



GRID RESILIENCE AND INNOVATION PARTNERSHIPS PROGRAM

Improving Power Quality by Repurposing Existing Grid Infrastructure with Advanced Transmission Lines

Established by the Bipartisan Infrastructure Law, the Grid Resilience and Innovation Partnerships (GRIP) Program is a \$10.5 billion investment to enhance grid flexibility, improve the resilience of the power system against extreme weather, and ensure American communities have access to affordable, reliable, electricity when and where they need it. GRIP funding is administered by the U.S. Department of Energy's Grid Deployment Office (GDO). This project was selected through the second round of GRIP funding.

Southern California Edison (SCE), in collaboration with HICO America, the International Brotherhood of Electrical Workers (IBEW) Local 47, local governments, and educational institutions across California's Inland Empire region, will construct a groundbreaking Solid-State Power Substation (SSPS) using medium voltage direct current (MVDC) technology in Fontana, California. The objective is to enhance the capacity of the existing sub-transmission lines by over 1.5 times without the need for a new right-of-way, offering a scalable solution to meet the state's clean energy and decarbonization goals. By repurposing existing infrastructure, the project minimizes environmental impact and speeds up construction, while providing essential grid upgrades to customers in Disadvantaged Communities (DACs).

Anticipated Outcomes and Benefits

Grid enhancement and efficiency: The SSPS will increase line capacity from 125 MVA to 190 MVA, improving power quality, grid control, and flexibility. This project sets the stage for the introduction of DC as a service to customers and could potentially reduce the buildout rate for new sub-transmission lines by up to 50%. The project aims to demonstrate cost-effective grid expansion and support new hybrid AC/DC grid architectures essential for future energy demands.

Industry impact and innovation: By deploying innovative MVDC multi-level converter (MMC) technology, the SSPS project could set a national precedent for using solid-state power substations in urban grid applications. The project can encourage domestic manufacturing of power electronic technologies, with HICO expanding its Memphis facility to produce these systems domestically.

Community benefits: SCE will collaborate to advance emerging craftworker positions for MVDC technology, and partner with HICO to develop an 18-month apprenticeship program for operating and maintaining SSPS. Construction services for substation work will be provided by Hal Hayes Construction Inc., a Native-American-owned construction organization. The project will create 35-40 construction jobs and two new operations positions, and support five EV maintenance workers with a local non-profit, Inland EV. Some or all of this project will be executed in collaboration with the International Brotherhood of Electrical Workers (IBEW).

Project Details



- **Project:**
Solid-State Power Substation (SSPS)
- **Applicant/Selectee:**
Southern California Edison
- **GRIP Program:**
Smart Grid Grants
(Bipartisan Infrastructure Law, Section 40107)
- **Federal cost share:**
\$49,971,078
- **Recipient cost share:**
\$116,867,282
- **Project location:**
California
- **Project type:**
Advanced Transmission Technologies

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