



ALLEGHENY COUNTY AIRPORT AUTHORITY

PITTSBURGH INTERNATIONAL AIRPORT
ALLEGHENY COUNTY AIRPORT

Building a Resilient Airport Microgrid Solution

IDEA 2019 Annual Conference, June 24-27, Pittsburgh, PA

Agenda

- **Drivers for Airport Microgrids**
- **PIT Microgrid Project**



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Airports – Ideal Application of Microgrids

- Large energy users
- Critical transportation infrastructure
- Growing energy requirements
- Cost reductions
- Carbon reduction goals
- Need for Resiliency



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Major Relevant Trends

- Growth of air travel
- Paradigm shift in electric grid
- Increasing threats to power system

“Capital spending at U.S. airports grew by 24% to \$12.7 billion in 2017 from the previous year, the biggest increase since at least 2010”

FAA

“481 million new passengers for a total of 1.3 billion (2017-2037)”

IATA

“Distributed energy resources contributed 46.4 gigawatts in 2017”

GreenTechMedia

“At least \$70 billion in renovations is planned at medium and large U.S. airports over the next five years”

ACC

“As of 2018, an estimated 1,869 microgrids or 20.7 GW built or underway globally”

Navigant



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Atlanta Hartsfield-Jackson Airport Power Outage

- **Power Outage December 2017**
- **Cost Delta Air Lines ~\$25 million to \$50 million**
- **Delta canceled about 1,400 flights**
- **The world's largest airport, with 100 million passengers per year**
- **Took airlines several days to resume their normal schedules**



Fork in the Road – Business as Usual or....?



- **Business as Usual**
 - Meet increased loads with new feeders
 - Improve reliability and resilience against threat vectors
 - Backup generators
 - Redundant feeders
- **Status quo, “head in the sand” and missed opportunities**
 - Trust and Reliance on the grid



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Innovative Strategies & Alternatives

- **Save capital and operating costs**
- **Improve resilience and reliability**
- **Decarbonize and achieve goals**



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Innovative Strategies & Alternatives

Understand that there are options

- “Non-Wires Alternatives”

Commit to careful analysis & planning

- Energy and resilience master planning

Optimize existing infrastructure, assets & systems

- Right-size through efficiency and control

Leverage technology, capital, expertise, programs & markets



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Pittsburgh International Airport On-Site Generation Project



About ACAA

- Allegheny County Airport Authority
- **Pittsburgh International Airport**
 - Midfield Terminal opened October 1992
 - 450+ Employees
 - 20 miles from Downtown
- **Allegheny County Airport**
 - Opened September 1931
 - Mainly Fixed Base Operations (FBO)
 - 4 miles from Downtown



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VISION

To transform Pittsburgh's airports to reflect and serve the community, inspire the industry, and advance the region's role as a world leader.

