Webinar: Current Stage of the Battery Energy Storage Systems in the US

Presented by: Jose Tellechea and Dixon Grant

January 2023

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Background on Mazars

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A Worldwide Presence

We are an international, integrated, transparent and independent organization, specialized in audit, accountancy, tax, legal and advisory services. We cover 100% of all major financial and economic regions.

90 Countries | 30,000 Professionals | 310 Offices

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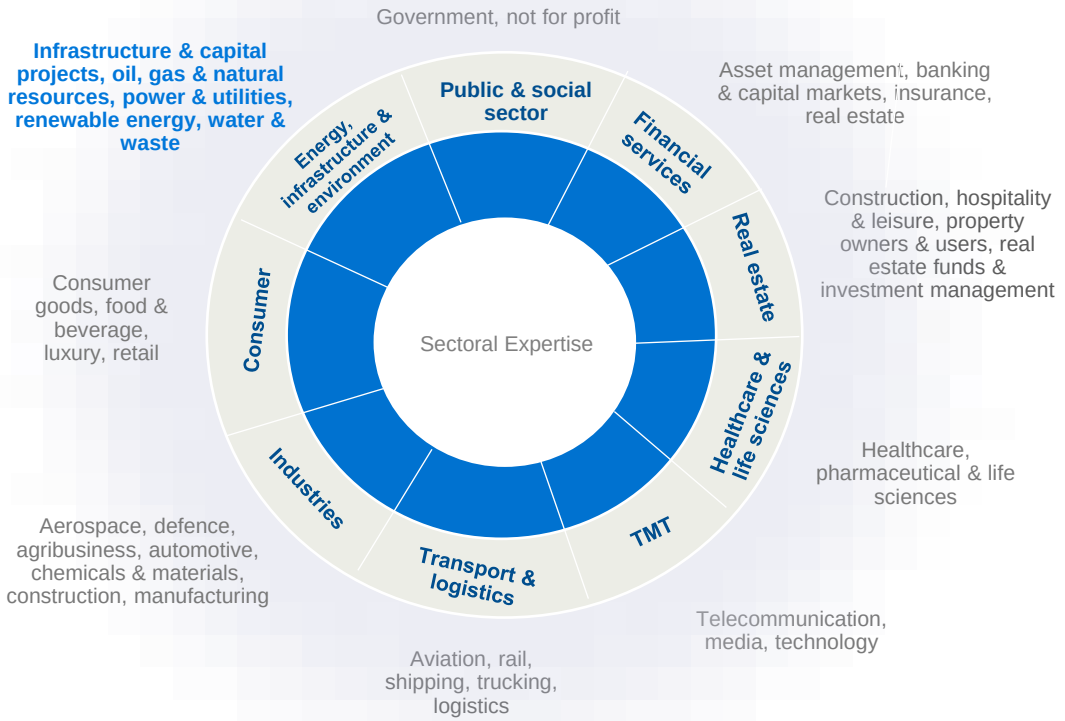

About Mazars

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Our Practice

The Energy, Infrastructure & Environment Practice has **200+ Professionals in Six Offices** Globally, working seamlessly with clients on deals across the globe.

Our Clients

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Our Services

Energy, Infrastructure & Environment

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With a financial modeling course portfolio of **15+ course types**, and experience from over **15,000 participants**, we have the right course for every situation. Whether you're at entry or board level, our courses will help you build your financial modeling capabilities throughout your career – giving you the analytical tools you need to succeed in your field.

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- **Best Practice Project Finance Modeling**
- **Advanced Project Finance Modeling**
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- Financial Modeling for Acquisition Transactions
- PPP Infrastructure: Financial Modeling and Transaction Analysis (US)
- Financial Modeling Techniques for Valuation Analysis
- Boost your Financial Models with VBA
- Microsoft Excel Diploma Course
- Business Analytics in Excel
- Financial Modeling for Oil & Gas Projects
- Financial Modeling for Power Generation Projects
- Financial Modeling for Real Estate Development
- Financial Modeling for Mining Projects

For more information or to book, please contact:
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Malena.Fuentes-Arbones@gif.mazars.com

Sample Modeling Credentials

Americas Renewable Energy Project Experience

HZ Wind Power Iowa Wind Farms: Pro Forma Multi-Asset Financing, United States

Shell New Energies: Gas & Solar Portfolio Financing, United States

Leeward Wind: Asset Portfolio Financing, United States *

Cotton Plains Renewables Portfolio with Northleaf Capital Partners, United States

Engie Canada Renewables Portfolio Financing, United States/ Canada

Neon Renewables Tax Equity Financing, United States

Allianz Global Investors Renewables Portfolio Financing, United States

Georgia Renewable Power Biomass Portfolio Financing, United States *

Rio Wind Energy Farm Portfolio for Denham Capital, Brazil

Matrix Renewables Solar Portfolio, Chile

Fresno State Univ. Central Heating & Cooling Plant Modernization, United States ***

GREinvest Latin America Hydroelectric Plant, Peru

Abengoa Renovar 2.0 Auction, Argentina

Deutsche Bank Chilean Solar Clusters, Chile

Matrix Renewables PMGD Solar Portfolio Financing, Chile

EnfraGen Chilean PMGD Portfolio, Chile

Altiplano – La Puna Solar Project Senior Financing, Argentina

Cerro Grane Wind Farm Acquisition Financing, Uruguay

Renewable Asset Portfolio Valuation, Colombia

Cabo Leones III Wind Farm Refinancing, Chile

DIF Solar Asset Portfolio Refinancing, Canada

University of Iowa Campus Utility System Development Financing, United States:

Ottawa Heating & Cooling District Energy System Financing, Canada *

Wataynikaneyap Transmission Line Development Financing, Canada *

Southend Residential & Commercial Building Battery Storage Financing, United States

RBC Capital Markets; Grand Solar Renewables Refinancing, Canada

La Jacinta & San Javier Solar Farms for Fotowatio Italia, Uruguay

Solarcentury Holdings' Latin American Renewable Energy Portfolio

San Juan and Totoral Wind Farms Refinancing, Chile

Peralta I-II Wind Farm Acquisition, Uruguay

Chile Energy Receivables Securitization, Chile

Project Greasewood Solar Financing, United States

Terra-Gen Wind, Solar & Geothermal Farm Financing, United States

BluEarth Renewables Energy Portfolio Acquisition Financing, United States & Canada

Leeward Wind Renewable Energy Portfolio Acquisition Financing, United States

Cordelio Power Generation Portfolio, Canada

Southgate & Windsor Solar Farm Project Financing, Canada

British Columbia Run-of-River Hydroelectric Facility Financing, Canada

Beauharnois Recycling Centre Financing, Canada *

Kingston Solar PV Facility Refinancing, Canada

** IJGlobal Magazine Deal of the Year Award Winning Projects*
*** Latin Finance Magazine Project & Infrastructure Finance Award Winner*
**** P3 Bulletin Project Award Winner*

Sample Modeling Credentials

Global Battery Storage Project Experience

Southend Development
United States // Modeling

Developed a financial model in relation to the development of an entire area in Albany, which includes residential and commercial buildings, a park redevelopment, and the adoption of energy efficiency, renewable energy (battery storage).

