

Mini-Bee for TRL4
2PAX VTOL hybrid multicopter
Ultra light air ambulance

Mini-Bee – Hybrid VTOL

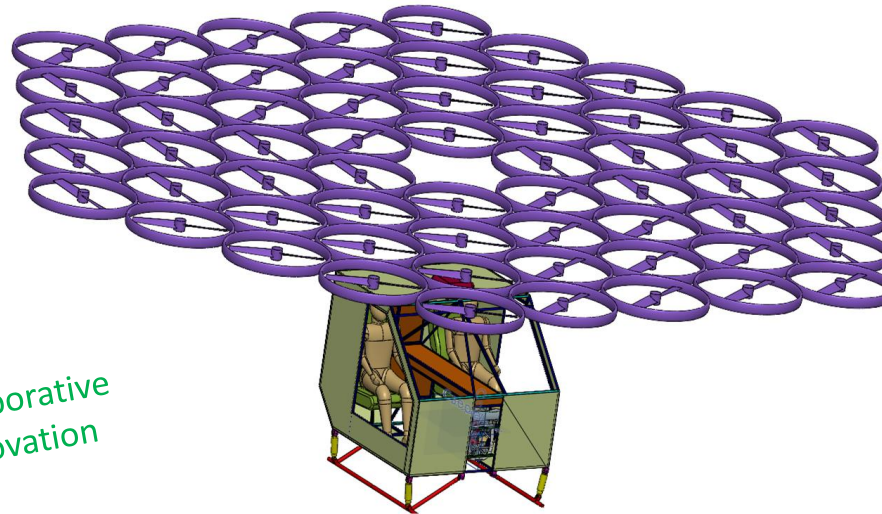
Regional Institutions



Urban Air
Mobility



Drive your
aircraft!



Collaborative
innovation

Public Fundings



Previous Incubators and institution



MINI BEE

Mini-Bee TRL3

2

www.mini-bee.com
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29 June 2022
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Fondations and associations



Emergency and
humanitarian
missions

Financial partners



Industrial
development



Institutional networks



Academic partners

Academics



Page Discussion

Minibee TRL3

Mini-Bee TRL3 task is active

Go back to Mini-Bee page.

Please refer to www.collaborativebee.com for usefull links on the project.

Brief summary of Mini-Bee projects since start in 2015.
File:Mini-Bee Evolution Projets v1.pdf

Collaborative Projects

- Mini-Bee
- Bee-Plane
- Iso-Plane

Social Media

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Information is available on
<https://wiki.collaborativebee.com>

Industrial Property

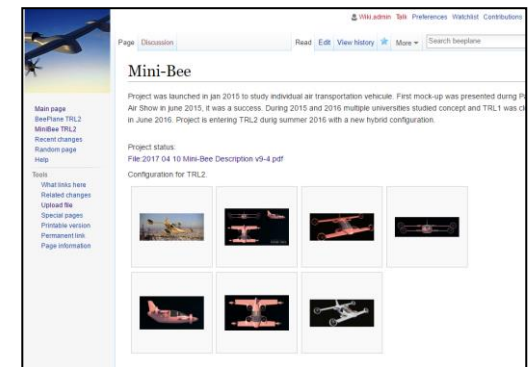
Lesser Open Bee License 1.3

- Mini-Bee project is achieved under dedicated **lesser open source** license mainly for **Academic** partners
- It allows multiple actors (academic, industrial, individuals) to collaborate in an **open-innovation** workflow. Project works are mainly shared on a public wiki.
- Tasks are achieved with coordinator management : **Technoplane**
- **Private Tasks** (without public disclosure, mainly for **industrials**) or product covered by other licenses or other intellectual property rights can be included within the project. Only interface works will be covered by the open source paragraph of the Lesser Open Source License
- Any Participant may use works done on the Project for technical or commercial use. By default, standard **royalties** percent are defined

