



# NASEO-NARUC Microgrids State Working Group Microgrids Action Planning Workshop

Bethesda, Maryland  
October 3-4, 2023

Thank you to the U.S. Department of  
Energy Office of Electricity for their  
support of this event

# Day 1 Agenda

- Welcome Remarks – Director Paul Pinsky, MEA
- Lunch
- Remarks – Dan Ton, Office of Electricity, Dept. of Energy
- State Roundtable
- Session 1: Microgrids and Transportation Electrification
- Break
- Session 2: Innovative Technological Models for Microgrids
- Session 3: Key Funding and Financing Opportunities for States and Local Governments



# Workshop Objectives

- Convene State Energy Offices and Public Utility Commissions for peer sharing and information exchange on the programmatic, policy, and regulatory opportunities and barriers for microgrids development
- Spotlight innovative state actions that have led to successful microgrid installations
- Conduct action planning and identify next steps for State Energy Offices and Public Utility Commissions to accelerate deployment of microgrids in support of other state priorities such as grid resilience and transportation electrification





# Director Paul Pinsky Maryland Energy Administration





Dan Ton, Program Manager  
Office of Electricity  
U.S. Department of Energy

# State Roundtable – Please answer the following questions

- Name, organization, title
- What you hope to learn at this workshop
- Your goal for a specific microgrid program, regulation, policy, or project



# Session 1: Microgrids and Transportation Electrification



**Moderator:** Cassie Powers, Chief of Staff, National Association of State Energy Officials

Sue Gander, Director, Electric School Bus Initiative,  
World Resources Initiative

Stephanie Gossman, Manager, Electric Transportation,  
Georgia Power

**BREAK**

**Access this publication here:**



**NASEO**  
National Association of  
State Energy Officials





# Session 2: Innovative Technological Models for Microgrids



**Moderator:** Kelsey Jones, Senior Program Manager,  
National Association of State Energy Officials

Dave Good, Director, Energy, Utilities, and  
Sustainability, Gallaudet University

