Design of a Carbon Neutral Airport
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Context

Problem and Design Alternatives

Problem Statement:
Airports need to achieve carbon neutral growth operating an enterprise with limited control
• Carbon neutral growth by 2020
• Baseline of 2005
• Zero net growth of emissions by 2050

Design Alternatives:

Method of Analysis

Airport Inventory Tool (AIT)
• User: airport manager
• Purpose: tradeoff analysis of design alternatives
• Outputs: CO2inventory vs. baseline emissions calculation for carbon neutral growth

Results

Output from AIT shows GAV and Aircraft are two largest contributors of emissions

Conclusions & Future Work

Design Alternative Recommendations:
1. Minimize use of APUs by using ground power
2. Implement Push Back Tugs to Reduce Taxi Time CO2 emissions
3. Alternatively Fueled Airport Access Taxis (e.g. Hybrids or Electric vehicles)

Inhibiting Factors to Carbon Neutrality:
• Technology (Aircraft)
• Cost of changes and limitations on available capital for CO2 mitigation
• Stakeholder Disagreement: Disagreement between people and policy; Required cooperation between multiple regulatory agencies

Future Work:
• Evaluate how advances in technology impact ability to attain carbon neutral growth
• Evaluate the use of ‘green’ ticket fee to cover carbon offsets and invest in new technology

CO2 (kg)/Pax [without mitigation] 25.8 kg
CO2/kg/Pax [with design alternatives] 7.8 kg
18.0 kg mitigated

Emissions Projection 2005 to 2050 (2% Growth)

* Assuming uninhibited implementation of all design alternatives in 2013