FRACTAL ENERGY STORAGE NEWS

In This Issue

Recent Storage M&A Transactions and Investment News

- *Nov 29th*: Reefilla, a start-up that develops energy storage and mobile power generation solutions also based on second-life batteries, announces that it has closed a new EUR 4.5M capital increase. The round was led by CDP Venture Capital through the Green Transition-PNRR fund, financed with NextGeneration EU resources with the aim of stimulating growth, with co-investment from the PiemonteNext fund, set up and managed by CDP Venture Capital and underwritten by the regional finance company FinPiemonte to maximize investments in innovation for the region, together with HCapital, a Portuguese venture capital fund making its first investment in Italy, Azimut through its venture capital fund Azumut Eltif – Venture Capital ALIcrowd III and Motor Valley Accelerator, the first investor in Reefilla. The company states that this funding will be used for R&D to transform end-of-life batteries into second-life batteries, which can be used in energy storage and mobile charging.[1]

- *Nov 29th*: NextEnergy Capital's fund NextPower UK ESG (NPUK) has acquired the Rutherglen project (29 MW / 58 MWh BESS) in Glasgow, marking NPUK's 13th acquisition into the NPUK, and its third acquisition in November. The project has an anticipated Commercial Operation Date (COD) in 2026. Across all NextEnergy Capital funds, the total BESS capacity now stands at over 700 MW of both operational and ready-to-build projects, either on a standalone or co-located basis. NPUK continues to actively fundraise towards its hard cap, having successfully secured total funds committed to date of £ 683M, c.37% above its target of £ 500M. NPUK has investors currently in late-stage due diligence with further capital expected to be closed in the following weeks.[2]
- *Nov 27th*: NTPC Green Energy's initial public offering (IPO) of ₹ 100B ($ 1.19B) was oversubscribed 2.42 times as the bidding period closed on November 22, 2024. The price range was set at ₹ 102-108 ($ 1.21-1.28) per equity share with a nominal value of ₹ 10 (~$ 0.12). Investors placed bids for 1.43 billion shares, significantly exceeding the 593.17 million shares available. At the time, the shares were trading without a premium in the grey market. The listing of the shares on the Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) is expected on November 25, 2024.[3]
- *Nov 25th*: MET Group has purchased a 100% shareholding in Comax France, an owner, operator, and developer of combined heat and power (CHP) and BESS. With the acquisition, Comax operates a 170 MW portfolio of small-scale thermal assets and 29 MW of BESS across France. In addition, Comax is developing further BESS projects to support the continued growth of flexible energy solutions in France. The company's project pipeline consists of several hundred MW of BESS projects in various stages of development. MET Group intends to support the construction of the company's ready-to-build projects to be operational by mid-2026.[4]

[1] https://www.startupbusiness.it/en/reefilla-eur-4-5-million-for-the-second-life-of-batteries/143397/
[2] https://www.nextenergycapital.com/news/nextpower-uk-esg-acquires-standalone-battery-energy-storage-system/
[3] https://www.reuters.com/business/energy/indias-ntpc-green-energy-rises-324-trading-debut-2024-11-27/
[4] https://group.met.com/en/media/press-releases/met-group-buys-flexible-energy-provider-comax-france

- *Nov 25th*: Alternus Clean Energy, Inc. (Alternus) announced the signing of binding terms with LiiON, LLC, (LiiON), a U.S.-based maker of advanced energy storage solutions. Alternus will pay $ 5M using an asset purchase agreement, under which Alternus will acquire LiiOn's customer contracts, service agreements, and partnerships. LiiON will exclusively license its intellectual property to Alternus as applicable. Total consideration will be in the form and debt and equity whereby Alternus will issue a $ 2M non-convertible loan note payable over three years and issue 250,000 shares of common stock on closing, reflecting an underlying share price of $ 12.00. Completion of the acquisition will immediately improve Alternus shareholder equity by approximately $ 3M.[5]
- *Nov 21st*: ABO Energy sold the rights for two standalone BESS projects (77 MW / 308 MWh each) in South Africa to the utility company Électricité de France (EDF). EDF was awarded preferred bidder status for both projects on November 30, 2023, in the first bid window of the Battery Energy Storage Independent Power Producer Procurement Program (BESIPPPP). The projects are located near Aggeneys in the Northern Cape province and Vryburg in the northwest province.[6]
- *Nov 21st:* Independent Power Producer (IPP) RWE and Peabody announced a new partnership to strategically advance renewable energy projects by repurposing reclaimed land previously used for mining. RWE is acquiring a majority interest in the R3 Renewables LLC ownership group alongside founding partner Peabody. R3, a joint venture (JV) launched by Peabody, Summit Partners Credit Advisors (SPCA), and Riverstone Credit Partners (Riverstone), repurposes land previously used for coal mining to deliver clean, renewable energy. RWE is acquiring SPCA and Riverstone's equity interest in R3, and Peabody will retain a 25 percent equity interest. The founding partners of R3 Renewables initiated the development of a 5.5 GW pipeline of 10 potential projects on reclaimed mining sites in Indiana and Illinois. RWE will acquire seven of the projects and enter a JV with Peabody to continue developing the three remaining projects.[7]
- *Nov 20th*: GridBeyond has secured an € 11.2M (£ 9.4M) investment to expand its energy storage projects in the UK and Ireland. The funding comes from the Triodos Energy Transition Europe Fund, which has pledged the amount as part of its ongoing collaboration with GridBeyond through its JV, GridBeyond Storage. This new funding, totaling € 12.5M (£ 10.4M), aims to accelerate the deployment of behind-the-meter (BTM) BESS across the region. The partnership has seen two successful years, with plans now in place to support two 8 MWh BESS projects in Ireland and Scotland. Beyond energy storage, the venture is also exploring opportunities in BTM Solar PV systems and electric vehicle (EV) charging solutions to further enhance sustainable energy solutions.[8]
- *Nov 17th*: Field has announced the acquisition of the Hartmoor project (200 MW / 800 MWh BESS) from leading independent developer Clearstone Energy. The project becomes the latest addition to Field's 11 GW of battery storage projects in development and construction across Europe. The project is located on the outskirts of Hartlepool, in the northeast of England.[9]
- *Nov 12th:* Castleton Commodities International LLC (CCI) announced that a subsidiary, S4 Energy BV, has signed an agreement with Terra One Climate Solutions GmbH, a prominent German battery developer, to acquire a 310 MW portfolio of BESS projects in Germany. S4 Energy will build, own, and operate the BESS assets. This acquisition marks S4 Energy's entry into the German market and reinforces CCI's commitment to advancing its BESS platform's proven capabilities across key European markets. The portfolio combines shovel-ready and advanced projects with expected operational dates between 2026 and 2028.[10]

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[5] https://alternusce.com/alternus-clean-energy-announces-binding-terms-for-acquisition-of-leading-storage-and-solution-provider-liion-llc/
[6] https://www.aboenergy.com/en/media-center/press/2024/2024-11-21_battery-projects-southafrica_financial-close.html
[7] https://www.prnewswire.com/news-releases/rwe-and-peabody-partner-to-develop-solar-and-energy-storage-pipeline-on-repurposed-reclaimed-mine-lands-302312305.html
[8] https://www.energymarketprice.com/home/news/1168969
[9] https://www.field.energy/views/Field-acquires-200-mw--800-mwh-battery-storage-project-in-hartlepool
[10] https://www.prnewswire.com/news-releases/s4-energy-enters-germany-with-agreement-to-acquire-a-310-mw-battery-energy-storage-portfolio-from-terra-one-302299485.html

Fractal Advisory, representing our client, invites reputable buyers to participate in the Project Foxtrot process (the “Process”). This standalone project consists of a 9.9 MWac, 2-hour Battery Energy Storage System (BESS) located in the Houston Load Zone, Texas (ERCOT), with an expected In-Service Date in Q2 2026.
NBO deadline has passed.
Binding Offer deadline is Friday, December 20th, 2024, at 5 pm CT.

- *Nov 11th*: EDF Group’s subsidiary, EDF International, has secured financial close for its South Africa Oasis 1 battery storage portfolio, totaling 257 MW capacity. The consortium, which includes Mulilo Energy Holdings, Pele Green Energy, and Gibb Crede, has raised ZAR 7B (USD 386.6M) from local lenders Standard Bank and ABSA to support these initiatives. The portfolio comprises the following projects: Oasis Mookodi (77 MW / 308 MWh), Oasis Aggeneis (77 MW / 308 MWh), and Oasis Nieuwehoop (103 MW / 412 MWh). All projects are in the Northern Cape Supply Area.[11]
- *Nov 6th*: FREYR Battery (FREYR) has announced that it has entered into an agreement to acquire the U.S. solar manufacturing assets of Trina Solar Co Ltd. (Trina Solar). The transaction is expected to close at the end of 2024 and includes a 5 GW, 1.35 million square foot solar module manufacturing facility in Wilmer, Texas, that started production on November 1, 2024. Total consideration to Trina Solar of $ 340 M, comprised of $ 100M of cash, $ 50M repayment of an intercompany loan, $ 150M loan note, 9.9% of FREYR outstanding common stock, and a convertible loan note that would convert into an additional 11.5% of FREYR outstanding common stock after certain conditions are satisfied. Simultaneously, FREYR has secured a $ 100M commitment for the issuance of preferred stock issuance to Encompass Capital Advisors LLC and $14.8 million through a private placement of FREYR common stock.[12]
- *Nov 6th*: ZE Energy, a Paris-based company specializing in solar power and energy storage, has secured € 54M (~$ 57.8M) to drive the expansion of its offerings across Europe. Established in 2019, the company focuses on developing, constructing, and operating hybrid photovoltaic power plants integrated with energy storage systems. It also finances projects aimed at providing renewable energy solutions with fixed pricing models. ZE Energy plans to grow its portfolio to include projects capable of producing 900 MW of Solar PV and storing 600 MWh by 2026, covering both operational and ready-to-build facilities.[13]
- *Nov 6th*: SSE has acquired the project development rights for a 120 MW / 240 MWh grid-scale BESS project in Ireland’s Midlands from UK-based renewable energy company Low Carbon. The Thornsberry project has

[11] https://www.edf.fr/en/the-edf-group/dedicated-sections/journalists/all-press-releases/oasis-1-battery-energy-storage-systems-projects-all-achieve-financial-close-0
[12] https://www.businesswire.com/news/home/20241105395960/en/FREYR-Battery-Announces-Transformative-Acquisition-of-Trina-Solar%E2%80%99s-U.S.-Manufacturing-Assets-Actions-to-Strengthen-Board-of-Directors-and-Management-Team
[13] https://www.esgtoday.com/solar-and-storage-developer-ze-energy-raises-e54-million-to-fund-expansion-across-europe/

received planning consent. Subject to a final investment decision by SSE Renewables, the project could enter construction and be operational by the end of the decade.[14]

- *Nov 5th:* Ampd Energy, a global energy industry innovator and manufacturer of the Enertainer and Ampd Silo™ BESS for heavy industries, announced that it has raised $ 27.3M in an oversubscribed Series B funding. The round was co-led by Kibo Invest and Openspace, the largest investor in this round, with notable participation from existing investors MTR Lab, Taronga Ventures, and 2150, confirming their support and belief in Ampd Energy by participating above pro-rata. The funds will be used to further expand decarbonization across new verticals and regions.[15]
- *Nov 4th*: Thermochemical energy storage startup Redoxblox gains a $ 30M boost in new Series A funding. Investors led by Prelude Ventures and Breakthrough Energy Ventures have helped San Diego-based Redoxblox top nearly $ 41M to scale its thermochemical energy storage systems (TCES). Prelude and Imperative Ventures joined early investors Breakthrough and Khosla Ventures in the Series A round. The new funding added $ 30M to the Series A round total.[16]
- *Oct 31st:* Avantus announced today the Catclaw Solar and Energy Storage Project sale to D. E. Shaw Renewable Investments (DESRI). Located in Buckeye, Arizona, in Maricopa County, the project features up to 225 MW_{ac} of solar and 250 MW/1,000 MW-hours of energy storage. The transaction includes a long-term Power Purchase Agreement (PPA) with Arizona Public Service (APS) for the project. Avantus was responsible for the initial greenfield development including interconnection, site acquisition and permitting, as well as commercial negotiations with APS and the procurement of select equipment, including batteries.[17]

Recent Finance and Tax Equity News

- *Nov 28th*: The Asian Development Bank (ADB) and Gulf Renewable Energy Company Limited, a subsidiary of Gulf Energy Development Public Company Limited (Gulf), have signed an $ 820M loan to provide construction financing for a portfolio of 12 renewable energy projects across Thailand. The portfolio comprises 8 ground-mounted Solar PV plants with a contracted capacity of 393 MW and 4 ground-mounted Solar PV plants with BESS (totaling 256 MW / 396 MWh). The financing package, led by ADB as the mandated lead arranger and bookrunner, comprises $ 260M from ADB's ordinary capital resources and $ 529M in parallel loans from the Asian Infrastructure Investment Bank, DEG - Deutsche Investitions- und Entwicklungsgesellschaft (German Development Finance Institution), the Export-Import Bank of China and KEXIM Global (Singapore), among others.[18]
- *Nov 26th*: Fengate Asset Management (Fengate) and Alpha Omega Power (AOP) have announced the closing of a tax equity commitment with U.S. Bancorp Impact Finance, a subsidiary of U.S. Bank, on the 100 MWh Caballero Energy Storage project (Caballero) to provide clean, resilient energy to the California grid.

[14] https://www.sserenewables.com/news-and-views/2024/11/sse-acquires-120mw-240mwh-battery-storage-project-in-ireland-s-midlands/
[15] https://www.prnewswire.com/ae/news-releases/ampd-energy-secures-oversubscribed-27-3-million-in-series-b-funding-to-accelerate-clean-battery-energy-storage-solutions-globally-302295919.html
[16] https://www.energytech.com/energy-storage/article/55240252/thermochemical-energy-storage-startup-redoxblox-raises-30m-in-new-series-a-funding
[17] https://avantus.com/news/avantus-completes-sale-of-catclaw-solar-and-energy-storage-project-to-d-e-shaw-renewable-investments
[18] https://world.einnews.com/pr_news/764556975/adb-gulf-sign-820-million-loan-to-scale-up-solar-and-battery-storage-in-thailand

Caballero marks the first investment by Fengate and AOP, which formed a development partnership in 2023 to develop, acquire, and operate BESS projects. The partnership acquired the 400 MWh contracted BESS project from Origis Energy and closed construction and term debt with MUFG Bank. Fengate is managing this investment on behalf of the Fengate Infrastructure Fund IV and its affiliated entities, including an investment by the LiUNA Pension Fund of Central and Eastern Canada. The anticipated COD is in early 2025.[19]

