

20 March 2019 | Green Conference Special Report

Charting a sustainable and responsible future for energy production

Managing climate change concern via investment in technology

THEMATIC HIGHLIGHTS

- Global Green House Gas (GHGs) emissions at record high with unprecedented leap in 2016
- Changing trajectory....conflicting signals from major economies
- Growing emphasis on sustainable energy production
- Shifting towards low-carbon economy in managing climate change
- Investing in technology to maximise hydrocarbon production while limiting environmental impact
- Improving energy efficiency via extending use of existing resources

THE CONCERN ON GHGs EMISSION MOUNTING...

Unprecedented GHG leap in 2016... Carbon dioxide (CO₂) in general is known as a Green House Gas (GHG) which is a gas that absorbs and emits thermal radiation which creates "greenhouse effect". Together with other greenhouse gases such as: methane and nitrous oxide, CO₂ is important in maintaining a habitable temperature for the planet. Should there be no GHGs, the planet would simply be too cold to inhabit. It is estimated that without GHGs, the average temperature of the earth's surface would be about -18 degree celsius. However, a recent study by World Meteorological Organization (WMO) in 2017 revealed that atmospheric CO₂ level has reached 403.3 parts per million (ppm) which is the highest level in 3 million years after climbing 3.3ppm from 2015. This unprecedented rise was mainly due to increased CO₂ emission from fossil fuels (coal, oil and gas) and the strong 2015-16 El-Nino event which has reduced the capacity of forests, grasslands and oceans to absorb carbon dioxide from the atmosphere.

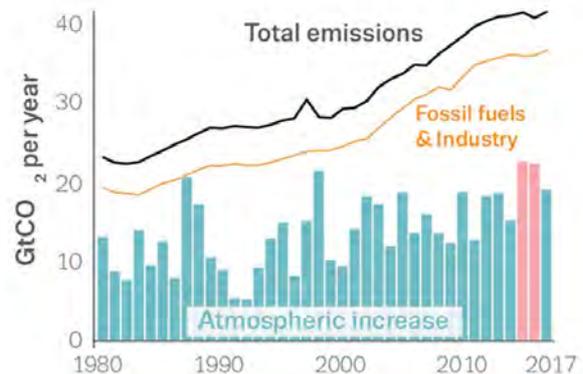
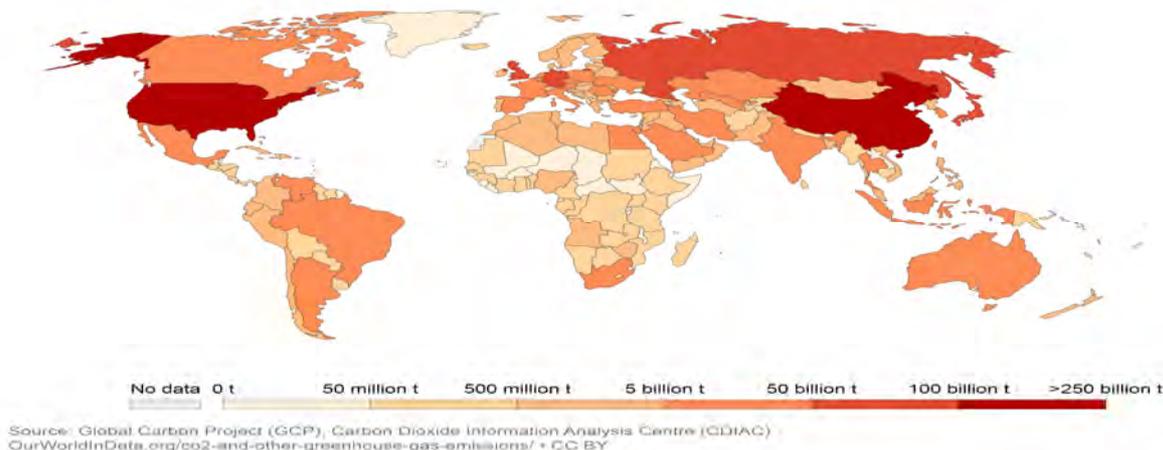


