



Energy
Storage
Association

Energy Storage in 2021 and Beyond

RENEW Wisconsin

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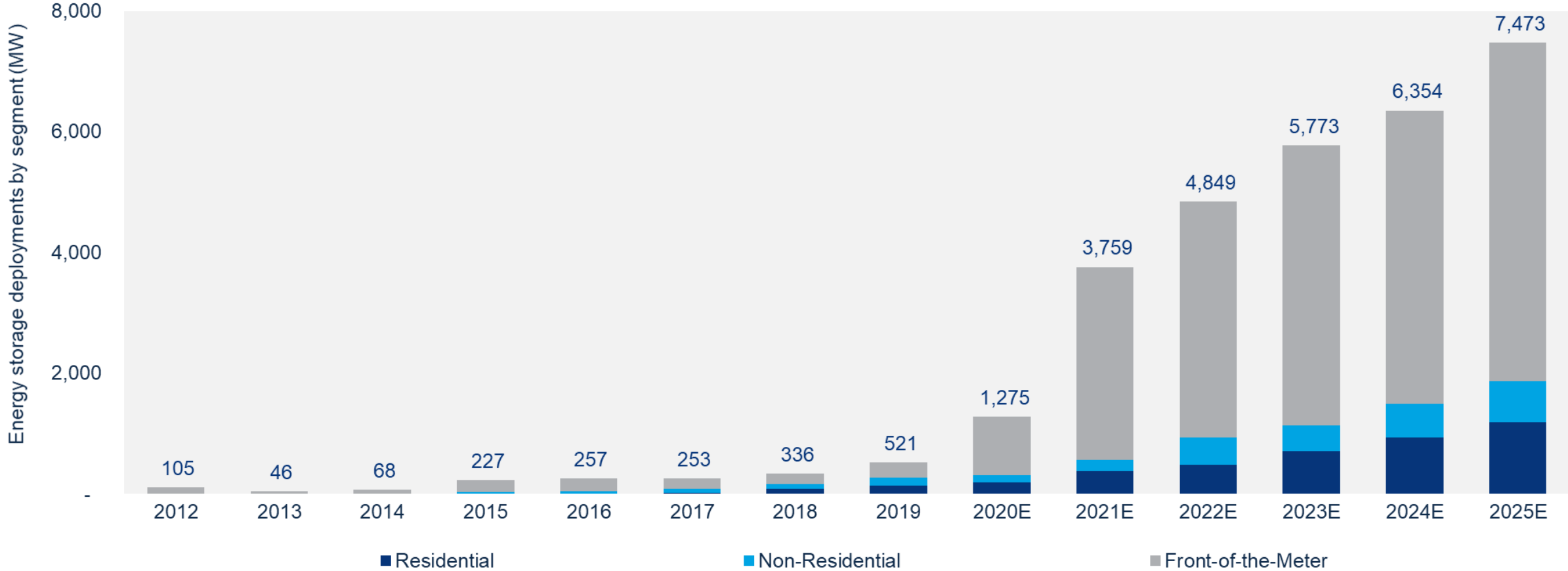