- *Nov 25th*: Switzerland-based Alpiq announced the acquisition of a 100 MW / 200 MWh BESS project located in the department of Oise, north of Paris, France, from Harmony Energy. The anticipated COD is in autumn 2026. The financial details of the acquisition were not disclosed. Alpiq is planning further acquisitions of battery storage projects in France, Switzerland, Germany, and the Nordics.[20]
- *Nov 25th*: The ADB has approved a $ 200M loan to upgrade Sri Lanka's power sector infrastructure, enhancing the reliability of transmission and distribution networks and facilitating greater integration of renewable energy. The "Power System Strengthening and Renewable Energy Integration Project" will expand the 220-kV and 132-kV transmission infrastructure with new transmission lines and substations, modernize the medium voltage distribution network, and upgrade grid protection systems. The project will introduce Sri Lanka's first grid-scale BESS (100 MW / 50 MWh) at the transmission level, establish a renewable energy center to forecast and monitor renewable energy generation, and implement network automation systems with SCADA and remote terminal units, providing operators with real-time data and alerts to ensure efficient power delivery.[21]
- *Nov 21st:* Renewables developer and IPP Pivot Energy announced two financing arrangements. Pivot has successfully secured a $ 450M debt warehouse facility, led by long-time partner, First Citizens Bank, which includes new strategic partner ATLAS SP Partners (ATLAS), the warehouse finance and securitized products business majority owned by Apollo funds. In addition, Pivot closed on a structured equity investment from HA Sustainable Infrastructure Capital, Inc. (HASI) in a new project JV. Together, these financing structures will support the construction of 300 MW_{dc} of distributed generation projects that Pivot is developing across the U.S. The portfolio consists of 96 projects, the majority of which are community solar with the remaining being single off-take PPAs for commercial clients. The projects are expected to be operational within the next two years, located across nine states: California, Colorado, Delaware, Hawaii, Illinois, Maryland, Minnesota, New York, and Virginia.[22]
- *Nov 21st:* Pathward®, N.A. (Pathward) has announced its expanded strategic partnership with BridgePeak Energy Capital (BridgePeak) to implement a digital-first renewables loan platform. The partnership between Pathward and BridgePeak will facilitate industry innovation and the continued growth of clean energy and rural economic development. Focused on both project-level and corporate capital, the partnership allows Pathward to offer comprehensive solutions to solar and storage projects by leveraging BridgePeak's industry knowledge and extensive relationships. In addition to supporting solar and battery storage developers, Pathward will continue its focus on biogas, waste-to-value, hydrogen fuel cells, and electric vehicle charging infrastructure projects.[23]
- *Nov 19th*: RIC Development, LLC (RIC Energy), a renewable energy company, and Rosemawr Management, an investment firm focused on municipal investing and sustainable and social infrastructure, have announced

[19] https://www.energyglobal.com/energy-storage/26112024/fengate-strikes-deal-with-aop-for-battery-storage-project/
[20] https://www.alpiq.com/alpiq-group/media-relations/media-releases/media-release-detail/alpiq-continues-to-invest-in-flexibility-and-acquires-a-100-mw-battery-project-in-france
[21] https://www.adb.org/news/adb-loan-advance-power-system-expansion-and-renewable-energy-integration-sri-lanka
[22] https://www.prnewswire.com/news-releases/pivot-energy-secures-over-450-million-in-major-financing-of-distributed-generation-portfolios-from-first-citizens-atlas-sp-and-hasi-302312371.html
[23] https://www.businesswire.com/news/home/20241121979011/en/Pathward-Announces-Strategic-Partnership-to-Support-Renewable-Energy-Loan-Growth

a financing partnership to fund interconnection deposits that will help to deploy up to 450 MW of solar and energy storage projects across New York over the next three years.[24]

- *Nov 19th*: National Renewable Solutions (NRS), a US-based renewable energy developer, owner, and operator, announced that it has closed $ 145M in project financing for its Shallow Basket project (140 MW_{ac} Solar PV + 50 MW BESS) located in Rio Arriba County, New Mexico, about 30 miles west of Cuba, NM. The project is under construction and is expected to be operational in 2025. Deutsche Bank provided construction financing. Guzman Energy will purchase 100 percent of the power and associated renewable attributes.[25]
- *Nov 19th*: Atlantic Green and Nofar Energy's UK-based storage platform has secured £ 152M in financing for its Cellarhead project (300 MW / 624 MWh BESS) near Stoke-on-Trent, northwest England. The project will connect to the National Grid's 400 kV Cellarhead substation. The funding comes from a consortium of lenders, including Goldman Sachs, Santander, Bank Hapoalim, and Bank Leumi. Goldman Sachs acted as the structuring bank, mandated lead arranger, and lender for the financing arrangement.[26]
- *Nov 18th*: Equitix has been granted € 271M of financing by Banco Santander for the refinancing, construction, and development of a portfolio (total 326 MW) of wind projects hybridized with solar and battery projects. This is Spain's first financing of a hybrid project that combines wind, solar, and battery storage.[27]
- *Nov 17th*: ACME Sun Power Private Ltd, a subsidiary of ACME Solar Holdings Ltd, has secured a ₹ 3,753 crore term loan from REC Ltd, a government-owned infrastructure lender. The funding will support the development and construction of firm and dispatchable renewable energy (FDRE) projects with a combined capacity of 320 MW in partnership with hydropower company SJVN. The projects will leverage high-resource areas, with solar facilities planned for Jaisalmer, Rajasthan, and windmill sites in Bhuj and Jam Khambhaliya, Gujarat. A power purchase agreement has been signed with SJVN, and grid connectivity has been secured. According to ACME, land acquisition is in its final stages.[28]
- *Nov 15th*: Axian Energy, a subsidiary of the Madagascar-headquartered Axian Group, has secured € 84M (~$ 89M) in debt financing to construct the Kolda Project, Senegal's largest utility-scale solar and battery project. The financing comes from the Emerging Africa & Asia Infrastructure Fund (EAAIF) managed by Ninety-One Group (€ 30.5M), the Dutch development bank FMO (€ 30.5M), and the Deutsche Investitions- und Entwicklungsgesellschaft (DEG), a subsidiary of KfW Group (€ 23M). Located in Casamance, Senegal, this solar facility will feature two plants with a total capacity of 60 MW and a 72 MWh BESS. The project has a total estimated cost of € 105M and is scheduled for completion in 2026.[29]
- *Nov 15th*: Gore Street Energy Storage Fund has secured an additional $ 90M in financing for its 200 MW / 400 MWH Big Rock energy storage project in California. Big Rock ESS Assets LLC, the Fund's wholly owned subsidiary responsible for the project, successfully completed the loan conversion process with First Citizens Bank. This allowed the facility to be increased from the initial $ 60M after achieving key construction milestones. The expanded financing will cover the remaining capital costs required to complete the Big Rock project.[30]
- *Nov 13th*: Vesper Energy has announced the successful refinancing of its Letter of Credit Facility with Macquarie Group (Macquari) and ICBC Standard Bank Plc (ICBCS). The facility, led and arranged by Macquarie's Commodities and Global Markets business, now includes a new $ 50M revolving credit component designed to support Vesper Energy's growth and provide operational flexibility in developing

[24] https://www.businesswire.com/news/home/20241106262035/en/RIC-Energy-and-Rosemawr-Announce-Financing-Partnership-to-Deploy-Solar-and-Energy-Storage-Projects-in-New-York
[25] https://natrs.com/national-renewable-solutions-secures-145-million-in-project-financing-for-new-mexico-shallow-basket-project/
[26] https://renews.biz/97171/300mw-uk-battery-bags-152m-cash-line/
[27] https://renews.biz/97037/equitix-finds-funds-for-326mw-spanish-projects/
[28] https://www.livemint.com/companies/news/acme-sun-power-loan-rec-fdre-projects-green-energy-transition-renewable-energy-projects-windmill-solar-power-11731840793998.html
[29] https://www.stears.co/article/energy-deal-briefing-axian-energy-secures-89m-for-senegals-largest-solar-project/
[30] https://renews.biz/97086/gore-street-finds-extra-funds-for-us-storage-project/

renewable energy projects.[31]

- *Nov 13th*: Leonid Capital Partners, a leader in flexible, non-dilutive financing for critical sectors, today announced a $10M debt investment in Ion Storage Systems, Inc. (ION), an innovator in advanced solid-state battery technologies. This funding aims to accelerate ION's mission to deliver a safer, more efficient energy solution through their groundbreaking solid-state battery technology.[32]
- *Nov 12th*: SolaREIT™, a solar and battery energy storage real estate investment company, has surpassed a major milestone in providing solar and energy storage real estate financing for projects valued at more than $ 3B since its founding. The company, which is celebrating its fourth anniversary, provides practical, streamlined capital solutions for financing solar and storage land, delivering maximum flexibility based on clients' individual needs, financial goals, and vision for their land. The $ 3B milestone encompasses projects in eighteen states.[33]
- *Nov 12th*: esVolta, LP (esVolta) announced the completion of a $ 110M tax equity transaction with Greenprint Capital Management (Greenprint) to finance the construction of the 300 MWh Hummingbird battery energy storage project in San Jose, California. Upon completion in 2025, the project will provide Pacific Gas & Electric with resource adequacy capacity under a long-term contract. It will also offer fast-responding energy and ancillary services to the CAISO market, helping to reduce congestion and strengthen the electric grid in the fast-growing San Jose region.[34]
- *Nov 12th*: Ormat Technologies Inc. (Ormat), a leading renewable energy company, announced the successful deal to transfer investment tax credits (ITCs) from the 80 MW / 320 MWh Bottleneck Project to a third party. This transaction, which was facilitated under the Inflation Reduction Act (IRA), represents a significant achievement in our goal to collect up to $ 152M in cash tax benefits this year. The gross proceeds from this transaction were priced at $0.93 per dollar. After deducting the buyer's broker and legal fees, the net proceeds from the transaction amounted to approximately $ 46.7M.[35]
- *Nov 6th*: Primergy announced $ 225M in corporate and project financing for its Valley of Fire Portfolio. The portfolio includes the Gemini Solar + Storage project, commissioned in early 2024, and five additional projects in Nevada, Colorado, and Arizona totaling over 2.65 GW of solar and up to 1.5 GW of battery storage capacity. The projects range from early-to-late-stage development targeting operational dates through 2030, including the contracted Purple Sage Energy Center, a 400 MW_{ac} Solar PV + 1.6 GWh BESS in Nevada. The funding, arranged with Dutch Rabobank, includes a $ 125M tax credit sale for the Gemini hybrid solar park in Nevada and a $ 100M revolving credit facility.[36]

[31] https://www.prnewswire.com/news-releases/vesper-energy-completes-refinancing-adds-50-million-revolving-credit-facility-302304555.html
[32] https://www.businesswire.com/news/home/20241113677485/en/Leonid-Capital-Partners-Announces-10-Million-Debt-Investment-in-Ion-Storage-Systems-Driving-Safer-Scalable-Energy-Solutions
[33] https://www.prnewswire.com/news-releases/solareit-surpasses-financing-for-3-billion-of-solar-and-battery-energy-storage-land-302302497.html
[34] https://www.prnewswire.com/news-releases/esvolta-secures-110-million-tax-equity-investment-for-300-mwh-hummingbird-energy-storage-project-302302499.html
[35] https://investor.ormat.com/news-events/news/news-details/2024/Ormat-Technologies-Announces-Successful-Monetization-of-40-Investment-Tax-Credit-for-Bottleneck-Energy-Storage-Facility/default.aspx
[36] https://www.primergysolar.com/posts/primergy-announces-225-million-in-corporate-and-project-financing-for-its-valley-of-fire-portfolio

MOU and Partnerships

- *Nov 21st*: Element Energy announced a partnership with LG Energy Solution Vertech to provide full turn-key second-life battery energy storage systems for select customers. Element Energy will provide containerized second-life batteries with its proprietary battery management system (BMS) hardware and software. LG Energy Solution Vertech will provide system integration, power equipment, energy management system hardware and software, plus operations and maintenance services. Element Energy plans to deploy its 2 GWh of second-life battery inventory.[37]
- *Nov 19th*: Fidra Energy and Sungrow announced the signing of a strategic 4.4 GWh energy storage partnership agreement to support Fidra's plans to establish a 10 GW BESS platform across the UK and other European markets by 2030. Under the Agreement, Sungrow will supply its liquid-cooled energy storage system (ESS) PowerTitan 2.0 to two of Fidra's UK sites. The first of Fidra's sites to have Sungrow's PowerTitan 2.0 installed will be its flagship Thorpe Marsh development located in South Yorkshire. Thorpe Marsh will be one of the largest battery storage sites globally. Construction of the site is scheduled to begin in 2025.[38]
- *Nov 13th*: Abu Dhabi Future Energy Company PJSC (Masdar) and Korporata Elektroenergjitike Shqiptare (KESH) have signed a JV term sheet agreement to explore the development of gigawatt-scale renewable projects in Albania. The JV term sheet agreement aims to develop, construct, and operate renewable energy projects utilizing a range of renewable technologies, including solar PV, wind, and hybrid solutions, with potential integration of battery storage. The energy produced is expected to be supplied to the Albanian market and exported to neighboring countries.[39]
- *Nov 11th*: Solidion Technology, Inc. (Solidion), an advanced battery technology solutions provider, announced a strategic Memorandum of Understanding (MOU) with Bluestar Materials Company of Taiwan. This agreement will leverage Solidion's patent portfolio and accelerate the commercialization of its anode technology, including its recently disclosed technology that allows lithium batteries to be charged in 5 minutes. The agreement will enable Solidion to explore and establish synergies in U.S. based manufacturing, commercialization strategies, and market opportunities related to Silicon (Si) and Silicon Oxide (SiOx) advanced battery solutions. Silicon and Silicon Oxide are now viewed as a more favored solution for battery technology over solid-state technology.[40]
- *Nov 5th*: Fotowatio Renewable Ventures (FRV) announced a strategic JV with AMP Tank Finland Oy, a prominent developer of energy storage systems in the Nordic and Baltic regions. The companies are collaborating to construct a 60 MWh BESS in Finland, located near the Fingrid Simojoki substation, approximately 100 km below the Arctic Circle. Construction of the project's first phase started in May 2024 and is expected to be operative in Q1 2025.[41]
- *Nov 5th*: Solar developer and IPP Emeren Group Ltd (Emeren) announced a co-development agreement with Arpinge, a permanent capital vehicle focused on sustainable infrastructure in Italy, to develop a 300 MW BESS portfolio in Southern Italy jointly. The partnership strengthens Emeren's growing presence in Italy's BESS market, where the Company has already achieved approximately 1.37 GW in the permitting pipeline.[42]

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[37] https://www.prnewswire.com/news-releases/element-energy-accelerates-the-deployment-of-second-life-batteries-with-lg-energy-solution-vertech-302313152.html
[38] https://www.prnewswire.com/news-releases/eigs-fidra-energy-and-sungrow-enter-into-strategic-partnership-on-4-4gwh-bess-projects-302310352.html
[39] https://www.prnewswire.com/ae/news-releases/masdar-and-kesh-sign-agreement-to-explore-renewable-energy-joint-venture-in-albania-302303773.html
[40] https://www.prnewswire.com/news-releases/solidion-technology-executes-strategic-memorandum-of-understanding-302300850.html
[41] https://frv.com/en/frv-and-amp-tank-partner-for-first-joint-battery-energy-storage-60-mwh-project-in-finland/
[42] https://www.prnewswire.com/news-releases/emeren-group-and-arpinge-partner-to-develop-300-mw-battery-storage-portfolio-in-italy-302296174.html

