

Natural Gas Power Generation

2018 West Virginia Governor's Energy Summit

October 10, 2018

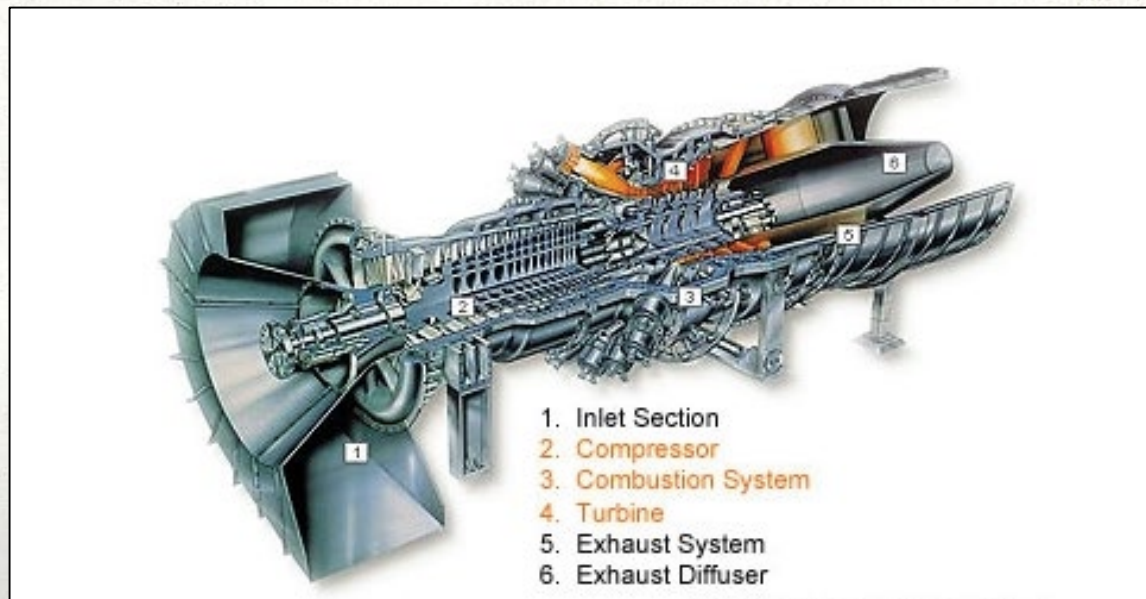


Combined-Cycle Power

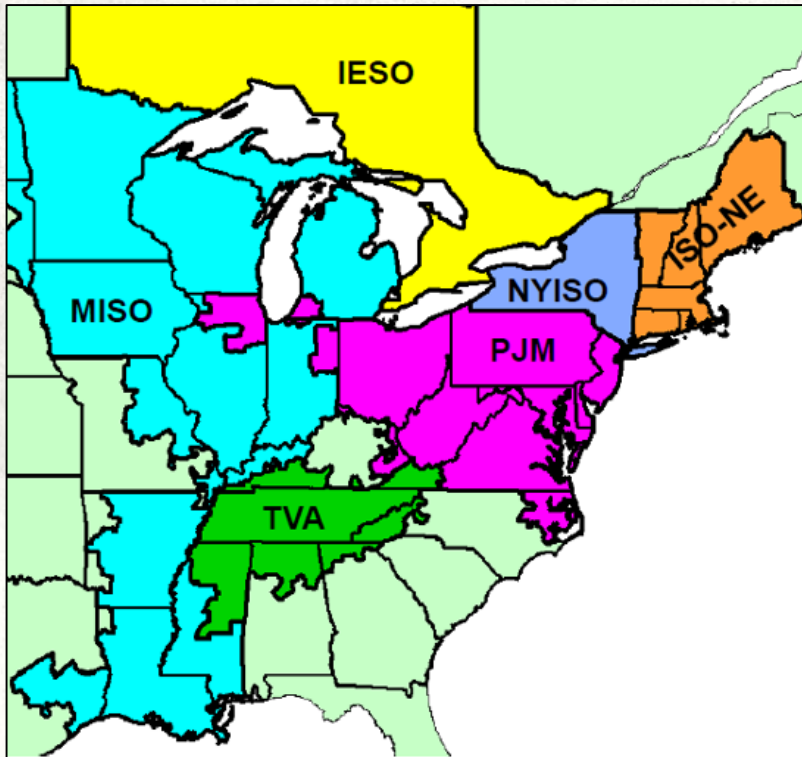
Small Footprint – less than 30 acres

Short stacks – less than 200 feet