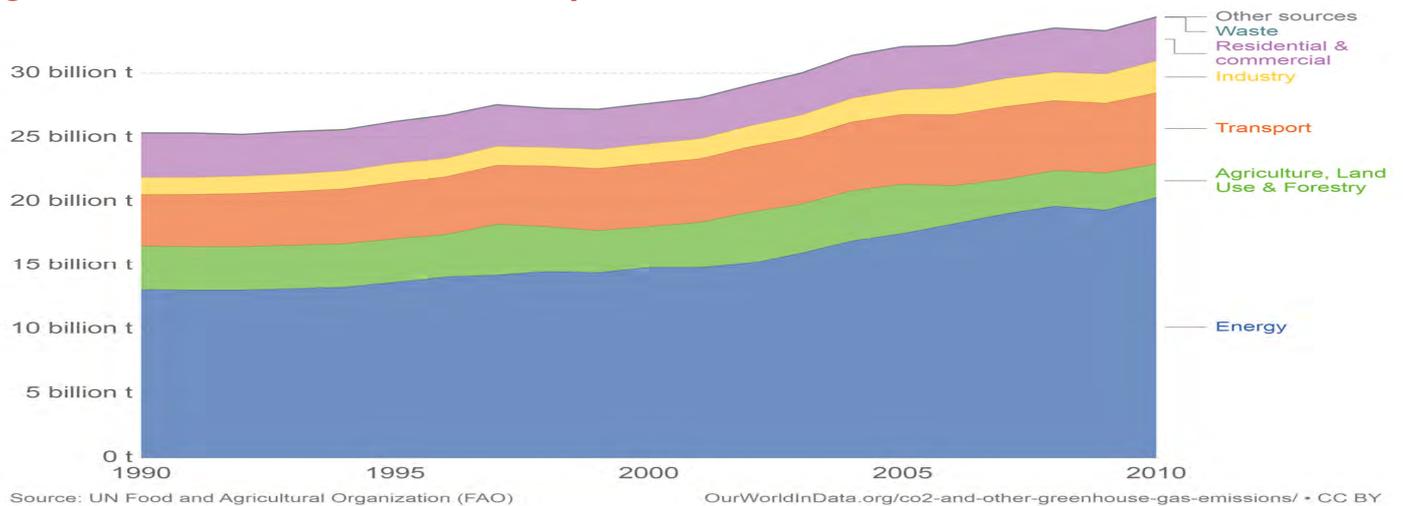
Figure 1: Global cumulative carbon dioxide emissions from 1751 to 2016 by country



Source: Ourworldindata

Ever since the industrial revolution, energy-driven consumption of fossil fuels has led to a rapid increase in CO₂ emissions which has disrupted the global carbon cycle which led to the current global warming effect. The change in climate and global warming have a range of potential ecological, physical as well as; health impacts including extreme weather conditions i.e: droughts, storms, floods, heatwaves etc, the rise of sea-level, altered growth for crops and disrupted water systems. Up until 2010, the energy sector contributes about 15.0b tonnes or 46% to the entire world's total global CO₂ emission and this figure is now on the rising trend prompting oil and gas companies to ramp up on their respective company's green initiatives.

