CERTIFICATION AND FINANCING PROPOSAL

DON LEE ENERGY STORAGE PROJECT IN ESCONDIDO, CALIFORNIA

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EXECUTIVE SUMMARY

DON LEE ENERGY STORAGE PROJECT IN ESCONDIDO, CALIFORNIA

Project: The proposed project consists of the design, construction and operation of a 6.5-megawatt alternating current (MW_{AC}) energy storage system located in Escondido, California (the "Project"), which will provide capacity, energy, ancillary services and resource adequacy benefits (altogether, the "Products").[1] Electricity from the grid will be stored and delivered to San Diego County to an existing 12-kilovolt (kV) distribution line through a 1,150-foot Gen-Tie line to be built as part of the Project.[2] The Products will be purchased by San Diego Gas & Electric (SDG&E), pursuant to a 10-year Power Purchase Agreement (PPA). The Project will be financed as part of a portfolio facility of energy storage projects totaling 144 MW (the "Portfolio").

Objective: The purpose of the Project is to increase the energy storage capacity of the California grid, which will allow the system operator to reduce the use of ramp-up/ramp-down fossil fuel power generating plants in the grid and manage it more efficiently. In addition, the Project will also help integrate electricity generated by intermittent renewable energy sources, such as solar and wind, and support a more efficient and reliable power grid in order to minimize power disruptions, reducing energy losses resulting from mismatches in supply and demand.

Expected Outcomes: The estimated outcomes resulting from the installation of 6.5 MW_{AC} of energy storage capacity are:

a) Reduction of approximately 2,866 metric tons/year of carbon dioxide (CO_2).[3]

[1] Ancillary services are those required to support the transmission of electric power from the seller to the purchaser, such as energy regulation up and down, voltage support and frequency control, among others. Resource adequacy benefits means the rights and privileges attached to any generating resource that satisfies the resource adequacy obligations of any entity.

[2] A Gen-Tie line is a transmission line built for the purpose of interconnecting a new generation facility into the power grid.

[3] CO_2 calculations are based on the potential emissions avoided as a result of charging and discharging 7,781.8 MWh/year of electricity for frequency control purposes that would otherwise be supplied by natural gas-fired power plants and on the emission factor for natural gas plants for the state of California calculated by NADB based on information reported by the U.S. Energy Information Administration and the California Energy Commission. The emission factor is: 0.36832 metric tons/megawatt-hour (MWh) for CO_2. Although SO_2 and NOx emissions reduction are expected, emission factors were not available related to production of electricity generated by natural gas plants.

b) Storing and delivering up to 7,781.8 megawatt-hours (MWh) of energy output per year for frequency control purposes.[4]

Sponsor:	esVolta, LP.
Borrower:	esFaraday, LLC.
NADB Loan Amount:	Up to US$6.8 million.

[4] Estimation based on information in the PPA and data received from the Sponsor. The Project is expected to complete the equivalent of one charge/discharge cycle (26 MWh) per day and has an AC-DC-AC conversion ratio of 0.82. Frequency control is a process to maintain stability in the power system. In power systems, when the demand is higher than the supplying power, the frequency in the system will drop. In a similar manner, when the demand is lower than the supplying power, the frequency in the system will increase.

CERTIFICATION AND FINANCING PROPOSAL

DON LEE ENERGY STORAGE PROJECT IN ESCONDIDO, CALIFORNIA

1. PROJECT OBJECTIVE AND EXPECTED OUTCOMES

The proposed project consists of the design, construction and operation of a 6.5-megawatt alternating current (MW_{AC}) energy storage system located in Escondido, California (the "Project"), which will provide capacity, energy, ancillary services and resource adequacy benefits (altogether, the "Products").[5] Electricity from the grid will be stored and delivered to San Diego County to an existing 12-kilovolt (kV) distribution line through a 1,150-foot Gen-Tie line to be built as part of the Project.[6] The Products will be purchased by San Diego Gas & Electric (SDG&E), pursuant to a 10-year Power Purchase Agreement (PPA) , which gives SDG&E the right to control and optimize the dispatch of the Project.

The purpose of the Project is to increase the energy storage capacity of the California grid, which will allow the system operator to reduce the use of ramp-up/ramp-down fossil fuel power generating plants in the grid and manage it more efficiently. The Project is expected to store and deliver up to 7,781.8 megawatt-hours (MWh) of energy a year mostly used for frequency control purposes. As a result, it will displace the emission of an estimated 2,866 metric tons/year of carbon dioxide (CO_2). In addition, the Project will also help integrate electricity generated by intermittent renewable energy sources, such as solar and wind, and support a more efficient and reliable power grid in order to minimize power disruptions, reducing energy losses resulting from mismatches in supply and demand.

2. ELIGIBILITY

2.1. Project Type

The Project falls into the category of energy efficiency.

[5] Ancillary services are those required to support the transmission of electric power from the seller to the purchaser, such as energy regulation up and down, voltage support and frequency control, among others. Resource adequacy benefits means the rights and privileges attached to any generating resource that satisfies the resource adequacy obligations of any entity.

[6] A Gen-Tie line is a transmission line built for the purpose of interconnecting a new generation facility into the power grid.

2.2. Project Location

The Project will be constructed in the southwestern region of the state of California in the city of Escondido, approximately 40 miles north of the U.S.-Mexico border. Escondido is part of the San Diego metro area in San Diego County. The Project site is located at the following coordinates: latitude 33°07'43.07"N and longitude 117°07'15.82"W. It will support the reliability requirements of the grid in the southwestern region of the U.S. served by SDG&E, including the cities of San Diego, Escondido, Imperial Beach, La Jolla and Oceanside, among others. Figure 1 illustrates the geographical location of the Project.

