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BUILDING STRENGTH THROUGH ADVERSITIES

PETROLIAM NASIONAL BERHAD (PETRONAS)
SUSTAINABILITY REPORT 2016





PETRONAS views sustainability as a business imperative that complements our growth strategy by addressing environmental, social and governance concerns of various stakeholders driven by balanced economic and business practices.

Since our inception in 1974, PETRONAS has grown to become a fully integrated oil and gas corporation and thrives amongst Fortune Global 500® companies. Over the last four decades, we remain committed and have not compromised our promise to develop the right talent, protect the environment, and contribute to the communities in areas where we operate.

Sustainability has become a vital element in doing business, responsibly and successfully. Aptly titled "Building Strength Through Adversities", the Sustainability Report shares PETRONAS' bold and uncompromising efforts as we continue our sustainability journey.



Both reports are accessible online at
www.petronas.com.my
 or Scan this QR Code with your smart device.

SECTION — INTRODUCTION

- 5 Sustainability Highlights and Group Financial Performance Overview
- 6 Letter from the President and Group Chief Executive Officer
- 9 Sustainable Development in PETRONAS
- 10 PETRONAS Corporate Sustainability Framework
- 11 About this Report
- 12 Sustainability Performance Data

01

SECTION — ENVIRONMENT

- 17 Climate Change
- 22 FEATURE: Interview with Dzafri Sham Ahmad
- The Climate Challenge and Our Opportunity for Change - Malaysia and Beyond
- 23 Water Management
- 24 Environmental Performance
- 26 FEATURE: Instilling Environmental Awareness

02

SECTION — SOCIAL

- 31 Occupational Safety
- 33 Process Safety
- 35 Occupational Health and Wellness
- 36 Industrial Hygiene
- 38 Emergency Preparedness and Response
- 39 Product Stewardship
- 42 Our People
- 44 Social Performance
- 46 Community Investments

03

SECTION — GOVERNANCE

- 53 Corporate Governance and Business Ethics
- 56 Health, Safety, Security and Environment Governance

04

SECTION — FEATURE STORIES

- 58 PFLNG SATU
- 59 Pengerang Integrated Complex

05

SECTION — OUR ACHIEVEMENT

- 62 Awards and Recognition

06

SECTION — APPENDIX

- 66 Our Approach to Reporting

07

Section One

INTRODUCTION

CONTENT

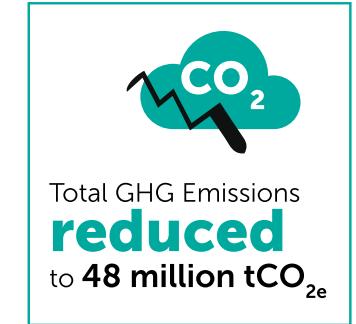
- 5 Sustainability Highlights and Group Financial Performance Overview
- 6 Letter from the President and Group Chief Executive Officer
- 9 Sustainable Development in PETRONAS
- 10 PETRONAS Corporate Sustainability Framework
- 12 About this Report
- 13 Sustainability Performance Data

SUSTAINABILITY HIGHLIGHTS



Corporate Sustainability Framework key areas
expanded from 7 to 9

Developed fuel efficient products (biodiesel)
Dynamic Diesel Euro 5



Total Recordable Case Frequency
reduced from 0.63 to 0.57

PFLNG SATU
Successfully produced its first drop of LNG

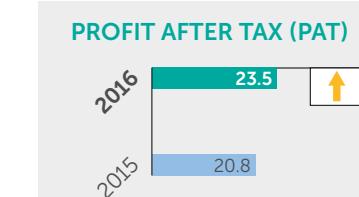


Extension of Maternity Leave to
3 months fully-paid

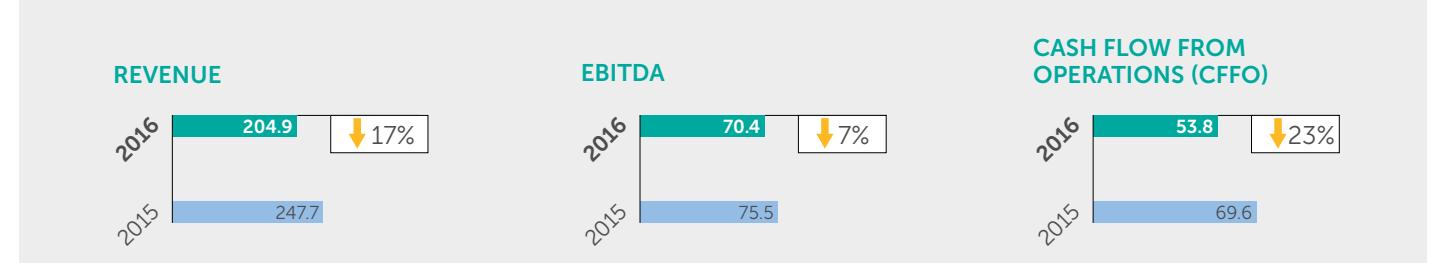
UTP
The first and only private university in Malaysia to be awarded a 6-star rating by Malaysia Research Assessment Rating System

GROUP FINANCIAL PERFORMANCE OVERVIEW (RM BILLION)

KEY INDICATORS	2015	2016
Dated Brent (USD/bbl)	52.46	43.69
JCC single-month (USD / bbl)	62.63	39.13
USD / MYR	3.90	4.15



Higher PAT was mainly due to lower operating expenditure, net impairment on assets and tax expense partially offset by lower average prices.





LETTER FROM THE PRESIDENT AND GROUP CHIEF EXECUTIVE OFFICER

I'm pleased to present you the PETRONAS Group Sustainability Report 2016 on our efforts to meet the world's growing energy needs in a safe, responsible and ethical manner, amidst a challenging operating environment. This report goes on to highlight sustainability as a pillar of PETRONAS' business philosophy and our unwavering promise to embody genuine concern for the wellbeing of our present and future generations.

2016 IN REVIEW

In 2016, the global energy industry continued to be affected by volatile crude oil prices, consequences of which placed greater challenges on business sustainability. This exerted immense pressure on energy companies, such as PETRONAS, to transform even faster with innovative strategies to optimise business practices in order to stay ahead of the evolving social dynamics and a changing environmental landscape. Despite the volatility, PETRONAS' quest to be a reliable producer of affordable energy remains intact.

In facing the headwinds of this tough environment, business strategies and investment projects were thus scrutinised to ensure favourable results amidst prudent management of costs. PETRONAS' strategies under Project CACTUS addressed cash management and generation, cost efficiency and process simplification, and focused execution of our projects to ensure PETRONAS' resilience. For our long-term sustainability, we focused on talent development, driving technology as a differentiator and exemplifying a world-class work culture.

Our priorities, transcending hard business results, are discussed further in this report with a central focus on climate change, safety and people to achieve optimum levels of operational excellence in our pursuit of delivering an uninterrupted energy supply.

REINFORCING SUSTAINABILITY

The uncertain operational landscape, coupled with the desire to prepare for emerging business challenges led us to undertake a thorough review of the PETRONAS Corporate Sustainability Framework (CSF) to better position our sustainability aspirations. The review exercise was concluded in early 2016 where the enhanced CSF was expanded from seven to nine key result areas to demonstrate an equal emphasis across the environmental, social and governance spheres.

With PETRONAS' participation in the UNFCCC Conference of Parties (COP 22) in 2016, the emphasis on Climate Change was further strengthened. We support the requirements stipulated in the Paris Agreement as well as our role as a responsible company to balance the issue of climate change with the challenge to sustainably produce affordable and

reliable energy. This is realised through diverse strategies to reduce operational greenhouse gas (GHG) emissions via energy efficiency improvements as well as reduction in flaring and venting, amongst others, in support of our Carbon Commitments.

We are also supporting Nationally Determined Contributions (NDC) by leveraging on our natural gas and liquefied natural gas (LNG) portfolio to deliver low carbon energy systems. Thanks to our game-changing technologies, we are able to tap into stranded and remote gas fields with our world's first floating liquified natural gas facility, the PETRONAS FLNG SATU (PFLNG SATU). By having greater access to gas resources, PETRONAS is in the position to promote natural gas as the cleaner energy alternative to meet future energy demand. Our ingenuity in the Floating LNG's design enables us to explore and produce gas with minimised environmental footprints, setting a new benchmark for the industry besides showing our serious commitment to sustainable energy.

ELEVATING HSSE

With the realisation that sustainability is even more critical when operating in challenging times, PETRONAS upholds a strong Health, Safety and Environment (HSE) culture which is a crucial enabler to take us to greater heights. With a keen foresight in 2016, two critical functions, HSE and Security, were merged into a single division named Group Health, Safety, Security and Environment (HSSE), in response to the evolving external landscape, where security and HSE elements were increasingly integrated.

Despite mandating stringent safety requirements and establishing controls to mitigate safety risks, we experienced 13 fatalities in 2016. We were disappointed by this and have introduced focused interventions to enhance safety practices in areas requiring immediate attention, as well as steps to enhance accountability and ownership of safety practices. The inaugural HSE Stand Down held in October 2016 brought together management personnel from across the Group to discuss strategies to enforce a stronger HSSE compliance culture, requiring increased leadership visibility and a steadfast determination from all levels of employees including third-party service providers.

With all the pre-requisites in place, we are committed to push our limits to strive for better HSSE standards, driving a strong message of zero-tolerance to noncompliance to better protect our assets and most importantly, our people.

STRENGTHENING RELATIONS

PETRONAS believes in people as one of the most critical and strategic aspect of our business as the Company becomes more diversified in terms of locations, operations and workforce composition. As part of our efforts to encourage

LETTER FROM THE PRESIDENT AND GROUP CHIEF EXECUTIVE OFFICER

our people to adopt a high-performing work culture, the PETRONAS Cultural Beliefs (PCB) was first introduced in 2015, which advocated positive behavioural change amongst our people, focusing on optimum performance delivery to co-create a resilient future for the Company. In meeting the needs of our people, we then rolled out two pilot initiatives in 2016 to provide an enhanced workplace experience, namely; Compressed Work Week and Enhanced Flexible Hours. Mutually-beneficial relationships with our stakeholders across varying multicultural settings are also fundamental to us. In 2016, we carried out social risk assessments at identified operational sites to ensure these risks are managed while meeting the expectations of our stakeholders. Governance mechanisms in the area of Human Rights were strengthened with the introduction of three new Technical Guidelines; namely on Indigenous Peoples Assessment, Land Acquisition and Involuntary Resettlement as well as Cultural Heritage Assessment. The Human Rights Best Practices for Contractors were also implemented in the same period.

PETRONAS continues to harness the collective strengths of our internal and external stakeholders in achieving our sustainability aspirations as set out in the PETRONAS CSF. We participated in numerous dialogues locally and internationally to discuss matters across the themes of environment, social and governance. This included insightful discussions on environmental management, operational safety, low-carbon economy and social performance. Closer to home, we have actively spearheaded gas-advocacy works and encouraged competitive sourcing of natural gas resources following the enactment of Third Party Access.

We will carry on pursuing stronger relationships with our stakeholders who can play an imperative role alongside businesses to collectively embark on sustainability endeavours in this increasingly interconnected marketplace.

PROGRESSING AHEAD

PETRONAS has been adapting well to the challenges of the industry's present-day realities, while staying focused on strengthening trust amongst our stakeholders as we pursue our Vision as a leading oil and gas multinational of choice. As energy remains a vital resource to facilitate developments across a myriad of industries to meet the needs of a growing global population, we will continue to leverage on technology to create a competitive advantage, turning numerous challenges into opportunities. We will continue to redefine the concept of value creation in the way we carry out our business activities, on the back of a dynamic world-class work culture.

Sustainability to us is a journey, and while PETRONAS has attained notable achievements over the years, we are actively exploring avenues to step a notch higher. In this regard, we will be embarking on an internal initiative to reassess our sustainability aspirations. It is likely that our resilience would be tested yet again as the global economy continues to face numerous challenges on the path towards a sustainable recovery. Nonetheless, PETRONAS will be ready to rise above adversities, with sustainability at the core of our business culture.

**DATUK WAN ZULKIFLEE WAN ARIFFIN**

President and Group Chief Executive Officer

SUSTAINABLE DEVELOPMENT IN PETRONAS

The projected rise in global population along with growing urbanisation and socio-economic developments collectively increased the global energy demand. Crude oil and natural gas will remain as a significant portion of the global energy mix. Global economic activity is forecasted to remain below trend at 3.4 per cent in 2017, with improved performance of emerging markets and developing economies. Oil prices are expected to remain volatile in the coming year due to uncertainty regarding the implementation of production cuts announced by Organisation of the Petroleum Exporting Countries (OPEC) and non-OPEC countries in late 2016.

PETRONAS responded to these challenges through many initiatives, ranging from organisational restructuring to eliminating redundancy and reducing expenditure. Ongoing efforts include a greater focus on cost cutting, improving cash generation and ensuring successful delivery of key projects. Doing so while capitalising on our pool of dedicated, empowered and accountable workforce to turn aspirations into achievements. These initiatives are further elaborated in the 2016 Group Annual Report.

This report focuses on our response in managing Environment, Social and Governance (ESG) matters, guided by the PETRONAS Code of Conduct and Business (the CoBE), PETRONAS Policies, Standards and Guidelines, as well as the CSF which outlines nine Key Result Areas (KRA)*.

Note: * The KRAs are described on page 10

A summary of ESG issues that were identified in the oil and gas industry are as follows:

ENVIRONMENT

- Environmental risks related to climate change and fresh water use may result in water scarcity which is a threat to long-term viability of energy projects.**

SOCIAL

- Increasing demand and requirements from stakeholders on social performance matters with rising concerns on human rights and community wellbeing.**
- Maturing facilities and assets that require proper late field life management to ensure continued safe operations.**
- Geopolitical issues and political unrest affecting security of supply.**

GOVERNANCE

- Business transparency and corporate governance to address stakeholders' demand for a transparent, fair and corruption-free business environment.**

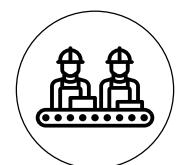
In responding to the ESG issues, a holistic management approach is embedded in our businesses and operations to ensure sustainability in PETRONAS. We do this by strengthening our existing governance mechanisms, leveraging on technology, rethinking talent, and contributing to socio-economic growth wherever we operate while creating a new cultural experience for the PETRONAS workforce.

Our approach on SD encompasses the following:



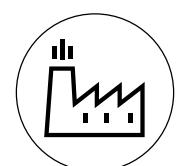
GOVERNANCE

Corporate Sustainability Council (CSC) guides the overall management and integration of sustainability in PETRONAS



INSTITUTIONALISATION

Ongoing capability development and robust systems and processes



INDUSTRY AFFILIATION

PETRONAS is a member of several industry associations and supports key relevant events to spur knowledge development

PETRONAS CORPORATE SUSTAINABILITY FRAMEWORK

Sustainable Development (SD) to PETRONAS means meeting the world's growing energy needs in a responsible manner, by balancing the economic, environmental and social needs of our stakeholders, guided by sound governance and ethical business practices. It is about creating long-term stakeholder value thus ensuring present and future business relevance.

Sustainability is guided by Corporate Sustainability Framework (CSF) which delineates the areas in which we have a role to play in managing our risks and impacts, and leveraging on our strengths to contribute to SD.

In 2016, a review exercise of the Framework was concluded involving multidisciplinary stakeholder engagements across the Group to better position our sustainability aspirations with the evolving external landscape.

The CSF was enhanced from seven KRAs to nine, to include ecosystem services under the environmental dimension. The previous social dimension was given further focus on human rights, corporate social investment and workforce development. A new governance perspective was included to emphasise on good governance and business ethics.

CORPORATE SUSTAINABILITY COUNCIL

The Corporate Sustainability Council (CSC) is entrusted to spearhead and ensure that CSF is effectively implemented. It provides a platform to discuss matters related to sustainability practices and makes recommendations for implementation of corporate sustainability across PETRONAS. The Council meets on a quarterly basis.



Adif Zulkifli
Corporate Sustainability Council Chairman

 *Sustaining growth as an oil and gas company amidst an era of low oil prices, emerging global climate change policies and cost competitive renewables, will be our greatest challenge. In response, PETRONAS will need to innovate the way we do things and explore new opportunities to sustainably produce affordable and reliable energy.*



NINE KEY RESULT AREAS

1. SHAREHOLDER VALUE

Fulfilling our responsibility as a business entity to deliver returns to our shareholders through the long-term creation of economic value.

2. NATURAL RESOURCE USE

Promoting optimum use of hydrocarbons and water in our operations through efficient processes and application of technology.

3. CLIMATE CHANGE

Recognising our corporate responsibility as a key player in the global energy sector to balance the issue of climate change with the challenge of sustainably producing affordable and reliable energy.

4. BIODIVERSITY AND ECOSYSTEM SERVICES

Ensuring projects and operations do not have significant effect on biodiversity and local ecosystems.

5. HEALTH, SAFETY AND ENVIRONMENT

Ensuring our facilities, products and services are in accordance with all legal requirements and industry best practice to safeguard the health, safety and wellbeing of our employees, contractors, communities, and the local environment.

6. GOVERNANCE AND BUSINESS ETHICS

Safeguarding the organisation's integrity and trustworthiness in delivering value through strong governance mechanisms and ethical business practices.

7. HUMAN RIGHTS

Respecting internationally-recognised human rights in our areas of operations, complying with our code of conduct and business ethics and all legal requirements.

8. CORPORATE SOCIAL INVESTMENT

Investing in sustainable initiatives as a socially-responsible company in line with our mission to contribute to the wellbeing of society.

