



2016 CORPORATE  
SUSTAINABILITY REPORT  
IRPC Public Company Limited

# GETTING TO THE TOP TOWARD SUSTAINABILITY



MEMBER OF  
**Dow Jones  
Sustainability Indices**  
In Collaboration with RobecoSAM

# In Remembrance of

## His Majesty King Bhumibol Adulyadej

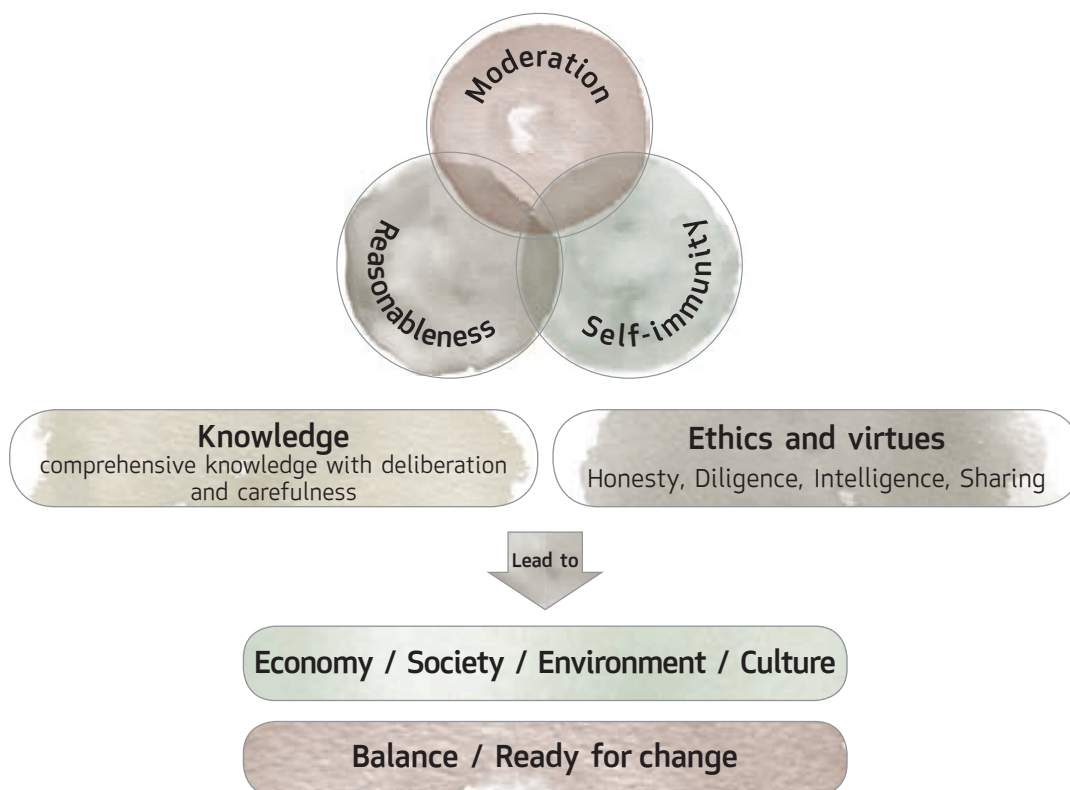
For seven decades under His Majesty King Bhumibol Adulyadej's guiding light, Thai people have been living happily and peacefully as it was uttered in the first traditional oath of coronation: "We will reign in righteousness for the benefits and happiness of Siamese people." From that day onward, His Majesty has always kept his promise to Thai People with his fortitude and devotion for the well-being of Thai people. He started by learning what were necessary for the development of the nation and expanding them into thousands of royal projects throughout the nation. His Majesty has laid down the foundation for the development of the country

by giving a "Sufficiency Economy" philosophy based on the fundamental principle of Thai culture since 1974 with his awareness of the economic and environmental impacts from development across the world.

IRPC would like to commemorate the royal grace of His Majesty King Bhumibol Adulyadej and to follow in His Majesty's footsteps through the Sufficiency Economy philosophy and carry on his royal legacies for the prosperity of life and success in work.

### Philosophy of Sufficiency Economy

#### Moderate Practice







“...Sufficiency means moderation, reasonableness and the need for self-immunity for sufficient protection from impact arising from internal and external changes. To achieve this, an application of knowledge with due consideration and prudence is essential. In particular, great care is needed in the utilization of theories and methodologies for planning and implementation in every step. At the same time, it is essential to strengthen the moral fibre of the nation, so that everyone, particularly public officials, academics, businessmen at all levels, adheres first and foremost to the principles of honesty and integrity....”

Definition of Sufficiency Economy approved and given by His Majesty King Bhumibol Adulyadej to the National Economic and Social Development Board for distribution.

Monday, November 29, 1999

# Philosophy of Sufficiency Economy

## in Business Context at IRPC

### Moderation

IRPC operates a fully integrated petrochemical business, in which the Company specializes, with a vision to become a leading integrated petrochemical complex in Asia by 2020 by considering from its business potential and how IRPC manage its resources which is based on moderate practice in business planning for sustainable growth, for example, a careful approval process for each investment project appropriate resource management system appropriate workforce management and compensation program, as well as promoting appropriate lifestyle among its employees, based on sufficiency economy philosophy. Regarding the environmental aspect, IRPC is committed to the optimum use of natural resources and avoid environmental impacts that may arise from its operation by effective production planning, modern production processes, environmental management to mitigate impacts from its production process by introducing the concept of 3Rs of the environment (Reduce, Reuse and Recycle) into its operation to minimize resources utilization, for example, water resource management, energy conservation, reduction of waste from operations, etc.

### Self-immunity

IRPC has built up self-immunity for its business operation in order to get ready or adapt to the change by efficiently using of Enterprise Risk Management, especially management of risks from the price of crude oil or products to minimize impact from price fluctuation and it also has Business Continuity Management plan to prepares for crisis which are not in the control of IRPC. In addition, IRPC also conducts research and development to continuously improve the quality of products to meet customers' demand and adapt to the changing world which will add value its products in a sustainable way. IRPC foresees the importance of continuous improvement of employee capability such as providing training courses that will maximize the benefit for IRPC, its employees and stakeholders. It also promotes work-life balance among its employees to have a better health, and happiness which results in the increased efficiency and effectiveness.

### Reasonableness

IRPC carefully operates its business, using screening process by experts and experienced personnels. IRPC also has Board of Directors and Executives to validate and determine soundness before any approval of policy and business plan. It also has a transparent and fair recruitment and performance assessment process and listen to feedback from all stakeholders and use it to improve its operation for the benefit of IRPC and every group of stakeholder with the aim for sustainable growth.

### Knowledgable

IRPC aims to be excellent in all aspects by focusing on human resource development which is a base for business growth as well as focusing on management and sharing of knowledge internally for employees to efficiently apply in their works. In 2016, IRPC launched the EVEREST project with the aim to increase IRPC's competency in process, software and human resource by applying best practices from around the world and development of learning process to increase personnel capability to continually accommodate efficiency improvement throughout the company.



## Ethics and virtues

IRPC is committed and expresses its desire to conduct business with transparency, integrity and responsibility toward its stakeholders. It has created "Corporate Governance Best Practices" that will serve as a guideline for the Boards, executives and every employee to follow. IRPC believes that ethics and virtues will be the base to support the organization development and lead to a sustainable success, therefore, IRPC treats

every stakeholder fairly and adheres to good corporate governance principles to decrease the gap in our social inequality by leading several social activities that focus on the development of quality of life of people in the community, such as water management under Lam Sai Yong Model project and the volunteer project to help making prosthesis leg for the disables to enable them to have a better life and be self-reliance.

"...Sufficiency Economy is the foundation of life, the stability of the nation - the way pilings support houses and buildings. Buildings can stand firmly because of the pilings. But piling cannot be seen and so people tend to forget about them...."

H.M. The Late King's Speech, taken from Chaipattana Journal, August 1999 Issue

The Philosophy of "Sufficiency Economy" can be used as a principle for appropriate conduct by the population at all levels, from an individual, a family, a community, a government and even in a business. This principle does not conflict with the concept of globalization but the three major elements, namely moderation, reasonableness and self-immunity shall be considered as well.

To honor His Majesty King Bhumibol Adulyadej, we at IRPC will follow in His Majesty's footsteps through the Sufficiency Economy philosophy and apply it in our business conducts for sustainable development and growth, along with the prosperity of Thailand.

May our beloved King rest in the eternal peace and will be always remembered in our heart.  
Board of Directors, Executives and all Employees at IRPC Public Company Limited.

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# CEO Statement

The passing of His Majesty King Bhumibol Adulyadej on 13<sup>th</sup> October 2016 marked the great loss of the Thai nation.

Amid the grief for our beloved the late King, the Board of Directors and employees of IRPC, as a part of Thai citizen, would become a driving force to continue the royal wish by following his Majesty's footsteps, following his royal guidance and speeches given in different occasions. These royal guidances and speeches are also known as 'Science of the King'. IRPC will adopt the royal guidance to our business operation, adhering to the Sufficient Economic Philosophy- the substantial concept of sustainability, leading the business for viable growth, taking into account the moderation, reasonableness, self-immunity for ourselves and creating knowledge and morality.

The 2016 was another year where IRPC successfully achieved the targeted goal despite the global economic slowdown. The Company generated net profit of THB 9,721 millions, an increase of 3.4% when comparing to 2015. Furthermore, IRPC has made a significant change by implementing EVEREST Project to our operating procedures in order to enhance capacity of generating profit as well as performance of our human resource. EVEREST is the best practice recommended by our world class consultant and will be applied to all departments to leverage working standard to be equal or even better than universal standard. The Project, under collaboration of all employees, is expected to be implemented for development of human resource and the entire corporate work systems for a period of 2 years. It is estimated that after enhancement, the Company will be able to generate EBIT value equal to THB 6,765 millions in 2017 and will also add profit margin at full capacity THB 10,500 millions in 2018. EBITDA will soar to THB 29,029 millions. As a result, IRPC will achieve the target when the ROIC exceeds over 14% to top quartile, which means the vision will be achieved within year 2020.

At IRPC, we are determined to implement a comprehensive human capital development, by assessing employees' potential in order to set up the progressive plan, assessment of leadership of 180-degree feedback and education of necessary knowledge for employees. The aim is to build up personnel skill to cope with the challenges in which coming together with business opportunity, as well as to take care on safety and hygienic health of all groups of stakeholders. In 2016 IRPC has set the period of 100 days as a Goal Zero to stimulate and to create the culture where employees

shall take into account the safety at work as a major factor. Our focus is also to create shared value to society. For example, social responsibility activities such as development of water resource in Rayong Province, promote health of communities which consists of health monitoring and health checkup activity, leverage life quality of the disables under collaboration with the Prostheses Foundation of H.R.H. The Princess Mother which have been proceeded continually since 2011, whereby the IRPC has made a donation of POLIMAXX for the production of prostheses, and has supported our staff to join the Prostheses voluntary group for the disables since 2013. On the subject of conservation of local culture, in 2016, the Company held "IRPC - Celebrating the Legend of Mon at Phra Pradaeng" to continue the fine culture and tradition of the Mon community etc. IRPC observes the concept to build participation with stakeholders and brings the feedback to develop work performance regularly, in order to earn trust and confidence from the stakeholders for the sustainable future together.

For environmental aspect, IRPC is well aware of taking care of the environment, and therefore, set forth the target to use natural resource for the maximum benefit, as well as to prevent the impact to environment by deploying proper technologies, focusing on proactive environmental management, improve production process on regular basis, promote to use clean energy, applying the 3Rs (Reduce, Reuse and Recycle) in the management of water, air and solid waste. Our ongoing support to energy conservation projects comes to be a major factor in the management of reduction of greenhouse gas emission. IRPC sets target on all important environmental works, formulates management strategy for the most effective use of water resource. Total 15 factories of IRPC are certified as an Eco Factory, following the Eco-Industry Concept of the Industrial Environment Institution, the Federal of Thai Industries, indicating as our signature to in participation and promotion the eco-industry development at national level to be substantial. Furthermore, IRPC aims to have all of our factories to be eco-industry certified within year 2017.

The Company places an importance on growing and adhering to moral principles under the sufficient economy philosophy. This concept is communicated through the IRPC Code of Conduct. IRPC sees the importance of anti-corruption, whereby, we have published the Anti-Corruption Policy since 2013 and educate our personnel in order to create their awareness and to guide their practice. IRPC and



employees act together as a network that send forward the power of goodness to all society, starting from encouraging all of IRPC's trading partners to join the anti-corruption authority in order to build the transparency and confidence in doing business together. Year 2016 also marked the proud of IRPC when we received the NACC Integrity Awards - honorable from the Office of the National Anti-Corruption (NACC) among 10 companies in Thailand. This reward is deemed as the symbol of our moral, ethics and integrity, which reflect business direction where IRPC operates based on professional approach, transparency under the good governance, good corporate governance and social responsibility.



Year 2016 also recorded the commitment of IRPC in doing sustainable business when the Company was selected into Dow Jones Sustainability Indices, DJSI Emerging Market of year 2016, for 3 consecutive years. The Company was ranked the second in Oil & Gas Refining and Marketing Industry, and consequently was ranked 2017 Bronze Class Sustainability Award. The result was announced in the 2017 Sustainability Year Book, published by RobecoSAM, an investment specialist focused exclusively on Sustainability Investing. Moreover, IRPC was selected into FTSE4Good Emerging Index, rated by FTSE Russell - an index that reflects the company's capability to manage environmental, social and governance risks (ESG risks). The reward marks our progressive success in sustainable management.

Look into year 2017 where it will be another challenge for IRPC since there are going to be major shutdown/turnaround for all production units in the early of the year and the expansion of additional 300,000 tons of Polypropylene production capacity that is expected to be completed and start COD in 2017. All of these activities do have significant impacts to our financial bottom line, and although in the future, IRPC may have to encounter the business challenges caused by the fluctuation of economy and other risk factors, as well as other impacts that could occur. With our sustainable management system together with the capability of our human resource, IRPC will achieve the goal of being a leading integrated petrochemical complex in Asia by 2020. and will definitely be a driving factor of our national economy in years to come.

“Gearing towards challenges and insisting on sustainability with resolute belief that we can define our own future”

A handwritten signature in black ink, appearing to read 'S. Surabotsopon', written in a stylized, cursive script.

Sukrit Surabotsopon  
President

# About IRPC



IRPC has been doing business to serve Thai society for more than a decade with a strong commitment to build a growing company and creating shared value with all stakeholders in a sustainable way.







IRPC's main operation is currently based in an industrial zone in Rayong Province with facilities to support the businesses such as deep sea port, tank farm and power plant. The Company's main business are petroleum, petrochemical and other supporting businesses.

## Vision

Leading Integrated  
Petrochemical Complex in  
Asia by 2020

## Mission

Operational Excellence  
High Performance Organization  
Corporate Social Responsibility  
Value Creation  
Innovation & Creation of New Business

## Values



INDIVIDUAL  
OWNERSHIP

having entrepreneurial spirit or mindset



SYNERGY

working together to reach common  
goals



PERFORMANCE  
EXCELLENCE

setting challenging targets, work hard  
to achieve a better result by continuous  
development and improvement process



INNOVATION

increasing capability and skills to create  
innovation based on knowledge about  
products, services, operations and  
processes



RESPONSIBILITY  
FOR SOCIETY

growing with a sense of responsibility to  
society and the environment, committed to  
response all stakeholders' needs



INTEGRITY  
AND ETHICS

believing in working with honesty with  
transparent management and good  
governance



TRUST AND  
RESPECT

building trust and confidence among  
customers, employees, suppliers and every  
stakeholder



## Strategic Goals



### BIG

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

To strives for 5% annual revenue growth and 10% annual EBITDA growth to reflect the company's stable and constant growth.



### STRONG

1<sup>st</sup> Quartile **ROIC**  
in Petroleum &  
Petrochemical Industry

To become a top-quartile petrochemical company, IRPC pursues a return on invested capital (ROIC) goal of over 14% by 2020.



### LONG

Member of **DJSI**  
Emerging Markets  
Universe

To showcase its commitment to sustainable operation with balanced economic, social, and environmental aspects, IRPC listed as a member of Dow Jones Sustainability Indices (DJSI), Emerging Market, Oil & Gas Refining and Marketing Industry.





## Petroleum businesses

One of IRPC's main business is refinery business. Its oil refinery has a capacity of 215,000 barrels per day (b/d), the third largest in Thailand. IRPC can produce different petroleum products, such as naphtha, gasoline, diesel and LPG. Its Lube Base Oil Plant has a total capacity of 320,000 tons per year which is considered the highest in the country. whereas an asphalt plant's total capacity is 600,000 tons per year.



## Petrochemical businesses

IRPC's upstream petrochemical products include olefins (1,221,000 tons per year) and aromatics (367,000 tons per year), both serving as downstream petrochemical feedstocks which are polyolefins consist of HDPE and PP (615,000 tons per year), and styrenics consist of ABS, SAN, EPS, and PS (334,000 tons per year). Sold under the POLIMAXX brand to various domestic and international plastic operators.

IRPC's petrochemical business focuses on growth and keeping pace with change, developing the quality of life, striving for improvement of customer satisfaction, together with enhancing international competitiveness by inventing and creating innovative products like POLIMAXX Green ABS which is an attempt to replace synthesis rubber with natural rubber for the first time of the world, POLIMAXX Natural Color Plastic which is plastic pellets that uses natural color in production, and POLIMAXX Wood Plastic Composite made from natural wood powder from furniture or toys, etc. to blend into the production of plastics to promote cost-effective use of resources. IRPC also has TDAE (Treated Distillated Aromatic Extract) and RAE (Residue Aromatic Extract) which are materials for manufacturing car tires for the safety of the customers because it has less carcinogenic substance. Another products from IRPC are POLIMAXX which is used to make prosthesis legs for donation to the Prostheses Foundation of H.R.H the Princess Mother and lastly, POLIMAXX Natural Rubber Grafted Polystyrene, a styrenic mixed with natural rubber in order to increase impact-resistant and applicable for traffic cone.



## Other supporting businesses

IRPC fully supports facilities and utilities services as electricity, steam, potable water system, and wastewater treatment system to our industrial customers as well as to Electricity Generating Authority of Thailand (EGAT) that meet the industrial estate standard.

IRPC has deep sea port to provide local and international shipping service with modern facilities and infrastructure that meet international standard. IRPC port consists of 2 terminals:

- Bulk & Container Terminal (BCT) The terminal is 900 meters in length and 44 meters in width, consisting of 6 wharves with vessel handling capacity ranging from 800 to 150,000 tons. It serves bulk and general products handling such as steel, palm shells, coals, ores etc. This terminal handles approximately 2 million tons of product.
- Liquid & Chemical Terminal (LCT) The terminal is 1,623 meters in length, consisting of 6 wharves with vessel handling capacity ranging from 1,000 to 250,000 tons. It serves petrochemical products, liquid petroleum products, and gas products handling. This terminal handles approximately 15 million tons of product annually and serves more than 2,000 vessels per year.

IRPC has more than 300 tanks for liquid petroleum and petrochemical products with a storage capacity of 2.9 million tons, designed to accommodate IRPC's oil product distribution and the public alike. Five IRPC oil depots are found in Rayong, Phra Pradaeng, Ayutthaya, Chumphon and Mae Klong. Each depot features a jetty to accommodate cargo transfers for efficient operation and merchandise distribution to save costs and shorten transport time for customers.

IRPC has set up a unit to manage high-potential land in Rayong and other provinces with a total area of about 12,000 rai, with a goal to develop approximately 2,000 rai in Baan Kai District, Rayong Province into an industrial estates fully equipped with essential infrastructure and utilities system to accommodate target industries.

IRPC also houses IRPC Solutions Provider, designed to provide full support to investors in IRPC Industrial Zone with skills and professionalism. Services include plant and machinery maintenance, IT and internet system configuration, testing and laboratory analytical services, metrology center, warehouse services, trailer weighing services, training on safety required by law, and environmental consulting service.





Sales Revenue

THB **168,349** millions



Community Investment budget

THB **360** millions



Petroleum Business

THB **113,152** millions



Petrochemical Business

THB **52,115** millions



Other Business

THB **3,082** millions



Commercial Initiatives

THB **288** millions



Charitable Donation

THB **27** millions



Community Development

THB **45** millions



Sales for specialty products and eco-friendly products

increased to  
**42%** of the total



Number of employees:<sup>(1)</sup>

**5,418**



Male  
**4,482**

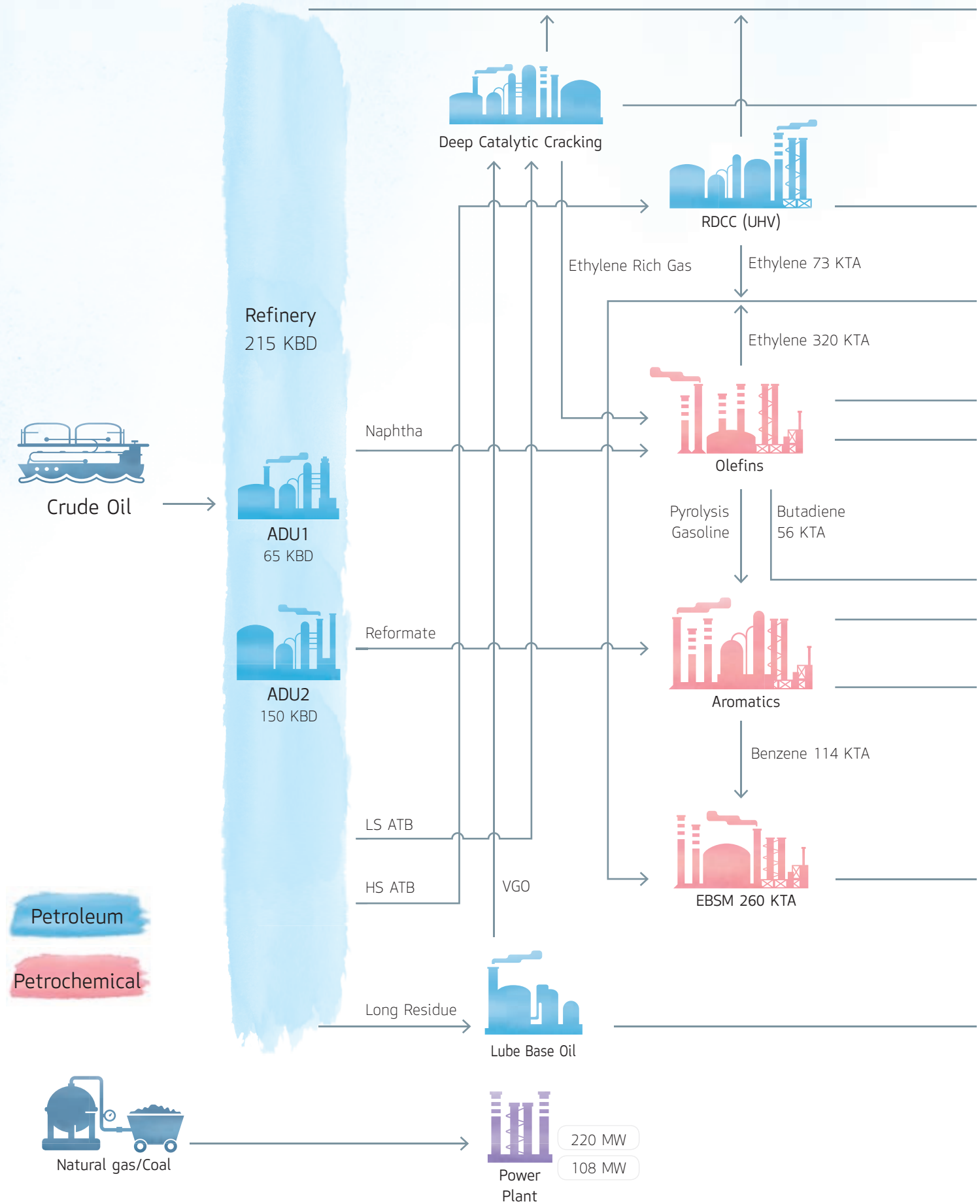


Female  
**936**

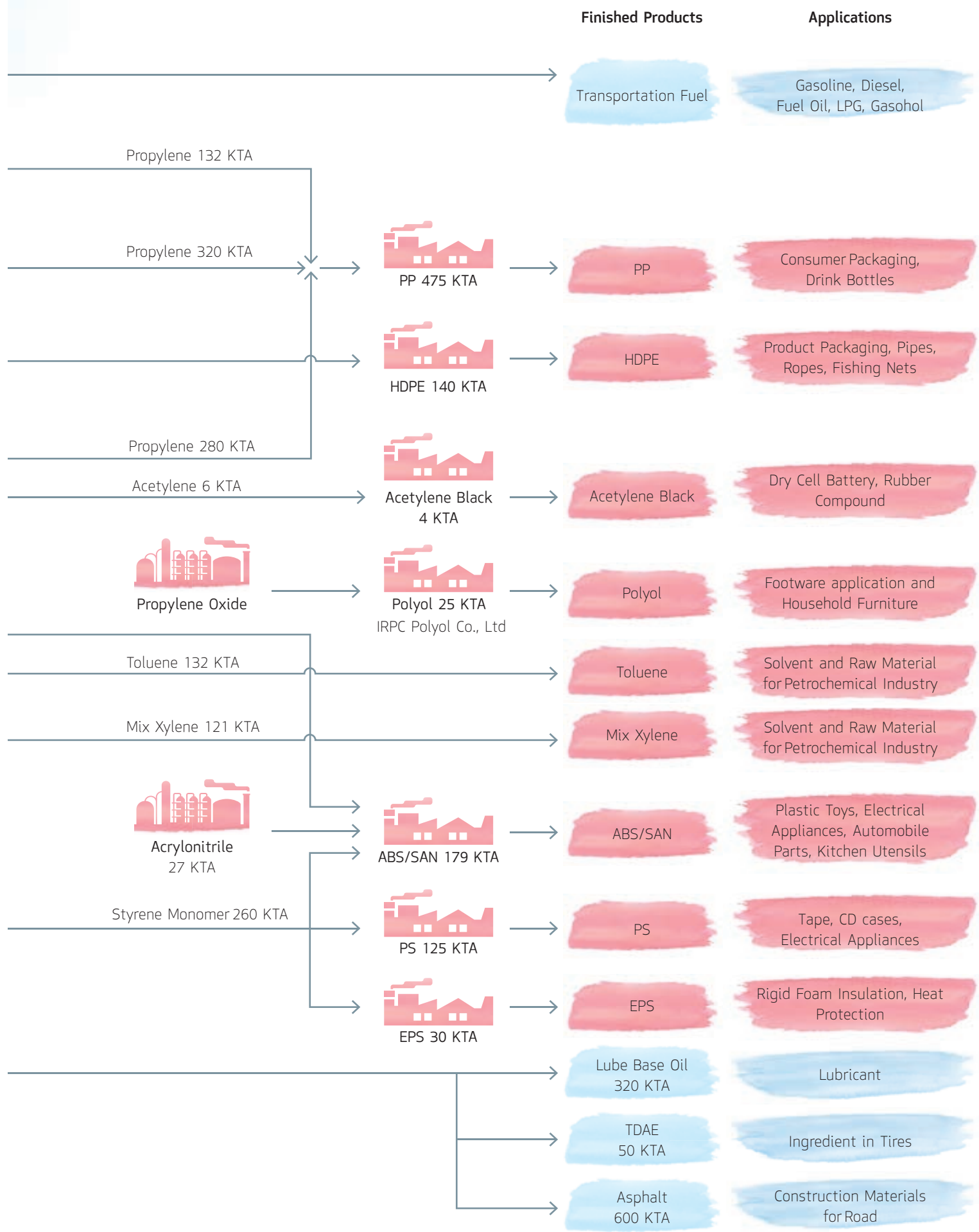
Remark: <sup>(1)</sup> IRPC employees only



# Integrated Refinery and Petrochemical Complex Flow Chart









# Business Strategy

As the current market become more competitive, the strategy that drives the company to be a leading integrated petrochemical complex in Asia by 2020 has become IRPC's priority. To realize this vision, the company puts effort to improve its people's and organization's capacity and focuses on business operation excellence in accordance with its principle of sustainable business. IRPC also aims to create balance between economic, social, and environmental areas by emphasizing on employee's safety and occupational health and minimizing negative impacts on societies, communities, and environment. Apart from these, the company also maintains its good governance, effective and systematic risk management, profitability, and trust among its stakeholders in the most sustainable way.

