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YOUTH AND JUST ENERGY TRANSITION IN THE CONTEXT OF BANGLADESH

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Background/Introduction

On the verge of LDC graduation, Bangladesh has achieved significant economic growth over the past few decades, placing it among the world's fastest-growing economies. In any development trajectory of modern times, energy plays a crucial role in running and expanding its economic activities that cover food production, providing services and amenities, and ensuring employment for citizens, with a special focus on young people. Evading demographic dividend, access to energy has become crucial for Bangladesh to sustain its economic progress and capitalise on the potentiality of the younger generation at the same time. Therefore in the discussion of energy, the important aspects lie in production capacity, process of production and whether these are adequate, sustainable and accessible for all at the same time. The Sustainable Development Goals (SDGs) 2030, by the UN, are committed to eradicating poverty, realising development potential, and protecting the natural environment.

Access to energy and electricity is a right for every citizen. If dealt with equity, justice, and fairness, then living standards will be raised particularly for people living in poverty and exclusion. Yet, the issues of energy, including its production, access, and sources are elaborated in various national policies in Bangladesh including the 8th Five Year Plan, Power Sector Master Plan, Climate Prosperity Plan, and the Vision 2041, etc.

Energy Scenario in Bangladesh

Currently, energy generation in Bangladesh is heavily fossil fuel dependent through means of natural gas, coal and oil. The government has initiated LNG imports to supplement rising gas demands while simultaneously the domestic natural gas reserve is depleting rapidly. To handle the situation, the government has intended to diversify energy generation. The dominant plan is generating electricity from large-scale coal-based power plants, along with the Rooppur Nuclear Project. However, energy from renewable sources remain largely untouched even though it is getting traction slowly.

The main energy resources in Bangladesh include natural gas, coal, imported oil, LPG, LNG, imported electricity, and a small share of hydro and solar power electricity. According to the government sources, Solar energy production currently stands at 723.68 MW. The calculation is based on the more recognised 6 million solar home system (SHS) even though many of them are now inoperative. However, on the more positive side the Government of Bangladesh has plans to set up large land-based solar power plants to increase the share of renewable sources with some of them being put into operation.

Consumption wise, annual energy consumption increased by approximately 6 percent, with per capita energy consumption at 346 KgOE (Kilogram Oil Equivalent) and electricity generation at 608.76 kWh per capita. Despite achieving 100 percent electricity access, per capita energy consumption and electricity generation in Bangladesh are lower compared to its South Asian Consumption wise, annual energy consumption increased by approximately 6 percent, with per capita energy consumption at 346 KgOE (Kilogram Oil Equivalent) and electricity generation at 608.76 kWh per capita. Despite achieving 100 percent electricity access, per capita energy consumption and electricity generation in Bangladesh are lower compared to its South Asian neighbours. Gas is the primary contributor to net energy generation, accounting for 46,013 MkWh or 52.02 percent of the total energy output.[1]

