

ENERGY ORIENTATION 2025

A Capacity-Building Workshop on Shifting Fossil Fuels to Renewables in Bangladesh

100+ Participants, 40+ Civil Society Voices & 11 Organizations
Attended to discover BD energy sector and its future

JULY 2025



A Capacity-Building Workshop on **SHIFTING FOSSIL FUELS TO RENEWABLES** **IN BANGLADESH**

100+ Participants, 40+ Civil Society Voices & 11 Organizations
Attended to discover Bangladesh energy sector and its future



bwged



JULY 2025

Energy Orientation 2025

A Capacity-Building Workshop on Shifting Fossil Fuels to Renewables in Bangladesh

Prepared By: N.M. Rifat and Mahdiul Islam

Edited By: Kaniz Rabeya



This publication is registered under Attribution-NonCommercial-Share Alike 2.0 Generic. Anybody can copy, alter, remix, transform, redistribute, or build upon this publication in any medium or format for non-commercial purposes only with proper attribution.



CLEAN is not any investment consultant or advisor and does not make any representation regarding the advisability of investing in any particular company, fund, or vehicle. The opinions expressed in this publication are based on the documents specified in the references and do not necessarily reflect the views of CLEAN.

Organizer:

Coastal Livelihood and Environmental Action Network (CLEAN), Bangladesh Working Group on Ecology and Development (BWGED).

Strategic Partners:

Forum on Ecology and Development (FED) and Campaign for Sustainable Rural Livelihoods (CSRL).

Acknowledgement:

Heartfelt thanks to Ariful Haque, Fahim Ibn Habib, Hasan Mehedi, Kaniz Rabeya, Mahbub Alam Prince, Mahdiul Islam, Mahfuz Ur Rahman, Mousumi Afrose, N.M Rifat, Nazmul Islam, Rahul Biswas, Sadia Rowshon Adhora, Suvodip Adhikari, Tanmoy Das Utsa and all the participants for their invaluable contributions and participation in the Energy Orientation 2025. Their collective management, insights, and dedication were instrumental in raising awareness and propelling our initiatives forward. We are also profoundly grateful to the many others who supported us behind the scenes. Your efforts have not gone unnoticed.

For any query, please contact:

Coastal Livelihood and Environmental Action Network (CLEAN)

4 Mallick Bari Road, Boyra-Rayermahal, Khulna 9000, Bangladesh

Phone: +88 02 477 701 458 | Email: info@cleanbd.org

Website: <https://www.cleanbd.org>

TABLE OF CONTENTS

1. Acronyms	05
2. Executive Summary	07
3. Background	08
1. Objectives	
4. Training Overview	09
1. Foundations of the Energy Transition	
2. Renewable Energy Technologies and Practices	
3. Practical Solar Applications and Economic Modelling	
5. Day 1: Friday, 14 March 2025	10
1.1 Registration	
1.2 Expectations of the Participants	
1.3 Self Assessment	
1.4 The Context	
1.5 Power Sector Project Lifecycle	
1.6 Policy Landscape of Energy & Power	
1.7 Characteristics of Energy in Bangladesh	
1.8 Why should we shift to renewables	
1.9 Myths about Renewable Energy	
6. Day 2: Saturday, 15 March 2025	14
2.1 Recap	
2.2 False Solutions & Greenwashing	
2.3 Approaches of Renewable Energy	
2.4 Residential Solar Power	
2.5 How much electricity do you use?	
2.6 Calculate how many Solar Panels you need	
2.7 How much money do you need?	
7. Day 3: Sunday, 16 March 2025	18
3.1 Recap	
3.2 How much electricity you will get	
3.3 Cost-Benefit Analysis	
3.4 Prize Distribution and Closing	
8. Epilogue	20
Conclusion	
Participant List	

ACRONYMS

ADP	Annual Development Program
BDP 2100	Bangladesh Delta Plan 2100
BWGED	Bangladesh Working Group on Ecology and Development
CLEAN	Coastal Livelihood and Environmental Action Network
CSRL	Campaign for Sustainable Rural Livelihoods
DC	Direct Current
EV	Electric Vehicle
FED	Forum on Ecology and Development
GHG	Greenhouse Gas
HFO	Heavy Fuel Oil
IEPMP	Integrated Energy and Power Master Plan
IPFF	Investment Promotion and Financing Facility
JETnet-BD	Just Energy Transition Network Bangladesh
kWh	Kilowatt Hour
LCOE	Levelized Cost of Energy
MCPP	Mujib Climate Prosperity Plan
MW	Megawatt
NDCs	Nationally Determined Contributions
RE	Renewable Energy
ROI	Return on Investment
SEZs	Special Economic Zones
SREDA	Sustainable and Renewable Energy Development Authority
T&D	Transmission and Distribution

Energy Orientation on **Shifting Fossil Fuels to Renewables in Bangladesh**

Date: 14-16 March 2025

Location: CSS Ava Centre, Khulna, Bangladesh



Organized By:

Coastal Livelihood and Environmental Action Network (CLEAN)
Bangladesh Working Group on Ecology and Development (BWGED)

Strategic Partners:

Campaign for Sustainable Rural Livelihoods (CSRL)
Forum on Ecology and Development (FED)