In 2016, IRPC benefited from the progress of its strategic projects as follows;

## EVEREST Project

In 2016, EVEREST Project give benefits worth of

# THB 2,300 millions

EVEREST Project is an important strategy to level up the organization's potential by adopting the best practices from world class experts and developing its organization and people with the aim of realizing the company's visions. The project was launched in October of 2015 to begin evaluating and finding a solution that could maximize the operational efficiency, improve production process and organization management to establish effective strategies and action plans. The project focuses on five areas including Operation, Commercial, Procurement, Corporate, and Organization Health. With the people management that has been improved in every dimension, its people are encouraged to drive self-development, appropriate mindset, core values, and corporate culture that motivate them to work in their full potential in a consistent way. Presently, more than 800 initiatives under EVEREST are being assessed for their potentiality to create added values worth THB 10,000 millions to the organization.

The purpose of EVEREST Project is to generate higher EBIT by THB 3,416 millions in 2016 from commercial operations. Yet, the project only generated EBIT of THB 2,311 millions, which was lower than originally targeted due to the reconsideration of major investment plan. However, it is expected that in 2017, the project will be able to fully generate EBIT as targeted.





## Business Operations



By implementing best practices to improve production efficiency and develop important data for each facility to control the operation conditions, IRPC's revenue increased by

**THB 225 millions**

Apart from these, the company also organized brainstorming activities for its employees and used their ideas to generate added value under the "Model Plant Project", which is part of the EVEREST Project.

The EVEREST Project expects to increase its EBIT to THB 6,765 millions in 2017 and maximize the EBIT to THB 10,500 millions in 2018. With this, the return on invested capital (ROIC) is expected to be higher than 14% and move to Top Quartile within 2020. To sustain this level of profitability,

the project has an aim to move its Organizational Health Index (OHI) to be in the first quartile at  $\geq 74\%$  as targeted. When the project is successfully complete, IRPC will be highly competitive in a long run.



*IRPC's president and executives joined the opening ceremony of EVEREST "Together We Can" on 29 April 2016 at IRPC Sport Complex, Rayong Province. During the ceremony, the company announced the goals of EVEREST Project to inspire and motivate the employees to put their most effort to drive the company's performance in a way that aligns with IRPC's strategies.*

## Upstream Project for Hygiene and Value Added Products (UHV)

UHV Project is expected to generate added value of

**THB 2,000-4,000  
millions per year**

The UHV Project had announced its commercial operating date in third quarter of 2016 with an aim to generate additional profits by converting low value heavy oil into high value products. With this, the company can maximize its refining capacity and increase propylene production by 320,000 tons per year. In addition, the UHV project can enhance stability and support growth of IRPC's petroleum business.



## Fully Integrated Polypropylene Project

Fully Integrated Polypropylene Project has an objective to improve and increase polypropylene production by 300,000 tons per year, from 475,000 tons per year to 775,000 tons per year. It consists of two sub-projects, Polypropylene Expansion (PPE), which increases the polypropylene pellet production capacity by 160,000 tons per year, and Polypropylene Compound and Specialties (PPC), which increases the production capacity of polypropylene compound and specialties by 140,000 tons per year.

The construction has started since May 2015 and seen more than 80% progress now. The construction is estimated to complete and begin commercial operation date by second quarter of 2017. It is expected that the project will generate added value of approximately THB 1,000-2,000 millions to IRPC and the project will increase IRPC's competitiveness and fulfil the client's future demands. In addition, it can strengthen petrochemical business and enable the company to become the number one of polypropylene pellet producers in Thailand.

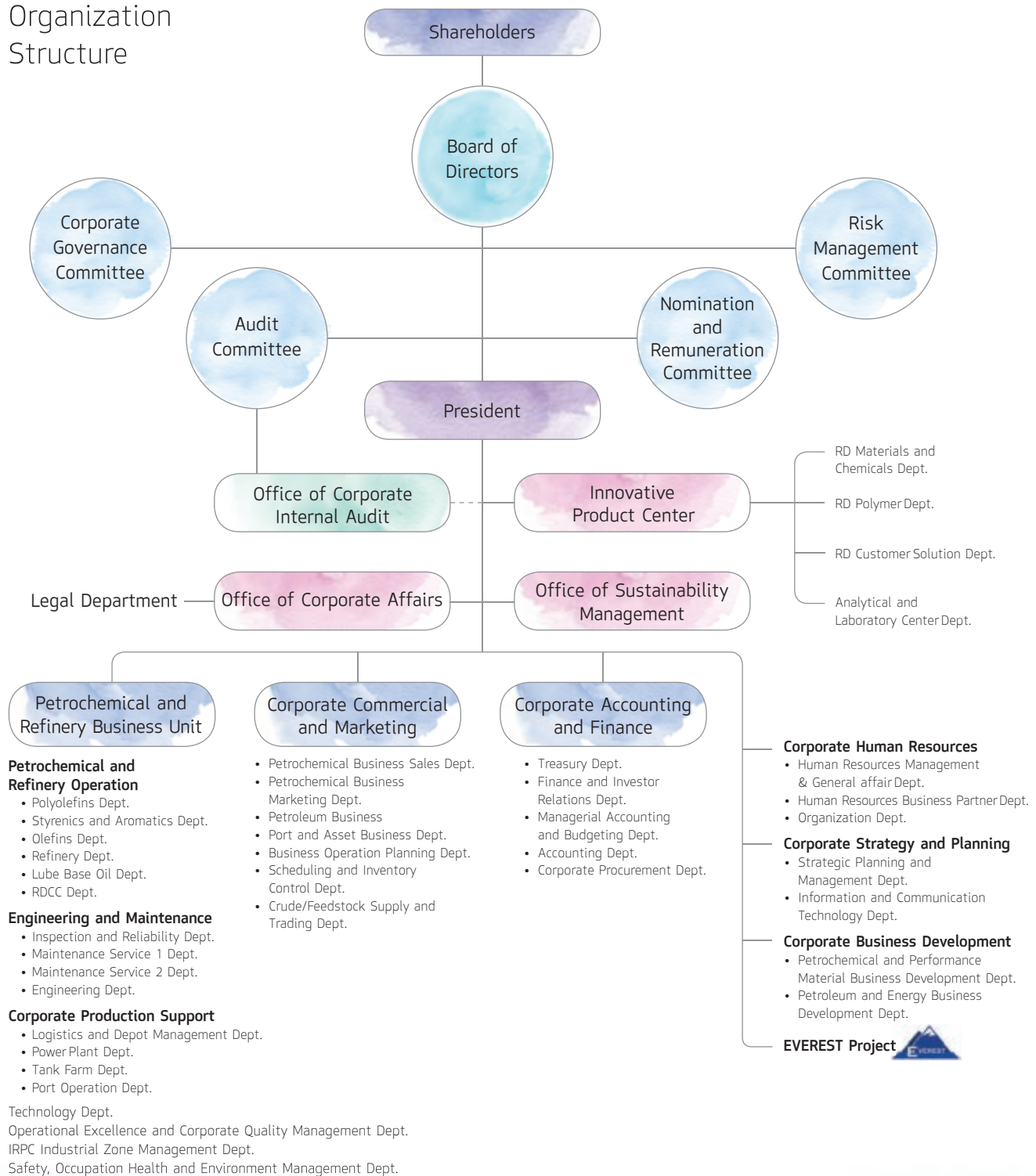




# Corporate Governance

IRPC strives for excellence in every area of our operation by keeping the balance between our business, community's interest and environmental protection based on corporate governance practice that will bolster the trust of stakeholders and add value to our business in order to achieve sustainable growth.

## Organization Structure



IRPC adheres to corporate governance practices, business ethics and corporate governance handbook that shall be signed and adhered to by all employees. Additionally, all employees are required to put into practice the company's six corporate governance principles, include Creation of Long-term value, Responsibility, Equitable Treatment, Accountability, Transparency and Ethics that will lay the foundation for corporate governance.

As of 2016, the Board of Directors consisted of 15 members: seven directors (one of which is an executive director (President)); eight independent directors with the chairman being a non-executive director. Board of Directors play an important role in directing the company's business in an effective and efficient way based on corporate governance practice as well as consideration of factors related to business, social responsibility, safety and environment protection. The Board consists of four sub-committees, namely the Audit Committee, the Nomination and Remuneration Committee, the Corporate Governance Committee, and the Risk Management Committee to take care of all important issues in the company with the president and the executive management being responsible for implementing the policy and principles determined by the Board to be of interests of the company and its stakeholders.

Performance assessment of the Board of Directors specified in the Corporate Governance handbook consists of: self-evaluation, performance evaluation of the Board of Directors, performance evaluation of the Sub Committees, performance evaluation of the Chairman and Individual Directors, and report the result to the Corporate Governance committee and shareholders. The Nomination and Remuneration Committee consider the compensation for the Board, recommend to the Board for approval, and propose to the annual general meeting for transparent approval based on Compensation Best Practices released by the Thai Institute of Directors Association. In 2015, IRPC included its assessment of the Board and sub-committees by independent assessment and intends to conduct it every three years, where the next assessment will be in 2018.

IRPC has also continuously provided reports to shareholders and investors for them to get complete and accurate disclosure of key information to make investing decision. To ensure the equitable treatment of all shareholders, IRPC gave the opportunity for shareholders to nominate directors 3 months before the end of the accounting year 2015. In 2016, IRPC's annual general meeting for shareholders were attended by all of the Board members, resulting in a full score of the quality of the annual general meeting of shareholders in 2016 assessed by Thai Investors Association. Moreover, IRPC was rated 4.64 on the 5 point scale (93%) in the shareholders satisfaction survey in 2016 which is higher than the 4.45 points (89%) in the 2015 survey. All of these performance indicators reflect our transparency in corporate governance for stakeholders' confidence and trust.

IRPC has arranged several activities to create an ethical culture and good business practice by strictly adhering to "integrity and ethics" which is one of our organization core values, i SPIRIT, for employees to adhere to and lead to an organizational culture.













IRPC CG DAY 2016: The Code To Victory is an activity with the aim to build ethical behavior among employees. Mr. Sukrit Surabotsopon, President of IRPC, has declared policy and guideline on how to conduct businesses with efficiency and transparency. In this event, Khun Khanitthanan Apihansakorn, an expert speaker from the Office of the Ombudsman Thailand, discussed about "Discretion and Ethics." The event also has a contest to find the idea on how to build ethical culture among employees with the theme "Shaping an Ethical Culture for Corporate Success." The objective of this activity is to share the view from representatives of the employees in different departments regarding principles of corporate governance and to raise employee's awareness on the importance and benefit of adhering to the business ethics principles specified in the Corporate governance Guideline by the Board. This activity drew attention from 1,398 employees to participate, which is 26% of the total number of our employees, higher than that of 20% original target. The event was broadcast live through Company's intranet for every employees to view and was also recorded for later viewing via Office of Corporate Affairs's website



IRPC has disclosed all details of the Boards such as role and responsibilities, selection and nomination process, performance evaluation and results, compensation for the

Boards and executives, as well as its corporate governance principles in its annual report and corporate governance handbook.

## Key Performance Indicators

		2014	2015	2016	Target 2016
Corporate governance assessment against the ASEAN CG Scorecard criteria (score)		 90	 92	 94	 92
Assessment according to the Corporate Governance Report (CGR) of Thai Listed Companies (score)		 5	 5	 5	 5





## Business Ethics



IRPC is committed to conducting business ethically and transparently as well as maintaining a balance of benefits among all of stakeholders because IRPC believes that business ethics will lead to trust that is essential for IRPC to reach its business goal.



IRPC is committed to corporate governance principles which are adopted internationally by following the principles set by United Nations Global Compact (UNGC) with a goal to conduct business in a manner consistent with the principles and respects and promotes the human rights principle. In 2016, IRPC was 1 of 15 leading organizations to meet and establish Global Compact Network Thailand Association (GCNT) with the drive to promote Thailand's business sector in understanding the importance of sustainable development which emphasize the areas of human rights, labor, the environment and anti-corruption in a national level and serves as a platform to the United Nations in carrying out various activities in accordance to 10 principles of United Nations Global Compact as well as to achieve 17 Sustainable Development Goals proposed by UN. IRPC also joined the workshop seminar titled "Moving toward Global Compact Network Thailand...with the Goal for Sustainable Development" in 2016 with the aim to join hands with representatives from every party to drive Thai businesses toward the future.





## NO GIFT POLICY

In 2016, IRPC announced its “No Gift Policy” and Anti-Bribery and Corruption Policy to express its commitment to transparency and anti-corruption effort.

All IRPC employees must sign their names in acknowledgment of the code of conduct and strictly comply with it. IRPC’s code of conduct covers issues of human rights, employee welfare, social responsibility, occupational health & safety, anti-corruption, compliance to laws and regulations, and treatment of all stakeholders. IRPC also encourages and promotes the compliance of code of conduct by arranging its employee to participate “PTT Group CG Day” organized by PTT Group every year. In 2016, PTT Group CG Day was organized under the “See Through the Future” theme to promote the implementation of corporate governance and to raise the standard of corporate governance within PTT Group with IRPC employees has met the target on joining this activity.

IRPC also disseminates the concept and provides training for its employees on corporate governance and business ethics via new employee orientation and periodic review via e-learning system and IRPC CG DAY.



*IRPC led by Mr. Sukrit Surabotsopon, President, together with PTT Group declared PTT Group to be a corporate with the highest level of good governance with emphasis on anti-corruption and broaden communication regarding corporate governance of PTT Group to partners outside of PTT Group and boost communication to other related anti-corruption organization.*

IRPC realizes the importance of ethics in business and has ethical business as one of the main issue in its corporate governance policy with definitions and how to apply in daily working life. The main aspect in business ethics are such as responsibility to shareholders, relationship with customers and public, relationship with suppliers, business competitors and creditors, responsibility to employees, responsibility to social and environment.

IRPC is committed to conducting business with integrity and transparency. For this reason, there was no activity at IRPC found to violate regulation of Stock Exchange of Thailand or any law related to business and environment.



IRPC strictly adheres to anti-corruption and bribery policy by designing the structure of organization that has well-defined authorization process with check and balance system as well as providing a guideline on how to handle and prevent frauds and conflict of interest within organization as well as a reporting system with appropriate procedures, reporting channels, and reporting management using an independence and fair investigation process with a measure to protect confidentiality and privacy of whistleblowers and involved witnesses by focusing on collecting facts.

The Audit Committee is responsible for monitoring of business operations to ensure its internal control system, internal audit and effective and efficient risk management system in place as well as its compliance with the relevance laws and regulations. IRPC has been working on the anti-corruption policy by having independence audit committee to conduct careful and cautious investigation under the scope and authority set by the Boards to ensure its compliance with the guidance from Stock Exchange of Thailand, Code of conduct, and international practices.

IRPC provides a notification and complaint channels for internal and external whistleblowers to notify clues and evidence on illegal and unethical conducts via phone, mail/email and P.O. Box 35 with protection measures of the whistleblowers and involved witnesses as well as a transparent and fair process of investigation and remedy. In 2016, IRPC received 39 complaints, 37 of which were related to noncompliance of and unethical conduct and 2 were feedbacks. IRPC finally concluded 32 cases, and the other 7 complaints are during investigation process. Among those, 21 of which had no sufficient evidence or fact for investigation, 13 were related to non-compliance to the Company's working rules, and 5 were misconduct. As a consequence, disciplinary action was taken fairly and transparently against each violation case, however, there was no complaint found related to anti-corruption policy or fraudulent and no significant damage found. The cases were assigned to Internal Audit and relevant business units for verification and the reports were made to the Audit Committee and the Board as well as the related party in a sequence specified in Complaint Management Procedure.

## Notification and complaint channels to report unethical conducts

**By phone:** 02 649 7000

**By website:** [http://www.irpc.co.th/th/cg\\_contact.php](http://www.irpc.co.th/th/cg_contact.php)

**By mail:** Audit Committee Chairman, IRPC Public Company Limited  
555/2 Energy Complex, Building B, 6th Floor, Vibhavadi-Rangsit  
Road, Chatuchak, Chatuchak, Bangkok 10900

**By email:** [auditor@irpc.co.th](mailto:auditor@irpc.co.th)

**By mailbox:** P.O. Box 35, Sun Tower, Bangkok 10900



With its commitment to corporate governance and anti-corruption effort, IRPC has joined the Collective Action of the Private Sector Against Corruption (CAC) since 2014. Suppliers of IRPC and PTT Group were also encouraged to join CAC to ensure transparency and trust in doing business. This is IRPC's effort to raise its corporate governance standard to be at the same level with those in PTT Group and to encourage every employee in PTT Group to form a network and convey the force of goodness to all sectors in the Thai society.

In addition, IRPC provided training about anti-corruption to 3,620 of its employees, which is 67% of the total number of employees. IRPC also arranged a seminar on the topic "IRPC Anti-Corruption Network" in a campaign against all forms of corruption following the guidelines of Thailand's Private Sector Collective Action Coalition Against Corruption (CAC).

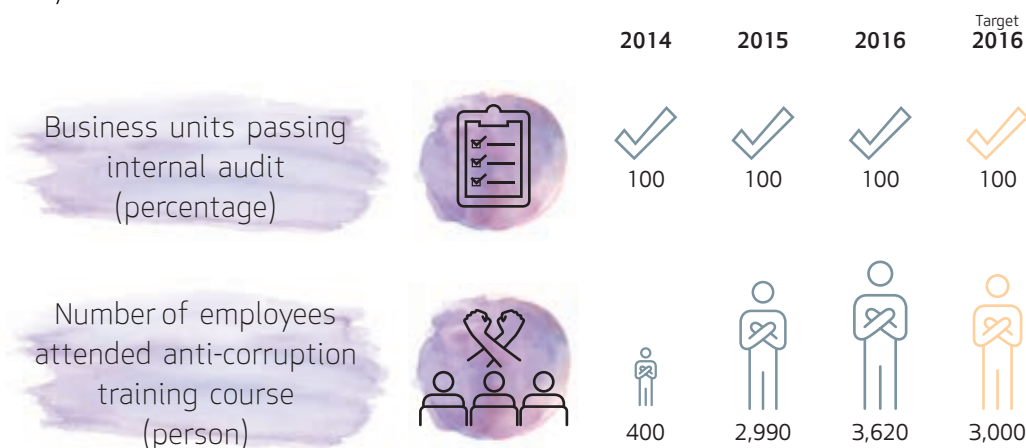


IRPC joined forces on Anti-Corruption Day 2016 which reinforces IRPC's business practices base on professionalism and transparency under corporate governance and social responsibility. The Anti-Corruption Day 2016 was organized by The Anti-Corruption Organization of Thailand (ACT) together with partners under the theme "Retribution on Corruption" whereby more than 500 executives and staffs from the PTT Group took part in the event to pledge in the combat against corruption at Sanam Luang on September 11, 2016.

In addition to assessment of internal and external risks, impact analysis, management of risks to an acceptable level, and the appointment of an audit committee, in 2016 IRPC also established a Compliance unit within the Company Secretary and Corporate Governance under the Office of Corporate Affairs to ensure compliance with regulations and rules. Employees of all level are required to report of any conflict of interest that may arise in executing their job duties via Company's intranet system to cultivate awareness of operating transparently. IRPC also has an audit execution in line with the plan created from the result of risk assessment,

environment of business and feedback from executives. This systematic internal audit helps detect the area with weakness and allows a timely remedy as well as reduces chance of corruption and fraudulent. In 2016, the Office of Internal Audit defined the audit task to prevent corruption and put it in IRPC's audit plans for 2016 along with other audit tasks. The 4 units successfully implemented the plan and formed the internal control policy officially announced last year.

## Key Performance Indicators



## Human Rights

IRPC promotes the human rights principle among its employees without discrimination against race, religion, gender, age, education, and status as well as honors the individual's right and protects personal information.

IRPC also took part in the development of Human Rights Management System (HRMS) for use in different businesses of PTT Group by applying necessary guiding principles on human rights which cover every activities that may violate human rights with the purpose of risk assessment and risk mitigation planning for issued related to human rights as well as tracking, monitoring, and reporting of the outcome.

The system also defines management structure of role and responsibility of each unit that are responsible for human rights management.

In order to align its operation with other companies in PTT Group and to make the impacts analysis and risks assessment on human rights aspect to meet international standard, IRPC has reviewed and improved its operation by hiring a consulting company to design a new Human Rights Risk and Impact Assessment Methodology which is expected to finish by 2017. Such methodology serves as a criteria for evaluation of human rights work at IRPC to make the management of quality, occupational health & safety, environment, social responsibility, and supplier screening process to comply with local and international laws and standards.



# Risk and Crisis Management

IRPC focuses on systemizing its risk management to line up with international best practices with the goal to mitigate the risk to an acceptable level, leading to efficient performance in pursuit of the organizational goals or minimize the impact or likelihood of the risk to business and also add value to stakeholders.



The Board appointed the Risk Management Committee (RMC), consisting of 4 Board members with responsibilities to form and define policy and framework for risk management, provide recommendation, monitor and support operations relating to organization risk management to align with strategies and goals in any situations, as well as screening high value projects that will gain the trust and confidence of all stakeholders. To this end, IRPC applied the ISO 31000:2009 risk management principles and guideline and Operational Excellence Management System (OEMS) management framework to its operation. IRPC also introduced Business Continuity Management System (BCMS) the latest internationally accepted standard ISO 22301:2012, to protect business from threats by

taking into account factors related to economy, society and environment and develop measures to prevent and mitigate impact effectively and efficiently.

IRPC also appointed a Risk Management Steering Committee (RMSC) chaired by the President with executives working as committees. The Risk Management Steering Committee is responsible for administering and developing of risk management process, monitoring and evaluation of risk management operation and report to Risk Management Committee and Board of Directors every quarter and to Audit Committee twice a year to review risk management plans and follow-up risk management performance.



In 2016, IRPC developed Risk Management Manual and Enterprise Risk Management Program to assist all employees in accessing Risk Management System. The program provides a link to Key Performance Indicator (KPI) which enhances the whole process of risk identification and assessment, risk management implementation, tracking and monitoring, as well as improving risk management system. Moreover, this program also assists preparation and publication of information and knowledge via Intranet for all employees to learn and be aware of the importance of risk management. In 2017, Risk Management will be implemented in core operations units first, and will be expanded to be executed in non-core operations units later within 2019.

IRPC also places importance on creating a Risk Culture because Risk Management is what all level of employees, starting from the Board, executives to every employee, has to pay attention to and take it seriously and continuously to make it a corporate culture for risk management to be effective and efficient. Risk Culture also allows IRPC to acquire opportunity to add value to its business and allows change and adaptation to be done on the process to make it fit with the situation and helps IRPC to meet its goal. In 2016, IRPC arranged a training course about building awareness on risk management for its employees. It also arranged a training course and workshop for risk management experts from different departments to be able to transfer knowledge and give advice to related employees and internal team. And finally, IRPC also provided management, monitoring and review mechanism on the performance of corporate risk management on a monthly or quarterly basis.

Regarding the management of strategic and business risk, IRPC has defined risk management plans and implemented the existing strategic plans such as EVEREST Project and UHV Project. IRPC also appointed a Financial and Supply Chain Risk Management Committee to manage risks related to price and financial aspects by using financial instruments and derivatives such as oil futures, foreign exchange futures etc. Nevertheless, all of these activities must be align with the policy and framework approved by the Boards.

Amid the raising concerns and awareness about climate change and global warming, IRPC has been promoting environmentally friendly products and manufacturing processes by taking into consideration the impact of the whole product life cycle with the aim to reduce air pollutions and greenhouse gas emissions,

improve energy efficiency, and improve management of resources, especially water which is one of the most important resource to the world. It is also the fact that IRPC's facility is located in the area with potential water scarcity risk. Therefore, it is important for IRPC to promote effective water management by having annual risk assessment on water management and having preventive and control measures against the impact of water shortage on communities and the company's operations. IRPC also gives priority to reduction of VOCs emission and waste generation of its existing plants and the developing projects.

