FW CONSULTING

POWER SOLUTIONS

Lyoid Fussell – Co-Founder, President of Engineering
lfussell@fwconsulting.llc
918-932-9157

Jesse Webb – Co-Founder, President of Business Development
jwebb@fwconsulting.llc
918-804-9106

OVERVIEW:

- INTRODUCTION
- Power demand projections
- Renewables discussion
- Oklahoma’s challenges
- Oklahoma’s opportunity
- Introduction to wellsite generation
- Benefits & future vision

introduction:

LYOID FUSSELL – Collinsville, OK

- Halliburton 2001 – Duncan, ok
- Relocated to Collinsville 2004
- Lack of opportunity began working out of state 2016
- Goal: revitalize Oklahoma Oil and gas industry

JESSE WEBB – Tulsa, ok

- Native to Oklahoma – Current City Tulsa, OK
- 20+ years experience in Business Development at an executive level.
- Diverse experience: Energy, Telecommunications, Financial Modeling/ Planning, Commodities, Healthcare.
- Goals: Help Oklahoma to become a top 10 State. Bring back Oil and Gas to Oklahoma.

Power demand historic:

Table 8. Sales to ultimate customers, revenue, and average price by sector, 1990 through 2021

Oklahoma

Sector	Year 2021	Year 2020	Year 2019	Year 2018	Year 2017	Year 2016
Sales (megawatthours)						
Residential	23,745,867	23,232,473	23,805,972	24,116,808	21,837,596	22,789,715
Commercial	19,999,312	18,698,988	20,085,991	21,229,143	20,498,860	20,695,703
Industrial	20,779,958	20,367,844	20,903,983	19,229,365	18,155,672	18,031,136
Total	64,525,137	62,299,305	64,795,946	64,575,316	60,492,128	61,516,554
Customers						
Residential	1,818,813	1,795,629	1,777,156	1,764,980	1,751,034	1,736,819
Commercial	296,856	290,192	285,641	282,875	281,267	278,027
Industrial	20,174	20,468	19,905	18,700	18,782	19,096
Total	2,135,843	2,106,289	2,082,702	2,066,555	2,051,083	2,033,942
Average price to ultimate customers (cents/kWh)						
Residential	11.00	10.12	10.21	10.30	10.61	10.20
Commercial	8.70	7.82	7.98	8.07	8.11	7.66
Industrial	5.50	4.61	5.07	5.34	5.42	5.02
Other	NA	NA	NA	NA	NA	NA
Transportation	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.52	7.63	7.86	8.09	8.20	7.83

U.S. Energy Information Administration, Form EIA-861, Annual Electric Power Industry Report.

Power production historic:

Table 5. Electric power industry generation by primary energy source, 1990 through 2021

Oklahoma

megawatthours

	Year 2021	Year 2020	Year 2019	Year 2018	Year 2017	Year 2016	Year 2015
Total electric industry	**80,754,586**	**83,367,729**	**86,386,170**	**87,181,402**	**73,731,654**	**78,655,007**	**76,135,596**
Coal	**11,246,007**	**5,937,510**	**7,826,057**	**14,906,747**	**17,367,854**	**19,158,044**	**24,867,032**
Hydroelectric	**2,766,175**	**2,854,441**	**3,903,231**	**2,034,897**	**2,036,200**	**2,573,424**	**2,663,901**
Natural gas	**33,857,238**	**44,828,786**	**45,357,632**	**42,570,657**	**30,450,569**	**36,529,086**	**34,286,327**
Other	**1,711**	**6,029**	**7,416**	**57,075**	**48,417**	**27,690**	**11,400**
Other biomass	**86,523**	**77,358**	**74,815**	**76,845**	**67,927**	**119,090**	**91,201**
Other gas	.	.	.	.	.	.	.
Petroleum	**35,178**	**26,454**	**17,504**	**17,987**	**16,054**	**17,261**	**10,812**
Pumped storage	**-86,940**	**-117,820**	**-104,059**	**-135,051**	**-117,610**	**-87,429**	**-72,496**
Solar	**76,618**	**63,297**	**59,623**	**61,626**	**32,582**	**5,436**	**1,556**
Wind	**32,540,312**	**29,416,977**	**29,008,131**	**27,338,228**	**23,598,843**	**20,069,089**	**14,030,897**
Wood	**231,765**	**275,466**	**235,821**	**252,390**	**230,818**	**243,316**	**244,967**

