

What the Energy Crisis means for distributed energy

Prepared for: PJM General Session

Ben Hertz-Shargel | May 17, 2022



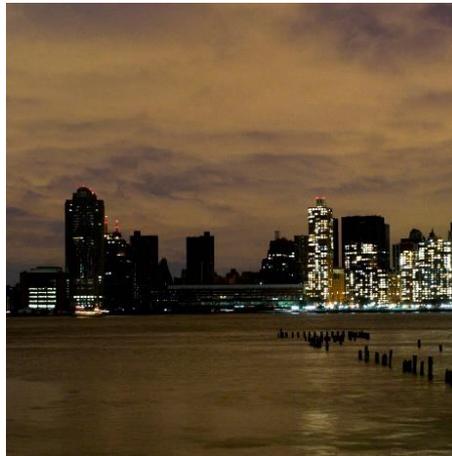
Is the global energy system resilient enough to meet the today's challenges?

**Record hot summers
and cold winters**



**Post-pandemic
record power
demand**

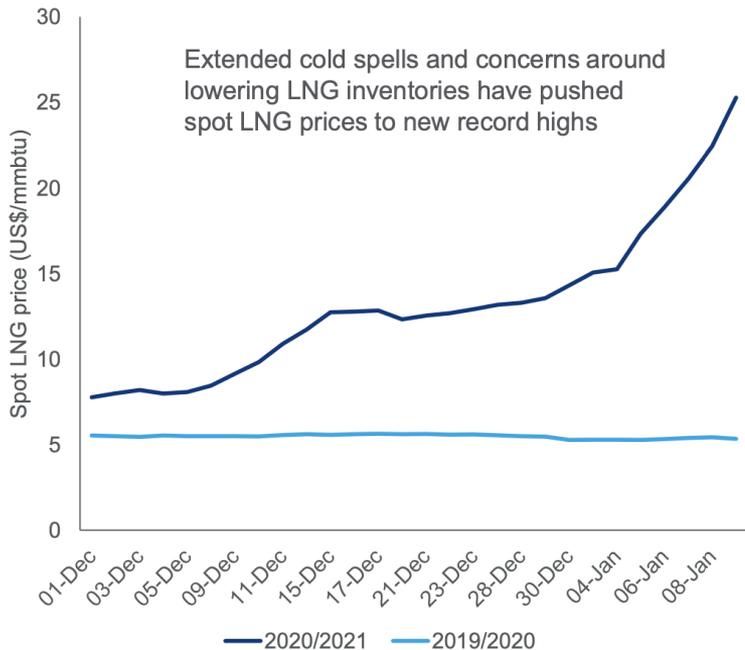
Grid outages



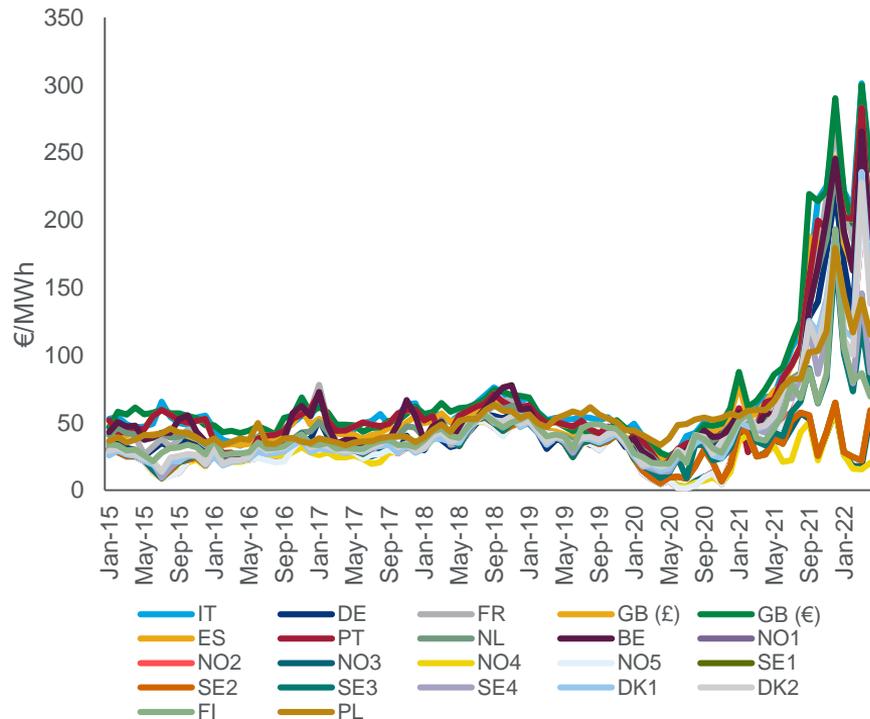
**Soaring power
prices**

Global energy security will require reliability and deliverability of gas supplies at reasonable prices