Justin Nieves, Project Manager, Scale Microgrids

Allan Schurr, Chief Commercial Officer, Enchanted Rock

Mike Brady, CEO, IMG Energy Solutions

# SCALE

MICROGRIDS



Gallaudet University – Microgrid Project

# Who we are

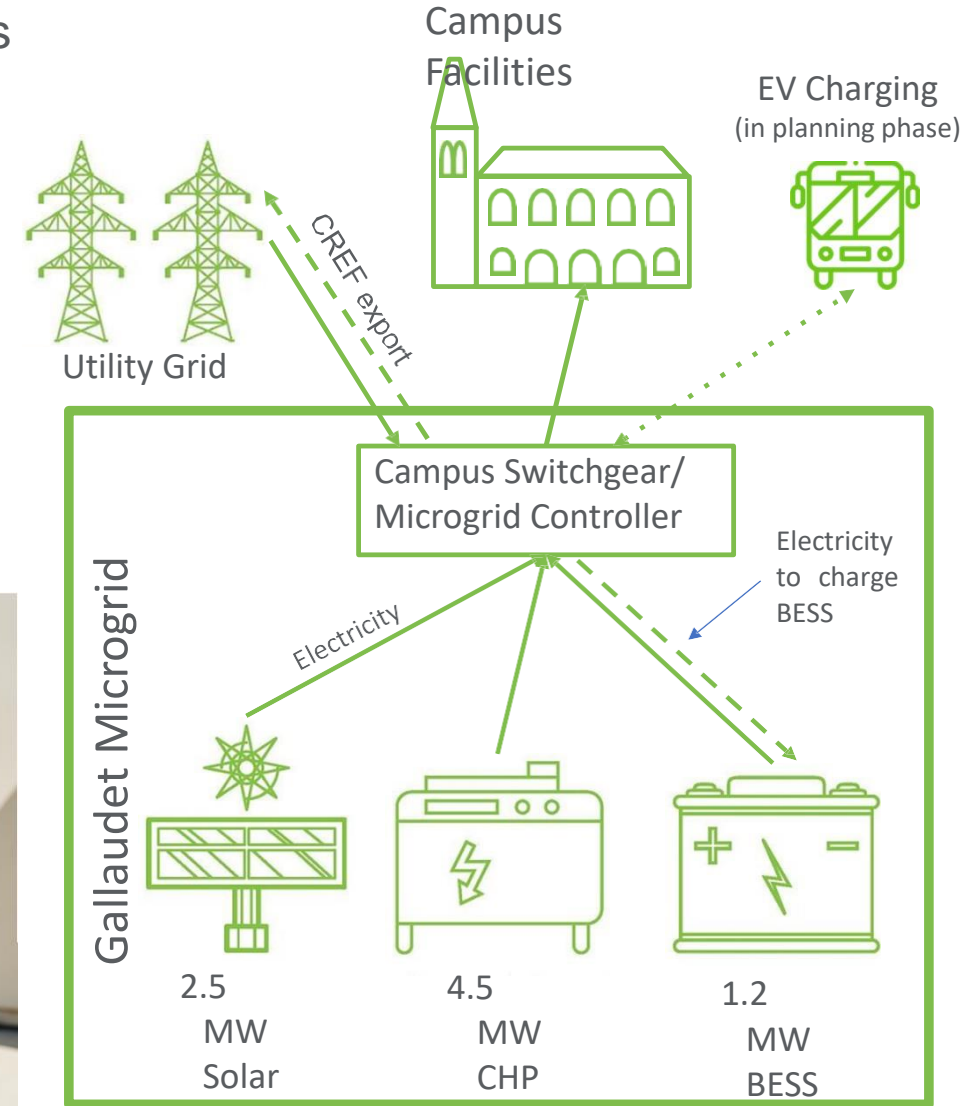
Scale is a vertically integrated distributed energy platform, with a core focus of designing, building, financing, owning and operating cutting-edge distributed energy assets that offer cheaper, cleaner, and more resilient power. Their team of energy and financing experts accelerate growth in distributed energy projects by providing financing to technology providers, energy developers, and OEMs, while also directly helping large energy-consuming customers to take charge of their energy infrastructure and future-proof their businesses.



**SCALE**  
MICROGRIDS



- 3 – 1.5 MW EPA Certified Natural Gas Engines with paired Generators
- 515 Ton Hot Water / Steam absorption chiller
  - Engine waste heat recovered via HRGS / Heat exchangers
- 1.2 MW / 2.4 MW Battery Energy Storage System
- Custom Microgrid controls with integrated instrumentation
- Power is distributed through campus via 13.8 kV Switchgear across a common bus
- Steam, Hot Water and Chilled water tie into existing campus systems



- Solar production is metered in real time and Washington DC residents can subscribe to “blocks” of KW’s that will receive credits on their utility bills. The average subscriber will a 10% reduction in their utility bill.
  - In Grid Parallel Mode, Solar power will be consumed at the building level and reduce overall campus utility import. Solar production will be credited via the utility as VCREF’s on community solar subscriber bills.
  - In Island mode, solar power will assist the microgrid operations pending time of day and solar irradiance.







# Data Center Resilience in the Energy Transition




October 2023






# Introduction to Enchanted Rock

Enchanted Rock’s solution to the energy transition is a clean dispatchable **microgrid** that sets the bar for price and performance associated with local resiliency needs and grid support services

