

JOBS FOR VIRGINIA

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RICK CLAYTON

- Economist with Bureau of Labor Statistics for 40 years
- Worked with Virginia Employment Commission staff over 30 years.
- Quarterly Census of Employment and Wages (QCEW)
- Job Openings and Labor Turnover Survey (JOLTS) (watch this for signs of a recession!)
- Green Goods and Services (GGS)
- Business Employment Dynamics

OVERVIEW

- Brief overview of VA economy
- Review a couple problem areas
- Provide a way to keep our money here creating jobs, incomes, wealth
- Energy transition to renewables serves VA

VIRGINIA'S ECONOMY

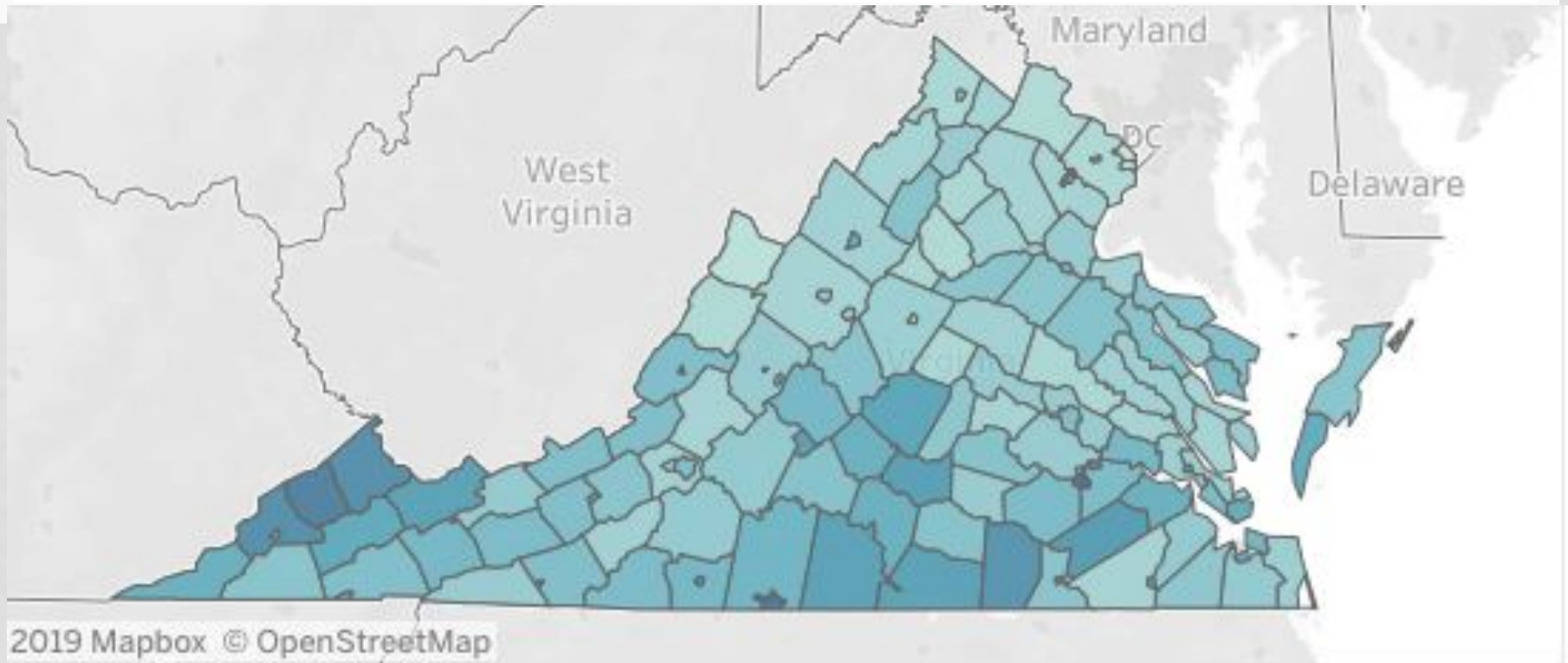
Employment is up over the year

- VA 4,030,700 +23,000 +0.6%
- US 151,431,000 +2,246,000 +1.5%

Unemployment is low

- VA 2.9%
- US 3.7%

VA UNEMPLOYMENT BY COUNTY



GDP GROWTH

Compound Annual Growth Rate 2011- 2018

- US 4.0
- **VA 3.1**
- DC 3.5
- MD 3.3
- NC 4.1
- PA 3.7
- WV 1.8

VIRGINIA vs NORTH CAROLINA vs US

- Personal Income

- US +4.5%
- VA **+3.9%**
- NC +4.8%

- Per capita personal income

- US \$53,712
- VA \$56,952 9th
- NC \$45,836 31st

Source : BEA

ENERGY

- “energy consumption is two and a half times greater than the state’s energy production”
- “electricity consumption is greater than electricity generation in Virginia”