Clean Burning Jet Engine and HRSG

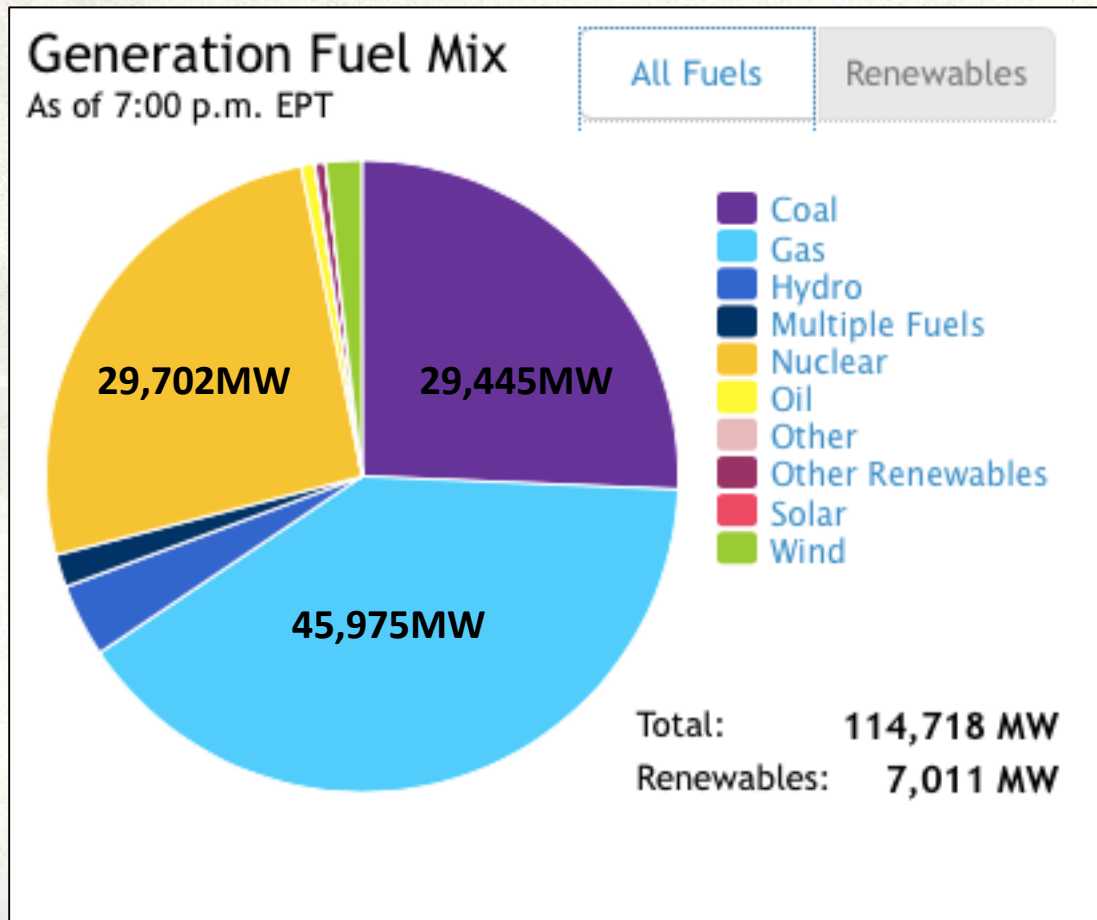


PJM – The Grid



- Pennsylvania, Jersey, Maryland
- 13-State Grid including West Virginia
- Provides a transparent daily and hourly power price for each supply and load location based on generation cost and power transmission

