

# Moving Forward with **Passion**

## Strategic Progress

Leadership  
perspectives and  
insights into how  
we are executing  
strategy to create  
value.

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# Ensuring We Remain Relevant in the New Normal

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**Dear Stakeholders,**

The year in review was undoubtedly one of the most testing years for the oil and gas industry with the twin shocks of the COVID-19 pandemic and the oil prices free plunging the industry to an unprecedented low.

As lockdown measures were swiftly implemented to stem the tide of the pandemic, economies the world over suffered with many coming to an abrupt standstill. At the same time, an oil price rout amidst a supply overhang wreaked further havoc on an already despondent industry. Like all oil majors, the PETRONAS Group felt the full brunt of this onslaught with a never-before-seen contraction in our revenue. Through prudent liquidity and cost management, PETRONAS continued to operate cautiously and efficiently.

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**Tan Sri Ahmad Nizam Salleh**  
Chairman



The industry was already contending with an energy mix shifting from a fossil fuel dominated to one that will see a significant rise in cleaner energy sources before the pandemic. More governments the world over and stakeholders are sending strong signals on the value of sustainability and intensifying their shift towards low carbon priorities.

To counter the effects of the energy transition combined with the impact of the pandemic, PETRONAS is upholding its strategies and implementing timely mitigation measures while drawing a new map of recovery and growth pathways with full support from the PETRONAS Board. The road ahead will require us to move forward with pace, while having the resilience to weather this long-drawn-out storm.

My Board and I are grateful for the relentless spirit shown by our people, and our partners who pushed through this tumultuous time to keep delivering energy while churning out value through their passion and dedication. They worked around stringent standard operating procedures (SOPs) and constraints to sustain operations in the safest possible manner, while stepping up to stay true to our Purpose – A progressive energy and solutions partner enriching lives for a sustainable future.





## Letter from the Chairman

### Committed to Enriching Lives

PETRONAS was formed to deliver value from the trust bestowed upon us in managing the nation's hydrocarbon resources. At a time where lives, lifestyles and economic activities are completely altered, we remain unwavering in our commitment to enrich lives wherever we operate. In 2020, PETRONAS staff came together to raise a voluntary salary contribution of RM6.4 million for 'Tabung COVID-19' under the National Disaster Management Agency (NADMA). This was part of our total contribution valued at RM50.6 million, which included the timely disbursement of medical supplies, protective gear and other essentials for frontliners and the public in Malaysia as well as in our countries of operation. In 2020, the Group's Corporate Social Responsibility (CSR) activities fronted by Yayasan PETRONAS (the PETRONAS Foundation), primarily focused on COVID-19 relief efforts, while we ensured that other philanthropic efforts were proportionately carried out to continue delivering value in meaningful and scalable ways.

For more details of our Corporate Social Responsibility activities, go to the Positive Social Impact section on pages 178 to 189.

With the pandemic precipitating a health and economic crisis, the livelihoods of lower income groups and small businesses have become even more vulnerable. Recognising this, in August 2020, Yayasan PETRONAS announced Program MEKAR which aims to elevate the socio-economic capacity of 3,400 low-income (or B40) families over the next two years by transforming ideas into sustainable businesses to narrow income gaps for a more equitable society. These families from eight states in Malaysia are expected to benefit from the MEKAR programme through targeted mentoring and training schemes. This is in support of the Malaysian government's stimulus packages to "build back better" which includes leveraging on the digital economy to empower communities to overcome economic hardship throughout the pandemic.



PETRONAS is also in tune with the ambitions and struggles of homegrown companies in becoming globally competitive, having gone through the ups and downs of the oil and gas business ourselves. As Malaysia's national oil company (NOC), we have taken it upon ourselves to safeguard and shape the resilience of the domestic oil and gas ecosystem. We collaborate with the Ministry of Entrepreneur Development and Cooperatives (MEDAC) to champion the Vendor Development Programme (VDP) which has helped produce four listed companies from a total of 99 local vendors who have graduated from the programme since 1993. A conducive environment for emerging Oil and Gas Service Equipment (OGSE) vendors will not only help them leap into more complex areas of the business but also enhance their business acumen to develop sustainably.

In 2020, over 200 of our high performing vendors received timely support from our Vendor Financing Programme and Road to Bursa initiatives, which enabled them to thrive in challenging circumstances and keep the domestic economy flowing from their earnings.

For more details of our Labour and Supply Chain activities, go to the Positive Social Impact section on pages 172 to 177.

PETRONAS staff came together to raise a voluntary salary contribution of  
**RM6.4 million**  
for 'Tabung COVID-19' under NADMA

Our total COVID-19 contribution valued at  
**RM50.6 million**  
included the timely disbursement of medical supplies, protective gear and other essentials for frontliners and the public in Malaysia as well as in our countries of operation

Approximately  
**3,400 low-income families**  
from eight states in Malaysia are expected to benefit from the MEKAR programme which transforms ideas into sustainable businesses to narrow income gaps for a more equitable society

## Letter from the Chairman

### Paving Recovery and Growth Pathways

For PETRONAS, recovery and growth go beyond just the confines of business and financial returns. We recognise that we have a responsibility to balance out our economic ambitions with positive social and environmental considerations. We draw on our strength and ability to balance our unique position to fulfill our commitment as Malaysia's NOC as well as live up to growing expectations in our position as an international oil company (IOC). To this end, PETRONAS' Sustainability Agenda is at the heart of all our value creation efforts, and this in turn is supported by four sustainability lenses.



Continued Value Creation



Safeguard the Environment



Positive Social Impact



Responsible Governance

The Agenda enables us to remain committed to our sustainability endeavours.

PETRONAS will continue to evolve as we brace for lower-for-longer oil prices and demand for low-carbon energy. The Board is fully supportive of the deliberate steps and new portfolio objectives that will see us pursuing superior performing and high value offerings and solutions, which are robust and sustainable in the long run, while positively contributing to society. This will be met through strengthening our core by being increasingly cost efficient, ensuring active portfolio management and accelerating our Stepping Out strategy into specialty chemicals and renewables such as solar and hydrogen.

I am pleased to share that despite the headwinds, PETRONAS has continued to deliver its Three-Pronged Growth Strategy and made great strides in providing new and innovative energy solutions to our customers which include:

➔ **Expanding our offerings with Liquefied Natural Gas (LNG) Bunkering, delivery of LNG via ISO tanks to off-grid customers** via a Virtual Pipeline System (VPS) and a range of IONA e-fluids to serve the electric vehicle market.

➔ **Enhancing customer experience at our local PETRONAS Mesra Stations with Setel, Deliver2Me and Makan@Mesra** that have contributed to increased growth in non-fuel retail income for PDB.

➔ **Providing access to renewable energy with M+ by PETRONAS, a flagship solar rooftop solution** for commercial and industrial customers.

On the home front, PETRONAS is committed to ensure the domestic oil and gas ecosystem continues to thrive and Malaysia is recognised as a world class investment destination. In our five-year plans, the bulk of our capital expenditure (CAPEX) will be invested domestically. With this move, we hope to rejuvenate the domestic oil and gas sector, to stimulate the recovery of the economy and generate growth for the longer term.

We are positioning ourselves to embrace a low-carbon energy future via our aspiration to achieve net zero carbon emissions by 2050 (NZCE 2050). It will not just be our licence to operate but is also integral in supporting our organisation's resilience moving forward. It presents opportunities for us to pursue new top line and bottom-line value creation and ensure the Group's market valuation strengthens over time.

Our enduring partnerships with stakeholders have already taken a new turn with the establishment of formidable

alliances to further grow the value pie for our stakeholders. In 2020, PETRONAS concluded a historical commercial settlement on oil and gas matters in the state of Sarawak. The evolution of this partnership will see the State having more active participation in the management of onshore oil and gas resources. It also paves the way for our new collaboration with Sarawak Energy Berhad (SEB) to explore commercial production of green hydrogen in meeting the demand for global clean energy.

PETRONAS has been an advocate for natural gas' pivotal role as a cleaner, more secure and abundant resource for the energy transition which will make up a quarter of the primary energy mix by 2040.

As one of the world's largest exporters of LNG, backed by an integrated value chain, customer-centric solutions and strategically located global assets, we are in an advantageous position to meet future gas demand which is anticipated to come mainly from Asia. PETRONAS is also supporting the formulation of Malaysia's Natural Gas Roadmap, a key part of the National Energy Policy under the 12<sup>th</sup> Malaysia Plan, 2021-2025.

This collaboration realises the ideal synergy of companies working closely with policy makers to move the needle in tackling climate change issues in an effective and sustainable manner.



### Integrity Anchored on Shared Values

At PETRONAS, we believe good governance translates into good business. As such, we remain committed to upholding high standards of corporate governance as well as applying robust risk management and internal control measures to our business. These elements are not only helping us ensure the delivery of sustainable and long-term business growth, they are also safeguarding PETRONAS' reputation as a trustee of the nation's oil and gas resources while ensuring continued shareholder value creation. Business ethics and corporate governance are the guardrails that keep our organisation on track and in check.

In the course of acting at pace in response to the highly challenging environment, individual and organisational integrity must be upheld as a way of life and must not be compromised at any cost.

**To this end, Integrity is upheld as one of our Shared Values alongside Loyalty, Professionalism and Cohesiveness to guide and drive us forward.**

PETRONAS practices zero tolerance against bribery and corruption and implements global practices to combat such acts. We were one of Malaysia's first companies to obtain and have since maintained our International Organization for Standardization 37001 certification. We have strengthened the tone from top where leaders model the way and speak on hard-hitting topics surrounding integrity. The Group also makes every effort to roll out compulsory training and e-learning programmes on PETRONAS' guidelines while our policies govern business conduct across the Group.

A single assurance platform, the PETRONAS Integrated Assurance platform is pervasively used across the Group's operations to prevent and mitigate risks that could impact the organisation, including unethical acts of bribery and corruption. This is one of our control measures to promote proactive self-assessment in regulating one's own behaviour and actions while performing daily work routines, in accordance with the PETRONAS Integrity Compliance Framework.

PETRONAS holds the nation's hydrocarbon resources in trust, and we share the accountability to ensure its well-being, while we harness its potential for the benefit of the people and the nation. To this end, we will continue to ensure individual and organisational integrity becomes a way of life at PETRONAS.

#### PETRONAS Practices Zero Tolerance Against Bribery and Corruption

One of Malaysia's first companies to obtain and have since maintained our

#### International Organization for Standardization 37001 certification

Rollout of compulsory training and e-learning programmes



### Moving Forward amidst a Challenging Outlook

As we embrace a new year, the economic outlook remains uncertain and challenging. Evidence points to the acceleration of the energy transition, while the impact from the pandemic-induced demand destruction and oil price rout remains. While there has been good progress made on the vaccination front and several pockets of recovery are already underway, new strains of the COVID-19 virus have caused some countries to consider stricter lockdowns. All in all, clouds of uncertainty still loom over the horizon as early economic indicators are showing the return to pre-pandemic normalcy will only be in 2022.

**Moving forward, PETRONAS maintains a cautious outlook for 2021 as the events of the past year continue to shape the challenges that we see today. Our mandate is to ensure that future generations inherit a strong and sustainable company. We have behind us 46 years of impressive growth that will drive us to take on the change and innovation that have become the business norms of today.**

If we are to make real progress amidst today's challenging landscape, we must not derail from our efforts of upholding the highest levels of integrity and governance. We must also stay true to our Shared Values and our accountability for the resources we have been entrusted with, to create new value for our customers who have given us the opportunity to serve and grow; resource owners who have entrusted us to become their partner in progress; and the nation for its support in allowing us to continue growing as a FORTUNE Global 500 company.

### In Appreciation

Many parties helped PETRONAS weather the very challenging year that was 2020 and we are indeed grateful for all their support and trust. On behalf of the PETRONAS Board of Directors, I wish to convey my deep gratitude to Tengku Muhammad Taufik, President and Group Chief Executive Officer (CEO) of PETRONAS, his Leadership Team, and each and every one of our loyal employees for stepping up to the plate and

remaining resilient amidst the year's challenges. It is because of your perseverance, hard work and team spirit that we were able to remain resolute in the face of 2020's extremely challenging operating environment.

I also wish to express my heartfelt appreciation to our valued stakeholders, particularly our customers and partners for their unwavering support and confidence in PETRONAS. My utmost appreciation to the government of Malaysia, the state governments and the governments of PETRONAS' host countries for their invaluable cooperation and backing that helped us keep our people safe and our businesses operational. Over and above, my sincere gratitude to my colleagues on the Board for their astute counsel and insights which helped us navigate safely through last year's highly taxing playing field.

In 2020, we bid farewell to two Directors namely Tan Sri Wan Zulkiflee Wan Ariffin, our former President and Group CEO who resigned in June 2020, and Encik Ahmad Faris Rabidin, an Independent Non-Executive Director who resigned in August 2020. We thank both gentlemen for their worthy contributions to PETRONAS and our nation and wish them every success in their future endeavours.

We extend a warm welcome to our three new Independent Non-Executive Directors, namely Tan Sri Datin Paduka Zaharah Ibrahim, Dato' Haji Razali Mohd Yusof and Dato' Hj. Ibrahim Hj. Baki, all of whom were appointed on 17 August 2020. We certainly look forward to the collective experience and expertise as well as the diverse perspectives that they bring to the table.

PETRONAS did not emerge from 2020 unscathed. The year taught us some very hard lessons and accorded us solid insights into what our next steps should be if we are to remain relevant as a progressive energy and solutions partner. As we steadily put the building blocks in place and move forward into the new normal, I am confident that PETRONAS will once again attain credible, sustainable progress. Last but not least, I call upon all our stakeholders to move forward together and lend PETRONAS their unstinting support. Thank you.

**Tan Sri Ahmad Nizam Salleh**  
Chairman



# Remaining Steadfast in Tough Times

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## Esteemed Stakeholders,

The year 2020 was an exceedingly difficult one for the industry. The unprecedented events that unfolded saw the industry contending with the challenges of the demand destruction brought about by the COVID-19 pandemic and fragile oil prices, following a sustained rout due to a prolonged supply glut. Within the broader energy space, the pandemic mercilessly tested the vulnerabilities in our current energy system. Since then, the push towards energy transition has become increasingly evident and accelerated. In totality, these developments have converged, forming an undeniable imperative requiring immediate reforms along the whole value chain. In short, the historic events of 2020 forced a Great Reset for the industry.

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**Tengku Muhammad Taufik**  
President and Group Chief Executive Officer



Amidst these disruptions, we have not wavered from our priority: to keep our people safe. We took **immediate measures** to ensure the safety of our 48,000-strong workforce, preserve business continuity across more than 33 countries as well as uphold the social well-being of communities in our areas of operation. To ensure PETRONAS' long-term survival, the Group embarked on **deliberate steps** to strengthen our resilience and steer the organisation towards a path to recovery.



Our focus is on becoming a more cost-efficient producer, de-risking our investments by pursuing opportunities that deliver quicker cash returns and are less volatile, as well as embarking on more innovative solutions while pivoting our portfolio. These efforts will continue to be driven by a stronger, more customer-centric workforce, committed towards the pursuit of our Three-Pronged Growth Strategy.

Despite the obstacles we faced, the PETRONAS Group has responded well to cushion the adverse impact of a turbulent year. This overview of our operational and financial performance is a testament to the mettle of our people, their appetite to innovate, as well as their commitment to working together to overcome all odds and progress with conviction.

## Turning in a Resilient Performance

Before net impairment losses, PETRONAS posted a Profit After Tax (PAT) of RM10.5 billion for 2020 as compared to RM48.8 billion in 2019. Accounting for impairments however, the Group recorded its first-ever annual Loss After Tax (LAT) of RM21.0 billion. What is important to note is, the swift, decisive and prudent measures undertaken to

provide PETRONAS with a stronger foundation to ensure the resiliency and sustainability of its operational and financial positions today.

At the onset of the pandemic in March, PETRONAS announced a targeted capital investments reduction of 21 per cent and operating expenditures reduction of 12 per cent. The decision was taken after careful deliberation to protect groupwide profitability while preserving liquidity to weather what we anticipated to be an extremely volatile period. We also remained firm on our cost compression and resource optimisation efforts.

As a result, we recorded positive Cash Flows from Operating Activities (CFFO) of RM40.7 billion in 2020, albeit 55 per cent lower than the RM90.8 billion in the previous year. The healthy CFFO provided comfortable liquidity cover to meet the Group's Capital Investments of RM33.4 billion. PETRONAS' Earnings Before Interest, Tax, Depreciation and Amortisation (EBITDA) remained strong at RM55.3 billion.

This performance allowed PETRONAS to continue contributing to our stakeholders in the form of cash payments, taxes, export duties and dividends.



Responding with Immediate Measures to 2020's Challenges

When the first hints of the pandemic emerged earlier in the year, the Group had to navigate operational and supply chain disruptions, demand disruptions, evolving market conditions and shifting consumer behaviour. We minimised the impact of these headwinds on our business by deploying **three immediate measures**:

#1

Activation of the PETRONAS Pandemic Preparedness and Response Team (PPRT) and Corporate Command Centre (C3) – to ensure timely decisions were made to safeguard the health and safety of our people and to regulate critical cross-business decisions.

#2

Implementation of Liquidity Plus (L+) – to provide steer on groupwide liquidity strategies to remain resilient while preserving credit metrics at Investment Grade.

#3

Rollout of Fast Forward (F2) – to shape the organisation post COVID-19, in response to the complexities of the new normal.

I am pleased to report that PETRONAS' operations were able to run safely, reliably and efficiently with minimal interruptions despite having to address more than 2,000 cumulative COVID-19 cases within the Group at the peak of the pandemic. We activated the evacuation of employees who developed COVID-19 symptoms and evacuated as well as redeployed approximately 1,039 employees, dependents and students from 33 countries. We also ensured digital infrastructure readiness for our more than 48,000-strong workforce to work remotely and safely during the crisis.



Moreover, the Group recorded 272.8 million man-hours in 2020 and the Fatal Accident Rate (FAR) stood at 1.47 per million man-hours. Major Loss of Primary Containment (LOPC) was contained at five incidents, which is the lowest rate over the last five-year period. Major Fires recorded were sustained at two incidents – an improvement compared to three incidents in 2019.



Leveraging Three Deliberate Steps to Ensure Sustainable Growth

As I stated at the outset of this letter, the confluence of events in 2020 forced a Great Reset for the industry which resulted in energy players taking a long, hard look at the way we had been doing things. For PETRONAS, it was an impetus for the Group to clearly define our long-term portfolio objectives so we could take deliberate steps into potential new spaces that will enable us to thrive in the energy transition. We recognised new opportunities in pursuing 'green shoots' through close collaborations between our Upstream, Gas + New Energy, Downstream as well as Project Delivery and Technology (PD&T) business segments that, in our view, could strengthen our resiliency in responding to challenging market conditions.

The year under review saw PETRONAS focusing on **three deliberate steps** – the first was to act immediately on the levers that were within our control, while the other two steps were long-term measures that would steer the organisation through the crisis and ultimately, thrive in the long run. The deliberate steps, which were timely tactical interventions to minimise operational impact and preserve value across the Group, entailed:

Focused Execution at Pace

This centres on our core engine running efficiently to (i) ensure optimum value from our assets and resources in a better, faster and safer manner, and (ii) enable a smoother portfolio review and business pivot where necessary. At the heart of this are two key components, namely cost-to-serve and knowing our customers. These are among a few commendable examples of our achievements:

A total of ten discoveries were made in 2020 comprising seven discoveries which contributed to our resource addition namely in Malaysia, Suriname as well as Gulf of Mexico, USA and Gulf of Mexico, Mexico

10% reduction in Upstream Unit Production Cost (UPC) and energy optimisation initiatives to improve efficiency in reducing UPC for all Downstream Plants

600 million standard cubic feet per day (MMscfd) minimum daily gas offtake during Movement Control Order (MCO)

Secured 6.5 mtpa LNG supply deals covering contract extensions, servicing new customer segments via Virtual Pipeline System (VPS) and LNG Bunkering Vessel (LBV) solutions, as well as entries into new markets

Achieved an Overall Equipment Effectiveness (OEE) rate of 90% across Downstream assets, 97% for domestic refinery and 86.2% for South Africa's refinery

Achieved an OEE rate of 96.8% across G+NE

PD&T's efforts generated RM2.9 billion in cost savings realised across the Group

I am pleased to report that PETRONAS ensured a safe and sustainable supply of energy to support the requirements of its customers, partners and businesses across the globe with strict compliance to our Health, Safety, Security and Environment (HSSE) standards and guidelines by local authorities – all this was delivered despite the many vagaries we contended with as a result of the pandemic.

Reshaping Our Portfolio

This allows us to shape a superior performing and high-value portfolio which is robust and sustainable in the long run whilst positively contributing to society.

Established the Portfolio Intervention and Transition (PIT) team – a multifunctional team with best-fit talents to accelerate the portfolio review with groupwide resilience and sustainability in mind

Introduced new and accessible LNG solutions encompassing the VPS and LBV solutions

Increased growth in the non-fuel retail segment with Setel and Mekan@Mesra

Close to a 1GW solar capacity under operation and development in Malaysia, India and Dubai

Stepping out through partnerships in specialty chemicals to meet the increasing demand for gloves, pharmaceuticals and hygiene products

Venture capital investments in technology start-ups for growth in industries adjacent to and beyond oil and gas namely, Braintree Technologies for smart farming solutions with PETRONAS Chemicals Group Berhad

PETRONAS through its corporate venture capital arm, PETRONAS Ventures, teamed up with SOLS Energy Sdn Bhd to invest in the solar photovoltaic (PV) system start-up that provides sustainable energy for residential and small-to-medium enterprise (SME) sectors in Malaysia

Venturing into the commercial production of green hydrogen, for export to the Far East Asia market

These are among the 'green shoots' that will expand PETRONAS' offerings as an energy and solutions partner to fulfil the aspirations of consumers and governments for a low-carbon future.

Retooling Our Human Capital Equation

In simple terms, this entails taking a long hard look at how we deploy the talents we already have, expect to recruit or potentially lose through natural attrition, while focusing on building new types of capabilities to ensure PETRONAS retains a robust workforce that is equipped to face the energy transition.

This will be absolutely essential as we pivot our strategy to move forward. People are our most valuable assets and PETRONAS remains steadfast in ensuring its talents are continuously upskilled.

83% of 48,679 employees worked from home with 47,127 online training sessions completed

TechnoDigital Agenda to accelerate PETRONAS transformation on the technology and digital front with enhanced capabilities and resources to steer a future-ready organisation

Leadership pipeline through accelerated development of our talents to become more transformative, agile and inventive

Diversity and Inclusion (D&I) efforts across global operations

The deliberate steps of focused execution at pace, reshaping our portfolio mix and retooling our human capital equation enabled PETRONAS to weather the challenges of the year in review. As a Group, we will continue to remain focused on preserving value, pursuing growth and intensifying our sustainability efforts as we progress forward in our Three-Pronged Growth Strategy.

### Strengthening Our Sustainability Agenda

For the year under review, we continued to make good strides forward on the sustainability front in several areas.

As an industry, we have before us the mammoth task of balancing the need to decarbonise the energy system while ensuring an energy supply that is affordable, secure and sustainable. For PETRONAS, our Purpose is to be a progressive energy and solutions partner enriching lives for a sustainable future. This signals our expansion beyond the traditional oil and gas portfolio into the broader energy space, while doing so in a way that benefits all.

**PETRONAS recognises that sustainability is no longer optional - going forward, it is our licence to operate. Demonstrating this commitment, we have recently declared our aspiration to achieve net zero carbon emissions by 2050 (NZCE 2050).**

This is part of our holistic approach to sustainability from the Environmental, Social and Governance (ESG) perspective. Our approach is guided by our four sustainability lenses of Continued Value Creation, Safeguard the Environment, Positive Social Impact and Responsible Governance.

On this note, I am pleased to share that PETRONAS appointed Ms Charlotte Wolff-Bye as Chief Sustainability Officer, PETRONAS effective 1 June 2021. With over 20 years' experience, Charlotte is an internationally recognised expert in delivering strategies that create positive and sustainable impact on society, the economy and environment. She brings to the table her in-depth experience and expertise in developing and deploying CSR and sustainability strategies across our integrated businesses.

We believe her immense experience will add momentum and value to PETRONAS' long-term sustainability journey. To this end, we will be developing a clear strategy for the Group to execute our NZCE 2050 aspiration, and together ensure we prudently navigate the energy transition while delivering the necessary portfolio impacts.

To date, PETRONAS has intensified its efforts through partnerships with the private and public sectors to accelerate sustainable industry practices globally and in Malaysia. The year's milestones included the following:

Organised the second Malaysia Energy Roundtable in partnership with the **World Economic Forum (WEF)** to facilitate public-private discussion on the future of Malaysia's energy landscape and the priorities for an effective energy transition.

Attained membership in the **World Business Council for Sustainable Development (WBCSD)** to collaborate with oil and gas industry peers, as well as the wider energy industry and other sectors, to share best practices, advocate and support policies, while developing solutions. PETRONAS is focusing on the Circular Economy where we will expand our involvement in areas such as Climate and Energy, People and Redefining Value via the WBCSD.

Became a signatory to the **WEF Stakeholder Capitalism Metrics** which aims to promote and steer convergence of global ESG standards.

It is in this spirit of collaboration that I believe we will be able to collectively move the needle towards the goal of NZCE 2050. With decisive, deliberate and coordinated action, I am confident that the industry will bring forth a sustainable energy equation for our shared future.

### Contributing to Nation-building Efforts

Despite the turbulent year, we remain fully committed towards contributing to the well-being of society through various social initiatives.

The B40 Empowerment Programme for instance, is targeted at the agricultural and agro-based industry. Dedicated to addressing youth unemployment whilst leaving a positive impact on communities through social entrepreneurship, our SEEd.Lab initiative forges sustainable solutions to manage community pain points and bridge youth employment gaps in Malaysia.

In the area of Education, we awarded 370 scholarships under the PETRONAS Education Sponsorship Programme in 2020, which brings the total number of beneficiaries to more than 37,000 students since 1975, with investments in human capital totalling more than RM3.3 billion. We also contributed to the Discover PETRONAS @ Schools and Vocational Institution Sponsorship and Training Assistance (VISTA) programme.

On the local OGSE front, PETRONAS continues to run its Vendor Development Programme (VDP) to nurture local SMEs in the oil and gas services sector. The Vendor Financing Programme, with support from local and foreign financial institutions, continues to provide assistance to the local OGSE sector and this was especially evident during the challenging period last year.

I am pleased to share that the Group undertook other initiatives to support the local OGSE ecosystem amidst the pandemic. These measures included the following:

➔ **PETRONAS introduced the Contractors' Special Assistance Programme in March 2020 to support the local OGSE sector and to minimise the impact of the COVID-19 pandemic and low oil prices on local contractors.**

➔ **PETRONAS Chemical Group (PCG) worked closely with Small and Medium Enterprises (SMEs) within its supply chain, authorities and regulators to ensure business continuity was preserved without compromising PCG's value.**

I would like to take this opportunity to thank all of our industry partners for the ongoing support and commitment towards these initiatives as we continue to collectively face the volatile business landscape.

PETRONAS also recognises that managing a finite resource logically cannot be an infinite venture. For the benefit of the nation, we continued setting aside funds through this difficult period. On that note, regardless of the headwinds we faced, PETRONAS fulfilled its commitment to contribute to the National Trust Fund which stood at RM10.4 billion as at 31 December 2020.

These societal initiatives are driven by PETRONAS' responsibility as Malaysia's national oil company (NOC) to uphold the *Amanah* or Trust given to us to manage the nation's hydrocarbon resources for the benefit of the people. This is a value that is deeply embedded in the organisation.

### Moving Forward into 2021 and Beyond

While we made strong strides forward in mitigating the impact of COVID-19 in 2020, we are not quite out of the woods yet. With fresh waves of COVID-19 cases still surging across the world, the economic outlook remains uncertain and difficult. While we remain hopeful given the pockets of recovery we are seeing in some parts of the world as vaccination programmes are rolled out in earnest, we anticipate a weakened growth trajectory for the rest of the year - putting 2021 on a fragile footing. Amid the ever evolving operating environment brought about by the pandemic as well as prolonged volatility of oil prices, PETRONAS is adopting a cautious outlook and anticipates that 2021 will be challenging all around.

In ensuring PETRONAS' ability to weather the storm in a resilient and sustainable manner, we must implement purposeful and laser-focused measures. To this end, we must ensure that we are able to be a more cost-efficient producer and are in a strong position to de-risk our business, while delivering more innovative solutions to pivot our portfolio. At the same time, we must be unrelenting in our focus to build a stronger, customer-centric workforce that is committed towards Focused Execution at Pace while strengthening our Sustainability Agenda. Ultimately, we must ensure that PETRONAS is able to continue contributing for the long term towards the shared prosperity of the nation and the industry as a progressive energy and solutions partner enriching lives for a sustainable future.

