



Pioneering electric aviation

Lessons learned and vision of the future



Towards zero-emission aviation in 2040

Avinor conference Oslo 2018



History



In the times of ex Yugoslavia – flying in secret, at night
“Pipistrellus” (lat.) - bat

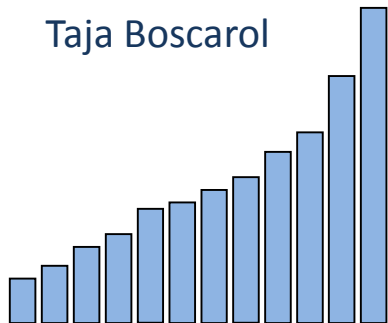


Est. in 1989 as the first private aircraft
producer in the former Yugoslavia –
made flying available to everyone.

Pipistrel Group



Mr. Ivo & Ms.
Taja Boscarol



Always positive growth,
never any loss



Pipistrel d.o.o.
Ajdovscina
(Slovenia)



Since **1989**
4,500 m²

Since **2011**
10,000 m²

Pipistrel s.r.l.
Gorizia
(Italy)

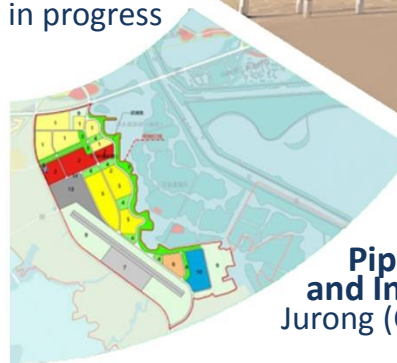


Since **2016**
4,200 m²



**Pipistrel Vertical
Solutions d.o.o.**
Ajdovscina
(Slovenia)

Since **2017**
in progress



**Pipistrel Asia-Pacific G.A.
and Investment**
Jurong (China)

Planned in
2018
230 m²



**Pipistrel
Branch Office**
New Delhi
(India)

**Pipistrel
Composites**
Vipava
(Slovenia)





12+ different aircraft models



1 – 4 seat aircraft, glider, motorgliders, trainers, UL,
LSA and Type certified, fuel and electric powered

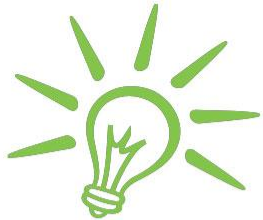


More than **1.500** aircraft produced
in 29 years



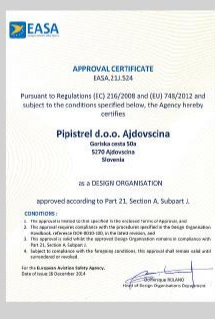
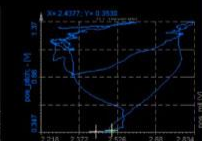
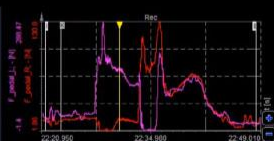
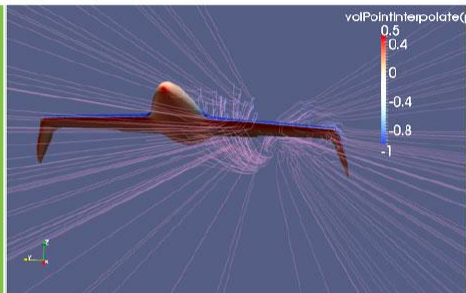
Experience second to none, catering to private and government
customers in **95 countries** on **5 continents**

Worldwide market, excellent reputation and customer trust,
production is booked in advance, producing **one aircraft every working day.**



All steps of process in-house:

Pipistrel offers all the phases of the process:



- idea and development
- prototyping
- testing on ground and in the air
- certification process
- serial production
- own international network for after-sales support



