

# Report 1: Electric Transport Market Analysis

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# 1 Introduction

This document will dive into the market analysis of the current commercial aircraft market and recommend baseline requirements (passenger count, range, and cruise speed) for an electric, fuel cell, or hybrid transport aircraft. This analysis will focus on current widebody, narrow body, regional jet, and regional turboprop aircraft.

## 2 Section 1

Section text

### 2.1 A subsection

The figure below shows PAX vs. Range, with each marker sized by deliveries of each airplane. Note that there is a quasi-linear relationship between PAX and Range. This relationship is described by equation 1. Note that the error in slope is  $\pm 5.7[NM/PAX]$ . Note that the aircraft in the top right corner is the Airbus A380 which, at 242 deliveries, is below the benchmark of a succesful program (300 deliveries).

$$R = 18.3 * PAX \quad (1)$$

The figure below shows PAX vs. Deliveries.

#### 2.1.1 A sub subsection

The assumed energy densities and efficiencies for each fuel type are tabulated below. Av gas and Jet A are included for comparison.

Type	$\eta$	Energy Density [kWh/kg]
Li-Ion	0.7	0.22
$H_2$ Fuel Cell	0.7	33.30
Av Gas	0.335	12.22
Jet A	0.4	11.94

Note that the local maimum deliveries with respect to PAX is approximately 180 passengers. This results in a max range of 3300 NM using equation 1. For the purposes of this analysis, 180 PAX, at 3300 NM will serve as the upper bounds.

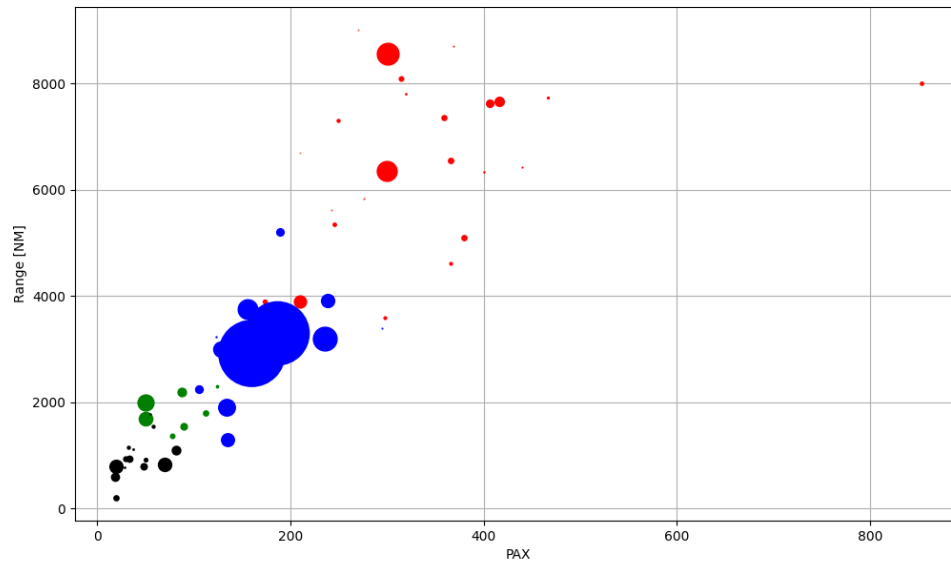


Figure 1: PAX vs. Range

Commercial transport cruise speeds, as of 2020, are limited by aerodynamic drag increase at transonic speeds. This limit will also serve as the bound of this analysis at 550 KTAS.

## 2.2 Conclusion

Conclusion text

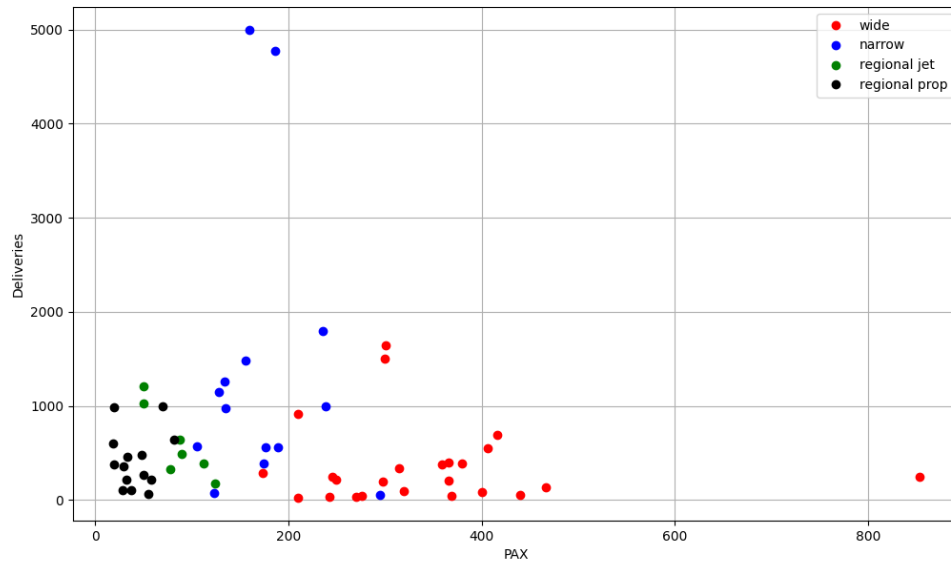


Figure 2: PAX vs. Deliveries

## References

- [1] authors. *name*. place, year.

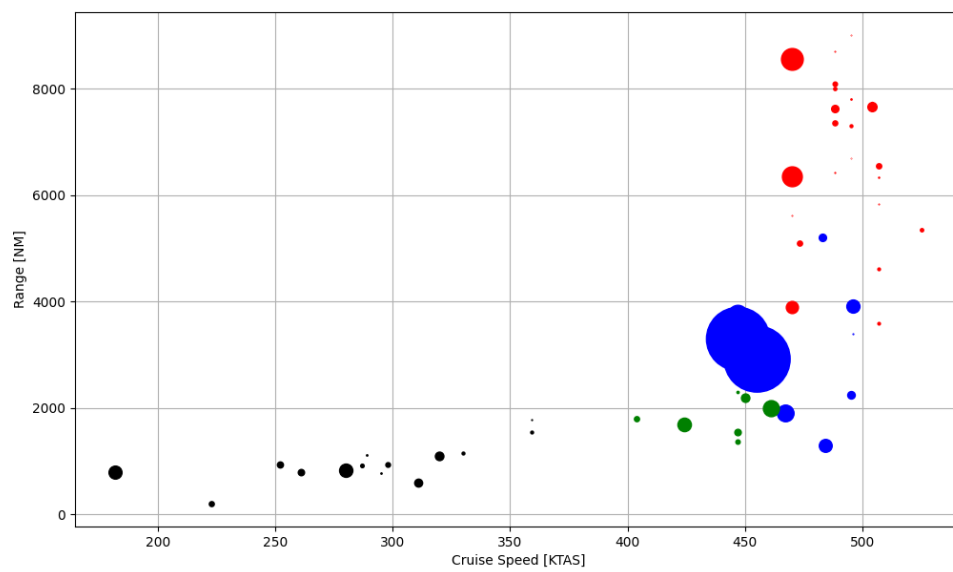


Figure 3: Cruise Speed vs. Range