Solar and Battery Projects
Australia // Modeling

Developed a financial model with the flexibility to assist with the evaluation of solar and battery projects across Australia, Japan and Vietnam.

UK Battery Storage Project
United Kingdom and Japan // Modeling

Financial Modeling for a grid-scale battery storage facility in the UK and a jointly developed Demand Side Response in Japan.

Darlington Point Solar Farm
Australia // Model Audit

Model audit in relation to the development of a 333MW solar farm, 10km south of Darlington Point, comprising of a Battery Energy Storage System (BESS).

Gresham House Battery Project
United Kingdom // Modeling

Developed a financial model in relation to several battery projects, which is to be used for immediate sale to potential purchasers.

Lincoln Gap Wind Farm
Australia // Model Audit

Model audit in relation to the 212MW Lincoln Gap Wind Farm, which comprises of 59 Senvion wind turbines and 10MW grid scale battery storage.

Duracell Battery Storage Projects
United Kingdom // Modeling

Financial Modeling in relation to the bid for eight battery storage projects in the United Kingdom.

Power Hub Project
Australia // Model Audit

Model audit in relation to the financing of a power hub project, which, using proven battery technology, is one of the first and largest grid-scale batteries in the world.

Today’s Presenters

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Today's Presenters

Jose Tellechea
Associate Director
New York

Jose is an Associate Director at Mazars Global Infrastructure Finance in the New York office. He has a total experience of more than 11 years in the renewable energy and energy storage project finance space, working with financial models on transactions in the US and Mexico.

In addition to financial modeling, Jose has direct experience in financing and loan agreements negotiations, tax equity, origination, off-take contract reviews and in the overall technical, legal and environmental due diligence.

- Led the first reported project finance loan for a fully merchant, stand-alone, energy storage portfolio of projects, a total of 165MW/ 330MWh located in California.
- Participated in the first reported stand-alone energy storage financing in the US, a portfolio of projects totalling 125MW/ 500MWh.
- Financing of wind and solar projects in the US and Mexico, including portfolio and back-levered loans.

Dixon Grant
Head of Americas Valuations
Toronto

Dixon Grant has over six years of experience acting as a trusted advisor for clients operating in the energy and infrastructure sectors. He has advised a broad array of clients including pension funds, government agencies, utilities, large multinational corporations, investment banks, and many others on a broad variety of complex engagements.

Dixon's key areas of specialization are energy, sustainability, infrastructure, financial valuation, due diligence, and strategic advisory. Dixon has valued renewable power, natural gas, and energy storage assets, as well as advised on transactions of varying scopes and sizes.

- Core team member on fund valuations for renewable power, natural gas power, intermodal logistics and depot portfolios.
- Manager of valuations of a large scale hydro-electric power plant in Eastern Canada, wind and solar portfolios in Ontario and British Columbia Canada, energy storage assets in Ontario Canada, and natural gas assets in Ontario and Saskatchewan Canada.

Energy Storage in the US

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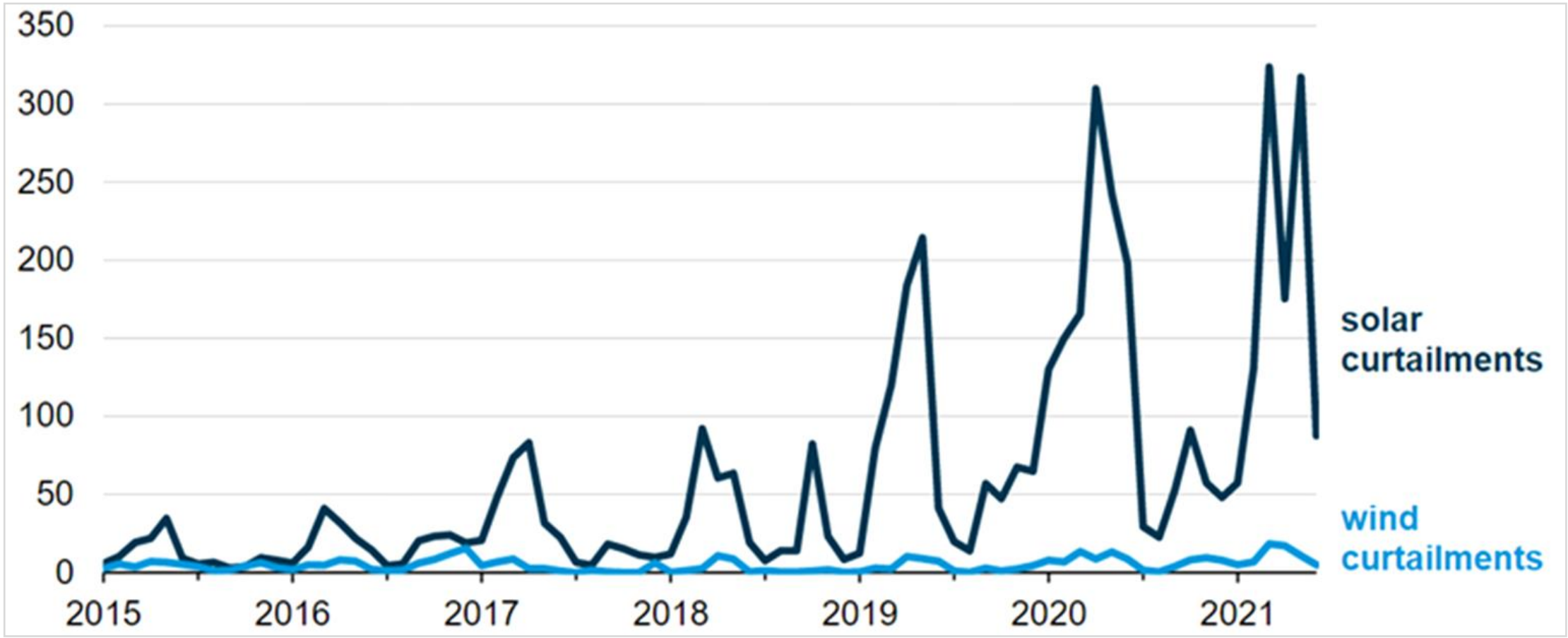
Storage Sector Overview in the US
Energy Storage

