

West Chester University

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Presentations

Sustainability Research & Creative Activities @
WCU

11-4-2020

West Chester's Energy Future

Will Williams

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Part of the Sustainability Commons



WEST CHESTER'S ENERGY FUTURE

West Chester's RF100 Pledge

- Approved in 2017
- 100% Clean Electricity 2035
- 100% Clean Energy, Heat and & Transportation 2050
- For ENTIRE community - some adjacent townships also approved
- How? Consultant hired to write a region-specific plan for WC Borough and five surrounding townships in 2019-2020

WCA Energy Consumption by Sector, Fuel

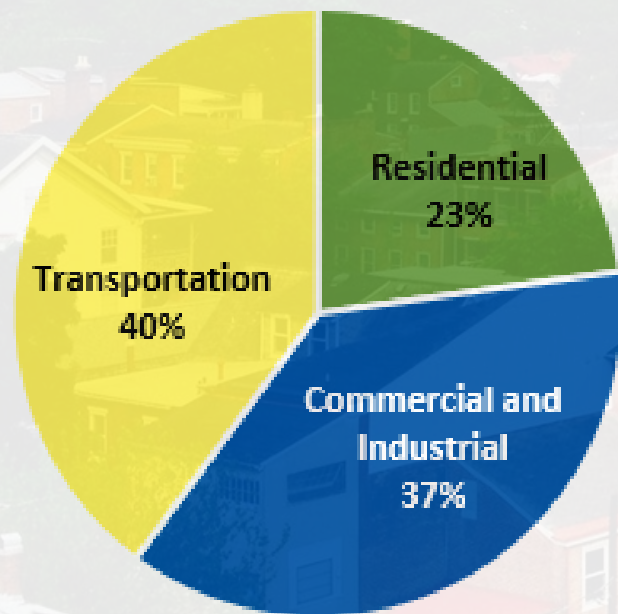
Maximize
Energy
Efficiency

Electrify
Everything

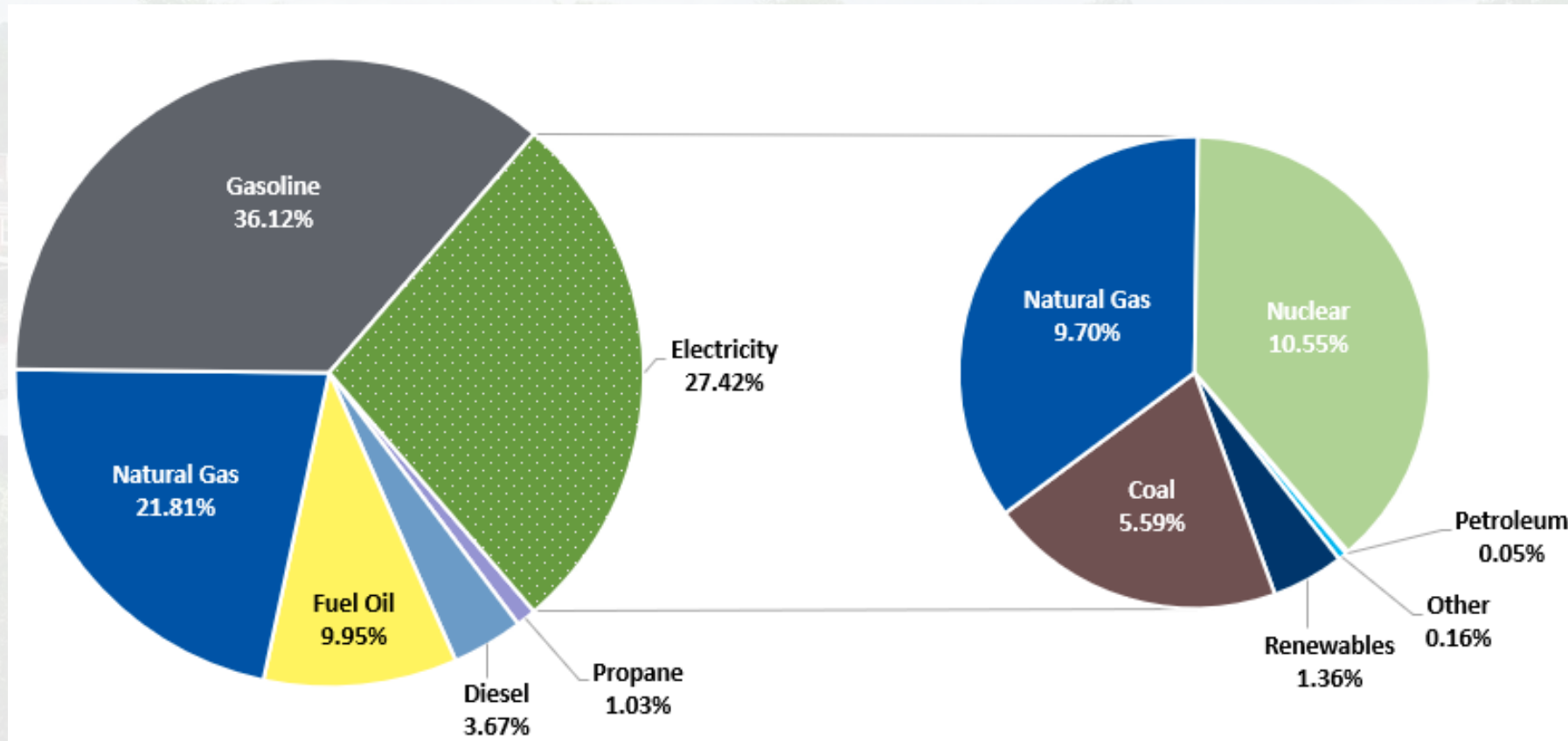
Build Very
Efficient

Buy
Renewable

WCA Energy Consumption by Sector, Fuel



WCA Energy Consumption by Sector, Fuel



An aerial, wide-angle night photograph of a city street corner. The foreground shows a curved road with light trails from moving vehicles, including red, white, and blue streaks. A white arrow on the road points towards the center, with the word 'ONLY' painted below it. In the middle ground, a row of multi-story buildings is illuminated. A prominent white building with arched windows and a sign that reads 'DALLAS BYE' is visible. A central inset box with a white border highlights a section of these buildings, with the word 'TRANSPORTATION' written in large, white, sans-serif capital letters across it. The background shows more city lights and buildings under a dark night sky.

TRANSPORTATION

Electrifying Transportation

Consider the following: EVs have achieved price parity



Kelley Blue Book
THE TRUSTED RESOURCE

Press Releases

Average New-Vehicle Prices Jump Nearly 4% Year-Over-Year

Manufacturer	August 2020 Transaction Price (Avg.)*
American Honda (Acura, Honda)	\$29,343
Fiat Chrysler (Alfa Romeo, Chrysler, Dodge, Fiat, Jeep, RAM)	\$43,305
Ford Motor Company (Ford, Lincoln)	\$45,033
General Motors (Buick, Cadillac, Chevrolet, GMC)	\$42,866
Hyundai Kia	\$28,217
Nissan North America (Nissan, INFINITI)	\$30,769
Subaru	\$31,030
Toyota Motor Company (Lexus, Toyota)	\$35,801
Volkswagen Group (Audi, Volkswagen, Porsche)	\$42,481
Industry	\$38,635

*Kelley Blue Book average transaction prices do not include applied consumables

Select Your Car

Purchase Price

Include potential savings*

All cars have a power trunk, glass roof, and Autopilot.