Other biomass includes agricultural byproducts, landfill gas, biogenic municipal solid waste, other biomass (solid, liquid and gas) and sludge waste.
Other gases includes blast furnace gas, and other manufactured and waste gases derived from fossil fuels.
Other includes non-biogenic municipal solid waste, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, tire-derived fuels, waste heat and miscellaneous technologies.
Note: Totals may not equal sum of components because of independent rounding.
Source: U.S. Energy Information Administration, Form EIA-923, Power Plant Operations Report and predecessor forms.

Power demand forecast:

ref2021.d113020a	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	Datekey	d113020a									
	Release Date		January 2021								
2. Energy Consumption by Sector and Source											
(quadrillion Btu, unless otherwise noted)											
Sector and Source	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Residential											
Total	**20.78**	**20.78**	**20.96**	**20.78**	**20.62**	**20.39**	**20.18**	**20.11**	**20.10**	**20.12**	**20.15**
Commercial											
Total	**16.68**	**17.00**	**17.29**	**17.43**	**17.55**	**17.58**	**17.38**	**17.32**	**17.31**	**17.32**	**17.31**
Industrial 5/											
Total	**31.18**	**31.42**	**32.27**	**32.91**	**33.42**	**33.91**	**34.19**	**34.33**	**34.54**	**34.77**	**35.06**
Transportation											
Total	**24.69**	**26.33**	**26.92**	**27.04**	**27.05**	**27.01**	**26.88**	**26.76**	**26.66**	**26.54**	**26.47**
Delivered Energy Consumption, All Sectors											
Total	**92.92**	**95.10**	**97.01**	**97.73**	**98.20**	**98.45**	**98.20**	**98.09**	**98.18**	**98.33**	**98.56**
Electric Power 19/											
Total	**35.77**	**35.94**	**36.70**	**36.67**	**36.63**	**36.41**	**36.00**	**35.93**	**35.99**	**36.10**	**36.26**
Total Energy Consumption											
Total	**92.92**	**95.10**	**97.01**	**97.73**	**98.20**	**98.45**	**98.20**	**98.09**	**98.18**	**98.33**	**98.56**

Forecast is inaccurate:

- Agenda driven exclusion
  - *Electric vehicles specifically*
- Data consumption
  - 2022 Avg Household 6 tb
  - 11.8% increase from 2021
- Crypto mining
  - 1.3% of electricity consumed by mining in 2022

Forecast is inaccurate:

- Artificial intelligence
  - 1,000 Desktops
  - 12 specialized graphics cards machines
  - Robotic arm
  - Learn independently to solve rubiks cube
  - 2.8 gw of power consumed

Closer look at ev's:

- Average EV consumption = 0.3 kWh/mile
- Average Driver = 13,489 miles/year
- Average EV Consumer = 4,046.7 kW/year (*Just for EV*)
- Average Household Consumption = 11,000 kW/year
- 36.8% Electricity Demand Increase Per Household
- 1,503,868 Households in Oklahoma
- 2% buy 1 EV Demand = 121,714,053 kW/year Increase
- Equivalent to adding 11,065 Households

Renewables discussion:

- Bottlenecks
- Subsidies
- Reliability

Renewables discussion:

"Wind Turbines primarily generate tax credits, not electricity." – Prominent Wind Investor Quote

Oklahoma's challenges:

- Competition from more profitable prospects – Permian basin
- Capacity
- Volatility
- To produce oil, we must produce gas

Oklahoma’s opportunity:

- Natural gas reserves

30.1 trillion cubic feet

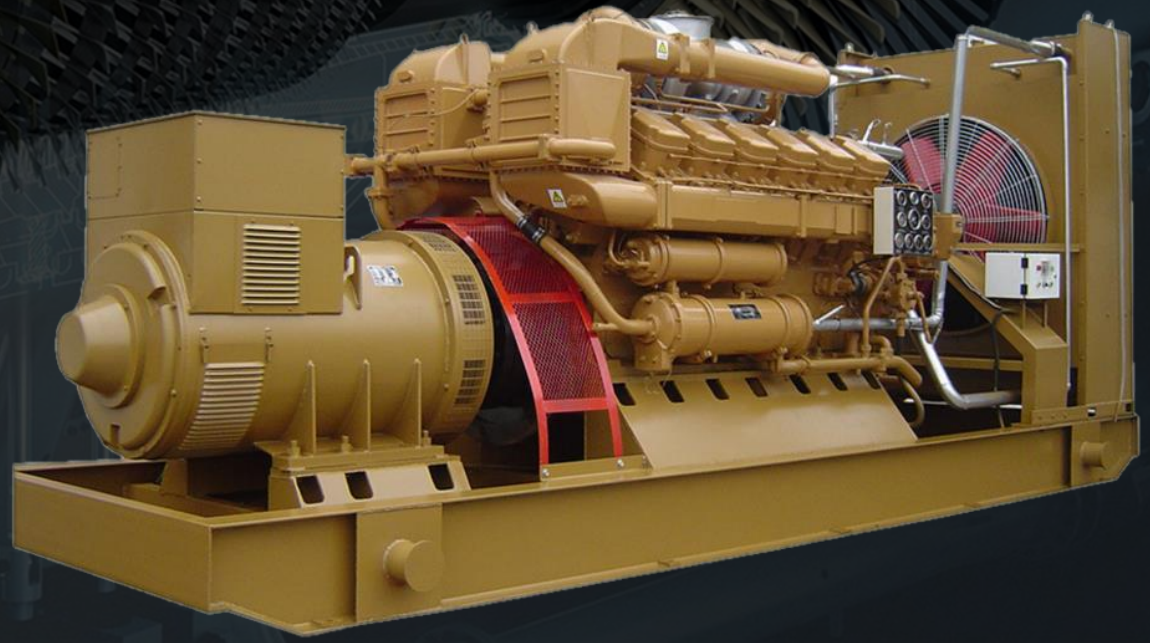
Oklahoma has **1.76 billion barrels of oil and 30.1 trillion cubic feet (Tcf) of natural gas in proved reserves** [1]. The state has more than 6% of the nation's total proved natural gas reserves and ranks sixth in the nation [2]. Thirteen of the 100 largest natural gas fields in the United States are in Oklahoma [3].
Oklahoma’s natural gas production reached an all-time high of 2.31 trillion cubic feet in 2014 [3]. In 2022, Oklahoma had the sixth-largest gross withdrawals of natural gas, at 6% of the nation's total [2].

Wellsite generation:

- Process gas at the wellsite
- Convert methane directly to electricity
- Fill pipeline with more valuable commodities (*NGLs – Propane, butane, ethane*)
- Eliminate flaring
- Easier to transport electrons than gas molecules

How?:

- Natural Gas Burning Generators
- Sized Based On Available Gas Supply
  - 500kW – 35mW
- Connect Directly to Grid or to Local Load



Wellsite generation:

- 2022 Oklahoma Production
  - 241,447 MMCF
- 1% Converted to power at wellhead
  - 2.7 gWh = 986 gW Produced Power
  - @ $0.035/kWh = $34,492,500 Revenue
- Value if Sold as Commodity
  - @ $3.00/MCF = $7,243,410
- Value Proposition = 4.8X Commodity Value

Benefits:

- Large investment and time delay of building large power plants eliminated
- Redundancy = reliability
- Create local, sustainable, stable market for natural gas
- Eliminate exploration cost of pipelines in undeveloped areas
- Energy independence and security

Oklahoma’s future Vision:

- O&g development boom
- Electricity exporter
- Data center hotspot
- Industrial expansion
- Technological innovation

questions:

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Jesse Webb – Co-Founder, President of Business Development
jwebb@fwconsulting.llc
918-804-9106