



Bangladesh's NDC 3.0: **Pathways for Ambition, Action, and Finance**

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Background

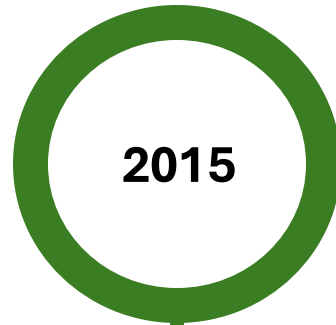
The Paris Agreement – Aims to limit global warming to 1.5°C, strengthen resilience, and align financial flows with these targets.

NDC (Nationally Determined Contributions)

- Include efforts by each country ***to reduce national emissions***
- Contains targets, policies, and measures for emission reduction and climate adaptation
- May include finance, technology, and capacity-building needs or support for climate action.
- Countries share the new or updated NDCs ***every 5 years***

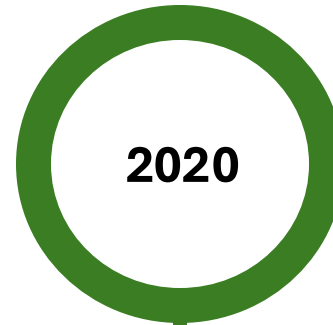
Subsequent NDCs should become increasingly ambitious, making global actions stronger toward achieving the objectives of the Paris Agreement.

NDCs and GHG Emission Targets of Bangladesh



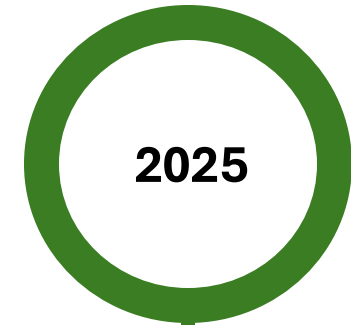
NDC 1.0

- **Unconditional** - 12 MtCO₂e (5%)
- **Conditional** - Additional 24 MtCO₂e (10%)



NDC 2.0

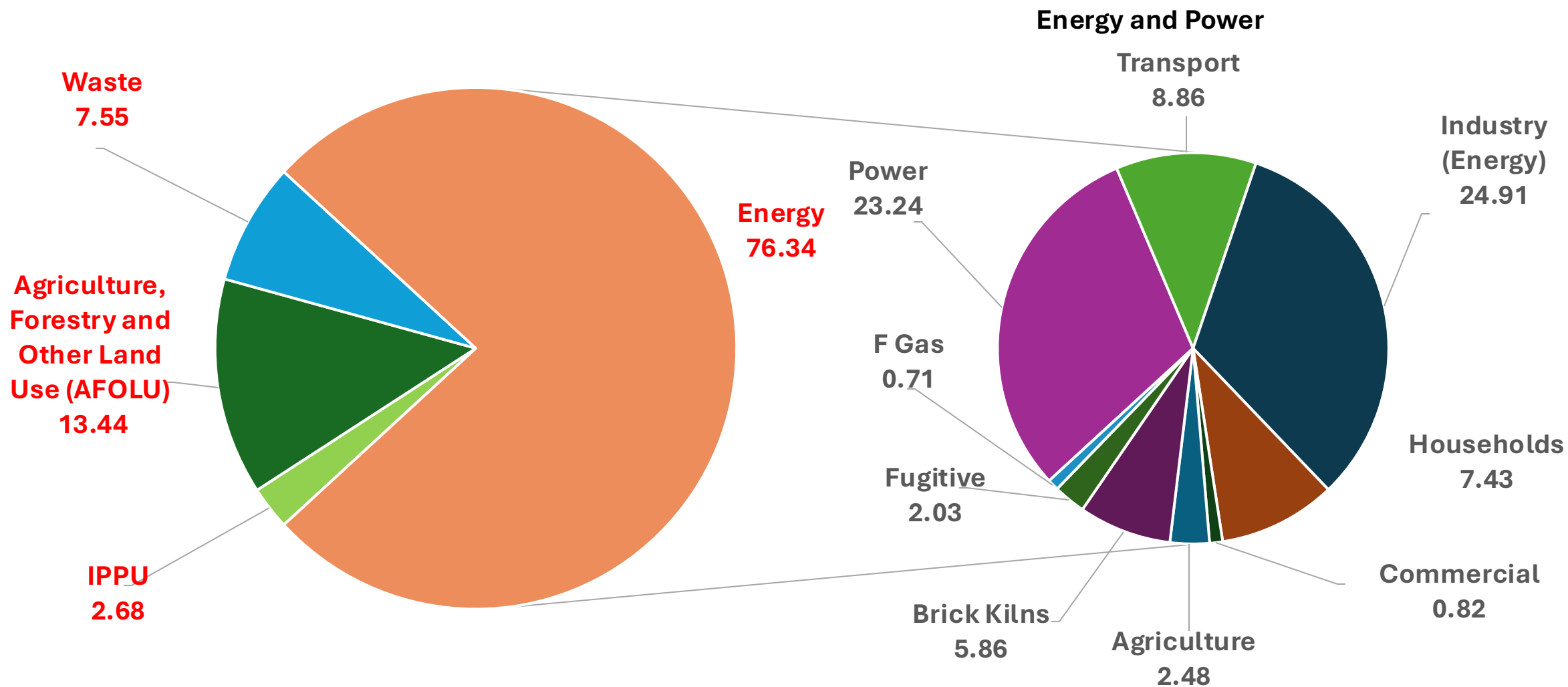
- **Unconditional** - 27.56 MtCO₂e (6.73%)
- **Conditional** - Additional 61.91 MtCO₂e (15.12%)