Rear-Wheel Drive

Partial Premium Interior

Standard Range Plus

\$37,990



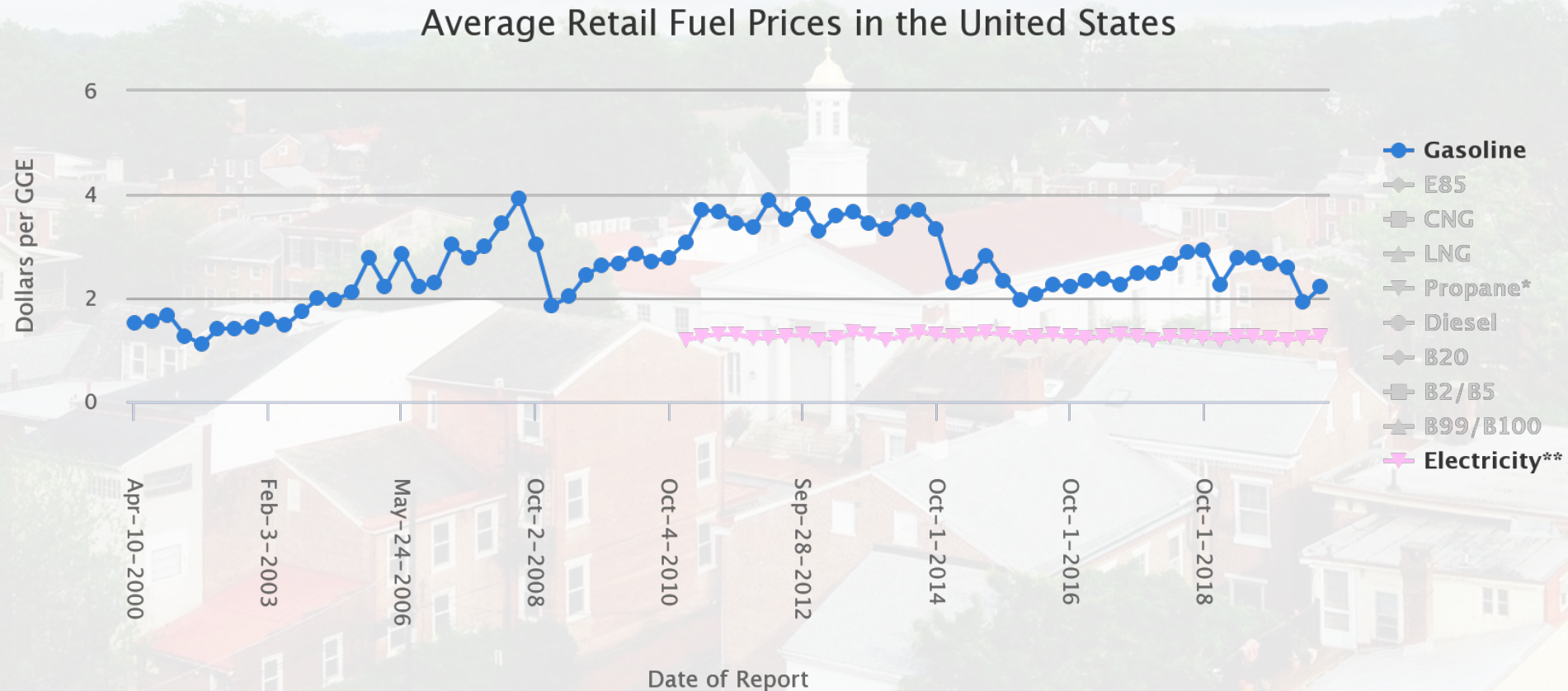
263mi
Range (est.)

140mph
Top Speed

5.3s
0-60 mph

Electrifying Transportation

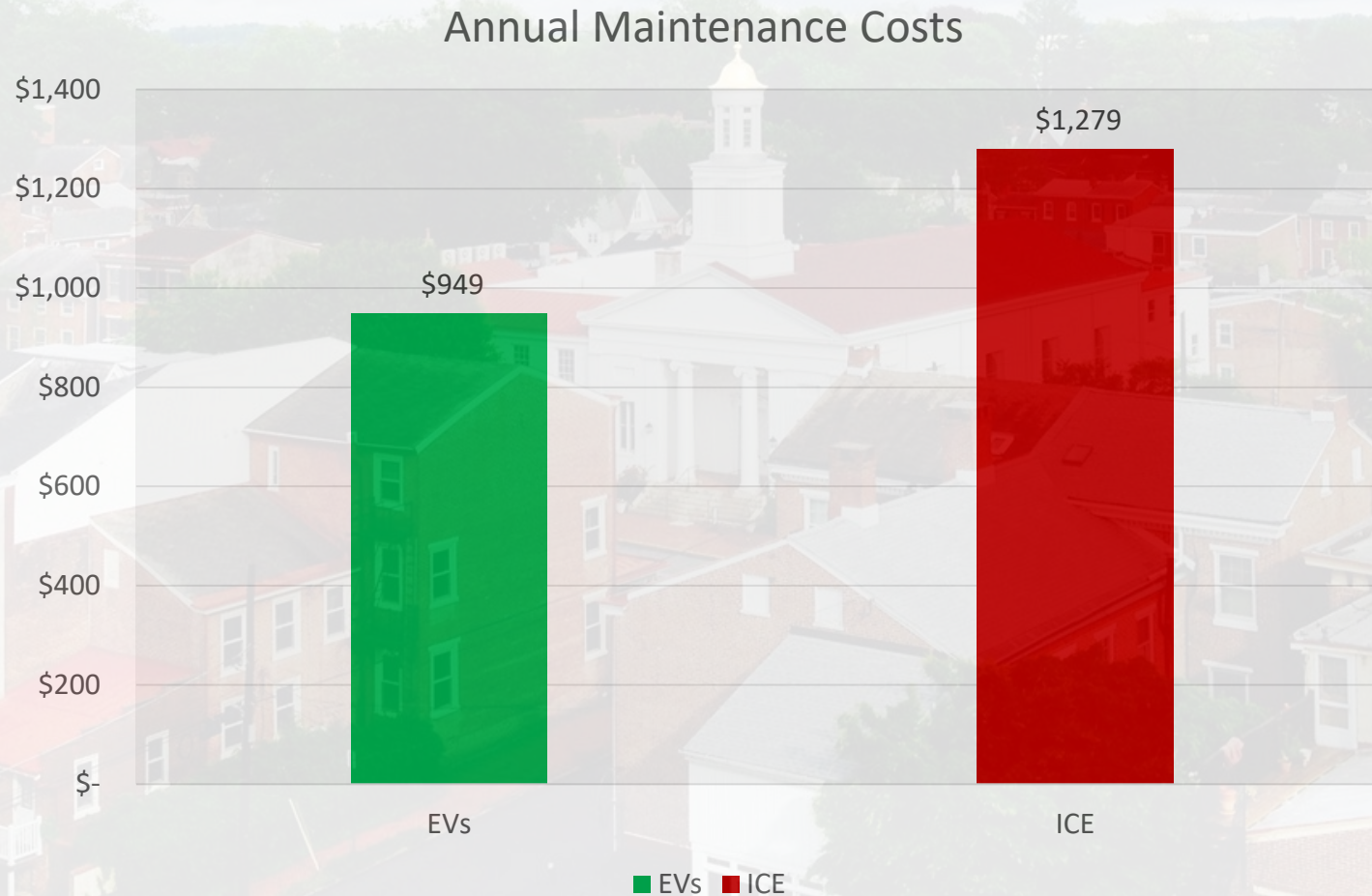
Consider the following: Fuel costs are 50-75% less than ICE (DOE)