Recent Project and Development Announcements

- *Nov 29th*: Trina Solar Co Ltd has applied for approval to construct a 500 MW / 1,000 MWh BESS in Victoria, Australia. The proposed site, located near Dederang in the Kiewa Valley, spans approximately 10 hectares and plans to leverage existing transmission infrastructure to improve grid reliability during peak demand. The Department of Transport and Planning is expected to review the application, with a decision likely by early 2025. Beyond this project, Trina Solar is advancing two other battery ventures in Australia: a 660 MW / 2,640 MWh facility in Western Australia and a 270 MW / 540 MWh system in South Australia.[43]
- *Nov 28th*: EDF Renewables has submitted an environmental permit application for its Quebrada Locayo project in Chile. This hybrid renewable energy initiative combines a 240 MW wind farm with a 300 MWh BESS. Located in the Coquimbo region, the project is expected to begin construction in October 2026.[44]
- *Nov 28th*: Spanish renewable projects developer Solarig announced plans to build a new EUR 1.15B ($ 1.21B) sustainable aviation fuel (SAF) plant in Teruel, Spain. The plant will be supported by a Solar PV facility, wind farm and BESS.[45]
- *Nov 28th*: E3/DC says a residential battery integrated with an LG Energy Solution module recently caught fire in Werne, Germany, prompting the company to replace battery modules in 77 homes as a precaution. The cause of the blaze is still under investigation.[46]
- *Nov 28th*: Synergy, a state-owned utility in Western Australia, has partnered with infrastructure provider GenusPlus Group to complete the Kwinana Stage 2 BESS, a $ 661M ($ 427.6M) project. The project is located 30 kilometers southwest of Perth and is part of the Southwest Interconnected System (SWIS).[47]
- *Nov 27th*: Energy storage developer Pulse Clean Energy announced that it has successfully energized its Hirwaun project (22 MW / 49.5 MWh BESS) in Aberdare, Wales. Habitat Energy will oversee its optimization, continuing its collaboration with Pulse Clean Energy on other BESS projects in England and Wales. The Hirwaun project is part of Pulse's broader initiative to transition former diesel power generation sites into grid-scale BESS facilities, marking the fifth conversion out of nine planned sites. This development was funded through a £ 175M credit facility provided by a consortium of financial institutions, including Santander, CIBC, Investec, the National Wealth Fund, and the Investment Management Corporation of Ontario.[48]
- *Nov 27th*: EnergyAustralia has secured approval from the New South Wales government to build its Mt Piper project (500 MW BESS) near the Mt Piper coal-fired power station. Constructed for the AUD 1B project is slated to begin in 2026.[49]
- *Nov 27th*: Statkraft, Europe's largest generator of renewable energy, has reached a crucial milestone in the construction of its Thornton Greener Grid Park (200 MW / 400 MWh BESS) with the arrival of the first of 620 battery units to be installed on-site. Located in East Yorkshire, UK, the project represents an investment of £ 150M and is the largest battery scheme in Statkraft's international portfolio. The anticipated COD is in the fall of 2025.[50]
- *Nov 26th*: Solar and storage developer Buccleuch Group has submitted a planning application to the Kettering District Council for its Oakley Bush project (39 MW Solar PV + 10 MW BESS) near Kettering, Northamptonshire. According to the application documentation, two battery technologies are being considered. The stakeholder process will be open until December 18th.[51]

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[43] https://www.ess-news.com/2024/11/27/trina-seeks-approval-for-1-gwh-battery-project-in-australia/
[44] https://renewablesnow.com/news/edf-renewables-files-eis-for-240-mw-wind-plus-bess-project-in-chile-1267279/
[45] https://renewablesnow.com/news/solarig-unveils-plan-for-new-eur-1-15bn-saf-plant-in-spain-1267302/
[46] https://www.world-energy.org/article/46496.html
[47] https://esdnews.com.au/synergy-celebrates-completion-of-second-kwinana-battery/
[48] https://pes.eu.com/press-releases/pulse-clean-energy-energises-22mw-hirwaun-battery-storage-project/
[49] https://esdnews.com.au/energyaustralias-mt-piper-battery-ticks-state-approval/
[50] https://www.statkraft.co.uk/newsroom/2024/statkrafts-largest-battery-scheme-hits-crucial-construction-milestone/
[51] https://vanadiumprice.com/2024/11/26/buccleuch-group-submits-plans-for-39mw-solar-10mw-storage-development/

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Q4 / 2024 Battery Storage Performance Benchmark Report

Target Audience:
Developers, Investors, Tax Equity Partners, IPPs

Key Insights:
Benchmark actual revenue versus perfect foresight for individual assets

- Investors and Tax Equity Partners can benchmark revenue performance risk based on in-depth market data
  - Price foresight risk
  - Availability risk
- "Insider Report" on better investment decisions

Discover the Location Advantage

- Project developers can identify the best-performing locations in ERCOT

Revenue Stack Trends

- Explore revenue stacks for best-performing assets
- Energy arbitrage v/s ancillary services
- Day-Ahead Market and Real-Time Market
- Compare trends in stack changes with ancillary service market price dilution and high ESS penetration

Trading Strategies for IPPS and Energy Traders

- Seek actionable insights gleaning into offer and bid strategies of best-performing assets

- *Nov 26th*: Neoen SA has announced the successful mechanical completion of its 200 MW / 400 MWh Blyth battery storage project in South Australia. This facility is poised to become the largest energy storage installation in the region, located approximately 7 km from the township of Blyth. The Blyth battery project is being developed alongside the initial phase of the Goyder wind park, which will enhance its energy production capabilities. Together, these two facilities will provide a 70 MW renewable energy baseload to mining giant BHP, fulfilling half of the energy requirements for the Olympic Dam mine starting next summer.[52]
- *Nov 25th*: Australian energy company AGL Energy has received approval from the New South Wales (NSW) government to construct an AUD 1B 500 MW / 2,000 MWh BESS in Newcastle. This significant project, known as the Tomago battery storage complex, will be one of the largest in New South Wales and aims to enhance energy reliability in the Hunter-Central Coast Renewable Energy Zone (REZ).[53]
- *Nov 24th*: Origin Energy has announced plans to expand the large-scale battery at the Eraring Power Station in New South Wales, positioning it as the largest BESS in the Southern Hemisphere. The project's third phase will add 700 MWh of storage capacity to complement the first stage's 460 MW / 1,070 MWh and the second stage's 240 MW / 1,030 MWh, which is still under construction. When fully completed, the Eraring battery will have a total capacity of 700 MW / 2,800 MWh, making it one of the largest battery energy storage systems globally.[54]
- *Nov 21st*: Renewables developer and IPP Arevon Energy, Inc. hosted a ribbon-cutting ceremony to mark the start of operations at its Vikings Solar-plus-Storage Project (157 MW Solar PV + 150 MW / 600 MWh BESS) in Imperial County, California, near Holtville. The Project has an off-take agreement with San Diego Community Power. The companies have also executed a commercial agreement for Arevon's 200 MW

[52] https://list.solar/news/neoens-blyth/
[53] https://finance.yahoo.com/news/agl-energy-gains-approval-500mw-154358169.html
[54] https://world.einnews.com/article/763510571?lcf=LoQIc8FHDqp-vDIGMnaUQBTLh1TqL4Ri4sdUVjKKdUU%3D&pg=10&search%5B%5D=news&search%5B%5D=press&order=relevance&age_h=2160&headlines_only=mostly&search_market=yes

Avocet Energy Storage Project located in the City of Carson, California, which is expected to start construction in early 2025.[55]

- *Nov 21st*: BW ESS and ACL Energy have announced a significant expansion of their joint project development pipeline for standalone, utility-scale BESS in Italy. Building on their initial partnership established in February 2024 – which included three projects totaling 0.4 GW – the two companies now commit to co-developing eleven more projects with a substantial 2.5 GW of capacity. This expansion brings the total development pipeline managed by the BW ESS and ACL Energy partnership to 14 projects, representing 2.9 GW of capacity across Italy's North and South electricity zones. All projects have secured land and grid access and are advancing towards obtaining permits. Notably, seven of these projects, totaling over 1 GW, are already undergoing review by the Ministry of Environment and Energy Security (MASE). Northern projects will target participation in the capacity market scheme, while Southern projects aim to bid in the Mechanism for Procuring Electricity Storage Capacity (MACSE).[56]
- *Nov 20th:* Distributed Generation (DG) developer Renewable America (RNA) received a Conditional Use Permit (CUP) from Contra Costa County for its Ranch Sereno Clean Power (RASE) project (2.48 MW_{dc} Solar PV + 3.6 MWh BESS) in Byron, California. MCE Community Choice Energy (MCE) will be the off-taker under the Feed-in Tariff Plus, purchasing the power generated by the project. RNA had previously collaborated with MCE, successfully completing the Fallon Two Rock Road solar farm in Marin County earlier this year.[57]
- *Nov 19th:* Eramet Grande Côte, a subsidiary of the French multinational mining and metals company Eramet, and South Africa's JUWI Renewable Energies have reached financial close on a € 30M off-grid 20 MW_p Solar PV and 11 MWh BESS project for the mine in Diogo, Senegal, Africa. The project will provide clean energy to meet 20% of the mine's energy needs and reduce carbon emissions.[58]
- *Nov 19th*: Renewable energy developer Galileo has submitted a planning application to West Lothian Council for a 49.9 MW BESS northwest of Bathgate Substation in Scotland.[59]
- *Nov 18th:* NHOA Energy, the company of NHOA Group (NHOA.PA) dedicated to energy storage, has signed the agreements and started the execution activities with Red Eléctrica, Spanish TSO, for the supply of two BESS in the Balearic Islands for a total power of 140 MW and 105 MWh energy. The systems will provide continuous support services to the islands' grids and represent, as an aggregate, the largest SATA (Storage as Transmission *Asset) in Southern Europe.*[60]
- *Nov* 15th: Iberdrola received approval from the Brazilian government to generate more Solar PV and battery storage in Fernando de Noronha. Through its company in Brazil, Neoenergia, Iberdrola, will allocate nearly EUR 50M for the development.[61]
- *Nov 14th*: Irish energy company ESB Group opened its latest major battery plant at its Aghada site in Co Cork, which will add 150 MW / 300 MWh of battery storage to help provide grid stability and deliver more renewable power to Ireland's electricity system. This BESS project is the latest in ESB's pipeline of projects delivered at sites in Dublin and Cork which are part of its investment of up to € 300M in the technology. In 2022, ESB launched the first of its BESS sites, the 19MW / 38 MWh project in Aghada. Earlier in 2024, a new 75 MW / 150 MWh project was opened at ESB's Poolbeg Energy Hub in Dublin.[62]

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[55] https://www.prnewswire.com/news-releases/arevon-announces-commercial-operations-at-vikings-solar-plus-storage-project-in-imperial-county-california-302312740.html

[56] https://bw-group.com/newsroom/articles/2024/11/bw-ess-and-acl-energy-expand-italian-bess-partnership/

[57] https://www.prnewswire.com/news-releases/renewable-america-obtains-conditional-use-permit-for-ranch-sereno-clean-power-project-302310966.html

[58] https://www.globalminingreview.com/mining/19112024/eramet-and-juwi-partner-on-solar-and-battery-storage-solution-at-senegal-mine/

[59] https://www.scottishconstructionnow.com/articles/application-submitted-for-middlerigg-battery-storage-proposals

[60] https://www.businesswire.com/news/home/20241118077042/en/NHOA-Energy-to-Supply-to-Red-El%C3%A9ctrica-De-Espa%C3%B1a-Two-Storage-Projects-With-a-Total-Capacity-of-105MWh

[61] https://www.iberdrola.com/press-room/news/detail/iberdrola-receives-the-go-ahead-from-the-brazilian-government-to-generate-more-clean-energy-in-fernando-de-noronha#:~:text=Through%20its%20company%20in%20Brazil,photovoltaic%20technology%20and%20battery%20storage.

[62] https://esb.ie/media-centre-news/press-releases/article/2024/11/15/esb-officially-opens-its-latest-battery-storage-project-in-co-cork-as-part-of--300m-investment

- *Nov 14th*: Cero Generation announced the completion of its Larks Green BESS (49.5 MW / 99 MWh). The facility was collocated with the existing 70 MW_p Larks Green Solar PV project, making it the first co-located PV+S project to connect to the UK National Grid's electricity transmission network.[63]
- *Nov 14th*: UK renewables developer Low Carbon announced plans for a 500 MW solar-storage hub in Kent, southeast England. The project, which is classified as a Nationally Significant Infrastructure Project, will require approval from the Secretary of State for Energy Security and Net Zero. Recently, the company also secured development consent for a similar 500 MW solar complex in Lincolnshire.[64]
- *Nov 13th*: French energy company TotalEnergies has won approval from the New South Wales Independent Planning Commission for its Middlebrook Solar Farm project (320 MW Solar PV + 320 MW / 780 MWh BESS) near Tamworth. The USD 564M facility will connect to the National Electricity Market (NEM) via the existing Transgrid 330 kV transmission line that traverses the site.[65]
- *Nov 11th*: TagEnergy's Lakeside Energy Park (100 MW / 200 MWh) is now connected to the National Grid Drax substation, making it the largest transmission-connected BESS project in the UK.[66]
- *Nov 11th*: EnBW Energie Baden-Wuerttemberg AG announced plans to construct a 100 MW / 100 MWh BESS at its site in Marbach, southern Germany. The system will connect to the local transmission network managed by TransnetBW GmbH. Construction is set to begin in 2025, with operations expected to start by the end of the year, making it EnBW's largest battery storage project to date.[67]
- *Nov 8th:* The Idaho Public Utilities Commission approved Idaho Power's request for a Certificate of Public Convenience and Necessity (CPCN) for a company-owned 150 MW BESS at the Boise Bench Station. In April 2024, Idaho Power Company applied to acquire the capacity due to a proposed capacity shortfall for 2026, as outlined in the company's Integrated Resource Plans (IRPs) from 2021 and 2023. Idaho Power secured the BESS through a competitive procurement process. In August 2024, the Commission Staff recommended that the Public Utilities Commission approve the CPCN with certain conditions. These conditions included a soft cap on equipment costs, sales tax, construction funds, future augmentation expenses, and a hard cap for system balance and interconnection costs.[68]
- *Nov 8th:* Paxton Municipal Light Department (PMLD) and battery storage developer Lightshift Energy hosted a ribbon-cutting ceremony to unveil a 3 MW / 9 MWh BESS in Paxton, Massachusetts. Part of a first-of-a-kind program to deploy battery storage for Massachusetts Municipal Wholesale Electric Company (MMWEC)'s municipal utilities, the BESS project will reduce grid load during peak events for PMLD.[69]
- *Nov 8th*: Chinese-owned Alinta Energy has signed an early contractor involvement (ECI) agreement with Gamuda and Ferrovial Construction to advance the design of its estimated USD 860M Oven Mountain pumped hydro energy storage project planned for northern New South Wales (NSW). The Oven Mountain project, located in the New England Renewable Energy Zone, is positioned to provide eight hours of energy storage, aiding in the transition from coal-fired power to renewable sources in New South Wales.[70]
- *Nov 8th:* Energy storage developer Energy Vault Holdings Inc. (Energy Vault) announced plans to self-develop and own a 57 MW / 114 MWh BESS in Scurry County, Texas. Energy Vault signed a 10-year synthetic toll with Gridmatic. Construction of the Cross Trails BESS is expected to begin in Q1 2025, with

[63] https://www.cerogeneration.com/project/larks-green-south-gloucestershire-england/
[64] https://finance.yahoo.com/news/low-carbon-plans-500mw-renewable-152128839.html
[65] https://www.ipcn.nsw.gov.au/news/2024/11/middlebrook-solar-farm-approved-subject-to-conditions
[66] https://www.nationalgrid.com/media-centre/press-releases/lakeside-facility-connects-grid-and-becomes-uks-largest-transmission-connected-battery
[67] https://www.enbw.com/press/marbach_battery_storage_facility.html
[68] https://lf-puc.idaho.gov/WebLink/DocView.aspx?dbid=0&id=142214
[69] https://www.businesswire.com/news/home/20241107076905/en/Paxton-Municipal-Light-Department-Lightshift-Energy-and-MMWEC-Unveil-Battery-Storage-Project-at-Paxton%E2%80%99s-Substation
[70] https://www.pv-magazine-australia.com/2024/11/12/alinta-signs-early-contractor-partners-for-900-mw-pumped-hydro-project/

commercial operation expected by summer 2025.[71]

- *Nov 6th:* Eku Energy has successfully achieved financial close on its Williamsdale project (250 MW / 500 MWh BESS) in the Australian Capital Territory (ACT). The UK-based battery platform, operating under Macquarie's Green Investment Group, secured a revenue swap and a debt funding agreement with Westpac, Sumitomo Mitsui Banking Corporation, and MUFG Bank. Under a deal with the ACT government, Eku Energy will receive fixed quarterly payments for 15 years, while the government will share in the revenue generated by the facility. The battery will connect to the Evoenergy electricity distribution network and provide essential frequency control and ancillary services. The COD is anticipated in 2026.[72]
- *Nov 4th:* Estonian renewables company Utilitas has launched Latvia's first utility-scale BESS with a capacity of 10 MW / 20 MWh in Ventspils. The project, located adjacent to the Targale wind park, took two years to complete and is set to connect to the Latvian electricity transmission system this fall. The facility cost € 7M and was financed through a loan from OP Corporate Bank.[73]