9. WORKFORCE DEVELOPMENT

Equipping workforce with the skills and mindset to deliver sustained high performance.

ABOUT THIS REPORT

This report covers entities where PETRONAS has operational control in our businesses of oil and gas production, in Malaysia and internationally, unless otherwise stated. Sustainability performance data are collated through a centralised PETRONAS data management system.

The content of this report is based on the outcome of yearly review of material sustainability matters. The internal review process conducted took into consideration current industry challenges, emerging global trends on SD and our focused areas. Typically, regular and timely engagements enable PETRONAS to share updates as well as obtain viewpoints from our stakeholders to determine current areas of concern and key priorities.

MATERIAL SUSTAINABILITY MATTERS

PETRONAS has identified a total of 11 material sustainability matters, mapped against the Environment, Social and Governance (ESG). Information related to each of these matters are presented subsequently in this report supported by disclosure on management approach, performance data, and selected key initiatives implemented to institutionalise material matters.

OUR INTERNAL REVIEW PROCESS

Step 1: Review

Review sustainability matters, findings from several internal and external sources and outcome of a benchmarking exercise

ENVIRONMENT

- Climate Change
- Water Management
- Environmental Performance

SOCIAL

- Occupational Safety
- Process Safety
- Occupational Health and Wellness
- Industrial Hygiene
- Product Stewardship
- Our People
- Social Performance
- Community Investment

GOVERNANCE

- Corporate Governance and Business Ethics
- Health, Safety, Security and Environment Governance

The above material sustainability matters were derived through engagements enabling PETRONAS to share updates as well as obtain viewpoints from our stakeholders to determine current areas of concern and key priorities.

STAKEHOLDER GROUPS

Customers and Consumers

ENGAGEMENT PLATFORMS

- Hotline
- Email queries

Employees and Trade Unions

- Townhall sessions
- Open dialogue among teams
- Intranet portal

Industry Associations and NGOs

- Engagement through business partnerships
- Leading working groups in industry associations

Shareholders, Financial Institutions and Investors

- Group Annual Report
- Email queries
- Media releases and/or briefings

Media

- Media releases and/or briefings

Local Communities

- Face-to-face meetings
- Various social events

Host Governments and Regulatory Authorities

- Participation in discussions
- Regular reports
- Face-to-face meetings

Business Partners, Suppliers and Service Providers

- Face-to-face meetings
- Audits
- Targeted forums
- Monitoring of contractual provisions

SUSTAINABILITY PERFORMANCE DATA

SAFETY	2012	2013	2014	2015	2016
NO OF FATALITIES	12	4	10	4	13
Employees	5	0	3	0	2
Contractors	7	4	7	4	11
FATAL ACCIDENT RATE (FAR)	3.91	1.23	3.03	1.02	3.53
Reportable Fatalities per 100 million man-hours					
LOST TIME INJURY FREQUENCY (LTIF)	0.39	0.24	0.19	0.20	0.26
No of cases per one million man-hours					
TOTAL RECORDABLE CASE FREQUENCY (TRCF)	0.68	0.4	0.64	0.63	0.57
No of cases per one million man-hours					
NO OF TIER 1 PROCESS SAFETY EVENTS	22	10	7	15	12
TOTAL RECORDABLE OCCUPATIONAL ILLNESS FREQUENCY (TROIF)	0.50	0.51	0.07	0.33	0.32
Illness per million working hours - employees					
ENVIRONMENTAL STEWARDSHIP	2012	2013	2014	2015	2016
TOTAL GREENHOUSE GAS EMISSIONS (millions tCO_{2e})	49.75	52.32	48.91	49.05	47.79
Upstream	28.9	31.79	29.54	29.38	29.8
Downstream	15.36	15.17	14.79	15.22	13.43
MISC Bhd	5.49	5.36	4.58	4.45	4.56
TOTAL FRESH WATER WITHDRAWAL (million cubic metres per year)	49.94	48.89	50.47	52.26	56.5
Upstream	2.23	2.17	2.93	3.71	3.1
Downstream	47.71	46.72	47.54	48.55	50.8
MISC Bhd, KLCCP Staples Group, PETRONAS Leadership Centre					2.58
TOTAL AMOUNT OF ENERGY GENERATED FROM SOLAR PV INSTALLATIONS IN MALAYSIA (megawatt-hours)	830	1,662	14,782	14,902	14,188
NO OF HYDROCARBON SPILLS TO THE ENVIRONMENT OVER ONE BARREL (BBL) (one bbl is equivalent to 159 litres)	-	24	25	25	27
TOTAL NITROGEN OXIDES EMISSIONS (metric tonnes)	-	85,496	100,915	154,128	133,801
TOTAL SULPHUR OXIDES EMISSIONS (metric tonnes)	-	63,721	61,698	86,814	72,134
TOTAL DISCHARGES TO WATER (metric tonnes of hydrocarbon)	-	992	992	680	534
TOTAL HAZARDOUS WASTE DISPOSED (metric tonnes)	-	-	26,974	29,280	32,355

Note:

1) Efforts are ongoing to achieve higher accuracy in data accounting.

2) Variances in safety and environment data reported previously is resulted by ongoing enhancements to data management practices, including accounting methodology.

SUSTAINABILITY PERFORMANCE DATA

OUR WORKFORCE	2012	2013	2014	2015	2016
TOTAL NUMBER OF EMPLOYEES	46,145	49,193	50,949	53,149	51,034
BREAKDOWN OF EMPLOYEES (%)					
Malaysian	79	78	79	80	80
Others	21	22	21	20	20
CONTRACT TYPE (%)					
Permanent	84	82	85	83	85
Contract	16	18	15	17	15
GENDER DISTRIBUTION (%)					
Male	73	72	72	72	72
Female	27	28	28	28	28
EMPLOYEES ABOVE AND BELOW AGE OF 35 (%)					
Above 35	48	44	46	47	46
Below 35	52	56	54	53	54
NO OF NEW HIRES	5,428	3,699	3,541	4,078	2,932
(core business in Malaysia)					
Malaysian	4,864	3,380	3,198	3,781	2,667
Other Nationals	564	319	343	297	265
NO OF GROUPWIDE TECHNICAL EXPERTISE					
Technical Authorities (TAs)	125	163	276	499	325
Technical Professionals (TPs)	613	673	736	825	815
Technical Trade Specialists (TTs)	114	126	144	297	198
WOMEN IN TECHNICAL POSITIONS (%)	14	14	14	14	12
TOTAL ATTRITION RATE BASED ON NO OF EMPLOYEES (%)	5.9	6.5	5.7	5.9	7.3*
Male	5.2	6.1	5.3	5.5	7.1
Female	7.6	7.4	6.7	7	8
NO OF STAFF UNDER COLLECTIVE BARGAINING AGREEMENTS	10,260	10,684	8,954	9,651	8,616
NO OF PETRONAS SCHOLARS RECRUITED (%)	563	432	250	351	365
Recruited by PETRONAS	63	75	47	51	50
Recruited by Others	37	25	53	49	50
NO OF SCHOLARSHIPS AWARDED TO MALAYSIANS (%)	318	329	337	326	375
International Universities	25	41	44	42	38
Malaysian Universities	75	59	56	58	62
NO OF SPONSORED NON-MALAYSIANS					
Universiti Teknologi PETRONAS (UTP), Malaysia	290	255	257	191	147

Note: Efforts are ongoing to achieve higher accuracy in data accounting.

* Attrition due to resignation, separation & termination

SUSTAINABILITY PERFORMANCE DATA

TOTAL NO OF MALAYSIAN & HOST COUNTRY NATIONALS (HCN) IN SELECTED COUNTRIES - 2016	NO. OF EMPLOYEES	HCN	MALAYSIANS	OTHER NATIONALITIES
Indonesia	387	361	25	1
Myanmar	346	268	74	4
South Africa	3,355	3,305	9	41
Turkmenistan	562	456	75	31

Note: Efforts are ongoing to achieve higher accuracy in data accounting.

LOCAL PROCUREMENT - 2016	LOCAL COMPANIES (MALAYSIAN)	FOREIGN COMPANIES (NON-MALAYSIAN)
PERCENTAGE (%) OF SPEND VALUE AWARDED FOR JOBS IN MALAYSIA	63	37

Note: Efforts are ongoing to achieve higher accuracy in data accounting.

Section Two

ENVIRONMENT

CONTENT

- 17 Climate Change
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- 23 Water Management
- 24 Environmental Performance
- 26 FEATURE: Instilling Environmental Awareness



PETRONAS' operations are premised on robust governance mechanisms to uphold environmental protection in all that we do. In doing so, we stay committed to our HSE Policy and complying to regulatory requirements wherever we operate, while keeping abreast of industry best practices.

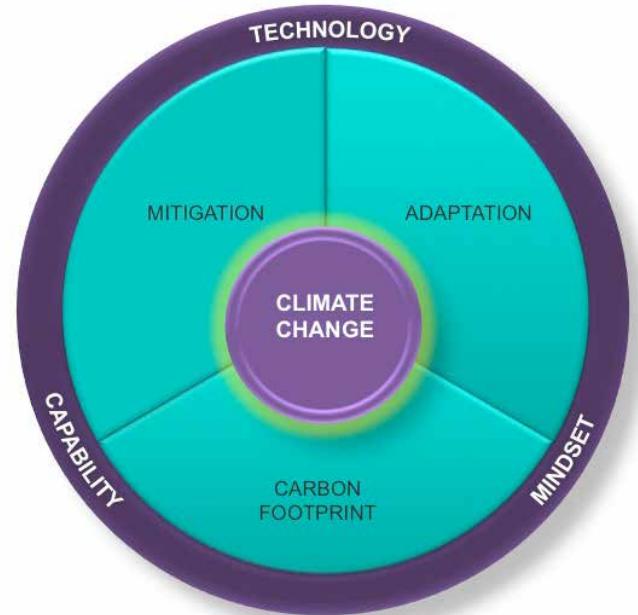
The underlying aim being to sustainably uphold operational excellence across our business value chain. This includes the prudent use of natural resources.

CLIMATE CHANGE

World leaders at the United Nations Framework Convention on Climate Change (UNFCCC) ratified the Paris Agreement in 2016, which provides the foundation for climate change mitigation and adaptation actions. The oil and gas industry will play an important role in meeting this climate challenge by exploring low-emission pathways to meet the world's growing energy demand.

PETRONAS Position Statement and Framework on Climate Change, as well as prudent risk management, steer holistic and innovative climate actions in adapting to the new low-carbon energy landscape. Efforts to lower our carbon footprint are driven by PETRONAS Carbon Commitments which include reducing flaring and venting as well as improve energy efficiency wherever we have operational control. Our Position Statement, Framework and Carbon Commitments apply to all our domestic and international operations.

Within Malaysia, we collaborate with the Government to improve the national Greenhouse Gas (GHG) inventory, as well as lead the development of the climate mitigation roadmap for Malaysia's oil and gas sector in support of the Nationally Determined Contribution (NDC) ambition. PETRONAS advocates the use of natural gas as a low-carbon fuel in the power sector to reduce Malaysia's national electric grid emissions, which in turn will further promote the transition towards a low-carbon economy.



PETRONAS CLIMATE CHANGE FRAMEWORK



PETRONAS AT COP 22

PETRONAS participated in the UNFCCC Conference of Parties (COP 22) in Morocco, highlighting how natural gas can play an important role in securing a low carbon future, as well as PETRONAS' climate actions as a responsible company.



PETRONAS' Position Statement on Climate Change

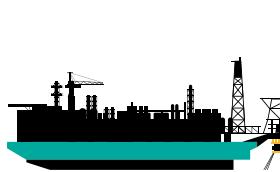
We duly recognise our corporate responsibility as a player in the global energy sector to balance the issue of climate change with the challenge to sustainably produce affordable and reliable energy.

CLIMATE CHANGE

CLIMATE ACTIONS

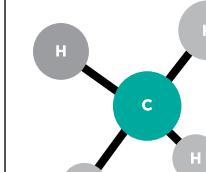
PETRONAS climate actions are geared towards reducing GHG emissions through the delivery of operational excellence, in support of our business strategies.

OPERATIONAL EXCELLENCE



1 PROMOTING NATURAL GAS AS A LOW CARBON FUEL

PETRONAS advocates the use of natural gas as a solution in the transition pathway towards a low carbon economy. In pursuit of the ambition to position PETRONAS as a leading global LNG player, we embarked on building the PFLNG SATU, a custom-built floating LNG facility which will unlock value from gas reserves which cannot be economically monetised through conventional means.



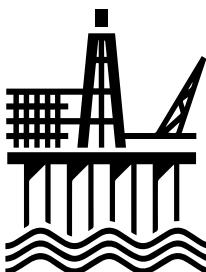
2 REDUCING METHANE EMISSIONS IN OPERATIONS

The PETRONAS Carbon Commitments were designed to implement zero continuous venting for all Upstream assets in Malaysia with more than 20 years life span which will reduce methane emissions in old assets inherited from other operators. In addition, enhanced leak detection and repair programmes in Upstream and Downstream operations have managed to reduce fugitive methane emissions too.



3 IMPROVING ENERGY EFFICIENCY IN OPERATIONS

PETRONAS Energy and Loss Management System (ELMS) was developed to monitor and subsequently improve energy utilisation in the Downstream operations to reduce GHG emissions. In addition, we also have cogeneration plants and district cooling systems which improve energy efficiency. Our cogeneration plants in Malaysian operations have a total installed capacity of 510 Megawatts (MW) that produce steam at a higher efficiency and displace electricity from the grid. Our district cooling systems have a total licensed capacity of 117 MW which supply chilled water to office and government buildings in Malaysia.



4 MINIMISE FLARING WHERE ECONOMICALLY FEASIBLE

The reduction of continuous flaring is a key aspect within the PETRONAS Carbon Commitments. All new facilities are designed according to the zero continuous flaring philosophy.



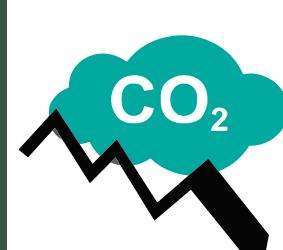
5 DELIVERING FUEL EFFICIENCY IN PRODUCTS

The development of fuel saving products such as PETRONAS Dynamic Diesel Euro 5, PETRONAS Syntium with CoolTech™ and PETRONAS Primax 97 has provided superior efficiency to maintain engine power, resulting in more efficient use of fuel and GHG emissions reduction.

CLIMATE CHANGE

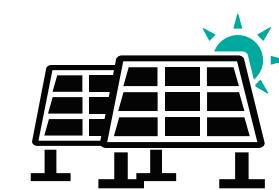
Leveraging on our operational excellence practices, PETRONAS will continue to create innovative solutions to adapt to the new low-carbon energy landscape and secure a competitive edge.

COMPETITIVE EDGE



1 INVESTING IN LOW CARBON SOLUTIONS

PETRONAS believes technology is a key differentiator which will deliver growth and sustainability. PETRONAS is investing in research and development of Carbon Capture, Utilisation, and Storage (CCUS) technologies in high CO₂ field development. We are collaborating with a technology research company to undertake research and development in CO₂ utilisation technologies to convert CO₂ into chemical products.



2 EXPLORING RENEWABLE ENERGY

Our largest renewable energy project is a 10 MW solar photovoltaic (PV) Independent Power Producer (IPP) project, located in the East Coast of Peninsular Malaysia. We also own solar PV demonstration projects located at the rooftop of Suria KLCC shopping complex and the Solaris Serdang and Putra retail stations in Peninsular Malaysia, which have displaced electricity from the grid since early 2013.



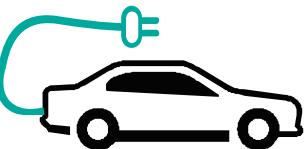
3 FACTORING CARBON PRICE INTO DECISION MAKING

An internal carbon price is applied to assess impacts of emerging climate legislation as well as deliver an optimum design for operations and projects. A higher carbon price is applied in developed countries as compared to developing countries to differentiate the potential financial risk associated with progress in carbon tax and carbon pricing mechanisms. PETRONAS continuously enhances capability in carbon footprint assessment for project personnel to manage our potential carbon liability.



4 ADAPTATION TO CLIMATE CHANGE

We have been enhancing our knowledge in climate science by gathering and analysing climate data, to better understand PETRONAS' adaptive capacity. A pilot vulnerability assessment is being undertaken to provide further insight into our vulnerability to climate change at our areas of operation, and to develop resilience against the potential impacts.



5 SUPPORTING INNOVATION IN THE TRANSPORT SECTOR

PETRONAS is the first oil and gas company in Malaysia to provide electric vehicle (EV) charging facilities to our retail stations, in support of the Malaysian government's National Electric Mobility Blueprint. Three EV charging facilities were commissioned during 2016 and additional facilities are planned for 2017.

CLIMATE CHANGE**CARBON FOOTPRINT**

Our carbon footprint is reported on an operational control basis and extends to our Upstream Business in Mauritania, Myanmar, Turkmenistan, Vietnam, Ireland and Indonesia; and Downstream Business in Argentina, Belgium, Brazil, China, Italy, South Africa and Spain. There were no new international operations added to our carbon footprint in 2016. We continuously enhance and align our carbon footprinting practices according to international industrial guidelines developed together with IPIECA (the global oil and gas industry association for environmental and social issues) in the Climate Change Working Group.