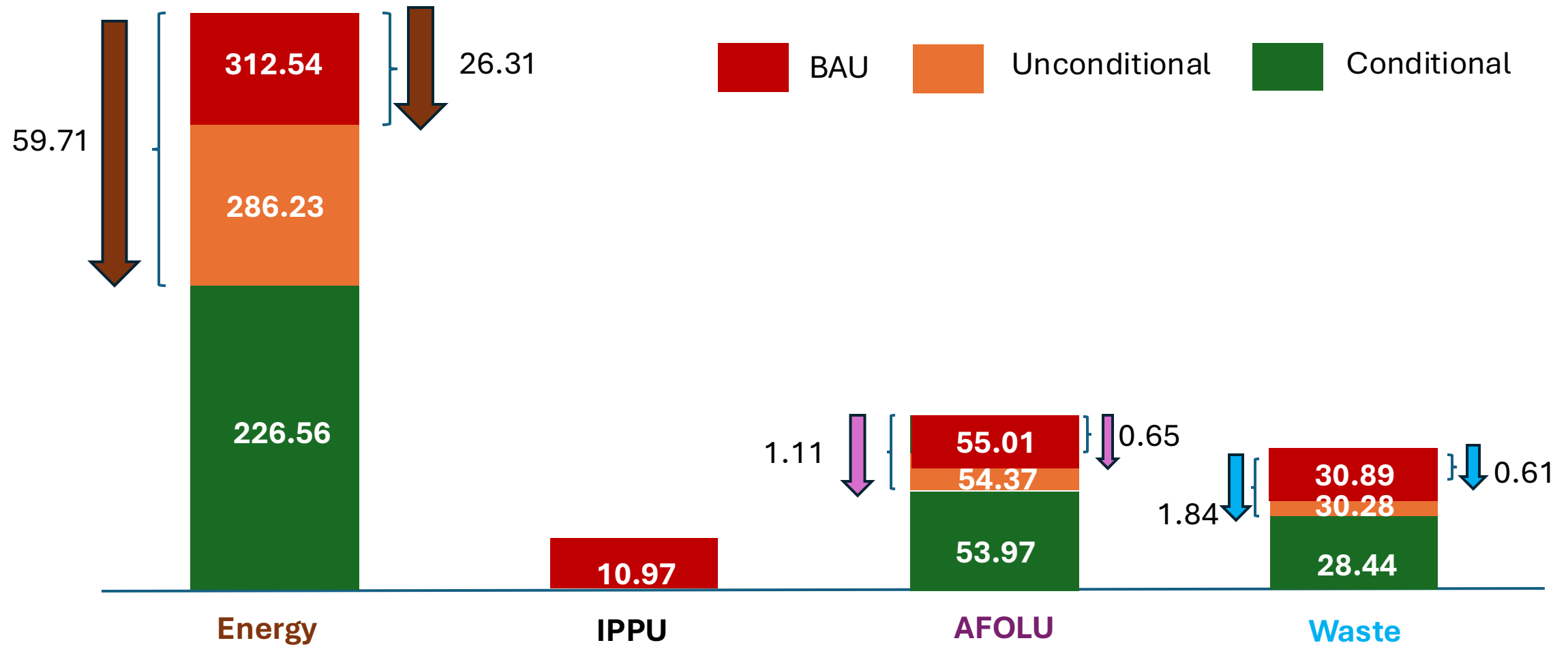
NDC 3.0

Will it be more ambitious compared to the previous two?

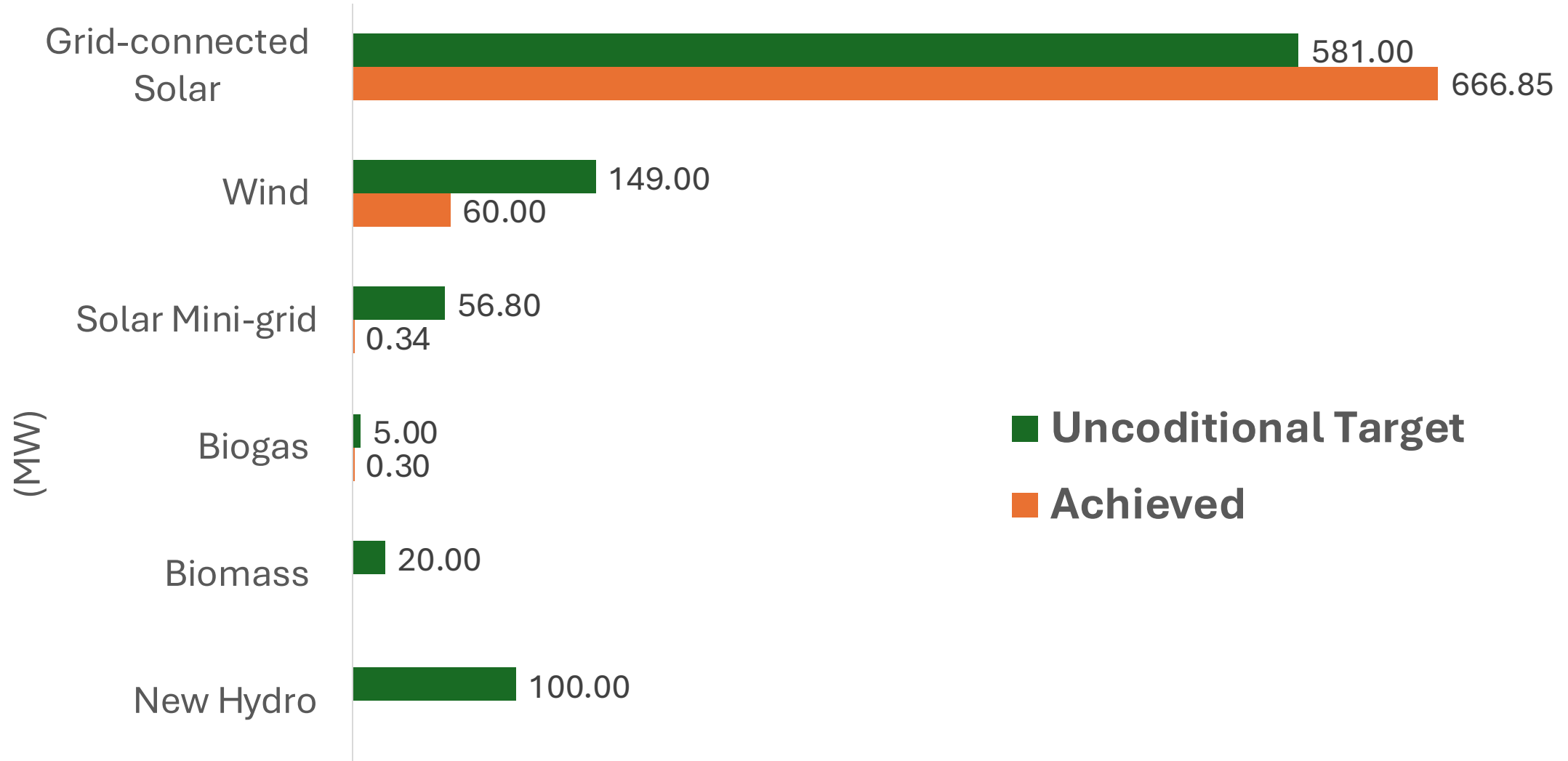
Snapshots of NDC 2.0 of Bangladesh : Sector Wise Emission Scenario (BAU 2030)



