

An aerial, high-angle photograph of an industrial facility, likely a power plant or data center, with a strong blue color overlay. The image shows several large, rectangular buildings and structures arranged in a grid-like pattern. The text 'FLUENCE' is prominently displayed in the center in a white, stylized font.

FLUENCE

A Siemens and AES Company

Transforming the way you power your world.

Fluence is the global leader in grid-connected energy storage

Joint Venture of Siemens & The AES Corporation delivers complete, proven storage systems

OUR TRACK RECORD

 **12+**
YEARS

 **100+**
PROJECTS

 **22**
COUNTRIES
AND TERRITORIES

 **2,000+**
TOTAL MW
DEPLOYED OR AWARDED

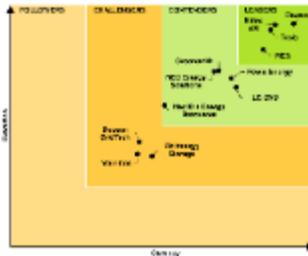
 **7,600+**
GW-HOURS OF DELIVERED
SERVICE GLOBALLY

INDUSTRY RECOGNITION

NAVIGANT

#1

ON NAVIGANT
ENERGY STORAGE
LEADERBOARD



FAST COMPANY

#3

IN ENERGY,
FAST COMPANY
MOST INNOVATIVE
COMPANY



OUR CUSTOMERS

SEABOARD
CORPORATION

SDGE

SIEMENS
Ingenuity for life

A Sempra Energy utility*

SW/M

Stadtwerke München

ukpowerreserve
PART OF semcorp GROUP

NEXIF
ENERGY

 **SPOTLESS**

 **TATAPOWER-DDL**

 **Mitsubishi**
Corporation

c-energy

e-on

 **AES**

AusNet
services

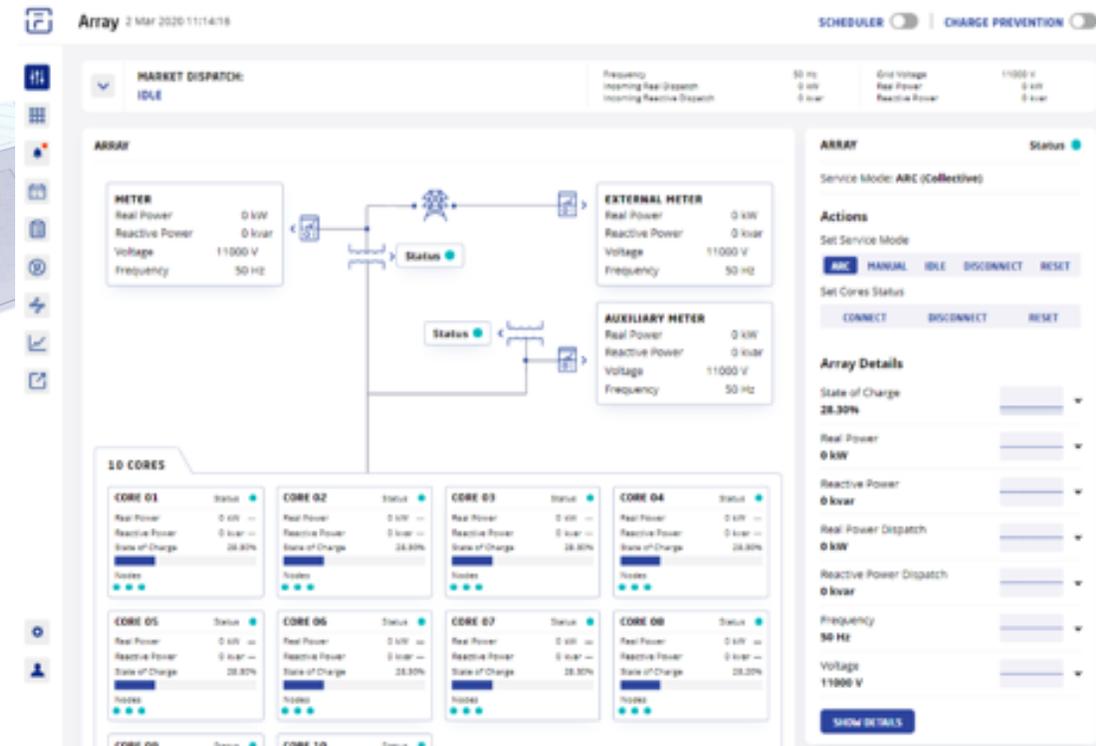


The future of storage: scalability, speed of deployment, fleets

New Fluence 6th-generation offerings designed to maximize scalability, reduce deployment time & non-battery costs, manage fleets



Combining a standardized form factor, fully integrated operations platform, and digital intelligence to improve asset performance and operating costs



Fluence Purpose-Built Systems - incorporating 12+ years of deep expertise in storage system design & delivery

Built on the core Tech Stack, Fluence offers three systems that are optimized for common customer applications but can be configured for specific use cases and requirements.



