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Public Private Investments for Energy in MN

Rural Minnesota Energy Board – Sept. 28, 2020

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How do we invest in the future of energy systems, buildings and communities

Trends

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Resiliency

Billion dollar weather and climate disasters affect power availability

D+

End of useful life

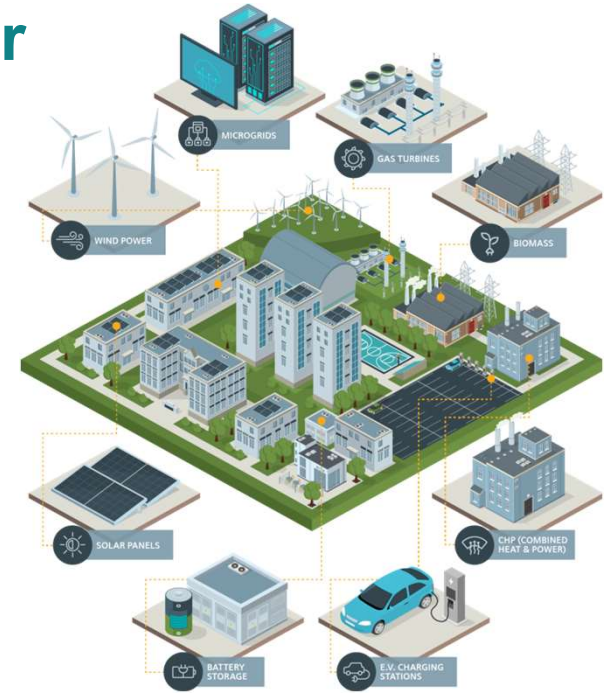
American Society for Civil Engineers 2017 Infrastructure Report

