



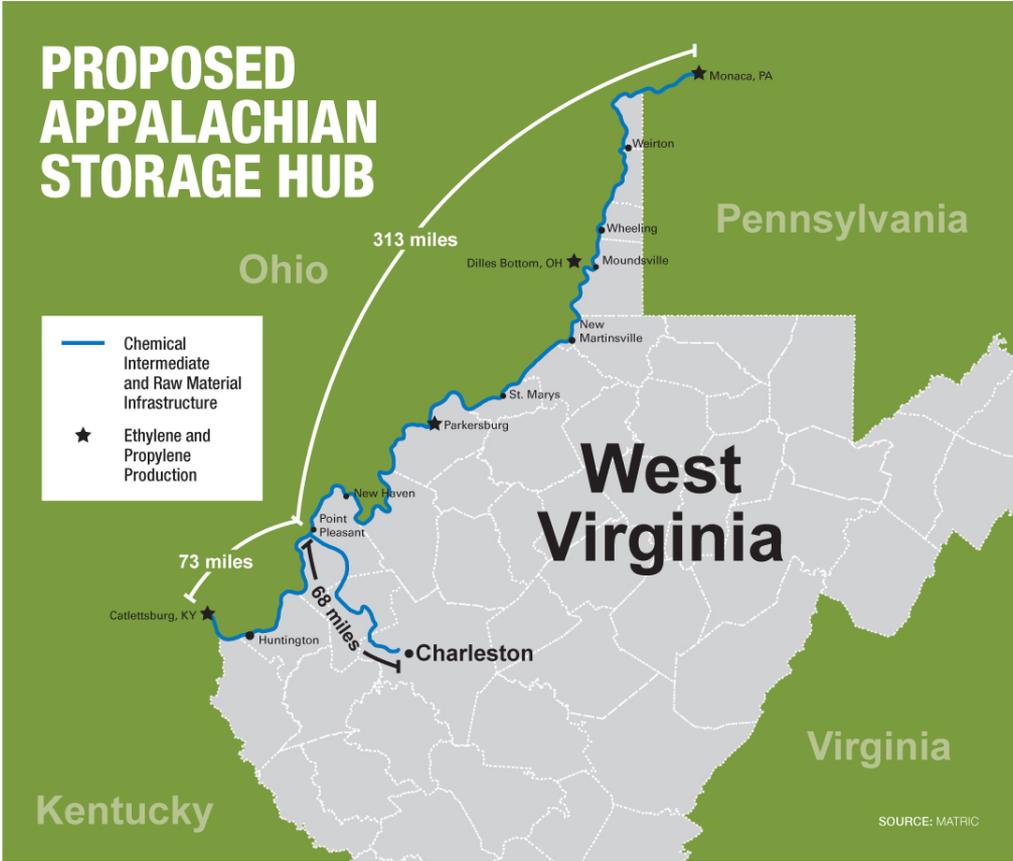
Transcending Boundaries

Building Energy Infrastructure in the Southern States

**2018 Briefing to WV Manufacturing Association Marcellus & Manufacturing
Development Conference**

Ken Nemeth, Southern States Energy Board
Morgantown, WV | April 17, 2018

Building Energy Infrastructure in the Southern States



MISSION STATEMENT

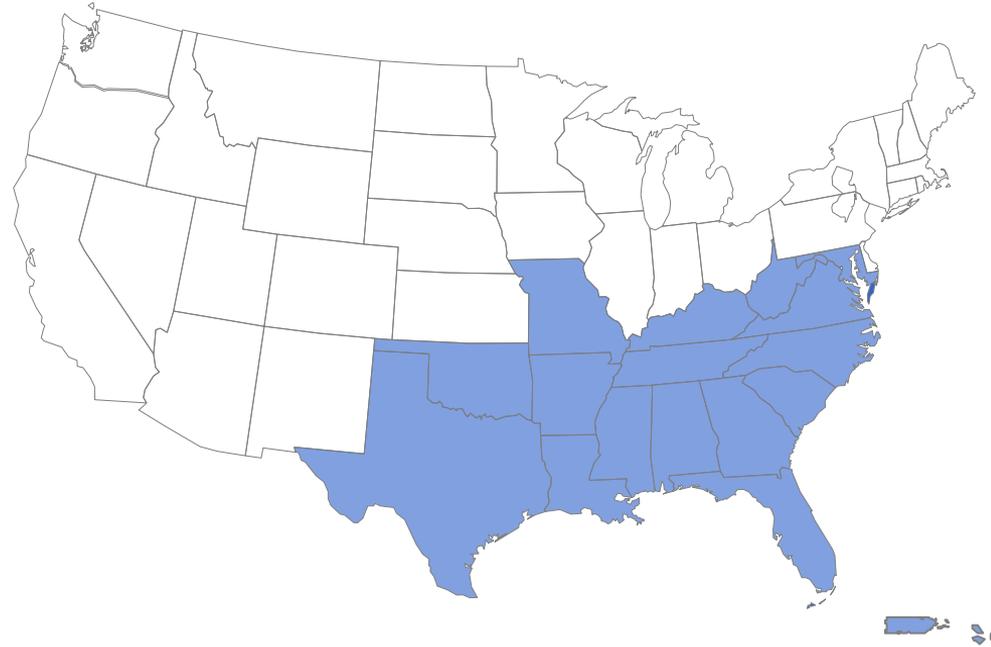
Through innovations in energy and environmental policies, programs, and technologies, the **Southern States Energy Board** enhances economic development and the quality of life in the South.