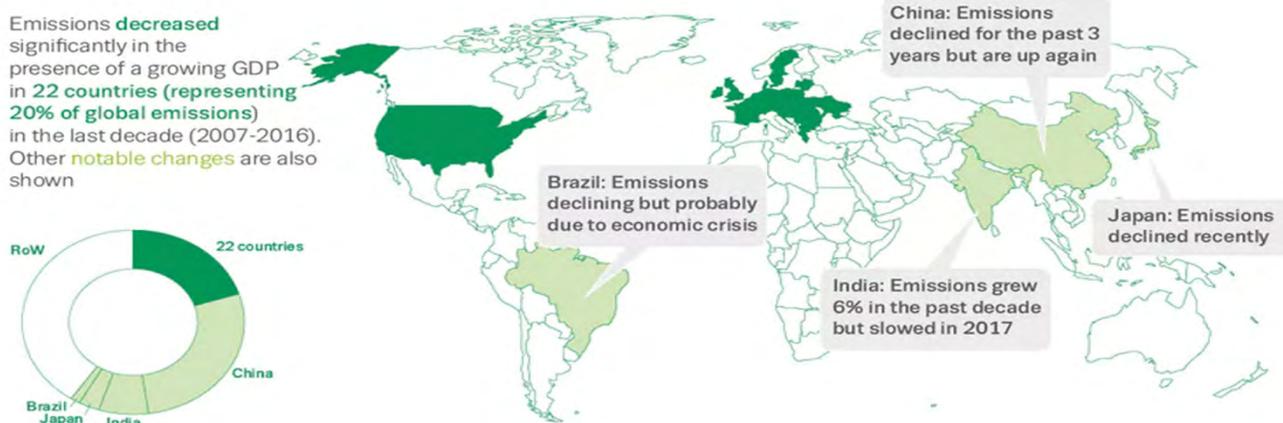
Figure 2: Global carbon dioxide emissions by sector



Source: Ourworldindata, UNFAO

Changing trajectory...conflicting signals from major economies. After registering three years of flat CO₂ growth emission or a "plateau", the CO₂ emission grew again specifically in 2015-16 due to both natural disaster i.e El-Nino as well as increase in emissions from fossil fuel energy production. Despite pledging to lower their respective CO₂ emission, major economies are finding it hard to cope with the pledge due to higher energy demand from the industrial sectors. While there are countries that proved that reducing emissions is still possible amidst economic growth however, other countries, such as Russia, Mexico, Japan, and Australia have shown more recent signs of slowdowns, flat growth, and somewhat volatile emissions trajectories as they pursue a range of different climate and energy policies in recent years. Still, the pressure is real. In 101 countries, representing 50% of global CO₂ emissions, emissions increased as economies grew. Many of these countries will continue to pursue economic development for years to come.

Figure 3: Global carbon dioxide emissions by sector



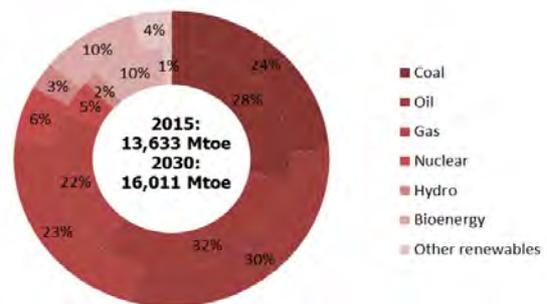
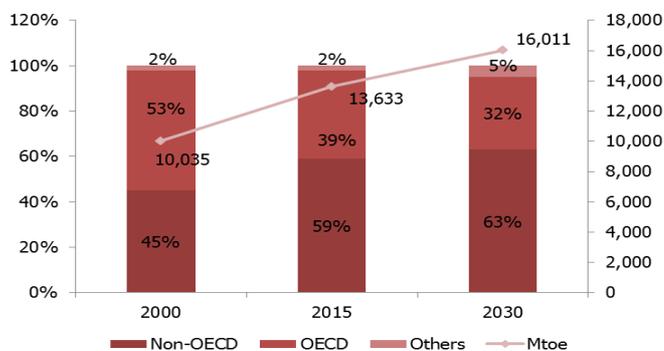
Source: Global Carbon Project

ENSURING UNINTERRUPTED AND SUSTAINABLE ENERGY SUPPLY

Growing emphasis on sustainable energy production. In line with abovementioned developments, there has been a growing emphasis on sustainable energy production of late as energy remains as part of an essential commodity that drives growth. It remains as one of the significant resource that will aid in fuelling socio-economic progress which contributes towards better quality of life. In line with the advancement of technology, evolution of world's energy landscape and increasing standard of living, there is also a growing call for a more robust, sustainable and responsible energy practice that will move in tandem with the growing need for energy from the society where global energy demand is expected to continue growing at +18.0% annually until 2030. Hence, there is a need to ensure that: (i) the continued access to energy supply is uninterrupted; (ii) the source of energy is clean; (iii) energy supply is affordable and; (iv) energy production is in compliance with the world's current aspiration to become a low-carbon economy.

