

# Watts Up With That?

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## Natural gas “emerging as the world’s go-to fuel” for electricity generation

David Middleton / December 29, 2019

Guest natural gas cheer-leading by David Middleton

“

*Dec 15, 2019*

### ***Global Natural Gas Electricity Is Gaining On Coal***

*Jude Clemente Contributor Energy*

*I cover oil, gas, power, LNG markets, linking to human development.*

*Perhaps the primary question for climate and reducing greenhouse gas emissions is the ability of natural gas to displace coal in the power generation sector. The coal-to-gas switch capacity is so important because both are more reliable and affordable than other climate solutions being promoted. And augmented by having few criteria pollutants, gas has 50% less CO<sub>2</sub> emissions than coal. Gas is also the backup for intermittent renewables, making it an essential resource for more wind and solar development.*

*[...]*

*More countries are turning to natural gas, which is [emerging as the world’s go-to fuel](#). Gas generation gaining share on coal will continue in the coming decades. Historically low gas prices globally are being*

*understated in terms of locking-in more gas infrastructure and usage. For the still developing world, these low prices are critical because the residents have less money to absorb high costs.*

*[...]*

*Our lowest-hanging fruit in the climate fight, switching to gas is the fastest way to claim significant CO<sub>2</sub> abatement. The U.S. provides the example: since 2008, surging shale production leading to low cost gas has doubled gas’ share in power generation to nearly 40%, while slicing coal’s in half. In turn, the U.S. has become the global leader in CO<sub>2</sub> reduction, unfortunately mostly left out of the Madrid climate conference this past week. This would be par for the course: [“How ‘Climate Week’ Completely Missed The Boat On Natural Gas.”](#) Both China and India see no need to improve on their current emissions reduction plans that run through 2030.*

*[...]*

**Jude Clemente**

*I am Principal at JTC Energy Research Associates, LLC. I hold a B.A. in International Relations from Penn State University, with a minor in Statistical Analysis. I got my M.S. in Homeland Security from San Diego State University, with a focus on Energy Security, and an MBA from St. Francis University, with a focus on Energy Economics. My research specialization includes North American and international trends in liquid fuels, natural gas, coal, renewables, electricity and GHG emissions – and their connection to human development. I have over 400 professional publications in a variety of energy-related media, notably Pipeline & Gas Journal, Carbon Capture Journal, Journal of Energy Security, Power, World Oil, Public Utilities Fortnightly, and the Journal of Energy and Development. I have also been a writer and editor for reports commissioned by the U.S. Department of Energy, International Energy Agency, and other major energy research organizations.*

*— [Forbes](#)*

Jude Clemente ranks right up there with Robert Rapier in excellent oil & gas industry analyses.

Mr. Clemente’s article included three very illuminating graphs.

Figure 1. “Gas generation is surging, but so has coal power. DATA SOURCE: BP; JTC”. The death of coal bears a striking resemblance to the premature reports of the demise of Mark Twain.

Figure 2. “Gas is catching up to coal power in terms of total global generation. DATA SOURCE: BP; JTC”. Gas kicks @\$\$.

And from the “too fracking funny” files...

Figure 3. “China and India have massive room to increase gas as a share of power generation. DATA SOURCE: IEA; JTC”... And Europe still generates more electricity from coal than from natural gas.

Europe still generates more electricity from coal than it does from natural gas...

Figure 4. That there is funny.

### Shill vs. Advocate

In response to [my last post](#), a [particularly ignorant commentator](#) accused me of being “a fossil fuel shill” for explaining what an asset impairment was.

shill **noun**

“  
Definition of shill (Entry 2 of 2) **1a**: one who acts as a decoy (as for a pitchman or gambler) **b**: one who makes a sales pitch or serves as a promoter

— Merriam-Webster

*Bloomberg New Energy Finance* would clearly fit the bill as a shill. I refute lies, falsehoods and misinformation about the oil & gas industry and make an effort to explain the science, engineering and economics of oil & gas exploration and production. I am a strong [advocate](#) for natural gas because it is abundant, inexpensive and one of the most environmentally friendly ways to generate electricity, heat our homes and cook our food. And it would be impossible to feed half of Earth’s human population without the synthetic fertilizers made from natural gas.