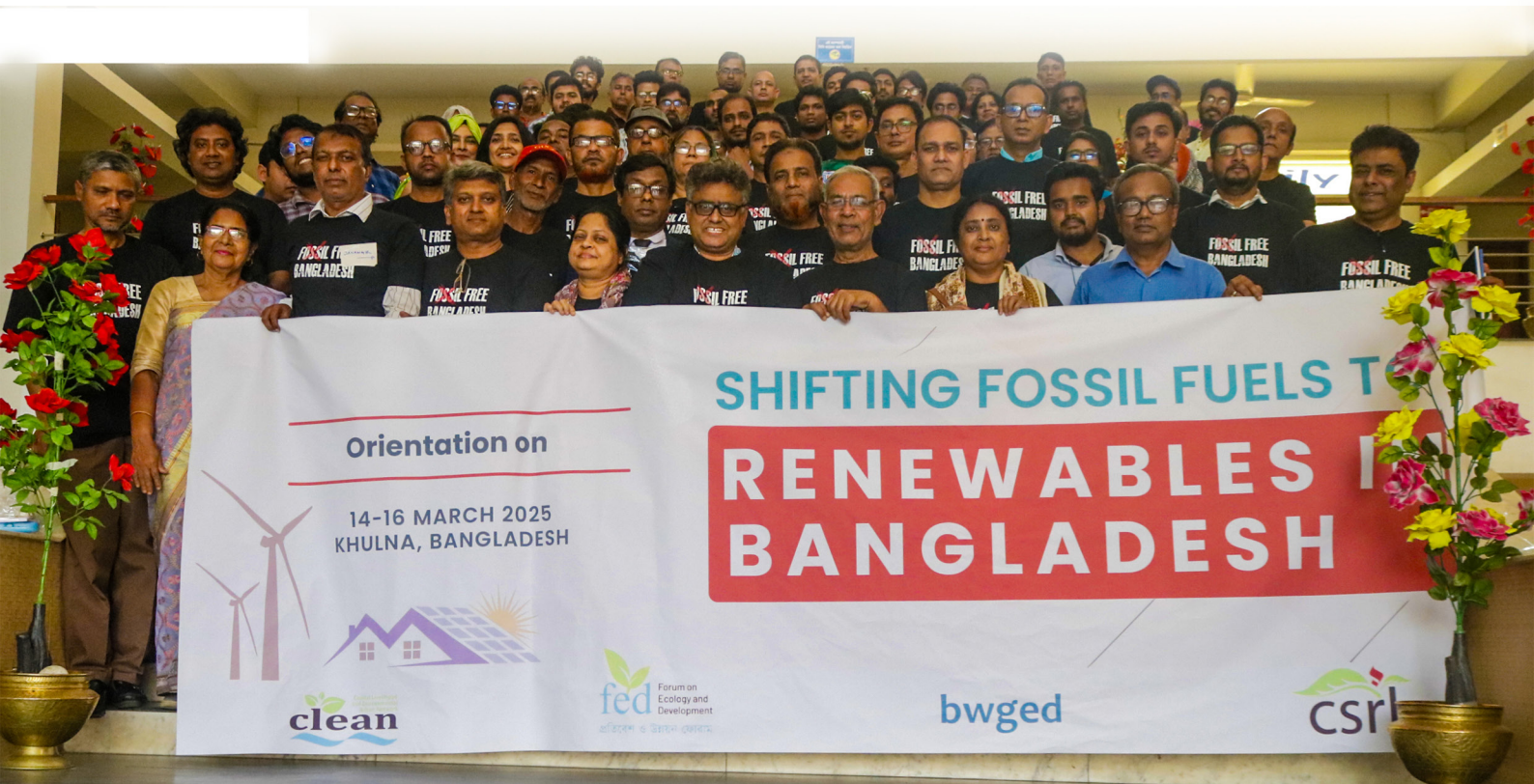
EXECUTIVE SUMMARY

The Energy Orientation 2025, held from 14-16 March 2025, at the CSS Ava Centre in Khulna, brought together over one hundred committed individuals, grassroots activists, civil society leaders, and energy practitioners united by a shared vision for an urgent transition from fossil fuel dependence to a sustainable, renewable energy system. Organized by the Coastal Livelihood and Environmental Action Network (CLEAN) and the Bangladesh Working Group on Ecology and Development (BWGED), in collaboration with the Forum on Ecology and Development (FED) and the Campaign for Sustainable Rural Livelihoods (CSRL), the three-day program served as both a knowledge exchange and a call to action.

Against the backdrop of an escalating climate crisis and persistent energy inequities, the orientation provided participants with a clear-eyed understanding of Bangladesh's current energy landscape and its entanglement with global systems. Through interactive workshops, participants engaged deeply with the realities of the country's fossil fuel dependency, examined policy and institutional shortcomings, and explored the financial and structural hurdles that impede renewable energy expansion.

The program blended rigorous analysis with hands-on learning, covering residential solar solutions, cost-benefit analysis, and the strategic dismantling of so-called false energy solutions. This practical approach empowered participants not merely to understand the renewable energy transition but to lead it within their communities actively.

Energy Orientation 2025 had forged a stronger, more informed network of energy justice advocates, equipped with both the moral conviction and the technical capacity to champion a just, equitable, and sustainable energy future for Bangladesh. It was not simply an event; it was the beginning of an enduring movement to reclaim the future of the nation's energy.



BACKGROUND

Bangladesh stands at a critical crossroads in its energy journey. Its continued dependence on fossil fuels has led to a convergence of challenges: rising generation costs, persistent overcapacity in the power sector, and deepening energy insecurity. These pressures not only strain public finances and weaken industrial competitiveness but also accelerate the country's exposure to the devastating impacts of climate change, a crisis to which Bangladesh remains among the most vulnerable in the world.

Despite formal commitments under the **Paris Agreement** and other international climate frameworks to expand renewable energy, the transition has been hampered by inconsistent policy direction, institutional inertia, and financing barriers. Moving decisively towards clean energy is therefore not simply an environmental imperative; it is essential for safeguarding energy sovereignty, stabilizing the economy, and building climate resilience for communities across the nation.

Against this backdrop, the orientation in Khulna, a frontline region already bearing the brunt of rising seas, salinity intrusion, and extreme weather was designed as both a knowledge-building and alliance-strengthening intervention. It brought together stakeholders from CSRL, FED, and allied networks to deepen their understanding of Bangladesh's energy systems, the strategic case for renewables, and the available technological pathways with a special focus on residential solar power as a viable, people-centred solution. The training's objectives were fourfold:

1. Strengthen participants' technical and strategic grasp of the national energy landscape and renewable transition pathways.
2. Familiarize them with essential energy terminology, policy frameworks, and technology options.
3. Equip them with hands-on skills in solar energy calculation, installation, and financing models.
4. Sharpen their ability to critically identify and challenge "**false solutions**" and "**greenwashing**" narratives in the sector.