Vendor / OEM News

- *Nov 27th:* On November 25th, Sungrow hosted a brand story film premiere and PhD Talk event, unveiling its brand story film "Bridge to a sustainable future". This film narrates Sungrow's journey of building a bridge through clean energy and technological innovation. It outlines five major tracks: solar energy, wind energy, energy storage, electric vehicles and charging, and hydrogen energy. These tracks enrich the application scenarios of clean energy conversion, inspire more creative methods of energy utilization, and enhance the user experience, ultimately aiming at "Clean Power for All".[74]
- *Nov 27th:* Chinese solar inverter and battery manufacturer Sungrow has secured significant distribution agreements in Australia, committing to supply 1.7 GWh of energy storage systems to businesses over the next three years. The deals include a 1 GWh contract with Raystech in Queensland and a 700 MWh contract with Solar Juice in New South Wales, partnering with wholesale distributors in the respective states.[75]
- *Nov 27th*: Korean battery maker LG Energy Solutions plans to start producing energy storage systems for stationary storage at its Polish factory to offset sluggish demand for EV batteries.[76]
- *Nov 21st*: Battery manufacturer Trina Storage announced the supply of 212 MWh of battery systems for two Aquila Clean Energy projects in Germany. The Strübbel site in Schleswig-Holstein, and the Wetzen site in Lower Saxony, are two of Aquila's 14 planned storage projects, which collectively aim to add over 900 MW of storage capacity across Germany and are part of the 4.5GW BESS portfolio that the company manages across Europe. The anticipated CODs are in 2025-26.[77]
- *Nov 5th:* Eos Energy Enterprises, Inc. (Eos), a leading provider of safe, scalable, efficient, and sustainable long-duration energy storage systems, today announced a new customer agreement with City Utilities (CU) to provide 36 MW / 216 MWh of energy storage for two project sites in Missouri.[78]

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[71] https://www.businesswire.com/news/home/20241108238574/en/Energy-Vault-Announces-FID-Approval-for-57-MW-Cross-Trails-Battery-Energy-Storage-System-in-Texas-and-10-Year-Offtake-Agreement-with-Gridmatic
[72] https://www.ekuenergy.com/news/eku-energy-reaches-financial-close-for-williamsdale-battery-energy-storage-system
[73] https://www.utilitas.ee/en/latvias-largest-battery-energy-storage-system-unveiled/
[74] https://www.prnewswire.com/news-releases/sungrows-brand-story-film-debuts-worldwide-unveiling-the-value-of-technology-and-embodying-the-brands-warmth-302317358.html
[75] https://onestepoffthegrid.com.au/sungrow-signs-1-7-gwh-battery-supply-deal-to-target-australian-business-customers/
[76] https://www.carscoops.com/2024/07/europes-biggest-battery-producer-considers-switching-to-static-storage-due-to-weak-ev-demand/
[7777] https://dpo.trinasolar.com/eu-en/resources/newsroom/eu-trina-storage-supply-aquila-clean-energy-106-mw-212mwh-bess-capabilities
[78] https://investors.eose.com/news-releases/news-release-details/eos-energy-signs-agreement-city-utilities-springfield-missouri

Grants and Funding News

- *Nov 29th*: Stoen Operator, a subsidiary of Germany's E.on, has received PLN 12M ($ 3M) from Poland's National Fund for Environmental Protection and Water Management to co-finance an energy storage project for its electricity grid. The funding is part of a broader PLN 1 billion program designed to enhance grid stability amid growing renewable energy adoption and EV charging infrastructure. The project involves constructing 10 energy storage units, each with a capacity of 150 kW / 200 kWh, in Warsaw. The total cost exceeds PLN 20M, and the initiative is expected to be completed by 2027.[79]
- *Nov 29th*: Spanish utility Naturgy Energy Group SA has signed an agreement to borrow EUR 400M (USD 422.5M) from the European Investment Bank (EIB) as the first tranche of a EUR 1B loan to support investments in renewables in Spain. The funds would be spent on new Solar PV and onshore wind projects, repowering and hybridization of existing plants, and some funds on battery energy storage.[80]
- *Nov 21st*: The U.S. Department of Energy (DOE) has awarded $ 50M over the next five years to establish the Low-cost Earth-abundant Na-ion Storage (LENS) Consortium. The consortium is led by DOE's Argonne National Laboratory, which includes Brookhaven National Laboratory, Lawrence Berkeley National Laboratory, Pacific Northwest National Laboratory, Sandia National Laboratories and SLAC National Accelerator Laboratory. The LENS Consortium aims to develop high-energy, long-lasting sodium-ion batteries using safe, abundant, inexpensive materials. This initiative addresses a critical need to reduce U.S. dependence on the limited and strategically important elements used in lithium-ion batteries, paving the way for a more sustainable future in EV technology.[81]
- *Nov 19th*: The European Commission has approved a € 590M ($ 622M) funding program in Bulgaria to support energy storage investments, aiming to add at least 3 GWh of new storage capacity to the national grid. The scheme, funded entirely by the Recovery and Resilience Facility (RRF), offers direct grants for various storage technologies, covering up to 50% of eligible project costs. Applications will be accepted until December 31, 2025. This initiative aligns with Bulgaria's Recovery and Resilience Plan, which was positively evaluated by the Commission and endorsed by the European Council.[82]
- *Nov 13th:* Energy storage solutions company NeoVolta announced that it has completed phase one of its loan application for $ 250M from the U.S. DOE Title 17 Loan Program (LPO) and has been approved to proceed with phase two technical due diligence. The company will establish a state-of-the-art manufacturing facility that can accommodate more than 150 high-paid employees to meet domestic content requirements for commercial grade BESS and other components. Additionally, NeoVolta will establish regional deployment and support centers to meet growing demand nationwide. The company will vertically integrate the manufacturing supply chain, primarily producing its battery cell technology, both cylindrical and prismatic. A percentage of that production will be utilized for 3rd party sales, enabling more manufacturers to participate with domestic content. The company will also expand into inverter production and assembly.[83]

[79] https://renewablesnow.com/news/polands-stoen-operator-gets-financing-for-energy-storage-project-1267371/
[80] https://renewablesnow.com/news/naturgy-taps-eib-for-eur-1bn-loan-to-boost-renewables-in-spain-1267344/
[81] https://www.businesswire.com/news/home/20241121357177/en/A-New-Era-for-Batteries-Argonne-Leads-50M-Sodium-ion-Innovation-Push
[82] https://seenews.com/news/ec-approves-590-mln-euro-bulgarian-state-aid-for-energy-storage-projects-1267368
[83] https://www.prnewswire.com/news-releases/neovolta-250m-loan-application-part-one-approved-by-the-us-department-of-energy-loan-program-302303653.html

Off-Take / Awards News

- *Nov 29th*: The Bulgarian Ministry of Energy has completed its first renewable energy auction, awarding more than 3 GW of new generation capacity and 1.176 GW of energy storage projects. A total of BGN 526M ($ 284M) has been allocated from the National Recovery and Resilience Plan (NPVU) to support these initiatives. The auction, which was launched in March 2024, set aside BGN 535M to assist wind and solar projects combined with energy storage across two procurement calls. In the first call, aimed at projects with capacities between 200 kW and 2 MW, 327 proposals were submitted. From these, 267 were shortlisted, leading to the selection of 200 projects that represent 435 MW of renewable capacity and 176 MW of storage. These projects are set to receive approximately BGN 107M ($ 57.78M). The second call targeted larger projects exceeding 200 kW. It received 70 proposals, of which 65 were shortlisted, and 49 were ultimately selected. These larger projects account for 2.66 GW of renewable capacity and 1,000 MW of energy storage, supported by BGN 419M ($ 226M). All winning projects must be operational by March 31, 2026.[84]
- *Nov 28th*: During a November 18th special board meeting, Alaska Energy Authority approved a 46.5 MW / 93 MWh BESS from Alaska Electric & Energy Cooperative, Inc. to provide oscillation dampening services for the Bradley Lake Hydroelectric Project on the Kenai Peninsula.[85]
- *Nov 27th*: Korea Zinc Inc., the world's largest lead and zinc smelter, announced that its Australian subsidiary, Ark Energy, has selected Hanwha Corp. as the preferred negotiation partner for a 275 MW / 2,200 MWh BESS project in Australia. This development highlights the growing collaboration between the two companies, which established a strategic partnership in September 2022. The partnership was formalized through a share exchange between Ark Energy and Hanwha Impact Co.'s U.S. subsidiary, HPS Global. The construction of the BESS is planned to begin in the third quarter of 2025, with commissioning expected to take place in 2026. This system will serve the New South Wales power market, delivering critical energy storage services for a period of 14 years.[86]
- *Nov 27th*: ENGIE and Neoen have signed a virtual battery offtake agreement for the Victorian Big Battery (300 MW / 450 MWh) near Geelong, Australia. The offtake agreement allows Engie to mirror the services of a grid-scale battery, providing the ability to virtually charge or discharge up to 40 MW of the Victoria Big Battery's capacity at any time as a financial product that is separate from the physical operation of the energy storage system. The agreement will kick off before the end of 2024 and will be complemented by a second similar transaction due to start in mid-2025.[87]
- *Nov 25th*: Plus Power announced that its Corazon Energy Storage project (150 MW / 600 MWh) in Albuquerque, New Mexico, was awarded a 20-year contract by the Public Service Company of New Mexico (PNM), subject to regulatory approvals in response to the utility's 2026-2028 Generation Resources RFP. The RFP was issued in 2022 and sought projects that will help serve the growing energy demand in New Mexico as it transitions to zero-carbon energy by 2045. PNM filed with the New Mexico Public Regulation Commission for approval of the project on Nov. 22, 2024. The anticipated COD is in late 2027.[88]
- *Nov 24th*: EDF Renewables North America has secured a 20-year Energy Storage PPA with Arizona Public Service (APS) for its Beehive BESS project (250 MW / 1,000 MWh) in the City of Peoria, Maricopa County, Arizona. The anticipated COD is in 2026.[89]
- *Nov 19th*: Energy services company Sunnova Energy International, Inc. (Sunnova) announced it was selected

[84] https://taiyangnews.info/markets/bulgaria-concludes-maiden-renewable-energy-auction
[85] https://www.akenergyauthority.org/Portals/0/About/Board%20Meetings/Documents/2024/2024.10.22/7Ai.%20%202024-13%20Resolution%20for%20AEEC%20BESS%20%20DRAFT.pdf?ver=3rN5QJ3vaqOH0ItPwmiprg%3D%3D
[86] https://www.chemanalyst.com/NewsAndDeals/NewsDetails/korea-zinc-and-hanwha-join-forces-on-australian-bess-project-31696
[87] https://esdnews.com.au/engie-inks-virtual-battery-offtake-deal-with-neoen/
[88] https://www.prnewswire.com/news-releases/plus-power-battery-storage-project-wins-public-service-company-of-new-mexico-award-302315592.html
[89] https://www.businesswire.com/news/home/20241104596290/en/EDF-Renewables-North-America-and-Arizona-Public-Service-Energy-Storage-Power-Purchase-Agreement

by the Penobscot Nation to deploy a 500 kW BESS in Maine for the tribe's community and commerce facilities.[90]

- *Nov 18th*: Aboitiz Power Corporation's geothermal subsidiary, AP Renewables Inc. (APRI), alongside Aboitiz Renewables Inc. (ARI), has partnered with Shandong Electric Power Engineering Consulting Institute Co. Ltd (SDEPCI) for an Engineering, Procurement, and Construction (EPC) contract for the Bay BESS Project. The project will be the first-ever BESS and geothermal hybrid system in the Philippines. The BESS size was not disclosed.[91]
- *Nov 18th*: Salt River Project (SRP) and Flatland Storage LLC, a subsidiary of EDP Renewables North America LLC (EDPR NA), have entered into an agreement for the Flatland Energy Storage Project (200 MW / 800 MWh) near Coolidge, Arizona. SRP currently has nearly 1,300 MW of storage and almost 3,000 megawatts of carbon-free resources online and serving customers. SRP also has significantly more solar energy and storage capacity under development, which, when operational by 2028, will make nearly half of SRP's generation carbon-free.[92]
- *Nov 16th*: At COP29, ACWA Power has signed a binding Implementation Agreement (IA) with Uzbekistan's Ministry of Energy (MoE) to develop up to 2GWh of standalone BESS capacity across the country. Under the agreement, ACWA Power receives contractual priority for 2 GWh of new BESS capacity in Uzbekistan, allowing the company to offer competitive tariffs. The agreement is valid for two years and may be extended by mutual consent. Both parties will collaborate on feasibility studies to identify optimal locations for BESS projects.[93]
- *Nov 15th*: Integrator Prevalon Energy has announced the signing of two new contracts with Innergex Renewable Energy Inc. to deploy battery systems at the San Andrés and Salvador facilities in Chile's Atacama region. The San Andrés facility (42 MW / 210 MWh BESS) and Salvador facility (20 MW / 100 MWh BESS) have a targeted completion in 2026.[94]
- *Nov 12th*: Strata Clean Energy is excited to announce a 20-year tolling agreement with Arizona Public Service (APS) for the 100 MW/400 MWh White Tank Energy Storage project located near Avondale in Maricopa County, AZ. The project is anticipated to be completed and integrated into the APS energy grid in April 2027. This latest agreement underscores Strata's commitment to expanding its 7 GWh storage pipeline in Arizona, with over 1.6 GWh of storage currently under construction.[95]

[90] https://www.businesswire.com/news/home/20241119343214/en/Sunnova-Awarded-Microgrid-Project-to-Bolster-Grid-Resiliency-for-Penobscot-Nation-in-Maine
[91] https://powerphilippines.com/aboitiz-power-unit-sign-epc-for-bess-project-in-laguna/
[92] https://www.prnewswire.com/news-releases/srp-and-edp-renewables-announce-new-energy-storage-system-to-support-increasing-energy-demand-302308626.html
[93] https://www.acwapower.com/news/acwa-power-signs-implementation-agreement-with-the-uzbek-ministry-of-energy-for-2-gwh-battery-energy-storage-systems-capacity-en/
[94] https://prevalonenergy.com/prevalon-energy-and-innergex-sign-two-contracts-for-bess-in-chile/
[95] https://www.businesswire.com/news/home/20241112425516/en/Strata-Clean-Energy-Enters-into-20-Year-Tolling-Agreement-with-Arizona-Public-Service-for-400-MWh-White-Tank-Energy-Storage-Project

