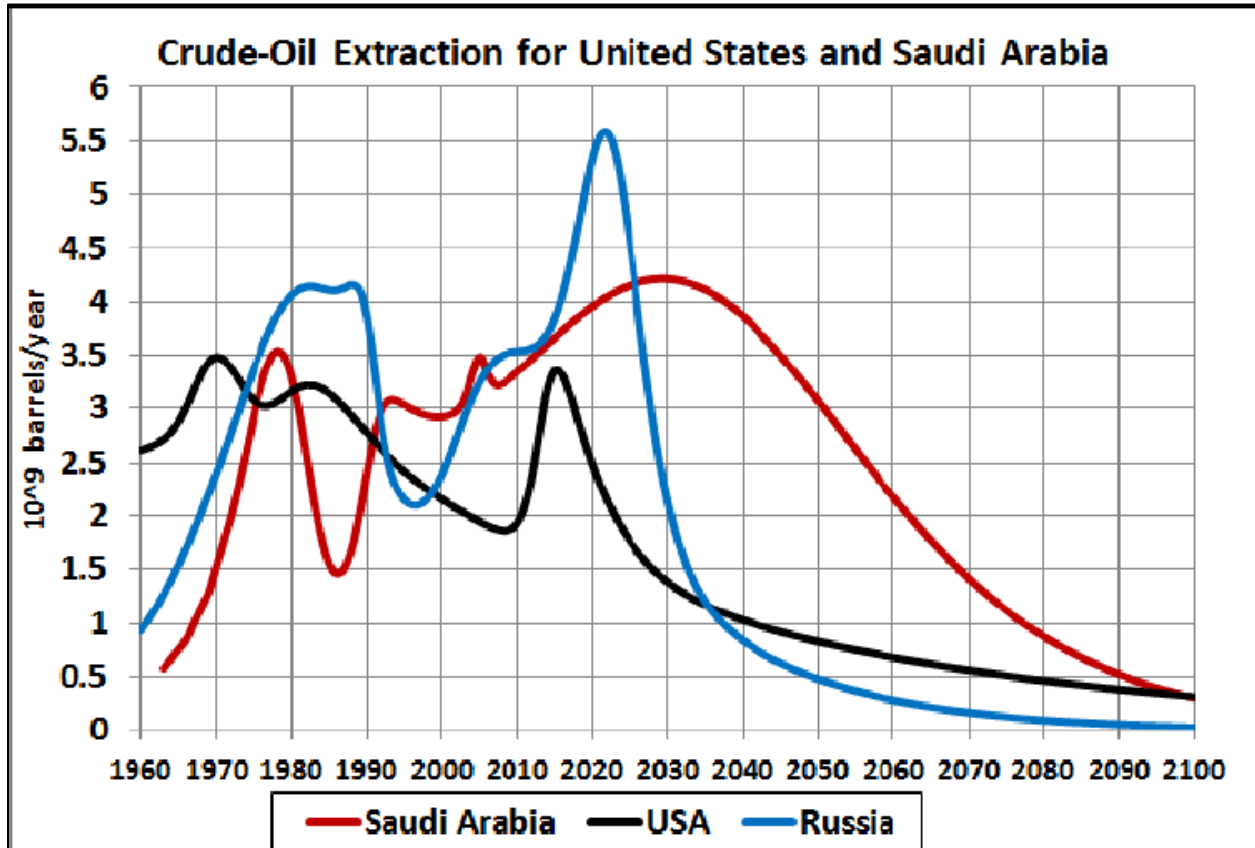


Why the U.S. wants to be Friends with Russia and Saudi Arabia Despite Their Human-Rights Records