**THE
STORAGE
HUB**

**Storage
makes everything
better.**



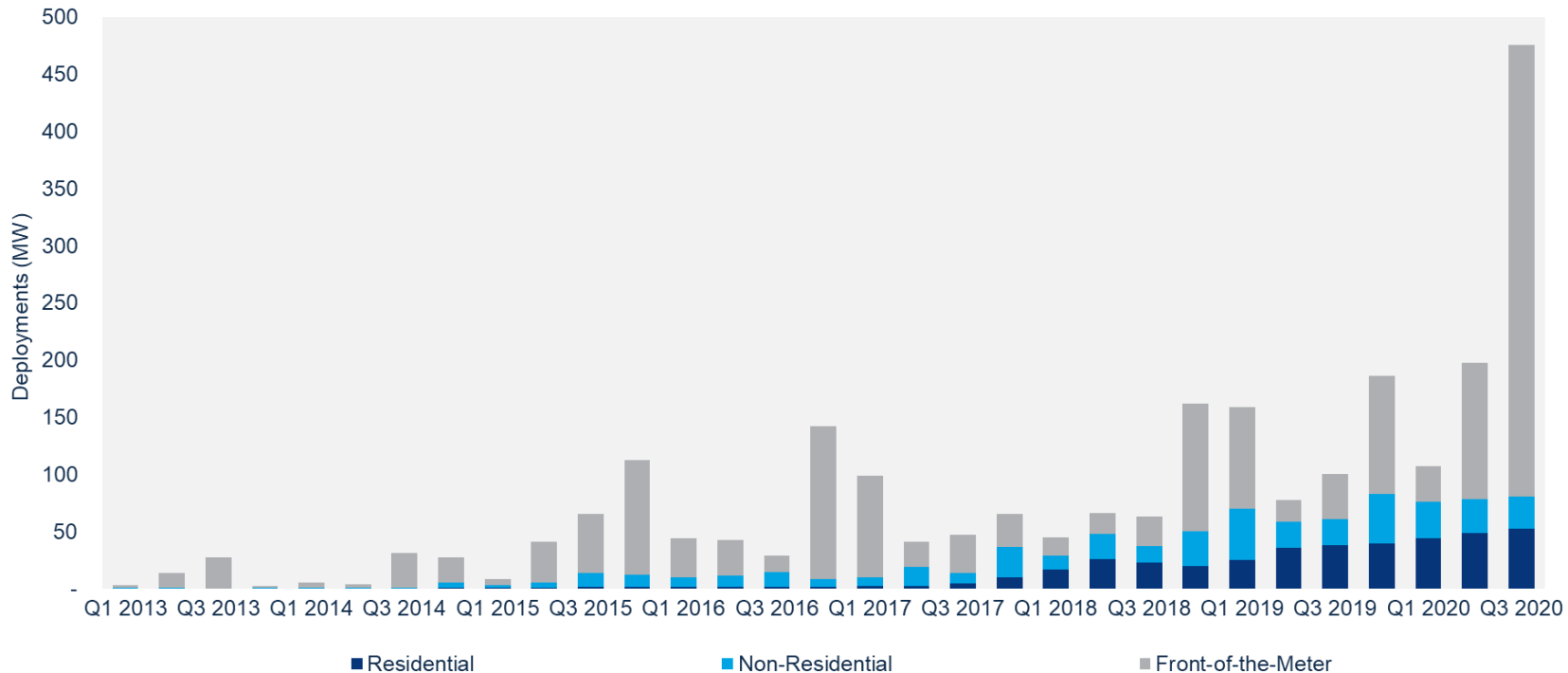
Industry Progress



Source: Wood Mackenzie Power & Renewables / U.S. Energy Storage Association.
U.S. energy storage monitor Q4 2020.



2020: Record Growth

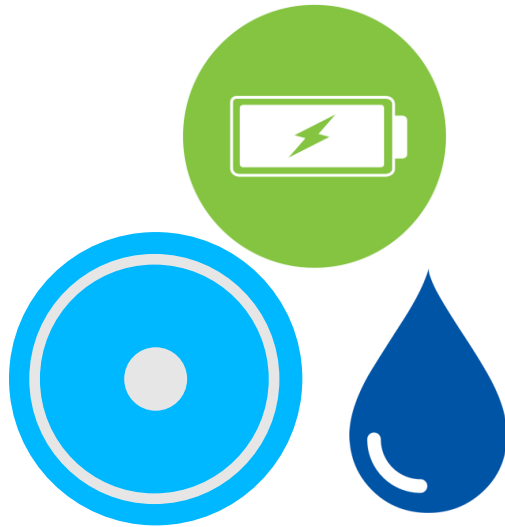


Q3: 476 MW / 764 MWh

2020 EOY: 1,275 MW
(doubling+ annual deployment)

2020 EOY: \$1.5 billion annual

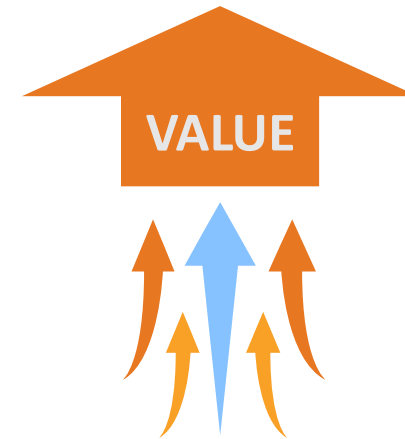
Why is storage so attractive?