Open Energy Storage RFPs/RFQs/RFIs

Off-Taker	Description
APS	Arizona Public Service is conducting an All-Source RFP. It is seeking approximately 2,000 MWs of resources to meet the growing needs of its residential and business customers with affordable, reliable, and clean electricity. RFP is open to all technologies. The proposals are due February 5, 2025, by 11:59 PM EST.[96]
Australian National Electricity Market	Under the Capacity Investment Scheme (CIS), the Australian government announced support for six large-scale battery projects in Victoria and South Australia, totaling 995 MW / 3,626 MWh of capacity. These batteries, capable of operating for up to four hours, are expected to begin service in 2027. The government is also inviting many qualitative unsuccessful bidders to reapply in the upcoming National Electricity Market (NEM) tender scheduled for later this year. [97]
ConEd / O&R	Consolidated Edison and Orange & Rockland Utilities announced to stakeholders their intention to release a Utility Dispatch Rights (UDR) RFP for transmission and distribution connected storage systems in the fourth quarter of 2024, which will begin commercial operation by the end of 2030. Through this procurement, they will seek bids for the scheduling and dispatch rights for bulk-connected energy storage projects.[98]
Colorado Springs Utilities	Colorado Springs Utilities intends to release an RFP to secure 1,250 MW of new renewable energy and energy storage capacity by 2030. The utility is seeking approximately 525 MW of solar, 100 MW of energy storage, and 625 MW of wind capacity, in addition to 350 MW of natural gas. The target date for new resources to be integrated is May 2028.[99]
Dominion Energy	Dominion Energy released an RFP for PPAs for new PV plus storage, among other renewable generation, for assets between 50 kW to 3 MW. All storage must have grid charging capacity. Proposals are due by February 3, 2025, at 3:00 PM Eastern time. [100]
Greece	Greece has launched a tender for 200 MW of standalone battery energy storage systems (BESS), forming part of its broader 1-GW energy storage initiative. Approved by the Regulatory Authority for Energy, Waste, and Water (RAAEY), the tender will remain open for bids until December 23, 2024. Projects can secure subsidies of up to EUR 200,000 (USD 217,920) per MWh, with a bidding ceiling of EUR 145,000 per MWh. This marks the final phase of Greece's energy storage program, following two successful rounds that allocated 411.8 MW and 299.8 MW, respectively. Eligible projects must provide four-hour storage capacity and be situated in Western Macedonia or the Peloponnese region. A specific allocation of 50 MW is reserved for four municipalities in Peloponnese. Developers must ensure their projects meet the connection application deadline of January 31, 2026.[101]
IPC	The Idaho Power Company (IPC) is preparing to issue an RFP for energy and capacity products. IPC identified a need for 138 MW of incremental peak capacity and 555 MW of supply-side resource additions. Asset purchases, PPAs, and battery storage agreements are eligible types of bids.[102]
LES	Lincoln Electric System (LES), in Lincoln, Nebraska, is soliciting discussions with entities interested in providing LES with firm or deliverable capacity within the Southwest Power Pool to meet LES' own load and reserve requirements for the 2026-2030 period. All offers, capacity amounts, length of term, and types of participation will be considered. Bids are due by January 31, 2025.[103]
Malawi	The Delegation of the European Union to Malawi is launching a call for tenders using a middle value: a negotiated procedure for the supply, delivery, and installation of lithium batteries and hybrid inverters. Interested parties must email the contact e-mail on the webpage.[104]
NV Energy	NV Energy is issuing a 2024 all-source request for proposals to interested parties to secure proposals for acquiring long-term dispatchable energy and energy storage resources with a minimum size of 20 MW and all associated environmental and renewable energy attributes, as applicable. The company

[96] https://www.aps.com/en/About/Our-Company/Doing-Business-with-Us/Resource-Planning/Request-for-Proposals
[97] https://list.solar/news/australia-boosts/
[98] https://www.coned.com/en/business-partners/business-opportunities/bulk-energy-storage-request-for-proposals
[99] https://www.bidnetdirect.com/colorado/colorado-springs-utilities
[100] https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/global/renewable-projects/rfp/2024/2024-renewable-ppa-rfp.pdf?rev=61b0641049424075a48b60e47823e0de&hash=E7C5984069F0F2EFD35CE5EC79DEB48C
[101] https://list.solar/news/greece-launches/
[102] https://docs.idahopower.com/pdfs/AboutUs/businessToBusiness/2028_IPC_AllSource_RFP.pdf
[103] https://naema.com/lincoln-electric-system-spp-capacity-solicitation/
[104] https://www.eeas.europa.eu/eeas/how-apply-eeas-call-tenders_en

Off-Taker	Description
	is seeking proposals for renewable generation, conventional generation, and energy storage under various types of agreements. The deadline for bids is February 14, 2025.[105]
PGE	Poland's PGE Group plans to release a procurement process for the design and turnkey construction of 263 MW BESS with a minimum capacity of 900 MWh. This facility will be located near the Żarnowiec Pumped Storage Power Plant, part of the PGE Group.[106]
RVUNL	Rajasthan Vidyut Utpadan Nigam Ltd (RVUNL) has launched a tender for selection of developers to set up standalone battery energy systems (BESS) for an aggregate storage capacity of 1,000 MWh (500 MW / 100 MWh) in Rajasthan. The BESS must support two cycles of complete charging and discharging per day. The selected bidders will develop state transmission system-connected projects on a build-own-operate basis at RVUNL power generating stations across Rajasthan. RVUNL may allot additional capacity up to 500 MW/1,000 MWh under Green Shoe option.[107]
Sasipa	Sasipa, a state-owned utility on Chile's Easter Island, issued an expression of interest (EOI) to identify potential partners for building a 2.994 MW Solar PV and a BESS of at least 2 MWh. The selected contractor will receive a contract to design, construct, monitor, and maintain the solar and BESS plant. The maintenance period will extend for 24 months.[108]
SCPPA	The Southern California Public Power Authority (SCPPA) is soliciting competitive proposals from qualified respondents for standalone energy storage. Offers are due December 31, 2024.[109]
Spanish Ministry	The Spanish Ministry for Ecological Transition launched a tender to award up to 1,259 MW of synchronous power generating modules and synchronous storage capacity. Applications will be chosen on a first-come, first-served basis. [110]
SPS	Southwestern Public Service Company (SPS) is issuing an all-source RFP to seek ~3,190 MW of capacity during the "Capacity Need Period" in New Mexico and the SPP region of Texas. Projects must be built on or before May 1, 2030, though projects seeking to replace existing coal and gas generation may need to be sooner due to retirements. Proposals are due by January 3, 2025.[111]
USVI	Accion Group, LLC (Accion) is conducting an auction on behalf of the U.S. Virgin Islands for six renewable resources presently owned by VIElectron, LLC, with a total of 128 MW of Solar PV and 63.2 MWh BESS. The initial auction for the first facility, Petronella, is being conducted expeditiously in response to the emergency. The initial unit is fully operational, has a 25-year PPA with WAPA, and has an assured Point of Interconnection and transmission.[112]
WSCC	West Sussex County Council has invited to tender (ITT) for a 16 MW / 32 MWh BESS. The ITT seeks private and public sector organizations to deliver pre-construction services agreement (PCSA) services for the Halewick Lane BESS phase 3 project.[113]
Xcel	The SPS section of Xcel Energy has released an All-source RFP. All resource types are eligible, including, but not limited to, wind, solar, wind plus storage, solar plus storage, standalone storage, natural gas-fired, hydrogen-fueled technologies, transitional technologies, and repowering. Proposals that incorporate a transition over time to carbon-free, for example, a gas-fired combustion turbine generator that transitions to hydrogen-fueled, will also be considered. Proposals are due January 3, 2025.[114]

[105] https://www.nvenergy.com/about-nvenergy/doing-business-with-us/energy-supply-rfps/2024-all-source-request-for-proposals
[106] https://ceenergynews.com/renewables/pge-group-to-launch-a-tender-for-a-large-scale-battery-energy-storage-facility/
[107] https://www.world-energy.org/article/45554.html
[108] https://www.pvknowhow.com/chilean-utility-seeks-partners-for-solar-project/
[109] https://scppa.org/wp-content/uploads/2024/04/2024-SCPPA-Standalone-Energy-Storage-RFP.pdf
[110] https://weadapt.org/organisation/miteco/?tab=about
[111] https://www.xcelenergy.com/company/rates_and_regulations/resource_plans/sps_2024_all-source_rfp
[112] https://usvi.accionpower.com/_usvia_2401/home.asp
[113] https://www.world-energy.org/article/45944.html
[114] https://www.xcelenergy.com/company/rates_and_regulations/resource_plans/sps%202024%20all-source%20rfp

General Energy Storage News

Final Illinois DER Workshop Approaching[115]

Nov 30th: Public Act 102-0662, the "Climate and Equitable Jobs Act," was signed into law by Governor Pritzker on September 15, 2021. The Commission was required to investigate the value of and compensation for distributed energy resources by conducting a series of workshops. The initial set of workshops to develop the strawman formula and inputs was conducted in 2023. The second set of workshops, aiming to refine the findings, began in 2024. At the conclusion of the second set of workshops, the Commission will initiate a rulemaking. The last scheduled workshop is scheduled for December 11th. Parties wishing to be on the distribution list for Workshop Series 1 should e-mail DER_Facilitator@enernex.com requesting to be added to the distribution list with the subject line "Value of DER Workshop Distribution List Additional Request."

Italy Reaches 12 GW of Energy Storage[116]

Nov 29th: Terna, the Italian grid operator, published its monthly electricity demand update for November 2024. From January 1st to October 31st, Italy added 1.74 GW of storage system projects. It was the first time Terma disclosed energy storage system data. Terna reported Italy had around 707,000 installations at the end of October, corresponding to 11,783 MWh of capacity and 5,186 MW of nominal power, of which 864 MW was in the form of utility-scale energy storage sites. In 2024, Italy accelerated its energy transition, with over 6 GW of new renewable capacity installed, already exceeding the 2023 total.

SolarEdge Closing Energy Storage Division

Nov 27th: SolarEdge Technologies, Inc. ("SolarEdge" or the "Company") (NASDAQ: SEDG), a global leader in smart energy technology, announced today that as part of its focus on its core solar activities, it will cease all activities of its Energy Storage division. This decision will result in a workforce reduction of approximately 500 employees, most of whom are in South Korea. The expected quarterly operating expenses savings due to the closure are approximately $7.5 million, with the full run rate expected to be achieved by the second half of 2025. The Company intends to sell the assets related to the storage division activities, including its battery cell and pack manufacturing facilities. This does not impact the solar business sale of batteries for residential and C&I markets.[117]

PNM Plans Additional 430 MW New Solar and Storage[118]

Nov 25th: PNM, a wholly owned subsidiary of TXNM Energy, filed an application with the New Mexico Public Regulation Commission (NMPRC) for adding new energy resources by summer 2028. The proposed resource portfolio extends existing resources and adds 430 MW of new solar and battery storage to meet PNM's forecasted peak load requirements in 2028. The filing requests approval for:

- Extension of a Valencia Purchase Power Agreement (PPA) for 167 MW through 2039 (current agreement expires in 2028)
- Addition of 300 MW capacity through Energy Storage Agreements (ESAs) for two 150 MW standalone battery storage facilities
- Addition of 130 MW solar and battery storage facility (100 MW solar, 30 MW battery storage), with an additional 20 MW of battery storage, to be owned and operated by PNM

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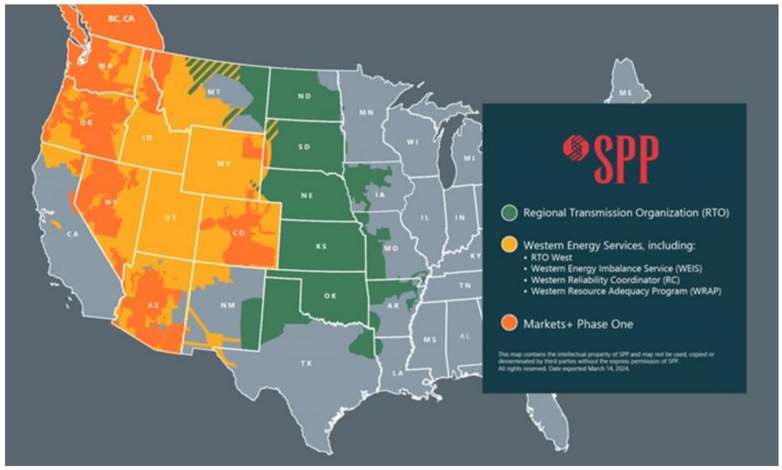
[115] https://www.icc.illinois.gov/programs/climate-and-equitable-jobs-act-implementation-investigation
[116] https://www.terna.it/en/media/press-releases/detail/electricity-consumption-october-2024
[117] https://www.businesswire.com/news/home/20241127876220/en/SolarEdge-Announces-Closure-of-Energy-Storage-Division
[118] https://www.prnewswire.com/news-releases/pnm-files-application-for-new-resources-in-2028-302314788.html

More Southwestern Utilities to Join Markets+ Over Western EIM[119]



Nov 25th: Arizona Public Service (APS), Salt River Project (SRP), Tucson Electric Power (TEP), and UniSource Energy Services announced plans to join Southwest Power Pool's (SPP) Markets+, a day-ahead and real-time energy market that is anticipated to span through the northwest, southwest, and mountain west regions of the U.S. The new market is expected to bring enhanced reliability and savings of nearly $100 million above current market participation, passed back across the electric companies' customers. It will also support adding more renewable resources to the energy grid as Arizona continues to experience residential and business growth and record-breaking energy demand. Along with other western utilities, Markets+ is anticipated to help the Arizona energy providers respond efficiently to market price changes and regional weather events driving energy usage while giving them access to a larger pool of diverse generation resources. After several years of strategic planning and development, APS, SRP, TEP, and UniSource expect to participate in the new market as early as 2027.

The following are participants in Markets+ phase one development**:**[120]

- Advanced Power Alliance
- American Clean Power Association
- Arizona Public Service Company
- Basin Electric Power Cooperative
- Black Hills Colorado Electric
- Black Hills Power, Inc.
- Bonneville Power Administration
- Chelan (PUD No.1 of Chelan County)
- Cheyenne Light, Fuel & Power Co.
- Clean Energy Buyers Association
- Colorado Independent Energy Association
- Interwest Energy Alliance
- Liberty Utilities (Calpeco Electric)
- Municipal Energy Agency of Nebraska
- Natural Resources Defense Council
- Northwest & Intermountain Power Producers Coalition (NIPPC)
- NW Energy Coalition
- Powerex Corp.
- Public Generating Pool
- Public Power Council
- Public Service Company of Colorado
- PUD No. 2 of Grant County, Washington
- Puget Sound Energy
- Renewable Northwest
- Salt River Project
- Sierra Club
- Snohomish Public Utility
- Tacoma Power
- The Energy Authority
- Tri-State
- Tucson Electric Power Company
- Western Energy Freedom Action
- Western Power Trading Forum
- Western Resource Advocates

Markets+ is not to be confused with the SPP Western Energy Imbalance Service (WEIS) Market. SPP's WEIS market launched in February 2021 and balances generation and load regionally and in real-time for participants in the Western Interconnection. Utilities do not have to be members of the SPP RTO to participate. The market centrally dispatches energy from participating resources throughout the region every five minutes, enhancing both the reliability and affordability of electricity delivery from utilities to their customers.

Markets+ is unrelated to WEIS. SPP submitted a new Markets+ tariff to FERC in April 2024, which is separate from the WEIS market operating in the Western Interconnection. SPP describes Markets+ as more than just a day-ahead market offering. It's a conceptual bundle of services proposed by SPP that would centralize day-ahead and real-time unit commitment and dispatch, utilize hurdle-free transmission service across its footprint, and pave the way for the reliable integration of a rapidly growing renewable generation fleet. For utilities that see

[119] https://www.businesswire.com/news/home/20241125569956/en/Arizona-Utilities-Plan-to-Join-Markets-to-Strengthen-Grid-Reliability-and-Resilience
[120] https://spp.org/western-services/

value in these services but who aren't ready to pursue full membership in a regional transmission organization (RTO) currently, Markets+ provides a voluntary, incremental opportunity to realize significant benefits. Markets+ includes an intra-day reliability unit commitment (RUC) process, which executes at least every four hours, a short-term intra-day reliability unit commitment process that executes every fifteen minutes and fast-start pricing for commitments in real-time.