Asia LNG spot prices



European nominal day-ahead power price by country

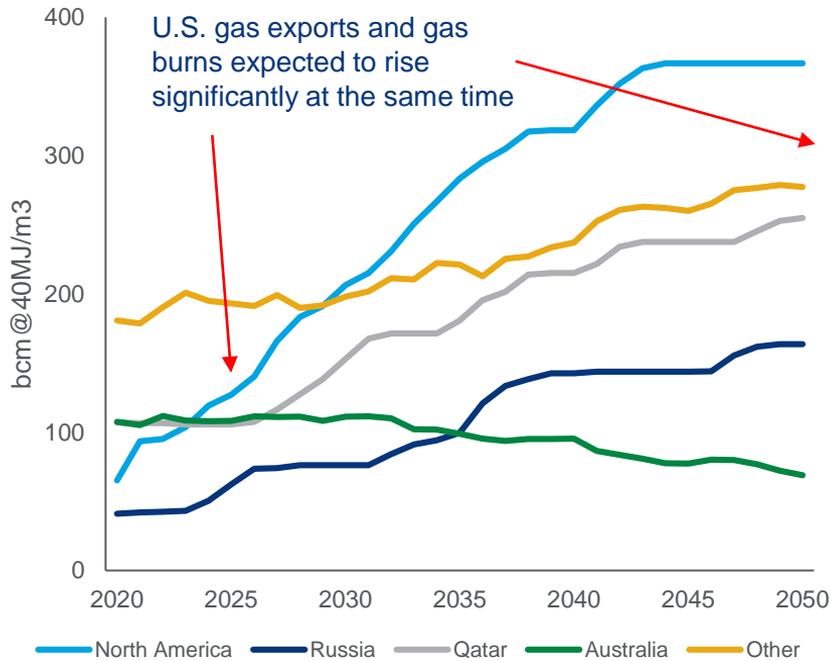


Source: TEPCO, Argus, Wood Mackenzie

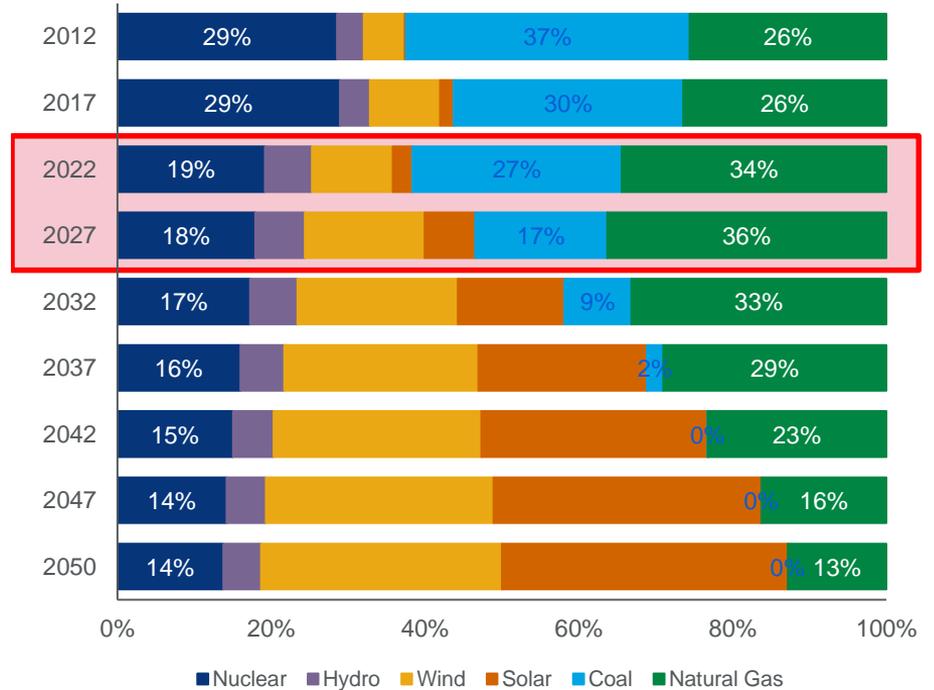
Source: ENTSO-E, EnergyMarketPrice & Wood Mackenzie

Opposing priorities to burn and export U.S. gas may create prolonged tightness in the market, raising electricity prices

Key LNG exporters (Woodmac Base Case)