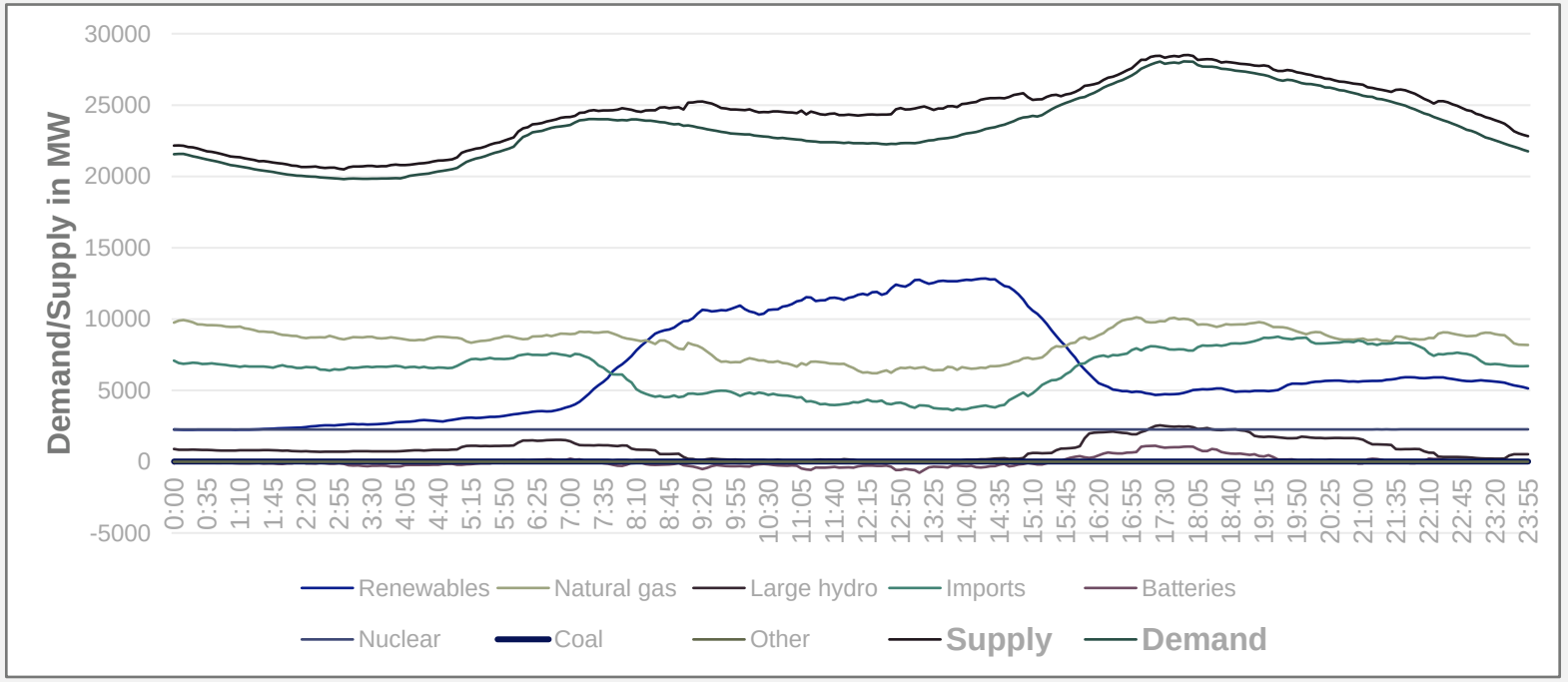
- Energy storage is a key technology for facilitating the penetration of renewables and contribute to a more resilient, reliable and cleaner electric grid.
- Large-scale battery energy storage systems (BESS) are increasingly being used across the United States.
- Several reports and projections have been made over the last couple of years. While numbers vary significantly, with estimates of CAGR of the BESS sector in the US until 2026 ranging from mid-high teens up to high twenties.
- Many expect that as a result of the IRA policies, demand for energy storage in the US will double by 2030.
- Expectations of a global market value of up to US$12+ billion (the US representing about 20 to 25% of the total market)
- The message is clear: the sector is expected to continue growing exponentially over the next 5 years, and the US will be a very important market.
- California, NY and Texas are some of the leading states in terms of projected energy storage projects.

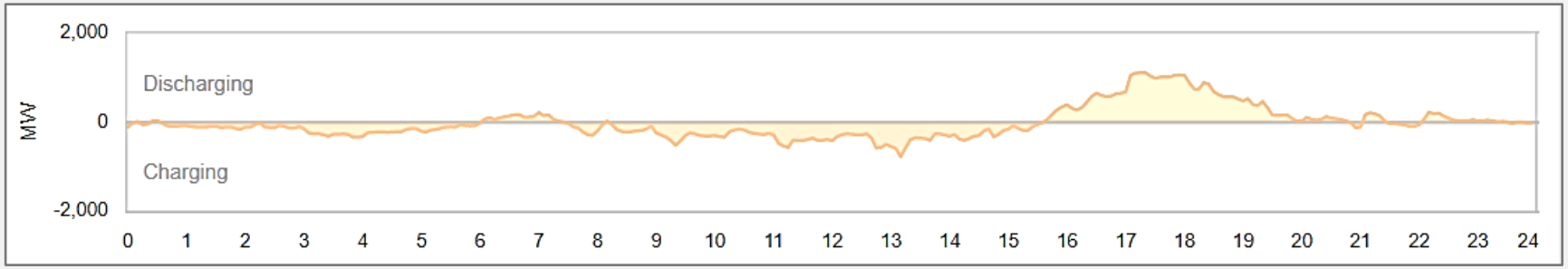
Storage Sector Overview in the US

CAISO Solar & Wind Curtailments



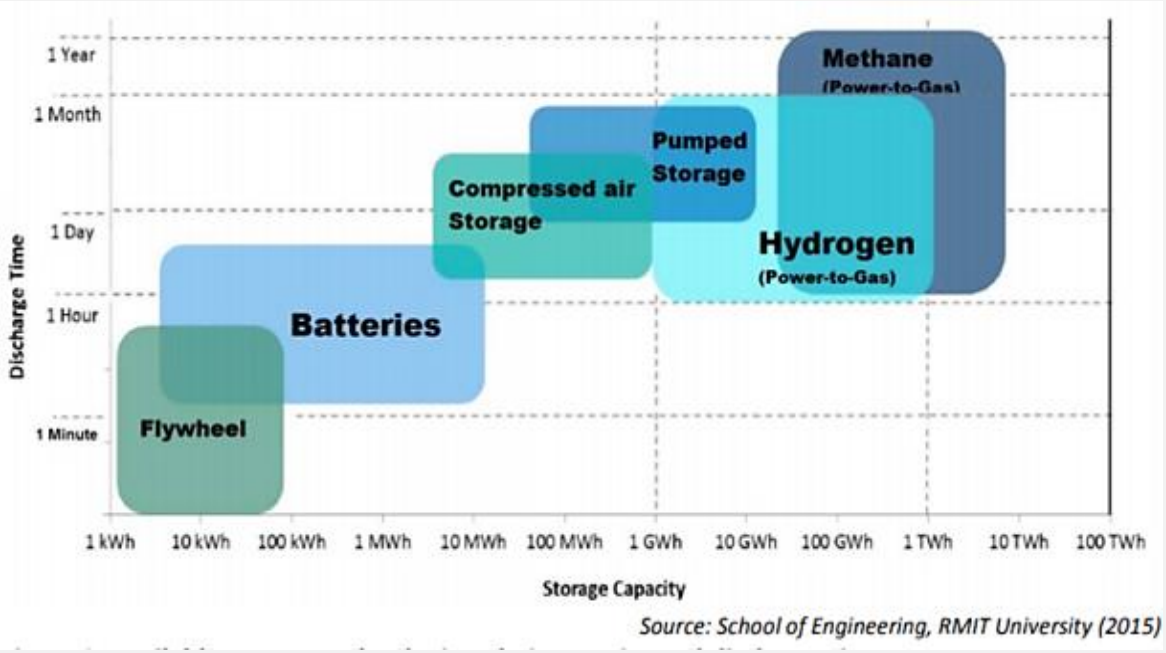
Storage Sector Overview in the US
Demand/ Supply Curve Example