Power in the PJM

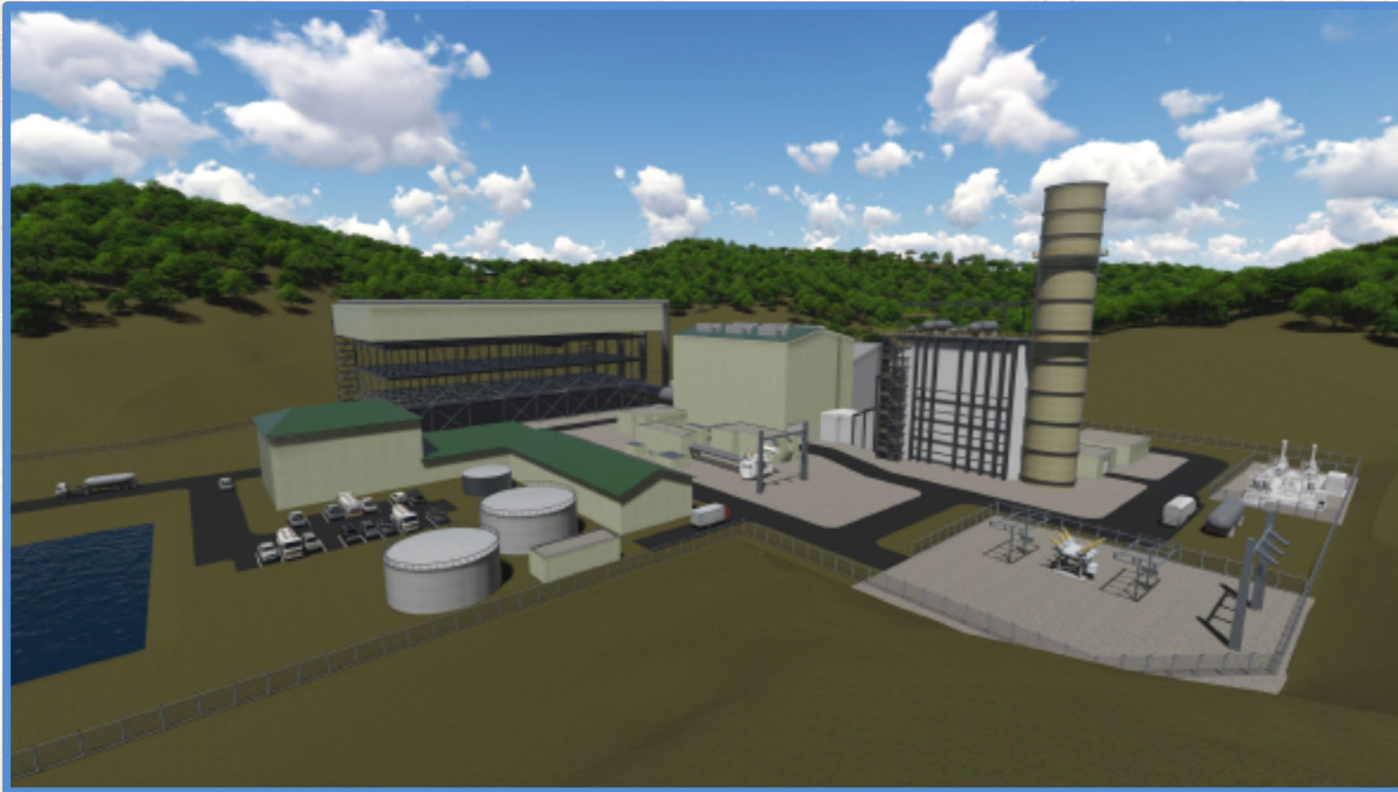


- Monday's PJM
- 1/3 of the Lights in this room



ESC Harrison County Power

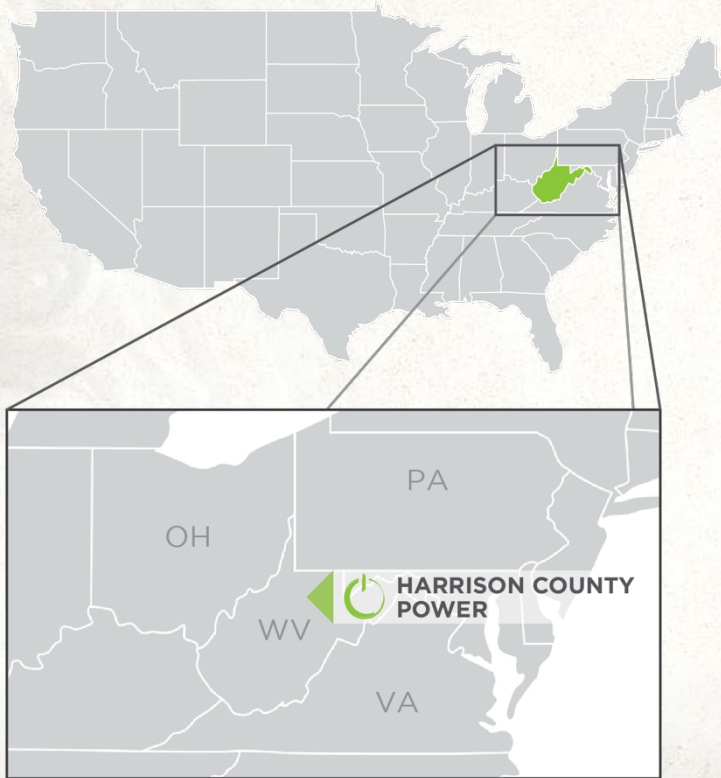
Project Rendering



ESC Harrison County Power

ESC Harrison County Power

Clarksburg, West Virginia



- 610 MW natural gas power plant
- GE 7HA.02 combustion turbine, most efficient fossil fuel technology available
- Site
 - Exhausted Coal Mine
 - Current Harrison County Commission Property
- Gas Usage: 85,000 MMBtu/Day
- Construction: ~24 Months



ESC Brooke County Power

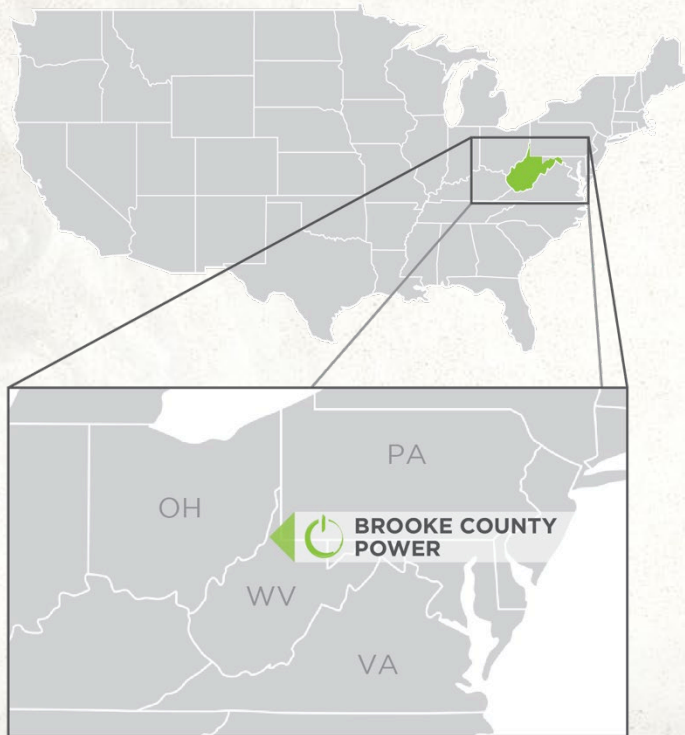
Project Rendering



ESC Brooke County Power

ESC Brooke County Power I, LLC

Colliers, West Virginia



- 830 MW natural gas power plant
- GE 7HA.01 combustion turbines, most efficient fossil fuel technology available
- Site:
 - Exhausted Coal Mine
 - Current DNR WMA
- Existing Infrastructure