Figure 1
PROJECT LOCATION MAP

2.3. Project Sponsor and Legal Authority

The private-sector project sponsor is esVolta, LP (the "Sponsor"), which will use the special-purpose vehicle company, Don Lee BESS 1, LLC to own the project, which in turn will be owned by esFaraday, LLC (the "Borrower"), to implement the Project and contract the financing. esFaraday, a California-based, limited-liability company, was incorporated on July 30, 2019, and has the legal authority to develop the Project.

3. CERTIFICATION CRITERIA

3.1. Technical Criteria

3.1.1. General Community Profile

The implementation of the Project is expected to benefit San Diego County by improving energy reliability and increasing electricity storage capacity to increase energy efficiency and maximize renewable energy use. The 6.5-MW_{AC} energy storage facility will be capable of storing up to 26 MWh of electricity, the equivalent of serving 4,333 customers for four hours.[7]

The Project is also expected to benefit San Diego County by creating employment opportunities and additional income during its construction and operation. Approximately 30 jobs are expected to be generated during construction. Since the Project will for the most part be operated remotely, no permanent on-site jobs are expected to be generated during Project operation; however, several off-site jobs will be generated during its operation, including various administrative positions.

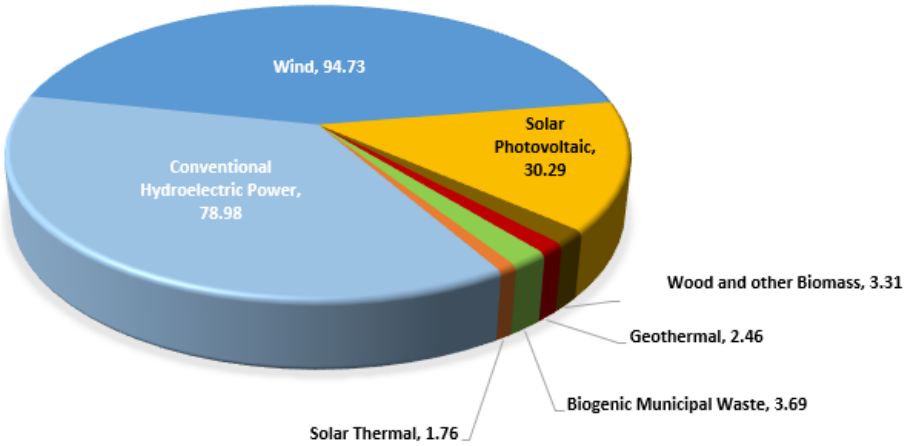
According to the U.S. Census Bureau, the population of San Diego County in 2017 was 3,337,685, which represented 8.4% of the state population.[8] The main economic activities are: management, business and arts (39.7%); services (18.5%); sales (25.5%); natural resources and construction (8.2%); and production and transportation (8.0%).

Local Energy Profile

According to U.S. Energy Information Administration (EIA), growing renewable energy use and the implementation of policies that encourage the use of renewables at the state level (renewable portfolio standards) and at the federal level (production and investment tax credits) have driven down the cost of renewable energy facilities, supporting their expanded adoption.[9] In 2018, wind, solar and other non-hydropower renewables were expected to provide more than 10% of U.S. power generation.[10] Net renewable capacity and net generation from renewable energy sources in the U.S. during 2017 are shown in Figures 2 and 3, respectively.

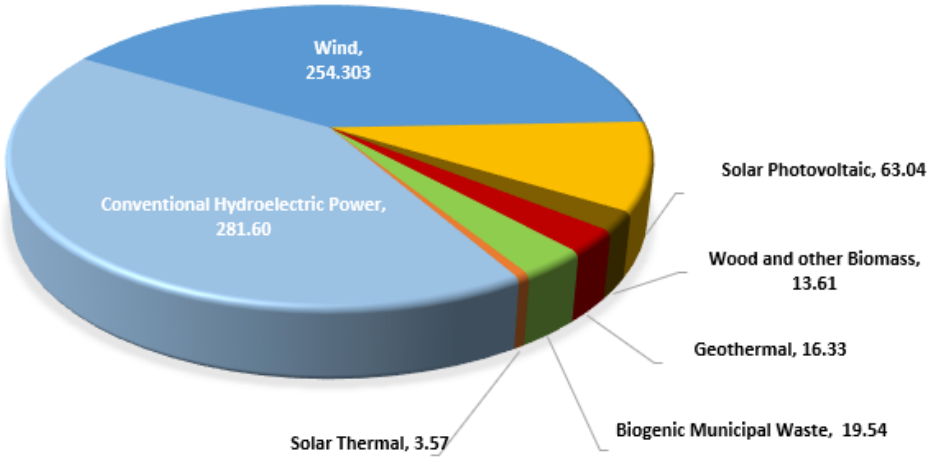
[7] The estimation is based on 1.5 kilowatt-hours of electricity consumption per customer per hour according to a press release by SDG&E (http://newsroom.sdge.com/battery-storage/sdge-unveils-world%E2%80%99s-largest-lithium-ion-battery-storage-facility)
[8] Source: U.S. Census Bureau (https://www.census.gov/en.html).
[9] Source: U.S. Energy Information Administration, Annual Energy Outlook, 2019.
[10] Source: U.S. Energy Information Administration.

Figure 2
U.S. NET RENEWABLE CAPACITY IN 2018
(Gigawatts)



Biogenic Municipal Waste includes municipal waste, landfill gas, and municipal sewage sludge.
Source: Chart prepared by NADB based on the EIA Annual Energy Outlook 2019.