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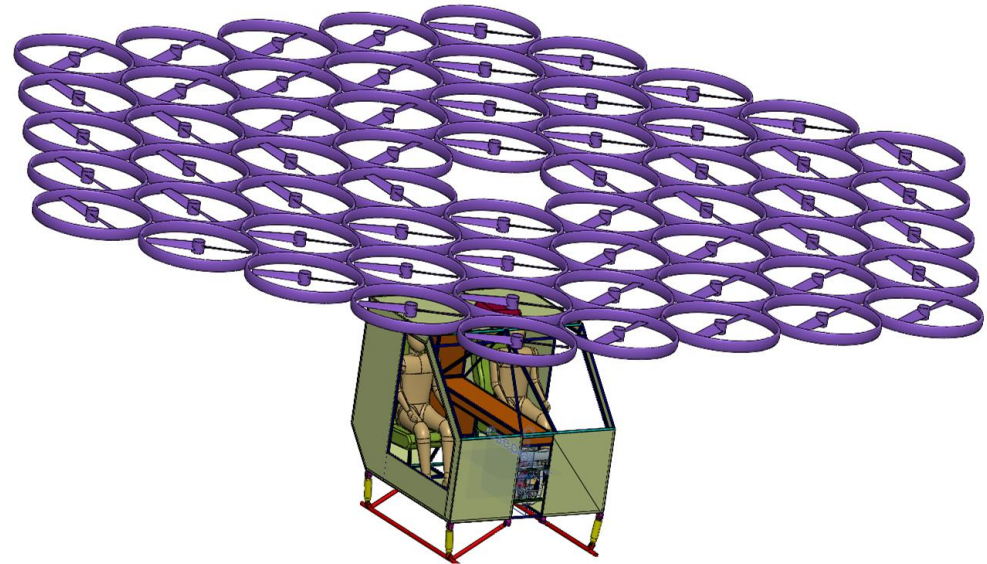
www.collaborativebee.com



Mini-Bee 2PAX : Hybrid Powered solution

Basic flight path

PAX	2 (including 1 pilot)
Rotors	60
Battery	None (only 12v)
Cruise speed:	170km/h
Range:	600 km
MTOW:	700 kg
Max power:	100 kW



