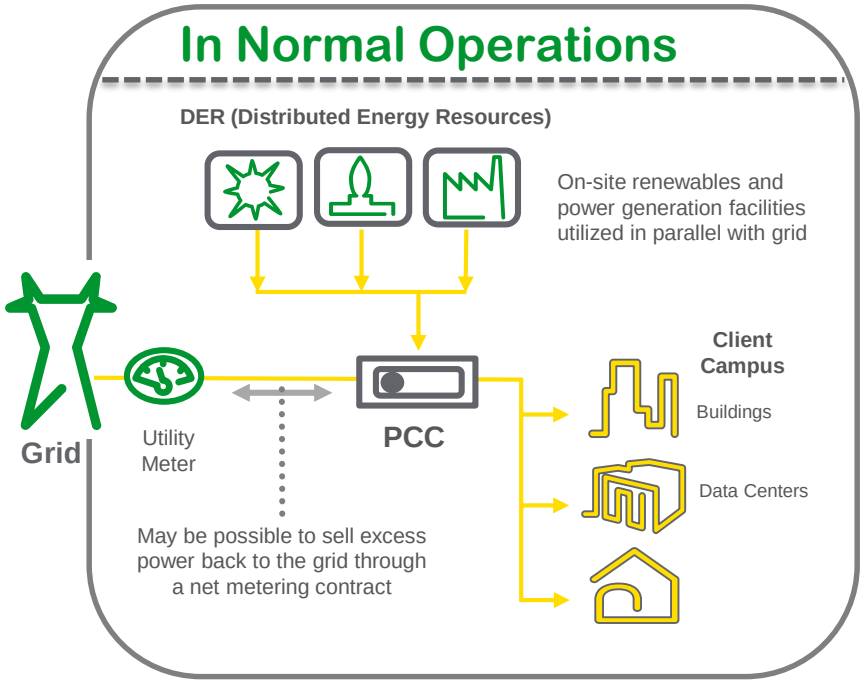
Microgrid and the New Energy Landscape

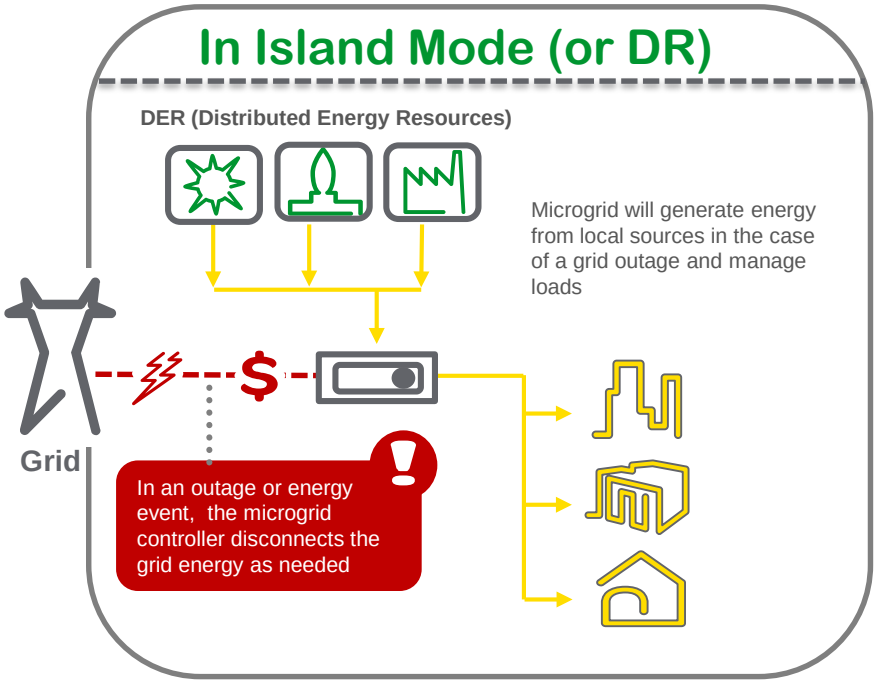
Energy Infrastructure Alternatives that unlock better efficiency, sustainability, and resilience

Life Is On Schneider Electric

What is a Microgrid?

“An integrated energy system consisting of interconnected loads and distributed energy resources which, as a single entity, can be controlled and operated in parallel with the grid or in an intentional *islanded* mode.”