GRIDSTACK™

Grid-scale energy storage system designed for the most demanding market applications with industry leading reliability and safety



SUNSTACK™

PV-optimized, co-located energy storage system designed to improve and expand the capabilities of solar generation



EDGESTACK™

Connection-ready, C&I energy storage system designed to support 500+ kW applications with rapid deployment



Faster grid services to accommodate higher levels of RE generation

Renewable Integration & Fast Frequency Response (FFR)

Statkraft Ireland

Kilathmoy, Wind Farm

34MW Wind-Battery hybrid plant

Services:

- Fast Frequency Response (150ms guarantee) for Ireland's DS3 Services
- Reactive Power compensation

Impact:

- Grid Code Compliance
- Deployment Synergies
- Increased RES-E integration
- First DS3 battery in Ireland
- World's fastest software-controlled BESS



Flexible Peaking Power

AES Alamos

Long Beach, California, United States

100 MW / 400 MWh

SERVICES

- Capacity, local reliability
- Peak power/off peak mitigation
- Ancillary services

IMPACT

- Competitive bid vs thermal peaker, cost effective
- Replaces environmental retired units
- Meets flexibility (duck curve)



Energy Storage is not a simple cut-and-paste of gas peakers



“If I had asked people what they wanted, they would have said faster horses.”

- Henry Ford

Three characteristics used to justify peaking capacity:

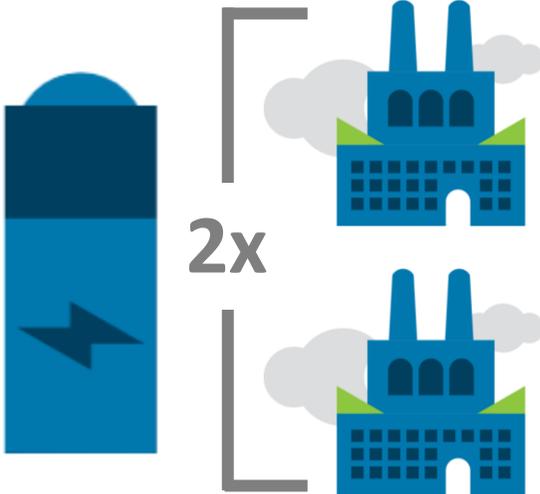
Availability



Reliability



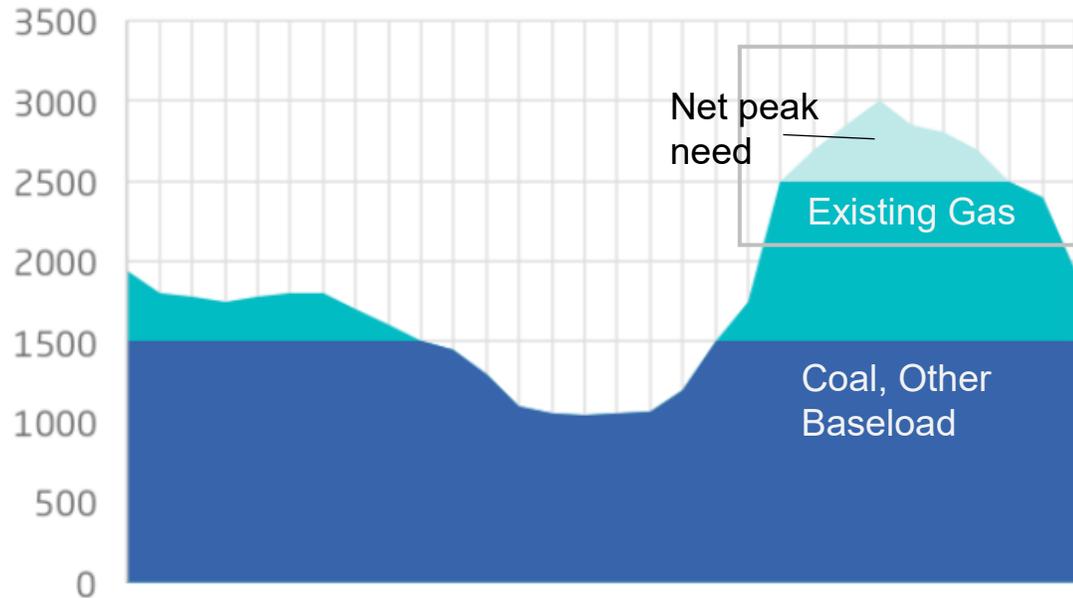
Flexibility



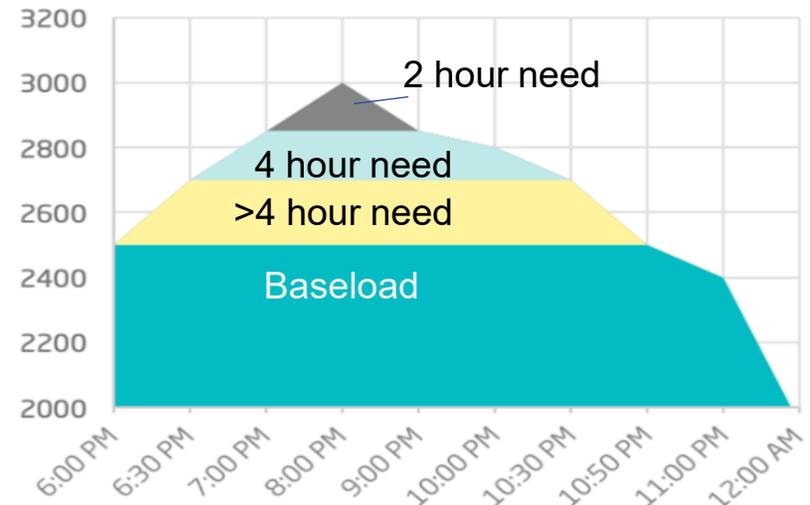
Energy storage is a cost-effective way to shave the net peak

Scenario: A vertically integrated utility with a 3,000 MW net peak load faces a 500 MW capacity need on its most challenging day due to a retired power plant