SSEB Overview



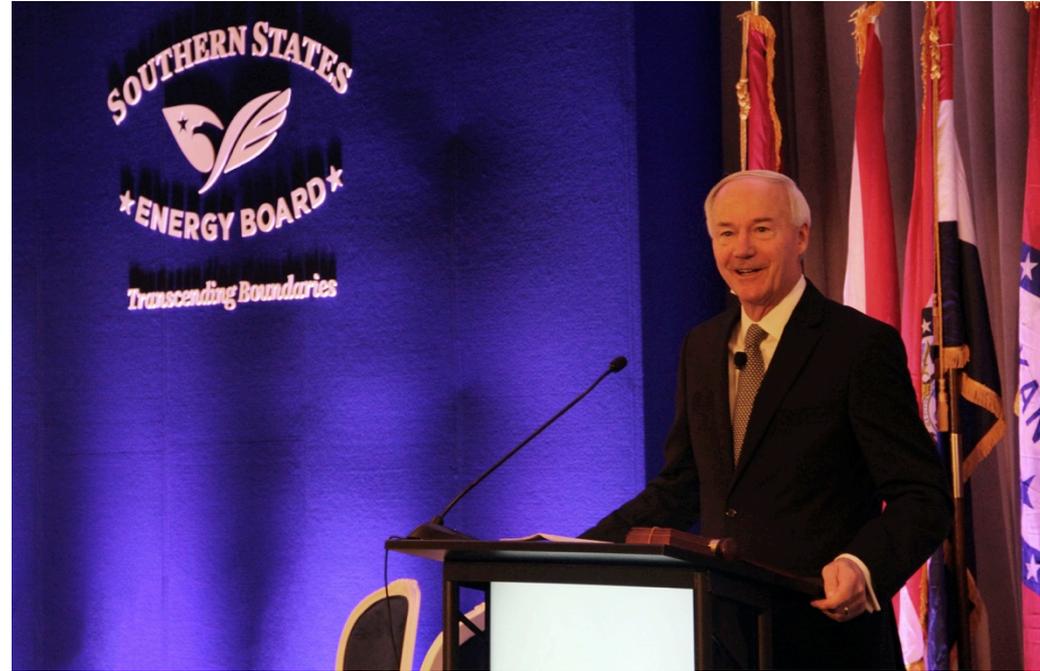
- Established 1960 and expanded in 1978
- 16 U.S. States and Two Territories
- Each jurisdiction represented by the governor, a legislator from the House and Senate, and a governor's alternate
- Federal Representative Appointed by U.S. President





Key Issues for states:

- *Appalachian Energy Hub*
- Hurricane support to states
- Workforce development & training
- Energy Infrastructure
- Cyber security
- Electric grid stability





Key Issues for states

- 45Q (CCUS tax credits)
- Hydropower relicensing
- Nuclear repository
- Fuel fabrication (MOX)
- Coal combustion products