By equipping participants with both analytical insight and practical know-how, the orientation aimed to nurture a cadre of informed advocates who can advance a just, equitable, and truly transformative energy transition for Bangladesh.

TRAINING OVERVIEW

Building Competence for Bangladesh's Renewable Energy Transition

This intensive three-day orientation was designed to equip participants with both the strategic vision and the practical competencies required to accelerate Bangladesh's shift toward a clean, resilient, and equitable energy future.

1. Foundations of the Energy Transition

This chapter covered the theoretical and policy background necessary to understand the renewable energy transition in Bangladesh. The programme opened with participant registration and an expectation-sharing dialogue, setting a collaborative tone and mapping individual learning goals. Initial sessions encouraged self-reflection through baseline knowledge assessments before expanding into the global and national energy context.

Drawing on insights from sector specialists, participants explored the full lifecycle of power sector projects from conception to decommissioning while critically engaging with Bangladesh's policy frameworks, including the Bangladesh Climate Prosperity Plan (BCPP), Nationally Determined Contributions (NDCs), and Bangladesh Delta Plan 2100. Discussions also unpacked systemic challenges such as licensing bottlenecks, financing constraints, and governance gaps.

Data-driven analyses shed light on overcapacity in generation, the economic burden of capacity charges, and the emissions profile of fossil-based systems. The day culminated in a dynamic role-play exercise drawn from the **Bijlee** Book, creatively dismantling persistent myths about renewable energy and encouraging fact-based advocacy.

2. Renewable Energy Technologies and Practices

The second chapter transitioned from macro-level policy to technology pathways and field-tested solutions. A structured recap anchored the new learnings to the foundational concepts of Day One.

Participants critically evaluated so-called "false solutions" including Waste-to-Energy incineration and Ammonia co-firing, which are frequently promoted under the guise of green innovation but often conceal significant environmental and economic trade-offs.

A comprehensive overview of renewable technology options in Bangladesh followed, covering rooftop solar PV, agrivoltaics, floatovoltaics, and wind generation. Technical modules on residential solar systems detailed the operational logic of on-grid, off-grid, and hybrid configurations, with particular emphasis on the country's net metering policy framework.

3. Practical Solar Applications and Economic Modelling

The final day moved decisively from theory to practice, embedding financial literacy and technical application at the heart of the training. Participants undertook hands-on exercises to audit their household or institutional electricity usage, size appropriate solar PV systems, and estimate capital expenditure.

In-depth technical sessions addressed inverter technologies, mounting structures, battery storage capacity, and autonomy day calculations. Using projected annual generation outputs, participants performed cost-benefit analyses to determine payback periods and Return on Investment (ROI), bridging the gap between engineering feasibility and financial decision-making.

The training concluded with a closing plenary and prize distribution, reinforcing the critical message that capacity building is only the first step. Long-term policy advocacy, stakeholder engagement, and continuous skill development remain essential to delivering a just, economically sound, and climate-resilient energy transition in Bangladesh.

DAY 1: FRIDAY, 14 MARCH 2025

The first day was dedicated to establishing the foundational understanding of the energy sector in Bangladesh and the global context necessitating a shift towards sustainability.

1.1 Registration

Tanmoy Das Utsha (Research Officer, CLEAN) & SM Nazmul Islam (Research Intern, CLEAN) facilitate the session. The orientation commenced with the registration of participants, efficiently managed by the research officer and research intern from CLEAN. This initial period also provided an opportunity for participants to settle in and briefly interact before the formal sessions began, setting a welcoming tone for the event.

1.2 Expectations of the Participants

Hasan Mehedi (Chief Executive, CLEAN) facilitated the session. Hasan Mehedi initiated the orientation by actively engaging participants through interactive sessions utilizing meta cards. The first part of this session, lasting 10 minutes, focused on eliciting participants' expectations from the training, followed by a quick segregation of ideas and a brief Q&A segment. This helped the facilitators understand what participants hoped to gain.

1.3 Self Assessment

Ziaul Hoque Mukta (General Secretary, CSRL)

facilitated the session. A self-assessment exercise by Ziaul Hoque Mukta, also using meta cards for 15 minutes, allowed individuals to reflect on their current knowledge level regarding renewable energy and the energy transition. This was followed by a more extensive 30-minute Q&A session, enabling participants to voice their initial questions and allowing the facilitators to gauge the collective baseline understanding and tailor the subsequent sessions more effectively to address the audience's specific needs and knowledge gaps.

1.4 The Context

Ziaul Hoque Mukta (General Secretary, CSRL) facilitated the session. Ziaul Hoque Mukta opened this session by providing a crucial overview of the broader global and national context that necessitates an energy transition in Bangladesh. He likely touched upon significant global trends, including the concept of the Anthropocene – the recognition that human activities have become a dominant force shaping Earth's climate and ecosystems. Discussions may have included the concept of the "polycrisis," where multiple global crises (environmental, social, and economic) interact and exacerbate each other, highlighting the interconnectedness of planetary and social imbalances.





1.5 Power Sector Project Lifecycle:

Hasan Mehedi (Chief Executive, CLEAN) facilitated the session. Hasan Mehedi detailed the various stages involved in the lifecycle of a power sector project. This comprehensive explanation covered the process from initial policy formulation and strategic planning, through proposal development and securing necessary approvals, to arranging financing, overseeing construction, managing ongoing operation, and finally, the eventual retirement of the facility. The session specifically highlighted how renewable energy projects fit into this established framework, outlining the unique considerations and potential challenges they face at each stage compared to traditional fossil fuel projects.