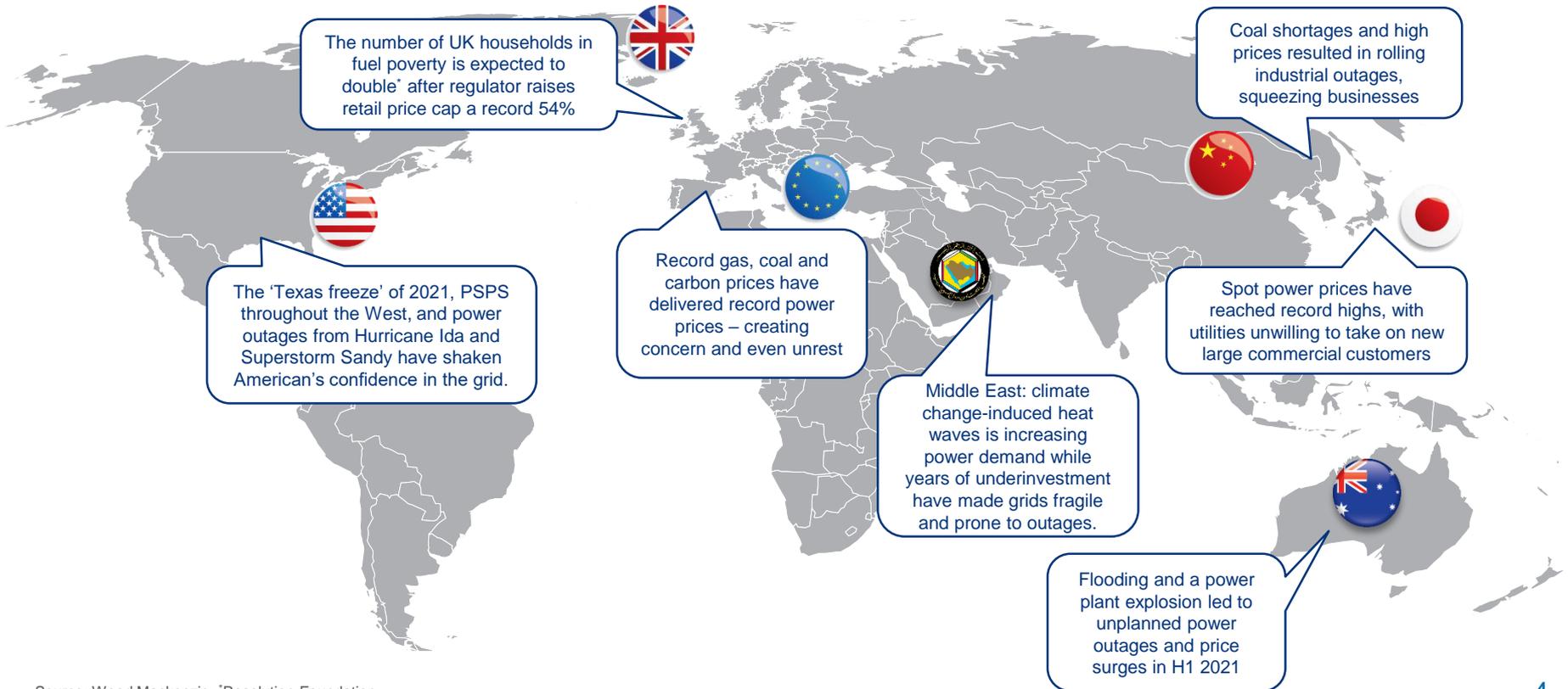
U.S. annual utility-scale generation from key energy transition fuel types



Source: Wood Mackenzie, EIA

Power interruption or unaffordability is affecting end users

Energy has emerged from the backdrop of life to the forefront, as a point of acute concern



Capacity financed by third parties has grown significantly over the last four years

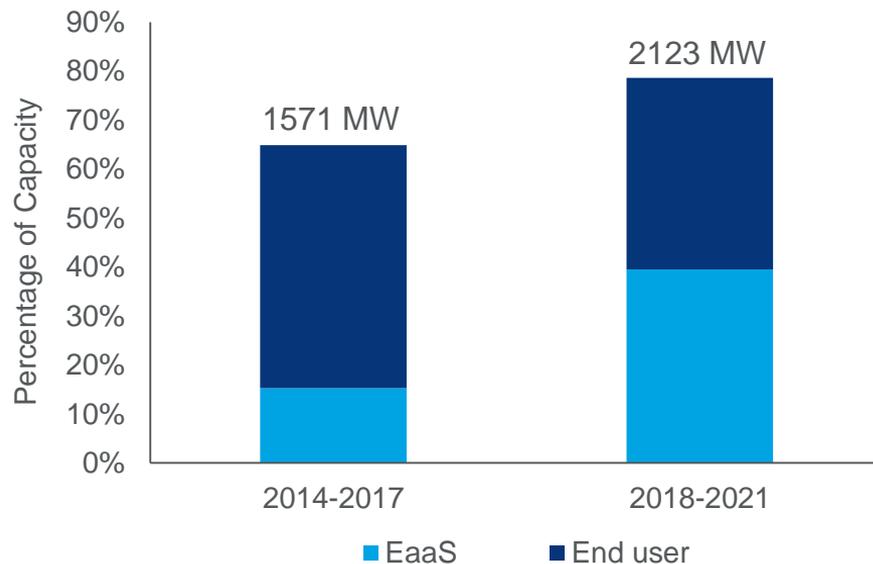
Energy-as-a-Service shifts the upfront capital cost, financial risk, and operation complexities to third-parties

Over the last four years, microgrid-as-a-service has grown by 160% while there has been a 21% drop in the capacity owned by the end user.