Figure 3
U.S. NET GENERATION FROM RENEWABLE SOURCES IN 2018
(Billions of kilowatt-hours)

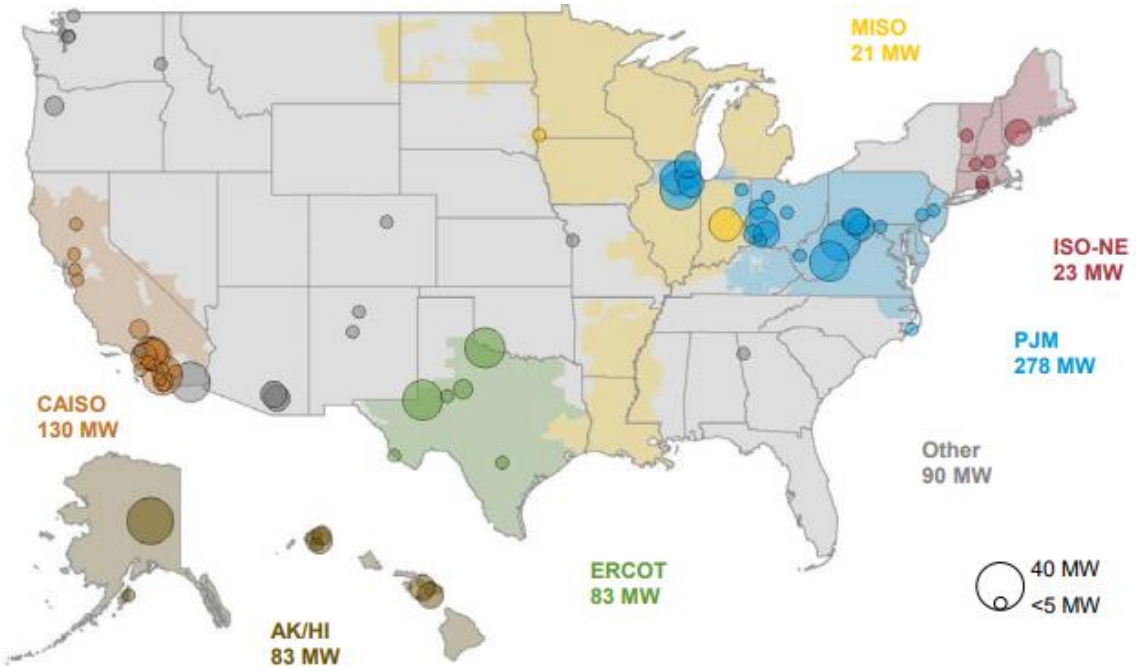


Source: Chart prepared by NADB based on the EIA Annual Energy Outlook 2019.

In May 2018, the EIA published the U.S. Battery Storage Market Trends report. According to the report, large-scale battery storage power capacity has nearly doubled every two years since 2011 in the United States, and 708 MW were in operation by the end of 2017.[11] In 2016, annual growth in U.S. power capacity peaked when 197 MW of large-scale battery storage was installed. Figure 4 shows the location of large-scale battery storage facilities in the U.S. in 2017.

[11] Large-scale refers to systems that are grid connected and have a nameplate power capacity greater than 1 MW.

Figure 4
U.S. LARGE SCALE BATTERY STORAGE INSTALLATIONS BY REGION (2017)



Source: U.S. Energy Information Administration | US. Battery Storage Market Trends

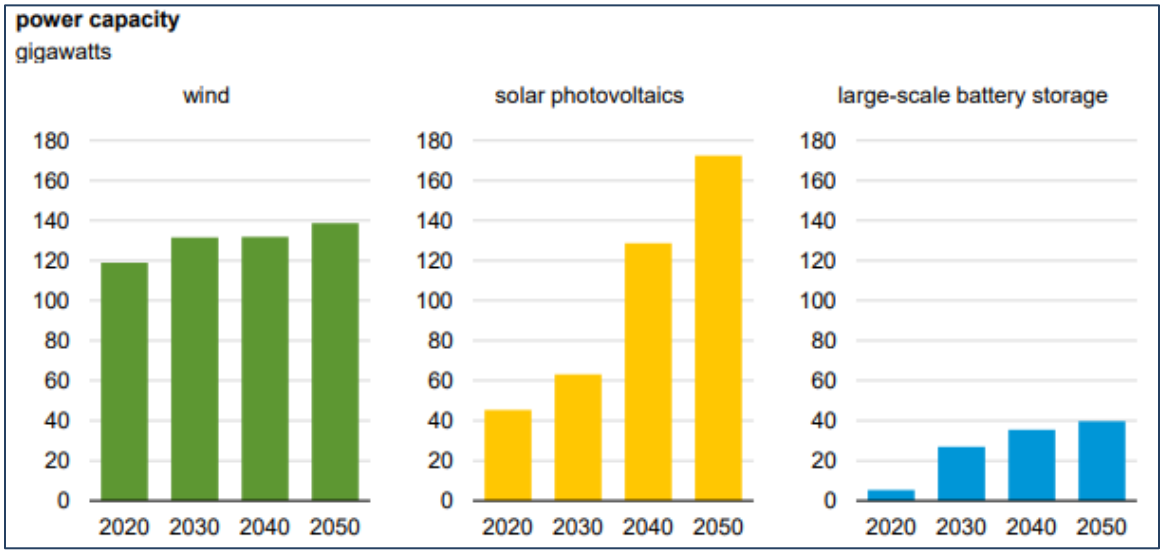
As shown in Figure 4, about 90% of large-scale battery storage capacity in the United States is installed in the regions covered by five of the seven organized independent system operators (ISOs) or regional transmission organizations (RTOs) and the non-contiguous states of Alaska and Hawaii (AK/HI).

As of December 2017, project developers had reported to EIA that 239 MW of large-scale battery storage was expected to become operational in the United States between 2018 and 2021. Given the short planning period required to install a storage facility, the planned capacity reported to EIA does not necessarily reflect all the storage that will be built over this period, but the estimates can be used as an indicator of trends.[12]

The 2018 Annual Energy Outlook (AEO) developed by EIA provides projections of supply and demand needs for energy markets in the United States through 2050. The 2018 AEO was the first to include operational and capacity projections for energy storage beyond pumped hydroelectric storage in the model results. The reference case utilized to analyze the expected future scenario, assumes implementation of current U.S. laws and policies, projects large-scale wind capacity growth of 50 gigawatts (GW) and large-scale solar photovoltaic capacity growth of nearly 150 GW by 2050. Over this same period, large-scale battery storage capacity is projected to grow to 40 GW, as shown in Figure 5 below. The 2019 AEO does not include information on storage.