Snapshots of NDC 2.0: GHG Emission Reduction Target by 2030 (MtCO₂e)



Snapshots on 2.0: Energy Production from 2020 to 2025



Methods and Estimations

Policy and document review



- Updated NDC from 2021
- Bangladesh Delta Plan 2100
- Sectoral guidelines from BPDB, SREDA, BBS, and DoE

Expert consultation



- Semi-structured interviews
- Validate the feasibility of mitigation options
- Clarify barriers to adoption
- Provided sector-specific data on costs, implementation capacity, and expected uptake trajectories.

Quantitative modeling



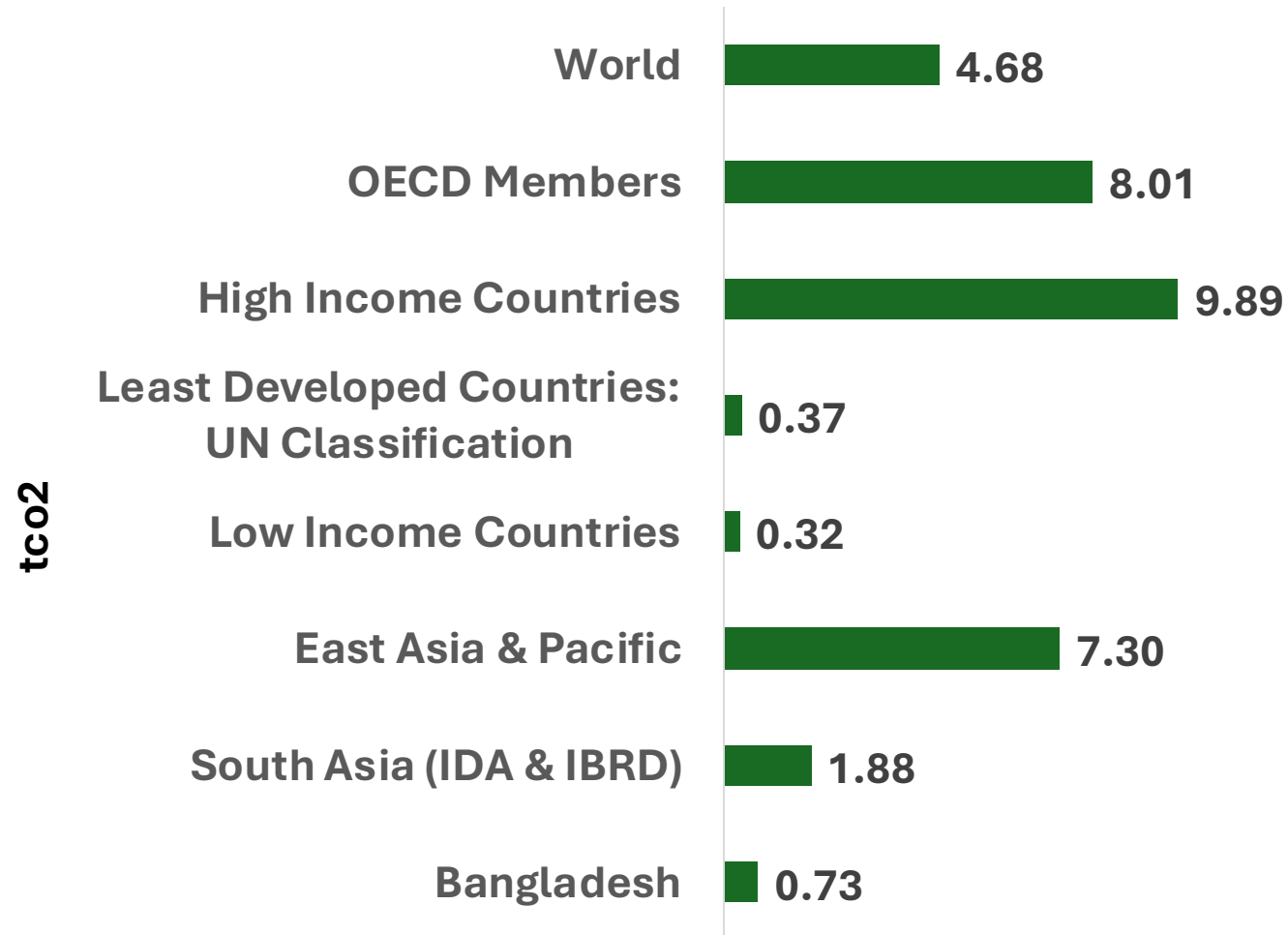
- Emission estimation following methods used by IPCC-AR6
- CAPEX, O&M costs, and investment cost analysis
- Carbon pricing from IPCC Annex-2

Data Sources



- Primary sources : BBS, BPDB, SREDA, BRTA, DoE, BFD.
- Secondary data: IPCC AR6, IEA, FAOSTAT, EDGAR and UNFCCC.

