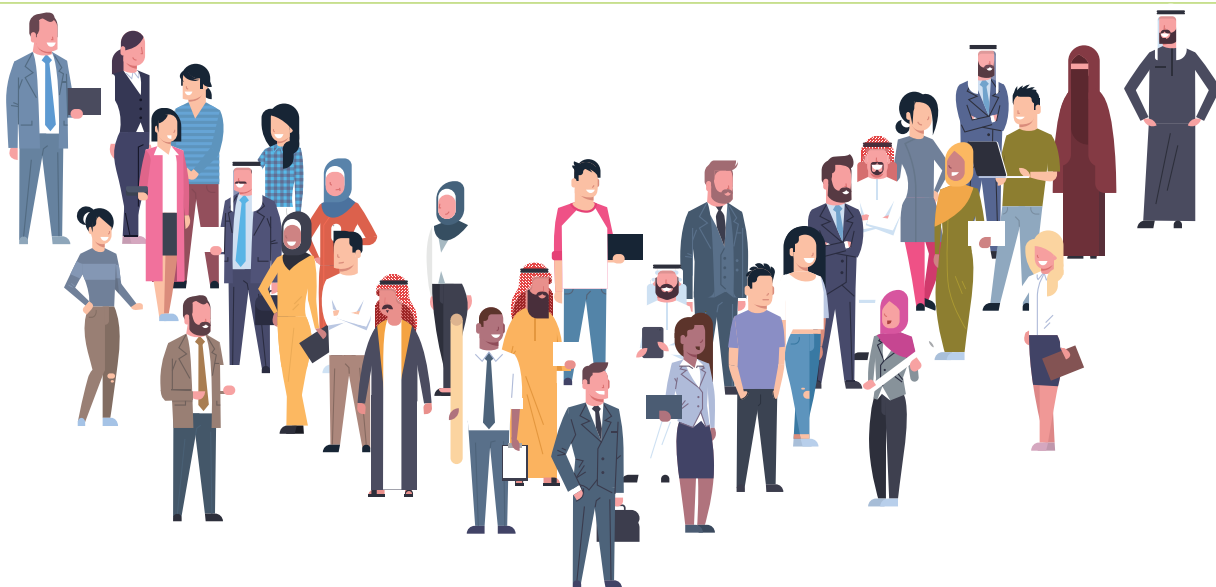
Furthermore, IRPC has a process in place to receive employees' suggestions and complaints. Informal talks are the preferred method to promote morale at work and demonstrate equality. Employees enjoy the freedom to associate and negotiate as a group. In 2019 IRPC received a total of 5 complaint and suggestion from the labor unions. Bilateral discussions between management and the unions led to solutions to all cases.

Human Rights Awards 2019

IRPC is a private-sector winner of the Human Rights Awards 2019 organized by the Department of Rights and Liberties Protection, Ministry of Justice. The company received the prize from the Justice Minister. This award was a part of the Human Rights Role Model Organizations Project, whose aim was to promote human rights as the foundation of operations among state and private entities. The project believed that by encouraging people to respect each other's human rights, it would be able to prevent human rights violations by organizations against customers and general consumers, as well as minimize risks and any human right related complaints.



At the event, the President presented IRPC's human rights promoting activities and partook in a discussion with other role model organizations from different sectors. Armed with an understanding that creating a peaceful society free of human rights violations was the duty of the public sector, the private sector, and civil society, IRPC expressed its commitment to the role through its respect for human rights and human rights promoting activities. For instance, IRPC exercises human rights due diligence and provides remedial measures in every business process to avoid and prevent possible impacts of human rights violations. The award bestowed upon IRPC is a testament that the company has been an outstanding supporter of human rights and has thoroughly respected the human rights of every stakeholder, including staff members, communities, society, customers, and trade partners. IRPC will continue serving as a human rights role model for other organizations.





NATURAL CAPITAL

Caring for
the Environment
for Sustainability



We operate our business in a way that maximizes the best use of our resources to provide us with the greatest benefits. In addition, our constant improvements to our production processes help us reduce the effects they will have on communities that are located around our area of operation. We are also cognizant of our environmental management responsibilities, especially in our supply chain operations. We are keenly aware of our ability, through our refineries, to have an effect on reducing greenhouse gas emissions, helping our ecosystem to achieve balance and to drive organizational growth steadily and sustainably.

Operational Eco-Efficiency

Being aware of the impact from a business operation that may occur to surrounding communities and realizing itself as a part that utilize the world resource with responsibility, IRPC hence places great importance on the eco-efficiency management on every production line, i.e., the worthwhile use of resource and raw materials, enhancement of energy efficiency, air quality management, waste management and wastewater management.

MANAGEMENT APPROACH

IRPC has in place a policy for Quality, Security, Safety, Occupational, Health, Environment and Energy Management (QSSHE) which focusing on:

- Operational Excellence Management System: OEMS
- Systematic Risk Management Planning
- Compliance with Laws and Regulations
- Risk Control and Mitigation according to 7Rs principle coupled with the control under engineering and circular economy principle

IRPC has established integrated management for energy, air, water, solid waste where the scope of Eco Factory

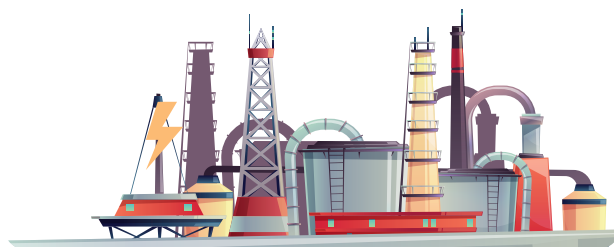
is implemented into operation of every plant to generate continued development. The Green Turnaround concept has been adapted in the management approach to reduce impacts during annual shutdown and turnaround. For instance, the operation is conducted in a closed system, the management of volatile organic compounds (VOCs), waste and wastewater, odor control. Furthermore, in 2019, IRPC has invested over THB 300 million to build a system for prevention or reduction of pollutants, environment quality monitoring, environment management and efficiency improvement to reduce the use of energy, conserving the biodiversity and ecosystems, and leading to low-carbon society.

INITIATIVES

Energy Efficiency

IRPC has over 30 various energy conservation projects within operating areas to control and improve the production process, to reduce the loss and to increase efficiency. These projects help reduce the use of energy by 422,120 gigajoules, reducing total expenses by THB 120 million, and reducing greenhouse gas emission by 25,597 tons of carbon dioxide equivalent. Following are the projects implemented in 2019.

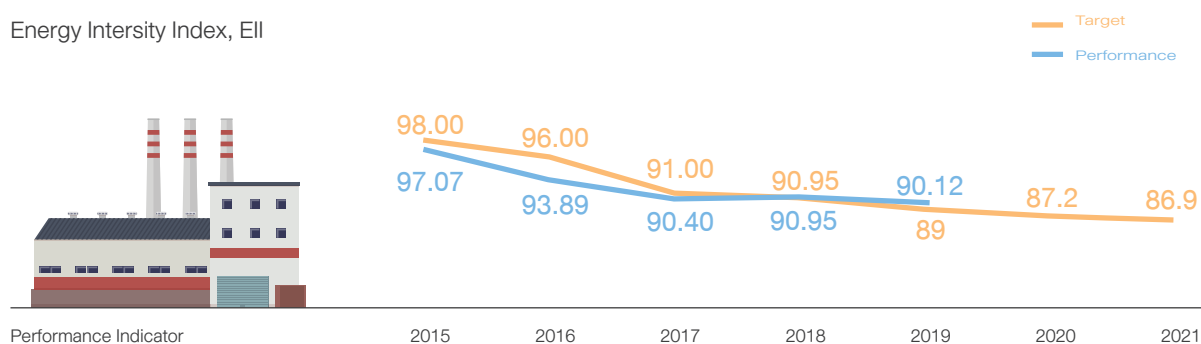
- Steam Pipeline Improvement: Based on the heat exchanger, the heat exchanged with air can reduce the use of energy by 15,100 gigajoules per year, while greenhouse emission is reduced by 809 tons of carbon dioxide equivalent.
- Reduction of Fuel Consumption : UHV Plant reduces the combustion temperature of a furnace to 580 Celsius (from 680 Celsius). Consequently, the energy consumption is



dropped to 10,828 gigajoules per year, reducing greenhouse emission by 318 tons of carbon dioxide equivalent.

- Preheat Train and Fire Heater Improvement to enhance efficiency cuts down the energy consumption by 54,296 gigajoules per year, reducing greenhouse gas emissions by 520 tons of carbon dioxide equivalent.
- Installation of Pre-Heater in steam pipeline reduce energy use by 19,800 gigajoules per year, and greenhouse gas emission by 835 tons of carbon dioxide equivalent.
- Enhancement of Heat Exchanger Performance in Olefins Plant cut back energy loss, reduces energy use by 86,969 gigajoules per year, reducing greenhouse gas emissions by 3,127 tons of carbon dioxide equivalent.

Energy Intensity Index, EII



Remark 1) The targets from year 2018 onwards have been revised to information of the plants which are commercially operated.
2) IRPC decrease production rate in 2019 to optimize economic value according to the changing of market factors.

Air Quality Management

Realizing the importance on controlling air quality and odor that caused by a production process in order to prevent impacts on surrounding communities, hence, IRPC has improved and developed production on a continual basis, implementing new technologies and monitoring air quality in the atmosphere around the operating premise by Real-Time approach at all times.

IRPC has in place measures to control air pollutants emission, to use more of clean energy in a production process in order to reduce the emission of Sulfur Oxide (SOx), Nitrogen Oxide (NOx) and Total Suspended Particles (TSP). Air quality at the emission vent is monitored regularly to ensure that the emission rate is within the standard range.

The reduction of volatile organic compounds (VOCs) has been proceeded as designated in the plan. Significant chemical tanks are improved to reduce the emission of VOCs on a regular basis while the VOC Inventory record is created for the management and development of the production process.

As for odor, IRPC has improved the system to be more closed, while wastewater treatment system and product storage tanks are adjusted accordingly. On addition, the operation during the shutdown is under supervision to be in a closed system with strict monitoring by using VOCs camera under the Green Turnaround to build trust and also reduce impacts on communities surrounding the operating premise. As a result, the complaints on odor in 2019 is lower compared to the previous years.

Odor Management for Wastewater Treatment System

For the Odor Management for Wastewater Treatment System at Wastewater Treatment Unit 2, Phase 2 continued from Phase 1 which has been started in 2018, IRPC installs covers for 5 treatment pits to make the system closed. The vapor is disposed by burning at the furnace for boilers in Ethylene Plant. Total budget spent in improvement during Phase 1 and 2 is over THB 50 million. The solution eliminates odor problem in treatment systems and also the volatile organic compounds problems in the system. The project has been accomplished according to work plan.



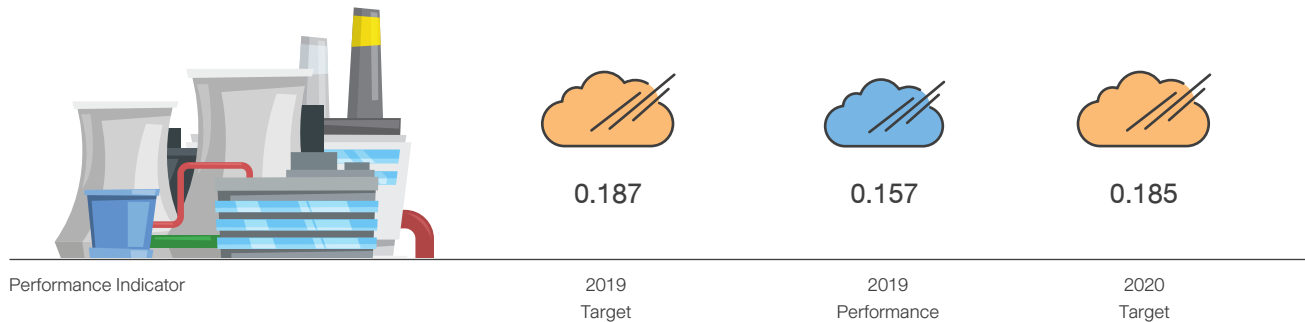
Odor Control for Raw Material and Product Storage Tanks

IRPC has installed dome roof and fix high efficiency on roof seal at total 18 raw material and product storage tanks. The project was initiated in 2018 and is expected to complete in the year 2028. In 2019, IRPC has installed the dome roof at 1 slop tank of the refinery plant and planned to complete another 2 tanks by 2021. The budget for each tank is THB 20 million, with the total budget assigned is over THB 60 million. The project will lower the VOCs emission and odor issue that may affect the communities.

Moreover, IRPC has a project that aims to reduce the VOCs emission from remaining 5 tanks that release significantly Benzene in BTX plant. By improving vent line of the tank that lead to VRU system Unit 2 which has been installed before, this will help trimming the VOCs emission and reducing odor in the atmosphere significantly. The budget assigned is over THB 17 millions.



VOCs Intensity
(ton per thousand tons of production)



Waste Management

IRPC realizes the use of resource for the highest benefits and hence focuses on cutting volume of waste from the production process and maintenance process by implementing 7Rs Principle in the integrated waste management, determining strict management measure that is in conformity to the government regulations, requirement covering the sorting of general waste and hazardous waste to allow proper and valuable utilization. IRPC also follows the Zero Waste to Landfill policy established by the PTT Group to lessen impacts on environment and to cause more beneficial use. IRPC raise awareness among its staff in waste management by passing on the benefits of reducing waste from the source, the reuse of waste and waste disposal

that suitable for each waste property. Such process is one of the solutions that adds value to the waste. The projects implemented in 2019 are as follows.