### Acknowledgements

The year's resilient performance is due to the efforts of many parties whom we wish to acknowledge. Permit me to place on record my thanks to my immediate

predecessor, Tan Sri Wan Zulkiflee, for his many years of dedicated service and valuable contribution to the Group. Without question, my utmost gratitude is only rightly reserved for our diligent and dedicated employees whose resilience and commitment to excellence saw us through a very challenging time. As a result of the collective efforts throughout the Group, PETRONAS has maintained its position as the most valuable ASEAN brand in the Brand Finance Global 500 report this year and remained in the ninth spot amongst the brand valuation consultancy's listing of global oil and gas brands.

I want, in particular, to extend my heartfelt appreciation to our Chairman, Tan Sri Ahmad Nizam Salleh and all members of the PETRONAS Board of Directors for their astute insights, counsel, and stewardship during this difficult and challenging period. My sincere thanks to our valued shareholder for their confidence and trust in PETRONAS, and last but not most definitely not least, to our loyal business partners, vendors and other stakeholders for their support and continued belief in PETRONAS as their preferred energy and solutions partner.

As we move into the new normal, there is still much uncertainty about what lies ahead. However, with strategic imperatives clearly drawn up, a motivated workforce whose commitment remains undiminished, and the support of a shareholder keen to ensure we succeed come what may, I am confident we will be able to tackle all imminent challenges and capitalise on all opportunities that the future may bring.

**Tengku Muhammad Taufik**  
President and Group Chief Executive Officer



# Remaining Resilient and Agile Amidst Unprecedented Challenges

The year 2020 was an unprecedented year globally. In the energy industry, all players were severely impacted by the twin shocks of plummeting oil prices and induced demand erosion resulting from the collapse of the OPEC+ alliance and the effects of the COVID-19 pandemic. Against this backdrop, the PETRONAS Group took several decisive and prudent measures to ensure the resiliency and sustainability of our businesses. We swiftly implemented several tactical interventions across the Group to preserve value and minimise interruptions, focusing our efforts on maintaining disciplined capital and operational spending as well as preserving liquidity. As a result, PETRONAS was able to turn in a commendable performance in financial year 2020 (FY2020).

*Liza Mustapha*

**Liza Mustapha**  
Executive Vice President\* and Group Chief Financial Officer



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our Financial Report 2020

**Note:**  
\* Appointment as at 1 June 2021



## The Financial Year in Review

Owing to the focused execution of our operational and financial measures, the Group managed to turn in a Profit After Tax (PAT) excluding net impairment losses of RM10.5 billion during the financial year despite operating in a challenging business environment, on the back of lower revenue realised partially offset with lower costs incurred.

Lower revenue recorded of RM178.7 billion against RM240.3 billion in the previous year was largely attributed to the plummeting commodity prices coupled with demand disruption, which led to lower sales volume from gas, petroleum products and Liquefied Natural Gas (LNG).

Following the downward revision in the commodity price outlook, further compounded by the accelerated pace of energy transition, most oil and gas companies including PETRONAS, have taken significant impairment loss provisions on their assets. In FY2020, a total of RM31.5 billion net impairment losses-after-tax was recognised, resulting in the Group reporting a Loss After Tax (LAT) of RM21.0 billion as compared to a PAT of RM40.5 billion in FY2019.

Despite the LAT registered, PETRONAS continued to maintain solid financial metrics. Our Earnings Before Interest, Tax, Depreciation and Amortisation (EBITDA) remained strong at RM55.3 billion, albeit lower than the previous year's RM96.3 billion.

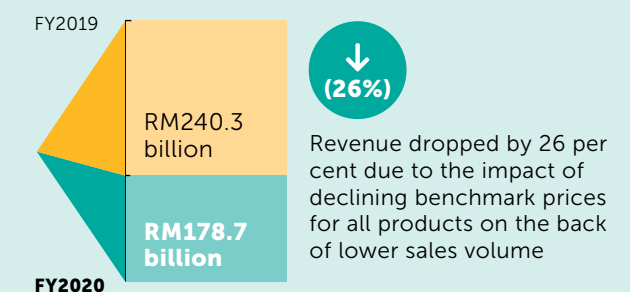
PETRONAS was also persistent in delivering positive Cash Flows from Operations (CFFO) amounting to RM40.7 billion, although lower by 55 per cent as compared to the previous year. This highlights our commendable performance given the gravity of the situation and reflects PETRONAS' effective management of our integrated business.

PETRONAS continues to benchmark itself against other international oil majors who also experienced the same challenges and adverse financial and operational impact. Given our prudent financial management, PETRONAS' financial position continues to outperform other oil majors. This was attested by the Group's strong CFFO margin of 23 per cent as well as our ability to sustain a unique net cash position of RM52.1 billion which placed us in a forefront position as compared to other oil majors.

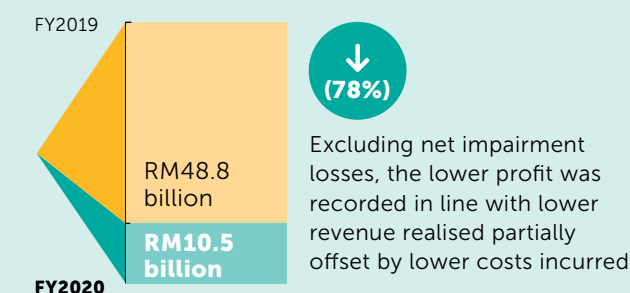


## Financial Indicators

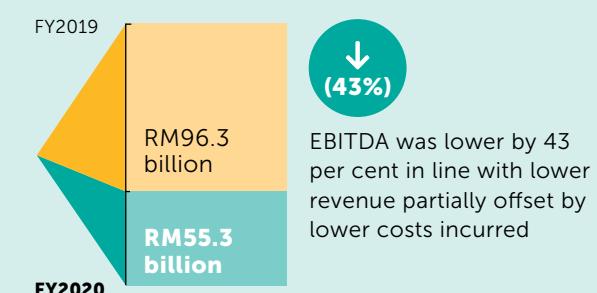
### Revenue



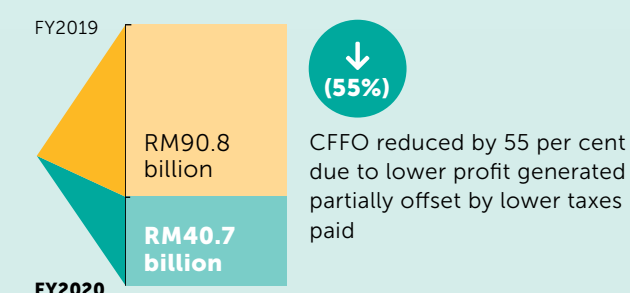
### PAT excluding net impairment losses



### EBITDA



### CFFO





**PETRONAS Deliberate Efforts to Withstand the Impact from the Unprecedented Twin Shocks**

The collapse of the OPEC+ alliance, COVID-19 pandemic outbreak and energy market imbalances have profoundly affected global energy demand and oil prices. As a response to these challenges, PETRONAS swiftly undertook deliberate efforts which included:

**1 Operational Measures**

- ➔ **Optimisation of Upstream production to accommodate the low demand and to ensure value protection.**
- ➔ **Establishment of an agile mechanism by Gas + New Energy (G+NE) to trigger ramp-up or ramp-down depending on market conditions.**
- ➔ **Downstream adjustment in refineries utilisation based on demand and market movement.**

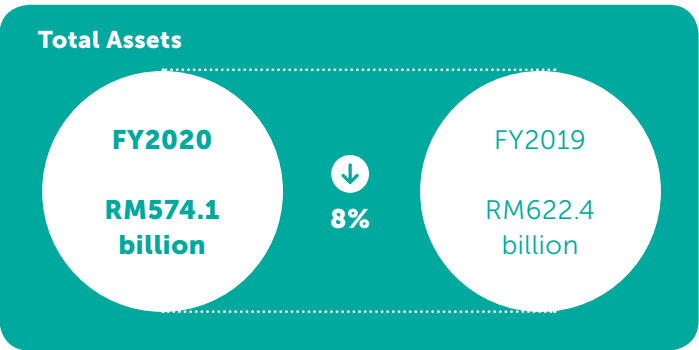
**2 Financial Measures**

- ➔ **Revised our view of the long-term price outlook which led to the sizeable non-cash impairments recorded during the year.**
- ➔ **Implemented focused cost-compression efforts along with continued tight fiscal disciplines.**
- ➔ **Undertook a strategic reassessment of capital allocation through prioritisation of projects.**

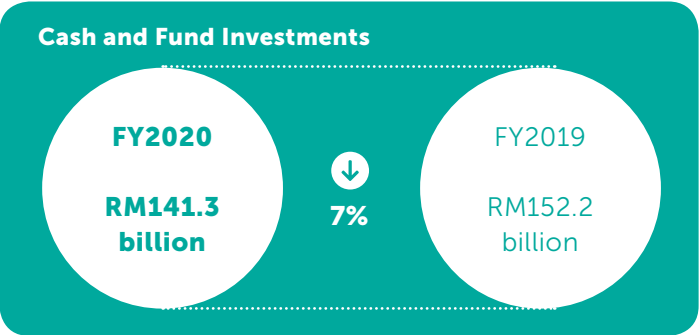
These efforts positively cushioned the adverse macroeconomic impact on the Group's financials with lower costs incurred during the year. The Group also successfully exceeded the spending reduction targets set in March 2020 which was to reduce our operating expenditure and capital investments by 12 per cent and 21 per cent respectively.

**Prudent Financial Management**

PETRONAS' financial position in FY2020 remained healthy, with total assets standing at RM574.1 billion as at 31 December 2020, a RM48.3 billion or 8 per cent decrease from RM622.4 billion as at 31 December 2019, mainly attributed to the significant net impairment losses on assets recognised during the year.



The Group's cash and fund investments balance stood at RM141.3 billion as at 31 December 2020, a decrease of RM11.0 billion or 7 per cent against the close of the preceding financial year. The movement was mainly contributed by a positive CFFO of RM40.7 billion, and a healthy cash balance carried forward of RM152.2 billion, which bears testimony to the Group's prudent cash management practices.



Given the uncertainties relating to the year's macroeconomic challenges, we maintained a cautious financial approach in making capital investment decisions in order to preserve PETRONAS' business liquidity.

FY2020 saw our spending on capital investments drop to RM33.4 billion from RM47.8 billion in the previous year. Of this amount, 52 per cent was allocated for domestic projects, primarily for the Upstream segment to intensify efforts to develop new fields and enhance recovery from existing mature fields. CAPEX for our international ventures was primarily spent on our LNG business in Canada and our shipping arm in the USA. PETRONAS continued to pursue strategic capital investments during the year to further strengthen our integrated business value chain and ensure the future growth of our businesses.

As an integrated oil and gas company, the Group and the Company are exposed to various risks that are particular to our core business of Upstream, G+NE and Downstream operations. These risks, which arise in the normal course of the Group's and of the Company's business, comprise credit risk, liquidity risk and market risk relating to interest rates, foreign currency exchange rates, equity prices and commodity prices.

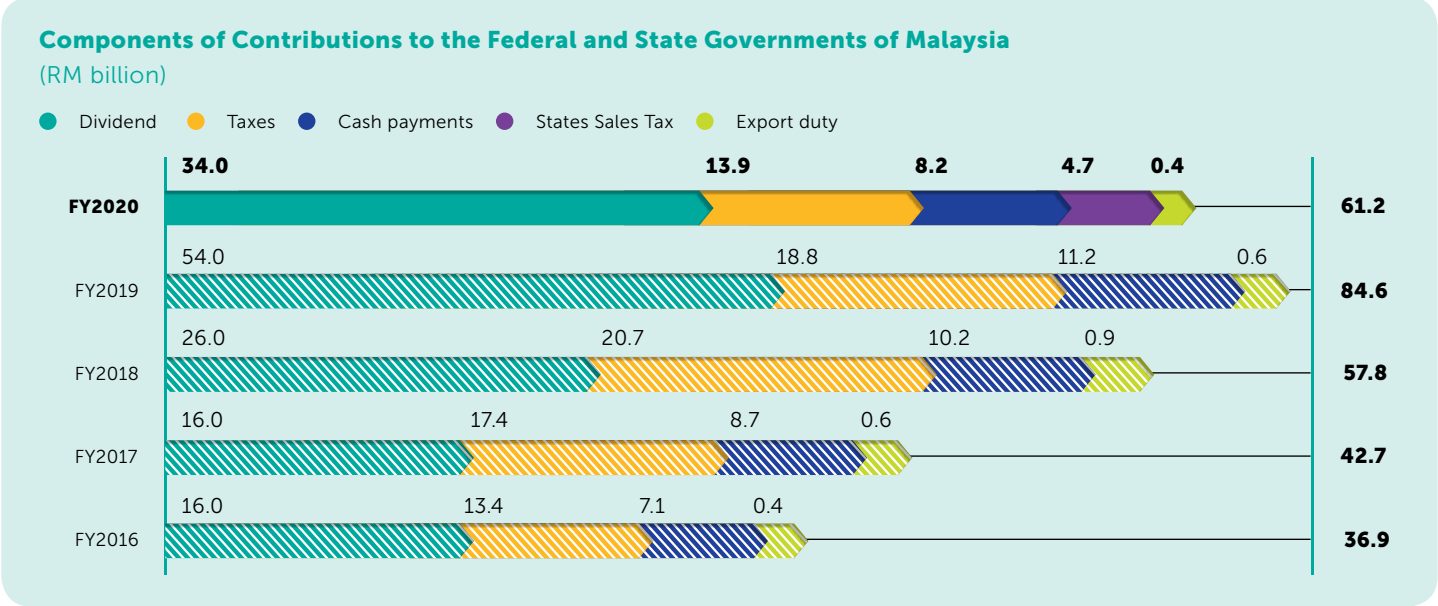
With regard to financial risks, PETRONAS has established guardrails as part of the measures to manage the abovementioned risks. These guardrails include the establishment of liquidity buffers to manage operational and market disruptions whilst ensuring operational sustainability; determining predefined borrowing levels within an acceptable affordability threshold; as well as advocating natural hedging practices for exposure, where permissible, while managing residual exposure.

**Credit Rating**

PETRONAS' credit ratings remain strong at A2, A- and BBB+ as affirmed by Moody's, Standard & Poor's (S&P) and Fitch respectively. Our standalone credit profile is four notches above our credit ratings as assessed by S&P and Fitch. Notably, the standalone credit profile was reaffirmed by S&P despite their actions to revise the Oil and Gas exploration and production (E&P) industry risk, from "intermediate" to "moderately high" risk, due to increasing risk from energy transition that has cast uncertainty over the supply and demand of fossil fuels. These ratings bear testimony to PETRONAS' robust financial strength and solid business fundamentals, which bolster our ability to adapt to and remain resilient amidst the new normal for the industry and market.

**Contributions to Governments**

PETRONAS' contributions to the Federal Government of Malaysia and state governments for the year ended 31 December 2020 amounted to RM61.2 billion, lower by RM23.4 billion compared with FY2019.



**Outlook**

Under the current COVID-19 pandemic environment, the outlook for the oil and gas industry remains uncertain and challenging with the expectation of a tentative and modest recovery in demand and prices for products. Nevertheless, we remain confident that our efforts and continued focus on commercial and operational excellence while preserving healthy levels of liquidity, will ensure the sustainability of PETRONAS' businesses.

To ensure we have the financial means to move forward effectively and grow in a sustainable manner, we will set our sights on strengthening liquidity and working capital management, enhancing commercial excellence, plugging value leakages along the integrated value chain as well as supporting the Group's Sustainability Agenda.

**Liza Mustapha**

Executive Vice President and Group Chief Financial Officer



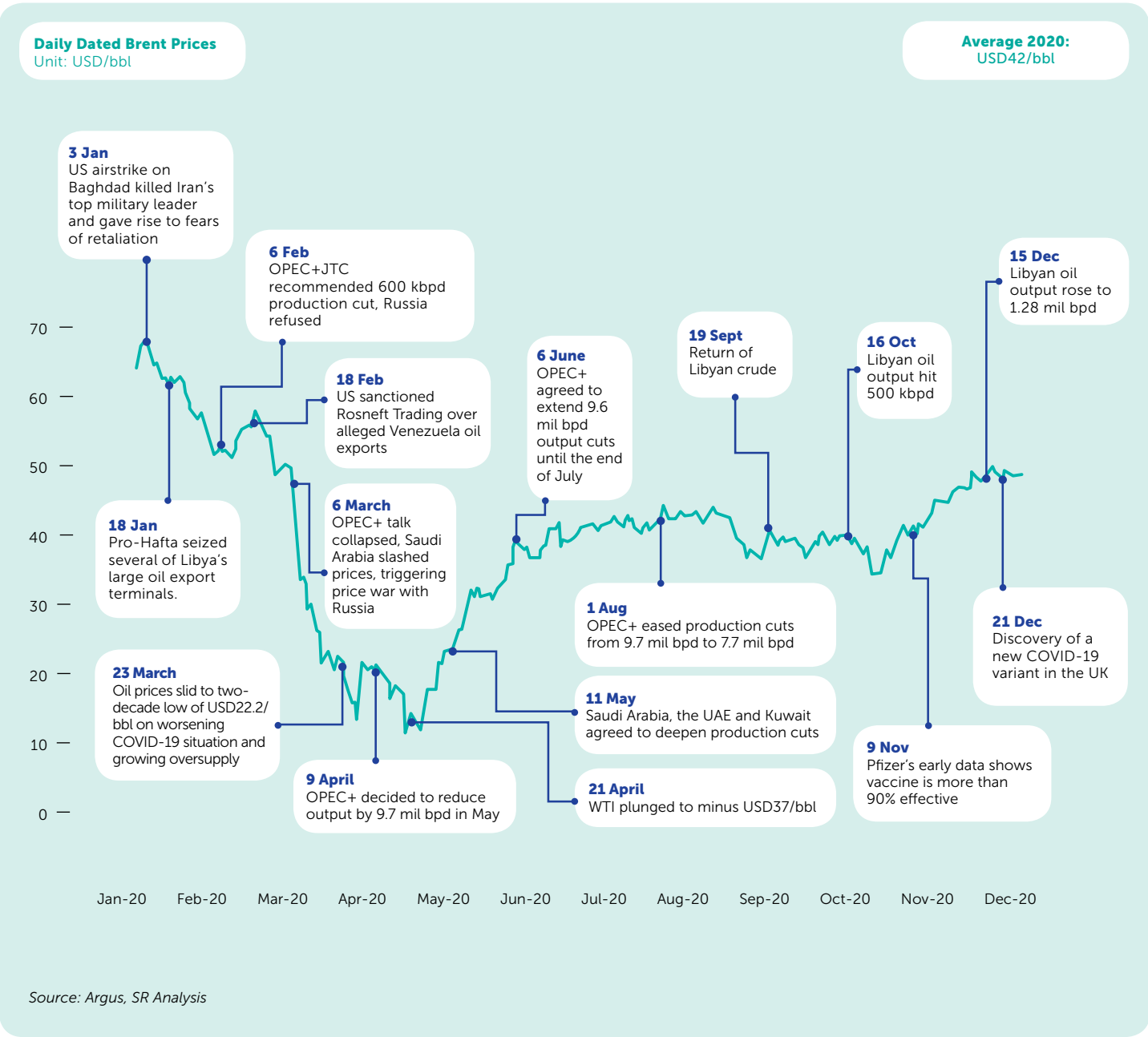
The World in 2020

Mounting Challenges

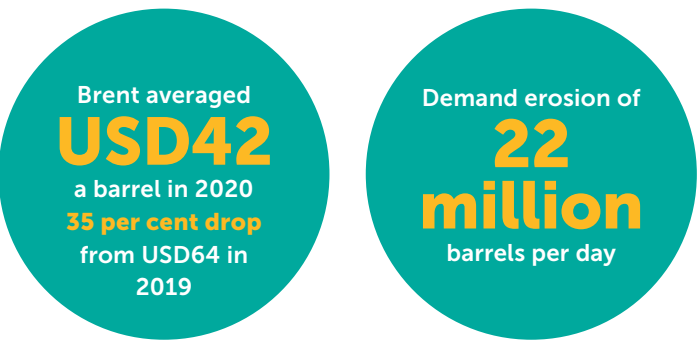
The year 2020 will be remembered as one of the most challenging years for people and businesses the world over. Oil and gas industry players in particular had to contend with the unprecedented double blows stemming from the COVID-19 pandemic and ensuing national lockdowns as well as an oil price rout. The combination of events coming together had an adverse effect not only on oil and gas players but also on nations and economies alike.

The Year 2020 in Review

Oil



The World in 2020



In the oil sector, Dated Brent averaged USD42 a barrel (bbl) in 2020 – a 35 per cent drop from USD64 in 2019. The COVID-19 pandemic and an oil price war between Saudi Arabia and Russia triggered a massive collapse in prices of US crude oil West Texas Intermediate (WTI), which nosedived to negative USD37/bbl on 20 April 2020, while Dated Brent plunged to a 21-year low of USD13/bbl on 21 April.

In April alone, global lockdowns and travel restrictions caused by the pandemic led to demand erosion of 22 million barrels per day (bpd) in comparison to the year before. The road transport and aviation sectors in particular were deeply affected, which consequently led to negative global refining margins. The pandemic forced refiners to review their operations and that led to the accelerated closure of refineries producing up to 2 million bpd in capacity worldwide.

Oil prices improved gradually in the second half of 2020, supported by OPEC+’s strong compliance with a historic production cut of 9.7 million bpd that was agreed upon in April. Tumbling US oil production from a peak of 13 million bpd in March, curbed output from Iran and Venezuela due to strict US sanctions and optimistic news of COVID-19 vaccine rollouts helped support the oil market. However, price upsidess were capped by lacklustre road transport fuel demand as well as an abundance of oil supplies idling in storage facilities on both land and sea.

Geopolitics

There was an increase in geopolitical tensions across the world due to an escalation of conflicts, coupled with new anti-government sentiment as unemployment and inadequate healthcare were magnified by the impact of the growing COVID-19 pandemic. Massive public unrest such as in Iraq heightened security risks around assets and personnel.

Against this backdrop, stakeholder management especially in relation to governments and the close monitoring of security risks were crucial in ensuring the safety of PETRONAS’ business interests.

The Economy

In lessening the impact from the pandemic and the ensuing nationwide lockdowns as well as to support the livelihood of people and businesses, governments across the world announced the introduction of fiscal stimuli at an unprecedented speed and scale. More than USD10 trillion of fiscal incentives were allocated during the first two months of the crisis. For some countries, their response as a percentage of Gross Domestic Production (GDP) was nearly 10 times what it was during the 2008/2009 crisis.

All in all, the fiscal packages announced over 2020 totalled a staggering USD23 trillion. Yet, some 90 per cent of these packages were concentrated in developed nations such as the US, Europe and Japan, as well as richer countries like China. Amid these costly pandemic relief measures and falling revenue, global debt reached record-high levels. The World Economic Forum (WEF) estimated that total debt touched USD277 trillion by the end of 2020, or some 365 per cent of 2019’s global GDP.

In the first half of 2020, Fitch Ratings had downgrades for a record 33 sovereign ratings and placed 40 countries and sovereign entities on a ‘negative’ outlook – a sign of the rising risk of sovereign debt default. The year 2020 was the year in which the global economy plunged into the worst peacetime recession in history with all major economies, barring China, charting a contraction in total output in the second and third quarter of 2020. The widespread nationwide lockdowns caused a severe 13.5 per cent contraction in exports year-on-year between January and May 2020, while values for April and May showed a 25 per cent contraction – a historic low. As new COVID-19 cases continued to rise and the reopening of borders were stalled, economies had to deal with a long and difficult ascent out of the recession.

In November 2020, a total of 15 Asia Pacific nations formed the Regional Comprehensive Economic Partnership (RCEP) – the world’s largest free-trade pact. This China-backed deal cemented the country’s position in shaping the region’s trade rules amid deepening rifts with the US and Australia. China’s trade war against Australia has revealed another side of Beijing’s increasingly assertive diplomacy. Canberra has invited the wrath of Beijing as the largest country in Australasia called for an international inquiry into the origins of the coronavirus. China continued to tighten the screws on Australia by placing USD40 billion worth of Australia’s exports at risk.

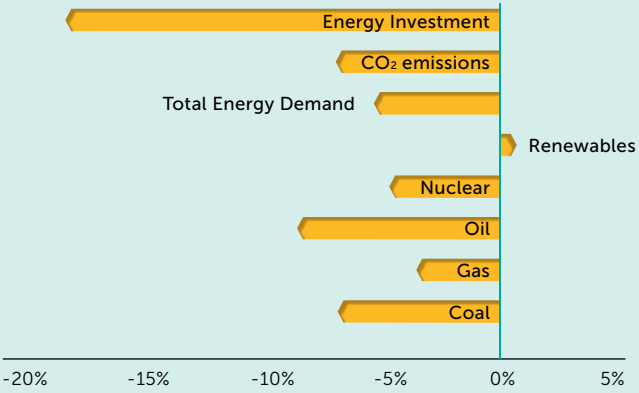
December 2020 saw China signing another deal, this time with the European Union (EU). The China-EU investment deal agreed in principle to retain multiple deep carve-outs to protect Chinese interests in key sectors, including the automotive, aviation, healthcare and telecommunications sectors. For the EU, the landmark investment deal with China after seven years of talks sought to liberalise trade between Brussels and Beijing.



Energy

The COVID-19 pandemic caused disruption to the energy sector while accelerating energy transition. Governments provided green stimuli to assist in the economic recovery. The year also saw a magnitude of companies championing net zero carbon emissions by 2050 (NZCE 2050) while heavy-emitting nations including China and Japan pledged carbon neutrality. Renewable energy was supported by priority access to grids, low operating costs and additional output from newly completed wind and solar projects over the past year.

Energy demand, CO<sub>2</sub> emissions and investment indicators, 2020 relative to 2019



Source: International Energy Agency (IEA), SR Analysis

Upstream

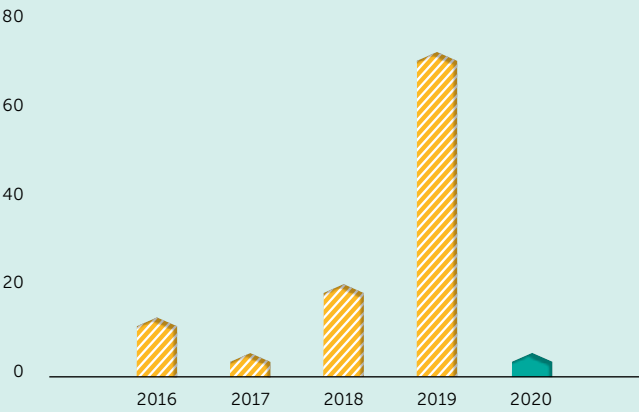
Upstream capital expenditure (CAPEX) in 2020 shrank to its lowest level in more than 15 years, as tumbling oil and gas prices forced players to cut back on spending and conserve cash. Early-stage projects were either cancelled or deferred, which will have a long-lasting impact on production in the years to come. Players held on to their large and low-cost producing assets, ranging from those in Guyana and Brazil to the Gulf of Mexico, USA.

Bankruptcies increased in the unconventional oil sector in North America while mergers and acquisitions also took place as smaller players buckled under the weight of their previous debt-fuelled expansion. Larger companies with the financial means purchased smaller rivals to access resources and improve economies of scale.

For Liquefied Natural Gas (LNG), the sanctioning of projects hit a record low, with only the 3.2 million tonnes per annum (mtpa) Costa Azul development in Mexico taking Final Investment Decision (FID). Plans for more than 60 mtpa of FID were put on hold by Qatar and developers in the US after Asian spot LNG prices tumbled in mid-2020 to the lowest ever amid lockdowns and port closures as cargoes were cancelled.

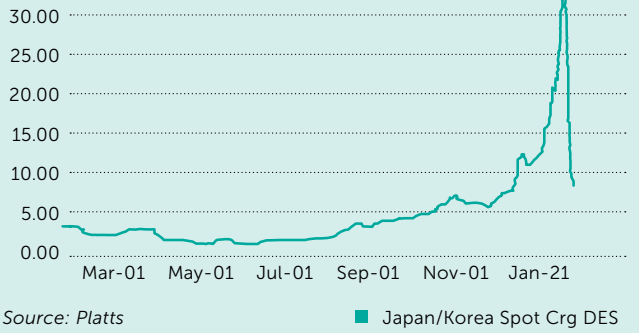
LNG prices surged by the end of the year, to almost 10 times the price in mid-2020, as delays in the resumption of supply after plant maintenance and shipping congestion met with a surge in demand due to a cold snap in China and other parts of Northeast Asia.

