

Business Review

Business Review



Project Delivery and Technology



Bacho Pilong
Senior Vice President,
Project Delivery and Technology

"The challenges brought forth by the COVID-19 pandemic have shed light on Project Delivery and Technology (PD&T)'s strengths in driving digital transformation across PETRONAS. Guided by PETRONAS' Three-Pronged Growth Strategy to drive groupwide advancement and maximise value across the three business segments, we continue to take decisive, proactive actions to fortify differentiated portfolios and elevate low-carbon energy delivery with innovation. We harness the power of data, technology and digital solutions to drive operational excellence and create growth opportunities. We proffer and deploy technology and digital solutions that bring step changes to business operations, to enrich and bring betterment to the lives of PETRONAS' customers and stakeholders within, and beyond the energy industry."

587

projects managed valued at more than RM9 billion



RM25 million

commercialisation revenue



25

Site readiness for key technologies achieved



6.4%

reduction of GHG emissions in support of NZCE 2050

17

technology and digital solutions deployed

98

TechApps™ softwares available

Technology Digital

RM830 million

total value creation through ARIES, our digital enabling engineering solutions

RM818 million

in cash generation achieved through Alpha Series, a digital transformation of our value chain

37 million

man-hours with a Full Time Equivalent of

12,600

personnel at work site and achieved zero fatality



Business Review

What We Do

PD&T provides technical, project, technology, and digital services while shaping and safeguarding PETRONAS' growth and future positioning strategies through best-in-class project delivery, extensive research and development, leading-edge technical expertise, and novel digital solutions. PD&T serves as the engine that accelerates growth and ventures across PETRONAS, driving transformation by leveraging data as an asset, digital as an accelerator and technology as a differentiator. As PETRONAS' Centre of Excellence (CoE) and a solutions partner, PD&T has a vital role in driving PETRONAS' aspiration towards NZCE 2050 and all strategic goals through a well-established and expanding ecosystem of innovation.



Key Priorities and Results

Key Priorities

Delivering Projects Beyond OTOBOS

- Delivered projects ahead of schedule safely despite challenges caused by COVID-19 pandemic.
- Delivered more value to the group through cost reduction, operational efficiency, and cash generation.

Innovation Driven Operational Excellence

- Achieved progress on key technology projects.
- Pursued new revenue streams through technology and digital products to drive competitive advantage.
- Improved operational efficiency through technical solutions.

Capitals Deployed:

Results

- PD&T managed projects had recorded over 37 million man-hours with a Full Time Equivalent of 12,600 personnel at work site and achieved zero fatality despite the increased HSE risk exposure mainly due to intensity and complexity of project related activities coupled with battling the COVID-19 situation.
- Projects delivered ahead of schedule:
 - Garagol Deniz West (GDW) first oil.
 - Kuala Lumpur International Airport Pipeline Project (KLIPP) Initial Acceptance.
 - NC3 condensate export pump modification Initial Acceptance.
 - Safeguarding Operations, Asset and Resilience (SOAR) Project completion.
- GDW revival in Turkmenistan achieved RM139 million cash generation.

- Achieved site readiness and commercialisation of 25 key technology projects.
- Registered RM25 million in commercialisation revenue through the deployment of 17 technologies and 98 TechApps™ software.
- Enhanced commercial execution through market expansion, accelerated commercial readiness and implementation of bolder commercialisation methods.
- Deployed 52 technical and digital solutions to improve reliability and efficiency of plants and facilities.
- Established PETRONAS Drone Control Tower with the support of the Civil Aviation Authority of Malaysia (CAAM) to expedite approval for drone operations in line with increasing demand for drone services within the group.

Business Review

Key Priorities and Results

Key Priorities

Data-Driven Operational Excellence

- Enabled digital transformation to improve efficiency, enhance productivity and strengthen operational resilience.
- Increased the safety of offshore platforms via the Facilities of the Future programme utilising robotics and drone technologies.
- Improved workforce digital competency.
- Introduced new initiatives to accelerate innovation and transformation in technology and digitalisation.
- Increased resilience and automation through scalability.
- Leveraged Internet of Things (IoT) for remote monitoring of plants and facilities Groupwide.
- Established Project Delivery Digital Ecosystem (PDE) to ensure rigorous portfolio management and improved process efficiency.
- Established Construction-Based Engineering (CBE) to improve construction cost through Advanced Work Packaging (AWP) and Project Production Management (PPM) process improvements.