Resilience-as-a-solution programs filed by utilities

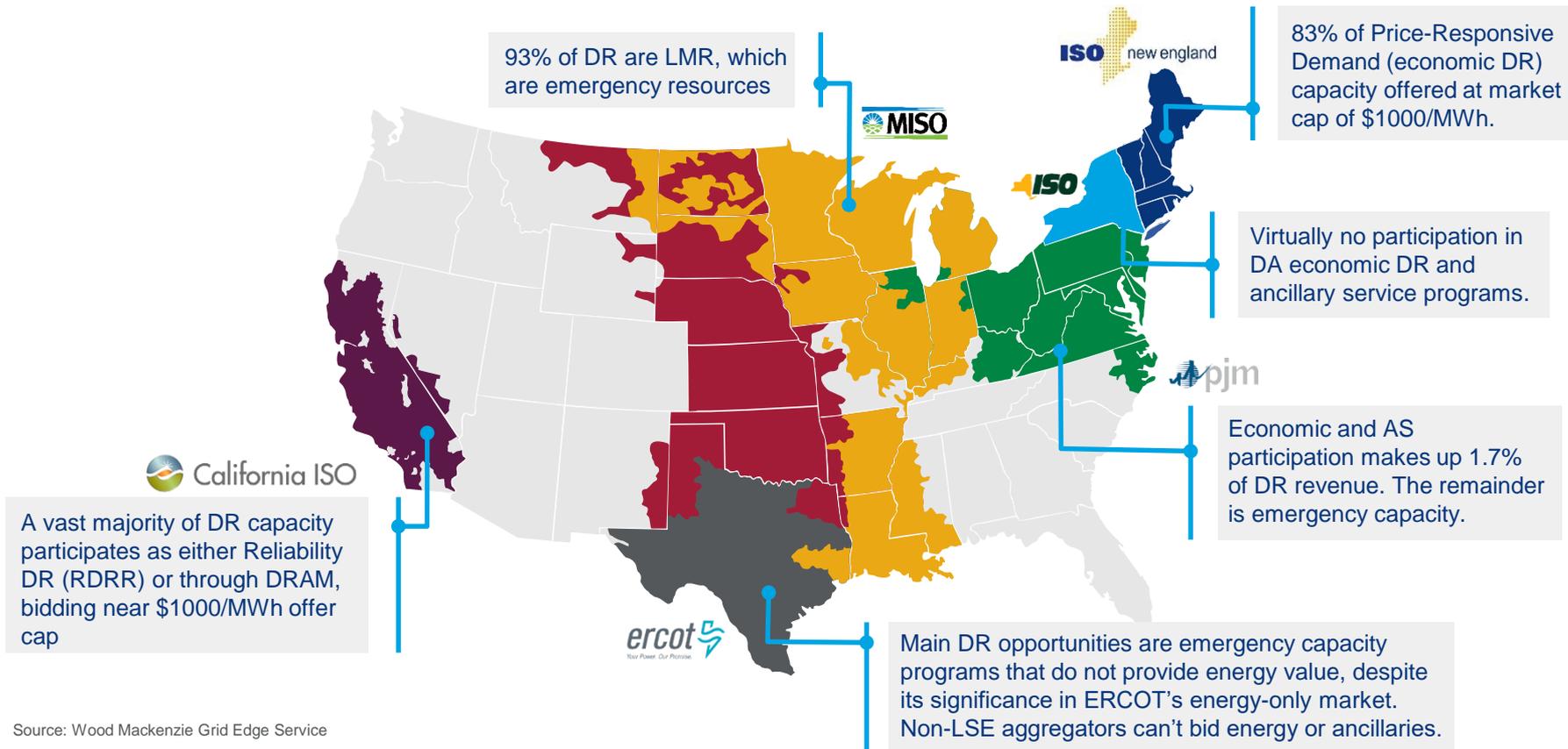
Utility	Program type
 Xcel ENERGY	Diesel or gas generators, batteries, solar+storage, and microgrids
 DTE Energy®	Battery storage targeting residential
 Liberty™	Battery storage targeting medical, critical infrastructure, and large commercial
 Georgia Power	Resilience asset service tariff targeting commercial and industrial

Microgrid-as-a-service vs end user-owned microgrid capacity



DERs today participate in wholesale markets as emergency demand response

Restricted to DR participation, DERs are unwilling or unable to participate economically



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