EIA

IMPORTING ENERGY = EXPORTING JOBS

- Virginia buys out-of-state energy and fuels
- We import 80% of NG
- We import 100% of fuels and oils
- We import electricity

- Minimum **\$13 B** per year

- 2.3% of state GDP leaves the state for energy

- VA citizens are supporting over **95,000 jobs in other states.**

VIRGINIA COAL EMPLOYMENT

(NAICS 2121)

<u>Year</u>	<u>Estabs</u>	<u>Employment</u>	<u>Avg Annual Wage</u>
2014	89	3,494	\$79,092
2015	80	2,978	\$73,892
2016	76	NA	NA
2017	63	2,495	\$76,648
2018	64	2,478	\$83,460

--declining businesses and employment

-- high paying

Source: BLS QCEW

VIRGINIA OIL AND GAS EMPLOYMENT

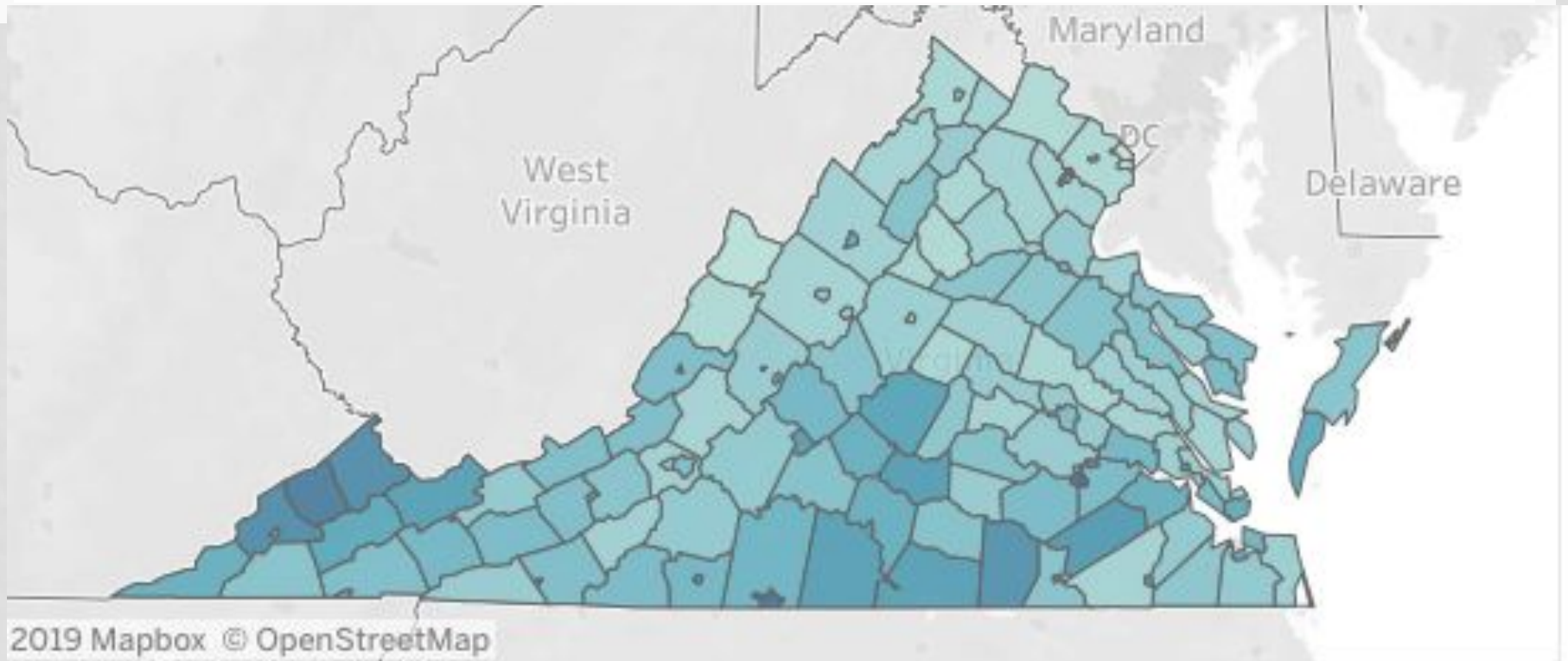
(NAICS 211)