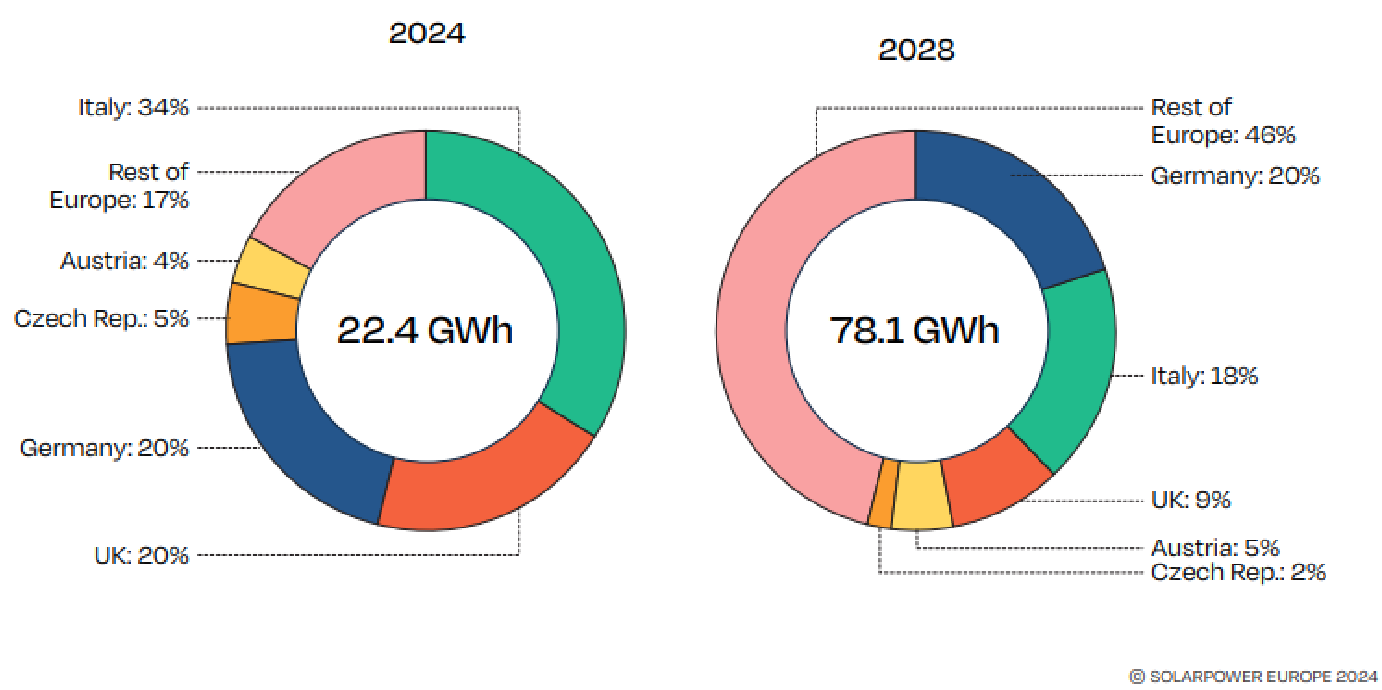
SolarPower Europe Names Italy and the UK as Best European Markets[121]

Nov 24th: SolarPower Europe's European Market Outlook for Battery Storage 2024-2028 highlights Italy as a leading market for battery storage in Europe. Italy's large-scale market is driven by three key factors:

- Capacity Market: This mechanism provides 15-year contracts to support investments in storage capacity, ensuring supply security. Payments, calculated in EUR/MWh with derating factors, can be combined with merchant revenue streams.
- MACSE Scheme: The newly introduced Electricity Storage Capacity Procurement Mechanism (MACSE) scheme offers long-term contracts, ranging from 15 to 30 years, to back investments in battery storage and pumped hydropower.
- Spot Market. The spot market presents great revenue potential, with short-term price signals driving power system balance and asset optimization.

There is a new energy trading platform to be launched by Terna, whereby storage owners can sell 'time-shifting' of energy to renewable energy owners, plus ancillary services. Projects will generally have a storage capacity of 4 hours or more.

The report also identifies the UK as Europe's most attractive large-scale energy storage market, thanks to an extensive project pipeline and ambitious goals of achieving 24 GW of storage by 2030. The UK government has eliminated asset size restrictions and actively funds front-of-the-meter (FTM).



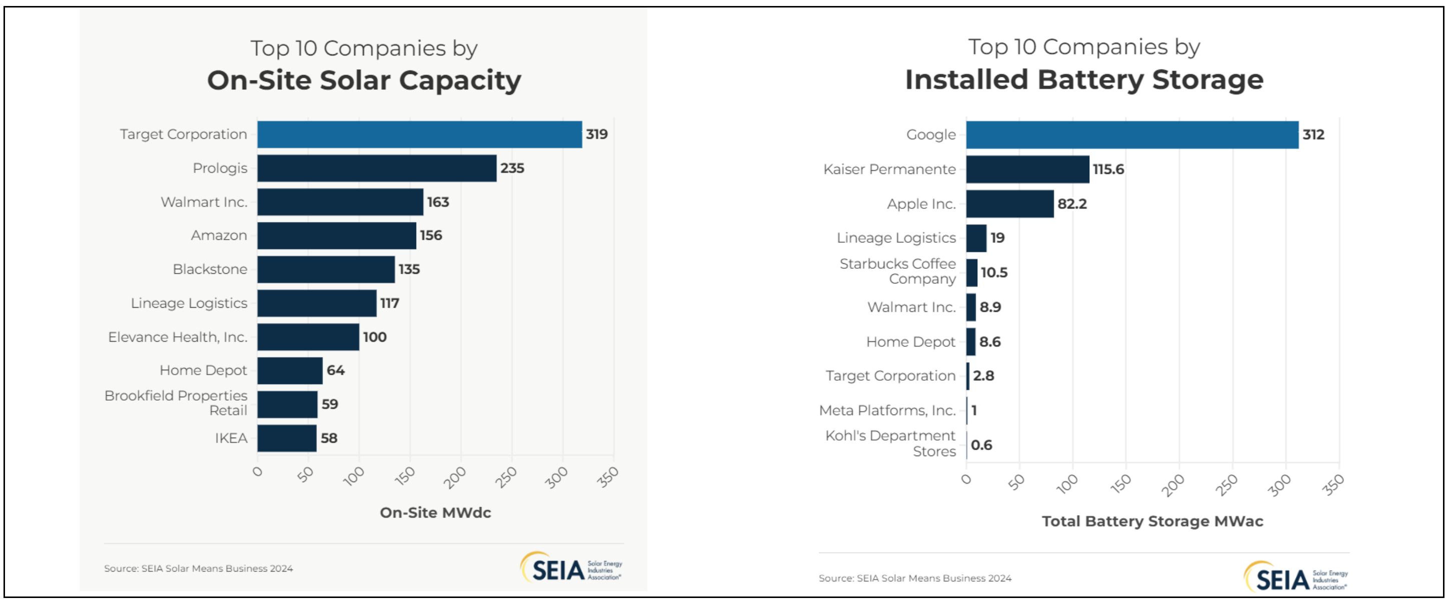
[121] https://cdn.rinnovabili.it/wp-content/uploads/2024/06/1424_SPE_BESS_report_10_mr_d069de2e2e.pdf

Eaton Launches New xStorage™ Solution[122]

Nov 21st: Eaton announced the xStorage™ battery storage solution. With built-in microgrid islanding capabilities, xStorage BESS helps minimize the impact of unplanned utility outages. It also provides the digital capabilities needed to monetize energy systems through participation in grid-connected demand response programs and energy markets. Predictive, remote equipment health monitoring and system management are enabled through Eaton's Brightlayer software suite. To help customers scale as needs evolve, Eaton's xStorage BESS provides 250 to 1000 kilo-watt hours (kWh) of usable stored energy and can be paralleled to double capacity in the future. A modular design provides customers with flexible installation options and a reduced footprint. With Eaton's national network of highly trained field service engineers, the turnkey solution can incorporate expert commissioning and lifecycle maintenance services.

SEIA Highlights Top Ten Corporate Solar and Battery Storage Customers[123]

Nov 20th: The Solar Energy Industry Association (SEIA) released its Solar Means Business 2024 report highlighting the top ten corporate companies with on-site solar and battery storage installations. In the United States, rooftop commercial solar capacity has grown at a compound annual growth rate (CAGR) of 12% over the past five years. Target has consistently ranked as the top company for on-site solar installations, with Prologis, Walmart, and Amazon also maintaining their positions from the 2022 report. Google leads with 312 MW_{ac} of installed storage capacity in the energy storage sector, surpassing the combined battery storage of the remaining companies in the top ten by 25%.



GUS Technology and Toshiba Partner on NTO Batteries[124]

Nov 20th: GUS Technology, a prominent player in Taiwan's lithium-ion battery sector, has signed a Technical Assistance and License Agreement with Japan's Toshiba Corporation. This partnership aims to commercialize next-generation lithium-ion battery cells using Niobium Titanium Oxide (NTO) as the anode, delivering superior performance, enhanced safety, and cost-effective solutions, with a global market launch planned for next year. The NTO lithium-ion battery cells produced will feature extended cycle life, wide operating temperature ranges,

[122] https://www.businesswire.com/news/home/20241121959335/en/Eaton-Launches-Energy-Storage-System-to-Accelerate-Decarbonization-and-Electrification-for-Commercial-and-Industrial-Customers-Across-North-America
[123] https://seia.org/research-resources/solar-means-business/
[124] https://www.prnewswire.com/news-releases/gus-technology-and-toshiba-signed-agreement-for-next-generation-niobium-titanium-oxide-nto-lithium-ion-batteries-302299592.html

and high charge-discharge rates, with energy density boosted by up to 1.5 times compared to current technologies.

ERCOT Approves Three Storage-Related NPRRs[125]

Nov 20th: ERCOT approved NPRR*1246*, *NOGRR268*, *OBDRR052*, *and PGRR118,* which make changes to terminology for the single-model era. PJM

Romania Opens €150 Million in Battery Storage Grants[126]

Nov 19th: The Romanian Ministry of Energy has initiated a grant program supported by the Modernization Fund, allocating €150 million to promote the development of battery storage systems integrated with existing renewable energy projects, including wind, solar, and hydroelectric sources. The batteries must derive at least 75% of their energy from the connected renewable source to qualify. The program offers non-refundable grants totaling €150 million under a state aid scheme, using a competitive bidding process to finance new behind-the-meter battery storage systems. Applications will be accepted until January 17, 2025.

e-Storage Announces Kentucky 6 GWh BESS Manufacturing Facility[127]

Nov 18th: e-Storage's subsidiary Shelbyville Battery Manufacturing is investing approximately $712 million to establish a 6-gigawatt-hour battery cell, module, and packaging manufacturing facility in Shelbyville, Kentucky. The plant will have an initial capacity of 3 GWh annually, doubling to 6 GWh in subsequent years. Production will begin production in late 2025, with full-scale operations expected by early 2026.

CAISO Kicks off New RA Workshop[128]

Nov 18th: The California Independent System Operator (CAISO) kicked off a Resource Adequacy (RA) Modeling and Design "workshop" designed to reevaluate and refine several mechanisms the ISO uses to ensure resource adequacy. This workshop series builds on the initial RA Modeling and Program Design working group established in 2023. The new workshop series will consist of three tracks: Track 1 – Modeling, Track 2 – Outage Substitution and Availability and Performance Incentive Mechanisms, and Track 3 – Visibility and Backstop. Upcoming events include:

- Dec 05, 2024 - Issue paper workshop comments due
- Dec 10, 2024 - Modeling workshop comments due
- Dec 13, 2024 - Straw proposal input workshop
- Dec 30, 2024 - Comments due

[125] https://www.ercot.com/mktrules/issues/NPRR1246#votingrecord
[126] https://www.thediplomat.ro/2024/11/19/ministry-of-energy-new-call-for-projects-worth-150-million-euros-for-investments-in-battery-storage/
[127] https://csestorage.com/e-storage-opens-state-of-the-art-manufacturing-facility-in-shelbyville-kentucky/
[128] https://stakeholdercenter.caiso.com/StakeholderInitiatives/Resource-adequacy-modeling-and-program-design

Sungrow Aces Second Large-Scale Burn Test[129]

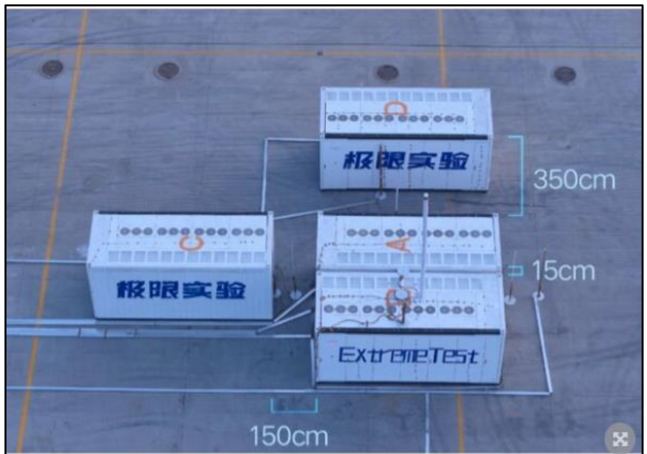


Image: Four fully charged Sungrow's& PowerTitan 2.0 BESS (5MWh each), each at 100% SOC (state of charge), were arranged in back-to-back (15 cm), side-by-side (150 cm), and face-to-face (350 cm) configurations, with all fire suppression systems disabled.

Nov 17th: Sungrow completed a second large-scale burn test to demonstrate advancements in lithium-ion BESS safety publicly. In June 2024, Sungrow took the bold step of deliberately combusting 10 MWh of its PowerTitan 1.0 liquid-cooled BESS, becoming the first company globally to conduct a large-scale burn test on an energy storage system. Recently, the company invested approximately 4.23 million USD to perform a second demonstration, making it the world's largest and longest burn test on 20 MWh of its PowerTitan 2.0 liquid-cooled BESS. Four fully charged containers, each at 100% SOC, were arranged in back-to-back (15 cm), side-by-side (150 cm), and face-to-face (350 cm) configurations, with all fire suppression systems disabled to replicate a real-world power plant fire scenario. The results were clear: there was no fire propagation during the runaway thermal incident. In contrast to conventional industry burn tests, this test was a significant upgrade in terms of combustion duration, testing conditions, and safety standards, establishing a new benchmark for safety through rigorous and extreme testing.

Enel Group to Invest € 12B in Renewables and Storage[130]

Nov 15th: Enel Group's 2024-2027 Strategic Plan calls for a total gross investment of about €43 billion, an increase of €7 billion with respect to the previous plan. Most of this will go to Europe, with about 75% of the total, while the remaining 25% will be shared by Latin America and North America. Of this, 78% will be allocated to Italy (more than €16 billion) and Spain (€4 billion), two countries with favorable regulatory frameworks, while 22% will be allocated to Latin America (nearly €6 billion). The Group will invest about €12 billion in renewables to add 12 GW of new capacity, with a focus on onshore wind and programmable technologies such as hydro and batteries. By 2027, total renewable capacity will grow further to about 76 GW, with an increase in generation of more than 15%, mainly in Europe and the United States.

New Electricity Law in Jordan Promotes Energy Storage[131]

Nov 11th: Jordan has enacted a new electricity law that replaces the temporary legislation from 2002. This updated framework is aimed at fostering investment in electricity storage and green hydrogen projects under public-private partnership (PPP) models. Additionally, the law enables private individuals to build and operate their own energy storage facilities for personal use, a measure anticipated to enhance grid security and promote sustainable energy practices across the country.

PNM To Join CAISO EDAM[132]

Nov 8th: Public Service Company of New Mexico (PNM) announced on Monday its intention to join the California Independent System Operator's (CAISO) Extended Day-Ahead Market (EDAM) starting in 2027. EDAM is scheduled to begin operations in spring 2026. This decision marks a victory for EDAM over the competing Markets+ initiative by the Southwest Power Pool, which is also expected to launch in 2027. PNM is already a participant in CAISO's Western Energy Imbalance Market (WEIM).

