

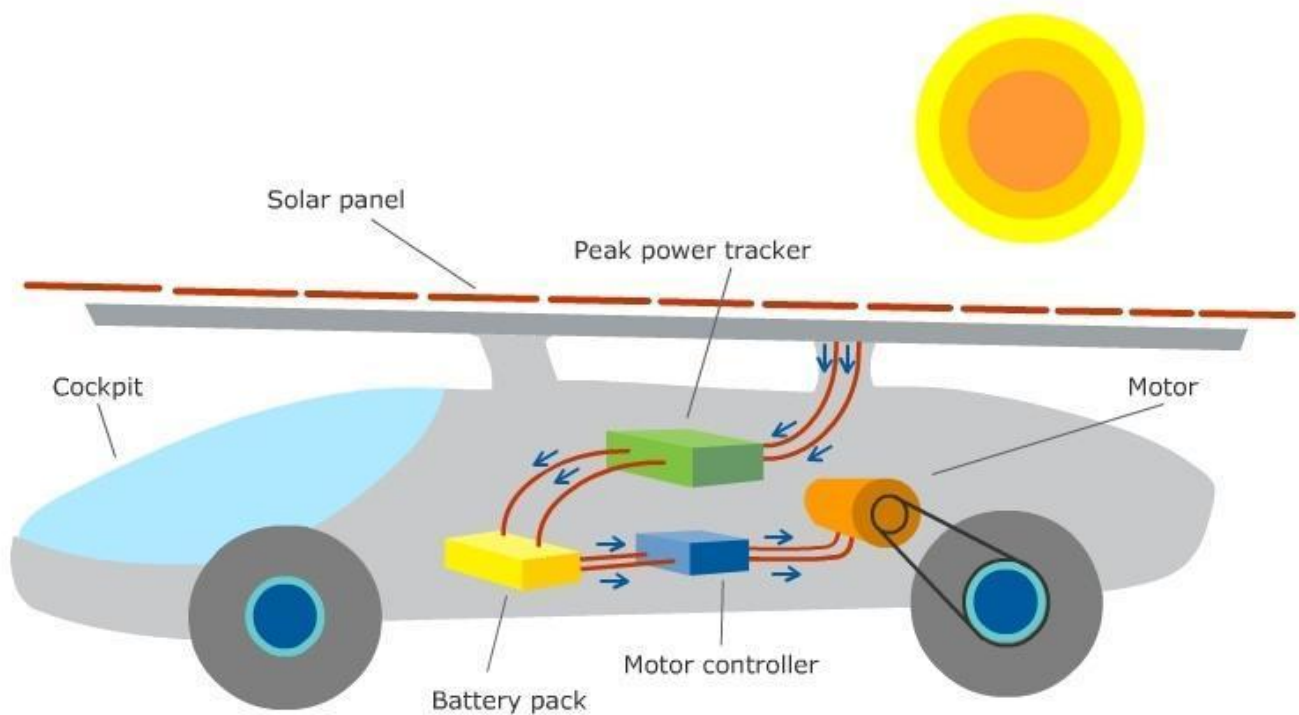
Are Solar-Powered Cars the Future of Transport?

The transport sector accounts for one-fifth of global carbon emissions ([Ritchie, 2020](#)). With all the discussions surrounding [net-zero emissions](#), it is crucial that we make transportation sustainable. So, how can we achieve this? Try solar-powered cars. They could be one of the best solutions to reduce [carbon emissions](#) from transport.

How do solar-powered cars work?

Solar-powered cars run electrically, using power obtained from [the sun](#). These cars use [solar panels](#) to harvest solar energy. Solar panels consist of [photovoltaic cells](#) that convert sunlight to electricity. The generated electricity runs the electric motor of the vehicle. These photovoltaic cells consist of [semiconductors](#) made up of silicon. Solar energy [frees electrons](#) in these semiconductors, creating an electron flow. This electron flow then generates electricity to power up the motor of the car.

This begs the question – can we drive these cars at night? The answer is yes. During the daytime, solar energy [charges](#) the car's battery. Cars are able to run with this stored energy. Still, the [charging capacity](#) of the battery may vary for different car models.



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How solar-powered cars work. Source: [Science Learn](http://www.sciencelearn.org.nz)

How far can we drive a solar-powered car?

The distance solar-powered cars drive depend on the [efficiency](#) of their solar panels. The efficiency of a solar panel then depends on the [cell temperature and energy conversion efficiency](#).

It is [estimated](#) that a car entirely covered with solar panels could only operate for a maximum of 40 km per day. This is assuming weather conditions are perfect.

For example, the [Sion](#) electric car from Sono Motors in Germany has 248 solar cells integrated into the car. It can run up to an average of 245 km per week under a fully charged battery.



