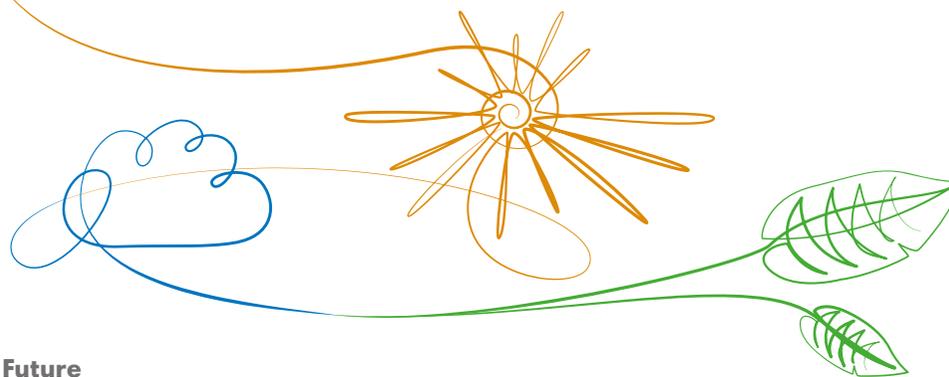


the tree the sky the sun



A Pathway Towards Malaysia's Carbon-Neutral Future

Shell, in consultation with key local stakeholders, has published *The Tree, The Sky, The Sun*, a story of how Malaysia could reach the **sky** – carbon-neutral by 2065 – with its unique advantages of **tree** and **sun**.

This aspirational scenario calls for fundamental changes to Malaysia's energy system, at a pace which will be challenging for any nation to meet. Malaysia's ambition to become a developed country and provide a better quality of life for its growing population has the potential to increase the country's greenhouse gas emissions. But instead of taking a carbon-intensive development path, today, the country has an opportunity to deliver economic growth that is environmentally sustainable by relying on low-carbon sources of energy, adopting new technologies, and preserving and restoring the country's natural carbon sinks – its forests.

By recognising and understanding the important levers in this journey, we hope that this story spurs discussion and adds to the national conversation about the energy transition.

Malaysia's carbon-neutral future

The Tree, The Sky, The Sun illustrates a technically possible but challenging pathway for Malaysia to achieve a carbon-neutral energy system by 2065*. Malaysia starts from a position of strength with its natural advantages of *tree* and *sun*, but the pace of change will need to accelerate.

The economy-wide transformation required to achieve a carbon-neutral state will be underpinned by **carbon pricing**, or the **external cost of carbon**, which is phased in starting from 2026. This drives reallocation of capital and resources toward low-carbon and energy efficient choices. By 2065, **renewable** sources of energy will dominate a deeply electrified energy system. **Solar** is the country's single largest energy source, coal has been phased out, and the remaining natural gas in the energy mix is used primarily to support renewables. **Biofuel** displaces oil as the preferred liquid fuel for transportation and is used increasingly to meet

the demand of difficult-to-electrify sectors such as aviation and shipping. **Hydrogen** starts to emerge in the 2030s as a fuel for industry and transport. Gains in **energy efficiency** allow the country's increase in final energy demand to remain marginal, despite healthy economic growth. Any remaining emissions from the energy system are removed by nature or technology – **reforestation** of an additional 5.8% of Malaysia's land mass captures up to 29 million tonnes of CO₂ per year.

Crucially, it will take policy frameworks and open public engagement to create societal support for action and enable the development of low-carbon solutions and green technologies. Strong collaboration across government, business and society will be crucial to make progress at the pace required for the energy system to be carbon-neutral by 2065.

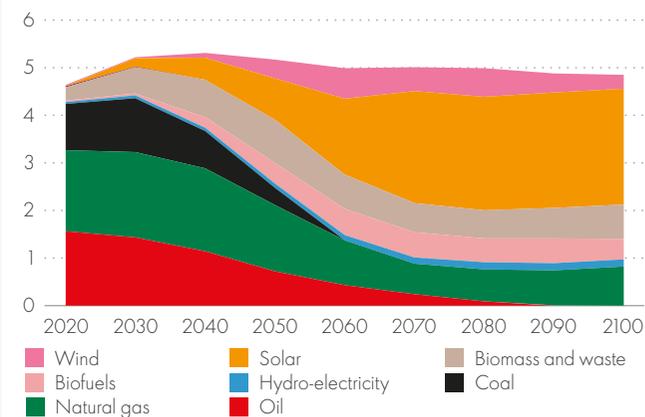
*The point at which Malaysia achieves carbon-neutrality depends on how aggressively the levers discussed are pursued. The pathway presented in *The Tree, The Sky, The Sun* is a product of Shell modelling and consultation with key stakeholders in Malaysia. Other pathways are possible and depend on societal and policy preferences, but we believe the key levers outlined here will feature in any credible pathway.

