

# Total investment cost of solar plus storage project in Norway





## Overview

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The Illvatn project, with an estimated price tag of NOK1.2 billion (US\$113 million), is expected to begin construction in 2025, targeting 2028 or 2029 for full operation. “We have carefully developed this project over an extended period, in close dialogue with authorities and the local community.

They’re surgically investing in three key areas: 1. Battery Boomtowns The city plans to build Europe’s largest flow battery array – think of it as a gigantic energy savings account. These aren’t your smartphone lithium-ion cousins. We’re talking vanadium-based systems that can power 20,000 homes.

With construction starting in 2025 and operations beginning in 2028/2029, the total investment for the project is estimated at approximately NOK 1.2 billion. Illvatn is part of a larger hydropower initiative in Hydro Energy. Kristen Johannes Rockland Aarethun (left), Head of Technical Support &.

The total project costs are estimated at NOK 25.1 billion. This includes both the investment and ten years of operation. The state’s part of these costs are estimated at NOK 16.8 billion, which means that the state expects to cover approximately two-thirds of the project’s cost. In September 2020.

The report has been written based on results from the research project Conditions for growth in renewable energy industries (RENEWGROWTH) and our activity in the Norwegian Research Centre for Sustainable Solar Cell Technology (SUSOLTECH). RENEWGROWTH is supported by the Research Council of Norway.



The Norwegian government has made room in its 2025 budget for a multimillion-dollar investment destined to be injected into its carbon capture and storage (CCS) project, described as a full-scale CO<sub>2</sub> capture, transport, and storage development in line with the country's international climate. What projects are under development in Norway?

Another project under development in Norway is a new power plant at Torolmen, in the Årdal municipality, with an estimated annual production of around 30 GWh. The total investment for this project could reach NOK290 million (US\$27.4 million), with potential construction starting as early as 2027.

Is Norsk Hydro planning a new pumped storage power plant?

In April 2020, the Norwegian Ministry of Energy granted Norsk Hydro a concession to develop the Illvatn pumped storage power plant. An application for a plan change is being processed by the Norwegian Water Resources and Energy Directorate (NVE).

Is pumped storage plant a solution for the European power system?

The European power system needs to develop mechanisms to compensate for the reduced predictability and high variability that occur when integrating renewable energy. Construction of pumped storage plant (PSP) is a solution. In this article an economic analysis of large-scale PSP in Norway is made considering sales of energy.

What is the Norfund investee Sael?

The Norfund investee SAEL is dedicated to providing sustainable and affordable energy solutions by converting agricultural waste into energy and promoting renewable energy projects.

Will a hydro concession be granted to the illvatn pumped storage power plant?

In April 2020, the Norwegian Ministry of Energy granted Hydro concession to develop the Illvatn pumped storage power plant. An application for a plan change is currently being processed by the Norwegian Water Resources and Energy Directorate (NVE).

Can a plan change be implemented in Norway?

An application for a plan change is currently being processed by the



Norwegian Water Resources and Energy Directorate (NVE). The project's implementation depends on a positive response to the application, with the final investment decision expected by the second quarter of 2025.



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### Energy storage 2023: biggest projects, financings, offtake deals

The expansion of Moss Landing Energy Storage Facility in California, already the world's biggest BESS project, to more than 3GWh was one of the highlights of the first half ...

### Commercial Energy Storage Solutions

We design our solar+storage systems to maximize clean energy incentives, and our proprietary energy management software can generate a savings guarantee estimate in minutes given ...



### Economic Analysis of Large-Scale Pumped Storage Plants in ...

Construction of pumped storage plant (PSP) is a solution. In this article an economic analysis of large-scale PSP in Norway is made considering sales of energy. The ...

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Declining storage costs, improving battery performance, grid stability needs, the lag of other power alternatives, and a surge in solar-



plus-storage projects are together ...



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Executive summary Large cost reductions have led solar energy to become the cheapest source of electricity in many countries, with large expectations for future growth (IEA, 2020; IRENA, ...



[Utility-Scale PV , Electricity , 2024 , ATB , NREL](#)

Units using capacity above represent kWAC. 2024 ATB data for utility-scale solar photovoltaics (PV) are shown above, with a base year of 2022. The Base Year estimates rely on modeled ...



**Battery Energy Storage Market: Commercial Scale, Lithium ...**

The Investment Tax Credit (ITC) and Modified Accelerated Cost Recovery System (MACRS) are national level incentives that can improve battery energy storage project economics.