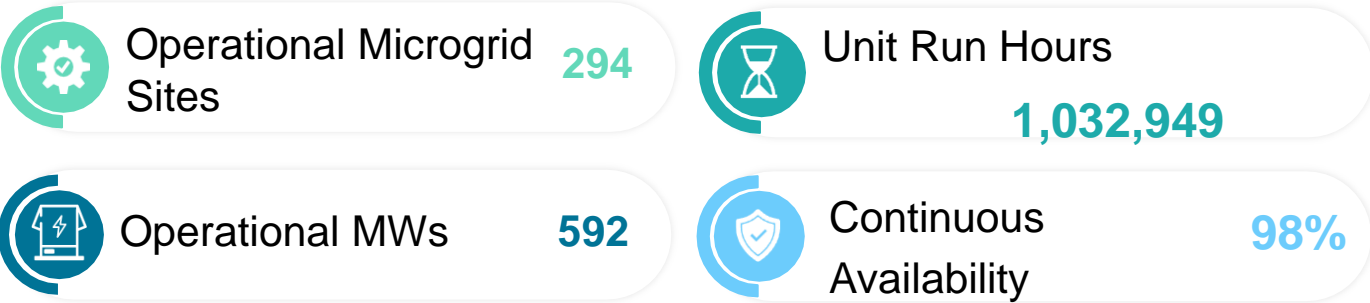
### Features

-  Flexible design
-  Ultra-clean local and GHG emissions
-  Affordable

### Use Cases

-  Balancing renewable generation
-  Protect against extreme weather
-  Resilient against grid emergencies and outages

## Enchanted Rock by the Numbers



# Technology Comparison

Back Up Genset Attributes	Diesel	Enchanted Rock - Natural Gas
<b>Technical Performance</b> Black Start, Transient Response, Ramp Time	Meets requirements	<b>Meets requirements</b>
<b>Local Emissions</b>	Higher emissions; Tier 4 requires SCR	<b>10-100x lower than Diesel; No SCR emissions control system required</b>
<b>GHG Emissions</b>	Reduction with HVO diesel blends	<b>Negative GHG with renewable natural gas</b>
<b>Power Density</b>	Meets requirements	<b>Meets requirements</b>
<b>Fuel Security</b>	Limited fuel on-site, subject to delivery interruptions in emergencies	<b>Continuous supply from underground pipeline; On-site storage possible</b>
<b>Grid Support</b>	Limited to no ability to provide grid services	<b>Clean emissions allow for participation in multiple grid services</b>
<b>Bridge Power</b>	Cannot be used for interim prime power while awaiting grid interconnection	<b>Can operate in interim prime power mode due to ultralow emissions</b>

# Data Center Microgrid



Microsoft San Jose Data Center

**Contract Executed:** May 2022

**Project Size:** Phase 1 60 MW

**Project Location:** San Jose, California

**Commercial Operation Date:** 2025

## Problem

Microsoft's proposed 96MW San Jose, CA data center faced external pressure for cleaner back up power solutions and their internal commitments for elimination of diesel generation led to evaluation of alternatives that could fit with their electrical design and space constraints yet deliver the same performance as diesel back-up.

## Solution

Enchanted Rock's modular natural gas genset was selected due to its performance (start time, transient response) and flexible configuration that did not require a change to the standard 3MW power block. Served by nearby redundant gas pipelines, and using renewable natural gas (RNG) offsets allows for market participation in PG&E's BIP electrical emergency programs to avoid rolling blackouts across CA, which generates a revenue stream resulting in a more cost-effective resiliency service compared to Tier 4 total cost of ownership

## Enchanted Rock Solution Benefits



**Ultra-Clean** – met stringent BAAQMD permitting requirements with CARB DG emissions. RNG offsets provide zero CO2 equivalent emissions