- Installation Spent Caustic Treatment Unit: SCTU at UHV plant lessens spent caustic that required for disposal by 85% per year.
- More than 300 square meters of insulations from Green Turnaround project during 2019 turnaround of EBSM and ADU 1 unit are reused.

Hazardous Waste to Landfill Comparing to Total Hazardous Waste (%)



Waste to Landfill Comparing to Total Waste (%)



Performance Indicator

2019
Target

2019
Performance

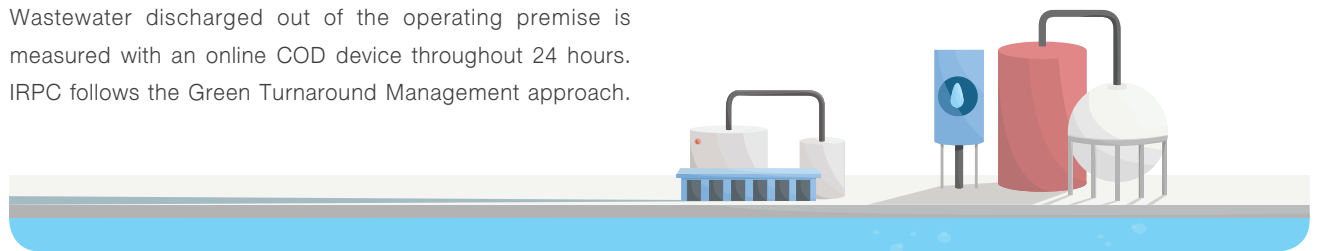
2020
Target

Wastewater Management

IRPC has in place the wastewater management to assure that the wastewater discharged from wastewater treatment system is within the standard range established by relevant authorities. There are 3 central wastewater treatment systems to sufficiently accommodate wastewater from each plant. Wastewater from each plant is monitored separately based on internal control value before entering the central wastewater treatment system. To maintain performance of the wastewater treatment system, pH meter and dissolved oxygen measurement device are installed at the Wastewater Treatment System 1 and 3. Wastewater discharged out of the operating premise is measured with an online COD device throughout 24 hours. IRPC follows the Green Turnaround Management approach.

when managing wastewater from machinery maintenance and cleaning where sediment and oil are trapped before releasing to Central Wastewater Treatment System to prevent impacts on the system.

Furthermore, IRPC conducts a feasibility study on collecting treated wastewater for quality improvement in order to reuse such treated wastewater in which, will subsequently cause the highest efficient use of water and reduce the use of water from the natural resource.



Complaint Management

IRPC has established a systematic and standardized complaint procedures where Emergency Control Center (ECC) is available for receiving complaints throughout 24 hours. When receiving a report or complaint, system administrator will send the complaint to related department for investigation and reporting to senior management for acknowledgment, monitoring and supporting the remedy. IRPC will inform the complainant of the cause, status and mitigate measure.

Moreover, through various publicity, IRPC communicates with stakeholders, arranges meetings, seminars or meet communities to clarify the ongoing operations and projects. After such communication, the number of community's complaints is lower comparing to year 2018. IRPC will use information from complaints as an input for improvement of work procedures and for complaint management in the future.

Complaints from Communities
(times)



6



3



2

Performance Indicator

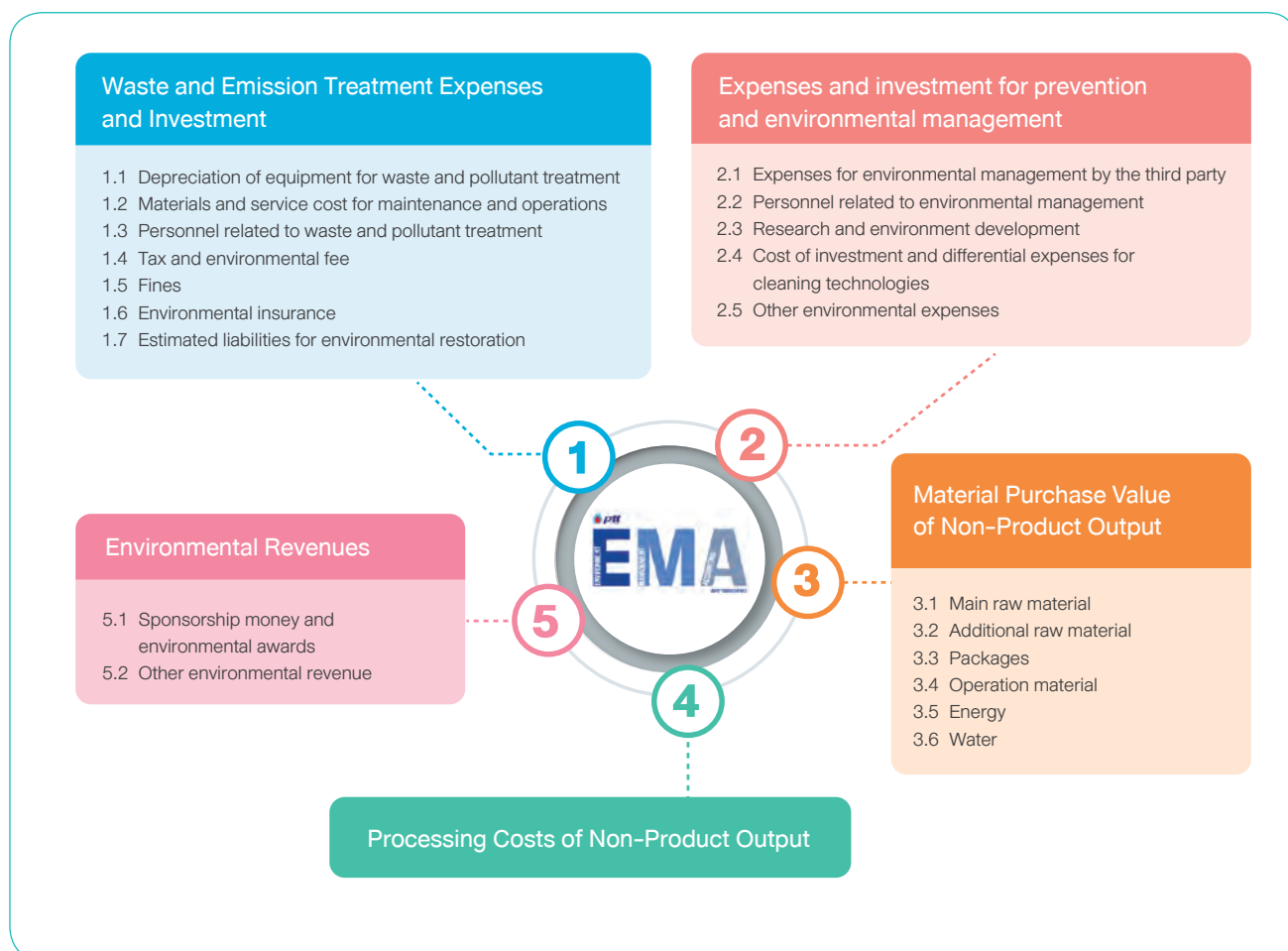
2017

2018

2019

Development of Environmental Management Accounting System

IRPC has developed the system to integrate expenses, income and environment investment under the international standard UN2001 to obtain accurate, adequate and reliable data. Such data are used in planning, controlling and making a decision on environmental management both in short and long terms in order to enhance environmental management efficiency for routine operation, and to cut down the cost of production together with reduce impacts on environment and societies. Phase 1 operation is scheduled for completion by 2020.



PERFORMANCE

For the operational eco-efficiency, IRPC requires that the plants located within operating zone must have management approach that enhance efficiency the use of raw materials and energy worthily and on a continual basis. Furthermore, there must be a systematic planning and operation, cooperation network between plants within operating zone to escalate production and to lower environmental impacts as well as to lessen the amount of waste from the production. As a result, the cost has been cut down and profit has been built up while competitiveness is enhanced. IRPC also reaches out to society to leverage life quality and economy of the surrounding communities for a better well-being, strengthening community immune together with our plants under sustainability concept. According to the promotion and implementation of the said procedures since 2015 onwards, 26 plants of IRPC has been accredited as the Eco Factor. In 2019, IRPC has requested for the accreditation of Eco Industrial Zone, Level 5 for 1 new plant and a renewal of 10 plants which continued from year 2016. Furthermore, IRPC collaborates with government and private sector within the development area leading Rayong being accredited as the Eco Industrial Town Level 4.



Climate Strategy

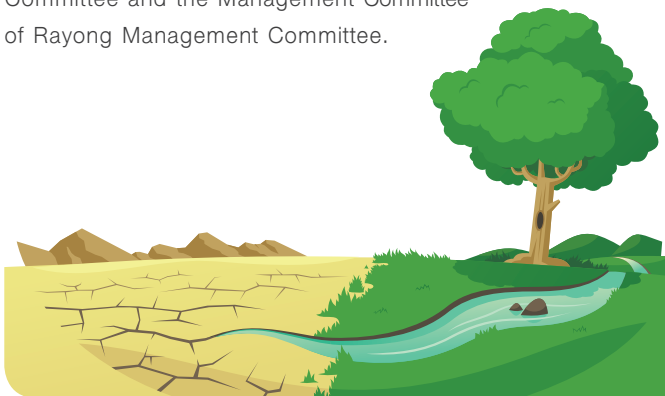
At present, the climate change situation has become more intense which may affect business risk and opportunity and daily life of everyone. For this reason, all over the world has placed the importance and awareness by collaborating in international and national level, for example, the United Nations Framework Convention on Climate Change – UNFCCC where Thailand contributes to sign for reduction of the greenhouse emission. As one of the business entity which commits to great importance and well awareness that its business operation is a crucial part in management of climate change and reduction of the greenhouse emission, IRPC, through establishment of strategy on climate changes and various operations, has proceeded in all aspects to show its commitment to become a part that driving to accomplish maintaining average world temperature not to exceed 2 Celsius. For instance, reducing risk on impacts that may occur from the climate change, building growth opportunity for low-carbon products, the efficient use of resources and energy, the use of alternative energy, raising awareness among staff regarding energy conservation and building cooperation in lowering the greenhouse emission.

MANAGEMENT APPROACH

IRPC has in place the climate change management approach by determining strategy, setting direction and reviewing strategy in accordance with the changes of situation, monitoring performance index regarding significant climate change. Energy Efficiency Index is set as an indicator for performance assessment among staff of all levels from the President to employees in the production line and supporting of related production lines. The performance is reported to the Board of Environmental Management, to the Management and the Board of Directors meeting. As for other indicator i.e., reduction of the greenhouse emission and water management which considered as an indicator for the operation unit, the result is reported to the Environmental Management Committee and the Management Committee of Rayong Management Committee.

Climate Change Strategy

Discerning of the risks related to regulations, the climate change severity which is likely to increase in the near future, IRPC takes into account the Paris Agreement which Thailand has expressed its intention to lower the greenhouse emission to control the rising of the global temperature in 2016, the changes of market demand toward low-carbon products and the advance of low-carbon technology, for instance, batteries and electrified vehicles including physical risk i.e., severe weather, flood and the draught which could get worse. In other point of view, IRPC visions the opportunity of business growth through a variety of low-carbon products and the use of alternative energy of which IRPC has invested continuously in terms of product development and project implementation to manage such risks and to seek for an opportunity to become a leader of climate change management in a concrete plan. IRPC has established the climate change strategy as a framework for business operation since 2018-2020 which includes 6 work plans as follows.



Climate Change Strategy for 2017-2020



INITIATIVES



**GHG Emission Reduced
by 12.34%
in 2020 compared to
2012 Base Year**

Requesting certification on carbon emission management

IRPC has been certified for the Carbon Footprint Organization (CFO) in Propylene Plant by the Thailand Greenhouse Gas Management Organization (public organization) and has been approved for the renewal of carbon reduction label by Thailand Environment Institute for plastic grain products under trade mark POLIMAXX which includes:

- Polypropylene (PP) for PP Homo Polymer, PP Random Copolymer and PP Block Copolymer
- Expandable Polystyrene (EPS) for STD TYPE (STANDARD TYPE) and SE TYPE (SELF EXTINGUISHING TYPE)

- Polystyrene (PS) for High Impact Polystyrene (HIPS) and General Purpose Polystyrene (GPPS)

IRPC has requested for the certification of the Carbon Footprint Organization and Carbon Reduction Label in order to enable the management on carbon emission, to reduce the cost of resource management at a proper level, take responsibility on environment and society by reducing the greenhouse gas emission of Thailand to meet the target set forth in the Conference of the Parties under the United Nations Framework Convention on Climate Change 21# in Paris, and to escalate business opportunity for global trade competition.

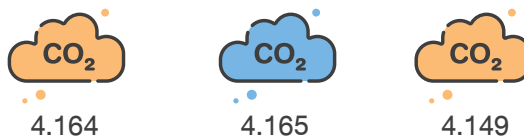


Floating Solar Power Project

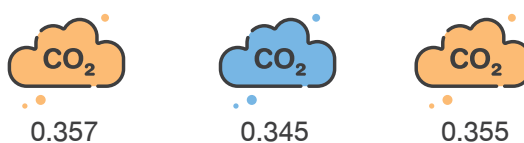
The project is a study on the use of alternative energy or the clean energy. Seeing an opportunity for business development and the use of 3 water storage reservoirs for highest benefit, IRPC has initiated the Floating Solar Power Project 12.5 MW which expected to be completed by the year 2020. The Floating Solar Power Plant will cut down the use of electricity from coal power plant and natural gas, hence lowering the greenhouse gas emission by approximately 10,510 tons carbon dioxide equivalent per year.

