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KEEPING UP WITH THE SOLAR LANDSCAPE IN OHIO

& Leveraging Onsite Power to Reduce Operating Cost

August 28, 2018

Presenters: Tom Armstrong & Jason Slattery

About Arcadis and GEM Energy

- Arcadis serves many communities throughout Ohio to provide safe and secure water and wastewater technology that is designed and built to withstand the demands of a rapidly changing world. From source to tap and then back to nature, the planet's most precious resource should be cherished.

- GEM Energy provides multiple services and technologies to improve customer business performance and reduce facility operation costs. The company is part of the Rudolph Libbe Group, a one-stop provider of construction and facility services that range from site selection and construction to energy solutions and ongoing facility management.

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Agenda

- Current Status of Ohio Energy Policy
- Options to consider for an Onsite Power Generating System
- A look at the financial variables related to an Onsite System
- Review several case studies

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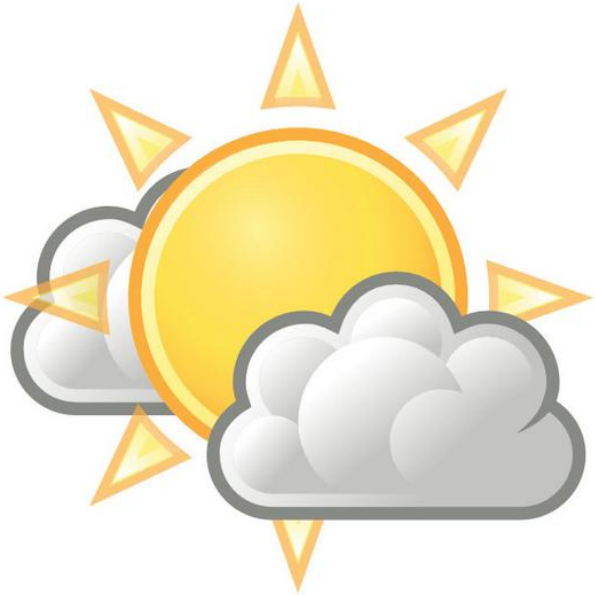
Energy Market in Ohio

Partly Sunny…

- 2008 Alternative Energy Portfolio Standard (AEPS) – Senate Bill 221
  - Including 12.5% energy from Renewables by 2025 via an annual ramp up



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Energy Market in Ohio

Then, Frozen…

- 2014 Senate Bill 310
  - Froze the multi-year renewable ramp up plan for 2 years

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Energy Market in Ohio

Now, Sunny again in 2018…

- …Freeze has been lifted!
- New governor – all candidates pro energy
- HB114
  - Mercantile opt out for large users
  - Wind set backs
  - Reduction of RPS percentages
- Bankruptcy of First Energy Solutions
- Retirement of Coal Plants

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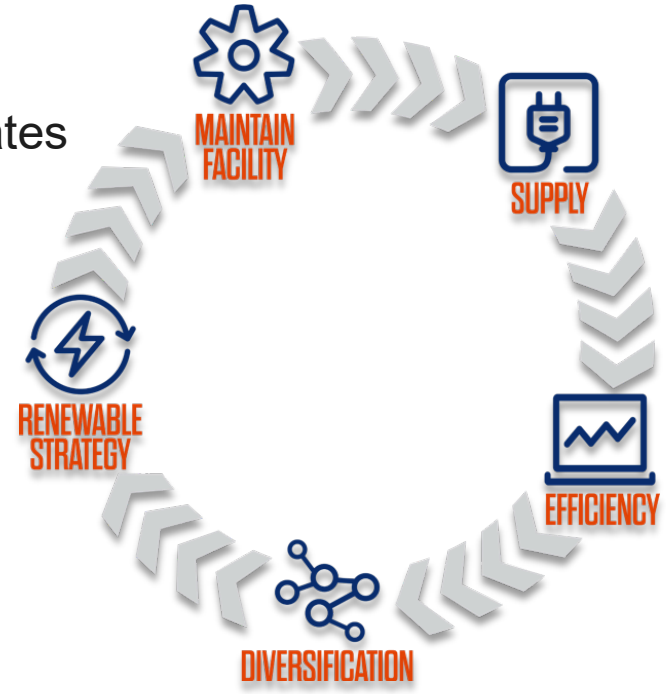
What doors does this open??