Net load on most challenging day



Net peak sliced by duration layer



150 Megawatts of 2-hour need
150 Megawatts of 4-hour need
200 Megawatts of >4-hour need

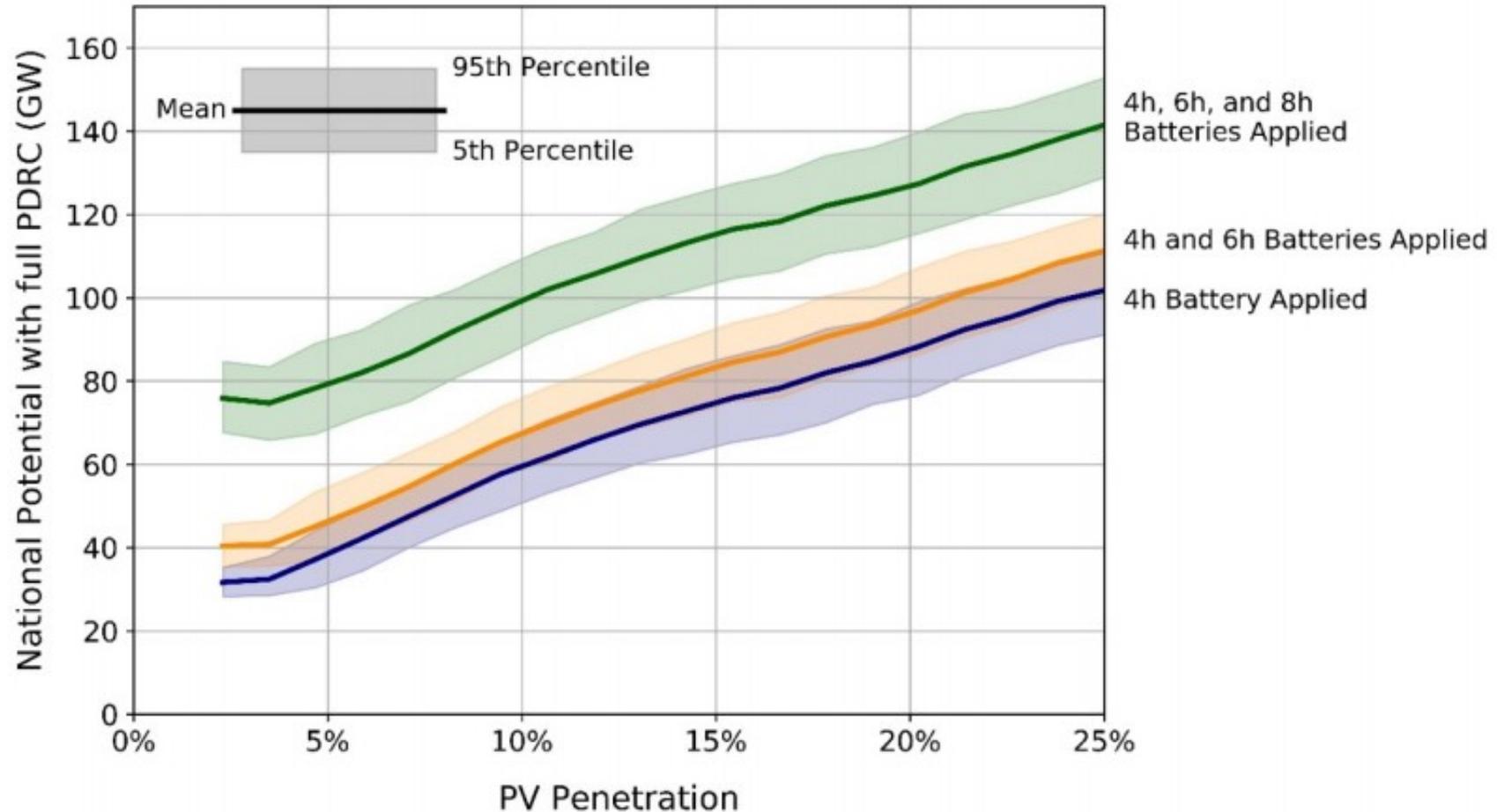


The results: a portfolio with a range of storage durations and minimized gas is the most cost-effective solution

	Megawatts of need	Duration portfolio approach: Mix of Battery-Based Storage & Thermal	Thermal only
2-hour Duration	150MW	\$650/kW, 2-hour Storage	\$1,200/kW
4-hour Duration	150MW	\$1000/kW, 4-hour storage	\$1,200/kW
8-hour Duration	200MW	\$1,200/kW Thermal	\$1,200/kW
Total cost to meet Peak		\$475MM: 300MW Storage and 200MW Thermal	\$600MM 500MW Thermal



NREL found that the US currently has over 40 GWs of 6-hour duration, and that this will increase as solar penetrates more deeply

