

New Impetus in the Race to Renewables

PETRONAS sets sail on its clean energy journey with the recently established New Energy unit.

An avid kite surfer, Jay Mariyappan loves the exhilaration that the sport offers. It's a feeling he can identify with in his day job, too. As PETRONAS' New Energy Head, he is about to surf over one of the biggest waves in today's energy space – renewables – and he is relishing the prospect.

"This is a really unique opportunity. In the next 10 to 20 years, we'll be seeing a big transformation in the energy sector. The business that we are entering is significantly different from oil and gas, so the modus operandi will have to change. There's a start-up feel, and we're going to have to be very lean and agile," he says.

The move into renewables and new energy is seen as crucial to securing PETRONAS' business sustainability, and is part of its Step Out strategy that includes specialty chemicals.

Currently incubated within Corporate Strategy, the New Energy unit was set up in April 2018 and is expected to be fully operational in the first quarter of 2019. Including Jay, who joined the team in October, it is a seven-member team made up largely of internal staffers, and will be supplemented with experienced industry personnel.



Jay and his New Energy team.

Though he is a newbie to PETRONAS, Jay has some two decades' experience in clean energy under his belt.

Prior to joining PETRONAS, Jay was with Sindicatum Renewable Energy Company Pte Ltd, a Singapore-based firm that develops, owns and operates clean energy projects in South and Southeast Asia. There, he was the managing director responsible for delivery, sales and trading of environmental products in Asia, and delivery and business development in Southeast Asia.

He has also earned energy sector credentials with stints at a major power company in the utility planning department, and at an engineering

consultancy where he advised a number of energy companies and financial institutions in power sector planning, investments and emissions trading.

He was also seconded part-time to the UK government for 18 months, advising on the emissions markets, policy and projects.

With such an impressive resume, it is no surprise that PETRONAS came calling. Ikmal Hisham Maharon, who joined the New Energy unit in August, explains why it was important to recruit someone externally to lead the team.

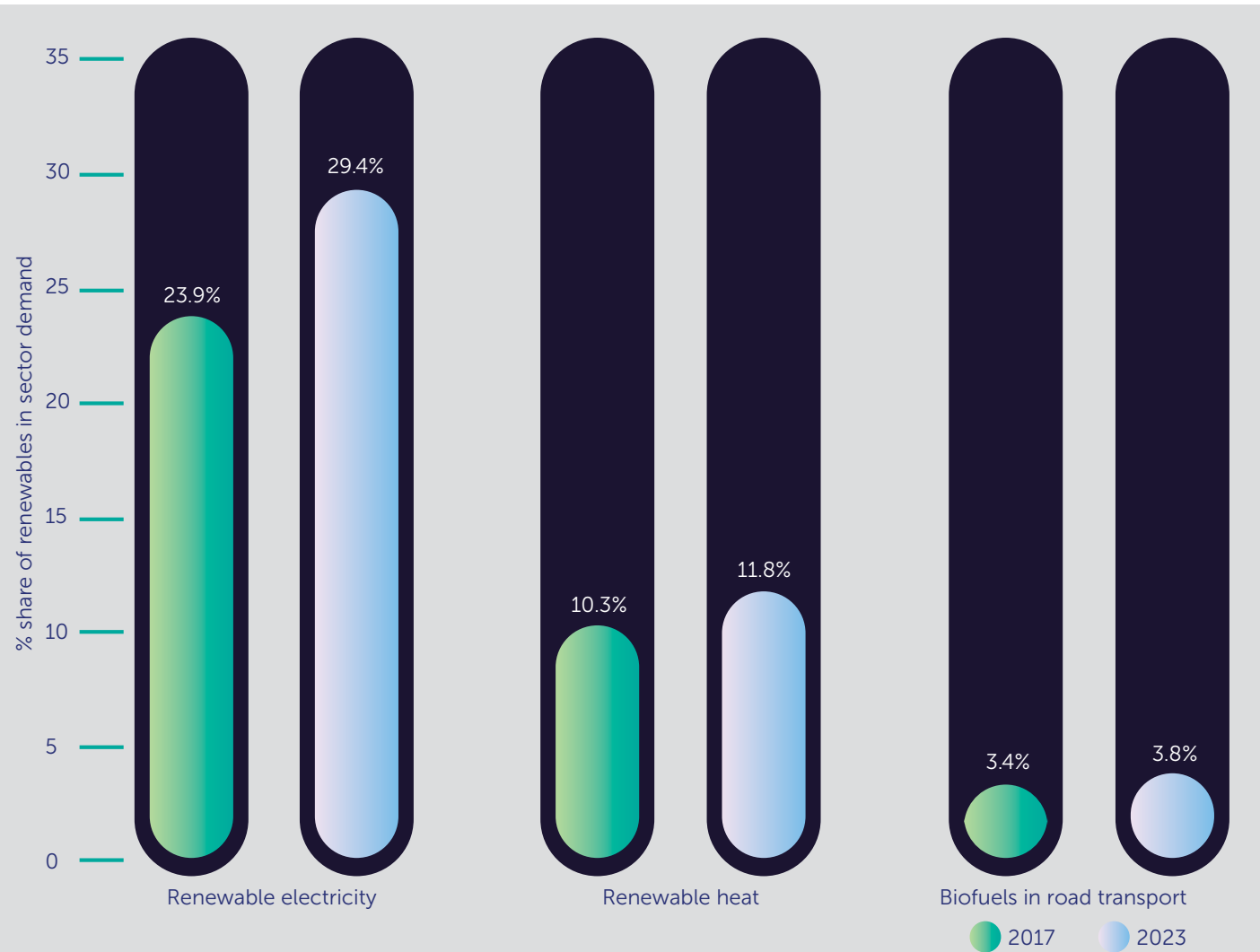
"If we didn't do that, we would be operating out of the same mould, very