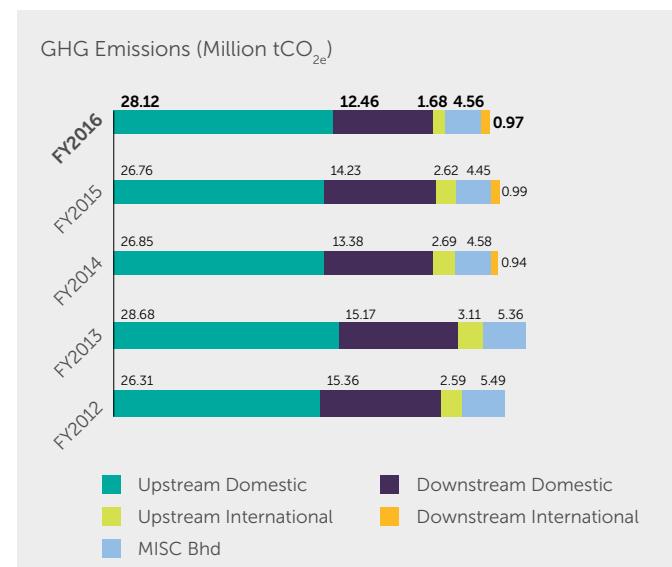
In 2016, PETRONAS' GHG emissions for the Group totalled at 47.79 million tCO_{2e}, which is three per cent lower compared to the previous year. Of this, more than 80 per cent was attributed to our Malaysian operations, while the remaining was from international operations. Direct GHG emissions were the major contributor to the carbon footprint and indirect emissions were insignificant as most of the energy used in our operations is generated internally. The primary GHG reduction was achieved from flare reduction and improved plant reliability supported by ongoing energy efficiency initiatives.

Upstream Domestic GHG emissions increased by five per cent compared to 2015, primarily due to an increase in overall production and commissioning of new offshore facilities. Upstream International GHG emissions reduced by 36 per cent compared to 2015, mainly contributed by reduced flaring in our Turkmenistan operations following the decommissioning of the Mobile Offshore Production Unit.

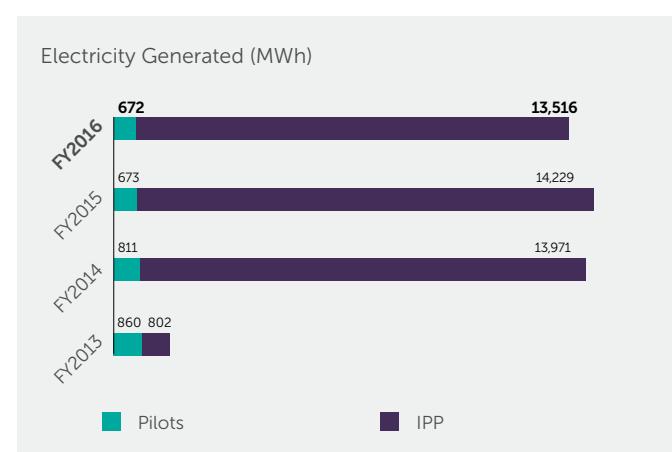
Downstream Domestic GHG emissions reduced by 12 per cent compared to 2015 as a result of flare gas recovery at PETRONAS Gas Berhad (PGB) and improved plant reliability at PETRONAS Chemicals Group Bhd (PCG).

RENEWABLE ENERGY

Our 10 MW solar PV Independent Power Producer (IPP) project in Gebeng, Malaysia, produced 13,516 MWh, resulting in a reduction of 9,245 tCO_{2e}. The Suria KLCC shopping complex and the Solaris Putra and Serdang retail stations (pilots) in Peninsular Malaysia generated 672 MWh of solar energy, displacing 459 tCO_{2e} GHG emission reductions from the grid.

GHG EMISSIONS FOR 2016

Note: 2013, 2014 and 2015 GHG data were revised based on upgraded GHG accounting software and enhanced GHG emission factors.

PETRONAS SOLAR ENERGY PROJECTS

Note: The Solar IPP project was only in operation for a two month period during 2013.

KEY HIGHLIGHTS OF INITIATIVES TO REDUCE GHG EMISSIONS**MINIMISE FLARING****ACHIEVING ZERO CONTINUOUS FLARING ONSITE IN PENINSULAR**

260 km offshore Peninsular Malaysia, PETRONAS Carigali has successfully reduced eight mmscfd of continuously flared hydrocarbon gases. This has approximately reduced 222,000 tCO_{2e} per year.

IMPROVING ENERGY EFFICIENCY**ENERGY MANAGEMENT SUCCESS AT PETRONAS CHEMICALS OLEFINS**

PETRONAS Chemicals Olefins Sdn Bhd reduced flaring by conducting a comprehensive evaluation of the overall fuel gas system, and subsequently modified its plant processes to allow the surplus fuel gas to be distributed to surrounding plants. In addition, excess steam generated by PC Olefins was re-routed to PC Derivatives where it is used for process heating. PC Olefins energy management strategies helped to reduce energy consumption by 1,200,000 GJ and GHG emissions by 81,000 tCO_{2e}, equivalent to removing approximately 17,000 cars off the roads annually*.

*As calculated using the United States Environmental Protection Agency's GHG Equivalencies Calculator.

RENEWABLE ENERGY SOLUTIONS**SOLAR PHOTOVOLTAIC IN ITALY**

Arexons, a leading manufacturer and marketer of "car care and multipurpose lubricant products" and a division of PETRONAS Lubricants International (PLI) in Italy, embarked on the installation of a solar photovoltaic (PV) system. The PV system generates a power output of 440 kW – equivalent to 30 per cent of the energy used by the plant. The energy saved in 2016 was 261 Megawatt-hour (MWh), which is equivalent to reducing 123 tCO_{2e} GHG emissions.



FEATURE: INTERVIEW WITH DZAFRI SHAM AHMAD

THE CLIMATE CHALLENGE AND OUR OPPORTUNITY FOR CHANGE – MALAYSIA AND BEYOND

The Paris Agreement is an accord within the United Nations Framework Convention on Climate Change dealing with GHG emission mitigation and adaptation starting in 2020. An ambitious target has been set to curb increases in global average temperatures to well below two degree Celsius above pre-industrial levels and to pursue efforts to limit this to 1.5 degree Celsius and ultimately net-zero GHG emissions by 2100.

Many are looking towards PETRONAS as an international oil and gas producer and how we respond to the growing climate challenge. Dzafri Sham Ahmad, Vice President of Group Health, Safety, Security & Environment (GHSSE) sits down to address some of the key concerns related to climate change.

WHAT ARE THE IMPLICATIONS OF THE PARIS AGREEMENT ON PETRONAS?

The Paris Agreement will impact our operations globally, which may vary depending on location. Transition to a low-carbon economy, coupled with strengthening climate legislation, will potentially pose a significant financial and reputational risk.



opportunity for everyone to change, as it paves the way for us to move into the low-carbon economy. We will, for instance, continue developing and marketing our natural gas as a low-carbon fuel to the world as we explore further in renewable energy. Our investment in research and development projects has sparked development of low carbon solutions in recent years.

HOW WILL PETRONAS ADDRESS CLIMATE CHANGE RISKS?

There are many aspects to the climate change risks ranging from more stringent legislation of host countries and stakeholder demands to extreme weather events and our capacity in addressing them. However, we acknowledge that failure to embrace climate risks at an early stage may potentially lead to the risk of limiting business growth.

Therefore, PETRONAS has a robust enterprise risk management system to continuously monitor and manage these risks. We will continue to enhance our systems and processes, including GHG monitoring, reporting

WOULD YOU LOOK AT THE PARIS AGREEMENT AS AN OPPORTUNITY OR CHALLENGE?

The Paris Agreement brings with it a new found commitment to address climate change within the global community. PETRONAS sees this as an

and verification, as well as, further strengthen our climate mitigation and adaptation initiatives and be prepared to develop a competitive edge and build our business resilience.

HOW WILL PETRONAS BALANCE THE ISSUE OF CLIMATE CHANGE WITH THE CHALLENGE TO SUSTAINABLY PRODUCE AFFORDABLE AND RELIABLE ENERGY?

Industrial consensus indicates that fossil fuels will still play a significant role and remain competitive in meeting the world's growing energy demands. Finding a balance to address climate change and fulfill energy demand will be challenging. We will continue to promote natural gas as a low-carbon fuel with the lowest GHG emissions which can complement renewables in the journey towards net-zero emissions.

We acknowledge the changing energy landscape, and emphasise "Technology as a Key Differentiator" to embrace innovation and align our business model to deliver affordable, reliable energy.

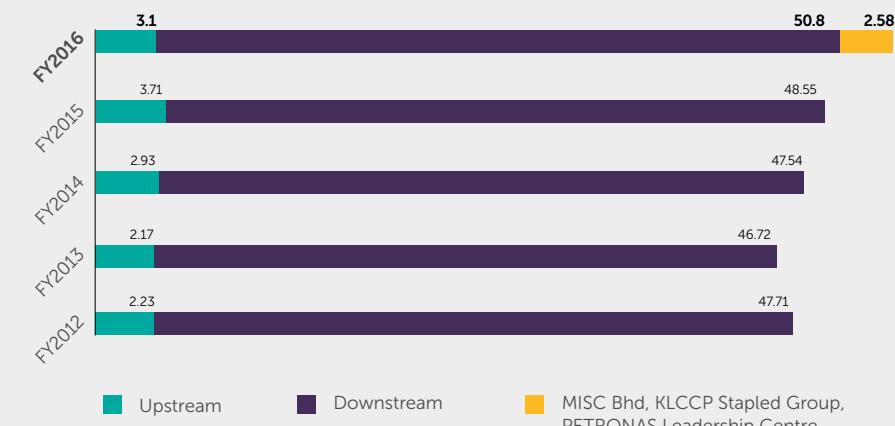
WATER MANAGEMENT

Water is a key commodity across multiple industries, and an essential resource of daily life. Recent changes in weather patterns, amongst others, impose a growing risk to water availability.

Efficient water management practices are fundamental for continued business growth. PETRONAS has in place water management strategies to support operational needs, which are gradually enhanced year-on-year. Our aim is to further elevate our water and wastewater management system towards reducing consumption, optimising usage as well as minimising discharge volume. This entails conducting Water Risk Assessments to identify, evaluate and address water stress levels as well as changes in fresh water management practices. In 2016, efforts were strengthened to streamline water practices across our operations. Additionally, the PETRONAS Produced Water Commitment was established for offshore operations.

PETRONAS FRESH WATER WITHDRAWN BY BUSINESS

million cubic meters



FRESH WATER WITHDRAWAL

Total fresh water withdrawn in 2016 stood at approximately 56.5 Mm³ for Malaysian and international operations. The Downstream Business constituted 50.8 Mm³ encompassing gas processing, petrochemical and refining. Whereas the remaining 3.10 Mm³ and 2.58 Mm³ were attributed to the Upstream Business and non-process facilities, respectively.

BOILER FEED WATER (BFW) RECOVERY

PETRONAS Chemical Olefins, Glycol and Derivatives (PCOGD) plant generated cost savings of RM1.37 million through the recovery of boiler feed water at a rate of 20 metric tonnes per hour. This was achieved by strengthening and improving its water management practices.

WATER SUPPLY SPIN-OFFS

PETRONAS' water supply facilities in Malaysia not only supports our operational needs, but also creates shared value for local communities. This includes the Bekalan Air KIPC Sdn. Bhd. (BAKIPC) and Raw Water Supply Project (PAMER) Phase 1.

JOHOR

PAMER Phase 1 will supplement the needs of the Pengerang Integrated Complex (PIC), while adding to the State's existing water supply for public consumption.



APPROXIMATELY 30 MILLION LITRES OF RAW WATER PER DAY FOR PUBLIC CONSUMPTION

TERENGGANU

PETRONAS handed over operations of BAKIPC to the State Government in 2016. It was constructed and operated by PETRONAS for nearly two decades.



PRODUCTION CAPACITY OF APPROXIMATELY 230 MILLION LITRES OF TREATED WATER PER DAY

ENVIRONMENTAL PERFORMANCE



PETRONAS governs environmental performance in the areas of spills, waste generation, effluent discharge, and air emissions. The primary intent is to elevate operational excellence throughout the life cycle of our activities, covering development, operations and decommissioning phases.

SPILLS TO THE ENVIRONMENT

PETRONAS takes a planned preventive maintenance approach to prevent spills at the source and ensure asset integrity. This covers monitoring and analysing to proactively prevent, manage and reduce spills.

In 2016, we fortified our oil spill response assessment criteria and developed an internal assessment framework in line with industry best practices such as IPIECA and the International Maritime Organisation (IMO). A pilot assessment was carried out in Malaysia, with implementation scheduled in 2017.

There were 27 spills in 2016 with the total estimated volume of hydrocarbon spills of 174 m³, two per cent lower than the previous year.

WASTE MANAGEMENT

In 2016, PETRONAS generated approximately 111,041 metric tonnes of hazardous waste, mainly from turnarounds and operational improvement activities at MISC Bhd and PETRONAS Penapisan (Melaka) Sdn Bhd (PP(M)SB), as compared to 78,685 metric tonnes of hazardous waste in 2015. Of this, around 83 per cent of the waste was recycled and recovered, and the remaining was disposed at approved licensed facilities. Waste characterisation is currently ongoing and a centralised database for waste card is ready for pilot testing at PETRONAS Gas Berhad (PGB).

EFFLUENT DISCHARGE

In 2016, PETRONAS recorded improvements in the controlled discharge of oil to water at 534 metric tonnes, compared to 680 metric tonnes in 2015. The reduction was partly due to improved produced water treatment system efficiency.

AIR EMISSIONS

In 2016, the sulphur oxides (SOx) and nitrogen oxides (NOx) emissions from our operations were recorded at 72,134 and 133,801 metric tonnes, respectively. The SOx and NOx emissions decreased by 17 per cent and 13 per cent respectively. Works are ongoing to embark on a Volatile Organic Compound (VOC) inventory programme, as well as develop a long-term mitigation plan.

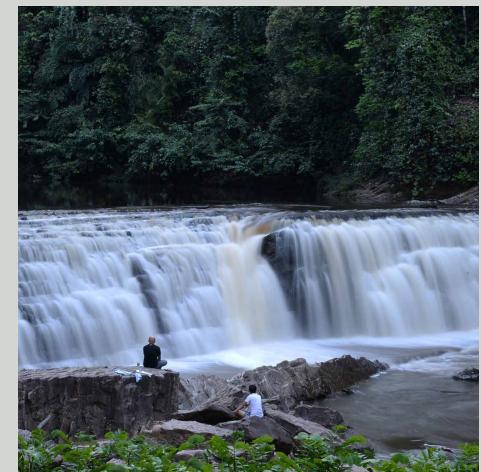
ENVIRONMENTAL PERFORMANCE

BIODIVERSITY AND ECOSYSTEM SERVICES

PETRONAS HSE Policy states the requirement to protect the environment and use natural resources sustainably. The Biodiversity and Ecosystem Services Risk Assessment (BESRA) was developed in 2015, which provides PETRONAS with a better understanding of issues surrounding Biodiversity and Ecosystem Services (BES).

From 2015 to 2016, eight locations in Malaysia were assessed and analysed using BESRA. The assessments identified the risks of the operations to BES and management plans were developed to mitigate the risks at site. The assessments also increased the awareness on BES internally through engagements with project staff during BESRA execution. For future work planning, BESRA will emphasise on mitigation hierarchy of "avoidance-minimisation-offset" in order to enhance BES management in operations and activities.

ONGOING SEVERAL PROGRAMMES TO NURTURE KNOWLEDGE ON THE IMPORTANCE OF BIODIVERSITY AND CONSERVATION.



IMBAK CANYON: A MEDICINAL TREASURE

PETRONAS' partnership with Yayasan Sabah for the Imbak Canyon Conservation Area (ICCA) entered its sixth year during the year. ICCA, is a 25-km long valley in central Sabah, and hemmed in on three sides by sandstone ridges.

PETRONAS has contributed RM83 million under the conservation partnership, including RM77 million for the development of the Imbak Canyon Studies Centre (ICSC). The Centre serves as ICCA's focal point for learnings on biodiversity conservation and sustainable use of natural resources, as well as on gene bank conservation and exploration for pharmaceutical and biotechnology potentials. The Centre's physical construction was completed end of 2016.

A number of awareness programmes were conducted for our key stakeholders in ICCA. Efforts were also underway to determine ICCA's carbon sequestration value, as well as conduct HSE assessments on ICSC facilities.

ECO MARINE CONSERVATION PROJECT

PETRONAS strives to protect the Miri-Sibuti Coral Reefs National Park in Sarawak together with the Sarawak Forestry Corporation. This RM8 million project is expected to last five years with the park covering an area of 186,930 hectares and is Malaysia's second largest Marine National Park. The focus is to regenerate and enhance Sarawak's marine biodiversity that was largely destroyed by illegal trawlers.

550 artificial reef balls have been deployed in 2016 at the project site, while the remaining units will be deployed over the next three years. These reef balls will deter fishing trawlers from the national park and protect the coral reefs in the area.



MELAKA REFINERY TURTLE CONSERVATION

This is a collaborative effort between PP(M)SB and state Department of Fisheries aimed at assisting the turtle sanctuary in its conservation efforts by ensuring more eggs can be protected and incubated in the sanctuary.

To date, we have contributed towards this initiative by conducting beach cleaning activities and rejuvenating the existing turtle nesting area that was built in 1990. The nesting area is the heart of the sanctuary where collected eggs are protected in a hatchery and incubated for two months until they are hatched. Participating in this collective effort are stakeholders such as local government authorities, and local community members and schools.