[12] Source: U.S. Energy Information Administration, U.S. Battery Storage Market Trends.

Figure 5
U.S. LARGE-SCALE WIND, SOLAR AND BATTERY STORAGE CAPACITY PROJECTIONS (2020-2050)



Source: U.S. Energy Information Administration, Annual Energy Outlook, 2018.

In the longer term, wind and solar growth are projected to support economic opportunities for storage systems that can provide several hours of storage and enable renewable generation produced during periods of high wind or solar output to supply electricity during periods of peak electricity demand.

The U.S. Department of Energy, through EIA, provides a state-by-state reference for information and data covering energy production and demand. In 2017, electricity generation in the state of California increased by 4% to 206,336 GWh compared to 198,227 GWh in 2016. California emitted 36.57 million metric tons of CO_2 from fossil fuel consumption in the electric power sector in 2016, representing 16% of the total CO_2 emissions of the state.[13] Current annual electricity generation in California relies on a mix of energy technologies as shown in Table 1.

[13] Source: California Energy Commission (https://www.eia.gov/electricity/state/california/).

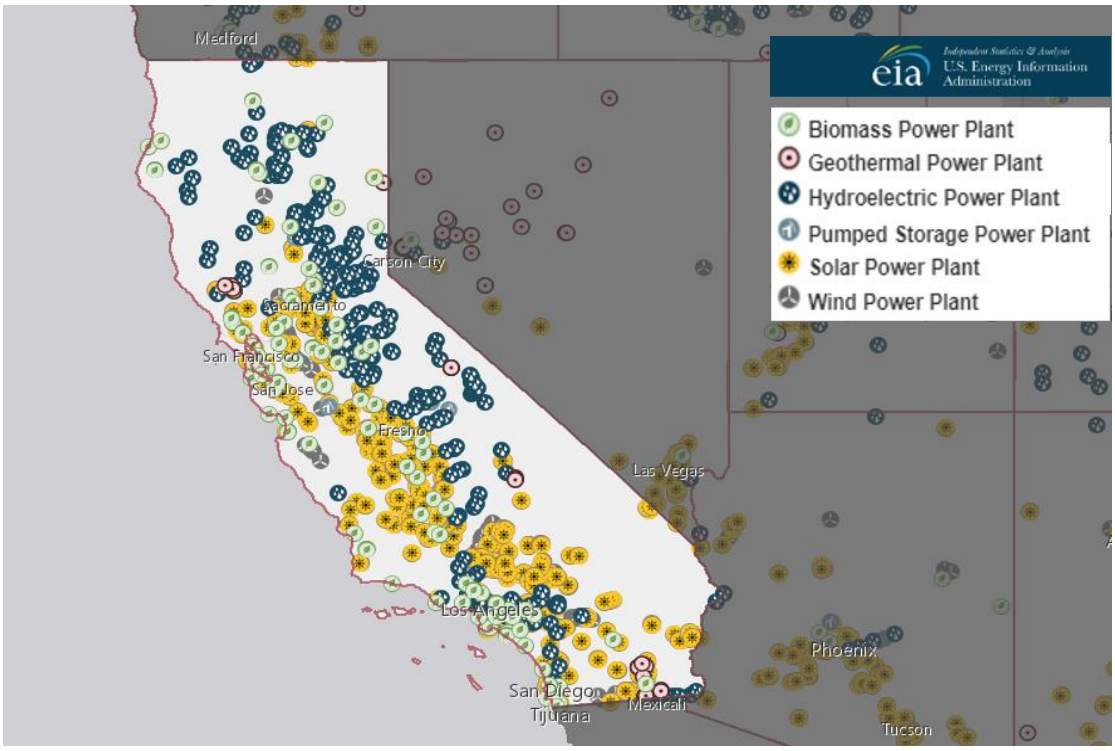
Table 1
CALIFORNIA POWER GENERATION IN 2018

Energy Source	Generation* (GWh)	Percentage (%)
Natural gas	90,642	46.55
Large hydroelectric	22,096	11.35
Solar	27,033	13.88
Nuclear	18,268	9.38
Wind	14,244	7.31
Geothermal	11,528	5.92
Small hydroelectric	4,248	2.18
Biomass	5,909	3.03
Coal	294	0.15
Oil	35	0.02
Other	430	0.23
Total	**194,727**	**100**

* Source: California Energy Commission Energy Almanac, Electric Generation Capacity & Energy (2018).

California's renewable energy mix includes biomass, geothermal, hydroelectric, solar, wind and pump storage power plants, as shown in Figure 6.

Figure 6
CALIFORNIA RENEWABLE ENERGY POWER PLANTS (2018)



Source: EIA.

On February 15, 2018, the U.S. Federal Energy Regulatory Commission (FERC) issued FERC Order 841, which requires that all RTOs and ISOs amend market rules so that energy storage can participate across all services. The Order also requires that market operators consider each energy storage system's specific physical and technical characteristics in market operations.[14] ISOs and RTOs have two years to implement the rule, although delays are possible. It is common for ISOs and RTOs to file for extensions in complying with a new regulation. Once implemented, the rule will ensure energy storage to compete with other generators in the wholesale markets. This will encourage additional storage deployments and create new opportunities for energy storage.[15]

Battery energy storage facilities within the territory covered by California Independent System Operator (CAISO) accounted for 18% of existing U.S. large-scale battery storage power capacity in 2017. According to the EIA, CAISO had a total installed power storage capacity of 130 MW in 2017. The proposed Project will increase battery storage capacity in the CAISO jurisdiction by 4.8%.