$225 billion

Investment gap in electricity, water, wastewater infrastructure

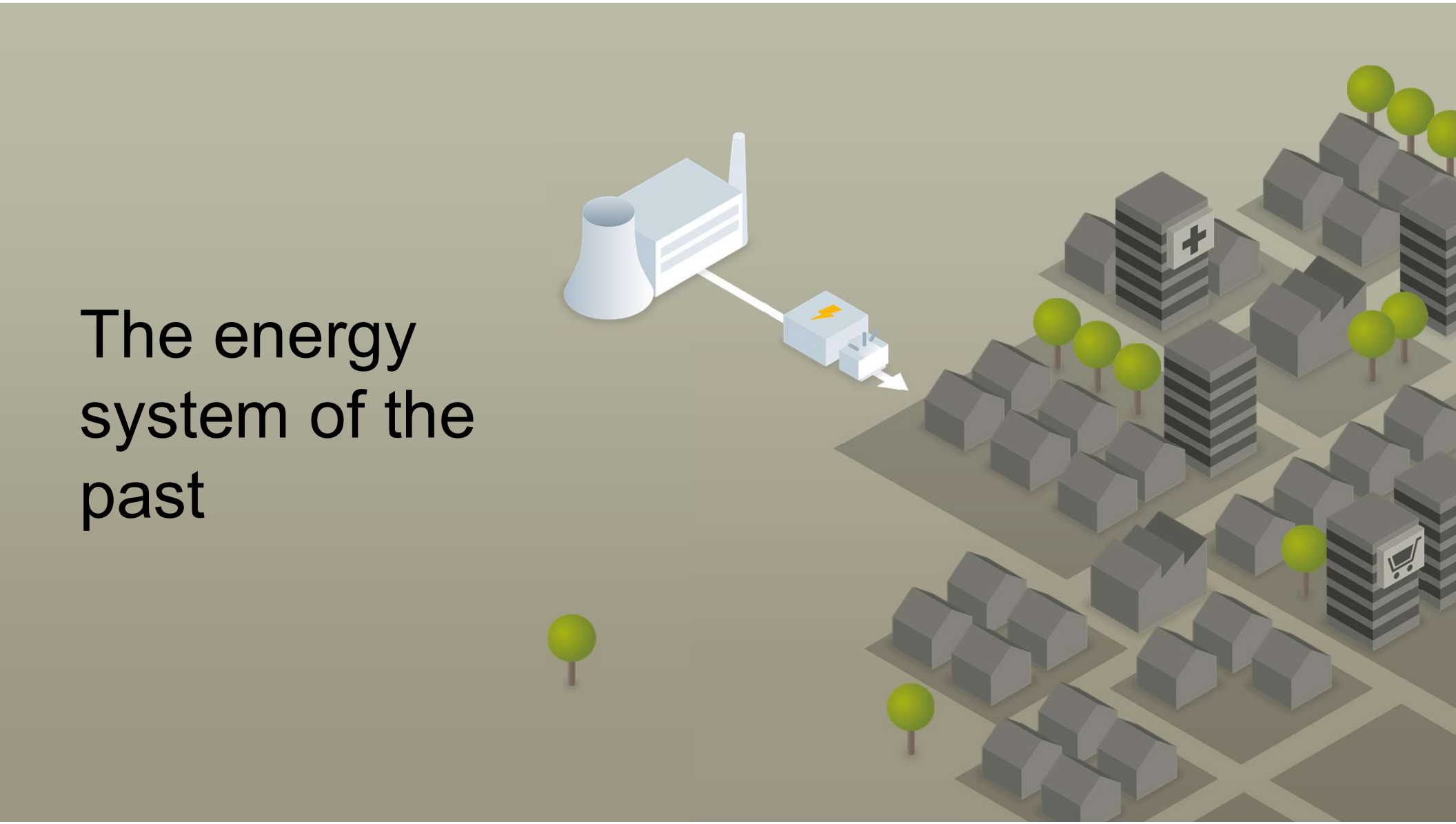
The rise of the Prosumer

Optimizing both demand and supply needs

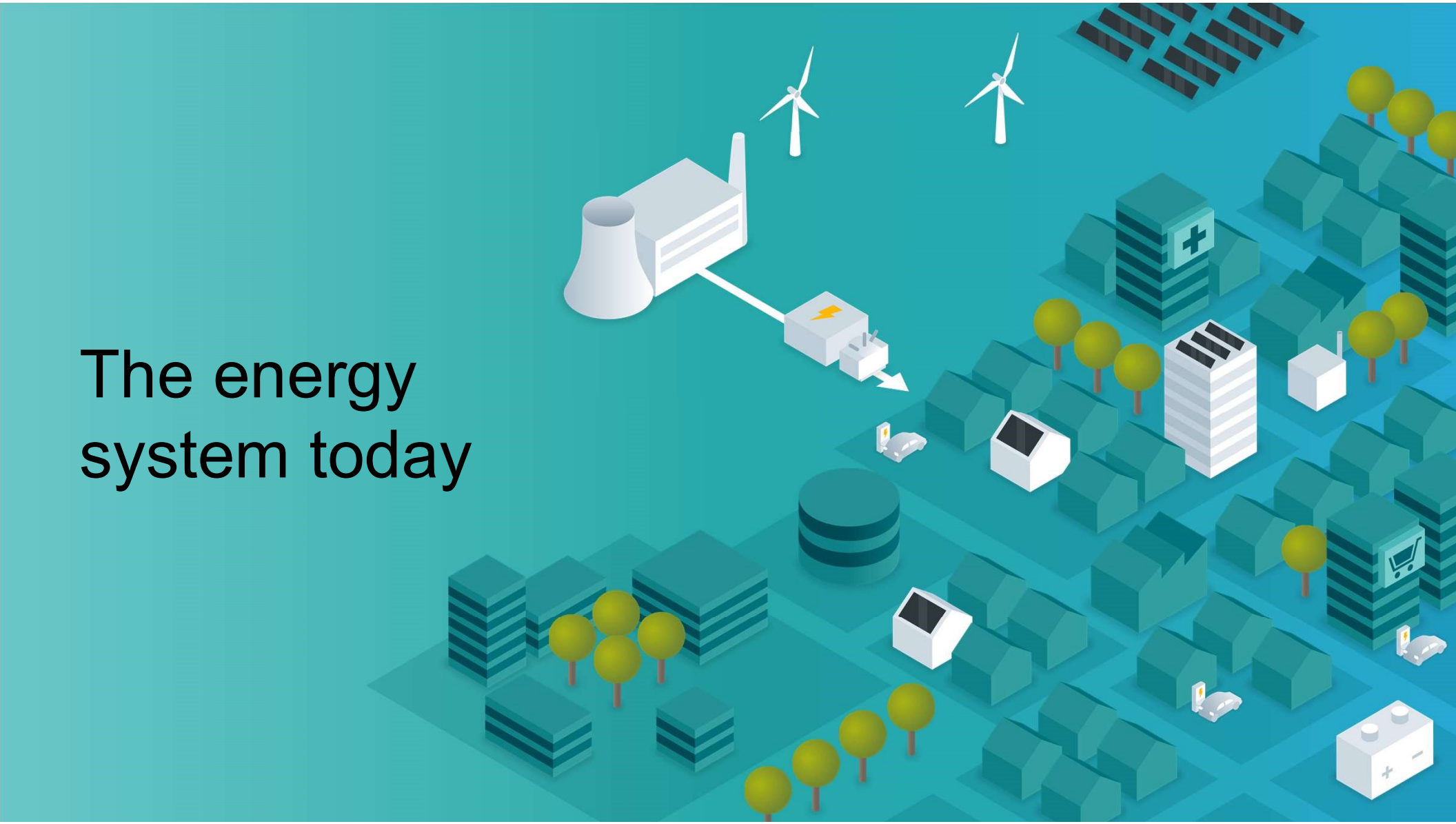


Sources: IDC, United Nations, UNCTAD Statistics, Scripps Institute Of Oceanography, "The Keeling Curve," November 11, 2015, Smart Communities: Rethinking Infrastructure, ASCE 2017 Infrastructure Report