 - Gas Wells & Pipelines
 - Electrical Transmission
- Gas Usage: 138,000 MMBtu/Day
- Construction: ~34 Months



ESC Harrison Economic Impact

ESC Harrison County Power Economic Impact

HARRISON POWER



HARRISON POWER WILL BURN
**LOCALLY
SOURCED & PROCESSED
NATURAL GAS**

to produce

ENERGY WITH A
NAMEPLATE CAPACITY OF
550 MEGAWATTS



which is

ENOUGH POWER TO MEET
THE ENERGY NEEDS OF
500,000 HOMES.



NATURAL GAS
IS RECOGNIZED AS TODAY'S
CLEANEST
COMMERCIAL FOSSIL FUEL
FOR POWER GENERATION.



HARRISON POWER WILL BE A
COMBINED CYCLE
POWER PLANT, MAKING IT VERY
FUEL EFFICIENT.



ECONOMIC IMPACT

HARRISON POWER WILL PROVIDE...

SUBSTANTIAL NEW PROPERTY
REVENUE
FOR HARRISON COUNTY.

AN ANNUAL ECONOMIC IMPACT
DURING OPERATION OF
\$288 MILLION.



AN ECONOMIC BOOST
DURING CONSTRUCTION OF
\$751 MILLION.

APPROXIMATELY
2,900 JOB YEARS
DURING CONSTRUCTION &
720 JOBS
DURING OPERATION.