3.1.2. Project Scope

The Project consists of the design, construction and operation of a 6.5-megawatt alternating current (MW_{AC}) energy storage system that will occupy 10,750 square feet of an existing warehouse in Escondido, California. The Sponsor has secured the area in the warehouse where the Project will be installed through a 13-year lease agreement, with the Project having options to extend the tenor of the lease agreement by an additional 10 years. The Project will be connected to the grid at an existing 12-kV distribution line through a 1,150-feet Gen-Tie line to be built as part of the Project.

The Project includes the following components:

- *Battery cells*. The lithium-ion power cells will have a nominal capacity of up to 40 ampere-hour (Ah)[16] with a working voltage of 3.2 Volts in direct current (V_{DC}). Approximately 7,600 battery cells will be installed in this Project.

- *Battery module*. A typical battery module contains a total of 8 cells. A battery module controller is installed on each module to monitor the state of charge and its operational performance.

- *Battery pack*. A battery pack is made up of two battery modules. Each battery pack has its own controller to monitor the performance of the pack.

- *Battery stack*. A battery stack is comprised of 17 battery packs and a controller. Each battery stack is rated with a nominal capacity of 225 kilowatt (kWh) and has a voltage range of 720-990 V_{DC}.

[14] Source: Federal Energy Regulatory Commission: https://ferc.gov/whats-new/comm-meet/2018/021518/E-1.pdf
[15] Source: U.S. Energy Information Administration, U.S. Battery Storage Market Trends.
[16] An ampere-hour is used in measurements of electrochemical systems such as battery capacity. For example, an AA battery has a capacity of about 2 to 3 ampere-hours.

- *System controller*. Using a management software for system operation and control, the system controller interacts with metering devices, system hardware and stored electricity to regulate power. It accepts commands remotely from customer sites or can execute operations locally as defined by use cases in a program. Additionally, it can serve as an interface for maintenance.

- *Energy storage inverter*. The energy storage inverter is responsible for converting and conditioning power to and from the battery system. It transforms the direct current from the batteries into alternating current at 480 V_{AC}.

- *Transformer*. The transformer converts the electricity from 480 V_{AC} to 12 kV_{AC} to allow the system to receive and deliver electricity through the distribution line near the Project site.

- *Gen-Tie line*. A 1,150-foot transmission line to connect the storage facility to the grid at an existing 12-kV distribution line.

Figure 7 shows the location of the warehouse where the batteries will be installed, as well as the location of the point of interconnection located 1,150 feet from the Project site.

Figure 7
PROJECT SITE

The Project will require a Generation Interconnection Agreement with SDG&E. On April 4, 2018, the Sponsor submitted an interconnection request to SDG&E and is expecting to obtain authorization by the first quarter of 2020.

3.1.3 Technical Feasibility

Lithium-ion technology is a common battery storage medium and is considered one of the safest, most easily understood and efficient methods of energy storage on the market. It is the technology most commonly used for this application given its high-cycle efficiency and fast-response time. At the end of 2016, lithium-ion batteries represented more than 80% of the installed power and energy capacity of large-scale battery storage in operation in the United States.[17] In addition, their high energy density makes them the current battery of choice for the portable electronic and electric vehicle industries.

Potential suppliers were evaluated based on such elements as cost-effectiveness, contractual terms, warranties and delivery times. The Sponsor selected Powin Energy, an energy storage and battery management solutions company, to supply the facility components, having determined that its equipment is best suited to the characteristics and requirements of the Project and offers the best performance.

The Sponsor contracted the services of an independent engineering firm to perform a technology assessment. The analysis included an evaluation of the characteristics, reliability and performance of all the components of the system, as well as a power conversion analysis and a review of product certifications, supplier warranties, etc. The review concluded that the lithium-ion batteries selected for the Project are capable of performing both the fast- and slow-response power applications required by the storage system. As part of the assessment, the batteries were also tested to determine their storage capacity after a certain number of charge and discharge cycles. The tests concluded that the batteries selected for the Project can retain 90% of their capacity after 5,500 charge-discharge cycles, which is considered above average for this type of application.

Prior to installation, Powin will test its batteries for moisture, puncture, impact, performance and accelerated degradation, under a variety of conditions and temperatures. The independent engineer review required by NADB will confirm the suitability of the technology and its expected performance.

3.1.4. Land Acquisition and Right-of-Way Requirements

The Project will occupy 10,750 square feet in an existing 60,000-square-foot multi-tenant warehouse. The Sponsor secured the area in the warehouse through a 13-year tenor lease agreement signed on February 8, 2018.

The proposed Project is being developed in the city of Escondido, California, in a site zoned as M-2 (general industrial), which allows activities such as manufacturing, warehousing, distributing, assembling and wholesale. Given that the City does not specify “energy storage use” in its zoning ordinance, the Sponsor wanted to gain a better understanding of how the City considers the proposed Project in terms of zoning, land use classification and development standards. In February and March 2018, the Sponsor contacted the City of Escondido to consult on this matter.

[17] Source: Source: U.S. Energy Information Administration, U.S. Battery Storage Market Trends.

The City responded and reaffirmed that the proposed Project would represent a permitted use within the M-2 zone and would not be subject to a Conditional Use Permit or other discretionary use permit/approval. However, a Zoning Conformance Letter for the Project is still pending. The Sponsor is expecting to receive it in March 2020.

A permit from the Building Department of the City of Escondido will be required. The Building Department will review the Project plans, electrical drawings and manufacturer specification sheets that detail the expected improvements to the space where the Project will be housed. The Sponsor is expecting to submit the required documentation to the Building Department during the first quarter of 2020.

The 12-kV Gen-Tie line will be constructed in the same right of way as an existing distribution line owned by SDG&E. No additional right of way is required.

3.1.5. Project Milestones

Construction of the Project is scheduled to begin in October 2020, and the Commercial Operation Date (COD) is expected to be no later than June 2021. Table 2 presents the status of key milestones for Project implementation.

