

ADDRESSING CLIMATE CHALLENGES IN BANGLADESH: A SMART CARBON PRICING STRATEGY: A CARBON USER FEE TO MOBILIZE CLIMATE FINANCE¹

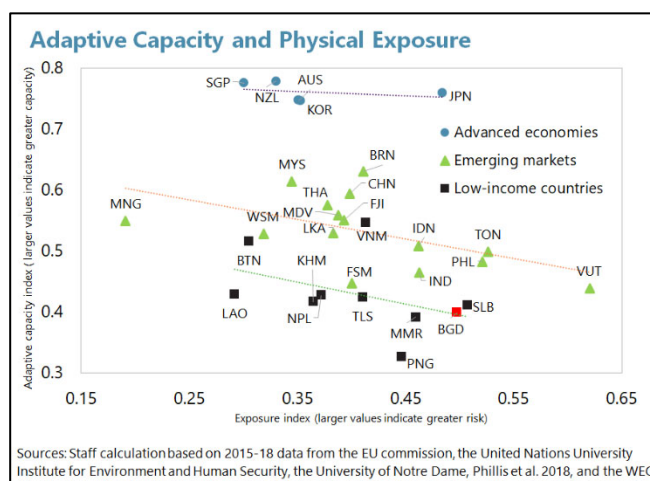
Summary: Climate change will pose critical macro-economic challenges for Bangladesh in the coming decades. Bangladesh is one of the most active countries in terms of planning and acting on climate change. Tackling climate change will require a mix of fiscal, financial and structural policy interventions. In this note, we explore the critical challenges facing Bangladesh in its pursuit to build climate-resilience and transition to a low-carbon economy, including lack of access to financing on favorable terms and explore the benefits of a gradual adoption of a carbon user fee before FY 25 per the 8th Five Year Plan (FYP). With the early adoption of carbon pricing, Bangladesh will provide a strong and credible signal to donors and investors on its commitment to a greener economy by meeting the 2021 Nationally Determined Contributions (NDC) mitigation targets. The fee will be easily implementable as it will fall narrowly on the energy sector and will increase gradually from US\$3 per metric ton of CO₂ in FY22 to US\$25 per metric ton of CO₂ in FY 30, helping firms to plan ahead for decarbonizing their production processes and improving energy efficiency, thereby reducing stranded assets, risks to competitiveness, and job losses in the future. A carbon fee in Bangladesh will also help with revenue mobilization that could be effectively recycled to protect the economically vulnerable, support firms in their decarbonization process, and create jobs through investment in climate projects. Finally, carbon pricing could also help negotiate better terms for prospective border carbon adjustments (BCAs) abroad and/or more favorable trade deals in the run up to LDC graduation. “The simplicity of a price signal is preferable to an approach that requires a complex case-by-case evaluation of the climate impacts of every individual project” (OECD 2021). This may be an opportune time for Bangladesh to align with interests and net-zero goals of its export consumers, donors, and the private investors following the renewed pledges at COP26.

A. Context

1. Bangladesh is extremely vulnerable to climate change. Bangladesh is ranked among the top ten countries in the world most affected by extreme weather events during 1998–2017 (Global Climate Risk Index). Losses linked to such events were estimated annually to average 1.8 percent of GDP between 1990 and 2008 (IMF 2019b). In addition, rising sea levels and coastal erosion is expected to result in a significant loss of land surface, food production and displacement of people. Not only Bangladesh is highly exposed to climate change risks, but also has limited adaptive capacity to cope with these risks (text figure). Bangladesh is the 27th most vulnerable country and the 26th least ready country (Notre Dame’s Global Adaptation Initiative Index). With increasing sea

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levels, abrupt changes and variability in monsoon rain, gradual rise in temperatures and more frequent natural disasters, Bangladesh, a densely populated delta, has an urgent need to build its adaptive capacity. The government should start monitoring and planning interventions in line with the long-term Delta Plan and the 8th five year plan, focusing on building adaptive infrastructure (e.g., dikes, barriers etc.) while supporting new, climate resilient jobs in agriculture and skill development to allow diversification into other sectors; investing in nature-based solutions (e.g., mangrove forests, natural dunes, beach replenishment); and being pro-active in land-use -planning. Importantly, the government should seek out concessional finance, to the extent possible, to support such investments to ensure macro and fiscal sustainability and a robust post pandemic recovery.



2. Bangladesh is in many ways at the forefront of preparing for climate change.²

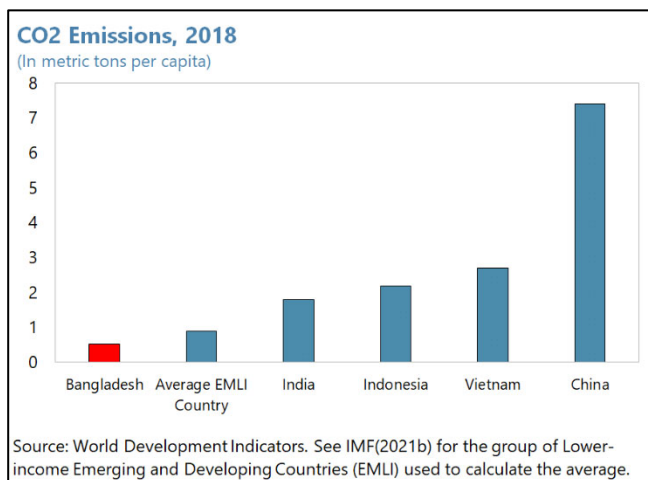
Bangladesh is one of the few countries in the world to have operationalized the Climate Fiscal Framework (CFF), which provides the principles and tools for climate fiscal policy making. It helps to identify the demand and supply sides of climate fiscal funds, and to ensure that the use of these funds is transparent and sustainable in the longer term. Bangladesh adopted climate change budget tagging in 2018 and publishes citizen climate budget annually. It has also identified and costed an extensive pipeline of adaptation projects through its Delta Plan 2100 and is currently working on the Mujib Climate Prosperity Plan 2030, a strategic investment framework to mobilize financing.³ Meanwhile, the Bangladesh Bank (BB) has developed a Sustainable Finance Policy for Banks and Financial Institutions and a green taxonomy to classify economic activities based on their contribution to sustainability and climate change objectives. BB has also put policies in place to promote green financing.