Capitals Deployed:

Growth Engine Acceleration

- Facilitated innovation of new solutions among industry players, focusing on long-term sustainability.
- Pursued new industry-wide collaborations to accelerate technology and digital transformation, and upskill talent.

Capitals Deployed:

Results

- Achieved RM818 million in cash generation, gained end-to-end value chain visibility and increased decision-making at the enterprise level via Alpha Series.
- Achieved the shortest pre-cooling time in 17 years, 10 hours faster, and 10 per cent reduction in carbon emissions via the STELLAR project.
- Enhanced operational efficiency by pushing digital-enabled efforts via NervCentre, gaining RM830 million via the ARIES project and RM28 million in cost savings via remote consulting to project teams.
- Achieved RM188 million in value creation, improved onshore pipeline monitoring and predictive analytics via Pipeline of the Future (PotF).
- IoT reduced HSSE risks, improved efficiency and productivity as well as pandemic/future-proofed assets.
- Improved Cybersecurity awareness where average phishing rates trended downwards between 2 per cent and 5 per cent from 8.8 per cent in 2020.
- Achieved 62 per cent of applications migrated to Cloud (ahead of targets) and are on target to have at least 90 per cent applications on Cloud by 2022.
- Upskilled 10,366 participants under the Citizen Analytics programme.
- Launched 16 PDE digital solutions that will be the Digital Backbone for project delivery and enabling Artificial Intelligence to assist decision making.
- Rolled out CBE to nine on-going projects with process improvements towards cost optimisation.

- Support enterprise growth and sustainability by cementing partnerships to drive value-added technology and innovation in the areas of:
 - Carbon capture and storage (CCS)
 - Specialty chemicals
 - Hydrogen
 - Renewables
 - Advanced Materials
 - Circular Economy


Business Review

Key Priorities and Results

Key Priorities

Capability Accelerator

- Bench strength measures of the organisation's technical workforce, succession planning and competency management efforts for Technical Authorities, Technical Professionals, Technical Trade Specialists and others.
- RESCISCO for Technical Executives, an initiative to develop empowered, enabled and agile talent to deliver business results.
- Certification of Competencies (CoC).
- PETRONAS Technical Trade Specialist (TTS).
- Digital Academy.
- Industry-academia collaborations.

Capitals Deployed:  

Sustainability

- Supported the nation to help those affected by natural disasters.
- Accelerated decarbonisation of existing PETRONAS assets.
- Produced sustainable fertiliser to increase energy efficiency and achieve carbon dioxide (CO₂) emission targets.
- Leveraged new technologies in high-risk environments to minimise HSSE risks and environmental footprint.

Capitals Deployed:   

Results

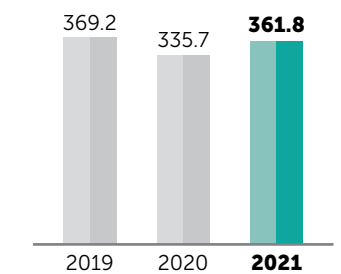
- Bench strength of the organisation recorded that our technical workforce met top quartile requirements.
- RESCISCO received recognition by the Malaysia Productivity Corporation (MPC) bagging the regional Gold Award in Innovation and Productivity, and 2nd place at the national level. RESCISCO also enabled cost reduction while talents were better valued through systematic evaluation and recognition. Scale up implementation to other locations planned for the year.
- CoC tracking ensured license to operate and sustainability compliance while establishing closer collaborations with stakeholders including governing authorities to optimise operations.
- PETRONAS TTS, through the Technical Trade Specialist Symposium, encouraged replication of successful innovation, ideas, improvements to bring forth cost optimisation, cost avoidance and cost savings.
- Digital Academy takes an all-round approach to digitally upskill and reskill the PETRONAS workforce, the initiative also goes beyond the Group to benefit communities through efforts such as PETRONAS Digital Bootcamp during which participants were offered employment by partner organisations, and collaborations with tertiary institutions.
- On the Corporate Sustainability Responsibilities front, the Senior Vice President of PD&T was appointed by the Ministry of Higher Education to expand and strengthen industry-academia collaboration amid a other human capital development efforts.