Fuel tank



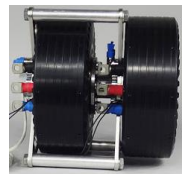
No Battery

5800 rpm / 2300 rpm

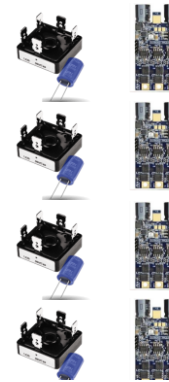


Rotax 915IS
141HP

10 Rounds



Emrax 268 twin HV
CC 2*6Phases

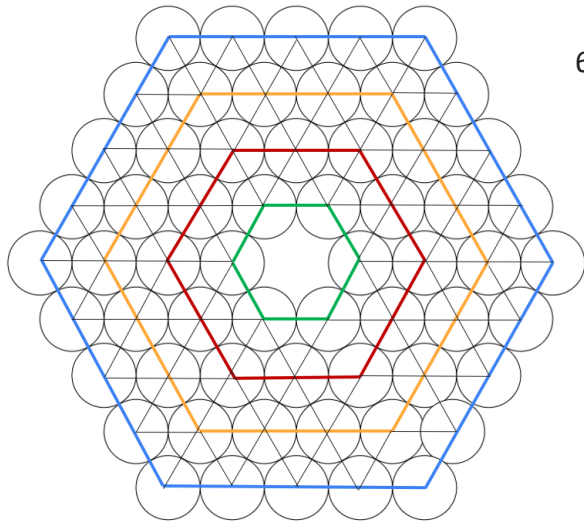


Supercondensator

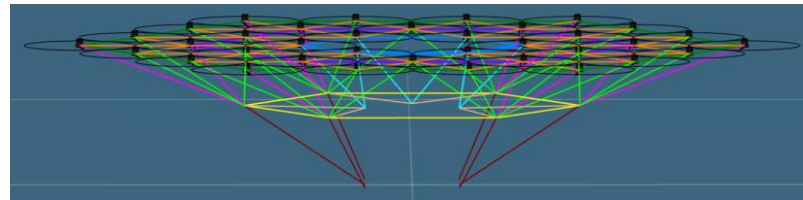


Qty 60

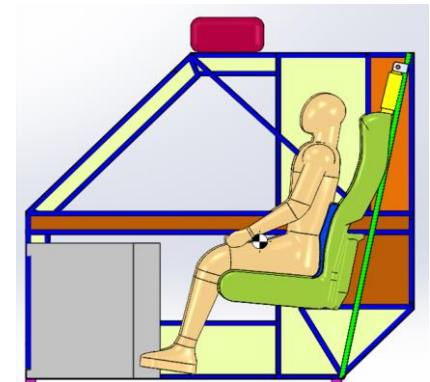
Actual 2PAX configuration for prototype



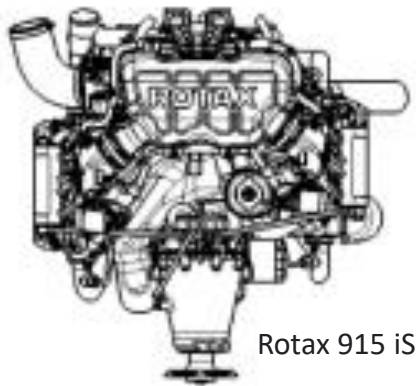
60 Rotors



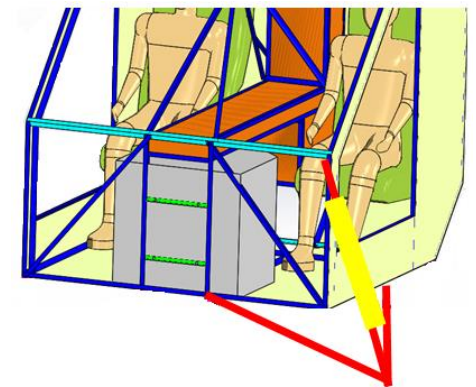
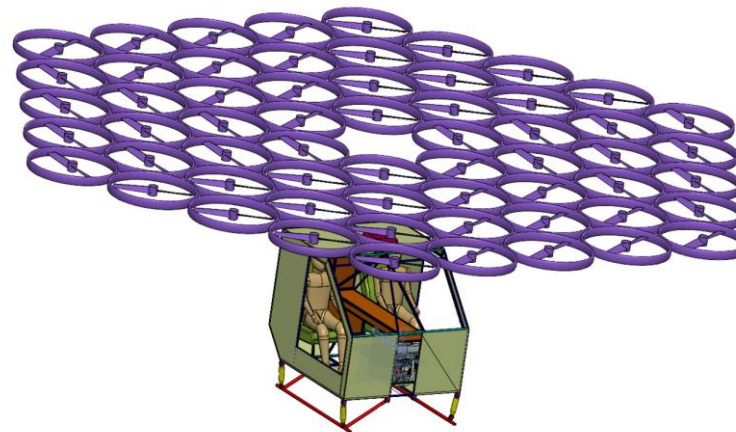
Composite tubular structure