² See World Bank (2021) for a review of the country experiences using these planning tools.

³ "The draft Mujib Climate Prosperity Plan, aims at mobilizing financing, primarily through international cooperation, for implementing climate resilience initiatives such as an expansion of locally-led adaptation, the establishment of carbon market regime, Bangladesh Delta Plan 2100 resilience bonds, climate-resilient and nature-based agricultural and fisheries development, climate resilient well-being programs and accelerated digital revolution, training and skills development." (MOEFCC 2020).

3. Bangladesh is also contributing to the global efforts to combat climate change.

Bangladesh accounts for less than 0.35 percent of global greenhouse gas (GHG) emissions, with per capita emissions significantly lower than many countries in the region (text figure). It has proposed an unconditional aggregate reduction of GHG emissions by 6.73 percent below Business-As-Usual (BAU) levels by 2030, shared between the Energy, Industrial Processes & Product Use (IPPU), Agriculture, Forestry and other Land use (AFOLU) and Waste sectors in its updated nationally determined contributions (NDCs, MOEFCC b 2021).⁴ Its proposed conditional contribution is to reduce GHG emissions by an additional 15.12 percent below BAU levels by 2030. While Bangladesh is a lower-than-average per capita emitter amongst Low Income Emerging and Developing countries (LIDCs), it's pledge on mitigation is substantially higher than the average for LIDCs at 4 percent below BAU in 2030 (IMF 2021b). In its Eighth Five Year Plan (8th FYP), Bangladesh has proposed a carbon tax of 5 percent of energy prices by 2025 to help achieve these emissions target.



4. Bangladesh faces key constraints to achieving its climate goals. Progress in resilience and adaptation to climate change has been prioritized but remains insufficient to meet the significant needs. The large adaptation needs can be accelerated by relaxing financing constraints, creating fiscal space for enabling new investments, and enhancing access to technology. It will also involve addressing macro critical structural constraints such as modernizing financial sector and strengthening investment climate. Progress in climate mitigation could be stepped up with international partner support.

Financing: The World Bank estimates that Bangladesh would need US\$5.7 billion per year as adaptation finance by 2050 (MOEFCC b), more than 5 times higher than its current expenditure of around US\$1 billion a year on climate change adaptation (CCA).⁵ In fact, total climate relevant budgetary allocations (for both mitigation and adaption) has been less than 1 percent of GDP annually, well below the 3-4 percent of GDP needed per year for climate and biodiversity

⁴ In the GHG emission reduction scenario presented in the updated NDC document, majority of the planned reduction is from the energy sector (about 95.5 percent in the unconditional scenario and 96.1 percent in the conditional scenario), with the remaining burden shared between the AFOLU and Waste sectors. For our study in 2030 the BAU emission level is expected to be 136 metric tons (as specified in the CPAT) and starting at 97 metric tons in 2021. The reduction in emissions in 2030 when mapping the NDC unconditional (conditional) commitments would mean a 6.73 percent (21.85 percent) unconditional (conditional) reduction from 136 metric ton of emissions.

⁵ As reported in the 2021 updated NDC document. As per the estimates of the Bangladesh authorities, costs for mitigation are estimated at about US\$27 billion (FY2011-30), which translates to about US\$1.4 billion per year for mitigation. Costs for the effective implementation of Nationally Determined Contribution (NDC) for adaptation (over FY15-30) have been estimated at about US\$ 42 billion, which translates to about US\$2.8 billion annually.

preservation mandated by the SDG goals. Adaptation investments, which are expected to be met through a combination of domestic and external funding, are significantly higher than mitigation investments. There can be no adaptation without finance.

Fiscal Space: Bangladesh seems to have limited fiscal space – especially post-COVID-19, making it challenging to deal with frequent natural disasters and to accommodate large scale, and costly climate resilient investment. At less than 10 percent, Bangladesh’s tax revenue-to-GDP ratio remains low, further constraining the government’s ability to increase social, climate and developmental spending, and build adaptive capacity. In addition, with depletion of domestic natural gas reserves and rising fuel prices, Bangladesh faces upward pressures on energy subsidy spending, potentially diverting resources from other development needs. Furthermore, as debt vulnerabilities have increased with the COVID-19 pandemic, Bangladesh needs to focus on concessional financing and non-debt creating flows (such as FDI) to achieve the goals laid out in the 8th FYP and Delta Plan. Adaptation will not be fiscally sustainable without expanding the net-tax base.