More ELECTRIC

2X faster growth of electricity demand compared to energy demand by 2040

Source : IEA WEO 2014

DIGITIZATION

10X more incremental connected devices than connected people by 2020

Source : Cisco, Internet World Statistics

DECARBONIZATION

82% of the economic potential of energy efficiency in buildings and more than half in industry, remains untapped

Source : World Energy Outlook 2012, Internal Analysis

DECENTRALIZATION

70% of new capacity additions will be in Renewables by 2030

Source : BNEF

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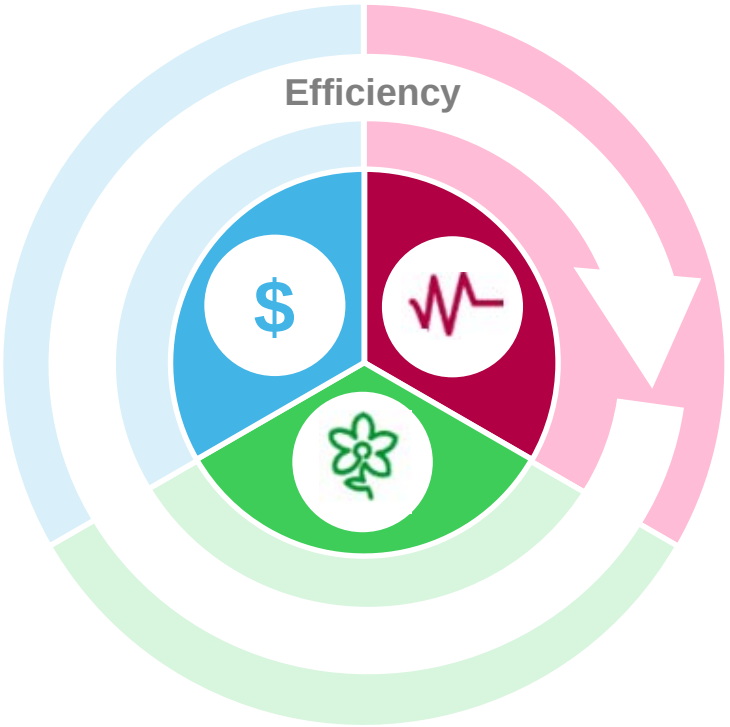
Integrated Energy Outcomes

Historically Passive Consumers are Thinking About Energy in a New Way



Cost

- Lower / More Predictable Energy Costs
- Energy / Fuel Source Arbitrage
- Flexibility drives savings / incremental revenue

Resilience

- Serve loads during times of grid stability
- Oasis for employees / customers – shelter in place
- Protect power sensitive / critical assets from poor power quality

Sustainability

- Reduce carbon footprint
- Improve brand image
- Attract / Service carbon sensitive customers

…and taking control of their energy spend

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From the Washington Business Journal:
http://www.bizjournals.com/washington/news/2017/02/10/montgomery-county-is-taking-two-large-buildings.html

Montgomery County is taking two large buildings off the energy grid

Feb 10, 2017, 1:40pm EST

Montgomery County is taking its correctional facility and public safety buildings off the grid.

The county has entered into a public-private partnership with **Schneider Electric** and **Duke Energy Renewables** to construct microgrid systems at the 300,000-square-foot jail in Clarksburg and the nearly 50-year-old, 408,000-square-foot police and fire headquarters in Gaithersburg.

It's a first-of-its-kind move for the county, bringing environmental and other benefits and protecting the county from power outages, said Eric Coffman, chief of the county's office of energy and sustainability. The microgrids will generate clean power using solar energy systems and natural gas generators. The public safety buildings will operate independent of the electrical grid, which will enable the county to replace aging equipment, install stiffer security measures and ensure uninterrupted service, Coffman said.

"This is the first advanced microgrid in this part of the state, to my knowledge," said Coffman. "Mont
big power outages, and our facilities need to operate."

The buildings are expected to be on the microgrid by mid-2018, the county said. While the contract
county will only pay for the energy it uses, which is expected to cost 12-13 cents a kilowatt hour —
Pepco for its power now. The project emerged from a request for proposals issued by the county in
dozen firms responded.