FEATURE: INSTILLING ENVIRONMENTAL AWARENESS

Efficient use of natural resources is a vital aspect of environmental sustainability. PETRONAS held a Groupwide Environmental Campaign themed 'Value Our Natural Resources, Less is More' in 2016 to:

- foster stronger environmental consciousness;
- raise greater awareness on the need for prudent use of natural resources; and
- promote innovation and sharing of best practices on environmental management.

The Campaign, complementing our HSE Policy and Corporate Sustainability Framework (CSF), focused on four areas, namely:



**WASTE
REDUCTION**



**ENERGY
CONSERVATION**



**WATER
CONSERVATION**



**VIRTUAL
COMMUNICATION**

The Campaign entailed timely sharing of fact sheets on our intranet portal citing the importance and benefits of managing natural resources efficiently. A competition was also held Groupwide to spur development of innovative solutions for conserving and managing natural resources in the four focus areas. Participating teams thus demonstrated feasibility of proposed initiatives to optimise, if not reduce the use of natural resources in our activities, outlining clear financial and non-financial benefits. Ideas derived were later cascaded Groupwide to encourage similar uptake.

A total of 43 entries were received, amounting to potential cost savings of about RM75 million. Approximately 70 per cent of the entries centred on operational improvement. The highest number of entries were on waste reduction, followed by water and energy conservation and virtual communication. Sustainability and long-term feasibility of initiatives were among the key judging criteria.

Four winning entries received the Excellence and Notable Awards under the Operational and Non-operational categories, respectively during a special ceremony, attended by top management personnel across the Group.



ENVIRONMENT CAMPAIGN WINNING STORIES

OPERATIONAL CATEGORY



**EXCELLENCE AWARD:
EVERY DROP COUNTS
-WATER CONSERVATION
IN PETRONAS GAS
UTILITIES KERTIH**

PETRONAS Gas Utilities Kertih embarked on a water conservation project by improving its operational efficiency of Brine Reverse Osmosis (BRO), which is used to recycle reject-water at the plant. Several attempts were made to reinstate the BRO efficiency which were not sustainable in terms of high operational costs for cleaning and replacement, chemical usage and manpower, as well as wastage of water. The project's final selection of a new membrane technology through root cause and failure analysis (RCFA), led to improvement of cleaning efficiency by 40%. The new membrane is able to deliver high quality permeate water, with low capital and operational costs. The performance of the BRO rides on the existing operational tracking system to ensure its effectiveness and proper maintenance programme. The project led to reduced non-beneficial consumptive losses (water, chemical, manpower) and pollutant loads from waste/wastewater to the receiving environment. The estimated water savings from the project is equivalent to water consumption for 3,000 houses per month for the communities within the vicinity with cost savings of over RM1 million per year.

**NOTABLE AWARD:
ENERGY SAVING INITIATIVE IN PETRONAS CARIGALI, TERENGGANU CRUDE OIL TERMINAL (TCOT)**

PETRONAS Carigali, TCOT embarked on an energy efficiency journey to reduce electricity consumption through process simplification and operational practices optimisation. High electricity consumption in TCOT has led to high operational cost, and GHG release to the environment. TCOT identified and assessed high energy consumption (hot-spots) in process and non-process areas, and thereafter introduced new operating philosophies without compromising its operational integrity.

Non-process area philosophies include changing to LED lights, minimum or no usage of lights during day time, fixed lights and air conditioning off timing at designated section, standardised air conditioning temperature and mode, and re-evaluation of tariff scheme. For process areas, TCOT evaluated and optimised its equipment back-up and train operational philosophies in high load areas. TCOT also looked at fire water management without compromising its safety and functionality. These new operating philosophies in TCOT have resulted in an average monthly reduction of energy and electricity bills by 23 per cent and 18 per cent, respectively, with cost saving of RM600,000 per year.

NON-OPERATIONAL CATEGORY



**EXCELLENCE AWARD:
PAPERLESS PROCUREMENT
IN PUTRAJAYA HOLDINGS**

Putrajaya Holdings (PJH) introduced a digital Tender (eTD) and Contract Document (eCD) to replace the printed hardcopy documents during the tendering and contracting period. The eTD are digital documents presented in PDF format, with an interactive digital forms for automated calculation of bill of quantities and schedule of rates, which eliminates arithmetical check and inking process. The features improve effectiveness of tender preparation and evaluation by the bidder and the client, respectively. The eCD are digital contract documents, scanned images of the conventional hardcopy version into PDF format. The transition into digital documents leads to reduction in printing costs and paper, ease of transaction of documents, facilitates instant retrieval and access of tender documents, and saves floor space and storage rental costs. In just 1.5 years, the initiative achieved savings of approximately RM500,000 of cost and 10.5 tonnes of paper, respectively.

**NOTABLE AWARD:
PAPER WASTE REDUCTION, PETRONAS INDONESIA OPERATIONS**

PETRONAS in Indonesia reduced paper in its day-to-day business activities by elevating awareness amongst employees and behaviour change to be more conscious towards reduce, reuse and recycle. The initiative started with displaying paper consumption trends in the departments as a baseline, monitoring of paper consumption patterns with trigger announcement to maintain a high level of awareness. Other efforts include provision of more efficient printers, controlled identification (ID) printing, and having facilities for collection of used paper. Papers were recycled and turned into books and stationeries for office usage. These initiatives led to approximately 50 per cent reduced paper consumption in one year, with 60 per cent savings in printing savings.

Section Three

S O C I A L

C O N T E N T

- 31 Occupational Safety
- 33 Process Safety
- 35 Occupational Health and Wellness
- 36 Industrial Hygiene
- 38 Emergency Preparedness and Response
- 39 Product Stewardship
- 42 Our People
- 44 Social Performance
- 46 Community Investments

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The social component of our report focuses on efforts to drive good health and safety performance. In addition to initiatives aimed at benefitting local communities, we anchor our endeavours on our mission of contributing to societal wellbeing, whilst respecting human rights.

OCCUPATIONAL SAFETY

Safety requirements and work practices in PETRONAS are governed through the PETRONAS Technical Standards (PTS) which are developed by Safety Technical Professionals. The Standards address, amongst others, safe systems, risk management processes, fire detection and protection systems and management of projects and contractors.

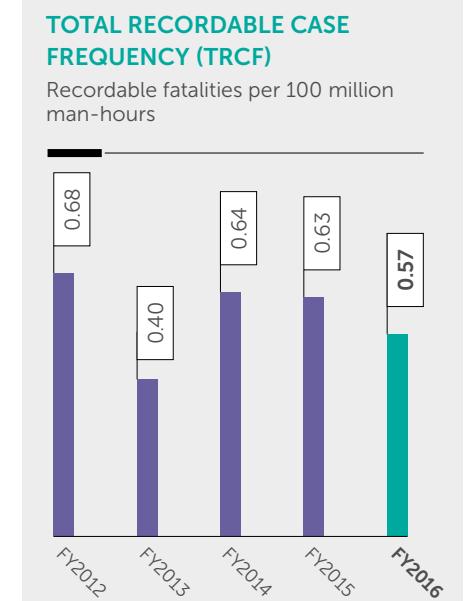
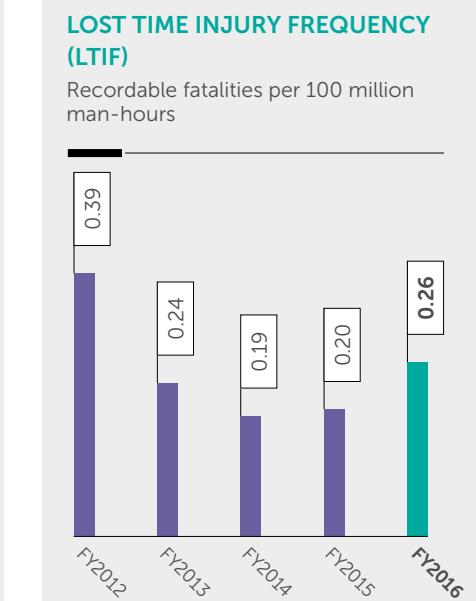
In 2016, several initiatives were undertaken to enhance safety performance at construction sites. For instance, a project safety induction video was standardised and made available in several languages. This is to ensure effective communication and consistent understanding of HSE requirements to our contractors who are of different nationalities. In collaboration with contractors, we piloted an Incident Injury Free (IIF) Programme at our Pengerang Integrated Complex (PIC), aimed at elevating accountability and safety leadership of supervisor and establishing coaching relationships amongst supervisors and workers to support elimination of unsafe act.

During the year under review, PETRONAS recorded a Fatal Accident Rate (FAR) of 3.53. Regrettably, 13 fatalities were recorded in 2016, the majority of which were attributed to incidents involving operation of vehicles/machinery and activities during project execution.



Dzafri Sham Ahmad
Vice President,
Group Health, Safety,
Security and Environment (GHSSE)

 Let us step back and ask ourselves this question – what can we do differently to ensure everybody goes home safely?



OCCUPATIONAL SAFETY

CONTRACTOR HSE MANAGEMENT

The involvement of contractors is vital in upholding HSE in our projects. Contractors are required to comply with PETRONAS HSE governance when performing their contractual obligations and tasks. PETRONAS specifies the HSE training programmes that each contractor must attend and also screens their HSE competency prior to awarding any contract and mobilisation to the work site. We also adopt a centralised system to track contractor HSE performance which is a key prerequisite to maintain validity as a PETRONAS registered contractor.

MANAGING LAND TRANSPORTATION

Safe driving and managing risks on the road is a top priority. In 2016, enhancements were made to the PTS to improve existing practices on Land Transportation Safety. Key changes to the PTS included segregation of requirements between light and heavy vehicles, and professional and normal drivers to ensure greater clarity in terms of standards and minimum requirements.

The PTS also addressed maximum driving or working hours and minimum rest time. It also incorporated the requirements on defensive driving skill to ensure safe long-distance driving for our people, where entities within PETRONAS are required to abide by host-country requirements or, in its absence, adopt standards set by the International Association of Oil and Gas Producers (IOGP).

PETRONAS continues to ensure best practices amongst our operating units (OPU) are shared and replicated when necessary to improve land transport safety. Ongoing programmes involving collaboration with businesses to conduct in-depth mapping to identify specific gaps that focus on "driver, journey, vehicle, and contractor", and develop tailored mitigation plans to close the identified gaps will continue in 2017.



DRIVING FROM THE TOP

In October 2016, PETRONAS' President and Group CEO led a Groupwide HSE Stand Down with the intent to reinforce safety across all levels of the Company to improve HSE performance and ensure that everybody goes home safely.

Key strategies discussed included encouraging incident reporting, adhering to ZeTo Rules and fortifying existing HSE culture in line with the PETRONAS Cultural Beliefs (PCB). At the same time, emphasis was placed on

grooming strong HSE leaders to own HSE and lead by example in moving towards a generative HSE culture.

The event involved Business Leaders sharing of key challenges and insights on improving HSE performance. Breakout sessions were held to provide opportunities for employees to contribute ideas in addressing the challenges shared by the Business Leaders. The outcome of the HSE stand down was used as an input to establish focused interventions to improve overall HSE performance.

INCIDENT AND INJURY FREE PROGRAMME

We piloted an IIF programme from June to December 2016, at our PIC for one of the packages in the Refinery & Cracker facility, based on a top driven approach. The key intent was to:

- elevate accountability and safety leadership.
- enhance supervisors' ability to recognise and acknowledge safe work, assign work safely, correct unsafe work and engage workers in effective conversation about hazards.
- improve workers' ability to recognise hazards.
- foster the relationship between workers as a result of 'looking out for each other' and creating a culture of 'care'.

The programme included classroom and field coaching sessions for leaders and supervisors and it has successfully improved the safety performance of this package with zero incidents at five million safe man-hours.

Following the success of this pilot programme, we are extending it to the rest of the packages to ensure our people adopt best practices which promotes lower incidents occurrences.

PROCESS SAFETY

Process safety is embedded from the design stage and throughout the facility life cycle. PETRONAS abides by the concept of 'design it right, operate it right and maintain it right' to prevent any process safety incidents. In 2016, PETRONAS continued to focus on Safety Critical Elements (SCE) management, by leveraging on operationalisation of Hazard and Effects Management Process (HEMP) deliverables, to ensure adequate and effective controls are in place. Concurrently, efforts to strengthen operating discipline and process safety culture were rolled out.

In 2016, PETRONAS recorded a total of 12 Tier 1 Process Safety Events, a 20 per cent reduction due to stringent governance, effective implementation and follow-through of process safety initiatives.

PROCESS SAFETY LEADERSHIP WORKSHOP

PETRONAS conducted a Process Safety Leadership workshop for the Leadership Team (LT) to condition leaders on expected leadership roles, mindset and behaviours in driving process safety. The aim was for leaders to reflect, align and establish a common understanding on process safety towards achieving operational sustainability and excellence.

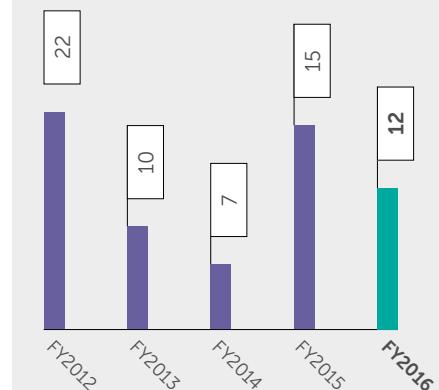
This workshop forms part of the continual effort to create, nurture, and fortify process safety culture across the organisation. This translates into delivering superior results through shared accountability without compromising process safety performance.

PROCESS SAFETY PERFORMANCE MEASUREMENT

Arising from an in-depth process safety performance analysis, PETRONAS enhanced our scope of leading Key

TIER 1 PROCESS SAFETY EVENTS

Number of Events



Performance Indicators (KPIs) to complement the existing KPIs in order to have a set of comprehensive indicators to monitor, track and gauge the effectiveness of process safety implementation throughout the asset life cycle. These enhanced indicators are integrated in the overall PETRONAS HSE Performance Monitoring and Reporting governance.

Process safety leading KPIs serve as early warning signs of challenges or potential dangerous deterioration within critical systems related to the multiple layers of protections in place to avoid major accidents. Acknowledging that effective control over process safety risks has a clear link with business efficiency, these indicators are being utilised as an input for decision-making to improve plant availability, reliability and optimisation. As such, monitoring, analysing and reporting of these indicators are being carried out diligently at OPUs, Business Units and Group level. In addition, periodical reporting to top management provides a more holistic management oversight.

PROCESS SAFETY CAPABILITY AND COMPETENCY BUILDING

In 2016, PETRONAS provided technical support to Universiti Teknologi PETRONAS (UTP) in the development of its Process Safety Master Programme (MSc in Process Safety) and modular Process Safety Training Programmes. These programmes provide avenues for PETRONAS Process Safety practitioners to enhance their knowledge on overall Process Safety management, safer design and operation of plant facilities to prevent process safety incidents.

In addition, a focused career development path for technical safety practitioners was developed and approved for implementation. This is one of our continued efforts to establish a technically knowledgeable and competent workforce in the niche discipline of process safety. We also continue to pursue capability development initiatives through networking and collaboration with internationally-renowned bodies on process safety such as Centre for Chemical Process Safety (CCPS), American Institute of Chemical Engineers (AIChE), Institute of Chemical Engineers (IChemE) and Society of Petroleum Engineers (SPE).

ENGINEERING DESIGN STANDARDS

The minimum requirements on Engineering Design Standards necessary to prevent major accident hazards are defined in PETRONAS HSE Mandatory Control Framework (MCF) and detailed out in selected PTS. To comply with these requirements, all our facilities and projects are subjected to an assessment to identify and adequately address design gaps prior to project development.

PROCESS SAFETY

LOSS OF PRIMARY CONTAINMENT REDUCTION FRAMEWORK

In 2016, a Loss of Primary Containment (LOPC) Reduction Framework was established to provide a structured and standardised approval process to address and prevent LOPC. This Framework was driven by the need to inculcate a deeper understanding of common LOPC failure mechanisms, and the importance of ensuring effective implementation and monitoring of preventive barriers. Programmes focusing on improving design, operational and technical integrity, supported by strong technical competency and leadership form part of the Framework. The implementation of the programmes are being monitored and reported based on agreed frequency and performance indicators.

SAFETY CRITICAL ELEMENTS MANAGEMENT

Safety Critical Elements (SCEs) were identified, assessed and maintained in line with asset integrity governance and practices which are centred on equipment reliability strategies and inspection, testing and preventive maintenance activities. Efforts include ensuring that SCEs are designed, installed and maintained to perform the intended function throughout the life of a facility. The aim of SCE Management is to ensure reliable performance and prevent release of hazardous substances or energy and to contain or mitigate its consequence and impact. SCE Management is embedded and operationalised through PETRONAS Maintenance Management System (PMMS).



FIRE SAFETY

We continued to conduct Fire Safety Assessments at selected operating facilities to assess the adequacy as well as readiness of our fire protection systems. Our efforts are strengthened through the introduction of improved fire safety governance that standardises the scope for conducting fire safety reviews, as well as selection of firefighting agents and emergency facilities across the Group. Several workshops and peer reviews were conducted to enhance capability and competency in order to meet the stipulated requirements.



PROCESS SAFETY AWARDS

ASEAN Bintulu Fertilizer Sdn Bhd (ABF) won the IChemE Malaysia Process Safety Awards in 2016 for its 'Electrochlorination Project – Eliminating the Use of Chlorine (a major hazard) in Cooling Water System'.