CHANGES IN HOW ENERGY IS PRODUCED

Renewables dominate, especially solar

Total primary energy

EJ per year



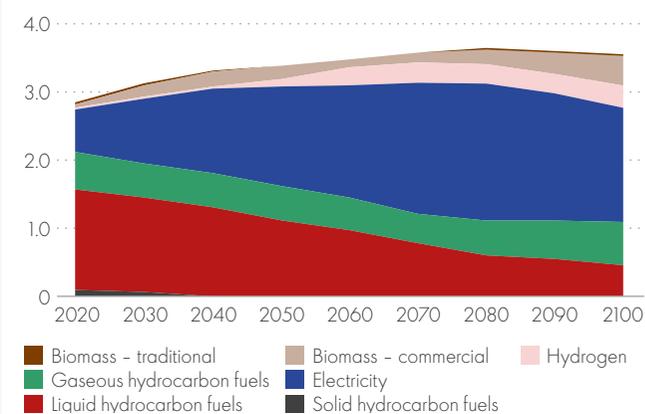
Source: Shell analysis based on historical IEA data

TRANSFORMATION OF ENERGY CONSUMPTION

Deep electrification, but hydrocarbons remain

Total final consumption

EJ per year



Source: Shell analysis based on historical IEA data

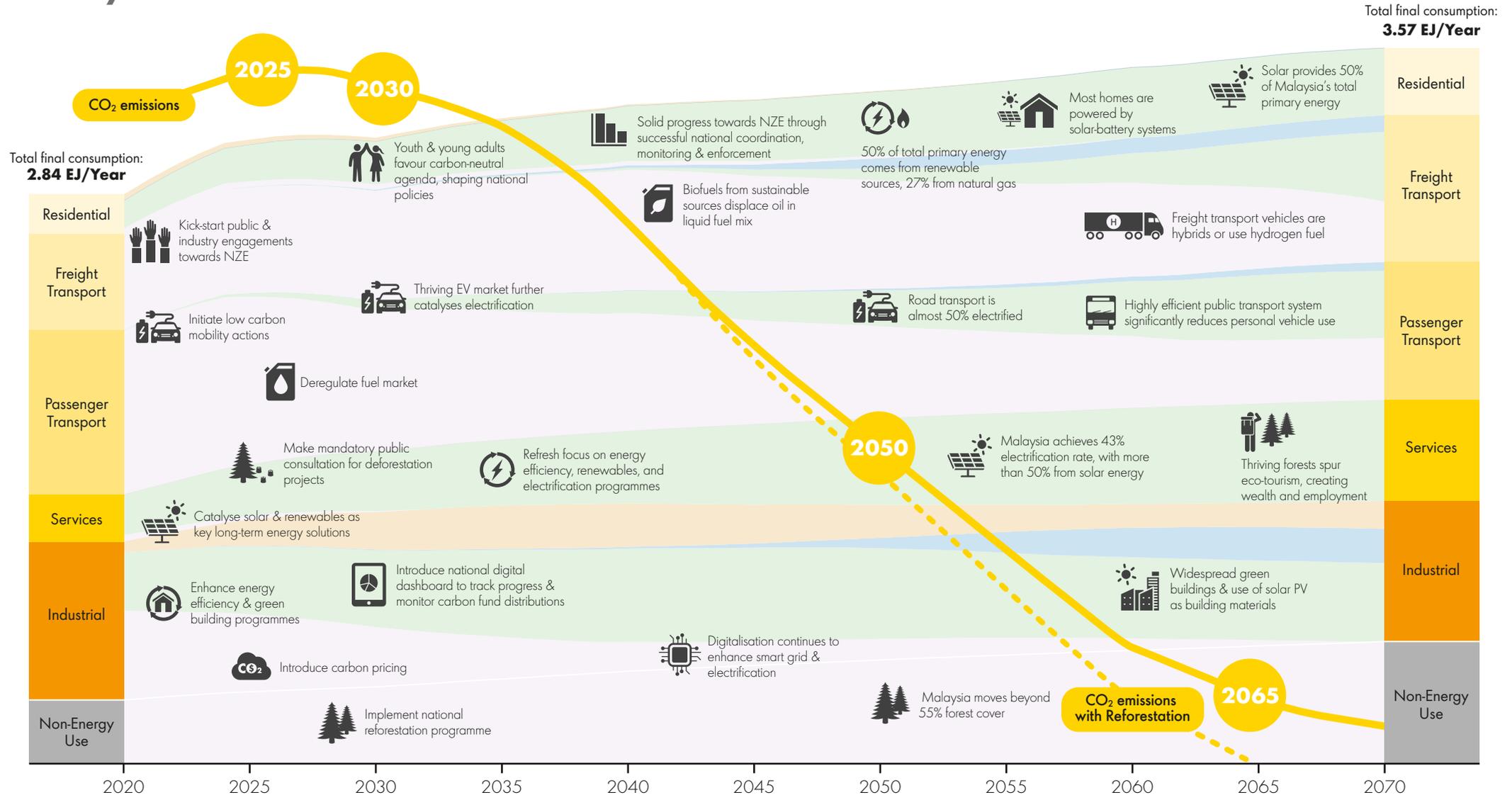
the tree, the sky, the sun

A Pathway Towards Malaysia's Carbon-Neutral Future

FINAL ENERGY FLOW IN MALAYSIA:

- Hydrocarbons
- Electricity
- Hydrogen
- Biomass

NZE: Net-zero emissions, or carbon-neutral, is the balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases



To find out more, please visit: www.shell.com.my/treeskysun

Scenarios describe possible future worlds to help stretch how we all think about and plan for the future - so we can make better decisions today. This scenario starts with data from Shell's Sky scenario and uses additional data from Shell's World Energy Model. We assumed the Malaysia energy system reaches net-zero emissions by 2065 and then worked back to see how this could occur. While there are other possible paths for Malaysia to achieve a net-zero emissions energy system, we believe this scenario is technically and economically possible. Nevertheless, it will be highly challenging and action must begin immediately. Our scenarios are not predictions, Shell strategy or business plans. Our scenarios present possible pathways for society to meet the goals of the Paris Agreement. Accordingly, when developing Shell's strategy, our scenarios are one variable among many that we consider. Ultimately, whether society meets the goals of Paris, is not within Shell's control. While we intend to travel this journey in step with society, only governments can create the framework for success.