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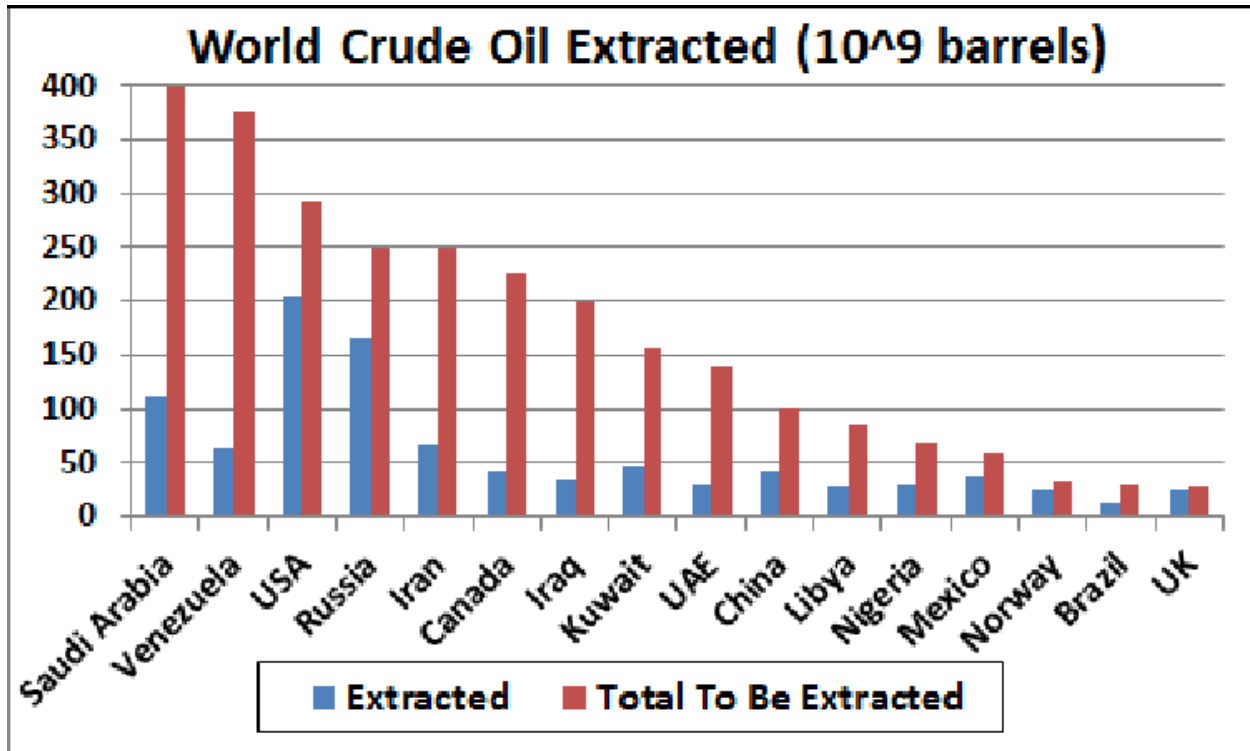
There may be many reasons why the Trump administration wants to be friends with Russia and Saudi Arabia, but a big one is seen from the depletion curves of crude-oil extraction of the three countries:



These depletion curves are calculated using the extraction data and high estimates of the remaining reserves for crude oil, with the assumption of one future symmetric peak. There could be more than one future peak due to political, economic or natural disasters.

Note that U.S. extraction will peak first at a lower value than the other two curves for Russia and Saudi Arabia.

Also of interest are the areas under the three curves up to the present (the amounts already extracted) and the total areas (the total amounts that will be extracted):



From these it is seen that Saudi Arabia has much more left to extract than do the U.S. and Russia combined.