Last updated: October 2020
Printed on: October 30

Electrifying Transportation

Consider the following: EVs cost 26% less to maintain than ICE (AAA)



Electrifying Transportation

Consider the following: EVs are now badass



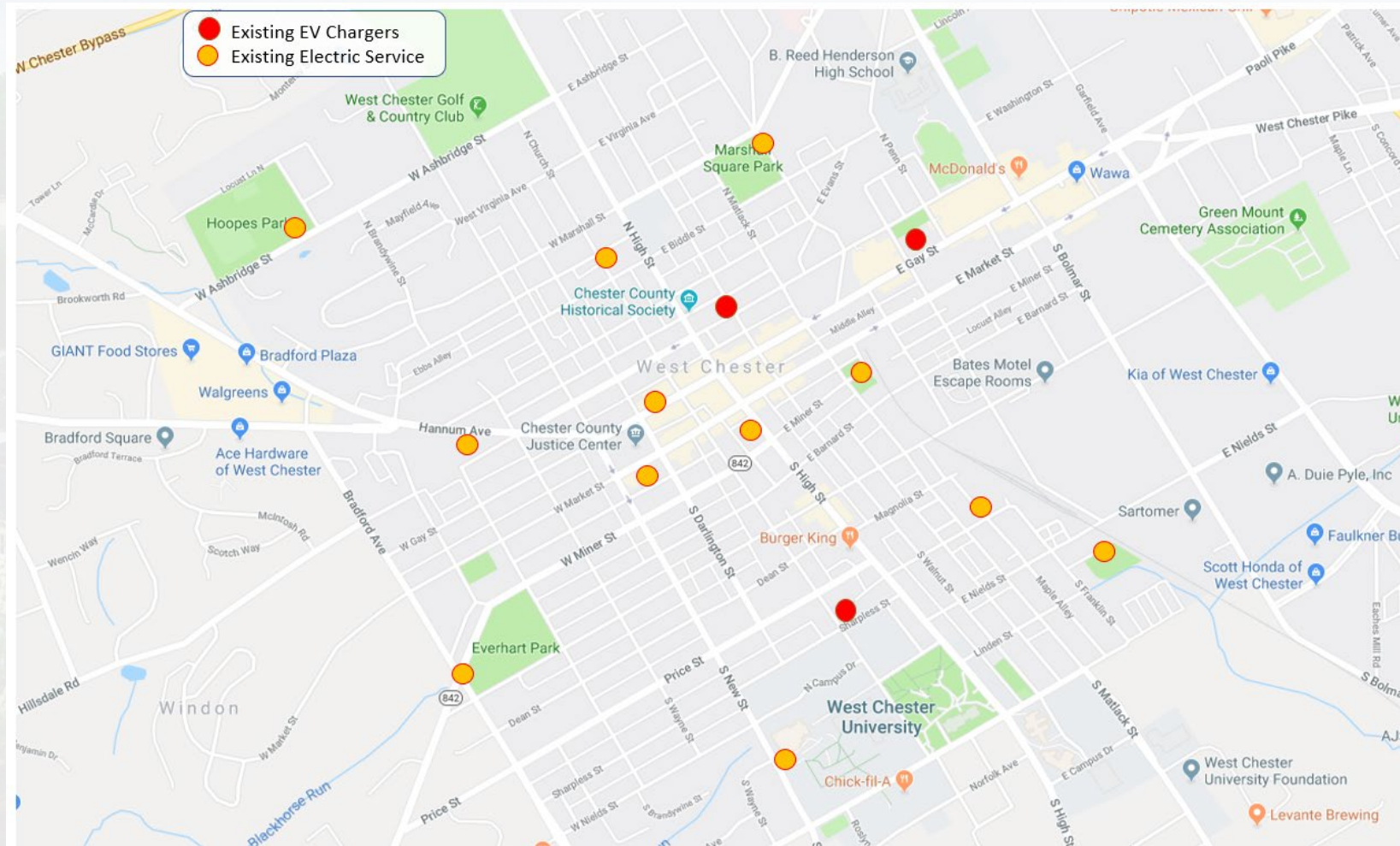
Electrifying Transportation

Consider the following: Progress on Medium & Heavy Duty



Local Government's Role?

Electrify fleet, build public charging infrastructure



An aerial photograph of a residential neighborhood. The scene is dominated by lush green trees in the background. In the foreground and middle ground, there are various types of buildings: a large brick building on the left, a yellow two-story house in the center, and a row of red brick townhouses on the right. A street with a few cars is visible in the lower left. A white rectangular box with a thin black border is centered over the image, containing the text "RESIDENTIAL & SMALL COMMERCIAL BUILDINGS" in white, bold, sans-serif capital letters.

RESIDENTIAL & SMALL
COMMERCIAL BUILDINGS

West Chester's RF100 Pledge

Maximize
Energy
Efficiency

Electrify
Everything

Build Very
Efficient

Buy
Renewable

Energy At Home

- PECO Smart Ideas Audit
- DIY & High ROI
 - LED Lighting
 - Smart thermostat and use it!
 - Reflective roof
 - Hang dry your clothes - \$70/year destroying our clothes in the dryer
- Hire a pro - decent ROI
 - Air sealing & insulation
- Upon replacement - good ROI but not a proactive choice
 - Efficient appliances
 - Efficient HVAC - i.e. Heat Pumps!

Heat Pumps



Gigantic Atlantic Coast Gas Pipeline Done In By Humble Household Heat Pump

July 6th, 2020 by [Tina Casey](#).



New Construction



Local Government's Role?