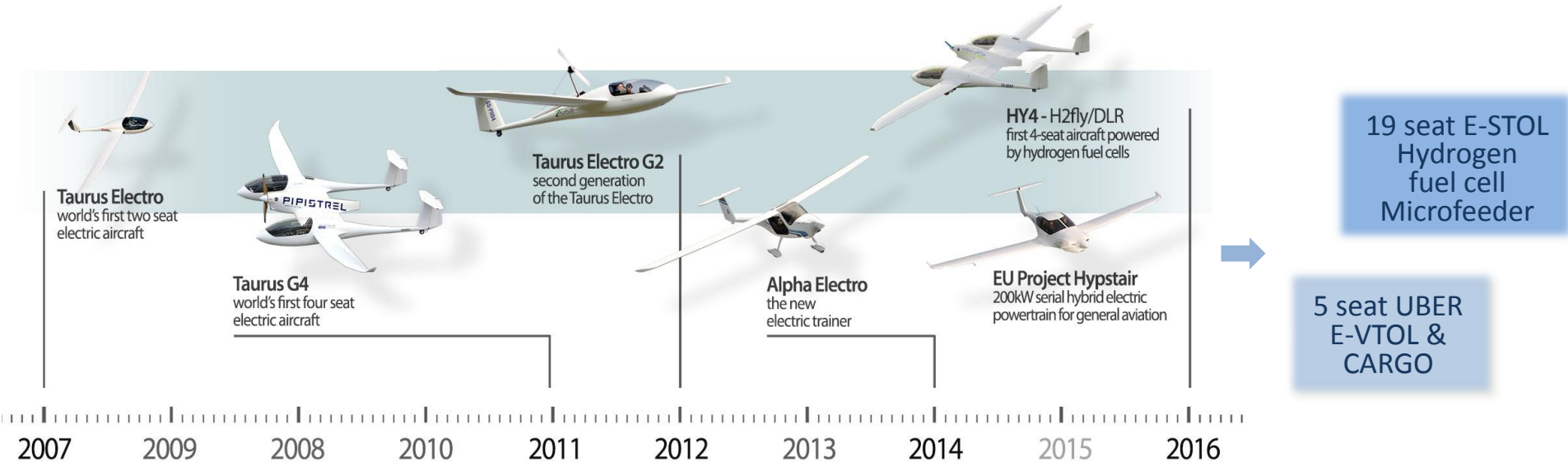
EASA DOA & POA

Design guidelines for Pipistrel aircraft:



- As little **drag** as possible
- As much **lift** as possible
- The lowest possible **engine power**
- The lowest possible **energy consumption**
 - Flight **without** engine power
 - As little **noise** as possible
 - Ease of **handling**
- Environment-friendly **biodegradable** materials

Our Electric Aircraft Projects & Awards



Nomination for
Collier Trophy

3 x NASA
Challenge winner

Bill Piper
Award



The future is electric!



The future is electric

Why is the transport turning to electric?

Why are renewable sources essential?

- Solar power: 2 minutes = 1 year's global population needs
- Only the “energy Internet” is needed to supply entire globe
- Electricity can be produced locally everywhere
- Ease of transfer
- SMART GRID - rationalisation

Advantages of electric propulsion

- Low cost
- Low noise
- High efficiency propulsions
- Eco friendly



Why electricity in aviation?

- Vertical take-off and landing A – B, time and money savings
- Multirotors
- No wings
- No airports
- No pollution
- Pilotless



A decade ago

PIPISTREL Taurus ELECTRO

- **FIRST** 2-seat aircraft with electric propulsion in the world
- Serially produced since December 2007





In 2017

PIPISTREL Alpha Electro: **serial production of one per week**



Users, authorities and the general public are more interested in sales than the scientific approach.

