Clean Energy – summary report

UK-Bangladesh Climate Partnership Forum

12 February 2021

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Strengthening Resilience and Responses to Crises
Service implementation by a DAI Consortium

EXPERT ADVISORY CALL DOWN SERVICE – LOT B

STRENGTHENING RESILIENCE AND RESPONSE TO CRISES

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1 Introduction

Mott MacDonald and ODI are coordinating a webinar series on behalf of the Foreign, Commonwealth & Development Office (FCDO) as part of the UK-Bangladesh Climate Partnership Forum virtual series which is building momentum on the journey to the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow in November 2021. The climate talks will be the biggest international summit the UK has ever hosted; bringing together over 30,000 delegates including heads of state, climate experts and campaigners to agree coordinated action to tackle climate change. In its role as president of the Climate Vulnerable Forum, Bangladesh will be representing more 1.2 billion people living in 48 of the world's most climate vulnerable countries at COP26.

This UK-Bangladesh Climate Partnership Forum virtual series creates an opportunity to advance the climate agenda in the journey towards COP26 and beyond by bringing together experts and leaders from Bangladesh and the UK. It is intended to help to identify innovative ideas, partnerships and initiatives between Bangladesh and the UK, and further strengthen collaboration between the two countries by catalysing climate action and building a community of practice.

The forum builds on a long history of cooperation between the UK and Bangladesh and is structured around four key COP26 themes: 1) Adaptation and resilience**,** 2) Nature, 3) Clean Growth and 4) Finance. The aim is to bring the two countries together to share innovative ideas, experiences, knowledge, technology and initiatives to achieve greater progress on climate change.

Beyond each event, it is expected that active members of the discussions from both countries will continue the dialogue and coalesce around key areas of interest and initiatives that can be taken forward in the run up to COP26 and beyond. A 90-minute virtual event co-moderated by Simon Maxwell and Saleemul Huq was held on the COP26 theme "Scaling up clean energy investments" on the 3rd February 2021.

Bangladesh has the highest Off-Grid Solar PV Access Rate in the world which has been important in ensuring last mile energy access in rural areas. There has also been a rapid uptake of Solar Home Systems serving around 18 million people, and the Government of Bangladesh plans to deploy 50,000 solar pumps by 2025. Hydro, solar, wind, and other sources of renewable energy generation capacity are expected to grow at an average rate of 6.5 percent per year to 2041 and IFC estimates an investment opportunity of $3.2 billion in Bangladesh's renewable energy sector to 2030.

The UK recently announced an ambitious ten-point plan for a green industrial revolution which will mobilise £12 billion of government investment to create and support up to 250,000 highly-skilled green jobs in the UK, and spur over three times as much private sector investment by 2030. The UK has the world's largest offshore wind portfolio and with well over a decade of commercial deployment, UK companies are uniquely well placed to bring this learning to emerging markets.

The session was introduced by Robert Chatterton Dickson, British High Commissioner in Dhaka, with opening remarks from Ken O'Flaherty, UK government's COP26 Regional Ambassador to Asia-Pacific and South Asia and Mr Ahmad Kaikaus, Principal Private secretary in the Prime Minister's Office. The session included four presentations and a panel discussion by Jim Watson, Professor of Energy Policy, UCL Institute for Sustainable Resources; Toby Ferenczi, Director of International, OVO Group; and Eshrat Waris, SolShare. The full programme and profiles of all the speakers are included in Annex 1 and 2 respectively.

2 Key messages from the presenters

"Recovery from Covid-19 could provide a once in a generation opportunity to build back better – a clean, green and resilient recovery". Ken O'Flaherty, COP26 Regional Ambassador for Asia-Pacific and South Asia.

If countries are going to meet their commitments under the Paris Accord, then the transition to clean energy needs to accelerate across the globe. The arguments are well-rehearsed, but the economic recovery from Covid-19 offers a potential turning point: a return to business-as-usual, or re-purposed and re-energised support for a greener recovery. The cost of renewable energy and storage has fallen and will continue to fall and it is now cheaper to build new renewable energy facilities than to continue operating coal plants. Clean energy is becoming a booming industrial sector with growing investment opportunities. The choices countries make now will have profound long-term consequences for the future of the planet.