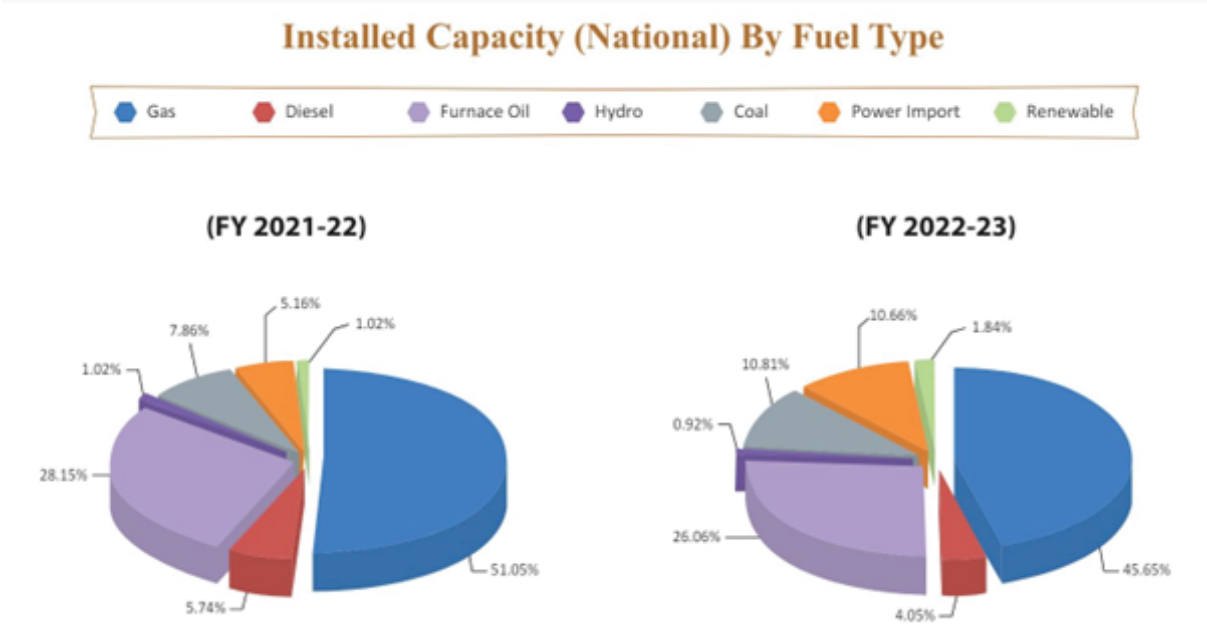

Fig 01: National Installed Capacity (fuel type)
Source: Annual Report 2022-2023, Bangladesh Power Development Board, Ministry of Power, Energy and Mineral Resources

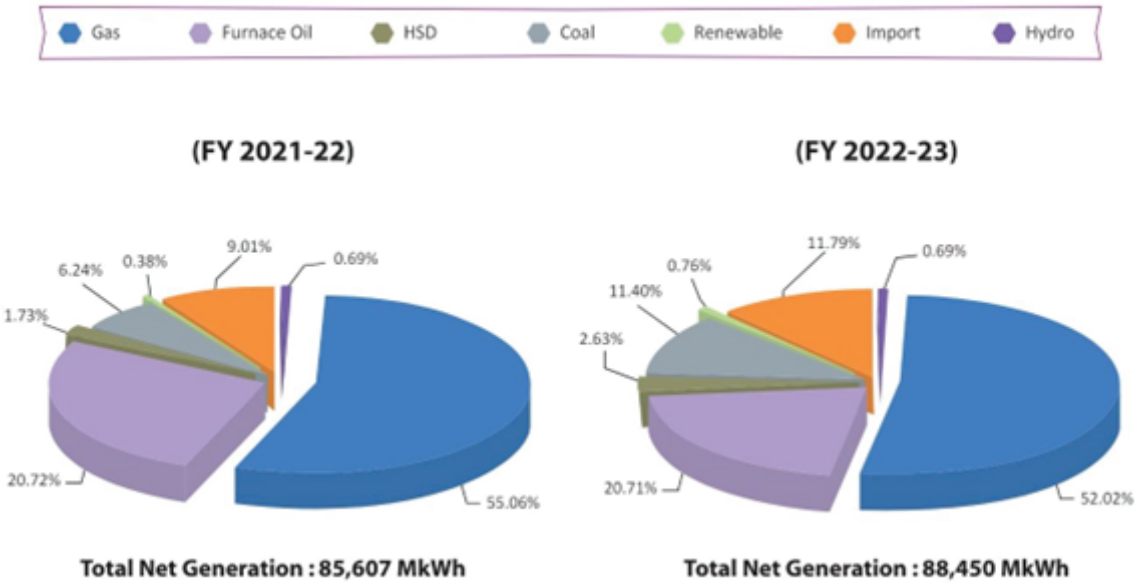

Fig 02: National Energy Generation (fuel wise)
Source: Annual Report 2022-2023, Bangladesh Power Development Board, Ministry of Power, Energy and Mineral Resources

[1] http://www.hcu.org.bd/sites/default/files/files/hcu.portal.gov.bd/publications/da1f3395_2c8f_4608_a48c_d184d5925d45/2023-03-14-07-47-0d3be29ec0b5cfc0dc6055e8eec23e37.pdf