LNG Project FID (Unit:mtpa)



Source: Wood Mackenzie

Northeast Asia LNG Prices (Unit: USD/mmBtu)



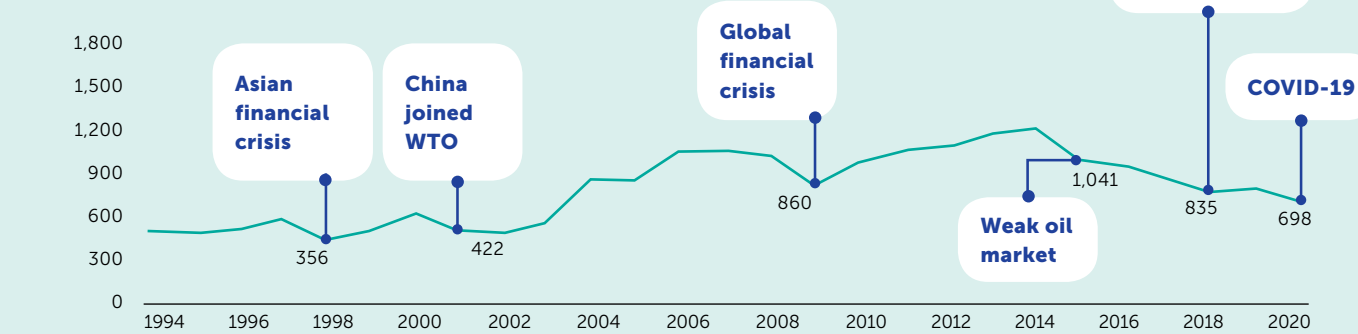
Source: Platts

■ Japan/Korea Spot Crg DES

Chemicals

COVID-19 and the oil price rout also had the effect of shrinking petrochemicals demand globally, putting pressure on a market that was already in a downcycle and prolonging the downturn for another year. As a result, average ethylene prices in Southeast Asia fell to USD698/tonne in 2020, lower than the USD860/tonne during the global financial crisis in 2009.

Chart 1: Ethylene CFR SEA Price (Unit: USD/tonne)



Source: ICIS, Platts

The specialty chemicals segment, the most resilient chemical products segment, was also not spared from the impact of the pandemic. This was particularly evident on the oilfield chemical and textile chemical market fronts. However, rising concerns on personal hygiene and safety boosted demand for surfactants, nutraceutical ingredients and packaging materials.

In regards to the sustainability initiatives, governments globally acknowledged the growing public demand to implement green policies, which include a reduction in plastic waste. Against this backdrop, China unveiled plans to cut the production and consumption of single-use plastics by 2025, and the EU said it will impose taxes on plastic packaging waste starting 2021. Chemical companies are actively collaborating in an effort to reduce plastic waste and single-use plastics while new technologies are being tested to accelerate circularity.

The Outlook For 2021

Oil

The path towards sustained oil demand recovery remains fragile. Rising new COVID-19 cases, made worse by new strains of the virus, have resulted in governments imposing further rounds of lockdowns which are deterring travel.

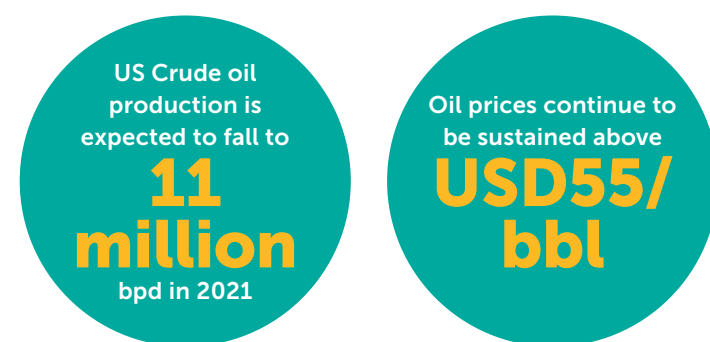
A pervasive rollout of vaccines to the masses starting in the second half of 2021 should provide some support for the recovery of road transport fuels such as gasoline and gasoil. A recovery in the aviation sector is expected to be delayed to beyond 2021 as governments continue to implement border closures while business travels remain muted due to cost-cutting measures and the rapid proliferation of virtual Meetings, Incentives, Conferences and Exhibitions (MICE).





Despite the gradual recovery, oil demand in 2021 is still expected to remain below pre-pandemic levels of 100 million bpd.

Refiners face an uphill battle running their facilities due to uneven demand recovery for transport fuels, challenged by robust mega-integrated capacity additions from China and the Middle East. On top of this, they have to contend with the growing traction for clean alternative fuels to meet NZCE 2050. Amidst these developments, PETRONAS will need to adapt quickly to the fast-changing landscapes of the refining and petroleum products segments.



In terms of oil supply, the OPEC+ coalition is expected to continue managing oil production to drive down oil stocks amidst renewed COVID-19 lockdowns. Saudi Arabia's decision in January 2021 to cut another 1 million bpd of its own output in February and March highlights its determination to hold OPEC+ together and rebalance the market. US crude oil production is expected to fall to 11 million bpd in 2021 due to rising bankruptcies, lack of access to capital amongst the US shale producers, and the need to focus on paying back investors. However, as oil prices continue to be sustained above USD55/bbl, tight oil producers could return to the market.

As a producer, refiner and marketer of oil, PETRONAS needs to ensure it is ready to adapt to continuing oil price volatility.

## Geopolitics

The geopolitical outlook for 2021 will continue to be challenging as governments face greater pressure to revitalise their economies amid fresh waves of the pandemic and oil prices that are only gradually recovering. The pace of vaccine rollouts, including in emerging economies, will determine how fast life will be able to return to normal and how fast economies will be able to recover.

Tensions and power struggles among global and regional powers will continue to play out in 2021, as the world rebounds from major upheavals in 2020 and experiences the shift in US policies.



## The Economy

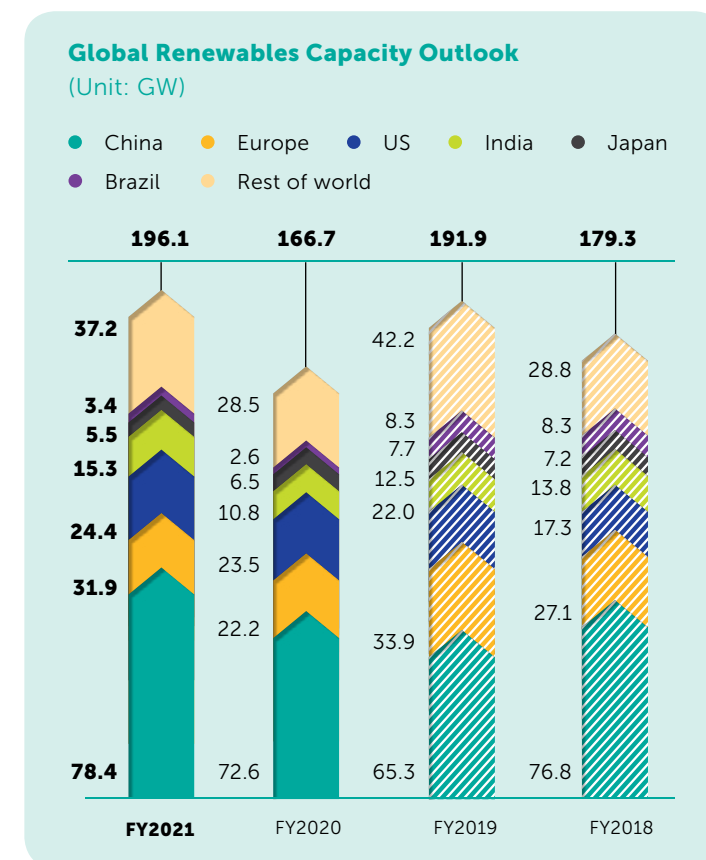
The global economic outlook for 2021 remains weak as most countries are still facing a resurgence in new COVID-19 cases, along with the latest strains of the coronavirus that are more potent and infectious. The rise in infection rates has pushed the governments to re-impose lockdowns to curb the spread, which is taking a heavy toll on the economies. In Malaysia, the second round of the Movement Control Order (MCO) is expected to cost the country RM660 million a day – about a fourth of the cost from the first round of lockdown imposed between March and May 2020 but still a significant loss to the country's productivity and businesses.

Amid the limited production ability and hoarding of vaccines in developed countries, the global growth this year and for the medium term will see a disparity between the haves and have-nots. The mounting global debt, which has swelled to an unprecedented USD277 trillion, will limit the ability of countries to borrow further and to widen stimulus to cushion the impact of the lingering pandemic. Countries will be forced to wind down and eventually withdraw stimulus to prevent a sovereign rating downgrade or any default.

Ultimately, economic activities, including demand for oil, oil products and chemicals will improve in due course as nations gradually open borders and fully shift to the new normal. This is expected to take place at the earliest juncture in the fourth quarter of 2021 for richer nations and possibly in 2022 or beyond for others.

## Energy

Global capital investment on renewables is expected to return to pre-pandemic levels in 2021. The solar photovoltaic (PV) segment is set to account for the majority of clean energy capacity additions while there is the expectation of an increase in the offshore wind segment. Battery storage will be significant as prices decline and demand for excess energy to be stored will increase when the sun and wind are at their peak, ensuring it can be made available to the grid. In terms of alternative sources of energy such as hydrogen, we expect to continue seeing more investments, joint ventures and large-scale projects announcement being made.



The year 2021 could be a turning point as the US re-joins the Paris Agreement and participate in the UN Climate Change Conference (COP26), to be held in November 2021 with countries revisiting their Nationally Determined Contributions.

## Upstream

Going into 2021, the capital expenditure for upstream is expected to remain at below USD400 billion, less than half the peak of the almost USD800 billion recorded in 2014. Due to the uncertainties in the oil and gas market, the industry will most likely remain reluctant when it comes to loosening their purse strings. The oil and gas industry, led by the North American unconventional sector, will tap technology in an increasing manner to drive cost compression as crude oil prices remain volatile. This is set to intensify competition even as demand remains weak.

Moving forward, host governments will have to compete for a smaller pie of investments, forcing them to accept a smaller take in return for players' presence in their countries.

LNG developers are looking to revive plans and take FID for projects amid an improved outlook for demand, especially in emerging markets. Demand for LNG is forecast to double as countries from China to India, and regions including Southeast Asia, seek cleaner-burning fuels to meet the rising consumption of electricity and to complement it with renewables to meet their clean-air goals. The increased competition will force suppliers to seek innovative and new technological solutions to meet the changing needs of buyers, especially those from emerging markets. Greater volatility is expected for LNG spot prices in the coming years as weather patterns change and sudden policy swings alter supply-demand dynamics.

## Chemicals

The chemicals industry is showing signs of recovery with demand expected to improve significantly, driven by the US and Asia Pacific. Stronger consumer confidence and gradual deployment of the COVID-19 vaccines will stimulate economic activities globally. In the US, the stimulus package approved by the US Congress in December 2020 will lead to increased economic activities, create jobs, aid businesses and boost consumer spending. Robust demand for plastics in the healthcare sector and packaging materials driven by online shopping will intensify, if the risk of infections from COVID-19 is prolonged.

A return to growth in specialty chemicals is also expected in 2021, in line with gradual improvements in the global economy. However, the rebound of this segment will be less pronounced as the impact of the downturn was less severe compared to commodity chemicals. In terms of market segment, catalysts are projected to register the highest growth in 2021, followed by specialty polymers and electronic chemicals, in line with the growth in the high-tech sector.

**PETRONAS is increasingly pursuing growth in specialty chemicals to insulate the company from the cyclical nature of the commodity chemical business and to capture long-term market potential. PETRONAS will continue to pursue its Sustainability Agenda which will continue to gain traction in 2021.**

This will be driven by rising consumer demand for sustainable products, growing recognition of the adverse impact of climate change and the needs of a growing global population in a resource-constrained world. Nature-based solutions and the circular economy are the key pathways towards a greener chemical industry and will support PETRONAS' aspiration towards achieving NZCE 2050.



Engaging with Stakeholders

Partnering with Our Stakeholders






For PETRONAS, ongoing engagement with stakeholders improves our understanding of their needs and interests and helps position us for a sustainable future. Our stakeholders are partners in realising our aspirations. Earning their trust, gaining recognition from them and having them advocate our cause, is therefore very meaningful to us.

Our Stakeholders
















Guided by PETRONAS’ Statement of Purpose: A progressive energy and solutions partner enriching lives for a sustainable future, we strive to be transparent, deliver on expectations and co-develop solutions for our stakeholders. We look beyond our own lens when providing solutions and conveying our messages to stakeholders.

Each stakeholder group is important to us, as we seek to build a strong network of relationships based on trust, transparency and open communication. Through established engagement platforms, we keep our stakeholders updated on our operations, performance and direction, while understanding their needs, interests and expectations. Our strategies, plans and daily decisions are developed with consideration of the feedback we receive from stakeholders.

Our purpose is to become a credible partner and create solutions for sustainable shared values. To this end, PETRONAS continues to be a socially responsible organisation, investing in sustainable initiatives that contribute to the well-being of employees and society as a whole. We identify, assess and monitor stakeholders’ expectations as well as track our commitments and the issues that stakeholders raise. We do all this through an end-to-end stakeholder management process guided by the PETRONAS Stakeholder Management Guidelines (PSMG).


Federal Government/Host Governments			
Value for Stakeholders	Our Response	Engagement Initiatives	
<ul style="list-style-type: none"><li>Nation-building</li><li>Human capital development</li><li>Employment</li><li>Compliance with laws and regulations</li><li>Ethical business practices</li><li>Health and safety</li><li>Environment</li><li>Social development</li></ul>	<ul style="list-style-type: none"><li>Supported nation-building initiatives and national-level crisis mitigation such as COVID-19 pandemic contributions and response</li><li>Partner for social development projects</li><li>Thought partner in policy shaping initiatives</li><li>Strategic partnership to achieve common objectives</li><li>Adhered to applicable regulations and legislation including environmental obligations and Malaysia’s Central Bank regulations</li><li>Provided regular updates on issues affecting our operations and the economy</li><li>Supported the Malaysian government’s New Plastics Economy (NPE) programme via PETRONAS Chemicals Group Berhad (PCG) which is spearheading the NPE initiative</li><li>Active engagements and continuous collaborations with host authorities and embassies to build strong relationships</li></ul>	<ul style="list-style-type: none"><li>Formal face-to-face engagements</li><li>Virtual meetings during the Movement Control Order (MCO)</li><li>Periodical reporting to relevant government agencies (including statutory and regulatory reporting)</li><li>Periodical briefings to government agencies</li><li>Partner for government programmes</li></ul>	
Value for Us	Link to Material Topics		
We continued to have strong relationships with the Federal/host governments so that we could stay ahead of changing policies and regulations as well as be a key partner to the government in shaping policies that support the industry and the broader economy.	    		


Engaging with Stakeholders

State Governments			
Value for Stakeholders	Our Response	Engagement Initiatives	
<ul style="list-style-type: none"><li>• Social development</li><li>• Human capital development</li><li>• Employment</li><li>• Compliance with laws and regulations</li><li>• Ethical business practices</li><li>• Health and safety</li><li>• Environment</li></ul>	<ul style="list-style-type: none"><li>• Undertook business collaboration/commercial agreement</li><li>• Collaborated on COVID-19 response and mitigation efforts</li><li>• Supported state economic transformation projects</li><li>• Participated in economic recovery efforts</li><li>• Collaborated with relevant agencies for common objectives</li></ul>	<ul style="list-style-type: none"><li>• Formal face-to-face engagements</li><li>• Virtual meetings during MCO</li><li>• Dialogue and feedback</li><li>• Regular meetings, briefings and updates</li><li>• Participation in state governments' programmes</li><li>• Joint working committee meetings</li></ul>	
Value for Us			Link to Material Topics
We earned the trust and gained endorsement from state governments to ensure the sustainability of our operations in the respective states. In return, our operations contributed to each state's local economy and enriched local communities.			   
Customers			
Value for Stakeholders	Our Response	Engagement Initiatives	
<ul style="list-style-type: none"><li>• Positive customer experience</li><li>• Reliable product quality and timely product delivery</li><li>• Competitive product pricing</li><li>• After-sales support</li><li>• Consumer data protection</li><li>• Collaborative solutions and technologies</li><li>• Confidence and trust in PETRONAS brands</li></ul>	<ul style="list-style-type: none"><li>• Accommodated customers' needs for better experience</li><li>• Offered customer-centric and innovative solutions in products and services</li><li>• Ensured undisrupted and continuous supply of products and services</li><li>• Ensured safety and standard operating procedure (SOP) compliance at all service stations and facilities</li></ul>	<ul style="list-style-type: none"><li>• Marketing activities and outreach programmes</li><li>• Virtual engagements</li><li>• Online customer surveys</li><li>• Feedback management system</li><li>• Customer appreciation programmes</li></ul>	
Value for Us			Link to Material Topics
Our customers are core to our business and its sustainable growth. By being responsive to customers' needs and expectations, we deliver customer-centric solutions via superior quality products, services and technological solutions, as well as improve the overall customer experience. This supported thriving mutual value creation.			    
Internal/Employees			
Value for Stakeholders	Our Response	Engagement Initiatives	
<ul style="list-style-type: none"><li>• Career growth and learning opportunities</li><li>• Business sustainability</li><li>• Health and safety</li><li>• Work-life integration</li><li>• Employee welfare</li><li>• Workplace environment</li><li>• Responsible and ethical business practices</li><li>• Diversity and inclusivity</li></ul>	<ul style="list-style-type: none"><li>• Provided regular updates to keep employees informed</li><li>• Undertook continuous implementation of the Employee Assistance Programme (EAP), as well as counselling and stress management programmes for employees' mental health and well-being especially during the pandemic</li><li>• Enhanced flexible working arrangements and encouraged Work-From-Home (WFH) mode</li><li>• Provided safe working environments through stringent SOP compliance and measures</li><li>• Continuously implemented programmes for awareness and promotion of gender diversity and women in leadership</li><li>• Conducted governance-related training and awareness programmes</li><li>• Implemented health-related initiatives including among others digital lifestyle coaching, ergonomics for WFH and virtual HSSE training programme</li></ul>	<ul style="list-style-type: none"><li>• Virtual town halls and staff engagement sessions</li><li>• Employee feedback sessions</li><li>• Intranet announcements</li><li>• Virtual staff engagements</li><li>• Group Health, Safety, Security and Environment (GHSSE) safety campaigns</li><li>• Online training</li><li>• Annual health survey and bi-annual culture survey</li></ul>	
Value for Us			Link to Material Topics
Our employees are key to our success as well as our most important asset. Their health, safety and well-being remain our top priority. A clearly communicated business strategy, plans and direction ensure employees remain engaged and motivated. Ongoing communications keep employees positive, optimistic and productive amidst the unprecedented crisis.			     





Engaging with Stakeholders

Media		
Value for Stakeholders	Our Response	Engagement Initiatives
<ul style="list-style-type: none"><li>Credible information partner</li><li>Advocate for transparency</li><li>Ethical business conduct and practices</li><li>Business performance</li><li>Environmental, social and corporate governance</li><li>Health and safety commitment</li><li>Innovation and technology</li></ul>	<ul style="list-style-type: none"><li>Undertook robust activation of media strategies and plans</li><li>Ensured timely communication and dissemination of information</li><li>Provided access and platforms for open and constructive engagement</li><li>Initiated collaboration and support for meaningful and worthy media initiatives</li></ul>	<ul style="list-style-type: none"><li>Physical and virtual engagement sessions</li><li>Dialogues with Senior Management</li><li>Supported media causes and accolades</li><li>Domestic and international media interviews and exposure</li></ul>
Value for Us		Link to Material Topics
<ul style="list-style-type: none"><li>PETRONAS has always been and continues to be a partner to the media providing access to timely, accurate, reliable and transparent information about our operations.</li><li>Regular media engagement complemented stakeholder engagement efforts to manage the PETRONAS Group's reputation.</li></ul>		

Shareholders/Investors/Credit Rating Agencies/Financial Institutions		
Value for Stakeholders	Our Response	Engagement Initiatives
<ul style="list-style-type: none"><li>Business outlook</li><li>Shareholders' returns</li><li>Corporate governance</li><li>Health and safety</li><li>Sustainability matters</li><li>Regulatory compliance</li><li>Leadership within the organisation</li></ul>	<ul style="list-style-type: none"><li>Maintained business excellence across operations to optimise financial performance</li><li>Enhanced business continuity and crisis management plans</li><li>Integrated sustainability development objectives into long-term corporate strategy and decision-making process</li><li>Adopted corporate governance best practices</li><li>Ensured compliance with internal and external policies and regulations</li><li>Ensured timely communication and dissemination of relevant information to guide assessment on business performance and prospect</li></ul>	<ul style="list-style-type: none"><li>Investor and analyst briefings by PETRONAS' listed subsidiaries</li><li>Annual Reports</li><li>Virtual Annual General Meetings by PETRONAS' listed subsidiaries</li><li>Virtual meetings and conferences</li><li>Announcements via corporate websites</li></ul>
Value for Us		Link to Material Topics
<ul style="list-style-type: none"><li>Consistent and clear communications relating to financial and strategic information enhance shareholders' and investors' trust.</li><li>The sustained trust and confidence of shareholders, investors and lenders enables business growth, reduces cost of borrowing and increases the share prices of our public listed subsidiaries.</li><li>Market intelligence and insights enable us to tap into opportunities and adapt to new trends within the financial and capital markets.</li></ul>		

Engaging with Stakeholders

Government Linked Companies (GLCs)/Industry Players/Partners		
Value for Stakeholders	Our Response	Engagement Initiatives
<ul style="list-style-type: none"><li>Governance and integrity</li><li>Business continuity and sustainability</li><li>Health, safety and environment</li><li>Industry requirements, local content, regulations and policies</li><li>Business opportunities and continuous value creation through partnerships</li><li>Capability development</li></ul>	<ul style="list-style-type: none"><li>Collaborated on innovative technology and digital solutions to meet market and industry needs</li><li>Strengthened good governance of business partnerships</li><li>Facilitated continuous business operations during the MCO by establishing clear guidelines, procedures and communications for affected parties</li><li>Partnered with local banks for Vendor Finance Programme</li><li>Collaborated with local partners and government for community empowering programmes</li><li>Strengthened the supply chain through programmes and initiatives</li><li>Continued to bolster the signature Vendor Development Programme (VDP) to enhance the capabilities of homegrown energy companies</li></ul>	<ul style="list-style-type: none"><li>Collaborations with industry players, banks, regulators and other GLC players</li><li>Dialogues with industry players</li><li>Periodic meetings</li><li>Virtual engagements</li><li>Virtual forums/conferences</li></ul>
Value for Us		Link to Material Topics
<ul style="list-style-type: none"><li>We collaborated with industry partners to jointly find innovative solutions to spur a thriving and robust industry amidst the economic and global health crisis.</li><li>We also partnered with stakeholders to pivot the industry for continuous growth and sustainability.</li></ul>		

Communities/Non-Governmental Organisations (NGOs)		
Value for Stakeholders	Our Response	Engagement Initiatives
<ul style="list-style-type: none"><li>Governance and integrity</li><li>Health, safety and environment</li><li>Education</li><li>Social well-being</li><li>Compliance with relevant legislation</li></ul>	<ul style="list-style-type: none"><li>Community-empowering programmes to improve economic livelihood (MEKAR programme)</li><li>A member of the World Business Council for Sustainable Development (WBCSD), on the development of sustainability policies</li><li>Initiated humanitarian and flood-relief activations for communities affected by natural disasters</li><li>Provided internet support for PETRONAS scholarship candidates in rural areas to facilitate online assessment during the pandemic</li><li>Collaborated with NGOs for the protection and preservation of wildlife, environment and social causes (i.e. Project BEACON, Smart House Programme, solar panels and co-generation with waste recovery at international operations)</li><li>Activated COVID-19 relief response for domestic and international communities at PETRONAS' operations</li><li>Continued to undertake Human Health Risk Assessments (HHRAs) to ensure the health and safety of people in key operational areas</li><li>Undertook facilities improvement for health and sanitation of international and domestic communities (i.e. Water For Life in the Republic of South Sudan)</li><li>Collaborated with NGOs on environmental innovation and stewardship initiatives by way of reducing CO<sub>2</sub> emissions at our Canada operations</li></ul>	<ul style="list-style-type: none"><li>Continuous collaboration with government agencies and NGOs for CSR programmes</li><li>COVID-19 and flood relief measures for affected communities</li><li>Periodic briefings</li><li>Engagement with local communities and availability of a grievance management system for communities to channel their concerns and feedback</li></ul>
Value for Us		Link to Material Topics
<ul style="list-style-type: none"><li>The sustainability of our business is premised on the relationships we build with communities and the contributions we make to uplift the communities that we operate in.</li><li>We gave back by contributing to community well-being and livelihoods through collaboration with relevant government agencies and NGOs.</li></ul>		



Material Topics

Our Materiality Approach: What Matters Most in Creating Sustainable Value

**This Report is Framed on Our Material Topics**

In ensuring effective management of our value creation efforts over the short, medium and long term, we identify topics that are material or important to our stakeholders. We employ a structured approach to pin-point what is most material to us. Consistent with IPIECA/API/IOGP Sustainability reporting guidance for oil and gas industry and the Global Reporting Standards Initiatives (GRI), we conduct our Materiality Assessment on a periodic basis to identify Environment, Social and Governance issues that are relevant to our stakeholders. The non-financial topics identified are vital for us to measure, monitor and manage its performance and the related impacts on society towards sustainable progress.

These include 1) broad scanning of the ecosystem that we operate in and benchmarking by referring to internal and external factors. The external factors include peer benchmarking and reference to IPIECA/API/IOGP Sustainability reporting guidance for oil and gas industry (IPIECA) and GRI Standards, 2) engagement with relevant stakeholders and Subject Matter Experts (SMEs) for input and verification, 3) prioritisation of the material topics and material issues, and 4) endorsement by the SD and HSSE Council Working Committee. In 2020, revisions were made to the abovementioned standards and guideline. The key

Material Topics

P

People

E

Environment

A







Asset

R

Reputation

changes that affect our disclosure in this report are: IPIECA, the global oil and gas industry association for advancing environment and social performance, along with American Petroleum Institute (API), and the international Oil and Gas Producers (IOGP) published the fourth edition of ‘Sustainability reporting guidance for oil and gas industry’. On top of this, GRI made effective the revised GRI 303: Water and Effluents (2018), GRI 403: Occupational Health and Safety (2018) and GRI 306: Waste (2020). Consequently, the PETRONAS Group undertook a revalidation of our material topics against the updated reporting standards and framework. Our findings revealed that our current six material topics remained relevant and valid in addressing the overall industry risks, energy transition and stakeholders’ expectations. As part of the Group’s management of Health and Well-Being, we have included disclosures on our COVID-19 pandemic responses throughout this Integrated Report.

The content below explains how each material topic can impact the Group’s business model and operations. While this list also highlights our responses, the SDGs we align with, and which stakeholder groups are affected, it is not an exhaustive listing. The material topics are used to report on the non-financial disclosures in this report. Please refer to our ‘Non-Financial Content Index’ on page 228 for a mapping of the locations of information regarding these issues.