Per Capita GHG Emission (tco2): Where We Stand on 2023

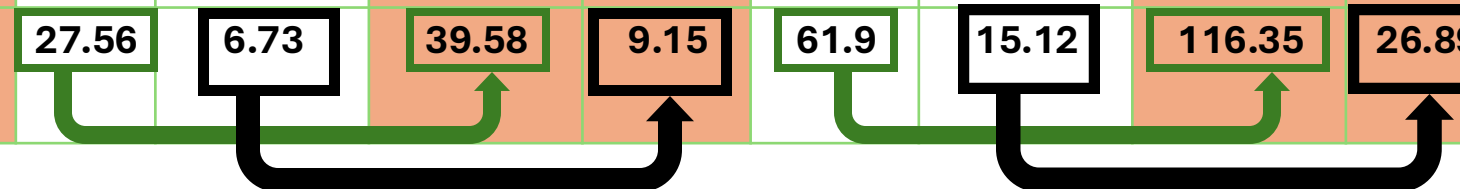


- INDC 2.0 target will be achieved smoothly if the current trend is being maintained
- Compare to high/upper middle income countries, OECD and EU Countries, Bangladesh emits much less but still highest emitters amongst LDCs and South Asian Countries
- Climate vulnerability of Bangladesh is increasing and also facing severe air pollution related economic losses – left rationales for curbing emission

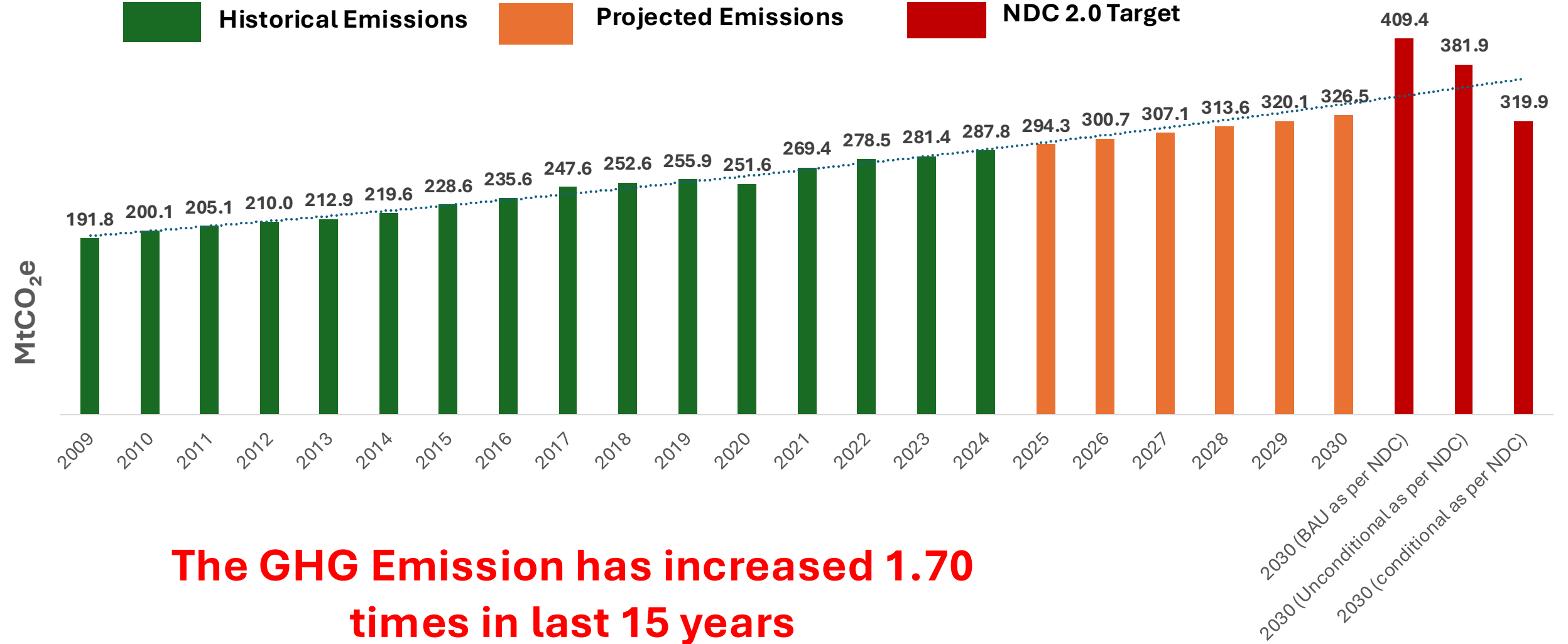
Predicted Scope and Challenges for Achieving NDC 3.0 of Bangladesh

Predicted Scope of GHG Emission-Different Scenario for NDC 3.0

Sectoral contribution	Business-as-Usual (BAU)				Unconditional				Conditional			
	NDC 2.0		NDC 3.0 (Estimated)		NDC 2.0		NDC 3.0 (Estimated)		NDC 2.0		NDC 3.0 (Estimated)	
	Mt CO2	%	Mt CO2	%	Mt CO2	%	Mt CO2	%	Mt CO2	%	Mt CO2	%
Energy (Power)	95.14	23.24	108.87	25.17	8.01	29.06	11.32	10.40	35.73	48.9	58.27	53.52
Transport	36.28	8.86	36.28	8.39	3.39	12.3	3.39	9.34	6.33	10.23	6.58	18.13
IPPU	10.97	2.68	20.37	4.71	-	-	-	-	-	-	3.908	19.18
AFOLU	55.01	13.44	55.01	12.72	0.64	2.32	0.757	1.38	0.4	0.65	0.752	1.368
Total	409.41	100	432.58	100	27.56	6.73	39.58	9.15	61.9	15.12	116.35	26.89



Past, Present, and Predicted GHG Emission for Bangladesh



Overall Mitigation Finance Required by 2030

Unconditional in NDC 3.0:

USD 46.38 billion (CI Study)

Unconditional in NDC 2.0:

USD 32.257 billion

Conditional in NDC 3.0: USD
270.126 billion (CI Study)

Conditional in NDC 2.0:

USD 143.710 billion

Sector Analysis for Proposed NDC 3.0 for Bangladesh

Energy: Capacity Versus Consumption



Emission forecasting should be based on **electricity consumption (GWh)**, not just installed renewable capacity (MW), since actual emissions depend on how much energy is generated and used.