**Multiple
technologies**



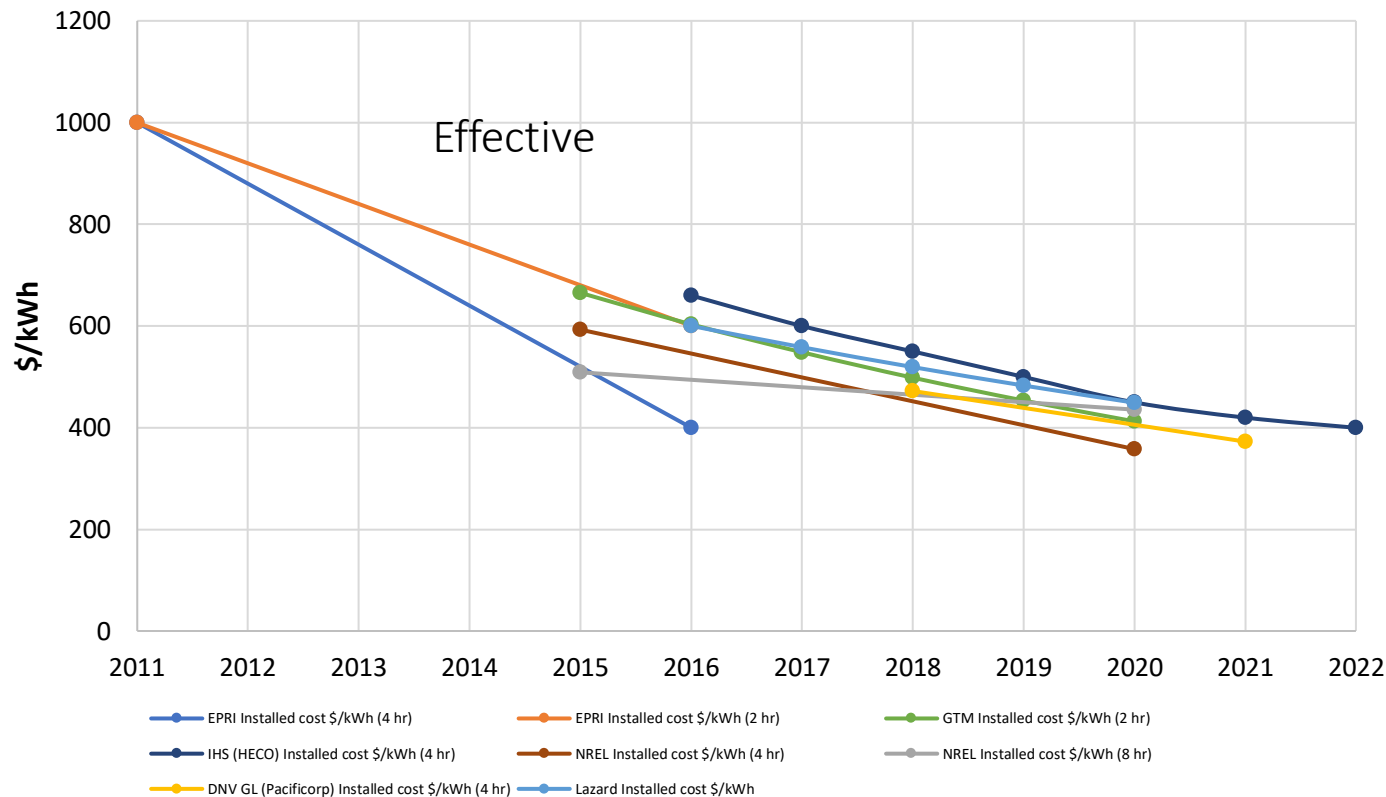
**Cost
Effective**



**Multiple
Value streams**

Cost Effective

Li-ion battery grid storage Installed costs estimates



TEP (AZ)