<u>Year</u>	<u>Estabs</u>	<u>Employment</u>	<u>Avg Annual Wage</u>
2014	29	378	\$111,020
2015	31	366	\$100,464
2016	28	291	\$99,008
2017	17	254	\$91,572
2018	18	228	\$99,996

- declining businesses and employment
- high paying

Source: BLS QCEW

VA UNEMPLOYMENT BY COUNTY



INVEST IN VIRGINIA

- Rather than investing in other states', let's invest in VA

\$500 M invested in VA solar	+ 6,500 jobs	in VA
\$1 B	+13,000 jobs	in VA
\$2 B	+26,000 jobs	in VA

Etc. How many good, new jobs do you want?

Source: BEA Final Demand employment multipliers

OCCUPATIONS: MANY TRANSLATE TO SOLAR / WIND

Coal mining

Solar

- **Construction and Extraction**
- **Electricians**
- **Installation, Maintenance and repair**
- Production operators
- **Sale, marketing and related**
- **Architects and Engineers**
- Transportation and material moving
- **Management and supervisors**
- Mining Machine operators
- Mine cutting and channeling operators
- Roof bolters
- Compliance professionals
- Protective services
- Welders, cutters, brazers

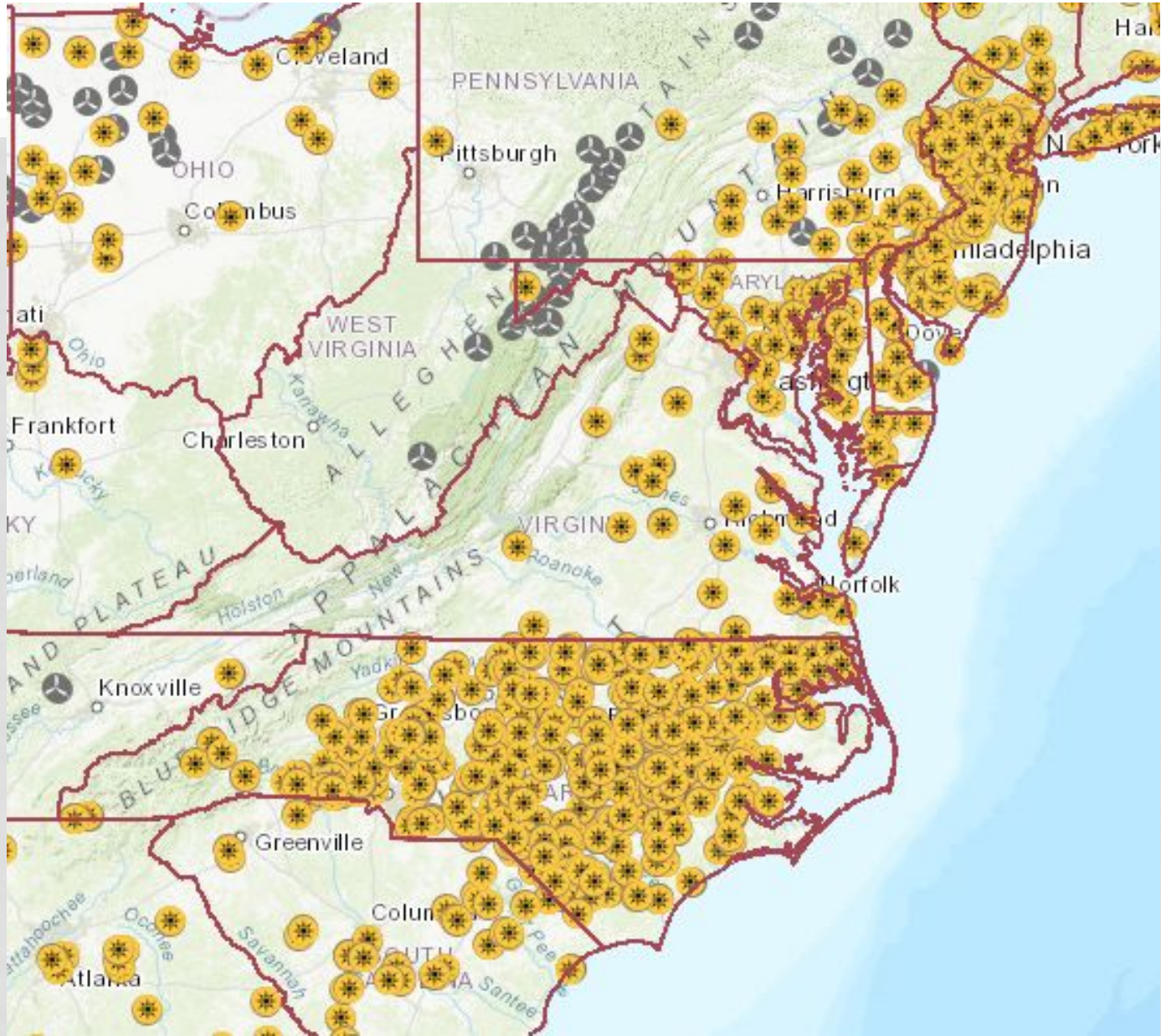
- **Construction and extraction**
- **Construction trade workers**
- **Electricians**
- **Installation, maintenance and repair**
- **Sales, marketing and related**
- **Architects and Engineers (electrical and other)**
- **Management and supervisors**
- **Office and admin**
- Developers
- **Financial Accountants**
- **Buyers and purchasers**