MW capacity reflects potential, but without accounting for utilization rates and demand-side consumption, the forecast risks underestimating or overstating emissions.



Using GWh aligns projections with **real energy use patterns**, enabling more accurate links between renewable integration, fossil displacement, and emissions reduction.

Present Energy Sector's Targets and Potential

As per **NDC 2.0** By **2030**, Bangladesh's **power sector emissions** are projected at **95.14 MtCO₂e** in the **Business-as-Usual scenario**.

- **Unconditional-** 8.01 MtCO₂e (≈8.4%) reduction
- **Conditional-** further 35.73 MtCO₂e (≈37.6%) reduction

In NDC 3.0, Bangladesh could bring power sector emissions down to **51.4 MtCO₂e**, nearly **half of the BAU levels**, if both unconditional and conditional targets are fully implemented.

Ongoing Energy Sector Related Activities of NDC 2.0

Activities	Unconditional (Implementation of renewable energy projects (911.8 MW))	Conditional (Implementation of renewable energy projects (4,114.3 MW))
Grid-connected Solar	581 MW	2277 MW
Wind	149 MW	597 MW
Biomass	20 MW	50 MW
Biogas	5 MW	5 MW
New hydro	100 MW	1000 MW
Solar mini grid	56.8 MW	56.8 MW
Waste to electricity		128.5 MW
Coal power plant with ultra-supercritical technology		12,147 MW
Installation of new combined cycle gas-based power plant	3,208 MW	5,613 MW
Efficiency improvement of existing Gas Turbine power plant	570 MW	570 MW
Installation of prepaid meters	-	-

Energy

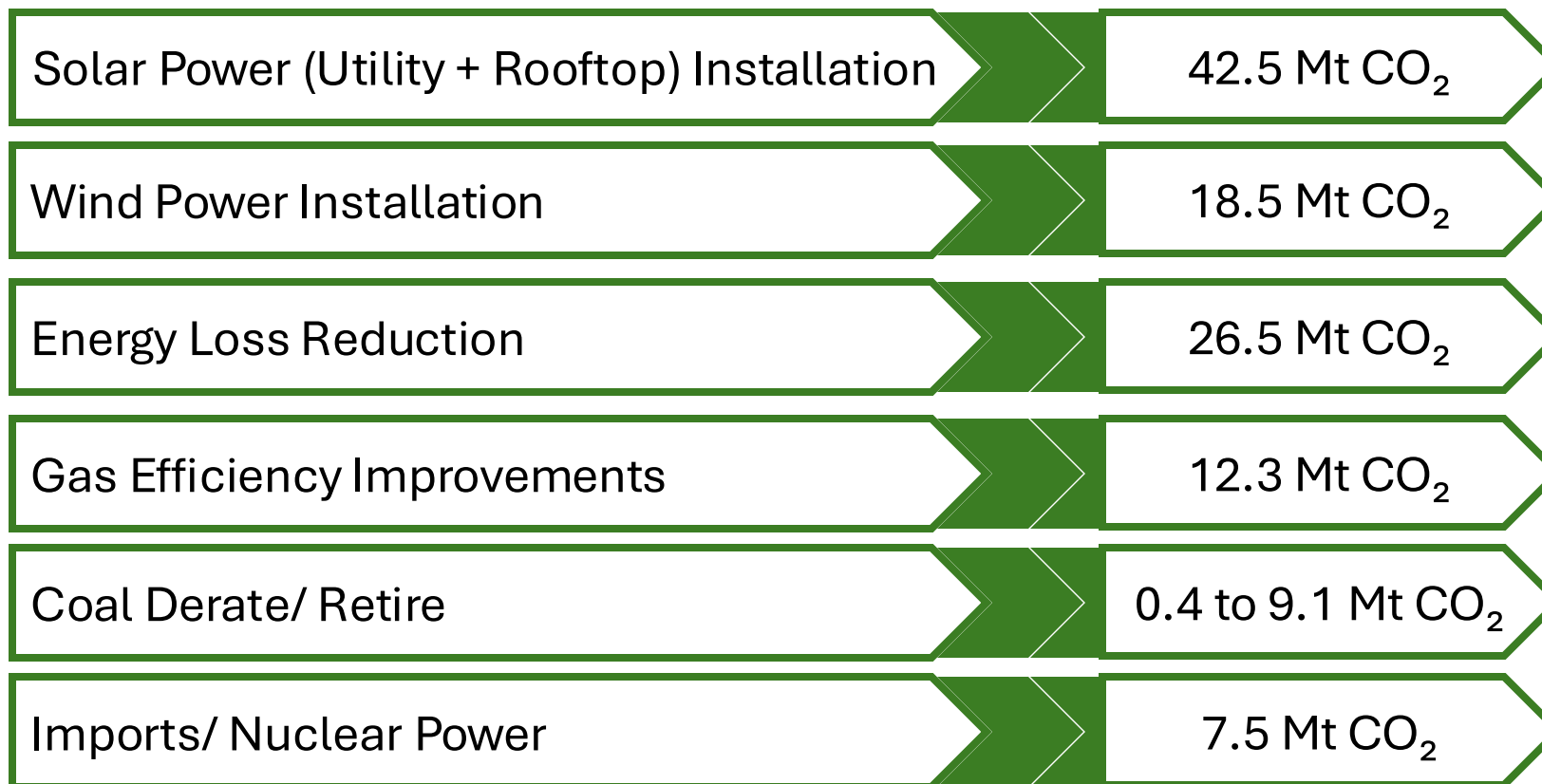
IPPU

AFOLU

Urban Systems

Transport

Proposed Energy and Power Sector Activity for NDC 3.0



Emission Scenario of Energy Sector in NDC 3.0

Scenario	Year	Total generation (TWh)	Power Sector Emission CO ₂ (Mt)	Grid EF (kg/MWh)	Reduction from BAU (Mt)	Low-carbon share (%)	RE gen (TWh)	Imports/ Nuclear (TWh)
BAU	2030	191.00	108.87	570.0	0.00	20.0	19.10	19.10
Unconditional	2030	185.21	97.55	526.7	11.32	26.1	29.22	19.10
Conditional (60% Resources)	2030	170.74	75.44	441.8	33.43	34.3	30.45	28.10
Conditional (100% Resource)	2030	157.23	50.60	321.8	58.27	45.9	38.01	34.10
Ideal (Net Zero)	2030	123.46	8.55	69.2	100.32	85.9	56.92	49.10