Regarding the social aspect, IRPC recognizes the importance of risk management of communities around its current facilities and the future projects to create coexistence between the company and communities in a sustainable way and reduce conflicts that may lead to complaints, disputes, and litigation. IRPC is also aware of the importance of community risk management, therefore it has implemented a risk management plan to prevent problems that may arise, such as dredging of ditches and canals to prevent flooding, digging reservoirs to keep water for drought season, utilizing company's land for the benefits of community, implementing a complaint system which help accelerate the process etc. Regarding the Customer Relationship Management, IRPC has implemented a customer satisfaction survey and complaint management system to continuously improve the quality of its products and services to meet customer's requirements as well as to promote and support CSR activities and enhance corporate image.





At the same time, IRPC also recognizes the importance of corruption risk assessment having joined the Collective Action of the Private Sector Against Corruption (CAC) which is initiated by Thai Institute of Directors Association (Thai IOD), together with Thai Chamber of Commerce (TCC), Joint Foreign Chambers of Commerce (JFCCT), Listed Companies Association, Thai Bankers' Association, Federation of Thai Capital Market Organizations, and Federation of Thai Industries. Companies joining CAC will follow framework and procedures under the UN Global Compact 10<sup>th</sup> Principle Against Corruption (Business Principles for Countering Bribery) recommended by Transparency International.

IRPC also has a tax policy in place in order to demonstrate its commitment to strictly comply with the law and ethical code regarding business taxes which helps IRPC to reduce risks relating to non-compliance with laws and regulations and to maintain maximum benefits for stakeholders as well as maintain IRPC's reputation and image.

IRPC is aware of Emerging Risks which often threaten business, therefore it foresees the importance of Emerging Risk Assessment to identify risks that may arise in the next 3-5 years which will result in opportunity loss for the

company if it is not appropriately managed. For this reason, IRPC has implemented assessment of the emerging risks such as risk from the changing free trade areas and trade rules.

- IRPC has assigned a responsible team to monitor and analyze the situations to find possibility of new free trade areas and new trade rules that may emerge in the future. In addition, the company's staffs have been jointly developing new products that meet the new rules and the trends which are constantly changing such as environment-friendly and energy-saving products.
- IRPC is also aware of risk of shortage of natural gas in the Gulf of Thailand which may affect production units that rely on natural gas such as Combined Heat and Power Plant (CHP). For this reason, IRPC has collaborated with PTT Group to plan for the allocation of natural gas as well as to plan for importing of natural gas from oversea in the event of natural gas shortage. Such plans may cause a higher operation cost for IRPC, therefore a team was assigned to study and find a solution on how to reduce the impact.



## Sustainability at IRPC

In order to become a leading integrated petrochemical complex in Asia by 2020, it is IRPC's philosophy of striking a balance among its economy, society and environment as well as creating of innovation of products, services and production process by utilizing our employees' skills and competences to build know-how and proprietary technologies that can drive the company and society to the modern world of the future. In addition, IRPC has continuously implemented several environmental and social projects to support sustainable growth in tandem with society and to create environment that business and society can co-exist in peace as well as to earn trust from the surrounding communities.

MEMBER OF  
**Dow Jones**  
**Sustainability Indices**  
In Collaboration with RobecoSAM



In 2016, IRPC was listed as a member of Dow Jones Sustainability Indices (DJSI) of Oil & Gas Refining and Marketing Industry in the Emerging market for 3 years in a row.





IRPC has established the Office of Sustainability Management since the end of 2014 with responsibility to manage corporate sustainability strategy which covers economy, society, environment and corporate governance. In 2015, IRPC also appointed the Sustainability Committee to set sustainability policies and strategies to screen business work plans and support sustainability operations to conform to the policies and strategies. It also formed IRPC's sustainability management policy to handle all issues challenging sustainable growth and to add value in the long term to all stakeholders.

IRPC has a climate of understanding and trust among its stakeholders and shareholders both in Thailand and oversea through presentation of business target and performance that keeps balance between economy, society and environment in the long run. In 2016, IRPC adopted the Sustainability Reporting Guidelines by Global Reporting Initiative, version 4 (GRI G4): Oil and Gas Sector Disclosure, so that its sustainability reporting will meet international standards with the content of the report prepared in accordance with the core option of the Guidelines. IRPC won the Sustainability Report Award 2016 (Outstanding),

named by a cooperative project of CSR Club, Thai Listed Companies Association, SEC, and Thaipat Institute for a forth consecutive year. This award is presented to the companies listed in the Stock Exchange of Thailand to promote social responsibility and environmental stewardship with corporate governance that will benefit the Thai capital market as a whole. Additionally, IRPC was granted 2016 SET Sustainability Awards at Excellence Level from Stock Exchange of Thailand reflecting the outstanding of IRPC's sustainable business management.

IRPC has promoted and encouraged production for economic, social and environmental balance by ensuring that each plant conform a good ecological management system under the Eco Factory concept of the Industrial Environmental Institute, Federation of Thai Industries, to serve as a foundation for developing into an Eco Industrial Zone in line with the scope of eco-industrial development of the Department of Industrial Works (DIW).



In 2016, IRPC had additional 11 plants granting Eco Factory certificates, namely Condensate Residue Plant, Deep Catalytic Cracking Plant, High Density Polyethylene Plant, Propylene Plant, Acetylene Black Plant, Compounding Plant, Polypropylene Plant, Water Supply Plant, Polystyrene Plant, Benzene Toluene and Xylene Plant, and Polyol Plant. Combining these with the certificates previously granted, IRPC has now 15 plants



certified as an Eco Factory with the goal to have all plants achieve such certification by 2017.



Environmental and social awareness among employees are the key to corporate sustainability, therefore IRPC strives to build a sustainability culture among its employees. In 2016, the Office of Sustainability Management communicated the subject of sustainable development with IRPC's executives and target employees from different departments to integrate sustainability management principles into its operation and make a concrete result through workshop and company visit

to share the idea which can be applied in its operations. The Office of Sustainability Management also developed a Sustainability Management training course in the form of E-learning to communicate and raise awareness around sustainability among all employees with a goal for cultivating recognition among all employees by 2020.

The Office of Sustainability Management arranged two workshops with the topic of "Sustainability for Executive Workshop" for Vice Presidents and above. The workshop had a guest speaker from Sasin Graduate Institute of Business Administration of Chulalongkorn University with the aim to build understanding of the importance of sustainability on IRPC business as well as to develop effective and efficient strategy that meet the expectation from every stakeholder.





# Occupational Health and Safety



IRPC fully understands the importance of Quality, Security, Safety, Occupational Health and Environment management (QSSHE) as well as energy management, therefore it promotes safety in every aspect, including personal safety, process safety and transportation safety. This effort is achieved by the use of high safety standard to reach the goal of being a safety workplace with zero-accident and strong safety culture among its employees and suppliers.

## Personal Safety



### Zero fatality for employee and contractor

in 2016

IRPC is committed to promoting a strong safety culture among its employees and contractors with a goal of Zero Accident and Zero Emergency Case. No fatal accident was suffered by employee and contractor in 2016.

All accidents in 2016 were analyzed and found that the main cause of accidents was related to violation of safety regulations, therefore IRPC has introduced preventive measures to raise safety awareness and to build safety culture through several Occupational Health and Safety projects, such as GOAL ZERO Project, Safety Excellence Project and Safety Network and Sharing Project, etc.

**GOAL ZERO Project** has the objective to build awareness among the employees in every area to adhere to safety principles with the following guideline:

- Always wear and use appropriate personal protective equipment and clothing before start working.
- Always follow the instruction or manual in every work performed.
- Work with cautiousness, do not rush or skip any safety procedure.
- Perform risk assessment or evaluation to find the risk associated with each task before starting.
- Tools, equipment and machines must be maintained in good condition and ready for use all the time.
- Perform work with consciousness and carefulness.



### Occupational Health and Safety Training Project

This is an on-going project with the aim to review safety knowledge and raise safety awareness among employees by providing training courses self learning via E-learning course and on On The Job Training program. One of the two main courses which are popular among employees was "Building Safety Awareness", with 1,056 employees attending this course, exceeding the target at 960 employees in 2016. Another popular course was "Ergonomics" which attended by 87.86% of the target number of employees. Other courses included "Occupational Lung Diseases", "Chemical Hazards" and "Workplace Noise Hazards" attended by 88.23%, 97.50% and 91.65% of employees with high risk of exposure respectively.

### Process Safety Management (PSM) Training Project

This training course was conducted by instructors from the Engineering Institute of Thailand under H.M. The King's Patronage (EIT) and Thai Institute of Chemical Engineering and Applied Chemistry (TICChE) to increase capability of employees to work as a knowledgeable PSM Internal Auditor to ensure the safety in production process and to apply concept and approaches in the auditing process to use in safety management in their unit as specified in the policy. In 2016, 76 employees have been trained in the PSM Internal Auditor training course.

**Safety Excellence Project** This Safety Awareness project is on top of the existing Behavior-Based Safety (BBS) Project, designed with the purpose to raise safety awareness among employees as well as to promote safety leadership and team building.

**Safety Network and Sharing Project** This project from PTT Group is for employees in each company in the group to be able to share knowledge about safety working and best practices to improve safety management such as accident prevention and safety measures, effective maintenance of tools and equipment, etc.

#### **Incident Database Management System or IdMS – Phase II**

This project combines the E-Unsafe Tracking Report project with Lessoned Learn from Incident (LLFI) project with the capability to analyze every type of incident and store in database using Root Cause Analysis approach. This system helps prevent repeat incidents in the future.

**Safety Report Guideline** IRPC's Propylene Plant is 1 of the 6 plants adopting "Safety Report Guideline" defined by the Department of Industrial Works (DIW) to use as a guideline for Plant Manager to report issues related to safety management and to prevent serious accidents in the plant according to the principle of Serious Incident Prevention for High Risk Industries as well as supporting the development of Safety Management System to prevent and control of serious incidents. IRPC is during trial of using this manual issued by DIW in 2016 with its Propylene Plant.

**“Good Health Starts Here” Project** In addition to its commitment on the safety issues, IRPC also foresees the importance of healthy lifestyles promoting among employees. For this reason, IRPC has started “Good Health Starts Here” project to help IRPC’s employees in different health issues, such as employees whose Body Mass Index (BMI) higher than the standard, by providing employees with information about dietary, providing free healthy lunches

such as organic vegetables and chili pastes, providing healthy snack in the meetings such as fruit, herbal juice etc. as well as providing facilities and exercise equipment for employees.

## Key Performance Indicators





## Safe Logistics

### Zero accident with lost time

in logistics in 2016

IRPC focuses on the quality improvement and safe logistics by raising awareness on safe driving among its contractors. In 2016, IRPC developed the Smart Driver (Logistics) project to encourage its contracted drivers for plastic pallets delivery to be aware of safety by providing training on safe driving, drug monitoring on every drivers and specifying qualifications of Smart Driver, i.e., having service mind and safety awareness, wearing proper dresses, communicate in a positive way with others. IRPC presented the Smart Driver Award 2016 to its drivers who have safe driving habits and never been complained from customers.

With IRPC's commitment in promoting of safe driving among employees and all related people, the accidents related to logistics in 2016 was at 0.07 case per million kilometers which is lower than the previous year and meet the target at 0.20 case per million kilometers.

## Key Performance Indicators

Accidents related to  
logistics  
(case per million kilometers)



2014



2015



2016



Target  
2016





## Process Safety and Reliable Production

IRPC realizes that an accident or a serious incident in the process may result in a damage to life, property and environment, and more likely to affect its stakeholders such as employees, contractors and communities around IRPC Industrial Zone. For this reason, IRPC has a strict safety management system with preventive measures for accidents or serious incidents from the process, such as oil or chemical leaks, fires, etc. for the safety of all stakeholders and business continuity. In this regard IRPC has the OEMS and the Process Safety Management (PSM) in place and has a risk assessment on safety issue for each plant every year according to TIS/OHSAS 18001 and every five year by law or whenever there are changes in process. In addition, IRPC also worked with PTT Group to develop PSM guideline that comply with international standard.

IRPC continuously conducts operations in line with the safety management policy. In 2016, Safety Critical Equipment criteria was introduced to prioritize the urgency of maintenance orders, especially for safety related machines and equipment, for example, human exposure protection equipment or emergency pressure release equipment, etc. These equipment are scheduled to a Time Base Preventive Maintenance and any malfunctioning machines or equipment must be given First Priority for Corrective Maintenance. With this proper

scheduling, it allows the maintenance unit to plan and manage the maintenance orders in a more efficient manner as well as being able to maintain good working conditions for those machines and equipment in order to reduce the possibility of unplanned shutdown, which is regularly caused by machine and equipment damages. As a result of this, IRPC was able to reduce unplanned shutdown by 75% compared to 2015, and at the same time, reducing more than THB 800 in losses.

Concurrently, IRPC has been continuously improving its employees competency in the process safety aspect by providing training for process control staffs to learn the operation procedures, components and maintenance of equipment and machines as described in Total Productive Maintenance and Management (TPM) concept where operators are involved in maintaining their own equipment to create a feeling of 'ownership' on the shop floor and to educate process control staffs. In 2016, IRPC provided Process Safety Management (PSM) training courses for every production unit.

Additionally, IRPC has established IRPC's fire and rescue center. In 2016, IRPC has conducted practical drills for the communities' prevention and mitigation committee and practiced emergency drill with Rayong Hospital as well as provided trainings and exercised fire evacuation drill with teachers and primary students from schools around IRPC Industrial Zone, which are Baan Don school, Wat Pruekket school, Matthayomtaksin Rayong School, Na Ta Kwan school, and Baan Nong Chok school, through "Be conscious to accident for Primary school" program.

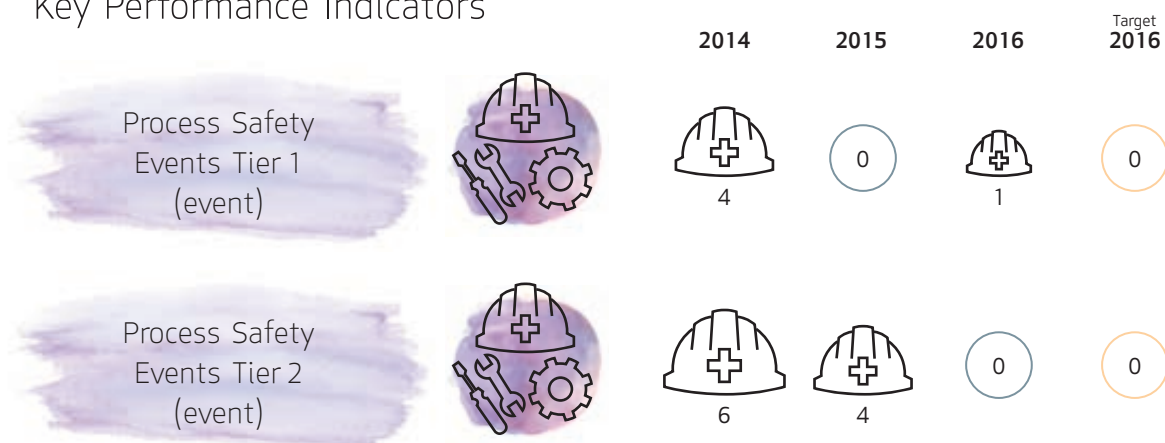


IRPC participated in the “Best Practice Sharing Award” in “PTT Group Operational Excellence Award” which presented to the companies in PTT Group that have outstanding performance towards the operational excellence, distinctive development of knowledge sharing culture and be able to adopt the knowledge to improve work efficiency and benefit values to the company. In 2016, IRPC received “Zero Unplanned Shutdown Award” for its 10 plants, namely Condensate Residue Plant, Refinery, Deep Catalytic Cracking Plant, High Density Polyethylene Plant, Polypropylene Plant, Benzene Toluene and Xylene Plant, Lube Base Oil Plant, Power Plant, Combined Heat Power Plant, and Polyol Plant.

**This resulted in 70% decrease of unplanned shutdown compared to 2015 and more than THB 782 millions decrease of Opportunity Loss.**

IRPC also received a Gold Award in Best Practice Contest Award for its “Athena” project which is a software development project to increase profitability from product sales and “Silver Award” for “Increasing Capacity at Condensate Residue Plant” project with the objective of increasing the capacity of the Refinery.

## Key Performance Indicators







## No Significant oil spill in 2016

IRPC has a strictly controlled oil and chemical spill management to prevent and reduce any possible impact to the environment and communities and build trust towards IRPC's operations by conducting oil and chemical spill plan for both on and off shore, evacuation plan, and prevention

and mitigation plan for communities, provincial and local governmental agencies as well as arranging practical drills with related agencies in Rayong on an annual basis. In 2016, there was no oil and chemical spill case.

### Key Performance Indicators

			2014	2015	2016	Target 2016
Significant spill (> 100 Barrels or 15.9 M <sup>3</sup> )		(case)	0	0	0	0
		(cubic meter)	0	0	0	0
Insignificant spill (> 1 Barrel or 0.159 M <sup>3</sup> )		(case)	3	2	0	0
		(cubic meter)	8.5	3.0	0.0	0.0





# Human Capital Resources



Employees are behind the success of IRPC and also the main driven force that lead the organization to reach its goal and its vision. For this reason, IRPC places the importance of employee recruitment and retention strategies the first priority. It also improves career development and career path for its employees along with the building of employees engagement to achieve sustainable growth.



## Human Capital Development

IRPC aims to develop employee potential at all level and all functions to improve capability of its human resource to get ready for the challenge that come with opportunity for business growth.

In 2016, IRPC carried on its mission which started in 2015 to restructure its organization to be in line with business strategy by improving Job Description and Functional Description to make it clearer and reduce overlapping of functions and increase efficiency in the company's recruitment process. It also defined a new Technical Competency Criteria and established a unit to improve technical competence of the employees in the production line to meet the Company's requirements.

IRPC defines standard leadership roles by best practice that can be used by employees as a behavioral guideline for a leader as expected by the Company. It also has activities to build leadership among its leaders via executive development program, executives coaching by world class consultant, and training courses in LEAD program which is a part of the EVEREST project. The training courses were in the form of on-line session and workshops, covering the topics of Problem Solving, Team Management and Effective Impact Communication. These courses resulting in systematically collaboration among teamwork as well as to promote employees capability in order to support EVEREST Project and to build corporate sustainability.

Moreover, IRPC also worked with PTT Group to arrange leadership training courses such as Advanced Management Program (AMP1-3) and Leadership Development Program (LDP1-3) and had its 14 executives with excellence performance to join the PTT Group Leadership Development Program in 2016 with the aim for its executives to meet competency requirements for effective job performance. IRPC also performed assessment of knowledge and competence of its employees to determine suitability to their job and responsibility and the result from the assessment was used to develop an Individual Development Plan for each employee.

IRPC foresees the importance of succession planning which is critical for its business to be successfully continue without interruption. Therefore, IRPC performed job analysis on senior management positions which will be vacant in the next 5 years and defined a succession plan for the new managers to have skills and knowledge that are sufficient for their positions without any interruption.

In 2016, employees were able to apply what they learned from the training courses to create a concrete result for the benefit of the Company with the total value of

**THB 687 millions**

using the training budget of

**THB 75 millions**

IRPC continued its Middle Management Leadership Program (MLDP) for the 7 consecutive years. The objective of this project is to ensure that its middle managers understand their roles relating to the management and potential development of their subordinates to work efficiently and effectively. Participants in this project will have a chance to improve their work process, management skill, and innovative thinking in business via education, learning, field trip, and experience exchanging. In 2016, senior officers could also participate in this project with 72 employees this year, and the total of 440 employees have been participated in this project since the beginning with the total training budget of THB 5.34 millions and increased revenue of THB 14.93 millions per year from cost reduction and value added.

Average training hours  
for each employee

**32.67**

hours per year





**Khun Kanjana Damduan**

Technical Support Manager, Technical Support and Product Development Division,  
Sales Department of Petrochemical Business

What the employees achieved from MLDP Project is a learning about management, leadership development and visiting to leading organizations as well as participating in the training on Development of Mind and Wisdom for employees organized by the Young Buddhists Association of Thailand. This training course allowed the participants to open their minds, listen to feedback and share information with others to reach the common goal. It also opened the opportunity for everybody in the team to demonstrate their ability and utilize each one's strongest point to the task assigned. I and my colleagues in the team worked together in the project to develop General Purposed Polystyrene (GPPS) High Performance which is a new type of plastic pellets that have a lower cost of production and could generate more than THB 6.1 millions per year return to the company.

Integrated learning development in chemical engineering project (I-ChEPs Project) for employees in the production line. The fifth batch of training in 2016, there were 21 employees participated in this project. The participants will learn the theory of Chemical Engineering and how to apply it in their work. The Company spent THB 8.1 millions in the budget for this training, and got the return of

THB 164.73 millions from cost saving and revenue generation from the activities such as increasing efficiency of steam in the production of ethylbenzene products which can reduce the production cost by THB 1.14 million per year, and the increasing of the efficiency of energy utilization by reduce the temperature of water from Feed Preheater Boiler which can save the energy and reduce the cost by THB 1.75 million per year, etc.



**Khun Itthipong Veevarakul**

Boardman, Cold 2 Section, Ethylene Division, Olefins Department

The I-ChEPs Project provides the basic knowledge about the career and Chemical Engineering for IRPC's employees to be able to analyze, create a plan and develop an integrated work plan that build a concrete result and solve the real problem in my work.

I and my colleagues in the team implemented a project to increase efficiency of Low Pressure Steam utilization in the Depentanizer in our Ethylene Plant which can reduce the energy utilization and reduce our cost by THB 531,000 per year.

## Key Performance Indicators

Average training hours  
for each employee  
(hour per year)



2014



30.46

2015



32.30

2016



32.67

Target  
2016



33.00





## Talent Attraction and Retention

Organizational Health Index (OHI) rose to 70% in 2016

**which is higher than 2015**



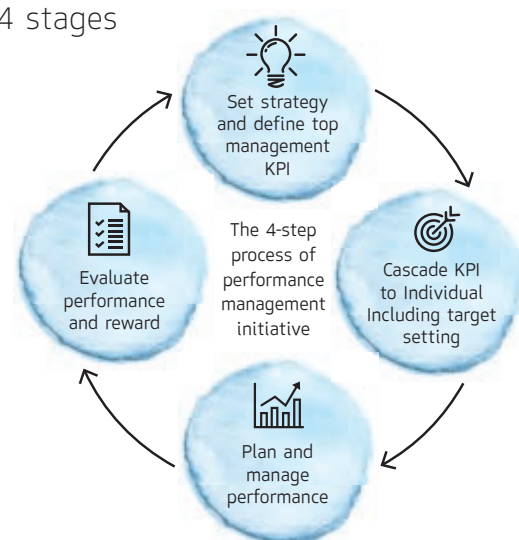
IRPC focused on keeping employee capability by measuring employee engagement and building corporate culture through participatory activities with the aim to see its employees growing happily with the organization.

In 2016, IRPC defined Leading and Lagging Indicators and used Value Tree and KPI Cascading Tool that can display a graphical representation that show the relationship between each KPI of the employees at all level to be able to analyze and define key indicators which can actually measure the performance. The performance assessment was also conducted twice a year using 180 degree appraisal on 731 employees at the supervisory level up to Senior Executive Vice Presidents and 360 degree appraisal on 72 middle managements who participated in MLDP Project.

IRPC plans to extend its 360 degree appraisal to cover Department Managers and above and Talent Managements as well as conduct performance evaluation on each function to identify employees who have excellent performance through high level management round table process. IRPC also introduced the concept of Career Estimated Potential (CEP) for its managers to identify appropriate CEP for their subordinates and make it in line with the long-term human capital development plan. This CEP works as a guide for their potential improvement plan to reach their career goal and to be in line with Company's business direction. More than 93% of the employees engaged in the identification of CEP that will lead the employees to stable growth and sustained success in their career. IRPC has a plan for all employees to identify their Career Path within 2017.

Performance assessment consists of the following 4 stages

IRPC also allows its employees who want to work in different unit can move internally in order to use their full potential in the new responsibility and allow the Company to identify competent and suitable personnel to work in each unit. IRPC is considering to implement job rotation policy for its managers by identifying potential employees with a succession plan for them to gain necessary skills and experiences as defined in the Career Experience plan before promoting to a higher level position. This policy will be implemented in 2017.





IRPC employees have a high commitment to organization because we love our work and the opportunity given by IRPC. I have been working with IRPC for more than 22 years and many of my colleagues have been working here even longer than me. We all agree that IRPC is one of the leading company in the country. It keeps employees motivated through the job rotation policy where employees can develop different skills that have been proven to be useful for the structure change in IRPC during the past year. With this policy, employees are eager to learn new things and ready for the change. I believe that IRPC's policy toward its employees is one factor that contributes to employee loyalty.