Those choices apply to all countries, but are particularly stark for the fast-growing economies of south Asia, including Bangladesh. Here, policy-makers are tasked with lifting millions out of poverty – including those newly impoverished by Covid-19. A green recovery could simultaneously provide jobs, incomes and stability, while building resilience to future shocks and reducing GHG emissions. Indeed a green recovery based on clean power could place these economies at the forefront of new and booming industrial sectors, generating more jobs and major public health benefits at lower cost than 'business-as-usual' growth.

FCDO have a long-standing commitment to Bangladesh, and the relationship is a close one. In support of climate compatible development, FCDO have helped extend access to clean energy for 4.3 million people under a rural solar programme, and has further plans to support on-grid renewables. At a global scale, FCDO has doubled its spend on international climate change projects to GBP 11.6 billion to 2026, including projects across south-east Asia. FCDO is also convening the COP26 Energy Transition Council to bring together countries with energy transition needs, including Bangladesh. Net zero targets have been set by countries across Asia, including Nepal, the Maldives and Laos. Meanwhile Pakistan and the Philippines have announced moratoriums on coal.

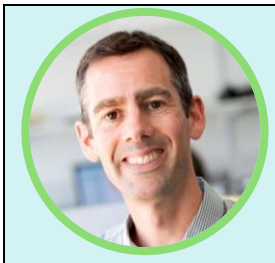
Progress is being made. But as the UK assumes the COP26 presidency, it is clear that the pace and scale of decarbonisation needs to accelerate. The ambition is to generate a clean, green and resilient recovery based on international cooperation.

"Bangladesh is a resource-poor country…Regional cooperation, particularly around hydropower, could help solve our clean energy challenge". Dr Ahmad Kaikaus, Principal Private Secretary of the Prime Minister's Office, Bangladesh.

As one of the most climate-vulnerable countries, Bangladesh is losing roughly 1% of GDP every year because of climate change. The impact of Covid-19 is an added and unexpected burden, but the country is determined to put climate mitigation and adaptation at the centre of its national recovery and development plans. This includes reducing subsidies in fossil fuels and increasing investments in clean energy.

In many ways, the country has made remarkable progress. Rooftop solar, in particular, is providing clean, renewable energy for millions. The country has developed a climate change Delta Plan, and is the first country among the LDC grouping to establish a climate change trust fund from its own resources. And Bangladesh is chair of the Climate Vulnerable Nations' Forum with an ambitious agenda and aspirations.

At the same time the country faces many challenges because of its small size, large population and resource scarcity. Rooftop solar can help, but land scarcity and limited wind and hydropower potential are serious constraints. The country will need to rebalance subsidies towards renewables and away from fossil fuels, but will also need to pursue regional solutions to achieve decarbonisation. Regional cooperation around developing and sharing hydropower presents an opportunity, and Bangladesh is building relationships with India, Myanmar, Bhutan and Nepal in this regard.



Jim Watson, Professor of Energy Policy, UCL Institute for Sustainable Resources

"The last three decades have witnessed big changes in UK electricity production, retail and consumption. Low carbon sources today account for over 50% of the mix, and coal is, almost, dead."

Moving away from coal to cleaner power sources – the UK experience

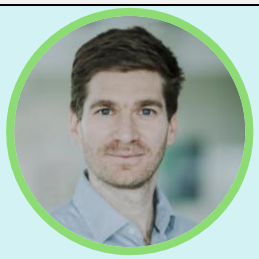
- Major shift in UK power generation since 1990, marked by a decline in coal (from c80% to almost 0% today) and growth of low/no carbon (>50% in 2019). Share of low carbon has doubled since 2003.
- Last three decades have also witnessed a 'decoupling' of economic growth (GDP) from GHG emissions: shift above a major factor, plus increases in industrial energy efficiency and off-shoring of industrial production. In contrast, poor progress with energy efficiency of housing stock.
- Privatisation of energy retail in 1990 has catalysed investment, innovation and competition, but did not deliver the decarbonization gains above. Rather, decarbonization achieved throug h policy & regulatory reform – e.g. subsidies for wind & solar; incentives for storage; phasing out of petrol/diesel car sales by 2030.
- Growth of renewables not without controversy – concerns raised about the problem of 'intermittency' at every stage. Nonetheless, the lights have stayed on! The grid has developed to adjust to the new energy mix (through increased back up capacity, the use of interconnectors and the emerging development of smart home devices).
- Challenges ahead: need for more flexible matching/integration of electricity demand and supply; increase energy efficiency of housing stock; boost storage; carbon capture and storage to offset any residual fossil fuel use; integration with non-UK grids (already happening – cross-channel electricity link).