PERFORMANCE

Direct and Indirect GHG emissions
(Million ton of carbon dioxide equivalent)



Direct and Indirect GHG emissions Intensity
(Ton of carbon dioxide equivalent per ton of production)



Performance Indicator

2019
Target

2019
Performance

2020
Target

Water Related Risk

Water is a highly valuable natural resource and a factor of living among communities and business operation. In the condition when impacts from climate change occurred, causing drought disaster, water management is very important in order to maintain the balance between the use of water in daily life, agriculture of communities and production of IRPC. Hence, IRPC has set the practice of comprehensive water management approach. For instance, the risk management for effective use of water, raising awareness in water consumption among employees, cooperating with government and passing on knowledge and understanding and sharing water resource with the communities.

Water-related Risk Management Strategy

IRPC uses water from natural resource to feed into the production process. The water is allocated from Rayong Irrigation Department, released into quality improvement for use in various systems, i.e., cooling water system, demineralized water production, using saltwater for Flue Gas Desulfurization (FGD). IRPC controls quality of water before discharging out of the premise under standard established by the Department of Industrial Works and other relevant authorities. Furthermore, to assure the effective use of water, IRPC has implemented the 3Rs principles to water management approach.

Water-related Risk Assessment

IRPC has the comprehensive risk management related to water, including physical risks i.e., water volume, water quality and risks related to regulations and provisions from risk assessment. According to the Aqueduct Water Tool of the World Resource Institute (WRI), it is found that IRPC is located in the low baseline water stress¹. Consequently, the assessment result is brought forward for preparing water management plan and for the study and forecast on the use of water in the future business operation, especially in the end of 2019 when the water situation is in risk of drought in Rayong and Chonburi. Accordingly, IRPC has prepared the measure to resolve the drought situation.

Stakeholder Engagement for Water-related Risk Management

Cooperating with government sector and stakeholders in the Eastern region

IRPC is a member of the Eastern Water War Room Management. The members include industrial operators and stakeholders of Eastern Region Water Resource Management such as Irrigation Department, Provincial Waterworks Authority, Industrial Estate Authority of Thailand and the Industrial Council of Thailand. The objective of the Eastern Water War Room Management is to acknowledge problems, to suggest prevention and solutions for the water-related problems, including to set working plans and strategies for efficient, systematic and sustainable operation among industrial sectors and consumption in the Eastern region.

Furthermore, IRPC is a member of the working team for the Key Man Water War Room - the sub-division of the Eastern Water War Room Management Center,

with duties in monitoring water volume in a large canal and basins which contain important water reservoir, i.e., Dok Krai water reservoir, Nong Pla Lai water reservoir and Klong Yai water reservoir, as well as to estimate water situation as a whole of the Eastern region, assess the risk of water shortage during the drought to prevent impacts on industrial and agricultural sector. In 2019, the area was in risk of water shortage, hence IRPC had set temporary quota for water use in order to overcome the drought situation.

The Irrigation Department allocates temporary 68,500 cubic meters of water per day to IRPC from 8 November 2019 while IRPC has established measures to resolve drought based on 3Rs and reserved water is delivered to replaced the amount of water reduced.

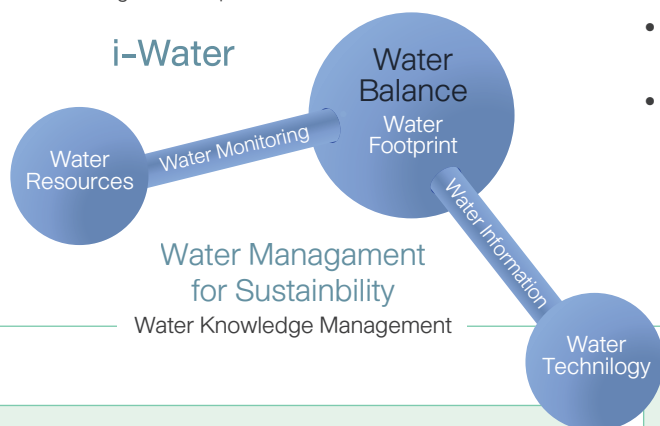
¹ Baseline Water Stress means the ratio of water allocated for a certain area per total volume of water resource based on the water consumption of the upper basin area (resource: WRI Aqueduct 2014).

Enhancement the use of water and raising awareness among employees

IRPC has communicated in the meeting to executives for an acknowledgment on direction of water management within the plants, which can be summarized as follows:

- Launch a water-saving campaign to employees and plants through various media
- Reserve raw water in water reservoir located with operating area to replace the reduced amount from the Irrigation Department.

- Reduce water use, for instance, increase cooling water cycles, reduce water volume used in fire drill, reduce water used in washing equipment including coordinate with customers within operating area for reducing the use of water.
- Reuse the treated wastewater for watering plants and garden, central area within the operating area instead of using raw water from reserved ponds.
- Use RO rejected water for Wet Scrubber from Demineralized Water instead of potable water.
- Improve water quality to recycle in a production process which include the use of condensate water through condensate polishing system as a demineralized water.



Collaborate within PTT Group

IRPC has collaborated with the Water Management Team from PTT Group in preparing efficient strategy and water management plan (PTT Group Water Management Team: PTTWT) in the meeting together every 3 month to discuss and seek for management guideline and effective water management, water security for a production process.

Knowledge sharing and water supply to community

Recognizing and taking into account the drought crisis, IRPC has established preventive measure and set solution and preparation for the drought crisis by coordinating with surrounding communities to reserve water and reduce the use of water to ensure sufficiency during the shortage between 2019-2020. IRPC shares the supplied water to Takad community, Moo 16, Pluak Kade Temple and Pluak Kade School. Raw water from IRPC is also distributed to Nong Phaya community Moo 2, Ban Laeng sub-district for waterworks in the villages, sub-district administrative organization, municipality and agencies.

With the concern on flood crisis in the surrounding communities, IRPC has prepared dredging operation in water resource in and out of the operating zone during rainy season every year.

For any inquires, concerns or additional comments regarding water resource management, please contact
Public Utilities Unit,
IRPC Industrial Zone
Address 299 Moo 5, Sukhumvit Road, Choeng Noen
Sub-district, Mueang District, Rayong Province
Phone 038-611333 ext. 2689
Email: thanawat.t@irpc.co.th



Amount of Water Withdrawn from
Natural Water Sources

Reduced by 38.1%

In 2020, Compared
to 2014 Base Year.





PERFORMANCE SUMMARY



A 2019 IRPC Performance Summary has been prepared to communicate the business' sustainability performance and its impact on the economy, society, and the environment at large.



Economic Financial Performance

GRI Standard	Data	Unit	2016	2017	2018	2019
201-1	Sale Revenues ⁽¹⁾	THB Million	185,041	214,101	280,551	239,315
	Operating Costs	THB Million	164,900	192,946	264,637	236,569
	Operating Profit (Loss)	THB Million	11,303	15,220	10,197	(356)
	Employee Wages and Benefits	THB Million	8,460	9,074	9,270	10,171
	Payments to Providers of Capital	THB Million	9,587	7,341	10,435	1,837
	Payment to Governments ⁽²⁾	THB Million	17,467	15,520	21,850	21,568
201-4	Tax Privileges from the Board of Investment, Thailand	THB Million	2,004	1,873	2,459	1,307
	Tax Compensation from Export	THB Million	147	130	79	106

Remark: (1) Sales revenue includes petroleum sales (including excise tax), petrochemical sales, power and utilities sales, sales of storage tank and port service, etc.
 (2) Taxes paid to government agencies and local officials such as corporate income taxes, local taxes, building taxes, and specific business taxes are paid directly to Thai government agencies and local officials as all IRPC operations are located only in Thailand.



Production

GRI Standard	Data	Unit	2016	2017	2018	2019
N/A	Annual Production	Ton	11,098,684	10,748,499	12,442,052	12,059,756

Remark: IRPC decrease production rate in 2019 to optimize economic value according to the changing of market factors.



Supply Chain Management

GRI Standard	Data	Unit	2016	2017	2018	2019
308-1	Percentage of new suppliers that were screened using environmental criteria	%	100	100	100	100
414-1	Percentage of new suppliers that were screened using labour practices criteria	%	100	100	100	100
	Percentage of new suppliers that were screened using human right criteria	%	100	100	100	100
	Percentage of new suppliers that were screened using criteria impacts on society	%	100	100	100	100
	Percentage of new suppliers that were screened using criteria impacts on society	%	100	100	100	100
204-1	Spending on purchasing of products and services from suppliers and contractors in Rayong	THB Million	2,900	2,894	2,568	2,470
	Percentage of spending in Rayong comparing to the total general procurement budget	%	28.30	20.87	18.90	21.46



Customer Relationship Management

GRI Standard	Data	Unit	2016	2017	2018	2019
102-43 102-44	Annual customer satisfaction survey results ⁽¹⁾	%	91	91	89	91
416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	Case	0	0	0	0
417-3	Incidents of non-compliance concerning marketing communications	Case	0	0	0	0
418-1	Number of substantiated complaints received concerning breaches of customer privacy	Case	0	0	0	0
	Total number of identified leaks, thefts, or losses of customer data	Case	0	0	0	0
419-1	Non-compliance with laws and regulations in the social and economic area	Case	0	0	0	0

Remark: (1) Only petroleum and petrochemical businesses.



People

GRI Standard	Data	Unit	2016	2017	2018	2019
102-8	Employee ⁽¹⁾	Person	5,418	5,498	5,466	5,467
	Total employees by area					
	Bangkok	Person	701	706	695	702
	Male	Person	296	297	291	295
	Female	Person	405	409	404	407
	Rayong	Person	4,414	4,493	4,478	4,480
	Male	Person	3,907	3,981	3,963	3,966
	Female	Person	507	512	515	514
	Other	Person	303	299	293	285
	Male	Person	279	276	270	263
	Female	Person	24	23	23	22
	Employees by level					
	Executive (Level 13-18)	Person	79	78	78	70
	Male	Person	62	60	57	53
	Female	Person	17	18	21	17
	Middle Management (Level 9-12)	Person	757	772	810	806
	Male	Person	590	599	619	623
	Female	Person	167	173	191	183

GRI Standard	Data	Unit	2016	2017	2018	2019
102-8	Supervisory (Level 6-8)	Person	2,576	2,801	3,125	3,199
	Male	Person	2,103	2,292	2,531	2,622
	Female	Person	473	509	594	577
	Operation (Level 1-5)	Person	2,006	1,847	1,453	1,392
	Male	Person	1,726	1,606	1,317	1,226
	Female	Person	280	241	136	166
405-1	Employees by age					
	Over 50 years old	Person	535	631	763	917
	Male	Person	432	506	615	734
	Female	Person	103	125	148	183
	30-50 years old	Person	4,243	4,199	4,086	3,968
	Male	Person	3,515	3,478	3,366	3,281
	Female	Person	728	721	720	687
	Below 30 years old	Person	640	668	617	582
	Male	Person	534	589	543	509
	Female	Person	106	79	74	73
401-3	New Employees					
	Total new employees	Person	125	32	63	97
		% of total employees	2.31	0.58	1.15	1.77
	Male	Person	104	9	41	73
		% of total employees	1.92	0.16	0.75	1.3
	Female	Person	21	23	22	24
		% of total employees	0.39	0.42	0.40	0.44
	New employees by area					
	Bangkok	Person	4	6	11	18
		% of total employees	0.07	0.11	0.20	0.33
	Male	Person	0	1	3	8
		% of total employees	0.00	0.02	0.05	0.15
	Female	Person	4	5	8	10
		% of total employees	0.07	0.09	0.15	0.18
	Rayong	Person	121	24	52	79
		% of total employees	2.23	0.44	0.95	1.45
	Male	Person	104	7	38	65
		% of total employees	1.92	0.13	0.70	1.19
	Female	Person	17	17	14	14
		% of total employees	0.31	0.31	0.26	0.26

GRI Standard	Data	Unit	2016	2017	2018	2019
401-3	Others	Person	0	2	0	0
		% of total employees	0.00	0.04	0.00	0.00
	Male	Person	0	1	0	0
		% of total employees	0.00	0.02	0.00	0.00
	Female	Person	0	1	0	0
		% of total employees	0.00	0.02	0.00	0.00
	New employees by age					
	Over 50 years old	Person	1	2	2	3
		% of total employees	0.02	0.04	0.04	0.05
	Male	Person	1	2	0	1
		% of total employees	0.02	0.04	0.00	0.02
	Female	Person	0	0	2	2
		% of total employees	0.00	0.00	0.04	0.04
	30-50 years old	Person	8	17	11	13
		% of total employees	0.15	0.31	0.20	0.24
	Male	Person	3	14	5	5
		% of total employees	0.06	0.25	0.09	0.09
	Female	Person	5	3	6	8
		% of total employees	0.09	0.05	0.11	0.15
	Below 30 years old	Person	116	147	50	81
		% of total employees	2.14	2.67	0.91	1.48
	Male	Person	100	130	36	67
		% of total employees	1.85	2.36	0.66	1.23
	Female	Person	16	17	14	14
		% of total employees	0.30	0.31	0.26	0.26
	Employee Turnover					
	Total Employee turnover	Person	144	61	55	71
		% of total employees	2.66	1.11	1.01	1.30
	Male	Person	118	48	44	52
		% of total employees	2.18	0.87	0.80	0.95
	Female	Person	26	13	11	19
		% of total employees	0.48	0.24	0.20	0.35