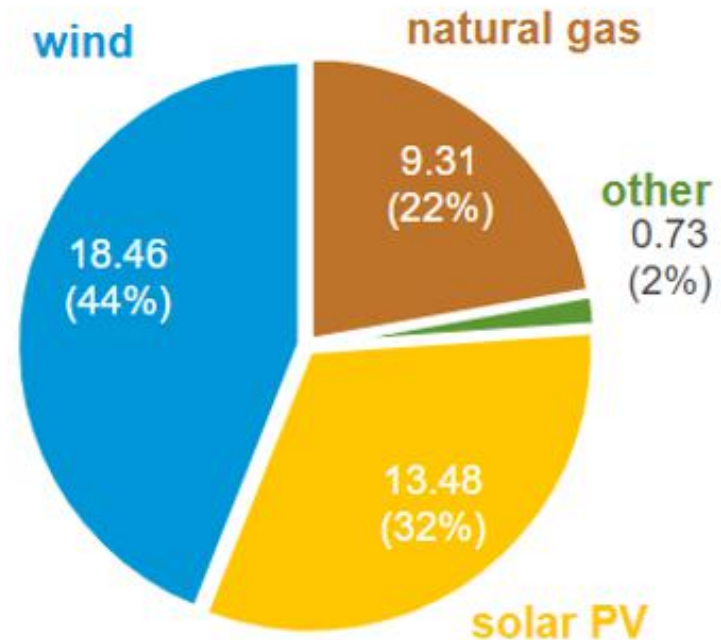
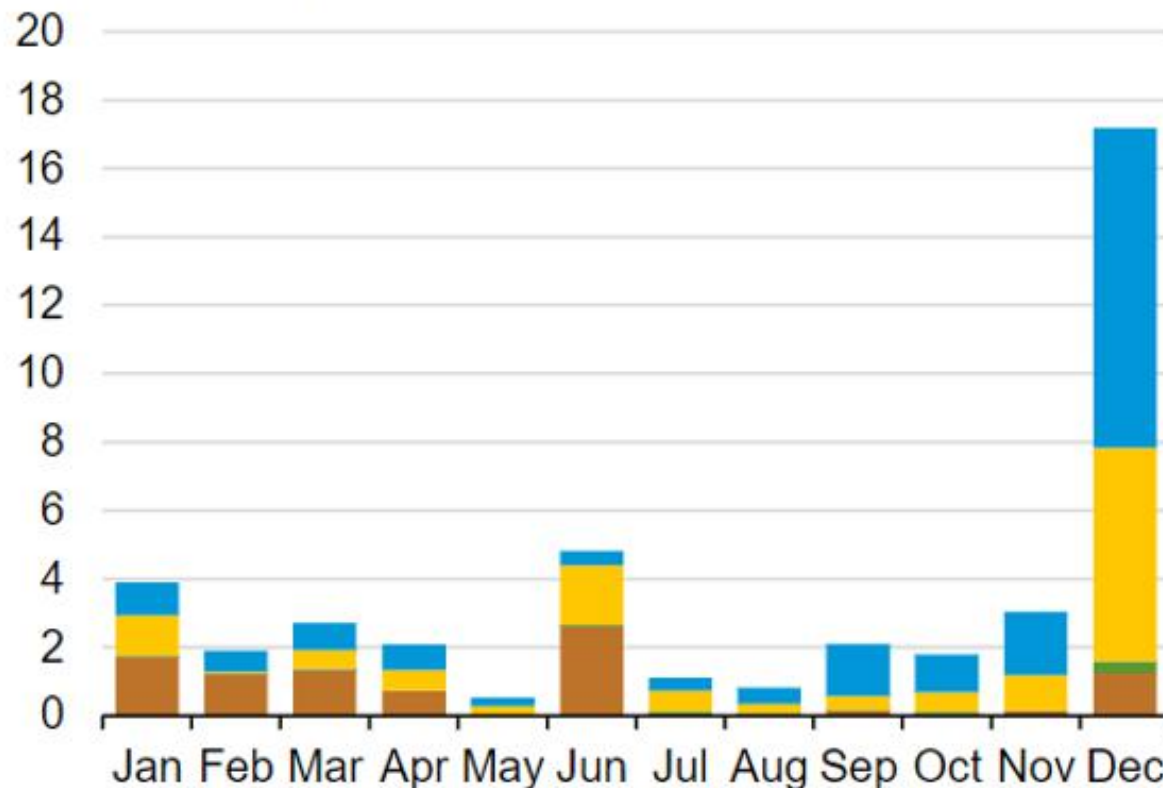




ENERGY SUPPLY

Energy Supply

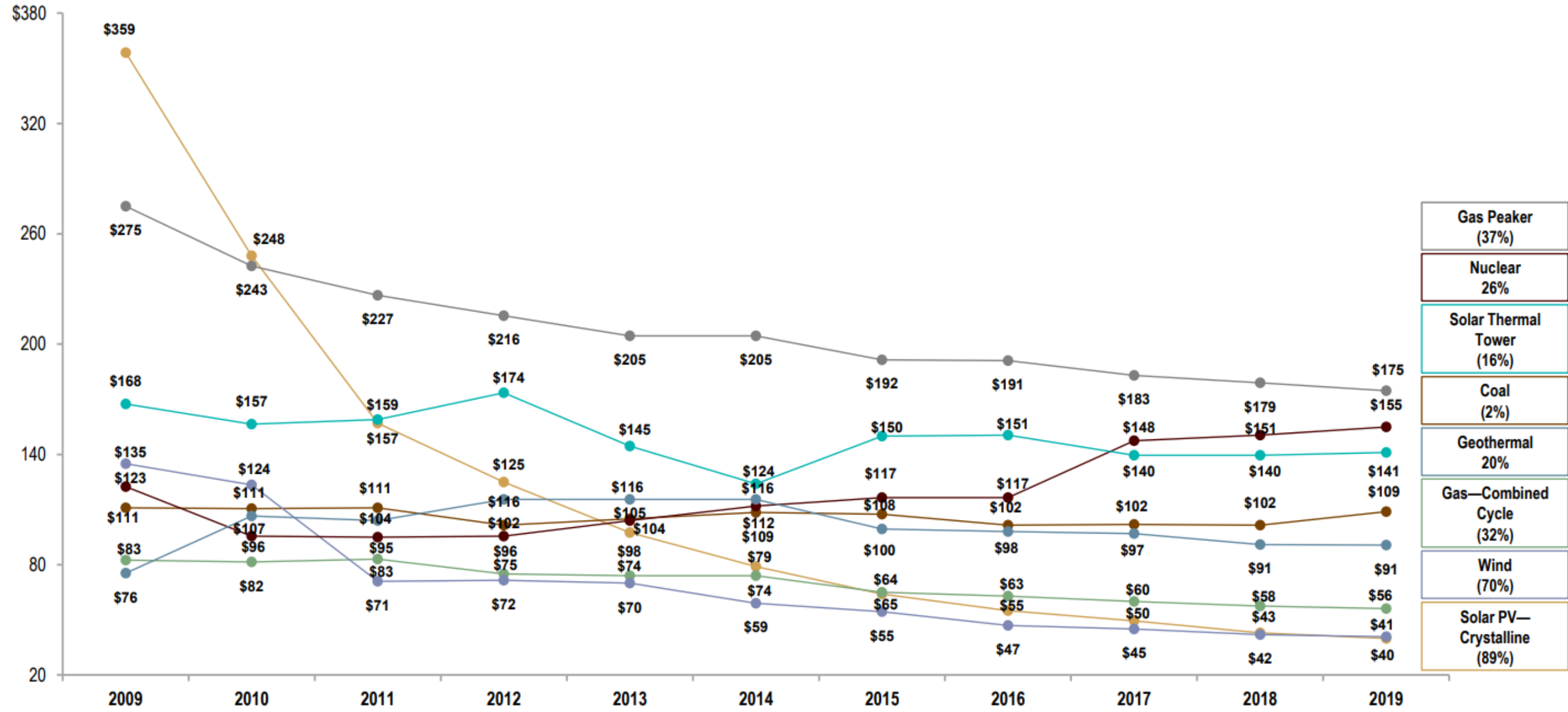
Planned U.S. electric generating capacity additions (2020)
gigawatts (GW)