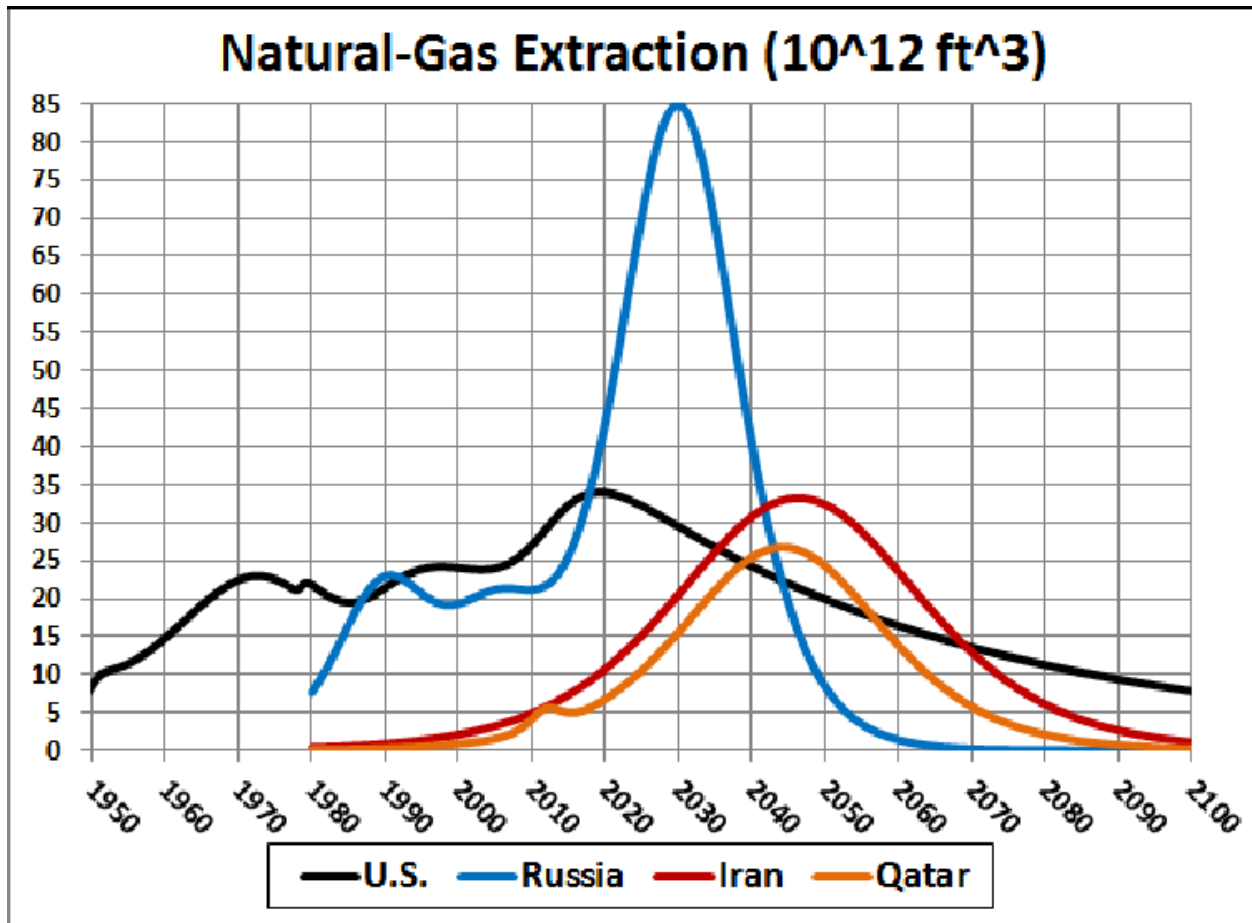
Despite the fact that Venezuela has much crude oil available for extraction, there are several reasons that it is not very important for crude-oil consumption:

- It is heavy crude-oil, which makes it more expensive to refine into fuels.
- It is more expensive to extract than light crude oil.
- Venezuela is mired in political disruption.

Note that Iran and Canada and Iraq could be considered as important for crude-oil consumption. However:

- Iran is struggling to recover from severe economic sanctions and does not have extensive infrastructure for extraction.
- Canada has mostly crude-oil made from tar sands, which is expensive to process and environmentally disruptive.
- Iraq is mired in war and probably will be for many more years.