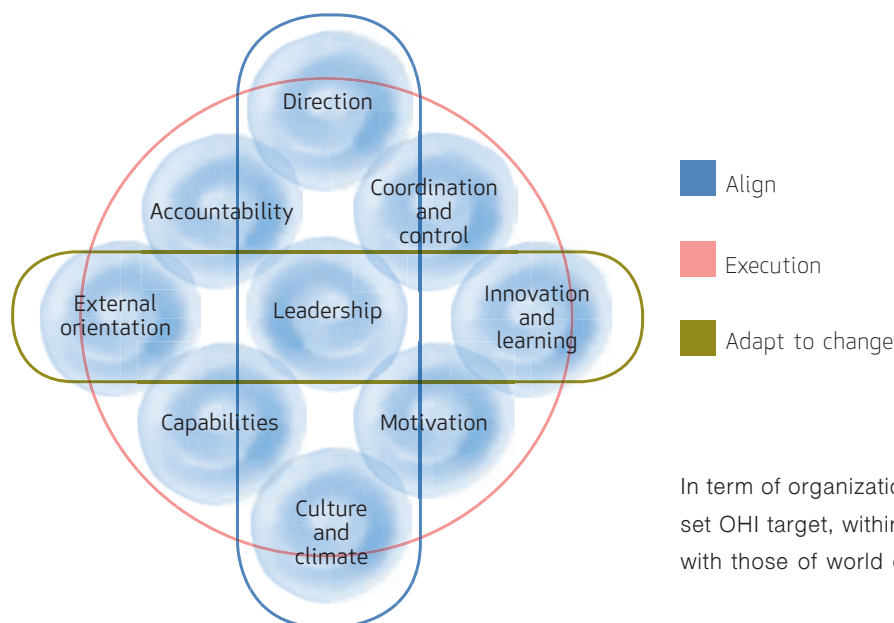
**Khun Thawatchai Kassurinchai**

Technical Support and Product Development Division Manager,  
Sales Department of Petrochemical Business

IRPC offers a welfare structure that is competitive compared with any in the industry to better retain quality employees and build their motivation. These welfare benefits included employee dependent's tuition scholarship, disaster relief, health insurance, phased retirement, rewards and recognition etc., as well as improve employees' general health and well-being through the project called "Good Health Starts Here". This project is a result of what IRPC found during the annual physical check-up in 2015-2016 that many of employees had their body mass index (BMI)

higher than the maximum standard limits and resulting in risk of illness among employees. For this reason, IRPC implemented a program to promote healthy life among employees with the purpose to change employees' behavior for a healthier lifestyle, better stress management and ready to perform their works. This program attracted 167 employees, 67 of who could lose their weight after joining.

IRPC assessed the Organizational Health Index (OHI) to see how ready the Company is in the 3 aspects and 9 elements as follows:



In term of organizational capability development, IRPC has set OHI target, within 2020, for not less than 74%, leveling with those of world class organizations.

The index is measured from 9 elements to reflect the organizational capability through 3 aspects as follows:

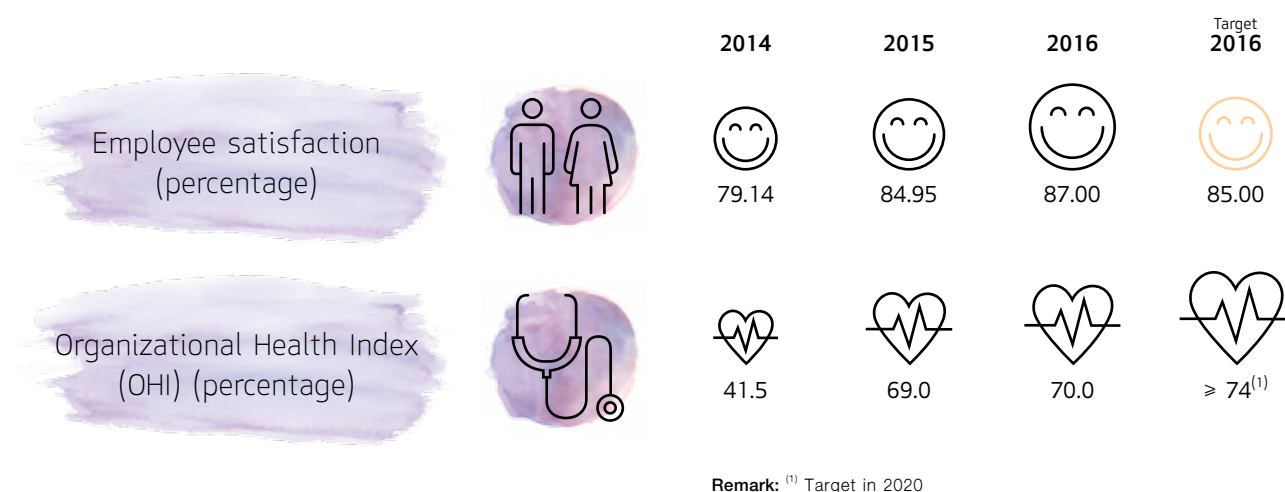
- 1) Align : through strategic target and corporate culture in line with corporate's target
- 2) Execution : through functional accountability, strong collaboration, organizational capability building, and employees motivation
- 3) Adapt to Change : through the business adaptation and innovation

The key linkage to organization capability development is leadership that is capable of policy setting, operational control, and business competency.

In 2016, OHI percentage was 70, of which will be taken into the analysis and planning for human capability development to support the Company's strategy focusing on Performance Management and Capacity Building of all aspects.

IRPC also conducted employee satisfaction survey in 2016 and found that the employee satisfaction score was 87%, which exceeded the target of 85%. IRPC has a plan to upgrade the tool used in the survey to be able to individually measure score of each element in 9 elements, with the priority of improvement. The upgraded tool will link to impact of the relationship and overall business outcome of the Company.

## Key Performance Indicators



## Labor Rights

IRPC supports the 8 labor unions, with 86% of its employees joined these unions so far. In 2016, the Company provided training to the unions on the topic of labor laws, employee work rules and guideline, for example, "Conflict-free union management" (1 batch), "Labor relationship management" (3 batches), with the total of 200 employees attended

the courses. Employees committee and executive representatives had meetings in 2016 to consider and resolve several issues that had been raised through the union and also resolved 6 complaints receiving, 3 of which was related to medical reimbursement rules and monetary contribution of employee in the club. IRPC had a properly conducted investigation, a clarification of the appropriate rules, and communication from the head of the union to all members for better understanding. The Company also provided legal advice regarding labor law.



# Contribution to Society



As a good citizen, IRPC is aware of its responsibility towards all stakeholders.







As a good citizen, IRPC is aware of its responsibility towards all stakeholders. The company emphasizes the importance of stakeholders and focuses on partnership management, customer relation management, innovative and environmentally friendly production, and make good contribution to the surrounding communities and society to create joint benefits between the organization, communities and society in order to ensure sustainable growth.



# Supply Chain Management



At IRPC, we strive for high efficiency in our procurement process by treating all suppliers fairly and transparently as well as managing risk and increasing our supplier's potential for long-term benefits and good relationship that will drive a sustainable growth in the future.

## Sustainable procurement

IRPC's "Supplier Code of Conduct" covers all aspects of business such as business ethics, human right, and safety health and environment. In 2016, IRPC required the code of conduct to be signed and complied by 129 of the first tier suppliers, 65 of which has signed and acknowledged. That is 50.39% of the total number of the first tier suppliers and it is higher than IRPC's target for 2015-2016 which was set at 20%. Furthermore, to reinforce our commitment to anti-corruption which is expressed in IRPC anti-corruption policy in 2016, the company's PO. Box No. 35 is provided as a channel for reporting irregular activities which are not complied with IRPC supplier code of conduct or business ethics.

IRPC is committed to conducting business with the highest ethical and fighting against any form of corruption. The Company also encourage suppliers to join Thailand's Private Sector Collective Action Coalition Against Corruption (CAC) and get certified as allies of CAC by providing support and advice on how to become a coalition member. In 2016, declaration of intent to fight against corruption was made by 27 suppliers and applications to join CAC have been submitted via IRPC and await for approval from CAC.

IRPC has continually dedicated our effort to improve the procurement system in order to enhance the international competitiveness. IRPC have developed a procurement web portal to be used as a communication channel to suppliers regarding IRPC's procurement requirements. The system provides suppliers with a convenient and fast tool to do business with the Company and also allows a transparent procurement with end-to-end audit process and the use of e-Auction system



from third-party provider. Suppliers can freely compete with each other to offer their best price, resulting in a fair and transparent procurement process for every party.

IRPC has also continually provided training for procurement staffs. In 2016, 58 of IRPC staffs participated in the "Smart BUYER" program held by a world-leading consulting company with the aim to increase efficiency in the area of Category Management of EVEREST Project. This program will help IRPC in the development of an optimized purchasing plan as well as gathering information on the requirements of products and services needed in each fiscal year to create purchasing and delivery plan that meet the requirement of end-users. As a result this program, cut more than THB 500 millions out of 2016 budget exceeded the THB 400 millions target.





Procurement Excellence  
helps IRPC to save more than  
**THB 500 millions,**  
THB 300 millions of which came  
from the implementation  
of e-Auction alone.

In 2016, IRPC also worked with PTT Group under the Petrochemical and Refining Integrated Synergy Management (PRISM) project by working with petroleum refinery in the supply chain of PTT Group to optimize the delivery of oil by loading the vessel to its maximum fill which reduced approximately THB 45 millions from the cost of delivery of crude oil. IRPC also purchased 300,000 liters of oil produced from plastic waste to support the social and environmental responsibility program, which, at the same time, helped reduce 650 tons of the country's waste.

## Managing risk in the supply chain

Managing risk in the supply Chain involves supplier selection process and supplier risk management which cover risks such as the quality of product and service, environment, social and corporate governance. In order to do business with IRPC, suppliers are required to register and pass the pre-approval process and answer the self-assessment questionnaire.

To mitigate any adverse impact from procurement process and to create a sustainable procurement system, IRPC conducts supplier/contractor risk assessment by identifying Environmental, Social and Governance (ESG) risks. In 2016, IRPC conducted risk assessment on 320 suppliers and 42 contractors, which was accounted for 18.37% of total number of suppliers and contractors, 28 of which were newly registered suppliers.

In addition, IRPC also collaborated among PTT Group of companies in the Management of Contractors and Suppliers (MCS) under OEMS to conduct environmental, social and governance risk assessment in order to raise our supplier's awareness which lead to the improvement and new development with IRPC and build a sustainable growth business. This project allows suppliers' information to be shared among the PTT group's companies, which, consequently, reduced the assessment cost and time. It also helps building a good relationship with our suppliers to support the future growth. In 2017, IRPC plans to conduct on-site audit for 6 of the Company's suppliers.

## Local procurement

IRPC gives the highest importance of local procurement. The Company believes that buying locally not only reduce the cost of transportation, but also a sustainable way to boost local economy. In 2016, the value of local procurement activities are equivalent to THB 2,900 millions. For example, hiring local for maintenance work, garden maintenance, planting, renting vehicles etc. These activities contribute to the economy of Rayong as well as of the community and local suppliers. IRPC also set up kiosks to sell rice to the employees and local people both in IRPC's head office site and in IRPC gas stations in order to help Thai farmers currently facing with the problem of dropping prices of rice.



IRPC is also committed to our Green Procurement project to promote purchasing environmentally friendly products and services that cause minimal adverse environmental impacts. In 2016, 12.9% of IRPC's total procurement budget was spent on environmentally friendly materials and services.

## Key Performance Indicators





# Customer Relationship Management

IRPC's approach to customer relations management is based on building good relationship with customers and building trust and confidence among customers regarding the quality of products and services. This approach reduces risks that may affect revenue and reputation of IRPC in the very competitive market. It is also a guide that will lead to achieving our goal in the long run.

In 2016, IRPC improved its Customer Information System and Complaint Management System for petrochemical business by upgrading from ICONS (IRPC Customer Oriented Network System) to ICON Plus. The new system has additional features with the database of customers that keeps information such as service records, troubleshooting detail, etc., which is useful in the management and diagnostic process to resolve customer's problem. This feature provides the detail of causes and important issues around the problems to help prevent the recurrence of the problem. It also serves as a database for salespersons to solve similar problems for the customers. IRPC also conducted a development program to increase salesperson competency to apply these information from the database to their benefit to promote and recommend the right products to the right customers in the most appropriate and efficient way.

In terms of petroleum business, IRPC has developed the systems, IRON (IRPC Oil on Net) and IRIS (IRPC Relationship Information System), to provide business that better cater to customers' needs with the focus on timing and accuracy of real-time information. IRPC also uses Procurement System that can link to other related systems to increase the efficiency of procurement process. Online Inquiry System is also used as a channel to communicate and build relationship with customers.

IRPC foresees the opportunity to increase its capability in the port and tanks businesses as well as asset management business, therefore these services were merged in to one business to provide "Total Service Solutions" for customers who require convenience, fast and cost-effective logistic system and warehouse service for product import/export by focusing on the increasing of the capacity of bulk and container terminal with the services provided as follows.







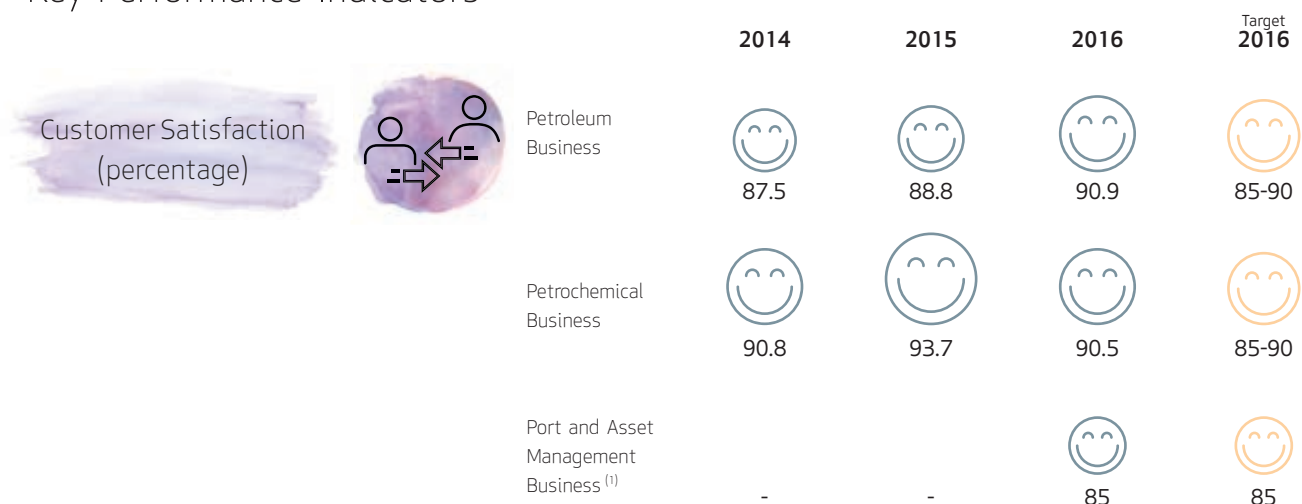
IRPC organized training courses to maximize employees' potential and leverage quality of service and asset in its port business. The Company also held activities to build strong relationship with customers. In 2016, IRPC welcomed a visit from our main customers in port business to observe our CSR activities to be applied in their organization.

In 2016, all customer satisfaction survey results achieved the target. IRPC has a plan to maximum customers' satisfaction by enhancing after-sales service such as providing swift advice and solutions to customer's problems, providing status report on the issue, etc.

In 2016, IRPC received 78 complaints from customers, most of which in the area of product and service quality, product delivery and the quality of packaging. IRPC has resolved those complaints by expanding the scope of inspection on plastic pellets and improve the specification requirements for vehicles used to deliver products as well as improving product sorting during transportation to prevent.

However, No product or service were found to have violated any law and regulation regarding the quality and safety of products, product labels, product marketing and customer's information leak.

## Key Performance Indicators



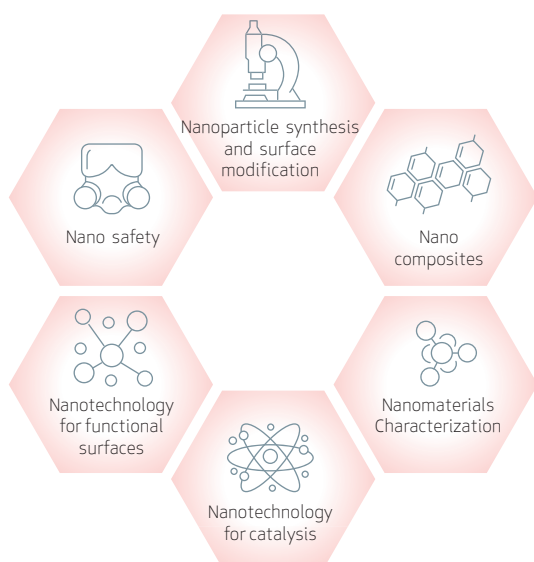
Remark: <sup>(1)</sup> Port and Asset Management Business began customer satisfaction survey in 2016



# Product and Innovation



IRPC is committed to the research and development of new products to meet the different requirements from customers and development of environmental-friendly products which creates more business opportunity and helps IRPC to be able to adapt to the change in economy, society and environment, which leads to a sustainable growth.



IRPC's R&D effort aims toward the development of Nanotechnology into products that can be used in household and in the industry to improve quality of life, promote healthy lifestyle, enhance safety in daily life as well as adding value to product for the benefits of customers and IRPC itself.

In 2016, IRPC spent **THB 58.5 millions** in research and development of the products.

IRPC focused on the development of specialty products that enhance the existing products to meet the specification as required by domestic and international markets. In 2016, IRPC invested THB 58.5 millions, THB 19.5 millions of which is the budget for collaborative research and development

projects with third parties. With this, IRPC could develop 47 new product prototypes, 28 (60% of total) of which could be further developed to become commercial products.



IRPC joined Thailand Industry Expo 2016 held by the Ministry of Industry during 26 to 31 July 2016 at IMPACT Exhibition and Convention Center in Bangkok. The Company has demonstrated its leadership in petroleum refining and petrochemical businesses in Thailand with a highly success innovative product development that promote environment protection and good quality of life.

Among the products from IRPC exhibited in the Thailand Industry Expo 2016 were POLIMAXX Natural Color Plastic, POLIMAXX Green ABS (Green Acrylonitrile Butadiene Styrene), and POLIMAXX Wood Plastic Composite etc.



Natural rubber price crisis is serious problem required involvement from every stakeholder. IRPC was aware of the crisis and put its effort to find the way to use rubber in the existing products. IRPC Innovative Product Center has been studying characteristics of natural rubber and synthesis rubber and modified them using chemical processes to get a new material for use according to government policy to add more value to the natural rubber products, resulting in new types of green product that are needed by customers in different business such as:

- Green Thermoplastic Vulcanizates (GTPVs) - a product, during development by IRPC's R&D team, is expected to be ready to launch by 2017. GTPVs is a mixture between natural rubber (10-50%) and IRPC's polymer using Reactive Extrusion technique which is a reaction during melting of polymer. The new material was tested to determine its' tensile and tension set properties. GTPVs can be used as a protective material in bathrooms and kitchens or as cushion grips for hand tools which can reduce cost of importing of natural material for customers.
- Natural Rubber Grafted Polystyrene - an innovative product made from 20-50% of styrenic mixed with natural rubber. The development of this product is a co-project between IRPC and a customer with the aim to develop a traffic cone made from plastic rubber composite which can reduce the use of synthesis rubber by 30%. The new traffic cone is strong, durable, flexible and impact-resistant. It is also 10-15% higher in value than existing products in the market.

These products made from mixture of natural rubber supports its rubber industry which is an important industry of Thailand. They also offer alternative solutions for users who are concerned about environmental impacts. These two new products are in the development process and are expected to be commercialized in the near future.



IRPC not only has R&D for petrochemical products, but is also in the development of new petroleum products such as a research project to improve the quality of asphalt for pavement application to support transportation infrastructure projects which require a long-life, high-quality road surface for higher safety and lower cost of maintenance. We have found that mixing of natural rubber with asphalt results in a higher quality of road surface and also produces less impact to environment.

IRPC is aware of business opportunities that come with open innovation, therefore it works with several academic institutes both in Thailand and oversea, such as Vidyasirimedhi Institute of Science and Technology (VISTEC), Synchrotron Light Research Institute, National Science and Technology Development Agency (NSTDA) and Nippon A&L (Japan)Co.,Ltd. etc., to conduct researches and studies on new product development as well as transfer of technologies and know-hows that enable IRPC to apply in its current and future innovation.

High quality products and services are key factors to customer satisfaction, IRPC, therefore focuses on the development of excellence products in line with PTT Group's Sustainability Management Framework. Our product development process not only complies with the law, but also meets the expectation of all stakeholders and the public. To be able to support the changing lifestyle of consumers who require higher-quality products, IRPC focuses on the development of special-grade and excellent products using environmentally friendly and safe materials, and development of new technologies for our production processes that will create new types of products or businesses.

IRPC realizes the importance of customer's and supplier's feedback and uses it to response to customer's and supplier's needs in the term of production efficiency improvement and cost reduction. For example, the Company has invented a new type of plastic pellet that is suitable for manufacturing of packaging for foods and beverages and manufacturing of fans for air conditioners using flax fiber instead of glass fiber, etc.



IRPC has developed fans that will be used in air conditioners. Glass fiber which are normally used to make these fans are replaced with flax fiber because glass fiber poses many health risks, for example, fibers can be dangerous to lung and respiratory system, powder of these fibers also has negative effect to human body etc. For this reason, IRPC has worked with its customer to develop a new type of fiber which has the same characteristic in term of strength with glass fibers. As of today, the part made from flax fiber were successfully tested by customer.



IRPC has worked with its supplier to develop a new type of plastic pellet that is suitable for manufacturing of packaging for foods and beverages. These packagings must be transparent, impact-resistant and can be stored below zero degrees Celsius for chilled food packaging market in order to add value to Ready-to-Eat products of Thailand.



Polypropylene 1103H product is another success from IRPC in the development of plastic pallets for packaging products which not only provide high impact resistance and transparency, but it also increases productivity, saves energy in the production and can be used in low temperature. This material has been approved for use with foods from several authorities such as US Food and Drug Administration and EU's Food Contact Materials Regulation as well as other standards, therefore consumers can be ensured that products made of Polypropylene 1103H is safe.

Additionally, IRPC is aware of the impact that its products have on the environment throughout their life cycle starting from acquiring raw materials, production process, logistics and distribution, product usage, reuse/recycle, and waste management. In 2016, IRPC, together with Petroleum Institute of Thailand, have worked in collaboration to conduct gate-to-gate Life Cycle Inventory (LCI) with boundary that covers steps of the production, but not include impacts during raw materials acquisition and logistics, and disposal of carcasses. Also, cradle-to-gate Life Cycle Inventory has been conducted to include impacts from raw materials acquisition and logistics, but exclude impact from product usage and disposal of

carcasses. Moreover, with this collaboration, the Life Cycle Assessment (LCA) has been conducted, covering petroleum products include Diesel, Fuel oil, Kerosene, LPG, Naphtha, Liquefied Sulfur, and Gasoline, to be used as the database at the national level and to improve the production and new production design processes. However, IRPC has set plan to conduct LCI and LCA to cover every product in 2020.

With its quality control and inspection as well as effective internal operation, IRPC did not have any report of products and services that violate related laws and regulations in 2016.

## Key Performance Indicators

		2014	2015	2016	Target 2016
Product sales revenue (THB million)		44,256 <sup>(1)</sup>	38,042	36,026	39,350
Specialty product sales revenue (THB million)		15,679 <sup>(1)</sup>	15,743 <sup>(1)</sup>	15,079	16,527
Ratio of plastic pallets and specialty products sales revenue compared to the total petrochemical products sales revenue (percentage)		35.4	41.4	41.9	42.0

Remark: <sup>(1)</sup> Updated information to fit the new category change.



# Impacts on Communities



IRPC is committed to operating its business based on Social License & Trust Principle. We evaluated impacts of our operation on environment, society, and health in accordance to legal requirements and conducted survey to gather public opinions so that the company can operate the business in a sustainable manner in order to gain acceptance from the surrounding communities.

IRPC carried out Community Consultation for all production plants  
**or 100% of the operations and developing projects**

In 2016, IRPC conducted the Environmental Impact Assessment (EIA) for the Expandable Polystyrene Project (EPS), which will increase the production capacity of EPS from 28,000 to 35,000 tons per year. The project was approved by the ONEP and construction will start in 2017.

With regard to all EIA approved projects, IRPC has strictly followed the mitigation measures and monitoring measures. Actions are subject to impact alleviation and monitoring measures established by third parties. IRPC also submit reports on its performance and environment assessment to relevant authorities on half-year basis. In 2016, IRPC won

EIA Monitoring Awards 2016 for five projects, these are, The Combined Heat and Power Plant, Ports and Lube Base Oil Plant have won Excellence Award, while the PTTAR-IRPC Multiproduct Pipeline project, a joint project between IRPC Plc., and PTT Global Chemical Plc., and Refinery won Honored award. The awards were granted by Minister of Natural Resources and Environment. The awards, itself, are motivation that drives IRPC to follow measures set in EIA report and improve its' environment management as well as raise awareness of safety, occupational health, and environment among all levels of employees in the organization.

To listen to opinions, concerns, and complaints regarding environment, IRPC also develops reporting and reoccurrence prevention procedures and establishes Emergency Control Center (ECC) to receive reports from external and internal sources 24 hours a day. After receiving a report, the center will inform Environmental Operation and Monitoring System and Communication Division and CSR Department and relevance operation units to inspect the particular area to investigate causes and then notify the informer of the corrective measure within one hour.



In 2016, the ECC has received 7 reports relating to odors and particulate matters. However, the Company has investigated and resolved the issues, including establishing both short-term and long-term mitigation measures.

Furthermore, IRPC has launched the ZERO Complaint Project to remind all levels of employees to keep in mind impacts of the operations on environment and communities by educating them about mitigation measures and monitoring measures as well as encouraging them to strictly follow the mitigation measures and monitoring measures, reduce negative impacts and increase positive impacts through CSR activities, which can be seen as a solution

to resolve social and environmental issues. Such CSR activities include sharing our reserved water with surrounding communities, granting scholarship to children and youths, especially vocational students, and develop IRPCT to be ASEAN's TOP Ten vocational schools within 2022.

In 2016, the iPEC memorandum had been signed between IRPCT and PTT group to exalt IRPCT to become a vocational capability development base, etc.



## Social Responsibility



IRPC has a firm commitment to developing a business with social responsibility by focusing on quality of life, education, health promotion, natural resource and environment protection, local culture preservation with the aim to create shared value and growth with Thai society as well as to build trust and respect from all stakeholders.