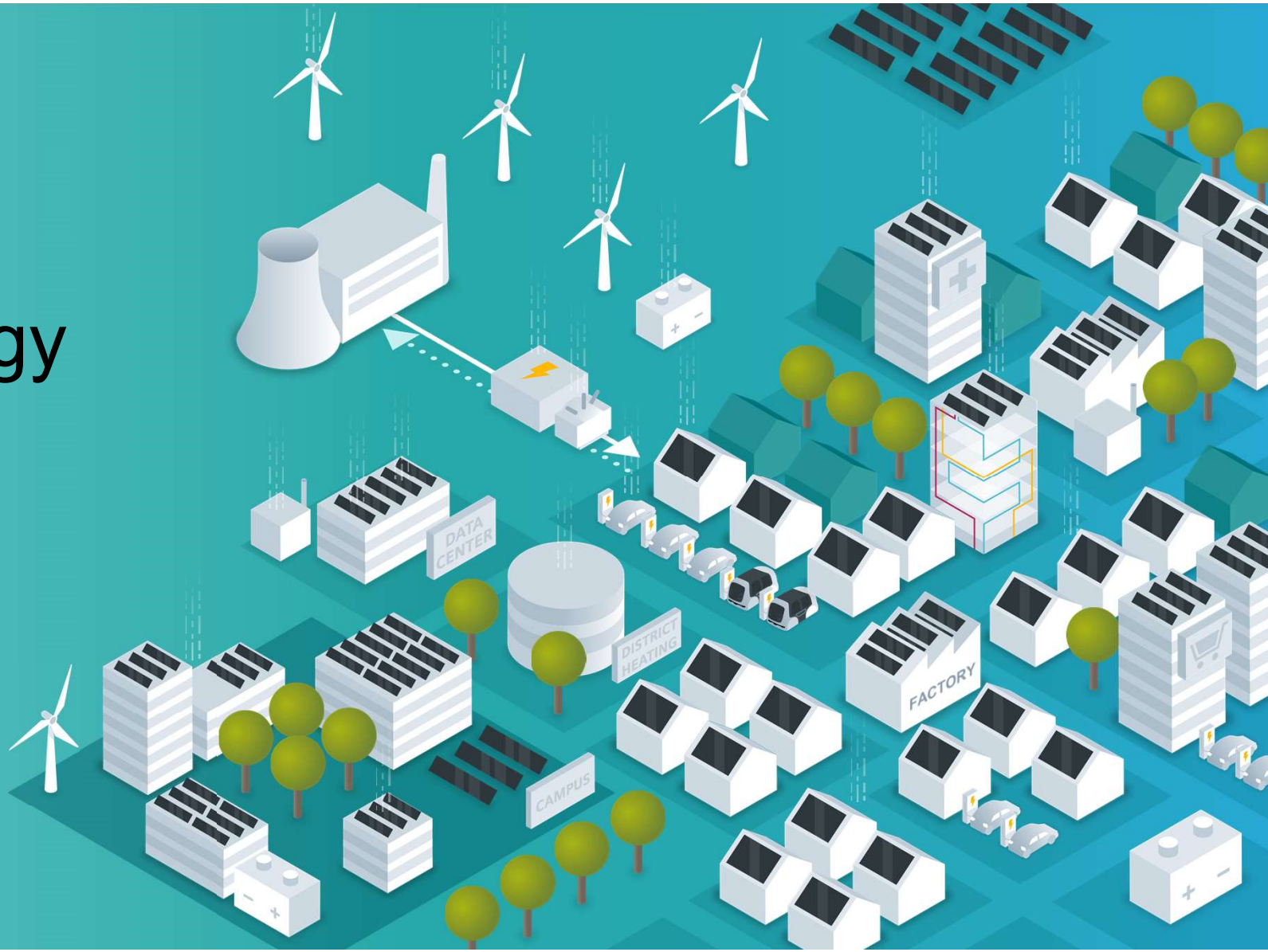
The energy system of the past



The energy system today



The energy system tomorrow



Distributed Energy Systems benefit communities

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Microgrids

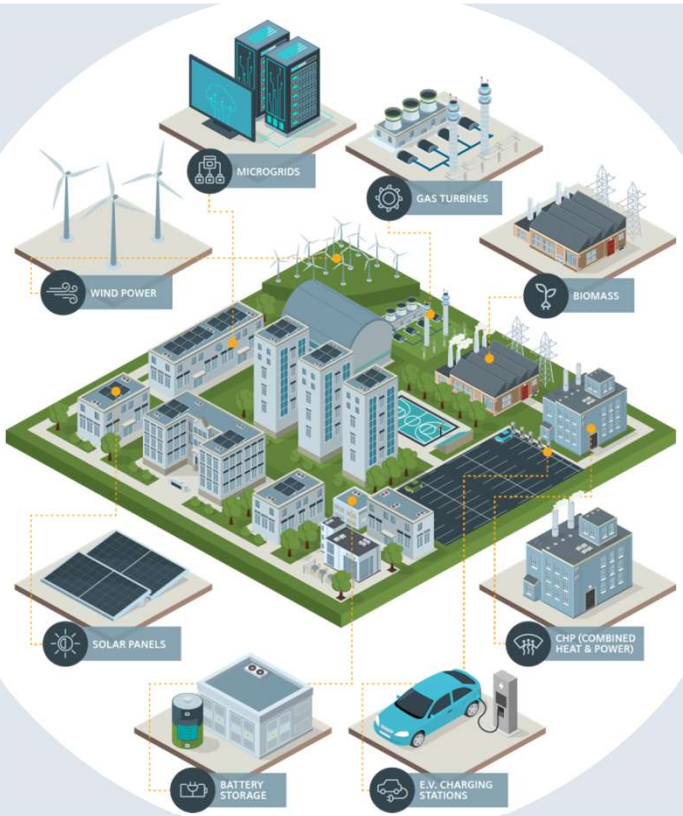
Small network of user(s) and local generation operating independently or in conjunction with the main utility grid.

- **Increased control of generation and loads**
- **Improved resiliency**
- **Integrate multiple generation sources**

Small Power/Solar PV

Generation Assets 100kW-100 MW connected to the MV/HV grid for flexibility of supply delivery.

- **Reduce costs**
- **Improved supply reliability**
- **Support Sustainability Goals**



Cogeneration/CHP

Combined generation of electricity behind the meter and thermal energy near point of use.

- **Reduced costs**
- **Increased energy efficiency**
- **Improved supply reliability**

Battery Energy Storage

Storage of electricity on-site for peak shaving, price arbitrage, and/or system benefits.