**Performance** – comparable to diesel (ISO 8528 G3), Microsoft cyber standard compliant



**Speed to Market** – Standardized equipment and field assembly process meets Microsoft buildout timeline

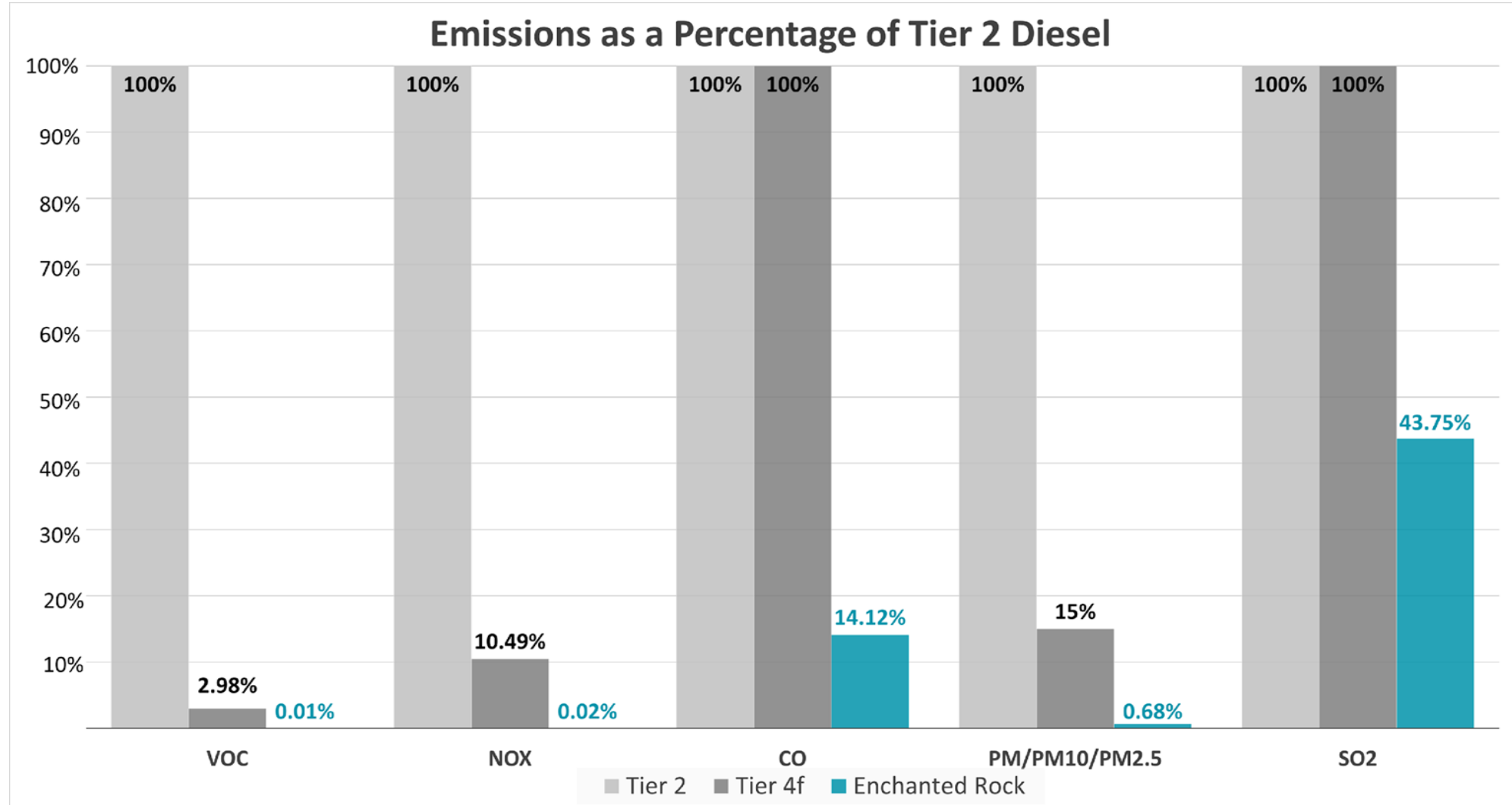


**High Availability** – modular design provides for even greater redundancy than 4:3 design



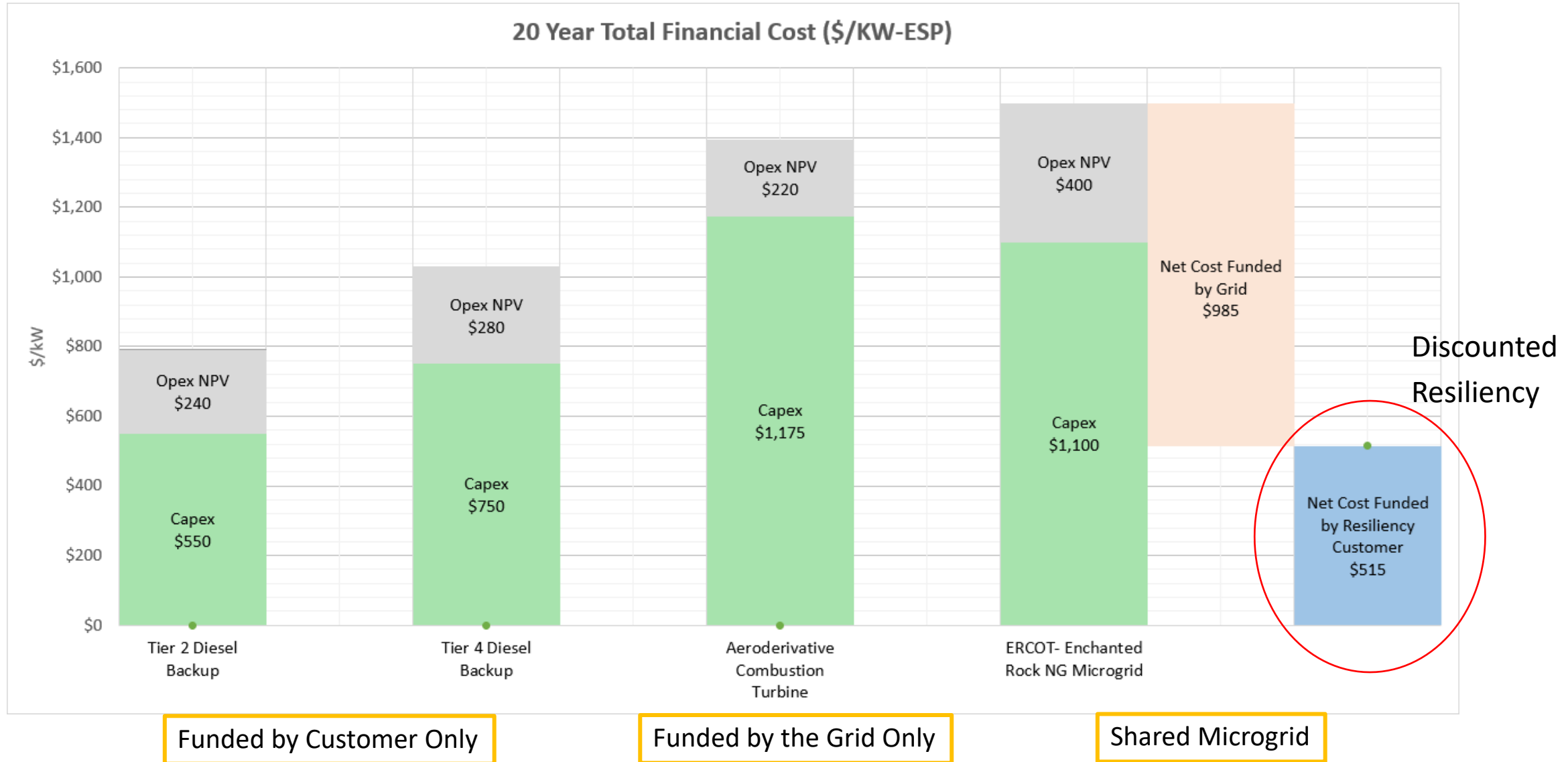
# Local Emissions

10-100x Cleaner than Diesel





# Economics Comparison



# State agencies should coordinate to encourage microgrids

1. Provide expedited interconnection, permitting and siting for clean alternatives to diesel to meet demand
2. Tighten air quality regulations, e.g., by updating BACT for the cleanest, commercially viable technology
3. Create market monetization opportunities for grid services provided by microgrids, via utility programs, state-run programs, or wholesale market access for behind-the-meter resources
4. Promote firm gas supply service to microgrids for resilience and low capacity factor operation
5. Promote use of renewable natural gas offsets to fully decarbonize fuel supply



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**A Power Generation Solutions Company**

**Developer, Owner and Operator of  
Distributed Power Generation Assets**

**NASEO-NARUC Microgrid Action Planning  
Workshop – October 3, 2023**



# IMG Energy Solutions



IMG's portfolio approach to distributed generation provides a unique combination of renewable energy complemented by flexible, quick start, base load power generation, designed to optimize intermittent renewables while maintaining a reliable, low carbon intensity power grid.