Figure 4: Global total primary energy demand

Figure 5: Global TPED by fuel type



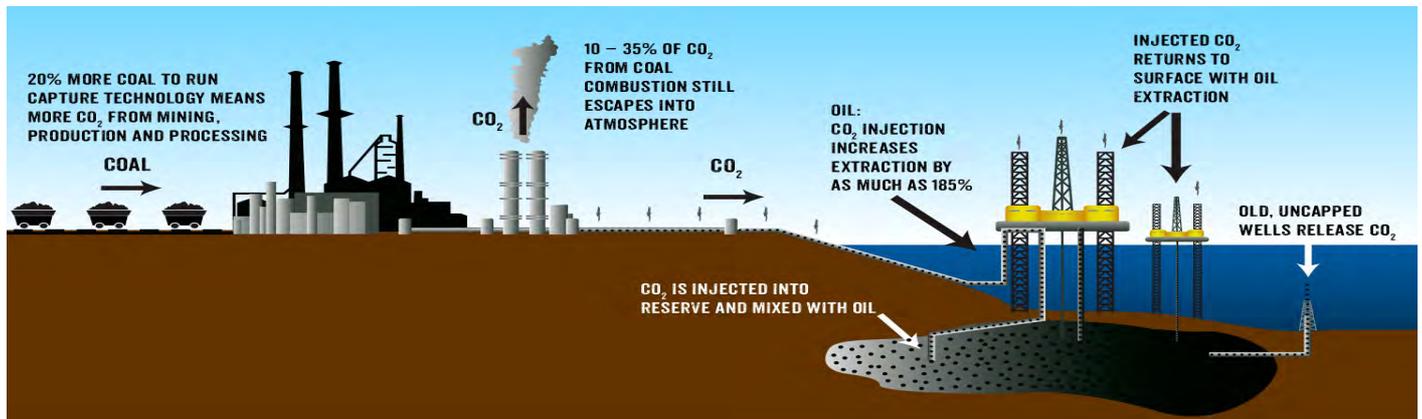
Source: IEA World Energy Outlook 2017, MIDFR

Source: IEA World Energy Outlook 2017, MIDFR

Shifting towards low-carbon fuel in managing climate change. Aside from branching out into alternative energy resources such as: solar and hydro; the focus of oil and gas companies are now looking into shifting towards supporting a low-carbon economy, adopting measures to ensure environmental protection and; ensuring efficiency of resources. While fossil fuel will remain as the core and main source of energy despite the expected reduction in its usage going forward from 32% in 2015 to 30% in 2030, promotion of the use of natural gas and LNG as lower carbon fuel has been on an increasing trend. This mainly stems from the intermittent nature of the existing renewable energies such as solar and wind power generations.

Natural gas use is thus expected to increase in power generation. Gas-fired power plants can be turned on and off much more quickly than other power plants to help address the challenge of seasonal and daily output variability of wind and solar energy. Natural gas also emits about 50% less CO₂ per kilowatt-hour compared to coal, prompting a switch away from coal and decreasing its share in the primary energy mix. On this note, Malaysia and its national petroleum company Petroliam National Berhad (PETRONAS) is also pursuing gas advocacy alongside its various stakeholders for creating awareness on the environmental benefits of natural gas and its role in facilitating energy transition. This includes promoting the use of natural gas in the power and transportation sectors.