Material Topic	Impact	SDGs	The Group’s Response	Affected Stakeholder Groups
Safeguard the Environment				
<div></div> <div><b>Climate Change and Environmental Management –</b> 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.</div>	<div><div>P</div><div>E</div><div>A</div><div>R</div></div>	<div><div><div>3</div><div>GOOD HEALTH AND WELL-BEING</div></div><div><div>7</div><div>AFFORDABLE AND CLEAN ENERGY</div></div><div><div>9</div><div>INDUSTRY, INNOVATION AND INFRASTRUCTURE</div></div><div><div>12</div><div>RESPONSIBLE CONSUMPTION AND PRODUCTION</div></div><div><div>13</div><div>CLIMATE ACTION</div></div><div><div>14</div><div>LIFE BELOW WATER</div></div><div><div>15</div><div>LIFE ON LAND</div></div></div>	<div><b>Climate Change</b><ul style="list-style-type: none"><li>Focused our efforts on collaboratively reducing climate change impacts by supporting host countries’ Nationally Determined Contributions, while implementing climate actions that included low-carbon energy solutions as well as innovative operations and technologies, guided by our Climate Change Framework and PETRONAS’ Carbon Commitments.</li></ul><b>Environmental Management</b><ul style="list-style-type: none"><li>Continued operational excellence improvements through equipment monitoring, spill prevention, Best Practicable Environmental Option (BPEO) for decommissioning and sustainable waste management; fortified these with internal controls beyond compliance to drive optimum use of hydrocarbon and water, while managing our emissions, wastewater and hazardous waste.</li></ul><b>Biodiversity and Ecosystem Services</b><ul style="list-style-type: none"><li>Minimised and prevented disruptions to biodiversity and the ecosystem through holistic Biodiversity and Ecosystem Services risk assessments, including the one-stop global dataset, the Integrated Biodiversity Assessment Tool (IBAT), while seeking to restore and nurture the ecosystems around us through conservation efforts.</li></ul></div>	<div><ul style="list-style-type: none"><li>Federal Government/Host Governments</li><li>State Governments</li><li>Customers</li><li>Internal/Employees</li><li>Media</li><li>Shareholders/Investors/Credit Rating Agencies/Financial Institutions</li><li>Government Linked Companies (GLCs)/Industry Players/Partners</li><li>Communities/Non-Governmental Organisations (NGOs)</li></ul></div>
Positive Social Impact				
<div></div> <div><b>Health, Well-Being and the Workplace –</b> We place employee well-being and enriching experiences at the forefront of our priorities for an agile, passionate, high-performing workforce.</div>	<div><div>P</div><div>R</div></div>	<div><div><div>3</div><div>GOOD HEALTH AND WELL-BEING</div></div><div><div>4</div><div>QUALITY EDUCATION</div></div><div><div>8</div><div>DECENT WORK AND ECONOMIC GROWTH</div></div></div>	<div><b>Health and Well-Being</b><ul style="list-style-type: none"><li>Promoted the holistic well-being of our employees while addressing occupational health risks such as chemical, physical, biological, ergonomic and psycho-social hazards that include fatigue and mental health; as well as addressed unhealthy habits such as physical inactivity, unhealthy diet and inadequate sleep.</li></ul><b>Human Capital</b><ul style="list-style-type: none"><li>Enabled a high-performing workforce by developing new types of capabilities, tools and ways of working, while nurturing leadership skills and broadening their career prospects in support of the Group’s growth ambitions.</li></ul></div>	<div><ul style="list-style-type: none"><li>Federal Government/Host Governments</li><li>Internal/Employees</li><li>Government Linked Companies (GLCs)/Industry Players/Partners</li></ul></div>
<div></div> <div><b>Safety –</b> We remain committed to ensuring there is no loss of life and to mitigating the possibility of injuries to our employees, contractors and communities.</div>	<div><div>P</div><div>E</div><div>A</div><div>R</div></div>	<div><div><div>3</div><div>GOOD HEALTH AND WELL-BEING</div></div><div><div>8</div><div>DECENT WORK AND ECONOMIC GROWTH</div></div></div>	<div>Ensured our facilities, assets, products and services fully comply with all government regulations, legal requirements and industry best practices with proactive analyses and robust risk mitigation strategies. <b>Personal Safety</b><ul style="list-style-type: none"><li>Shaped a Generative HSSE Culture supported by proactive and comprehensive policies, frameworks and digital technology application to align our initiatives.</li></ul><b>Process Safety</b><ul style="list-style-type: none"><li>Deployed the Process Safety Loss of Primary Containment Reduction (PSLR) and Fire Prevention and Mitigation Framework (FPMF) for effective management and improvement of process safety events.</li></ul><b>Crisis and Incident Management</b><ul style="list-style-type: none"><li>Deployed clear role demarcation for crisis events with Emergency Response Exercise (ERE) drills at the facility/asset level to ensure full readiness in the event of an emergency or crisis. Established Business Continuity Plans (BCPs) for crisis or prolonged business disruption.</li></ul><b>Security</b><ul style="list-style-type: none"><li>Built physical and digital security preparedness for optimum readiness against emerging security threats governed by the PETRONAS Security Policy, PETRONAS Security Management System, PETRONAS Mandatory Minimum Security Standards and Cyber Security Control Standards.</li></ul></div>	<div><ul style="list-style-type: none"><li>Federal Government/Host Governments</li><li>State Governments</li><li>Customers</li><li>Internal/Employees</li><li>Media</li><li>Shareholders/Investors/Credit Rating Agencies/Financial Institutions</li><li>Government Linked Companies (GLCs)/Industry Players/Partners</li><li>Communities/Non-Governmental Organisations (NGOs)</li></ul></div>
<div></div> <div><b>Product Stewardship and Supply Chain –</b> We enhance the sustainability and safety of our products by incorporating elements relating to supply chain sustainability and responsible procurement.</div>	<div><div>P</div><div>E</div><div>R</div></div>	<div><div><div>3</div><div>GOOD HEALTH AND WELL-BEING</div></div><div><div>8</div><div>DECENT WORK AND ECONOMIC GROWTH</div></div><div><div>9</div><div>INDUSTRY, INNOVATION AND INFRASTRUCTURE</div></div><div><div>12</div><div>RESPONSIBLE CONSUMPTION AND PRODUCTION</div></div><div><div>13</div><div>CLIMATE ACTION</div></div></div>	<div><b>Product Stewardship</b><ul style="list-style-type: none"><li>Carried out Product Risk Assessment to ensure product risks are well managed and to strengthen public trust in our products.</li></ul><b>Supply Chain</b><ul style="list-style-type: none"><li>Strengthened the local OGSE ecosystem through efforts such as the annual PETRONAS Activity Outlook, Cyber Security Control Standards, the Vendor Finance Programme (VFP) and the signature Vendor Development Programme (VDP).</li><li>Undertook supply chain due diligence on raw materials to phase out substances of very high concern.</li></ul></div>	<div><ul style="list-style-type: none"><li>Customers</li><li>Internal/Employees</li><li>Media</li><li>Shareholders/Investors/Credit Rating Agencies/Financial Institutions</li><li>Government Linked Companies (GLCs)/Industry Players/Partners</li><li>Communities/Non-Governmental Organisations (NGOs)</li></ul></div>
<div></div> <div><b>Social Responsibility –</b> We resolutely support human rights with fair and ethical treatment to communities and those who perform work for our business, while delivering sustainable value and elevating the social well-being of the communities that we operate in.</div>	<div><div>P</div><div>E</div><div>R</div></div>	<div><div><div>3</div><div>GOOD HEALTH AND WELL-BEING</div></div><div><div>4</div><div>QUALITY EDUCATION</div></div><div><div>7</div><div>AFFORDABLE AND CLEAN ENERGY</div></div><div><div>8</div><div>DECENT WORK AND ECONOMIC GROWTH</div></div><div><div>9</div><div>INDUSTRY, INNOVATION AND INFRASTRUCTURE</div></div><div><div>12</div><div>RESPONSIBLE CONSUMPTION AND PRODUCTION</div></div><div><div>13</div><div>CLIMATE ACTION</div></div></div>	<div>Invested in sustainable initiatives to contribute to the well-being of society and the environment as well as to uphold our position as a socially responsible organisation. <b>Social Performance</b><ul style="list-style-type: none"><li>Managed the impacts and associated risks to our business and operations with a commitment to human rights applicable to the staff and the contractor value chain, while adopting the outcome-based Just Transition approach to generate inclusive opportunities for social impact through our operations.</li></ul><b>Human Rights in Supply Chain</b><ul style="list-style-type: none"><li>Embedded the Contractors Code of Conduct on Human Rights (COCHR) in our procurement process to cascade ethical practices which is also part of our contractual obligations for goods and services procured.</li></ul><b>Corporate Social Responsibility</b><ul style="list-style-type: none"><li>Delivered value in societal well-being focusing on Education, Community Well-Being and Development, and the Environment to deliver sustainable, scalable impacts to society through our philanthropic arm, Yayasan PETRONAS.</li></ul></div>	<div><ul style="list-style-type: none"><li>Federal Government/Host Governments</li><li>State Governments</li><li>Customers</li><li>Internal/Employees</li><li>Media</li><li>Shareholders/Investors/Credit Rating Agencies/Financial Institutions</li><li>Government Linked Companies (GLCs)/Industry Players/Partners</li><li>Communities/Non-Governmental Organisations (NGOs)</li></ul></div>
Responsible Governance				
<div></div> <div><b>Governance and Ethics –</b> We uphold the organisation’s integrity and trustworthiness, while delivering value through strong governance mechanisms and ethical business practices.</div>	<div><div>P</div><div>R</div></div>	<div><div><div>8</div><div>DECENT WORK AND ECONOMIC GROWTH</div></div><div><div>16</div><div>PEACE, JUSTICE AND STRONG INSTITUTIONS</div></div></div>	<div><b>Good Governance and Compliance</b><ul style="list-style-type: none"><li>The PETRONAS Legal Compliance Framework (LCF) as a control oversight and monitoring of legal and regulatory compliance to the Critical Legal Areas to effectively manage legal compliance which embeds and integrates compliance assurance and reporting for the Group.</li><li>Implementation of the third-party due diligence process and controls to the Group as part of strengthening third-party risk management in assessing integrity risks and compliance in the Critical Legal Areas.</li><li>Exercised zero tolerance towards any forms of bribery and corruption through robust policies and frameworks; signed the Corruption-Free Pledge (CFP) in committing to a graft-free organisation; ensured a continuous commitment to upholding high standards of governance by maintaining the International Organization for Standardization 37001 on Anti-Bribery Management System (ISO 37001) certification, validating PETRONAS’ strategy in implementing global best practices to combat bribery and corruption.</li></ul></div>	<div><ul style="list-style-type: none"><li>Federal Government/Host Governments</li><li>State Governments</li><li>Customers</li><li>Internal/Employees</li><li>Media</li><li>Shareholders/Investors/Credit Rating Agencies/Financial Institutions</li><li>Government Linked Companies (GLCs)/Industry Players/Partners</li><li>Communities/Non-Governmental Organisations (NGOs)</li></ul></div>

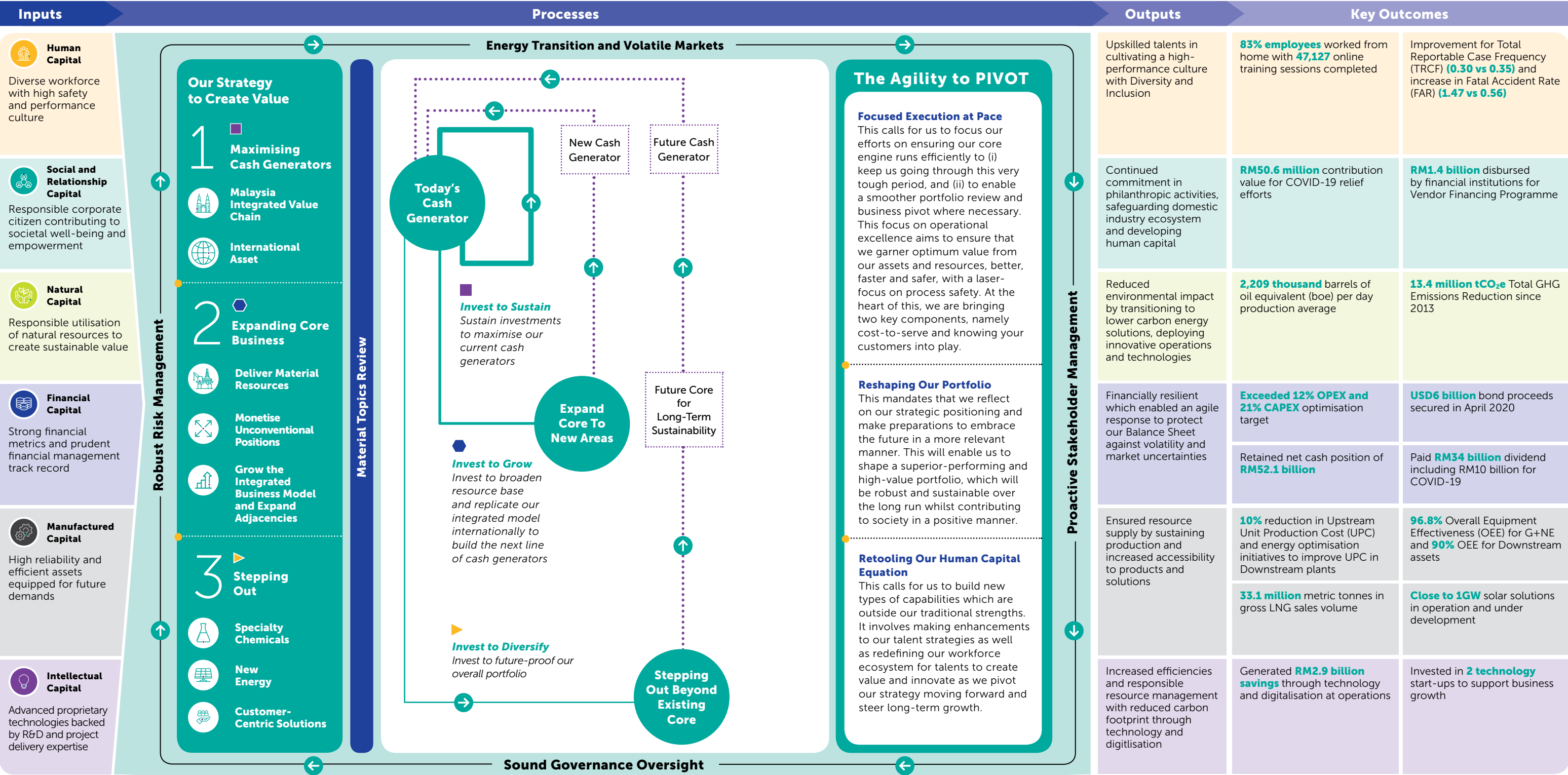


Value Creation Model

Lens 1







Continued Value Creation

Statement of Purpose : A progressive energy and solutions partner enriching lives for a sustainable future





Value Creation Model

Key Inputs	Key Outcomes and Outputs
<div><b>Human Capital</b><ul style="list-style-type: none"><li>48,679 employees</li><li>47% below 35 years old</li><li>14% women in technical positions</li><li>Established the Corporate Command Centre (C3) and PETRONAS Pandemic Preparedness and Response Team (PPRT)</li><li>Established Diversity and Inclusion (D&amp;I) Council</li><li>More than RM170 million invested in learning</li></ul></div>	<ul style="list-style-type: none"><li>Improvement for TRCF (0.30 vs 0.35) and increase in FAR (1.47 vs 0.56)</li><li>Process Safety: Reduction in Loss of Primary Containment (LOPC) incidents: 5 major and 24 minor / Reduction in fire-related incidents: 2 major incidents and 58 minor / Tier 1 incident: 7 cases</li><li>Total Recordable Occupational Illness Frequency (TROIF) increased to 0.16</li><li>Remobilisation of staff and dependents to 13 host countries and evacuation from 33 countries</li><li>Achieved 1 million safe man-hours on the Kasawari Integrated Offshore High Contaminant project</li><li>Strengthened the leadership pipeline by accelerating talent development to become more transformative, agile and inventive</li><li>Raised awareness on unconscious bias through Theatre Exchange sessions which was initiated by PETRONAS Leading Women Network in collaboration with LeadWomen</li><li>83% of employees working from home said Work-from-Home (WFH) arrangements are “satisfactory”, based on an internal survey</li><li>30,268 digital learning users with 47, 127 online learning sessions completed</li><li>Good progress made in shaping the way our people think and act toward becoming an agile workforce to face oncoming challenges and seize new opportunities for future progress</li></ul>
<div><b>Social and Relationship Capital</b><ul style="list-style-type: none"><li>Annual RM100 million allocation for Yayasan PETRONAS for philanthropic activities</li><li>Digitalisation of procurement system</li><li>Support of Malaysia's Oil and Gas Service Equipment (OGSE) sector through Vendor Financing Programme (VFP) and Road to Bursa initiatives</li><li>PETRONAS Education Sponsorship Programme (PESP) and Graduate Employment Enhancement Scheme (GEES) programme</li></ul></div>	<ul style="list-style-type: none"><li>Total contribution of RM50.6 million for COVID-19 relief efforts in Malaysia and countries where we operate</li><li>Set-up of government quarantine centres at facilities</li><li>Developed standard operating procedures (SOPs) and Contact Tracing Guide Book for Malaysia's oil and gas industry</li><li>200,000 users benefited from the online tendering platform's ease of use</li><li>RM1.14 billion in loans approved and disbursed to 214 applications by financial institutions through the VFP</li><li>Facilitated high potential vendors to meet IPO requirements for listing on Bursa Malaysia</li><li>Awarded 370 scholarships, recruited 133 (61%) PETRONAS scholars and 140 GEES trainees</li></ul>
<div><b>Natural Capital</b><ul style="list-style-type: none"><li>Fossil fuels</li><li>Air</li><li>Water</li><li>Biodiversity and ecosystem</li></ul></div>	<ul style="list-style-type: none"><li>Oil and gas daily production average: 2,209 thousand barrels of oil equivalent (boe) per day</li><li>Total Petroleum Reserves (2P): 8.6 bboe (as at 1 Jan 2021) / Total Contingent Resources (2C): 15.27 bboe (as at 1 Jan 2021)</li><li>Total Reduction of 13.4 million tCO<sub>2</sub>e of GHG emissions since 2013</li><li>Reduced freshwater withdrawal: 60.0 million cubic metres (m<sup>3</sup>) from 60.3 million cubic metres</li><li>Reduced oil in water content: 532 metric tonnes (MT) from 648 metric tonnes</li><li>Reduced sulphur oxides emissions: 84,225 metric tonnes (MT) compared with 110,214 metric tonnes in 2019</li><li>Hazardous waste reduction of 20,183 MT</li><li>Recycled and recovered waste 65,173 MT (71% of generated waste)</li><li>Completed feasibility study for Plastic Waste to Crude Naptha project</li><li>Signatory member of the Methane Guiding Principles partnership</li><li>Collaboration with Malaysian government agencies for: forest-based carbon offset potential, Rigs-to-Reefs decommissioning approach and Malaysian Oil Spill Contingency Plan</li><li>Conducted and mitigated risks based on Environmental Impact Assessment and Biodiversity and Ecosystem Services Assessment for all 28 onshore and 74 offshore facilities in Malaysia</li></ul>
<div><b>Financial Capital</b><ul style="list-style-type: none"><li>Efficient capital management in pursuit of business objectives with appropriate balance between risk and reward</li><li>Reputable credit rating</li><li>Robust liquidity management, cash preservation efforts and optimum source of funding</li><li>Strong governance mechanism</li></ul></div>	<ul style="list-style-type: none"><li>Exceeded OPEX and CAPEX optimisation target of 12 per cent and 21 per cent respectively</li><li>Solid corporate credit ratings at A2, A- and BBB+ as affirmed by Moody's, Standard &amp; Poor (S&amp;P) and Fitch respectively, underpinned by strong stand alone credit rating at four notches above our credit ratings as assessed by S&amp;P and Fitch</li><li>Secured proceeds of USD6 billion in April 2020 through issuance of multi-tranche senior bond offering</li><li>Retained unique net cash position of RM52.1 billion and low leverage level amongst peers in 2020</li><li>Paid RM34 billion dividend including RM10 billion for COVID-19</li></ul>
<div><b>Manufactured Capital</b><p>Sustained optimum level operations and innovative solutions offerings through</p><p>247 producing fields 432 offshore platforms 30 floating facilities 3 LNG plants 2 Floating LNG facilities 2 Regasification terminals 4 Refineries 11 Petrochemical production sites 4 Virtual Pipeline System trucks 14 ROVR trucks Product availability in more than 90 countries</p></div>	<p><b>Operations</b></p> <ul style="list-style-type: none"><li>Upstream achieved first hydrocarbon and Final Investment Decision (FID) for 17 and 13 projects respectively, plus 10 exploration discoveries</li><li>10% reduction in Upstream Unit Production Cost (UPC) and energy optimisation initiatives to improve UPC in Downstream plants</li><li>Sustained Overall Equipment Effectiveness (OEE): G+NE (97.2%) and Downstream (90%)</li><li>PFLNG DUA achieved Ready for Start-Up milestone</li><li>Signed a Memorandum of Understanding (MoU) with Sarawak Energy Berhad (SEB) for the commercial production of Green Hydrogen</li><li>Pengerang Integrated Complex (PIC) on track for operations by second half of 2021</li><li>Diversifying into derivatives and specialty chemicals to cater to prioritised markets</li></ul> <p><b>Distribution</b></p> <ul style="list-style-type: none"><li>Achieved 33.1 mtpa LNG sales including 6.5 mtpa new deals through innovative solution offerings (Virtual Pipeline System, LNG bunkering capabilities and LNG export via ISO tank)</li><li>Secured 600 MMscfd minimum daily gas offtake during Movement Control Order (MCO) in Malaysia and achieved 274.4 MMscfd new and extended gas sales</li><li>Facilitated 7 MMscfd capacity of third-party shipper supply under the Third Party Access (TPA)</li><li>Delivered 16 MW of power and 105 MT of steam to customers</li><li>Increased solar capacity in Malaysia (90MW); India and Dubai (over 900MW)</li><li>Expanded chemical distribution channel in Indonesia</li><li>Launched PETRONAS Primax 97 with Pro-Race fuel for advanced technology engines and widened access to Sprinta lubricant through e-commerce</li><li>Supplied 10 million litres of fuel through ROVR mobile refueling system</li><li>Increased growth in non-fuel retail segments (Makan@Mesra food-to-go solutions, Deliver2Me service under Setel e-payment solution and PRYSM motorsport and lifestyle merchandise)</li></ul>
<div><b>Intellectual Capital</b><ul style="list-style-type: none"><li>Top quartile project management expertise</li><li>Patented technologies and digital tools for operational efficiencies and low carbon solutions</li><li>Venture capital investments in technology start-ups to grow adjacent to and beyond oil and gas sphere</li><li>Facilities of the Future programme</li></ul></div>	<ul style="list-style-type: none"><li>Generated RM2.9 billion cost savings through expertise, technology and digital tool deployments in project delivery and operations</li><li>Invested in Braintree Technologies for smart farming solutions and SOLS Energy as a one-stop solutions start-up for high quality solar energy systems</li><li>First in Southeast Asia to receive ISO 19650:2-2018 certification for PETRONAS New Leadership Campus construction</li><li>Achieved on-track deployment of the Kasawari Integrated Offshore High Contaminant project with CO<sub>2</sub> separation technology currently under development to convert CO<sub>2</sub> into fuel for land transportation</li><li>Built green hydrogen testing facility for efficient and cost-effective production</li><li>Progressed the Bio-Agenda with projects to turn biomass to chemicals, bio-based specialty surfactants and plant-based aviation fuel</li><li>Piloted Remote Autonomous Operation in Resak field, offshore Terengganu to reduce carbon footprint, increase safety on offshore platforms and reduce operational expenditure by 50%</li></ul>

Value Creation Model

Key Actions	Trade-offs
<ul style="list-style-type: none"><li>Drive sustainable HSSE performance through solid frameworks benchmarked against industry best practices, robust risk mitigation measures, generative HSSE culture and digitalisation</li><li>Close collaboration with the Malaysian government, host governments and authorities for COVID-19 HSSE measures</li><li>Cascaded PETRONAS D&amp;I statement and D&amp;I awareness through virtual immersive sessions and workshop and escalated D&amp;I discussions at ELT and Board levels</li><li>Implemented special working arrangements with split teams, equipped with digital collaboration tools and support desks with cyber security measures</li><li>Converted 23 training programmes to fully digital and blended learning; and leveraged on extensive e-learning facilities</li><li>Undertook constant engagement with staff focusing on mental and physical well-being through various programmes and provided accessibility to coaches and dedicated mental health helpline</li><li>Refreshed the PETRONAS Cultural Beliefs as part of internal rally towards meeting desired results</li></ul>	<ul style="list-style-type: none"><li>All capitals are affected by the fatalities and the incidents that lead to the fatalities</li><li>Transformation exercise may cause fatigue which could negatively affect human capital and benefit intellectual and manufactured capital</li><li>Lower remuneration due to cost-cutting measures would affect human capital and benefit financial capital</li><li>Investment in upskilling broadens career prospects and benefit human capital and manufactured capitals while causing a requirement for additional financial capital</li></ul>
<ul style="list-style-type: none"><li>Ensured continued commitment to CSR activities via focusing on the areas of Education, Community Well-Being and Development, as well as the Environment</li><li>Continued the close collaboration with the Malaysian government, host governments and authorities for COVID-19 relief efforts</li><li>Timely acquisition and delivery of medical equipment and supplies for COVID-19 relief efforts</li><li>Accelerated transformation to fully digitalised procurement ecosystem</li><li>Forged innovative collaborations with 9 financial institutions, 5 investment banks and financial institutions to support the Vendor Financing Programme and Road to Bursa listing initiatives</li></ul>	<ul style="list-style-type: none"><li>Contributions, donations and support programmes would require financial capital and serve social, manufactured, human and intellectual capitals by securing our licence to operate and bolster local industry's ability to thrive in crises</li></ul>
<ul style="list-style-type: none"><li>Established short-term targets and identified 4 levers towards achieving PETRONAS' net zero carbon emissions by 2050 (NZCE 2050) aspiration</li><li>Made operational excellence improvements: hydrocarbon flaring and venting reduction as well as renewable energy generation in operations</li><li>Low-carbon energy and solutions delivery: gas supply as low carbon fuels; increased installed renewable capacity in portfolio mix; and improved fuel efficiency in energy products</li><li>Technology and innovation: Accelerated technology development for Carbon Capture, Utilisation and Storage (CCUS), biofuels, hydrogen and renewable feedstock and New Plastics Economy (NPE) initiatives</li><li>Responsible reporting: Improved climate actions performance disclosure through digitalisation and continuous engagements, internal and external verification exercises</li></ul>	<ul style="list-style-type: none"><li>Operations powered by non-renewable sources, with emissions and waste production would negatively impact natural capital</li><li>More efficient operations with sound environmental and biodiversity management would benefit social and manufactured capitals over the mid and long term and may adversely impact financial capital in the short term</li></ul>
<ul style="list-style-type: none"><li>Continued to strengthen liquidity management through robust strategies to protect and grow cash</li><li>Established guardrails for financial risks management by establishing liquidity buffers and identifying pre-defined borrowings level within acceptable affordability threshold</li><li>Maintained prudent financial approach in making capital investments decisions for capital efficiency to strike optimum balance between risks and rewards</li><li>Implemented disciplined cost management and successful cost compression initiatives across the Group</li><li>Upheld strong corporate governance at all times</li></ul>	<ul style="list-style-type: none"><li>Cost compression efforts would positively impact financial capital and lower allocation for investment would potentially impact manufactured and intellectual capital</li></ul>
<ul style="list-style-type: none"><li>Leveraged on an integrated value chain to adapt to price and market volatility</li><li>Forged enduring relationships with host governments, authorities and industry peers</li><li>Built resilience in operational excellence with stringent SOPs, minimum manning and adjusted production levels</li><li>Reset commercial strategies to generate long-term margins</li><li>Implemented customer-centric and demand-led solutions to capture broader markets in Reshaping Portfolio</li><li>Created new value through pervasive digitalisation across the operations and business value chain</li></ul>	<ul style="list-style-type: none"><li>Lower overall production and supply cause an adverse impact on financial capital and benefit natural capital</li><li>Ability to sustain and optimise production in an agile manner cushions the impact on financial capital and benefits all capitals</li><li>Go-to-market innovation benefits the natural, social, financial and intellectual capitals</li><li>Clean energy business would benefit natural capital and adversely impact financial capital in the short term and positively impact all capitals in the mid and long term with improved valuation, brand equity and value</li></ul>
<ul style="list-style-type: none"><li>Prioritised delivering top quartile projects at a fraction of cost and time to support NZCE 2050 aspiration and delivered value on the cost reduction and operational efficiency fronts</li><li>Leveraged on 3,934 IPs ranging from patents, trade secrets, copyrights and trademarks across technology segments to improve facility and equipment reliability as well as deliver products and solutions of superior quality</li><li>Collaboration with companies with proven technologies and commercially viable products to accelerate scalability</li><li>Built on in-house R&amp;D capabilities and technologies to accelerate low carbon technologies to support NZCE 2050 aspiration and Reshaping Portfolio</li></ul>	<ul style="list-style-type: none"><li>Scalability limitations of new technologies in uncertain markets and operating environments would adversely impact financial and manufactured capitals</li><li>New technologies for operating in high risk environments would benefit human, social and natural capitals by minimising HSSE risks and our environmental footprint</li><li>Investment towards NZCE 2050 would benefit social and natural capitals with a cost to financial capital</li></ul>



As an integrated energy player, the PETRONAS Group is exposed to a variety of significant risks that can have an impact on our operations, prospects, future performance, financial position, liquidity, asset value, growth potential, sustainable development and reputation. To ensure that the Group is able to continue creating, preserving and realising value, we are proactively leveraging on an effective and comprehensive system of risk management and internal control to mitigate these significant risks.

This system, which includes identifying, assessing, responding to and monitoring a range of financial and non-financial risks, remains a cornerstone of our business strategy and is fundamental to our goal of delivering sustainable long-term value. It is not intended to eliminate risk entirely, but instead to manage our risk exposure across our businesses, whilst at the same time making the most of any opportunities. This system provides reasonable but not absolute assurance against material misstatement or loss, or the occurrence of unforeseeable circumstances.