Mr. Mohammad Alauddin, Chairman Sustainable and Renewable Energy Development Authority (SREDA)

"Bangladesh has achieved remarkable success in extending access to electricity for over 20 million people outside the grid network, largely through household solar."

Scaling up clean energy in Bangladesh.

- The mandate of SREDA, established in 2012, is to promote and facilitate the country's transition to clean energy, with a focus on promoting renewable energy and increasing energy efficiency. Plans for the latter outlined in the Energy Efficiency and Conservation Master Plan to 2030.
- Electricity production in Bangladesh heavily dependent on fossil fuels, especially gas (c48%). Renewables currently account for c3% of the mix – mainly solar. Government has invested approx. USD 800 million in renewable energy (RE) over the last 10 years with plans for major uplift.
- Solar may account for small proportion of capacity, but hugely significant in terms of extending electricity access: 5.8 million 'home systems' serving c10% of the population – mainly rooftop. Other applications include irrigation & domestic water supply, water heating, cold storage, street lighting, telecom towers, charging stations. Costs are falling, though land scarcity is an issue in a densely populated country (floating solar can help).
- Wind energy – both onshore and offshore – also has potential though costly. Plans to develop 150 MW onshore wind plants at three locations (Mongla, Chadpur & Inani).
- Challenges ahead: land scarcity an obvious constraint (solar), plus lack of a comprehensive renewables (RE) roadmap, lack of bankable data to attract investors, variability of supply, variability of supply, limited institutional capacity for developing & managing RE and financing-investment. Government has introduced package of tax incentives to encourage FDI.



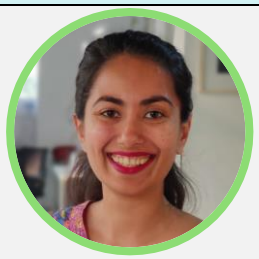
Toby Ferenczi, Director of International, OVO Group.

"To have a world with 100% renewable energy, you need to flip the power system on its head – controlling demand to meet uncontrollable supply."

Increasing access to renewable electricity and smart home products that help households to save energy and lighten their carbon footprints in the UK.

- Ovo is a new (2009) entrant to the UK energy market but has grown very rapidly – currently the 2nd largest energy supplier with c8 million accounts (15% UK population). An energy retailer, but also a technology/software company.
- Ovo has joined a liberalised and rapidly evolving market. The traditional (linear) generation, transmission & retail model, with the consumer as passive end-of-line recipient, is changing, though many countries still follow this model (under state monopoly).
- What does the future look like? A much more decentralised & disaggregated system, with the consumer centre-stage. Company role becomes one of enabling intelligent provision and consumer use, storage, monitoring, grid returns etc. through a range of smart products and systems. For example, using the battery storage in Electric Vehicles to balance the grid to support RE integration to deliver savings back to consumers.
- The journey – Ovo giving customers 'tools to make transition to zero carbon lives', while use of AI and machine learning through e.g Kaluza technology platform to handle complex consumer demand and reduce operating costs for the utility. Success depends on having the right incentive mechanisms in place to drive the right behaviours and use of grid (to avoid over-investment in transmission system). This avoids consumers bearing the price for inefficient or un-needed technology.

- Now looking to expand operations into new (international) markets as energy markets deregulate and open-up.



Eshrat Waris, SolShare

"SolShare's aim is to integrate systems…offering households the financial incentive to engage in an energy trading market."

The solar power industry in Bangladesh, innovative approaches and what next?