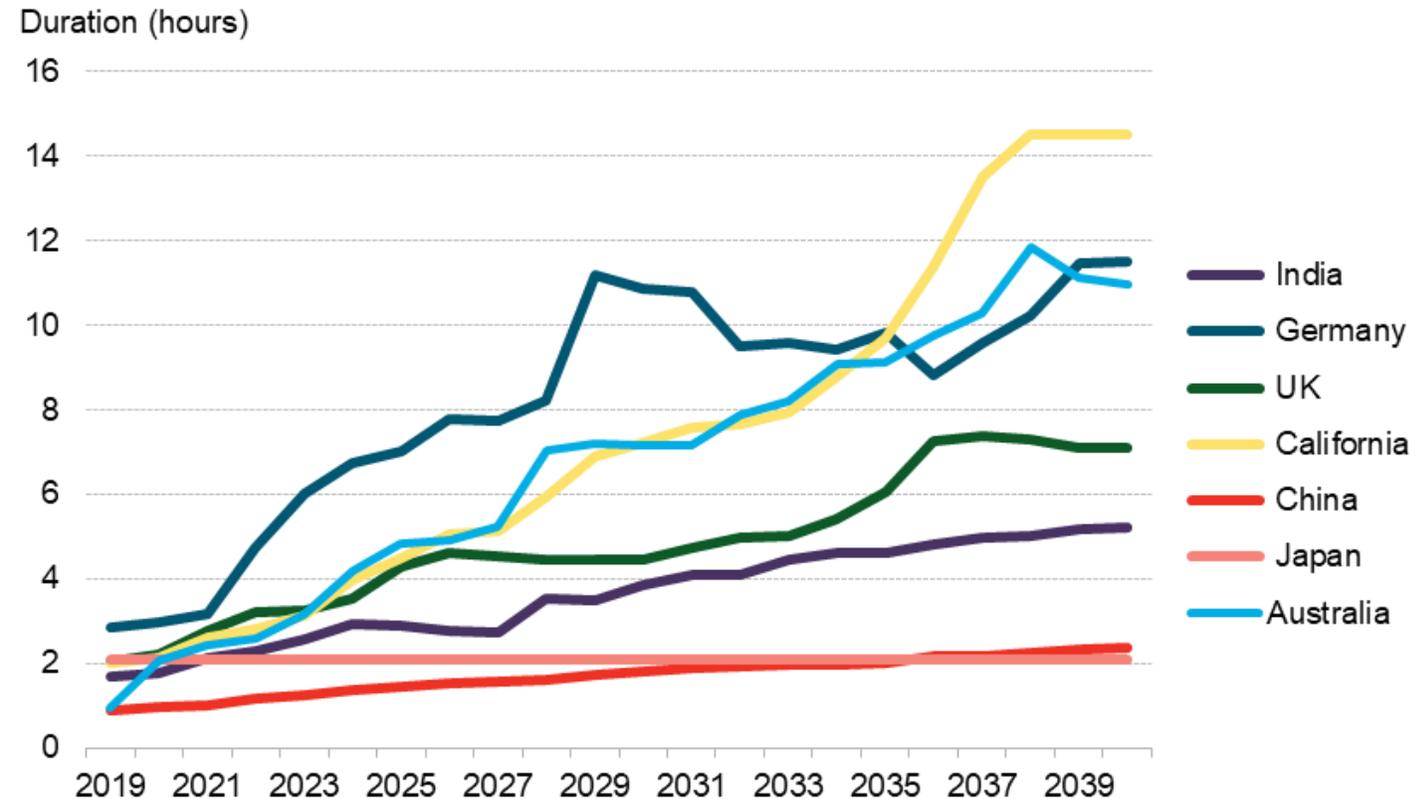


Source: NREL, 2019



Bloomberg New Energy Finance has found deep needs for 6-hour duration across the globe

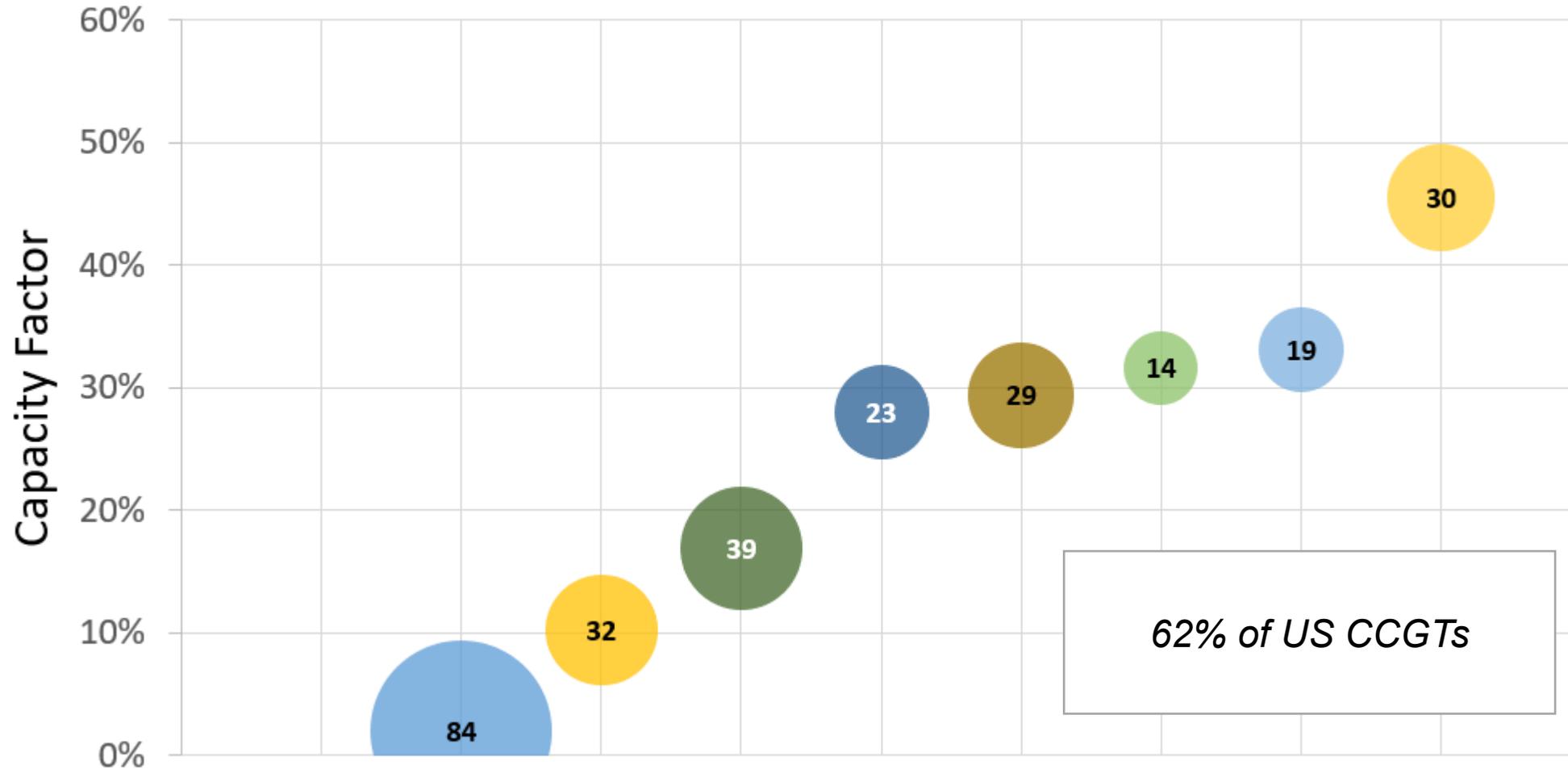
Country	GWs of <= 6 hour duration
China	119+
India	40+
UK	19
Australia	6
Japan	4+
Germany	4



