

Don on a mission to roll out cheap, safe electric air taxis

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Tech Editor

He was called the “Steve Jobs of Rotorcraft” in 2013 by Wired Magazine for unveiling the world’s first electric aerial vehicle that year.

In June this year, Professor James Wang relocated to Singapore from Italy, armed with ideas to roll out a commercially viable electric air taxi in six years, or 2025.

He left Italian helicopter maker AgustaWestland, where he became known in 2013 for the invention, to join Nanyang Technological University (NTU) to take his research to the next level. “NTU has many of the key components of smart mobility – rechargeable battery, motor, flight and traffic control management and lightweight composite material researches – which can be modified and used for electric air taxis,” said Prof Wang in an exclusive interview with The Sunday Times.

He now heads NTU’s four-month-old research and innovation centre that focuses on this specialised field, dubbed electric vertical take-off and landing (eVTOL).

The centre aims to make Singapore a global supplier of disruptive technologies that will power a new generation of safer, quieter and

cheaper urban air taxis for short shuttles between major cities.

Aircraft today are powered by old technologies like turbine engines and the gearbox, which make the aircraft, and thus rides in it, expensive, he said.

For instance, it costs one US\$195 (S\$265) for a one-way eight-minute helicopter ride from Lower Manhattan to John F. Kennedy International Airport in New York. The service is operated by Blade Urban Air Mobility, a short-distance aviation firm. For comparison, going by ground taxi costs around US\$70.

Over the past year, many automotive and aerospace giants have jumped on the electric aircraft bandwagon, hoping to secure a slice of the future of smart mobility – expected to generate revenues of US\$270 billion and profits of at least US\$125 billion by 2040, according to New York-based research company Oliver Wyman.

Germany’s Volocopter, which took a test spin in Singapore at the Marina Bay area last month, is a type of eVTOL aircraft. Its backers include German automotive giant Daimler, American chipmaker Intel and Chinese carmaker Geely.

But Prof Wang, a 30-year industry veteran, is not too enthusiastic about the design of the Volocopter.



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FUTURE OF SMART MOBILITY

High-tech electric motors and longer-lasting batteries are the game changers in the automotive world. Now we have to make them fly taxis and make an aircraft that is cheap, powerful and light.



PROF JAMES WANG, on the future of electric aircraft. He hopes to roll out a commercially viable electric air taxi in six years, or 2025.

“It has too much drag. Thus it will not travel far,” he said, noting that many of the current designs, including those from renowned aerospace firms, look “crude”.

He believes that there will be a consolidation in the field over the next few years. The winners will have intelligent designs and strong financial backing. But those that can mass-produce cutting-edge technologies will also win. “Mass production provides economies of scale. There is a lot of untapped potential from the electric car production chain which can be used for making air taxis,” said Prof Wang.

The Taiwan-born American is looking for funding of at least US\$500 million from potential business partners – venture capital firms, automotive manufacturers or aerospace manufacturers – to carry out the mission he came to Singapore for.

Among his ideas are research to increase the maximum flight endurance between quick charges from 150km to 250km, and a new electric motor that can generate twice the horsepower without any increase in its size and weight.

Although ditching the pilot will lower operating costs further, it is not something that the public will accept until after 2030, he said. That is at least five years after a commercially viable electric air taxi is introduced here.

Prof Wang, who is in his 50s, holds two undergraduate degrees in aeronautical and electrical engineering. After completing a master’s from the Massachusetts Institute of Technology Sloan Business School and a

PhD in aerospace engineering from the University of Maryland, he started his career at US helicopter maker Sikorsky Aircraft.

He left America in 2007 for Italy to join AgustaWestland as its vice-president of research and development, where he managed an annual research budget of €25 million (S\$37.5 million). That was when he pushed the transportation technology boundaries with the world’s first electric aerial vehicle, coined Project Zero. In June 2011, a full-scale model performed a tethered flight in Cascina Costa, Italy. And two years later, the invention was unveiled at the Paris Air Show.

Now the same idea has also been picked up by ride-hailing service provider Uber. It is working with two US firms to design and build electronic air taxis to beat urban congestion. Although the needed safety regulations have yet to be laid down, Uber has already announced plans to make Uber Air commercially available in Dallas, Los Angeles and Melbourne by 2023.

“High-tech electric motors and longer-lasting batteries are the game changers in the automotive world. Now we have to make them fly taxis and make an aircraft that is cheap, powerful and light,” said Prof Wang.

And what if the industry does not take off?

He said jokingly: “My speciality is to design something that spins and runs with an electric motor. I could apply my skills to design washing machines if I lose my current job.”

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