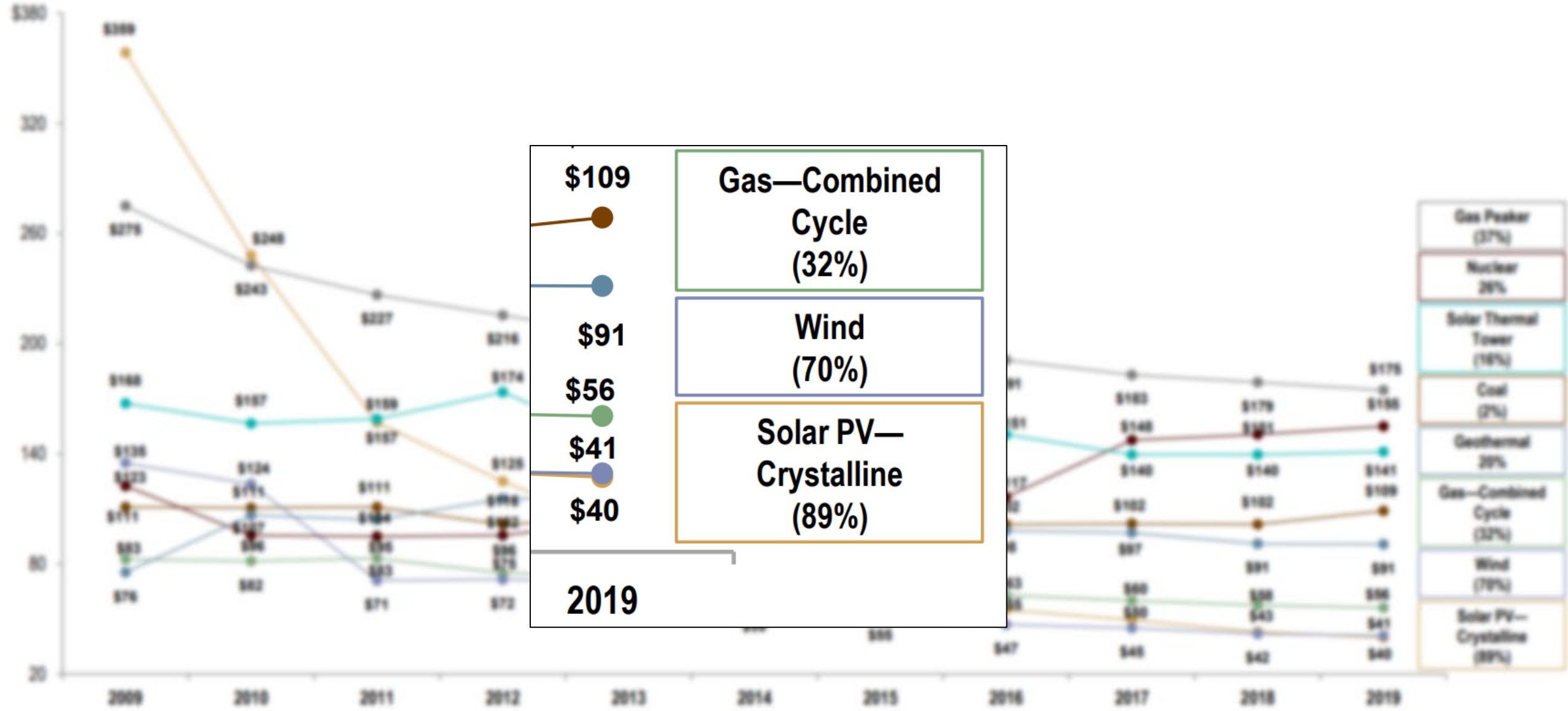
Source: U.S. Energy Information Administration, *Preliminary Monthly Electric Generator Inventory*



Levelized Cost \$/MWH



Levelized Cost \$/MWH



Local Government's Role

- WCB and five surrounding townships released an RFI in October
- Responses due Friday after next
- If successful we'll solicit a power purchase agreement through a full RFP 1Q 2021