Source: BNEF, 2019



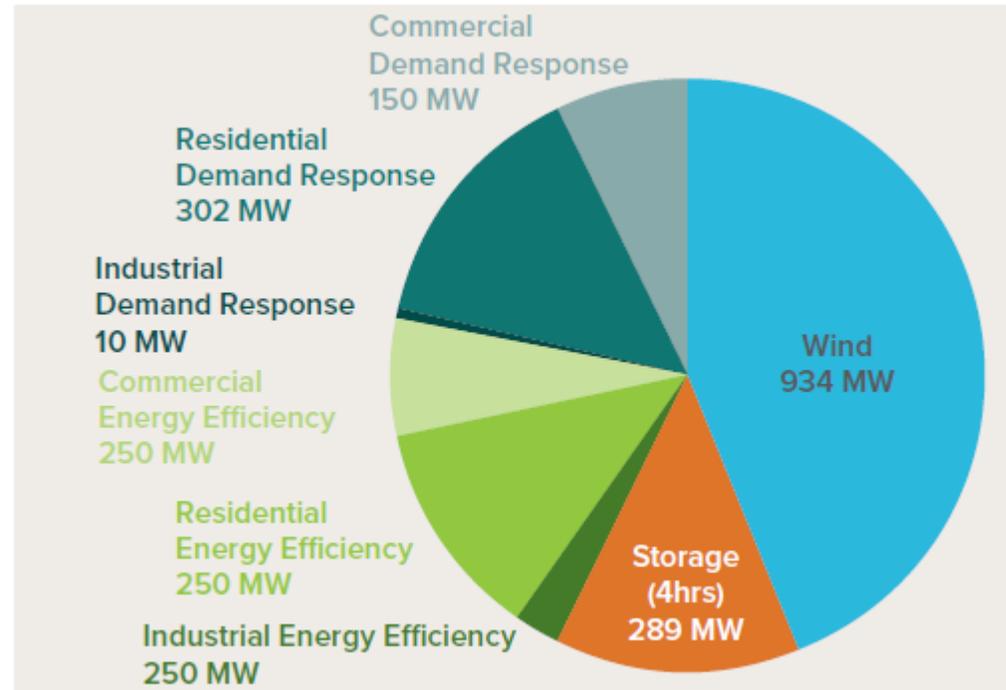
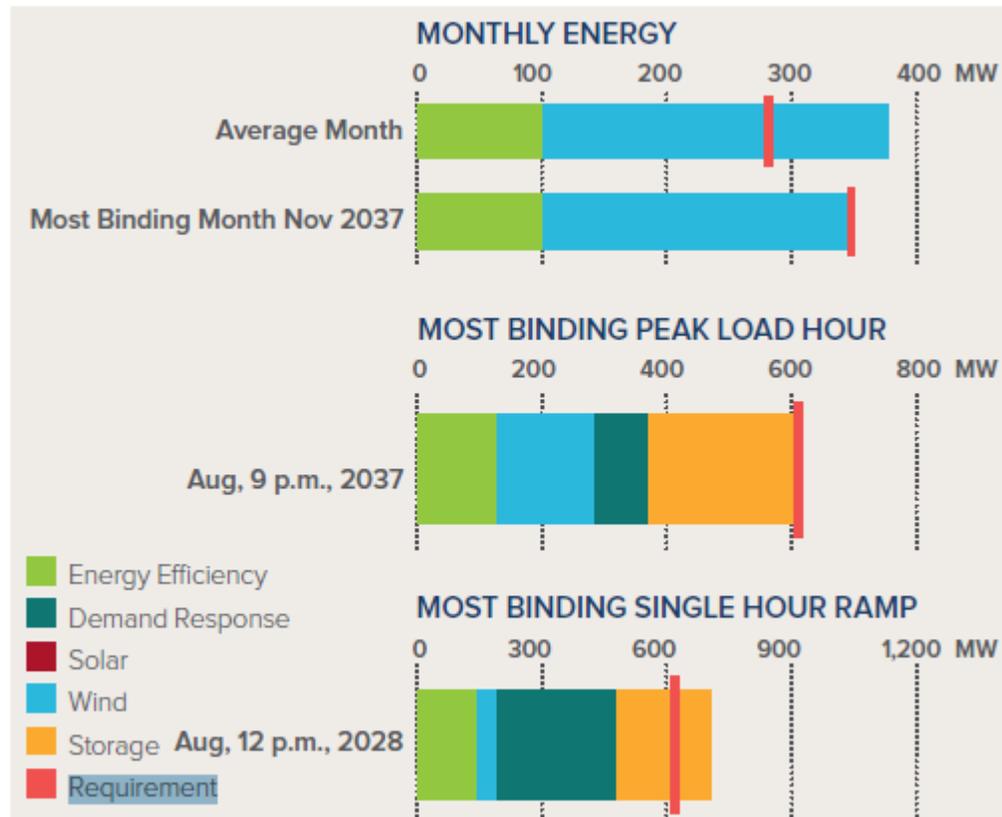
Beyond peakers: many combined cycle plants are being pushed to shorter and shorter duration runs