- Wind industry is similar ...plus lawyers

Source: BLS OES

SOLAR AND WIND INSTALLATIONS

EIA



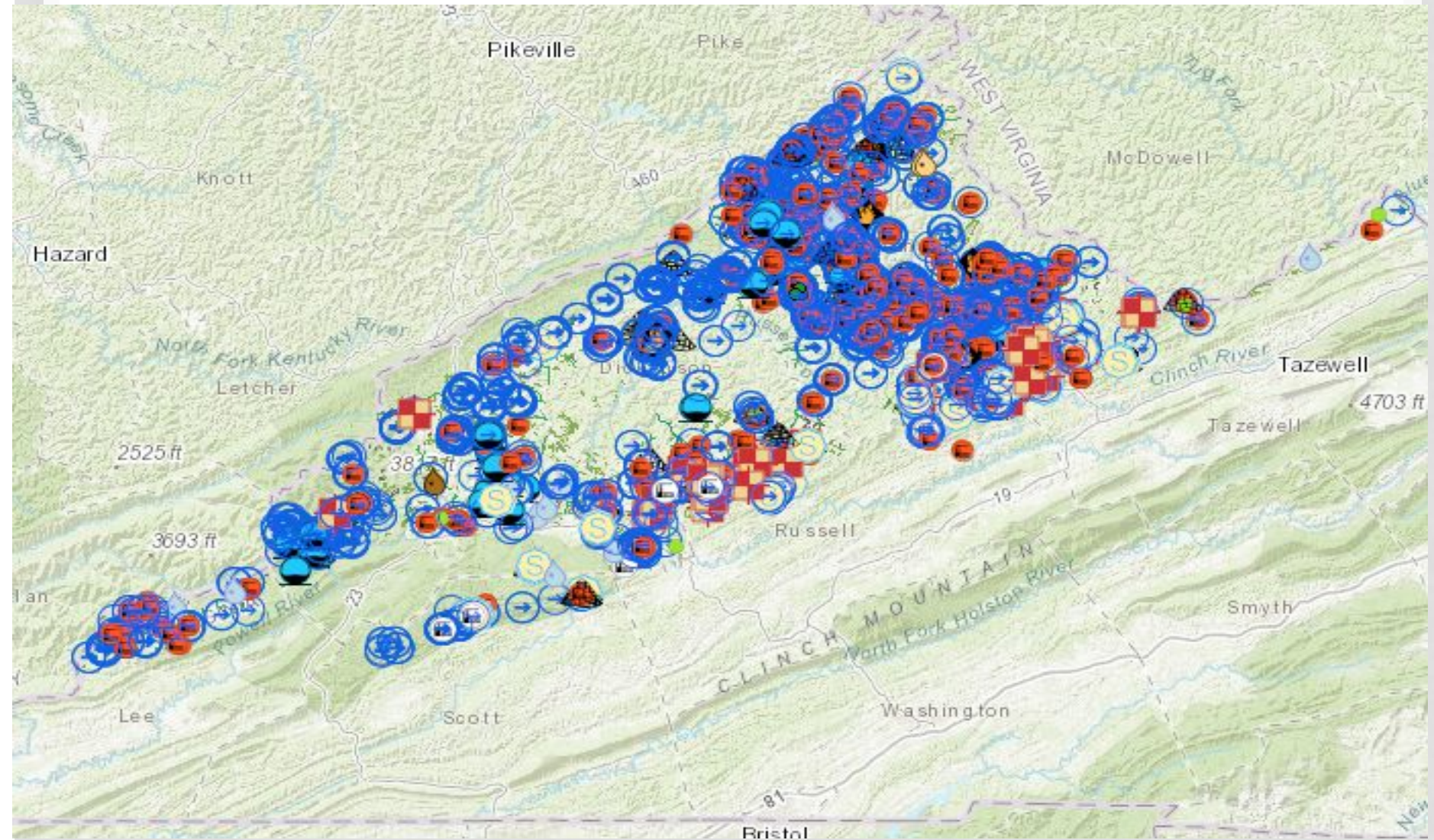
POTENTIAL SOLAR INSTALLATION LOCATIONS

VA has 270,557 business locations

• Government facilities	1,638
• Schools	782
• Retail stores	25,858
• Wholesale	11,557
-----Warehouses	399
• Parking lots	a million
• Closed mines	see map
• Closed dumps	
• Closed contaminated sites	
• Other marginal lands	

ABANDONED COAL MINES IN VIRGINIA

SOURCE: VA DMME/EIA





C2 Energy Capital Completes Solar Project at Tennessee Landfill

The power generated from the 2.7-megawatt system will be sold to the Tennessee Valley Authority.