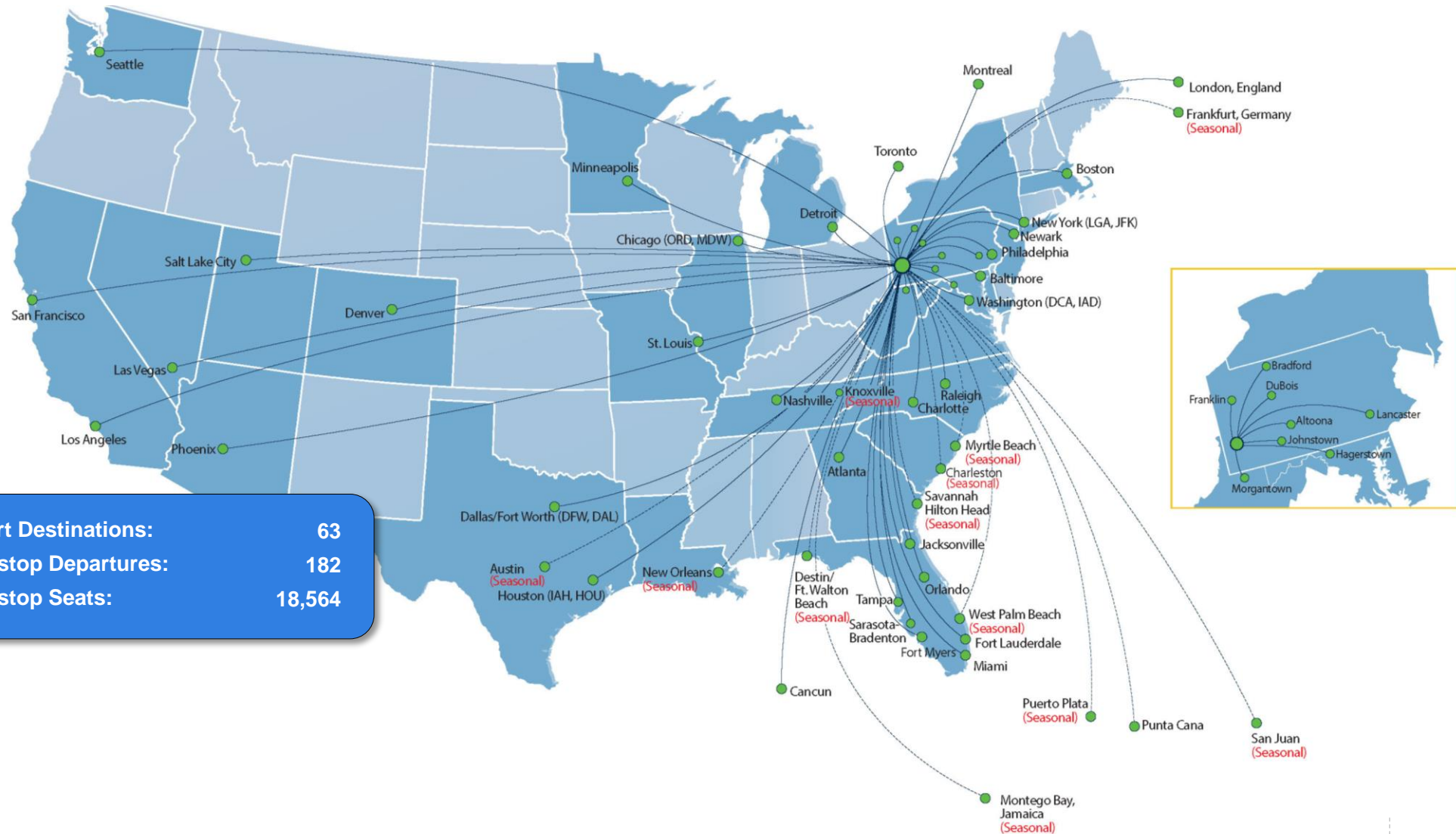


MISSION

A global aviation leader driving innovation,
regional growth and prosperity by investing in our employees,
customers, airlines, and partners.



Pittsburgh Currently Offers Nonstop Service to 66 Airports



Nonstop destination count includes seasonal service to AUS, CHS, FRA, MJB, MSY, MYR, PBI, POP, SAV, SJU, TYS and VPS.

Source: Innovata schedules via Diio Mi (June 2019)

Current PIT Site

- **8,800 Total Acres**
 - 3,500 acres are developable
- **Pittsburgh Airport Innovation Campus**
 - 195-acre parcel for office space, research/development labs, industrial manufacturing, town center, retail
 - 16 pad-ready sites by 2023
- **Terminal Modernization Program**