- More economical to add on-site power
- Larger generating systems allowed
- More credits/subsidies available
- Opportunity to lock in long term electric rates



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What size and type of options?

- Up to 5 megawatts (MW) behind the electric utility meter (net meter in Ohio)
  - Installed close to the load that will consume the generated power
  - 5 MW = ~525 houses = ~6,700 total HP
- Renewable energy sources
  - Solar – ground, roof, walkway cover/ elevated structure
  - Combined Heat & Power (CHP)
  - Biomass
  - Wind
- Storage options – backup; peak load; short backup

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Ground Mount

Roof Mount

Walkway/Carport

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Combined Heat & Power (CHP)

9.3 MW installed generation

127,000 metric tons of avoided CO_2 emissions as of 2017

30 customer sites

103 Capstone microturbines in use

$31.7mm in total electricity expense avoided

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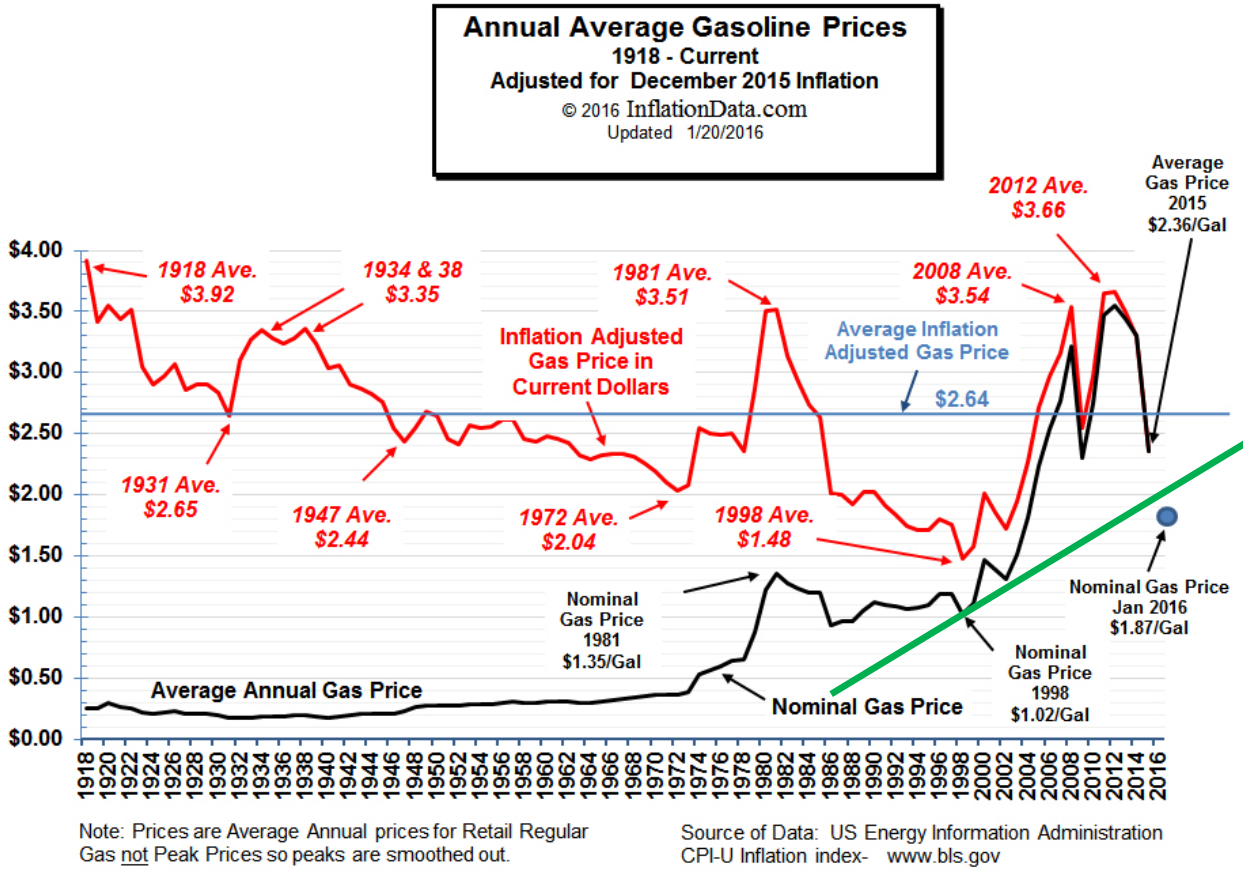
Gasoline prices at the pump – have they remained low?