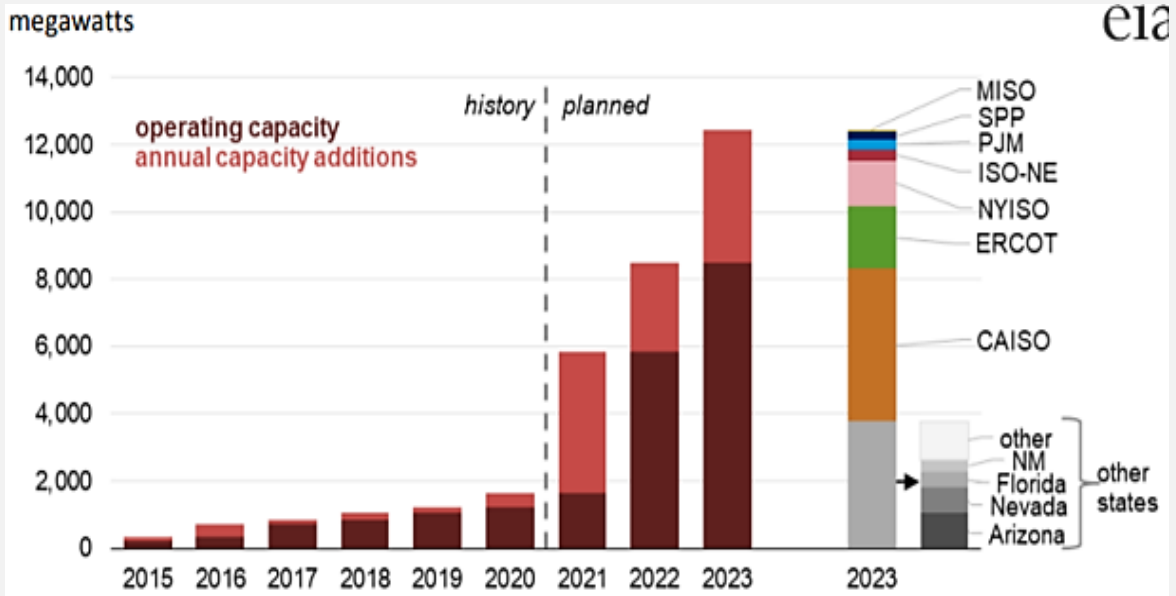
Storage Sector Overview in the US
Energy Storage Technologies & US Pipeline

Technologies



Source: School of Engineering, RMIT University (2015)

US Pipeline



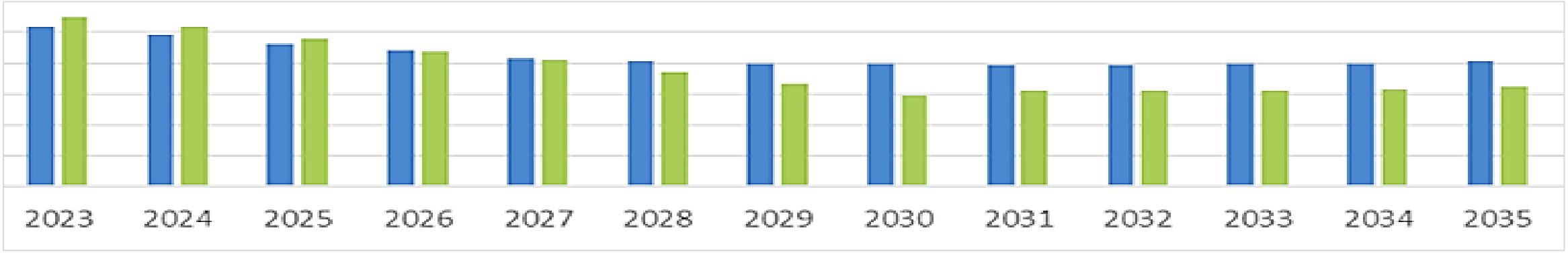
Source: U.S. Energy Information Administration, December 2020 Form EIA-860M, *Preliminary Monthly Electric Generator*

Storage Sector Overview in the US
Market Revenue Streams

- **Resource adequacy/capacity:** Resource adequacy is the mechanism to procure capacity in California. The storage resources need at least 4 hours of duration to qualify for RA under current rules, though such rules are likely to change in the future. It can be referred to as capacity in other States.
- **Energy arbitrage**: Price variations allow storage to charge during low-priced hours and discharge during high-priced hours to capture energy arbitrage.
- **Flexible ramping product**
- **Spinning reserves**
- **Frequency regulation**

Storage Sector Overview in the US
Challenges & Critical Aspects

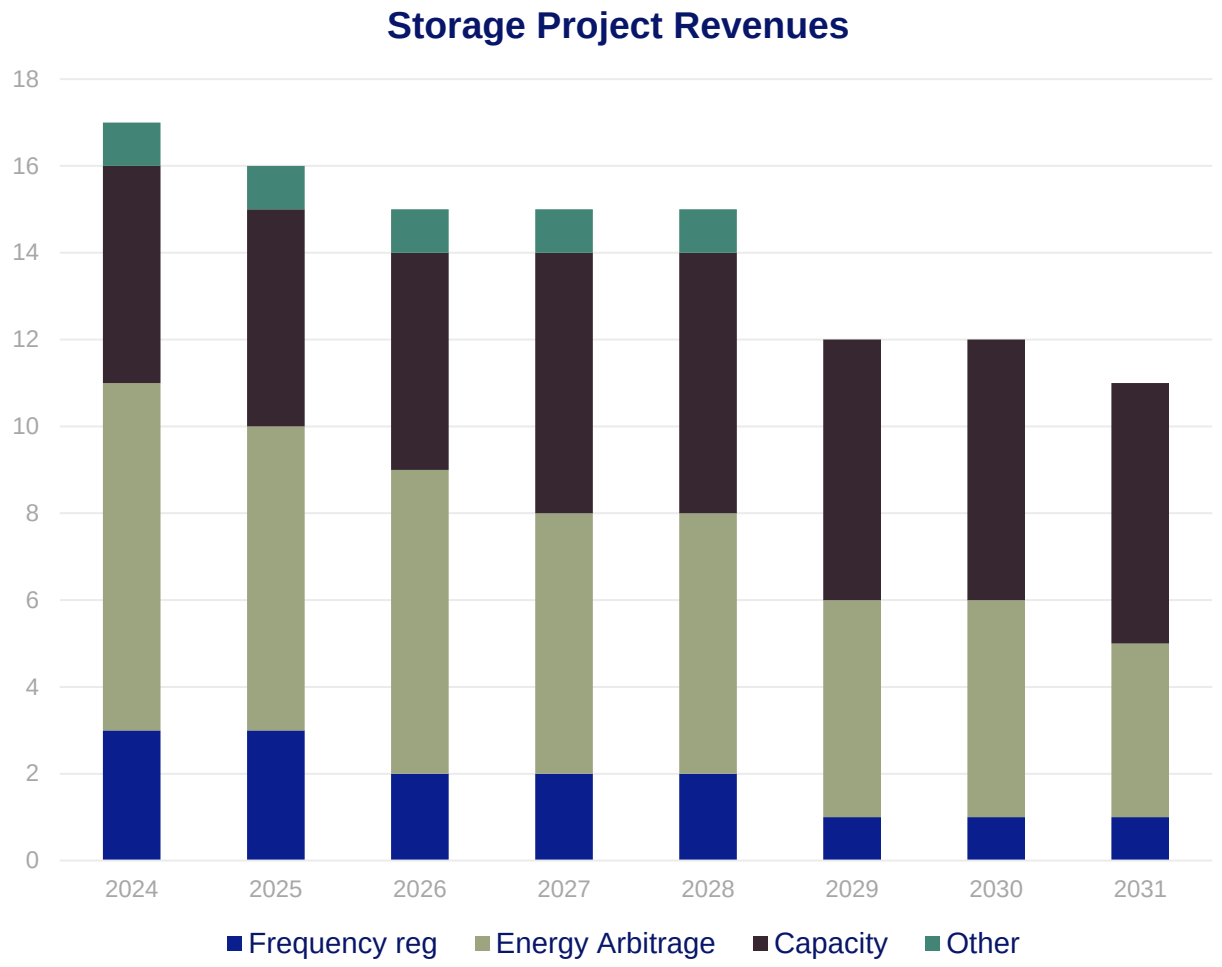
- Multiple revenue streams that need to be understood.
- Multiple revenue strategies make for varying revenue forecasts.
- Projections differ widely between market consultants, below are 2 projections of the same project.