### Quality of Life Improvement

IRPC has a strong collaboration to improve quality of life for communities around IRPC Industrial Zone and promote self-sufficient economy concept to the communities via the following projects:

#### From Bench to Community Project:

IRPC has been working with the Prostheses Foundation of HRH the Princess Mother to enhance a better quality of life of people with disabilities since 2011 by donating 20-25 tons per year of POLIMAXX products, made from anti-bacteria Polypropylene (PP) to the foundation for prosthesis-making and has been sending volunteer staffs to join the foundation in prosthesis-making since 2013. In 2016, 72 volunteer staffs were sent out to Rayong Province and 178 disables



were fitted with 191 prosthetic legs in this mission. Since 2011, a total 8,748 prosthetic legs have been assembled for 7,091 people with disabilities from 115 tons of polymers donated by IRPC.

### Lam Sai Yong Model Project:

is one of the programs that aim at promoting the economy of local community by developing water resources at Baan Nong Yang, Lam Sai Yong Sub-district, Nang Rong District, Buriram Province. This project applied IRPC's expertise and experience in water management projects around IRPC Industrial Zone to support water reserves in the community for consumption and agriculture in order for the villagers of Baan Nong Yang to have sufficient water throughout the drought season.



*Use diggings for land fill on villager's properties.*

Lam Sai Yong Model Project provides adequate water reserves for drought season

**enables more than 440 households to have water for use**

and have more income THB 30,000 per year per household on average compared to 2014.



In 2016, IRPC started building water pipe from public aqueduct with the aim to reserve water in rainy season in the nearby reservoir in Don Joan community, Lam Sai Yong Sub-district, Nang Rong District, Buriram Province. IRPC also supported marketing activities to promote products made locally and joined the Royal Forest Department in the

project to preserve important commercial and economic trees at Don Joan. It is expected that the project would be a pilot model for drought relief and be used by other organizations to solve this problem in the future and at the same time support government's activities.



*IRPC won the "2016 Asia Responsible Entrepreneurship Awards: Social Empowerment" for the Lam Sai Yong Model: Water Management Project "Sustainable Drought Solving" project which is one of IRPC's project to promote local economy with aim to provide the community with a water reservoir for making standard tap water which can be used for general consumption and for agriculture. This project helps the villagers to have sufficient water supply throughout the drought season and raise the quality of life as well as increasing household income.*

## Education

IRPC realizes the importance of education and strives to promote development of education system to build human resource for society and for the country by supporting these projects:

### 1 for 9 Programs

With the Office for National Education Standards and Quality Assessment, Public Organization, IRPC developed innovative education by leveraging its potential and readiness to develop 9 schools. This project focuses on the development of essential academic knowledge, ethics promotion, students' safety and occupational health and schools' role in community and environmental development. Additional, IRPC also joined the "Four U For You" Club, which brings volunteer students from several universities, to provide special tuition in Math and Science thinking process and analysis of questions for 314 of sixth graders from four schools, namely Thepsenanusorn School, Ritthikrai Suksa School, Kalayawit School, and Beaconhouse Yamsaard Ladprao School as part of the preparation for the national O-Net examination in 2016.



### "Moderate Class More Knowledge" Initiative

In 2016, IRPC joined the attempt to promote genius in children through robot contest held at Beaconhouse Yamsaard Ladprao School. This program aligns with the purpose of the "1 for 9" Programs and "Moderate Class More Knowledge" policy of the government by





inviting instructors from Raise Genius School which is a private institute offering courses for developing student's skills in robot development certified by SMEs University Technological Office, King Mongkut's University of Technology Thonburi. The forth graders and sixth graders learned how to build robots using robotic kits in this course with more time to practice. This club-style activity which held every Wednesday after school hours provides students with analysis thinking skills, effective teamwork, and increased knowledge about digital technology, innovative invention, and effective communication skills. In the first term, 30 students finished Class 1 and in the second term, 30 students finished Class 1 with 28 students finished Class 2. After finishing from this project, students will have basic knowledge to build robots.

### IRPC Cubic Academy

IRPC established IRPC Cubic Academy in 2015 with the aim to drive organization to sustainability by creating a learning society and focus on human resource development and corporate governance via 6 training courses, namely Corporate Governance, Corporate Social Responsibility, Communication, Green Society, Social Image and Trust, and Sustainability with the participants consisting of employee and interested outsiders. In 2016, IRPC had an advance course under "Cubic Academy Advance" project with the topic "Maker/Start up Outlook - a Road to Billion" for its employees to gain knowledge and use in their work for professional career development.

IRPC Cubic Academy is structured in the form of classroom lectures, exchange of opinions, workshops, and social activities, each course conducted in a four-month period. In 2016, 2 additional batches of students attended the course with 93 students in batch 3 and 95 students in batch 4 and more training was planned to be held in the next year.

## Community Health

IRPC has 3 projects to support medical necessity of communities around the IRPC Industrial Zone as follows:

### Mobile Clinic for Communities

Mobile Clinic provides medical service for communities around IRPC Industrial Zone. In 2016, the clinic provided 12 services in the area with 1,081 patients receiving the service.

### Pan Nam Jai Clinic

The clinic, located at the IRPC Community Center in Rayong, provides free medical service to people of Rayong province who live around the IRPC Industrial Zone. In 2016, the clinic served the total of 4,864 patients.

### Health Checkup and Public Health Surveillance Program

In 2016, IRPC with the cooperation of Rayong Hospital and Rayong Public Health Office collected data and analyzed the cause of diseases found in people in the high-risk areas to provide knowledge about diseases, cautions and preventive measures for communities. Health data from 900 people in the communities were collected and in the process of analysis. The result will be used to plan for medical service in the Mobile Clinic project. This process will be repeated with the same group of people as an on-going basis within the area covering 5 sub-municipal districts namely, Cherno Nern municipal, Baan Lang, Na Ta Kwan, Tapong and, Nakhon Rayong municipal.

Mobile Clinic for Communities  
and Pan Nam Jai Clinic provide  
medical service for communities,  
**with 5,945 Patients**  
in 2016



**Khun Woravit Supachokchai,**  
Mayor of Muang Rayong Municipality

"Our communities benefit from this CSR program in the term of education via scholarship program and the support of art and cultural activities.

The program has an aim to create a long term development such as the research and development projects to reuse industrial waste which is a good thing for communities"



**Khun Sayan Sripuak,**  
Chief Executive of SAO Baan Lang

"During the past few years, IRPC has been improving its business operation with less impact to communities and environment. IRPC also takes good care of people in the area by providing more information to the public, advance notice before any change in their process and talking to people in the communities. Every unit in IRPC is effective and keep in touch as well as listen to comments and feedback from communities"



**Khun Lumyong Dhammaying,**  
Chief Executive of SAO Na Ta Kwan

"IRPC is very effective in resolving environmental problems. There are teams to talk to local people with quick solutions and explanations. Their CSR programs fit the need and support existing activities of communities"



**Khun Sikanya Chaipinit,**  
Cherg Nern Village  
Headman

"IRPC has been providing quick helps and solutions to problems. Their staffs will make a visit to meet people with explanations and solutions to solve the problems in a timely manner. In addition, our community benefits from IRPC's support in different areas such as scholarship program, support programs for community, religion and cultural development"

## Natural Resources and Environment Protection

IRPC works with Ministry of Natural Resources and Environment in several projects to protect natural resources and environment following the initiative of His Majesty the King, Rama IX to find practical and sustainable ways to protect important natural resources. In 2016, the projects undertaken by IRPC are as follows:

### Commercial plants preservation project:

This project is to collect and plant local tree species in the 5 - 10 Rai area in the forest of Don Joan, Baan Nong Yang, Lam Sai Yong Sub-district, Nang Rong District, Buriram Province with the help from the Forest Research and Development Bureau, Royal Forest Department. The purpose of this project is to preserve good local tree species and serve as an income source for community. This project also serves as a remembrance of His Majesty the late King Bhumibol, and his royal grace and wisdom seen in the concept of cultivation of three kinds of forests for four benefits:

"...three-type forests should be grown for four uses: lumber, edible products, and commercial timber; and the fourth benefit is soil and water conservation..." His Majesty on his concept of Three Forest, Four Benefits - at Rinkam Hotel, Chaingmai Province, January 7, 1980

The "Three Forest, Four Benefits" part in this concept are

- 1) trees for economic purposes that can be used to generate income, such as to build houses, furnitures, cattle pens, agricultural tools, wickerworks, etc. Example of trees for local economy purpose are wild tamarind, Sarapee (*Mammea siamensis*), eaglewood, Thai bungor, Rang (*Shorea siamensis*), Teng (*Shorea roxburghii*), iron wood (*Xylia xylocarpa*), Payom (*Shorea roxburghii*), Ta-khian (*Hopea odorata*), etc.;
- 2) trees for fire wood which can be used for cooking or keep people warm in winter. These types of trees should be of fast growing species for people to have a constant supply of firewood all the time to reduce cost of fuel. Example of trees for making firewood are neem, santol, cassod tree, shaitan wood, Indian gooseberry, sesban, etc.;
- 3) trees for food. These types of trees not only be used as foods and herbs, but also sold for additional income. These trees include elephant yam, Asiatic bitter yam, santol, cassod tree, pak-wan tree, rambeh bambi, neem, leucaena, banana, longan, etc.

### Herb Rehabilitation Project - Phu Lanka National Park:

This project is aimed for propagation of herbs, wild orchids, and wild flowers in the nature by reforestation of these trees in Phu Lanka National Park under the auspices of the Department of National Parks, Wildlife and Plant in the area of 2,000 Rai of land in Ban Pang District, Nakorn Panom Province. This will raise awareness on natural resource preservation among local people and brings back the nature as well as serve as a site for study and travel destination.

### Tree Tunnel Project at the ancient city of Sri Mahosot, preservation and environmental protection area and surrounding area:

The ancient city of Sri Mahosot is a historic site aged of more than 1,200 years. IRPC supports the budget in the landscape improvement project of the road to the ancient city of Sri Mahosot in Prachinburi Province. The project is under the Office of Natural Resources and Environmental Policy and Planning (ONEP) which proposed the planting of floral trees such as Bougainvillea to add more green area and enhance the landscape for bike lane that will raise the quality of life for people in the area and also serve as an ecotourism destination.





## Preservation of Local Culture

IRPC has a plan for preservation of local art and culture in communities around the each tank farm. In 2016, IRPC together with Mon communities around IRPC's tank farm in Phra Pradaeng, Samutprakarn Province held a festival "IRPC - Celebrating the Legend of Mon at Phra Pradaeng",

with the aim to preserve tradition and culture of Mon people. There were several shows that demonstrate the local way of living, local culture as well as local plays of Mon. IRPC also donated book cases to Songtham Worawihan Temple for storing of books and important papers related to tradition and culture of Mon ancestry. IRPC has a plan to collect these papers and publish them in a complete book in the future.



*"IRPC - Celebrating the Legend of Mon at Phra Pradaeng"  
at Songtham Worawihan Temple, Phra Pradaeng District, Samutprakarn Province.*

With dedication to conduct business with responsibility to social and communities around IRPC Industrial Zone, IRPC received a high score of 87.49% from the latest community satisfaction survey, which is higher than the target at 85% and received the award and certificate for CSR-DIW (Corporate Social Responsibility, Department of Industrial Works) from the Department of Industrial Works for 8 consecutive years. IRPC has undertaken CSR-DIW projects since 2009, with 16 from a total of 23 plants (64%) run by IRPC were certified to join the CSR-DIW Continuous project in 2016 for its constant performance in corporate social responsibility.



"I am happy and proud that I have a chance to help the community and make them happy, bring unity, love and understanding between the community and our plant. I always see our employees and local people greeting at each other, especially while driving on the road. It proves that this project reduce the gap between community and our plant, leading to a sustainable development in the future"

**Khun Pongpan Luangsingchai,**

a volunteer staff from IRPC's Waste Water Treatment Plant who participated in the project to build drainage channel for Chula Muni Temple Community at Moo 1, Baan Lang Sub-district, Muang Rayong.



**Khun Saran Nitipong,**

a volunteer staff from IRPC's Lube Base Oil Plant who participated in the project to produce bio-fertilizer for Nong Paya community, Moo.3, Ban Lang Sub-district, Muang Rayong.

"This is a very useful project. It promotes the effective use of bio-fertilizer which reduce chemical usage and reduce cost of farm production because chemical fertilizers are expensive. This project also provides training for community on how to utilize machines donated by IRPC which lead to long-term self-reliance and sustainability"

"The objective of the Organic Layer Chicken Farm project is to support the chemical-free and hydroponic vegetables project by using the vegetable leftover from cooking or selling to feed the chickens, resulting in an effective use of resources. I believe that it is a very useful project implemented on top of the existing one. This project also serves as an additional income for local, especially students in the area can use what they learned from school at home.



**Khun Bandit Thongthuan,**

a volunteer staffs from Ethylene Plant who participated in the "Organic Layer Chicken" project Community at Moo 1, Wat Na Ta Kwan School, Na Ta Kwan Sub-district, Muang Rayong.

## Key Performance Indicators

		2014	2015	2016	Target 2016
Community satisfaction (percentage)		 88.82	 93.31	 87.49	 85.00
Community Investment <sup>(1)</sup> (THB)		 99,416,046	 464,628,760 <sup>(2)</sup>	 359,664,783 <sup>(2)</sup>	 398,303,128
Employee Volunteer (hour)		 4,244	 7,651	 10,032	 -

Remark: <sup>(1)</sup> Include community development budget, Charitable donation, and Commercial initiatives.

<sup>(2)</sup> Include fund to establish Kamnoetvidya Science Academy School and Vidyasirimedhi Institute of Science and Technology.



# Minimizing Impacts on the Environment



IRPC is fully aware of the importance of operational responsibility to prevent and reduce any adverse impacts to the environment and society







IRPC adheres to the Operational Excellence Management System (OEMS) that comprehensively covers all dimension of business operations as well as sets environmental operational targets to help drive the organization to a sustainable growth.



# Air Emissions



IRPC has in place air emission management procedures to prevent negative impact on environment and health of the local residents. We, whereby, have leveraged the efficiency of production process, develop working plan to minimize continuous airemission, assign the monitoring and checking of the air emission by installing Air Monitoring Station using VOCs Camera to detect the volatile organic compound.

Furthermore, IRPC is now replacing free vent with breather valves at chemical tanks in order to control the gas vent system. and the vapor recovery unit at Benzene Toluene and Xylene Plant and Ethylene Plant in order to control and

reduce the VOCs emission. The systems are expected to be completed and ready for operation within 2017.

## Key Performance Indicators

			2013 <sup>(1)</sup>	2014 <sup>(2)</sup>	2015	2016	Target 2016
Oxides of Nitrogen (NOx)	The amount of NOx (ton)		4,146	2,700	1,778	1,722	-
	NOx Intensity (ton per thousand ton of production)		0.382	0.271	0.169	0.155	0.382
Sulphur Oxides (SOx)	The amount of SOx (ton)		1,843	1,430	1,491	2,164 <sup>(3)</sup>	-
	SOx Intensity (ton per thousand ton of production)		0.170	0.143	0.142	0.195	0.170
Volatile organic compounds (VOCs)	The amount of VOCs (ton)		2,350	1,603	1,690	2,420 <sup>(4)</sup>	-
	VOCs Intensity (ton per thousand ton of production)		0.216	0.161	0.161	0.218	0.216

Remark: <sup>(1)</sup> Data in 2013 (based year) has been adjusted to include UHV, Phra Pradaeng depot, Chumphon depot, and Ayutthaya depot to align and be comparable with 2016, the absolute data prior to adjustment were illustrated in Performance Summary (page 87).

<sup>(2)</sup> A fire accident happened at VGOHT in 2014.

<sup>(3)</sup> The amount of SOx in 2016 increased from 2015 due to the use of fuel oil, which contained higher sulfur, however, we have a strict control of ratio and proportion of gas fuel and fuel oil to prevent negative impact to environment and communities.

<sup>(4)</sup> In 2016 we added more information from UHV, Phra Pradaeng Depot, Chumphon Depot and Ayutthaya Depot. There were changes in VOCs calculation from flare, by amending emission factor to be in accordance with US.EPA 2015, while in VOCs calculation for tank, by using the average height of the product or raw material inside the tank.



## Waste

3 GOOD HEALTH AND WELL-BEING



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



The effective production process does not only allow the company to cost-effectively use the resources, but also reduce the impact to environment and society as a result of reduction of the waste. In 2016 IRPC have achieved the goal of reducing the amount of landfill of hazardous waste up to only 5% of total hazardous waste. For now, our goal in waste management is to reduce hazardous waste to landfill to zero within 2020.





The volume of hazardous waste to landfill in 2016

**is reduced by  
348 tons**

or 45% reduction comparing to the 2015.

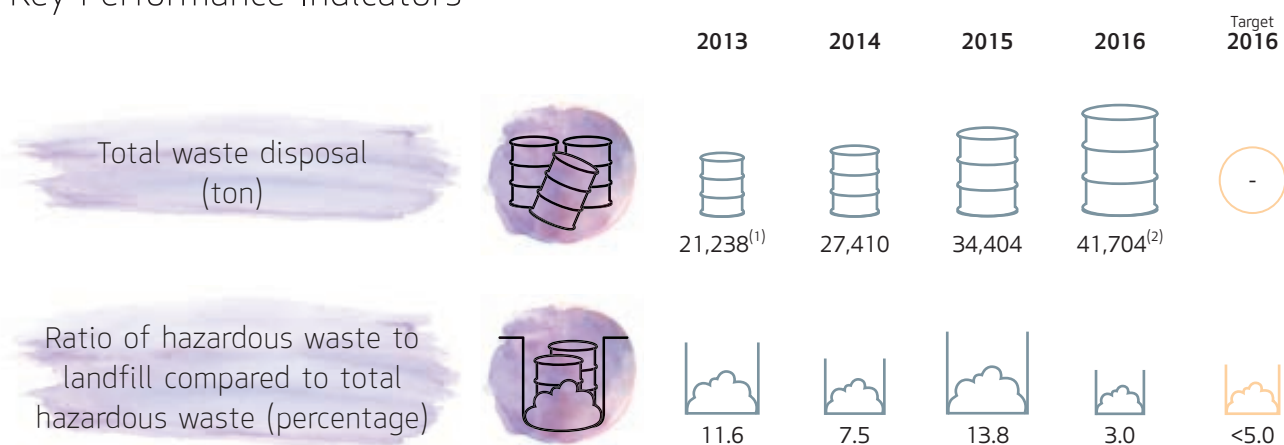
- Changing the disposal method of 40 tons of Carbon Black, which is a waste from Acetylene Carbon Black Plant, from landfill to alternative fuel for cement factory.
- IRPC is now developing the use of bio sludge to be a soil fertilizer. The method is under study of The Federation of Thai Industries which will be requiring approval from the DIW. We expect that it will be another way to support the reduction of landfill of bio sludge for over 540 tons per year.

In 2016, IRPC has strong determination to leverage efficiency in waste management in order to minimize impact on environment by following approaches:

- Join the pilot project to enhance effectiveness of PTT Group Waste Management on environment and economy which is under collaboration between the companies in PTT Group. The aim is to cooperate in management of waste pooling, to reduce the transportation cost, and to reduce the landfill waste for PTT Group. The Company has transported 2.6 tons of insulation for disposal by incineration and to be used as a raw materials in cement plants. This process saved THB 19,500 of expense.

Moreover, IRPC has prepared a plan to manage volume of the waste as a result of major turnaround in 2017 following IRPC's green turnaround scheme. The procedures consist of sorting out waste and solid waste from the beginning. Industrial waste from the major turnaround will be sent for disposal with the agency authorized by the DIW, where IRPC will monitor the transportation of the solid waste closely.

## Key Performance Indicators



Remark: <sup>(1)</sup> In 2013 total hazardous waste does not include the waste from the scheduled maintenance.

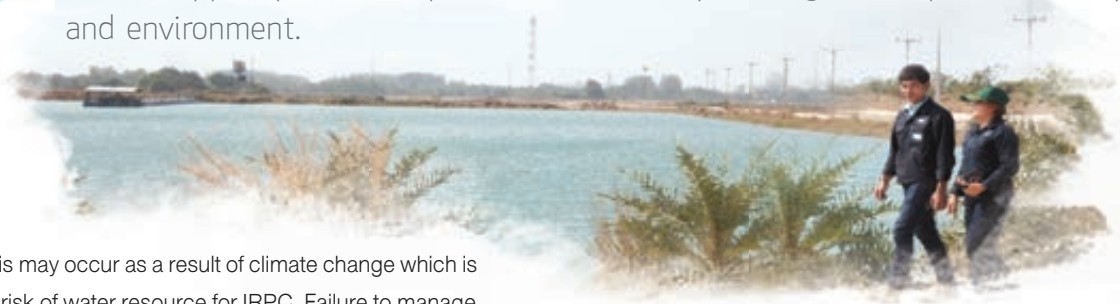
<sup>(2)</sup> In 2016 total waste is included 11,317 tons of waste from UHV, which started Commercial Operation Date (COD) in July 2016.



# Water Resource



IRPC implements the proactive water resource management, intending to allocate the water for highest effectiveness, by cooperating with PTT Group. We target Rayong for working area, where it is risk for shortage of water. We deploy monitoring procedures closely to prepare proper utility measure of water, and to support production process continuously, leaving zero impact to society and environment.

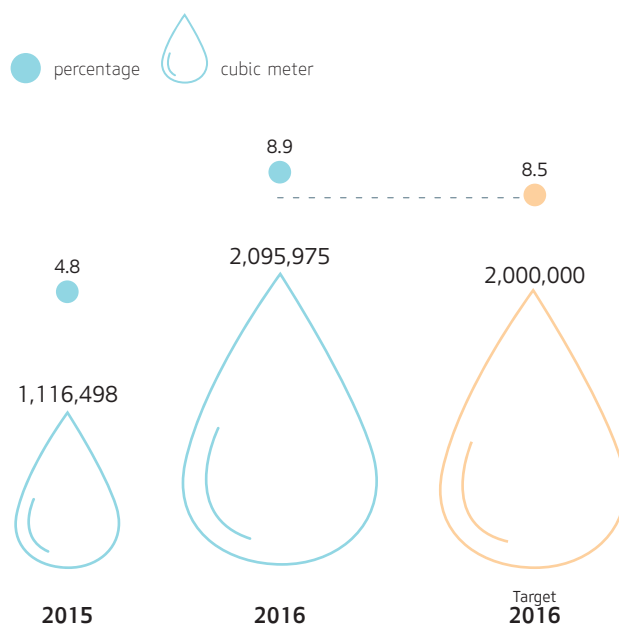


The drought crisis may occur as a result of climate change which is considered as a risk of water resource for IRPC. Failure to manage the crisis may cause severe impact to our business operation. Hence, we have implemented different measures to mitigate the potential risks. For instance, IRPC divert water withdrawal from Prasae basin into Klongyai basin, to enhance capacity of water supply to 6 millions cubic meters per month. Previously, IRPC took 9 millions cubic meters of water from Prasae Reservoir. We also built up 5 water ponds having capacity to store water up to 72 consecutive days for feeding production process, in case of a drought crisis etc.

In 2016, IRPC has created a chart showing directional flow of water, in order to determine approach to utilize the water effectively and to minimize impact to our organization, environment and society. We improved the data storage system for water resource management to ensure the efficiency that will enable convenient monitoring and analysis at maximum quality. IRPC established the Water Data Center to store and analyze water information in systematic way. The Water Management Handbook is expected to be completed within year 2017. The use of water of our units within operating area is being analyzed for priority in order to further develop the water management measures for those factories that using large amount of water to ensure the maximum efficiency.

IRPC has set target to reduce surface water withdrawal from Klongyai basin, which is considered as an at risk area of water shortage and primary source of water for communities, at 27% or equivalent to 6.4 millions cubic meter within 2020 compared to 2014. In 2016, as a result of diverting water withdrawal to IRPC own reservoirs, IRPC managed to overachieve the target, which was set at 8.5% or 2 millions cubic meter compared to 2014.

The volume of surface water consumption at Klongyai Basin (risk area) comparing to year 2014



In addition, IRPC has been working continuously with the PTT Group Water Management Team (PTTWMT) to ensure the efficiency of water management. In 2016, the team had major discussion regarding preparation of drought management as well as Klongyai basin water forecast report.

## Corporate and Social Water Management

IRPC takes into consideration communities' needs and concerns on water resources regarding sufficiency of water used between groups of users as well as impacts from natural disasters such as drought and flood. Moreover, water allocation structure, regulated by the Royal Irrigation Department, which prioritizes the importance of water intensive sectors, include agricultural, consumption, and industrial, is also taken into account. In 2016, IRPC had, without charge, shared water from its 5 reservoirs to 5 communities around the industrial zone

**totaling of 345,778 cubic meters.**

**We contributed to develop quality of life  
to the communities**

by building water supply system for Baan Mab Song Salueng, village no. 9,  
Bangboot Sub-district, Baan Khai District, Rayong Province

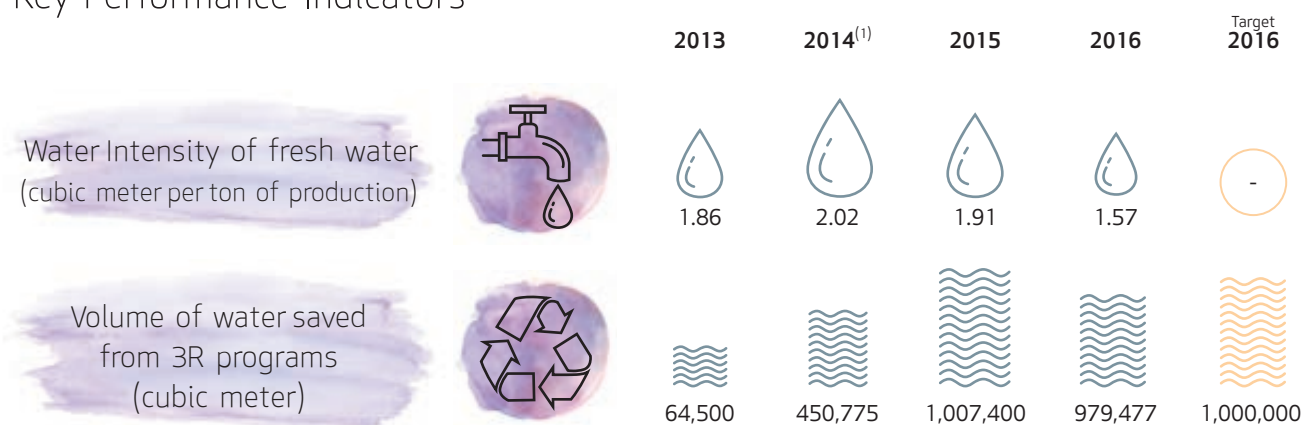
**with combined residents of 1,055 people,  
from 393 households.**



As for management of wastewater, IRPC deploy water treatment system before releasing to environment by

using activated sludge system and ultra-filtration system to control the quality of wastewater in order to meet the regulatory standard.