GRI Standard	Data	Unit	2016	2017	2018	2019
401-3	New employees by area					
	Bangkok	Person	29	6	10	17
		% of total employees	0.54	0.11	0.18	0.31
	Male	Person	16	2	4	8
		% of total employees	0.30	0.04	0.07	0.15
	Female	Person	13	4	6	9
		% of total employees	0.24	0.07	0.11	0.16
	Rayong	Person	106	53	40	50
		% of total employees	1.96	0.96	0.73	0.91
	Male	Person	93	45	35	41
		% of total employees	1.72	0.82	0.64	0.75
	Female	Person	13	8	5	9
		% of total employees	0.24	0.15	0.09	0.16
	Others	Person	9	2	5	4
		% of total employees	0.17	0.04	0.09	0.07
	Male	Person	9	1	5	3
		% of total employees	0.17	0.02	0.09	0.05
	Female	Person	0	1	0	1
		% of total employees	0.00	0.02	0.00	0.02
	New employees by age					
	Over 50 years old	Person	37	5	11	20
		% of total employees	0.68	0.09	0.20	0.37
	Male	Person	33	5	9	13
		% of total employees	0.61	0.09	0.16	0.24
	Female	Person	4	0	2	7
		% of total employees	0.07	0.00	0.04	0.13
	30-50 years old	Person	97	22	32	33
		% of total employees	1.79	0.40	0.59	0.60
	Male	Person	48	16	26	23
		% of total employees	0.89	0.29	0.48	0.42
	Female	Person	49	6	6	10
		% of total employees	0.90	0.11	0.11	0.18
	Below 30 years old	Person	18	34	12	18
		% of total employees	0.33	0.62	0.22	0.33
	Male	Person	12	27	9	16
		% of total employees	0.22	0.49	0.16	0.29
	Female	Person	6	7	3	2
		% of total employees	0.11	0.13	0.05	0.04

GRI Standard	Data	Unit	2016	2017	2018	2019	
401-3	Parental Leave						
	Employees Entitled for Parental Leave	Person	5,418	5,498	5,466	5,467	
	Male	Person	4,482	4,554	4,524	4,524	
	Female	Person	936	944	942	943	
	Number of Employees Taking Parental Leave	Person	129	114	131	118	
	Male	Person	112	100	115	97	
	Female	Person	17	14	16	21	
	Number of Employees Return to Work After Parental Leave	Person	127	114	131	118	
	Male	Person	112	100	115	97	
		% of employees taking parental leave	100	89	100	100	
	Female	Person	15	14	16	21	
		% of employees taking parental leave	88	82	100	100	
	Employees Entitled for Parental Leave Who are Still Employed for the Next 12 Months	Person	134	126	110	135	
		% of employees returning to work after parental leave	99	99	96	103	
	Male	Person	124	112	98	121	
		% of employees returning to work after parental leave	98	100	98	105	
	Female	Person	10	14	12	14	
		% of employees returning to work after parental leave	100	93	86	88	
102-41	Total Employees Covered by Collective Bargaining	%	86	86	75	75	
404-1	Training Hours of Male Employees Based in Bangkok		Hour	6,892	10,326	13,212	9,529
	Executive (Level 13-18)	Hour	815	771	1,100	185	
	Middle Management (Level 9-12)	Hour	3,154	4,006	5,256	4,958	
	Supervisory (Level 6-8)	Hour	2,671	5,030	6,350	3,858	
	Operation (Level 1-5)	Hour	252	519	507	528	
	Training Hours of Female Employees Based in Bangkok		Hour	9,112	15,776	17,560	15,861
	Executive (Level 13-18)	Hour	331	418	1,154	606	
	Middle Management (Level 9-12)	Hour	3,722	5,059	6,450	6,689	
	Supervisory (Level 6-8)	Hour	4,626	9,843	9,278	8,116	
	Operation (Level 1-5)	Hour	433	457	678	450	

GRI Standard	Data	Unit	2016	2017	2018	2019
404-1	Training Hours of Male Employees Based in Rayong	Hour	132,785	150,027	194,056	168,853
	Executive (Level 13-18)	Hour	1,065	1,038	1,629	348
	Middle Management (Level 9-12)	Hour	21,648	25,374	24,141	22,174
	Supervisory (Level 6-8)	Hour	74,328	84,661	122,578	105,868
	Operation (Level 1-5)	Hour	35,744	38,956	45,708	40,463
	Training Hours of Female Employees Based in Rayong	Hour	9,738	36,192	15,590	17,535
	Executive (Level 13-18)	Hour	0	0	0	0
	Middle Management (Level 9-12)	Hour	1,497	2,733	2,647	2,275
	Supervisory (Level 6-8)	Hour	5,140	7,726	10,757	13,020
	Operation (Level 1-5)	Hour	3,101	3,092	2,186	2,240
	Training Hours of Male Employees Based in Other Areas	Hour	8,589	12,593	11,298	11,031
	Executive (Level 13-18)	Hour	0	0	0	0
	Middle Management (Level 9-12)	Hour	736	1,650	816	982
	Supervisory (Level 6-8)	Hour	4,091	7,610	7,548	6,719
	Operation (Level 1-5)	Hour	3,762	3,333	2,934	3,330
	Training Hours of Female Employees Based in Other Areas	Hour	542	877	813	754
	Executive (Level 13-18)	Hour	0	0	0	0
	Middle Management (Level 9-12)	Hour	2	65	0	0
	Supervisory (Level 6-8)	Hour	226	529	537	501
	Operation (Level 1-5)	Hour	314	284	276	253
403-9 (2018)	Absentee Rate ^{(2) (3)}					
	Male	%	0.661	0.696	0.679	0.838
	Female	%	0.206	0.217	0.201	0.253

Remark: (1) IRPC does not employ any part-time employees.

(2) This represents absentee rates for only full-time employees.

(3) In 2019, Influenza A (H1N1) spread out. IRPC ordered the infected employees to be fully recovered before returning to work.



Safety

Process Safety

GRI Standard	Data	Unit	2016	2017	2018	2019
N/A	Number of Tier 1 Process Safety Events	Case	1	1	0	3
	Number of Tier 2 Process Safety Events	Case	0	1	2	0

Occupational Health and Safety ⁽¹⁾

GRI Standard	Data	Unit	2016	2017	2018	2019
403-9 403-10 (2018)	Total number of hours worked	Million hours	32.8	30.2	20.35	19.88
	Employees	Million hours	11.5	11.5	11.25	11.20
	All Workers	Million hours	21.3	18.7	9.1	8.68
	Total Recordable Injury Rate (TRIR) ⁽²⁾	Case/Million hours	0.60	0.45	0.39	0.25
	Employees ⁽³⁾	Case/Million hours	0.85	0.75	0.36	0.18
	All Workers ⁽⁴⁾	Day/Million hours	0.47	0.27	0.44	0.35
	Lost Time Injuries Frequency Rate (LTIFR)	Case/Million hours	0.32	0.19	0.25	0.20
	Employees	Case/Million hours	0.57	0.17	0.27	0.18
	All Workers	Case/Million hours	0.19	0.21	0.22	0.23
	Total Recordable Occupational Illness Rate (TROIR) ⁽⁵⁾	Case/Million hours	0	0	0	0
	Employees	Case/Million hours	0	0	0	0
	All Workers	Case/Million hours	0	0	0	0
	Lost Day Rate (LDR) ⁽⁶⁾	Day/Million hours	1.52	1.79	5.26	1.31
	Employees	Day/Million hours	2.85	1.67	8.18	1.43
	All Workers	Day/Million hours	0.85	1.86	1.65	1.15
	Fatalities	Person	0	0	0	0
	Employees	Person	0	0	0	0
	All Workers	Person	0	0	0	0

Remark: (1) Health and safety statistics are based on OSHA and measured per million working hours.

Employees of IRPC Public Company Limited, including its subsidiaries with more than 50% of the shares held by IRPC. All workers exclude Employees.

(2) TRIR does not include first aid cases.

(3) Types of work-related injury for employees are fatalities, permanent total disabilities, lost workday case, restricted workday case and medical treatment case.

(4) Types of work-related injury for workers are fatalities, permanent total disabilities, lost workday case, restricted workday case and medical treatment case.

(5) TROIR is obtained from the results of annual employee health check-ups and diagnosed by occupational medicine doctor.

(6) LDR accounts injuries or sickness causing inability to work on the next working day.



Environment

Materials Consumption

GRI Standard	Data	Unit	2016	2017	2018	2019
301-1	Crude Oil	Ton	8,863,305	8,592,344	9,943,352	9,383,905
	Naphtha	Ton	682,215	700,113	961,415	1,026,692

Energy Consumption ⁽¹⁾

GRI Standard	Data	Unit	2016	2017	2018	2019
302-1	Total energy consumption ^{(2), (3), (4)}	GJ	50,610,551	52,080,051	59,020,452	58,719,745
	Total direct energy consumption	GJ	51,564,793	52,512,622	59,221,327	59,072,047
	Fuel Oil	GJ	3,556,753	1,994,818	2,429,764	2,349,064
	Natural Gas	GJ	20,241,297	19,326,121	21,783,924	21,908,700
	LPG	GJ	1,118,996	707,990	684,881	638,187
	Diesel	GJ	365,560	282,617	295,826	269,792
	Fuel Gas	GJ	16,173,055	17,469,024	20,214,853	19,547,018
	Coke	GJ	4,580,035	6,189,950	6,269,004	5,745,860
	Propane	GJ	0	0	0	0
	H ₂	GJ	336,115	303,062	297,061	309,563
	H ₂ S	GJ	245	269	298	0
	Purge Gas	GJ	N/A	925,442	1,030,912	1,038,258
	Recycle monomer	GJ	26,068	28,360	30,361	30,929
	Coal	GJ	5,166,668	5,284,968	6,184,444	7,234,675
	Total indirect energy consumption	GJ	4,371,882	4,016,112	4,502,344	4,549,128
	Electricity purchased from PEA ⁽⁴⁾	GJ	158,838	472,087	301,578	308,166
	Electricity purchased from IRPC Clean Power	GJ	1,221,417	833,180	1,505,209	1,520,670
	Steam purchased by IRPC Clean Power	GJ	2,991,627	2,710,845	2,695,557	2,720,292
	Total electricity sold	GJ	2,200,936	1,963,211	2,242,431	2,365,088
	Total steam sold	GJ	3,125,188	2,485,472	2,460,788	2,536,342
302-3	Energy intensity ⁽⁵⁾	GJ/Ton of production	4.56	4.49	4.75	4.87
302-4	Energy saved due to conservation and efficiency improvements	GJ	756,750	1,914,021	604,997	422,120

Remark: (1) The calculation standards and methodologies are based on relevant laws and regulations.

(2) UHV plant has commercially produced since June 2016.

(3) The energy consumption in 2017 increased due to the commercial production of UHV, UHMWPE, PPE and PPC plants since 2017.

(4) Electricity purchased from the Provincial Electricity Authority and the Metropolitan Electricity Authority (Bangkok office has been included since 2015).

(5) Energy consumption rate does not include energy consumed during the turnaround in 2017.

Flared and Vented Hydrocarbon ⁽¹⁾

GRI Standard	Data	Unit	2016	2017	2018	2019
G4-OG6 (GRI-G4)	Volume of flared hydrocarbon ^{(1), (4)}	Million M ³	62.17	70.01	57.44	62.67
	Volume of continuously flared hydrocarbon	Million M ³	58.89	59.67	55.37	52.80
	Volume flared hydrocarbon for oil & gas production in relation to volume produced	M ³ /Ton of production	5.60	6.51	4.61	5.20
	Volume of Vented hydrocarbon	Million M ³	N/A	3.78	4.54	3.83
	Production process ⁽²⁾	Million M ³	N/A	1.09	1.42	1.28
	Tank & Marketing & Terminal ⁽³⁾	Million M ³	N/A	2.69	3.12	2.55
	Volume Vented hydrocarbon for oil & gas production in relation to volume produced	M ³ /Ton of production	N/A	0.10	0.11	0.11
N/A	Methane Emission of flared hydrocarbon	Ton	80.65	90.83	74.52	81.30

Remark: (1) The volume of vented hydrocarbon is calculated in accordance with IRPC's Hydrocarbon Management Manual, in reference to HM31: Guide to HC Management in Petroleum Refinery Operation and HM32: Guide to Product HC Management at Petroleum Product Marketing and Distribution.

(2) The volume of hydrocarbon released from production process includes ABC data (HC calculated from the difference of feed to product as stored in SAP) and EPS data (calculated from feed to reactor in each 7.5% batch and products with 6.6% pentane I each month).

(3) The volume of hydrocarbon released from storage tanks and product and raw material handling is collected from VOC report. The unit is converted to cubic meter.