- Potential future regulatory changes.
- Safety considerations.
- Relatively new sector, many sponsors have little experience, although the bigger players are also investing in the sector either directly or through new companies being backed by global renewable energy leaders.
- Scrutiny on equipment/materials sourcing
- End of life/ disposal

Storage Sector Overview in the US
modeling Energy Storage Projects

- The number of revenue sources as well as the exposure to uncontracted revenues can increase the complexity of financial models for BESS projects.
- Given that many projects will have a significant exposure to merchant revenues (given the attractiveness of those in many markets) revenue forecasts can include analysis and projections down to even 15 or even 5-minute intervals (although this level of granularity will vary by participant) which will need to be incorporated in the financial models.
- Several additional assumptions are also being incorporated into the financial model on the operational side, including battery duration, cycles per day limits, degradation based on guaranteed equipment curves and augmentation costs.
- Many of these assumptions will need to be validated by external consultants, such as independent engineers, as the forecasted use of the batteries will have a direct impact on both the life and operational costs of the project(s).



Storage Sector Overview in the US
modeling Energy Storage Projects

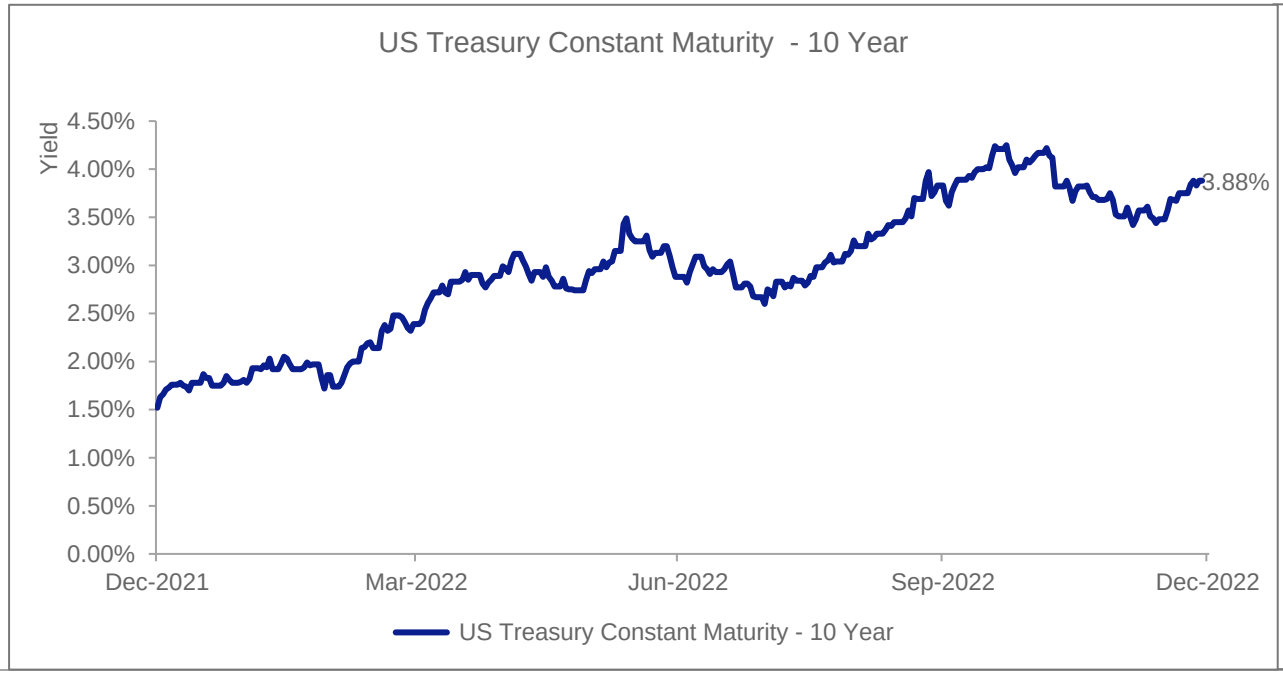
- Utilizing tax credits efficiently will be key to making BESS projects attractive to investors.
- While there will be a transferability and a tax credit market as a result of the IRA, the option will be less than ideal as the accelerated depreciation benefits are not transferrable (MACRS) and the price these credits will have will be less than 100% of their value.
- As a result, many projects will continue to be developed under current tax equity structures and financial models will need to correctly reflect this.
- Financial models could potentially have the option to perform analysis under both a traditional tax equity and a transfer scenario to determine a preferred strategy.