## Oversight Across the PETRONAS Group

Risk management is one of the core responsibilities of the PETRONAS Board, and is central to the decision-making process. The Board is responsible for overseeing and ensuring a sound system of risk management and internal control across the Group.

The PETRONAS Board is also responsible for providing risk oversight as well as setting the tone to ensure risk management practices are embedded within the Group's culture and the mindset of its people. As per the requirements of the Companies Act 2016, the Board Charter encompasses risk management and internal control oversight as one of the main functions of the Board.

The Board is supported by the Audit Committee and the Risk Committees in carrying out its risk oversight responsibilities:

The President and Group Chief Executive Officer (CEO) is assisted by the Executive Leadership Team (ELT) in ensuring a holistic approach is taken for all business development strategies as well as high-impact and high-value investments including mergers and acquisitions.

The establishment of the ELT is to review key risk management matters and provide guidance and direction to the RC and Board. In addition, the ELT undertakes Focused ELT Meetings to discuss specific matters which include Health, Safety, Security and Environment (HSSE) and People Development.

The RC assists the Board in providing, among others, direction, guidance and oversight on risk management matters. The RC reviews risk policies, strategies, principal risks, risk practices and oversees the adequacy of the risk management system to effectively monitor and manage risks in the Group.

The AC assists the Board in fulfilling its responsibilities relating to internal controls and financial reporting by performing oversight functions on behalf of the Board. This is to ensure good governance practices and proper conduct while safeguarding the Group's assets.

**Supported by**

The RMC is tasked with assisting the ELT, the RC and the Board in identifying principal risks and reviewing governing documents at the corporate level. It also provides assurance on risk management practices across the PETRONAS Group to protect and safeguard the Group's interests. The RMC also promotes sound risk management practices through the sharing of information, best practices and lessons learnt to enhance the risk culture across the Group.

## Focus Risk Areas

Dedicated risk management functions exist within the Group, particularly for listed subsidiaries, to assess and evaluate the risk management processes for reporting to their respective Leadership Teams and Board of Directors. Internal controls have also been developed to facilitate the standardisation of processes and practices across the Group for areas of risk such as Financial, HSSE, Plant and Facilities, Project, Procurement, Digital, Reputation, Human Capital and Country.

All employees have a role to play in risk management and internal control. Assurance programmes are conducted regularly to ensure compliance with established governing documents and to gauge the effectiveness of the risk management implementation processes.



Risks Linked to Creating Value

Risk Policy

The PETRONAS Risk Policy (refer Chart 2) stipulates the general principles and guidelines for actions which influence decisions. It clearly communicates the management’s expectations in relation to risk management practices throughout the Group.

It is complemented by the PETRONAS Resiliency Model that provides an integrated and holistic view of the overall strategy to manage the Group’s risks, focusing on three areas of business resilience, namely Enterprise Risk Management (ERM), Crisis Management (CM) and Business Continuity Management (BCM). These are supported by the risk management frameworks and the relevant guidelines to govern, guide and institutionalise risk management practices across the Group. The status of risk management practices across the Group are continuously monitored and reported quarterly to the RMC.

Chart 2: PETRONAS Risk Policy and PETRONAS Resiliency Model

PETRONAS is committed to become a risk resilient organisation.

PETRONAS shall continuously strive to implement:

- ➔ Risk management best practices to protect and create value within the set boundaries.
- ➔ Risk-based decision-making by providing a balanced and holistic view of exposures to achieve business objectives.

Managing risk is everyone’s responsibility.

- ➔ **Enterprise Risk Management**  
Structured and holistic approach to identify, assess, treat and monitor risks. The aim is to reduce the likelihood and impact of identified risks to enhance the organisation’s ability to achieve its strategic objectives.
- ➔ **Crisis Management**  
Comprehensive set of processes that aim to prepare the organisation to respond and manage crises in the risk areas to protect people, environment, assets and reputation.
- ➔ **Business Continuity Management**  
Holistic management process that aims to build the capability of an organisation to recover and continue delivery of products or services at acceptable predefined levels following a prolonged disruptive incident.

Enterprise Risk Management

The ERM (refer Chart 3) process is an integral part of managing the business as it provides a guide to systematically identify, assess, treat, monitor and review risks. It aims to improve the ability to reduce the likelihood and/or impact of the identified risks that may affect the achievement of business objectives.

The risk profiles, which are established through the ERM process are monitored at the corporate level and across the Group, consist of identified principal risks with the corresponding risk mitigations and key risk indicators. This allows actions to be taken to ensure that risks are being effectively managed by the respective units. Such actions are endorsed by the Heads of Division of the respective Holding Company Units (HCUs), Business Units (BUs) or Operating Units (OPUs), and are reported to the respective Leadership Teams and Board of Directors on a quarterly basis.

The Group’s Risk Appetite articulates the type of risks that the Group is willing to accept to guide strategic decisions at the corporate level in pursuit of business values and objectives. It reflects the Group’s position, propensity and acceptability to take risks in various areas, namely strategic, financial, operational, reputational, while maintaining legal and regulatory compliance and is defined by the respective area’s tolerances and threshold levels. At the corporate level, the PETRONAS Group’s Risk Appetite is monitored and reported on quarterly basis to the ELT, RC and the Board.

Chart 3: ERM Framework



Risks Linked to Creating Value

Crisis Management

CM (refer Chart 4) is an integrated process that aims to prepare an organisation’s domestic and international operations to respond to and manage crises in risk areas to protect People, Environment, Asset and Reputation (PEAR).

Under CM, there is a three-tiered response protocol that demarcates the roles and responsibilities of the emergency site management, operating unit management, corporate and internal/external response agencies, and/or authorities. Testing and Exercising (T&E) via simulation of test scenarios validates the effectiveness of response strategies as well as promotes continuous improvement as identified in the Emergency/Crisis Management Plan. T&E programmes are carried out at the respective HCUs, BUs and OPUs.

Chart 4: CM Framework



Business Continuity Management

BCM (refer Chart 5) is a management process that aims to build the capability of the Group to recover and continue delivering products or services at acceptable predefined levels following any prolonged disruption.

Key to the BCM Framework is the Business Continuity Plan (BCP) which has been established to enhance the Group’s preparedness to recover and restore business critical functions within a reasonable period, so as to sustain activities and minimise disruptions to stakeholders. T&E via simulation of test scenarios validates the effectiveness of recovery strategies as well as maintains a high level of competence and readiness as identified in the BCP. T&E programmes are carried out at the respective HCUs, BUs and OPUs.

Chart 5: BCM Framework



Risks Linked to Creating Value

Mitigating Key Risks

The Group's businesses are subject to a number of factors, some of which are beyond our control. These and other risks, whether known or unknown, may have potential material adverse impacts on our operations. The risks set out below are linked to our Three-Pronged Growth Strategy and are not an exhaustive list of the challenges that we currently face or may develop in the future. The order in which these risks and uncertainties appear does not necessarily reflect the likelihood of their occurrence or the relative magnitude of their potential material adverse impact on our business.



Market Risk

Our financial performance is impacted by the volatility of commodity prices, change of customer preferences, fluctuations of exchange rates, and the general macroeconomic outlook.

Context of Risk (Implications on PETRONAS)

As PETRONAS' core business is predominantly in oil and gas, our financial performance is highly influenced by the volatility of commodity prices, which is generally determined by the supply and demand in the market. The COVID-19 pandemic and movement restrictions imposed globally have a substantial impact on the fluctuation in commodity prices and customers' demands.

There is also a shift in customers' preferences, namely an increased demand for lower carbon sources of energy. The shift in customers' preferences and emergence of cleaner sources of energy intensifies the competition within the oil and gas industry and indirectly affects PETRONAS' value chain.

PETRONAS' reporting currency is in Ringgit Malaysia, however there are transactions dealt in the US Dollar which expose the Group to the volatility of the US Dollar to Ringgit Malaysia exchange rate. Additionally, our presence globally has exposed us to the changes in the value of other currencies and exchange controls imposed by the countries we are in.

Mitigations Conducted

In response to the wide-ranging market risks and the corresponding challenge in generating values from our business, a thorough review of PETRONAS' portfolio mix is being undertaken, with a focus on prioritising resources to the areas that are of the highest value to the organisation and business whilst meeting the expectations of our customers.

Additionally, the PETRONAS Financial Policy (PFP) sets the overarching philosophy and

outlines high level principles for PETRONAS to be financially resilient for longer-term sustainability through efficient capital and liquidity management practices, as well as financial risk management practices. Relevant Supporting Guidelines are also in place to further guide and ensure financial management and financial risk management practices are implemented. This also enables visibility of the Group's key financial risk exposures for improved risk management.

In addition to the PFP, digital and strategic initiatives are outlined to address the integrated demand and supply chain, creating new demands and the optimisation of values within the value chains.

Elements of market risk also make up the PETRONAS Risk Appetite which is implemented across the Group. Key factors affecting PETRONAS' financial performance and risk appetite are reviewed and monitored regularly to ensure compliance and timely response to risks.

➔ Link to Strategy



➔ Link to Material Topics



Execution Risk

Our business, financial performance and results of operations are dependent on the successful delivery of complex, long-term, capital-intensive projects, as well as asset portfolio optimisation. Consequently, insufficient insurance coverage could have material adverse impact on PETRONAS' fiscal bottom line.

Context of Risk (Implications on PETRONAS)

PETRONAS' business and financial performance within the Upstream, Downstream, Gas + New Energy, corporate and other Divisions are highly dependent on the successful execution of the

projects. The complex nature of oil and gas projects relies on the high degree of technology applied, technical capabilities of PETRONAS' talent, our

capacity to undertake the required capital investments and market conditions at the point of the investment decision.

Mitigations Conducted

The progress of PETRONAS' key projects is reviewed and monitored regularly, aligned to the risk appetite established for project delivery.

Project risk management is implemented in accordance with the PETRONAS Project Management System (PPMS), with the objective of reducing the risk of unexpected technical and/or commercial factors significantly affecting the project's viability. The PPMS Phase Gated Process is designed to retain and maximise project value across a project's life cycle from the identification of business opportunity until operationalisation of the project and to bring a measure of rational processes to the decision-making associated with transforming business opportunity into operational assets.

Group Project Delivery (GPD) has oversight for all of PETRONAS capital projects, technical deployment projects and plant change projects,

plus executes the role of Asset Owner Representative where PETRONAS is the major shareholder.

Throughout execution, performance of the projects schedule, cost and scope are monitored on a regular basis. Emerging risks and early warning signals are tracked and mitigated accordingly to protect the overall projects' value.

The risk management of plant and facilities in PETRONAS is governed by various governing documents and processes such as the Reliability and Integrity Management Systems (RIMS), PMMS Guideline, Plant and Facilities Risk Management (PFRM) Guideline, PETRONAS Technical Standard (PTS), PETRONAS Basic Technical Requirement (PBTR) and PETRONAS Technical Guideline (PTG). These governing documents and work processes outline the requirements to ensure proper management of operational risk and safe operations of the assets.

PFRM prescribes the principles and structured processes in managing operational risks in accordance with the PETRONAS Resiliency Model. It guides plants and facilities to systematically identify, assess, control, monitor and review operational risks to improve the ability to reduce the likelihood and/or impact of identified risks. The remaining governing documents prescribe the specific system and work processes required by the Group's plant and facilities over the asset life cycle in order to operate safely and achieve the targeted reliability, integrity and performance.

Additionally, businesses conduct capability development programmes to equip personnel with the technical knowledge required.

Collaborative efforts with peers/partners within the oil and gas industry facilitate the transfer of technical knowledge to PETRONAS.

➔ Link to Strategy



➔ Link to Material Topics



Risks Linked to Creating Value



Legal and Regulatory Risk

Changes in the regulatory landscape and rising climate change concerns could increase the cost of compliance, reduce demand for our products, affect our provisions and limit our access to new growth opportunities.

Additionally, inherent uncertainty of litigation proceedings could have adverse material impact on PETRONAS' business operations, financial condition and/or reputation.

Context of Risk (Implications on PETRONAS)

As a multinational corporation, PETRONAS is subject to compliance with the wide-ranging legal and regulatory requirements that are unique to each country that we operate in. These include critical legal areas such as international sanctions, antitrust, anti-bribery, anti-corruption, anti-money laundering and data protection laws with extraterritorial effect.

PETRONAS is exposed to various claims, suits and legal proceedings that could involve shareholders, labour, intellectual property, tax and other matters. The disputes and legal proceedings that PETRONAS may be involved in are often

subject to many uncertainties beyond our control and have outcomes that are difficult to predict. Due to the inherent uncertainty of the litigation and dispute resolution process, the resolution of any particular legal proceeding or dispute may have adverse material impact on PETRONAS' business operations, results of operations and/or financial condition.

Additionally, within PETRONAS' approximately more than 48,000 strong workforce, limited awareness and misaligned incentives can lead to intentional or unintentional non-compliance with laws and regulations by personnel, which is beyond

PETRONAS' control. The impact of these actions may go beyond personal liability and could have a wider impact on the organisation.

Rising concerns over climate change could lead to additional legal and regulatory measures and add on to our compliance obligations including higher compliancy costs. The nature of oil and gas operations exposes us to potential claims and suits by environmental and legal authorities as well as communities on issues pertaining to carbon emissions, waste materials, as well as commissioning and decommissioning activities of our operations.

Mitigations Conducted

The establishment of relevant governance, compliance and legal frameworks and the PETRONAS Code of Conduct is central to managing legal and regulatory risks.

The Legal Compliance Framework (LCF) is developed to serve as a control oversight and measure of legal compliance for the Group. The foundation of the LCF is based on five critical legal areas, posing an enterprise risk to the Group.

PETRONAS via Group Legal conducts regular communications, awareness sessions and training programmes on the critical legal areas and specific laws affecting the respective entities to enhance awareness and emphasise strict compliance with legal and regulatory requirements.

The state of compliance by the workforce and business is reviewed and monitored regularly, in alignment with the risk appetite established for compliance with critical laws and anti-corruption

measures. PETRONAS emphasises strict compliance with legal and regulatory measures and has no tolerance for non-compliance with legal and regulatory measures and acts of bribery and corruption.

As PETRONAS aspires to achieve net zero carbon emissions by 2050 (NZCE 2050), the Group's Sustainability Agenda will support our efforts to reduce carbon emissions and better manage other environmental impact resulting from our business operations.

➔ Link to Strategy



➔ Link to Material Topics



HSSE Risk

The nature of our business operations give rise to exposure to a wide range of health, safety, security threats and environmental risks which could cause harm to people, the environment and our social assets as well as result in regulatory action, legal liability, business interruption, increased costs and damage to our reputation, potentially affecting our social licence to operate. Additionally, the onset of the COVID-19 pandemic has further increased the health risks to PETRONAS staff.

Context of Risk (Implications on PETRONAS)

Any occurrence of incidents during the operations of our business could result in injury or loss of life, environmental damage, resulting in rectification costs, equipment damage and damage to PETRONAS' facilities. A shutdown of the affected facilities could disrupt PETRONAS' production and increase its production costs.

The ongoing COVID-19 pandemic and movement restriction orders globally have to a certain extent resulted in business interruptions, deterioration of financial performance resulting from adverse market impact, as well as affected our people.

Security threats such as acts of terrorism, piracy and kidnapping may adversely affect our business operations, the safety of our people and assets as well as do damage to the environment.

Mitigations Conducted

The Group's Health, Safety, Security and Environment (HSSE) policy is supported by the HSSE Management System (HSSE MS) and the HSSE Mandatory Control Framework (MCF), which includes clear requirements for health, operational and process safety, as well as the environment for consistent and effective groupwide implementation.

Additionally, the PETRONAS Security Policy is supported by the Security Management System (SeMS) with Minimum Mandatory Security Standard (M2S2) which outlines the minimum security standards required to effectively manage security risks and protect the Group's assets. Both framework and management systems facilitate the strengthening of HSSE governance within the Group.

Operational discipline is further heightened through intervention and oversight via HSSE assurances, enhancements to contractor management, and by leveraging the HSSE digital system. This is supported by Generative Culture Leadership Programmes at all levels focusing on psychological safety and conscious risk awareness. Furthermore, the Loss of Primary Containment (LOPC) Reduction Framework and Fire Prevention and Mitigation Framework have been established to strengthen Process Safety Management.

At the start of the COVID-19 pandemic, the PETRONAS Pandemic Preparedness and Response Team (PPRT) was activated. The PPRT comprises subject matter experts from various disciplines across the Group (including Occupational Health, Crisis Management, Business Unit Occupational Health, Group Human Resource Management and Group Security) with the key objectives of minimising risks

to our staff and operations from the pandemic outbreak as well as reducing business disruption by ensuring business continuity and the maintenance of essential operations.

The Corporate Command Centre (C3) taskforce was established with the mandate to monitor the impact of the pandemic and prolonged low oil prices on the business, as well as to ensure overall coordination and monitoring of the response across PETRONAS. The taskforce comprises senior representatives from all Business Units and selected Corporate Units namely PD&T, Procurement, HSSE, Security and Crisis Management, HRM, Finance, Risk, Legal, Group Digital, Communications and Corporate Strategy. Their key objectives are to make critical cross-business decisions, ensure there is a unified crisis response for the Group, and undertake reputation management under crisis.

➔ Link to Strategy



➔ Link to Material Topics





Risks Linked to Creating Value



Reserves and  
Resources Risk

The level of PETRONAS' oil and gas reserves, resources and production may decline over time. The level of our reserves depends on the successful discovery and development of commercially-exploitable oil and gas reserves and resources as well as the reliability of discovered resource estimation.

Context of Risk (Implications on PETRONAS)

Future oil and gas production will depend on our access to investment opportunities and new reserves and resources through exploration, success of negotiations with relevant parties and acquisitions, as well as development and application of new technologies to existing fields. Ineffective management of reserves and resources can severely threaten the viability of PETRONAS' current business operations, deterioration of financial performance, and adverse impact on the achievement of our growth ambitions.

PETRONAS' crude oil and natural gas discovered resource estimates involve some degree of uncertainty and may prove to be incorrect over time

or may not accurately reflect actual discovered resource levels. The reliability of discovered resource estimates depends on the quality and quantity of technical and economic data, the production performance of the fields and may also be subject to revision due to changes in published rules and guidance.

Mitigations Conducted

The oil and gas reserves and resources are being reviewed via the Annual Review of Petroleum Resources (ARPR) process.

PETRONAS' international ventures form part of the strategy to secure new sources of supply. The successful execution of our international ventures will provide us with additional security of supply.

Ongoing efforts to manage sustainability of supply include development of the Carbon Capture, Utilisation and Storage (CCUS) technology for the development of the High CO<sub>2</sub> fields for competitive LNG pricing and optimising the value of remaining indigenous gas resources.

➔ Link to Strategy

➔ Link to Material Topics



Geopolitical  
Risk

Our businesses domestically and globally, are exposed to a wide range of political, legal and fiscal developments, which could affect our business operations and financial condition.

Context of Risk (Implications on PETRONAS)

PETRONAS operates in numerous countries which have differing degrees of political, legal and fiscal stability. This exposes us to a wide range of political developments that could result in changes to contractual terms, laws and regulations.

PETRONAS' global business activities are also subjected to regulations and directives of the national and host governments with respect to matters such as limitations on production volumes and exports, pricing policies, environmental protection controls and possible nationalisation of assets, expropriation and cancellation of rights. Governments may intervene directly or indirectly in PETRONAS' commercial and operational affairs, which would have adverse material impact on PETRONAS.

Inability to mitigate the internal and external challenges within the domestic and international business landscapes may result in the deterioration of our financial condition and constrain our growth capacity.

Mitigations Conducted

Country Risk Management Framework (CRMF) established to govern the oversight structure, roles and responsibilities, and assessment tools in ensuring country risks are managed in a systematic and structured manner across the Group. It also prescribes requirements on pre-entry, in-country and exit management to support decision-making in relation to international investments and managing in-country risk holistically, which are also reported to respective country's Management and Board.

The geopolitical landscape and investment concentration in the countries we are in is reviewed and monitored regularly, aligned to the risk appetite established for our international investments.

Additionally, PETRONAS is undertaking a rigorous review of its investment portfolio through the formation of a dedicated Portfolio Intervention and Transition team. This effort involves identifying the most valuable assets within the portfolio and undertaking the relevant high-grading strategies. These efforts aim to optimise the value of the overall portfolio.

➔ Link to Strategy

➔ Link to Material Topics



Financial  
Liquidity Risk

Our business activities require significant capital investments, sufficient operating cash flows and/or sufficient external financing to support business activities and growth projects.

Context of Risk (Implications on PETRONAS)

Deterioration of PETRONAS' financial performance and inability to obtain the required financing during these challenging times may affect PETRONAS' capital investments and achievement of our growth projects.

In addition, a global or regional financial crisis and unfavourable credit and market conditions may negatively affect PETRONAS' liquidity, customers, businesses, and operational results.

The downgrade of Malaysia's sovereign rating has put pressure on PETRONAS' final credit rating and may affect our cost of financing and ability to tap the capital market.

Mitigations Conducted

PETRONAS' liquidity position is reviewed and monitored regularly, aligned to the risk appetite established for liquidity and indebtedness level.

The PETRONAS Liquidity Risk Contingency Protocol (LRCP) is intended to safeguard the Group's liquidity position and its financial sustainability.

Whilst the Liquidity Crisis Management Team (LCMT) is established to deliberate the impact assessment and mitigation strategies to safeguard the Group's liquidity position and its financial sustainability in the event of crisis, the onset of COVID-19 necessitated the establishment of Liquidity Plus (L+) at the beginning of the year, to review PETRONAS' groupwide liquidity position, highlight potential liquidity issues and provide guidance for groupwide strategies in managing liquidity.

➔ Link to Strategy

➔ Link to Material Topics



Risks Linked to Creating Value



Technology  
Risk

Technology and innovation are essential for PETRONAS to remain competitive. If we inadvertently develop technologies and products that cause an unfavourable effect on the environment or the safety of people, there could be a potential material adverse impact on our financial condition and reputation.

The acceleration of digital efforts within PETRONAS has exposed us to cyber security threats which may impact the safety of our operations, people, environment, data and sensitive information. It may also lead to legal and regulatory breaches as well as reputational damage.

Context of Risk (Implications on PETRONAS)

Technology and innovation are essential if we are to remain competitive in this challenging business environment. PETRONAS is dedicated to delivering the best solutions for our customers and this includes keeping up with the latest innovations and technologies within the industry. However, the adoption of new technologies always comes with an inherent set of risks covering adoption, legal and regulatory compliance, cyber security exposure and in-house capabilities.

There could be an adverse material impact on the delivery of our strategy and our licence to operate if we do not develop the right technologies and products, do not have access to such technology and products or do not deploy these effectively. If we are unable to develop the right technologies and products in a timely and cost-effective manner, or if we develop technologies and products that adversely impact the environment or safety of the people, there could be adverse material impact on our financial condition and reputation.

PETRONAS is subject to fast-evolving risks from cyber threats. A breach or failure of our digital infrastructure from cyber-attacks could result in the loss or misuse of data or sensitive information, injury to people, disruption to our business and harm to the environment or our assets. It could also lead to legal or regulatory breaches and legal liability.

Mitigations Conducted

PETRONAS drives competitive advantage with dynamic in-house research and innovation solutions by having an immaculate and unique system in place to mitigate and manage risk through the PETRONAS Technology Management System (PTMS). The PTMS ensures that we develop the right technology solutions that meets business needs and which are aligned with the current challenges and agenda. It curates the value chain and ensures focus in technology journey from ideation, development, management, deployment and optimisation of technology programmes up until the commercialisation aspects of individual technology.

PETRONAS also maintains a strong position in mitigation of risk on the Intellectual Property (IP) front where we hold over 3,000 IPs ranging from patents and trade secrets to copyrights and trademarks across different technology segmentations including Bio-Chemical and Advanced Materials, amongst others. This robust and extensive strategy of protecting our innovations include the development of an IP Policy at the enterprise level which provides a systematic structure, procedures and guidelines for effective management of PETRONAS' IPs for technology. In addition, the IP Guidelines is included as part of the key processes in the PTMS.

PETRONAS has set in place a strict recruitment policy for its research and development arm that hires best-in-class experts to help aid the development and deployment of technology as well as continuously upskill its current crop of researchers to a higher level.

PETRONAS Group Digital is responsible for shaping and driving a unifying digital vision and strategy groupwide as well as for accelerating concerted efforts to drive digital transformation for the PETRONAS Group. PETRONAS Group Digital is also accountable for upholding Digital and ICT governance across the Group in the areas of Cyber Security, Enterprise Architecture and Enterprise Data.

Additionally, any incidents involving ICT and Operational Technology (OT) and cyber-attacks are reviewed and monitored regularly, aligned to the risk appetite established for ICT, OT and cyber security.

PETRONAS Information Security is guided by the PETRONAS ICT Principles and PETRONAS Records Management Principles and supported by ICT Standards and Guidelines which set out the purpose, commitment and governance of ICT and Records Management for the Group.

PETRONAS is guided by the Group's ICT Principles, Standards and Guidelines. In 2020, a new framework, namely the Enterprise Cyber Security Governance Framework, was introduced to ensure relevance to the current environment. It replaces the PETRONAS Information Security Standards and Guidelines.

The Enterprise Cyber Security Governance Framework (ECSGF) has been established based on leading industry standards and best practices such as NIST, ISO 37001, ISA/IEC 62443, PDPA, GDPR and PCIDSS. The ECSGF provides a single consolidated view of the frameworks, standards and guidelines required to govern and manage cyber security across PETRONAS.

PETRONAS Group Digital also has in place a Disaster Recovery Plan (DRP) for identified critical business applications. Scheduled drills and exercises are conducted periodically to ensure readiness in the event of an ICT disaster.

Technology Risk In Action

Towards Large-Scale and Accelerated Deployment of M365

The year 2020 was the year the rules of the game changed and business as usual was no longer possible. The year saw PETRONAS leveraging on technology and innovation in an even greater manner to ensure we remained competitive. As restrictions were imposed on the number of people allowed at the workplace at any one time and Work-from-Home (WFH) mode became necessary and commonplace, we got down to seeing how best to maintain our competitive edge. To this end, Microsoft 365 (M365) was identified by PETRONAS as the best transformative tool for the organisation to adopt as it aligned with PETRONAS' overall digital transformation ambitions and accorded users heightened cyber security measures.

Prior to the COVID-19 pandemic, the plan was for M365 to be deployed in stages across a 14-month period, beginning with a pilot phase for 4,000 users. However, given the trend of growing COVID-19 cases at the beginning of 2020, the M365 deployment team foresaw the need for a full-scale WFH arrangement to curb infections. As such, the team readjusted the 14-month timeline to ensure full support for all staff during the movement restrictions. As this had not been done at such a large scale and in such an accelerated manner, the team faced the risk of a failed migration to the new platform and an ineffective transition to WFH mode.

The plan was for M365 to be deployed in stages across a 14-month period, beginning with a pilot phase for

4,000  
users

M365 deployment team foresaw the need for a full-scale WFH arrangement to curb infections. The team readjusted the 14-month timeline to ensure full support for all

52,000  
M365 users during the movement restrictions

As they got down to the task at hand, the M365 deployment team saw the need to leverage forward planning and agility to ensure a successful rollout under the WFH arrangement. They also put in place the necessary guardrails for the seamless adoption of M365 across the Group, including a comprehensive governance framework, an adoption plan, and the necessary remedial steps to address common issues. With all the necessary elements in place to mitigate an effective transition, the team pressed on with the unprecedented exercise.

In March 2020, Microsoft Teams was successfully rolled out to all staff, and this was followed by the effective deployment of other M365 services throughout 2020. All in all, the entire M365 suite of products were successfully deployed across the Group well ahead of the original pre-pandemic deployment schedule. Despite the sudden but necessary switch to WFH mode, PETRONAS' businesses experienced fluid business continuity. Moreover, given the necessary safeguards available in the M365 suite that make it a suitable productivity tool for digital workspaces, cyber security risks to the organisation during remote working were minimised.

➔ Link to Strategy

➔ Link to Material Topics







# Upstream



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The unprecedented events that unfolded in 2020 served as the perfect catalyst for Upstream to reinvent itself. We continued to deliver results operationally through a combination of strategic and decisive measures. This was no doubt made possible by the herculean efforts of our frontliners despite the challenges they faced. As we implemented rigorous measures to reduce costs and maintain liquidity, we also strengthened our portfolio by encouraging more value-driven exploration and development of discovered resources to promote a vibrant oil and gas landscape. This was especially true in Malaysia. In parallel, bold efforts were undertaken within Upstream to support PETRONAS' Sustainability Agenda, including making ground-breaking progress in Carbon, Capture and Storage (CCS) as well as emissions reduction initiatives.