Energy

IPPU

AFOLU

Urban Systems

Transport

Key Patterns



The **grid EF** falls with stronger conditional uptake: **570 → 322 kg/MWh** at Conditional in 2030, and to **69 kg/MWh** at Ideal (Net Zero).



Reduction (2030) rises roughly monotonically with the different Scenario level: **5.4 Mt** (10%) → **58.3 Mt** (Conditional) → **100.3 Mt** (Ideal).



Low-carbon share (RE + imports/nuclear) rises from **20%** in BAU-2030 to 45.9% under Conditional to 85.9 under Ideal.



We have potential of installing **24,106 MW** Renewable Energy plants, if under conditional scenario funds are received

Proposed Energy Investment Requirements for NDC 3.0

Scenario	CAPEX (Annual) (Million USD)	Fixed O&M Costs (Million USD)	Program Costs (Million USD)	Fuel Savings (Million USD)	Variable O&M Savings (Million USD)	Total Savings (Million USD)	Gross Costs (Million USD)	Net Costs (Million USD)	Reduction from BAU (Mt CO ₂)	Cost per tCO ₂ (USD)
Unconditional	2,380.8	63.9	1,888.0	104.3	4.8	109.1	6,043.3	5,059.0	11.3	448.7
Conditional (60% Resources)	8,742.3	126.8	3,016.0	184.5	7.8	192.3	7,477.9	7,021.5	33.4	210.4
Conditional (100% Resources)	12,010.7	178.4	4,163.7	210.3	9.3	219.6	9,180.1	8,540.5	58.3	146.1
Ideal	20,101.7	319.2	6,687.6	285.5	12.7	298.3	12,036.1	11,832.5	100.3	117.0

Energy	IPPU	AFOLU	Urban Systems	Transport
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Energy and Power: Key Findings from NDC 3.0 Proposal



Under **Conditional Scenerio** by 2030, Bangladesh would need **USD 12.1 billion** for CAPEX, **USD 0.18 billion** for O&M, and **USD 4.1 billion** for program costs, totalling **9.1 billion**



However, with significant savings from **fuel** and **VOM**, the net financial requirement is **USD 8.54 billion**, reflecting the balance between investment and savings.



The **cost per ton of CO₂ emission reduction** under this scenario is approximately **117 USD/tCO₂**, which provides an efficient pathway to meeting climate goals.

Proposed Activity for NDC 3.0 (Conditional)

- **Iron and Steel Industry:** Transitioning from blast furnaces to electric arc furnaces (EAFs) powered by renewable electricity.
- **Fertilizer Industry:** Implementing energy-saving technologies and practices in fertilizer production.
- **Cement Industry :** Replacing clinker with supplementary cementitious materials (SCMs) like fly ash, slag, or natural pozzolans.

Proposed Emission Reduction for NDC 3.0 (Conditional)

Industry	Current Emission (in MtCO ₂)	CO ₂ Emission Reduction Potential (in %)	Total Emission Reduction (in MtCO ₂)
Iron and Steel Industry	9.9	60	1.782
Fertilizer Industry	3.97	12	0.4764
Cement Industry	7.00	12	0.84

Required Investment for NDC 3.0 (Conditional)

Sector	Emission Reduction (MtCO ₂)	Investment Required (USD million)	Cost per tCO ₂ e (USD/tCO ₂ e)
Iron & Steel (30% EAF)	1.782	450–720	252–404
Fertilizer	0.4764	35.7	75
Cement (Clinker Subst.)	0.84	14.7	17.5
Total	3.098	500–770	161–249 (Weighted average)

NDC 2.0 Target and Activities

Thematic Area		Key Actions / Targets		
Sustainable rice cultivation		• AWD on 100,000 hactor • Improved rice varieties on 2.13 million ha • Better fertilizer management on 627,000 ha • Deep urea placement on 150,000 ha		
Livestock productivity & feed improvement		• Replace 1.88 million large ruminants • Replace 1.78 million small ruminants • Improved feed for 1.01 million large ruminants • Improved feed for 1.36 million small ruminants		
Better manure management		• Install 107,000 mini biogas plants • Scale up awareness and training programs		
Forestry expansion & restoration		• Afforest/reforest 150,000 ha • Restore 337,800 ha degraded/deforested forests • Co-manage 72,000 ha protected areas • Raise tree cover from 22.37% → 24%		
Community engagement & livelihoods		• Support 55,000 forest-dependent families with alternative income • Plantations along roadsides, embankments, and private lands		
Energy	IPPU	AFOLU	Urban Systems	Transport

Proposed Additional Activity for NDC 3.0

Activities	Area/ Units	Emission Reduction Factor	Unconditiona l (Mt-co2-eq)	Conditional (Mt-co2-eq)	Total Emission Reduction (Mt- co2-eq)	Investment cost assumption (Cost per tCO ₂ -eq (USD))	Cost Unconditional (in millions USD)	Cost Conditional (in millions USD)
Cover Cropping	100,000 ha	1.0 tCO ₂ /ha/year	0.025	0.075	0.1	20–30	0.625	1.875
Livestock Feed Additives	0.50 million animals	0.2 tCH ₄ /animal/year	0.025	0.075	0.1	50–80	1.625	4.875
Agroforestry	50,000 ha	5 tCO ₂ /ha/year	0.063	0.188	0.25	10–25	1.094	3.281
Mangrove Restoration	20,000 ha	1 tCO ₂ /ha/year	0.005	0.015	0.02	30–60	0.225	0.675
Total Additional (MtCO2)			0.118	0.353	0.47		3.569	10.706