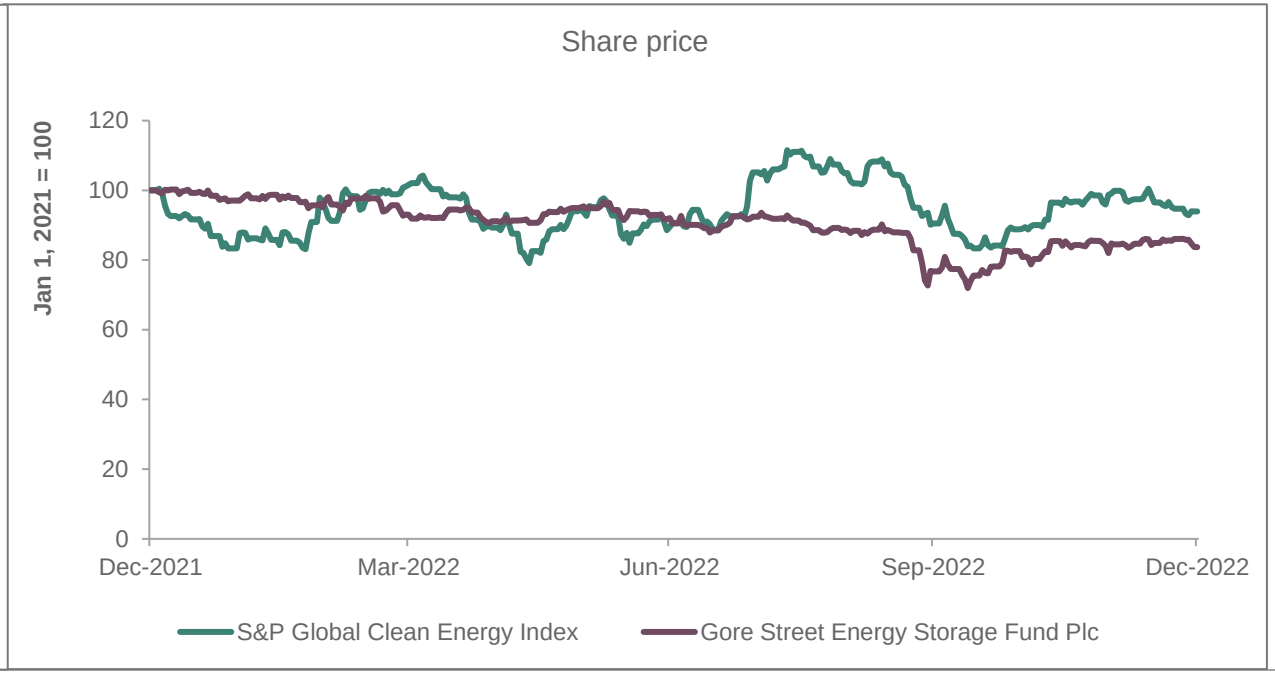
Distribution split		
Equity flip flags		
Income/(loss) allocation pre flip	Mar-30	
Cash Flow Distribution share		
Tax equity partner - pre flip	15.0%	%
Tax equity partner - post flip	5.0%	%
Tax equity partner share		%
Cash equity partner share		%
Tax Benefit share		
Tax equity partner - pre flip	99.0%	%
Tax equity partner - post flip	1.0%	%
Tax equity partner share		%
Cash equity partner share		%
Distributions		
Tax equity investors		
Total distribution from OC		*USD thous.*
Less: preferred yield		*USD thous.*
Total cash flow available for equity investors		*USD thous.*
Preferred yield for tax equity partner		
Cumulative tax equity invested		*USD thous.*
Tax equity partner's preferred yield - pre-flip	-	*% p.p.*
Tax equity partner's preferred yield - post-flip	-	*% p.p.*

Valuation Characteristics
Debt & Equity Metrics

Sustained increases in the underlying cost of debt through 2022, indications of decline in share price for storage & clean energy assets

- Government bond yields are relevant to valuations because they are often used to inform the risk-free rate and also influence the cost of debt – which in turn influences the cost of equity.
- The cost of US Government debt increased throughout the year in response to central bank efforts to mitigate persistently high inflation
- The Global S&P Clean Energy Index did not show a consistent trend throughout the year, however, December 2022 share pricing ended lower than the start of the year
- In contrast, GSF – a pure play battery storage investor, showed a declining share price trend throughout the year. The company invests in operating and development-stage battery storage assets in the US, UK, and EU