Figure 6: Carbon dioxide emission into the environment via coal and oil production

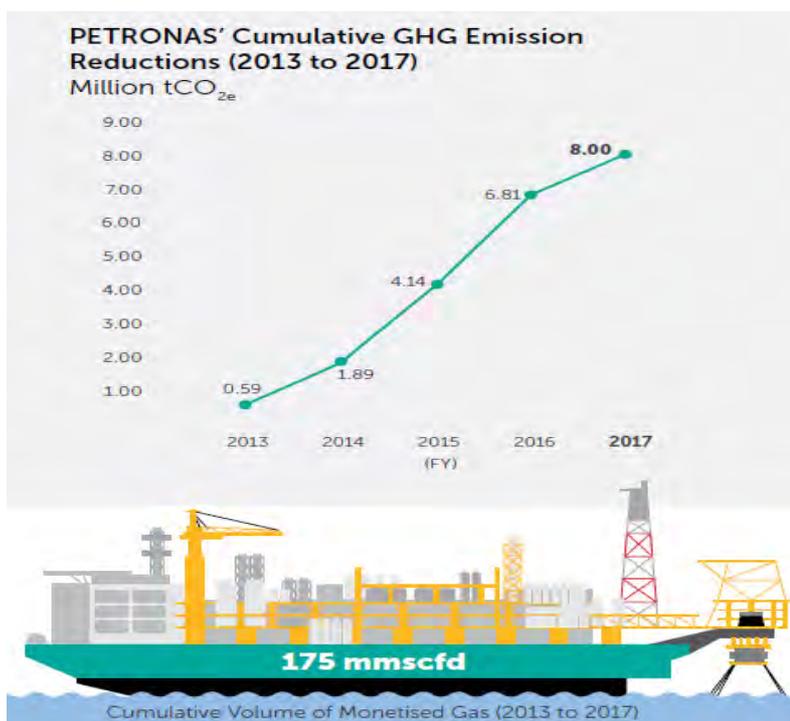


Source: Worldwideweb, MIDFR

Investing in technology to maximize hydrocarbon production while preserving the environment. Supplying the world's energy needs is an ongoing challenge requiring ingenuity in solutions, including technological developments. On the supply side, solutions like energy storage, hydrogen fuel cells, next-generation nuclear systems and biofuels are being developed whilst on the demand side, innovations to energy systems and business models continue to optimise energy production, delivery and use.

In the case of Malaysia, over the years, the national oil company PETRONAS has invested in technology development to maximise hydrocarbon resources whilst reducing environmental footprint, for example through CO₂ management. There are also investments made into emerging technologies through collaborations with academia and corporations. PETRONAS has also embarked on a digital transformation in 2016 to deliver new value and change the way we work through advanced analytics and machine learning. In 2017, greater emphasis was placed on non-oil and gas solutions with the establishment of PETRONAS New Energy Business. Through these initiatives, PETRONAS has managed to not only monitor but also contain GHG emissions arising from its business processes from 0.59mt of CO₂ in 2013 to 8.0mt of CO₂ in 2017 while ensuring the sustainability of the business.