much that of oil and gas. But here, we are going into a very different kind of business and even though it is still energy, the way we work and do things in this business is very different from oil and gas," he says.

Aware of the expectations, Jay is nonetheless taking it in his stride. "There is a lot of expectations and I do feel them, but that's in a positive way because, right from the top, everyone wants this to be a success... so yeah, it's good pressure," he says.

The team, too, is reveling the chance to forge its way in this new business segment. "We're getting ourselves plugged into the network, from industry players' research, analysis and the venture capital side."

By **Sreerema Banoo**



Source : Renewables 2018
 In the *Renewables 2018* forecasts, the share of renewables in meeting global energy demand is expected to grow by one-fifth in the next five years to reach 12.4% in 2023.

From niche to mainstream

So why clean energy? And why now? Ikmal points to a Group Positioning Study in 2017 that identified, among others, clean energy as a new business for PETRONAS.

“Technology changes and disruptors come in and if we don’t change, then many of our businesses will be disrupted. So there is a need for us to have a revenue stream decoupled from oil and gas.”

“What we want to do is grow new energy and make it a substantial business so that it can help the company weather the changes in the oil and gas industry,” adds Jay, not discounting that in the future, new energy may well be one of PETRONAS’ core revenue earners alongside the upstream and downstream businesses.

Although the move into renewables seems evolutionary for oil and gas players, especially if you want to brand yourself as an energy company, there have not been many success stories, even among the oil majors.

“Oil and gas companies have been in and out of renewables for a long time, even from back in the 1970s and again in the 1990s. But as soon as a financial crisis hits, these companies start looking at maximising cash flows and cutting a lot of non-core businesses, including renewables,” says Jay, adding this is one pitfall to avoid.

He also feels that given the stop-start stance of oil and gas companies in renewables, PETRONAS isn’t a late entrant. More to the point, the timing, he reckons, is right on the money.