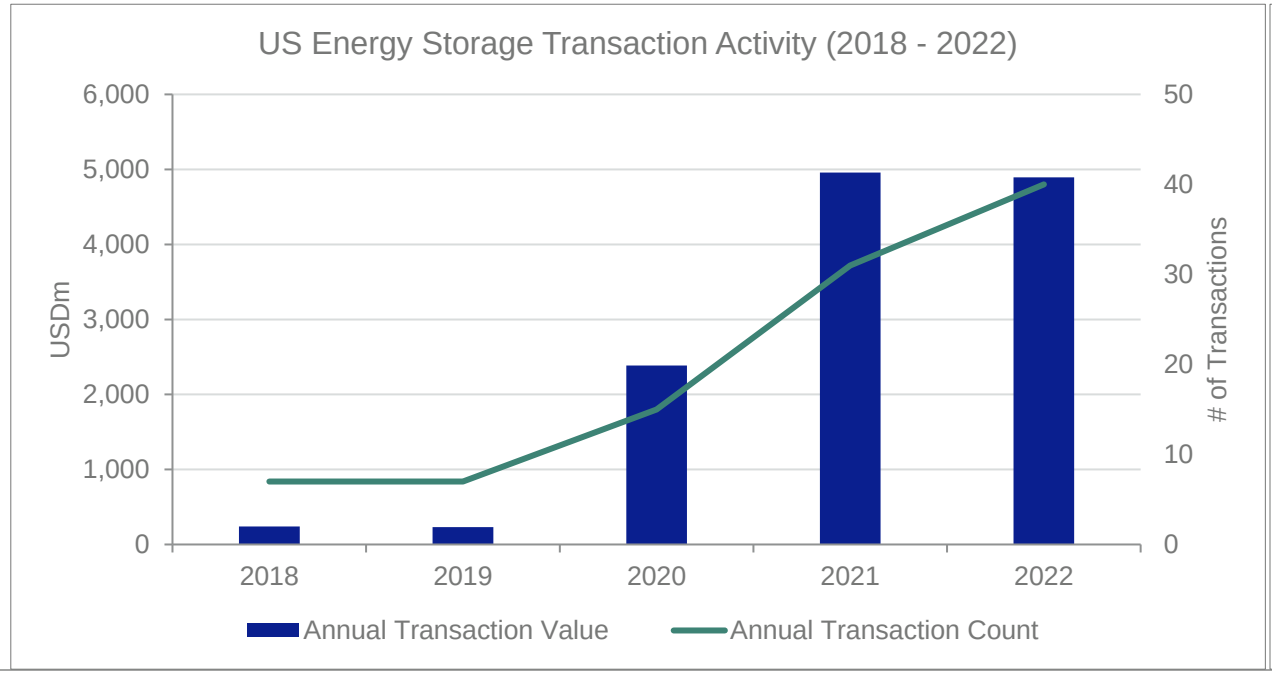


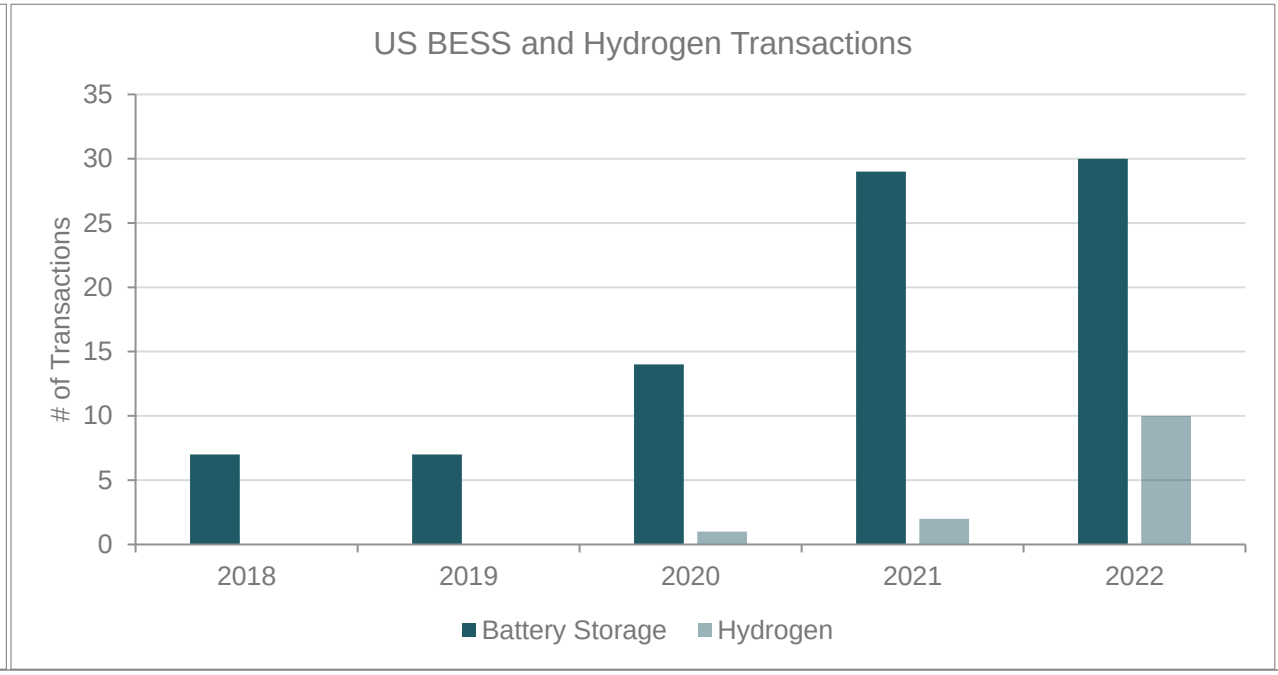
Valuation Characteristics
Transaction Activity

There is strong transaction activity in the US energy storage sector, but battery transaction growth has fallen

- Total transaction counts remain high in 2022, but total storage transaction value declined marginally from 2021.
  - BESS transaction growth has slowed in the last year, transactions for Hydrogen projects has grown considerably

- The results show, at a high level, that investor appetite for storage assets remained strong in 2022, but there are early indicators that broader macroeconomic trends (inflation, high cost of debt) are impacting transaction activity for the sector overall



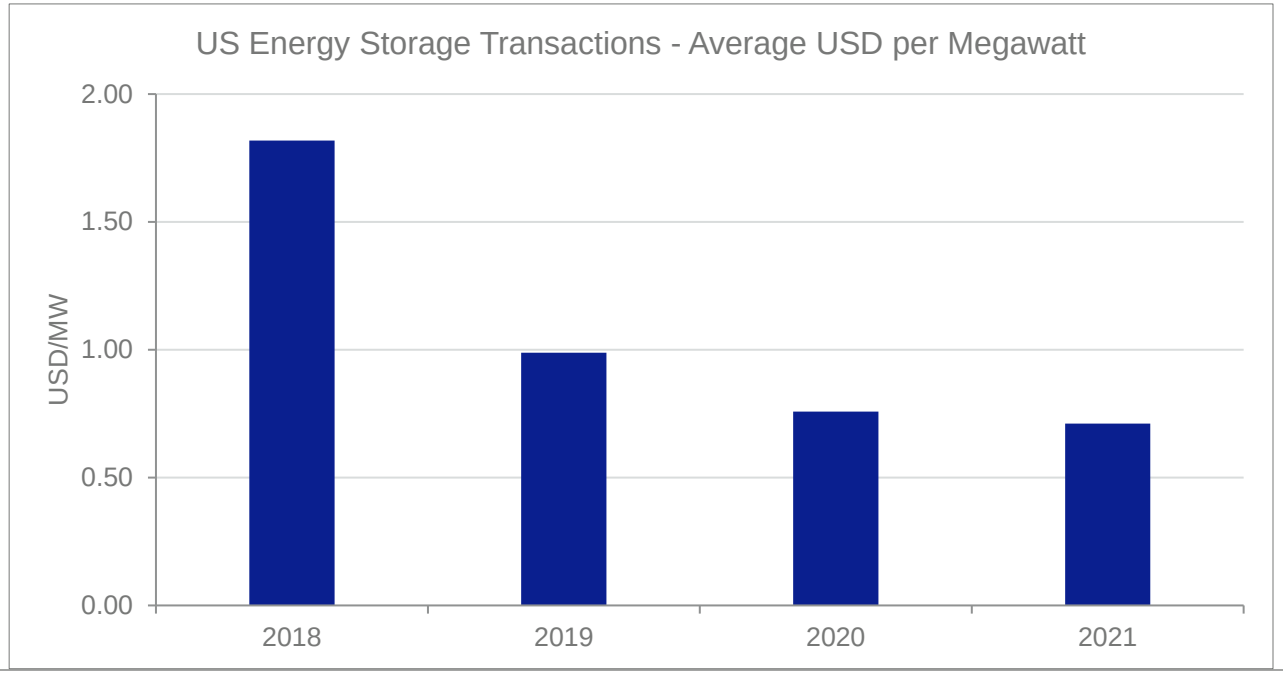


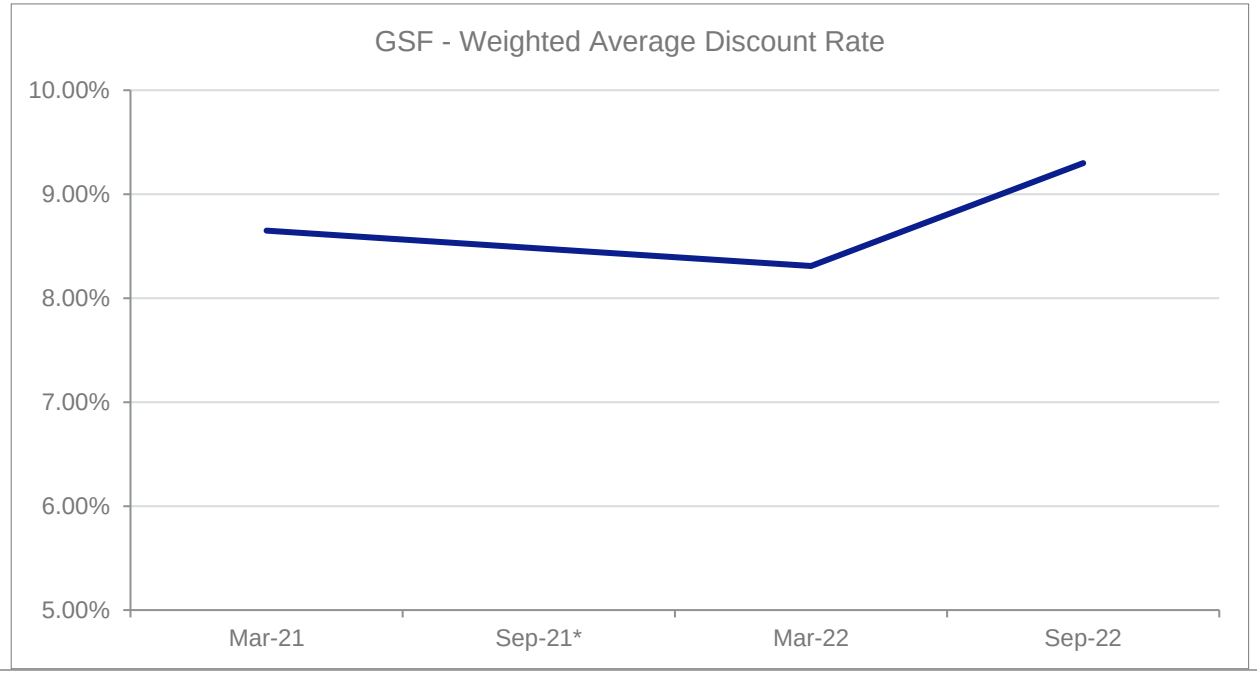
Valuation Characteristics
Valuation Insights

Preliminary signs of impact on storage valuations given current macro-economic environment

- The average transaction value per megawatt for storage assets in the US has declined year over year. Many of these projects are greenfield, indicating that project economics is a key driver of this decline.