### Key Performance Indicators



Remark: <sup>(1)</sup> A fire accident at VGOHT in 2014, and increase of steam and power production capacity to serve the ABS and EBSM expansion projects.





# Climate Change

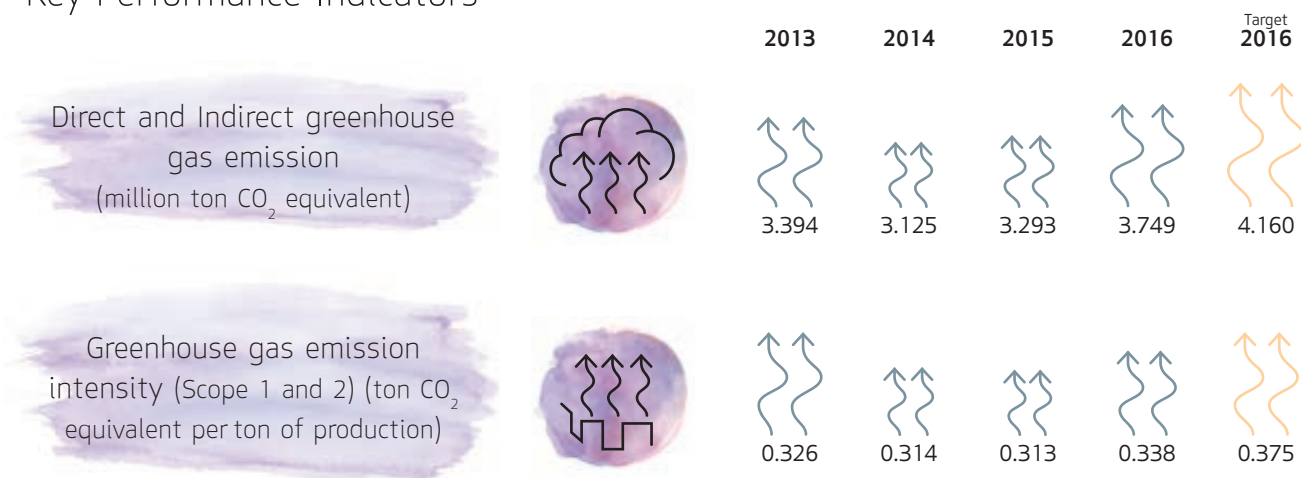


IRPC is fully aware of the climate change, the global scale problem that need global collaboration in order to reduce the emission of greenhouse gas. To contribute to the management of climate change, IRPC has improved the efficiency of production process, develop low-carbon products and energy saving products.

Also, IRPC is committed to reducing greenhouse gas emission as part of the National intention, expressed in the 2015 Conference of the Parties-United Nations Framework Convention on Climate Change (COP 21), to reduce greengouse gas emission by 20-25% in 2030 compared to 2011. IRPC, as of now, is in the process to analyzing its strengths, weaknesses, risks, and opportunities in response to climate change in terms of related law and regulations, terms of trade that covers stakeholders' expectations in order to prepare for strategic climate change plan, which is expected to complete in 2017, as well as set long term targets for 2025 and other plans necessary to the achievement for the targets

In 2016 IRPC managed to reduce the emission of greenhouse gas, as a result of increased energy efficiency, by 61,000 tons of CO<sub>2</sub> equivalent. Also IRPC had applied for Carbon Footprint Organization for Ayutthaya Depot and has received the Carbon Footprint Certification from the Thailand Greenhouse Gas Management Organization (Public Organization). IRPC's carbon footprint was sorted by sources, quantitatively assessed and identified hot spot for improvement. With these information , IRPC is able to set up efficient greenhouse gas management guideline and communicate with both internal and external stakeholders regarding the importance and benefits of carbon footprint assessment, which is an integral part of green logistics and supply chain management that later leads to a sustainable industrial development.

## Key Performance Indicators



Remark: Data of 2012 based year has been adjusted to include UHV and electricity purchased for IRPC clean power (CHP2) to support UHV to align and be comparable with 2016. (4.039 million ton CO<sub>2</sub> equivalent or 0.378 ton CO<sub>2</sub> equivalent per ton of production)



# Energy Efficiency



IRPC enhanced the energy efficiency in production process continuously in order to utilize the natural resources to its maximum efficiency and bring about minimal impact to environment. IRPC has set the 2020 target for Energy Intensity Index (EII), an index indicating the efficiency of energy used in the production process, not to exceed 85 compared to 2012. In 2016, the target of 96 EII was overachieved with 93.89 actual EII, which was a result of several production process improvements include efficiency improvement in heat and steam management, Electricity reduction and logistic management, as well as collaborative initiatives with PTT Group, etc.



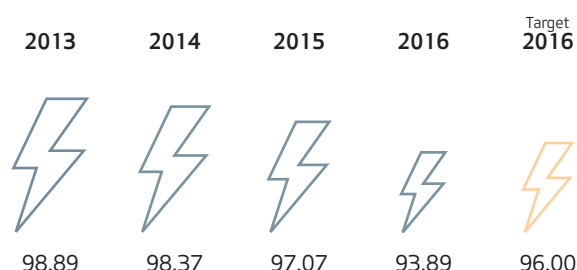


IRPC manages its logistics through PTT Group Logistic Master Plan (PTT GLM), which is one of many collaborative initiatives among companies in PTT group that aims to enhance logistics capability to be able to accommodate business growth as well as to save cost, create added value, and reduce social and environmental impacts. PTT group has set forth the target for energy reduction from its logistics by 15% from 2015 and promoted must-have driver's behaviors and knowledge through driving related traffic regulations training, preventive driving techniques training, safety awareness,

readiness for safe driving, basic vehicle maintenance, and vehicle conditions checkup. As a result of these trainings, the accident rate from logistics was significantly reduced as targeted and, at the same time, the on-time delivery rate in 2016 was more improve than in 2015.

IRPC has formulated Logistic Excellence and set up team to drive the integration of logistics and transportation to its maximum efficiency. The Team is responsible for managing risks, supporting and giving advice in project implementation, which leads to the excellence in logistics and transportation. In 2016, the Team has determined direction and goal of Logistics Excellence to align with policies set forth by IRPC and logistics group from PTT Group.

## Key Performance Indicators





# Performance Summary



## ECONOMIC

### Financial Performance

GRI	Data	Unit	2013	2014	2015	2016
G4-EC1	Sale Revenues	THB million	292,593	281,589	214,172	185,041
	Operating Costs	THB million	287,695	287,930	197,913	164,900
	Operating Profit (Loss)	THB million	3,364	(5,979)	14,434	11,308
	Employee Wages and Benefits	THB million	6,749	6,764	8,243	8,460
	Payments to Providers of Capital	THB million	3,790	4,445	4,106	7,065
	Payment to Governments <sup>(1)</sup>	THB million	10,761	9,639	14,990	17,467
G4-EC4	Tax Privileges from the Board of Investment, Thailand	THB million	384	1,169	659	2,004
	Tax Compensation from Export	THB million	203	186	172	147

**Remark:** <sup>(1)</sup> Payment to governments are taxes to government and local government authorities such as income tax, local maintenance tax, property tax, excise tax and other specific taxes. As all IRPC businesses are operated domestically, therefore, payments are made to Thai government only.



## Production

GRI	Data	Unit	2013	2014	2015	2016
	Annual Production	Ton	10,421,615	9,965,199	10,518,179	11,098,684



## Supply Chain Management

GRI	Data	Unit	2013	2014	2015	2016
G4-EN32	Percentage of new suppliers that were screened using environmental criteria	%	100	100	100	100
G4-LA14	Percentage of new suppliers that were screened using labor practices criteria	%	100	100	100	100
G4-HR10	Percentage of new suppliers that were screened using human right criteria	%	100	100	100	100
G4-S09	Percentage of new suppliers that were screened using criteria impacts on society	%	100	100	100	100
G4-EC9	Spending on purchasing of products and services from suppliers and contractors in Rayong	THB million	1,594	2,096	2,312	2,900
	Percentage of spending in Rayong comparing to the total budget	%	16.22	15.84	20.29	28.30



## Customer Relationship Management

GRI	Data	Unit	2013	2014	2015	2016
G4-PR5	Annual customer satisfaction survey results <sup>(1)</sup>	%	88	89	91	91
G4-PR8	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

**Remark:** <sup>(1)</sup> Annual customer satisfaction rate has been calculated from Petroleum and Petrochemical Business only.



## People

GRI	Data	Unit	2013	2014	2015	2016
G4-10	<b>Workforce</b>					
	Total Workforce	Person	6,685	6,528	6,543	6,767
	Male	Person	5,593	5,495	5,499	5,637
	Female	Person	1,092	1,033	1,044	1,130
	Total Workforce by area					
	Bangkok	Person	817	774	759	749
	Male	Person	354	329	326	321
	Female	Person	463	445	433	428
	Rayong	Person	5,430	5,337	5,300	5,598
	Male	Person	4,837	4,747	4,735	4,941
	Female	Person	593	590	565	657
	Others	Person	438	437	484	420
	Male	Person	402	402	438	375
	Female	Person	36	35	46	45
	Total Workforce by employment type <sup>(1)</sup>					
	Full-time employees	Person	5,273	5,267	5,262	5,418
	Male	Person	4,409	4,420	4,417	4,482
	Female	Person	864	847	845	936
	Supervised workers	Person	1,412	1,261	1,281	1,349
	Male	Person	1,184	1,075	1,082	1,155
	Female	Person	228	186	199	194
	Female in total workforce	%	16.34	15.82	15.96	16.70
		Person	1,092	1,033	1,044	1,130
	<b>Employees</b>					
	Total Employees	Person	5,273	5,267	5,262	5,418
	Employees by level					
	Executive (Level 13-18)	Person	81	72	72	79
	Male	Person	64	59	60	62
	Female	Person	17	13	12	17
	Middle Management (Level 9-12)	Person	346	705	708	757
	Male	Person	282	563	563	590
	Female	Person	64	142	145	167
	Supervisory (Level 6-8)	Person	933	2,281	2,407	2,575
	Male	Person	745	1,837	1,948	2,103
	Female	Person	188	444	459	473
	Operation (Level 1-5)	Person	3,913	2,209	2,075	2,006
	Male	Person	3,318	1,961	1,846	1,726
	Female	Person	595	248	229	280
G4-LA12	Employees by age					
	Over 50 years old	Person	329	390	458	535
	Male	Person	270	319	375	432
	Female	Person	59	71	83	103



GRI	Data	Unit	2013	2014	2015	2016
G4-LA12	30-50 years old	Person	4,477	4,396	4,324	4,243
	Male	Person	3,745	3,672	3,604	3,515
	Female	Person	732	724	720	728
	Below 30 years old	Person	467	481	480	640
	Male	Person	394	429	438	534
	Female	Person	73	52	42	106
G4-LA1	<b>New Employees</b>					
	Total new employees	Person	100	95	69	125
		% of total employees	1.90	1.80	1.31	2.31
	Male	Person	88	92	56	104
		% of total employees	1.67	1.75	1.06	1.92
	Female	Person	12	3	13	21
		% of total employees	0.23	0.06	0.25	0.39
	New employees by area					
	Bangkok	Person	11	0	1	4
		% of total employees	0.21	0.00	0.02	0.07
	Male	Person	4	0	0	0
		% of total employees	0.08	0.00	0.00	0.00
	Female	Person	7	0	1	4
		% of total employees	0.13	0.00	0.02	0.07
	Rayong	Person	89	95	68	121
		% of total employees	1.69	1.80	1.29	2.23
	Male	Person	84	92	56	104
		% of total employees	1.59	1.75	0.86	1.92
	Female	Person	5	3	12	17
		% of total employees	0.09	0.06	0.23	0.31
	Others	Person	0	0	0	0
		% of total employees	0.00	0.00	0.00	0.00
	Male	Person	0	0	0	0
		% of total employees	0.00	0.00	0.00	0.00
	Female	Person	0	0	0	0
		% of total employees	0.00	0.00	0.00	0.00
	New employees by age					
	Over 50 years old	Person	2	0	1	1
		% of total employees	0.04	0.00	0.02	0.02

GRI	Data	Unit	2013	2014	2015	2016
G4-LA1	Male	Person	2	0	0	1
		% of total employees	0.04	0.00	0.00	0.02
	Female	Person	0	0	1	0
		% of total employees	0.00	0.00	0.02	0.00
	30-50 years old	Person	4	1	1	8
		% of total employees	0.08	0.02	0.02	0.15
	Male	Person	1	0	0	3
		% of total employees	0.02	0.00	0.00	0.06
	Female	Person	3	1	1	5
		% of total employees	0.06	0.02	0.02	0.09
	Below 30 years old	Person	94	94	67	116
		% of total employees	1.78	1.78	1.27	2.14
	Male	Person	85	92	56	100
		% of total employees	1.61	1.75	1.06	1.85
	Female	Person	9	2	11	16
		% of total employees	0.17	0.04	0.21	0.30
	<b>Employee Turnover</b>					
	Total employee turnover	Person	70	83	69	144
		% of total employees	1.33	1.58	1.31	2.66
	Male	Person	57	66	55	118
		% of total employees	1.08	1.25	1.05	2.18
	Female	Person	13	17	14	26
		% of total employees	0.25	0.32	0.27	0.48
	<b>Employee turnover by area</b>					
	Bangkok	Person	20	21	14	29
		% of total employees	0.38	0.40	0.27	0.54
	Male	Person	9	11	7	16
		% of total employees	0.17	0.21	0.13	0.30
	Female	Person	11	10	7	13
		% of total employees	0.21	0.19	0.13	0.24
	Rayong	Person	49	59	54	106
		% of total employees	0.93	1.12	1.03	1.96
	Male	Person	47	53	47	93
		% of total employees	0.89	1.01	0.89	1.72
	Female	Person	2	6	7	13
		% of total employees	0.04	0.11	0.13	0.24
	Others	Person	1	3	1	9
		% of total employees	0.02	0.06	0.02	0.17

GRI	Data	Unit	2013	2014	2015	2016
G4-LA1	Male	Person	1	2	1	9
		% of total employees	0.02	0.04	0.02	0.17
	Female	Person	0	1	0	0
		% of total employees	0.00	0.02	0.00	0.00
	Employee turnover by age					
	Over 50 years old	Person	10	13	12	36
		% of total employees	0.19	0.25	0.23	0.66
	Male	Person	9	11	10	32
		% of total employees	0.17	0.21	0.19	0.59
	Female	Person	1	2	2	4
		% of total employees	0.02	0.04	0.04	0.07
	30-50 years old	Person	41	48	39	94
		% of total employees	0.78	0.91	0.74	1.73
	Male	Person	32	36	30	46
		% of total employees	0.61	0.68	0.57	0.85
	Female	Person	9	12	9	48
		% of total employees	0.17	0.23	0.17	0.89
	Below 30 years old	Person	19	22	18	14
		% of total employees	0.36	0.42	0.34	0.26
	Male	Person	16	19	16	11
		% of total employees	0.30	0.36	0.30	0.20
	Female	Person	3	3	2	3
		% of total employees	0.06	0.06	0.04	0.06
G4-LA3	<b>Parental Leave</b>					
	Employees Entitled for Parental Leave	Person	5,273	5,267	5,262	5,418
	Male	Person	4,409	4,420	4,417	4,482
	Female	Person	864	847	845	936
	Number of Employees Taking Parental Leave	Person	88	167	136	129
	Male	Person	74	152	126	112
	Female	Person	14	15	10	17
	Number of Employees Return to Work After Parental Leave	Person	88	167	136	127
	Male	Person	74	152	126	112
		% of employees taking parental leave	100	100	100	100
	Female	Person	14	15	10	15
		% of employees taking parental leave	100	100	100	88
	Employees Entitled for Parental Leave Who are Still Employed for the Next 12 Months	Person	26	87	166	134
		% of employees returning to work after parental leave	100	99	99	99



GRI	Data	Unit	2013	2014	2015	2016
G4-LA3	Male	Person	1	73	151	124
		% of employees returning to work after parental leave	100	99	99	98
	Female	Person	25	14	15	10
		% of employees returning to work after parental leave	100	100	100	100
G4-11	Total Employees Covered by Collective Bargaining	%	86	86	87	86
G4-LA9	Training Hours of Male Employees Based in Bangkok	Hour	5,925	4,509	7,683	6,892
	Executive (Level 13-18)	Hour	976	321	477	815
	Middle Management (Level 9-12)	Hour	2,046	1,562	3,552	3,154
	Supervisory (Level 6-8)	Hour	2,376	2,157	3,264	2,671
	Operation (Level 1-5)	Hour	528	470	390	252
	Training Hours of Female Employees Based in Bangkok	Hour	8,925	7,384	10,273	9,111
	Executive (Level 13-18)	Hour	123	144	213	331
	Middle Management (Level 9-12)	Hour	3,256	2,041	3,791	3,722
	Supervisory (Level 6-8)	Hour	5,189	4,640	6,058	4,626
	Operation (Level 1-5)	Hour	357	560	211	433
	Training Hours of Male Employees Based in Rayong	Hour	133,187	125,780	143,162	132,784
	Executive (Level 13-18)	Hour	1,046	183	574	1,065
	Middle Management (Level 9-12)	Hour	14,065	11,445	14,189	21,648
	Supervisory (Level 6-8)	Hour	79,108	65,521	85,671	74,328
	Operation (Level 1-5)	Hour	38,969	48,631	42,728	35,744
	Training Hours of Female Employees Based in Rayong	Hour	13,803	10,474	9,288	9,737
	Executive (Level 13-18)	Hour	0	0	0	0
	Middle Management (Level 9-12)	Hour	1,492	1,100	1,696	1,497
	Supervisory (Level 6-8)	Hour	6,077	5,186	4,668	5,140
	Operation (Level 1-5)	Hour	6,234	4,189	2,924	3,101
	Training Hours of Male Employees Based in Other Areas	Hour	12,136	12,428	10,661	8,589
	Executive (Level 13-18)	Hour	0	0	0	0
	Middle Management (Level 9-12)	Hour	714	637	882	736
	Supervisory (Level 6-8)	Hour	7,398	550	4,230	4,091
	Operation (Level 1-5)	Hour	4,024	11,241	5,549	3,762
	Training Hours of Female Employees Based in Other Areas	Hour	1,034	928	803	542
	Executive (Level 13-18)	Hour	0	0	0	0
	Middle Management (Level 9-12)	Hour	19	32	5	2
	Supervisory (Level 6-8)	Hour	429	342	364	226
	Operation (Level 1-5)	Hour	586	555	434	314
G4-LA6	Absentee Rate <sup>(3)</sup>					
	Male	%	0.038	0.013	0.031	0.031
	Female	%	0.004	0.041	0.001	0.000

**Remark:** <sup>(1)</sup> IRPC has calculated total workforce by including supervised workers since 2014.

<sup>(2)</sup> IRPC has no part-time employees.

<sup>(3)</sup> Absentee rate has been calculated from total employees only. .

<sup>(4)</sup> IRPC does not have temporary employment policy and does not have significant variations in employment numbers due to seasonal variations.

<sup>(5)</sup> IRPC does not have such work is performed by workers who are legally recognized as self-employed.



## Safety

### Oil and Chemical Spills

GRI	Data	Unit	2013	2014	2015	2016
G4-EN24	Significant Oil & Chemical Spills	Case	0	0	0	0
		M <sup>3</sup>	0	0	0	0

### Process Safety

GRI	Data	Unit	2013	2014	2015	2016
G4-OG13	Number of Tier 1 Process Safety Events	Case	9	3	0	1
	Number of Tier 2 Process Safety Events	Case	19	6	4	0

### Occupational Health and Safety<sup>(1)</sup>

GRI	Data	Unit	2013	2014	2015	2016
G4-LA6	Total Recordable Injury Rate (TRIR)					
	Total Workforce	Case/million man hours	0.55	0.95	1.08	0.77
	Contractors	Case/million man hours	1.52	0.23	0.20	0.43
	Lost Time Injuries Frequency Rate (LTIFR)					
	Total Workforce	Case/million man hours	0.28	0.36	0.43	0.42
	Contractors	Case/million man hours	0.76	0.04	0.03	0.22
	Occupational Illness Frequency Rate (OIFR) <sup>(2)</sup>					
	Total Workforce	Case/million man hours	0	0	0	0
	Contractors	Case/million man hours	0	0	0	0
	Lost Day Rate (LDR)					
	Total Workforce	Case/million man hours	2.02	12.47	2.02	2.09
	Contractors	Case/million man hours	4.84	1.09	0.00	0.58
	Fatalities					
	Total Workforce	Person	0	0	0	0
	Contractors	Person	0	0	1	0

**Remark:** <sup>(1)</sup> Occupational Health and Safety records are based on OSHA incident report, which is per one million hours worked for injury, illness rates, lost day, and fatality rates.

<sup>(2)</sup> Occupational Illness from employee was investigated based on complete health check of employees.



## ENVIRONMENTAL

### Materials Consumption

GRI	Data	Unit	2013	2014	2015	2016
G4-EN1	Crude Oil	Ton	8,638,824	8,233,754	8,737,143	8,863,305
	Naphtha	Ton	781,570	745,450	787,527	682,215

### Energy Consumption<sup>(1)</sup>

GRI	Data	Unit	2013	2014	2015	2016
G4-EN3	Total energy consumption <sup>(2), (3)</sup>	GJ	41,571,700	41,438,061	45,015,597	50,610,551
	Total direct energy consumption	GJ	46,514,605	46,802,327	49,427,071	51,564,793
	Fuel Oil	GJ	3,260,643	3,232,745	3,639,238	3,556,753
	Natural Gas	GJ	19,746,980	19,541,406	18,002,986	20,241,297
	LPG	GJ	4,500,009	5,264,745	1,151,317	1,118,996
	Diesel	GJ	544,483	306,776	395,884	365,560
	Fuel Gas	GJ	11,751,676	11,283,953	18,082,921	16,173,055
	Coke	GJ	2,344,800	2,196,671	2,383,627	4,580,035
	H <sub>2</sub> S	GJ	135	110	134	245
	Coal	GJ	4,365,879	4,951,037	5,300,941	5,166,668
	H <sub>2</sub>	GJ	N/A	N/A	447,583	336,115
	Recycle monomer	GJ	0	24,884	22,440	26,068
	Total indirect energy consumption	GJ	6,617	18,636	889,249	4,371,882
	Electricity purchased from PEA <sup>(4)</sup>	GJ	6,617	18,636	89,268	158,838
	Electricity purchased from IRPC Clean Power	GJ	0	0	292,062	1,221,417
	Steam purchased from IRPC Clean Power	GJ	0	0	507,919	2,991,627
	Total electricity sold	GJ	1,748,048	2,161,886	2,108,913	2,200,936
	Total steam sold	GJ	3,201,474	3,221,016	3,191,809	3,125,188
G4-EN5	Energy intensity	GJ/Ton of production	3.99	4.16	4.28	4.56
G4-EN6	Energy saved due to conservation and efficiency improvements	GJ	5,149,700	372,357	1,611,884	756,750
G4-EN30	Total diesel consumed by IRPC owned marine vessels	Liter	810,386	726,146	852,094	615,199

**Remark:** <sup>(1)</sup> Standards, methodologies, and assumption of energy consumption used are identified relevant regulations.

<sup>(2)</sup> Total energy consumption in 2015 increased from 2014 due to an increase in annual production, unplanned shut down, and produce premium grade at HDPE and Polyol plants.

<sup>(3)</sup> Total energy consumption in 2016 increased from 2015 due to commercial operation of UHV plant

<sup>(4)</sup> IRPC has calculated electricity purchased from PEA by including the data from IRPC Bangkok office since 2015.

### Flared and Vented Hydrocarbon<sup>(1)</sup>

GRI	Data	Unit	2013	2014	2015	2016
G4-OG6	Volume of flared hydrocarbon	million M <sup>3</sup>	31.25	38.67	36.19	62.17
	Volume of continuously flared hydrocarbon	million M <sup>3</sup>	N/A	N/A	N/A	58.89
	Volume flared hydrocarbon for oil & gas production in relation to volume produced	M <sup>3</sup> / Ton of production	3.00	3.88	3.44	5.60

**Remark:** <sup>(1)</sup> Report volume of flared hydrocarbon only (excludes volume of vented hydrocarbon).



## Greenhouse Gas<sup>(1)</sup>

GRI	Data	Unit	2013	2014	2015	2016
G4-EN15 G4-EN16 G4-EN17	<b>Operational Control</b>					
	Direct emissions of greenhouse gas (Scope 1) <sup>(2), (3)</sup>	million tCO <sub>2</sub> e	3.393	3.121	3.223	3.469
	CO <sub>2</sub>	million tCO <sub>2</sub> e	N/A	N/A	3.190	3.438
	CH <sub>4</sub>	million tCO <sub>2</sub> e	N/A	N/A	0.028	0.026
	N <sub>2</sub> O	million tCO <sub>2</sub> e	N/A	N/A	0.004	0.003
	HFC	million tCO <sub>2</sub> e	N/A	N/A	0.001	0.002
	SF <sub>6</sub>	tCO <sub>2</sub> e	N/A	N/A	N/A	397
	Biogenic CO <sub>2</sub> emissions	tCO <sub>2</sub> e	N/A	N/A	195	19
	Indirect emissions of greenhouse gas (Scope 2) <sup>(3)</sup>	million tCO <sub>2</sub> e	0.001	0.004	0.070	0.280
	Other indirect emissions of greenhouse gas (Scope 3) <sup>(4)</sup>	million tCO <sub>2</sub> e	N/A	N/A	7.662	7.495
	<b>Equity Basin<sup>(5)</sup></b>					
	Direct emissions of greenhouse gas (Scope 1)	million tCO <sub>2</sub> e	N/A	3.124	3.307	3.992
	Indirect emissions of greenhouse gas (Scope 2) <sup>(3)</sup>	million tCO <sub>2</sub> e	0.001	0.004	0.070	0.280
G4-EN18	GHG Emission Intensity <sup>(6)</sup>	tCO <sub>2</sub> e/Ton of production	0.326	0.314	0.313	0.338

**Remark:** <sup>(1)</sup> Greenhouse gas (GHG) emissions calculation is based on API 2009, IPCC 2006, ISO14064-1, and The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition). GWP used is IPCC Fourth Assessment Report (AR4-100year).