Challenges in Energy Sector

Bangladesh's energy sector faces critical challenges including overcapacity, rising power, expensive generators and fuel shortages. Overcapacity arose from ambitious power plant expansions without accurate demand assessments, leading to low system utilisation rates. The devaluation of the Bangladeshi currency (Taka) and global fuel market volatility due to events like the Russia-Ukraine war have worsened the situation, causing fuel shortages and operational disruptions in power plants. Consequently, power generation costs have surged by 33 percent in recent years, straining government subsidies and escalating tariffs. On the other hand, unlocking the full potential of rooftop solar facilities in the country requires addressing several crucial challenges such as lack of domestically manufactured high-quality solar inverters, high import duties on inverters, inadequate testing facilities and the prevalence of sub-standard solar accessories in the market.

Prioritising transition towards the renewable sources is crucial for overcoming current challenges such as energy crises, reducing costs, and energy security. However, achieving Bangladesh's renewable energy goals requires robust financial commitments, enhanced governance, and a steadfast policy focus on transitioning away from fossil fuels. Addressing these challenges is pivotal for securing Bangladesh's energy future and advancing its sustainability objectives.[2]

What's there in the policies?

Generating energy from renewable sources has been given priority in the various policy documents in Bangladesh.

In **Bangladesh Delta Plan 2100 (BDP2100)**, the strategy touches upon energy and indicates a policy of promoting development of renewable energy from the standpoint of preserving clean water, sustainable development, and mitigating the effects of climate change. In particular, it targets for at least 30 percent energy production from renewable sources by 2041 in the context of being a prosperous country.

The **Climate Prosperity Plan (MCPP) 2022-41** aims to eradicate extreme poverty and climate-induced migration by 2030, create 4.1 million new climate-resilient jobs, improve air quality and mobility, and achieve "net savings or avoided losses" of at least $30 billion annually by 2030. With assistance from international and other investors, the plan aspires to achieve 30 percent renewable energy target by 2030 and up to 40 percent by 2041, while also focusing on enhancing grid resilience and modernization.

The **Energy Efficiency and Conservation Master Plan (EECMP) up to 2030** by Sustainable and Renewable Energy Development Authority (SREDA), sets out energy efficiency policies with a view to reducing the energy intensity (primary energy per GDP) by 15 percent in 2021? and 20 percent by 2030 compared to 2013.

The **Perspective Plan of Bangladesh 2021-41 (PP2041)** provides the main pillars of the electricity policy. It envisions that, with an accelerated GDP growth and urbanization, demand for electricity and primary energy will surge and require further development of power and energy resources.

Highlighting the green energy transition, **8th Five Year Plan (8FYP)** highlights that the government now has an increased focus on renewable energy, energy efficiency and the financial sustainability of the power system.

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http://www.hcu.org.bd/sites/default/files/files/hcu.portal.gov.bd/publications/da1f3395_2c8f_4608_a48c_d184d5925d45/2023-03-14-07-47-0d3be29ec0b5cfc0dc6055e8eec23e37.pdf

Keeping the future in mind, the government is working towards the implementation of power generation capacity of 40,000 MW by 2030 and 60,000 MW by 2041 as per Power System Master Plan (PSMP). According to the long-term master plan for the power sector, the government has been working to implement the plan in phases to generate 40 percent electricity from clean energy by 2041.

Correlation between energy and economic development

There are studies confirming that electricity consumption has an impact on employment, but also that both electricity consumption and economic growth contribute to increased labour force participation in the country. Across economies, high demand for electricity is driven by factors such as industrialization, urbanization, population growth, rising living standards, and advancements in agriculture. In Bangladesh, electricity is a major energy source for the industrial and agricultural sectors, which collectively contributes significantly to the GDP. Agriculture and industry accounted for 19.9 percent and 30.4 percent of GDP respectively during the fiscal years 2010-11.

Energy infrastructure plays a pivotal role in economic growth by serving as a key factor of production for firms and facilitating the delivery of essential public services such as healthcare, education, agriculture and so on. Access to reliable and affordable electricity directly enhances household well-being and efficiency gains through time savings and improved communication.
However, the idea of sustainable development doesn't focus on mere economic growth, rather it has responsibilities to protect the natural environment without further pollution, i.e., air, water bodies and CO2 emission. Particularly, in the time of climate change when the world is devastated by frequent natural disasters damaging life and livelihood.