1.6 Policy Landscape of Energy & Power:

Rahul Biswas (Research Coordinator, CLEAN) facilitated the session. This in-depth session, by Rahul Biswas, delved into the intricate policy framework governing Bangladesh's energy and power sector. It began by outlining Bangladesh's adherence to significant global commitments, including being a signatory to the Paris Agreement, which aims to limit global temperature rise, and the Climate Vulnerable Forum (CVF) Marrakech Communique, targeting 100% renewable energy by 2050. The session also mentioned Bangladesh joining the Global Renewables and Energy Efficiency Pledge (GREEP). The core of the discussion focused on national Renewable Energy

(RE) targets as articulated in various key policy documents. These included the ambitious targets set in the Mujib Climate Prosperity Plan (MCP) (30% RE by 2030, 40% by 2041, 100% by 2050), the Bangladesh Delta Plan (BDP) 2100 (around 30% RE by 2041), the Integrated Energy and Power Master Plan (IEPMP), and the Nationally Determined Contributions (NDCs). The facilitators highlighted significant inconsistencies and discrepancies among these targets, pointing out the challenges this poses for coherent policy implementation.

Furthermore, the session addressed critical institutional limitations, such as the limited capacity and workforce of the Sustainable and Renewable Energy Development Authority (SREDA) and the absence of a dedicated ministry for renewable energy, contrasting this with the more robust institutional support seen in countries like India. The complex and often cumbersome approval process for power plants in Bangladesh was detailed, noting the requirement for obtaining 38 different types of licenses and certificates from various government bodies, which acts as a significant barrier to project development. Financial barriers were extensively discussed, including the high capital costs for RE projects in Bangladesh compared to neighboring countries, the comparative generation costs (with solar and wind being notably more expensive per MWh in Bangladesh than the global average), the insufficient allocation of funds for renewables in



the Annual Development Program (ADP) compared to fossil fuels, the lack of accessible equity financing, instances of misuse of funds intended for sustainable infrastructure (e.g., utilizing the IPFF for HFO power plants), and the notable absence of specific incentives or tax rebates to encourage individual and household adoption of rooftop solar systems.

The session concluded by emphasizing the critical need for improved inter-ministerial cooperation to streamline processes and accelerate the energy transition.

1.7 Characteristics of Energy in Bangladesh

Sadia Rowshon Adhora (Campaign Coordinator, CLEAN) facilitated the session. Sadia Rowshon Adhora provided a focused presentation on the specific characteristics defining the energy sector in Bangladesh. The session presented data on electricity demand segmented by sector, revealing that the residential sector accounts for the largest share at 55.7%. Growth trends in installed capacity were compared against peak hour demand, illustrating a widening gap. It was pointed out that in fiscal year 2023-24, the installed capacity stood at 28,098 MW, while the maximum supply reached only 16,477 MW, resulting in a substantial 11,621 MW of idle capacity, representing 71% of the demand. The concept and increasing financial burden of capacity charges paid to power plants were explained, noting that a staggering BDT 147,556 crore had been paid over the preceding 16 years, with the amount increasing at an annual rate of 17%. The Levelized Cost of Energy (LCOE)

for different energy sources was discussed, clarifying how components like fuel cost, operation and maintenance (O&M) cost, capacity charge, and transmission and distribution (T&D) charge contribute to the overall cost of electricity generation. Data was presented showing the increasing trend of electricity generation cost per kWh in Bangladesh, rising from BDT 2.91 in 2007-08 to BDT 11.03 in 2022-23. Finally, the environmental impact, particularly greenhouse gas emissions from fossil fuels, was detailed, providing specific CO₂ emission figures per kWh for coal (around 1 kg), gas (471 gram), Heavy Fuel Oil (HFO), and High-Speed Diesel (HSD), along with the associated emission costs (e.g., BDT 3.50 per kWh from coal).

1.8 Why should we shift to renewables

Ziaul Hoque Mukta (General Secretary, CSRL) facilitated the session. Ziaul Hoque Mukta presented a compelling and multi-faceted case for Bangladesh to transition towards renewable energy sources. The session explored the benefits from various crucial perspectives. For agriculture, the potential of solar irrigation to replace diesel pumps, reducing costs for farmers and increasing efficiency, was highlighted. The critical role of renewables in addressing climate change by significantly reducing greenhouse gas (GHG) emissions was emphasized, linking it to Bangladesh's vulnerability to climate impacts. The implications for international trade and energy independence were also discussed, explaining how reducing reliance on imported fossil fuels can improve the balance of payments and enhance national energy security.

The session likely introduced or reinforced the concept of a just and equitable energy transition, outlining its minimum components, such as prioritizing RE over fossil fuels, ensuring policy consistency, promoting public ownership and equitable profit sharing, safeguarding the rights of affected communities (workers, women, indigenous people), conserving land and natural resources, and implementing a 'green tax' on high-emitting sectors to internalize environmental costs. It likely reinforced the arguments presented earlier regarding the long-term detrimental impacts of continued fossil fuel dependency on the nation's economy, environment, and social equity, making a strong case for the necessity of a fundamental shift.

1.9 Myths about Renewable Energy (Dialogue Delivery from the characters of Bijlee Book)

Mahbub Alam Prince (Operations Coordinator, CLEAN) & Hasan Mehedi (Chief Executive, CLEAN) facilitated the session. Mahbub Alam Prince and Hasan Mehedi jointly addressed common misconceptions and myths surrounding renewable energy that often hinder its wider adoption, based on the performance of the *Bijlee* book. They likely discussed concerns related to the large land area

required for solar and wind farms, the perceived unreliability due to weather dependency, the initial cost-effectiveness of renewables compared to established fossil fuel technologies, the ability of renewables to provide consistent baseload and meet peak hour supply demands, the challenges and solutions related to energy storage, and the environmental implications of managing e-waste from renewable energy technologies which are mentioned in *Bijlee*.

A significant portion of this session was dedicated to identifying and debunking "false solutions" and exposing greenwashing tactics by acting from the *Bijlee* book. This acting session defined what constitutes truly clean (minimal to no pollution) and green (derived from replenishable sources) energy, differentiating genuine renewable energy sources like Solar, Wind, Wave, and Run-of-River Hydro from "false solutions" such as Waste-to-Energy, Ammonia, Hydrogen, Geothermal, and certain forms of Large Hydro projects, which may have significant environmental or social drawbacks despite being marketed as green. All participants acted as *Bijlee* book characters, which made them more engaged towards renewables.