LOCAL SOLAR EXPERT ANECDOTES

Company with 2500 MW @300 sites

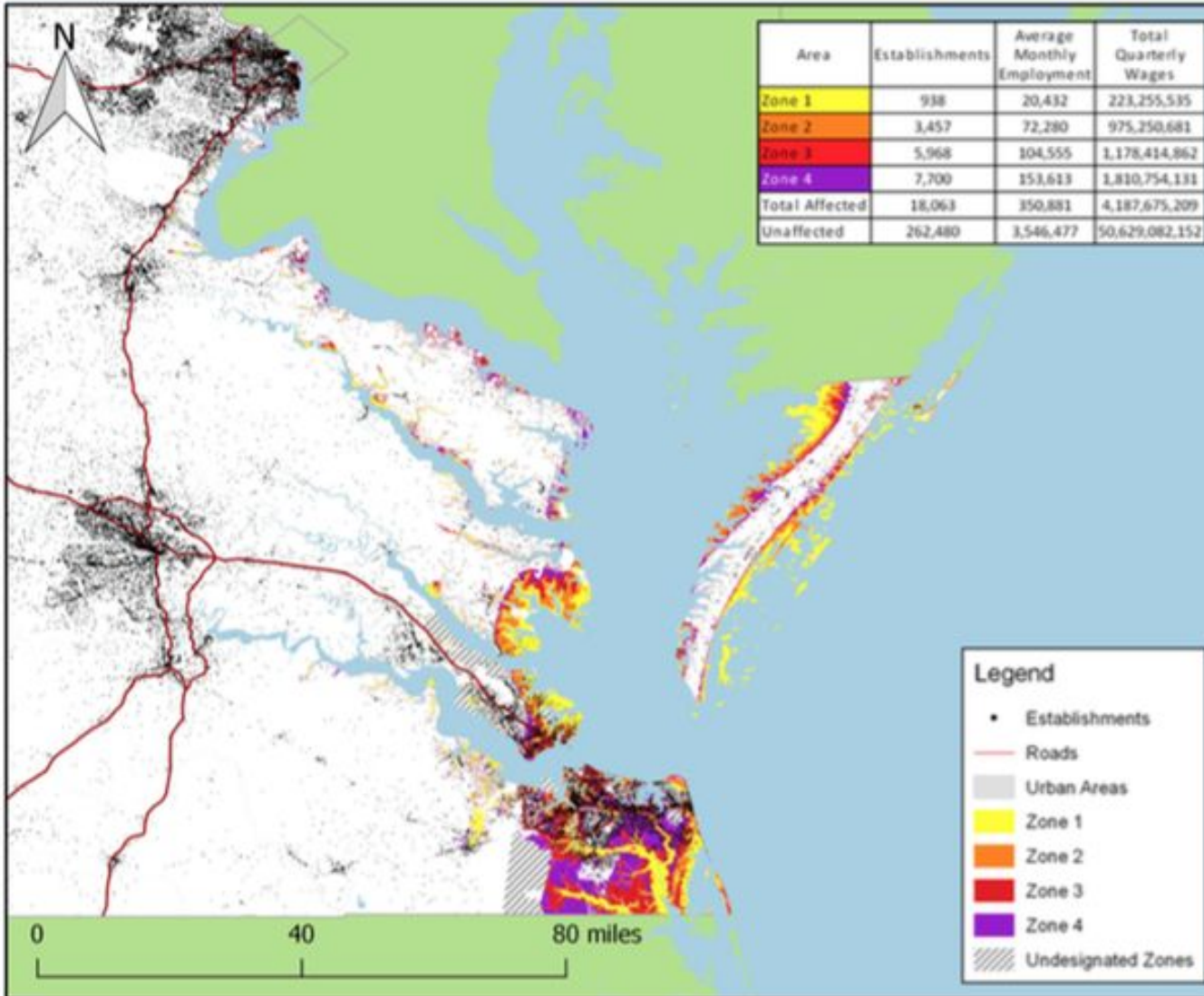
- 100 permanent jobs in the field
 - Maintenance and repair (inverters, tracking , gearboxes)
- 30 permanent jobs (mostly in NC)
 - Professional, finance, accounting, asset management
 - AI (uses drones to assess production – find weak cells)
- Avg wage around \$75,000 with benefits
- Grass cutters paid \$17-20 /hour
- ONE is in Virginia

OTHER ANECDOTES

- Gas stations are evolving ...captive charging audience who stay longer
 - adding charging stations
 - expanding eating capacity
 - other shopping
- it cost me \$200 for a single charge (shoes)

VIRGINIA BUSINESSES AND JOBS AT RISK OF SEA LEVEL RISE

Employment in Hurricane Storm Surge Flood Zones, Virginia



Note: Flood zones represent a conservative estimation of areas that would experience flooding in the event of a hurricane. Zone 1 is the area that would be flooded by a Category I hurricane. A Category II hurricane would cause flooding in Zones 1 and 2. The hurricane categories reference the Saffir-Simpson Hurricane Scale.

Each black dot represents at least one establishment.

Data Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages; 2018 Third Quarter
<https://www.bls.gov/cew>

Flood Zone Source: National Hurricane Program



SEA LEVEL RISE IN VA

- Communities, households, businesses government facilities are at-risk
- Huge investment in existing infrastructure will be need to address sea-level rise (money that otherwise could be spent on fixing existing roads, bridges, airports, etc.)
- Prevention is cheaper than fixing/replacing

VIRGINIA NET ELECTRICITY GENERATION BY SOURCE (4/19)

- Natural Gas 3.4 m MWh 53.0%
 - Coal fired .1 m MWh 1.6%
 - Nuclear 2.4 m MWh **37.5%**
 - Hydro .1 m MWh **1.7%**
 - Non hydro renewables .38 m MWh **5.9%**
- 6.4 m KWh
- **45.1%** from carbon free sources