- Most likely a Virtual PPA
 - Offset our electricity use via new, regional clean energy placed on grid

West Chester Area Council of Governments

REQUEST FOR INFORMATION

for

*Renewable Energy Development
for the West Chester Area Municipalities
Electricity Load*

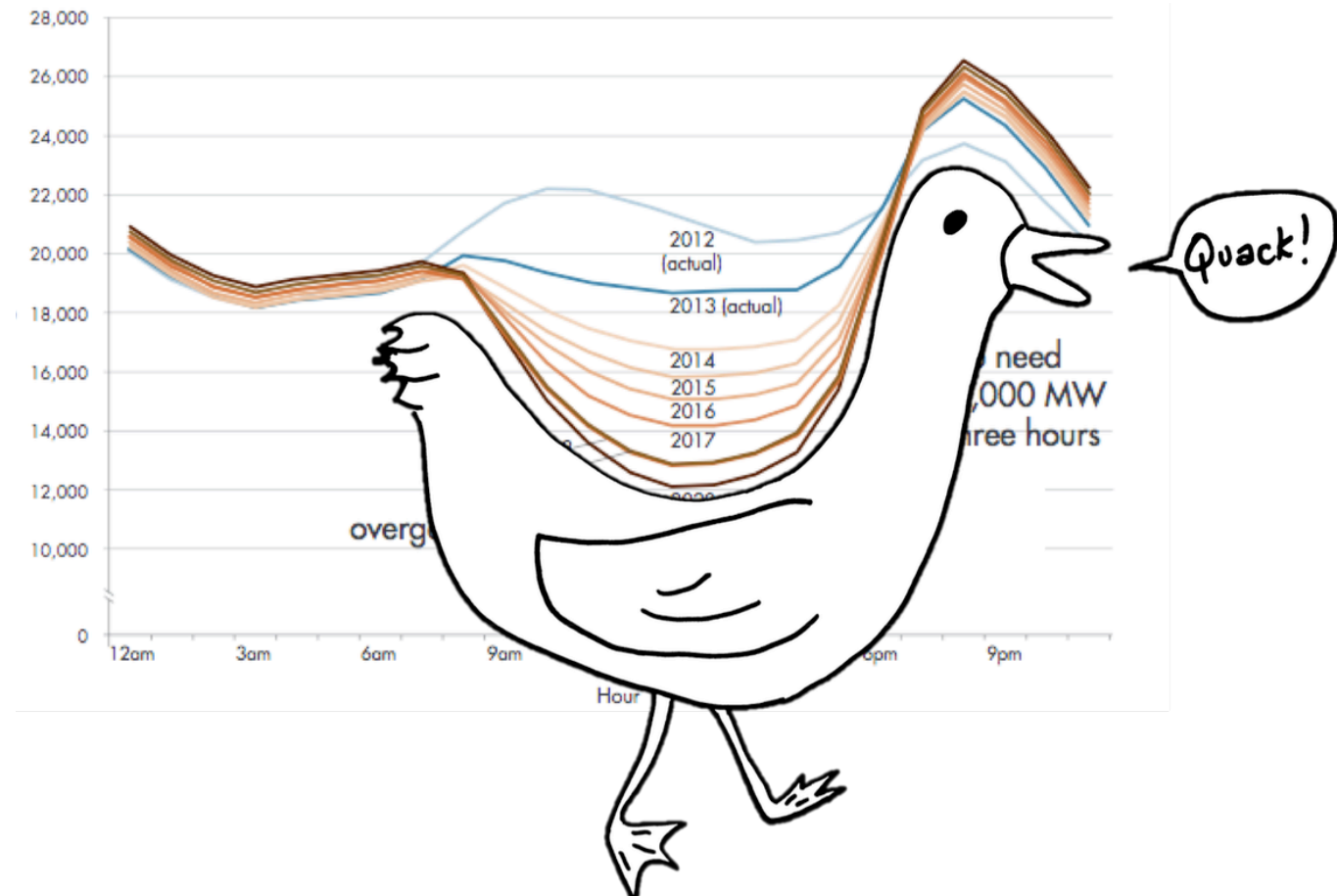
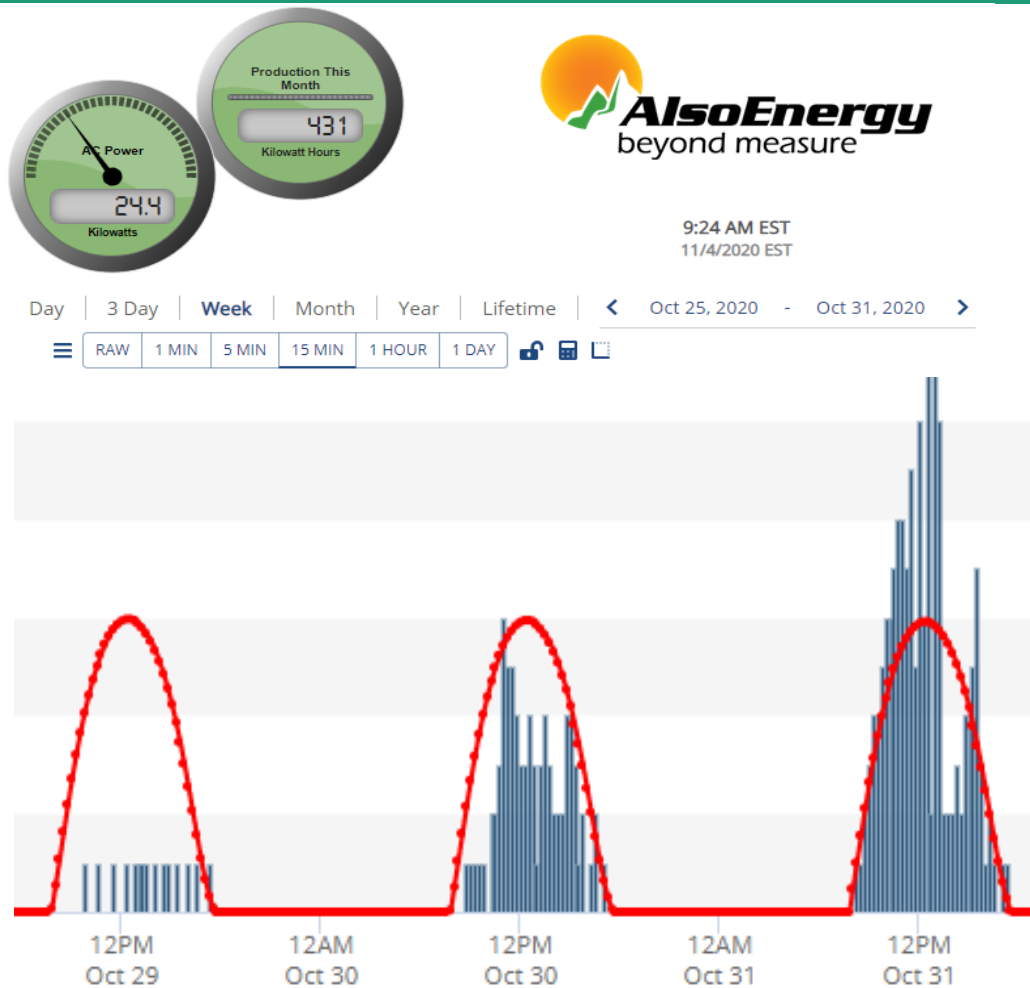
DUE DATE: Friday, November 13, 2020