Figure 5. “Trends in human population and nitrogen use throughout the twentieth century. Of the total world population (solid line), an estimate is made of the number of people that could be sustained without reactive nitrogen from the Haber–Bosch process (long dashed line), also expressed as a percentage of the global population (short dashed line). The recorded increase in average fertilizer use per hectare of agricultural land (blue symbols) and the increase in per capita meat production (green symbols) is also shown.” [Erisman et al., 2008](#)

If there actually was a need to replace coal and reduce CO<sub>2</sub> emissions, only nuclear power and natural gas could do so on a megawatt for megawatt basis. In the US, our

world-leading natural gas production and infrastructure should make natural gas the “go to fuel” everywhere in the Lower 48. However, [pipeline-o-phobes](#) and [fractards](#) are depriving large parts of the US of affordable electricity (i.e. New York, New England, California).

Nuclear power faces a nationwide combination of NIMBY-ism (Not In My Back Yard-ism) and an irrational fear of radiation.

However, these two sources of energy are the only way to economically reduce CO<sub>2</sub> emissions quickly enough to save us from the climate change Bogeyman.

Figure 6. Wind breaks even while natural gas kicks @\$\$.

([Real Clear Energy](#))

The fact that so many of the loudest voices opposing frac’ing and natural gas are also the loudest voices demanding that we save the planet from CO<sub>2</sub>, is *prima facie* evidence that the AGW scam is nothing but a Marxist Trojan Horse.

I am also a strong supporter of coal-fired generation. Coal and nuclear are our most resilient generating sources. While the construction of nuclear and coal-fired power plants has become relatively expensive, once up and running, these power plants provide the least expensive, reliable electricity. Coal has the additional benefit of being a source for CO<sub>2</sub> for enhanced oil recovery (EOR) projects.

Hydro-electric is also great, where there is an adequate resource. The Pacific Northwest and some Scandinavian countries enjoy very low electricity rates due to their abundant hydro-electric resources.

Wind can be an effective component of an ensemble of generating sources, It works fairly well in Texas and a few other places due to physical geography.

Figure 7. U.S. 80-m Wind Resource: Land and Offshore ([US DOE NREL](#))

Unfortunately, onshore wind resource potential is limited and despite misleading headlines about offshore wind becoming less expensive, it is cost-prohibitive in every logical sense of the phrase. Despite public announcements of \$65-75/MWh power purchase agreements (PPA), Vinyard Wind, Massachusetts’ first approved offshore wind project, has an estimated levelized revenue of energy (LROE) of \$98/MWh, more than twice the cost of natural gas.

“  
*An extensive accounting of the PPA price schedule and expected revenue sources inclusive of those that are exogenous to the reported PPA is conducted in this study to estimate the project’s levelized revenue of energy (LROE). This allows for a more equivalent comparison of the reported PPA pricing with bottom-up modeled (unsubsidized) levelized cost of energy (LCOE) estimates. The reader*

*should note that this analysis solely reflects the opinions of the authors and was conducted independently of the ongoing evaluation by the Massachusetts Department of Energy Resources of the PPA between Vineyard Wind LLC and Massachusetts electric distribution companies as filed on July 31, 2018. **The analysis and conclusions described herein do not reflect actual cost data, which are confidential to Vineyard Wind and its partners.***

***The total calculated LROE from the Vineyard LLC/EDC PPA is estimated to be \$98/MWh (2018\$).** This LROE estimate for the first commercial-scale offshore wind project in the United States appears to be within the range of LROE estimated for offshore wind projects recently tendered in Northern Europe with a start of commercial operation by the early 2020s. This suggests that the expected cost and risk premium for the initial set of U.S. offshore wind projects might be less pronounced than anticipated by many industry observers and analysts.*

— [US DOE NREL](#)

The US Energy Information Administration currently estimates that the levelized cost of electricity (LCOE) for offshore wind to be [\\$117.40/MWh](#). Unless Vinyard Wind can substantially beat this cost, it will lose money even with a heavily subsidized LROE of \$98/MWh.