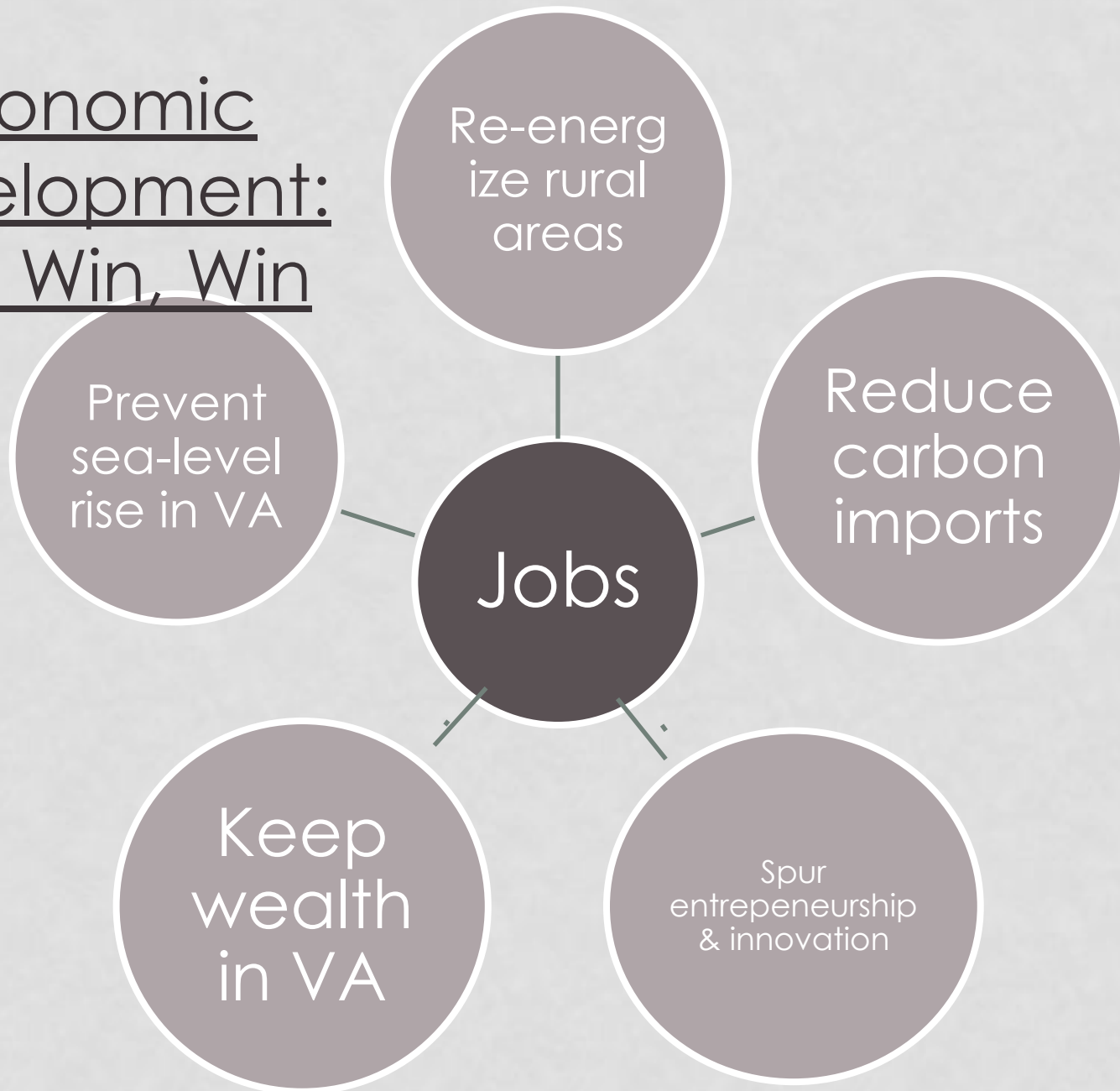
Source: EIA

GETTING TO 80% RENEWABLE BY 2050

- Current carbon free power production
- Nuclear = 37.5%
- Hydro = 1.7%
- Renewables = 5.9%
- Total carbon free = 45.1%

- 80%-45% = 35%

Economic
Development:
Win, Win, Win



SUMMARY

- VA economy is good, but growing slower than US and neighboring states
- We **export jobs** by **importing** coal, gas and fuels and electricity
- We could re-orient policies to invest in VA, VA jobs, VA families and multipliers
- Coal and oil/gas jobs are declining -- parts of VA are hurting
- We could replace lost coal/oil jobs with clean energy jobs
- Many jobs/occupations re-translate into solar/wind jobs
- We have “endless” flat/sloped places to put solar
- Parts of VA are at huge risk to sea-level rise/storm surge
- Creates jobs, good jobs and aids rural VA
- We would energize VA:
 - Entrepreneurs
 - Job creation/incomes
 - Economic development