

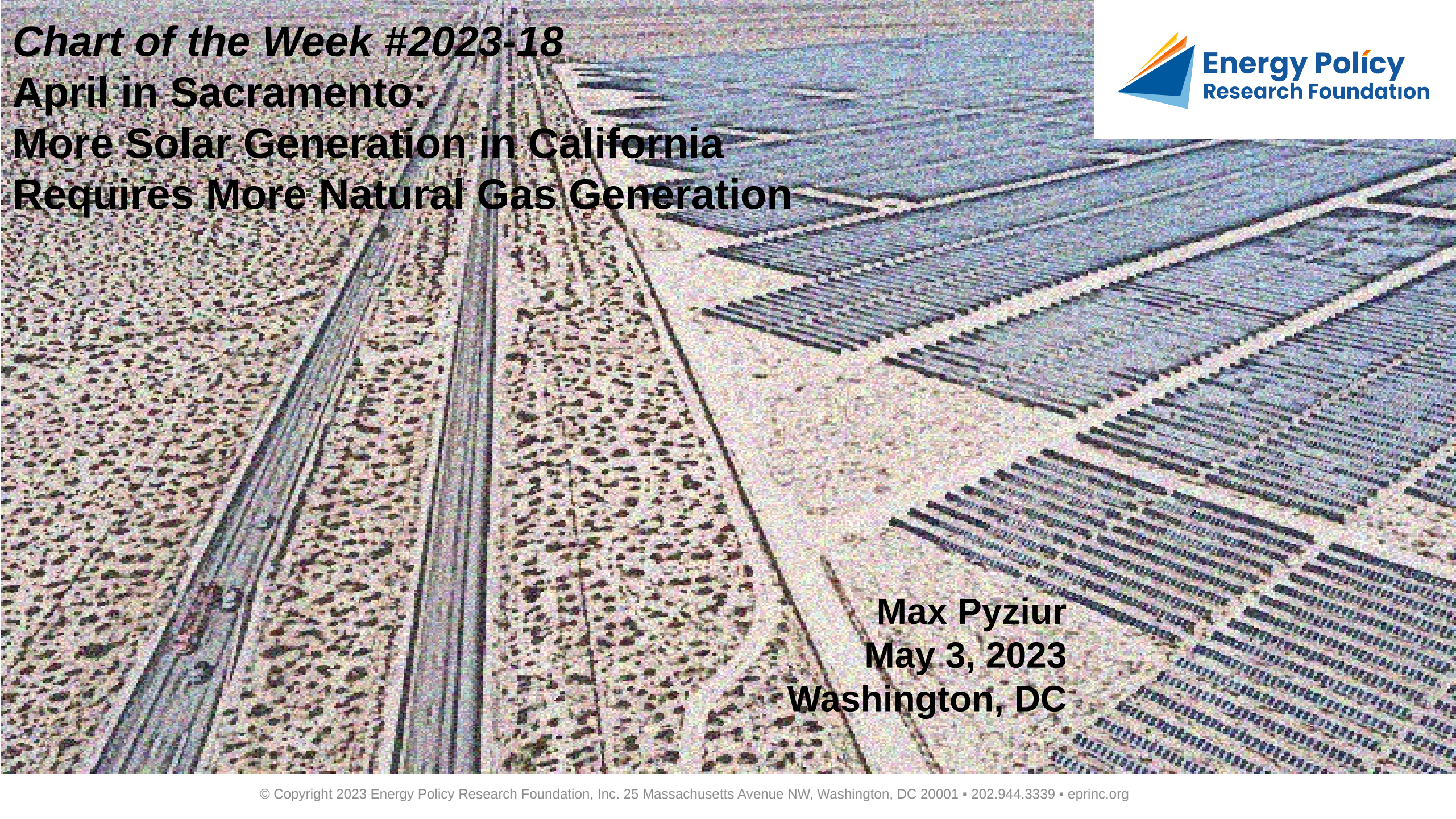


Chart of the Week #2023-18

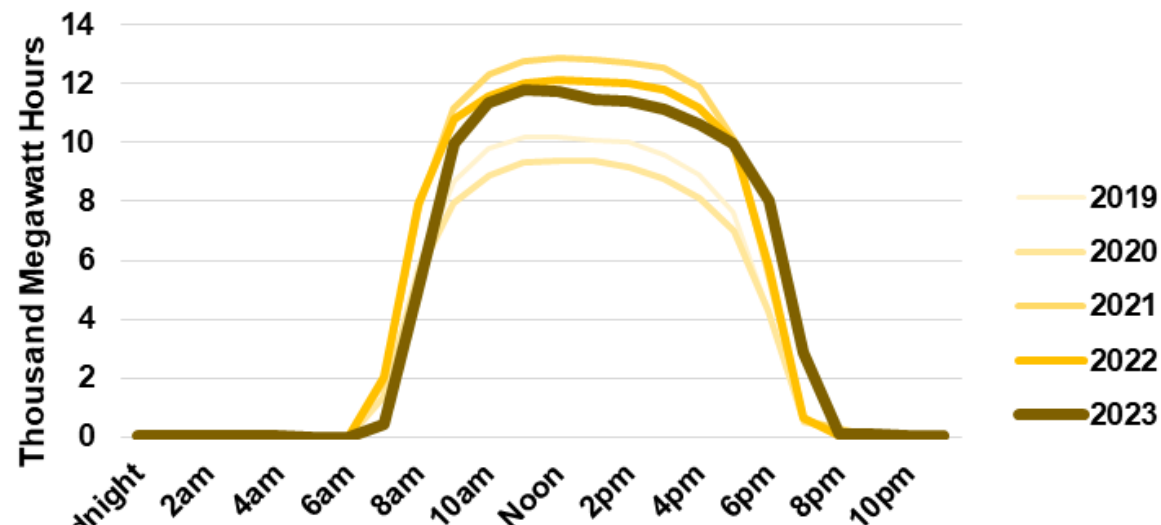
April in Sacramento: More Solar Generation in California Requires More Natural Gas Generation