Technology: Investment in resilient infrastructure and low-carbon technologies is costly. Active support from international partners on the development, transfer, and industrial-scale deployment of technologies would be critical for a transition to a green economy (World Bank 2020). Equally, investment in renewables such as wind, biomass, biogas, solar mini grid, waste to electricity (see updated NDC 2021), as well as preservation of natural capital, investment in waterways, mangroves and coastal areas protection as laid out in the 8th FYP and Delta plan, can help with both adaptation (a natural sea-wall) and mitigation (a natural carbon sink).

Distributional Consequences and Risks to a Just Transition: Climate change disproportionately affects the poor and exacerbates inequalities, ultimately undermining development and poverty eradication efforts. Poorly designed climate policies risk amplifying existing inequalities. Adaptation policies should ensure an equitable allocation of limited resources, and mitigation policies should compensate the vulnerable for the burden from higher energy prices and investment in new skills. A just transition must create jobs and foster equality.

Bangladesh has other macro-critical economic challenges that will have implications for its resource and climate goals and appropriate climate policy interventions could also help deal with them.

Prepare for the LDC Graduation: As Bangladesh graduates from LDC status in 2024, now postponed to 2026, it is expected to lose its preferential tariff status in the EU. In addition, climate funds, such as the Green Climate Fund and Global Environment Facility, prioritize financing for LDCs, and although small, Bangladesh could lose access to such concessional climate financing after LDC graduation. It is therefore imperative for Bangladesh to negotiate new international support mechanism and look for alternative sources of climate funds (Rahman and Bhattacharya 2020).

Enhance Export Competitiveness: As Bangladesh looks to diversify its exports, concerted efforts on climate mitigation and adaptation could be critical for supporting Bangladesh’s international competitiveness. Trends in export demand and capital flows are increasingly based on trade and investment partners’ compliance with environmental standards and greener production processes as

well as broader ESG (environment social and governance) considerations. The need to decarbonize the supply chains is becoming even more urgent as EU is expected to introduce Border Carbon Adjustments (BCAs) in 2023 that would require importers to pay an import tax or purchase emissions allowance on highly energy intensive products from countries that do not have comparable emissions pricing requirement. This would place Bangladesh's export firms at a disadvantage in the EU and could appropriate government revenues at Bangladesh's expense.

Underdeveloped Financial Markets. In April 2021, Bangladesh Securities and Exchange Commission (BSEC) approved the first green bonds in Bangladesh, for SAJIDA, a non-governmental organization, to raise Tk 1.0 billion from the capital market. However, the scope for financial instruments such as green bonds, catastrophe bonds are limited in Bangladesh as the capital market remains shallow. More broadly, financial sector reforms to tackle nonperforming loans stock and flows and improving corporate governance remain imperative for capital market development.

5. Bangladesh has already invoked a mix of policy tools but more is needed in moving the implementation forward (Table 1). On adaptation, Bangladesh is lagging on post disaster resilience and has inadequate resources for building resilient infrastructure. On mitigation, it has primarily focused on non-price instruments such as promoting green financing, adopting PFM measures such as climate change budget tagging, and focusing on conservation. There are a range of policy options available within Bangladesh's constraints.

Table 1. Bangladesh: Climate Policy Tools

Fiscal	Financial	Institutional
Climate Fiscal Framework (2014)	Sustainable Finance Policy/Green Taxonomy (2020)	Bangladesh Delta Plan (2018)
Climate Change Trust Fund (2010)	Securing climate financing	8th Five Year Plan (2020)
Climate Change Budget Tagging (2018)	Initiating Green Bond issuances (2021)	Disaster Management Act (2012)
Carbon fee/ETS/Feebates	Risk insurance, Cat bonds, Contingency credit lines	Bangladesh Climate Change Strategy and Action Plan (2009)
Contingency/Reserve Funds	Integrating climate risks into financial sector supervision	Mujib Climate Prosperity Plan
		National Adaptation Plan

Note: Green indicates policy tools already implemented or in progress in Bangladesh. Black indicates tools for consideration. Source: IMF staff based on the review of various official documents produced by the Bangladesh Government, World Bank (2021), IMF country report no.19/300.

Structural: Reforms to improve governance and the investment climate, including continued liberalization of FX regulations, a review and adaptation of the regulatory framework to be more supportive of trade and outward FDI, and further legal reforms, such as in land registration and contract enforcement, would encourage more FDI and domestic investment in emerging green sectors and resilience building. Investments in skill development and reskilling the workforce would be essential to diversify the export base and accelerate the transition to a low-carbon economy. Strengthening regulations on resilient building codes, vehicle emissions codes, fertilizer use etc. will help Bangladesh attain its climate goals in various sectors (IMF 2021a).

Fiscal: Bangladesh can strengthen its post-disaster resilience by introducing a dedicated contingency line in the national budget that would be geared more specifically at crisis management and emergency relief efforts in the event of severe flooding or droughts. Unused funds could be placed in a natural disaster reserve fund with strict governance and transparency requirements (IMF 2019b). With regards to mitigation, Bangladesh aims to reduce its fossil fuel subsidies and establish a carbon tax as noted in its 8th FYP. Non-tax incentives such as feebates and Emissions trading Systems (ETS), and other tax incentives such as accelerated depreciation, investment tax credits can usefully complement these measures to accelerate development and adoption of green technologies (IMF 2021a).⁶

Financial: To further strengthen post-disaster resilience, Bangladesh could consider risk-sharing instruments such as catastrophe bonds and parametric disaster insurances, as well as pre-arrange financing like the CAT DDO (IMF 2019b).⁷ The National Security Certificate (NSC) pricing reforms would deepen the government bond market. Further efforts to promote green financing could usefully focus on better integrating environmental risks in financial sector supervision and specifically promoting financing for climate-resilience building. The effectiveness of green taxonomy could be enhanced by unifying the framework that currently is only applied on domestic capital markets to cross-border financing as well.