Anti-crash seats and structure



Rotax 915 iS



Flight controls

Computerized flight controls

Emergency beacon ON

Computers ON



ON

Sport mode ON

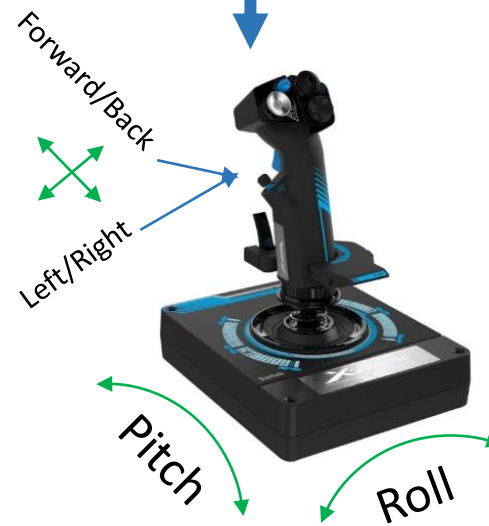


Engine Boost

Basic flight controls



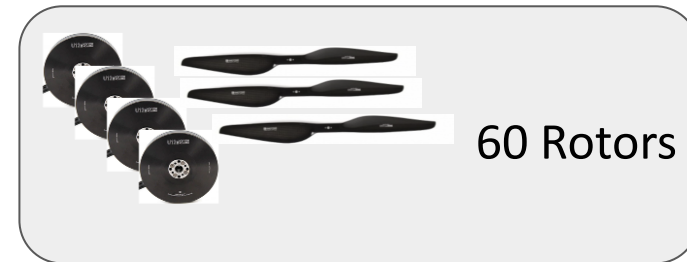
- ▲ Accélérer
- ▼ Freiner
- Stop
- ▼ Descendre
- Radio



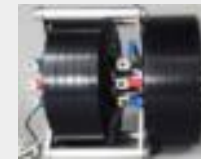
Joystick activated



Sensor integration



Flight and engine monitoring



STM32F401RE



Physical sensors



Benchmark compared to small helicopter

Existing helicopter solutions

Mini-Bee solutions



Robinson R22

- Single-Engine
- No Parachute

No rotor loss

Autorotation in case of emergency landing



Zephyr

- Parachute



- Cost



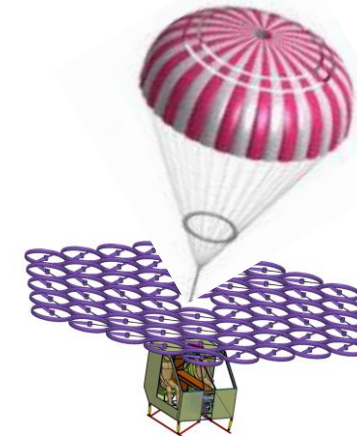
EC130

- Cruise speed: **261km/h**
- Purchase cost: **3,6m\$**
- Total Variable cost/h: **\$847**



