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The Environmental Impact of Paris Climate Accord Ratification

A deeper look at renewable energy trends in the Middle East and how ratification of the Paris Climate Accord affects renewable energy production in the region

Based on the research paper, "Impacts of Paris Climate Accord Ratification on Renewable Energy Production" by Matthew Barker, Student of the University of Utah Eccles School of Business

Source: www.gouvernement.fr

Key Takeaways

✓ Total renewable energy production increased in the Middle East between 2014 and 2018.

✓ In the same time period, the share of renewable energy production as a percentage of total energy production also increased.

✓ Most importantly, ratification of the Paris Climate Agreement was shown to increase renewable energy production as a percentage of total energy production by about 4% in a country.

The Paris Climate Accord was one of the most influential steps in environmental history to date, bringing together every nation on earth with the goal of decreasing CO2 emissions and stop other environmentally harmful practices. While this was a positive first step, there was another major hurdle to pass to officially bind these nations with their promises: ratification. Unlike simply signing the agreement, ratification legally binds nations to their promises and helps keep them accountable for their actions.

Most countries acted quickly and ratified the agreement within a few months of signing it. But, there were some countries, mostly located in the Middle East, that did not ratify the accord in 2016. To better understand whether or not ratification actually makes a difference for meeting renewable energy production goals, I looked at renewable and total energy production levels in Middle Eastern countries before and after ratification. These are the main findings from my research.

1. Average energy production increased in the region between 2014 and 2018, with Saudi Arabia, Iran, the United Arab Emirates, Qatar, and Iraq being the largest producers.

Average country-level energy production – including oil, natural gas, and renewables – increased from 4.4 million terajoules in 2014 to 5 million terajoules in 2018 (the United States produced 90 million total terajoules of energy in 2018). For context, one terajoule is enough energy to carry a Boeing 737 across the Atlantic Ocean.

The five largest producers of energy in the region - Saudi Arabia, Iran, the United Arab Emirates, Qatar, and Iraq – produced 78% of the average renewable energy in the Middle East between 2014 and 2018. These countries have traditionally been major suppliers of global oil and will likely have a difficult time transitioning to renewable energy.

Source: PBS

Table 1

Total Energy Production by Year (measured in terajoules)

Year	Mean	Std. Dev.
2014	4,414,614	6,564,761
2015	4,551,150	6,861,494
2016	4,896,768	7,335,685
2017	4,905,413	7,193,768
2018	5,013,682	7,297,053

Table 2

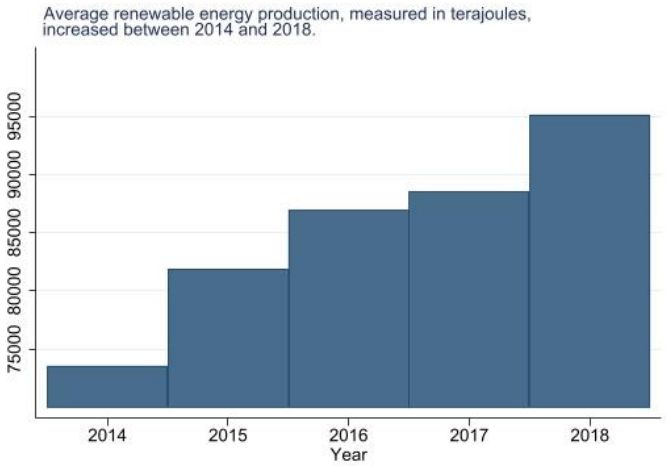
Total Energy Production by Country (measured in terajoules)

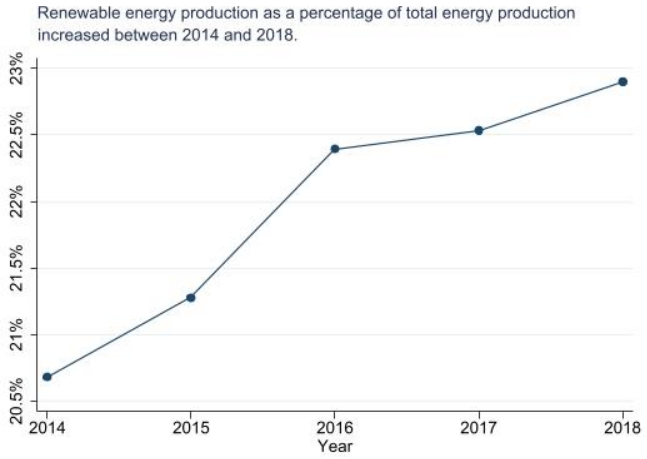
Country	Mean	Std. Dev.
Bahrain	951,785	8,223
Egypt	3,254,456	297,123
Eritrea	26,014	448
Iran	15,526,621	1,996,977
Iraq	8,824,329	1,451,511
Israel	295,507	33,028
Jordan	16,240	5,196
Kuwait	6,999,022	191,258
Lebanon	8,617	661
Libya	1,953,541	683,853
Oman	3,276,878	112,050
Qatar	9,392,708	73,876
Saudi Arabia	27,246,045	791,502
South Sudan	319,437	14,014
Sudan	745,051	12,864
Syria	189,094	27,085
Turkey	1,456,533	188,659
United Arab Emirates	9,674,379	428,012
Yemen	213,925	265,460

2. Like total energy, renewable energy production steadily increased between 2014 and 2018.

Average total renewable energy production in the region increased from roughly 73,000 terajoules in 2014 to nearly 95,000 terajoules in 2018. While this is a positive sign, total energy production also increased over the same period.