Note: Prices are Average Annual prices for Retail Regular Gas not Peak Prices so peaks are smoothed out.

Source of Data: US Energy Information Administration CPI-U Inflation index- www.bls.gov

If only you could lock in your rate…

Save $1MM over 20 years with Solar

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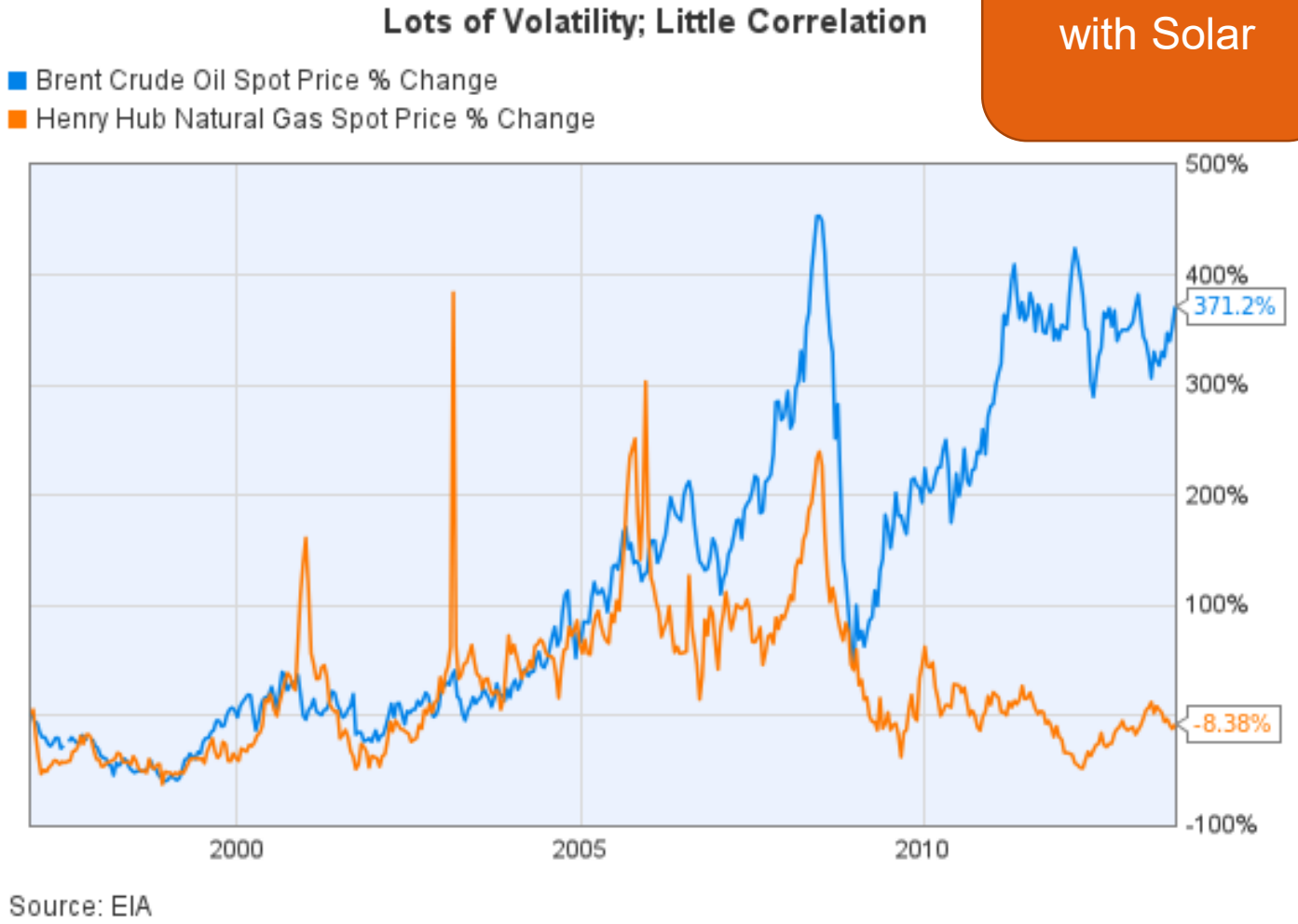
Natural Gas & Crude Oil – Volatile commodities

Lock in Rates with Solar



Source: EIA

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Utility Procurement

NATURAL GAS CUSTOMER	Estimated Term MMBTU's	Term (Month's)	Term Savings	% Savings
Steel Fabrication Plant	54,870	36	$51,089	63.7%
Commercial Office Building	3,000	12	$2,881	42.6%
ELECTRICITY CUSTOMER	**Estimated Term kWh's**	**Term (Month's)**	**Term Savings**	**% Savings**
Union Hall	830,167	34	$33,447	41.0%
Charter School	996,412	24	$7,489	11.4%
Full Service Media Distributor	1,451,720	12	$23,304	33.0%

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What is next??