- Completed first Integrated Multi-Site Optimisation Study across 14 sites under the Kerteh Side-wide Strategic Review (SSR).
- PETRONAS New Leadership Campus obtained Certificate of Partial Completion in December 2021, with the aim to be the first Green Certified building in PETRONAS.
- Completed plastic bitumen road paving under PETRONAS Research Sdn Bhd's Greenification Initiatives.
- Achieved a reduction of 6.4 per cent of GHG emissions in 2021 compared to 2020, in support of NZCE 2050.
- Fast-tracked decomposing process using biochemical compost technology.
- Helped clean up 35 homes of PETRONAS employees and families from local communities affected by floods.

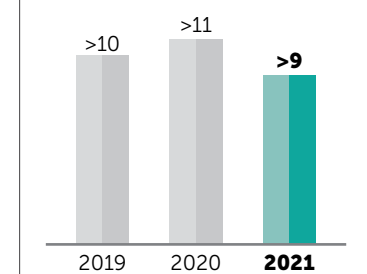
Business Review

Performance Highlights and Achievements

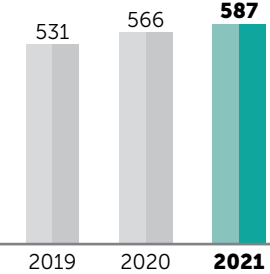
Investment in Technology (RM Million)
– Technology Delivery and R&D Budget



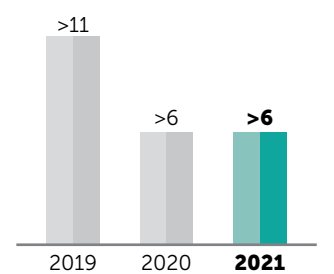
Portfolio size (including CAPEX and OPEX) (RM Bil)






Number of Projects



Value Creation (RM Bil)



Value Created for Stakeholders

Stakeholder	Expectations	Value Created
 Customers	<ul style="list-style-type: none"> • Sustainable and innovative products and solutions. 	<ul style="list-style-type: none"> • Collaborated with a spectrum of industry partners to deliver value-added digital innovations to support sustainability. • Developed the most competitive green hydrogen production technology in its class using our own patented Proton Exchange Membrane (PEM) Electrolyser, putting PETRONAS at par with other hydrogen market leaders. • Developed Bio-MEG technology to diversify our product offerings with bio-based and Circular Economy portfolios.
 Government and Regulators	<ul style="list-style-type: none"> • Elevate industry capabilities and shape industry standards via multilateral knowledge sharing. • Create opportunities to collaborate on the latest technologies for application in other industries and wider purposes. • Pursue a strong partnership ecosystem to support growth in the hydrogen business. 	<ul style="list-style-type: none"> • Strengthened regulatory collaborations to enhance market growth with, among others, Immigration Department of Malaysia, Fire and Rescue Department, Malaysian Communications and Multimedia Commission (MCMC), Department of Safety and Health (DOSH) and Department of Environment (DOE). • Established Joint Industry Collaboration (JIC) for Advanced Work Packaging and Project Production Management with 27 companies. • Established reputation as the leader in Decommissioning and Abandonment capability in the Southeast Asian region. • Collaborated with the Civil Aviation Authority of Malaysia (CAAM) and Department of Survey and Mapping Malaysia (JUPEM) to obtain approval for the use of drone technology for pipeline and facility inspections as well as logistics. • Collaborated with SIRIM Berhad to develop a solution providing data transparency to simplify approval and validation process of custody metering.
 Employees	<ul style="list-style-type: none"> • Training and capability development opportunities. 	<ul style="list-style-type: none"> • Contributed to myDigital aspirations to build a strong pipeline of digital-ready workforce for the nation through Digital Academy. • Enhanced cybersecurity awareness among talent base.