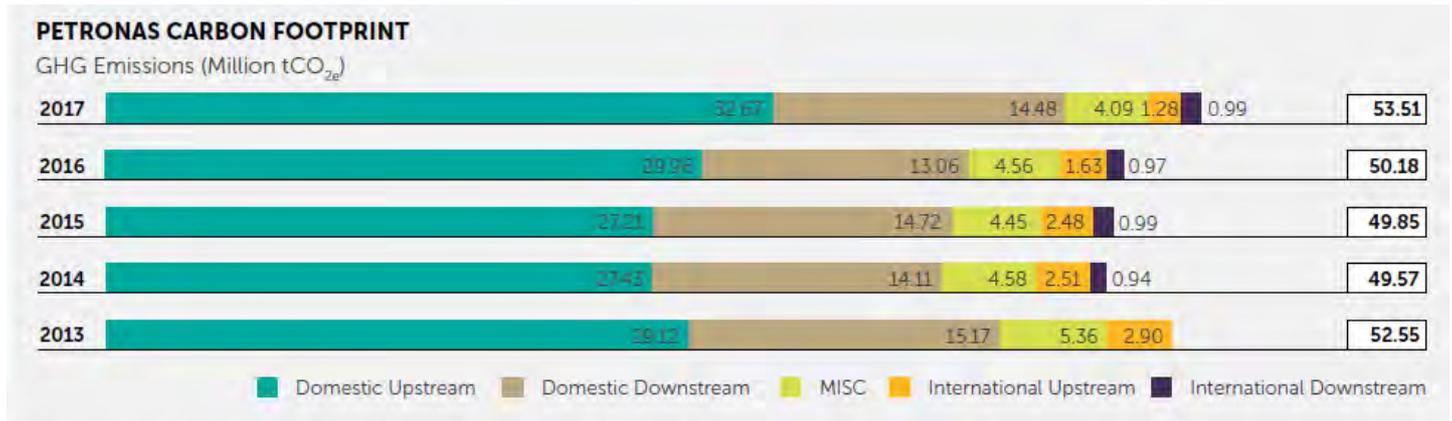
Figure 7: PETRONAS' cumulative GHG emissions reductions from 2013-2017



Source: Petronas

Improving energy efficiency via extending use of existing resources. In Malaysia, PETRONAS is currently pursuing several initiatives in the area of monetising flared and vented hydrocarbon resources to prolong its gas reserves. The company is also exploring commercially viable energy efficient technologies such as expanding its cogeneration capacity to minimise operational cost. Collectively, these initiatives are aimed at reducing its carbon footprint. The application of an internal carbon price paves the way towards better managing its business portfolio amidst a tightening legislative landscape driven by the Paris Agreement.

Figure 8: PETRONAS' carbon footprint from 2013-2017

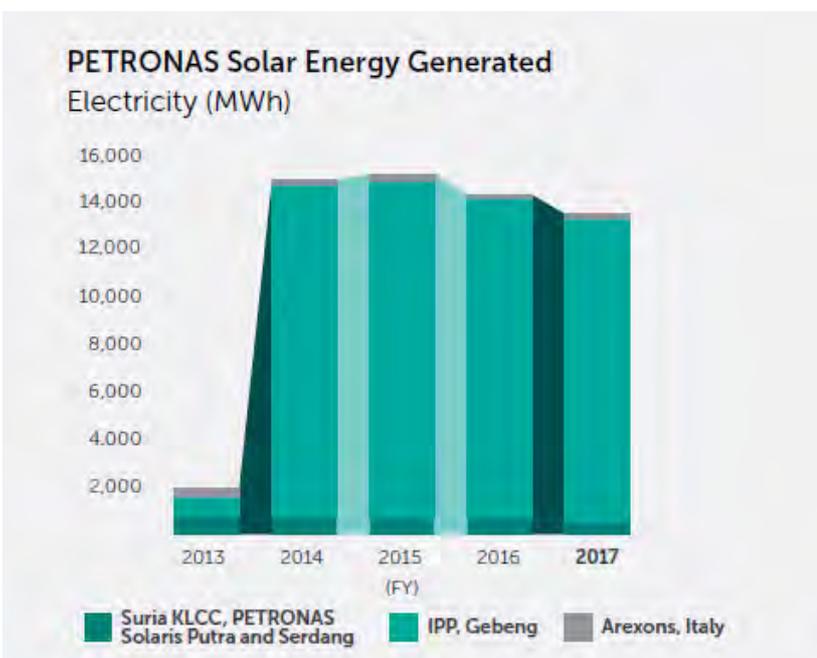


Note: GHG data for the years prior to 2016 was revised following ongoing efforts aimed at streamlining our accounting practices.