This year



AVINOR: first order from Norway, big support

- Norway, France, Switzerland & Finland: national certificates
- EASA Certificate is planned in December 2018
- Annex 1: increase of weight to 600 kg will open the sky to UL electric aircraft in EU



Australia & Canada



Electric flight has roots on the ground

- Power supply
- Charging stations
- Grants
- Aviation standards
- **Legislation**

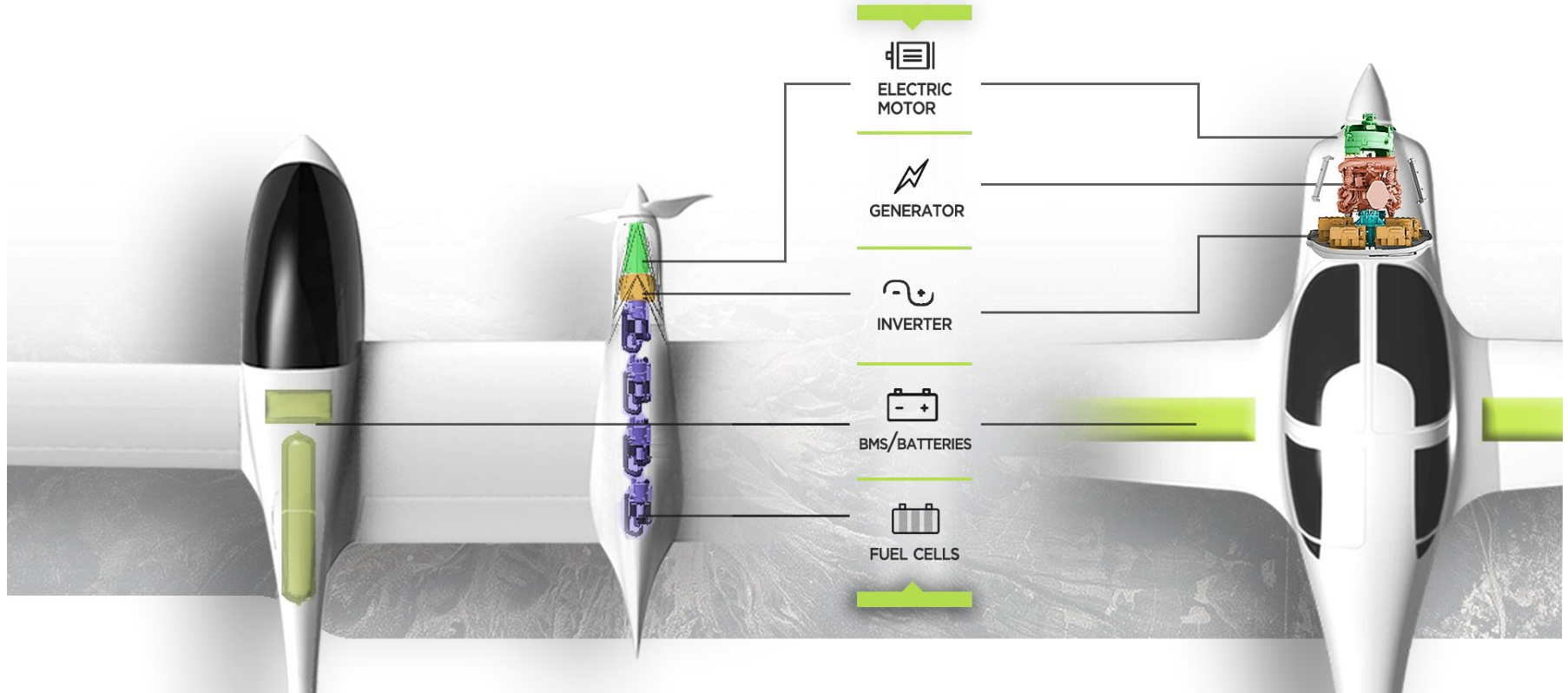


Authorities' vision of mechanisms and support of the process to achieve mass use.
Norwegian concept of incentives to electric cars should include electric aviation.

Coming in 2019!