<sup>(2)</sup> Excludes GHG emission associated with process vents.

<sup>(3)</sup> In 2016 GHG emission scope 1 and 2 increased from 2015 due to commercial operation of UHV plant.

<sup>(4)</sup> Other indirect emissions of greenhouse gas (Scope 3) include travel of employees, and use of B5, E10, and E20 products.

<sup>(5)</sup> Equity basis has been calculated by adding GHG emissions from IRPC, IRPC Oil, Thai ABS, and IRPC Polyol, UBE Chemical (Asia), and IRPC Clean Power.

<sup>(6)</sup> GHG emission intensity includes direct emissions of greenhouse gas (Scope 1) and indirect emissions of greenhouse gas (Scope 2).

## Air Emissions<sup>(1)</sup>

GRI	Data	Unit	2013	2014	2015	2016
G4-EN21	Total NOx	Ton	4,138	2,700	1,778	1,722
	NOx Intensity	Ton/thousand Tons of production	0.397	0.271	0.169	0.155
	Total SOx <sup>(2), (3)</sup>	Ton	1,666	1,430	1,491	2,164
	SOx Intensity	Ton/thousand Tons of production	0.160	0.143	0.142	0.195
	Total Suspended Particulate (TSP)	Ton	323	325	298	308
	TSP Intensity	Ton/thousand Tons of production	0.031	0.033	0.028	0.028
	Total VOCs	Ton	1,839	1,603	1,690	2,420
	VOCs Intensity <sup>(4)</sup>	Ton/thousand Tons of production	0.176	0.161	0.161	0.218

**Remark:** <sup>(1)</sup> Standards, methodologies, source of emissions factors, and assumption used are identified relevant regulations. The measurement approaches include direct measurement.

<sup>(2)</sup> SOx reported in the table is in the form of sulfur dioxide (SO<sub>2</sub>).

<sup>(3)</sup> SOx in 2016 increased from 2015 due to increasing of sulfur content in fuel oil

<sup>(4)</sup> VOCs in 2016 included UHV plant (commercial production on July 2016), Phra Pradaeng depot, Chumphon depot, and Ayutthaya depot, and change calculation method for flare VOCs to refer US EPA 2015 and tank VOCs.

## Water Consumption and Wastewater

GRI	Data	Unit	2013	2014	2015	2016
G4-EN8	Water withdrawn by source <sup>(1)</sup>	M <sup>3</sup>	36,918,347	37,635,997	38,938,454	36,497,766
	Surface water	M <sup>3</sup>	19,398,347	19,298,917	19,607,178	16,798,846
	Rain water	M <sup>3</sup>	0	817,080	1,111,159	1,563,885
	Municipal water supply	M <sup>3</sup>	N/A	N/A	21,625	16,208
	Ground water	M <sup>3</sup>	N/A	N/A	769	7,715
	Salt / brackish water	M <sup>3</sup>	17,520,000	17,520,000	18,197,723	18,111,112
	Fresh water withdrawal intensity <sup>(2)</sup>	M <sup>3</sup> /Ton of production	1.86	2.02	1.91	1.57
G4-EN10	Total volume of recycled/reused water	M <sup>3</sup>	64,500	450,775	1,007,400	979,477
		% of total water withdrawal	0.17	1.20	2.59	2.68
G4-EN22	Total volume of water discharge <sup>(3)</sup>	Million M <sup>3</sup>	19.73	19.73	20.41	21.21
	Chemical oxygen demand (COD) in treated wastewater discharged	Ton	211	179	172	186
	Biochemical oxygen demand (BOD) in treated wastewater discharged	Ton	16	17	23	12
	Total suspended solid (TSS) in treated wastewater discharged	Ton	74	47	40	31

**Remark:** <sup>(1)</sup> Water withdrawn by source is taken into account all business under IRPC group only.

<sup>(2)</sup> Fresh water withdrawal intensity excludes water consumption for new project (UHV) and salt/brackish water.

<sup>(3)</sup> Total volume of water discharge during 2013-2016 has been recalculated by taking into account sea water scrubber that has been already passed neutralization process.

## Solid Waste

GRI	Data	Unit	2013	2014	2015	2016
G4-EN23	<b>Total waste disposal<sup>(1), (2), (3)</sup></b>	Ton	21,238	27,410	34,404	41,704
	Non-hazardous waste	Ton	15,643	22,849	28,843	26,476
	Reuse	Ton	0	0	0	0
	Recycling	Ton	13,974	15,812	18,587	22,680
	Recovery	Ton	0	144	48	15
	Incineration	Ton	42	41	0	0
	Landfill	Ton	1,627	4,620	6,302	3,460
	On-site storage	Ton	N/A	359	1,856	28
	Others	Ton	0	1,873	2,050	293
	Hazardous waste	Ton	2,386	4,111	5,508	13,984
	Reuse	Ton	0	42	32	62
	Recycling	Ton	147	440	441	838
	Recovery	Ton	787	2,234	3,255	6,858
	Incineration	Ton	1,175	860	813	5,587
	Landfill	Ton	277	312	766	419
	On-site storage	Ton	N/A	57	189	34
	Others	Ton	0	166	12	185

GRI	Data	Unit	2013	2014	2015	2016
G4-EN23	Waste from non-routine operations	Ton	3,209	451	53	1,244
	Non-hazardous waste	Ton	N/A	336	16	1,125
	Landfill	Ton	N/A	92	16	0
	Recovery	Ton	N/A	244	0	0
	Recycling	Ton	N/A	N/A	N/A	1,125
	Hazardous waste	Ton	N/A	115	38	119
	Incineration	Ton	N/A	0	21	0
	Landfill	Ton	N/A	1	2	0
	Recovery	Ton	N/A	114	14	119
G4-EN25	Hazardous waste transportation	Ton	N/A	4,169	5,356	14,103
	Hazardous waste import to IRPC	Ton	N/A	0	0	0
	Hazardous waste export from IRPC	Ton	N/A	4,169	5,356	14,103
	Hazardous waste treated	Ton	N/A	0	0	0
	Hazardous waste shipped internationally	Ton	N/A	165	89	23

**Remark:** <sup>(1)</sup> Total waste disposal in 2015 was increased from 2014 due to changing source of coal resulting in an increase in non-combusted waste, furnace refractor at Ethylene Plant, and inspection and cleaning of 6 crude oil tanks.

<sup>(2)</sup> Information of waste disposal method is provided by waste disposal contractor as approved by DIW.

<sup>(3)</sup> Total waste disposal in 2016 increased from 2015 due to commercial operation of UHV plant.

## Legal Compliance

GRI	Data	Unit	2013	2014	2015	2016
G4-EN31	Environmental protection expenditures and investments (e.g. operation related costs, etc.) <sup>(1)</sup>	THB million	407	626	1,059	803
G4-EN29	Monetary value of significant fines	THB million	0	0	0	0
	Number of non-monetary sanctions	Case	0	0	0	0

**Remark:** <sup>(1)</sup> IRPC has calculated Environmental protection expenditures and investments by including investment in energy saving projects and projects that can reduce GHG emissions.



## Philanthropy

GRI	Data	Unit	2013	2014	2015	2016
G4-EC1	Community investment budget <sup>(1)</sup>	THB million	101	99	465	360

**Remark:** <sup>(1)</sup> In 2015, community investment budget included allocation of the investment fund funding Kamnoetvidya Science Academy (KVIS), and Vidyasirimedhi Institute of Science and Technology (VISTEC).



# About This Report

IRPC has made corporate sustainability report to disclose key performance covering economy, society, and environment aspects during January, 1 to December 31, 2016. This report adopted the Sustainability Reporting Guidelines by Global Reporting Initiative, version 4 (GRI G4): Oil and Gas Sector Disclosure, which is an international standards with the content of the report prepared in accordance with the core option of the Guidelines to communicate the issues that are material to corporate sustainability and are of interest to stakeholders. This report also presents progress status for the compliance with the principles of United Nations Global Compact (UNGC). The performance verification of environment and occupational health and safety in 2016 was done by Lloyd's Register Quality Assurance Ltd. for more detail please refer to Assurance Statement page 96-97.



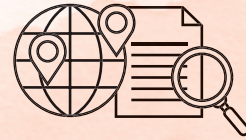
## Scope of Report <sup>(G4-17, G4-18)</sup>

The disclosure of information in this report has the same scope as of those in 2015 which cover 100% of businesses operated by IRPC Plc., including its subsidiaries with more than 50% IRPC ownership, which are 1) IRPC Oil Co., Ltd., 2) Thai ABS Co., Ltd., 3) IRPC Polyol Co., Ltd., and 4) IRPC Technology Co., Ltd. and other companies whose 50% shares or more are held by IRPC's subsidiaries, those are, 1) IRPC A&L Co., Ltd., and 2) Rak Pa Sak Co., Ltd.

However, Thai ABS Co., Ltd. was merged with IRPC Plc. by transfer the entire business to IRPC Plc., which is completed in August 2016. However, such merging posed no significant impact to the report.

## Materiality Assessment <sup>(G4-18)</sup>

IRPC carried out materiality assessment by applying GRI Reporting Principles for Defining Report Content into use to evaluate and give recommendation as well as report the performance related to each material issues in this sustainability report.



### Identification of Material issues and Scope of Report

- Identify issues related to IRPC's sustainable business development and identify material issues to stakeholders.
- Identify scope of the related issues to cover every group that has an influence on the material issues.



### Prioritization of the material issues

- Prioritize issues according to risk assessment criteria and impact on stakeholders.



### Validation and Approval of the material issues

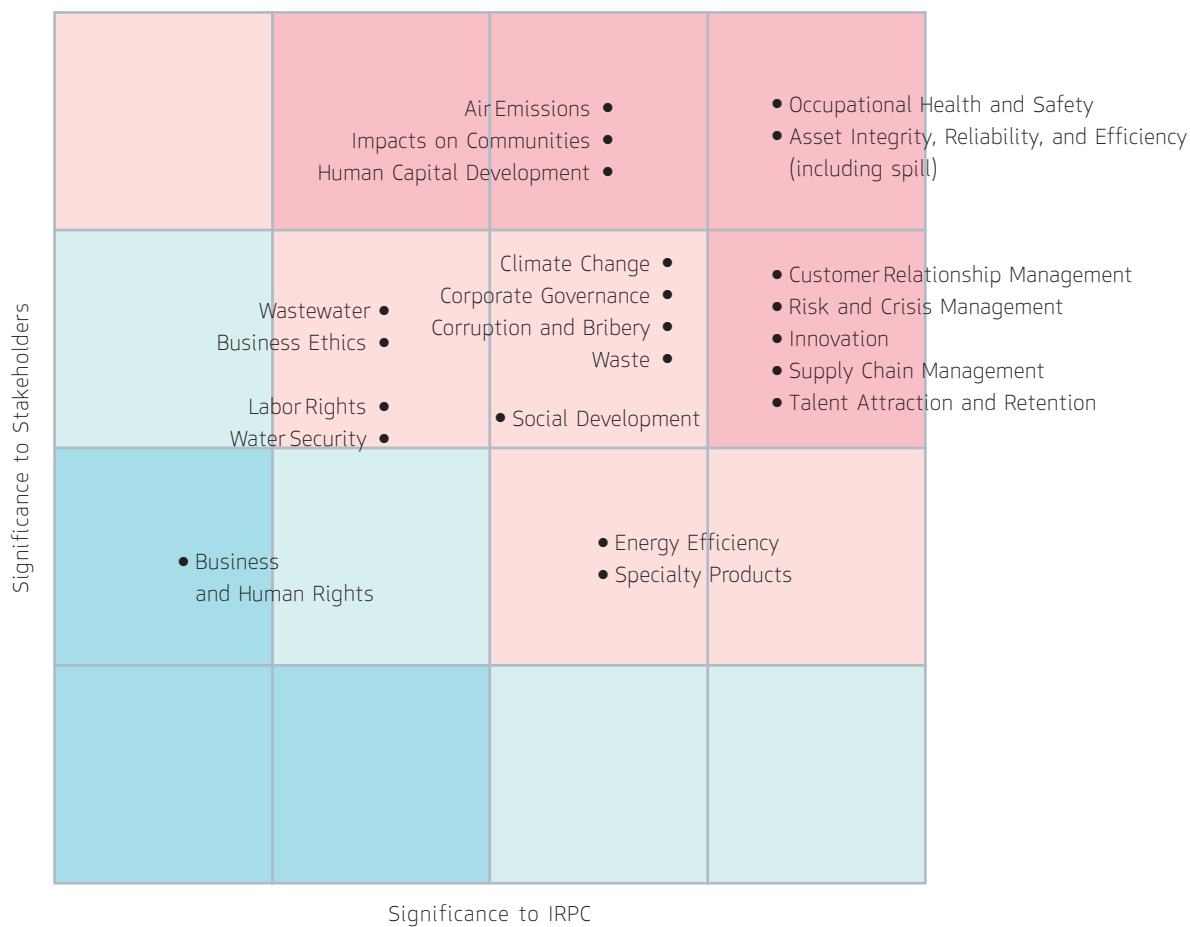
- Present the result from materiality assessment to IRPC's Sustainable Development Committee for validation and approval.



### Review of the material issues

- Collect and review issues from both internal and external.
- Review key issues in the report and validate materiality assessment outcome.









## Outcome of IRPC's Sustainability Materiality Assessment 2016 <sup>(G4-19)</sup>



## IRPC's sustainability material issues <sup>(G4-20, G4-21)</sup>

Material issues	GRI Aspects	Scope of Impact	Topic in the report
 <p>Risk and Crisis Management</p>	-	<ul style="list-style-type: none"> <li>IRPC</li> <li>Subsidiaries</li> <li>Shareholders</li> <li>Customers</li> <li>Suppliers</li> <li>Business competitors and creditors</li> <li>Employees</li> <li>Community, society, and environment</li> </ul>	<ul style="list-style-type: none"> <li>Risk Management</li> </ul>
 <p>Innovation</p>	<ul style="list-style-type: none"> <li>Regulatory compliance of products</li> </ul>	<ul style="list-style-type: none"> <li>IRPC</li> <li>Subsidiaries</li> <li>Customers</li> </ul>	<ul style="list-style-type: none"> <li>Products and innovation</li> </ul>


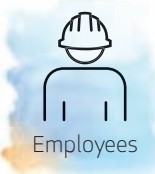

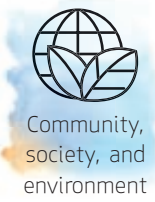


Material issues	GRI Aspects	Scope of Impact	Topic in the report
 Customer Relationship Management	<ul style="list-style-type: none"> <li>• Customer Health and Safety</li> <li>• Product and Service Labeling</li> <li>• Marketing Communications</li> <li>• Customer Privacy</li> </ul>	<ul style="list-style-type: none"> <li>• IRPC</li> <li>• Subsidiaries</li> <li>• Customers</li> </ul>	<ul style="list-style-type: none"> <li>• Customer Relationship Management</li> <li>• Performance summary report</li> </ul>
 Supply Chain Management	<ul style="list-style-type: none"> <li>• Supplier Environmental Assessment</li> <li>• Supplier Assessment for Labor Practices</li> <li>• Supplier Assessment for Impacts on Society</li> <li>• Supplier Human Rights Assessment</li> </ul>	<ul style="list-style-type: none"> <li>• IRPC</li> <li>• Subsidiaries</li> <li>• Suppliers</li> </ul>	<ul style="list-style-type: none"> <li>• Supply Chain Management</li> <li>• Performance summary report</li> </ul>
 Air Emissions	<ul style="list-style-type: none"> <li>• Emissions</li> </ul>	<ul style="list-style-type: none"> <li>• IRPC</li> <li>• Subsidiaries</li> <li>• Customers</li> <li>• Suppliers</li> <li>• Community, society, and environment</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental Mitigation</li> <li>• Performance summary report</li> </ul>
 Asset Integrity, Reliability, and Efficiency (including spill)	<ul style="list-style-type: none"> <li>• Asset Integrity and Process Safety</li> </ul>	<ul style="list-style-type: none"> <li>• IRPC</li> <li>• Subsidiaries</li> <li>• Employees</li> <li>• Suppliers</li> </ul>	<ul style="list-style-type: none"> <li>• Process Safety and Reliable Production</li> <li>• Performance summary report</li> </ul>
 Occupational Health and Safety	<ul style="list-style-type: none"> <li>• Occupational Health and Safety</li> </ul>	<ul style="list-style-type: none"> <li>• IRPC</li> <li>• Subsidiaries</li> <li>• Community, society, and environment</li> </ul>	<ul style="list-style-type: none"> <li>• Occupational Health and Safety</li> <li>• Performance summary report</li> </ul>
 Talent Attraction and Retention	<ul style="list-style-type: none"> <li>• Employment</li> </ul>	<ul style="list-style-type: none"> <li>• IRPC</li> <li>• Subsidiaries</li> <li>• Employees</li> </ul>	<ul style="list-style-type: none"> <li>• Human Capital Resources</li> <li>• Performance summary report</li> </ul>
 Human Capital Development	<ul style="list-style-type: none"> <li>• Employment</li> <li>• Training and Education</li> </ul>	<ul style="list-style-type: none"> <li>• IRPC</li> <li>• Subsidiaries</li> <li>• Employees</li> </ul>	<ul style="list-style-type: none"> <li>• Human Capital Resources</li> <li>• Performance summary report</li> </ul>
 Impacts on Communities	<ul style="list-style-type: none"> <li>• Local Communities</li> <li>• Grievance Mechanisms for Impacts on Society</li> <li>• Indirect Economic Impacts</li> </ul>	<ul style="list-style-type: none"> <li>• IRPC</li> <li>• Subsidiaries</li> <li>• Community, society, and environment</li> </ul>	<ul style="list-style-type: none"> <li>• Trust and respect from communities</li> <li>• Performance summary report</li> </ul>

## Stakeholders Engagement (G4-24, G4-25, G4-26)

Stakeholder engagement is key to corporate sustainability management. IRPC identifies 5 groups of stakeholders, namely 1) shareholders, 2) employees, 3) customers, 4) suppliers, business competitors, and creditors, and 5)

community, society, and environment. IRPC provides channel for stakeholders to feedback on related material issues and considers feedback to improve its sustainability management process.

Stakeholders	Communication Channels	Material Issues
 <p>Shareholders</p>	<ul style="list-style-type: none"> <li>• Annual general meeting</li> <li>• Local &amp; international investors road show and Company visit</li> <li>• Analyst meeting</li> <li>• Activities with SET to publicize company information</li> <li>• Press conference to disclosure company information to the public</li> <li>• Quarterly journal to all shareholders</li> <li>• Shareholder's company visit</li> </ul>	<ul style="list-style-type: none"> <li>• Consistent positive ROI</li> <li>• Sufficiency of information disclosure</li> <li>• Transparency in corporate governance</li> <li>• Legal issues and impacts to business</li> <li>• New market opportunity</li> <li>• New projects and plans</li> <li>• Risks from overall market, both local and international</li> </ul>
 <p>Employees</p>	<ul style="list-style-type: none"> <li>• Employees' Magazine "I-Oon"</li> <li>• Electronic newsletter</li> <li>• CEO Town hall</li> <li>• Exchange idea with Employees Committee</li> <li>• Exchange idea with employees via unions</li> <li>• Employees engagement survey</li> </ul>	<ul style="list-style-type: none"> <li>• Provide appropriate compensation and welfare benefits</li> <li>• Employee career paths development</li> <li>• Occupational health and safety care</li> <li>• Sharing of business direction and Company's performance</li> <li>• Labor relationship management</li> <li>• Job Security</li> </ul>
 <p>Customers</p>	<ul style="list-style-type: none"> <li>• Annual customer surveys</li> <li>• Customer relationship management</li> <li>• Customer meetings</li> <li>• Communication via websites: <a href="http://www.irpc.co.th">www.irpc.co.th</a> <a href="http://www.irpcmarket.com">www.irpcmarket.com</a> and <a href="http://www.irpcpetroleum.com">www.irpcpetroleum.com</a></li> </ul>	<ul style="list-style-type: none"> <li>• High-quality products and customer responding</li> <li>• Customer on-time delivery</li> <li>• Products and service quality improvement, development of specialties</li> </ul>
 <p>Community, society, and environment</p>	<ul style="list-style-type: none"> <li>• Corporate Social Responsibility activities</li> <li>• Public Participation on EIA Process</li> <li>• Open house</li> <li>• Public relation via SMS</li> <li>• Public relation via broadcasting tower</li> <li>• Public relation via mobile unit</li> <li>• Public relation via radio station</li> <li>• Local mass media</li> <li>• Multilateral committee meetings/EIA Monitoring</li> <li>• Village/district meeting</li> </ul>	<ul style="list-style-type: none"> <li>• Taking care of society, environment, and public health around the facility</li> <li>• Local economy development</li> <li>• Progress of community development program</li> </ul>

Stakeholders	Communication Channels	Material Issues
 Suppliers	<ul style="list-style-type: none"> <li>• Supplier newsletters</li> <li>• Supplier conference</li> <li>• Contact via <a href="http://www.irpc.co.th/pdf/Procurement-Manual.pdf">http://www.irpc.co.th/pdf/Procurement-Manual.pdf</a> and <a href="http://procurement.irpc.co.th">http://procurement.irpc.co.th</a></li> </ul>	<ul style="list-style-type: none"> <li>• Fair remuneration</li> <li>• Transparent procurement process</li> <li>• Sustainable procurement policy</li> <li>• Transparency in corporate governance</li> <li>• Strict compliance with the terms and conditions</li> <li>• Legal issues and impacts to business</li> <li>• Business disruption and impacts on communities</li> <li>• Creating value added and sustainable cooperation.</li> </ul>
 Business competitors	<ul style="list-style-type: none"> <li>• Meeting with official organizations such as Federation of Thai Industries, Thai Plastic Industries Association, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Conform to trade regulations</li> <li>• Shall not damage competitors' reputation by abusive accusation(s)</li> </ul>
 Creditors	<ul style="list-style-type: none"> <li>• Letters to creditors</li> <li>• Meeting with creditors</li> </ul>	<ul style="list-style-type: none"> <li>• Sufficiency of information disclosure</li> <li>• Transparency in corporate governance</li> <li>• Legal issues and impacts to business</li> <li>• The Company shall strictly comply with all the terms and conditions agreed upon with the creditors.</li> <li>• In the event that any particular condition cannot be met, the Company will inform any creditor(s) concerned beforehand and seek a mutually acceptable solution</li> </ul>

## Opinions from Representatives of Stakeholders <sup>(G4-27)</sup>

In 2016, IRPC collected issues related to sustainability from the 5 groups of stakeholders via the above-mentioned channels with the key issues summarized as follows:

- Products and service quality improvement, development of specialty products
- Risks of plans and projects in the future from the changing local and world market
- Excellence sales and delivery service as well as an effective Customer Communications Management System
- Transparency in procurement process
- Enhancing the quality of life of employees, provide capital development as well as creating ethical culture, professionalism, career path and safety culture in workplace
- Minimizing impacts on environment and communities' welfare by adding more green area, air and noise quality monitoring, wastewater quality monitoring, and waste management
- Progress report of community development projects such as providing medical care to communities, especially vulnerable groups of people around the IRPC Industrial Zone and communication channel between communities and IRPC

**For more information, please contact:**

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IRPC Public Company Limited

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## LRQA Assurance Statement Relating to IRPC Public Company Limited's Sustainable Development Report for the calendar year 2016

This Assurance Statement has been prepared for IRPC Public Company Limited in accordance with our contract but is intended for the readers of this Report.

### Terms of Engagement

Lloyd's Register Quality Assurance Ltd. (LRQA) was commissioned by IRPC Public Company Limited (IRPC) to provide independent assurance on its Sustainability Report 2016 ("the report") against the assurance criteria below to a limited level of assurance and at the materiality of the professional judgement of the verifier using LRQA's verification approach. LRQA's verification approach is based on current best practice and uses the principles of AA1000AS (2008) - inclusivity, materiality, responsiveness and reliability of performance data and processes defined in ISAE3000.

Our assurance engagement covered IRPC's domestic operations and activities, its subsidiaries in Thailand where IRPC holds more than 50% of ownership, the companies where its subsidiaries hold more than 50% shares, and specifically the following requirements.

- Confirming that the report is in accordance with:
    - GRI G4's Sustainability Reporting Guidelines and core option
    - GRI G4's Oil and Gas Sector Disclosure
  - Evaluating the reliability of data and information for only those selected specific standard disclosures listed below:
    - Environmental : energy consumption within the organization (G4-EN3), total water withdrawal by source (G4-EN8), direct greenhouse gas emission (G4-EN15)<sup>(1)</sup>, energy indirect greenhouse gas emission (G4-EN16), NO<sub>x</sub>, SO<sub>x</sub>, and other significant air emissions (VOCs) (G4-EN21), total water discharge by quality and destination (G4-EN22), total weight of Waste by type and disposal method (G4-EN23), total number and volume of significant spill (G4-EN24), and volume of flared and vented hydrocarbon (G4-OG6)<sup>(2)</sup> and
    - Social : type of injury and rates of injury, occupational diseases, lost days, and absenteeism, and total number of work related fatalities, by region and by gender (G4-LA6)<sup>(3)</sup>.
- Notes: (1) Excludes GHG emission associated with process vents, (2) excludes volume of vented hydrocarbon, (3) also includes IRPC contractors but excludes performance data by region and gender.

