



ORRICK ENERGY STORAGE UPDATE 2021-2022

Including Special Updates on Solar + Storage and Hydrogen Storage



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INTRODUCTION

By any measure, 2020 served as a banner year for the global energy storage market, despite significant challenges posed by the COVID-19 pandemic. Investment in storage projects worldwide in 2020 increased almost 40% year-over-year to \$5.5b, which included more than \$1.5b in the United States. Moreover, 3.5 GWh of new storage capacity were installed in the United States in 2020, more than the 3.1 GWh of storage capacity installed between 2013 and 2019 combined.

The future for storage promises even greater growth. Global energy storage capacity is expected to increase at a compound annual growth rate of 31% through 2030, reaching 741 GWh of total capacity by 2030. Over 10 GW of storage capacity is expected to be added worldwide in 2021, and the United States will account for half of those additions. By 2026, the United States is expected to add 33 GWh annually, representing an \$8.5 billion domestic annual energy storage market.

Driven by this growth, battery storage projects have increased in number and size in recent years, transactions and deal structures for the development and financing of storage have proliferated, and the geographic diversity of storage projects has expanded both inside and outside the United States. In the face of the devastating impacts of climate change, governments and investors outside the United States have increased their political and financial commitments to both renewables and battery storage. Within the United States, the energy transition is well underway and storage development is at its present-day peak due to a combination of long-term decreases in battery costs, increasing renewables penetration and political momentum at the federal and state levels. These dynamics have prompted increased public and private investments into storage as well as substantial mandates for utility and other LSE procurements for products and services from stand-alone storage and hybrid/co-located storage facilities.

We hope this update proves useful to our clients and friends in the renewables and energy storage industries and look forward to a continued dialogue.



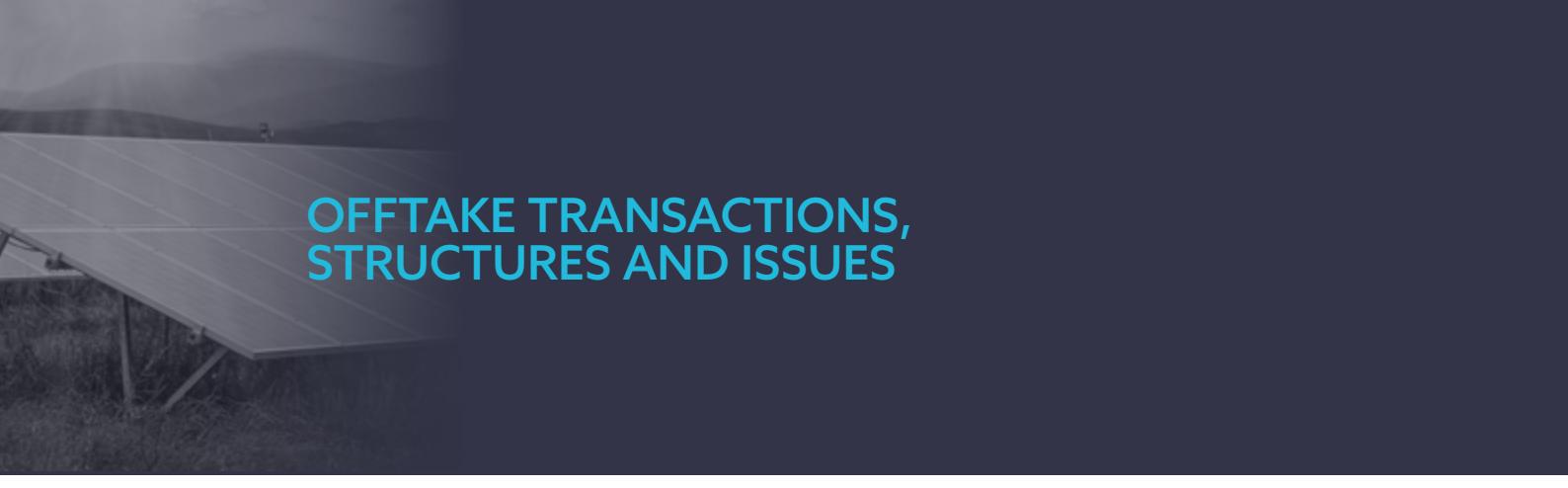
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With the booming energy storage sector as a backdrop, we focus our attention in this fourth Orrick Energy Storage Update on the key topics and trends most relevant in today's global and domestic storage markets, including:

- **Solar + Storage:** Recent developments in offtake, EPC/procurement, financing, M&A, tax and regulatory issues in solar + storage projects
- **Trade and Compliance:** Discussion of the important trade and compliance issues impacting storage projects, including tariffs, CFIUS and bulk-power systems
- **ESG:** Highlights of Environmental, Social and Governance issues relating to storage projects, including forced labor, conflict minerals and child labor issues
- **U.S. Regional Updates:** Updates on the most active domestic regions, including California/CAISO, Texas/ERCOT, PJM and New York/NYISO
- **International Storage Trends:** Focus on recent storage trends in the United Kingdom, Japan, Italy and Spain
- **Hydrogen:** Summary of key transaction structures and issues in the burgeoning green hydrogen market



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OFFTAKE TRANSACTIONS, STRUCTURES AND ISSUES

Since our latest Energy Storage Update published in 2018, offtakers across the country, including investor-owned and municipal utilities, community choice aggregators ("CCAs"), electrical cooperatives and corporates have contracted for products and services from gigawatts of stand-alone energy storage and hybrid generation + storage projects. Although preferred use cases and value streams vary among offtakers and continue to diversify, the transaction structures we outlined in detail in 2018 – the energy storage tolling agreement, capacity sales agreement and hybrid PPA – continue to serve as the prevalent vehicles for contracting front-of-meter energy storage projects.

Focus on New Structures and Solar + Storage

In this article, we will introduce:

- the fourth and newest agreement in the market for front-of-meter stand-alone storage projects: the shared savings contract;
- several important commercial and structural issues that arise in the negotiation of solar + storage PPAs, the most popular type of Hybrid PPA today; and
- innovative structured and merchant/hedged offtake arrangements currently in the market for energy storage projects.

Shared Savings Contracts

The energy storage tolling agreement continues to serve as the most common contracted revenue structure for front-of-meter, stand-alone storage assets in the United States today. Capacity sales agreements are less common and exist primarily in regions with an active "bilateral" capacity market such as California (see our [California section](#) for important updates on Resource Adequacy and storage).

In recent years, developers of projects in the Northeastern United States and certain other jurisdictions have also entered into "shared savings" contracts to monetize unique revenue streams from stand-alone storage projects.

The shared savings contract is a variant of the energy storage tolling agreement and is used in certain ISO/RTO markets where utilities face periods of congestion and high transmission, distribution and/or capacity charges. In a shared savings contract, the project developer, as "seller," owns and operates the project for the duration of the delivery term. However, in contrast to a tolling structure, the offtaker typically does not maintain dispatch authority over the project, schedule the battery into the relevant ISO/RTO market or pay a fixed capacity charge to the seller. Instead, the seller retains dispatch and scheduling authority for the project and is responsible for charging the battery during off-peak periods and discharging it during high-demand periods to reduce annual or seasonal coincident peaks on the utility offtaker's system, resulting in cost savings to the utility offtaker. The seller is paid in connection with each peak that is successfully reduced.

Even though the seller is entitled to dispatch the project and retain other revenue streams (e.g., by engaging in energy arbitrage activities or selling ancillary services into the market) when it is not being used to reduce peak load, the contracted revenue stream with the utility offtaker is inherently uncertain. It depends on the occurrence of peak demand periods and the battery's ability to perform sufficiently to achieve the agreed peak shaving requirements. Since the shared savings contract is relatively new and uncommon for front-of-meter storage projects, at this time there are no "standard" or "customary" formulas in the market for calculating the seller's compensation. This results in highly negotiated and customized compensation metrics and baselines against which savings or other benefits are measured.

Also available as part of the eCourse
[2022 Renewable Energy Law eConference](#)

First appeared as part of the conference materials for the
17th Annual Renewable Energy Law Institute session
"Energy Storage Development Panel"