2017 Resolutions from SSEB Board

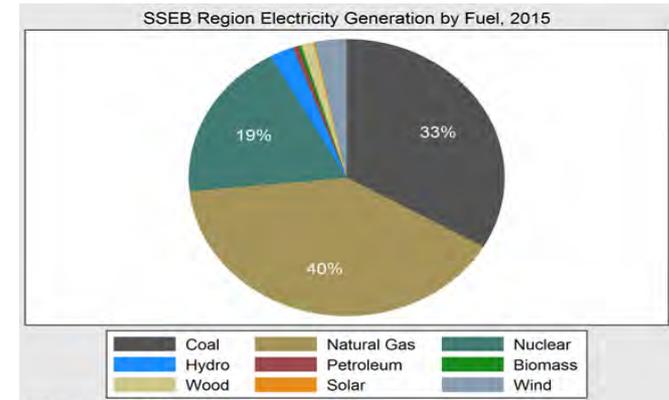
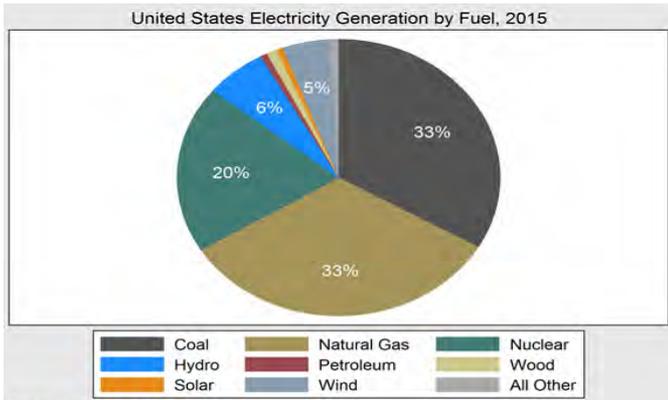
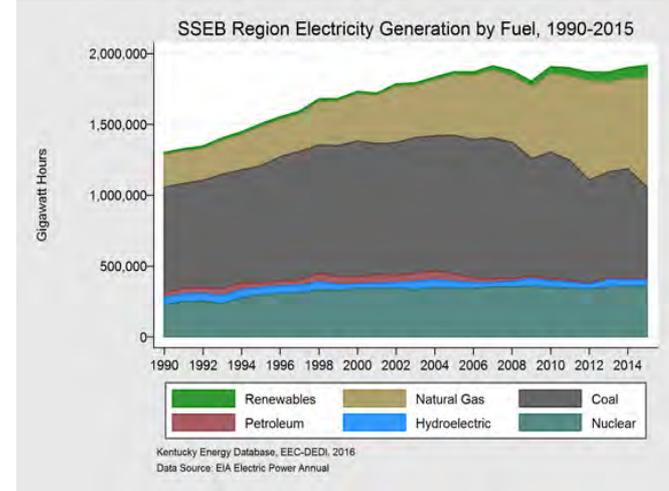
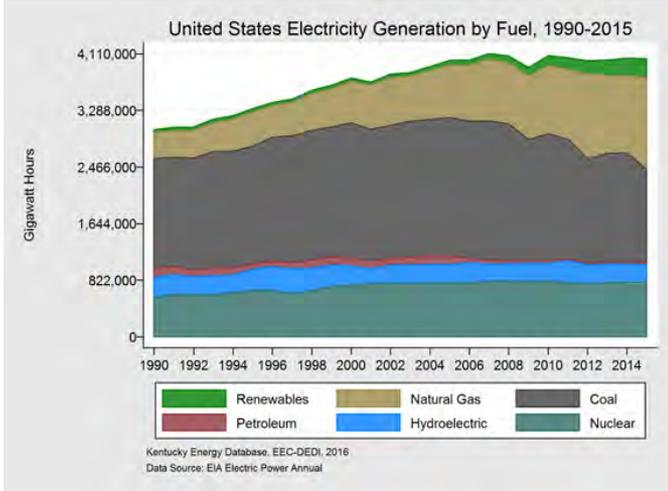


- **Prioritizing Appalachian Storage Hub**
- Modernizing/ energy infrastructure & improving federal permitting
- Reforming New Source Review Modification program
- Protecting electric power grid from cyber/ physical security threats
- Supporting nuclear waste repository & fuel fabrication facility in SC
- Improving efficiency of coal units
- Encouraging recovery of coal combustion products
- Ensuring cost allocation of grid-stability projects
- Prioritizing property/ conservation law principles related to CCS-EOR
- Supporting states' rights in hydro relicensing
- Providing support to SSEB members following hurricane disasters



- Region contains significant natural gas & natural gas liquids (NGLs)
- Investment in storage hub would harness those supplies
- NGLs are major chemical industry feedstock
- Storage hub investments could create jobs, generate economic output, generate tax revenue
- SSEB urges federal and state policymaker prioritization of Appalachian Storage Hub development

SSEB Region and U.S. Generation Mix By Fuel Type 1990 – 2015 and 2015



Electric Generating Resources Nationwide Selected States (2015)