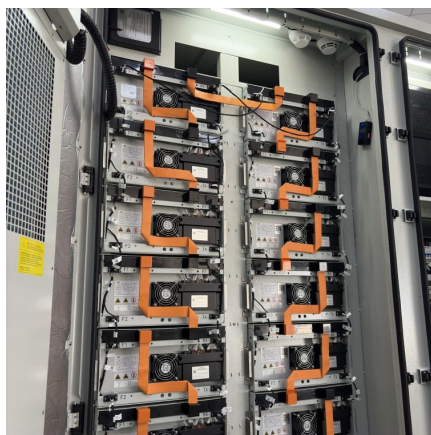




### [What's Driving the Cost of Residential Solar-Plus](#)

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The cost of solar storage: A small battery solar-plus-storage system using a 5.6 kW photovoltaic (PV) array and a 3 kW / 6 kWh lithium-ion battery is about twice as expensive as a stand-alone grid-connected 5.6-kW ...



### [Solar Installed System Cost Analysis . Solar Market ...](#)

Solar Installed System Cost Analysis NREL analyzes the total costs associated with installing photovoltaic (PV) systems for residential rooftop, commercial rooftop, and utility-scale ground-mount systems. This work has ...

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Solar Levelized Cost of Energy is influenced by a multitude of factors such as investment costs for material and product, operational and maintenance costs, solar cell lifetime, degradation, as



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Another project under development in Norway is a new power plant at Torolmen, in the Årdal municipality, with an estimated annual production of around 30 GWh. The total investment for this project could reach NOK290 ...

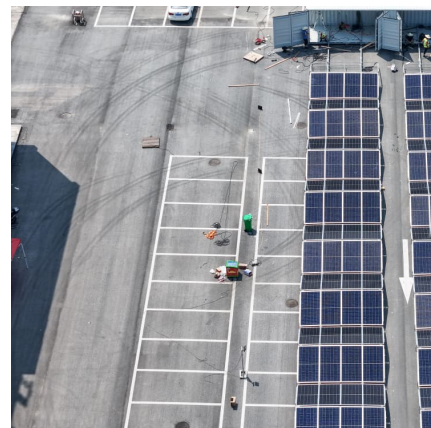


### **Solar Installed System Cost Analysis , Solar Market Research**

Solar Installed System Cost Analysis NREL analyzes the total costs associated with installing photovoltaic (PV) systems for residential rooftop, commercial rooftop, and utility ...

### [CCS costs , Estimation for the Longship CCS project ...](#)

Costs of the Longship Project The total project costs are estimated at NOK 25.1 billion. This includes both the investment and ten years of operation. The state's part of these costs are estimated at NOK 16.8 billion, which means that the ...





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### [Utility-Scale PV , Electricity , 2024 , ATB , NREL](#)

Units using capacity above represent kWAC. 2024 ATB data for utility-scale solar photovoltaics (PV) are shown above, with a base year of 2022. The Base Year estimates rely on modeled capital expenditures (CAPEX) and operation and ...



### [MENA Solar and Renewable Energy Report](#)

1. Investment in Renewable Energy The total corporate funding in the global solar sector saw an 11% increase year-on-year at \$109.4 billion in the first half of 2019. More than \$2.6 trillion has ...

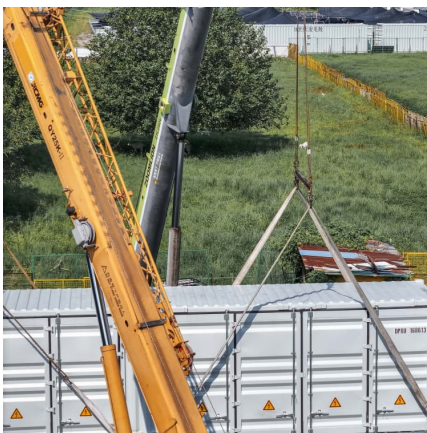
### [Solar-Plus-Storage Program Design: Frameworks and ...](#)

This resource aims to provide an overview of program and policy design frameworks for behind-the-meter (BTM) energy storage and solar-plus-storage programs and examples from across ...



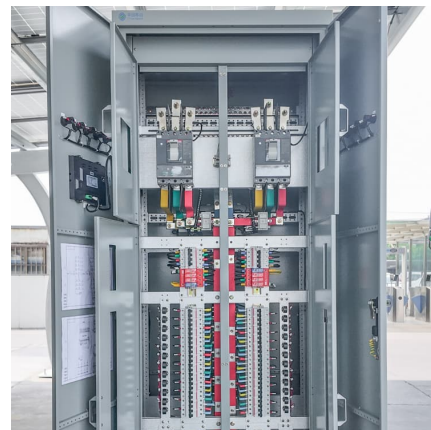
### [CCS costs , Estimation for the Longship CCS project ...](#)

The cost estimates for the Longship CCS project are based on concept studies for CO2 capture and feasibility study for transportation and storage.