After broad recommendations, the next section explores the potential catalytic role of a carbon fee to attract finance (including FDI), by signaling a strong commitment to Bangladesh's NDC mitigation goals, and its potential as a complementary tool to facilitate distribution, adaptation, and development goals.

⁶ Under Emissions Trading Systems (ETSs), firms can trade their allowances for CO₂ emissions at market prices and the government sets a ceiling on total allowances or emissions. ETSs are more widely used in the Asia and Pacific region compared to carbon taxes. However, ETS is generally less effective at reducing CO₂ emissions due to free allowances, narrower coverage and uncertain effects on energy prices, and would therefore constitute only a second-best approach for advancing mitigation efforts. IMF (2019a) estimates that ETS can only achieve around three-fifths of the CO₂ reductions from a carbon tax at \$70 per metric (mt) ton for Bangladesh.

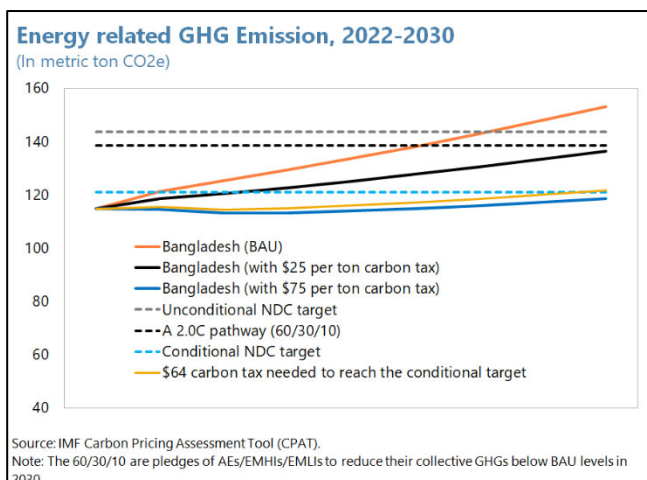
⁷ Examples include Sri Lanka's national natural disaster insurance scheme (NNDIS), a public insurance program launched in 2016 by the Sri Lanka government and Caribbean Catastrophe Risk Insurance Facility, a multi-country risk pool providing disaster risk insurance for Caribbean countries.

B. Considering an Early Adoption of Carbon Pricing to Mobilize Climate Finance

[“Bangladesh PM Hasina tells rich world to fulfil carbon pledges.” Reuters, November 1, 2021](#)

“Being part of the solution requires all providers of development co-operation to align their activities with the objectives of the Paris Agreement. However, many still lack the mandates, resources, incentives and strategies to do so.” (OECD 2019). “Carbon pricing can facilitate such an alignment as the price signals sent by carbon pricing can help to ensure that aid flows into Paris-compatible projects.” (OECD 2021).

6. The introduction of a carbon user fee on the energy sector could be a highly effective measure to reduce CO₂ emissions in Bangladesh.⁸ Gradually implementing a moderate carbon fee starting at US\$3 per mt. ton of CO₂ on the energy and IPPU sectors in 2022, and increasing to US\$25 per mt. ton by 2030 could reduce CO₂ emissions by 12 percent by 2030, exceeding Bangladesh’s 6.73 percent unconditional updated NDC target (text figure). Assuming Advanced Economies (AEs) and Higher-Income Emerging and Developing Countries (EMHIs) reduce their emissions by 60 and 30 percent respectively, and other Lower-Income Emerging and Developing Countries (EMLIs) reduce their emissions by 10 percent, a US\$25 carbon fee for Bangladesh would also be consistent with the global collective target of keeping warming to 2C (See IMF 2021b for details on this global scenario). The US\$25 carbon fee is IMF’s proposal for an International carbon price floor (ICPF) for low-income countries (LICs) in consideration of international equity and competitiveness (IMF 2021c). To reach the conditional target of an additional 15.12 reduction, Bangladesh would require a carbon fee of US\$64, and would need sufficient compensation mechanisms to offset distributional impacts such as job loss or loss of competitiveness.



7. A Carbon user fee can raise additional and predictable fiscal revenue to achieve adaptation goals and pay for just transition costs. A US\$25 carbon fee on the energy sector can bring a gradual increase in additional revenue, amounting to 0.48 percent of GDP on an annual basis

⁸ It is assumed that non-energy sectors emissions reduction is tackled through non-tax interventions. The estimates on impact of carbon taxes on emissions, revenue, costs and net welfare benefits are from the Carbon Pricing Assessment Tool (CPAT). We assume a linear increase in carbon tax starting in 2022 and with no exemptions on sectors. The carbon tax is applied on all commercial energy sources, including, natural gas, petroleum, coal, electricity, kerosene, and gasoline. CPAT incorporates assumptions on economic growth (IMF WEO), population growth, energy mix changes based on the authorities’ energy plans, autonomous and endogenous efficiency improvements in energy-consuming capital, and existing fossil fuel subsidies in its calculations.

