



DSP Solar Initiative and Norion Renewable Energy Limited

From Royal Vision to Sustainable Energy Infrastructure in Bhutan.

“Driving Bhutan’s Renewable Energy Transition Through Skilling and Innovation”

Executive Overview

The DSP Solar Initiative (DSP-SI) represents Bhutan’s effort to build national capacity in solar-energy development, reduce dependence on imported electricity, and create a skilled local workforce. The initiative originated in a Royal Command received at Tashichho Dzong on 8 June 2022, directing the development of Bhutanese technological and manpower capabilities in solar power and the skilling of Desuups. The initiative was subsequently instituted in 2023 under the His Majesty’s Secretariat (HMS) serving as the principal institutional reference point and the Project Implementation Department (PID) responsible for implementations.

Between 2023 and 2026, DSP-SI progressed from an initial 765.05 kW installation to three commissioned phases with a combined capacity of approximately 9.625 MW. These projects generated recorded energy-sale revenue of approximately Nu. 79.109 million as of 31 July 2026. At the same time, the initiative expanded its mandate beyond project construction. It developed Desuup skills, reduced the cost of solar capacity through experience and scale, established a corporate vehicle known as Norion Renewable Energy Limited (NREL), and prepared a 30 MW expansion Programme targeted for capitalization by December 2027. The longer-term vision includes the proposed 100 MW Tareythang Agrivoltaics Farm, which would integrate solar generation with agricultural land use and youth training.

1. Background and Institutional Development

The DSP-SI was conceived as a practical response to Bhutan’s need for energy security, import substitution, and domestic technical capability. The Royal Command was received on **June 8, 2022** at **TashiChho Dzong** to take up the **Solar Initiative** to **build Bhutanese capacity (technology and manpower) in harnessing solar power for energy security and import substitution through the Skilling of Desuups.**

The Royal directive set out three connected objectives: to build in-house capacity and know-how for implementing solar projects; to develop the ability to repair and maintain installations after completion; and to help establish Bhutanese entrepreneurs and businesses capable of leading the sector collectively. The initial vision focused on solar rooftops across the Thimphu Valley up to Chuzom, but the Programme subsequently developed into a broader national initiative.

To take this vision forward, DSP-SI was instituted in 2023. A Board of Directors was established as an advisory body to the PID, which operates under HMS. The PID brought



together skilled Bhutanese engineers deputed from different agencies, supported by personnel and Desuups working on contract. This structure allowed the initiative to combine institutional oversight with a project-focused technical team. In this sense, DSP-SI was not designed simply as a construction Programme; it was also intended to create the knowledge, systems, and workforce required to sustain solar infrastructure over its operating life.

The programme’s institutional development culminated in the incorporation of DSP-SI as a legal entity under the name **Norion Renewable Energy Limited**. NREL has been incorporated with the Desuung Skilling Programme (DSP), His Majesty’s Secretariat (HMS), as its Principal Shareholder. The Company has an initial paid-up capital of BTN 316.5 million and an authorized share capital of BTN 6 billion. The name “Norion” is derived from the fusion of “Nor” symbolizing wealth and prosperity and “ion,” representing energy and technology, thereby reflecting the Company’s vision of advancing sustainable and innovative energy solutions in Bhutan.

NREL represents a strategic national initiative aimed at strengthening Bhutan’s domestic capacity in renewable energy development, with a particular focus on solar power. The Company is mandated to contribute to enhancing national energy security, promoting environmental sustainability, and fostering economic self-reliance

2. Project Implementation and Capacity Growth

DSP-SI’s implementation record shows a clear progression in project size and declining cost per unit of installed capacity. Phase I established the initial operating base, while Phases II and III expanded the Programme across additional institutional and public locations. Phase IV and V are planned to take the initiative to a much larger scale.