We are well on our way towards becoming a safe, resilient, low cost and low carbon exploration and production (E&P) business through value-focused, purposeful strategies combined with world class execution, anchored on PETRONAS' integrated business model. We are resolutely adopting digitalisation and technology in the way we work and deliver business excellence. Last but not least, we remain uncompromising in our safety endeavours to ensure everyone goes home safely.

”

**Adif Zulkifli**  
Executive Vice President and Chief Executive Officer,  
Upstream

The Upstream business continued to create value and achieve business excellence whilst remaining resilient despite the disruptions brought about by the COVID-19 pandemic and energy demand volatility. Upstream activities in Malaysia and internationally were inevitably affected due to the prolonged lockdowns implemented all over the world.

The impact of the challenges was largely hedged by the deliberate steps we undertook to enhance our operational performance while keeping costs down. Upstream implemented prudent measures to ensure continued business resilience, including reviewing all its activities as well as prioritising and rephasing projects. We also continued to focus our efforts on maintaining asset integrity and reliability, whilst ensuring that our customers were optimally served.

In addition, we also enhanced our strategies to address future uncertainties which included the implementation of innovative technology and digital infrastructure. These continued to fuel the way forward in Upstream, empowering our people and redefining the way we work. All this enabled us to capitalise on opportunities, ensure sustainable production and carry on operating safely.

We continued to uphold disciplined capital and operational spending as well as preserved liquidity to ensure business sustainability for the long term.

The upstream industry is expected to face an increasingly uncertain outlook given the low oil price environment, lower spending across the industry, higher costs, finite resources and production gaps as the shift to a low-carbon economy picks up pace. Moving forward, the strategies in place to reinvent Upstream will hold us in good stead in our aspiration to be a safe, resilient, low cost and low carbon E&P business.



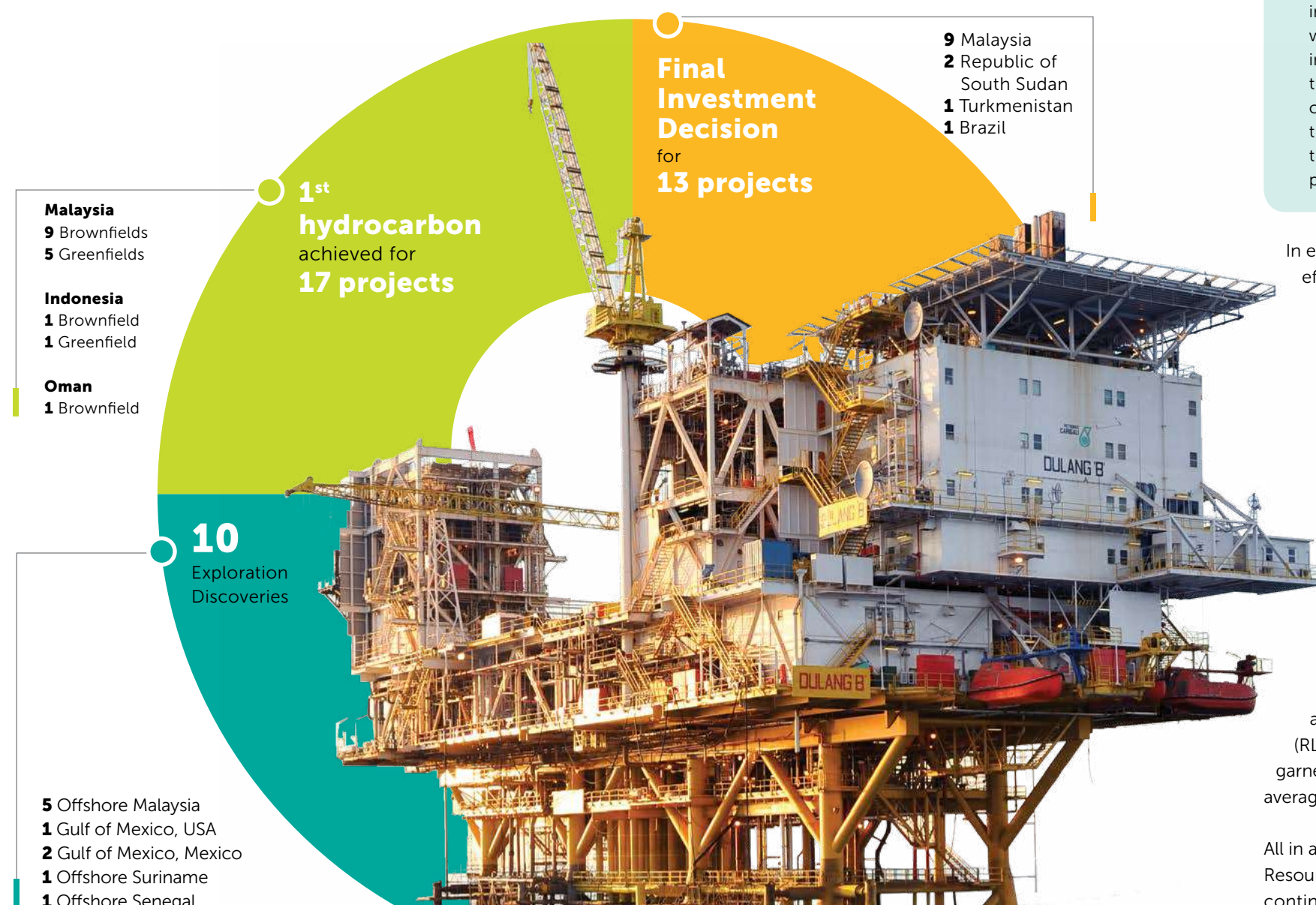


## How We Created Value

### 1 Ensuring Sustainable Supply

We remain focused on two strategic prongs, namely **Maximising Cash Generators** and **Expanding Core Business**, by taking prudent steps to ensure sustainable production despite the challenges faced during the pandemic. We ensured continued energy supply to our stakeholders, attesting to our resilience and agile operations.

During a tough 2020, Upstream recorded a total daily production average of 2,209 thousand barrels of oil equivalent (boe) per day, an 8.2 per cent decrease in comparison to 2019. This was attributed to the low oil price environment and reduced demand brought on by the prolonged impact of the COVID-19 pandemic. Despite an unpredictable year, a total of 17 Upstream projects achieved first hydrocarbon. These comprised nine Brownfields and five Greenfields in Malaysia, one Brownfield in both Indonesia and Oman respectively, as well as one Greenfield in Indonesia.



### Expanding Core Business



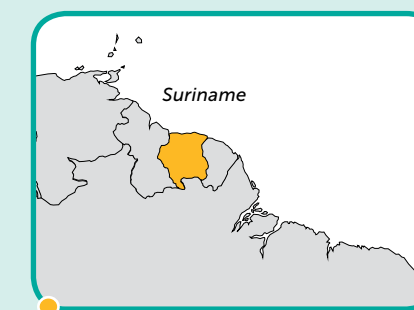
Monument Discovery

The Monument discovery in the Gulf of Mexico, USA marked a significant milestone for PETRONAS in our efforts to expand our oil and gas business portfolio by growing our international resource base. This was our first entry and discovery into oil and gas operations in the Gulf of Mexico, USA. We will continue to explore opportunities in the Americas region to strengthen the sustainability of our global portfolio.



Polok-1 and Chinwol-1 Deepwater Discoveries

In line with our expansion into the Americas, PETRONAS made two deepwater oil discoveries in Mexico from the Polok-1 and Chinwol-1 exploration wells in Block 29, located in the Salina Basin, Gulf of Mexico, Mexico. PETRONAS currently holds interest in 10 exploration blocks across three of Mexico's prolific main basins encompassing a total area of approximately 22,000 sq. km.



Drilling Success of Sloan-1

The successful discovery of the Sloan-1 exploration well in Block 52, located in the Suriname-Guyana basin, offshore Suriname paves the way for PETRONAS to continue exploring in Suriname, which is one of our focus basins in the Americas.

In ensuring sustainability of production, we continued our efforts to replenish our resources and reserves, focusing on prudent growth. Upstream recorded a total of 13 projects which achieved Final Investment Decision (FID). These FID projects encompassed nine projects in Malaysia, two in the Republic of South Sudan, one in Turkmenistan and one in Brazil. As at 1 January 2021, PETRONAS' total Petroleum Reserves (2P) stood at 8.6 bboe, a decrease of 7 per cent from 2019.

PETRONAS' total Contingent Resources (2C) stood at 15.3 bboe, an increase of 1 per cent from 2019. A total of ten discoveries were made in 2020 comprising seven discoveries which contributed to our resource addition namely in Malaysia, Suriname as well as Gulf of Mexico, USA and Gulf of Mexico, Mexico.

Our strong performance track record saw Upstream achieve a three-year average 1P Reserves Life Index (RLI) of 8.9 years, an increase over the 1P RLI of 8.0 years garnered in 2019. This also led to a commendable three-year average 1P Reserves Replacement Ratio (RRR) of +1.6.

All in all, we recorded a three-year average Overall (2P+2C) Resource Life Index (ORLI) of 38.7 years. PETRONAS will continue to focus on high value and material prospects



moving forward, by leveraging technology and our world class capabilities. We will continue to set our sights on ensuring a balanced, value-driven and healthy funnel of resources and reserves in sustaining a robust portfolio.



## 2 Banking on Operational Excellence

We continued to enhance operational excellence through technology, digitalisation and intelligent facilities to reduce costs as well as increase productivity and efficiency across Upstream's operations.

The introduction of Upstream's Operational Excellence Management System (OEMS) incorporates a value-driven approach that delivers bespoke solutions in each field to ensure safe, reliable, and sustainable operations. This was seen in the Asset Reference Plan (ARP), where a holistic long-term asset strategy was established and applied in the Samarang Production Sharing Contract (PSC) off the coast of Sabah, offshore Malaysia. This has led to the identification of potential value creation of RM519 million over the next five years. Of this, RM16.5 million has been earmarked to be realised by the end of 2021.

Another example is the implementation of the Run-To-End (RTE) operating model in late life fields. As of the first quarter of 2021, OEMS successfully implemented the RTE model in three fields. This is expected to deliver a potential value creation of over RM40 million in the next five years. OEMS continues to set the standard for Upstream's value-driven approach by continuously improving asset management and efficiency.

In line with Upstream's expansion into the area of intelligent facilities, the Resak platform located offshore Kertih in Terengganu is the first platform in Malaysia to pilot remote operations with a 30 per cent potential operational expenditure (OPEX) reduction. This comes on the back of swift technological advancements in automation, robotics and Artificial Intelligence (AI).

In Canada, we continue to gain capital and operational efficiencies through technological advancements and cost compression efforts. In 2020, PETRONAS Energy Canada Limited (PETRONAS Canada) further refined the updated well design that was implemented in 2018, which has over 60 per cent longer lateral sections, as a minimum, and up to 100 per cent longer lateral sections than the previous design. As a result, PETRONAS Canada's wells on certain pads were drilled up to 25 per cent faster and completion costs were 15 per cent lower than planned for the year.

PETRONAS Canada also completed the construction and commissioning of key infrastructure for gas processing plants and compressor stations to support its production ramp-up plan over the next five years. This includes the construction of its Town North gas plant which was completed in November 2020 with commissioning well underway. Serving as its flagship gas plant, this facility will have a processing capacity of 555 million standard cubic feet per day (MMscfd) when the third phase is completed (tentatively in 2025). This will help us deliver our long-term production commitment for our North Montney venture in Canada.

Further improving operational efficiencies in our La Amarga Chica (LAC) block in Argentina, we reduced cost per well by 20 per cent. The adoption of longer wells, robust well design and High-Density Completion improved our resources and reserves by 13 per cent. The accelerated learning experience also helped LAC achieve comparable cost efficiency in just one year compared to six to seven years in neighbouring blocks. LAC under PETRONAS E&P Argentina S.A. (PEPASA), is on track to be Best-in-Class in unconventional play by 2025. This coupled with the first crude export deals in collaboration with its partners in June–August 2020, cemented PETRONAS' ability to monetise its unconventional resources in the region.

In addition, PETRONAS' Unconventional Centre of Excellence located in Calgary, Canada, continues to enhance our unconventional expertise, refine technical innovations, strengthen collaborations and share best practices with our other operating regions that have unconventional resources including Argentina, Australia and Oman.

Other highlights for the year include:

**50 %** reduction in operating rig time following the deployment of the **Enhanced Single-Trip Multizone (ESTMZ)** at Samarang, off the coast of Sabah, offshore Malaysia for well extension packing. This was achieved by simplifying complex operational processes which also led to a **50 per cent capital expenditure (CAPEX)** reduction in the gravel pack operation.

**0.34 million tCO<sub>2</sub>e/year** of **Greenhouse Gas (GHG) emissions reduction** at Samarang field off the coast of Sabah, offshore Malaysia by recovery of associated gas through separator pressure tuning and recommissioning of additional lines to deliver all gas from satellite platforms to a central platform.

**75 %** cumulative **OPEX reduction since 2016 for mature field operations** at the Tembungo field, off the coast of Sabah, offshore Malaysia through successful process simplification, maintenance optimisation and Run-to-End approach (RTE).

**33 %** reduction in OPEX from the pilot **Corrosion Under Insulation (CUI) system** at Erb West, off the coast of Sabah, offshore Malaysia. The CUI system, which incorporates a portable lightweight x-ray device designed to monitor and detect corrosion without removing any insulation, has proven to be **10 times swifter** than conventional methods.

## 3 Focused on Progress

Anchoring on PETRONAS' Three-Pronged Growth Strategy, Upstream has clear targets underpinned by a robust strategy to safely deliver superior performance.

We continuously look at innovative solutions to mitigate any potential risks or challenges that may impact the industry. With this purpose in mind, we are leveraging technology, digitalisation, and data as our differentiator, accelerator and asset respectively, to deliver our strategy with pace, while being cost effective and low carbon-oriented. As a result, our digitalisation efforts, namely the Facilities of the Future programme, is helping us reduce our carbon footprint and enhancing safety at offshore platforms, allowing us to reduce future OPEX by up to 50 per cent.

Similarly, among Upstream's new initiatives include incorporating virtual inspection and performance testing which have enhanced our Process Cycle Efficiency (PCE). This includes Factory Acceptance Testing (FAT) which was done online. This has helped us to move away from conventional on-site testing at vendor and offshore facilities, saving time and costs. Furthermore, our focus on intelligent facilities, which includes remote operations such as the Resak platform offshore Terengganu, is set to be more pervasive across our operations.

Meanwhile, our GHG emissions reduction efforts are focused on achieving zero continuous flaring and venting of hydrocarbons

which aim to reduce GHG emissions by approximately 2 million tCO<sub>2</sub>e per year, and potentially recover about 33 million standard cubic feet per day towards the sale of gas.

We are also applying Carbon Capture and Storage (CCS) in our high CO<sub>2</sub> fields; and considering Renewable Energy as our preferred source of power at platforms. Our focus on CCS innovation aims to target further carbon emissions reduction, while seeking to expand our portfolio of technologies to create value.

The Kasawari CCS project off the coast of Sarawak, offshore Malaysia is a strategic project that supports the PETRONAS Carbon Commitment (PCC) and GHG emissions reduction efforts. We plan to commence the first injection of CO<sub>2</sub> by the end of 2025. Once onstream, the project is expected to reduce CO<sub>2</sub> volume emitted via flaring by 76 million metric tonnes with an annual average of 3.7 million metric tonnes per annum (mtpa).

As the energy landscape continues to change, particularly in the upstream space, our continuous efforts are focused on making our business safe, resilient, low cost and low carbon.





Digitalisation at Upstream

Innovative technologies and digital solutions will continue to be deployed at scale to improve the bottom line across our assets and increase the efficiency of our growth engines.

Delivering New Value

- Recorded RM180.6 million incremental value with Alpha LNG which integrates Upstream’s production optimisation with G+NE’s cargo delivery needs.
- Delivered 2.1 kboed incremental production from six fields in Malaysia via data driven production optimisation. This was enabled on a scaled-up Digital Fields techno-digital solution which has generated more than RM756 million in value since its implementation in 2017.
- Realised RM41 million in cost savings by implementing a combination of off-the-shelf wells and sand management technologies in drilling operations and gained approximately 230,000 boe in incremental production in 2020. Among the technologies piloted were Single Trip Multizone (STMZ), SMART Digital Artificial Lift (DIAL), and Enhanced Single Trip Multizone (ESTMZ) at four fields which were then replicated in other fields in Malaysia.

Improving Safety, Productivity and Efficiency

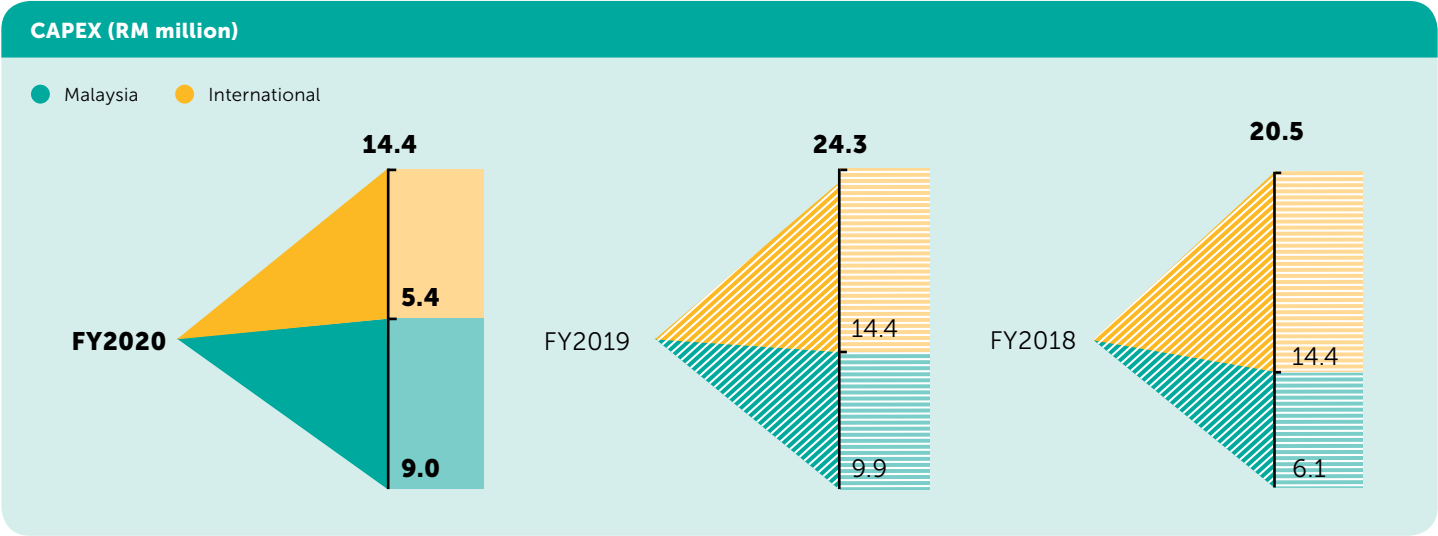
- Achieved 90% reduction in human exposure to onsite data collection activities and removed the need for facility modification by digitising assets through Internet of Things (IoT) and Edge Analytics (Edge) Technologies.
- Accelerated up to 36 times faster seismic data transfer (from 12 days to eight hours) by leveraging on global cloud and networking infrastructure.
- PETRONAS progressed from being a participant to an implementor with the Software as a Service (SaaS) Open Subsurface Data Universe (OSDU) exploration and production (E&P) data platform. This aims to free up 1,000x more E&P data for users, integrating 12 corporate data stores to a single data platform and lowering data management and infrastructure costs by 10 per cent over a two-year period.
- Attained 30% efficiency improvement in Field Development Planning with step changes in subsurface big data processing and analysis workflows.

Partnerships and Collaboration in Data Liberalisation

As a progressive and innovative regulator, PETRONAS through its regulatory arm, Malaysia Petroleum Management (MPM), introduced new guidelines for its Petroleum Arrangement Contractors (PACs) to utilise cloud computing to accelerate their businesses. Combined with the establishment of advanced data centres in Malaysia by public cloud service providers in 2022, cloud will establish an open and cyber-secure data ecosystem to revitalise the Malaysian E&P landscape.

Doing More with Less

Upstream CAPEX was lower in 2020 against 2019, mainly due to volatile demand and fluctuating oil prices that affected our cashflow. In 2020, we embarked on an extensive cost optimisation exercise on both CAPEX and OPEX to maintain PETRONAS’ resilience and competitiveness. We streamlined projects and activities, focused on prudent and efficient operations, and implemented technology and digital solutions to bring down costs. On the domestic front, we continued to commit to maintain spend to sustain the local oil and gas industry and to spur economic growth in Malaysia amidst the prolonged crisis.



Note: Graphs are not to scale.



The year 2020 was undoubtedly a year that prompted a great reset across all industries, no less in the oil and gas industry. For the medium to long term, the upstream industry is expected to face an increasingly challenging outlook given the low oil price environment, lacklustre spending, higher costs, finite resources and production gaps as the shift to a low-carbon economy picks up pace. These factors are expected to be compounded by the ongoing COVID-19 pandemic.

Upstream’s game plan to address future challenges at pace is to be a safe, resilient, low cost and low carbon E&P business.

Our overall focus will be on being leaner, more efficient and more competitive than before as guided by the Group’s Three-Pronged Growth Strategy which is changing the way we do business and the way we work.



Governance and Disclosure  
(Reserves and Resources)

PETRONAS' Discovered Reserves and Resources framework, governance and procedures, known as the PETRONAS Reserves and Resources Management System (PRRMS), is closely aligned with globally recognised industry standards that are guided by the Society of Petroleum Engineers' Petroleum Resources Management System (SPE PRMS). The PRRMS governance framework stipulates that PETRONAS' Management can call for a fully independent third-party audit at least once every four years or more often, in the event of any special requirements. Annually, PETRONAS' Reserves and Resources department is also required to perform independent audits on PETRONAS' hydrocarbon portfolio to assess the integrity and robustness of PETRONAS' Reserves and Resources as reported in its Annual Review of Petroleum Resources (ARPR) to be approved by the PETRONAS Executive Leadership Team (ELT).

In 2018 and 2019, PETRONAS appointed Sproule International Ltd (Sproule), a global energy consulting firm, as its independent oil and gas Reserves auditor, based on a competitive bidding process. The last independent third-party audit was conducted in April 2019, and the scope of audit covered by this fully independent third-party audit included PETRONAS' Reserves and Contingent Resources base and the ranges associated with the subsurface uncertainties as per the ARPR of 1 January 2019, as well as the Net Present Value of PETRONAS' total Entitlement of Reserves and Contingent Resources as of the same date. The following is Sproule's audit opinion in respect of PETRONAS' Reserves and Contingent Resources as per the ARPR of 1 January 2019:

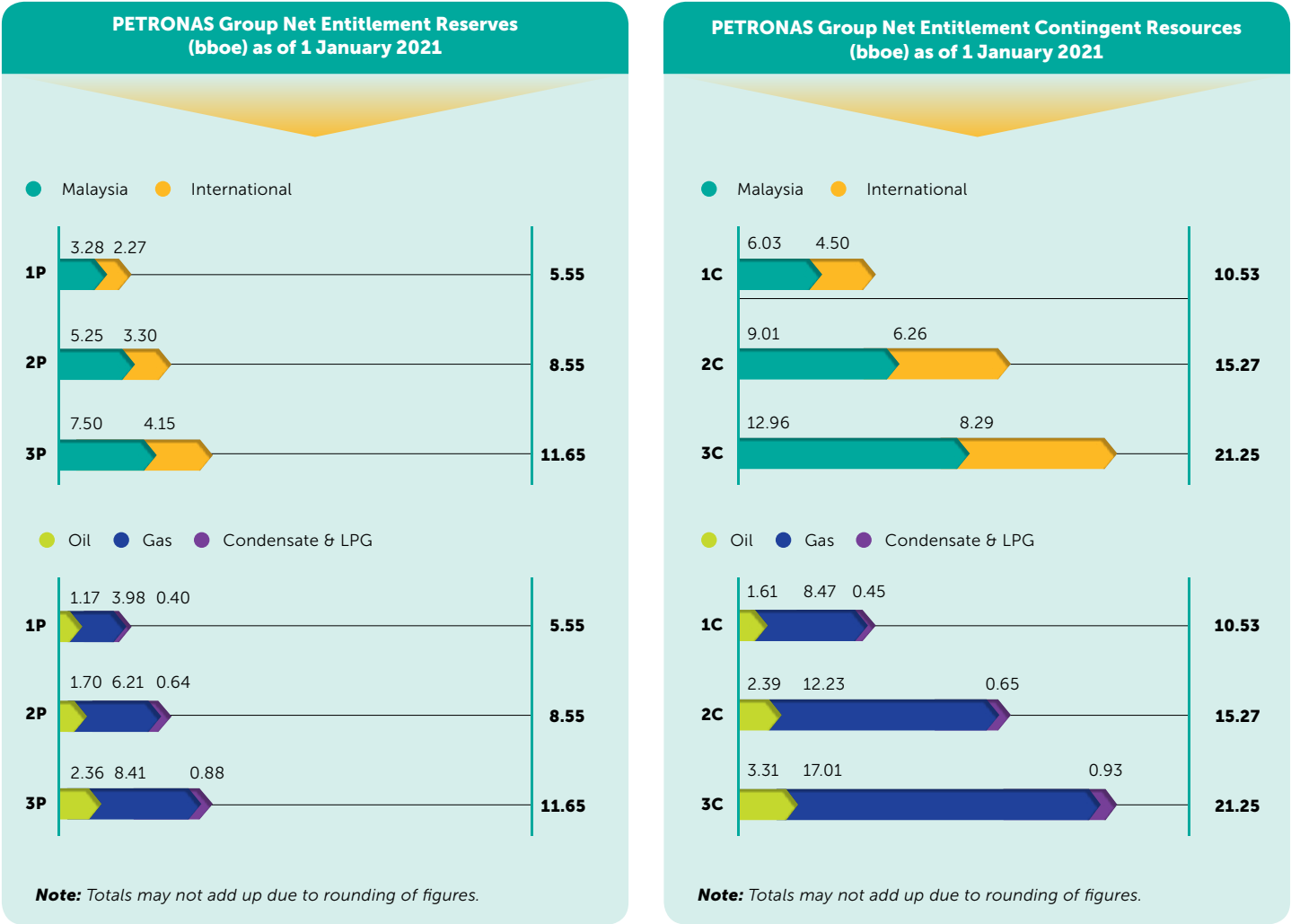
Based on the results of our audit, it is our opinion that PETRONAS' internally generated 1P, 2P and 3P\* crude oil, natural gas and natural gas products Reserves and the related Net Present Value at 8% discount factor (NPV8) (based on Key Planning and Budget Input basis), as well as the 1C, 2C and 3C\*\* crude oil, natural gas and natural gas products Contingent Resources and the related NPV8 value (KPBI basis) are, in aggregate, reasonable, and have been prepared in accordance with generally accepted oil and gas engineering and evaluation practices as set out in the PRRMS.

\* The term 1P is used to denote Proved Reserves; 2P is the sum of Proved and Probable Reserves; and 3P is the sum of Proved, Probable and Possible Reserves.  
\*\* The term 1C denotes low estimate of Contingent Resources; 2C is the best estimate of Contingent Resources; and 3C denotes a high estimate of Contingent Resources.



PETRONAS' estimated volumes came within +/- 0 per cent of Sproule's estimates for 2P and +/- 3 per cent for 2C for the data as at 1 January 2019. These results demonstrate the integrity and robustness of PETRONAS' internally generated Reserves and Contingent Resources estimates.

Although no fully independent third-party Reserves audit was conducted in 2020, PETRONAS believes the same independence, rigour and standards as applied by third-party auditors were upheld by PETRONAS' Reserves and Resources Department in assuring the integrity and robustness of PETRONAS' Reserves and Resources estimates as at 1 January 2020 and 1 January 2021. For example, for the finalisation of the ARPR as at 1 January 2021, a total of 81 fields were audited between March and August 2020 by PETRONAS' Reserves and Resources department, covering approximately 70 per cent of the top NPV fields, and approximately 65 per cent of the 2P and 2C fields. These fields span PETRONAS' operations in 11 countries (including Malaysia) and 44 contracts.



Note: Graphs are not to scale.





# Gas + New Energy



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Despite a challenging year in 2020, G+NE successfully weathered the storm by implementing agile measures to preserve value, optimise production and ensure our contractual obligations with our customers were met. We leveraged PETRONAS' integrated gas value chain to respond to price volatility and market challenges while continuing to expand our market presence. These efforts saw us make good progress by way of securing new natural gas sales and concluding liquefied natural gas (LNG) deals that encompassed contract extensions, new customer segments and expansion into new markets.

Today, as a reliable provider of cleaner energy solutions, G+NE with its expanded portfolio is well positioned to respond to the shifting needs of governments and customers as they move toward their goal of net zero carbon emissions. By tapping our strength as an adaptive organisation, we will endeavour to ensure long-term value creation for PETRONAS via innovative, sustainable and customer-centric solutions in LNG, gas, renewable energy and hydrogen.