by 2030, about a 5 percent increase in the revenue base (Table 2). Given that Bangladesh already has an established fuel tax system, the fee would be relatively easy to administer. A carbon fee could also improve the efficiency and revenue yield of the tax system as tax evasion is harder. Also, when revenues from the carbon fee are used to lower other distortionary taxes such as labor or production taxes, it can help to shift the tax mix away from taxes that are only paid by the formal sector, lowering the relative tax burden of the formal sector and reducing the incentives for informality (Timilsina and others 2021). Finally, additional revenue from the carbon fee could be earmarked for promoting domestic equity and transition to a greener economy.⁹ For example, revenues from India's coal "cess", implemented in 2010 at INR 50 per ton of coal imported or produced domestically and gradually increased to the current rate of INR 400 per ton (equivalent to a carbon tax of US\$2 per mt. ton CO₂), have been allocated to the National Clean Environment Fund (NCEF) to finance clean energy technologies and related projects (Sumarno and Laan 2021).

Table 2. Bangladesh: Impact of Carbon Fee, 2030			
CO₂ Emission Reduction			
Carbon Fee per ton of CO ₂	\$25	\$50	\$75
Reduction below 2030 Baseline	12%	19%	24%
Domestic Environmental Benefits			
	\$25	\$50	\$75
Economic Cost (In percent of GDP)	-0.07	-0.2	-0.4
Gross Benefit (In percent of GDP)	0.32	0.5	0.7
Net Benefit (In percent of GDP)	0.255	0.3	0.3
Revenue			
Carbon Fee per ton of CO ₂	\$25	\$50	\$75
In percent of GDP	0.483	0.89	1.24
Energy Price Increase			
Baseline Price	\$25	\$50	\$75
Coal (\$2.47 per GJ)	101%	202%	304%
Natural Gas (\$5.66 per GJ)	27%	54%	81%
Electricity (\$0.22 per kwh)	19%	36%	51%
Gasoline (\$1.42 per liter)	5%	9%	14%

Source: IMF Carbon Pricing Assessment Tool.

8. Domestic environmental benefits from reduced pollution among other impacts, would outweigh the economic costs of carbon pricing. High levels of pollution in Bangladesh reduce human welfare, labor productivity and labor supply. Estimated losses linked to urban pollution and environmental degradation in Bangladesh is close to three percent of GDP (World Bank 2018). The gross national monetized welfare benefits including the health and mortality related environmental co-benefits from a US\$25 carbon fee could reach to about 0.32 percent of GDP, more than covering

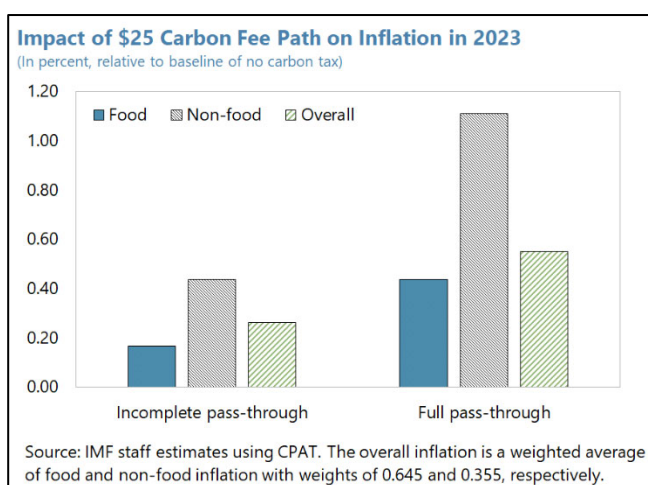
⁹ IMF (2021a) shows that even universal transfers that distribute carbon tax revenues equally to the population could make the majority of households, including poor ones, better off.

the total economic costs from a decline in overall economic activity due to higher energy prices and generating a net benefit of 0.26 percent of GDP by 2030.¹⁰

9. Despite the urgency to build back better post pandemic and pledges made towards net-zero emissions by mid-century, governments are wary of the political costs of enacting market-based measures such as a carbon user fee on fossil fuels (Furceri et al. 2021). Foremost among the challenges are the cost of being the first mover, in terms of equity considerations as well as plausible adverse impact on prices and competitiveness, the scale and scope of coverage, and available non-price options to reduce emissions. Bangladesh seems to be well positioned to handle these challenges, especially if implementation of a carbon fee is able to catalyze the needed finance.

10. The impact on prices and inflation from the phased-in carbon pricing is likely to be

small. A gradual introduction of carbon fee starting at US\$3 per mt. ton of CO₂ emission in FY 22 scaling up to US\$ 25 per mt. ton of CO₂ emission by 2030, will have very little impact on food prices and overall inflation. Assuming full-pass-through, a US\$3 increase in carbon fee per year would translate to an increase in food-price inflation of around 0.2 percent and non-food inflation of around 1.1 percent in 2023, resulting in an overall inflation of around 0.5 percent. Incomplete pass-through would further reduce the impact of carbon pricing on inflation.