Also of interest to the U.S. is natural-gas extraction for the major extractor nations (U.S., Russia, Iran & Qatar):

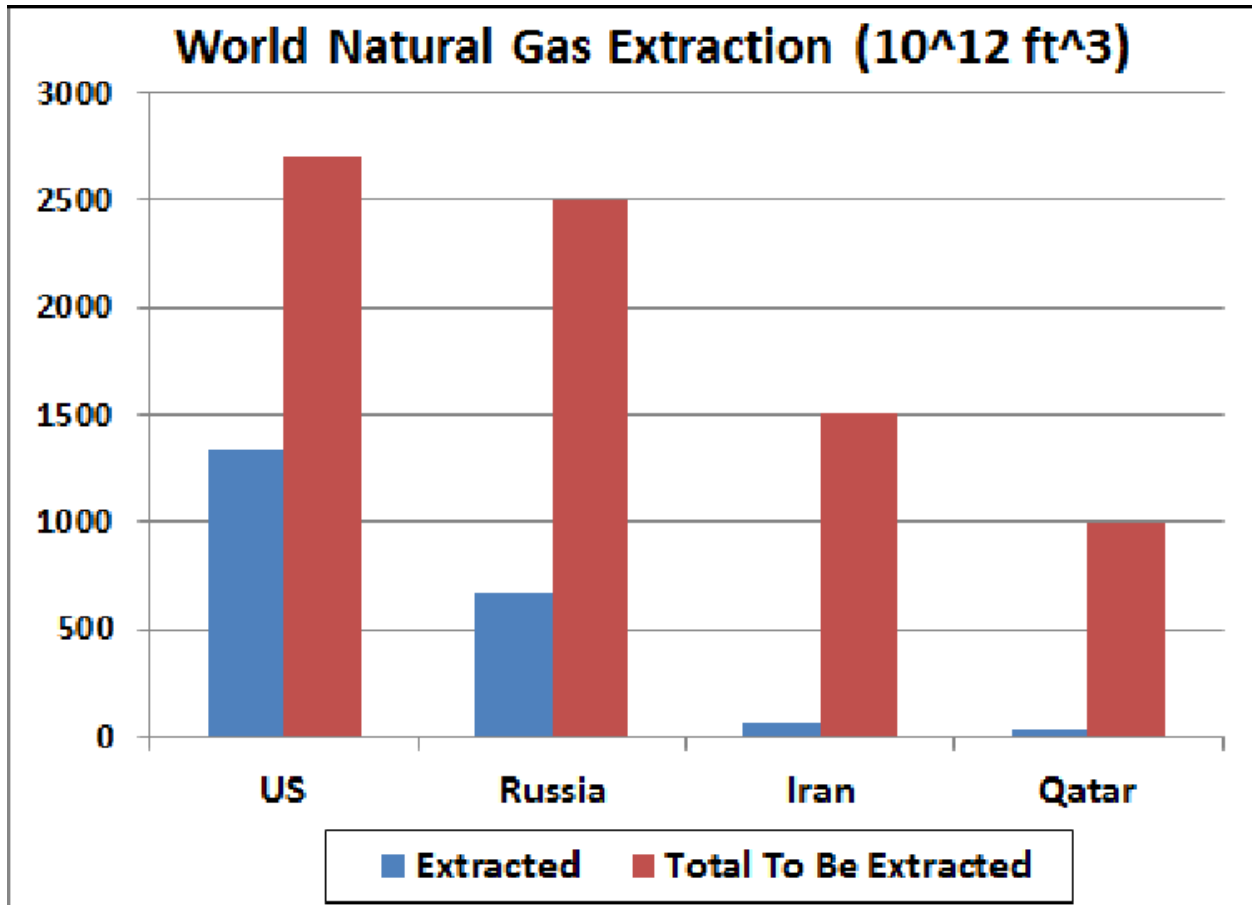


These depletion curves are calculated using the extraction data and high estimates of the remaining reserves for natural gas, with the assumption of one future symmetric peak. There could be more than one future peak due to political, economic or natural disasters.

Note that U.S. extraction will peak first and at a much lower value than the curve for Russia.

One can readily see why the U.S. is courting Russia rather than Iran and Qatar, but that might change after 2040.

Also of interest are the areas under the three curves up to the present (the amounts already extracted) and the total areas (the total amounts that will be extracted):



The two graphs above show that Russia, Iran and Qatar will be the main extractors of natural gas.

The graphs above show why it is very important that the world move quickly in developing the infrastructure for renewable energy and to electrical transportation while crude-oil and natural gas are available to make that possible.