EU Project MAHEPA - 4 seat Hybrid Aircraft



Flying prototypes in 2020

After that, 5 years testing & certification

Partnership with UBER

Pipistrel has been chosen
by **Uber** to develop:

- 3-5 seat VTOL
- electric or hybrid
- designed for city traffic
- 60 miles range
- 150 MPH speed

Start-up cities: Dallas, Dubai,
London, San Francisco,
Singapore, Shanghai

Pipistrel and **Uber** share
the same vision:
improvement of
life quality in
big cities

Make the
atmosphere
clean again!

Less noise,
less pollution
less stress

Spend time
with your loved ones,
not in traffic jams

Uber's market and
potential combined
with **Pipistrel's**
experience

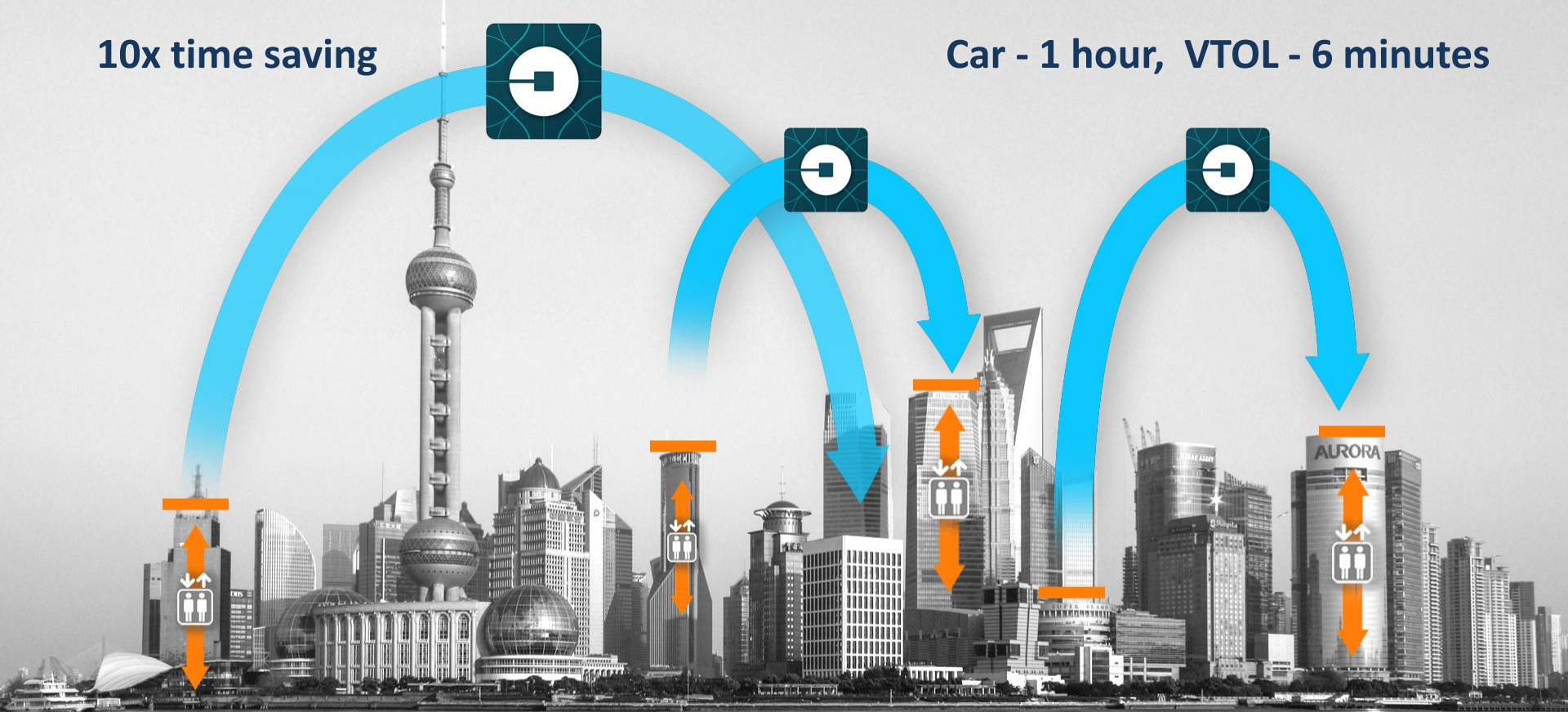


The most urgent transport challenge: emission-free traffic in megacities



10x time saving

Car - 1 hour, VTOL - 6 minutes



- CO₂ savings in billions of tones