Predominantly Coal

- KY, WV, WY 87-94%
- MO, IN, UT, ND 75-78%
- MT, WI, OH, NE, NM, CO 55-62%
- IA, KS, MN 45-55%
- TN, AR, MD 40%

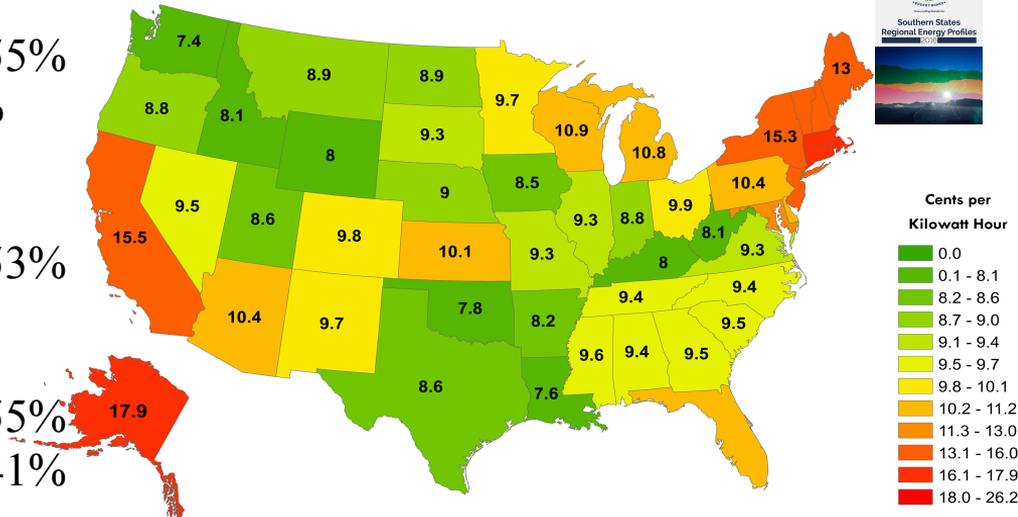
Predominantly Natural Gas

- NV, MS, FL, LA, CA 59-74%
- TX, OK, NJ 46-53%
- VA, GA, AL, NY 37-41%

Predominantly Nuclear

- SC, IL 50-55%
- MD, PA 37-41%
- TN, VA, NC 33%
- GA, AL, AR 25-27%

Electricity Prices by State, 2015



Kentucky Energy Database, EEC-DEDI, 2016

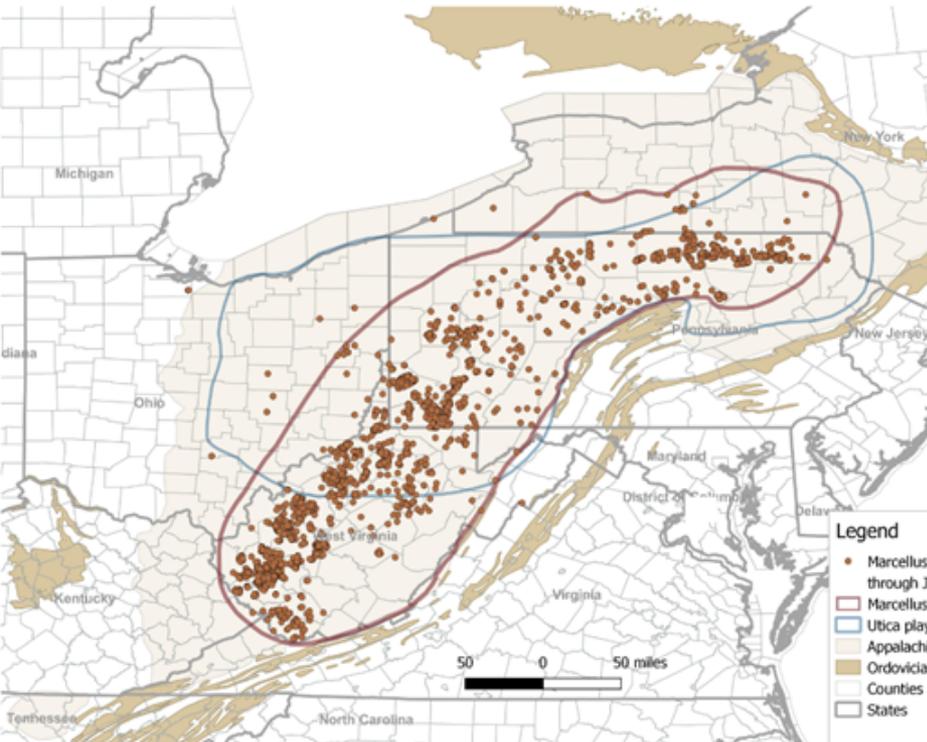


- West Virginia ranked fourth nationwide in total energy production in 2015, 4.7% of nation's total
- In 2016, WV was 9th largest natural gas producing state, withdrawing some 1.4 trillion cubic feet
- Coal production is in decline
 - Loss of mining jobs, workforce and economics
- WV regaining traction as a net exporter of energy to other states

