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OP-ED FOR SHELL ECO-MARATHON ASIA/MAKE THE FUTURE SINGAPORE BY JOHN ABBOTT

Will the cars of the future have four wheels? Or three? Or none at all? Will they even have windows? And what will we use to fuel them? An event taking place next weekend will provide a little preview of what that future might have in store: the Shell Eco-marathon. At Singapore's Changi Exhibition Centre, students from around the world will compete to drive the furthest distance on the least amount of energy.



Some will drive ultra-efficient petrol and diesel cars. But others will drive cars powered by hydrogen, liquefied natural gas, ethanol, and lithium batteries.

It's a lot of fun... but it's more than just fun.

The world is undergoing a transition to lower-carbon forms of energy. If it's to succeed – and it will take decades, not years – transport must be at the heart of that transition.

Climate change poses a challenge and opportunity to every one of us. The development of lower-carbon fuels for our cars, trucks, ships and planes is critical to global efforts to tackle it. Transport accounts for 28% of world energy consumption.

And as Asia's economies grow, there will be more people on the roads, eager to travel and to own and drive cars. Today, there are roughly 1 billion passenger vehicles on the world's roads. By 2040, the International Energy Agency (IEA) expects this number to reach around 2 billion.

It is crucial, therefore, to cut emissions by boosting the efficiency of vehicles. But make no mistake, that is just the start. Yet, there is no simple, single answer when over 90% of transport runs on liquid fuels as it does today.

The world will need mass-produced and affordable battery-electric cars; it will need hydrogen fuel cell electric vehicles too, with their greater range and quicker refuelling. The infrastructure to support these vehicles must be put in place. And most importantly, consumers must be willing to make the change.

BMW, Tesla and others are making great advances on battery-electric cars and Shell, amongst others, is exploring ways to make the charging up process better.

Electric vehicles have made much progress but there is a long way to go. According to the IEA there are now over 1.26 million electric cars, a global market share of around 0.1%.

Tesla says it plans to sell 500,000 electric cars a year. Using current technology, they would require roughly two-thirds of the world's annual lithium production for their batteries. Supplies for other minerals like cobalt could also come under pressure. And with over a billion cars on the roads, 500,000 is, in any case, less than one two-thousandth of the world's fleet.

Finally, an electric car is only as clean as the source of its electricity. That means lower-carbon natural gas power generation or renewable energy, or a combination of both.

The world move towards lower-emission transport will be helped by cleaner and more economical fuels, more efficient lubricants and better engines too. Low-carbon biofuels will be important, too. The next generation of this technology will be able to convert waste directly to fuel.

Such innovations, among many others, will help the world make the transition to a low-carbon and more energy-efficient future.

Ultimately, if the huge transport sector is going to be transformed successfully over time, we will need all the creativity we can muster among the designers and the engineers of the future.

We hope the fun had this weekend at the Changi Exhibition Centre can help nurture that creativity. This year, 124 student teams from 20 Asia-Pacific countries, including 27 students from Brunei's local institution will be taking part. Perhaps, among them, are people who will go on to help revolutionise transport for a low-carbon future. Five years ago a man called Konstantinos Laskaris competed in the event. Today, he is chief motor engineer at Tesla.

Now, as then, Shell wishes him the best of luck.

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Notes to Editors Brunei Shell Petroleum Company Sdn Bhd (BSP) should be referred as BSP or Brunei Shell Petroleum for abbreviation or headline purposes. Brunei Shell Petroleum Company Sdn Bhd's activity is primarily for the exploration and production of crude oil and natural gas from onshore and offshore fields. The Government of Brunei Darussalam and a company in the Royal Dutch Shell Group of Companies each owns a 50% stake in BSP.