- SolShare is a peer-to-peer energy trading start-up, connecting individual solar home systems into micro-grids. Connecting households allows electricity trading: households that need electricity can buy it from others through the micro-grid; sellers can monetise their surplus. Those who cannot afford solar panels can buy electricity from those that do.
- To date, 40 micro-grids have been established with plans for further expansion. With electrification rates expected to reach 100% by the end of this year, SolShare's business focus is shifting from increasing energy access for poor households to grid integration and stability. SolShare has created a trading platform for owners of solar home systems (SHS) to sell electricity into the national grid via micro-grids. Micro-grids can also be linked through 'points of common coupling' (PCCs) to reach a scale that allows connections to the national grid – for buying or selling electricity in 'bulk'. Solshare technology tracks energy flow within micro-grids and between micro-grids and the national grid, and settles financial debits/credits. The Government's willingness to experiment with the regulatory sandbox to allow consumers to sell into grid has been important. This approach has the potential to transform stranded assets into a distributed energy storage solution through the pooling of SHS to increase the share of RE in the country's energy portfolio without utilising scarce land resources.
- SolShare is currently experimenting with rickshaw charging points to hasten the electrification of transport in district towns and rural areas. These 'local Teslas' provide vital last mile transport in Bangladesh – there are around 1500 now operating in Bangladesh. SolShare is also testing its trading algorithm as a means of pooling the energy from 'local Teslas'.
- Challenges ahead: batteries allow these trading systems to work, provide grid stability and power millions of EVs. But lead-acid batteries still dominate, posing health and environmental hazards. R&D in new, affordable storage technologies with extended lifetimes are needed so there is a sound investment case for in owners of SHS. Financial support is also needed to scale-up smart EV charging infrastructure as Bangladesh prepares for an electric future.

"*A renewable energy system will look very different to one based on fossil fuels – in terms of distributed power, feed-in mechanisms, storage, incentives/regulation…and the role of the state, amongst other actors*." Simon Maxwell.

3 Main points raised in discussion

3.1 The transition from coal

While much of Europe is phasing out coal, Bangladesh has commissioned new coal-fired plants. However, their future is uncertain as financing such projects becomes increasingly difficult. Meanwhile, prices of (imported) LNG are extremely volatile. Bangladesh is facing some difficult choices with major long-term consequences in terms of its energy mix, favoured institutional approaches to meeting growing demand, and the emphasis it places on regional cooperation with respect to energy imports – from India and other 'upstream' states such as Nepal and Bhutan that are developing e.g. hydropower projects. Despite the scarcity of land, more than 30 GW of RE capacity installation is possible using 0.32% of the country's land area to meet 10% of total power demand by 2041. Floating solar, coastal areas for onshore wind and offshore wind can be considered as options to accelerate RE development in Bangladesh.

One of the big successes in the UK has been the shift away from coal-fired power generation. And the UK government has signalled its intention to end 'unabated' coal completely by 2024 - part of its drive to decarbonise the power sector and achieve net zero by 2050. In this context, the recent decision to green-light a new coal mine in Cumbria (to supply coking coal for steel manufacture) has been highly controversial.

"We know that Bangladesh is importing 1160 MW of electricity from India. And there are talks about importing electricity from Nepal and Bhutan. How much of the planned coal generation can be replaced by importing electricity from hydropower from neighbouring countries?" Kumar Debnath, Post-doctorate Research Associate, Heriot-Watt University.

3.2 Upgrading and managing the power grid

The UK has invested in upgrading its national grid to facilitate the entry of more renewables - including developing an offshore network for wind and strengthening capacity between Scotland (where a lot of wind capacity is sited) and England. There have also been changes in how the grid is operated, and in the incentives/markets used to help balance the grid.

Power grids designed for the centralised, top-down delivery of reliable power will need to change to accommodate more dispersed, intermittent renewables such as solar. In Bangladesh, a key challenge is interconnecting the 5.8 million (and growing) household solar systems and developing reliable storage. The SolShare experience highlights the progress that can be made in balancing demand and supply through trading, and in connecting scaled microgrids to the national grid.