On the other hand, there is no option to compromise with economic activities which would demand sufficient access to energy if one were leading a respectable and better life. Therefore, the need to mitigate those impacts holds us accountable to transitioning to renewable energy sources and enhance efficiency in uses. Developing resilient energy infrastructure is essential for sustaining economic development amidst evolving climate pressures and energy demands.

Reducing CO2 emissions and ensuring energy sovereignty

In addition, a transition to renewable sources is also important to develop energy sovereignty for countries like Bangladesh since it is a highly import-dependent country. High dependency on foreign sources to meet the energy demand only increases the risk factors particularly in the volatile periods. Similarly, it creates huge pressure on foreign reserves and limits the country's capacity to invest in realizing basic rights. Energy generation from renewable sources ensures energy production from local sources and enhances energy sovereignty simultaneously.

The International Energy Agency (IEA) underscores energy efficiency as crucial in clean energy transitions, offering quick CO2 mitigation at low cost while enhancing energy security and reducing bills. Methane emissions, especially from coal, oil, and gas operations, pose substantial environmental concerns that can be mitigated with current technologies. Bangladesh's 2021 Nationally Determined Contributions (NDCs) target a 21.8 percent reduction in greenhouse gas emissions by 2030, focusing on energy sector actions such as enhancing industrial energy efficiency and addressing methane leaks.

Energy/Green transition and COP 28

The conference marked a significant global commitment to phasing out fossil fuels, injecting funds into the Loss and Damage Fund, and bolstering the Adaptation Fund. COP 28 established a three-year Just Transition Work

Programme to ensure equitable implementation of the Paris Agreement, emphasizing labor rights and social protection. The Global Stocktake framework briefly mentions "transition fuels" like natural gas, raising further questions. Despite positive commitments to triple renewable energy and double energy efficiency by 2030, there is little detail on financing these initiatives.

Potentiality in energy transition

A report on the renewables technical capacity found that Bangladesh has potentiality to generate 156 gigawatts (GW) energy from utility-scale solar and 150 GW of wind. According to policy documents the Government of Bangladesh has set a target generation 30 percent (total power generation capacity 40,000 MW) of electricity from renewable sources by 2030.

Recent developments in solar power technology show great hope for meeting almost 100 per cent power demand of the country from this source. Bangladesh has an estimated 150,000 hectares of ponds. If one-third of these ponds can be used for floating solar system, solar panels covering up to a third of each pond can give a total power generation of 15,000MW. Bangladesh is also rich with a suitable number of shallow water bodies like bills, haors and baors having a total area of more than 250,000 hectares. Opportunities can be found across thousands of hectares of river pockets and the 70,000-hectare Kaptai lake. It can be assumed these water bodies can add another 20,000MW. So, the total need of 60,000MW power is possible to generate from various floating solar systems only.[3]

Few initiatives for promoting renewable energy

So far, 7 solar parks have been set up across Bangladesh with total capacity of 130 MW. As of September 2021, 29 solar parks with a total capacity of 1350 MW are under implementation and planning. Among all solar systems, solar parks have the biggest capacity, at 2470.66 MWp. Five wind power projects with an aggregated capacity of 245MW are under implementation. In December 2020, Bangladesh approved a major 55 MW wind power project in Mongla, and other projects are also in the pipeline. More than 1 million battery-run electric three-wheelers are replacing fuel-operated three-wheelers in the rural areas at an increasing rate. These can significantly improve Bangladesh's economy, society, and environment with a proper regulatory framework.[4]

OPEX & CAPEX model for renewable energy adoption

The Operational Expenditure (OPEX) Model is a financial and operational framework utilised primarily in the renewable energy sector. Unlike the Capital Expenditure (CAPEX) model where upfront investment is required to purchase and install renewable energy infrastructure, the OPEX model allows clients to avoid initial capital costs. Instead, developers bear all expenses related to the design, installation, and maintenance of renewable energy systems. The OPEX model could half electricity costs for clients, saving foreign loans and currency for priority sectors. Carbon trading opportunities also arise. The OPEX model is particularly attractive in contexts where access to capital for upfront investment is limited or where clients prefer to allocate capital to core business activities rather than energy infrastructure. It encourages the adoption of renewable energy by minimizing financial barriers and leveraging economies of scale through centralised project management and maintenance.