- Cooler atmosphere
- Better visibility

- Noise reduction
- Energy produced locally
- No smog pollution



WTOL

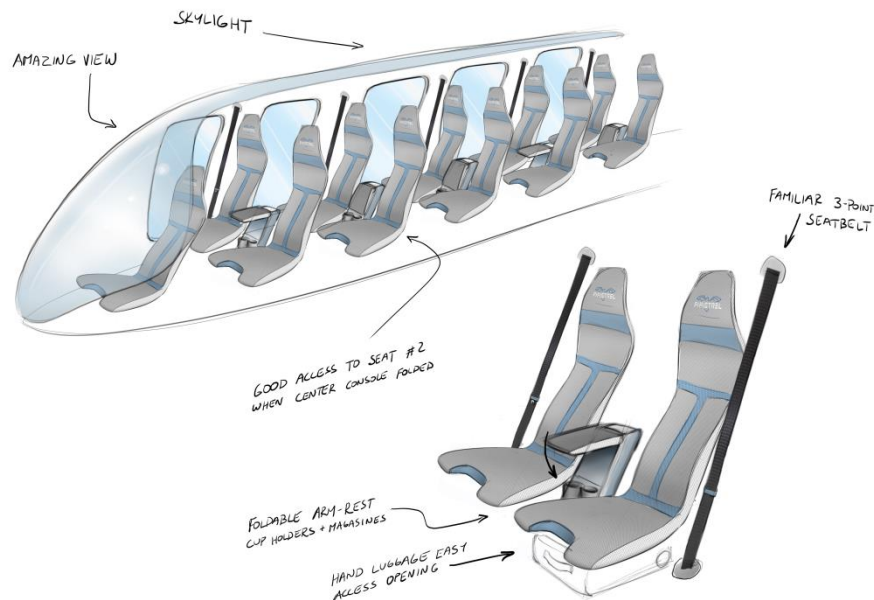
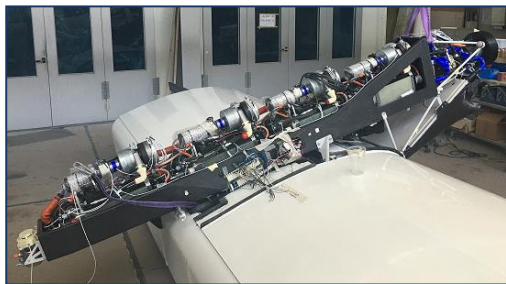
Window Take-Off
and Landing

PIPISTREL

Robert Brown

Coming in 2025!

19 seat E-STOL Hydrogen Fuel cell Microfeeder

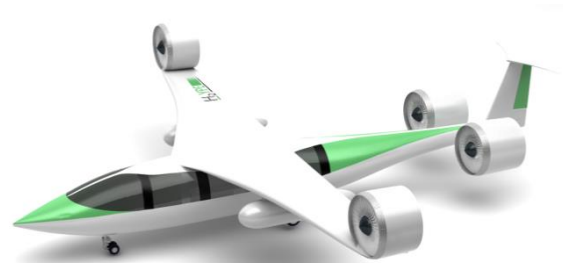




**I believe in the future of clean aviation -
and Pipistrel is proving it on the market.**

**A 100-passenger electric flight over the Atlantic
with current technology may still be infeasible...**

But by 2040 it will happen!



There are no goals which technology could not reach eventually.
The only obstacles on the road to success... are in our own heads!



Thank you for your attention!

Enjoy the next presentation...



Ivo Boscarol
Pipistrel CEO

...and I will return to my world.