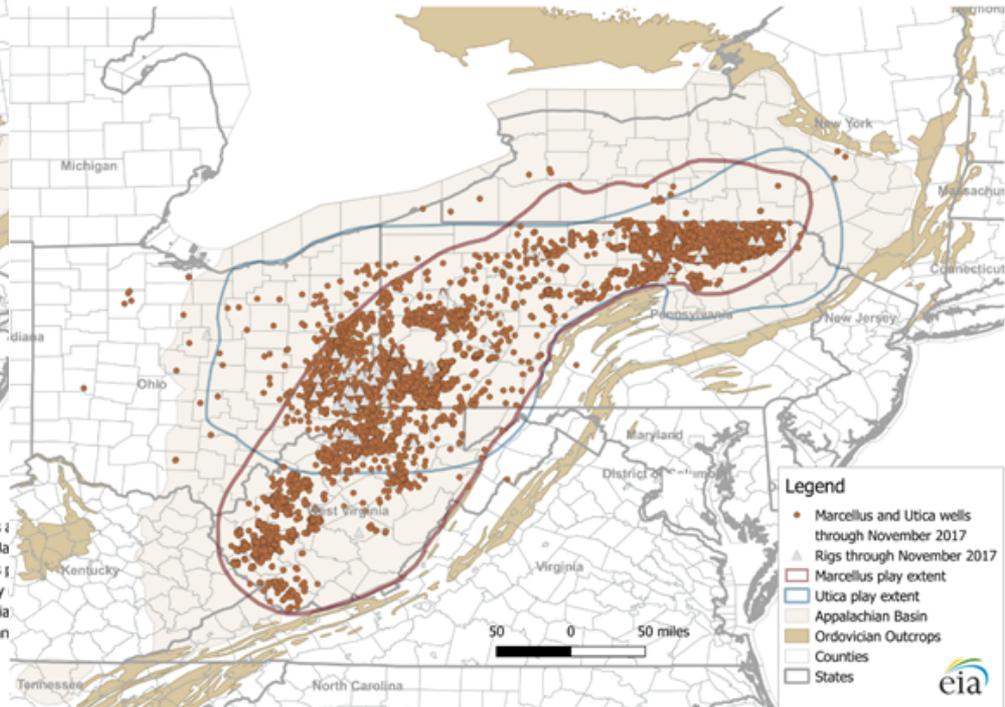
Marcellus & Utica Wells in Appalachia



Marcellus and Utica wells through January 2012



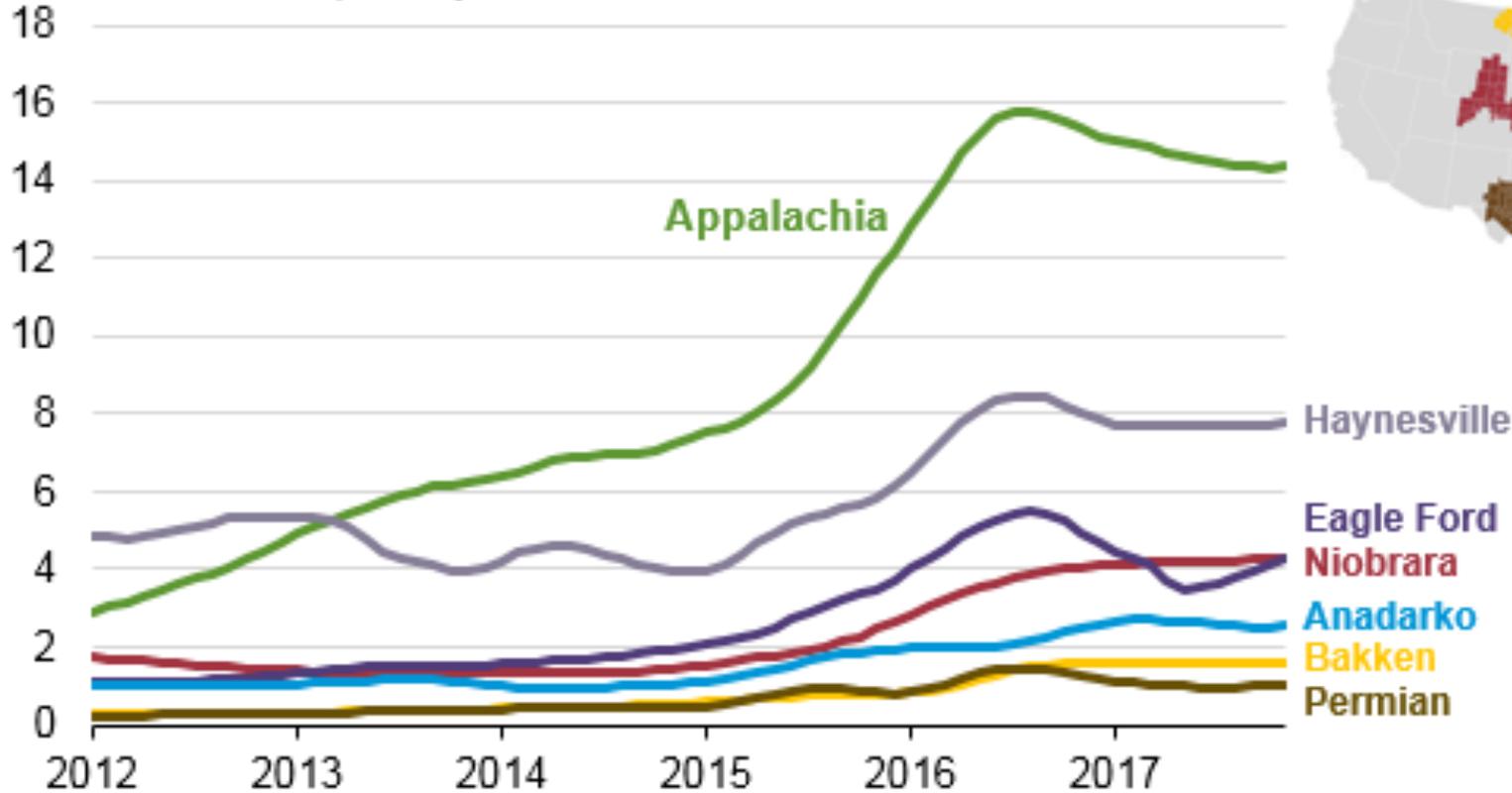
Marcellus and Utica producing wells (Jan 2003 – Nov 2017)