Levelised Cost of Energy Comparison - Unsubsidised Analysis

Certain Alternative Energy generation technologies are cost-competitive with conventional generation technologies under certain circumstances

Category	Technology	2017 LCOE (\$/MWh)	2023 LCOE (\$/MWh)
Alternative Energy	Solar PV - Rooftop Residential	\$160	\$260
	Solar PV - Rooftop C & I	\$81	\$170
	Solar PV - Community	\$73	\$145
	Solar PV - Crystalline Utility Scale	\$40	\$46
	Solar PV - Thin Film Utility Scale	\$36	\$44
	Solar Thermal Tower with Storage	\$98	\$181
	Fuel Cell	\$103	\$152
	Geothermal	\$71	\$111
	Wind	\$29	\$56
	Conventional	Gas Peaking	\$152
Nuclear ⁽⁴⁾		\$36 ⁽⁵⁾	\$112
Coal ⁽³⁾		\$36 ⁽⁵⁾	\$60
Gas Combined Cycle		\$41	\$74

Levelised Cost (\$/MWh) \$0 \$50 \$100 \$150 \$200 \$250 \$300 \$350
 Note: Levelised Cost of Energy (LCOE) is the Net Present Value of energy over the lifetime of the generating asset.

“Renewable energy today has got the level of maturity, where it’s moved from niche to mainstream. And if you look at renewables in power generation, it’s seeing the fastest capacity growth rates of any generation types,” he says.

A recent report from the International Renewable Energy Agency (IRENA) confirms this. It found that after years of steady cost decline for solar and wind technologies, renewable power is becoming an increasingly competitive way to meet new generation needs.

It is also predicted that electricity from renewables will soon be consistently cheaper than most fossil fuels, and in some countries are already cheaper than coal power.

A latest report from Lazard compares the Levelised Cost of Energy (LCOE) of different power generation technology and shows that wind and solar are already below or within the range of coal and gas.

The vehicles and transport sectors are also undergoing transition. “These are likely to see major transformation and technology evolution including the use of new types of clean fuels.”

The push factors for renewables and clean energy are just as apparent. Climate change concerns coupled with air quality issues are increasingly part of the everyday conversation.

“When we talk about what consumers want these days, they include high levels

of service but also they want energy that’s cleaner, especially with some companies pledging to go 100 per cent renewable.”

“In the past, people didn’t think about where energy came from or how much they consumed but now, with smart metering and labelling or certificates, you know what’s your carbon footprint and so people are looking at how they can use resources more efficiently and contribute to a better environment. Additionally, with the Internet of Things (IoT) the lines between someone who consumes energy and someone who is producing energy becomes blurred, leading to what may be a very different energy market place than we have seen before,” he says.

The Malaysian government also has aggressive climate-change targets – 20 per cent of the country’s electricity to be generated by renewable sources by 2025, from two per cent currently – where it will need all key players in the country to play a role in meeting that target.

“And having PETRONAS on board is key to that,” he says.

Although fossil fuels are getting a bad rap, Jay however, stresses the importance of natural gas, especially as a complementing fuel. “It has an important role in the whole transformation of the energy sector because it’s the most flexible, and in electricity generation it will help with the intermittencies of renewables.”

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Jay Mariyappan

Capturing long-term value

So what does the New Energy unit have up its sleeve? Jay is tight-lipped, only disclosing that wind and solar look promising.

"We're still working on the strategy. It's going to be a dynamic one. It's not really a question of how large the capital invested, but more of a question of what's an attractive business case that will enable us to capture long-term value," he says, adding that the goal is to be fully self-sufficient within a few years.