Greenhouse Gas ⁽¹⁾

GRI Standard	Data	Unit	2016	2017	2018	2019
305-1 305-2 305-3	Operational Control					
	Direct emissions of greenhouse gas (Scope 1) ^{(2), (3)}	Million tCO ₂ e	3.469	3.681	3.953	3.911
	CO ₂	Million tCO ₂ e	3.438	3.674	3.946	3.674
	CH ₄	Million tCO ₂ e	0.026	0.002	0.002	0.002
	N ₂ O	Million tCO ₂ e	0.003	0.003	0.004	0.003
	HFC	Million tCO ₂ e	0.002	0.002	0.000	0.002
	SF ₆	tCO ₂ e	397	38	863	38
	Biogenic CO ₂ Emissions	tCO ₂ e	19	184	192	379
	Indirect emissions of greenhouse gas (Scope 2) ⁽³⁾	Million tCO ₂ e	0.280	0.296	0.316	0.254
	Location Based ⁽⁴⁾	Million tCO ₂ e	0.001	0.049	0.029	0.031
	Market Based ⁽⁵⁾	Million tCO ₂ e	0.279	0.247	0.287	0.224
	Other indirect emissions of greenhouse gas (Scope 3) ⁽⁶⁾	Million tCO ₂ e	7.495	17.903	20.295	16.623

GRI Standard	Data	Unit	2016	2017	2018	2019
305-1	Equity Basis					
305-2	Direct emissions of greenhouse gas (Scope 1)	Million tCO ₂ e	3.992	3.905	4.403	4.365
305-3	Indirect emissions of greenhouse gas (Scope 2) ⁽³⁾	Million tCO ₂ e	0.280	0.296	0.316	0.254
305-4	GHG Emission Intensity ⁽⁷⁾	tCO ₂ e/Ton of production	0.338	0.370	0.343	0.345

Remark: (1) The GHG calculations are based to API 2009, IPCC 2006, ISO14064-1, The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition), while GWP is based to the IPCC Fourth Assessment Report (AR4-100 year) are the reports of the following subsidiaries: IRPC PCL, IRPC Oil Co., Ltd., IRPC Polyol Co.,Ltd., UBE Chemicals (Asia) Co., Ltd., and IRPC Clean Power Co., Ltd.

(2) This does not include GHG emission from process vents.

(3) UHV plant has commercially produced since June 2016 while UHV, UHMWPE, PPE and PPC plants since 2017.

(4) GHG emission from electricity purchased from the Provincial Electricity Authority is calculated in reference to PDP 2015 Conversion Factors Calculation.

(5) GHG emission from electricity and steam purchased from (local) private power plant is calculated in reference to Allocation of GHG Emission from Combined Heat and Power (CHP) Plant Guide to Calculation Worksheet V.10 (A WRI/WBCSD GHG Protod. Initiative Calculation Tod).

(6) GHG emission from other sources are employee transportation, consumption of B5, E10 and E20, etc. The emission in 2017 was higher than in 2016 as a result of reporting expansion, such as maritime sales and transportation data, PTT tool loss data, etc.

(7) GHG emission intensity was calculated from Scope 1 and Scope 2.

Air Emissions⁽¹⁾

GRI Standard	Data	Unit	2016	2017	2018	2019
305-7	Total NOx	Ton	1,722	1,418	1,759	1,592
	NOx Intensity	Ton/Thousand Tons of production	0.155	0.132	0.141	0.132
	Total SOx ^{(2),(3)}	Ton	2,164	2,154	1,566	1,800
	SOx from Normal Operation	Ton	1,987	1,219	1,566	1,800
	SOx from Commissioning and Major Turnaround	Ton	177	935	0	0
	SOx Intensity ⁽³⁾	Ton/Thousand Tons of production	0.195	0.113	0.126	0.149
	Total Suspended Particulate (TSP)	Ton	308	238	270	338
	TSP Intensify	Ton/Thousand Tons of production	0.028	0.022	0.022	0.028
	Total VOCs	Ton	2,420	2,015	2,107	1,897
	VOCs Intensity ⁽⁴⁾	Ton/Thousand Tons of production	0.218	0.187	0.169	0.157

Remark: (1) This comes from direct measurements or calculation based on relevant standards and regulations.

(2) The amount of sulfur's oxide is in the form of sulfur dioxide.

(3) SOx Intensity does not include the amount of sulfur's oxide during the turnaround in February 2017.

(4) In 2016, UHV plant has commercially produced and the oil depots outside Rayong changed the calculation of vented emission based on US.EPA 2015 as well as the calculation of raw material and product storage tanks.

(5) The SOx and TPS Emission in 2019 increased due to the CFBC Boiler (Power Plant) Operate after the renovation.

Water Consumption and Wastewater

GRI Standard	Data	Unit	2016	2017	2018	2019
303-3 (2018) a	Total water withdrawal ⁽¹⁾	Million M ³	43	37	42	40
	Fresh water (Water with total dissolved solids less than 1,000 Milligram/liter)	Million M ³	25	25	29	28
	Surface water ⁽⁵⁾	Million M ³	25	25	29	28
	Ground water	Million M ³	0	0	0	0
	Third-party water	Million M ³	0	0	0	0
	Other water (Water with total dissolved solids more than 1,000 Milligram/liter)	Million M ³	18	12	13	12
	Sea water	Million M ³	18	12	13	12
	Total third-party water withdrawal by withdrawal source	Million M ³	0	0	0	0
303-3 (2018) b	Water consumption in risk area	Million M ³	0	0	0	0
	Fresh water	Million M ³	0	0	0	0
	Ground water	Million M ³	0	0	0	0
	Water quantity usage from other departments separate by water source	Million M ³	0	0	0	0
	Fresh water	Million M ³	0	0	0	0
	Ground water	Million M ³	0	0	0	0
	Other water (Water with total dissolved solids more than 1,000 Milligram/liter)	Million M ³	0	0	0	0
	Sea water	Million M ³	0	0	0	0
303-4 (2018)	Total volume of water discharge by type and destination ⁽²⁾	Million M ³	27	22	23	25
	Fresh water (Water with total dissolved solids less than 1,000 Milligram/liter)	Million M ³	6	6	6	8
	Surface water	Million M ³	0	0	0	0
	Third-party water sent for use to other organizations	Million M ³	6	6	6	8
	Other water (Water with total dissolved solids more than 1,000 Milligram/liter)		22	16	17	17
	Surface water	Million M ³	1	2	2	2
	Sea water	Million M ³	21	14	15	15
	Fresh water withdrawal intensity ⁽³⁾	M ³ /Ton of production	3.625	3.252	2.999	2.947
303-5 (2018)	Total water consumption	Million M ³	40	35	37	36
	Results of water volume in Reservoir at 1 st January and 31 st December of that year ⁽⁴⁾	Million M ³	2.10	3.11	3.18	1.45

Remark: (1) Water usage from various sources, including the distribution to third parties.

(2) Volume of water discharged includes seawater used for sulfur scrubbing which is treated before being released to the sea. The volume of wastewater is measured from the sewage sent to wastewater treatment system (except seawater that the volume of process water is equal to that of wastewater according to process design) and the volume of water distributed to third parties (the communities surrounding IRPC Industrial Zone and other third-parties businesses within IRPC Industrial Zone).

(3) Freshwater usage intensity does not include process water for machinery testing of UHV plant, seawater, process water of customers, process water during the turnaround in February 2017.

(4) The difference of water volume in reservoirs in 2019 was less than in the previous year. The process water was reserved for drought. Therefore, the water was not taken from the reservoir.

(5) The surface water from natural sources is calculated from the receipts issued by Royal Irrigation Department (Khlong Yai River Basin) and rainwater in the reservoirs within IRPC Industrial Zone.

Solid Waste

GRI Standard	Data	Unit	2016	2017	2018	2019
306-2	Total waste disposal ^{(1), (2), (3)}	Ton	41,704	54,691	55,598	51,275
	Waste from routine operations	Ton	40,460	54,222	55,129	51,009
	Non-hazardous waste	Ton	26,476	28,287	38,460	39,383
	Composition	Ton	293	1,540	0	0
	Export	Ton	0	0	0	0
	Incineration	Ton	0	276	65	1,937
	Landfill	Ton	3,460	2,665	97	0
	Waste water treatment	Ton	0	0	0	0
	Recovery	Ton	15	707	1,298	1,052
	Recycling	Ton	22,680	22,406	27,689	35,590
	Reuse	Ton	0	0	0	318
	On-site storage	Ton	28	693	0	486
	Land reclamation	Ton	0	0	9,312	0
	Hazardous waste	Ton	13,984	25,936	16,669	11,626
	Composition	Ton	0	0	0	0
	Export	Ton	23	522	1,054	266
	Incineration	Ton	5,587	17,038	12,620	3,392
	Landfill	Ton	419	269	57	0
	Waste water treatment	Ton	162	0	0	0
	Recovery	Ton	6,858	5,957	2,707	5,747
	Recycling	Ton	838	2,023	156	2,168
	Reuse	Ton	62	36	37	31
	On-site storage	Ton	34	90	38	21
	Waste from non-routine operations	Ton	1,244	469	469	266
	Non-hazardous waste	Ton	1,125	36	78	145
	Incineration	Ton	0	0	0	0
	Landfill	Ton	0	36	0	0
	Recovery	Ton	0	0	5	145
	Recycling	Ton	1,125	0	73	0
	Hazardous waste	Ton	119	433	390	121
	Incineration	Ton	0	0	201	0
	Landfill	Ton	0	2	33	0
	Export	Ton	0	0	0	121
	Recovery	Ton	119	428	115	0
	Recycling	Ton	0	3	41	0

GRI Standard	Data	Unit	2016	2017	2018	2019
306-4	Hazardous waste transportation	Ton	14,103	26,275	17,019	11,747
	Hazardous waste import to IRPC	Ton	0	0	0	0
	Hazardous waste export from IRPC	Ton	14,103	26,275	17,019	11,747
	Hazardous waste treated	Ton	0	0	24	42
	Hazardous waste shipped internationally	Ton	23	522	1,054	266

Remark: (1) Waste management data from service providers certified by the Department of Industrial Works.

(2) UHV plant has commercially produced since June 2016.

(3) The waste disposal in 2017 was higher than in 2016 due to the turnover and the commercial production of UHMWPE, PPE and PPC plants.

Oil and Chemical Spills

GRI Standard	Data	Unit	2016	2017	2018	2019
306-3	Significant Oil & Chemical Spills	Case	0	0	0	0
		M ³	0	0	0	0

Environmental Protection Expenditures and Investment and Fines

GRI Standard	Data	Unit	2016	2017	2018	2019
201-1	Environmental protection expenditures and investments (e.g. operation related costs, etc.) ⁽¹⁾	THB Million	803	609	194	311
N/A	Benefit from environmental investment ⁽²⁾	THB Million	2,287	2,581	2,616	1,427
307-1	Monetary value of significant fines	THB Million	0	0	0	0
	Number of non-monetary sanctions	Case	0	0	0	0
	Case brought through dispute resolution mechanisms	Case	0	0	0	0

Remark: (1) Expenditures of environmental protection investment are calculated by summing the investment in energy saving project and Project Everest.

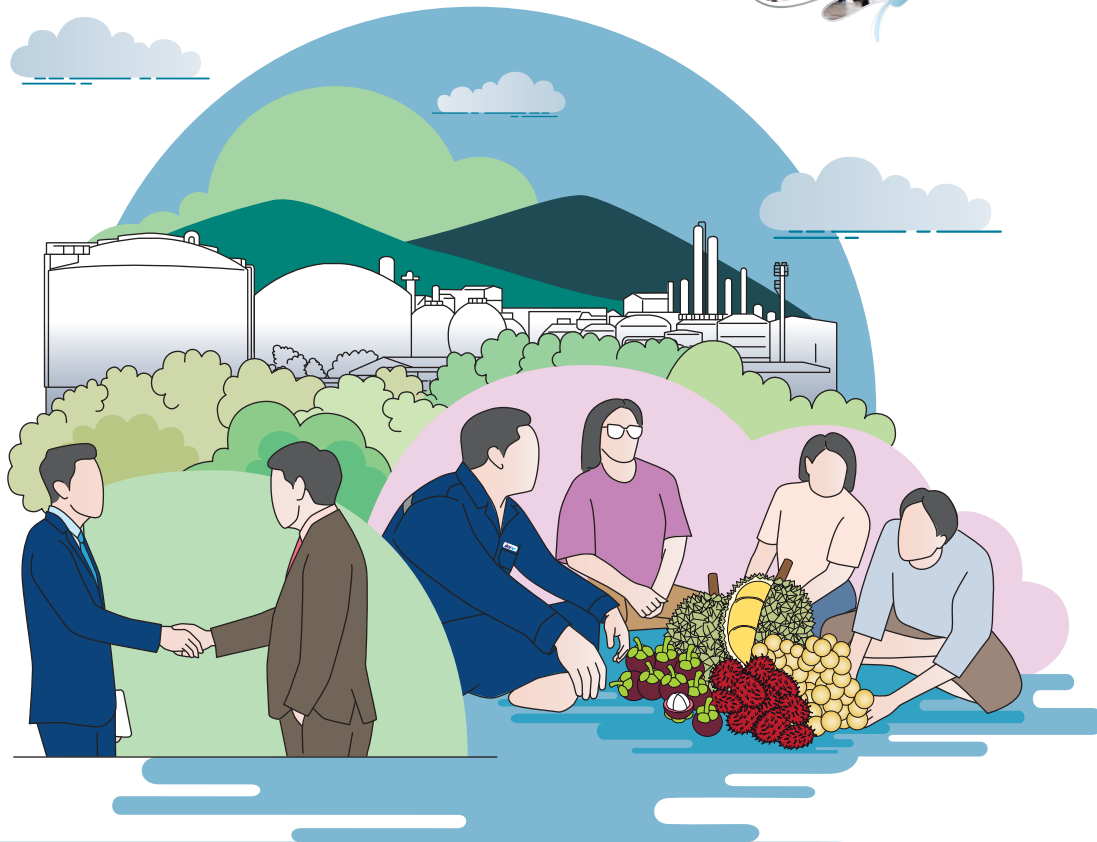
(2) Benefits from environmental investment, such as investment returns, tax incentives from the Board of Investment of Thailand (BOI).