EC135

Turbine Engine



High Security

Parachute

Loss of multiple rotors



Source power piston engine

Cost effective

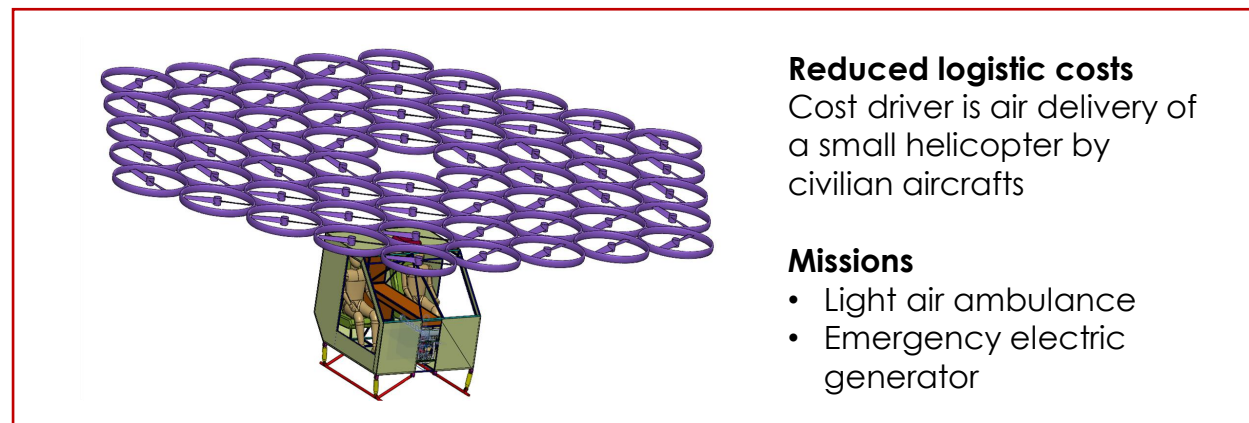
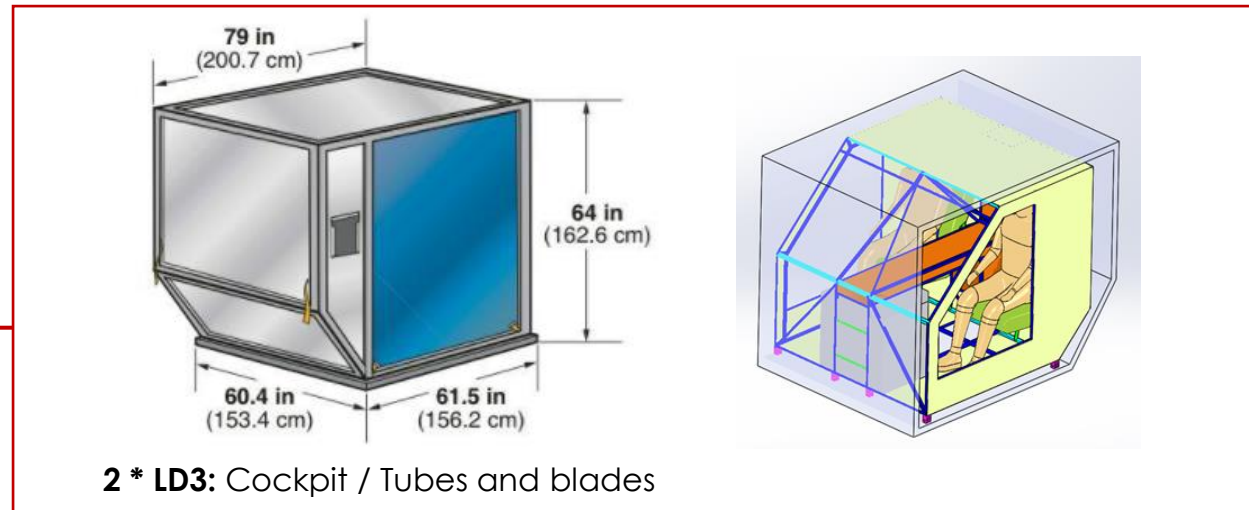
Mini-Bee : Modular deployment