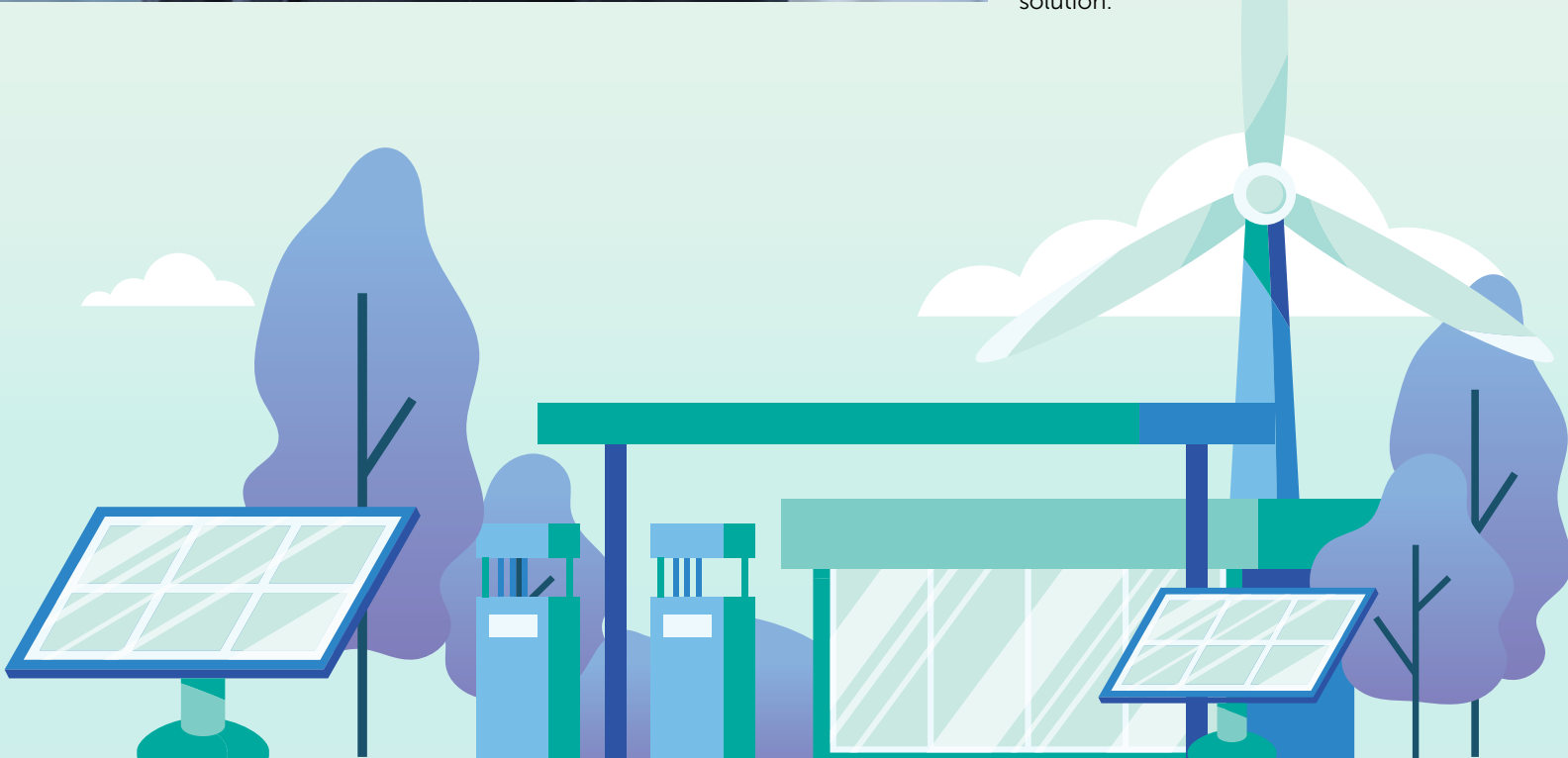
"There is still a lot of work that needs to be done to make this goal a reality," he admits.

"We want to develop a sizeable business and that would mean working with a few companies and partners as well as building the capability within PETRONAS to be able to develop and execute new energy projects."

"The key for us is to leverage on what we're already good at so that we can have that edge, including being able to provide a broad range of clean energy solution."



Bird's eyeview of solar panels installed on the rooftop of Suria KLCC.



These solutions, he adds, will be "technology neutral".

"We could be looking at any technology that has a good business case and is proven... in the shorter term, we are looking at commercial technologies. We ask: Are they commercial today? Are they proven and cost-effective today? We are aware that there is a lot of technology development going on and markets and regulations are also changing, so there will be opportunities in the future that are not here today."

"When we look at technology, we're also looking at making a link to the future in order to grow the business. So that means working with other parts of PETRONAS, especially the research and development side under Project Delivery

& Technology (PD&T) division to see how we can bring in the new energy angle into what they are doing or to develop our own technologies and know-how."

Ikmal also doesn't discount the possibility of partnering with other new energy players. "In our discussions with local developers and energy vendors, who have been around for some time, they are excited that PETRONAS is coming in."