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[129] https://www.prnewswire.com/news-releases/eigs-fidra-energy-and-sungrow-enter-into-strategic-partnership-on-4-4gwh-bess-projects-302310352.html

[130] https://www.enel.com/investors/strategy/strategic-plan-2025-2027
[131] https://www.ess-news.com/2024/11/11/jordans-new-electricity-law-encourages-investment-in-energy-storage/
[132] https://www.prnewswire.com/news-releases/pnm-announces-plan-to-join-caiso-edam-regional-energy-market-302300927.html

Maine Releases Draft Plan for 1,700 New Battery Systems with Incentive[133]

Nov 8th: On November 8, 2024, Efficiency Maine released its draft Triennial Plan VI for fiscal years 2026 to 2028, aiming to achieve a 137 MW reduction in summer peak load by 2028 and deploy 1,700 new small commercial and residential battery systems. The plan includes an expansion of the existing Distributed Energy Resources (DER) initiative, introducing new participation options for all DER measures. Among these is an incentive for small batteries to be used as emergency backup power, inspired by the success of a similar program by Green Mountain Power in Vermont. This initiative, called the Renewable Reliability battery measure, allows aggregators (equipment manufacturers, third-party owners, and electric load aggregators) to establish payment arrangements with residential and small commercial customers, compensating them based on performance. Under this measure, Efficiency Maine will provide incentives directly to aggregators to facilitate these payment agreements. Initially, $200/kW per year will be offered to aggregators based on the capacity made available during targeted peak hours. Customers with existing battery systems or those installed outside the Renewable Reliability program can enroll in the DERMS platform to access performance-based incentives through the Open Access Battery Incentive. This program, a continuation of Triennial Plan V, is designed for residential and small commercial customers with storage capacities of up to 20 kW.

NJ BPU Submits Final Incentive Program Proposal[134]

Nov 7th: On November 7, 2024, the New Jersey Board of Public Utilities (BPU) submitted its final proposal for the New Jersey Storage Incentive Program (SIP). This updated version includes several changes from the 2022 proposal. Fixed incentives will no longer be tied to uptime metrics. Instead, grid supply projects must undergo a competitive solicitation process. Additionally, bid participation fees will be refundable, and incentives for overburdened communities will apply to both distributed and grid supply categories. A new pre-development fee has been introduced to encourage the timely completion of grid supply projects. The proposal outlines initial incentive targets based on project capacity, with a 33% bonus for projects located in overburdened communities. The targets are set as follows: $300 per kWh for projects up to 100 kW (with an additional $100 per kWh for those in overburdened communities), $200 per kWh for projects between 100 kW and 500 kW (plus $67 per kWh for overburdened communities), and $150 per kWh for projects over 500 kW (plus $50 per kWh for overburdened communities). Performance-based incentives have been postponed until adequate data is available for evaluation. Solar-plus-storage projects that do not qualify for the successor solar incentive program will also be eligible for SIP. Along with the Straw Proposal, the NJBPU held a virtual stakeholder meeting on November 20, 2024, to present the NJSIP Straw Proposal and associated draft rules. This 2024 Straw Proposal builds on the NJBPU's September 29, 2022, NJSIP Straw Proposal to reflect stakeholder input solicited by the NJBPU via a Request for Information, which was issued by the NJBPU under Docket Number. QO22080540 on August 8, 2023.

Duke-Approved IRP Eyes 1 GW of Storage[135]

Nov 1st: The North Carolina Utilities Commission approved the Duke Energy Progress, LLC, and Duke Energy Carolinas, LLC (Duke) Consolidated Carbon Plan and Integrated Resource Plan (CPIRP). Duke's plan, amongst others, includes the following renewables and storage-related actions:

- Conducting two competitive solar procurements between 2025-2026, targeting 3,460 MW of new controllable solar generation to be placed into service by 2031

[133] https://mpuc-cms.maine.gov/CQM.Public.WebUI/MatterManagement/MatterFilingItem.aspx?FilingSeq=126588&CaseNumber=2024-00310
[134] https://publicaccess.bpu.state.nj.us/CaseSummary.aspx?case_id=2111434
[135] https://www.ncuc.gov/documents/2024carbonplanpr.pdf

- Procuring 1,100 MW of battery storage, including 475 MW of standalone storage and at least 625 MW of battery energy storage paired with solar generation, to be placed into service by 2031
- Procuring 1,200 MW of onshore wind to achieve commercial operation by 2033, including at least 300 MW targeted for commercial operation by 2031
- Working toward the construction of 1,834 MW of pumped storage hydropower at the Bad Creek Hydroelectric Station in Oconee County, South Carolina, to be placed into service by 2034
- Conducting early development activities associated with 300 MW of advanced nuclear generation to be placed into service by 2034 and an additional 300 MW of advanced nuclear generation to be placed into service by 2035
- Conducting an advanced request for information (ARFI) process to gather information regarding the development of up to 2,400 MW of offshore wind off the coast of North Carolina to achieve commercial operation by 2035

PURA Issues Final Decision on Year 4 of Connecticut Annual Energy Storage System Program[136]

Nov 1st: On November 1, 2024, the Public Utilities Regulatory Authority (PURA) issued a final decision on Year 4 updates to the Energy Storage Solutions Program, administered by Eversource Energy, the United Illuminating Company, and the Connecticut Green Bank. On July 28, 2021, the Authority established a nine-year program to support electric storage in Connecticut, starting on January 1, 2022, and continuing through at least December 31, 2030. The upfront incentives for residential participants remain unchanged, while the incentives for commercial projects have been revised. Now, there are three declining blocks for commercial incentives instead of four: 50 MW for the first block, 25 MW for the second, and 51.1 MW for the final block. This final block is 13.9 MW smaller than initially proposed in June 2024 due to an overallocation in Tranche 2; the excess capacity has been deducted from Tranche 3. The starting incentive rates for projects are $182 per kWh for small projects, $159.25 per kWh for medium projects, and $91 per kWh for large projects. Due to low residential participation, PURA proposed reallocating future residential capacity to the commercial sector. Each of the residential Tranches 2 and 3 will now have 50 MW, totaling 150 MW across all three tranches. The remaining 140 MW will form a new commercial Tranche 4, bringing the total to 430 MW across four tranches. Multifamily residential projects must share system resilience benefits equitably with tenants rather than providing monetary incentives. These projects can apply for a waiver to install front-of-the-meter systems if behind-the-meter systems are cost-prohibitive. PURA introduced minor changes to the utility interconnection guidelines to improve the interconnection of storage systems and directed those future updates to be made to Docket No. 17-12-03RE06. While PURA acknowledged the end-of-life study, it decided to defer decisions on this matter to the legislature. Program administrators are now required to provide performance data to participants upon request. Year 1 participants, who were previously eligible for forward capacity market participation, can trade this right for a 25% additional incentive on their upfront payment if their system has not yet been energized. Storage aggregators are now also eligible to submit applications. The program has faced challenges with participants meeting the base requirements (80% energy dispatched across 90% of dispatch hours). To address this issue, PURA revised the performance and clawback formulas to impose proportional penalties rather than flat fees for underperformance. Participants will no longer be removed from the program after two violations but will incur additional clawback fees. Waivers for clawback fees will now require PURA approval. By May 1, 2025, the program administrator must propose a performance-based incentive model, where incentives are provided only after specific passive dispatch performance milestones are achieved. The passive dispatch window has been shortened to 5 PM–8 PM, and utilities may conduct test dispatch events in March and April to prepare for the peak season.

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[136] https://www.dpuc.state.ct.us/DOCKCURR.NSF/8e6fc37a54110e3e852576190052b64d/4f3836e932e8f0c585258bc80045f29b/$FILE/24-08-05%20PFD%20.pdf

NJ BPU Approves PSEG Proposed Energy Storage VPP Program[137]

Oct 31st: On December 1, 2023, Public Service Electric & Gas Company (PSE&G) filed a petition with the New Jersey Board of Public Utilities ("Board" or "BPU") seeking approval to invest approximately $3.4 billion in its Clean Energy Future – Energy Efficiency II Program (CEF-EE II) over a thirty (30)-month period from January 1, 2025, through June 30, 2027 ("Triennium 2"). The petition included a $25 million demand response program budget to fund a Virtual Power Plant (VPP) demonstration. This demonstration aims to network behind-the-meter energy storage systems to provide grid services. The proposal also included energy storage incentives ranging from $8,000 to $16,000 for 8 kW systems, with additional battery costs eligible for repayment through PSEG's on-bill financing program. In October 2024, PSEG filed a joint stipulation revising the demand response budget to $26 million. This updated budget included a pilot program for the VPP demonstration, offering customers $5,000 incentives to install 8 kW battery storage systems. On October 30, 2024, the Board issued an order approving the stipulation.

CAISO Files Final Bid Cost Recovery Proposal for Energy Storage Resources[138]

Oct 31st: In June 2024, the California Independent System Operator (CAISO) began a new initiative to revise the Bid-Cost Recovery (BCR) provisions for both standalone and paired energy storage systems. BCR payments are available to generating units and storage systems if their total market revenues over a day do not cover all their accepted bids. These bids include costs for start-up, minimum load, ancillary services, residual unit commitment availability, and energy from both day-ahead and real-time markets.

This initiative addresses concerns that storage systems might receive unnecessary or excessive BCR payments due to their unique operational characteristics. Unlike traditional generators, which have long ramp-up times, batteries do not incur costs for start-up, shutdown, minimum load, or transition, which could justify lower BCR payments. A CAISO study revealed that while batteries constituted only 5% of their capacity, they accounted for nearly 10% of BCR payments in 2022, a figure expected to rise. To tackle this issue, CAISO plans to collaborate with stakeholders to develop guidelines that better reflect the distinct features of storage systems. The initiative will also explore ways to enhance the estimation of opportunity costs in Default Energy Bids (DEBs) for storage and to create DEBs for hybrid resources.

The initiative consists of two tracks. Track 1 focuses on refining BCR provisions for standalone storage systems, while Track 2 examines enhancements to BCR and DEBs for paired storage systems. In July 2024, CAISO published an Issue Paper and Straw Proposal outlining four key issues divided between these two tracks. Track 1 addresses the need to refine the BCR process to prevent excessive payments to storage systems. Track 2 aims to improve BCR provisions for co-located storage systems, refine opportunity cost estimates in DEBs for storage, and establish DEBs for hybrid systems.

In October 2024, CAISO submitted a Draft Final Proposal for Track 1. This proposal provides an interim solution to adjust the real-time energy bid cost calculation for BCR settlements, addressing discrepancies between the 15-minute market, the day-ahead schedule, and real-time dispatch. Later in October, CAISO added an addendum that included updated BCR formulas and draft tariff language, inviting comments by November 12, 2024. On October 31, 2024, CAISO submitted the final proposal for Track 1, which did not significantly change from the draft version.

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[137] https://publicaccess.bpu.state.nj.us/CaseSummary.aspx?case_id=2112533

[138] https://stakeholdercenter.caiso.com/InitiativeDocuments/Final-Proposal-Storage-Bid-Cost-Recovery-and-Default-Energy-Bids-Enhancements-Oct-31-2024.pdf

Energy Storage Conferences

December 4-5, 2024	RE+ Centroamérica - Panama City, Panama
December 4-5, 2024	Reuters Energy LIVE 2024 – Houston, TX
January 14-15, 2025	RE+ Hawai'i - Honolulu, Hawai'i
January 27-28, 2025	Infocast Projects & Money – New Orleans, LA
February 4-5, 2025	Solar Finance & Investment Europe 2025 – London, UK
February 10-12, 2025	Solar Power Africa - Cape Town, South Africa
February 12-13, 2025	RE+ Northeast - Boston, MA
February 17-19, 2025	Energy Storage Summit 2025 – London, UK
February 25-27, 2025	ERCOT Summit 2025 – Austin, TX
February 25-27, 2025	Intersolar / Energy Storage North America 2025
February 26-27, 2025	Solar & Storage Live Thailand 2025 – Bangkok, Thailand
March 3-5, 2025	ACP Operations, Maintenance & Safety Conference 2025 – Nashville, TN
March 5-7, 2025	RE+ Mexico - Jalisco, Mexico
March 12-13, 2025	Energy Storage Show – Birmingham, AL
March 16-19, 2025	Infocast Solar Wind Finance and Investment 2025 – Phoenix, AZ
March 18-19, 2025	Energy Storage Summit USA 2025 – Austin, TX
March 18-19, 2025	Energy Storage Summit Australia 2025 – Sydney, Australia
March 19-20, 2025	RE+ Microgrids - New Orleans, LA
March 25-26, 2025	Large Scale Solar Europe 2025 - Lisbon, Portugal
March 25-27, 2025	Solar & Storage Live Africa 2025, Johannesburg, South Africa
March 26-27, 2025	Solar & Storage Live Queensland 2025 – Brisbane, Australia
March 25-27, 2025	Distributech 2025 – Dallas, TX
April 2-3, 2025	Solar & Storage Live London 2025 – London, UK
April 7-9, 2025	New York Energy Summit – Albany, NY
April 9-10, 2025	Solar + Storage España - Valencia, Spain
April 9-10, 2025	Solar & Storage Live Malaysia 2025 - Kuala Lumpur, Malaysia
April 10-12, 2025	Energy Storage International Conf & Expo 2025 – Beijing, China
April 14-16, 2024	ACP Siting & Permitting Conference – Seattle, WA
April 14-17, 2025	UK and World Energy Storage Conferences - UK
April 15, 2025	GCPA Spring Conference 2025 – Austin, TX
April 22-23, 2025	RE+ Southeast - Atlanta, GA
April 23-24, 2025	Wood Mackenzie Solar & Energy Storage Summit 2025 – Denver, CO
April 23-24, 2025	Renewables Energy Revenues Summit USA 2025 – Dallas, TX
April 24-25, 2025	Solar & Energy Storage Summit 2025 – Denver, CO
April 28-29, 2025	ACP Clean Power on the Hill – Washington D.C.
April 29, 2025	NPM Development & Finance Conference 2025 – NYC
April 29-30, 2025	Large Scale Solar USA 2025 – Dallas, WA
April 29-30, 2025	Solar & Storage Live Egypt 2025 – New Cairo, Egypt
May 6-7, 2025	California Energy Transition Summit – Sacramento, CA
May 7-9, 2025	Electrical Energy Storage 2025 – Munich, Germany
May 7-9, 2025	Intersolar Europe 2025 – Munich, Germany
May 7–9, 2025	ees Europe 2025
May 13-14, 2025	RE+ Texas - Houston, TX
May 14-15, 2025	Novogradac 2025 Spring Renewable Energy Tax Credit Conference
May 19-22, 2025	Clean Power 2025 – Phoenix, AZ
May 21-22, 2025	Hawaii Energy Conference – Maui, Hawaii
May 27-28, 2025	Renewable Energy Revenues Summit 2025 – London, UK
May 28-29, 2025	Infocast Energy Storage Finance 2025 – San Diego, CA
June 3-5, 2025	The Battery Show Europe 2025 - Messe Stuttgart, Germany
June 2025	RE+ Portugal, Porto, Portugal
June 23-24, 2025	Transmission & Interconnection Summit – Arlington, VA
June 24-25, 2025	Solar & Storage Live Dubai 2025 - Dubai
June 25-26, 2025	Global Energy Transition 2025 – New York
June 25-26, 2025	Solar & Storage Live Espana 2025 – Valencia, Spain
July 1-2, 2025	Large Scale Solar Southern Europe 2025 – Athens, Greece