30 MW, 4-hr storage

+100 MW solar

\$0.045/kWh

KIUC (HI)

20 MW, 5-hr storage

+ 28 MW solar

\$0.11/kWh

Xcel (CO)

solar+storage \$0.036/kWh

wind+storage \$0.021/kWh

The Value of Storage

Reliability & Resilience

- Backup power
- Microgrid islanding
- Flexibility to firm intermittent resources

...of multiple services

Operational savings

- Peak reduction
- Power quality (Volt VAR)
- DER firming

...the full value...

Ancillary services revenues

- Frequency regulation/response
- Load following
- Ramping
- Curtailment
- Congestion mitigation
- Black start

Stacking...

Flexibility, Reliability & Resilience



Short-term uncertainty Seconds/Minutes/Hours

RELIABILITY

- Voltage/VAR support
- Frequency regulation
- Load-following
- Ramping
- Curtailment avoidance
- Resource adequacy
- Congestion mitigation

RESILIENCE

- Frequency response
- Microgrid islanding
- Black start service
- Backup power



Longer-term uncertainty Days/Seasons/Years

RELIABILITY

- Tx upgrade/ replacement
- Operates independent of environmental restrictions
- Tx congestion relief

RESILIENCE

- Backup Power
- Fast deployment to replace failing infrastructure
- Microgrid islanding

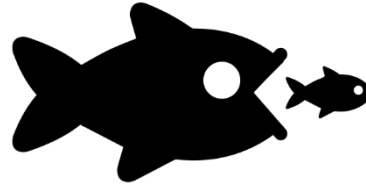
Barriers



Cannot **VALUE** or
compensate storage
flexibility

Solutions

Deployment targets
Incentive programs
Tariff/rate design
Wholesale market products
Cost-benefit studies



Unable to **COMPETE**
in all grid planning and
procurements

Solutions

Long-term resource planning
Distribution planning
Transmission planning
GHG/renewables standards
Wholesale market rules
Resource adequacy rules



Cannot **ACCESS** grid or
constrained to narrow use

Solutions

Interconnection processes
Multiple-use frameworks
Ownership rules

Federal Policy

Promote domestic supply chain, finance, innovation

- Stand-alone energy storage ITC (S.1142/H.R.2096)
- Remove Li-Ion batteries from Section 301 tariffs
- Finalize guidance on Sec 48 ITC eligibility for retrofits

Promote equitable electric system resilience

- \$2b in appropriations to resilience investments, with a focus on low-income customers and at-risk communities
- Energy Storage Grand Challenge
- DOE safety training for code officials on BTM systems

Establish market designs that compensate flexibility

- FERC 841 and FERC 2222
- FERC driving PJM, SPP rules on storage capacity value
- EO for clean energy sources time-matched with demand



State Policy

Targets

- 11,500 MW of storage targets across 8 states
- VA: 3,100 MW by 2035
- AZ: 5% of peak capacity (~1400 MW)