Jay is optimistic about the future. "In Malaysia, what we are seeing now is excitement in the clean-energy space. The focus now is to build up assets and capabilities for the next five to 10 years, and if we can do that, then it will form a good base for future growth."

The sky, as they say, really is the limit.

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Charting the Low-Carbon Journey of PETRONAS

The pursuit of renewables or clean energy is viewed with a different lens over at PETRONAS' Climate Change unit. While the team at the recently established New Energy unit has its sights trained on renewables from a business and business sustainability standpoint, over at the Climate Change unit, renewable energy is one of the routes in PETRONAS' low-carbon journey.

And the man to talk to about that journey is Thirupathi Rao, who heads the Climate Change unit.

"We look at energy efficiency improvement, hydrocarbon flaring and venting reduction, carbon capture utilisation and storage (CCUS), renewables, carbon pricing and carbon offset, to name a few. We also look at adapting our operations to build resilience against potential consequences of climate change," he says.

The electrical engineer, who has been with PETRONAS since 2011, leads a team responsible for bringing all the climate-related data to the corporate level – facilitating risk assessments that aid in the delivery of the organisation's climate-change strategies.

The climate-change journey at PETRONAS has been evolutionary.

"We first built our capability, tools and standards to inventorise GHG emissions, following which, we focused on operational excellence initiatives to help in reducing GHG emissions," he says. Then in 2012, we came up with a carbon commitment. Instead of focusing on just accounting emissions, we started to have an internal target to reduce GHG emissions," he says, disclosing success stories between 2012 and 2017 in annual PETRONAS Sustainability Reports, the internal goal of shaving eight million tonnes of carbon dioxide equivalent (CO₂e) was achieved.

Having ticked that box, as a responsible company, PETRONAS is now in the midst of setting the next set of targets,

leading up to 2030, aligned with Paris Agreement and the United Nations' Sustainable Development Goals (SDG). One of the SDG is climate action, and it is governed and operationalised under the UN Framework Convention on Climate Change (UNFCCC) negotiations, in particular, the Paris Agreement in 2015.

The agreement's central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 °Celsius and to pursue efforts to limit the temperature rise even lower to 1.5 °Celsius.

"Since we are operating internationally, we need to see which countries have ambitious reduction targets and if they are going to introduce laws on mandatory reporting or carbon pricing. We need to keep our radar open every year to screen for changes resulting from the annual global climate-change negotiations.

"We highlight emerging legislation in relation to climate change, and work closely with Group Risk Management and Group Corporate Strategy as well as the Business Risk fraternity to manage potential exposure arising from carbon liability.

"We partner with Group Research and Technology to ensure that the right technologies are developed at the right time," he adds.

"By early next year, we'll have a digital GHG dashboard internally so that our people can view the carbon footprint of each operating unit and business – allowing management to track and make the necessary early interventions."

The low-carbon journey of the organisation is building momentum, says Thirupathi, pointing out that new plants or facilities built after 2013 will need to comply with the PETRONAS Carbon Commitment to ensure business sustainability.



Thirupathi Rao

Going SOLAR

In 2012, PETRONAS embarked on a solar-power project, which saw the commissioning of a 685-kilowatt solar photovoltaic system on the rooftop of Suria KLCC.

The system is reported to be able to supply 30 per cent of the mall's energy needs or power 250 typical Malaysian households for a month, and saves emission of 360 tonnes of CO₂e annually.

On the heels of the Suria KLCC project was the development of a 10MW solar plant in Gebeng, Pahang. Both projects were developed under the feed-in-tariff (FiT) scheme. Through the FiT scheme, companies and homeowners can sell

energy generated to the national grid at a fixed rate for 21 years.

More recently, there has also been a push to look at the feasibility of installing solar panels at PETRONAS assets, says Thirupathi. This project is called SINARAN (Solar INstallation and Application on PETRONAS Rooftops & Assets Nationwide).

"We surveyed all our facilities, including training centres, buildings, depots and petrol stations and we found it's possible to install 30 MW peak of Solar PV on the rooftops of our facilities, as a start," he says, adding that this will increase our Solar PV capacity by three times resulting in the reduction of electricity bill as well as GHG emissions.