Philanthropy

GRI Standard	Data	Unit	2016	2017	2018	2019
102-43	Community satisfaction	%	87.49	92.29	88.50	91.40



ABOUT THIS REPORT



IRPC publishes a sustainability report annually to communicate issues that are material to corporate sustainability and are of interest to its stakeholders, as well as reporting the progress of compliance with the United Nations Global Compact (UNGC). This report has been prepared in accordance with the GRI Standard Core Option and Oil and Gas Sector Disclosure. This report covers the economic, social and environmental aspects of IRPC's business operations from January 1 to December 31, 2019. and has been verified with a limited level of assurance by KPMG Phoomchai Audit Ltd.

The information disclosed in this report covers businesses owned and operated by IRPC PLC., including its subsidiaries with more than 50% of the shares held by us, comprising of 1) IRPC Oil Co., Ltd., 2) IRPC A&L Co., Ltd., 3) IRPC Technology Co., Ltd., and 4) iPolymer Cp., Ltd. Furthermore, it also includes Rak Pa Sak Co., Ltd., another company in which IRPC's subsidiaries hold more than 50% shares. The scope of this report is in accordance with the 2019 Annual Report and 2019 Integrated Report in which the reference can be found in our annual report and integrated report and on the website: www.irpc.co.th.

Sustainability Materiality Assessment Procedure



Identification of Materiality and Scope of Report

- Identify issues material to stakeholders by listening to their opinions.
- Identify IRPC's relevant material issues and context of sustainability.
- Identify scope of the related issues to cover all relevant stakeholder groups.



Prioritization of Material Issue

- Prioritize material issues based on company's ESG (Environment, Social, and Governance) risk assessment criteria and significance of the issues among stakeholders.



Validation and Approval of The Material Issues

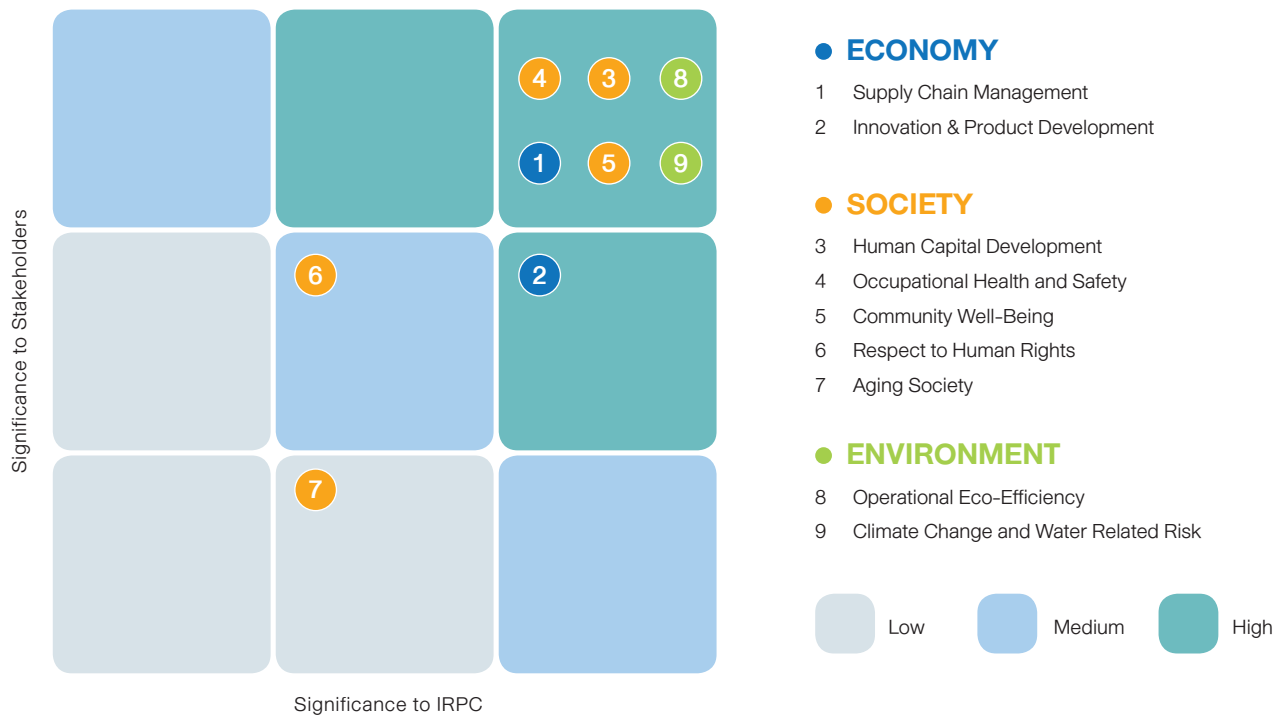
- Present results of materiality assessment to the management committee for validation and approval.



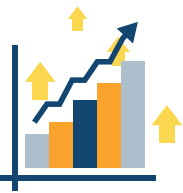

Review of Material Issues

- Gather and review both internal and external issues.
- Review reported materiality and examine the materiality assessment outcome to ensure completeness of the report.

IRPC's 2019 Sustainability Materiality Assessment Matrix



IRPC's Sustainability Material Issues

Material Issues	GRI Aspects	Scope of Impact	Topic in This Report
Supply Chain Management 	<ul style="list-style-type: none"> Procurement Practices Anti-Corruption Supplier Environmental Assessment Supplier Social Assessment Customer Health and Safety Marketing and Labeling Customer Privacy Socioeconomic Compliance 	<ul style="list-style-type: none"> IRPC and Subsidiaries Suppliers Customers 	<ul style="list-style-type: none"> Sustainable Supply Chain Performance Summary
Innovation & Product Development 	<ul style="list-style-type: none"> Non-GRI Topic 	<ul style="list-style-type: none"> IRPC and Subsidiaries Customers 	<ul style="list-style-type: none"> Innovation and Product Development Performance Summary

Material Issues	GRI Aspects	Scope of Impact	Topic in This Report
Human Capital Development 	<ul style="list-style-type: none"> • Employment • Training and Education 	<ul style="list-style-type: none"> • IRPC and Subsidiaries • Employees 	<ul style="list-style-type: none"> • Human Resource Management • Performance Summary
Occupational Health and Safety 	<ul style="list-style-type: none"> • Occupational Health and Safety • Asset Integrity and Process Safety 	<ul style="list-style-type: none"> • IRPC and Subsidiaries • Employees • Communities, Society and Environment 	<ul style="list-style-type: none"> • Occupational Health and Safety • Performance Summary
Community Well-Being 	<ul style="list-style-type: none"> • Indirect Economic Impacts • Local Communities 	<ul style="list-style-type: none"> • IRPC and Subsidiaries • Communities, Society and Environment 	<ul style="list-style-type: none"> • Community Well-Being • Performance Summary
Respect to Human Rights 	<ul style="list-style-type: none"> • Human Rights Assessment 	<ul style="list-style-type: none"> • IRPC and Subsidiaries • Customers • Suppliers • Employees • Communities, Society and Environment 	<ul style="list-style-type: none"> • Respect for Human Right
Operational Eco-Efficiency 	<ul style="list-style-type: none"> • Energy • Emissions • Waste and Effluent • Regulatory Compliance 	<ul style="list-style-type: none"> • IRPC and Subsidiaries • Customers • Employees • Communities, Society and Environment 	<ul style="list-style-type: none"> • Operational Eco-Efficiency • Performance Summary
Climate Change and Water Related Risk Management 	<ul style="list-style-type: none"> • Water Related Risk • Emissions 	<ul style="list-style-type: none"> • IRPC and Subsidiaries • Customers • Employees • Communities, Society and Environment 	<ul style="list-style-type: none"> • Climate Change and Water Related Risk • Performance Summary

Remark : When material issues was assessed, age society was of low importance; therefore, the topic are not reported in this report.

Additionally, other important issues for IRPC which have not been prioritized in the materiality assessment in 2019 but are reported in this Sustainability Report are as follows: Business Strategy, Corporate Governance, Business Ethics, and Compliance, Risk and Crisis Management, Sustainability Management, and total social value evaluation of business operation.



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Independent limited assurance report

To the Directors of IRPC Public Company Limited (“IRPC”)

Conclusion

Based on the procedures performed, as described below, nothing has come to our attention that causes us to believe that the selected subject matters (“Subject Matters”) identified below and included in the Sustainability Report 2019 (the “Report”) for the year ended 31 December 2019, are not, in all material respects, prepared in compliance with the reporting criteria (the “Criteria”).

Our Responsibilities

We have been engaged by IRPC and are responsible for providing a limited assurance conclusion in respect of the Subject Matters for the year ended 31 December 2019 to be included in the Report as identified below.

Our assurance engagement is conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 *Assurance Engagements other than Audits or Reviews of Historical Financial Information*, and ISAE 3410 *Assurance on Greenhouse Gas Statements*. These standards require the assurance team to possess the specific knowledge, skills and professional competencies needed to provide assurance on sustainability information, and that we plan and perform the engagement to obtain limited assurance on whether the Subject Matters are prepared, in all material respects, in compliance with the Criteria. We have complied with the requirements of the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants to ensure their independence. The firm applies International Standard on Quality Control 1 and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

We have not been engaged to provide an assurance conclusion on any other information disclosed within the Report.

Subject Matters

Subject Matters comprised of the following data expressed numerically or in descriptive text for the year ended 31 December 2019:

- GRI 302-1 Energy consumption within organization (2016 version)
- GRI 303-3 Water withdrawal (2018 version)
- GRI 303-4 Water discharge (2018 version)
- GRI 303-5 Water consumption (2018 version)
- GRI 305-1 Direct (Scope 1) GHG emissions (2016 version)
- GRI 305-2 Energy indirect (Scope 2) GHG emissions (2016 version)
- GRI 305-3 Other indirect (Scope 3) GHG emissions (2016 version)
- GRI 305-7 Nitrogen oxide (NOx), sulfur oxides (SOx), and other significant air emissions (2016 version)
- GRI 306-2 Waste by type and disposal method (2016 version)
- GRI 306-3 Significant spill (2016 version)
- GRI 403-9 Work-related injuries (2018 version)
- GRI 403-10 Work-related ill health (2018 version)
- OGSD - OG6 Volume of flared and vented hydrocarbon
- OGSD - OG13 Number of process safety events, by business activity



Criteria

The Subject Matters were assessed according to the following criteria:

- The Sustainability Reporting Standards of the Global Reporting Initiative (“GRI Standards”) with core option; and
- The Oil and Gas Sector Disclosures (“OGSD”);

Directors’ and management’s responsibilities

The directors and management of IRPC are responsible for the preparation and presentation of the Subject Matters, specifically ensuring that in all material respects the Subject Matters are prepared and presented in accordance with the Criteria. This responsibility also includes the internal controls relevant to the preparation of the Report that is free from material misstatement whether due to fraud or error.

Procedure performed

In forming our limited assurance conclusion over the Subject Matters, our procedures consisted of making enquiries and applying analytical and other evidence gathering procedures including:

- Interviews with senior management and relevant staff at corporate and operating sites;
- Inquiries about the design and implementation of the systems and methods used to collect and process the information reported, including the aggregation of source data into the Subject Matters;
- Inquiries about managements practices and procedures related to identifying stakeholders and their expectations, determining material sustainability matters and implementing sustainability policies and guidelines;
- Visits 2 sites; HDPE and CHP/PW site, selected on the basis of risk analysis including the consideration of both quantitative and qualitative criteria;
- Agreeing the Subject Matters to relevant underlying sources on a sample basis to determine whether all the relevant information has been included in the Subject Matters and prepared in accordance with the Criteria.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement and consequently the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed. Accordingly, we do not express a reasonable assurance opinion.

Inherent limitations

Due to the inherent limitations of any internal control structure it is possible that errors or irregularities in the information presented in the Report may occur and not be detected. Our engagement is not designed to detect all weaknesses in the internal controls over the preparation and presentation of the Report, as the engagement has not been performed continuously throughout the period and the procedures performed were undertaken on a test basis.

Restriction of use of our report

Our report should not be regarded as suitable to be used or relied on by any party wishing to acquire rights against us other than IRPC, for any purpose or in any other context. Any party other than IRPC who obtains access to our report or a copy thereof and chooses to rely on our report (or any part thereof) will do so at its own risk. To the fullest extent permitted by law, we accept or assume no responsibility and deny any liability to any party other than IRPC for our work, for this independent limited assurance report, or for the conclusions we have reached.

KPMG Phoomchai Audit Ltd.