- **Reduced costs**
- **Increased supply reliability**
- **Improved power quality**

Energy is a FORCE MULTIPLIER

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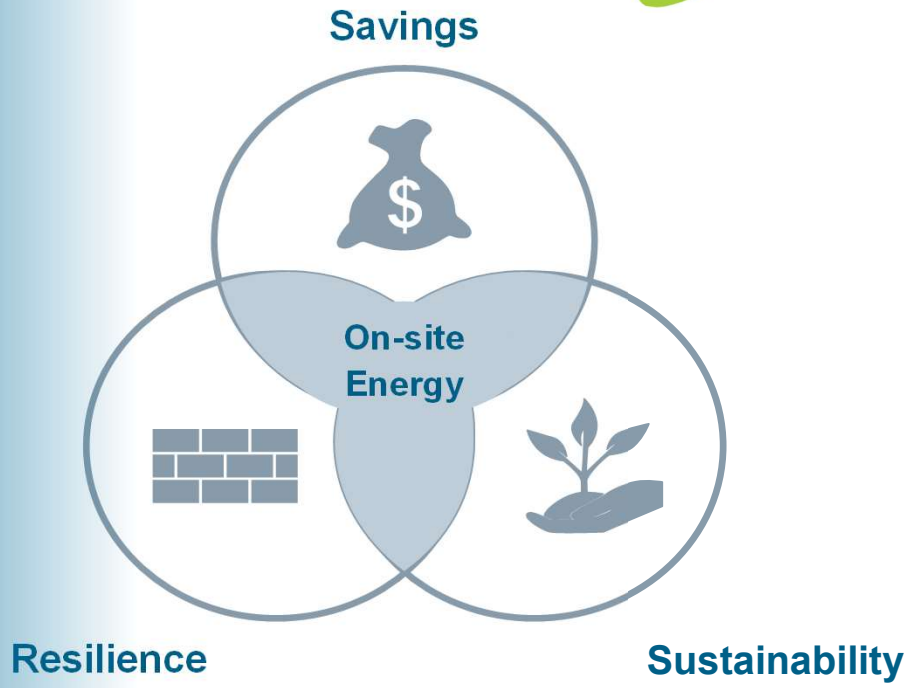
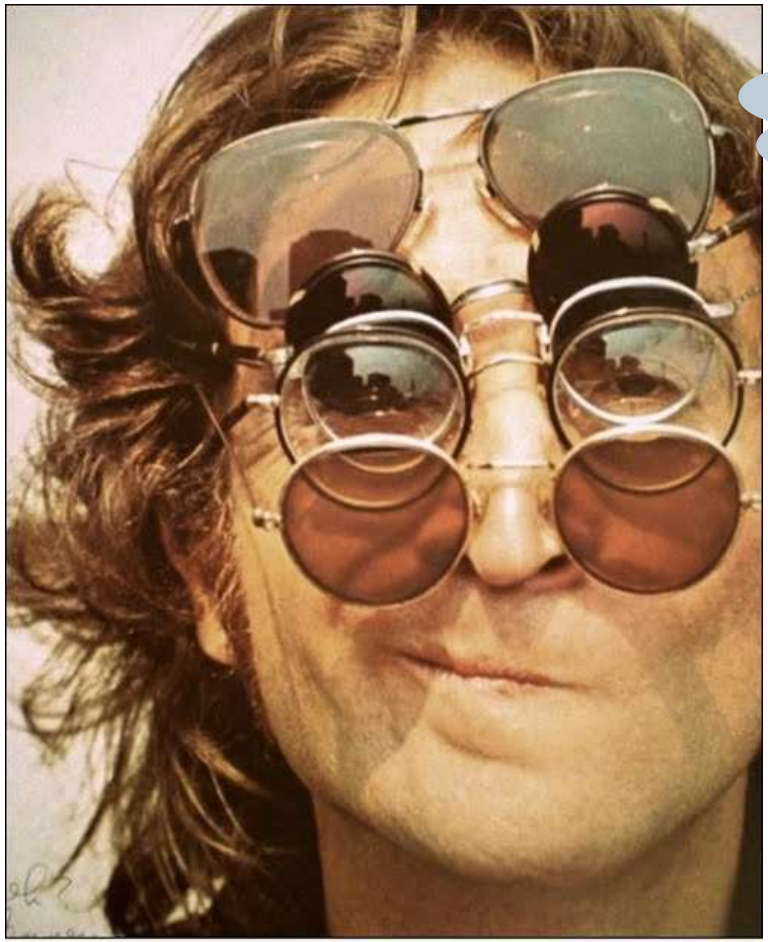
- Increased Reliability
- Reduced Energy Costs
- Improved Grid Resilience
- Reduced Carbon Footprint
- Enhanced Control
- Financed Solutions





I'm the private sector

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1. **Make efficient use of limited resources**
2. **Prioritize key investments**
3. **Proactive vs. reactive**
4. **Expect more from your partnerships**

Growth and variety of project implementation options enable greater application of energy and investment in communities

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Trends in Utilities and Energy Management

- Preserve limited capital for organization's core mission.
- Monetize existing utility assets; Capture tax benefits on investments.
- Shift financial and operational risks to third party partner(s).
- Outsource services to address labor and skills shortages.