- We have seen through proprietary and public sources that discount rates used to value battery storage assets have started to increase in the latter half of 2022 – implying that a higher risk is associated with revenues from battery storage projects.
    - Gore Street Energy Fund recently increased its weighted discount rate to value its portfolio by 100bps in light of the increased cost of debt and higher opportunity cost for renewables/storage investors.





*Sep-21 is an interpolated value

Storage Sector Overview in the US
Financing Environment

- Generally speaking, storage projects have either been developed/owned by utilities or have long term off-take agreements in order to be able to secure financing, usually under a project-finance structure.
- However, over the last year, some lenders have been increasing its appetite for projects with exposure to merchant revenues.
- Increasing project costs as a result of inflation and logistics constrains, as well as a significant increase in the cost of financing, has put a lot of projects on hold.
- However, with the tax credits for stand alone storage starting this month, the economics can once again be very attractive for certain investors.
- As a result, there is a growing number of projects and thus of lenders in the storage space.
- Tax equity will continue to be a major source of funding in the RE space, including BESS.
- Equity funds are also investing in the space.

Storage Sector Overview in the US
Financing Environment

- Additional investors have also started looking into the sector as a result from the IRA benefits. Many European developers who were not active in the US are now looking to come into the country for this reason.
- Financing terms and conditions are rapidly changing. The higher the exposure to merchant, the higher the required DSCRs and the lower maximum leverage. Contracted cash flows are treated very much like those in a solar or wind project.
- Interest rate spreads vary widely given the number of variables in storage projects vs a renewable energy project financing.
- Terms and maximum leverage are both increasing but tenors are still relatively short (5 to 7 years) with a maximum leverage of around 50 to 60%.

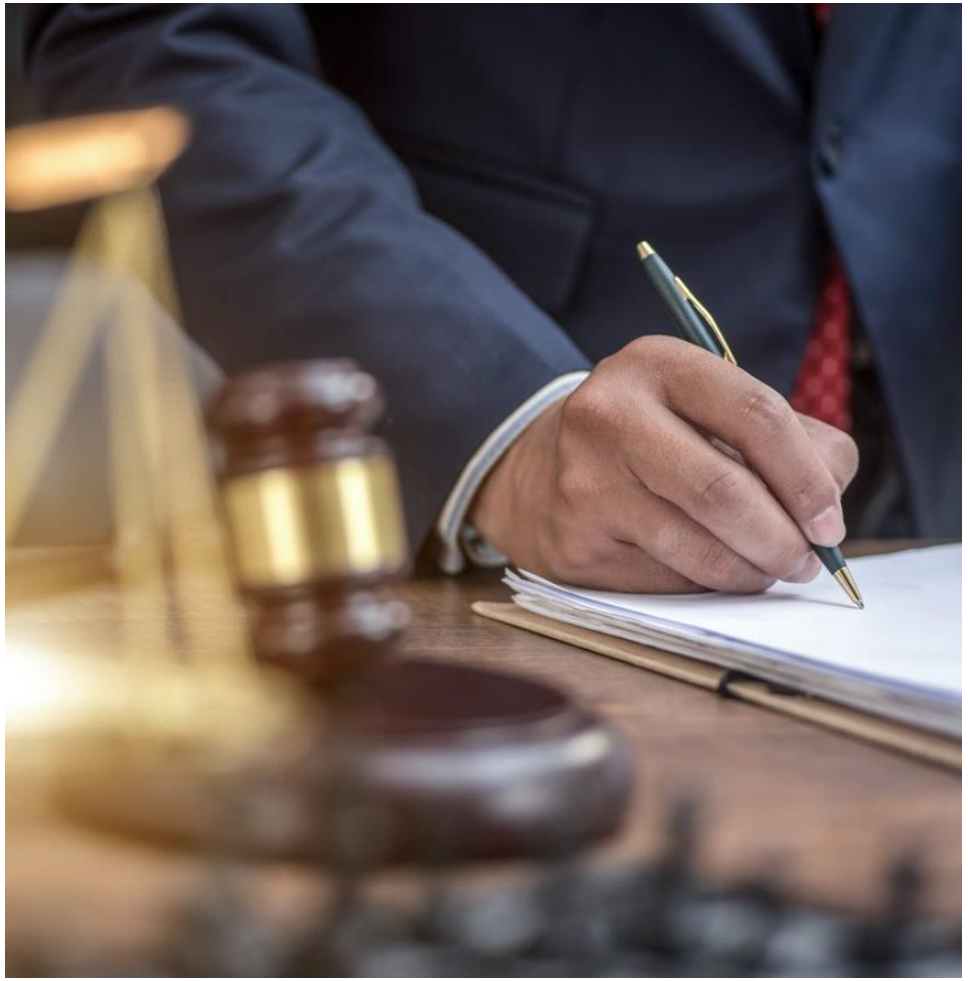
Storage Sector Overview in the US
Recent Announcements

- Because of the importance of securing prime locations for the development of storage projects (node that have opportunities to capture volatile prices, sites near substations, congested areas that could delay transmission line constructions, etc.) many projects are being developed but not publicly announced yet.
- The majority of the projects announced continue to be located in Texas, California an New York. Some of the largest deals announced include:
  - Sale of projects under development such as Q-cells sale of 1.2 GW (2-hour batteries) of projects in Texas
  - Utility-led projects such as ConEd 200 MW RFP in NY and PG&E's 9 projects totaling 1.6 GW.
  - Greenfield developments ranging from <50 MW to 400+ MW, mostly in CA, TX and NY
- For TX, batteries are shorter duration (1 or 2 hours) to capture price spikes. For CA, projects are primarily 4 hours given that RA/ capacity payments are based on having a 4-hour battery.



Storage and the IRA
Key Highlights

- Section 48 of the IRA: 30% ITC for stand alone storage projects
- For projects placed into service starting Jan 1st, 2023.
- Wages and apprentice requirements apply.
- Bonus credits if projects have domestic content and/or are located in an energy community*
- Augmentation (at least 5 kWh) to existing projects will be eligible.
- Current solar+ storage projects claiming credits can't "migrate" to the standalone tax credit and will need to continue charging at least 75% from the solar project.
- Unlike clean hydrogen, direct pay is only available for tax exempt entities.
- The bonus credits for domestic content in addition to supply constraints can result in more local production of equipment.
- The IRA will have a global impact in many sectors, including storage.



Questions?

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Thank you!

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*where permitted under applicable country laws.

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