Productivity of Appalachia Wells



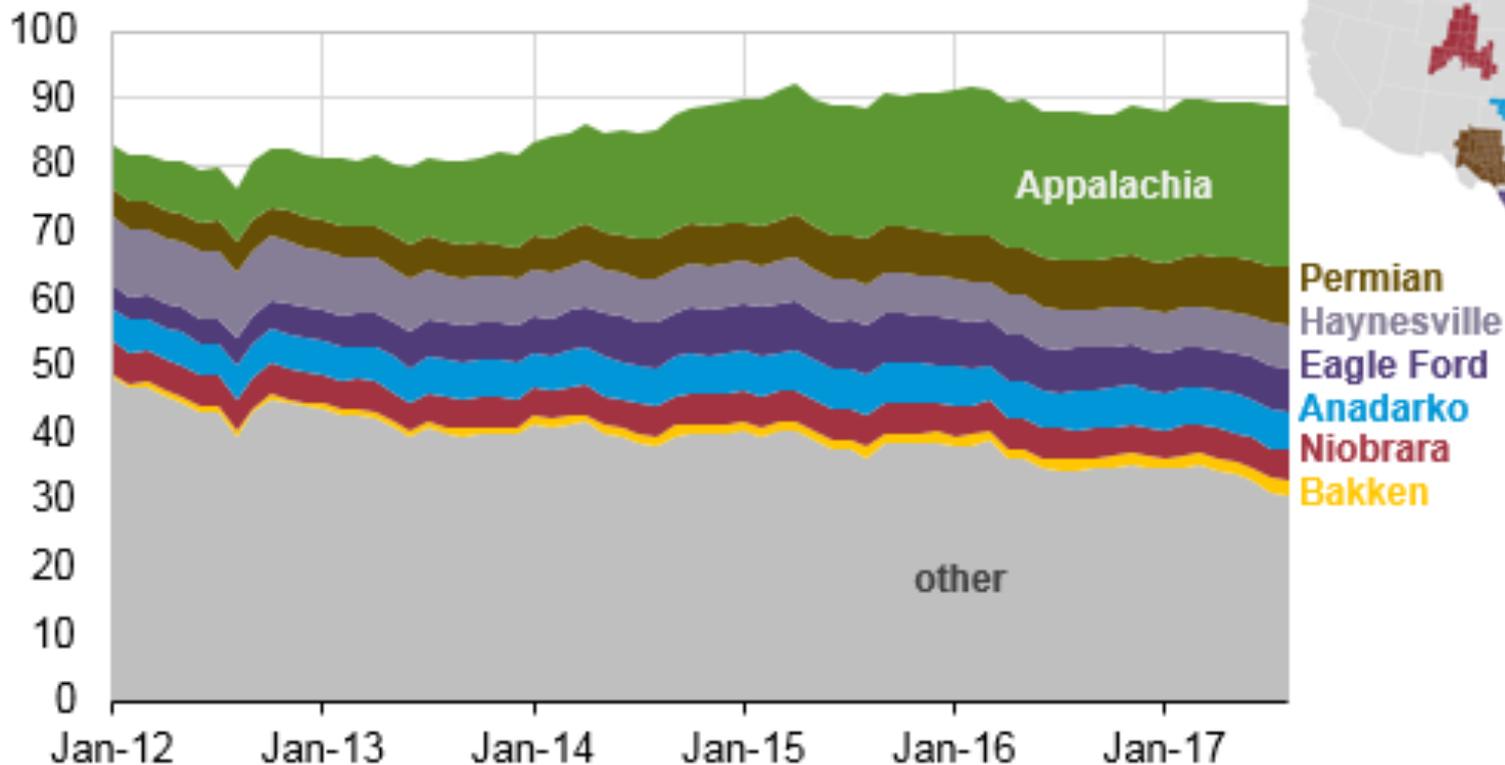
Average monthly new well natural gas production per rig (Jan 2012 - Nov 2017)
million cubic feet per day



