2020 IATA FACE UP! Thesis Competition
Announcement of shortlisted submissions

The IATA FACE-UP! Competition gives recent graduates from around the world with the opportunity to present their thesis to industry executives at the 2020 World Cargo Symposium (WCS) in Istanbul, Turkey.

This year, the jury panel has decided to reward a broad spectrum of ideas, from Unmanned Aerial Vehicles (UAVs) to digitalization to aircraft alternatives. The students will have a lead role during the closing plenary of the 2020 World Cargo Symposium.

Out of the 27 theses submitted to the competition, an independent jury has shortlisted three finalists:

- **Tereza Bartlová**, Brno University of Technology: “Performance Possibilities of VTOL Unmanned Aerial Vehicle”
- **Martina Brysch**, University of Groningen: “Air Cargo in the Physical Internet”
- **Craig Neal**, University of New South Wales: “Demand for Cargo Airships in Australia: An analysis of mode choice decision making by logistics professionals”

IATA is inviting these three finalists to present their research at the 14th IATA World Cargo Symposium in Istanbul. Delegates will then vote for their preferred submission during the Closing Plenary on the 12 March 2020.

Since the launch of the competition in August 2019, IATA received 27 entries from students and researchers from all around the world.

The entries have been evaluated by an independent jury comprising industry experts, academics and executives of leading logistics companies. They have based their assessment upon the innovative, transforming, and visionary nature of the content, as well as the quality of the solution presented in the thesis.

IATA would like to thank the five members of the 2020 Jury for their hard work and detailed and honest feedback. It was not an easy task, but they demonstrated their commitment and passion for our air cargo industry and innovation.

- **Olivier Chabin**, Chief Innovation Officer, Cargolux
- **Vivien Lau**, Executive Director, HACTL
- **Mikael Lind**, Senior Strategic Research Advisor, Research Institute of Sweden
- **Sara Van Gelder**, Cargo Business Development Manager, Brussels Airport Company
- **Janet Wallace**, Director Cargo Transformation, Air Canada
Summary of the shortlisted submissions

**Tereza Bartlová – Brno University of Technology**

"Performance Possibilities of VTOL Unmanned Aerial Vehicle"

Manufacturing companies face huge penalties for late deliveries. This thesis offers a new solution to avoid late deliveries by transporting crucial parts with Vertical Take-off and Landing (VTOL) Unmanned Aerial Vehicle (UAV), which can save up to 48% of the delivery time compared to on-road transportation. The first part of the thesis describes the cargo delivery mission and specifies performance requirements for the UAV. The second part is focused on quick and easy analyses that evaluate the performance requirements and estimates the power required for the UAV. The third part of the thesis focuses on the chosen configuration of the aircraft and hybrid propulsion system.

**Martina Brysch – University of Groningen**

"Air Cargo in the Physical Internet"

The air cargo traffic is continuously growing while cargo rates are shrinking. Besides, problems such as the slow adaptation of novel technologies, high complexity, or lack of transparency do not facilitate a quick change in the air cargo industry. The Physical Internet (PI) is a new logistics concept based on modular and autonomous PI-containers, full automation, the openness of the system, and decentralization, which may create a novel solution for current problems across all transportation modes. In recent years multiple research studies and industrial pilots have focused on the PI development, however only the air transportation mode has not been included in any past or current PI studies. Therefore, the lack of possible PI implementation in air freight is a relevant gap in research. By using Design Science Research and the multiple case study methodology, the current and future PI air cargo handling process was reverse engineered and respectively redesigned. Requirements, physical and operational constraints based on the air cargo industry were added and a PI implementation road map for airlines proposed. Moreover, a validated hybrid PI air cargo process design solution with two PI-container implementation options at airports, air cargo hubs, ground handling agents and combination carriers was introduced.

**Craig Neal – University of New South Wales**

"Demand for Cargo Airships in Australia: An analysis of mode choice decision making by logistics professionals"

The thesis examines the economic feasibility of the cargo airship mode in Australia by undertaking demand analysis of the freight market in Australia. The results of the research proved that there is a significant market in Australia for the cargo airship mode, with the potential to capture up to 25% of the total freight share depending on the model of a cargo airship. This research proved that the majority of cargo doesn't need jet speeds and that a slower, cheaper form of air transportation (cargo airship) has the potential to capture a significant market share of the Australian domestic freight market.