**Max Pyziur
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Washington, DC**

More Solar Generation in California Requires More Natural Gas Generation

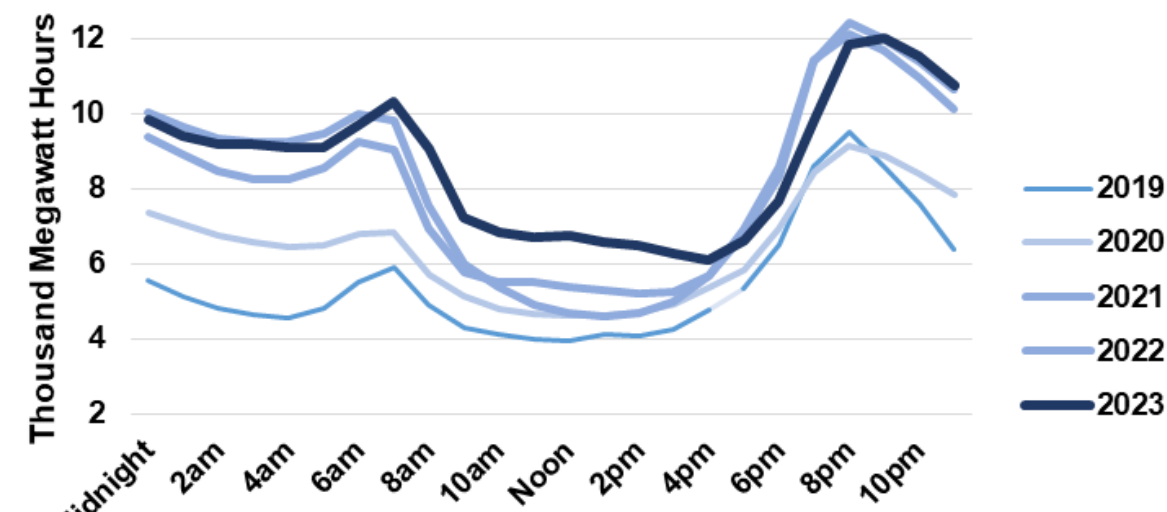
Average April Solar Electricity Generation in California



