Problem
All commercial jets use an Auxiliary Power Unit or APU to provide power and pre-conditioned air to the plane when parked at the gate. APUs are necessary for the function of jets, but they aren’t needed when greener sources of energy are available. Many metropolitan airports provide their own pre-conditioned air and power to docked planes; but for a variety of reasons, pilots and mechanics might still choose to use an APU over these greener sources. There are currently no systems in place that accurately monitor and regulate the usage of APUs at airport gates, leading to excess pollution in our environment and wasted jet fuel for airlines.

Solution
In efforts to create a healthier planet, SeaTac airport is implementing rules for airplanes to reduce APU usage for jets at the gate based on pre-determined policy requirements. In partnership with Microsoft’s AI for Earth initiative, we’ve developed a system which automatically monitors APU usage in real-time, providing operational insights into a previously inaccessible data stream, and enabling enforcement of upcoming environmental regulations. Through our edge device’s sensors using machine learning and utilizing multiple data streams, we are able to accurately determine APU usage 90% of the time, and provide users the ability to gain insights on every instance of APU use.

Process/Approach
Field Study & Primary Research
11 expert interviews
Field study at SeaTac

User Tests
Usability tests on front end dashboards to tailor towards airport needs

Deployment / Iteration
Deployed two edge devices with our in-house ML algorithm to detect APUs

Secondary Research
APU usage and airport logistics
Stakeholder analysis

Prototypes
Microphone testing
Prototype design requirements to meet airport standards