Sono Motor's Sion solar car. Source: [Sono Motors](#)

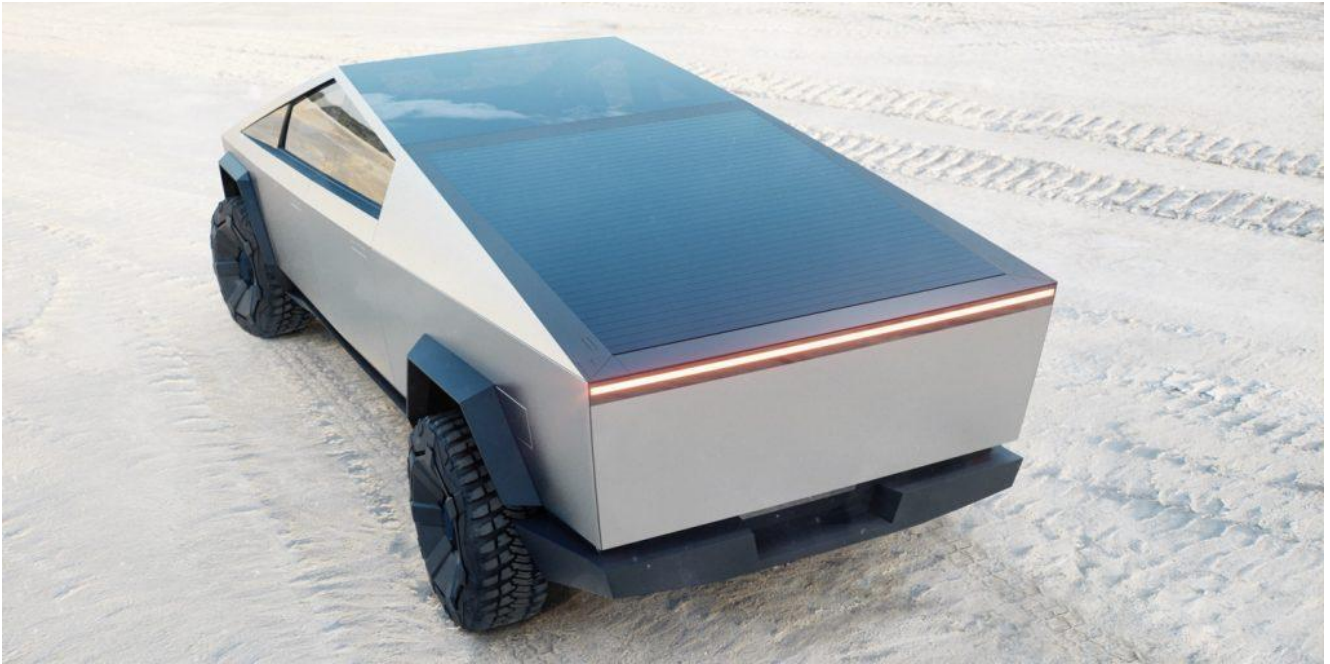
The [Bridgestone World Solar Challenge](#) is a great opportunity to encourage young inventors to design efficient solar cars. It is one of the most prestigious solar car events. In this [challenge](#), participants design and build solar cars that can run 3000 km in an outback route from Darwin to Adelaide.

The costs

Are solar-powered cars affordable? The cost of a solar-powered car may differ according to its developer. For example, the list below outlines the various costs of solar-powered vehicles:

1. California's [Aptera Motors](#) is starting its distribution of the first ever mass-produced solar car in 2021. It consists of 34 square feet of solar cells and could provide energy to drive up to 64 km on a clear sunny day. The cost will be USD 25,900.
2. Germany's Sono Motor's [Sion](#) electric will cost USD 30,000.
3. Tesla's [Cybertruck](#) has yet to be released to the market.
4. Dutch start-up company's [Lightyear One](#) will cost around USD 170,000. Marketed as a luxurious solar car, it can drive up to 800 km on a single

charge ([Jie & Inoue, 2019](#)).



Tesla's Cybertruck. Source: [Tesla](#)



Lightyear One solar car. Source: [Light Year](#)

Are solar powered cars our future?

The Benefits

Solar-powered cars come with many [benefits](#) and they are;

1. Relies on renewable energy. Therefore, they are sustainable and [environmentally friendly](#).
2. Reduces costs spent on fuel.
3. Low maintenance with no costs required for solar panels, except battery replacements.
4. Produces no greenhouse gas emissions. Thus, [no pollution](#).

Presently, solar-powered cars are being used in motorsports. It is no secret that they are going to revolutionise the industry ([Kirkland, 2020](#)). Their use in motorsports shows just how much potential they have. However, there are some [limitations](#) that make it difficult for commercial use.

The Limitations

Current commercial solar panels lack efficiency, having only about 20-35% efficiency ([Vyas, 2021](#)). Thus, in order to power solar-powered cars, it will require [numerous solar cells](#). Adding more solar cells means a need for more space. It also [adds weight to vehicles](#) and [ultimately increases their costs](#).

However, researchers have carried out studies to design [more efficient solar panels](#) and [lightweight batteries](#). Therefore, [advances in technology](#) can only increase the efficiency of solar panels and battery storage. As a result, in the near future, everyone will be able to enjoy a ride in cost-effective solar-powered cars.

As we approach net-zero emissions, sustainable modes of transportation will be critical. Solar-powered cars offer an emission-free mode of transport! To learn more about sustainability, visit our [THRIVE](#) blog for more information. Let's work together to make this world a greener place.