DAY 2: SATURDAY, 15 MARCH 2025

The second day built upon the foundational knowledge by exploring specific renewable energy technologies and engaging participants in practical calculations related to residential solar power.

2.1 Recap

Shilpi Barman (Volunteer, CSRL) facilitated the session. Shilpi Barman led a recap session to effectively review the key takeaways and concepts discussed on the previous day. This likely involved a brief interactive segment, such as asking participants to recall important points or summarizing the main topics covered, including the context of the energy transition, policy landscape challenges, characteristics of Bangladesh's energy sector, the rationale for shifting to renewables, and the identification of myths and false solutions. This ensured participant Day 2: Saturday, 15 March 2025s were aligned and prepared to delve into the more technical and practical sessions of Day 2.

2.2 False Solutions & Greenwashing

Hasan Mehedi (Chief Executive, CLEAN) facilitated the session. Hasan Mehedi revisited the critical topic of "false solutions" in the energy sector and the deceptive practice of greenwashing. This session likely reinforced and expanded upon the concepts introduced on Day 1, providing further examples and deeper analysis. He reiterated the clear distinction between genuinely clean and green renewable energy sources and technologies that are marketed as sustainable but have significant hidden environmental, social, or economic drawbacks. The specific dangers and inefficiencies associated with technologies like Waste-to-Energy (high emissions, damage to air quality, high cost, abandonment of circular economy options), Ammonia (toxicity, high GHG emissions from production, inefficient use for power), Hydrogen (production emissions, flammability, inefficiency, import dependency),

Geothermal, and certain Large Hydro projects (displacement, biodiversity loss, altered river flow, high emissions) were likely discussed again with additional details.

The session emphasized the importance of critically evaluating energy solutions and recognizing greenwashing tactics, highlighting that these false solutions often serve the interests of private companies in developed countries rather than providing genuine, sustainable benefits for the local population in Bangladesh.



2.3 Approaches of Renewable Energy:

Sadia Rowshon Adhora (Campaign Coordinator, CLEAN) facilitated the session. Sadia Rowshon Adhora provided a comprehensive overview of various viable techniques and approaches for harnessing solar and wind energy in Bangladesh. The session covered a range of technologies applicable to different scales and contexts. These included household-based rooftop solar systems, industrial rooftop solar systems (with a potential of at least 5,000 MW), agrivoltaics (combining solar panel installation with agriculture, with a potential for 18,100 MW on Khasland vegetable gardens), floatovoltaics (installing solar panels on water bodies, with a potential for 21,000 MW on just 10% of stagnant water bodies), roadside solar installations, solar power in Export Processing Zones (EPZs) and Special Economic Zones (SEZs), and solar power irrigation pumps (with a potential to replace 1.4 million diesel pumps and install 9,750 MW). The session also covered wind energy, discussing both onshore and offshore wind potential (totaling 39,760 MW).

Enabling technologies such as smart grids and distribution systems for efficient integration of renewables, energy storage technologies like Lithium-ion batteries, electric vehicles (EVs), and solar EV charging stations were also presented as crucial components of a modern renewable energy system. The session highlighted the significant potential for renewable energy deployment in Bangladesh across various sectors and land types, referencing the provided visuals on solar radiation and wind speed maps to illustrate the geographical distribution of these resources.



2.4 Residential Solar Power

Hasan Mehedi (Chief Executive, CLEAN) facilitated the session. Hasan Mehedi provided a focused introduction to residential solar power systems, framing it within the “Suriyabari” (Solar Home) concept. He clearly explained the distinctions between the three main types of renewable energy systems: on-grid systems, which are connected to the national electricity grid and typically do not require battery storage under a net metering arrangement; off-grid systems, which are entirely independent of the grid and necessitate battery storage to ensure a continuous power supply; and hybrid systems, which combine grid connection with battery storage for enhanced reliability and energy independence. The concept of net metering was explained in detail, based on the 2018 policy and guidelines, outlining how residential solar owners can export excess electricity generated back to the grid and receive credit for it, up to 70% of their approved load.

The session likely elaborated on the compelling benefits of adopting residential solar power, such as substantial long-term cost savings on electricity bills (potentially saving BDT 960 per month and BDT 230,000 over 20 years for a household consuming 400 units per month), achieving greater energy security and independence from grid outages, reducing economic risk by decreasing reliance on volatile fossil fuel prices and saving valuable foreign currency, and making a direct contribution to mitigating climate change by significantly lowering carbon emissions per unit of electricity generated compared to fossil fuels.



2.5 How much electricity do you use?

Hasan Mehedi (Chief Executive, CLEAN) facilitated the session. This practical and interactive session, led by Hasan Mehedi, guided participants through the process of calculating their individual household electricity consumption. Participants were instructed to use their past electricity bills to determine their monthly usage in units. They then summed up their monthly usage over a year to find their total annual consumption. To determine their average daily electricity demand in units, they divided the total annual units by 300 (a standard approximation for days of significant solar generation).

This daily unit figure was then converted to Watt-hours (Wh) by multiplying by 1,000 (since 1 unit = 1 kWh = 1,000 Wh). Using an example of a household consuming 4,411 units annually, the daily demand was calculated as 14.70 units or 14,700 Wh. The session also introduced the crucial concept of DC to AC conversion loss. Solar panels generate Direct Current (DC) electricity, while most household appliances use Alternating Current (AC). Converting DC to AC using an inverter results in some energy loss, typically around 20%. To account for this, participants learned to calculate the required DC solar electricity generation by adding approximately 25% to their AC Watt-hour demand. For the example household, this resulted in a calculated daily DC requirement of 18,375 Wh.

2.6 Calculate how many Solar Panels you need:

Hasan Mehedi (Chief Executive, CLEAN) facilitated the session. This session involved participants working in groups to apply their calculated daily electricity needs to determine the number of solar panels required for their potential installation. The calculation process involved using the daily required DC Watt-hours (calculated in the previous session) and dividing it by the Wattage of the chosen solar panel and the average daily solar hours for their location. The session likely included presentations of the group calculations, allowing participants to share their results and methodologies.