Our assurance engagement excluded the data and information of IRPC's subsidiaries where it has no operational control and all its operations and activities outside of Thailand.

LRQA's responsibility is only to IRPC. LRQA disclaims any liability or responsibility to others as explained in the end footnote. IRPC's responsibility is for collecting, aggregating, analysing and presenting all the data and information within the report and for maintaining effective internal controls over the systems from which the report is derived. Ultimately, the report has been approved by, and remains the responsibility of IRPC.

### LRQA's Opinion

Based on LRQA's approach nothing has come to our attention that would cause us to believe that IRPC has not:

- Met the requirements above
- Disclosed reliable performance data and information as no errors or omissions were detected within the selected specific standard disclosures
- Covered all the issues that are important to the stakeholders and readers of this report.

The opinion expressed is formed on the basis of a limited level of assurance and at the materiality of the professional judgement of the verifier.

**Note:** The extent of evidence-gathering for a limited assurance engagement is less than for a reasonable assurance engagement. Limited assurance engagements focus on aggregated data rather than physically checking source data at sites.

### LRQA's Approach

LRQA's assurance engagements are carried out in accordance with our verification procedure. The following tasks though were undertaken as part of the evidence gathering process for this assurance engagement:

- Assessing IRPC's approach to stakeholder engagement to confirm that issues raised by stakeholders were captured correctly. We did this by interviewing IRPC employees who engage directly with stakeholder groups as well as reviewing documents and associated records.
- Reviewing IRPC's process for identifying and determining material issues to confirm that the right issues were included in their report. We did this by benchmarking reports written by IRPC and its peers to ensure that sector specific issues were included for comparability. We also tested the filters used in determining material

issues to evaluate whether IRPC makes informed business decisions that may create opportunities that contribute towards sustainable development.

- Auditing IRPC's data management systems to confirm that there were no significant errors, omissions or misstatements in the report. We did this by reviewing the effectiveness of data handling procedures and systems. We also spoke with those key people responsible for compiling the data and drafting the report.
- Visited sites of ADU2 Refinery Plant, Power Plant, and Central Waste Yard of IRPC Complex in Rayong province to sample evidence for the selected specific standard disclosures to confirm their reliability. LRQA did not verify the data back to its original sources, nor did it assess the accuracy and completeness of the data reported by individual locations.

### Observations

Further observations and findings, made during the assurance engagement, are:

- **Stakeholder inclusivity:**  
We are not aware of any key stakeholder groups that have been excluded from IRPC's stakeholder engagement process. IRPC has maintained open dialogue with all of its stakeholders. The report contents, as well as IRPC's visions for addressing sustainability development, have then been informed by the views and expectations of these stakeholders.
- **Materiality:**  
We are not aware of any material issues concerning IRPC's sustainability performance that have been excluded from the report.
- **Responsiveness:**  
IRPC has processes for responding to concerns from various stakeholder groups. We believe that these communication processes are effective in explaining IRPC's aim in contributing towards sustainable development.
- **Reliability:**  
Data management systems are considered to be defined for the data and information collection and calculation associated with the selected indicators. However, systematic and periodic implementation of internal verification within IRPC's subsidiaries will further improve the reliability of its data and information. We also believe that a robust data quality control and internal verification system particularly relevant to vented hydrocarbon should be established. This will expand its reporting scope for a full disclosure of G4-OG6 (flared and vented hydrocarbon) performance, a material specific standard disclosure for oil and gas sector.

### LRQA's competence and independence

LRQA ensures the selection of appropriately qualified individuals based on their qualifications, training and experience. The outcome of all verification and certification assessments is then internally reviewed by senior management to ensure that the approach applied is rigorous and transparent.

This verification assessment is the only work undertaken by LRQA for IRPC and as such does not compromise our independence or impartiality.

Signed

Dated: 26 February 2017



Paveena Hengsitawat  
LRQA Lead Verifier

On behalf of Lloyd's Register Quality Assurance Ltd.  
Lloyd's Register International (Thailand) Limited  
22nd Floor, Sirinrat Building, 3388/78 Rama IV Road  
Klongton, Klongtoey, Bangkok 10110 THAILAND)

### LRQA reference: BGK6046021

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# GRI Content Index

## GENERAL STANDARD DISCLOSURES
























General Standard Disclosures		Page Number (or Link)	Omissions/Remarks	External Assurance	SDGs	UNGC Advanced Level
Strategy and Analysis	G4-1	8-9	-	-	-	19
	G4-2	29-31	-	-	-	19
Organizational Profile	G4-3	10-13	-	-	-	-
	G4-4	10-17	-	-	-	-
	G4-5	11	-	-	-	-
	G4-6	11	-	-	-	-
	G4-7	This page	<a href="http://www.irpc.co.th/en/ir_home_th.php">http://www.irpc.co.th/en/ir_home_th.php</a>	-	-	-
	G4-8	10-17	-	-	-	-
	G4-9	16-17, 78-79	Refer to IRPC Annual Report 2016, Financial Highlights, page 7	-	-	-
	G4-10	80	Majority of IRPC's workforce are employees and supervised workers. No significant variation in employment numbers and changes in 2016.	-		-
	G4-11	84	-	-		-
	G4-12	50-52	-	-	-	2
	G4-13	This page	No significant changes during the reporting year.	-	-	2
	G4-14	29-31, 68-77	-	-	-	-
	G4-15	24	-	-	-	-
	G4-16	24, 27	-	-	-	-
Identified Material Aspects and Boundaries	G4-17	91	-	✓	-	-
	G4-18	91	-	✓	-	-
	G4-19	92	-	✓	-	-
	G4-20	92	-	✓	-	-
	G4-21	92	-	✓	-	-
	G4-22	This page	None.	✓	-	-
	G4-23	This page	No significant changes in scope and boundary from previous reporting periods.	✓	-	-
Stakeholder Engagement	G4-24 <sub>OGSS</sub>	94	-	✓	-	21
	G4-25	94	-	✓	-	21
	G4-26	94	-	✓	-	21
	G4-27 <sub>OGSS</sub>	95	-	✓	-	21























General Standard Disclosures		Page Number (or Link)	Omissions/Remarks	External Assurance	SDGs	UNGC Advanced Level
Report Profile	G4-28	90	-	✓	-	-
	G4-29	This page	Most recent previous report is 2015 IRPC Sustainability Report.	✓	-	-
	G4-30	This page	IRPC publishes Corporate Sustainability Report annually.	✓	-	-
	G4-31	95	-	✓	-	-
	G4-32	90	-	✓	-	-
	G4-33	This page	IRPC engaged Lloyd's Register Quality Assurance Ltd. to provide limited independent assurance service to IRPC's 2016 Corporate Sustainability Report. IRPC has process to ensure transparent external assurance.	✓	-	-
Governance	G4-34	This page	<a href="http://www.irpc.co.th/en/cg_chart.php">http://www.irpc.co.th/en/cg_chart.php</a>	-	-	1, 20
	G4-35	33	-	-	-	1, 20
	G4-36	33	-	-	-	1, 20
	G4-37	This page	Channels to Communicate with the Shareholders in Annual Report 2016.	-		1, 20
	G4-38	This page	Composition of the Board and Committees, refer to Annual Report 2016, Management Structure.	-		1, 20
	G4-39	This page	Role of the Chairman, refer to Annual Report 2016, Roles and Responsibilities of the Chairman.	-	-	1, 20
	G4-40	This page	Nomination and selection process of the Board, refer to Annual Report 2016, Committee and Top Management Recruitment and Appointment and Nomination Process.	-		1, 20
	G4-41	This page	Refer to CG Handbook, <a href="http://www.irpc.co.th/en/cg_policy_ethics.php">http://www.irpc.co.th/en/cg_policy_ethics.php</a>	-		1, 2, 20
	G4-42	This page	Sustainability Management, refer to Annual Report 2016, page 142-143, 154-155.	-	-	1, 20
	G4-43	This page	Board Development, refer to Annual Report 2016, page 60.	-		1, 20
	G4-44	This page	Committee Evaluation, refer to Annual Report 2016, page 58-59.	-	-	1, 20
	G4-45	This page	Risk Management Committee and Risk Management, refer to Annual Report 2016, page 81-82, 152-153.	-		1, 20
	G4-46	This page		-	-	1, 20
	G4-47	This page		-	-	1, 20
























General Standard Disclosures		Page Number (or Link)	Omissions/Remarks	External Assurance	SDGs	UNGC Advanced Level
Governance	G4-48	91	-	-	-	1, 20
	G4-49	26	-	-	-	1, 20
	G4-50	26	-	-	-	1, 20
	G4-51	This page	Board of Director nomination process, refer to Annual Report 2016, page 80.  Nomination and Remuneration Committee, refer to <a href="http://www.irpc.co.th/en/pdf/bord/Nomination-Committee-Charter-Remuneration-eng-rev.pdf">http://www.irpc.co.th/en/pdf/bord/Nomination-Committee-Charter-Remuneration-eng-rev.pdf</a>	-	-	1, 20
	G4-52	This page	No remuneration consultants were involved in the process.	-	-	1, 20
	G4-53	This page	Remuneration is formally presented to the shareholders for approval.	-		1, 20
	G4-54	-	Not reported. Information is confidential.	-	-	1, 20
	G4-55	-	Not reported. Information is confidential.	-	-	1, 20
Ethics and Integrity	G4-56	This page	CG Policy, CG Handbook, Procurement Manual, refer to <a href="http://www.irpc.co.th/en/cg_policy.php">http://www.irpc.co.th/en/cg_policy.php</a>	-		12-14
	G4-57	26	-	-		12-14
	G4-58	26	-	-		12-14





















## SPECIFIC STANDARD DISCLOSURES

Material Aspects	DMA and Indicators	Page Number (or Link)	Omissions/Remarks	External Assurance	SDGs	UNGC Advanced Level
<b>ECONOMICS</b>						
Economic Performance	G4-DMA	18-20	-	-	-	15-18
	G4-EC1 <sub>OGSS</sub>	78	-	-	  	-
	G4-EC4	78	-	-	-	-
Indirect Economic Performance	G4-DMA <sub>OGSS</sub>	60-67	-	✓	-	15-18
	G4-EC7 <sub>OGSS</sub>	60-67	-	-	  	-
	G4-EC8 <sub>OGSS</sub>	60-67	-	-	  	-
Procurement Practices	G4-DMA <sub>OGSS</sub>	52	-	-		15-18
	G4-EC9	52	-	-		2
<b>ENVIRONMENTAL</b>						
Energy	G4-DMA <sub>OGSS</sub>	76-77	-	✓	-	9-11, 15-18
	G4-EN3	86	-	✓	   	9-11
	G4-EN4	-	Information is currently unavailable. IRPC will improve the data collection process.	-	   	2, 9-11
	G4-EN5 <sub>OGSS</sub>	86	-	-	   	9-11




























Material Aspects	DMA and Indicators	Page Number (or Link)	Omissions/Remarks	External Assurance	SDGs	UNGC Advanced Level
Energy	G4-EN6	86	-	-	   	9-11
	G4-EN7	86	Not Reported	-	-	-
	G4-OG2 <sub>OGSS</sub>	-	IRPC's core businesses are petroleum refinery and petrochemical.	-	  	-
	G4-OG3 <sub>OGSS</sub>	-	IRPC's core businesses are petroleum refinery and petrochemical.	-		-
Water	G4-DMA	73-74	-	✓	-	9-11, 15-18
	G4-EN8 <sub>OGSS</sub>	73-74, 88	-	✓		9-11
	G4-EN9 <sub>OGSS</sub>	73-74	IRPC uses water from its water reservoirs where water threshold for IRPC equals to water quota from the Royal Irrigation Department. IRPC manages water together with PTT Group (PTT Group Water Management Team).	-		9-11
	G4-EN10	73, 88	-	-	  	9-11
Emissions	G4-DMA	70, 75	-	✓	-	9-11, 15-18
	G4-EN15 <sub>OGSS</sub>	87	Not include GHG from process vent due to availability of data, IRPC will improve the data collection process.	✓	  	9-11
	G4-EN16 <sub>OGSS</sub>	87	-	✓	  	9-11
	G4-EN17 <sub>OGSS</sub>	87	-	-	  	2, 9-11

Material Aspects	DMA and Indicators	Page Number (or Link)	Omissions/Remarks	External Assurance	SDGs	UNGC Advanced Level
Emissions	G4-EN18 <sub>OGSS</sub>	87	-	-		9-11
	G4-EN19 <sub>OGSS</sub>	75	GHG gases include CO2, CH4, N2O, HFCs, PFCs, and SF6. NF3 is not applicable to IRPC's business. 2012 is the base year. Identified GHG reduction is under IRPC's control; as a result, it is considered as GHG emission reduction in Scope I.	-		9-11
	G4-EN20	-	Not material. IRPC is in the process of phasing out the usage of the ozone-depleting substances (ODS).	-	 	9-11
	G4-EN21 <sub>OGSS</sub>	70, 87	Standards, methodologies, source of emission factors and assumptions used are identified relevant regulations.		 	9-11
Effluents and Waste	G4-DMA <sub>OGSS</sub>	71-72, 74	-		-	9-11, 15-18
	G4-EN22	88	Omission to report effluents from retention ponds due to availability to data. IRPC will improve the data collection process		  	9-11
	G4-EN23 <sub>OGSS</sub>	88, this page	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.		  	9-11
	G4-EN24 <sub>OGSS</sub>	85	-		  	9-11
	G4-EN25	89	-	-	 	9-11
	G4-EN26	-	Not material. IRPC has processes in place to prevent impacts on the environment. IRPC continuously improves the management approach and mitigation measures to control risks on biodiversity associated with our activities e.g. ship-to-ship lightering and loading/unloading at IRPC Ports.	-		9-11

Material Aspects	DMA and Indicators	Page Number (or Link)	Omissions/Remarks	External Assurance	SDGs	UNGC Advanced Level
Effluents and Waste	G4-OG5 <sub>OGSS</sub>	-	Not applicable to IRPC's business.	-	   	-
	G4-OG6 <sub>OGSS</sub>	86	Omission to report vented hydrocarbon due to availability of data. IRPC will improve the data control process.	✓	    	-
	G4-OG7 <sub>OGSS</sub>	-	Not applicable to IRPC's business.	-	  	-
Supplier Environmental Assessment	G4-DMA	50-52	-	✓	-	2, 9-11, 15-18
	G4-EN32	79	-	-	-	2, 9-11
	G4-EN33	-	Information is currently unavailable. IRPC will improve the data collection process.	-	-	2, 9-11
<b>LABOR PRACTICES AND DECENT WORK</b>						
Employment	G4-DMA <sub>OGSS</sub>	42-47	-	✓	-	6-8, 15-18
	G4-LA1	81-83	-	-		6-8
	G4-LA2	46	-	-		6-8
	G4-LA3	83-84	-	-		6-8
Occupational Health and Safety	G4-DMA <sub>OGSS</sub>	35-41	-	✓	-	6-8, 15-18
	G4-LA5	-	Information is currently unavailable. IRPC will improve the data collection process.	-		6-8
	G4-LA6 <sub>OGSS</sub>	85	Omission to report by region and gender due to unavailable of data	✓	 	2, 6-8
	G4-LA7	35	-	-	 	6-8



Material Aspects	DMA and Indicators	Page Number (or Link)	Omissions/Remarks	External Assurance	SDGs	UNGC Advanced Level
Occupational Health and Safety	G4-LA8	This page	Local formal agreement includes IRPC's management approach and standards in all aspects such as labor practice, health and safety, etc. which applies to IRPC workforce.	-		6-8
Training and Education	G4-DMA	42-44	-		-	6-8, 15-18
	G4-LA9	44, 84	-	-	 	6-8
	G4-LA10	46	-	-		6-8
	G4-LA11	45	-	-		6-8
Supplier Assessment for Labor Practices	G4-DMA	50-52	-		-	2, 6-8, 15-18
	G4-LA14	79	-	-	 	2, 6-8
	G4-LA15	-	Information is currently unavailable. IRPC will improve the data collection process.	-	 	2, 6-8
Labor Practices Grievance Mechanisms	G4-DMA	47	-		-	6-8, 15-18
	G4-LA16	26, 47	-	-		6-8
<b>HUMAN RIGHTS</b>						
Supplier Human Rights Assessment	G4-DMA <sub>OGSS</sub>	50-52	-		-	2, 3-5, 15-18
	G4-HR10	79	-	-	-	2, 3-5
	G4-HR11	-	Information is currently unavailable. IRPC will improve the data collection process.	-	-	3-5
<b>SOCIETY</b>						
Local Communities	G4-DMA <sub>OGSS</sub>	59-67	-		-	15-18
	G4-S01	59	-	-	-	-
	G4-S02 <sub>OGSS</sub>	59-60	-	-	-	-
	G4-OG10 <sub>OGSS</sub>	-	Not applicable to IRPC's business.	-	-	-
	G4-OG11 <sub>OGSS</sub>	This page	None.	-	-	-
Supplier Assessment for Impacts on Society	G4-DMA	50-52	-		-	2, 15-18
	G4-S09	79	-	-	-	2
	G4-S010	-	Information is currently unavailable. IRPC will improve the data collection process.	-	-	2

Material Aspects	DMA and Indicators	Page Number (or Link)	Omissions/Remarks	External Assurance	SDGs	UNGC Advanced Level
Grievance Mechanisms for Impacts on Society	G4-DMA	59-60	-	✓	-	15-18
	G4-SO11	60, This page	All issues prior to 2016 had been resolved.	-		-
Asset Integrity and Process Safety	G4-DMA <sub>OGSS</sub>	39-40	-	✓	-	15-18
	G4-OG13 <sub>OGSS</sub>	40, 85	-	-		-
Emergency Preparedness	G4-DMA <sub>OGSS</sub>	29, 39-41	-	✓	-	15-18
	G4-OG13 <sub>OGSS</sub>	40, 85	-	-		-
<b>PRODUCT RESPONSIBILITY</b>						
Customer Health and Safety	G4-DMA	57-58	-	✓	-	15-18
	G4-PR1	-	Not reported.	-	-	-
	G4-PR2	58	-	-		-
Product and Service Labeling	G4-DMA	53-54	-	✓	-	15-18
	G4-PR3	-	Not reported.	-		-
	G4-PR4	-	Not reported.	-		-
	G4-PR5	54, 79	-	-	-	-
Marketing and Communication	G4-DMA	53-54	-	✓	-	15-18
	G4-PR6	This Page	None.	-	-	-
	G4-PR7	54	-	-		-
Customer Privacy	G4-DMA	53-54	-	✓	-	15-18
	G4-PR8	54, 79	-	-		-
Compliance	G4-DMA	54, 58	-	✓	-	15-18
	G4-PR9	This page	In 2016, IRPC has not been fined for non-compliance with laws and regulations concerning the provision and use of products and services	-		-

# Awards

## Excellence and Sustainability

MEMBER OF  
**Dow Jones  
Sustainability Indices**  
In Collaboration with RobecoSAM

Listed Member of the Dow Jones Sustainability Indices (DJSI) 2016 in Emerging Market of the Oil & Gas Refining and Marketing Industry for the 3<sup>rd</sup> consecutive year

*RobecoSAM and  
S&P Dow Jones Indices*



Bronze Class Sustainability Awards 2016 in Oil & Gas Refining and Marketing Industry announced in Sustainability Yearbook 2017

*RobecoSAM and  
S&P Dow Jones Indices*



Sustainability Report Award 2016 in Outstanding Category

*Stock Exchange of Thailand*



SET Sustainability Award 2016 at Excellent Level

*Stock Exchange of Thailand*



Thailand Sustainability Investment Awards 2016

*Stock Exchange of Thailand*



Thailand Top Company Awards 2016: Outstanding Award

*Business+ Magazine in ARiP Group  
and University of the Thai Chamber  
of Commerce*





Thailand ICT Excellence Awards 2016 for Core Process Improvement Project for Athena - Achieving Pricing Excellence Project

*Thailand Management Association*



Certificate of ESG 100 Company 2016 in Resource Category for remarkable performance in Environmental, Social and Governance (ESG)

*Thaipat Institute*



TPM Excellence Award 2015, Category A for Refinery, Lube Base Oil Plant and Tank Farms

*Japan Institute of Plant Maintenance: JIPM*



Thailand Quality Class (TQC) 2015 for Polypropylene Plant

*Office of Thailand Quality Award*



FTSE4Good Emerging Index which is granted to companies with good Risk Management on Environmental, Social, and Governance

*FTSE Russell*

## Environmental Responsibility



Eco Factory certification for Condensate Residue Plant, Deep Catalytic Cracking Plant, High Density Polyethylene Plant, Propylene Plant, Acetylene Black Plant, Compounding Plant, Polypropylene Plant, Water Supply Plant, Polystyrene Plant, Benzene Toluene and Xylene Plant, and Polyol Plant.

*The Industrial Environment Institute,  
The Federation of Thai Industries*



Carbon Footprint for Organization Certification 2016 for Ayutthaya Depot

*Thailand Greenhouse Gas Management Organization  
(Public Organization)*



The Prime Minister's Industry Award 2016 for Productivity Improvement at ADU Plant, NTU Plant and Energy Management at Benzene, Toluene and Xylene Plant

*Ministry of Industry*



Carbon Reduction Label Certificates for Polypropylene and Polystyrene

*Thailand Business Council for Sustainable Development (TBCSD)*



Green Meeting Certification for the 4<sup>th</sup> consecutive year from Annual General Meeting 2016

*Thailand Business Council for Sustainable Development (TBCSD)*

## Social Responsibility



Asia Responsible Entrepreneurship Awards 2016 for Social Empowerment for Lam Sai Yong Model: Water Management Project "Sustainable Drought Solving"

*Enterprise Asia*



Zero Accident Campaign Awards 2016 for the 4<sup>th</sup> consecutive year for Ayutthaya and Phra Pradaeng Depots

*Department of Labor Protection and Welfare*



National Outstanding Practice Awards 2016 for Occupational Health and Safety and Environment for Chumphon Depot at Diamond Level for the 3<sup>rd</sup> consecutive year, Ayutthaya Depot at Diamond Level for the 3<sup>rd</sup> consecutive year, and Phra Pradaeng Depot at Gold Level for the 3<sup>rd</sup> consecutive year

*Department of Labor Protection and Welfare*



CSR-DIW Award for all plants since 2014. In 2016, there were 16 plants (out of 23 plants) have received CSR-DIW Continuous Awards 2016

*Department of Industrial Works*



EIT-CSR Awards 2016  
Outstanding Category

*Engineering Institute of Thailand under  
H.M. The King's Patronage*

## Corporate Governance



Golden Peacock Global Award  
for Excellence in Corporate  
Governance 2016

*Institute of Directors (IOD), India*



Best Investor Relations  
Company and Asia's Best CEO  
2016

*Corporate Governance Asia Magazine*



Best CEO "IAA Awards for  
Listed Companies 2015/2016"  
Resource Category

*Investment Analysts Association*



Corporate Governance Report of Thai Listed  
Companies (CGR) 2016 : Excellent Level

*The Thai Institute of Directors together with the Securities and  
Exchange Commission and the Stock Exchange of Thailand*



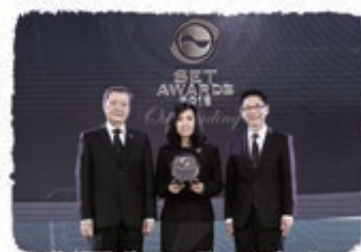
NACC Integrity Awards 2016

*Office of the National  
Anti-Corruption Commission*



The Best Corporate in Asia 2015  
Asia's Outstanding Company on  
Corporate Governance

*Corporate Governance Asia*



Best Investor Relations Awards  
2016

*Stock Exchange of Thailand*



# Survey of Readers' Opinions

Your suggestions will be valuable inputs for us to improve the better IRPC Sustainability Report.

Please mark X into ☐ and fill the blank.

1 Please specify your personal information

Sex ☐ Female ☐ Male  
Age ☐ Under 30 years ☐ 30-45 years ☐ Over 45 years

2. Which best describes you as a stakeholder?

☐ Employee ☐ Customer ☐ Shareholder/investor ☐ Public / communities  
☐ Supplier ☐ Academic institution ☐ Financial institution/creditor  
☐ Media ☐ Government officer ☐ Others (please specify.....)

3. Which channel did you receive the Sustainability Report

☐ IRPC website ☐ Seminar/ presentation/exhibition ☐ IRPC's employee  
☐ Other website ☐ Annual general meeting ☐ Others (pleasespecify.....)

4. What is your objective in reading the Sustainability Report 2016?

☐ Knowing about IRPC ☐ Investment in IRPC ☐ Research and education  
☐ Serving as guideline for your Sustainability/CSR report preparation  
☐ Special interest (please specify.....) ☐ Others (please specify.....)

5. Please specify your satisfaction on 2016 Sustainability Development Report

Completeness	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low	<input type="checkbox"/> Dissatisfied
Topics	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low	<input type="checkbox"/> Dissatisfied
Attractiveness	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low	<input type="checkbox"/> Dissatisfied
Ease to understand	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low	<input type="checkbox"/> Dissatisfied
Report design	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low	<input type="checkbox"/> Dissatisfied
Overall satisfaction	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low	<input type="checkbox"/> Dissatisfied

6. What issue in the report have you found most interesting? (Please specify your reason)

.....  
.....

7. What issue in the report have you found least interesting? (Please specify your reason)

.....  
.....

8. Have you found IRPC's strong commitment and intention to perform through the Sustainability Report? How?

.....  
.....

9. Have you found the completeness in the report?

☐ Complete ☐ Incomplete

If not, please specify additional issues that should be included in the Sustainability Report?

.....  
.....

10. Please provide additional recommendations/ suggestions for the next Sustainability Report improvement. (if any)

.....  
.....

Please fill in and send back to IRPC Plc.

We appreciate your valuable inputs.





บริการธุรกิจตอบรับ

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▶ พิมพ์ตรงรอยประทับ