The new system enhances safety of employees and those living around the plant facility. The project is an important milestone for Bintulu in becoming a chlorine-free town in Malaysia. We are looking into the potential application of similar technology at other water treatment plants.

OCCUPATIONAL HEALTH AND WELLNESS

PETRONAS strives to provide a safe and healthy environment for all employees and contractors working at various locations across the Group. Identification and management of workplace occupational health risks are done by addressing requirements stipulated in PETRONAS' Mandatory Control Framework (MCF) and technical standards.

Based on the 2015-2019 occupational health strategies and priorities, key initiatives carried out in 2016 include quality enhancement of third party medical service provision by PETRONAS' Approved Medical Examiners and development of Medical Emergency Response and Mass Casualty management procedure for PETRONAS Integrated Petrochemical Complex (PIPC) in Kertih, Terengganu.

To manage staff wellness, especially lifestyle health risk factors and chronic diseases, a risk based health and wellness strategy was developed, which will be implemented in 2017. Revisions were also completed to enhance Fatigue Management and Fitness to Work (FTW) standards in 2016.

OCCUPATIONAL ILLNESS

We continue to monitor and improve our Total Recordable Occupational Illness Frequency (TROI) data via stricter compliance with PETRONAS MCF, namely, Element 2.7 - Food and Water Safety, as well as Technical Standard on Managing Communicable Disease. Ongoing initiatives on hearing conservation resulted in the adequate management of Occupational Noise Induced Hearing Loss (ONIHL).

TRAVEL HEALTH

In 2016, the second phase of PETRONAS Travel Health Management programme was launched and rolled out with the focus on implementation, monitoring and enhancement. Staff on business travel and on overseas assignment have access to the Travel Health website, pre-trip health advisories, a 24-hour medical consultation and medical emergency management services.

HEALTHY LIFESTYLE AND CULTURE

PETRONAS facilities conducted health promotion programmes for increasing awareness on health risks, providing information related to exercise, nutrition, substance misuse and smoking. We continued our series of interactive health talks through our in-house platform 'Klinik HSE dan Rakan-Rakan'. Topics ranging from ergonomics and cancer screening predominantly stressed upon the importance of preventive actions through self-assessments, preventive measures and healthy living.

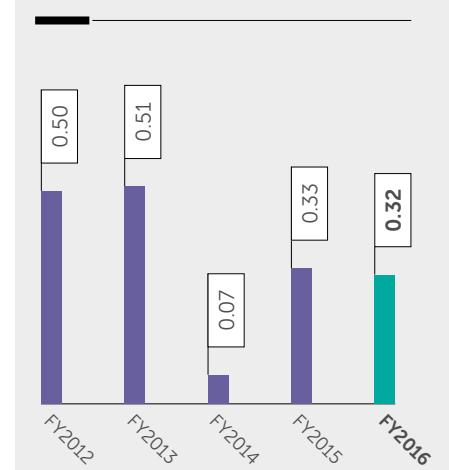


PETRONAS AT THE MALAYSIAN BUSINESS CONSORTIUM ON HIV AND AIDS (MBCH) FORUM 2016

In August 2016, more than 30 corporations across a wide spectrum of industries in Malaysia came together to effectively deliberate on measures for addressing HIV and AIDS in the workplace. PETRONAS provided insights on our journey to establish a HIV Work Policy and our Groupwide implementation to ensure that no individual is unfairly discriminated on one's HIV/AIDS status.

TOTAL RECORDABLE OCCUPATIONAL ILLNESS FREQUENCY

Illness per million working hours - employees



PERSONAL HEALTH PROMOTION PROGRAMME

PC Mauritania 1 Pty Ltd (PCML) introduced the Non-Communicable Diseases Control Campaign (NCDCC) as part of their annual health promotion programme to maintain a healthy workforce. One of the activities focused on encouraging participants who have a long history of smoking to give up the habit. The programme included monitoring of health risk factors such as hypertension, blood pressure and cholesterol.

INDUSTRIAL HYGIENE

PETRONAS' Industrial Hygiene (IH) practices involves the anticipation, recognition, evaluation, prevention and control of health risks in or from the workplace. The aim is to provide a safe and healthy working environment and employees are protected from workplace chemical, physical, biological, and radiological hazards and its adverse health effects.

Our governance mechanisms are aligned with the PETRONAS MCF to address health risks related to IH. These include coordinated health risk assessments using an integrated online system that not only simplifies processes, but also produces consolidated statistical information. Additionally in 2016, we enhanced our IH programmes such as Office Ergonomics, Chemical Management and Asbestos Management, while providing active support for industry engagement efforts. We collaborated with multi-disciplinary teams in analysing workers' hazard exposure, effectiveness of control measures and gap closure, whilst ultimately ensuring these IH controls are sustainably implemented across PETRONAS. Finally, emphasis was placed on strengthening our IH technical capabilities to reinforce and support the PETRONAS IH strategies and initiatives.

OFFICE ERGONOMICS

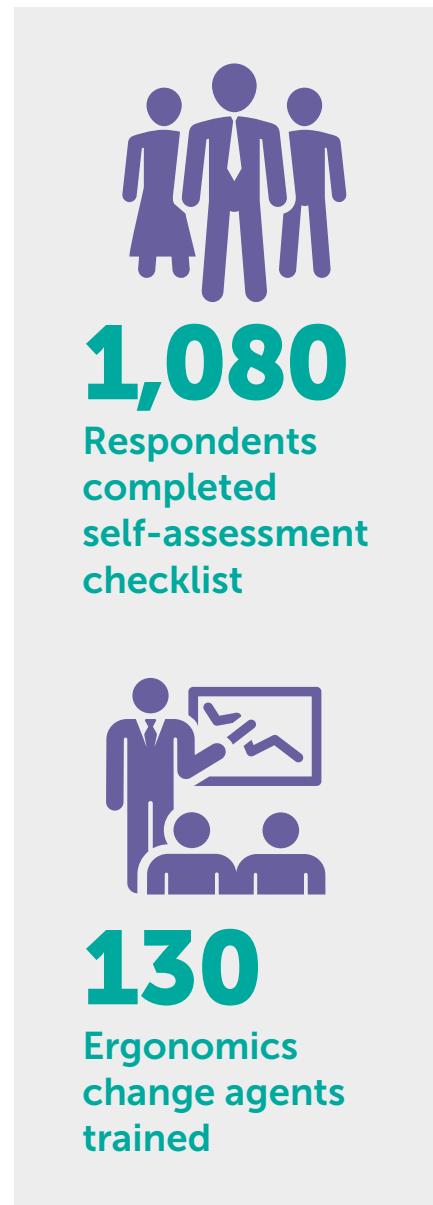
Our benchmark on the national and international occupational illnesses statistics showed an increasing trend of Musculoskeletal Disorders (MSD) amongst office workers. PETRONAS proactively carried out several initiatives in 2016 to manage potential impacts that may arise from MSD. One of the key initiatives was the roll-out of a revised PETRONAS Technical Guideline (PTG) on Ergonomics for Computer Workstations. Additionally, we developed an Office Ergonomics Programme for the PETRONAS Twin Towers (PeTT) that was deployed across 50 floors during the year. The programme which involved various levels of workforce aimed to intensify awareness on ergonomics.

During the year, 130 ergonomic change agents were trained and a self-assessment checklist was developed for employees to identify and subsequently rectify posture to improve workplace ergonomics. In total, 1,080 employees participated in the self-assessment exercise. By using internal resources and leveraging on existing systems and platforms, we saved RM160,000 via the successful implementation of the programme.

Moving forward, this initiative will contribute to the overall long-term reduction of MSD occurrence and cost of treatment.

ASBESTOS MANAGEMENT

In 2016, the Asbestos Management practices via our PETRONAS Technical Standards (PTS) were revised and expanded to cover a holistic management of Asbestos Containing Material (ACM) by ensuring the availability of adequate controls, in addition to the requirements for its ultimate removal. Collectively, these revisions demonstrate PETRONAS' commitment to exceed Malaysia's regulations on asbestos.



INDUSTRIAL HYGIENE

INDUSTRY ENGAGEMENT

PETRONAS continues to play a proactive role in promoting and participating in initiatives which support the development of Industrial Hygiene (IH). Our efforts are focused on spurring knowledge and capability development. We provide platforms for experts to congregate for intellectual discourses, whilst contributing insights towards shaping local legislation. Domestically, PETRONAS continues to participate in the Malaysian Industrial Hygiene Association (MIHA). Through MIHA, we played an active role of collaborating with the Department of Occupational Safety and Health (DOSH) to mould and ensure the success of Mainstreaming IH, part of the national Occupational Safety and Health Master Plan (OSHMP) 2020. Internationally, PETRONAS collaborated with key associations such as the International Occupational Hygiene Association (IOHA) and Asian Network of Occupational Hygienists (ANOH) to expand our network and promote sharing of best practices amongst IH fraternity members.

THE FIRST GENERIC CHEMICAL HEALTH RISK ASSESSMENT IN MALAYSIA FOR OIL AND GAS SECTOR

Chemical Health Risk Assessment (CHRA) is a risk assessment required to be conducted at workplace as governed by Occupational Safety and Health - Use and Standard of Exposure Chemicals Hazardous to Health Regulations 2000.

To meet this requirement, the Downstream Business will incur a total cost of RM24 million for the risk assessments at its facilities namely, PETRONAS Dagangan Berhad (PDB) 30 terminals and 1,062 PETRONAS retail stations, as well as PGB Gas Transmission's 11 Regional Offices, three compressor stations, 34 city gates, 53 metre stations facilities and 2,596 km of pipelines. On top of the significant investment, completion of the risk assessments also entailed significant man-hours due to the extensive number of risk assessments.

In the spirit of process simplification, the Downstream Business Excellence (DBE) collaborated with PDB, PGB and Group HSE, and sought advice from the Department of Occupational Safety and Health (DOSH) to strategise an alternative CHRA. Resulting from this collaboration, we successfully developed five generic CHRAs: one assessment for PDB PETRONAS retail stations, three assessments for each type of PDB Terminal (fuel, aviation and LPG) and one assessment for PGB Gas Transmission's Regional Office. The internal assessment was conducted at PDB's five terminals, 17 PETRONAS retail stations and PGB's three Regional Offices.

In November 2016, we successfully received approval from DOSH on the CHRA. This means instead of 1,093 CHRAs, only five Generic CHRAs are required to be conducted every five years thus leading to a total cost avoidance of RM22.4 million. Thus, the Generic CHRAs save cost, time and assure compliance to regulations for a safer and healthier workplace.

EMERGENCY PREPAREDNESS AND RESPONSE

PETRONAS has in place crisis management programmes and emergency response plans to enable swift response for managing security threats as well as emergencies. These measures are reviewed and assessed through drills and periodic table-top exercises at our operating facilities including administrative sites both domestic and international to evaluate our readiness, preparedness and response capabilities.

PETRONAS also has frequent engagements and training sessions with various stakeholders such as local government agencies, host country authorities, business partners, contractors and local communities to help build closer working relationships.

OIL SPILL PREPAREDNESS AND RESPONSE

PETRONAS is guided by an in-house Technical Standard on Oil Spill Contingency Planning updated in March 2016 which amongst others, spells out response frameworks, mechanisms and strategies and specifies the construct of the Oil Spill Response Teams (OSRT).

In an effort to continuously hone the expertise and skills of our oil spill responders, exercises are held annually by the Business Units, often in collaboration with government agencies and local authorities. In 2016, PETRONAS participated in the Malaysian National Oil Spill Exercise coordinated by the Department of Environment (DOE) and deployed our oil spill response asset from the Melaka refinery at sea. Internationally, exercises such as Garuda 2 by our Indonesia Operation were also conducted to test response capabilities away from our home base in Kuala Lumpur.

Continuous assessment is an integral part of our oil spill preparedness and response. To this end, PETRONAS completed our Oil Spill Response (OSR), Readiness, Preparedness and Capability Assessment in 2016 which amalgamated the best elements of

current OSR practices into a single document. This document will be used as part of a Groupwide OSR assessment to be carried out in 2017. These efforts illustrate our commitment to protect and safeguard people, environment, our assets and reputation.

MARITIME SECURITY

Maritime assets and operations are core aspects of our business. Emerging issues affecting the seas include maritime inter-state disputes, maritime terrorism, piracy, trafficking of narcotics, people and illicit goods, arms proliferation, illegal fishing, environmental crimes, encroachment or maritime accidents and disasters. Collectively, these impose a growing risk to offshore installations and vessels given its strategic as well as economic importance.

PETRONAS addresses maritime security in our operations and projects by developing relevant governance mechanisms in line with the PETRONAS Security Management System (SeMS). This extends to conducting coordinated security assessments using asset classification and minimum mandatory security standards, while developing timely mitigation efforts.

Maritime Security Operations (MSO) work closely with multi-disciplinary domestic and international authorities to ensure security controls are established and implemented across



EVACUATION OPERATIONS

We evacuated about 30 employees and contractors from one of our operational sites in the African continent due to rising civil unrest. The availability of robust mechanisms such Country Contingency Plans (CCP) and sound understanding of conditions on the ground as a result of regular drills and exercises enabled a smooth and timely evacuation. The CCP established clear organisation structures, roles and responsibilities for the Country Contingency Team, as well as internal communication protocols which aided in the execution of the evacuation. We also worked closely with relevant authorities in Malaysia to jointly coordinate the transfer of evacuees through neighbouring countries.

PETRONAS. Various engagement fora on effective control measures and monitoring gap closure activities were conducted.

MSO also engages with local fishery departments and communities together with other government agencies through initiative such as SAHABAT MARITIM to enhance awareness and knowledge of the community regarding PETRONAS offshore operations.

PRODUCT STEWARDSHIP

PETRONAS continuously identifies, assesses, controls and communicates HSE risks throughout our products' life cycle. The underlying intent is to ensure our products conform to quality specifications and adhere to global regulatory requirements.

The product life cycle management approach entails minimising the use of hazardous chemicals in Upstream and Downstream operations.

Our Product Stewardship initiatives are aligned with the United Nations' Strategic Approach to International Chemicals Management (SAICM) 2020 goals. As part of our industry's contribution to SAICM, PETRONAS voluntarily complied with the Responsible Care Global Charter and the Global Product Strategy (GPS).

Research and development remain a priority to ensure we deliver efficient products formulated using innovative solutions. We constantly conduct engagements and awareness programmes with stakeholders and customers for the management and safe handling of chemicals and dangerous goods.

PRODUCT RISK ASSESSMENT

In 2016, PETRONAS Chemicals Group Bhd (PCG), continued to conduct product risk assessments systematically across its portfolio to facilitate the development of Global Product Safety Summaries (GPSS), which provide product safety and associated risks and controls information in a simplified manner. The GPSS documented are published in the GPS Chemical Portal via the International Council of Chemical Associations (ICCA) website.

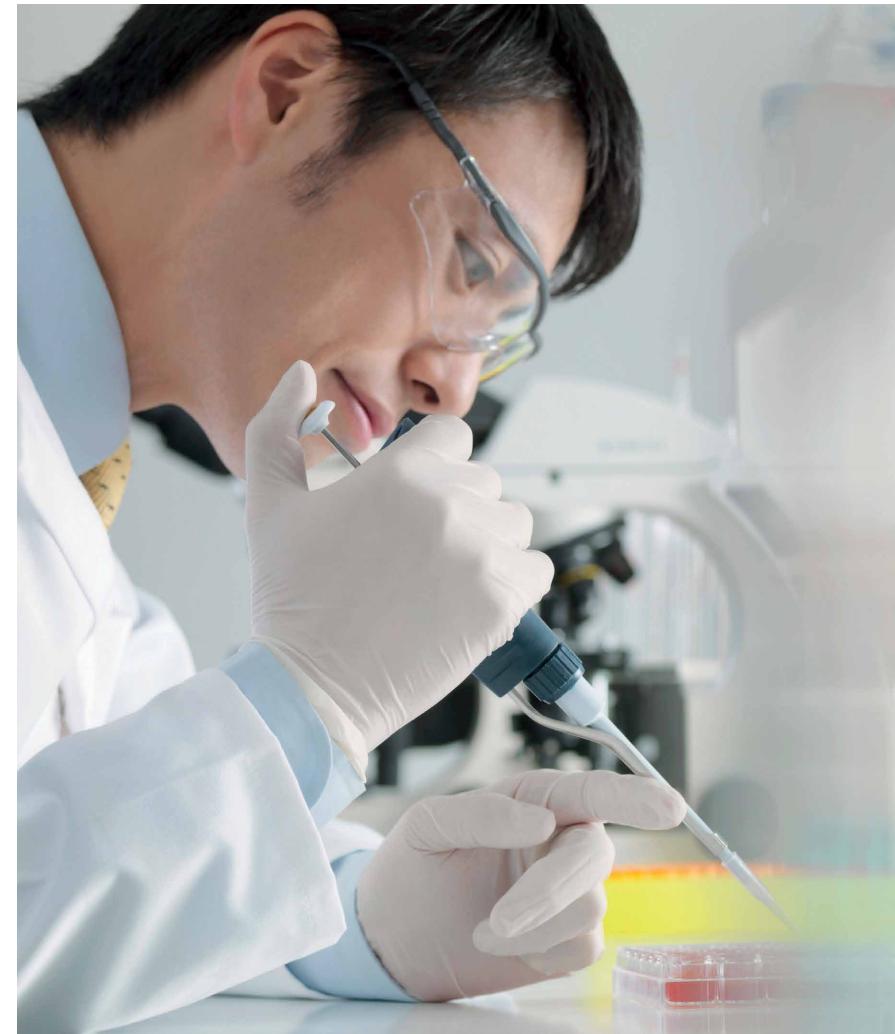
PRODUCT SAFETY DATA SHEETS

Safety Data Sheets (SDS) provide crucial information on all PETRONAS' products for customers and are available in both English and Bahasa Malaysia. To serve its customers better, SDS are now made available to additional 10 export markets; in accordance to regulations by respective local authorities.