PIT Terminal Modernization Program



PIT Energy Opportunities

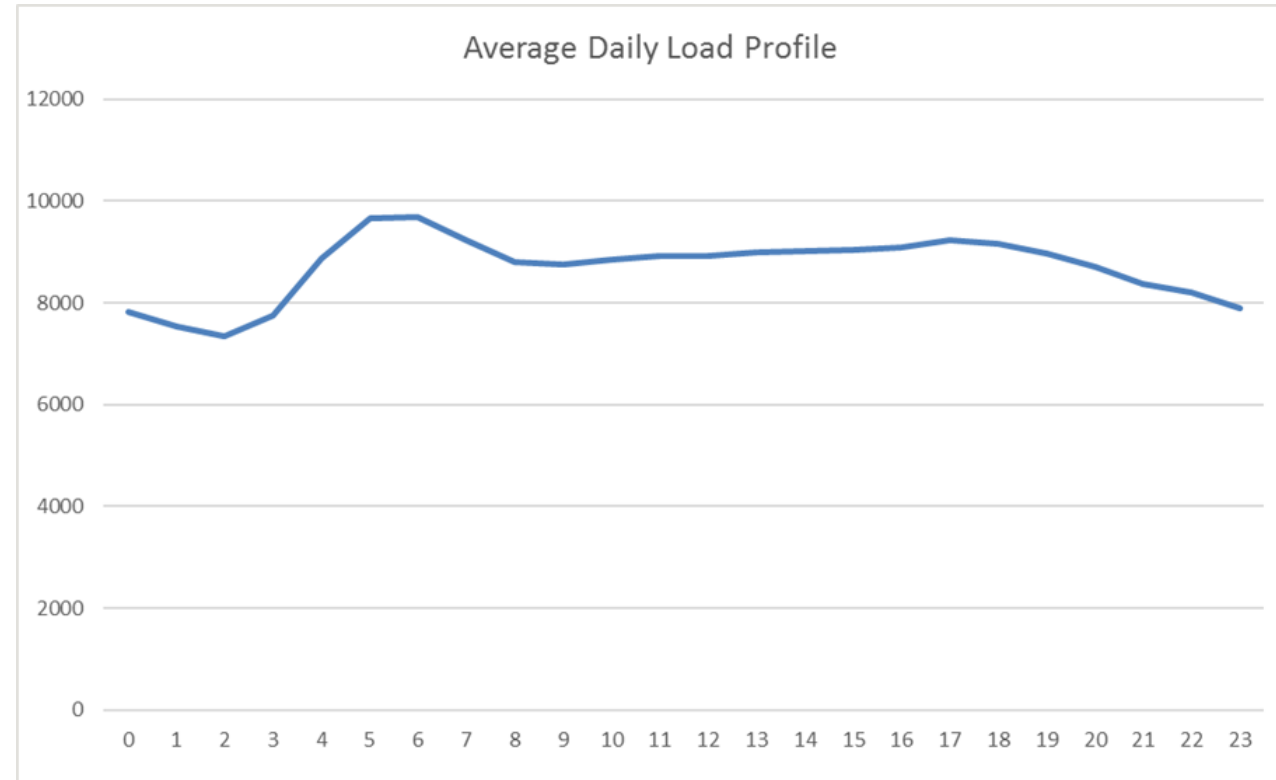
- **8,800 Total Acres**
 - 3,500 acres are developable
- **Gas Transmission Pipelines On-Site**
- **Natural Gas Drilling On-Site**
 - 6 permitted well pads (2 producing) with on-site gathering lines
- **Existing Central Utility Plant**
- **Existing Gas Distribution**
- **Existing Electrical Infrastructure**