- System evaluation – space, location
- Load profile developed upfront
- Review existing electrical infrastructure for interconnection point
- Evaluate economics/rate structure
- Implement an on-site power project

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Implement an Onsite Power Project

- D/B/B
- D/B
- No money down solutions
- Leases
- PACE funding
- Incentives

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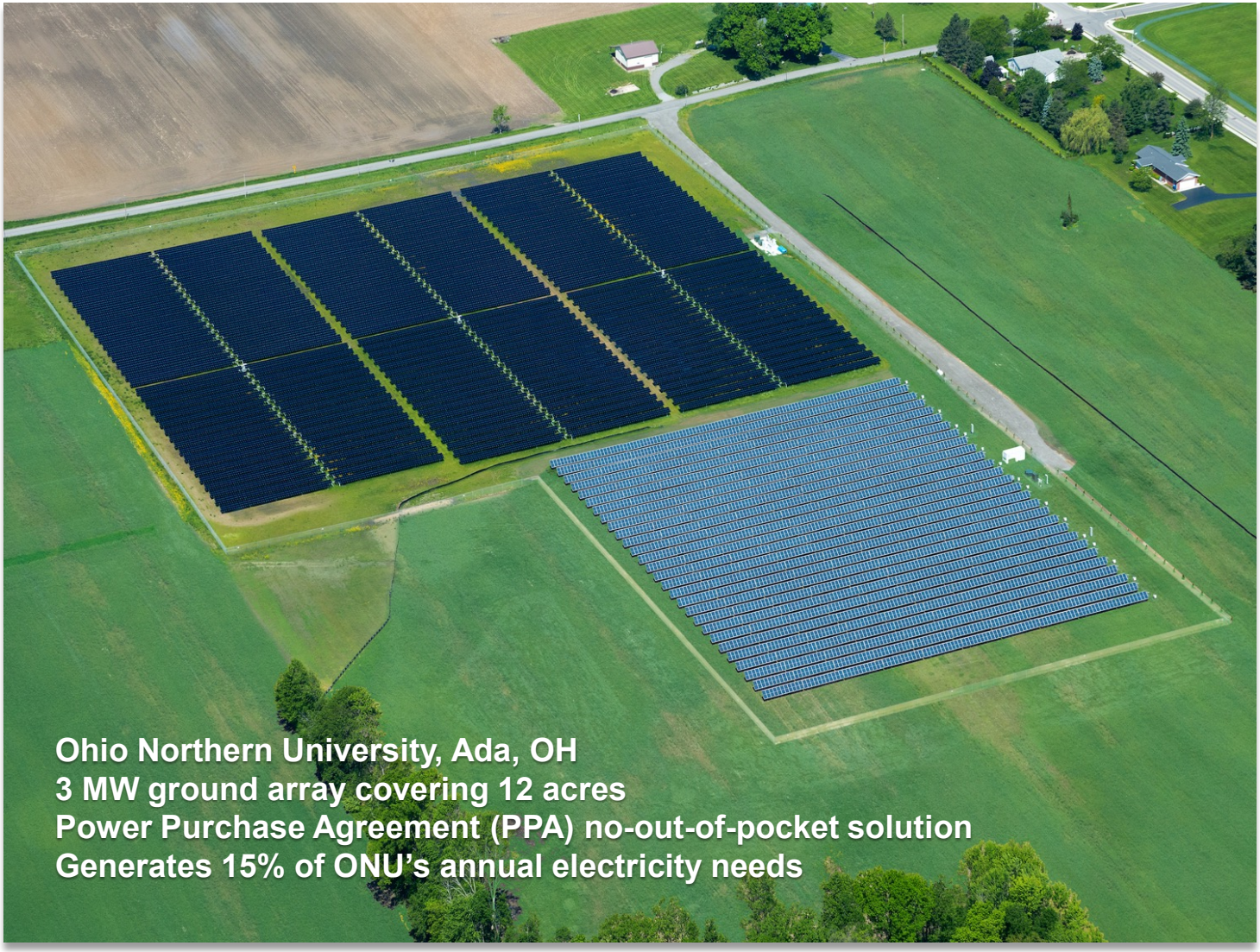