Incentives

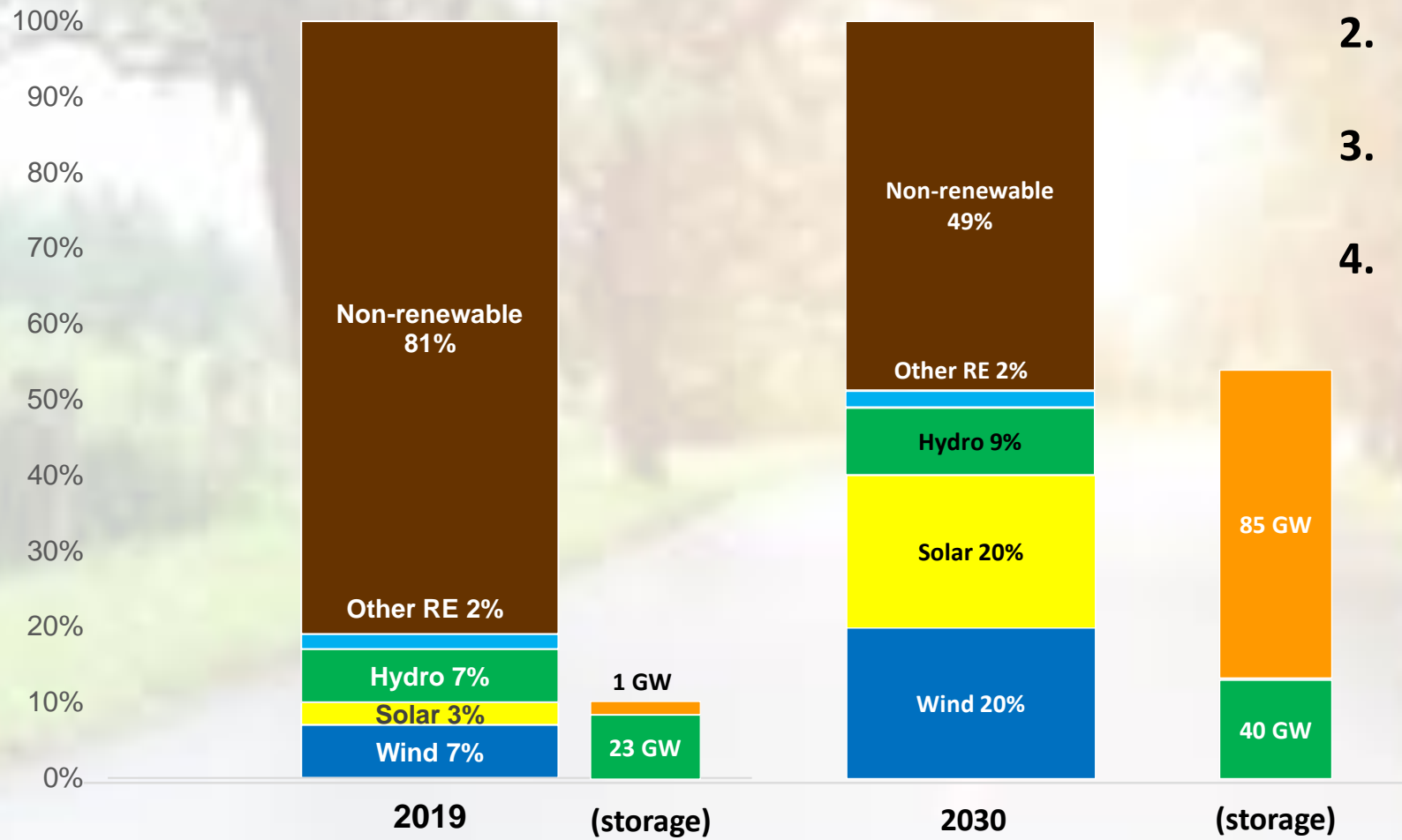
- >\$1.1b across six states
- MA: Clean Peak Standard

Planning

- 32 states require long term planning for utilities
- 11,000 MW selected to date
- NARUC, NASEO, NASUCA approved resolutions related to storage development



The Road Ahead



4 Guiding Principles:

- 1. Carbon:** Achieve Significant Carbon Reductions
- 2. Grid:** Build a More Resilient, Efficient, Sustainable and Affordable Grid
- 3. Markets:** Advance Greater Competition through Fair Market Rules
- 4. Collaboration:** Actively Collaborate Across Industry Segments

100 GW energy storage based on ESA 35x25 Vision.
 20% wind target based on DOE Wind Vision.
 20% solar target based on SEIA Solar Decade+.
 Hydro target based on DOE Hydrovision.



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Thank you

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