PIT Electrical Demand

- **Annual Electric Use**

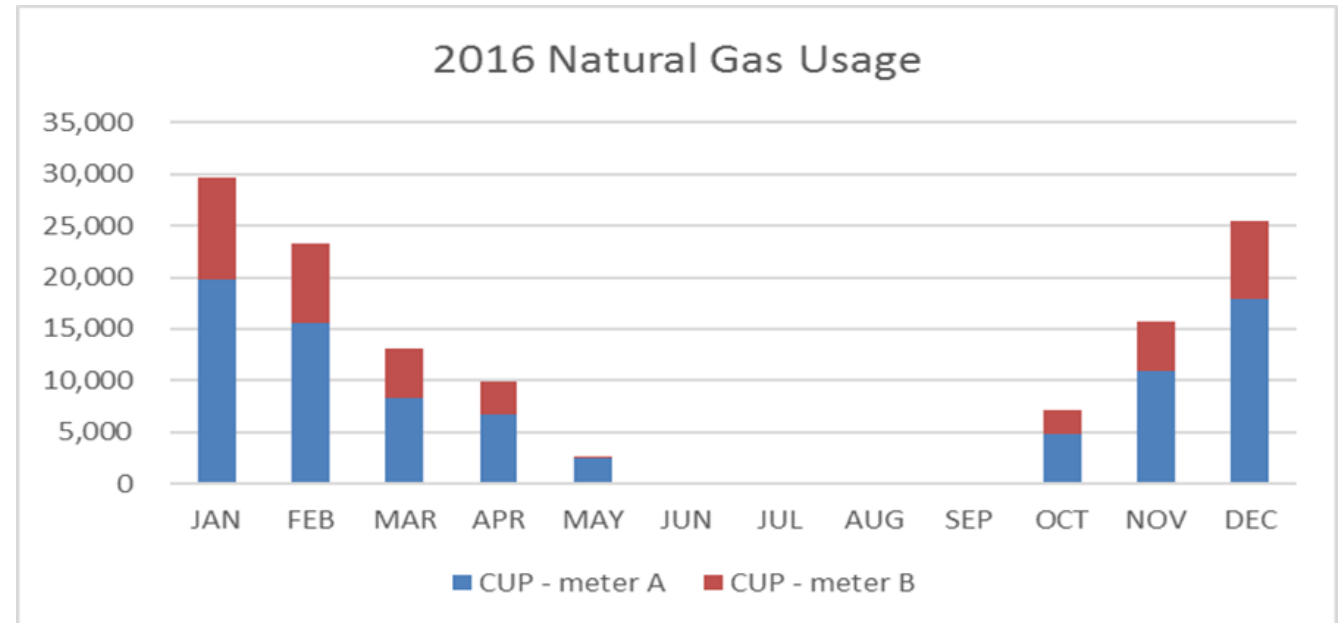
- ~15MW Peak
- ~100,000,000 kWh
- ~\$7.2M