Although it is more complicated to integrate a distributed RE system into the grid compared with a more centralised large-scale grid-connected utility system, this allows producers to feed in at the grid edge in doses, especially if it is coupled with storage. However, for this to happen, there is a for a supportive policy framework to enable smaller decentralised RE units to feed in.

"*There is a "double bonus" to be had from upgrading Bangladesh's grid infrastructure - to reduce the significant transmission losses, and to enable the grid to receive more intermittent sources of renewable energy*." John Warburton, FCDO.

3.3 Environmental and social considerations

The transition to renewables brings obvious benefits in terms of slowing, and ultimately reversing, climate change. But the transition is not environmentally benign. Supporting hydropower, biofuel and solar projects, for example, can have major impacts on land and water resources, and on those people with a stake but little voice in their use.

The environmental and social impacts of major hydropower projects are well rehearsed, but the expansion of solar can also raise difficult questions around where panels go (land is rarely 'unused') and the storage of energy in batteries. Floating and rooftop positioning of panels can help in a densely populated country such as Bangladesh, but millions of lead-acid batteries pose health and pollution risks that need to be addressed.

There is a need for policies and associated regulatory frameworks (in both the UK and Bangladesh) to improve battery management, recycling and avoidance of long-term pollution.

"*Population and land scarcity is our problem, but at the same time this also our strength. We can drive community-based small/mini-scale production units that use renewable in many ways…and massively scale-up renewable energy*." Md. Abul Kalam Azad

"There is a need in both (all) countries to take into account how different choices may have different social impacts. We should add social dimensions to the policies which are needed to accelerate the clean energy transition." John Carstensen, Mott MacDonald.

3.4 The policy and regulatory framework

Reforms to the incentive and regulatory system were mentioned by speakers, and by chatbox participants, but not explored in detail. The UK experience has shown how subsidies for wind and solar, incentives for storage, and careful regulation of competitive energy markets were necessary to achieve decarbonisation. In Bangladesh, a clean energy transition will not be achieved through state action alone, but government has a key role to play in attracting private investment, working with CSOs/academia and setting the 'rules of the game'.

SolShare's experience has been positive in terms of its relationship with government – government has been keen to integrate renewable energy and supportive in encouraging entry of private sector plays. But more investment in research and development is needed – from different sources – to overcome obstacles with e.g. battery technology and smart EV infrastructure.

"The incentive and regulatory system needs to change – a lot: to incentivise new entrants, manage distributed energy systems, deal with intermittency and 'keep the light on'. Much to learn if universities can join up and support mutual learning". Simon Maxwell, co-moderator of the session.

Annex 1: Programme for clean energy

"Scaling up clean energy investments", Wednesday 3 February 2021

Moderators
Professor Saleemul Huq and Simon Maxwell

Introductions
Judith Herbertson, Director of Development, FCDO

Opening remarks
Ken O'Flaherty, UK government's COP26 Regional Ambassador to Asia-Pacific and South Asia
Mr Ahmad Kaikaus, Principle Private secretary in PMO

- Moving away from coal to cleaner power sources – the UK experience. Jim Watson, Professor of Energy Policy, UCL Institute for Sustainable Resources
- Scaling up clean energy in Bangladesh. Mr. Mohammad Alauddin, Chairman SREDA (Sustainable and Renewable Energy Development Authority)
- Increasing access to renewable electricity and smart home products that help households to save energy and lighten their carbon footprints in the UK. Toby Ferenczi, Director of International, OVO Group.
- The solar power industry in Bangladesh, innovative approaches and what next? Eshrat Waris, SolShare

Annex 2: Speakers and panellists

MODERATORS

Simon Maxwell

Simon Maxwell is an economist who began his career working in Kenya and India for the UN Development Programme, and then in Bolivia for the UK aid programme. He was a Fellow of the Institute of Development Studies in Sussex from 1981-1997, and was Director of the Overseas Development Institute from 1997-2009. Since 2009, he has inter alia been Executive Chair of the Climate and Development Knowledge Network (2010-17), and Specialist Adviser to the International Development Select Committee of the UK House of Commons (2010-17). He is currently on the Steering Committee of the annual UN Environment Emissions Gap Report. Simon is a past President of the Development Studies Association of the UK and Ireland. In 2007, he was awarded a CBE for services to international development. He writes extensively on development policy. In January 2016, Simon delivered the Anniversary Lecture of the Centre for Policy Dialogue in Dhaka, on the topic of 'Climate Compatible Development: Pathway or Pipedream' (see here). For further information, see www.simonmaxwell.net.