Source: Fluence research on EPA CEMS data



Researchers at the Rocky Mountain Institute have found that storage combined with other clean resources can reliably match the output of combined cycle plants



Source: Rocky Mountain Institute, "The Economics of Clean Energy Portfolios" (2018)



Utilities are selecting RE+storage

...replacing (not replicating) baseload...

PacifiCorp to add 7 GW renewables + storage, close 20 of 24 coal plants



Kentucky Leads The Country In 2020 Coal Retirements

By Ryan Van Velzer

Coal plants increasingly operate as cyclical, load-following power, leading to inefficiencies, costs: NARUC



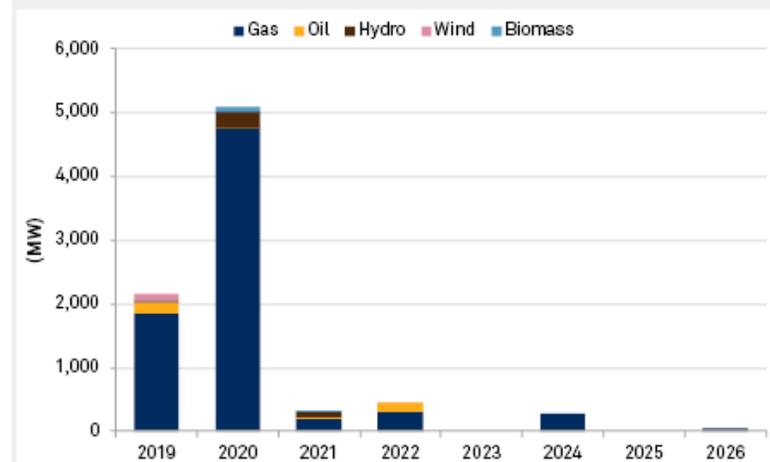
in the USA...

... as well as replacing gas...