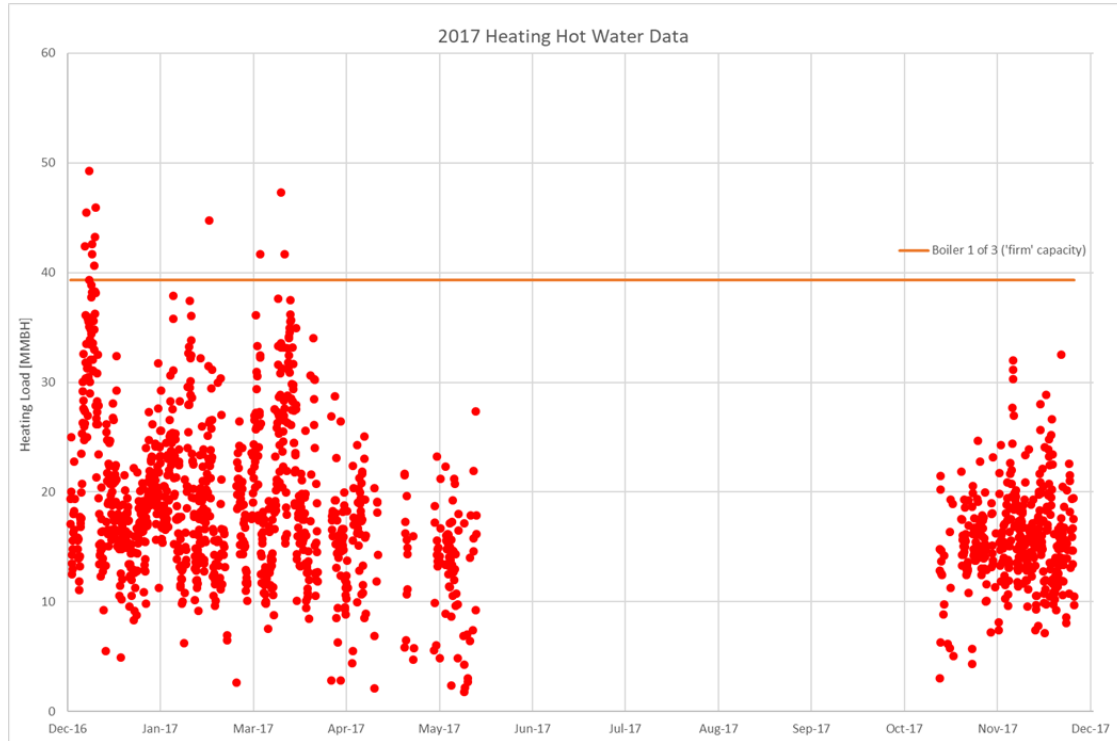
PIT Natural Gas Demand

- **Annual CUP Boilers Gas Use**

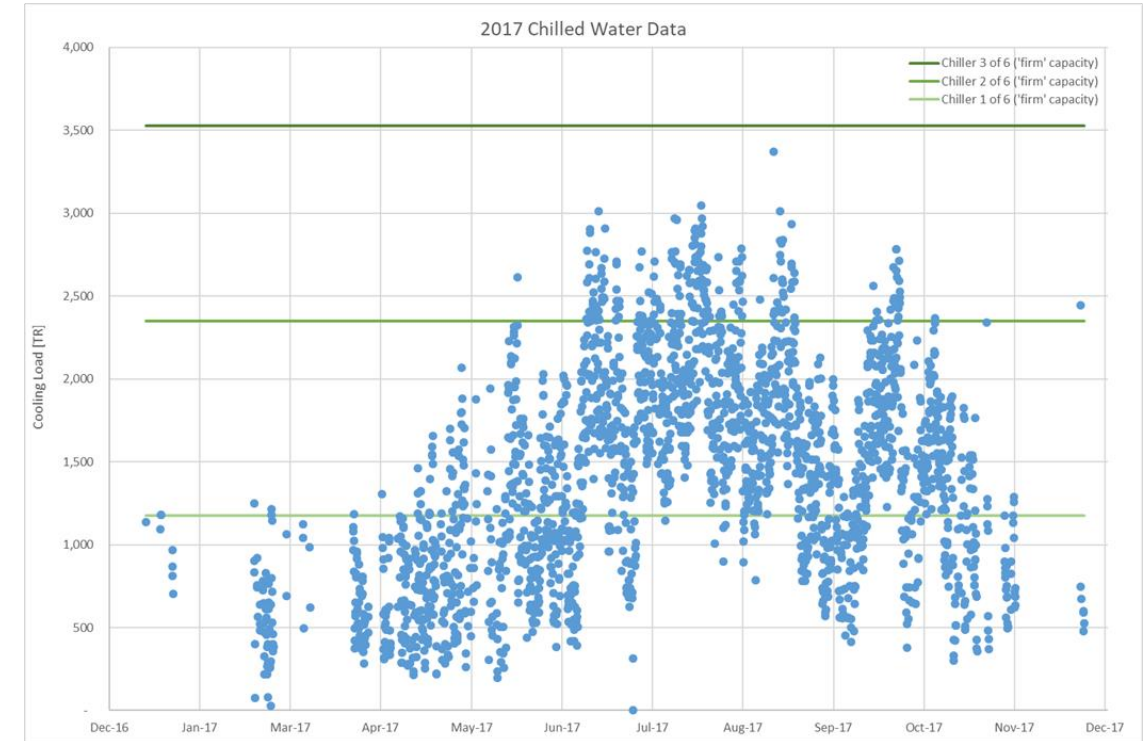
- ~127,000 MCF
- ~\$878,000 Total Cost
- \$353,000 Distribution
- \$525,000 Retail
- ~\$6.90/MCF