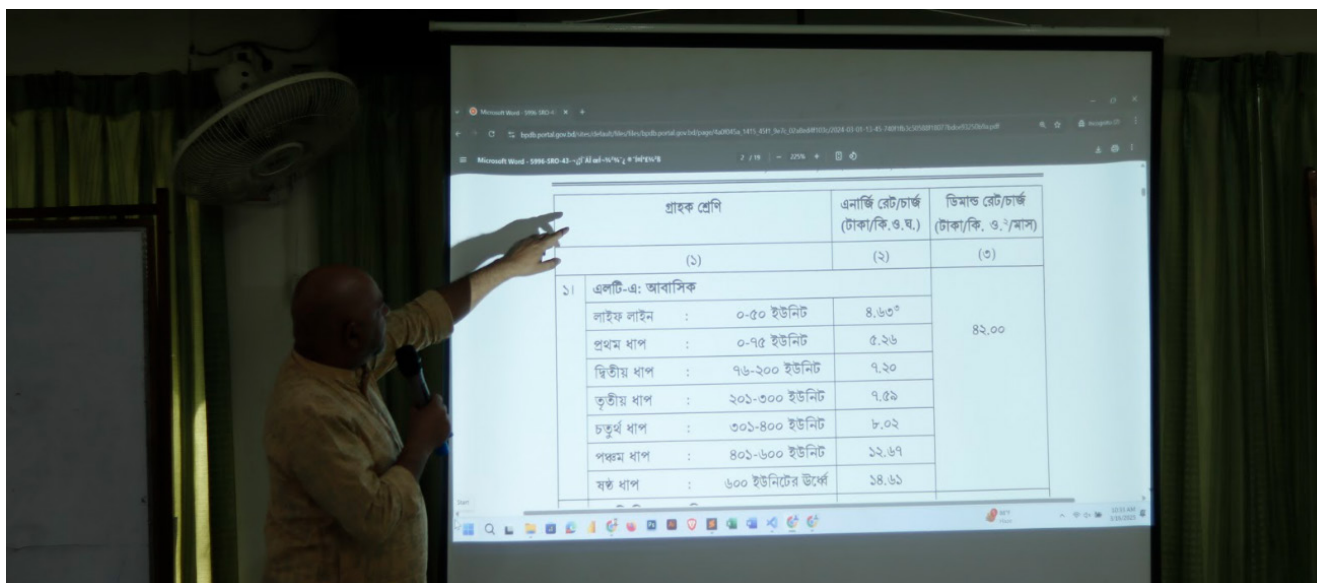
Discussions also continued around the different types of solar panel technologies available, and materials on solar panel types. Their characteristics, such as efficiency (ranging from 10% for Thin Film to over 26%), lifespan (10 to 40 years), and cost per watt (ranging from BDT 13 to over 75), were discussed to help participants understand the trade-offs. The importance of checking panel specifications like thermal co-efficiency (which affects performance at different temperatures, ideally 0.2% to 0.3%), efficiency over time (indicated by the performance warranty, typically guaranteeing around 80-90% output after 25 years), and the product warranty (covering manufacturing defects, normally 10-12 years) was also emphasized as crucial factors when selecting how many panels need at participant's house.



2.7 How much money do you need?

Hasan Mehedi (Chief Executive, CLEAN) facilitated the session. This session involved group work focused on calculating the estimated cost associated with installing the required solar panels and the complete system. Participants likely estimated the total expenditure based on the number and type of

panels needed (determined in the previous session), factoring in additional costs for essential components such as inverters (converting DC to AC), mounting structures (for rooftops or ground), wiring, and potentially batteries for off-grid or hybrid systems. The session included presentations of the group calculations, allowing for comparison and discussion of different system costs.



The financial aspects of solar investment were discussed, including the potential payback period (the time it takes for electricity bill savings to equal the initial investment) and the long-term return on investment (ROI) over the system's lifespan, building upon the earlier discussions on LCOE and tariffs. The cost of different battery types, specifically Lead-Acid and Lithium-ion batteries. Participants

also learned how to calculate the required battery capacity based on their desired "Days of Autonomy" – the number of days they want the system to run solely on stored energy in case of grid outage or insufficient solar generation. For the example household with a daily requirement of 18,375 Wh, 1 day of autonomy would require 18,375 Wh of usable battery storage.

DAY 3: SUNDAY, 16 MARCH 2025

The final day focused on evaluating the economic viability of renewable energy installations through cost-benefit analysis and formally concluding the orientation.

3.1 Recap

Rekha Maria Bairagi (Executive Director, Dhruba) facilitated the session. Rekha Maria Bairagi led the



final recap session of the orientation, providing a concise review of the key messages, concepts, and practical skills learned over the previous two days. This likely involved summarizing the discussions on the energy landscape in Bangladesh, the challenges and opportunities of the energy transition, the various renewable energy approaches, the identification of false solutions and greenwashing, and the practical steps involved in calculating household electricity needs, determining the required solar panel capacity, and estimating system costs. This session served to consolidate the participants' learning and prepare them for the final analytical session and the closing ceremony.

3.2 How much electricity you will get

Hasan Mehedi (Chief Executive, CLEAN) facilitated the session. This session involved participants working in groups to calculate the expected annual electricity generation from their planned solar panel installations.

This calculation built upon the previous sessions by taking into account the number and wattage of the selected panels, the average daily solar hours specific to their location (referencing the solar hour data provided in the materials), and incorporating estimated system losses (beyond the DC to AC conversion loss, such as losses from wiring, dust, and temperature).

The groups presented their projected annual electricity generation estimates, demonstrating their understanding of how to predict the energy output of a solar system based on its specifications and local solar resource availability. This provided participants with a concrete figure to use in the subsequent cost-benefit analysis.