Saleemul Huq

Prof. Saleemul Huq is the Director of the International Centre for Climate Change and Development (ICCCAD) at Independent University, Bangladesh (IUB) since 2009 and Senior Fellow at the International Institute for Environment & Development (IIED) in London. He is also Senior Advisor on Locally Led Action, Global Centre on Adaptation (GCA) and Advisor of Climate Change Programme at Brac. Before that Dr Huq was the Director of the Climate Change Programme at IIED and founding Executive Director at the Bangladesh Centre for Advanced Studies (BCAS). He has worked extensively in the inter-linkages between climate change (both mitigation as well as adaptation) and sustainable development, from the perspective of the developing countries, with special emphasis on least developed countries (LDCs). He has published numerous articles in scientific and popular journals, was a lead author of the chapter on Adaptation and Sustainable Development in the third assessment report of the Intergovernmental Panel on Climate Change (IPCC), and was one of the coordinating lead authors of 'Inter-relationships between adaptation and mitigation' in the IPCC's Fourth Assessment Report (2007). He has been named among the "World's 100 Most Influential People in Climate Policy for 2019" for making a positive difference by The Apolitical, a London-based public servants' networking group.

Eshrat Waris, Principal, SOLShare, Bangladesh

Eshrat is a Principal at SOLshare, a peer to peer energy trading startup serving off-grid rural communities. SOLshare interconnects standalone solar home systems and unlocks untapped clean energy to power local economic development. Previously she led the team at BRAC that deployed technology products to empower field staff with actionable insights and address youth labour market gaps. She pursued her graduate studies from Johns Hopkins School of Advanced International Studies.

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Mohammad Alauddin, Chairman, Sustainable and Renewable, Energy Development Authority (SREDA), Bangladesh

Mohammad Alauddin is currently the Chairman of Sustainable and Renewable Energy Development Authority (SREDA). As a career civil servant, he served in different ministries and divisions and in various capacities of field administration. Mr Alauddin received his B.Sc. Ag. (Honours) degree from the Bangladesh Agricultural University and a Masters in Public Affairs (MPA) with specialization in Governance and Public Policy from the Civil Service College, Dhaka (CSCD). He also worked as a part-time faculty at CSCD and the

Asian University of Bangladesh. He drives the initiatives of the International Renewable Energy Agency and International Solar Alliance in Bangladesh.

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Jim Watson, Professor of Energy Policy and Research Director, Institute of Sustainable Resources, University College London

Jim Watson is Professor of Energy Policy and Research Director at the Institute of Sustainable Resources, University College London (UCL). He was previously Research Director and Director of the UK Energy Research Centre from 2013 to 2019, and Director of the Sussex Energy Group, University of Sussex from 2008 to 2013. He has over 20 years' research experience on climate change, energy and innovation policy. He frequently advises UK government departments and other organisations, and has been a Specialist Adviser with three UK Parliamentary committees. He also has extensive international experience, including over ten years working on energy scenarios and energy innovation policies in China and India and a period as a Visiting Scholar at the Kennedy School of Government, Harvard University. He is a judge for the Queens Awards (on sustainable development), an executive committee member of the Tyler Prize for Environmental Achievement, and chair of the technical advisory group to the World Bank Energy Management Assistance Programme (ESMAP).

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Toby Ferenczi, Director of International at OVO Energy

Toby is Director of International at OVO Energy. OVO is one of the world's largest energy retailers providing power and gas to 7.8m customers in the UK, France, Spain and Australia. OVO is also a provider of software systems to utilities globally. Toby has a PhD in solar energy from Imperial College London, and a BA and MSci in Physics from Cambridge University. His previous roles have included working as COO and MD of VCharge, and CEO of Hanergy Solar UK. During his time at Hanergy, Toby launched a partnership with IKEA, making it possible to buy PV through its stores in four countries. He also has experience in working for General Electric in renewable energy