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[3] Alam, Shafiq. (2020). Solar power can meet full electricity needs in Bangladesh!.

[4] https://sreda.portal.gov.bd/sites/default/files/files/sreda.portal.gov.bd/page/7290ddb4_a205_41a9_a6a0_1436a56b7329/2021-11-16-09-11-79cf0309322effa45ba513650d68e162.pdf

The demand for rooftop solar power has surged due to factors including the introduction of the net energy metering scheme in 2018 and frequent electricity price hikes in 2022 and early 2023. In Bangladesh, there is significant potential to integrate rooftop solar, especially in industrial hubs like economic and export processing zones, to achieve ambitious renewable energy targets. Two primary business models are observed in global best practices: the CAPEX model, where clients bear all project capital costs and engage solar EPC (Engineering, Procurement, and Construction) firms for system installation, often supported by concessional loans, tax incentives, higher tariffs, and capital subsidies. Alternatively, the OPEX or Energy Service Company (ESCO) model involves third-party financing to overcome the upfront financial barrier associated with CAPEX, which has been instrumental in expanding rooftop solar globally.

ActionAid contribution to promote youth-led transition in collaboration with CAB

Involvement of Youth in energy advocacy and campaigns brings fresh perspectives, innovative solutions, and strong commitment to sustainability. Youth activists are increasingly involved in the policy-making process by participating in forums, networks and campaigns to influence energy policies and promote sustainable practices. Their advocacy efforts often focus on pushing government and private corporations towards greener practices and more sustainable investment in renewable energy. Youth-led grassroots movements on just energy transition are driving local change by claiming their energy right. ActionAid Bangladesh in collaboration with Consumer Association of Bangladesh (CAB), contributes significantly to promote a youth-led transition to sustainable energy through several initiatives. Several campaigns and dialogues were participated in by nearly one thousand young people from local and national level to overcome energy rights. Youth-led state reform program is expected to trigger legislative changes in the energy sector, initiated by CAB with the collaboration of AAB, that will establish a level playing field for renewable energy and challenge the dominance of fossil fuels.