Solar PV can even be useful in certain niche environments, particularly where other generating sources are unavailable or prohibitively expensive, like Hawaii.

Figure 8. US photovoltaic resource map. ([US DOE NREL](#))

The State of Massachusetts is literally covered with solar panels...

Figure 9. [Massachusetts](#) is covered with solar farms (yellow circles).

Yet generates very little photovoltaic electricity...

Figure 10. Massachusetts Net Electricity Generation by Source Aug. 2019 ([US EIA](#)).

“All of the above” is a great concept... But it only works when the resources are available and properly exploited.

[About the author of this WUWT post](#)

To avert further accusations of being a covert shill for fossil fuels I will try to include a brief biography in future posts.

I have been a geologist/geophysicist in the “climate wrecking industry” (oil & gas) since 1981, primarily working the Gulf of Mexico, the second most prolific oil play in these tangentially United States.

Figure 7. MAGoMA!!! (Making the Gulf of Mexico Great Again). U.S. Energy Information Administration, [Petroleum Supply Monthly](#) and [State Energy Data System](#)

“  
*EIA forecasts GOM production to average 1.9 million b/d in 2019, making this region the second-largest contributor to crude oil production growth from 2018 to 2019. The forecasted growth is driven by 14 new fields brought online in 2018 and 9 new fields expected to come online in 2019. These 23 fields collectively are expected to contribute more than 200,000 b/d of the total 1.9 million b/d of GOM production in 2019.*

— [US EIA](#)

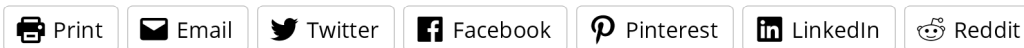
As a proud member of the “climate wrecking industry”, I am proud of our industry’s accomplishments. I recently attended a salt tectonics conference at the University of Texas at Austin. The opening remarks were by [Texas State Geologist and Director of the Bureau of Economic Geology, Scott Tinker](#). His remarks mostly focused on how oil & gas are integral components of lifting people out of energy poverty and he closed with, “When someone asks you what you do, reply with ‘I work in the oil & gas industry, I lift people out of poverty. What do you do?’” The “[Moral Case for Fossil Fuels](#)” is undeniable.

I have a BS in Earth Science, with a geology concentration and minor in math, along with 38+ years of “OJT”. I am a member of the Society of Exploration Geophysicists (SEG), American Association of Petroleum Geologists (AAPG) and Houston Geological Society (HGS). I live in Dallas with my wife (also a geo) and 11 dogs (9 rescues, mostly Pomeranians, & 2 Corgis, who we love almost as much as the rescues) and I work in Houston... My commute has a YUGE carbon footprint. MAGA!!!



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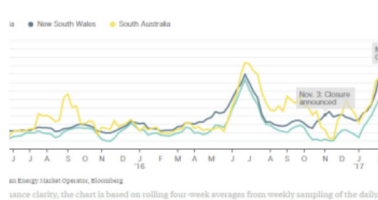
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## 149 thoughts on “Natural gas “emerging as the world’s go-to fuel” for electricity generation”

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**Mark Broderick** December 29, 2019 at 2:11 am

Great post Mr. David !

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**David Middleton** December 29, 2019 at 2:58 am

No typos? 😊

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**Mark Broderick** December 29, 2019 at 3:56 am

....Nope ! LOL

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**Roger Knights** December 29, 2019 at 4:16 am

“No typos?”

Well, since you asked, here’s what you wrote and next is what the *Chicao Manual of Style* says about it:

“And it would be impossible to feed half of Earth’s human population ....”

“The names *earth*, *sun*, and *moon*, ordinarily lowercased, are often capitalized when used in connection with the names of other bodies of the Solar System.”

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**David Middleton** December 29, 2019 at 4:23 am



Chicao is spelled Chicago... 😊

I capitalize Earth when referring to the specific planet, because it’s a proper noun, and use lowercase when referring to dirt. Proper nouns are capitalized everywhere but Chicago.