Table 2
PROJECT MILESTONES

Permits	Status
Lease agreements for the Project	Completed (February 2018)
Generation Interconnection Agreement with SDG&E	In process (expected by first quarter 2020)
Zoning Conformance Letter from the City of Escondido	In process (expected by March 2020)

NADB procurement policies require that private-sector borrowers use appropriate procurement methods to ensure a sound selection of goods, works and services at fair market prices and that their capital investments are made in a cost-effective manner. As part of its due-diligence process, NADB will review compliance with this policy.

3.1.6. Management and Operation

esVolta develops, owns and operates utility-scale energy storage projects across North America and has a portfolio of two operational and seven utility-contracted projects with a total storage capacity of 522 MWh, including the 26 MWh of this Project. esVolta also has more than 15 projects under negotiation for more than 2,000 MWh.

esVolta will act as asset manager and will engage Powin Energy to act as the O&M provider for the Project. As the O&M contractor and warrantor, Powin will be responsible for battery disposal, and the O&M Agreement will obligate Powin to dispose of battery materials in accordance with

local regulation. The Sponsor expects to use the battery recycling program of Powin's primary cell supplier.

In general, the recycling process entails technicians dismantling the battery packs and separating assembly pieces and circuitry from the actual battery cells. The separated packs are then fed by conveyor into an automated crusher. The crusher operates under a liquid solution to prevent fugitive emissions and to reduce potential chemical reactions of the processed batteries. It produces three types of material: metal solids, metal-enriched liquid and plastic fluff. The metal solids typically contain various amounts of copper, aluminum and other materials that can be used as raw materials in new products. The metal-enriched liquid is solidified using filtering technology and is sent off-site for further metal purification.

3.2. Environmental Criteria

3.2.1. Environmental and Health Effects/Impacts

A. Existing Conditions

Historically, the United States has depended to a great extent on fossil fuels for the generation of energy. This conventional method of energy generation can affect the natural environment due to harmful emissions related to the generation process, including greenhouse gases (GHG) and other pollutants, such as sulfur dioxide (SO_2) and nitrogen oxides (NOx). Consequently, there is a need for affordable and environmentally beneficial alternatives to conventional hydrocarbon-based energy sources.

In California, in 2017, a total of 44.4 million metric tons of CO_2 were emitted in conventional power plants related to the generation of electricity.[18] With the objective of reducing these emissions, California has established a series of policies and regulations. One of the most important is the Renewables Portfolio Standard (RPS) Program which mandated in 2002 through Senate Bill 1078 an initial requirement that 20% of electricity retail sales be generated by renewable resources by 2017. The program was accelerated in 2015 through Senate Bill 350 which established a 50% RPS by 2030. Senate Bill 350 also included interim annual RPS targets with three-year compliance periods and requires that 65% of RPS procurement to be derived from long-term contracts of 10 or more years. In 2018, Senate Bill 100 was signed into law, which increased the RPS to 60% by 2030 and requires that all the electricity in the state come from carbon-free resources by 2045.

In line with the policies mentioned, power generation from renewable sources has increased in the state of California. In 2018, solar and wind power plants generated almost 20% of the electricity consumed in California. Given the intermittent nature of renewable energy sources, grid operators must have the capability to regulate and maximize the efficient use of electricity generated by intermittent sources. One of the simplest and most efficient solutions is the implementation of energy storage systems.

[18] Source: Source: U.S. Energy Information Administration.

ISOs and RTOs, the independent, federally-regulated non-profit organizations that ensure service reliability and optimize supply and demand bids for wholesale electric power in the United States, must ensure that market rules do not unfairly preclude any resources from participating in the production of electricity, as enforced by FERC. Many existing market rules may not take into account the unique operating parameters and physical constraints of battery storage as both a consumer and producer of electricity. However, recent actions by FERC, ISOs and RTOs have begun to carve a path for storage to participate in their markets.

The State of California has introduced several measures related to energy storage. In 2013, the California Public Utility Commission (CPUC) implemented Assembly Bill 2514, which set a mandate for its investor-owned utilities to procure 1,325 MW of energy storage across transmission, distribution and customer levels by 2020. In May 2017, CPUC implemented Assembly Bill 2868, which ordered its investor-owned utilities to procure up to an additional 500 MW of distributed energy storage. The Self-Generation Incentive Program has designated US$48.5 million in rebates for residential storage systems that are 10 kW or smaller and US$329.5 million for storage systems larger than 10 kW.[19]

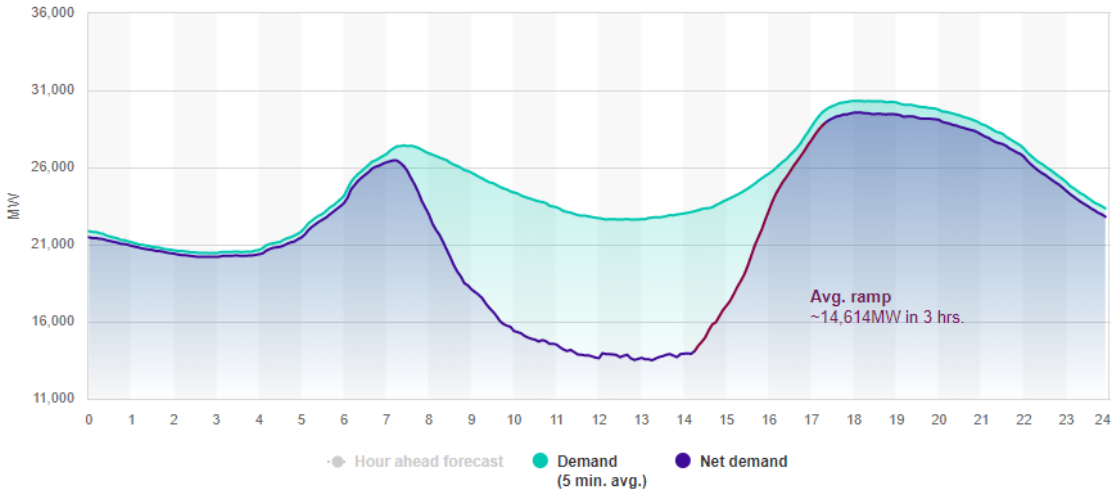
More than 60% of existing battery storage power capacity in California was installed in response to a leak at the Aliso Canyon Natural Gas Storage Facility, which posed a risk of limited access to natural gas for power generation. In May 2016, to help address reliability risks due to constraints on the natural gas supply, CPUC authorized local power utilities, including SDG&E, to hold an expedited solicitation for energy storage. By early 2017, 38 MW of battery storage were installed for the SDG&E service area.[20]