MEETING GLOBAL REGULATIONS

PETRONAS Group HSE Toxicology assisted PETRONAS Lubricants International (PLI) in meeting respective export country regulatory requirements.

PLI leveraged on PETRONAS' internal system to generate SDS in the export country language and format.



To download SDS for PETRONAS products, please visit
<https://sds.petronas.com.my>
or Scan this QR Code with your smart device.

PRODUCT STEWARDSHIP**DEVELOPMENT OF GLOBAL REPOSITORY FOR LUBRICANT PRODUCTS**

The development of the Application Communication Toolbox (ACT) system, which commenced in 2014 aimed to provide easier access to information and put in place a more defined approval process. The ACT system which was developed in-house, meets PLI Research and Technology's business requirements as a repository and working toolbox.

In 2016, a Raw Materials Information Management System (RaMIMs) was launched with the aim to upload, evaluate, approve and codify new raw materials and their related documentation. Raw materials will be tracked across the product life cycle. The system will enable product technology teams to systematically evaluate ingredients that make up the final product to ensure all components used are compliant with applicable regulatory requirements and to facilitate continual improvement for new products. It also ensures the availability and proper traceability of relevant component information which is important to ensure that the product technology team makes decisions and component evaluations based on complete information. This is also in line with good product stewardship principles.

A Global Formulation Approval Workflow was introduced to enhance the approval process for new product formulations and modifications to existing products. The workflow adopts a five-step approval process made available to all PLI subsidiaries.

PRODUCT STEWARDSHIP DEVELOPMENTS**MANAGEMENT OF HAZARDOUS CHEMICALS IN THE WORKPLACE**

New initiatives, which are complementary to existing IH and occupational health processes, have been undertaken to identify, prioritise and minimise the occupational risk of hazardous chemicals in PETRONAS.

In 2016, reproductive toxicants, chemicals that can cause adverse effects on reproductive systems were identified. Subsequently, guidelines were introduced to improve their management for safer use through engineering controls and workplace safety programmes. Moving forward, further guidelines will be developed to manage other prioritised toxicants to create a safer workplace.

GLOBAL LABEL MANAGEMENT

PETRONAS embarked to standardise all product labelling processes by developing the Global Label Management (GLM) which functions as an automated central repository for all product safety labels. The GLM aims at ensuring consistency, accuracy and compliance across the labelling processes and eliminates human error. In 2017, GLM will be implemented and integrated into existing distribution processes, thus ensuring product regulatory compliance.

REGULATORY COMPLIANCE TO KEY EXPORT MARKETS

With the multitude of emerging regulations within the Asia Pacific region in 2016, PETRONAS Businesses ensure full regulatory compliance for all products sold in our key export markets aligned with emerging regulations in the Asia Pacific region. This involves extensive engagement with suppliers and customers to properly control all aspects of product HSE management.

PRODUCT STEWARDSHIP**SHIELD – JOURNEY TOWARDS DIGITALISATION**

SHIELD, short for Stewardship, Health, Information and Environment Linked Database, was developed on the SAP EHS platform to further integrate HSE risk management practices across PETRONAS. This is conducted via a systematic, integrated and secure data management system in the form of an enterprise-wide database on HSE from which relevant risks can be managed holistically from the Business, Operating and Holding Company's perspective. SHIELD was rolled out in 2014 and spans through several waves over a period of five years.

In 2016, SHIELD successfully deployed Waste Management and Global Labelling Management (GLM) Modules and further enhanced Occupational Health (OH), IH and Product Safety (PS) Modules. Such enhancements were necessary to ensure compliance to local and international regulations.

Key highlights of the benefits derived in 2016 cover the following:

SUCCESSFUL HEALTH RISK ASSESSMENT REPORTING USING SHIELD RISK ASSESSMENT MODULE

Moving into the third year of its implementation, SHIELD has received a lot more positive feedback and user's footprint. The Risk Assessment (RA) Module aims to enhance workplace governance in line with PETRONAS' growth by establishing a centralised system to document all risk assessments, and to ensure standardised processes and system integrity.

In 2016, additional operating sites namely, TCOT, Terengganu Onshore Slug Catcher (OSC), Resak Platform and Sabah Gas Terminal (SBGAST) conducted respective Health Risk Assessment (HRA) directly via the SHIELD RA Module. As a result, the turnover to produce the HRA report was reduced from three months to just below 10 days for each site. Moreover, the exercise contributed towards the technical capability building of our internal IH resources and achieved total cost savings of approximately RM240,000.

TRANSFORMING MEDICAL RECORDS MANAGEMENT IN PETRONAS USING SHIELD OCCUPATIONAL HEALTH MODULE

SHIELD's OH Module looks into the efficiency of employees' medical data management and health performance indicator analysis which consist of FTW, Medical Surveillance and Substance Misuse Testing.

MLNG is one of the pioneering operating units that implemented the automation of employees' medical surveillance, FTW health assessment and audiometry records. As a result, MLNG was able to reduce record management efforts from 1,615 man-hours per year to 25 man-hours per year, translating into a 98 per cent increase in efficiency and substantial cost savings.

In addition, e-Health aims to automate the existing manual data entry and semi-analysed medical data submitted by medical service providers, directly to the system via a dedicated web-based network. This effort will reduce significant workload by PETRONAS users, enabling more focus on data verification and analysis.

OUR PEOPLE

Being a global energy player, our workforce comprises individuals from multicultural backgrounds, with varying experiences and expectations, across 75 countries. PETRONAS recognises that our employees are the key to successful and rapid growth around the world. We ensure that the business is driven by a highly reliable and competent workforce through the implementation of various career programmes and policy enhancements that effectively promote diversity and inclusivity.

Guiding our talent management practices are the Human Resource policies, strategies and procedures aligned with international law, regulatory requirements, cultural customs as well as industry best practices. Talent management in PETRONAS is driven by Human Resource Management (HRM). In 2016, we embarked on an exercise to streamline talent, roles and responsibilities against business and organisational needs. We remain committed to our Global Talent Strategy (GTS) to have the 'Right Talent, Right Environment and Right Leaders' to ensure continued business growth, both domestically and internationally.

HUMAN RESOURCE POLICY ENHANCEMENTS

In 2016, PETRONAS made enhancements to the Human Resource Policy to empower and support our employee's work-life balance needs and preferences. These include:

- Three months fully paid maternity leave.
- Five days of paternity leave, an increase from three days.
- Compressed Work Week (CWW) and 'Flexible Working Hours' work arrangements approved by Board for pilot implementation in the first half of 2017. The flexibility allows employees to customise and optimise their 39 working hours per week.



TALENT RECRUITMENT AND RETENTION

Against the backdrop of our PETRONAS Employment Value Proposition (EVP) of Trust, Grow and Reward, PETRONAS' GTS continues to define the long-term aspiration to build a sustainable pipeline of global talent to promote a high performance culture. PETRONAS strives to align human capital management initiatives with business talent imperatives to drive the achievement of our business targets by 2020 and transform on a broader scale.

PETRONAS was awarded the most popular graduate employer in the Energy/Oil and Gas/Utilities sector as part of the Graduate Employer of the Year Awards for 2016, by TalentCorp Malaysia which recognises Malaysia's 100 Leading Graduate Employers. Additionally, we also emerged as the second runner-up for the overall Graduate Employer of the Year Award.

LOCAL HIRING

We provide employment opportunities to individuals both domestically and internationally to spur socio-economic growth while supporting capability development efforts. Our local hiring practices are guided by regulatory requirements in all countries of our operations and grounded on the principle of meritocracy. Targeted initiatives are pursued to groom local

talents' technical skills and knowledge as part of effective talent development and talent retention.

EMPOWERING WOMEN

PETRONAS Leading Women Network (PLWN), established in 2015, strives to enable women, who make up about 28 per cent of our workforce, to achieve their ultimate potential through various career opportunities. Rolled out in Malaysia, PLWN provides women employees with a platform to network, share success stories and promote fellowship in achieving their career goals.

In response to the growing demand, we improved our 'mother's room' facility to provide more space and privacy for nursing mothers. The rooms are now equipped with more comfortable chairs and adequate storage space for nursing equipment.

COLLECTIVE BARGAINING

PETRONAS adheres to the CoBE alongside other Human Resource guidelines and procedures, aligned with global requirements set out by bodies such as the International Labour Organisation. PETRONAS and our in-house staff unions successfully signed the following Collective Agreements; Kesatuan Kakitangan Petroliam Nasional Berhad (KAPENAS) in January 2016 for the period 2016-2018 and Kesatuan Pekerja-Pekerja Optimal Chemicals (M) Sdn Bhd (KEPKO) under PETRONAS Chemicals Derivatives Sdn Bhd for the period 2017-2019.

The new agreement is aimed to strike a balance between employee welfare and fulfilling stakeholder expectations. For KAPENAS, the signing agreement was witnessed by the Department of Industrial Relations and PETRONAS Leadership Team. To date, a total of 8,996 of our employees are covered under the Collective Agreements.

OUR PEOPLE

WORKFORCE TRAINING AND DEVELOPMENT

PETRONAS conducts targeted capacity building programmes and adopts information sharing platforms to enhance the skills and knowledge of our employees in various disciplines. These programmes and platforms aim to develop the technical, managerial and leadership knowledge and skills of our people to effectively address sustainability risks and pave the way for employees' timely career progression. In 2016 for instance, we invested in staff knowledge and capability development efforts which comprised formal and informal trainings, such as classroom sessions and on-the-job trainings at various operating facilities.

WORKFORCE ENGAGEMENT

We recognise that business transparency is vital. A President's Town Hall was held in 2016 to discuss strategies and transformation exercise in mitigating the impacts of the low oil price environment. Similar Management-led engagement sessions were also conducted throughout the year to foster closer working relationships, share business directions as well as challenges. PETRONAS also utilised intranet portal, such as @wanzul channel to provide monthly updates by the President and Group CEO.



SOCIAL PERFORMANCE

PETRONAS defines Social Performance as managing impacts arising from areas of our business while contributing to the society in a responsible manner. Social Performance practices are governed by the PETRONAS Social Performance Framework which consists of five key elements namely, Health, Safety, Socio-economic and Cultural, Environment and Security. It entails robust social risk management as well as adequate systems and processes aligned with industry best practices.

Leading our efforts is a dedicated pool of Social Performance practitioners, supported by multidisciplinary teams within Businesses, Operating and Holding Company Units.

HUMAN RIGHTS

PETRONAS is committed to respecting internationally-recognised human rights in areas of its operations, complying with our Code of Conduct and Business Ethics (the CoBE), and all relevant legal requirements.

The PETRONAS Human Rights Commitment was launched in 2015 and aims to ensure that our activities are governed by human rights principles, laws, best industry practices and standards to manage impacts in our areas of operation. A clear line of sight on human rights related risks is crucial to sustain our long-term growth.



In 2016, our Group Social Performance practitioners collaborated with various stakeholders within PETRONAS such as Group Procurement, Group Legal, Group Security, Projects and businesses to assess potential human rights risks in the four key focus areas; labour and working conditions for contractors, third-party security, supply chain and community wellbeing.

To support the implementation of the PETRONAS Human Rights Commitment, 70 training sessions were conducted in 2016 across PETRONAS to advocate and reinforce the importance of respecting human rights.

In enhancing governance and incorporating human rights into our management system and processes, three technical guidelines were developed in 2016.



SOCIAL PERFORMANCE

HUMAN RIGHTS IN SUPPLY CHAIN

We strive to ensure that our contractors, subcontractors and suppliers respect human rights principles.

Engagement sessions were held with the Group Procurement (GP) management team and practitioners. The objectives of these sessions were to roll-out the PETRONAS Human Rights Commitment and communicate how it will be integrated into the supply chain system and processes. The sessions provided a platform for GP practitioners to deliberate on potential risks to human rights and essential impacts to the value chain.

We have also established a technical guideline to ensure that temporary accommodation provided to contract workers are not compromised with regards to health, safety, security and environment aspects in support of PETRONAS Human Rights Commitment. The guideline is in adherence with international standard practices and prescribes minimum considerations when providing temporary onshore accommodation.



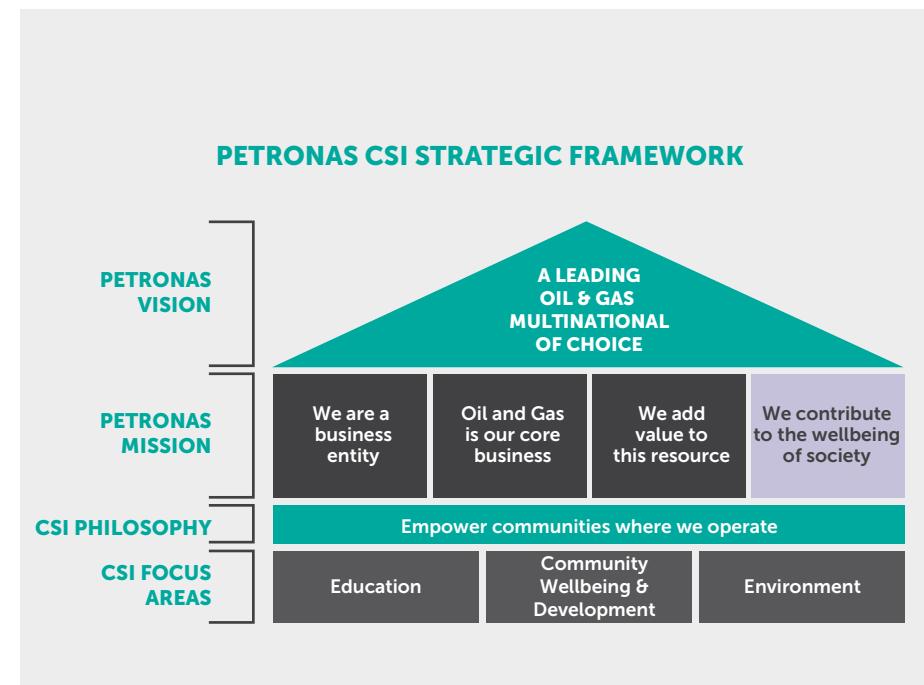
COMMUNITY INVESTMENTS

PETRONAS, guided by our Corporate Social Investment (CSI) Strategic Framework aims to create shared value within communities where we operate.

The Framework supports PETRONAS' Vision and Mission and our strategic CSI initiatives provide a platform for us and the community to grow together through three focus areas namely education, community wellbeing and development, and environment. Collectively, CSI initiatives carried out throughout 2016 amounted close to RM300 million.

EMPOWERING WOMEN VIA THE LIVELIHOOD PROGRAMME

PETRONAS Gas Berhad (PGB) launched the Livelihood Programme in collaboration with Salam Foundation Malaysia. The purpose of the programme is to provide skill-building training to women living below the national poverty line. PGB and Salam Foundation Malaysia's employees collectively facilitated the training sessions and motivational seminars for 20 women each from Hulu Langat, Selangor and Segamat, Johor. The participants were able to generate and sustain their income through acquiring skills such as baking and pastry making, marketing, as well as basic finance management. Within eight months of the programme, the participants managed to raise RM60,000 and secure a platform to market each of their respective products at nearby locations. With sustainability in mind, plans are in the pipeline to establish an entrepreneurial club to be steered by the participants and thus, extend the necessary support to other women.



COMMUNITY WELLBEING AND DEVELOPMENT

PETRONAS through our CSI programmes endeavours to empower the surrounding community to improve their standards of living. This is attained by increasing awareness on health, sanitation and safety, improving the quality of healthcare, providing access to clean water and business skills development of the community.

PETRONAS' All About Youth (AAY) is a competition-based education programme developed in 2014 to empower and nurture well-rounded youths in the areas of education, community wellbeing, and environment. Entering its third year, we adopted a unique approach where past projects were further enhanced to ensure its sustainability, with endorsement by the relevant regulatory authority.

30 schools participated in AAY 2016 and 20 students from each school were given a refresher course and a "buddy" to provide guidance and support. The duration of this project is six weeks and the judging criteria includes creativity, project enhancement and sustainability, impact on community, and clarity of presentation. The winning school received a grand prize of RM50,000 for the purpose of executing and upgrading their existing projects.

WATER AND ENERGY SAVINGS IN SARAWAK

This year, SMK Tatau Sarawak won the AAY All Star 2016 award for their Green Toilet project which emphasised on green technology, aimed to save water and electricity. The students integrated solar light bulb and clear roofing to enable energy saving while demonstrating water conservation through rain water harvesting. Through this project the school was able to save an average of RM150 per month in utility bills.

COMMUNITY INVESTMENTS

Through Petrosains - The Discovery Centre, we continue to extend our commitment to the nation in providing a rich and stimulating learning environment whilst instilling passion for acquiring science knowledge from an early age. In November 2016, Petrosains celebrated International Science Centre and Science Museum Day (ISCSDM) on the occasion of the United Nations Educational, Scientific and Cultural Organization's (UNESCO) World Science Day for Peace and Development in partnership with the International Council of science centres, science museums, and their networks worldwide. The workshops and science shows addressed Goal 6 of the United Nations' Sustainable Development Goals (SDGs) which is Clean Water and Sanitation, with the aim of educating the public on the availability and sustainable management of water.