Energy

IPPU

AFOLU

Urban Systems

Transport

Total Investment Required in AFOLU for NDC 3.0

AFOLU	Unconditional (USD million)	Conditional (USD million)
NDC 2.0	769.54	2488.68
NDC 3.0	773.109	2499.386

Energy

IPPU

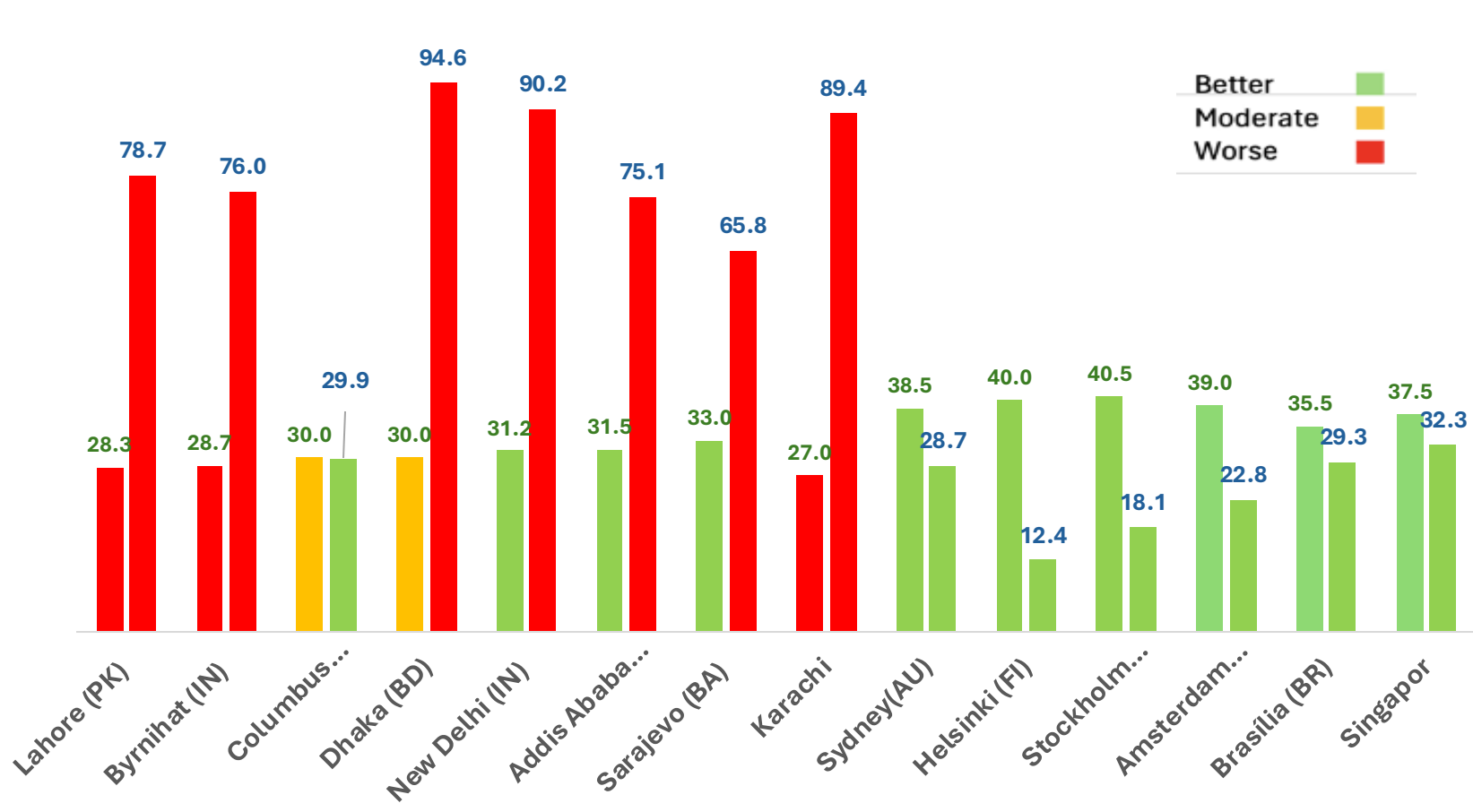
AFOLU

Urban Systems

Transport

The Need for Urban System-Based GHG Emission Reduction

UNRI Score VS Pollution Index



The Natural Rights framework advocates for Natural Rights Led Governance, focusing on:

- 1.Life and Dignity:** The right to exist free from harm, violated by pollution.
- 2.Liberty and Freedom:** The right to live freely, hindered by environmental damage.
- 3.Social Harmony and Justice:** Pollution deepens inequities, especially for vulnerable groups.
- 4.Protecting Indigenous Knowledge:** Urban planning neglects indigenous wisdom, harming biodiversity and culture.

Energy

IPPU

AFOLU

Urban Systems

Transport

Scope of Urban Systems-based GHG Emissions

Socio-Behavioural Change

- **Energy-efficient appliances** can reduce household energy consumption by **10-30%**.
- **Cycling, walking**, and using **public transportation** can lead to a **15-25% reduction** in transport emissions.
- **Food waste reduction** and **recycling** by urban residents can contribute to a **10-15% reduction** in emissions from the waste sector.

Green and Blue Infrastructure (Nature-Based Solutions)

- In Dhaka, running 1.82 million tons of **air conditioners at 26°C instead of 22°C** could **cut electricity demand from 12,847 MW to 8,545 MW, saving about 4,302 MW**.
- Urban green spaces help reduce urban heat island effects, lowering energy consumption for cooling systems.
- The cooling impact of greenery can reduce the need for air conditioning by **5-15%**.

NDC 2.0 Target and Activities



Improve fuel efficiency: Road traffic congestion reduction targets 5% (unconditional) and 15% (conditional) improvement in fuel efficiency.