Business Review

Risks and Opportunities

Risks	Opportunities	Actions Taken	Results
<ul style="list-style-type: none"> Prolonged COVID-19 pandemic may impact PD&T projects and service delivery. 	<ul style="list-style-type: none"> Leverage digitalisation and enhance technological innovation to achieve project and service delivery with pace. 	<ul style="list-style-type: none"> Implemented COVID-19 precautionary measures such as HSE checklist and Pandemic Preparedness and Response Team (PPRT) Guideline for PETRONAS groupwide. 	<ul style="list-style-type: none"> Successfully rolled out Green Bubble, Green Net and Strengthening Current Control Measures (SCCM) concept and enhanced Standard Operating Procedure (SOP) in Q1 2021 including vaccination requirements as per PPRT directive.
<ul style="list-style-type: none"> Untimely delivery of proven, competitive, and differentiated technology to deliver value via development and deployment may affect competitiveness for future investment. 	<ul style="list-style-type: none"> Realise opportunities to capture renewable and green technology via strategic partnerships with Global Technology Centres. 	<ul style="list-style-type: none"> Identified technology projects achieving major milestone towards Strategic Technology Objective (STO), to unlock the technology readiness. PETRONAS Research Centre Sdn Bhd (PRSB) is connected globally with our Global Technology Centres – Heriot Watt University, Imperial College London and Universiti Teknologi PETRONAS (UTP). Established technology agenda for Future Positioning (FP) and updated Competitive Edge (CE) technology programmes. 	<ul style="list-style-type: none"> A Suite of carbon capture, utilisation and storage (CCUS) technologies achieved commercial readiness, opening opportunities to monetise recoverable reserves in Malaysian waters and Southeast Asia. Achieved first drop for Bio-MEG plant. Bio-MEG technology is being scaled up to capture new markets in sustainable bio-derived products. Proton Exchange Membrane demonstrated low hydrogen production cost and progressing for business application in the region. Achieved commercial readiness for advanced material technology. Immersive Cooling Fluid prototype met target specification for Electric Vehicle (EV) Battery Thermal Management. Achieved critical milestones for thermal management in battery solid state technology. Ramped up technology commercialisation efforts with the establishment of Digital, Automation, Robotics Technology (DART) to pursue new revenue stream from Technology. Rolled out new personal and healthcare products in response to market opportunities. Identified technologies to future-proof PETRONAS and elevate its competitive edge.
<ul style="list-style-type: none"> Cyber threats could lead to breach of information and security resulting in business disruption. 	<ul style="list-style-type: none"> Leverage strategic collaboration in developing cyber awareness, cyber hygiene, and independent assurance to shape cyber security practices and behaviours in PETRONAS. 	<ul style="list-style-type: none"> Continuous improvement of enterprise cyber security resilience by enhancing cyber security preparedness in Information Technology (IT) and Operational Technology (OT) to proactively mitigate any prolonged effect of high impact incidents to business and operations. These include proactive efforts to secure Identity, Assets and Data that are monitored by the Cyber Security Operations Centre. Established a dedicated plan for Cyber Security Programme and Incident Response Procedure to all IT systems and OT sites. 	<ul style="list-style-type: none"> Completed the implementation and deployment as well as change management of the Cyber Security Enterprise Governance Framework for Malaysia and International Assets. Completed Cyber Security Programme. Incident Response Procedure has been rolled out to PETRONAS sites groupwide, and to all Malaysia OT Sites.

Business Review

Moving Forward

As PETRONAS' CoE, PD&T will continue its efforts to identify innovative solutions to maintain a competitive edge, leveraging its expertise in project delivery, technology, technical and digital solutions, and ensuring safe and efficient operations throughout the value chain.

In this regard, PD&T has charted a Five-Year Strategic Plan (2022-2026), which is aligned with the Group's Three-Pronged Growth Strategy, focusing on three key thrusts:

- Continuous safety, reliability, and efficiency improvements through distinctive digital and technology solutions.
- Pursue commercialisation opportunities for PD&T solutions to generate new revenue for the Group.

- Explore new focus areas to future-proof the business, and realise PETRONAS' Sustainability Agenda via:
 - Circular Economy, which aims to repurpose waste into new products
 - Advanced Materials to strengthen asset integrity, extend service life and reduce overall carbon footprint
 - Improved decarbonisation efforts by managing and reducing GHG emissions of assets
 - Driving renewables and supporting growth of hydrogen to fast-track the energy transition
 - Progress in production and utilisation of specialty chemicals beyond oil and gas, into everyday consumer products.

Moving forward, we will continue to pursue technology and digital advances throughout our value chain to ensure we meet the Group's business goals and achieve our NZCE 2050 aspiration.