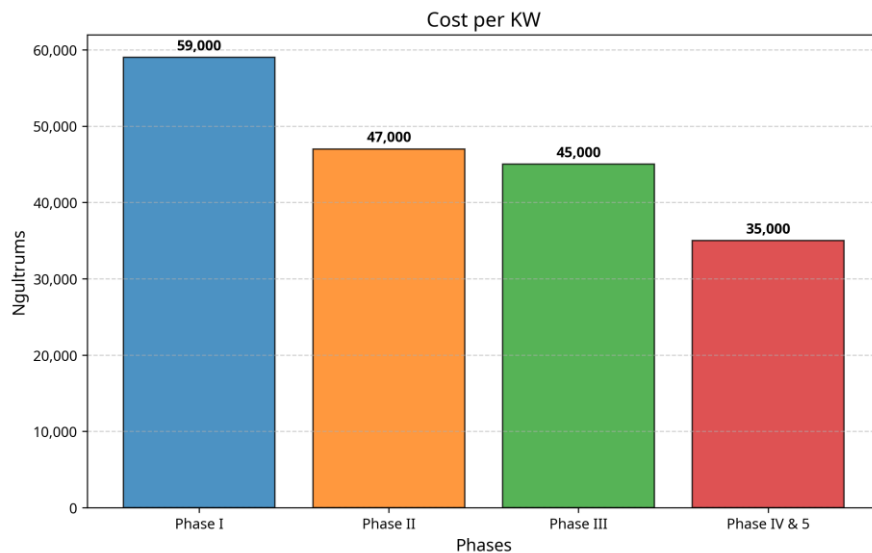
Phase	Installed capacity	Capitalized project cost	Cost per kW	Commissioning / target	Gross revenue from energy sales
Phase I	765.05 kW	Nu. 45.880 million	Nu. 59,973.85	June 2023	Nu. 13.663 million
Phase II	3,840.74 kW	Nu. 182.1105 million	Nu. 47,387.58	October 2023	Nu. 47.336 million
Phase III	5,016.44 kW	Nu. 229.243 million	Nu. 45,702.57	December 2025	Nu. 18.107 million
Phases IV–V	20,000 kW planned	Nu. 700 million	Nu. 35,000.00 planned	December 2026–27	Nu. 63.072 million estimated annually

Phase I comprised 255 kW at the Centenary Farmer’s Market (CFM) and 510 kW at Dechencholing. Phase II added 103.8 kW at the CFM, 2,137 kW at Dechencholing, and 1,602 kW at Dungkar Estate. Phase III included installations at Dungkar Estate, Paro Airport, Dechencholing, and Tareything in connection with the Gyalsung-related development. These locations demonstrate the programme’s movement from an initial rooftop concept toward a portfolio of institutional, estate, airport, and other public-sector installations.



Figure 1. Phase I Solar Initiative Project (510kW Dechencholing and 255 kW CFM)

A major performance indicator is the reduction in cost per kilowatt. The cost declined from Nu. 59,973.85 per kW in Phase I to a planned Nu. 35,000 per kW for Phases IV and V. This represents an approximate reduction of 41.6 percent. The presentation attributes the improvement to economies of scale, improved procurement strategies, and learning by doing. The trend suggests that the programme's early phases generated practical experience that can be applied to larger and more standardized installations.



Strategic Cost Reduction: The cost per kW has seen a significant decline of approximately **41%** from Phase I to Phase IV/V, driven by economies of scale, improved procurement strategies, and learning by doing.

3. Energy Sales and Financial Performance

The commissioned phases generated a combined total net energy output of 18,204,312 kWh in the revenue statement presented through 31 July 2026. At the applicable tariffs, the projects



produced total energy-sale revenue of Nu. 79,108,556.76 from their respective commercial operation dates. Phase II contributed the largest amount, with revenue of Nu. 47,336,933.58, followed by Phase I at Nu. 13,663,691.64 and Phase III at Nu. 18,107,931.54.

Phase	Total net energy shown	Tariff range shown	Energy-sale revenue through 31 July 2026
Phase I	3,156,907.60 kWh	Nu. 4.48 / 4.07 per kWh	Nu. 13,663,691.64
Phase II	10,766,989.40 kWh	Nu. 4.50 / 4.07 per kWh	Nu. 47,336,933.58
Phase III	4,280,415.00 kWh	Nu. 4.50 / 4.07 per kWh	Nu. 18,107,931.54
Total	18,204,312.00 kWh	—	Nu. 79,108,556.76

The financial material in the presentation also identifies an estimated annual revenue of Nu. 171.4 million from Phases I–V after December 2027, together with cumulative revenue of more than Nu. 55 million for 2022–2026 in the broader financial-growth summary. Because these figures are presented as estimates or summary indicators, they should be distinguished from the realized energy-sale revenue recorded for Phases I–III. The presentation further highlights NREL’s Nu. 316.5 million paid-up capital and Nu. 6 billion authorized share capital as indicators of the organization’s strengthened financial foundation.