RFI NUMBER:

Requests for information related to this solicitation should be directed to:

Will Williams, Sustainability Director, at: wwilliams@west-chester.com

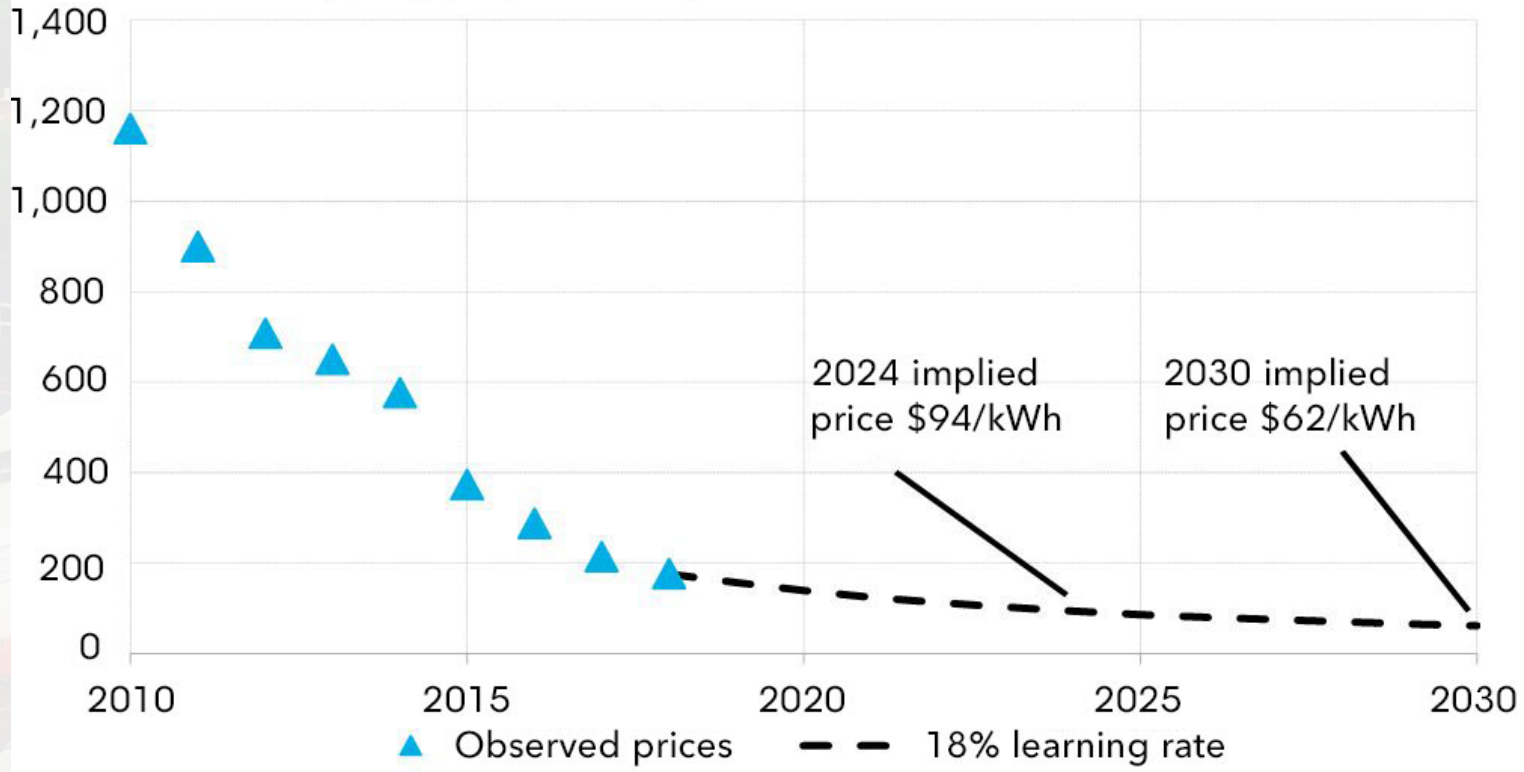
The Intermittency Issue



Energy Storage

Lithium-ion battery price outlook

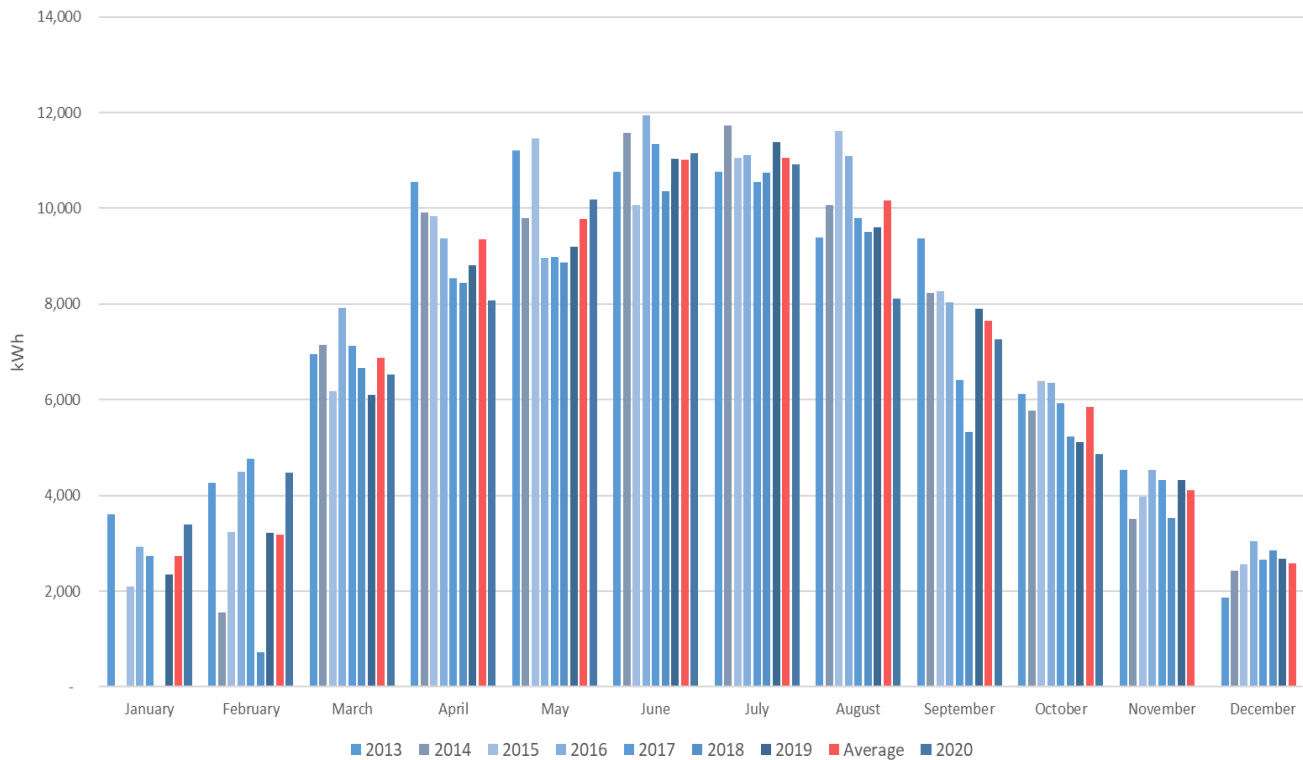
Lithium-ion battery pack price (real 2018 \$/kWh)