Dominion suspends plan to add 1.5 GW of peaking capacity as Virginia faces gas glut

Age, lack of use prompt upcoming retirement of US gas-fired capacity

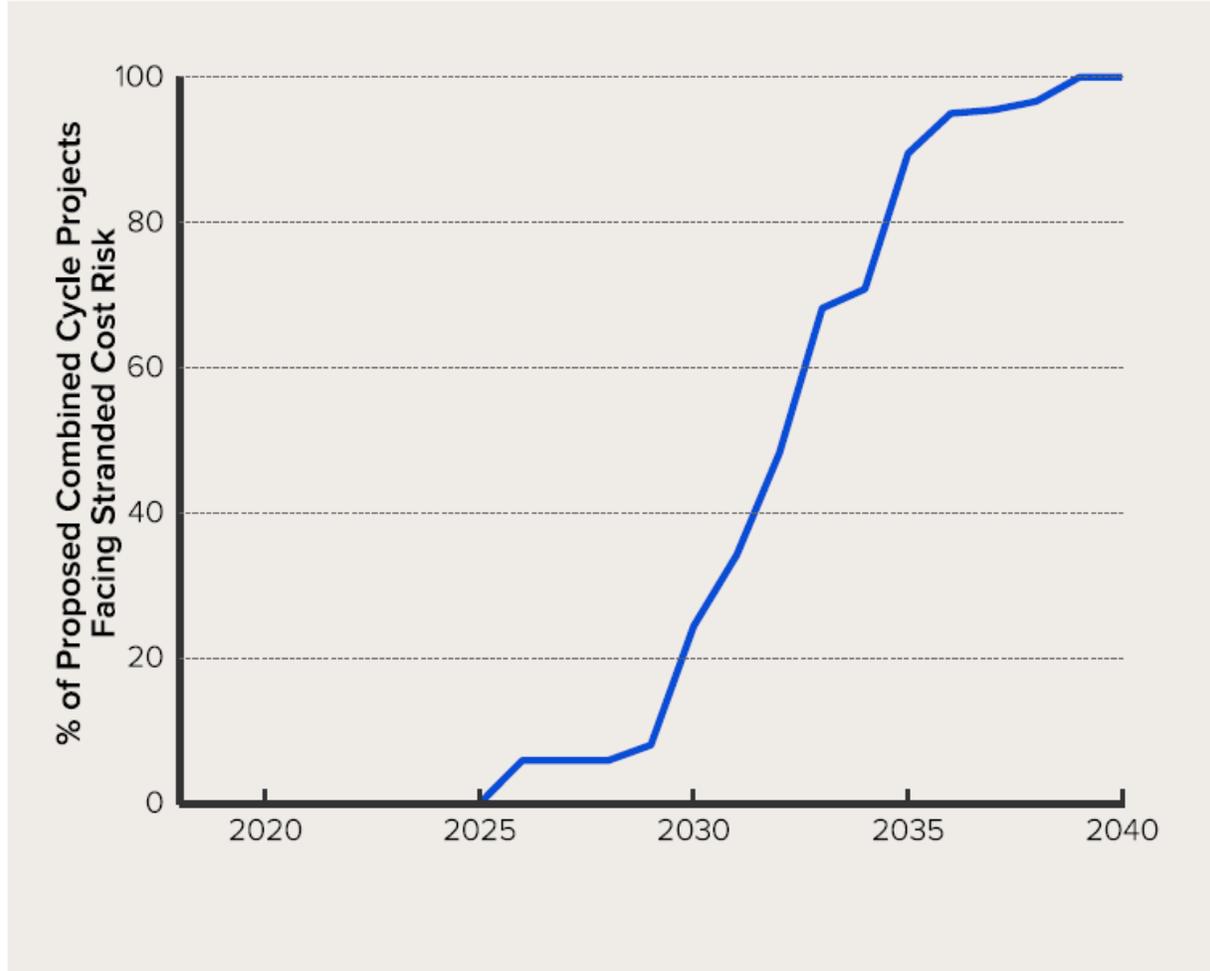
Planned noncoal and non-nuclear retirements in the US



Data compiled Feb. 20, 2019.
Only includes units that have received regulatory approval to retire.
Source: S&P Global Market Intelligence



According to the Rocky Mountain Institute, the risk is high that gas built today will become economically stranded before the end of its planned life



Source: Rocky Mountain Institute, "The Growing Market for Clean Energy Portfolios" (2019)



Thank You!

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