Construction:

- Construction investment estimated at \$616.1 Million

Operation:

Full year operational impact projected:

- 713 jobs
- \$47.9M employee compensation
- \$72.8M in value added
- \$287.4M in output

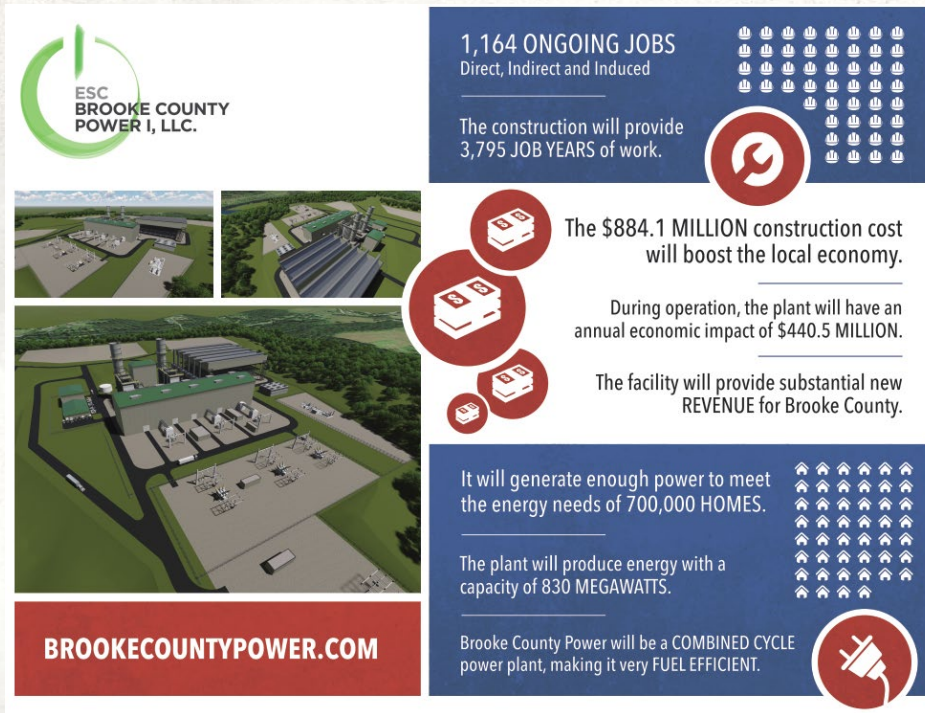
Natural Gas:

- \$111 Million of natural gas annually
- Pipeline investment \$20 Million



ESC Brooke Economic Impact

ESC Brooke County Power I, LLC Economic Impact



Construction:

- Construction investment estimated at \$884.1 Million

Operation:

Full year operational impact projected :

- 1,164 jobs
- \$73.3M employee compensation
- \$112.7M in value added
- \$440.5M in output

Natural Gas:

- \$177.5M of natural gas annually
- Pipeline Investment \$60 Million



Power Plants Status

ESC Harrison County Power, LLC

- Electricity Injection: PJM Interconnection Rights – Complete
- State Waters Permit – Complete
- Public Service Commission: Siting Certificate – Complete
- Air Permit – Under Appeal by OVJA

ESC Brooke County Power I, LLC

- Electricity Injection: PJM Interconnection Rights – Complete
- Federal/State Wetland Permits – Complete
- Public Service Commission: Siting Certificate – Under Appeal by OVJA
- Air Permit – TBD



Marcellus-Utica Power Plants

WV – OH – PA Power Generation Summary

	<u>WV</u>	<u>OH</u>	<u>PA</u>	
2017 Operating Capacity - MW	15,122	28,111	46,026	
2017 MWH Produced	69.9 Million	104 Million	186 Million	
2017 % Produced by Coal	97%	55%	24%	
				<u>Total</u>
Natural Gas Plants Built in the Last 10 YRS	0	7	14	
Operating Capacity of Plants Built in Last 10 YRS - MW	0	3,395	4,005	7,400
Natural Gas Plants Currently Under Constructuion	-	2	8	
Operating Capacity Once Online - MW		2,122	5,717	7,839
Total Natural Gas Plants Under Const or Built in last 10 YRS - MW		5,517	9,722	15,239
Natural Gas Plants Under Development	1,408*	7,663	6,963	14,626

Source: SNL Energy - S&P Global Market Intelligence
 *Brooke County Power & Harrison County Power

- Late in the cycle of new natural gas plant construction.
- Limited new capacity needed in PJM Grid.
- Clear path for new plant approval in OH & PA and many in late stage development.
- Timing is critical factor in determining if WV plants will be built or if remaining new capacity will go to PA & OH.





THANK YOU!

ORION STRATEGIES

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