Analysis Based on Hourly EIA Data

EPRINC

Average April Natural Gas Electricity Generation in California



Analysis Based on Hourly EIA Data

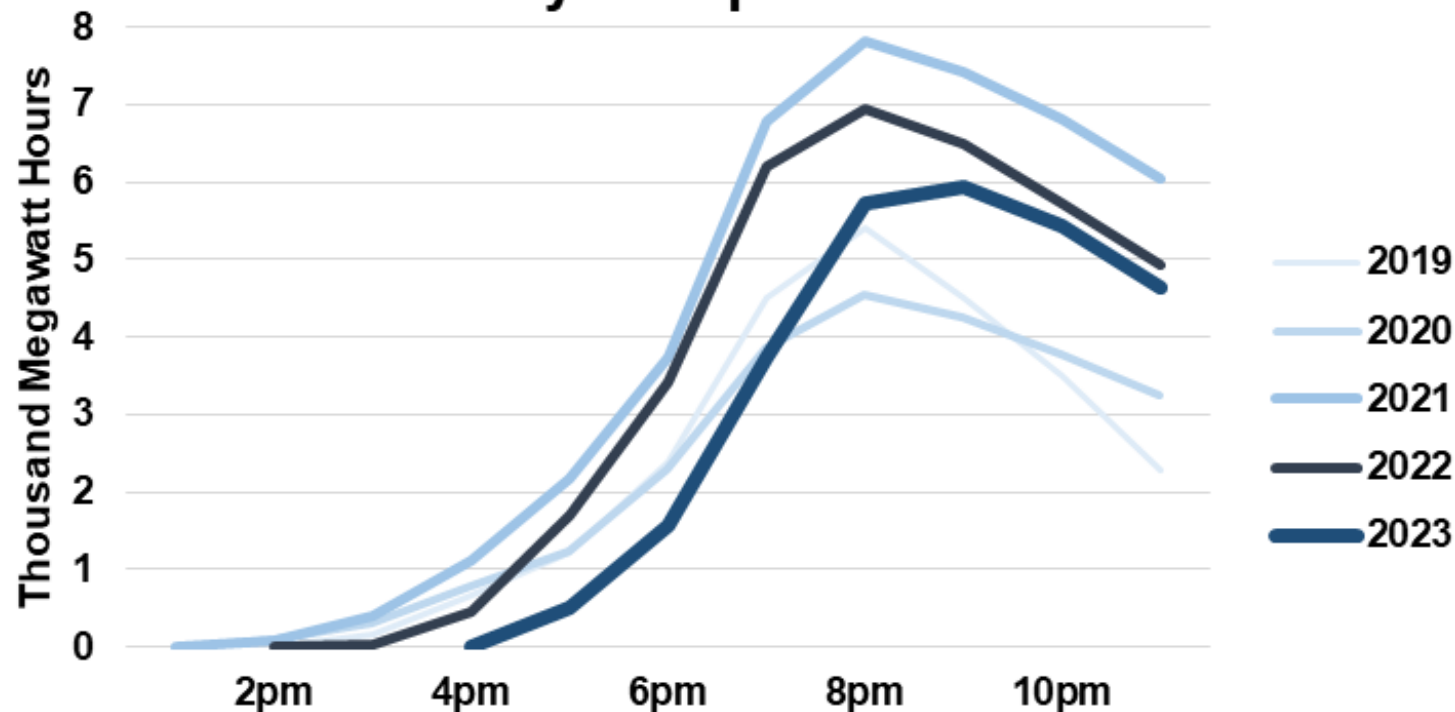
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ITCs (investment tax credits) and mandates in the form of RPS (Renewable Portfolio Standards) have spurred and expanded the construction and use of solar generation in California. Averaging across April, noon-time solar generation peaked this year at almost 12 thousand megawatt hours (MWh) compared to 10 thousand MWh in 2019.

The graphical representation of the amount of non-solar electricity generation that is withdrawn due to the increasing midday bulge of California's solar generation has come to be known as the "duck curve."

More Solar Generation in California Requires More Natural Gas Generation

Average April Natural Gas Afternoon Electricity Ramps in California



Analysis Based on Hourly EIA Data

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“Ramp rate” is the term that describes the rate at which power generating assets can produce more electricity. Coal and nuclear electricity generation ramp slowly at 4 MWhs per minute. Conversely, natural gas used in simple-cycle generation can ramp as high as 40 MWhs per minute.

Given how rapidly solar generation ramps and falls off combined with California increasing its reliance on it, simple-cycle natural gas generation is the flexible and reliable to offset solar generation as well as match load requirements.

In 2023 during April, California required almost 6 thousand MWhs of natural gas generation over the course of 5 hours, or a rate of 20 MWhs per minute. During April 2020, the state only needed a ramp of 4.5 thousand MWhs over a period of 7 hours, or 11 MWhs per minute.

Generally during August, California's natural gas ramp rates become more acute reaching 16 thousand MWhs of generation over 7 hours, or almost 40 MWhs per minute almost all from natural gas.

Western European Near-Term Natural Gas Requirements

- The expanded version of this slide deck is available at: <https://eprinc.org/chart-of-the-week/>
- For more information on this chart, please contact Max Pyziur, maxp@eprinc.org