Air **transportation** by
civilian aircraft

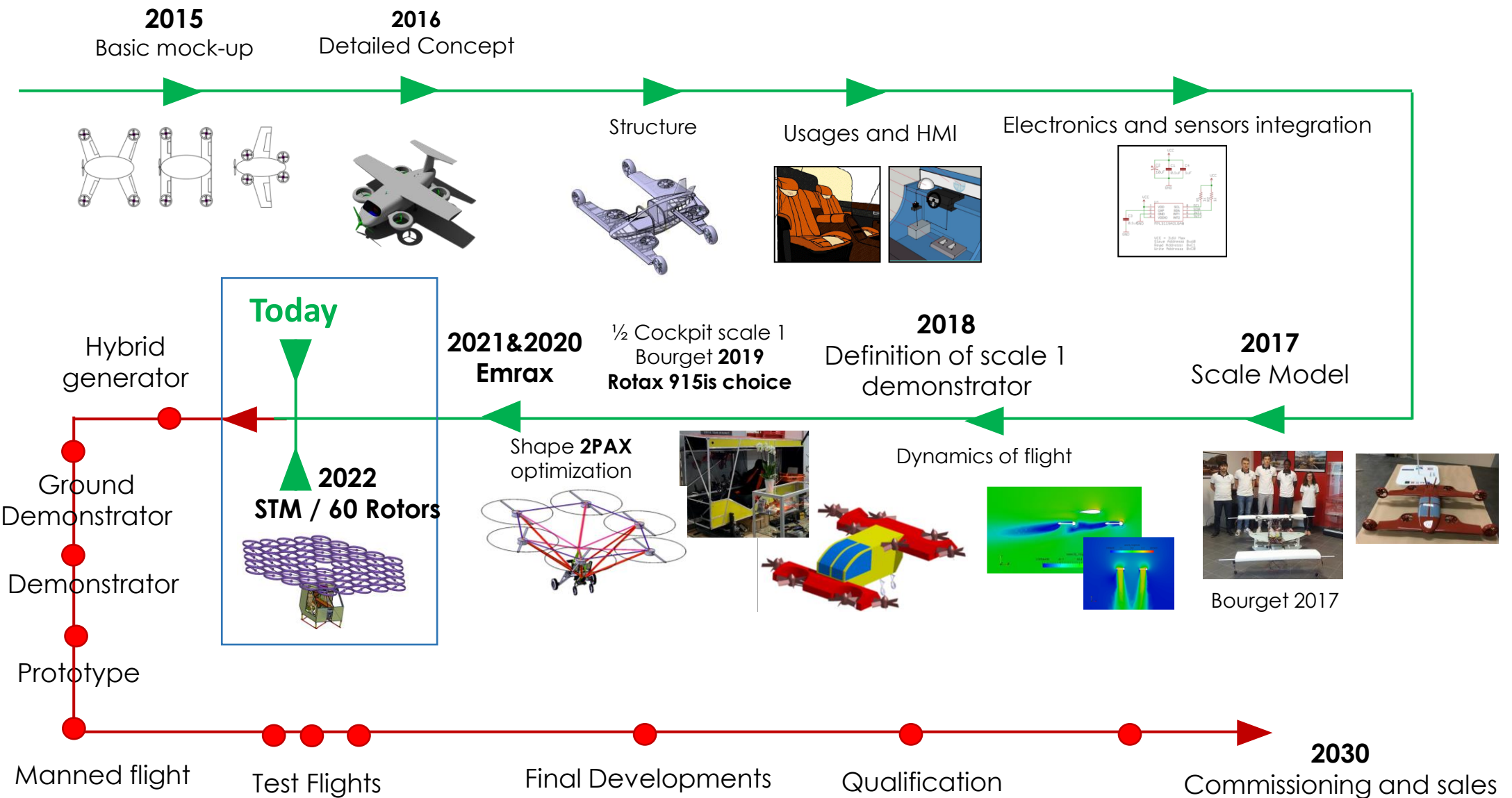


Mini-Bee can be loaded
onto civilian aircrafts
cargo soute

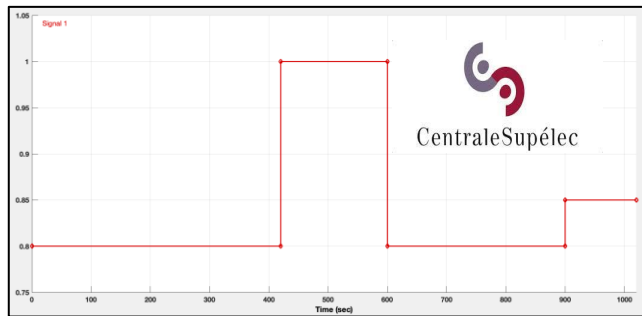
Mini-Bee can be **easily
mounted** on tarmac