Appalachia Shale Gas Production- Rapid Increase



U.S. gross withdrawals of natural gas (Jan 2012 - Aug 2017)
billion cubic feet per day



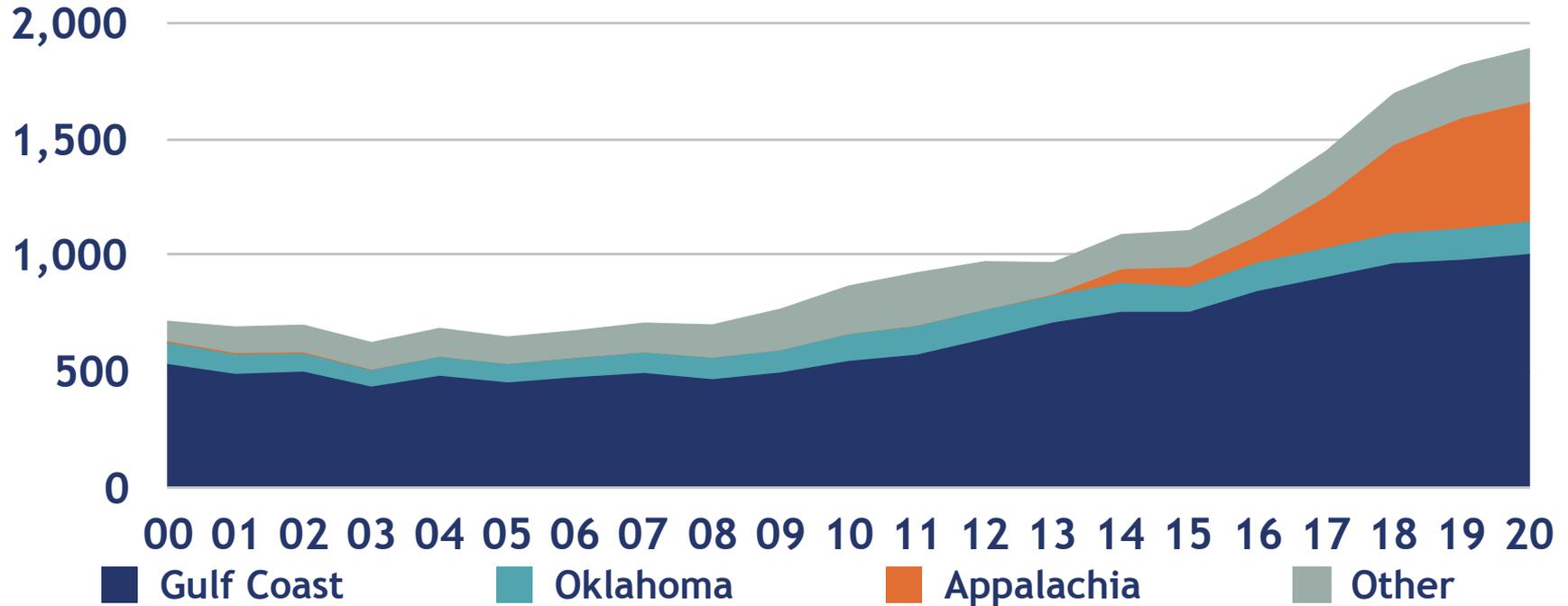


- Proximity to abundant NGL resources in Marcellus/Utica and Rogersville shales
- Proximity to manufacturing markets in Midwest, East Coast and Canada
- Opportunity to strengthen the U.S. economy by providing employment and supply diversity
- Avoids ethane rejection