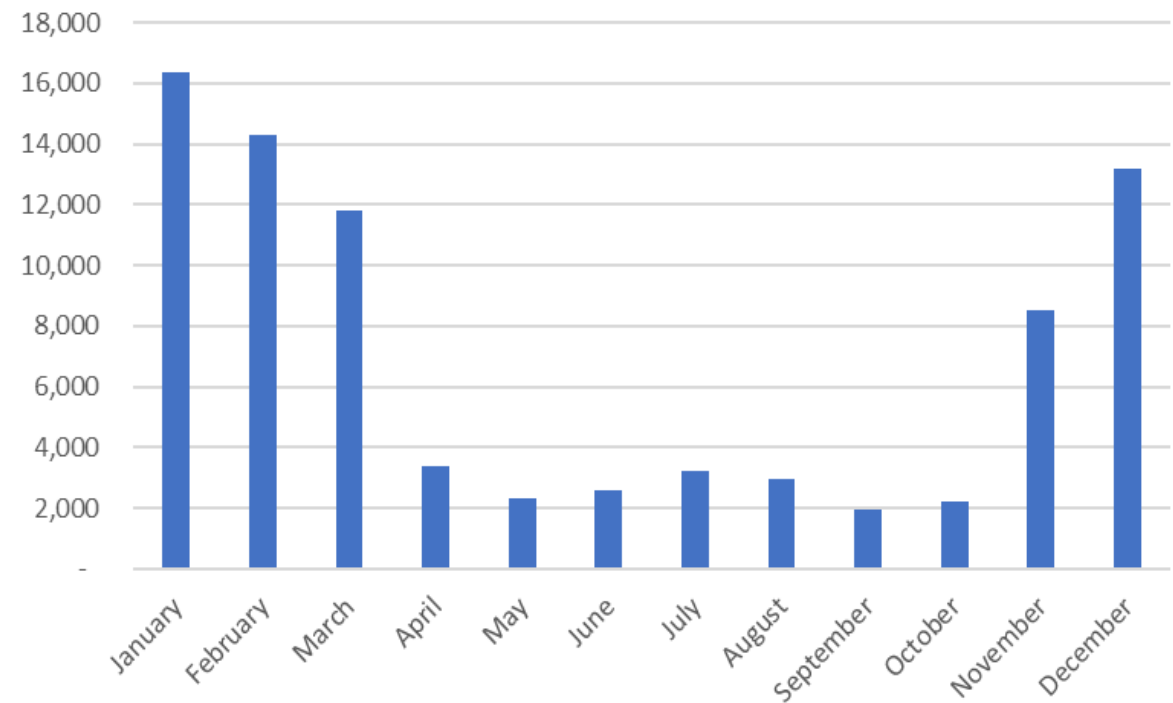
Source: BloombergNEF

Seasonal Intermittency

Annual Production By Month

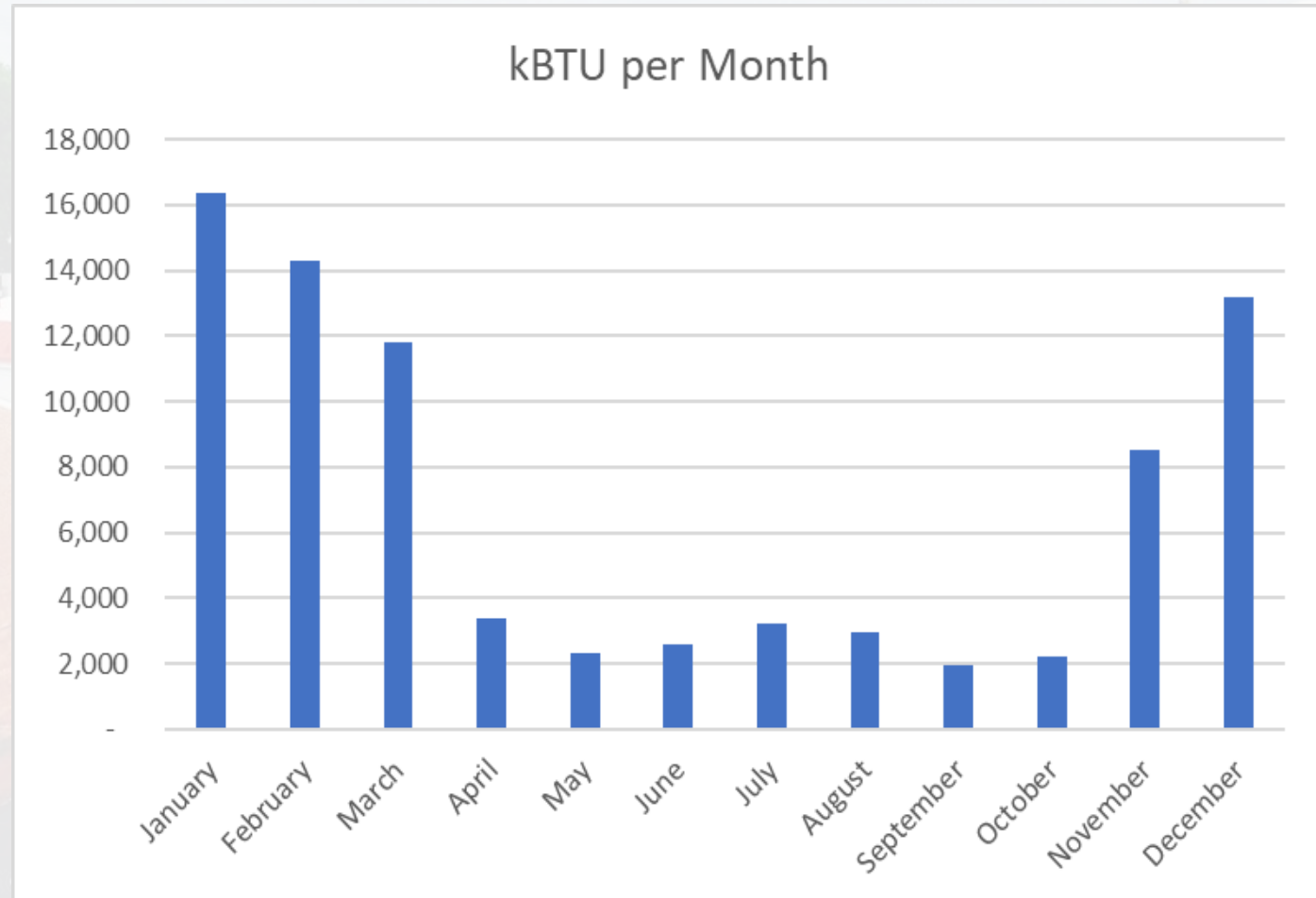


kBTU per Month



Seasonal Intermittency

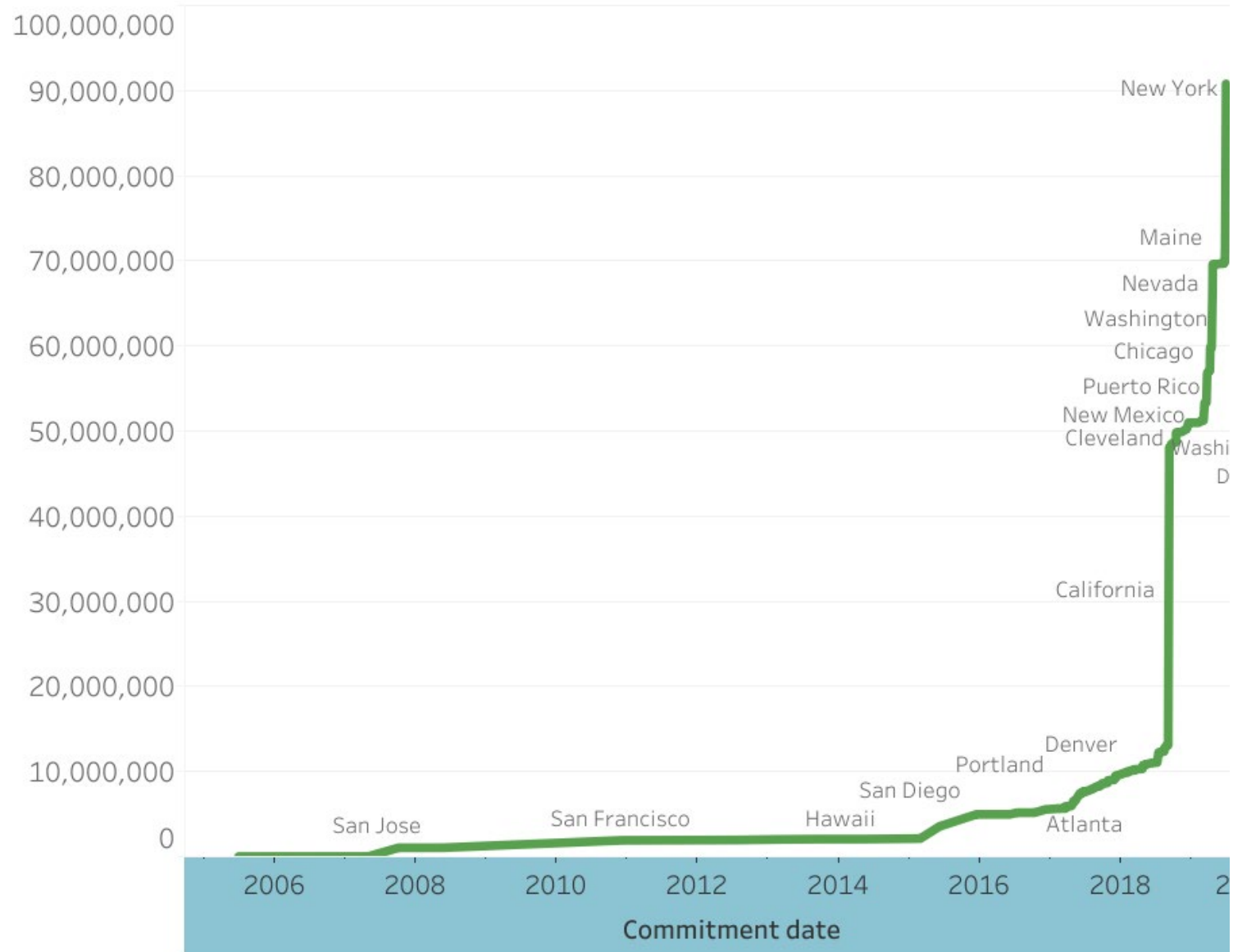
- Efficiency
- Heat Pumps
- On-site solar
- Offshore wind?
- Nukes?
- Gas Peakers?



We don't have to figure it out alone!

- Ambler
- Cheltenham
- Conshohocken
- Downingtown
- East Bradford
- East Pikeland
- Haverford
- Kennett Square
- Narberth
- Norristown
- Phoenixville
- Plymouth Meeting
- Radnor
- Reading
- Schuylkill
- Springfield
- State College
- Swarthmore
- Tredyffrin
- Upper Merion (KoP)
- Uwchlan
- Whitemarsh

U.S. population committed to 100% clean energy over time



Source: U.S. Census Bureau. Population data is based on the 2016 census. Incremental population for 100% states is reduced by the cities previously committed to 100% clean energy in those states, so as not to double count.



THANKS!