3.3 Cost-Benefit Analysis:

Hasan Mehedi (Chief Executive, CLEAN) facilitated the session. In this extended and pivotal session, participants conducted a comprehensive cost-benefit analysis of their potential renewable energy installations. This involved systematically comparing the estimated initial investment costs (calculated in previous sessions, including panels, inverter, mounting, wiring, and batteries if applicable) with the projected long-term benefits over the system's lifespan (typically 25 years or more for solar panels). The financial benefits analyzed included significant savings on electricity bills by reducing or eliminating reliance on grid electricity, and potentially generating income by selling excess electricity back to the grid under a net metering arrangement.

Participants likely calculated key financial metrics such as the payback period (the time required for accumulated savings to recover the initial investment) and the return on investment (ROI) over the system's lifetime. Beyond the financial

aspects, the analysis also incorporated the non-financial benefits, particularly the environmental advantages of a reduced carbon footprint and contribution to mitigating climate change, as well as enhanced energy security and independence.



3.4 Prize Distribution and Closing:

Ziaul Hoque Mukta (General Secretary, CSRL) & Hasan Mehedi (Chief Executive, CLEAN) facilitated the session. The orientation formally concluded with a closing ceremony. This included a prize distribution segment, likely acknowledging active participation, successful completion of exercises, or outstanding contributions during group work. Ziaul Hoque Mukta and Hasan Mehedi delivered the closing remarks. They summarized the key outcomes and achievements of the three-day orientation, reiterating the critical importance of the energy transition for Bangladesh's sustainable development and resilience, particularly in the context of climate vulnerability, which is highly relevant given the location in Khulna, a coastal region. They encouraged participants to become informed

advocates and proactive implementers of renewable energy solutions within their communities and spheres of influence.

In closing, the path to a sustainable and resilient energy future demands more than isolated initiatives; it requires steadfast collective action, informed policymaking, and unwavering commitment from all stakeholders. Overcoming existing barriers and accelerating the transition to renewable energy is not merely a technical challenge; it is a social and economic imperative. By aligning innovation with equity and ambition with accountability, we can ensure that the benefits of clean energy reach every community, leaving no one behind. Let us move forward with urgency, vision, and collaboration, shaping an energy landscape that is not only sustainable but just, inclusive, and transformative for generations to come.

EPILOGUE



The Orientation on Shifting Fossil Fuels to Renewables in Bangladesh, held in the climate-fragile region of Khulna, did not end as a mere series of lectures and exercises; it concluded as a defining moment of transformation. Across three intensive days, participants engaged in open and transparent exchanges about the country's entrenched reliance on fossil fuels, confronting the economic inefficiencies, social inequities, and ecological devastations that stem from it. They also dissected the contradictions within existing energy policies and the systemic inertia that has long slowed Bangladesh's energy transition.

Yet the most remarkable achievement of the orientation was its pivot from critique to empowerment. Participants were not left with abstract concepts, but with concrete skills and tools ranging from designing rooftop solar systems and conducting cost-benefit analyses to exploring agrivoltaics and floatovoltaics as scalable alternatives. These practical sessions

helped demystify renewable technologies, making them tangible, affordable, and within reach of households, entrepreneurs, and communities alike. Moreover, the discussions on recognizing and rejecting "false solutions" cultivated sharper judgment, equipping attendees with the critical capacity to safeguard the transition from being diluted by short-term fixes or greenwashed projects.

What emerged, therefore, was not only knowledge but conviction. Participants left the workshop with a renewed sense of urgency, responsibility, and possibility. They understood that the renewable energy transition is not just a matter of reducing emissions; it is a pathway to economic stability, energy sovereignty, public health, and climate justice. The connections they forged, the insights they exchanged, and the confidence they gained are poised to ripple outward, inspiring a wider civil society momentum. The orientation ended, but the movement it helped galvanize is only beginning.

Conclusion

Energy Orientation 2025 created a united force, where around 100 participants gained the knowledge and skills to design solar systems, check their feasibility, carry out cost-benefit analysis, and speak up for renewable-friendly policies. It was more than just a training; it built a strong grassroots network of leaders ready to challenge fossil fuel

dependence, ensure accountability, and speed up the just transition. The message from Energy Orientation 2025 is clear: Bangladesh's energy future will not be decided by fossil fuel contracts, but by the courage, creativity, and determination of its people—leading to a renewable-powered, fair, and resilient Bangladesh within reach.

