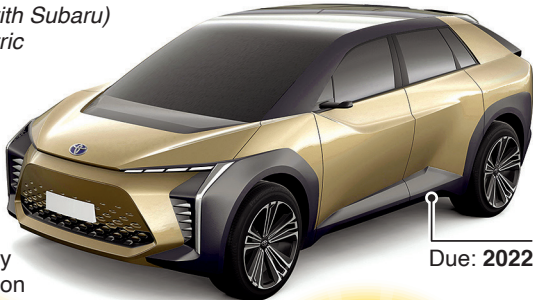


New battery to revolutionise car industry

In 2021, Toyota intends to debut an electric vehicle, powered by a solid-state battery, able to travel 500km in one go and recharge in 10 minutes

Toyota (in collaboration with Subaru) is developing its first electric vehicle (EV), dubbed **BZ EV** (right)



Due: 2022

■ **2021:** Toyota plans to introduce prototype electric vehicle powered by revolutionary **solid-state battery**

■ **2025:** Solid-state battery could enter mass production


HOW SOLID-STATE BATTERY COULD BE GAME CHANGER

Lithium-ion battery (*Li-ion*):

Technology has reached limit of efficiency

Electrons

Anode (-)

 **Liquid or gel electrolyte:**
Highly flammable

Battery:
Charged **ions** travel from **cathode** to **anode** through **electrolyte**. Free **electrons** pass from anode to cathode, powering device

Cathode (+)


Ions

Solid-state battery:

More powerful than Li-ion

Cathode (+)

Anode (-)

Solid electrolyte:  Smaller and lighter than liquid or gel. Made from sodium-based material, so less harmful to environment and less likely to catch fire

EV with solid-state battery could replace combustion engine vehicle because battery: has range of **500km** per charge (*more than double Li-ion fuel cell*); can fully recharge in **10 minutes**; can power EV for **380,000km** before degrading; requires no cooling system