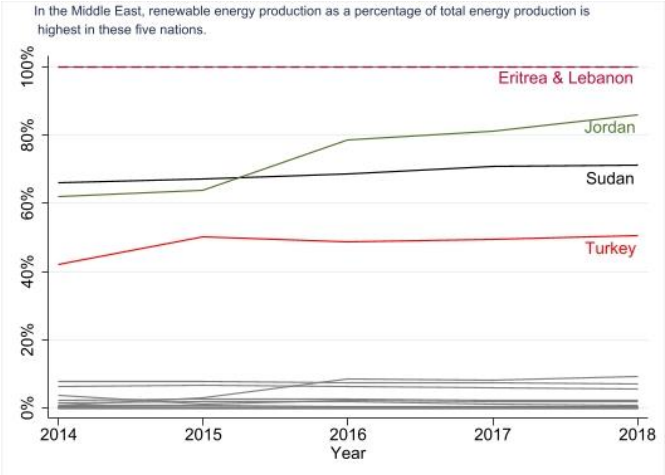
For this reason, the second graph is more important in considering renewable energy trends. Specifically, renewable energy production as a percentage of total energy production increased from about 20.7% in 2014 to about 23% in 2018. This means that the rate at which renewable energy production is increasing outpaced total energy production in the time period. This trend will have to continue if world leaders hope to make positive environmental change.





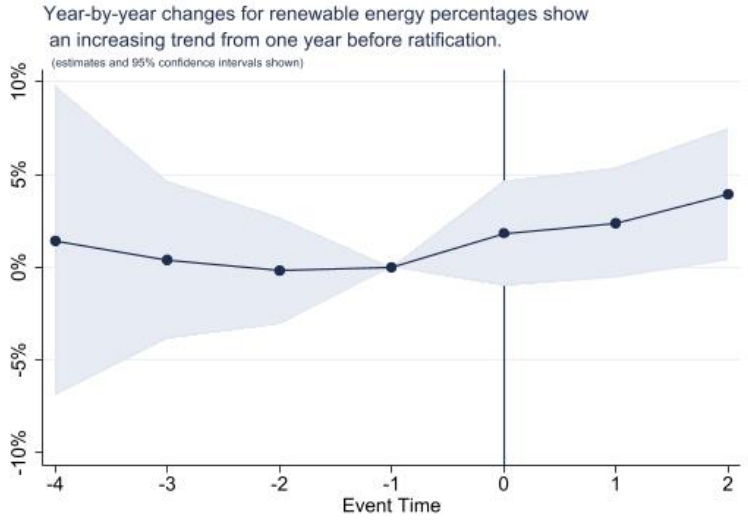
3. Five countries – Eritrea, Lebanon, Jordan, Sudan, and Turkey – produce half or more of their total energy through renewables, with the rest of the Middle Eastern countries producing less than 20% through renewables.

Eritrea and Lebanon are clear outliers in the Middle East because they don't produce any oil or coal, but derive most of their energy from biofuels, waste, hydro, solar, and other renewable energy sources. Jordan, Sudan, and Turkey are all very similar in regards to energy production, as they produce the majority of their energy through renewables. Importantly, all three of these countries increased their renewable energy production as a percentage of total energy production from 2014 to 2018.



4. Renewable energy production as a percentage of total energy production was shown to increase by about 4% two years after ratification of the Paris Climate Accord, compared with one year before ratification.

This graph is the most important for showing how ratification affects renewable energy production, with event time 0 being the date of ratification, event time 1 being one year after ratification, and so forth. This graph shows that ratification of the Paris Climate Accord materially affects renewable energy production in a nation, as it likely forces countries to more strictly follow renewable energy production plans.



One possible confounding factor could be that most of the countries in the dataset signed and ratified the climate agreement in the same year, meaning that the true effect is coming from signing and not ratifying the agreement. I was unable to get enough data to accurately tell the difference between the two factors, but with more data, this would be possible.

Conclusion

Renewable energy production trends in the Middle East have been positive, which has only been accentuated by ratification of the Paris Climate Agreement. Specifically, ratification was found to increase renewable energy production as a percentage of total energy production by about 4%. This shows that ratification of the climate accord is vital to meeting increasingly important climate change standards.

About the Author

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