B. Project Impacts

Battery storage systems can reduce the use of regulation-up and regulation-down fossil fuel generating power plants that are needed as a result of constant changes of energy supply and demand. As a result, battery storage systems are often designed to optimize the delivery of power to the grid and improve its efficiency. [21] The transition to a low-carbon, and eventually zero-carbon grid provides challenges and opportunities, as the state of California incorporates increasing amounts of renewable energy on to the electric system. CAISO, as the electric system operator in most of California, is responsible to ensure service reliability and optimize supply and demand bids for wholesale electric power. For a grid to be stable, electricity supply should always exceed demand by a small percentage, but the greater the difference between supply and demand, the greater the cost-inefficiency of the grid. Figures 8 and 9 illustrate how the CAISO meets demand while managing the quickly changing ramp rates of variable energy resources, such as solar and wind.

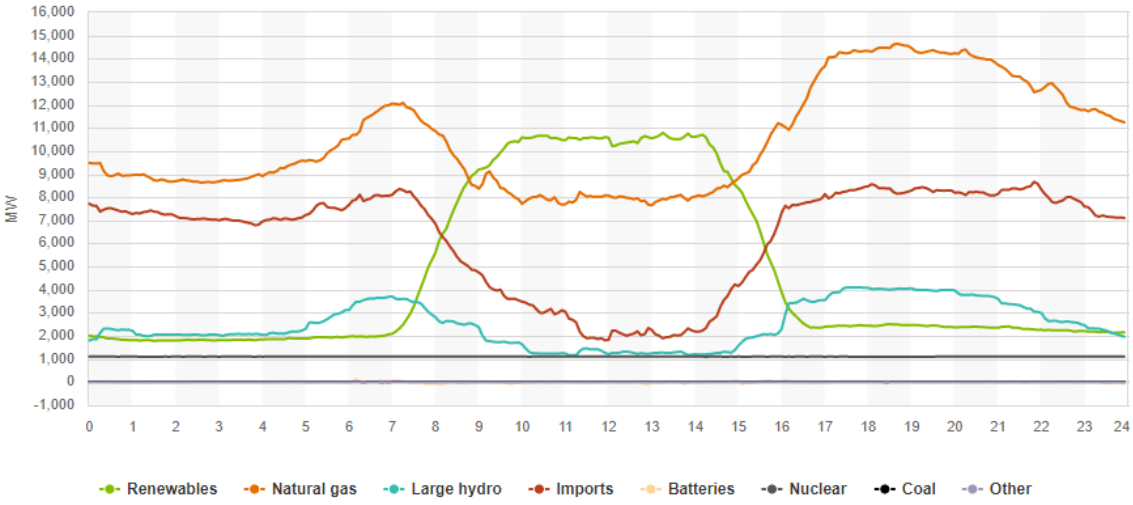
[19] Source: U.S. Energy Information Administration, U.S. Battery Storage Market Trends.
[20] Ibid.
[21] Grid efficiency is measured by the energy losses resulting from mismatches in supply and demand, where excess energy goes unused.

Figure 8
CAISO's NET DEMAND[22]



Source: California ISO Outlook as of December 16, 2019.

Figure 9
CAISO'S SUPPLY MIX



Source: California ISO Outlook as of December 16, 2019.

As shown in Figure 9, as solar generation increases when the sun is shining, supply from natural gas-fired plants decreases, but given the intermittent nature of renewable energy sources, and the response times of conventional generation sources, supply always exceeds demand. Based on Figures 8 and 9, Table 3 shows the supply and demand in CAISO at different times of the day.

[22] Net demand means the total Demand minus electricity produced by solar and wind.

Table 3
CAISO'S DEMAND AND SUPPLY

TIME	SUPPLY (MW)	DEMAND (MW)	DIFFERENCE (MW)
02:00	20,866	20,625	241
06:00	24,405	24,147	258
10:00	24,547	24,378	169
14:00	23,166	23,016	150
18:00	30,439	30,324	115
22:00	27,364	27,227	137

Source: California ISO Outlook as of December 16, 2019.

By increasing installed capacity of electricity storage systems, CAISO will be able to manage the grid more efficiently and to more closely match electricity demand reducing the need to ramp-up or down fossil fuel power generating plants. The anticipated environmental outcomes from the installation of 6.5 MW_{AC} battery energy storage system with the capacity to store up to 26 MWh of electricity per cycle or 7,781.8 MWh per year include the reduction of approximately 2,866 metric tons/year of CO_2.[23]

Additionally, the charge-discharge capacity of energy storage also increases the capacity factor of existing resources. Battery storage helps smooth out the delivery of variable or intermittent resources such as wind and solar, by storing excess energy, delivering it when demand increases. As the energy supply mix becomes cleaner with low- and no-carbon resources, energy storage will help that supply mix evolve more easily and reliably. Energy storage also supports the development of a more resilient grid by increasing the reliability and security of the energy supply for end users.

Additional benefits of battery storage systems are outlined below.