Bangkok

6 March 2020

GRI Content Index

GRI Standard	Disclosure	Page Number (s) and/or URL (s)	Omissions / Remark	External Assurance	SDGs	UNGC
General Disclosures						
GRI 102: General Disclosures 2016 (Organizational Profile)	102-1 Name of the organization	Cover, 4, 106, Back Cover	-		-	-
	102-2 Activities, brands, products and services	4-7	Remark: IRPC did not sell any banned or disputed products in 2019.		-	-
	102-3 Location of headquarters	Back Cover	-		-	-
	102-4 Location of operations	4-7	-		-	-
	102-5 Ownership and legal form	Website	http://irpc.listedcompany.com/home.html		-	-
	102-6 Markets served	5	-		-	-
	102-7 Scale of the organization	Annual Report 2019	Remark: Refer to IRPC Annual Report 2019, Financial Highlights, Page 151-157		-	-
	102-8 Information on employees and other workers	93-98	Remark: Majority of IRPC's workforce are employees and supervised workers. No significant variation in employment numbers and changes during the reporting year.		8	-
	102-9 Supply chain	32-37	-		-	2
	102-10 Significant changes to the organization and its supply chain	This Page	Remark: No significant changes (i.e. location, operation, share capital structure, supply chain, etc.) during the reporting year.		-	2
	102-11 Precautionary principle or approach	22-25	-		-	-
	102-12 External initiatives	8, 11, 16-17, 67-72	-		-	-
	102-13 Membership or associations	20	-		-	-
GRI 102: General Disclosures 2016 (Strategy)	102-14 Statement from senior decision-maker	3	-	-	-	19
	102-15 Key impacts, risks, and opportunities	22-24	-	-	-	19

GRI Standard	Disclosure	Page Number (s) and/or URL (s)	Omissions / Remark	External Assurance	SDGs	UNGC
GRI 102: General Disclosures 2016 (Ethics and Integrity)	102-16 Values, principles, standards and norms of behavior	1, 50	-		16	12-14
	102-17 Mechanisms for advice and concerns about ethics	14-15	-	-	16	12-14
GRI 102: General Disclosures 2016 (Governance)	102-18 Governance structure	16 and Website	Remark: https://www.irpc.co.th/sustainability-management/sustainability-management-structure/		-	1, 20
	102-19 Delegating authority	16-17	-	-	-	1, 20
	102-20 Executive-level responsibility for economic, environmental, and social topics	16, 106,	-	-	-	1, 20
	102-21 Consulting stakeholders on economic, environmental, and social topics	26, 75-77, and This Page	Remark: Communication with the Shareholders refers to Annual Report 2019, Page 94	-	16	1, 20
	102-22 Composition of the highest governance body and its committees	8 and This Page	Remark: Composition of the Board and Committees refers to Annual Report 2019, Page 65 (Management Structure Section)	-	16	1, 20
	102-23 Chair of the highest governance body	This Page	Remark: Roles of the Chairman refers to Annual Report 2019, Page 69. (Roles and responsibilities of the Chairman Section)	-	-	1, 20
	102-24 Nominating and selecting the highest governance body	This Page	Remark: Nomination and selection process of the Board refers to Annual Report 2019, Page 67. (Committee and Top Management Recruitment and Appointment and Nomination Process Section)	-	16	1, 20
	102-25 Conflicts of interest	Website	Remark: https://www.irpc.co.th/sustainability-management/business-ethics-and-transparency/	-	16	1, 2, 20

GRI Standard	Disclosure	Page Number (s) and/or URL (s)	Omissions / Remark	External Assurance	SDGs	UNGC
GRI 102: General Disclosures 2016 (Governance)	102-26 Role of highest governance body in setting purpose, values, and strategy	This Page	Remark: Sustainability Management refers to Annual Report 2019, Page 249.	-	-	1, 20
	102-27 Collective knowledge of highest governance body	This Page	Remark: Board Development refers to Annual Report 2019, Page 122.	-	4	1, 20
	102-28 Evaluating the highest governance body's performance	This Page	Remark: Committee Evaluation refers to Annual Report 2019, Page 118.	-	-	1, 20
	102-29 Identifying and managing economic, environmental, and social impacts	This Page	Remark: Risk Management Committee and Risk Management, refer to Annual Report 2019, Page 135.	-	16	1, 20
	102-30 Effectiveness of risk management processes	This Page	Remark: Risk Management Committee and Risk Management refers to Annual Report 2019, Page 135.	-	-	1, 20
GRI 102: General Disclosures 2016 (Governance)	102-31 Review of economic, environmental, and social topics	This Page	Remark: Risk Management Committee and Risk Management refers to Annual Report 2019, Page 135.	-	-	1, 20
	102-32 Highest governance body's role in sustainability reporting	107-108	-	-	-	1, 20
	102-33 Communicating critical concerns	76	-	-	-	1, 20
	102-34 Nature and total number of critical concerns	76	-	-	-	1, 20
	102-35 Remuneration policies	This Page and Website	Remark: Board of Director nomination process refers to Annual Report 2019, Page 67. http://www.irpc.co.th/en/pdf/bord/Nomination-Committee-Charter-Remunerationeng-rev.pdf	-	-	1, 20
GRI 102: General Disclosures 2016 (Stakeholder Engagement)	102-40 List of stakeholder groups	18-19, 75	-	-	-	-
	102-41 Collective bargaining agreements	77	-	-	-	21
	102-42 Identifying and selecting stakeholders	This Page and Website	Remark: https://www.irpc.co.th/sustainability-management/stakeholder-engagement/	-	8	-

GRI Standard	Disclosure	Page Number (s) and/or URL (s)	Omissions / Remark	External Assurance	SDGs	UNGC
GRI 102: General Disclosures 2016 (Stakeholder Engagement)	102-43 Approach to stakeholder engagement	This Page and Website	Remark: https://www.irpc.co.th/sustainability-management/stakeholder-engagement/		-	21
	102-44 Key topics and concerns raised	13-14, 18, 75-76	-		-	21
GRI 102: General Disclosures 2016 (Reporting Practice)	102-45 Entities included in the consolidated financial statements	107-109	-		-	-
	102-46 Defining report content and topic boundaries	107-109	-		-	-
	102-47 List of material topics	107-109	-		-	-
	102-48 Restatements of information	This Page	Remark: No restatement in 2019		-	-
	102-49 Changes in reporting	This Page	Remark: No significant changes in scope and boundary from previous reporting periods.		-	-
	102-50 Reporting period	106	-		-	-
	102-51 Date of most recent report	This Page	Remark: Most recent previous report is 2018 IRPC Sustainability Report.		-	-
	102-52 Reporting cycle	This Page	Remark: IRPC publishes Corporate Sustainability Report annually.		-	-
	102-53 Contact point for questions regarding the report	Back Cover	-		-	-
	102-54 Claims of reporting in accordance with the GRI Standards	106	-		-	-
	102-55 GRI content index	124-132	-		-	-
	102-56 External assurance	110-111	Remark: IRPC engages KPMG Phoomchai Audit Ltd. to provide limited independent assurance service to IRPC's 2019 Corporate Sustainability Report. IRPC has process to ensure transparent external assurance.		-	-

GRI Standard	Disclosure	Page number (s) and/or URL (s)	Omissions / Remark	External Assurance	SDGs	UNGC
Materials Topics						
Supply Chain Management						
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	31	-	-	-	-
	103-2 The management approach and its components	32-38 and Website	Remark: https://www.irpc.co.th/economic-dimension/supply-chain-management/	-	-	-
	103-3 Evaluation of the management approach	32-38	-	-	-	-
GRI 204: Procurement Practices 2016	204-1: Proportion of spending on local suppliers	35	-	-	12	2
GRI 205: Anti-corruption	205-1 Operations assessed for risks related to corruption	25	-	-	-	-
	205-2: Communication and training about anti-corruption policies and procedures	13-14	-	-	-	-
	205-3 Anti-corruption	This Page	Remark: IRPC did not experience any cases of corruption and bribery in 2019. IRPC is accredited as a member in private sector collective action Coalition Against Corruption (CAC) from Anti-Corruption Organization Thailand, in which IRPC is required to report any cases of corruption.	-	-	-
GRI 206: Anti-competitive Behavior	206-1 Anti-competitive behavior	This Page	Remark: IRPC did not experience any cases of anticompetitive behaviors in 2019. For reporting of anti-competitive practices, IRPC provides 1) Whistleblower system; 2) submission of feedbacks to website and 3) Annual Reputation Survey. From these several channels IRPC did not experience any cases of anticompetitive behaviors in 2019 and IRPC is not involved in any ongoing anticompetitive cases.	-	-	-

GRI Standard	Disclosure	Page number (s) and/or URL (s)	Omissions / Remark	External Assurance	SDGs	UNGC
GRI 308: Supplier Environmental Assessment 2016	308-1: New suppliers that were screened using environmental criteria	92	-	-	-	2, 9-11
GRI 414: Supplier Social Assessment 2016	414-1: New suppliers that were screened using social criteria	92	-	-	-	2, 9-11
Logistic & Customer Relationship Management						
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	36	-	-	-	-
	103-2 The management approach and its components	36	-	-	-	-
	103-3 Evaluation of the management approach	36-37	-	-	-	-
GRI 416: Customer Health and Safety	416-2 Incidents of non-compliance concerning the health and safety impacts of products and services	36	-	-	16	-
GRI 417: Marketing and Labelling 2016	417-3 Incidents of non-compliance concerning marketing communications	39	-	-	16	-
GRI 418: Customer Privacy 2016	418-1 Substantiated complaints concerning breaches of customer privacy and losses of customer data	39	-	-	16	-
GRI 419: Socioeconomic Compliance 2016	419-1 Non-compliance with laws and regulations in the social and economic area	39	-	-	16	-

GRI Standard	Disclosure	Page number (s) and/or URL (s)	Omissions / Remark	External Assurance	SDGs	UNGC
Innovation and Product Development						
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	42	-	-	-	-
	103-2 The management approach and its components	43-45	-	-	-	-
	103-3 Evaluation of the management approach	43-45	-	-	-	-
IRPC's Own Indicator	Percentage of petrochemical revenue invested in research and development	45	-	-	-	-
	Percentage of sales of specialty products by petrochemical revenue	45	-	-	-	-
Human Resource Management						
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	48	-	-	-	-
	103-2 The management approach and its components	49-54 and Website	Remark: https://www.irpc.co.th/en/social-dimension/human-resources-management/	-	-	-
	103-3 Evaluation of the management approach	54-55	-	-	-	-
GRI 401: Employment 2016	401-1 New employee hires and employee turnover	94-96	-	-	8	6-8
	401-3 Parental leave	97	-	-	8	6-8
GRI 404: Training and Education 2016	404-1 Average hours of training per year per employee	97-98	-	-	4, 8	6-8
	404-2 Programs for upgrading employee skills and transition assistance programs	51-52	-	-	8	6-8
	404-3 Percentage of employees receiving regular performance and career development reviews	52	-	-	5, 8	-

GRI Standard	Disclosure	Page number (s) and/or URL (s)	Omissions / Remark	External Assurance	SDGs	UNGC
Occupational Health and Safety						
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	56	-	-	-	-
	103-2 The management approach and its components	56-62 and Website	Remark: https://www.irpc.co.th/social-dimension/occupational-health-and-safety/	-	-	-
	103-3 Evaluation of the management approach	63-64	-	-	-	-
GRI 403: Occupational Health and Safety 2018	403-1 Occupational health and safety management system	56-64 and Website	Remark: https://www.irpc.co.th/social-dimension/occupational-health-and-safety/	-	8	6-8
	403-2 Hazard identification, risk assessment, and incident investigation	56-59	-	-	3, 8	2, 6-8
	403-3 Occupational health services	61	-		8	6-8
	403-4 Worker participation, consultation, and communication on occupational health and safety	62		-	8	6-8
	403-5 Worker training on occupational health and safety	59 and Website		-	8	6-8
	403-6 Promotion of worker health	57-58 and Website	Remark: https://www.irpc.co.th/social-dimension/occupational-health-and-safety/	-	8	6-8
	403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	57-59	-	-	8	6-8
	403-9 Work-related injuries	63	-			6-8
	403-10 Work-related ill health	63	-		-	6-8

GRI Standard	Disclosure	Page number (s) and/or URL (s)	Omissions / Remark	External Assurance	SDGs	UNGC
G4-Oil and Gas Sector Disclosure: Asset Integrity and Process Safety 2012	G4-OG13 Number of process safety events, by business activity	99	-		3, 6, 8, 11	-
Community Well-Being						
GRI 201: Economic Performance 2016	201-1 Direct economic value generated and distributed	Website	Remark: https://www.irpc.co.th/social-dimension/social-responsibility/	-	-	-
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	65	-	-	-	-
	103-2 The management approach and its components	66-72 and Website	Remark: https://www.irpc.co.th/social-dimension/social-responsibility/	-	-	-
	103-3 Evaluation of the management approach	68, 71-72	-	-	-	-
GRI 203: Indirect Economic Impacts 2016	203-1 Infrastructure investments and services supported	70-72	-	-	-	-
	203-2 Significant indirect economic impacts	26	-	-	7, 9, 11	-
G4-Oil and Gas Sector Disclosure: Indirect Economic Impacts 2016	G4-EC7 Development and impact of infrastructure investments and services supported	This Page	Omission: Information is not applicable to IRPC because company does not specifically invest initiatives related to access to energy for local communities.	-	-	-
GRI 413: Local Communities 2016	413-1 Operations with local community engagement, impact assessments, and development programs	67-70	Remark: 100% of operation has local community engagement program and formal grievance process. Environmental and social impact assessment are conducted at all eligible operations in line with local regulatory standards.	-	-	-

GRI Standard	Disclosure	Page number (s) and/or URL (s)	Omissions / Remark	External Assurance	SDGs	UNGC
G4-Oil and Gas Sector Disclosure: Local Communities 2012	G4-OG10 Number and description of significant disputes with local communities and indigenous peoples	This Page	Omission: Information is not applicable to IRPC's business.	-	-	-
	G4-OG11 Number of sites that have been decommissioned and site that are in the process of being decommissioned	This Page	Remark: There is no site that have been decommissioned and in the process of being decommissioned.	-	-	-
Human Rights						
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	73	-	-	-	-
	103-2 The management approach and its components	73-78 and Website	Remark: https://www.irpc.co.th/social-dimension/human-rights/	-	-	-
	103-3 Evaluation of the management approach	76-77	-	-	-	-
GRI 412: Human Rights Assessment 2016	412-1 Operations that have been subject to human rights reviews or impact assessments	77-78	-	-	-	-
	412-2 Employee training on human rights policies or procedures	34, 75	-	-	-	-
Operational Eco-Efficiency						
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	79	-	-	-	-
	103-2 The management approach and its components	80-90 and Website	Remark: https://www.irpc.co.th/environmental-dimension/operational-eco-efficiency/	-	-	-
	103-3 Evaluation of the management approach	82-84, 88, 90	-	-	-	-