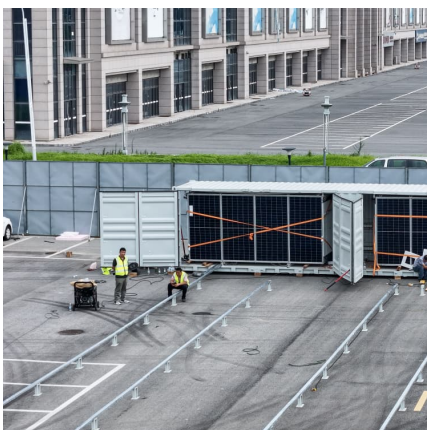
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### [Powering India's Clean Energy Transition with Solar ...](#)

Innovative financing models: We explore blended financing options, such as viability gap funding and long-term PPAs with storage components, to improve project bankability and attract investment. By ...





### [How does the cost of battery storage impact the ...](#)

In conclusion, battery storage costs are a critical component of the total cost of renewable energy projects. As battery storage technologies become cheaper, they reduce the overall system cost and enable higher ...



### **Evaluating the Technical and Economic Performance of PV ...**

Report Background and Goals Declining photovoltaic (PV) and energy storage costs could enable "PV plus storage" systems to provide dispatchable energy and reliable capacity. This study ...

### [Enlight launches major solar and storage project in ...](#)

Enlight Renewable Energy has successfully commissioned its flagship solar-plus-storage project, known as the Atrisco project, located in New Mexico. This significant development marks a milestone for Enlight and its U.S. ...



### [Egypt set for giant solar-plus-battery storage project](#)

Norway's Scatec has signed a 25-year PPA with Egyptian Electricity Transmission Co. (EETC) for a 1 GW solar and 100 MW/200 MWh battery storage hybrid project in Egypt.



### [Energy Storage Updater: February 2021](#)

This project will be the largest battery storage system in Latin America to date and Chile's first solar plus storage project. The batteries will be paired with 253 MW of solar energy generation.



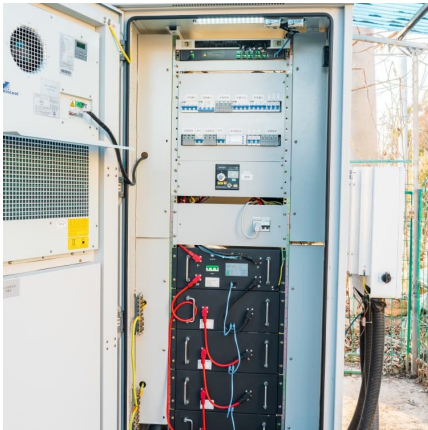
### [Edwards & Sanborn Solar and Energy Storage Project, USA](#)

The Edwards and Sanborn project is a combination of a solar and energy storage facility, located in southern Kern County, California, US.

### [84 GWh pumped storage project planned for Norway](#)

This project could increase annual power production by 800 GWh and capacity by 650 MW. The total investment is estimated to be up to NOK7 billion to 8 billion, (US\$660 million to \$756 million), with a possible ...



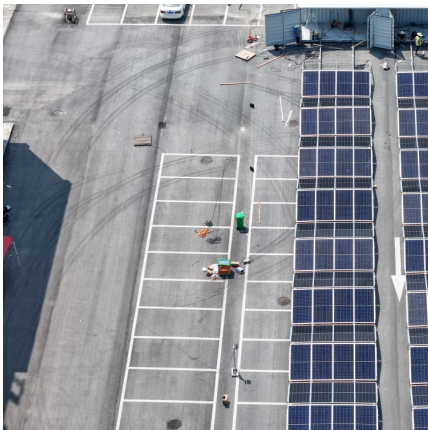
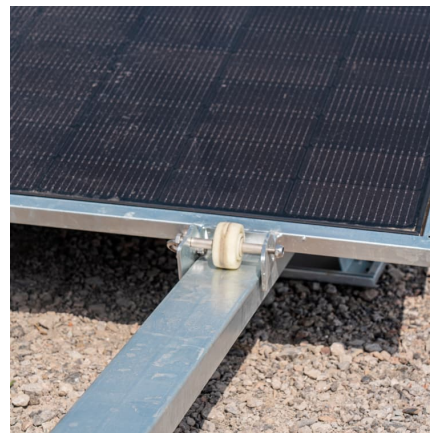


### About the Longship project

About the Longship project Northern Lights is responsible for developing and operating CO<sub>2</sub> transport and storage facilities, open to third parties, as part of Longship, the Norwegian Government's full-scale carbon capture and storage ...

### All You Need to Know About the \$2Bn Eland Solar-plus-Storage ...

The Eland Solar-plus-Storage Center in Los Angeles, California -- developed by Arevon -- is now fully operational. With 758MW of solar photovoltaic capacity and a 1,200MWh ...



### [Factory PV plus energy storage investment cost](#)

The benchmarks in this report are bottom-up cost estimates of all major inputs to PV and energy storage system (ESS) installations. Bottom-up costs are based on national averages and do ...

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