

Can Storage Provide Firm Capacity and Replace Retiring Generators?

ESIG Spring Technical Workshop March 27, 2024 P. Denholm

Yes....

There is clear analytical evidence that ~4-hour storage provides very high capacity credit in summer peaking systems





Market	Duration	
Operator	Minimum	
	(hours)	
ISO-NE	2	
CAISO	4	
NYISO	4	
SPP	4	
MISO	4	
PJM	ELCC based	IREL

And it gets better.....

The opportunities increase with solar deployment. So there is 100+ GW of peaking capacity that could be replaced with relatively shot duration storage



- 3

But...As net load shifts to winter longer duration (more \$) is required





This could be accelerated and made worse with electrification





And ultimately multi-day to seasonal storage is required



The seasonal mismatch problem in 100% clean energy systems

Ultimately we still need a lot **(hundreds of GW)** of something that basically looks like a peaking plant

Mix of resources providing firm capacity from NREL standard scenarios



Thank you

www.nrel.gov