Source: Petronas

At the same time, PETRONAS has also embarked on using its own solar-generated electricity to power all its building locally as well as; internationally of which both the generation as well as the usage has doubled since it was started back in 2013. In 2017, the continued production of solar energy via its existing solar PV investment projects in Malaysia and internationally amounts to 13,628MWh. This has resulted in a reduction of GHG emission by 9,261tCO₂. Additionally, a portion of the solar energy generated in Malaysia was also sold to the national grid, indirectly increasing the possibility of power-generation coming from renewable energy.

Figure 9: PETRONAS' solar energy generated electricity from 2013-2017



Source: Petronas

CONCLUSION

We opine that it is unlikely that the Global community would return to the high emissions growth rates of recent decades, given continued improvements in energy efficiency and rapid growth in low-carbon energies. Nevertheless, the recent uptick in CO₂ emissions and continued lobbying by environmental NGOs are a reminder that there is no room for complacency if the world is to meet the goals of the Paris Agreement, which calls for temperatures to be stabilised at “well below 2°C above pre-industrial levels”. This requires net zero global emissions soon after 2050.

Hence, with these rising trends coupled with ongoing development and usage of renewable energies (Malaysia targets to have 20% of its energy generated via renewable energies by 2025); we opine that the continuous effort in balancing both economic growth as well as; maintaining reliable energy supply will remain the focus going forward for oil and gas companies. It will continue to be an uphill battle for the oil and gas companies to achieve the desirable balance however; we believe that a robust sustainability policy should be in place and ingrained into the companies’ business processes to ensure continuity of the responsible energy production and generation going forward as per illustrated earlier using PETRONAS as an example.

Noor Athila Mohd Razali
noor.athila@midf.com.my
03-2772 1679

MIDF RESEARCH is part of MIDF Amanah Investment Bank Berhad (23878 - X).
(Bank Pelaburan)
(A Participating Organisation of Bursa Malaysia Securities Berhad)

DISCLOSURES AND DISCLAIMER

This report has been prepared by MIDF AMANAH INVESTMENT BANK BERHAD (23878-X). It is for distribution only under such circumstances as may be permitted by applicable law.

Readers should be fully aware that this report is for information purposes only. The opinions contained in this report are based on information obtained or derived from sources that we believe are reliable. MIDF AMANAH INVESTMENT BANK BERHAD makes no representation or warranty, expressed or implied, as to the accuracy, completeness or reliability of the information contained therein and it should not be relied upon as such.

This report is not, and should not be construed as, an offer to buy or sell any securities or other financial instruments. The analysis contained herein is based on numerous assumptions. Different assumptions could result in materially different results. All opinions and estimates are subject to change without notice. The research analysts will initiate, update and cease coverage solely at the discretion of MIDF AMANAH INVESTMENT BANK BERHAD.

The directors, employees and representatives of MIDF AMANAH INVESTMENT BANK BERHAD may have interest in any of the securities mentioned and may benefit from the information herein. Members of the MIDF Group and their affiliates may provide services to any company and affiliates of such companies whose securities are mentioned herein. This document may not be reproduced, distributed or published in any form or for any purpose.

MIDF AMANAH INVESTMENT BANK : GUIDE TO RECOMMENDATIONS

STOCK RECOMMENDATIONS

BUY	Total return is expected to be >10% over the next 12 months.
TRADING BUY	Stock price is expected to <i>rise</i> by >10% within 3-months after a Trading Buy rating has been assigned due to positive news flow.
NEUTRAL	Total return is expected to be between -10% and +10% over the next 12 months.
SELL	Total return is expected to be <10% over the next 12 months.
TRADING SELL	Stock price is expected to <i>fall</i> by >10% within 3-months after a Trading Sell rating has been assigned due to negative news flow.

SECTOR RECOMMENDATIONS

POSITIVE	The sector is expected to outperform the overall market over the next 12 months.
NEUTRAL	The sector is to perform in line with the overall market over the next 12 months.
NEGATIVE	The sector is expected to underperform the overall market over the next 12 months.