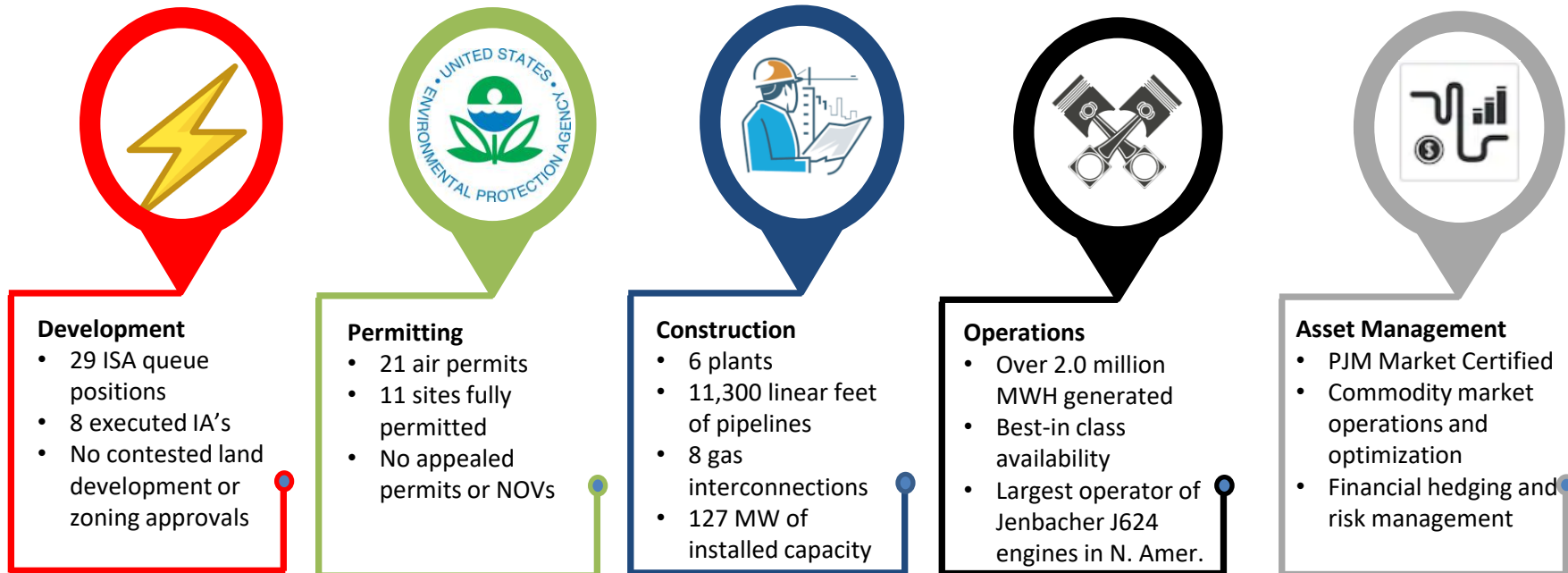
**Headquartered in Pittsburgh, PA, IMG's vision is to provide cost-effective, clean, and resilient energy to businesses and institutions to help them meet their energy goals.**





# A Strong History of Success

*With a seasoned leadership team with over 130 years of collective Solar, Natural Gas Power as well as CHP sector experience, IMG is devoted to playing an integral role in North America's sustainable energy landscape and we're actively exploring ways to integrate clean natural gas power with renewable energy sources similar to the innovative ACAA microgrid project*



# ACAA Microgrid – An Airport First



## Pittsburgh International Airport's Energy Infrastructure Goals:

1. Make the Airport Facility more resilient to a major power outage
2. Support the local Natural Gas industry (On-site CNX gas wells)
3. Integrate Clean Energy
4. Reduce Annual Utility Costs