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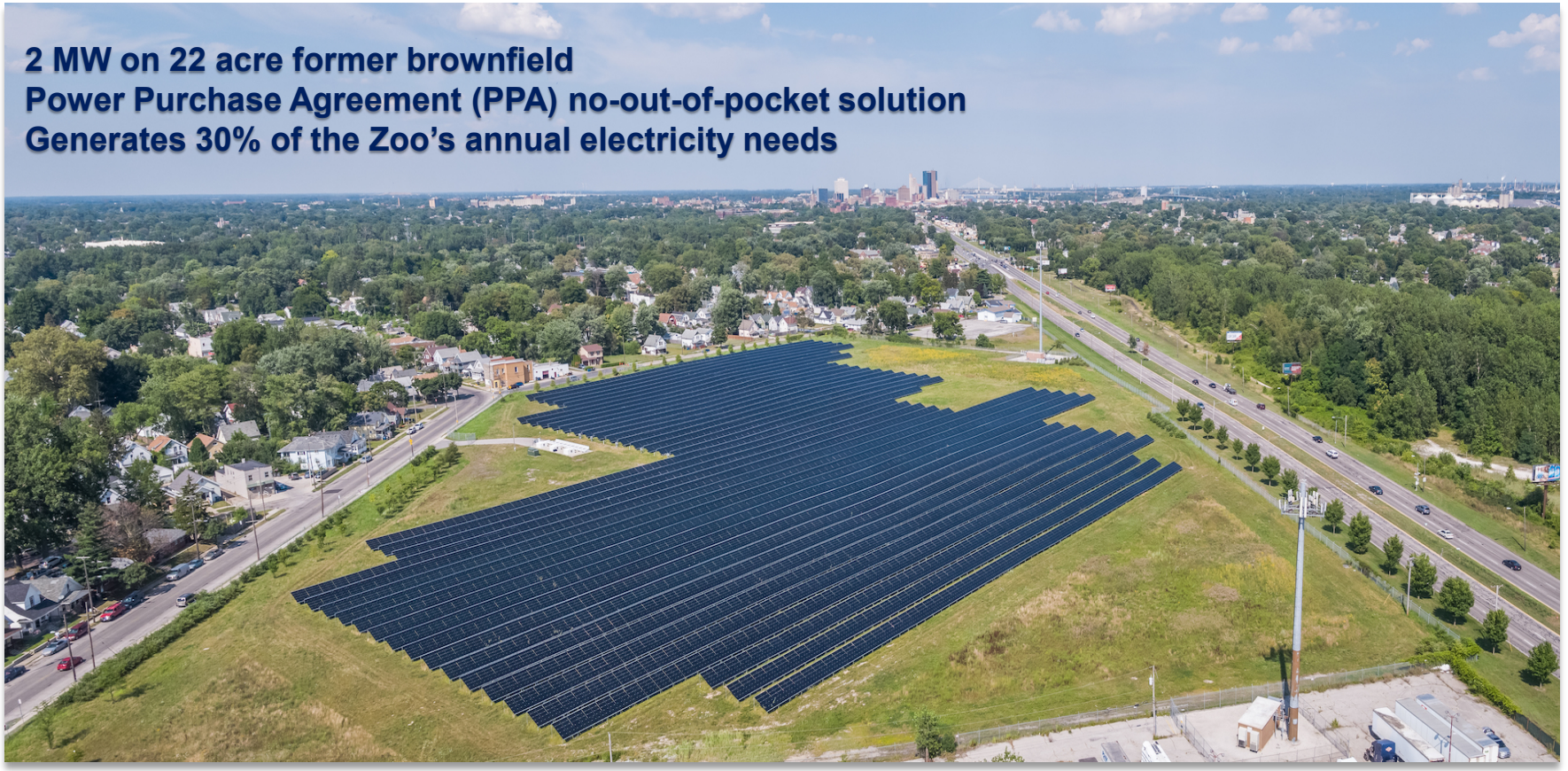
Toledo Zoo – Brownfield Development



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AEP Energy

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DTE Energy

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Owens Corning

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Questions?

Thank you!

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