11. **Carbon pricing is likely to result in limited aggregate job losses due to minimal cost increases in most manufacturing sectors.** For example, a US\$25 carbon fee can raise the input cost of manufacturing of other nonmetallic minerals by 6 percent, which is the highest among all the downstream sectors.¹¹ Other downstream sectors appear to be not very sensitive to carbon taxes, especially industries that have large shares in exports such as textiles and textile products. Because Bangladesh's labor force is also concentrated in less carbon-intensive industries, the jobs at risk from carbon pricing could be manageable with appropriate compensatory measures. By IMF staff estimates, the aggregate jobs at risk in the manufacturing industries is around 1 percent of employment (Table 3). These estimates are likely an upper bound as they do not account for growth of new green sectors, revenue recycling, and endogenous efficiency responses that could mitigate

¹⁰ The economic costs include losses in consumer surplus from lower energy consumption and higher costs to produce cleaner energy, less net revenue gains to the government (accounting for the erosion of pre-existing fuel tax bases). Net revenue gains from carbon fees would be attenuated if existing fuel subsidies increase simultaneously. See Appendix III in IMF (2019a) for details.

¹¹ A carbon fee affects downstream industries by directly by raising the price of energy and indirectly through driving up costs and prices for intermediate inputs in general. The indirect cost effects are estimated by assuming full pass-through of the burden from upstream energy and intermediate inputs producers to downstream producers using the GTAP Input-Output tables.

the impact on jobs.¹² Existing evidence points to a typically small and indeterminate effects on aggregate jobs, depending on the extent of substitution between high- and low-emission activities (IMF 2020). However, it is important to compensate the poor through targeted, short-term transition assistance, and dislocated workers through vocational training programs and to re-skill the workforce for new industries and job search assistance.

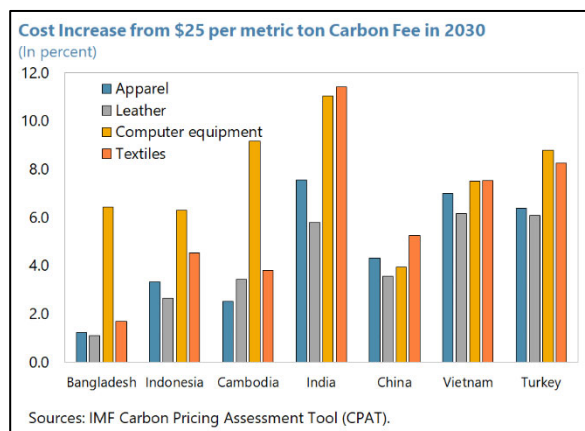
Table 3. Bangladesh: Cost Increase and Jobs at Risk in Manufacturing

Industry	Cost Increase by Carbon Fee (In percent)			Medium-term Jobs at Risk (In percent of total employment)		
	\$25/mtCO ₂ e	\$50/mtCO ₂ e	\$75/mtCO ₂ e	\$25/mtCO ₂ e	\$50/mtCO ₂ e	\$75/mtCO ₂ e
Nonmetallic minerals	6.22	12.21	18.07	0.58	1.15	1.70
Textiles and textile products	1.35	2.62	3.85	0.21	0.42	0.61
Chemicals, chemical products and other manufacturing	11.95	22.98	33.48	0.10	0.19	0.28
Basic metals and fabricated metal	2.65	5.02	7.22	0.09	0.16	0.24
Food, beverages, and tobacco	1.10	2.16	3.19	0.08	0.15	0.22
Rubber and plastics	9.18	17.88	26.30	0.07	0.14	0.21
Pulp, paper, paper products, printing, and publishing	4.69	9.05	13.20	0.06	0.12	0.18
Electrical and optical equipment	2.57	4.79	6.80	0.02	0.04	0.06
Leather, leather products, and footwear	1.11	2.17	3.19	0.02	0.03	0.05
Machinery, nec	2.32	4.32	6.14	0.01	0.02	0.03
Transport equipment	1.88	3.71	5.51	0.01	0.02	0.02
Wood and products of wood and cork	2.14	4.14	6.05	0.00	0.01	0.01
Coke, refined petroleum, and nuclear fuel	10.08	19.37	23.58	0.00	0.01	0.01
Total				1.27	2.46	3.62

Source: Carbon Pricing Assessment Tool; ADB IO table; IMF staff estimates using the employment data from UNIDO database. See IMF (2021a) for details on the methodology.

12. Bangladesh would be able to maintain its export competitiveness with a carbon fee under the assumption of low carbon intensive energy use.¹³

Looking at the estimated cost increases from a US\$25 per mt. ton carbon fee on the apparel and textiles industry e.g., across major exporters in the world in (text chart), Bangladesh has the lowest projected cost increase at less than 2 percent by 2030. Additionally, many sectors that Bangladesh would like to diversify to, such as leather and computer products will remain competitive. The relatively benign cost impacts of carbon pricing are primarily a result of Bangladesh's energy mix – its primary energy source, natural gas, is a less carbon intensive fuel than coal that is the primary energy source in



¹² In addition, we assume complete pass-through of cost increases, unitary price elasticity of demand and no substitutability between factors. Incomplete pass-through, less elastic demand, and substitutability between labor and energy would result in lower job losses. Coke, refined petroleum and nuclear are not impacted jobwise as they have large import content. However, they could be possible candidates for border carbon adjustment taxes.

¹³ This is consistent with evidence in the literature which find carbon pricing may not have significant impacts on competitiveness (Ellis and others 2019).