PIT left the technical and commercial solution development to the many responders to incentivize innovation and allow participants to bring their best solutions forward

## The Winning Solution:

A 20MW gas reciprocating engine plant and 3MW “Net Metered” solar array

1. ACAA's power demand of 10-12MW is a perfect fit to IMG's standard five engine powerplant – inherently resilient and capable of operating in “island mode,” providing 100% off-grid power to the airport campus
2. When regional power prices are above the plant's cost to produce energy, unutilized ACAA plant capacity is sold into the PJM Wholesale Market
3. **Zero investment in the solution by the ACAA**

# The Process

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## **Project Development:**

1. IMG worked closely with Duquesne Light Company on the interconnection of both the solar and gas solutions
2. IMG worked closely with PADEP to permit a first-of-its-kind solar array built on an otherwise unusable closed landfill

## **Project Challenges:**

1. Very tight air permitting requirements in Allegheny County
2. Gaining approval for a driven post solar installation vs. a PADEP (initially) preferred ballasted solution (a nine-month process)
3. Project kicked off at the start of COVID

## **The Outcome:**

1. Project was built on-time and on-budget and just celebrated its 2<sup>nd</sup> year of successful operations
2. Project has so far “resulted in savings of millions of dollars in electricity costs and boosted resiliency, while reducing carbon emissions by more than 6 million pounds per year” per ACAA

# A Couple Key Project Statistics

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## Gas Plant:

1. Best-in-class thermal efficiency (~49% with no water consumption)
2. Start-up to full load in under six minutes
3. 93.5 million kWh of power delivered to the airport, annually
4. Approximately 50% excess capacity available to export into PJM's Wholesale market with approximately 30% of those hours currently economic
5. Airport Availability of ~99.8%
6. Has operated in Island Mode during two critical utility disruptions

## Solar Array:

1. 4.7 million kWh of annual production with approximately 85% offsetting airport utility power at 23 independent meters including Allegheny County's 911 Center
2. 3MW<sub>AC</sub> net metered project delivers approximately 4% of total airport power consumption
3. Adequate, additional land is available to expand the array by an additional 5MW – currently in PJM's interconnection queue (submitted October 1, 2020, with expected study completion July 2026)

# How can you help?

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## **Interconnection reforms**

1. Allow generators to install hybrid behind-the-meter and wholesale generation more quickly and efficiently
2. Time between submission and interconnection approval has expanded from 18 months to 6+ years
3. Potential grid reliability improvements from reduced loads and additional supply

## **Reduce mandated back-up power tariffs**

1. Potentially onerous to the microgrid off-taker without adding layers of redundant energy storage, even with >99% availability
2. Would like to see reasonable demand charges with limited utility utilization

## **Consider additional capital cost recovery incentives for microgrids at critical load centers (e.g. airports, hospitals, schools, datacenters)**

## **Expand Net Metering laws**

1. Increase arbitrary max project size (PA) from 3MW to 10MW and expand two mile metering limitations



# Some Shameless Self-promotion



IMG is addressing the emerging need for reliable, innovative and environmentally conscious energy solutions that bridge the gap to a carbon neutral energy future.

## About Us:



- Fully integrated development, construction, operations, maintenance, asset management, and project financing
- Expertise across various energy technologies, but with a focus on solar and natural gas power
- We think like an Owner because we are an Owner

Renewable energy goals are being formed across many organizations, while various sectors of our economy can benefit from a new approach to local energy production



Corporations



Hospitals



Universities



Manufacturing



Airports



Data Centers



Government/  
Municipalities



Agriculture/  
Indoor Farming

# Session 3: Key Funding and Financing Opportunities for States and Local Governments



**Moderator:** Jeff Loiter, Technical Director, NARUC  
Center for Partnerships & Innovation

Nate Burnand, Analyst, Michigan Public Service  
Commission

Brandon Bowser, Section Chief, Maryland Energy  
Administration

Ari Gerstman, Office of State and Community Energy  
Programs, U.S. Department of Energy