Ohio State's Endowment Gets $1 Billion With Campus Energy Deal

by **Janet Lorin** and **Brian Eckhouse**

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UTILITIES

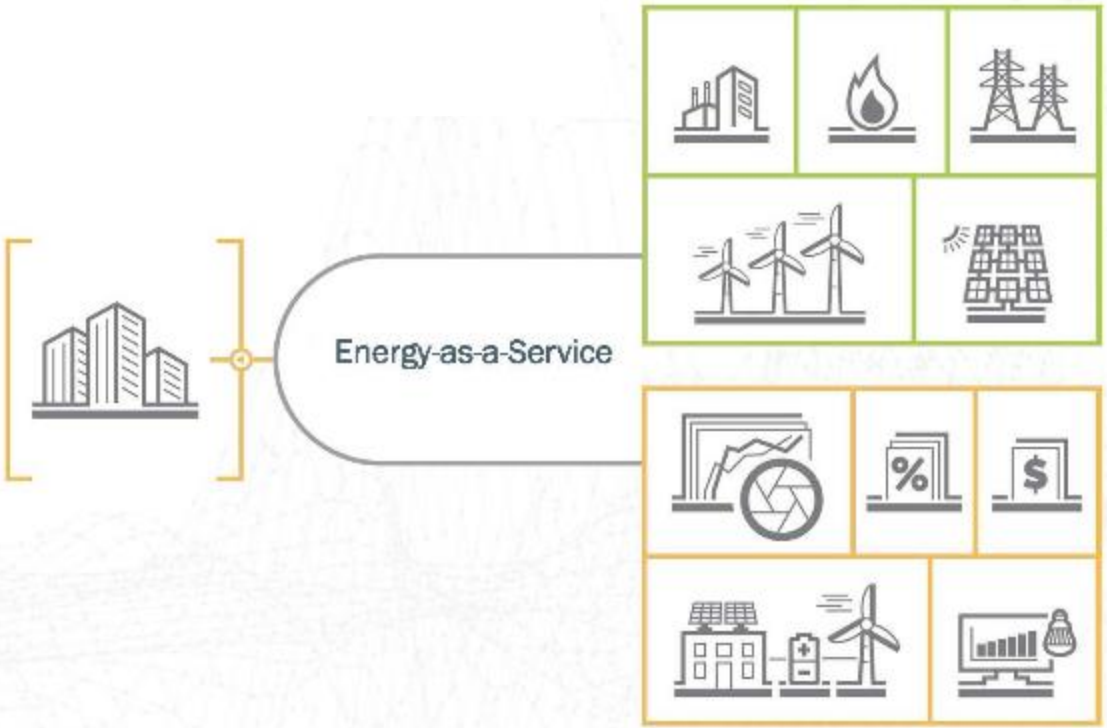
How MGM Prepared Itself to Leave Nevada's Biggest Utility

Photo Credit: NRG Energy

The casino conglomerate expects to double its use of renewable energy and earn payback within 7 years.

by Julian Spector
September 16, 2016

Energy as a Service Concept



Benefits to Host

- Choice
  - Energy-as-a-Service (EaaS) vs. Energy-as-a-Commodity
- Tailored solutions
  - Meets your specific requirements
- Guaranteed outcomes
  - Energy bill /lower price point
  - Predictable and committed values
- Delegation of complexity
  - Transfer risk to partner
  - Technology, financing, engineering, deployment and maintenance
- Focus your attention on you're your capital and strategic objectives

Case Study: Montgomery County Maryland

Situation

- After a deadly gale caused widespread outages, Montgomery County set out to find partners to help mitigate the impact of future disasters to its over 1M residents.
- After robust bidding, Schneider Electric was selected to deliver two advanced microgrids to improve resiliency and sustainability at the Public Safety HQ and Correctional Facilities.

Approach

- Deliver via innovative, public-private Energy-as-a-Service model eliminating up-front costs
- Infrastructure upgrades (low- and medium-voltage gear)
- Integration of existing generation assets.
- New Solar and Gas CHP generation
- Advanced controls and monitoring
- Advanced cybersecurity

Outcomes

- Improve resiliency of county operations by upgrading existing aging electrical distribution infrastructure
- Provide the ability to island operations for >7 days without grid support
- Mitigate risk of escalating energy price over 15 years.
- Upgrade infrastructure without capex
- Reduce greenhouse gas and other emissions
- Create replicable models for other facilities and governments
- Procured as EaaS

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