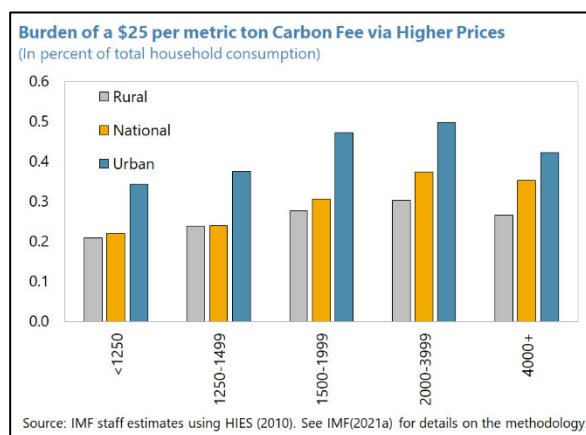
countries like India and Indonesia, and relatively low energy dependence of its industries. Increasing usage of coal above the baseline assumption of 23 percent share in energy production by 2035 could dilute this cost and competitive advantage, as carbon prices would need to be higher to reach the NDC targets.¹⁴

13. A carbon fee would be moderately progressive in Bangladesh. Based on the 2010 Household Income and Expenditure Survey (HIES), carbon fees would be disproportionately borne by the rich in Bangladesh as electricity and

gasoline consumption accounts for only 0.4 percent of the monthly consumption for the bottom 5 percent of households as opposed to 2.4 percent for the top 5 percent (text figure).¹⁵

Similarly, an average rural household would face less burden than an average urban household, primarily because majority of the rural households have limited commercial energy usage. The regressive indirect and adverse effects of a carbon fee on price of non-energy goods in the consumption bundle—driven largely by spending

on food – are offset by the progressive direct impact of fuel consumption.¹⁶ As more of the rural and low-income households gain access to electricity and other commercial energy sources, more targeted transfers would be required to compensate the most vulnerable households unless expansion of energy access to low-income households uses low-carbon technologies.¹⁷



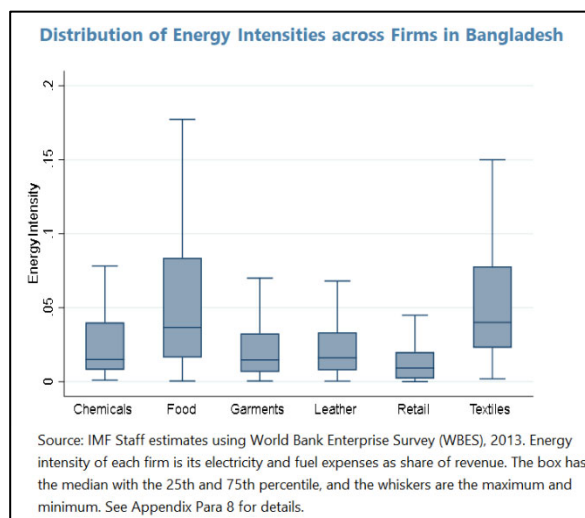
¹⁴ Under the BAU baseline scenario, coal used in power generation is projected to increase from around 3 percent in 2018 to 24 percent in 2025 and slightly decrease to around 23 percent in 2035, compensated by the projected increase in renewables from around 1 percent in 2018 to 4 percent in 2035. Natural gas is projected to decline from 85 percent in 2018 to 65 percent in 2025 and 63 percent in 2035. At the 26th session of the COP26, Prime Minister Sheikh Hasina announced the cancellation of 10 coal-fired power plants involving US\$12 billion foreign investment and setting a roadmap to have 40 percent of country's energy from renewal sources by 2040. Implementation of the nuclear power projects and renewable energy such as solar would reduce emissions under the BAU scenario, resulting in a lower carbon price to reach the NDC targets.

¹⁵ While low-income households spend more on fuel and lighting as a share of their monthly expenditures, their primary energy source is biomass (firewood, cow dung, jute stick and fuel from agricultural products) that is in informal, non-commercial scale and does not fall under the carbon pricing regime.

¹⁶ The impact is expected to be small because of the limited cost increase in non-energy goods and low carbon fuel usage by the poor. E.g., Using the 2010 HIES, fully compensating the lowest quartile of households for the burden of carbon tax would have been 880 million taka.

¹⁷ The government is already committed to driving up renewable energy and has a host of incentives such as tax breaks on offer to drive net-metered solar rooftop installation (SHS). Government is working towards universal electricity access by 2021 by expanding the program.

14. A carbon fee could also foster efficiency gains.¹⁸ Carbon pricing would not only incentivize the reallocation of resources from high-to low-carbon sectors, it could also help to safeguard and preserve less-energy intensive firms within each sector. Using the World Bank Enterprise Survey data from 2013, these allocative efficiency gains could be the largest for textiles and food manufacturing in Bangladesh as they have the highest dispersion in energy intensities. In addition, the less energy-intensive firms are also generally more productive in Bangladesh, reinforcing the limited risks on international competitiveness.¹⁹ A proactive approach, starting with a small and gradual increase in carbon prices, would provide a clear signal of policy directions for firms, helping them to plan ahead in terms of investments to decarbonize their production processes and improve energy efficiency, thereby reducing stranded assets, risks to competitiveness, and job losses in the future.