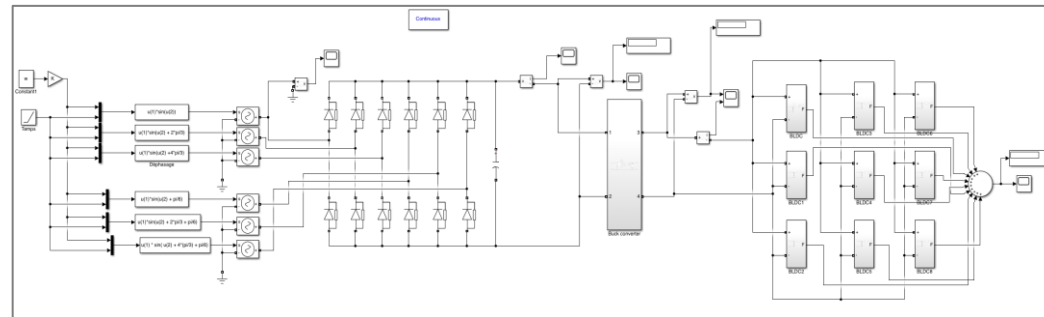
Mini-Bee – Project development steps



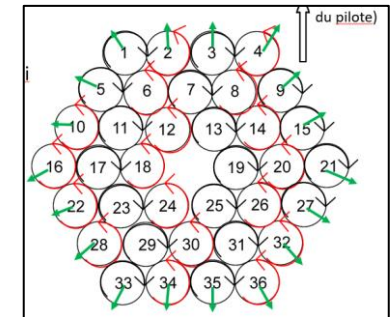
Power and flight control simulation



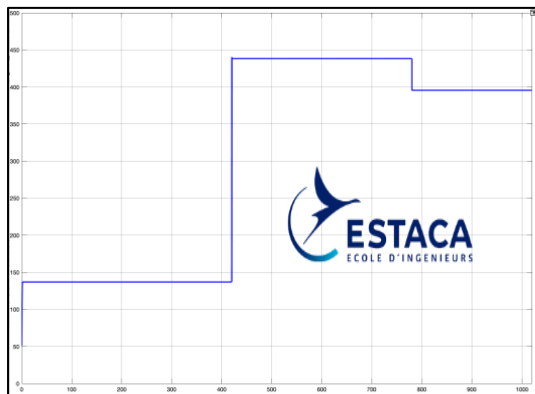
Power control



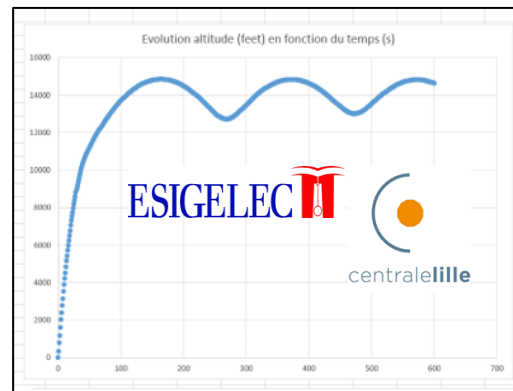
Hybrid power generation



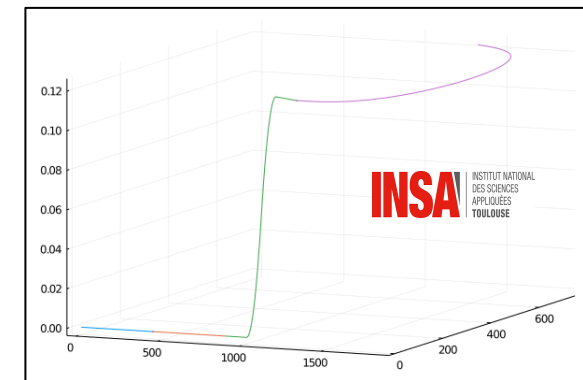
Rotor management



Thrust

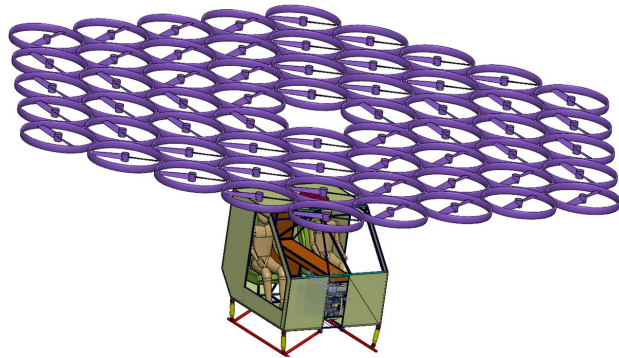


Altitude



Trajectory and control

Join us !



www.mini-bee.com



www.beecoin.com
for investors

Academics



wiki.collaborativebee.com

Key future actions for TRL4 starting in 2022 :

- Continue **collaborative project** with academics and industrials
- **Detailed conception** of structure and equipments
- Define **Flight Control Unit (FCU)** of 60 rotors based on STM components
- Basic ground test bench for **Rotax 915is** and tests of Kanardia equipments
- Test of **hybrid power generation** with Emrax 268 and hexaphase redressor with supercondensator