PETRONAS STREETSMART BRINGS ROAD SAFETY EDUCATION TO THE NATION

PETRONAS StreetSmart – Lessons for Life, is an interactive travelling exhibition established by PETRONAS and operated by Petrosains to promote road safety awareness and inculcate responsible road safety habits amongst Malaysians especially the younger generation. It aims to educate visitors by explaining the science behind road safety to fully understand the risks and safety implications whilst on the road. The exhibition showcases interactive exhibits, simulated road systems and traffic situations to deliver the message of road safety in a fun, immersive and interactive manner. The PETRONAS StreetSmart exhibition has travelled to most states in Malaysia and will stay at a location for approximately six months. Since its inception in 2001, the programme has reached over 1.6 million Malaysians.



ORCHID RUN AND RIDE

In September 2016, the Association of Wives and Women Staff of PETRONAS (PETRONITA) in collaboration with PETRONAS organised the Orchid Run and Ride. The objective of the event was to promote a healthy lifestyle while supporting the less fortunate. Over 5,500 eager runners and cyclists turned up as early as 6am for the one of the kind running and cycling event in the heart of Kuala Lumpur.

The event was able to raise RM240,000 for a host of charities and the proceeds were channelled to Institut Jantung Negara (IJN) Paediatric Unit, Institute of Ear, Hearing and Speech (HEARS), National Autism Society of Malaysia (NASOM).

PETRONITA also presented their contribution to the National Intraocular Lens Bank during the 'World Sight Day Charity Run 2016' which aimed to increase awareness of cataract blindness. The donation was used to provide treatment to the patients in need nationwide.

COMMUNITY INVESTMENTS

EDUCATION

PETRONAS recognises the value of education and human capital development to ensure a sustainable talent pool for the benefit of PETRONAS and the oil and gas industry. This is evident in our Corporate Social Investment (CSI) Strategic Framework, where education is one of the key focus areas. PETRONAS aims to provide access to knowledge and capability building opportunities in a fair manner, regardless of gender, ethnicity or social

standards to support nation building. In realising this, PETRONAS adopts an integrated approach covering a broad spectrum of investments, which may be continuous in nature involving building infrastructure, promoting learning and development programmes and supporting student development.

EMPOWERING YOUNG MINDS

PETRONAS believes in creating opportunities for individuals and communities to realise their full

potential. PETRONAS has established numerous education programmes and learning institutions spanning across various levels of education with the intent of instilling awareness and interest on Science, Technology, Engineering and Mathematics (STEM). These continuous efforts are to ensure the long-term growth and sustainability of the nation's workforce.

LEARNING INSTITUTIONS BY PETRONAS



www.utp.edu.my

UNIVERSITI TEKNOLOGI PETRONAS (UTP)

- Established in 1997 and has grown to be one of the most prominent engineering, science and technology universities in Malaysia. It has produced more than 14,000 graduates from more than 66 countries around the world.
- The new research and development (R&D) building, which was completed in 2016, demonstrated PETRONAS' efforts in strengthening our R&D as well as furthering UTP's journey towards becoming an internationally valued research institution.
- The only private university in Malaysia to be rated with an overall 5-Star institution by Quacquarelli Symonds (QS).
- The first and only private university awarded with a 6-star rating by Ministry of Higher Education Malaysia for its research, development and commercialisation efforts under Malaysia Research Assessment Rating System (MyRA).
- Ranked 127th in the QS Asian University Rankings 2016.
- Top 100 best research-led university in the developing world and made its debut in the Times Higher Education BRICS and Emerging Economies Rankings 2017.



www.instep.my

INSTITUT TEKNOLOGI PETROLEUM PETRONAS (INSTEP)

- Established in 1981 with the aim to accelerate human capital development to support sustainable growth PETRONAS as well as the oil and gas industry.
- Learning experience and module offerings have since transformed with the launch of the integrated Upstream Downstream Training Plant (UDTP) on 27 March 2014, making a phenomenal shift in learning.
- Awards received in 2016: Global Getenergy 2016 Award – Education and Training Provider of the Year, 12th IECEx Recognised Training Provider in the world, Pearson BTEC Centre of Excellence, Pearson Medallion Awards (Outstanding Learners).
- The training institute also serves international clients from more than 15 countries in line with its aspiration to be "A Leading Partner of Choice in Oil and Gas Technical Learning and Certification".



www.alam.edu.my

MALAYSIAN MARITIME ACADEMY (ALAM)

- Ranked consistently amongst the top 10 per cent of world Maritime Education and Training (MET) institutions by DNV-GL annual ratings exercise.
- Since its inception in 1977, it has trained over 13,000 seafarers who are now serving in many key positions in the merchant marine sector in Malaysia and internationally.
- Shortlisted in 2016 for the Lloyd's List Asia Awards 2016 in the "Excellence in Training" category.
- Received accreditation from Jabatan Pembangunan Kemahiran Malaysia (the Department of Skills Development) as an approved training centre for Offshore Support Vessel Training Programmes
- Eight ALAM trainers were certified as National Occupational Skills Standard (NOSS) trainer by Centre for Instructor and Advanced Skill Training (CIAST) Ministry of Human Resource.
- The academy also received ISO 9001:2015 standard accreditation from SIRIM in 2016.

COMMUNITY INVESTMENTS

EDUCATION PROGRAMME	PROGRAMME OBJECTIVE	BENEFITS TO DATE
Program Sentuhan Ilmu PETRONAS (PSIP)	To instil learning interest and motivation amongst students to stay in school while promoting interest in Science, Technology, Engineering and Mathematics (STEM) at an early age.	Benefitted more than 1,000 students in 2016.
Trust school	Collaborative programme with Yayasan AMIR to drive the transformation of selected public schools while focusing on students' education excellence.	Collaborated with students across 15 schools in Sabah, Sarawak and Terengganu.
Vocational Institution Sponsorship and Training Assistance (VISTA)	To develop fully-prepared workforce in various in-demand job scopes that can fulfil the technical workforce requirement based on the rapid growth of various business domestically especially the oil and gas industry.	Engaged with more than 787 trainees in 2016.
TRENGLISH	A state-government initiative which aims to enhance interpersonal English communication skills amongst students in Terengganu.	Reached out to 37 secondary school students in 2016.
BUDI PETRONAS	A collaboration with Majlis Amanah Rakyat (MARA), this programme provides sponsorship for students from underprivileged families in the form of yearly allowances to pay for schooling fees and other basic needs.	Sponsored more than 300 students to study at six Maktab Rendah Sains MARA (MRSM) in Sabah and Sarawak since initiation in 2015.
Discover PETRONAS @ Schools (DPS)	To instil interest in the oil and gas industry and its related careers to students from schools such as Sekolah Menengah Sains and MRSM.	Engaged 7,100 students to date across Malaysia from January 2014 to October 2016.
SLIM GEES	To provide soft skills training and experiential learning through on-the-job training to enhance the marketability of unemployed undergraduates.	Enrolled 11 batches of GEES with 390 graduates since 2013; of that, approximately 75 per cent trainees were employed within three to six months after course completion with 28 per cent currently employed by PETRONAS since 2013.
PETRONAS Education Sponsorship Programme (PESP)	Provision of scholarships to deserving students in realising their academic pursuits and career aspirations in oil and gas related fields.	Sponsored more than 35,000 students since 1975.
Kimanis Training Centre (KTC)	To equip Sabah's youths with necessary oil and gas related technical skills as well as knowledge to spur the development in the domestic oil and gas industry.	Enrolled 132 students in KTC since 2011.

COMMUNITY INVESTMENTS



COMMUNITY ENGAGEMENT

PETRONAS continues to engage with the longhouse communities living within the vicinity of the Sabah Sarawak Gas Pipeline (SSGP) to build a healthy, sustainable and thriving future, while addressing Environment, Social and Governance (ESG) challenges. This is achieved by conducting timely discussions with the communities led by project team members where feedback is scrutinised for identifying areas of development.

In 2016, PETRONAS arranged for 30 Baram community leaders to visit SSGP at Kimanis in Papar, Sabah. As part of the programme, the community leaders also visited Sabah Ammonia Urea (Samur), Sabah Oil and Gas Terminal (SOGT) and Sabah Gas Terminal (SBGAST).

Educational activities and dissemination of relevant information on SSGP and PETRONAS' operations in Sabah were conducted during the visit with the aim to strengthen relationship with the communities and for their better understanding of PETRONAS' presence in Baram.

Section Four

GOVERNANCE

CONTENT

- 53 Corporate Governance and Business Ethics
- 56 Health, Safety, Security and Environment Governance



PETRONAS strives to achieve sustainable performance and long-term business competitiveness by proactively responding to business risks and opportunities.

Good governance enables us to function efficiently, effectively and responsibly, by providing clarity on acceptable standards of behaviour. Supporting our efforts are robust policies, management systems and standards as well as guidelines that conform to internationally accepted standards and industry best practices.

We also abide by our PETRONAS Shared Values of Loyalty, Integrity, Professionalism and Cohesiveness in every aspect of business decision making.

CORPORATE GOVERNANCE AND BUSINESS ETHICS

With the increased attention being given to corporate governance matters in today's environment, every employee within the organisation has a stake in the governance process. As PETRONAS expands our business and geographic presence, the inculcation of the Group's Shared Values continue to stand steadfast and form the foundation of PETRONAS' General Business Principles.

The Board Governance and Risk Committee as well as the Board Audit Committee were established to assist the PETRONAS Board in fulfilling its oversight functions in relation to internal controls, risk management as well as monitoring the Group's compliance with applicable laws and regulations, internal policies and procedures. Collectively, these pave the way to continuously elevate the standards of accountability and integrity in PETRONAS.

The foundation of corporate governance, business ethics and integrity are guided by the PETRONAS Code of Conduct and Business Ethics (CoBE) that sets out general policy statements on the standards and ethical conduct expected of our employees, directors as well as any third parties performing work or services for or on behalf of PETRONAS Group. In addition, the PETRONAS Anti-Bribery and Corruption Policy and Guidelines (ABC Manual) was developed to supplement the broad policy statements in the CoBE. The ABC Manual governs amongst others, matters including engagement with public officials and with third-parties, facilitation payments, gifts, entertainment and corporate hospitality. The Whistleblowing Policy (Policy) was implemented to provide an avenue for all PETRONAS employees and members of the public to disclose any improper conduct (misconduct or criminal offence or malpractices) in accordance with the procedures as provided under the Policy.

CODE OF CONDUCT AND BUSINESS ETHICS

The CoBE stipulates standards of behaviour and ethical conduct in areas such as conflict of interest, anti-corruption, competition, anti-money laundering, international trade and export controls, among others. The CoBE also emphasises and advances the principles of discipline, good conduct, professionalism, loyalty, integrity and cohesiveness that are critical to the success and wellbeing of our Group.

The CoBE accompanied by a CoBE Guide sets out FAQs, together with a list of "Do's and Don'ts" in relation to certain specific situations. These were distributed to all employees, requiring written acknowledgement on their commitment to adhere to the CoBE. Consequences of breaching the CoBE are clearly set out in the CoBE and subject to applicable laws, disciplinary action will be taken against any employee for non-compliance.

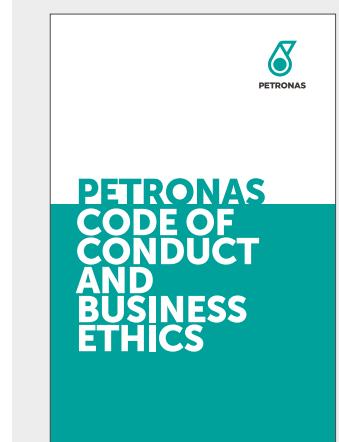
In view of the CoBE's global application across the Group in all countries where PETRONAS has operations, some

provisions of the CoBE will be modified to adopt the requirements of local jurisdictions in countries of operations. In such cases, the CoBE will have a separate Country Supplement to cater for the local jurisdictions applicable legislation and social norms in host countries.

The CoBE is communicated to all employees through timely training sessions, including on-boarding programmes for new executives. An online helpdesk is available for employees and third parties to forward enquiries, seek greater clarification or report breaches of the CoBE or any matters relating to the CoBE at cobe@petronas.com.my

In 2016, a total of 39,596 employees completed their face-to-face CoBE training. Additionally, a compulsory CoBE online training programme via the PETRONAS Compliance Desktop was rolled out for an extended reach, with the initial phase targeting PETRONAS Group employees in Malaysia. The online training programme for PETRONAS Group employees in Malaysia was completed in March 2016.

LIVE THE CoBE



The PETRONAS CoBE is made available online at
[http://www.petronas.com.my/about-us/governance/Pages/governance/
code-of-conduct-business-ethics.aspx](http://www.petronas.com.my/about-us/governance/Pages/governance/code-of-conduct-business-ethics.aspx)
or Scan this QR Code with your smart device.



CORPORATE GOVERNANCE AND BUSINESS ETHICS**ANTI-BRIBERY AND CORRUPTION COMPLIANCE PROGRAMME**

PETRONAS has zero tolerance for all forms of bribery and corruption, a reflection of our strong commitment to high ethical standards and anti-corruption laws. In supporting this commitment, a 'No Gift' Policy was implemented.

The ABC Manual, a core component of the PETRONAS Integrity Compliance Framework (PICF), supplements the CoBE's general policy statements on fighting corruption and unethical practices. The ABC Manual, applicable across PETRONAS Group, contains detailed procedures on dealing with improper solicitation, bribery and corruption. Key topics covered include dealing with gifts, entertainment and corporate hospitality, facilitation payments, dealing with third parties including promoting PETRONAS' whistleblowing channels to all employees as well as third parties.

The consequences of breaching the ABC Manual are clearly set out in the CoBE, and subject to the requirements of applicable laws, consequence management will be taken against any employee for non-compliance.

In 2016, a total of 32,990 employees have undergone face-to-face training on the ABC Manual. Personnel working in positions or job functions exposed to a higher risk of bribery and corruption were identified to attend a more in-depth training programme.



The ABC Manual is made available online at
<http://www.petronas.com.my/about-us/governance/Pages/default.aspx>
or Scan this QR Code with your smart device.

▼

VARIOUS INITIATIVES WERE IMPLEMENTED TO ADVOCATE THE IMPORTANCE OF CONDUCTING BUSINESS ETHICALLY AND WITH INTEGRITY.

PETRONAS COMPLIANCE DESKTOP

The PETRONAS Compliance Desktop is an integrated online solution to effectively raise awareness on anti-bribery and corrupt practices. The aim is to facilitate compliance activities related to the declaration of gifts, entertainment and conflict of interest, as well as screening and conducting third party due diligence, including policy life cycle management.

COMPLIANCE AND INTEGRITY PROGRAMMES

A series of Corporate Integrity Advocacy Programme (CIAP) to promote integrity and compliance was held internally. In 2016, a total of six engagement sessions were held.

INTEGRITY MANAGEMENT TRAINING MANUAL

Integrity Management Training Manual complements the ongoing efforts to develop effective anti-bribery and corruption compliance programmes for all levels of employees, including third party service providers.

CORPORATE GOVERNANCE AND BUSINESS ETHICS

COMBATING THIRD PARTY CORRUPTION

PETRONAS imposes a provision for all third party service providers to comply with the CoBE in all our contracts. Consequently, all contractors, sub-contractors, consultant, agents, representatives and others performing work or services for or on behalf of PETRONAS are expected to comply with the relevant parts of the CoBE when performing such work or services, failing which there shall be legal repercussions which may include termination of contract.

An online third party due diligence compliance screening on companies applying for licensing and registration was rolled out in 2016, via the PETRONAS Compliance Desktop. The screening process involved verification of information provided during the application process against official sources such as Companies Commission of Malaysia (CCM) to detect any elements of corruption, fraud, money laundering, sanctions and insolvency. Findings were assessed to assign an overall risk rating, to determine if the application for licensing and registration will either be approved or rejected.

We conduct training and continuously engage with our third parties to ensure compliance with our expectations as set out in the CoBE and ABC Manual. The training aims to drive the message that non-compliance will have severe consequences which may include termination of contract, debarment and/or disqualification from participating in any PETRONAS tender exercise. In 2016, a total of 192 companies participated in the PETRONAS' Vendor Integrity Programme (PVIP).

WHISTLEBLOWING POLICY AND PROCEDURES

The PETRONAS Whistleblowing Policy provides an avenue for employees and members of the public to disclose any improper conduct (misconduct or criminal offence or malpractices) in accordance with the procedures as provided under the Policy. A whistleblower will be accorded with protection of confidentiality of identity, to the extent reasonably practicable. Such protection is accorded along with the disclosure made in good faith, even if the investigation later reveals that the whistleblower is mistaken as to the facts and the rules and procedures involved.

The PETRONAS Whistleblowing Committee deliberates on disclosures made and to determine the next course of action as well as to monitor progress on cases. The Committee meets at least once a month and provides updates to the Internal Audit Management Committee. In 2016, the Committee received a total of 59 disclosures. Appropriate actions were taken on reports received via the Whistleblowing channels in accordance with the Whistleblowing Procedures.



The Whistleblowing Policy and Procedures is available on PETRONAS' corporate website at
www.petronas.com.my/about-us/governance/Pages/governance/Whistleblowing-eForm.aspx
or Scan this QR Code with your smart device.

HEALTH, SAFETY, SECURITY AND ENVIRONMENT GOVERNANCE

HSE AND SECURITY

In April 2016, as part of PETRONAS Group restructuring exercise, Group Health, Safety, Security and Environment (GHSSE) Division was established through the merging of Group Security and Group HSE. The Unit is headed by a Vice President who reports directly to the President and Group Chief Executive Officer (CEO).