- Combining a renewable energy generator with an energy storage system provides constant power output over a certain period.
- Load management provides power reliability and maximizes renewable power consumption.
- Storing excess wind and solar generation reduces the rate of change of the power output from a non-dispatchable generator (e.g., wind or solar) in order to comply with local grid codes related to grid stability or prevent overproduction or overproduction penalties.

[23] CO_2 calculations are based on the potential emissions avoided as a result of charging and discharging 7,781.8 MWh/year of electricity for frequency control purposes that would otherwise be supplied by natural gas-fired power plants and on the emission factor for natural gas plants for the state of California calculated by NADB based on information reported by the U.S. Energy Information Administration and the California Energy Commission. The emission factor is: 0.36832 metric tons/megawatt-hour (MWh) for CO_2. Although SO_2 and NOx emissions reduction are expected, emission factors were not available related to production of electricity generated by natural gas plants.

- Frequency regulation helps balance temporary differences between demand and supply, often in response to deviations in the interconnection frequency.
- Voltage support ensures the quality of power delivered by maintaining the local voltage within specified limits.
- Storing and delivering power to compensate for grid demand variations.
- Arbitrage occurs when batteries charge with inexpensive electrical energy and discharge when prices for electricity are high, also referred to as electrical energy time-shift.
- Backup power, following a failure of the grid, provides an active reserve of power and energy that can be used to energize transmission and distribution lines, provides start-up power for generators, or provides a reference frequency.
- Transmission and distribution deferral keep the loading of transmission or distribution system equipment lower than a specified maximum, which allows for delays or completely avoids the need to upgrade a transmission system or avoids congestion-related costs and charges.

C. Transboundary Impacts

No transboundary impacts are anticipated as a result of the development of the Project.

3.2.2. Compliance with Applicable Environmental Laws and Regulations

A. Environmental Clearance

As previously mentioned, the proposed Project will be developed in a multi-tenant warehouse zoned for general industrial use. According to provisions of the California Environmental Quality Act (CEQA), the Project does not constitute a "discretionary project," since it is not expected to physically change or indirectly affect the environment.[24] Therefore, the CEQA process is not applicable, and no environmental clearance is required.

B. Mitigation Measures

Although no environmental clearance is required, the Sponsor is planning to take the following actions regarding the implementation of the Project.

- *Hazardous Materials*. The proposed Project will utilize lithium-ion technology that has a long lifespan and boasts superior safety and stability characteristics. Given that energy storage is a relatively new technology, the Sponsor will be educating staff and will respond to any questions that staff and/or the public may have during the planning and design processes. Additionally, the Sponsor expects to use the battery recycling program of Powin's primary cell supplier.

[24] Source: California Natural Resources Agency. (http://resources.ca.gov/ceqa/more/faq.html).

- *Noise*
    - In order to comply with Section 17-220(a) of the Escondido Municipal Code, the Sponsor is considering screening any outdoor equipment, including inverters and switchgear. The screening material should be free from gaps or holes to ensure noise reduction.
    - The Sponsor will comply with the construction schedules set by Escondido Municipal Code Section 17-234: Monday through Friday, 7:00 a.m. to 6:00 p.m., and Saturdays 9:00 a.m. to 5:00 p.m. No construction noise shall be generated on Sundays.

C. Pending Environmental Tasks and Authorizations

There are no pending environmental authorizations to be obtained for the Project.

3.3. Financial Criteria

The Project Sponsor has requested a loan from the North American Development Bank (NADB) to complete the financing of the Project. The Project's financing will be structured under a portfolio loan with additional projects that will provide revenue streams for the repayment of the loan. This payment mechanism is consistent with the project structure and similar projects in the U.S. market. The source of payment will be the revenues generated by these additional projects in the portfolio in accordance with long term Power Purchase Agreements (PPAs) and sales in the spot market. NADB loan will have no recourse beyond the Borrower company.

NADB performed a financial analysis of the sources of payment; the proposed payment structure; and the projected cash flows over the term of the loan. These cashflows are estimated to be sufficient to a) cover scheduled O&M expenses, b) fund any debt service reserve or cover the costs of a debt reserve letter of credit and c) pay the debt service on the senior loan. The loan will also be sized to comply with the required debt service coverage ratios.

In addition, NADB's analysis verified that the Borrower has the legal authority to contract financing and pledge its revenue for the payment of financial obligations. The Borrower also has the legal and financial capacity to operate and maintain the portfolio correct performance. NADB has verified that the projected O&M costs are in accordance with industry standards.

Considering the Project's characteristics and based on the financial and risk analyses performed, the proposed Project is considered financially feasible and presents an acceptable level of risk. Therefore, NADB proposes providing a market-rate loan for up to US$6.8 million for the construction of the Project described herein.

4. PUBLIC ACCESS TO INFORMATION

4.1. Public Consultation

NADB published the draft certification and financing proposal for a 30-day public comment period beginning on December 19, 2019.

4.2. Outreach Activities

Given the Project is not subject to a CEQA process, no public consultation is required for the Project per CEQA. However, the Sponsor will be available to respond to any questions that the public may have during the planning and design processes.

NADB conducted a media search to identify potential public opinion about the Project. References to the Project were found on the websites listed below:

- *Globe Newswire* (December 11, 2017) – "*Powin Energy Sells 110MWh of Operating Projects and Pipeline to esVolta",* (https://www.globenewswire.com/news-release/2017/12/11/1250781/0/en/powin-energy-sells-110mwh-of-operating-projects-and-pipeline-to-esvolta.html).

- *Business Wire* (October 15, 2018) – "*esVolta Selected for Four Energy Storage Projects Totaling 38.5 MWhs in Southern California*", (https://www.businesswire.com/news/home/20181015005312/en/esVolta-Selected-Energy-Storage-Projects-Totaling-38.5).

In summary, these publications highlight the scope of the Project. Opposition to the Project was not detected from the available media coverage. The Sponsor has conducted the appropriate consultations in order to comply with applicable permitting processes.