”

**Adnan Zainol Abidin**

Executive Vice President and Chief Executive Officer,  
Gas + New Energy

In 2020, the LNG market was faced with oversupply and unprecedented low prices due to demand destruction. Against this backdrop, the Gas + New Energy (G+NE) business leveraged PETRONAS' robust integrated gas value chain and adaptive advantage, to switch from a traditional produce-and-sell approach to a demand-led approach to deliver innovative LNG and natural gas solutions. At the same time, we collaborated with our term buyers and provided flexible contractual terms, as well as introduced more accessible, affordable and sustainable cleaner energy solutions to our customers.

G+NE maintained its LNG sales volume at 33.1 million tonnes per annum (mtpa) and achieved an overall Operational Equipment Effectiveness (OEE) rate of 96.8 per cent. We also successfully delivered 11,547 cargoes to date, while our second floating LNG facility, PFLNG DUA, achieved its Ready for Start-Up (RFSU) milestone.

In Malaysia, PETRONAS Gas Berhad (PGB) went on to achieve top quartile performance in both energy index and maintenance costs, as well as sustained world class asset reliability propelled by its four-year strategic roadmap, 301Q99 Pushing Forward, which was launched in 2019 with clear goals to be achieved every year up to year 2022. In 2020, the identified efforts generated a RM97.7 million improvement in PGB's Profit Before Tax (PBT). On the back of these robust financial results, PGB declared total dividends amounting to 127 sen per share for the year (the highest dividend payout in the company's history) which translated into a dividend payout ratio of 125 per cent to its shareholders in 2020.

On the New Energy front and through M+ by PETRONAS, we rolled out rooftop solar solutions for commercial and industrial customers such as Lotuss Stores (previously known as TESCO) and for our own sites. Today, we have over 90-megawatt (MW) solar capacity under development and operation in Malaysia. Internationally, our subsidiary Amplus Energy Solutions (Amplus), has secured projects with over 900 MW of solar capacity under operation and development in India and Dubai.

In November 2020, G+NE established the Hydrogen business and signed a Memorandum of Understanding (MoU) with Sarawak Energy Berhad (SEB) to explore the commercial production of green hydrogen. Our venture into hydrogen builds upon our experience in extracting blue hydrogen from our facilities as well as our experience as a reliable LNG supplier.

The year also saw the energy transition to cleaner and more sustainable energy sources gather greater momentum as governments reaffirmed their commitment to achieving net zero carbon emissions by 2050 (NZCE 2050). In response to this, G+NE continues to strengthen its position as a one-stop-centre for cleaner energy solutions to meet future demand and requirements.





## How We Created Value

### 1 Delivering Operational Excellence

The G+NE business segment, comprising the Liquefied Natural Gas (LNG), Gas & Power (G&P), New Energy and Hydrogen businesses, aims to deliver long-term value creation and profitable growth to PETRONAS and its partners.

#### Providing a Reliable and Competitive Natural Gas Supply

PETRONAS continues to make the case for natural gas as a crucial component of the global energy mix and LNG as a cleaner choice of fuel for our global customers. Natural gas provides clean, secure, reliable and flexible energy to drive the energy transition towards a sustainable future. It is also the ideal complementary fuel for renewable energy sources such as solar.

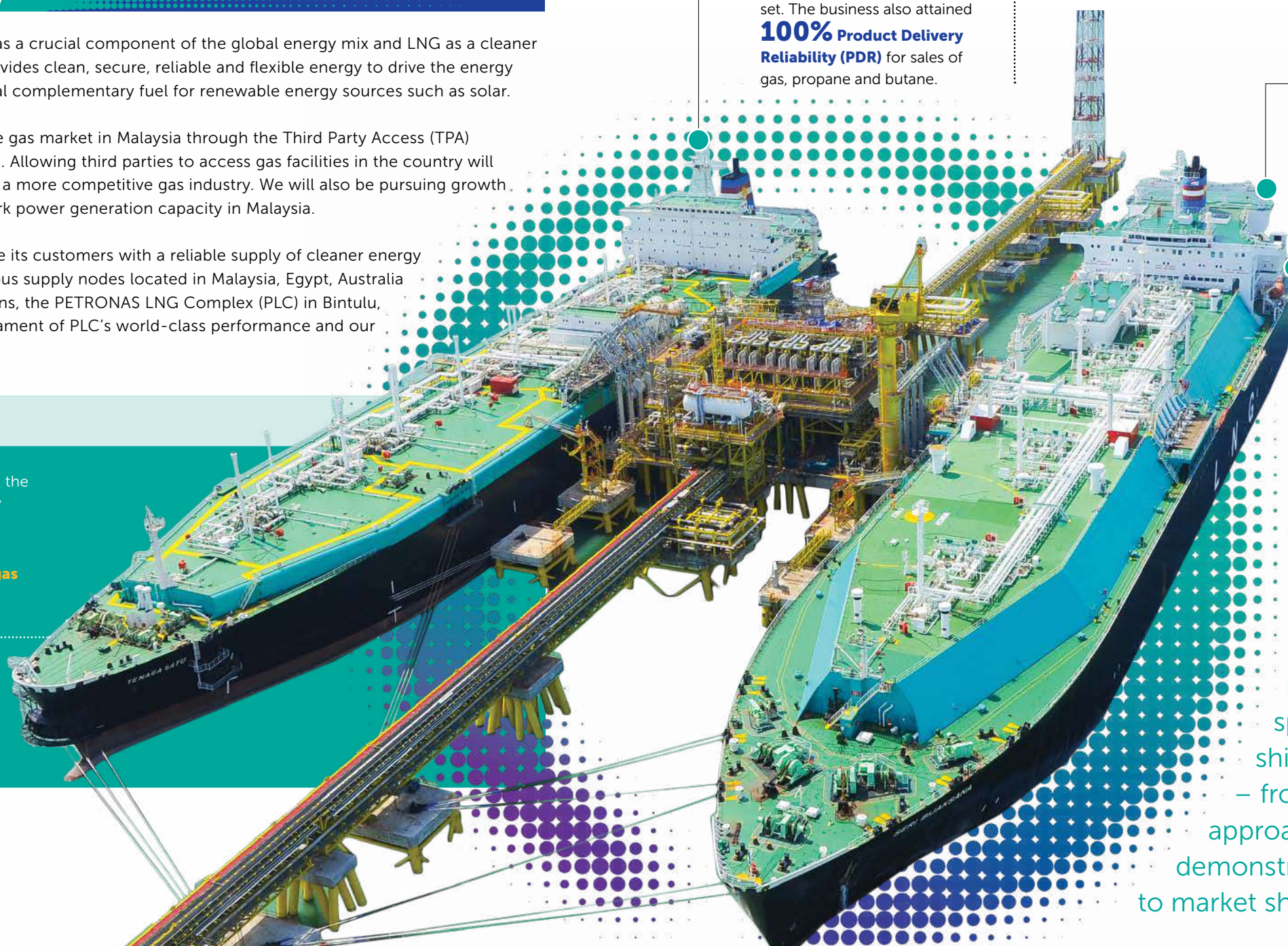
In Malaysia, PETRONAS supports the liberalisation of the gas market in Malaysia through the Third Party Access (TPA) mechanism governed by Malaysia's Energy Commission. Allowing third parties to access gas facilities in the country will contribute positively towards market-based pricing and a more competitive gas industry. We will also be pursuing growth opportunities leveraging on our integrated industrial park power generation capacity in Malaysia.

In the global LNG space, PETRONAS continues to assure its customers with a reliable supply of cleaner energy by leveraging on our global portfolio of assets and various supply nodes located in Malaysia, Egypt, Australia and, in the future, Canada. The bedrock of our operations, the PETRONAS LNG Complex (PLC) in Bintulu, Sarawak delivered its 11,547<sup>th</sup> LNG cargo in 2020, a testament of PLC's world-class performance and our focus on delivering operational excellence.

#### In Maximising Cash Generators, we:

Worked with the **Malaysia's Energy Commission** during the Movement Control Order (MCO) phase to ensure energy security by maintaining power sector sales gas offtake at a minimum of **600 million standard cubic feet per day (MMscfd)**, while securing new and extended **sales gas volume at 1,123 MMscfd**.

Produced **26.7 million metric tonnes (MMT)** of LNG and achieved gross LNG sales of **33.1 MMT**, to meet our customers energy requirements, despite the challenges posed by the pandemic.



We also accomplished the following in 2020:

Sustained **top quartile performance of our G&P and LNG assets** demonstrating our strength in operational excellence and enabling us to extract more from less in difficult market conditions. This saw us turning in a world-class operational performance on the gas processing, gas transportation, regasification and utilities fronts:

→ The gas processing business achieved an **Operational Equipment Effectiveness or OEE rate of 99.4%, 99.6%, 99.7% and 99.7%** for sales gas, ethane, propane and butane respectively – above the targets set. The business also attained **100% Product Delivery Reliability (PDR)** for sales of gas, propane and butane.

→ Our gas transportation business and utilities plant for steam, electricity and industrial gases as well as LNG regasification terminals achieved **100% reliability** and PDR respectively.

→ Our onshore gas and offshore floating LNG plants in Malaysia achieved an **overall OEE of 96.8%**.

**Facilitated third-party shipper supply** under the TPA for a **7 MMscfd capacity** at the offshore LNG Regasification Terminal Sungai Udang (RGTSU) and the Peninsular Gas Utilisation (PGU) gas pipeline network.

Bolstered shareholders' confidence via PGB's **total dividend payout of 127 sen per share including special dividend of 55 sen per share**, was achieved through the Group's focus on safety, reliability and efficiency of operations, despite the global pandemic.

Strong commercial excellence enabled G+NE to respond well to fundamental and emergent shifts in the market while at the same time maximising value. In the LNG space for example, a significant shift in our mode of operations – from a produce-and-sell approach to demand-led planning – demonstrated our agility in responding to market shifts.



## 2 Innovative, Customer-centric Solutions for Growth

We support the PETRONAS Group in its efforts to expand its existing markets and capture new markets through innovative, end-to-end customer-centric solutions across the cleaner energy value chain.

### From Reliable Supplier to Innovative LNG Solutions Partner

With more than 37 years to our name as a reliable supplier of LNG and some 11,547 LNG cargoes delivered to date from the PETRONAS Integrated LNG Complex in Bintulu, Sarawak (one of the world's largest LNG production facilities in a single location with a total capacity of 29.3 mtpa), we continue to deploy innovative solutions to existing and new markets. The year saw G+NE **Maximising Cash Generators** by securing over 6.5 mtpa of LNG deals through innovative, end-to-end customer-centric solutions that opened up new routes-to-market to serve new customer segments.

In 2020, G+NE went on to deliver the following achievements:



#### PETRONAS Floating LNG SATU and DUA

PETRONAS continues to harness its capabilities in floating LNG (FLNG) technologies to monetise stranded gas fields and further augment Malaysia's resource investment potential. In 2020, PETRONAS became the first global energy company to own and operate two FLNG facilities, following the successful arrival of the PFLNG DUA at the Rotan gas field in Block H, offshore Sabah, where it has achieved its Ready for Start-Up (RFSU) milestone and progressing towards commercial operations. PETRONAS' first FLNG, PFLNG SATU, has delivered 38 cargoes to date since start of production in 2017. These floating facilities provide an environmentally-friendly alternative to conventional onshore plants, which would otherwise require sizeable tracts of land to build and whose longevity depends on the supply of nearby gas reserves.



#### Virtual Pipeline System (VPS)

This first-of-its-kind business solution for Peninsular Malaysia enables LNG to be supplied to small-scale customers and off-grid customers located away from the PGU gas pipeline network via trucks fitted with cryogenic tanks. In 2020, a total of 62 tanks of LNG were delivered via the VPS.



#### LNG Bunkering service via an LNG Bunkering Vessel (LBV)

PETRONAS is one of the first service providers in Southeast Asia to launch the LBV service. The maiden delivery saw LNG from our modified Floating Storage Unit 1 at RGTSU being loaded onto the MV Avenir Advantage, PETRONAS' first LNG bunkering vessel. The vessel then sailed for the ship-to-ship transfer to the SIEM Aristotle in the waters off Pasir Gudang in Johor. This solution underscores the Group's efforts to drive greater use of LNG as a cleaner and economically competitive source of energy in the marine industry as well as support the concerted efforts under the IMO 2020 Regulations to limit sulphur content in marine fuels.



#### LNG export via ISO tank

This customer-centric and pragmatic solution supports and enables greater accessibility to cleaner energy, particularly for remote customers located away from physical LNG pipelines and customers with smaller parcel requirements. Furthermore, the delivery of LNG via ISO tanks can also act as an agile backup solution to address importing terminal restrictions for large vessel deliveries. In 2020, we signed a long-term deal with Tiger Clean Energy Limited (TCEL) for the supply of LNG to TCEL's LNG ISO Tank filling facility at Bintulu for distribution to China.

### Securing New Markets with Novel Solutions

By tapping PETRONAS' strength as an adaptive organisation, we endeavour to ensure long-term value creation and profitable growth for the Group and its partners by providing innovative, end-to-end customer-centric solutions that will help the Group secure new markets covering gas, renewable energy and hydrogen in the near future. The renewable energy developments that took place in the year under review were:

We introduced **Yelo (a last mile logistic provider)** in the B2B segment as a unique offering in the electric vehicle (EV) space in India.

Today, **Amplus is offering risk-free solar solutions to its customers via a service model** where Amplus invests its own capital to set up rooftop solar photovoltaic (PV) plants on customers' premises.

Amplus has also introduced innovative products that suit urban homeowners' needs to render their terrace space useful rather than occupying it with low height solar structures. Under the **HomeScope** brand, Amplus offers **real time and remote monitoring of solar generation and home energy consumption** on a HomeScope app.

### Digitalisation at G+NE



**Note:** This photo was taken before the pandemic.

In 2020, several measures were taken to strengthen G+NE's digital focus and transformation. These included the following:

Implemented **PGB's Gas Processing Unit (GPU) Technical Centre (GTC)**, a centralised location empowered by digital that provides descriptive, predictive and prescriptive analyses to maximise plant reliability and prevent business interruptions.

Upgraded our signature **Alpha LNG** digital solution to enable demand-led production in order to improve the agility of our value chain amidst a volatile LNG market. To date, some **USD42.4 million** in value has been realised from data-driven planning and optimisation of scheduled deliveries.

Embarked on the digital transformation for our **RGTSU asset** to build a new way of working through step-changes in the terminal's digital operations. This entailed a **Unified Operation Centre, Virtual Asset Walkabout and JIT (Just in Time) Field Responder** which all led to improved operational efficiency.

Improved pipeline and Right-of-Way (ROW) encroachment monitoring through technological and digital means such as **PiriGIS, Drone, CCTV and Parameter Intrusion Detection System (PIDS)**.



### 3 Blazing a Trail on the New Energy Front

In line with PETRONAS' **Stepping-Out** strategy and NZCE 2050 aspiration, G+NE continues to make good progress in the energy transition by diversifying its suite of cleaner energy solutions. In 2020, we fast-forwarded our presence in the renewables and new energy space by making strategic moves into new areas of opportunity. The following are some of the developments that took place and are underway:

#### Bolstering Our End-to-End Solar Solutions Market Position

In Malaysia, PETRONAS is **focusing on rooftop solar solutions** for commercial and industrial customers via M+ by PETRONAS which has over 90 MW capacity under development. In 2020, a **total of 13 out of 15 Lotuss stores** (previously known as TESCO) across Malaysia were fitted with rooftop solar solutions. Upon completion, this initiative will help Lotuss reduce approximately **13,624 tCO<sub>2</sub>e**.

We are also making good progress by way of cleaner energy generation in our own backyard. PETRONAS' assets and facilities including our retail stations, operations sites, as well as the Malaysia Marine and Heavy Engineering Holdings Bhd and Universiti Teknologi PETRONAS sites, are all being fitted with rooftop solar solutions. A **49 MW rooftop and ground mounted solar panel installation** is being planned for PETRONAS Refinery and Petrochemical Corporation (PRPC) and Projek Air Mentah RAPID (PAMER) as part of the PRPC Solar Master Plan located at Pengerang, Johor.

With **close to 1GW of solar capacity** projects under operation and development in India and Dubai, PETRONAS New Energy's wholly-owned distributed energy company, Amplus, continues to reinforce its position as a key regional clean energy provider. **Amplus** is now capable of providing cleaner energy to India's utility sector on top of its commercial, industrial and residential customers. It is also the first solar company in India to trade power online through the **Green Term Ahead Market (GTAM)** for electricity, a move that will spur participation in India's renewable energy sector.

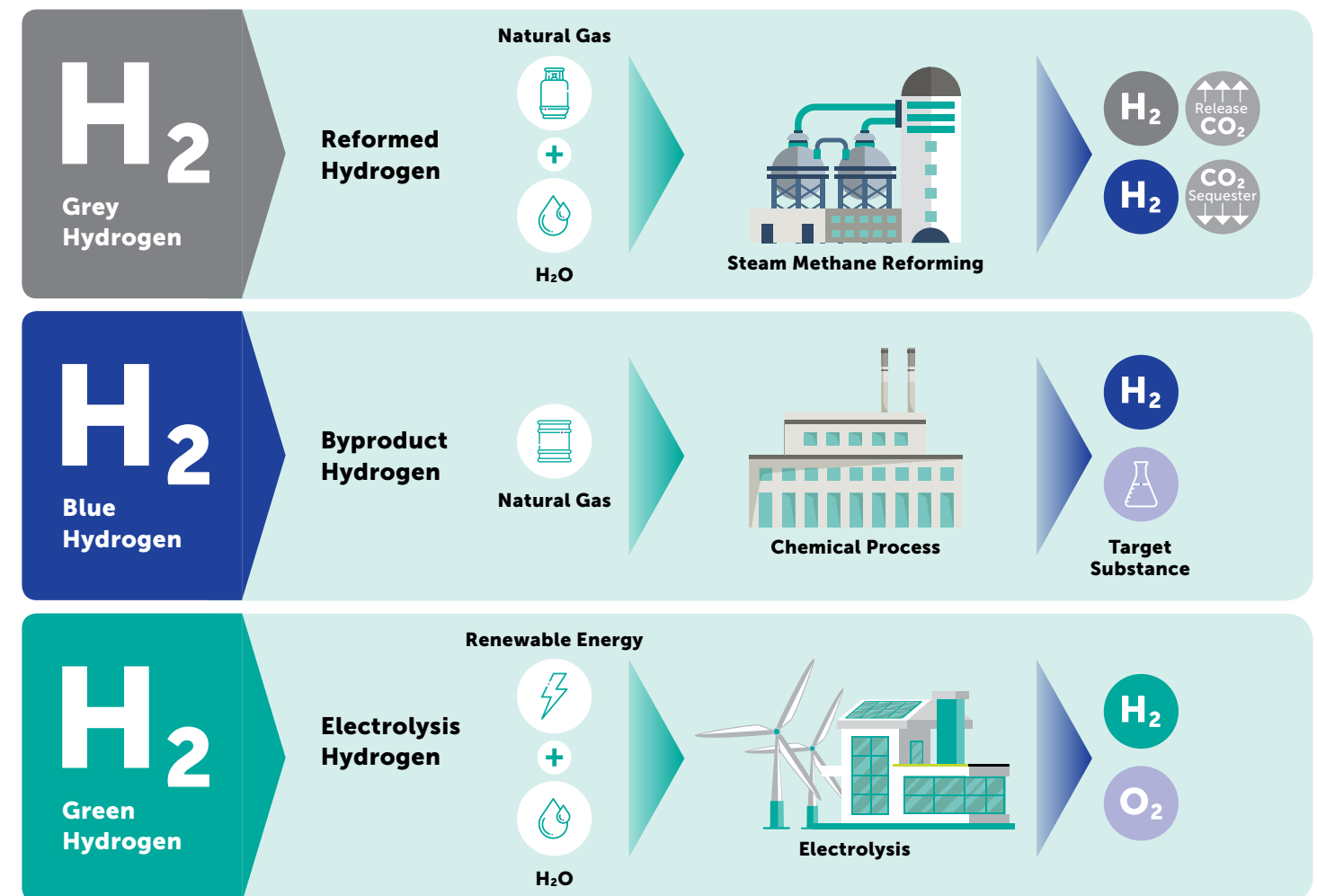
We also encouraged PETRONAS' employees to transition to solar energy to power their homes with competitive solar solutions offered through the employee-exclusive **HomeScape by PETRONAS programme**. This resulted in the registration of a **total capacity of 3.2MW** for installation at the employees' homes in Peninsular Malaysia.



#### Hydrogen Solutions



G+NE rolled out its Hydrogen business through the signing of an MoU with Sarawak Energy Berhad (SEB) in November 2020, to explore the development of competitive green hydrogen production and a value chain to serve emerging markets in Asia. These efforts will supplement the low-carbon hydrogen that PETRONAS is already producing as a co-product at its facilities. PETRONAS has to date been involved in producing grey and blue hydrogen; and will now work with stakeholders to explore the production of green hydrogen.



Hydrogen is a clean and a versatile source of energy that can be used as an energy carrier as fuel for mobility, power and heating, as well as feedstock for industry. Grey hydrogen is produced using fossil fuels like natural gas and coal, which emit CO<sub>2</sub> into the air in the process. Blue Hydrogen is made in a similar manner using carbon capture technologies to prevent CO<sub>2</sub> from being released, enabling the captured carbon to be safely stored deep underground or utilised in industrial processes. Green hydrogen, the cleanest of these three varieties, produces zero carbon emissions. It is produced using electrolysis powered by renewable energy, like offshore wind, to produce a clean and sustainable fuel.





Moving into 2021, G+NE will execute PETRONAS' Three-Pronged Growth Strategy to push our four businesses forward. In line with the Group's Stepping-Out strategy and NZCE 2050 aspiration, G+NE continues to reinforce its position on the energy transition front by making strategic moves into new areas of opportunity in the cleaner energy space.

Having reviewed our business portfolio, G+NE as PETRONAS' one-stop-centre for cleaner energy solutions, is determined that moving forward, it will anchor itself on this winning formula, namely Operational Excellence, Commercial Excellence and Customer-centricity and Sustainability.

G+NE's focus on Operational Excellence will see us leveraging the years of experience we have accumulated, to enable us to ride out the current challenges brought on by the pandemic. Our current assets will continue to prioritise reliability and efficiency, while we will benchmark ourselves against industry leaders to match or surpass their performances. It is through these lenses that we will fulfil our role of maximising value through LNG and domestic gas sales. However, in our pursuit of operational excellence, there will be no compromise on safety, and it will continue to be one of our topmost priorities.

Commercial Excellence and Customer-centricity focuses G+NE's efforts on value-centric opportunities. It covers our existing business segment as well as our new growth engines.



The pace of global economic recovery post pandemic and governments' decarbonisation efforts will greatly influence the short-term and long-term energy supply demand outlooks. Gas + New Energy is well positioned to capitalise on the evolving market dynamics.

In our LNG business, as market leadership comes under pressure, we will be defending our core markets and getting expanding to new ones. To do so, our LNG marketing efforts and touch points with customers will be increased to truly provide innovative customer-centric solutions such as our VPS, LBVs and ISO tank solutions. This will enable us to capture opportunities in this period of low demand and amidst the global supply glut.

The Gas & Power (G&P) is also expected to continue facing a growingly competitive domestic market. While routes to increase sales are being explored including scaling up sales via VPS and LNG bunkering, we are also looking into

more fundamental shifts for the G&P business to realise its growth plans. In Malaysia, PETRONAS remains committed to support the gas market liberalisation and is working closely with the government to shape the future of gas demand through energy policy developments such as the National Energy Policy and Natural Gas Roadmap.

New Energy and Hydrogen, will serve as the new growth engines for G+NE. New Energy continues to gain momentum in both the domestic and international markets and is currently on track with its growth trajectory that is set to hit 3 gigawatts (GW) in 2024. This will be achieved through partnerships and acquisitions on top of building New Energy's capacities organically. With the increased push towards a green and sustainable energy, growth in this sector is expected to be substantial although competition is expected to intensify. Our focus markets in India, Malaysia and Asia Pacific offer sizeable opportunities and we hope to capture significant capacity from these markets. New Energy is expected to grow considerably in our portfolio to capture new value pools as well as contribute to our reduced emissions target.

For the Hydrogen business, we continue to set in place the building blocks to drive the business with the immediate target of exporting hydrogen from our existing facilities. Through partnerships, we are also making our move to become a competitive green hydrogen producer. The MoU with SEB to explore the commercial production of green hydrogen bodes well in supplementing the ongoing low carbon hydrogen production efforts. Additionally, pursuing low carbon solutions through renewables and hydrogen, lend support to our Sustainability Agenda as well as contribute to PETRONAS' NZCE 2050 aspiration.





# Downstream



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In 2020, the Downstream business witnessed the creation of real value in a time of crisis. Despite margin erosions, the business sustained its operational performance for the financial year, supported by our integrated value chain and reliable assets. The year's unprecedented events served as a catalyst, accelerating some of our strategic plans that had been embedded in our core business. By deploying innovative solutions, we overcame customers' pain points and delivered seamless, frictionless customer experiences.

Moving forward, we will work hard to ensure the sustainability of our Operational Excellence efforts. We are also gazing out into the customer needs horizon and identifying potential areas of high-value growth. By shifting our business focus from an output-led to demand-led one, we aim to create an agile enterprise with innovation at scale. This will see us pushing boundaries and stimulating portfolio growth beyond traditional oil and gas into the broader energy solutions arena.

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**Datuk Md Arif Mahmood**

Executive Vice President and Chief Executive Officer,  
Downstream

The year 2020 was like no other. As movement restrictions came into play, abruptly halting economic activities and altering lifestyles, demand for petroleum products eroded. Amidst this demand disruption, the Downstream business resiliently sustained its overall operational performance, preserving production volume and standards. The overall integrated value chain was well supported by reliable assets resulting in stable operations across the business. Throughout this period, Downstream remained focused and continued to operate at an optimum level. At the peak of the pandemic and the implementation of global lockdowns, we closely monitored our operational requirements and were prepared to continue operating, despite minimal manning.

In Malaysia, when the government imposed the Movement Control Order (MCO) in March 2020, petroleum products including gasoline and jet fuels registered a significant decline. PETRONAS Dagangan Berhad (PDB), took the hardest hit with its overall sales volume dipping by 23 per cent. Upon the easing of the MCO and restrictions being lifted, domestic activities slowly resumed and started to build up again in the second half of the year until the Conditional MCO was imposed again in the final quarter of 2020.

At a global level, the slowdown in the economy and travel restrictions caused global oil demand to erode by 22 million bpd. Market recovery continues to be challenging and the overall outlook remains uncertain. The market will take time to fully bounce back depending on the effectiveness of vaccine deployment. Meanwhile, Downstream continues to strengthen its foundations and deliver excellence through ongoing efforts. This will allow us to capitalise on the situation once the market recovers.





## How We Created Value

### 1 Widening Access to Markets

In 2020, Downstream continued to focus its efforts on sustaining sales volume while delivering high-value products that helped to address customers' pain points. As a reliable and credible partner in providing innovative products and solutions, we got down to resetting our commercial strategies to generate sustainable long-term margins and create greater value for the PETRONAS Group.



Our chemicals arm, PETRONAS Chemicals Group Berhad (PCG), formed a joint venture with **PT AKR Corporindo Tbk (PT AKR)**, a logistics and supply chain company, to distribute various chemicals to customers in Indonesia, the first of which was methanol. This joint venture which aligns with the Group's **Expanding Core Business** strategic prong, provides us with greater market access in Indonesia via PK AKR's extensive distribution network across Java, Sumatra, Borneo and Sulawesi.

PDB introduced its best fuel yet in December 2020 – the new **PETRONAS Primax 97 with Pro-Race**, engineered to meet the demands of advanced technology engines as well as customers' desire for a more powerful, responsive and efficient performance. The fuel formulation was engineered using **PETRONAS Fluid Technology Solutions™**, an advanced formula developed from the Group's collective experience in motorsports, as well as the insights and expertise garnered from its pool of global scientists, engineers and the **Mercedes-AMG PETRONAS Formula One team** at its facilities in the United Kingdom.

PETRONAS Lubricants International (PLI) marked its e-commerce debut through showcasing its **PETRONAS Sprinta** lubricant range on Shopee, one of Southeast Asia and Taiwan's leading digital marketplaces. This is part of PLI's larger effort to capture a sizeable customer network nationwide on the back of increasing online demand and to provide a richer experience in a more convenient manner.

### 2 Exceptional Operational Excellence

As the Downstream business is primarily a margin-led business, one of the first steps to cushion any impact from headwinds that dampen demand is to build resilience in Operational Excellence (OE). This calls for assets to sustain their performance at optimal levels even with minimum manning and adjusted production levels, while always delivering high quality products.