[Is Earth Capitalized?](#)

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**Johann Wundersamer** January 10, 2020 at 7:14 pm

David, we’re forced to accommodate with earth on Earth.

<https://www.google.com/search?q=boku+universit%C3%A4t+f%C3%BCr+bodenkultur+wien&oq=boku+Boden+Kultur+&aqs=chrome>.

Cause it’s 1 for the money, 2 for the show. 3 to get ready now go cat go but don’t you

[https://www.google.com/search?client=ms-android-huawei&sxsrf=ACYBGNR8CGJ7CERcgCsIWCKOQm77Hj8gIQ%3A1578712336698&ei=ED0ZXoGYKqj4qwHN3Jj4Bg&q=blue+suede+shoes+lyrics&oq=step+on+my+blue+suede+shoes&gs\\_l=mobile-gws-wiz-serp](https://www.google.com/search?client=ms-android-huawei&sxsrf=ACYBGNR8CGJ7CERcgCsIWCKOQm77Hj8gIQ%3A1578712336698&ei=ED0ZXoGYKqj4qwHN3Jj4Bg&q=blue+suede+shoes+lyrics&oq=step+on+my+blue+suede+shoes&gs_l=mobile-gws-wiz-serp).

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**Mark Broderick** December 29, 2019 at 4:30 am

....No !

“Earth (capitalization)

When the noun earth refers to our planet, it is capitalized only when it’s a proper noun (meaning it acts like a name and is not preceded by the—for example, everything on Earth). The word is not capitalized when it is a common noun (meaning it does not act like a name and is preceded by the—e.g., everything on the earth).”

<https://grammarist.com/style/earth/>

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**David Middleton** December 29, 2019 at 7:48 am

If I was referring to the ground it would be earth. I was referring to the planet Earth.

*“And it would be impossible to feed half of Earth’s human population without the synthetic fertilizers made from natural gas.”*

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Mark Broderick December 29, 2019 at 8:28 am

David, I was replying to Roger. Your usage is correct.

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David Middleton December 29, 2019 at 9:11 am



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Johann Wundersamer January 10, 2020 at 3:53 am

Earth is capitalised.

soil, ground, earth ain’t capitalised.

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David Middleton January 10, 2020 at 3:57 am

Earth, when referring to the planet, is capitalized.

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**Johann Wundersamer** January 10, 2020 at 6:44 am

David, what about earth, Boden Kultur:

<https://www.google.com/search?q=boku+universit%C3%A4t+f%C3%BCr+bodenkultur+wien&oq=boku+Boden+Kultur+&aqs=chrome>.

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**Mark Broderick** December 29, 2019 at 4:23 am

....Nope ! LOL

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**David A** December 29, 2019 at 8:21 am

I read this right after my 94 year old dad ( Dad) said ” people can and do argue about anything.” (-;

Dave M, do you think Texas wind really works after all costs, including spinning back up, and life span are considered?

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**David Middleton** December 29, 2019 at 8:46 am

It works OK. I’d say wind breaks even (pardon the pun). When the decision was made to build out the transmission lines and subsidize the wind farms, natural gas was expensive and we were building LNG import terminals, so it seemed to be a good idea.. Had we known that the “shale revolution” was about to make gas cheap and lead to the conversion of import terminals to export terminals, the investment in wind power wouldn’t have made any sense. Hindsight is usually 20:20.

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**Mark Broderick** December 29, 2019 at 11:14 am

No-matter the cost, they are a blight on the landscape !  
They are @#\$%ing UGLY ! IMHO

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**Scissor** December 29, 2019 at 7:03 am

Great post!

A flyby critic may come along to make some inane disparaging comment. His short comment, and by that I mean not even a complete sentence, will likely contain more mistakes than your entire article.

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**Joel O'Bryan** December 29, 2019 at 9:49 am

MAGoMA!!! (Making the Gulf of Mexico Great Again)

MGMGA???

or,  
Making America’s Gulf of Mexico Awesome,  
= MAGMA

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**David Middleton** December 29, 2019 at 9:51 am

$+42 \times 10^{42}$

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**Drake** December 29, 2019 at 12:54 pm

Would that be liquid hot?