Funding arrangements have evolved across the phases. Phase I was supported by a Nu. 33.50 million loan from the Bhutan Trust Fund, together with a Nu. 16.50 million grant. Phase II involved a Nu. 150 million Ministry of Finance loan and Nu. 32.1105 million in equity. For Phases IV and V, the presentation reports a Nu. 700 million Bank of Bhutan manufacturing renewable-energy loan at 7 percent interest, agreed on 11 December 2025. The broader 30 MW capitalization plan is described as requiring Nu. 1.2 billion of capital investment at a 70 percent loan-gearing ratio.



Figure 2. Phase II Solar Initiative Project (3.85 MW)

4. Human-Capital Development and NREL's Operating Mandate

A central feature of DSP-SI is its skilling mandate. The Programme has trained a total of 404 Desuups through batches associated with the initial initiative and Phases I–IV. The training component supports the Royal directive that Bhutan should develop its own capacity not only to install solar systems but also to operate, repair, and maintain ourselves. By linking infrastructure delivery to practical training, DSP-SI seeks to ensure that project benefits extend beyond the electricity generated by the panels.

Following incorporation, NREL is positioned to continue this integrated model through four core business activities. First, it will develop, own, and operate utility-scale rooftop and ground-mounted solar power plants. Second, it will provide engineering, procurement, and construction services for solar PV projects on a deposit-work basis. Third, it will offer consultancy services covering solar PV design, technical engineering, and feasibility studies for public and private-sector clients. Fourth, it will continue training and certifying Desuups in advanced solar technology, thereby supporting a sustainable local workforce.^{[1](#)}

This operating model gives NREL a diversified role in Bhutan's renewable-energy transition. It combines asset ownership and energy generation with project delivery, advisory services, and workforce development. The combination may also support institutional learning: experience gained through NREL-owned projects can inform EPC work and consultancy, while trained personnel can contribute to operations and maintenance across the country.

5. Expansion Plans and the Tareythang Agrivoltaics Project

The next stage of the Programme is focused on expanding installed capacity to 30 MW by December 2027. The procurement and implementation of 10 MW of rooftop-solar materials

began in January 2026 for Phase IV. Identified locations include RBA Shaba, Paro College of Education, JSW College in Pangbisa, RBA headquarters, Gyelposhing College of Information Technology (GCIT), Gyalsung Infra Academy in Khotokha, the Pema Secretariat, and RUB headquarters. Together with the planned Phase V installations, these sites would broaden the programme's institutional reach and increase the volume of clean electricity supplied to Bhutan Power Corporation.



Figure 3. Phase III Solar Initiative Project (5.016 MW)

The proposed 100 MW Tareythang Agrivoltaics Farm represents a further expansion of the initiative's development approach. The project was initiated following a Royal Command on 10 July 2025 for a feasibility study. It is planned over approximately 214 acres, with an estimated project cost of Nu. 5.422 billion. The financing structure under discussion is based on a 70:30 debt-to-equity ratio, comprising approximately Nu. 3.795 billion in debt and Nu. 1.626 billion in equity. Negotiations with NEDA, Thailand, are described as advancing around a 1.5 percent loan interest rate.

The project is estimated to generate 153.144 million units of net energy annually and annual revenue of Nu. 623.293 million. Its distinguishing feature is the combined use of land for solar generation and agriculture. This approach is intended to optimize land use while opening opportunities for Desuups and Gyalsups to gain practical, multi-skilled experience in both renewable energy and agriculture. In addition to its energy and financial potential, the project is therefore presented as a platform for youth engagement, employment, and national self-reliance.



Conclusion

The DSP Solar Initiative has progressed from a Royally directed capacity-building concept into a functioning renewable-energy Programme with commissioned solar assets, measurable energy-sale revenue, an expanding training record, and a dedicated corporate successor in NREL. The initiative's first three phases established approximately 9.625 MW of capacity and generated Nu. 79.109 million in recorded energy-sale revenue through 31 July 2026. Its declining cost per kilowatt indicates that experience and scale are improving implementation efficiency.

The incorporation of Norion Renewable Energy Limited provides a formal institutional vehicle for the next stage of growth. Through solar energy generation & allied services, EPC services, consultancy, and continued Desuup skilling, NREL is positioned to support a broader renewable-energy ecosystem rather than operate only as a project owner. The planned 30 MW capacity by December 2027 and the proposed 100 MW Tareythang Agrivoltaics Farm would further extend the programme's contribution to energy security, land-use efficiency, technical employment, and Bhutan's transition toward a more self-reliant and sustainable economy.

The DSP-SI and Norion Renewable Energy Limited stand as a testament to the Royal Vision of a self-reliant, sustainable, innovative, and technologically advanced Bhutan.