Considering the synergies and optimisation opportunities for the two functions, the establishment of GHSSE was in line with the aspiration of the company to have a resilient operating model under the evolving business landscape.

In December 2016, a refined policy for security was approved by PETRONAS Board. The essential contents of the policy include the promotion of security as everyone's responsibility, and striving for best practice in terms of security management to ensure that our business operations are conducted in a safe and secured environment.

HSE CULTURE AND LEADERSHIP

PETRONAS HSE Executive Leadership Team (ELT), provides leadership for strengthening existing governance and strategies on HSE across the Group. The HSE ELT, which meets twice a year, is chaired by PETRONAS' President and Group CEO, supported by GHSSE. Similar HSE committees are established at Business, Operating and Holding Company Unit levels to deliberate on HSE matters.

Leadership visibility within our operating facilities is essential to inspire a positive mindset change in fostering a strong and sustainable HSE culture in the organisation. HSE culture is inculcated by emphasising the Zero Tolerance or ZeTo Rules which must be adhered to by everyone at our facilities, including third parties. The rules supplement our safety requirements, including all applicable laws and regulations wherever we operate.

ZeTo Rules



Work with a valid work permit (PTW) required by the job



Verify energy isolation before starting work



Obtain authorisation before overriding or disabling safety critical equipment



Obtain authorisation before entering a confined space



Protect yourself against a fall when working at height



Use the correct personal protective equipment (PPE) when handling hazardous chemicals



Obtain authorisation before excavation or entering a trench



Do not position yourself under a suspended load



Do not smoke outside designated areas or bring potential ignition sources into process areas without authorisation



Do not use your mobile phone/walkie-talkie while driving, follow the speed limit and use your seat belt

In 2016, efforts were undertaken to standardise consequence management practices with a distinct focus on violations. The initiative entailed ongoing communications of ZeTo Rules to create a robust culture of compliance and proactively prevent potential incidents and subsequently improve HSE performance.

MANDATORY CONTROL FRAMEWORK

In 2016, the HSE Mandatory Control Framework (MCF) was enhanced and rolled out as part of PETRONAS' continuous efforts to improve HSE performance. The new MCF, otherwise known as MCF 2.0, strengthens the requirements for all relevant sections particularly Safety and Transportation, Safe Operations and Environment. It aims to provide better clarity and focusing on high risk areas in HSE as well as allowing for a more streamlined approach to address significant HSE risks throughout PETRONAS.

MCF 2.0 was developed in-house through consultation with multidisciplinary teams across PETRONAS and internal subject matter experts whilst keeping in view any changes in the external HSE landscape. Regular engagement sessions were held with key businesses to ensure smooth transition to the new MCF.

MANAGING HSE RISK

PETRONAS has in place a Tier 3 HSE Assurance process as an integrated component to strengthen HSE governance to provide an independent and objective assurance of the overall adequacy, integrity and effectiveness of implementation of HSE MS, HSE risk controls and HSE MCF across PETRONAS. In 2016, a total of 10 HSE Tier 3 Assurances were successfully carried out.

Section Five

FEATURE STORIES

CONTENT

58 PFLNG SATU

59 Pengerang Integrated Complex (PIC)

FEATURE STORY**PFLNG SATU**

2016 year marked a historic milestone for PETRONAS as a major producer for liquefied natural gas (LNG). PETRONAS' first floating LNG facility, the first of its kind in the world was an industry breakthrough with the successful production of its first drop of LNG from the Kanowit gas field, offshore Sarawak on 5 December 2016.

The operational milestone marks a decade long journey for PETRONAS since conceptualising a floating LNG facility to maximise the potential of remote and stranded gas reserves to deliver a game changer in the global LNG business. By pushing engineering limits, we are making floating LNG facilities a reality to secure Malaysia's energy future whilst consistently demonstrating our commitment to safety as our top priority.

PFLNG SATU reached its final stages of commissioning and start-up with the introduction of gas from the KAKG-A central processing platform at the Kanowit gas field on 14 November 2016. The gas is treated and liquefied via its Nitrogen-based Liquefaction Unit – the heart of PFLNG SATU, and processed into the first drop of LNG.

The floating LNG facility will grow PETRONAS' global LNG portfolio as a leader in FLNG technology and enhance the company's reputation as a preferred and reliable LNG supplier. As we become the preferred choice for FLNG, we can expand our presence within the fast-growing LNG and low-carbon markets.

PFLNG SATU is expected to lift its first cargo and achieve commercial operations in the first quarter of 2017. The floating LNG facility will grow PETRONAS' global LNG portfolio as a leader in FLNG technology and enhance its reputation as a preferred and reliable LNG supplier.

Globally, demand for cleaner energy is rising especially with countries having committed to the Paris Agreement to mitigate Greenhouse Gas (GHG) emissions. Rising global populations as well as consumers growing conscious of their energy consumption will also contribute to greater demands. LNG is among the cleanest viable sources apart from renewable energy with lower GHG intensity if used as fuel.

In addition to growing our business into the low-carbon market, floating LNG vessels itself offer sustainable solutions and can reduce our carbon footprint. FLNG vessels eliminate the need for complex infrastructure, logistical issues and onsite personnel.

FEATURE STORY**PENGERANG INTEGRATED COMPLEX (PIC)**

The project is one of Asia's largest oil and gas industrial developments, as well as PETRONAS' largest downstream investment to date.



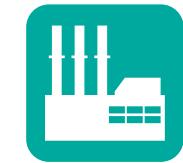
With an investment of USD27 billion, PIC supports the Malaysian Government's overall Economic Transformation Programme (ETP) and will spur the growth of Malaysia's oil and gas downstream sector, pushing Malaysia into a new frontier of technology and economic development. PIC is a step in the right direction for us to meet domestic demand for petroleum products and the Malaysian Government's future legislative requirements on the implementation of Euro 5 specifications for petrol and diesel.

Beyond Malaysia, it also opens up opportunities for us to capitalise on the growing need for petrochemical products in Asia in the next 20 years. PIC will be able to meet such demands as it consists of a 300,000 bpd refinery and petrochemical plants designed to produce premium differentiated petrochemicals.

**Poised for overall start-up in early 2019
54% completion as of Dec 2016 and on-schedule**



PAMER
Raw Water Supply Project to RAPID
260 MLD of water



PCP
Pengerang Cogeneration Plant
Power > 1,200 MW
Steam at 1,480 tph

to the national grid, while the remaining will be used for PIC.

In December 2016, the Prime Minister of Malaysia, visited PIC and officiated the successful installation of a propylene fractionator process column for the steam cracker facility. The fractionator has been recognised as the tallest and heaviest process column in Malaysia by the Malaysia Book of Records.

PIC will not only expand PETRONAS' existing business portfolio, but also act as a catalyst for further investments and create a multiplier effect on the nation. PIC is poised for an overall start-up in early 2019.

FEATURE STORY

We want to ensure the local community around the complex benefit from its development in areas of business and employment opportunities as well as from sustainable corporate social investment (CSI).

PETRONAS collaborated with various state and federal government agencies and Pengerang community leaders and representatives to develop a fit for purpose initiative, called #ForPengerang in 2015. Approximately 1,000 families were relocated to make way for the project and this initiative focuses mainly on the their needs and capabilities as well as their available opportunities and aspirations.

In 2016, we supported Koperasi Pengerang Jaya Johor Berhad (KOPEJA) which comprises of 90 per cent of relocated residents from Taman Bayu Damai to operate the first commercial retail station within the PIC site area and was launched by the Chief Minister of Johor. This is one key step of many in our commitment towards opening business opportunities for the community, providing job opportunities to locals and promoting capability building to operate a PETRONAS retail station effectively.

PETRONAS also enhanced the recruitment process for the main contractors at PIC to ensure better suitability and proper matching of skill sets.

There are also CSI activities that were put in place to ensure the people of Pengerang benefit in the long run in the areas of education, environment and community wellbeing. These includes the YoungScientist@Pengerang programme to nurture and nourish Pengerang students' interest in Science, Technology, Engineering and Mathematics (STEM); contribution of storage facilities for the community of Taman Bayu Damai; donation of ambulance and medical equipment to Sungai Rengit Health Clinic; cemetery cleaning at Perkuburan Ar-Raudhah and beach cleaning at Tanjung Setapa with the locals.

UPLIFTING LIVES OF COMMUNITY

PETRONAS contributes to the development of the community through opportunity matching, skills enrichment as well as relevant business support and guidance. Our aim is to ensure they benefit not just during the construction period, but more importantly on having the ability to sustain and expand their economic reach for years to come.

For commercial entities, a total of 649 Malaysian sub-contractors have been awarded with contracts valued of up to USD7.35 million. These companies take part in wide-ranging services to PIC, from fabrication, equipment supplies and solution services, to telecommunications, food and beverages, laundry services and sundry shops.

RECRUIT TO TRAIN (RTT)

A recruitment and training programme by PIC for securing talent pool to drive project growth and operations readiness, in both technical and non-technical areas. A total of 1,259 Malaysians are currently trained under this programme.

ENTREPRENEURSHIP DEVELOPMENT PROGRAMME (EDP)

PETRONAS partners with Johor State Entrepreneur Development Centre (EDC) to pave the way for reliable and established Johorean companies to participate in the various upcoming business opportunities at PIC via our Bina Niaga initiative. We also help small local business entities to identify other suitable opportunities via our Business-Matching initiative. For instance, in late 2016, we successfully helped MyCraft; a member of Persatuan Peniaga dan Usahawan KEJORA (PUPUK) in supplying prayer veils to PETRONAS retail stations around the Kota Tinggi district in Johor.



Find out more about PIC, its facilities and other initiatives at
<https://pic.petronas.com>
 or Scan this QR Code with your smart device.

Section Six

OUR ACHIEVEMENT

CONTENT

62 Awards and Recognition

OUR ACHIEVEMENT: AWARDS AND RECOGNITION



AWARD	AWARD TITLE/PRIZE
Malaysian Institute of Chemistry Laboratory Excellence Awards 2016	Winning Companies: PETRONAS Penapisan (Terengganu) Sdn Bhd PETRONAS Chemicals Ammonia Sdn Bhd PETRONAS Chemicals Glycols Sdn Bhd ASEAN Bintulu Fertilizer Sdn Bhd PETRONAS Chemicals Methanol Sdn Bhd PETRONAS Research Sdn Bhd
Chemical Industries Council of Malaysia (CICM) Responsible Care Awards 2015/2016	Corporate Awards for the Six Codes of Management Practices Petrochemicals Category under the Chemical Industry Total: Five gold, 13 silver and 5 merit awards
Royal Society for Prevention of Accidents (ROSPA) Occupational Health and Safety Awards 2016	Gold Class 1 Award: PETRONAS Penapisan (Melaka) Sdn Bhd
	Gold Award: PETRONAS Chemicals Ammonia Sdn Bhd PETRONAS Chemicals Ethylene Sdn Bhd
OTC Asia 2016 Spotlight	New Technology Award for Intelligent Circulation While Drilling (iCWD™): PETRONAS Carigali Sdn Bhd in collaboration with MIT Technologies Group
China Membrane Industry Association Science and Technology Award 2015/2016	First Class Award: PETRONAS in collaboration with Dalian Institute of Chemical Physics (DICP)
Putra Brand Awards 2016	Gold Award for the Automotive Fuel and Lubricants category

OUR ACHIEVEMENT: AWARDS AND RECOGNITION IN 2016

AWARD	AWARD TITLE/PRIZE
Malaysian Society for Occupational Safety and Health (MSOSH) Awards 2016	Occupational Safety and Health Grand Award: PETRONAS Chemicals Ethylene Sdn Bhd
	Gold 1 Awards: PETRONAS Penapisan (Melaka) Sdn Bhd PETRONAS Penapisan (Terengganu) Sdn Bhd PETRONAS Chemicals Ammonia Sdn Bhd PETRONAS Chemicals MTBE Sdn Bhd
	Gold Merit - Excellence in OSH Performance: ASEAN Bintulu Fertilizer Sdn Bhd PETRONAS Chemicals LDPE Sdn Bhd
Institution of Chemical Engineers (iChemE) Malaysia Awards 2016	Oil and Gas Award (Malaysia) Winner: PETRONAS
	Process Safety Award (Malaysia) Winner: ASEAN Bintulu Fertilizer Sdn Bhd Highly Commended: PETRONAS Chemicals Olefins Sdn Bhd
	Training and Development Award (Malaysia) Highly Commended: PETRONAS Chemicals Ammonia Sdn Bhd
Malaysia's 100 Leading Graduate Employers 2016	Second runner-up for Graduate Employer of the Year
	Most Popular Graduate Employer in Energy/Oil and Gas/Utilities
JobStreet.com People's Choice Award 2016	First place in Top 10 Companies in 2016
Quacquarelli Symonds (QS) Award 2016/2017	Debuted in the 601-650 band for QS World University Rankings and is the only Malaysian private university to make it into the ranking: UTP
	Rated as a 5-Star institution by QS: UTP
Brand Laureate Awards 2015/2016	Best Brand Award in Tertiary Education for Engineering, Science and Technology: UTP
Getenergy Global Award 2016	Education and Training Provider of the Year: INSTEP

OUR ACHIEVEMENT: AWARDS AND RECOGNITION IN 2016

ORGANISATION/AWARD	STAFF AWARD AND RECIPIENT
Academy of Sciences Malaysia	2016 Top Research Scientists Malaysia (TRSM) Award: Dr Suzana Yap, Associate Professor at the Chemical Engineering Department, Universiti Teknologi PETRONAS (UTP)
	Elected as Fellow in the discipline of Engineering & Computer Sciences: Prof Dr Mohamed Ibrahim Abdul Mutalib, Deputy Vice Chancellor Academic, FASc
Malaysia's Rising Star Award (MRSA) 2016 Award	Highly Cited Review for Women in Science Award: Dr Suzana Yap, Associate Professor at the Chemical Engineering Department, UTP
Elsevier Green and Sustainable Chemistry Challenge 2016	2 nd Prize Winner: Dr Suzana Yap, Associate Professor at the Chemical Engineering Department, UTP
William Pitt Fellowship from Pembroke College, University of Cambridge	Second Malaysian to be admitted: Datuk Ir Dr A Rahim Hj Hashim, UTP Vice Chancellor, FASc
National Technologist Award 2016	Shaiful Hisham Shamsudin, Mechanical Engineering Department, UTP
Institution of Chemical Engineers (iChemE) Malaysia Awards 2016	Young Chemical Engineer in Industry Award (Malaysia) Winner: Anis Zafirah Binti Sipal Anuwar, PETRONAS Chemicals Olefins Sdn. Bhd.
	Young Chemical Engineer in Research Award (Malaysia) Highly Commended: Nurzatil Aqmar bt Othman, PETRONAS Research Sdn. Bhd.

Section Seven

APPENDIX

CONTENT

66 Our Approach to Reporting

OUR APPROACH TO REPORTING

SECTION	IPIECA	GRI - G4	WHERE REPORTED (PAGE TBD)
INTRODUCTION			
PETRONAS' Sustainability Journey		G4-28 – G4-30	2
Corporate Overview	-	G4-3 – G4-9	Refer to Annual Report FY2016
Sustainability Highlights and Group Financial Performance Overview	E1, SE13, SE14		5
Letter from the President and Group Chief Executive Officer			7 - 8
Sustainable Development in PETRONAS		G4-35, LA5	9
PETRONAS Corporate Sustainability Framework		G4-34 - G4-36, G4-46 – G4-48	10
About This Report - Material Sustainability Matters		G4-17 – G4-21, G4-24	11
Sustainability Performance Data	E1, E3, E4, E6, E7, E8, SE6, SE7, SE13, SE15	EN3, EN8, EN15, EN21, EN22, EN23, EN24, LA1, LA6, LA12, SO6	12 - 14
ENVIRONMENT			
Opening Statement			16
Climate Change	E1, E3, E4, SE14	DMA, EN3, EN15, EN19	17 - 21
Feature: Interview with Dzafri Sham Ahmad: The Climate Challenge and Opportunity for Change – Malaysia and Beyond		DMA	22
Water Management	E6, E7	EN8	23
Environmental Performance	E5, E7, E8, E9, E10, E11	DMA, EN23, EN24,	24 - 25
Feature: Instilling Environmental Awareness			26 - 27

OUR APPROACH TO REPORTING

SECTION	IPIECA	GRI - G4	WHERE REPORTED (PAGE TBD)
SOCIETY			
Opening Statement			30
Occupational Safety	HS1	LA6, DMA	31 - 32
Process Safety	HS1, HS5, SE17		33 - 34
Occupational Health and Wellness	HS1, HS2, HS3		35
Industrial Hygiene	HS2		36 - 37
Emergency Preparedness and Response	HS5		38
Product Stewardship	HS4	DMA, PR3	39 - 41
Our People	SE6, SE15, SE16, SE17	LA10,	42 - 43
Social Performance	SE3, SE8, SE9, SE17	DMA	44 - 45
Community Investments	SE1, SE3, SE4, SE5	DMA	46 - 50
GOVERNANCE			
Opening Statement			52
Corporate Governance and Business Ethics	SE11, SE12, SE17, SE18	G4-56 – G4-58, SO4	53 - 55
Health, Safety, Security and Environment Governance		DMA	56
FEATURE STORIES			
PFLNG SATU		SE14	58
Pengerang Integrated Complex (PIC)	SE1, SE3, SE5	SO2	59 - 60