15. Carbon pricing could serve as an effective signaling tool and commitment mechanism for securing climate-financing and reaching its development goals.²⁰ An early adoption of carbon fee could make Bangladesh stand out among regional and worldwide peers and catalyze interest from donors and private investors interested in Economic, Social and Governance (ESG) lending commitments. A carbon user fee is incentive compatible, requiring a higher fee to reach the NDC target if the country chooses a less green pathway to meet its developmental needs. Introducing carbon pricing in line with the objectives of the Paris Agreement can serve as a concrete signal to ensure investment flows into Paris-compatible projects. “The simplicity of a price signal is preferable to an approach that requires a complex case-by-case evaluation of the climate impacts of every individual project” (OECD 2021). This is increasingly relevant now, given mounting pressure on providers of development financing and capital market investors to align their activities with the objectives of the Paris agreement and net-zero. As a useful commitment mechanism, carbon pricing could also catalyze private sector green investments from donors and capital market investors. Finally, for Bangladesh, early introduction of a carbon price could also help to prepare the grounds for concessions on border carbon adjustments (BCAs) and better tariff deals with trading partners like the EU among others, in the run up to LDC graduation.

¹⁸ Under the Energy Efficiency and Conservation Master Plan up to 2030, the government aims to lower energy intensity (national primary energy consumption per unit of GDP) in 2030 by 20 percent compared to the 2013 level, resulting in a total savings of 95 million toe (113 billion m³ of gas equivalent).

¹⁹ Many studies find a small positive impact of carbon pricing on productivity and innovation (Ellis and others 2019).

²⁰ See OECD (2021) for a detailed review on the compatibility of carbon pricing with sustainable development.

C. Conclusion

16. Bangladesh is highly vulnerable to climate change and is concurrently facing other economic challenges and early adoption of a small carbon fee as a climate commitment mechanism towards its NDC targets can help to generate interest and/or catalyze funds and/or technical assistance for adaptation and assist with a just transition. Given that Bangladesh is a relatively low intensity brown energy user in the region, introduction of an early carbon fee on the energy sector could be an equitable and viable option for Bangladesh to reach its NDC targets with considerable co-benefits. The impact on inflation and loss of competitiveness and jobs will be limited. Moreover, the net revenue gains from a carbon fee can be earmarked to go towards funding a just transition by compensating the most vulnerable while preserving competitiveness and limiting job losses and distributional impacts on workers and households. Carbon pricing alone will not be sufficient to finance the adaptation needs of Bangladesh. However, the carbon pricing strategy through the implementation of an energy related user fee can serve as a commitment device for meeting Bangladesh's NDC targets and help to signal to donors and investors Bangladesh's strong climate mitigation commitments to further catalyze funds. This strategy can also be considered as a complementary incentive to negotiate better trade deals and prospective border carbon adjustment concessions in lieu of green commitments.

17. Donor support and financial flows in the pursuit of net-zero investments as well as negotiating climate friendly trade deals are critical for meeting Bangladesh's climate and developmental aspirations. With the decarbonization incentives in place, external finance will be less costly as the climate part of the environmental impact assessment of an investment will be in place. Also, Paris-incompatible projects, such as coalfired power plants, will become less appealing as they will mandate higher rates of carbon fees in line with the NDC carbon goals. That said, a departure from the commitment to green energy supporting growth would imply higher carbon fees to reach the NDC emission targets. In addition, with an early commitment to carbon pricing, bilateral trading partners like the EU and others can facilitate better terms for prospective border carbon taxes abroad and/or negotiate favorable trade deals in the run up to LDC graduation.

18. Carbon pricing is not the be-all-end-all solution for catalyzing external finance. Complementary fiscal policies such as ETS, feebates, feed-in tariffs, accelerated depreciation, R&D and investment tax credits etc. can help accelerate the decarbonization process. Besides the fiscal measures, enhancing the investment climate, strengthening climate-related regulations, promoting diffusion of information and technologies, preservation of natural capital, appropriate labor force skilling and reforms to deepen the financial sector would help to foster an enabling environment for finance and investment needed for Bangladesh to achieve its climate goals in a just manner.

19. The authorities highlighted their commitment to meeting the climate challenge. They underscored that Bangladesh has been on the forefront of climate action, including operationalizing the Climate Fiscal Framework and establishing Climate Change Trust Fund. They highlighted their continued efforts, including via several central bank initiatives, to promote solar and other renewal energy sources to reduce emissions. BB also circulated the Sustainable Finance Policy for Banks and

Financial Institutions in December 2020 and incorporated lists of 68 Green Products/Projects/Initiatives. They added that ten coal-fired power plants projects have been cancelled. The authorities emphasized that Bangladesh has largely been a recipient of climate change and concessional climate financing is needed to meet their mitigation and adaptation challenges. The authorities are also strengthening the regulations for tapping ESG finance, including BB's issuance of Environmental and Social Risk Management Guidelines for mainstreaming ESG in overall credit rating methodology. While they broadly agree that a carbon charge or user fee could signal their commitment towards meeting their NDC targets, they reiterated that carbon pricing should be also adopted by other economies. The authorities expressed interest in exploring the potential of an Emissions Trading System (ETS) for Bangladesh in light of the political feasibility concerns with regards to carbon taxation. They noted the political economy constraints linked to plausible increase in production costs and energy prices, and that implementing a progressive carbon charge was impeded by several factors, such as the lack of competent energy auditors.

20. Donors commended the idea of a carbon charge or user fee as a good first step for meeting Bangladesh's NDC targets but more was needed to translate it into a catalyst for climate financing. While some donors said it could be a good first step towards bringing on a financing response, others noted that more effort is needed in creating and identifying climate friendly and viable investment projects. Continued efforts towards reforming the financial sector and improving corporate governance should remain the key priorities to attract investments.

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