Surging Ethane Supply from Marcellus and Utica Shales



•Thousand Barrels per Day



Sources: US Energy Information Administration, ACC analysis



- *Hypothetical* scenario based on ~350,000-400,000 barrels per day of ethane expected to be available by 2025
- Assumes storage and pipeline infrastructure is built
- \$35.8 billion in new chemicals and plastics industry investment
 - 5 ethane crackers
 - 2 propane dehydrogenation (PDH)
 - Polyethylene, polypropylene and other derivatives
 - Plastics compounding
 - Plastic products manufacturing
- \$28.4 billion in new output by 2025

American Chemistry Council- Economic Impact of New Chemical and Plastic Products Manufacturing (2016\$)



	Employment	Payroll (\$B)	Output (\$B)	Federal Tax Revenue (\$B)	State/Local Tax Revenue (\$B)
Direct	25,664	1.7	28.5	0.6	0.5
Indirect	43,042	3.0	10.0	0.7	0.5
Payroll-induced	32,112	1.5	4.5	0.4	0.2
Total	100,818	\$6.2	\$43.0	\$1.7	\$1.2

Support for Appalachian Storage Hub

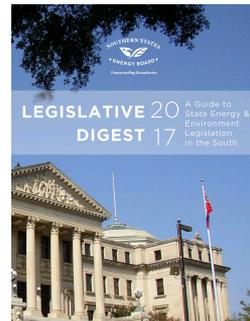


- DOE Energy Secretary Perry
 - Diversify geographical risks of hurricanes in Gulf Coast
 - Provide jobs in Appalachia
 - Increases national security related to energy infrastructure
 - DOE loan guarantee program is possible
- Three-State Consortium (OH, WV, and PA)
 - World Petrochemical Conference (Houston in March)
 - *“We are working to attract investors and downstream partners; chemicals and plastics manufacturers to come here, stay here, grow here in the Appalachian region.”* (Gov. Justice, WV)
- Senators Manchin, Capito, and Representative McKinley support for SB “Appalachian Ethane Storage Hub Study Act of 2017”
 - Bill would direct DOE and DOC to conduct feasibility study on establishing a hub for Marcellus, Utica and Rogersville natural gas shale formations





- S. 1075 - Senators Capito, Manchin, and Portman (OH) sponsored act
- Directs DOE and Commerce to conduct feasibility study of establishing “*a subterranean ethane storage & distribution hub in the Marcellus, Utica and Rogersville shale plays...*”
- *Why?*
 - Unprecedented growth in natural gas production in this region
 - Lack of infrastructure leads to inefficiencies in obtaining full value
 - Add redundancy to refining & manufacturing capacity in the Gulf
 - Create jobs in Appalachia
- *Status:* Congressional delays in energy hearings



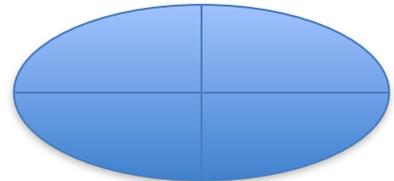
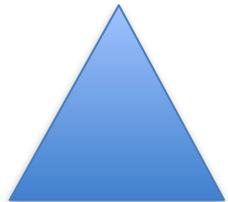


- Questions to consider post-tariffs:
 - Will necessary pipeline construction costs increase substantially?
- Will plant construction costs increase significantly?
- Other unforeseen impacts??





- *Explore ethylene/propylene markets to encourage investments in petrochemical plants and supporting infrastructure*
- *Evaluate downstream economic impacts of NGL utilization on economy*
- *Identify resilience in NGL supply chain & petrochemical industries*
- *Develop methods to evaluate energy security implications of domestic NGL supply chain and U.S. petrochemical plant capacity*
- *Conduct Research & Development to enhance recovery efficiency of unconventional natural gas production; materials, technologies & methods to improve conversion of NGLs into feedstocks & products; enhance safety & efficiency of NGL storage*





- Board members and committees
- Associate members
- Members of Congress
- Regional Energy Profiles
 - Electricity mix and production, fuel mix by state
- Governors' Energy Caucus





Transcending Boundaries



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