Range of innovative financial structures available to meet customers objectives.

Off-taker/Host ← **Operational Risk** → **3rd Party**

Design Build and Service Agreements	Performance Contract Agreement	Solar Power Purchase Agreement	Design Build Own Operate Maintain (DBOOM)	Master Energy as A Service Agreement

DBOOM Financing

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D Third party collaborates with you to *Design* the energy solution

B They *Build* and commission the energy solution and validate performance

O They will *Own* title to the asset, *you contract for output from asset*

O Long-term, they *Operate* and has responsibility for performance metrics

M Third party *Maintains* asset(s), ensuring a high level of performance

DBOOM – Why?

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Third party becomes an Investor in the Project

- Customer does not pay until asset is operational & then pay over time

Asset ownership & operations is third party responsibility

- Customer does not have to take long-term responsibility for O&M resources and expertise—third party will implement and operate

Lower overall OPEX vs. traditional central plant ownership model

- Customer payment is similar to traditional utility bill(s) and simply lowers/offsets those bills/ costs

Partner Solution and Alignment

- Partner may provide a complete turnkey + lifecycle solution (Development, Technical, Financial, Performance without seams to the Customer)

Plan For Future Expansion and/or Expanding Scope to Other City Facilities

DBOOM – Standard Terms

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A contract between an energy customer and an energy provider where the customer buys power from the provider at a set rate over the term of the agreement

Customer Benefits	
No Up-Front Cost	The power producer makes the capital investment.
Off Balance Sheet	The asset is on the books of the power producer.
Low-Risk	Client only pays for the generated solar power with no obligations to maintain and operate the system.
Tax Incentives	Vehicle for monetizing federal tax benefits, including the 26% Investment Tax Credit plus the bonus and accelerated depreciation schedules.
Energy Hedge	Locking electricity rate allows clients to hedge a portion of their electricity budget at a fixed price. Protection from price volatility and price increases.

Common Terms	
Term Length	15-25 Years
Set Annual Escalation	Varies but typically 2%
Buy Out Options	Buy out options during the term after year 7.
End of term options	1) Remove the system at no cost 2) Extend the PPA 3) Client buys the system at the Buy Out Value or Fair Market Value, which ever is higher.
Contracts	Power Purchase Agreement and Lease Agreement.

Atwater, CA, Water Treatment Plant Benefits from Siemens Solar Power Purchase Agreement (PPA)

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2,177,387 kWh

Clean renewable energy annually

$0

Capital expenditure

>$1,000,000

Savings over 20 years with Siemens PPA

Holland Co-Generation Plant

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holland michigan

Largest Snowmelt System in North America

Revitalizes Downtown Economy

115 MW

New power generated
via CHP plant

20%

The maintained average rate advantage over competitors

Santa Fe Community College Microgrid

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Living Learning Lab

Workforce Development
Apprenticeship Programs

$4 Million in savings

Over life of Program

“Island Mode”

Self-sustain during grid outages
Microgrid: 1.5 MW solar, battery energy storage system, natural gas-fired peak shaving engine, microgrid controls

Source: http://www.algonquincollege.com/public-relations/algonquin-college-history/

Blue Lake Rancheria Low-Carbon Microgrid

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THE GREAT TRIBAL SEAL OF THE BLUE LAKE RANCHERIA

7 days

Duration of available on-site power independent from the utility

Link: https://youtu.be/6FcI4CHKh7g

Thank You!

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You're Invited!!!

In this webinar Microgrid Knowledge, Siemens, and Santa Fe Community College will explore the financial payoff and purpose of its dual nested microgrid design.

Date: Wednesday, October 28, 2020

Time: 02:00 PM Eastern Daylight Time

Duration: 1 hour

Registration Link:

https://event.on24.com/eventRegistration/EventLobbyServlet?target=reg20.jsp&referrer=&eventid=2635504&sessionid=1&key=93C4813B49CCFFFF819126F0C26C36C8&regTag=&sourcepage=register