The Standard

Takeoffs in JET market require long runways

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People were excited to see the recent inaugural commercial flight of the China-made C919 from Shanghai to Beijing - a significant achievement.

Of all the forms of transport the plane is probably the most demanding technologywise.

Planes must be light, totally reliable and safe. They must also be economical on fuel to be fit for use for commercial operations.

It has been a big challenge to make planes commercially viable to transport passengers and cargo.

It's been about 120 years since the Wright brothers launched the world's first plane that could support its own weight. But even with the most advanced technological advancements in developing lightweight materials and aerodynamic design the best commercial plane nowadays can carry only about a quarter of its weight, including fuel, as a payload.

This explains why so few countries have the capability to design and make them and why the United States and France dominate as their planes are the most fuel efficient and safe.

Currently the Boeing 737 and the Airbus 320 are the most popular since they are energy efficient and possess the capacity and range that suit the biggest market sector, and the C919 compares favorably with them.

Dimensions such as its total length and wingspan, are generally similar, and so is carrying capacity, which is from 150 to 180 tonnes. The weights are also very similar, with the C919 just below 80 tonnes while the others are slightly above that.

Weight is especially important as it is probably the biggest factor affecting fuel consumption, and the C919 is claimed to have lighter materials based on aluminum, composite and steel for the body, wings and landing gear, which makes it competitive against established products.

It's said the C919 was made with 60 percent indigenous content. But the engine and the avionics are from leading international manufacturers such as General Electric, Safran and Honeywell.

I'd not be surprised to see within five to seven years the indigenous content increasing, and it will become less dependent on imported components.

At present, Comac, the manufacturer, has a healthy order book (said to be over 1,000 units and growing). Naturally, most are from Chinese airlines, and as production increases it's estimated Comac can produce 150 units per year. Hopefully by that time the plane will be certified for international flights and become a strong player in the market.

The significance of this plane is that China will soon become an exporter instead of an importer. We've seen this in motor vehicles and trains. China now makes the most battery electric vehicles and is the leading train manufacturer.

But the path ahead is not without hurdles. Unlike motor vehicles and trains, aircraft are subject to extremely stringent certification requirements, and international politics may not allow doors to be open for China to enter the market.

Like all manufactured products, efficient design and large production volume should make for world leaders. It may be many years for Chinese aircraft to become international leaders, but they will at very soon be recognized as a serious force internationally.

Engineers can design efficient machines, but market success depends on many factors such as commercial, regulatory and political aspects. But efficiency will win long term as physics doesn't change with commercial and political trends.

Veteran engineer Edmund Leung Kwong-ho casts an expert eye over features of modern life