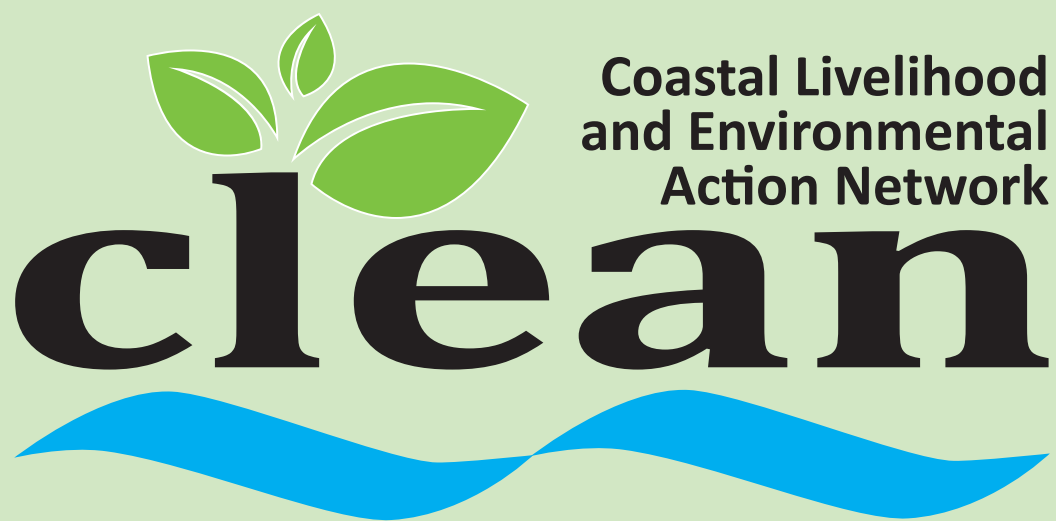
Participants

SL.	Name	Designation	Organization
1	A S M Fazlul Karim	Member	FED Sylhet
2	Abdur Rahman Mintu	Member	FED Rangpur
3	Abedin	Member	FED Rangpur
4	Akhtarul Kabir	Member	FED Barishal
5	Alima khatun	Member	FED Rajshahi
6	Amar Krishna Boidya	Member	FED Khulna
7	Asaduzzaman Romense	Member	FED Mymensingh
8	Ashikur Rahman	M&E Officer cum Trainer	M&E Officer cum Trainer Mati
9	Asma Akter Mukta	Executive Director	RACINE
10	Babul Hawladar	Member	FED Khulna
11	Choton Sarder	Member	FED Rajshahi
12	Dilal Ahmed	Member	FED Sylhet
13	Dollar	Member	FED Mongla
14	Gauranga Barman	Organising Secretary	JAUP
15	Gazi Zahidul Hossain	Member	FED Barishal
16	Hakim Mitiera Begum	Member	FED Khulna
17	Hasib Sarder	Member	FED Mongla
18	Imon Sarker	Director	Onnochitra Foundation
19	Kabir Mia	Member	FED Rangpur
20	Kajal Kumar Das	Member	FED Barishal
21	Kamal Sarker	Member	FED Mymensingh
22	Kamala Sarker	Member	FED Mongla
24	Karna Babu Das	Member	FED Sylhet
25	Kazi Al Imran Abir	Documentation Officer	USS
26	Khairul Islam	Member	FED Chattogram
27	M Idris Emon	Member	FED Mongla
28	M. A. Hossain	Member	FED Chattogram
29	M. Nasirul Haque	Member	FED Chattogram
30	Madhab Roy	Member	FED Rangpur
31	Mahmud -Un- Nabi	Member	FED Rajshahi
32	Masum Helal	Member	FED Sylhet
33	Mathura Bikash Tripura	Executive Director	Jabarang
34	Mina Halder	Member	FED Khulna
35	Mohuya Monjure	Executive Director	Arjon Foundation
36	Molla al Mamun	Member	FED Mongla
37	Molla Md. Safiqur Rahman	Member	FED Khulna
38	Mudassir Alam	Vice-President	FED Sylhet
39	Mustafa Md. khairul Alam Tuhin	Secretary	FED Mymensingh
40	Mustafizur Rahman	Member	FED Mymensingh
41	Nazim Ahmed	Director Programme	IDEA
42	Nazmul Hoque	Member	FED Mongla
43	Nechar Uddin	Executive Director	ASECED

SL.	Name	Designation	Organization
44	Noor Alam Sheikh	Member	Secretary, FED Mongla
45	Nurul Hasan Ataher	Member	FED Sylhet
46	Pankaj Karmakar	Member	FED Rajshahi
47	Rahela Rabbani	Treasurer	CSRL
48	Ranjit Barman	Digital Campaigner	Uttaran, Gaibandha
49	Ranjit Das	Member	FED Rangpur
50	Rashed Ibn Obaid Ripon	Executive Director	Paribartan
51	Rayhan	Member	FED Chattogram
52	Rekha Maria Boiragi	Member	FED Khulna
53	Selim Jahangir	Member	FED Chattogram
54	S.M. Saiful Islam	Project Manager	BUP
55	Salehin Choudhury Shuvo	Executive Director	HAUS
56	Salim	Convener	FED Mongla
57	Sayera Begum	Member	FED Chattogram
58	Sazle Rabbi Tawhid	Member	FED Chattogram
59	Sazzad Hossain Khan	Programme Manager (Training and Development)	GUK
60	Shah Akhtaruzzaman	Member	FED Sylhet
61	Shazahan Kabir	Member	FED Mymensingh
62	Shilpi Barmon	Volunteer	CSRL
63	Shukla Rani	Member	FED Rangpur
64	Shuvankar Chakrabarty	Member	FED Barishal
65	Shuvasish Ghosh	Member	FED Barishal
66	SM Atahar Ali	Member	FED Khulna
67	Soma Hasan	Program Officer	Paribartan
68	Subhash Chandra Das	Member	FED Barishal
69	Suman Sarker	Member	FED Mymensingh
70	Swapon Khandoker	Member	FED Barishal
71	Syed Hasan Mithun	Member	FED Mymensingh
72	Tahera Khatun	Member	FED Rajshahi
73	Tanmoy Das Utsha	Research Officer	CLEAN
74	Tauhidul Islam Shahazada	Executive Director	Prantojon Trust
75	Ujjal kumar Chakrabartty	Executive Director	DOPS
76	Ziaul Hoque Mukta	General Secretary	CSRL
77	Zulfigure Ali Haider	Member	FED Rajshahi

CLEAN Team

SL.	Name	Designation
1	Ariful Haque	IT Officer, CLEAN
2	Arzoo Binta Arman	Research Intern, CLEAN
3	Fahim Ibn Habib	Research Assistant, CLEAN
4	Hasan Mehedi	Chief Executive, CLEAN
5	Kaniz Rabeya	Communication Coordinator, CLEAN
6	Mahbub Alam Prince	Coordinator, CLEAN
7	Mahdiul Islam	Regional Campaign Officer, CLEAN
8	Mahfuz Ur Rahman	Research Officer, CLEAN
9	Mousumi Afrose	Communication Intern, CLEAN
10	N. M Rifat	Campaign Officer, CLEAN
11	Rahul Biswas	Research Coordinator, CLEAN
12	S M Nazmul Islam	Research Intern, CLEAN
13	Sadia Rowshon Adhora	Campaign Coordinator, CLEAN
14	Suvodip Adhikari	Campaign Intern, CLEAN



Coastal Livelihood and Environmental Action Network (CLEAN)

4 Mallick Bari Road, Boyra-Rayermahal, Khulna 9000, Bangladesh

Phone: +88 02 477 701 458, Email: info@cleanbd.org

Website: www.https://cleanbd.org