We were able to sustain an Overall Equipment Effectiveness (OEE) rate of **90 per cent in 2020** across all business segments with domestic refineries recording an improvement of **97 per cent**. This was the highest OEE rate recorded by our domestic refineries since 2014. Meanwhile the refinery in Durban, South Africa registered an **OEE rate of 81.6 per cent**. During this period, domestic crude was used for our refinery, to balance the upstream production.

PCG recorded its **highest annual production volume of 10.7 million metric tonnes**, contributed by strong plant performance and reliability. The **overall Plant Utilisation rate was 94.3 per cent**, with **sales volume of 8.2 million metric tonnes**.



This commendable operational performance was mainly attributable to the extraordinary commitment shown by our people. Their keen sense of ownership and responsibility to care for one another continued to keep them safe and our assets running at optimal levels.

For more details of PETRONAS' HSSE-related practices and performance, go to the Positive Social Impact section on pages 136 to 144 of this report.



### 3 Focused On Growth

The COVID-19 pandemic has undoubtedly been a game-changer to those who have been swift to embrace and adapt to the disruption it has brought. Within PETRONAS, it has accelerated our strategic plans to secure new revenue streams and is positioning our businesses for their next chapter of growth.

We keep the sustainability of OE in check while enabling us to gaze out into the future horizon of customer needs and identify areas of potential high value growth. It is helping guide the shift of our focus and business from being output-led to becoming demand-led. At the same time, it is enabling us to prepare ourselves with the right talent, culture and tools to secure new opportunities and mitigate the challenges ahead.

The intensive digitalisation efforts being undertaken within Downstream are enabling this shift. This, for instance, encompasses areas such as predictive analysis of output which anticipates customer needs even before they arise. Measures are underway to diversify the Downstream portfolio even further to create fresh solutions for customers which are not solely dependent on hydrocarbon resources. While we have made good progress to date, we need to amplify and scale with pace, so we can truly grow.

Our latest development, the Pengerang Integrated Complex (PIC) in Johor, has been designed with a Growth Blueprint since its very beginning. It incorporates a detailed roadmap that outlines its three phases of growth over the next 10 years. The agile design of the facility enables the business to extract the highest value from its molecules for maximum value creation, with the ultimate aim of positioning PETRONAS as a specialty chemicals producer and PIC as the leading petrochemicals park in the region. Driven by sustainable development, PIC will strive to achieve net zero carbon emissions by 2050 (NZCE 2050). PIC is expected to commence operations in the second half of 2021.

#### Building a Base for Specialty Chemicals Production

In diversifying into derivatives and specialty chemicals, we are identifying growth opportunities through an understanding of the global megatrends that will shape our future lifestyle. The future lifestyle will determine the right chemicals market for us to pursue.

We have identified eight priority end markets for our sustainable growth. These eight prioritised end markets will be pursued via the following three growth levers:

- 1 Extend Value Chain through downstream investments in derivatives and specialty chemicals at existing assets.**
- 2 Build Specialty Platform to access technology and market, through mergers and acquisitions.**
- 3 Create Optionality for Growth by seeding innovative technologies through Research & Development and investments in corporate venture capital.**

#### The Nitrile Butadiene Latex (NBL) plant

at the PIC in Johor with a production capacity of 200,000 tonnes targets the growing nitrile glove market. It will further strengthen Malaysia's position as the largest exporter of gloves globally.

**The Oxyalkylates facility** within the Kertih Integrated Petrochemical Complex (KIPC) in Terengganu is set to produce ethoxylates and polyether polyols. This plant is being developed through the acquisition of a 50 per cent equity stake in PCC Oxyalkylates Malaysia Sdn Bhd (PCC-OM) from PCC SE (an international chemicals, logistics and energy corporation) marking our entry into the growing oxyalkylates market.

PCG has two new facilities in the pipeline helmed by **Da Vinci Group (DVG)**, a wholly-owned subsidiary of PCG. DVG has obtained approvals for two expansion projects, namely for a silicone blending plant in Gebeng, Pahang and a new facility for lubricant additives and chemicals in Echt, the Netherlands. These facilities will use PCG's own technology and know-how acquired from DVG. When completed, the above projects will enable PCG to widen its access to high-growth markets, especially in Southeast Asia, to cater to the personal care, food and beverage, and automotive segments.

#### Beyond Fuel Offerings in Retail Shops



Note: This photo was taken before the pandemic.

Going beyond fuel, PDB has reinvented its retail offerings by expanding its food and beverage (F&B) products through the Makan@Mesra initiative which addresses the increasing demand for fresh and well-balanced premium food-to-go solutions at affordable prices. The new concept is part of PDB's continuous efforts to grow its non-fuel business and elevate customers' experience at its remodelled Kedai Mesra outlets. By the end of 2021, PDB will have expanded its F&B product line in over 200 stations from 22 stations currently.

#### In Support of Entrepreneurs



The Downstream business is the PETRONAS business that is closest to customers' hearts, hence it focuses on creating a positive social impact and enriching communities, especially local entrepreneurs. In support of the Malaysian government's "Beli Barangan Malaysia" campaign, PDB launched its "Love Local" campaign to intensify support for local entrepreneurs by allowing them to leverage PETRONAS' network of stations to market their goods.

To date, more than 350 local vendors are supplying products to PDB's Kedai Mesra network nationwide.

The Downstream business, in collaboration with Tata Consultancy Services, also aims to shape a sustainable future for communities by leveraging on digitalisation and technology to address the issue of youth unemployment. Through the 12-month SEEd.Lab. social enterprise programme, we aim to contribute towards the development of youth aspiring to be social entrepreneurs by helping them build their own sustainable businesses. This will not only help improve their well-being but will also create multiplier effects for the communities around them. Recently, SEEd.Lab successfully delivered its first cohort and will enter its second cohort this year.

For more details of how PETRONAS is helping to strengthen the communities, go to the SENTUHAN HARAPAN – Community Well-Being and Development section on pages 185 to 188 of this report.



Advocating the Use of Electric Vehicle (EV) Technology



Even as the PETRONAS Iona e-fluid range paves our entry into the burgeoning electric vehicle (EV) market for passenger cars, PETRONAS Lubricants International (PLI) is championing a collective effort to advance fluid technology. The efforts to date include the hosting of symposiums and webinars for industry-leading experts, Original Equipment Manufacturer (OEM) partners, academia and suppliers from across the world to build collaborative opportunities and be future-ready for e-mobility.



Resolutely Reinforcing  
Our Reputation

The one thing that remained resolute amidst 2020's volatility, was customer affinity towards the PETRONAS Brand. **PDB was voted as Malaysian's favourite automotive fuel and lubricants brand at the prestigious Putra Brand Awards for the 11<sup>th</sup> consecutive year. In addition, Engen Petroleum was voted as South Africa's Coolest Petrol Station brand for the 11<sup>th</sup> consecutive year, as well as the favourite petrol station brand for the 10<sup>th</sup> consecutive year.**

Digitalisation at Downstream

Our business strategy mandates that we disrupt traditional business models and embrace digital. To this end, new methodologies and technologies are enabling us to focus on untapped opportunities and sharpen our competitive edge to create new value for the Group.

Seamless and Frictionless Customer Experiences



Deliver2Me

is a new feature that was launched under the umbrella of Setel, Malaysia's first e-payment solution for fuel purchases directly from mobile devices. It allows our retail customers to purchase items from Kedai Mesra retail shops and have them delivered directly to their vehicles while refuelling.



Virtual Pipeline System

solution via the Regasification Terminal in Pengerang, Johor is an extended offering under our integrated value chain that provides customer wider access to LNG solutions. The innovative VPS solution, which involves the use of road trucks fitted with cryogenic tanks delivering LNG to off-grid customers in Peninsular Malaysia, underscores our environmental sustainability efforts and helps facilitate the growth of natural gas usage in Peninsular Malaysia.



ROVR

another Malaysian first, is a mobile refuelling station for both commercial and everyday drivers. It aims to ensure uninterrupted fuel services to customers and has, to date, delivered over 10 million litres of fuel. ROVR was mobilised during the Restricted MCO in Kedah and flash floods in Pahang, to fuel vehicles for rescue missions when there was no way to get to petrol stations.



PRYSM

is PETRONAS' authorised merchandiser which offers a range of motorsport and lifestyle brands that are sold online and at selected Kedai Mesra. PRYSM has chalked up an estimated RM8 million in online sales since its launch in 2020.

Our retail business continues to leverage the power of technology to strengthen its growth momentum. The year in review saw the introduction of a new generation cloud-based Point-of-Sales system and the installation of our new Outdoor Payment Terminal with enhanced digital and secure touch points at stations nationwide.



Data-Driven Productivity



→ In 2020, we registered value creation of **RM26.68 million through Project DOVE (Drive Optimisation Value for Enterprise)**. With data-driven inventory management and oversight, we are able to protect margins through market-based product pricing and vessel optimisation, while empowering staff across the value chain to make better and faster decisions.

→ A total of **10 Downstream plants** will be plugged into the PIVOT Descriptive Dashboard with a target to improve operational efficiency and provide effective oversight of the performance of our refineries and petrochemical plants. The study began back in 2020 and is expected to be rolled out in 2021.

In 2020, we successfully recorded **RM64.2 million cost avoidance from the deployment of the PIVOT Advance Analytics (AA) - MMPD (Machinery Monitoring and Predictive Diagnostic) solution**. The AA targeted at turbomachinery equipment by predicting and preventing unplanned plant trip, has allowed Downstream plants to maximise their production while empowering staff and enhancing collaboration within organisations for better and faster action.



Moving Forward Together

The Great Reset has resulted in a disruptive transition and Downstream needs to change fundamentally as a business so that we can move forward together with the rest of the Group as a more agile organisation in the market. As we venture forth, the Downstream business remains committed to enriching lives through innovative solutions. To maintain our competitive advantage, we will continue to leverage new tools, advanced infrastructure and high-value products, as well as robust strategies and business models to deliver sustainable and long-term value creation opportunities. In addition to that, we will also continue to leverage our integrated value chain and advanced infrastructure to support our operations while delivering high value products and solutions for a seamless and frictionless customer experience.

We continue to be guided by the PETRONAS' Statement of Purpose: A progressive energy and solutions partner enriching lives for a sustainable future. Our aim is to make Downstream an agile enterprise with innovation at scale. In the long run, we want to push boundaries that have not been explored and will continue to inculcate an innovation culture.

Our next step is to move towards a portfolio beyond traditional oil and gas and into the broader energy solutions market.

The market will continue to be challenging as the energy sector undergoes a historical transition in an unprecedented manner and scale. Demand for cleaner energy continues to grow and a new algorithm has been embedded within the market. The entire energy transition requires full collaboration and full buy-in from a broad cross section of industries. We are experiencing a revolution in the way energy is being produced and consumed on a global scale, from carbon intensive to low carbon sources. Eventually it will also impinge on scalable solutions for critical sectors such as the heavy trucking, iron and steel, cement, shipping, and aviation sectors, to name a few. All eventualities must be considered today if we are to protect our tomorrow.

As we venture forth into the new year, we anticipate a gradual recovery for the domestic market. It may take a longer time before we see anything close to our previous numbers again. This will to a large extent depend on the trajectory of the overall crisis, the efficacy of the vaccines that are now being distributed across the world, as well as fluctuating product prices.

Moving forward, we will continue to focus on delivering a seamless and frictionless experience to our customers in innovative ways as well as continually seek out opportunities to grow and sustain our business operationally and financially in the new normal.





# Project Delivery and Technology



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Serving as PETRONAS' Centre of Excellence, Project Delivery and Technology (PD&T) is mandated with servicing, safeguarding and shaping PETRONAS' business portfolio across the value chain with its distinctive research and technical expertise, innovative solutions, as well as robust systems and processes.

Amidst 2020's disruption that delayed projects and prevented targets from being met, PD&T took extraordinary measures to safeguard the PETRONAS value chain. From containing project costs and safeguarding investments, to optimising emerging technologies and tapping innovation to accelerate projects, we were able to successfully swing things around for the Group's businesses. Moving forward, we will look to PD&T's mantra of "Technology as a differentiator; Digital as an accelerator; and Data as an asset" to guide us in our efforts to bring a semblance of normality back to an otherwise highly disrupted playing field.

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**Samsudin Miskon**  
Senior Vice President,  
Project Delivery and Technology



The year's twin shocks saw PD&T facing an uphill task as all areas of project delivery, technology and technical solutions were affected. This in turn hindered projects and prevented sanctioned targets from being met. The period March-October 2020 was the most harrowing, with some projects registering 30 to 90 days of zero productivity. Moreover, there were supply chain interruptions for equipment and materials from pandemic-impacted nations; delays in procurement activities; restrictions in critical staff movements; and a lack of access to manufacturing facilities. These resulted in project cost overruns with contractors requiring Extensions of Time and activating the force majeure clauses in contracts.

Amidst this backdrop, PD&T took extraordinary measures to contain project costs, safeguard investments and optimise emerging technologies to safeguard the value chain. To protect value, PD&T and the businesses took swift and decisive steps to rationalise capital expenditure (CAPEX) to free up cash flow. We also secured alternative supply sources from non-affected countries and Original Equipment Manufacturers (OEMs), while technology was leveraged as a differentiator to ensure projects that are critical to PETRONAS' future growth such as our Facilities of the Future (FOF) programme, our Remote Autonomous Operations (RAO), and the commercialisation of Hydrogen, maintained their momentum.

We strengthened the resiliency of operations by tapping digital tools including predictive and prescriptive analytics as accelerators. This helped maximise operational uptime and cost compression across the Group's operations. Utilising data as an asset, we leveraged tech-digital solutions to proactively monitor the well-being of our people across diverse locations and environments. PD&T's efforts generated RM2.9 billion in cost savings across the PETRONAS Group. This included the on-track deployment of the Kasawari Integrated Offshore High Contaminant Project, which recorded 1 million safe man-hours on the back of stringent SOPs and zero COVID-19 cases.



## How We Created Value

### 1 Delivering World Class Projects

Since PD&T's inception in 2016, we have tripled the value for the PETRONAS Group by delivering Top Quartile projects at a fraction of cost and time. Our achievements to date include the construction of the novel PETRONAS Floating Liquefied Natural Gas (LNG) vessels, the PFLNG SATU; the world's first and PFLNG DUA.

Amid the year's supply disruptions, we successfully rolled out several key projects to keep the Group on track to deliver on its net zero carbon emissions by 2050 (NZCE 2050) aspiration. These projects also helped to deliver more value to the Group on the cost reduction and operational efficiency fronts.

#### Methane Watch

Successfully quantified the total methane emissions from Malaysia LNG Sdn Bhd and PETRONAS Gas Bhd (PGB)'s operations as part of effective methane management practices. This is a significant step towards achieving our NZCE 2050 aspiration.

#### Plant Reliability Extension

Extended the run length of the Propane Dehydrogenation (PDH) plant at PETRONAS Chemicals MTBE Sdn Bhd in Gebeng, Kuantan in Pahang. Tapping the Hybrid Dynamic Process Advisor or HDA methodology (a hybrid digital solution combining data analytics with engineering-first principles), the plant achieved an extended run length of 830 days and 100 per cent reliability. This has ensured the supply of 301 kmta to customers, thus surpassing 2019's production capacity.

#### Drone Delivery

Instead of depending on the availability of supply vessels, drones are now used for inter-platform delivery at the Bekok Field, offshore Terengganu.

#### Kasawari Integrated Offshore High Contaminant Project

The offshore installations works for Southeast Asia's biggest and heaviest platform in Sarawak is on track. The project achieved 1 million safe man hours by stringently adhering to SOPs and ensuring zero COVID-19 cases.

#### PETRONAS New Leadership Campus (PNLC)

The PNLC is the first construction project in Southeast Asia to receive ISO 19650:2-2018 certification, meeting world class standards of project execution. The project is also the first to leverage both Building Information Modelling (BIM) and Common Data Environment (CDE) technologies simultaneously and is on target to attain Green Building Index (GBI) Platinum status.

*Note: This photo was taken before the pandemic.*

### 2 Technology-Driven Operational Excellence

PD&T's aim is to innovate with pace and enable a tech-digital transformation in line with PETRONAS' Industry Revolution (IR) 6.0 ambition. In 2020, several initiatives were rolled out:



#### ADaPT

The Advanced Diagnostic and Prognostics (ADaPT) technology provides early warning and intervention to prevent creep failure. By tapping ADaPT, we have achieved production gains of 7 per cent and avoided unplanned shutdowns.



#### I-PIMS

By leveraging the Integrated Pipeline Integrating Management System (I-PIMS), we have seen improvements of up to 67 per cent in Process Cycle Efficiency (PCE) and achieved cost savings of RM50 million.



*Note: This photo was taken before the pandemic.*

#### PIVOT

The PETRONAS Integrated Vision for Operation Excellence Technology (PIVOT) tool is a descriptive and predictive analytics tool that helps address business pain points and improves efficiency. Use of the PIVOT PETRONAS Machine Monitoring and Prescriptive Diagnostic (P-MMPD) at PETRONAS Chemicals Fertiliser Kedah Sdn Bhd and PGB has helped improve machinery reliability via early detection of mechanical failure.



#### Robotics (ANYmal and BIKE)

By tapping these robotic technologies to enable remote and autonomous operations, we are minimising HSE issues and improving efficiencies as there is less human intervention.



### 3 Focused On Progress

#### Facilities of the Future (FOF) Programme

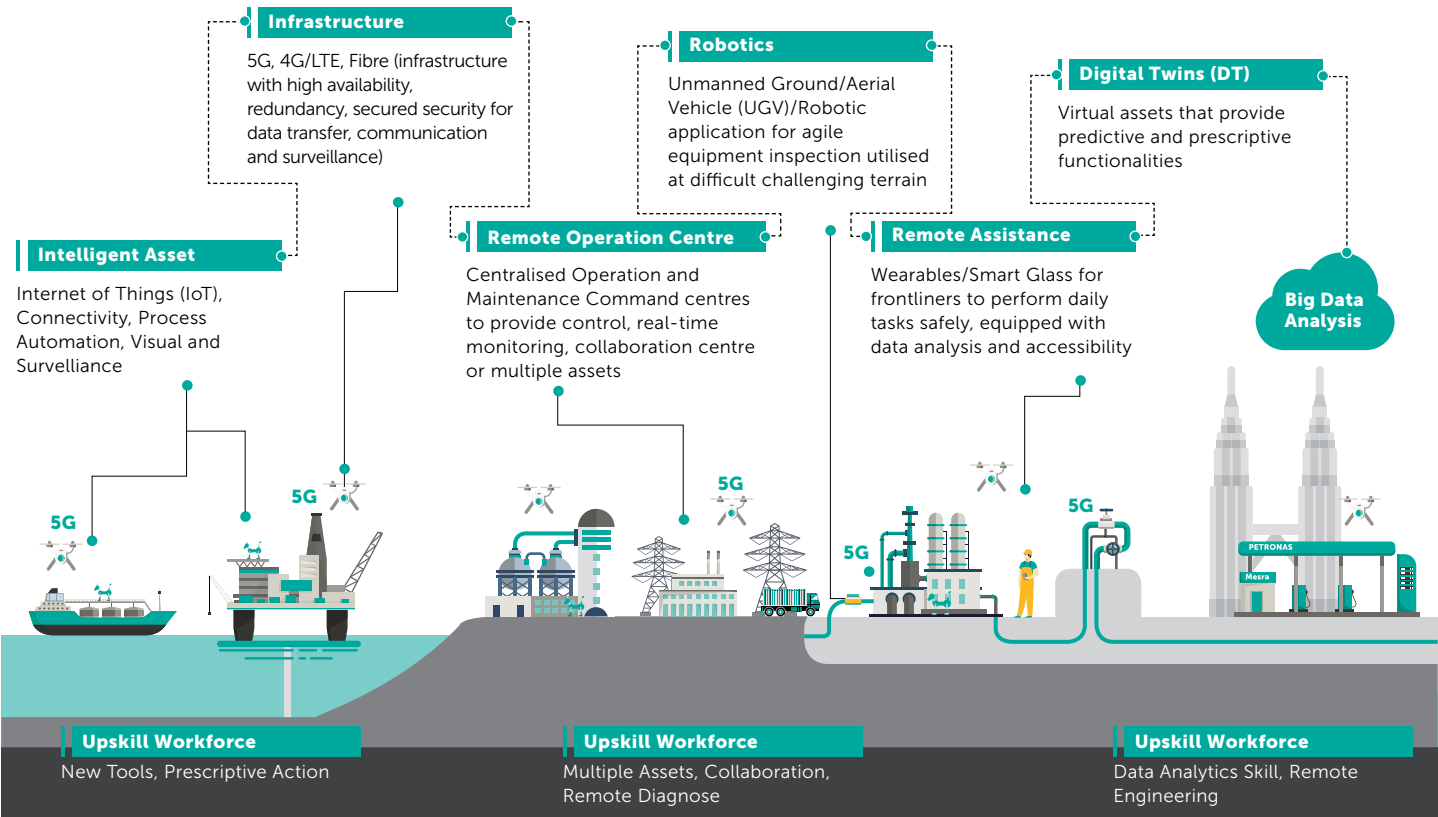
As part of our efforts to reduce our carbon footprint, increase safety on our offshore platforms and reduce operational expenditure (OPEX) by up to 50 per cent, we are leveraging the FOF programme. It is part of the paradigm shift that PETRONAS is aggressively pushing by making the most of Remote Autonomous Operation (RAO) technologies. Under the RAO approach, there will be zero exposure to any sort of hazardous risk and faster response time as there is no requirement to travel and be physically present at site.

As we move into the new norm, members under the purview of the International Association of Oil & Gas Producers (IOGP) have embarked on a long-term sustainability effort of operating oil and gas facilities remotely. This is to standardise and ensure industrial acceptance of a safe and reliable remote operation of Normally Unattended Facilities (NUF). In addition, a remotely operated facility also reduces carbon emissions as there would be less need for marine vessels to mobilise crew visits. PETRONAS sees this as an important and critical milestone that is safer and more cost effective. As such, PETRONAS has positioned itself to play a critical role in supporting the NUF task force and the Joint Industrial Practices of IOGP.

The remote capability and autonomous operation functions augmented by technologies such as digital twins do not just accord us a safe working environment, they also help to improve the availability and predictability of our assets.

This will result in a more reliable, sustainable plant operations and a significant reduction in our operating costs. The groundwork needed to accomplish this includes enhancing the readiness of our infrastructure such as our information technology/operational technology (IT/OT) system; ensuring reliable and robust connectivity; implementing process automation, cloud-enabled solutions, remote assistance, robotics, software and applications; and more importantly, strengthening our safety shutdown philosophy and the overall functional safety system.

Our pilot RAO project, the platform at the Resak field offshore Terengganu, is progressing well and has the potential to achieve a 30 per cent reduction in OPEX.



#### Advanced Connectivity

Advanced connectivity for exploration and production (E&P) activities can yield higher value for an industry pressured by price and demand plunges. To fully harness the power of ROA, we are incorporating fifth generation (5G) infrastructure and networks into our operations. In 2020, we carried out the following activities that moved us closer towards our 5G ambitions:

Conducted the **PETRONAS 5G Demonstration Project and Test Bed** exercise at Institut Teknologi Petroleum PETRONAS (INSTEP), Kuala Terengganu, affirming **5G's low latency (less than 50 ms) and high upload bandwidth (more than 130 Mbps) capability** for remote operations.

**Collaborated with the Malaysian Communications and Multimedia Commission (MCMC)** to prepare for the rollout of a 5G Campus Network.

**Equipped the Resak platform offshore Kerteh** with 5G capabilities as Malaysia's first platform to be remotely controlled from land.

#### Advanced Materials

At the Angsi Field offshore Terengganu, we piloted the attachment of grafted bentonite to rock pore surfaces at oil wells which has successfully reduced water production and enhanced oil gain.

#### Advanced Bio-Fuel and Hydrogen Production

While remote operations will help reduce carbon emissions in our operations, we also see much potential in converting contaminants such as CO<sub>2</sub> and biomass feedstock into high-value products. To date we are exploring the following initiatives:

By leveraging **CO<sub>2</sub> separation technology** such as the one deployed at the Kasawari Integrated Offshore High Contaminant Project, **we aim to convert CO<sub>2</sub> into fuel for land transportation.**

Our ultimate **aim is to produce green hydrogen where we produce plant-based aviation fuel. In the process, water becomes energy** and the **energy consumed is also emitted as water vapour.**

Today, **PETRONAS' Hydrogen business** is accelerating forward in its efforts to achieve competitive costs in production. We have **built our green hydrogen production testing facility, complete with an advanced electrolyser that we developed to enable efficient and cost-effective green hydrogen production.** The system is designed to **deliver about 50 kg of clean hydrogen** per day. Combined with competitive clean electric, hydrogen will be the new source of fuel in the future.

**Bio-Agenda, a strong sense of appreciation for resources** has led to projects on **biomass to chemicals, bio-based specialty surfactants, and plant-based aviation fuel from crude algae oil.** Efforts to enrich lives sustainably continue with fuels and lubricants research (novel additive for fuels, ionic liquid and graphene studied for future mobility), as well as thermal management fluids for energy storage, among others.



For more details on Green Hydrogen production and our collaboration with Sarawak Energy Berhad, please refer to page 89 of the G+NE section.



Specialty Chemicals



**APG Sultaine**  
(extra mild biodegradable novel specialty surfactant)

The APG nonionic is further upgraded to amphoteric surfactant. Amination and sulfonation of nonionic APG yield the PETRONAS in-house novel specialty surfactant, APG Sultaine.

**Emollient**  
(a sustainable platform for the production of Bio-based polyol esters)

Polyol esters are versatile chemical building blocks for numerous commercial applications, ranging from lubricants to personal care. PETRONAS develops a unique synthesis method using fatty acids derived from palm oil to produce various grades of polyol esters emollient.

**Bio-MEG : Bio-based Monoethylene Glycol**  
(from biomass waste to feedstock of bioplastics)

PETRONAS' proprietary one-pot process converts empty fruit bunch (EFB) waste from the palm oil industry into bio-based monoethylene glycol (Bio-MEG).

This patented technology not only marks lower carbon dioxide emission, it also produces a more environmental-friendly consumer products.



**Moving Forward Together**

PD&T's role has become even more crucial in the face of unprecedented challenges as PETRONAS steps out to pursue new areas of opportunity beyond oil and gas, as well as meet its NZCE 2050 aspiration. As PD&T ventures forth, we will be guided by PETRONAS' Three-Pronged Growth Strategy to build the engines that will drive groupwide growth and maximise the value produced by the Upstream, Downstream, and Gas + New Energy business segments.

Moving forward into a highly disrupted playing field, PD&T will aim to bring some semblance of normality to the equation by pursuing its mantra. This will see us working to unlock opportunities with greater value for PETRONAS in the new normal by tapping technology as a differentiator. We will also look to strengthening the digital landscape and ensure stable and efficient operations throughout the Group by leveraging on digital as an accelerator. Last but not least, PD&T will work to harness data as an asset to deliver value via tech-digital products and solutions. In all this, PD&T will set in place the guardrails and measures to ensure that the Group continues to operate its total business value chain as optimally, and as safely and efficiently as possible.

PETRONAS leverages technology and digitalisation in our strategy to meet the Sustainability Agenda. Pivoting on "Technology as a Differentiator, Digital as an Accelerator and Data as an Asset", we capture and optimise value from source to market in fulfilling our role as the custodian of the country's energy resources, to power the nation and beyond.

We believe only by putting sustainability at the core of everything we do, will we be able to safeguard people, planet and profits for generations to come. Our stewardship of tech-digital transformation is aimed at bringing forth a sustainable future.

By achieving "do more with less" through our tech-digital transformation, we are minimising our carbon footprint and HSE risks to meet the target of capping Greenhouse Gas (GHG) emissions by 49.5 million tCO<sub>2</sub>e by 2024, as well as the phased targets up to NZCE 2050.

Our push to achieve "best-in-class" through tech-digital innovations in all that we undertake amid an accelerated energy transition, is anchored upon the four PETRONAS Sustainability Lenses of Continued Value Creation, Safeguard the Environment, Positive Social Impact and Responsible Governance. This all-round approach enabled by the "Innovate Now" culture that the PETRONAS leadership emphasises, empowers us to not only deliver optimised value to our customers, but also enrich their lives, as well as that of communities, industries and nations.

To date, we have created value through our tech-digital efforts and will continue to unlock opportunities and future-proof the Group's businesses through cost optimisation and efficiency, building new competitive areas, and the push for a sustainable future. We remain committed to supporting the Group in its efforts to re-shape its assets and operations by embedding technology and digital to bring down operational costs. In all that we do, we will maintain a laser-focus ensuring a sustainable future for all of PETRONAS' businesses.