



An Alstom hydrogen-powered train pulls into a station in Germany.

HYDROGEN TRAINS' TIME MAY COME, JUST NOT HERE

I have predicted that the long-term future for road vehicles will be by hydrogen-powered fuel cells. Let me explain how other modes of transport are developing.

In Germany, they have started running such trains as an alternative to diesel power.

These prototype trains were made by Alstom, a world-leading train manufacturer in France.

To understand this development, let me go back in the history of trains.

Rail transport became popular in the past two centuries, thanks to the invention of steam engines.

Steam locomotives have the advantage of huge tractive power, and coal is used as it is readily available.

Its heavy engine and the need for a coal bunker trailer was not a burden as trains only travel on level tracks.

Such locomotives faithfully pulled long and heavy trains across countries for centuries, moving goods and people reliably and affordably, until diesel engines took over in the mid-1900s.

Diesel locomotives are lighter and produce a lot less pollution due to the more efficient combustion process.

The older generation here will remember the early days of KCR trains.

In our early childhood days, we learned to pull up windows in wooden carriages before trains entered tunnels or coal soot would blacken our faces.

With wider diesel locomotive use in the 60s, we no longer needed to do that.

The present electric trains are even more efficient and clean, and for city transport, locomotives are not required as motors can be installed in carriages for more efficient traction and lower weight.

But everything has a price. City and suburban railways can efficiently use electricity with overhead power lines.

For travel across countries, especially those railway systems operating for more than a century, the fitting of power lines could be prohibitively costly.

Besides, it might not be economical to do so in remote regions just for trains.

That is why diesel locomotives



Nuts and bolts

Edmund Leung

continue to be used for many long-distance railways today.

The key for hydrogen trains is the availability of hydrogen.

France has a large number of nuclear stations that may have spare capacity to manufacture hydrogen at nighttime.

But as it has already developed a comprehensive electrically driven railway network, the potential for replacing its trains with hydrogen-powered ones is small.

But in neighbouring Germany, there is still some potential: that is why we see the two hydrogen-powered trains being tested in Germany.

The United Kingdom, Japan, Korea and many other countries will be trying out hydrogen trains soon.

Their wider application will depend on hydrogen supply in sufficient quantities at commercially competitive prices, but I am optimistic it will work.

What about opportunities for Hong Kong?

Fortunately, we have already developed an electric railway network from the mid-1980s.

We also do not have ready access to hydrogen supplies.

Electric trains, powered by overhead lines, have fully developed as the technology matured, and we are already enjoying the service free of pollution at relatively low costs and involving low maintenance of electric power systems.

For once in Hong Kong, we are ahead of the curve in terms of technological development in rail transport, thanks to the foresight and planning of our predecessors.

As we enjoy the efficiency and cleanliness of this modern transport system, we should be thankful to the engineers of the previous generation. **Veteran engineer Edmund Leung Kwong-ho casts an expert eye over Hong Kong's iconic infrastructure**