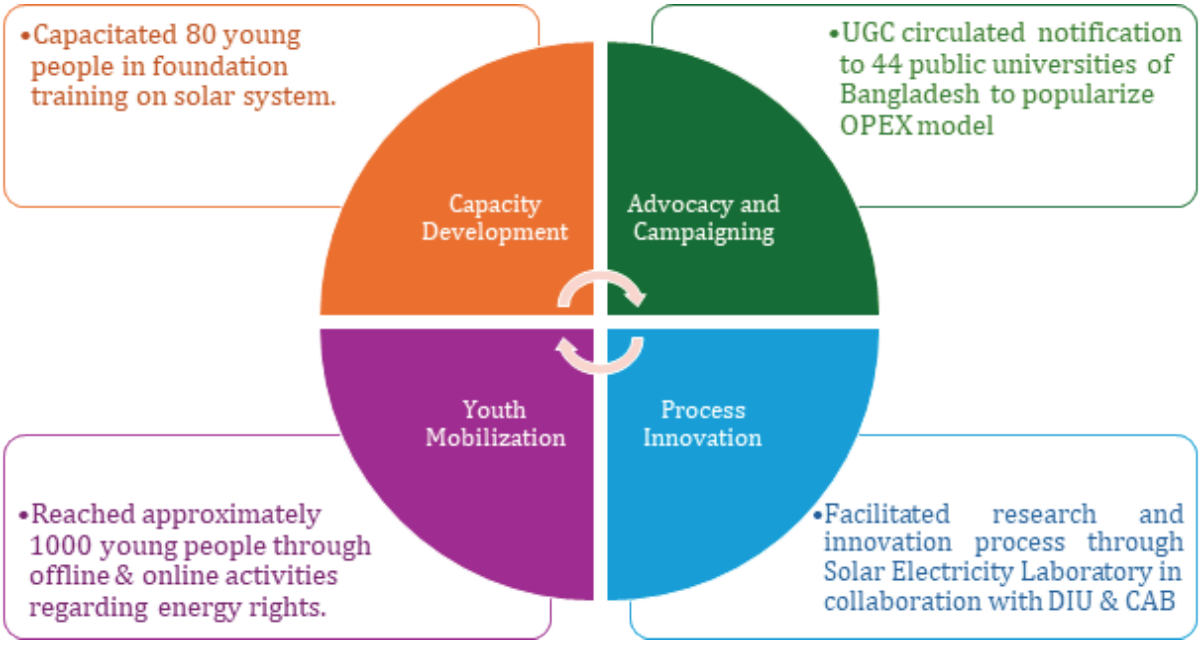

Fig 03: Joint initiatives of AAB & CAB on youth engagement in energy transition

AAB and CAB focuses on strengthening the capacities of young people by providing training on introduction of solar system, planning, design, installation and operation for engineering students of Rajshahi University of Engineering & Technology (RUET). Our collaborative engagement also contributed to establishing a Solar Electricity Laboratory and Training Centre at Daffodil University to develop skilled human resource. Through these initiatives, young people are equipped with the knowledge and skills necessary to drive energy transition in their communities. Finally, the result of national level advocacy initiatives where the University Grants Commission (UGC) circulated notification to 44 public universities of Bangladesh to develop OPEX model solar system project to accelerate the capacity of renewable energy.

Empowering youth as agents of change

Building a sustainable future requires involving youth in the just energy transition. The mass uprising of anti-discrimination by students on August 5, 2024, is expected to transform the Bangladesh state and play a positive role in implementing a Just Energy Transition. Through the provision of knowledge, skills, support, and advocacy opportunities, they can serve as agents of change in the promotion of just energy transition, the resolution of energy justice challenges, and the mitigation of the global impacts of climate change. Engaging young people in this endeavor will ensure sustainable development, promote intergenerational equity, and develop the next generation of environmental leaders. Programs for teachers and students to receive training can improve comprehension and involvement. Students at universities can work as Energy Auditors, promoting energy efficiency, creating green jobs in the renewable energy industry as well as attracting national and global private investments.

Recommendation to promote renewable energy transition

- Expand the current solar parks and develop additional large-scale land-based and floating solar plants can significantly boost renewable energy capacity. Prioritise using the vast water bodies and ponds for floating solar installations.
- Implement incentives for rooftop solar systems, including subsidies or tax rebates. Encourage industries and commercial buildings to adopt rooftop solar through streamlined regulatory processes and financial support.
- Encourage the adoption of the OPEX model for renewable energy projects, reducing upfront costs for businesses and households. This model can be particularly effective in promoting rooftop solar and small-scale renewable projects.
- Expand wind power projects by identifying and utilising high-wind areas across the country. Focus on both onshore and offshore wind farms to diversify wind energy sources.
- Invest in smart grid technologies to improve grid reliability and integrate renewable energy sources effectively. Reassess power plant capacities and operational efficiencies to avoid overcapacity issues and optimize existing infrastructure.
- Ensure that policies like the Power Sector Master Plan, Mujib Climate Prosperity Plan, and the Delta Plan 2100 align with current and future energy needs, emphasizing renewable energy targets and strategies. Conduct regular assessments of energy policies and projects to ensure they are meeting targets and making the desired impact on energy security and sustainability.
- Encourage collaboration between the government, private sector, and international organizations to drive renewable energy initiatives and address infrastructure challenges. Explore regional energy cooperation with neighboring countries to enhance energy security and share renewable energy resources.
- Continue and expand training programs for youth in renewable energy technologies and project management, as demonstrated by the collaboration between ActionAid and CAB. Provide grants and support for youth-led energy projects and advocacy initiatives, fostering grassroots engagement in the energy transition.
- Increased youth involvement in these activities create new opportunities for a just and consumer-friendly energy transition in Bangladesh.
- Launch educational campaigns to raise awareness about energy conservation, renewable energy benefits, and the importance of sustainable practices.