July 1-2, 2024	UK Solar Summit 2025 – London, UK
July 8-9, 2025	Energy Storage Summit Asia 2025 - Asia
July 9-10, 2025	Solar & Storage Live Vietnam 2025 - Ho Chi Minh City, Vietnam
July 10-11, 2025	RE+ Mid-Atlantic, Philadelphia, PA
Summer 2025	RE+ Northwest – Tacoma, WA
August 19-20, 2025	Midcontinent Clean Energy Summit – Indianapolis, IN
August 26-28, 2025	Texas Clean Energy Summit – Austin, TX
August 26-28, 2025	ees South America 2025 - São Paulo, SP Brazil
August 26-27, 2025	Solar & Storage Live Kenya 2025 – Nairobi, Africa
Fall 2025	RE+ Alaska - Alaska
Fall 2025	RE+ Midwest- Chicago, IL
Fall 2025	RE+ Florida - Florida
September 8-11, 2025	RE+ 2025 – Las Vegas, NV
September 29-30, 2025	Tax Credits & Transferability – Houston, TX
September 30, 2025	GCPA Fall Conference 2025 – Austin, TX
September 2-4, 2025	ees Mexico 2025 – México City, Mexico
September 16-17, 2025	Solar & Storage Live Zürich 2025 - Messe, Zürich
September 16-17, 2025	Solar & Storage Live Zurich 2025 – Zürich, Switzerland
September 23-25, 2025	Solar & Storage Live UK 2025 – The NEC, Birmingham
September 23-25, 2025	Solar & Storage Live UK 2025 – Birmingham, UK
September 2025	Energy Storage Summit Central Eastern Europe 2025 - TBD
September 2025	SNEC 10th (2025) International Energy Storage Technology - TBD
October 8-9, 2025	Solar & Storage Live Italia 2025 – Veronafiere, Italy
October 12-14, 2025	Solar & Storage Live KSA – Saudi Arabia
October 12-14, 2025	Solar & Storage Live KSA 2025 - Riyadh Front, Saudi Arabia
October 14-15, 2025	Clean Energy Investment Summit – Houston, TX
October 15-16, 2025	Solar & Storage Live Amsterdam 2025 - Amsterdam
October 15-16, 2025	Solar & Storage Live Cape Town 2025 – Cape Town, South Africa
October 27-29, 2025	ACP Recharge Energy Storage Summit 2025 – Austin, TX
October 29-31, 2025	ACP PEAK: Performance, Modeling & Assessment Conference – Austin, TX
October TBD, 2025	Energy Storage Canada 2025 – Canada
October 14-5, 2025	Energy Storage Summit Latin America 2025 - Santiago, Chile
October 19-23, 2025	CARILEC Conference and Exhibition 2025 – Dominican Republic
October 29-30, 2025	All Energy Australia 2025 – Melbourne, Australia
October 6-9, 2025	The Battery Show North America – Detroit, MI
November 3-5, 2025	Southeast Renewable Energy – Charlotte, NC
November 4-5, 2025	Mountain West Renewables – Salt Lake City, UT
November 5-6, 2025	Solar & Storage Live Paris 2025 – Paris, France
November 6-7, 2025	Solar & Storage Live Indonesia 2025 - Tangerang, Jakarta, Indonesia
November 6-7, 2025	Novogradac Fall Renewable Energy Tax Credits Conference
November 7-8, 2024	Reuters Energy Storage North America 2024 – Houston, TX
November 7-8, 2024	RE+ Midwest, 2024 - Chicago Illinois
November 12-13, 2024	Battery Asset Management – San Diego, CA
November 13-14, 2024	Solar & Storage Live Barcelona 2024 - Barcelona, Spain

Fractal Energy Storage Consultants News

FRACTAL ENERGY STORAGE CONSULTANTS

Site Design and Investment Analysis / Third-Party Revenue Analysis

Fractal specializes in high-resolution techno-economic modeling of storage and hybrid projects. Analysis can be exploratory, for RFPs, for investment committees, or confirmatory due diligence.

- Identify and prioritize technically and financially feasible business models while accounting for technical, financial, or policy limitations
- Co-optimize, maximize, and de-risk revenue streams while accounting for battery physics e.g., degradation, losses, auxiliary load
- Optimize sizing (BoL, augmentations)
- Sizing and specifications (power, energy, chemistry, C Rate, BESS sizing, solar sizing, ILR)
- Optimize the duty cycle for increased performance and state of health
- Provide detailed CAPEX, OPEX, cashflow, tax equity and off-take structures

RFP, Procurement and Contracting Support

Let Fractal do all the heavy lifting for your BESS procurement. We specialize in storage and run an efficient process for equipment only, turnkey, EPC only or EMS. Contact Scott Huennekens (scott@fractalba.com) or Sean Bruno (sean@fractalba.com) with questions.

- RFP specifications and documentation
- Provide, review or enhance contracts (EPC, Equipment, LTSA, Toll, PPA) including technical exhibits, warranties, performance, guarantees, testing and LDs
- Evaluation and scoring
- Contract negotiation support
- Schedule preparation and distribution list

Fractal Due Diligence

Fractal provides energy storage project due diligence on projects, portfolios and platforms for equity or debt financing, tax equity, acquisition or investment purposes. Fractal reviews the technical design, financial performance and commercial terms, while balancing regulatory, legal concerns and overall risk to include:

- Phase 1: Red Flag Technical, Financial and Commercial Review

- Phase 2: Confirmatory Due Diligence

Please contact our VP of Development, Cyrus Etemadi for more information (cyrus@fractalba.com).

Fractal M&A Advisory

Please contact our VP of Development, Cyrus Etemadi for more information (cyrus@fractalba.com) to learn more.

- Due Diligence services tailored to acquisitions, investments, financing and tax equity
- Complete financial, commercial and technical preparation
- Arrange and lead competitive, two-phase sale processes
- Sell-side representation
- Flexibility to work on unique transactions and special situations (landowner representation, hedge origination and structuring, co-development, dev capital and syndication)
- Operating assets, projects under development, pipeline assessment and platform-level transactions

Fractal Owner's Engineering Services

We want to bid on your upcoming solar, storage and PV+S OE services.

- SLD and Site Layouts
- Procurement Packages
- Technical Due Diligence
- Grounding Plans / Materials Takeoff / BOM
- System Protection Design
- Procurement and Test Plan Specifications
- 30%, 60%, IFP, IFC Design and Drawing Review
- Review Technical Studies
- Project Management
- SAT and Energization Witness and Verification
- Pre-Commissioning Review
- Commissioning and Performance Testing and Certification
- Annual Performance and Capacity Testing Review
- 3D Design and Video Creation

FRACTAL MODEL TECHNOECONOMIC MODELING SOFTWARE

INVESTMENT-GRADE BATTERY STORAGE AND HYBRID DESIGN AND ANALYSIS TOOL

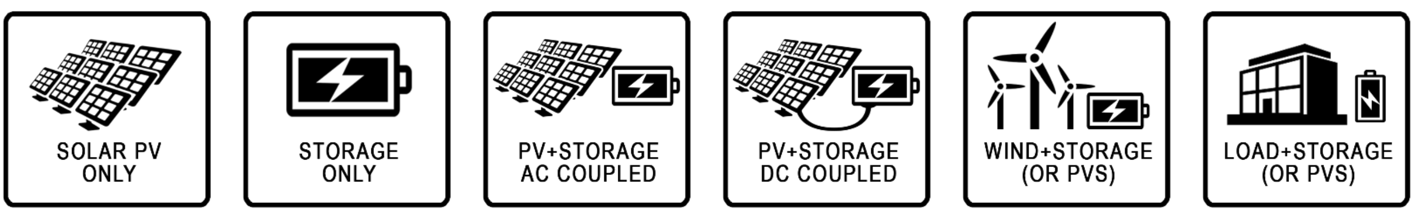
V24.9 RELEASED SEPTEMBER 30th – SCHEDULE A DEMO

STANDALONE STORAGE OR HYBRID SYSTEM ANALYSIS

The Fractal Model is a techno-economic modeling tool used for project development, due diligence, and RFP evaluation. Used by hundreds of companies globally, the Fractal Model provides investment-grade analysis while simulating performance, degradation, warranty, costs, and revenues to optimize the economics of your energy storage and hybrid projects.

The Fractal Model platform is a cloud-based solution and is available through a license with quarterly updates. The Fractal Model is used by electric utilities and tier-1 energy companies (developers, EPCs, integrators) to perform battery storage sizing, dispatch, and financial analysis. Fractal Model strives to be the energy market's choice for transparent, real-world storage investment analysis.

Contact Rahul Verma (rahul@fractalba.com) for a demo.



Our latest release included the following new features:

1. Fractal Energy, a new portal for downloading historic prices
2. Updated templates for NY Index Storage Credit and Massachusetts Clean Peak Standard
3. Updated BESS CAPEX and OPEX benchmarks

SUPPORTED USE CASES AND CONFIGURATIONS

STANDALONE OR HYBRID PROJECTS
- Standalone BESS
- Solar PV (AC and DC Coupled)
- Wind
- Load

REVENUE SOURCES
- ISO/RTO Market Participation
- PPAs and Tolling Contracts
- Retail Energy and Demand Charge Offsets

BESS APPLICATIONS
- Wholesale Power and Ancillary Services
- Renewable Energy Shifting
- Load Following and Peak Shaving
- Capacity Market Obligations
- Solar PV Smoothing and Firming
- Curtailment Reduction
- Solar PV Clipped Energy Recapture

WHOLESALE MARKETS
- Built-in Functionalities for all North American Markets
- Customizable for European and Asia Pacific Markets

INTERCONNECTION
- Front-of-the-meter
- Behind-the-meter

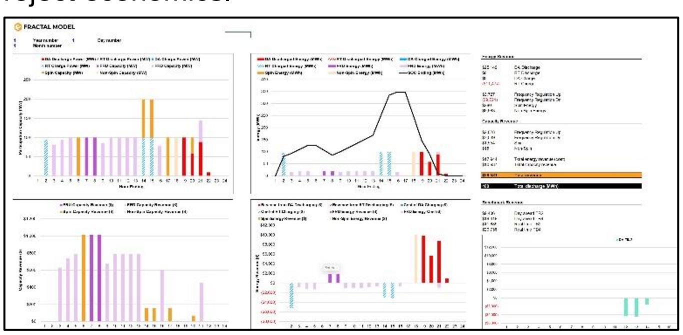
TECHNOLOGIES
- Lithium-ion (multiple LFP, NMC, LTO, etc.)
- Flow Batteries (multiple)
- Zinc Aqueous
- Sodium Sulphur Batteries

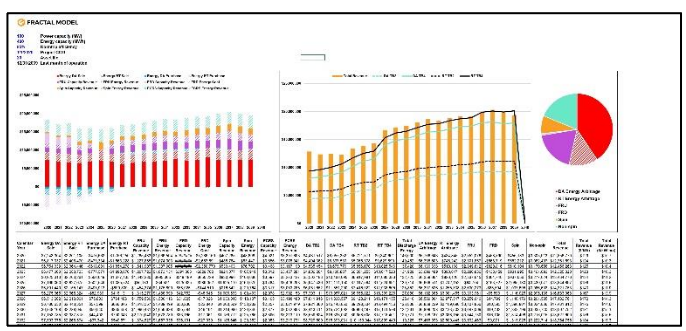
TAX INCENTIVES
- Investment Tax Credit
- Production Tax Credit
- State Incentives

STATE LEVEL PROGRAMS
- CA Self-Generation Incentive Program (SGIP)
- MA Solar Massachusetts Renewable Target (SMART)
- NY Value of Distributed Energy Resources (VDER)
- MA Clean Peak Energy Standard
- MA / RI Connected Solutions
- NY Index Storage Credits (ISC)
- Custom – Build Your Own

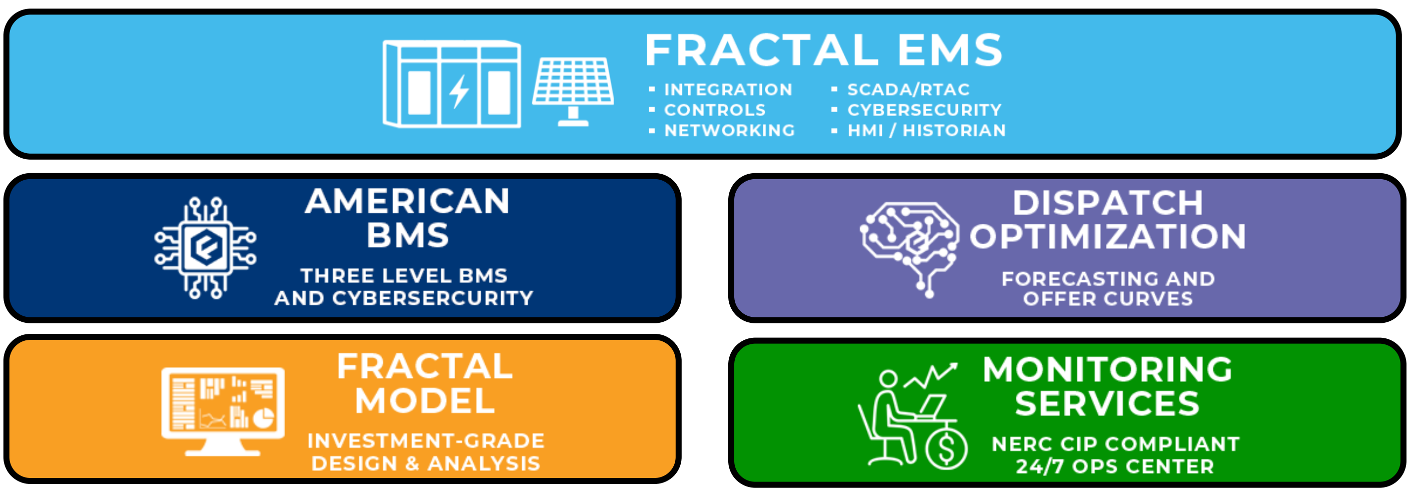
INVESTMENT-GRADE ANALYSIS

Fractal Model's financial model generates detailed cash flow results used for investment analysis worldwide. Fractal Model supports tax equity cash flow, back leverage, construction loans, and other advanced financial model features. Users can perform sensitivity analysis by changing annual escalators for capacity payments, arbitrage revenue, ancillary revenue, warranty costs, aux load costs, corrective maintenance, etc., to derisk project economics.





Fractal EMS News



EMS/PPC KEY FEATURES

Fractal EMS combines advanced features with competitive pricing to create the industry's best energy storage and hybrid controls value.

TECHNOLOGY AGNOSTIC

Flexible architecture that allows you to use different types of batteries and inverters.

MADE IN THE U.S.A.

Fractal EMS is US-made. We build our controllers in-house. Our software development is performed domestically.

TURNKEY CONTROLS

Full stack onsite controls and software. Fractal designs, installs, and commissions the controls, networking, SCADA, historian, and HMI.

VERTICAL CONTROLS

Fractal provides a range of options, from top to bottom to higher levels controls.

SCALABLE

An open, modular platform that can control multiple sites with 100+ inverters. Fractal provides a fleet-level view of your portfolio.

CYBER SECURITY

Built on ISO 27001, NERC CIP, and NIST 800-53 framework. Highly experienced in-house cyber/IT team with third-party auditing.

ON-SITE SOLUTION

Fractal hosts the historian, reports, and HMI on-site or off-site (the equipment controls are on-site and do not need the cloud).

EXPERIENCED TEAM

Our team has over a decade of energy storage control development, integration, commissioning, and operations with over 10 GWh in operations.

LATEST PROJECT AWARDS

Fractal EMS has been awarded nearly 100 projects for 2025 – thank you so much!! Our team will be working hard to COD these projects on time. The following projects were awarded in the last few weeks:

200 MW / 800 MWh Standalone BESS	Arizona	Utility Services
5 MWp + 5 MW / 20 MWh DC-Coupled PV + Storage	New York	NYISO Grid Services
5 MW / 20 MWh Standalone BESS	New York	NYISO Grid Services
5 MW / 20 MWh Standalone BESS	New York	NYISO Grid Services
5 MW / 20 MWh Standalone BESS	New York	NYISO Grid Services
200 MW / 480 MWh Standalone BESS	ERCOT	ERCOT Grid Services

22 GWh
Total Awards

10 GWh
Operating Projects

SCHEDULE A DEMO

Schedule a demo today. Feel free to reach out about bidding on your projects (Fractal partners with vendors and EPCs to provide quotes):

- Corrie@FractalEMS.com
- Alice.Lu@FractalEMS.com