GRI Standard	Disclosure	Page number (s) and/or URL (s)	Omissions / Remark	External Assurance	SDGs	UNGC
GRI 302: Energy 2016	302-1 Energy consumption within the organization	80-81	-		7, 8, 12, 13	9-11
	302-3 Energy intensity	81	-	-	7, 8, 12, 13	9-11
	302-4 Reduction of energy consumption	80	-	-	7, 8, 12, 13	9-11
G4-Oil and Gas Sector Disclosure: Energy 2012	G4-OG2 Total amount invested in renewable energy	80	-	-	7, 9, 17	-
	G4-OG3 Total amount of renewable energy generated by source	80	-	-	7	-
GRI 305: Emissions 2016	305-6 Emissions of ozone-depleting substances (ODS)	This Page	Omission: Information is not applicable to IRPC because the company is in the process of phasing out the usage of the ozone-depleting substances (ODS).	-	3, 12	9-11
	305-7 Nitrogen oxides (NOx), Sulphur oxides (SOx), and other significant air emissions	102	Remark: Standards, methodologies, source of emission factors and assumptions used are identified relevant regulations.		3, 12	9-11
GRI 306: Effluents and Waste 2016	306-2 Waste by type and disposal method	105	For non-hazardous waste, IRPC sorted and disposed waste to local contractors and municipality in accordance to law. For hazardous waste transportation and disposal, IRPC sourced contractors who hold license as required by law.		3, 6, 12	9-11
	306-3 Significant spills	103	-		3, 6, 12	9-11
	306-4 Transport of hazardous waste	105	-	-	3, 12	9-11



GRI Standard	Disclosure	Page number (s) and/or URL (s)	Omissions / Remark	External Assurance	SDGs	UNGC
G4-Oil and Gas Sector Disclosure: Effluent and Waste 2012	G4-OG5 Volume and disposal of formation or produced water	This Page	Omission: Information is not applicable to IRPC.	-	3, 6, 8, 12	9-11
	G4-OG6 Volume of flared and vented hydrocarbon	101 and This Page	Remark: IRPC only reports on vents from Acetylene Carbon Black (ACB) plant, Expandable Polystyrene (EPS) plant, and VOC Emission. The information for process vent and safety control vent that are unavailable due to the ongoing data collection process.		3, 7, 8, 12, 13	9-11
	G4-OG7 Amount of drilling waste (drill mud and cuttings) and strategies for treatment and disposal	This Page	Omission: Information is not applicable to IRPC.	-	3, 6, 12	-
GRI 307: Environmental Compliance	307-1 Non-compliance with environmental laws and regulations	83	-	-	3, 6, 7, 8, 12, 13	9-11
Climate Change and Water Related-Risks						
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	86, 89	-	-	-	-
	103-2 The management approach and its components	86, 89 and Website	Remark: https://www.irpc.co.th/environmental-dimension/climate-strategy-and-water-management/	-	-	-
	103-3 Evaluation of the management approach	87-88	-	-	-	-
GRI 303: Water and Effluents 2018	303-1 Interactions with water as a shared resource	89	-	-	6	9-11
	303-2 Management of water discharge-related impacts	83	-	-	6	9-11
	303-3 Water withdrawal	103	-		6	9-11
	303-4 Water discharge	103	-		6	9-11
	303-5 Water consumption	103	-		6	9-11




GRI Standard	Disclosure	Page number (s) and/or URL (s)	Omissions / Remark	External Assurance	SDGs	UNGC
GRI 305: Emissions 2016	305-1 Direct (Scope 1) GHG emissions	101	-		3, 12, 13	9-11
	305-2 Energy indirect (Scope 2) GHG emissions	101	-		3, 12, 13	9-11
	305-3 Other indirect (Scope 3) GHG emissions	101	-	-	3, 12, 13	2, 9-11
	305-4 GHG emissions intensity	88, 102	-	-	13	9-11
	305-5 Reduction of GHG emissions	101	Remark: CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, and SF ₆ . NF ₃ are GHGs gas that are not related to IRPC's business. The calculation is based on 2012 base year. Identified GHG reduction is under IRPC's control; as a result, it is considered as GHG emission reduction in Scope 1.	-	13	9-11
Economic Performance						
GRI 201: Economic Performance 2016	201-4 Financial assistance received from government	92	-	-	-	-
Sustainability Performance						
GRI 415: Public Policy	415-1 Political contribution	This Page	Remark: IRPC did not contribute to any political activities/campaigns in 2018. However, IRPC has joined trade association, business association and industry association, which shape policies and directions in oil and gas, and refinery sectors.	-	-	-







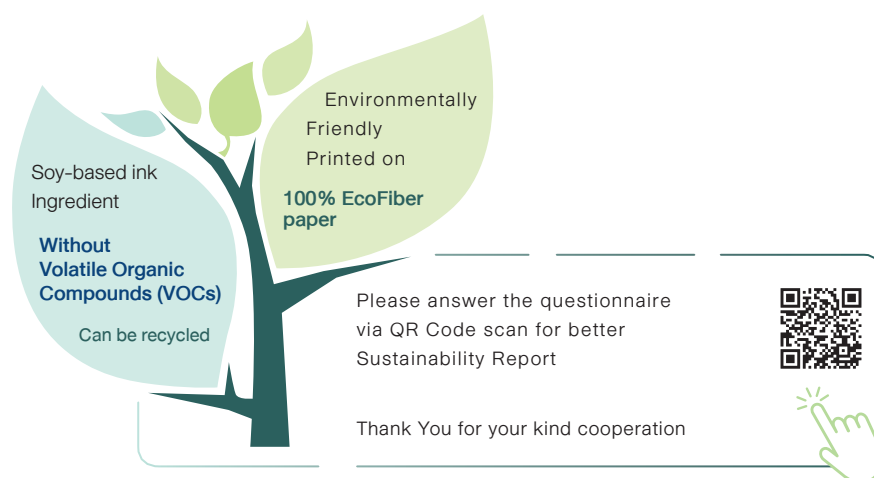
SUSTAINABLE DEVELOPMENT GOALS

SUSTAINABLE DEVELOPMENT GOALS	Objectives of SUSTAINABLE DEVELOPMENT GOALS	Objectives of IRPC' s GOAL	2019 Performance
 <p>Goal 3: Good health and well-being</p>	3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.	Promoting community health around the IRPC industrial zone.	Community Well-Being (Page 66-72)
 <p>Goal 4: Ensuring that everybody will have an equal opportunity to access to good quality education covering all fields of knowledge and promoting lifelong learning opportunity</p>	4.3 Ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university.	Launching Social Responsibility project focusing on education opportunities promotion and development for children, youths and the elderly every year.	Community Well-Being (Page 66-72)
	4.4 Substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.	To educate technical skill of occupation to youths through IRPC Technological College, which has a strategy to improve education quality in accordance with international standard aiming to achieve an excellence in building vocational qualification in petrochemical and energy, including other fields that fulfill the needs of the country.	Annual Report (Page 223-227)
	4.7 Ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.	To organize sustainability trainings to embed sustainable awareness to our employees.	Corporate Governance, Business Ethics and Compliance (Page 8-15) Respect for Human Rights (Page 73-78)
 <p>Goal 5: Gender equality</p>	5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision making in political, economic and public life	To notify Diversity of Board of Directors policy and cascade to all employees in order to promote equality without discrimination in terms of age, gender, race, religion and belief and no prohibit to employees who are member of unions and participated in unions activities.	Corporate Governance, Business Ethics, and Compliance (Page 8-15) Respect for Human Rights (Page 73-78) Annual Report (Page 122) And Company Website: https://www.lrpc.co.th/Social-Dimension/Human-Resources-Management/
 <p>Goal 6: Clean water and sanitation</p>	6.3 Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.	To notify the policy and target of KPI focusing the integration of energy, air quality, water quality and waste management.	Operational Eco-Efficiency (Page 80-85)

SUSTAINABLE DEVELOPMENT GOALS	Objectives of SUSTAINABLE DEVELOPMENT GOALS	Objectives of IRPC' s GOAL	2019 Performance
	6.4 Substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	To integrate the management of water crisis risk, efficiency of water consumption, awareness building for water use to employees, cooperation with governments including knowledge sharing and potable water sharing to the communities.	Water Related Risk (Page 89-90)
	6.6 Protect and restore waterrelated ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	To support and promote the agricultural communities who suffered from water shortage to handle the impacts of drought and enhance their quality of life to be fruitful communities where will be strong as the Thailand's agricultural producers.	Community Well-Being (Page 66- 72)
 Goal 7: Providing energy that is accessible, reliable, sustainable and modern for everyone	7.2 Increase substantially the share of renewable energy in the global energy mix	To study the renewable energy and plan to operate Floating Solar Power project with capacity of 12.5 MW for internal use.	Operational Eco-Efficiency (Page 80-85) Floating Solar Power Project (Page 88)
	7.3 Double the global rate of improvement in energy efficiency	To set targets of the IRPC's Energy Intensity Index (EII) for energy consumption reducing and utilize energy efficiently.	Operational Eco-Efficiency (Page 80-85)
 Goal 8: Decent work and economic growth	8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors	To appoint long term 10-years master plan and cascade annual goal up to 2025. We also allocate 3% monetary from revenue of petrochemical sale to develop innovation research of new products.	Innovation and Product Development (Page 40-45)
	8.4 Improve progressively global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead	To strive to drive the performance of Eco efficiency to control and minimize the impacts from the operation to the communities.	Operational Eco-Efficiency (Page 80-85)
	8.7 Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms	To notify Sustainable Procurement policy covering labor and human rights and enhance the operation of Environment, Social and Governance (ESG) to our suppliers and partners.	Corporate Governance, Business Ethics, and Compliance (Page 8-15) Respect for Human Rights (Page 73-78)

SUSTAINABLE DEVELOPMENT GOALS	Objectives of SUSTAINABLE DEVELOPMENT GOALS	Objectives of IRPC' s GOAL	2019 Performance
	8.8 Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment.	To formulate strategies for an organization with safety excellence and achieving the goal of being an zero accident organization.	Occupational Health and Safety (Page 56-64)
		To ensure process safety management and no incident in the operation essential the chemicals or flammable leakage from container or productions which impact to Loss of Primary Containment Tier 1.	Logistic Management (Page 36-37)
		To implement human rights due diligence covering all operation areas and conduct thorough human right risk assessment to our main suppliers.	Respect for Human Rights (Page 73-78)
 Goal 9: Industry, innovation and infrastructure	9.4 Upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.	To improve to upgrade the efficiency of resources utilization and apply clean technology in production process.	Operational Eco-Efficiency (Page 80-85)
	9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.	To allocate budgets for research and development(R&D) including R&D professional recruitment to expansion opportunity for new S curve development.	Innovation and Product Development (Page 41-45)
 Goal 10: Reducing inequality	10.3 Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard.	To notify Diversity of Board of Directors policy and cascade to all employees in order to promote equality without discrimination in terms of age, gender, race, religion and belief and no prohibit to employees who are member of unions and participated in unions activities.	Corporate Governance, Business Ethics, and Compliance (Page 8-15) Respect for Human Rights (Page 73-78)
 Goal 11: Sustainable settlement and community	11.6 Reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.	To apply clean energy in production process for impacts prevention toward the communities and environment.	Operational Eco-Efficiency (Page 80-85)

SUSTAINABLE DEVELOPMENT GOALS	Objectives of SUSTAINABLE DEVELOPMENT GOALS	Objectives of IRPC' s GOAL	2019 Performance
 <p>Goal 12: Responsible consumption and production</p>	12.2 Achieve the sustainable management and efficient use of natural resources.	To apply clean energy in production process for impacts prevention toward the communities and environment.	Operational Eco-Efficiency (Page 80-85) Circular Economy (Page 46-47)
	12.4 Achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment	To set up the target of greenhouse gas scope 1 and 2 emission, air emission, volatile organics compounds (VOCs) release, hydrocarbon vent from flares and significant spills including improvement the capital project management to achieve goal.	Operational Eco-Efficiency (Page 80-85) Climate Strategy (Page 86-88)
	12.5 Substantially reduce waste generation through prevention, reduction, recycling and reuse	To apply 7Rs into production process.	Innovation and Product Development (Page 41-45) Circular Economy (Page 46-47)
	12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities	To promote green procurement in IRPC and enhance the operation of Environmental, Social and Governance to our suppliers and partners.	Supply Chain Management (Page 32-39)
 <p>Goal 13: Climate action</p>	13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	To reduce the greenhouse gas emission by 12.34% in 2020 compared as baseline 2012.	Climate Strategy (Page 86-88)
	13.2 Integrate climate change measures into national policies, strategies and planning.	To follow the Climate Change strategy.	Climate Strategy (Page 87)
	13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.	To promote the awareness building to all employees through Energy Conservation project and Energy Conservation News on intranet.	Eco-Efficiency in Production Process (Page 80-85) Climate Strategy (Page 86-88)
 <p>Goal 14: Life below water</p>	14.1 Prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.	To set up zero significant oil and chemical spill's target and manage to achieve.	Logistic Management (Page 36-37)
 <p>Goal 16: Peace, Justice and strong institutions</p>	16.5 Substantially reduce corruption and bribery in all their forms.	To manage the operations transparently and fairly without corruption and bribery in all business activities and commit to be anti-corruption organization.	Corporate Governance, Business Ethics, and Compliance (Page 8-15)



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Thank You for your kind cooperation





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