PIT Thermal Demand



Current Peak ~50MMBH, Winter heating,
350-degree High Temp Hot Water



Air Conditioning, Peak ~3500Tons,
42-degree Chilled Water



Two Stage Selection Process

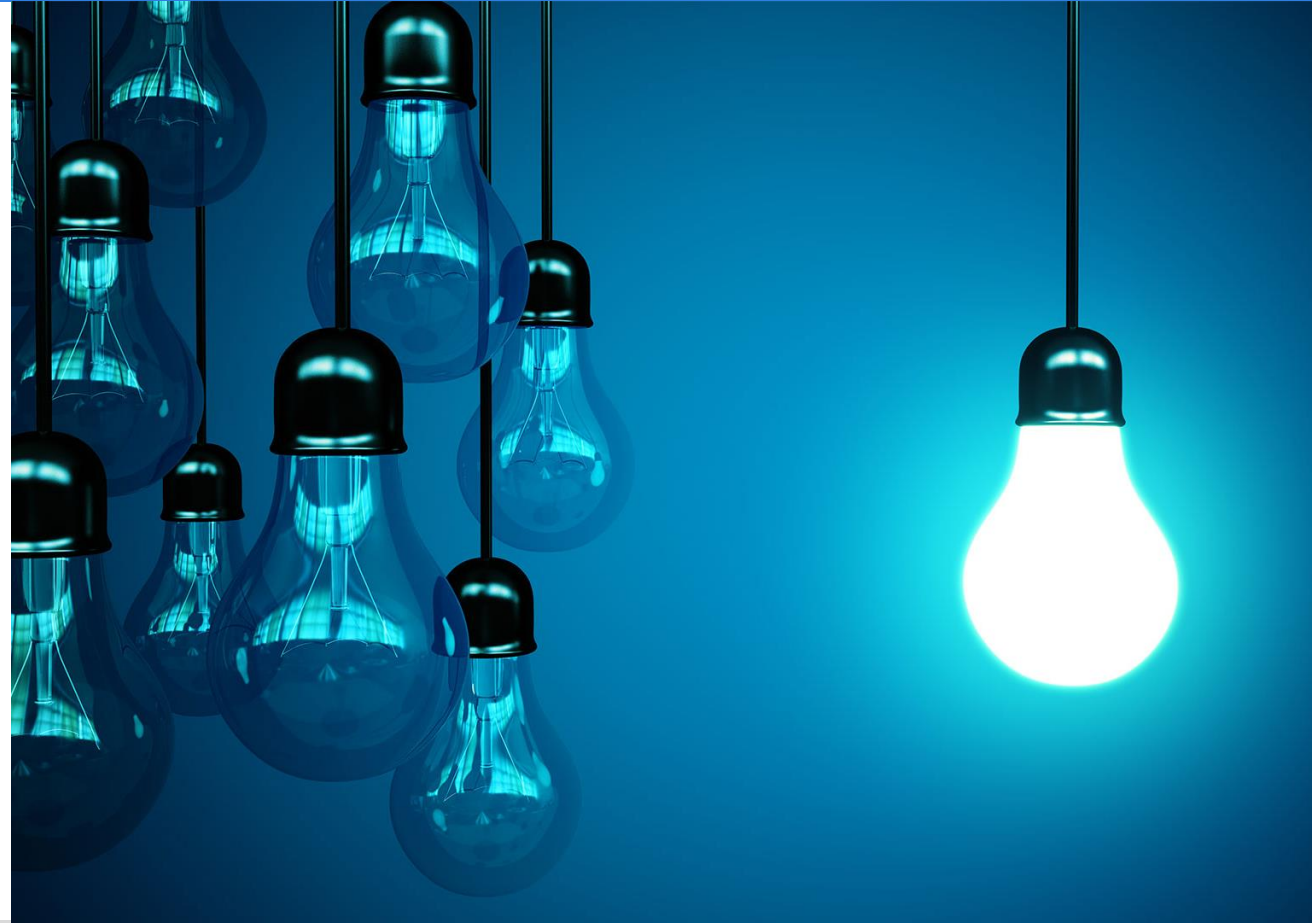
- **Public Advertisement**
- **20 year ESA/PPA Agreement**
- **Request for Development Qualifications (RFDQ)**
 - Solicited qualifications
 - Received 16 responses
 - Shortlisted 8 Qualified firms RFDP
- **Request for Development Proposals (RFDP)**
 - Evaluated responses against a variety of factors, critical factors were maximizing savings for ACAA and resilience, 20 year ESA agreement



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Variety of Proposed Solutions

- **Satellite Tri-Gen Plants**
 - New NG generation assets between 6-10MW
 - Heat recovery used for hot/chilled water generation
 - Provides efficient base load supply for PIT
 - Standby power for a portion of PIT load
- **Generation Plant**
 - New generation assets up to 20MW
 - No heat recovery
 - Low cost gas
 - Standby power for entire PIT load
- **Ground Mounted PV Arrays**



Next Steps

- **Finalize the ESA terms and conditions**
- **Anticipate award of contract by 3rd qtr 2019**
- **Start design and permitting in 2019**
- **Construction is anticipated in 2020**
- **Assumed on-line date in the 2nd qtr 2021**
- **Coordination with Terminal Modernization Program**
 - enhance diversification and redundancy of the power distribution system with the goal of a grid independent, 100% resilient airport





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