Shift to low-emission transport: Encourage electric/hybrid vehicles, construct NMT & bicycle lanes, and develop charging station networks and electric buses in major cities.



Railway modernization: Achieve 10% passenger-km shift to rail (unconditional) and 25% shift (conditional) with MRT, BRT, Padma Bridge, multi-modal hubs, electrification, and modern rolling stock.



Urban transport planning: Implement Urban Transport Master Plans (UTMP) and Intelligent Transport Systems (ITS) for all major cities to improve reliability, safety, and service.



Inland water transport upgrade: Enhance IWT navigation, vessel maintenance, and introduce electric water vessels to cut emissions and improve efficiency.

Proposed Activity for NDC 3.0

- **Mitigation Activity:** Introduce Electric Vehicle (EV) with proper capacity e.g. frequent charging facilities and incentives
- **Estimated Emission Reduction:** 25,000 tonnes CO₂ per year for 10,000 vehicles replaced

Investment Required

- **Number of EVs:** 10,000 vehicles
- **Average cost per EV (mid-range):** USD 25,000
- **Total Investment Required:** 10,000 × 25,000 = **USD 250 million**

Challenges

- Resistance by Fossil Fuel promoters
- Higher duties driven high costs
- Myopic focus on profit over public health degradation
- Infrastructure constraints
- O&M supports
- Resale value apprehensions

Overall Priority Actions for NDC 3.0

Transport	Electric bus fleets, charging corridors, scrappage of diesel buses, protected bike lanes.
Waste	Source separation, compost/AD, landfill methane capture, plastics-to-energy, landfill-PV.
AFOLU	Agroforestry, AWD irrigation, homestead forestry; integrate farmer incentives.
Blue Carbon	Mangroves & seaweed, have the highest carbon credit values.
IPPU	Add clinker substitution, HFC phase-out, energy management in cement/fertilizer.

Challenges for Implementing NDC 3.0

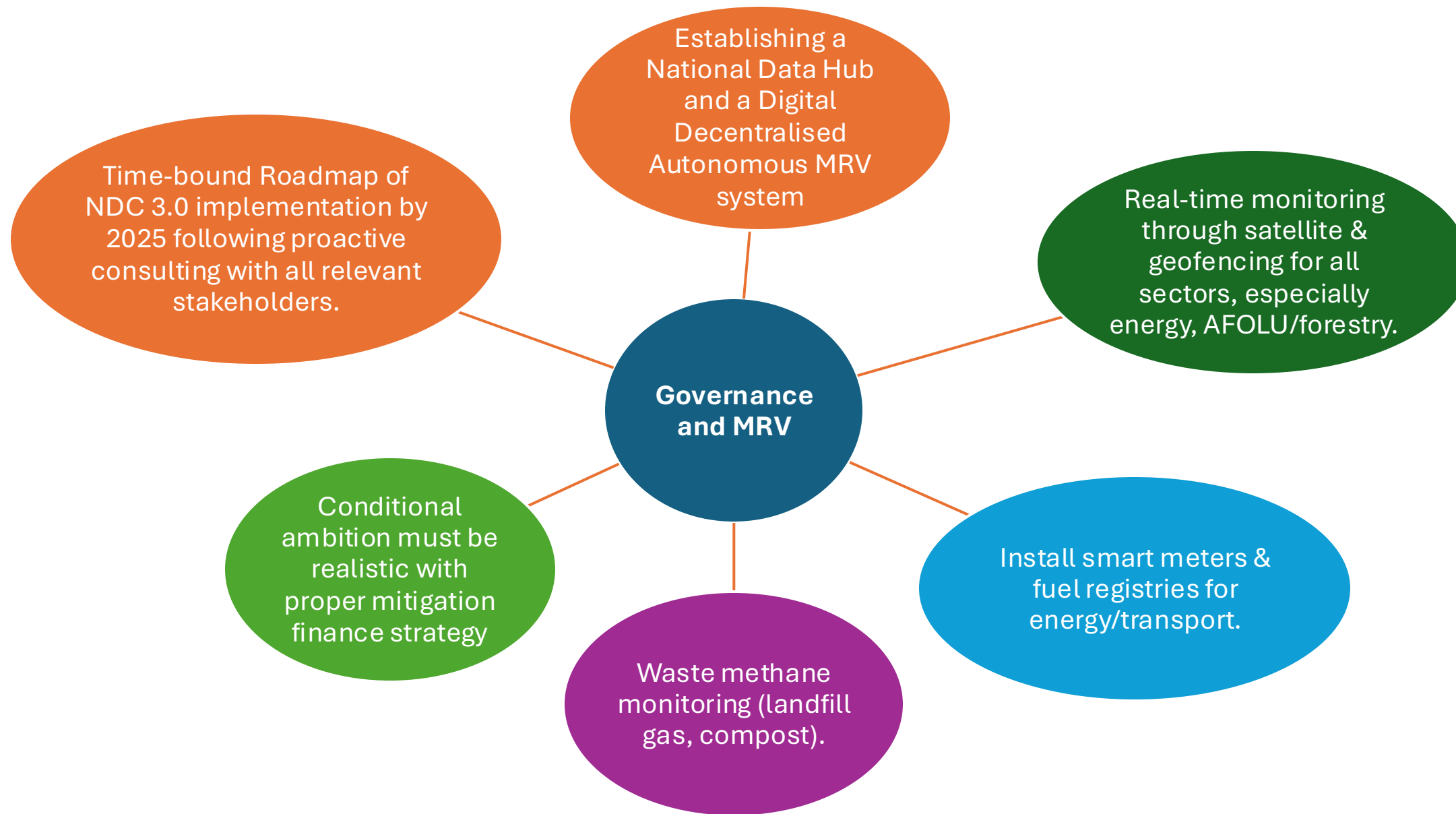
Governance and Finance

- Climate policy shifts with government changes and leaders are not always fully committed
- Weak coordination among actors e.g. MoEFCC, MoPEMR, MoLGRD, etc.
- NDC financing skewed to adaptation while mitigation is underfunded
- Participation of and incentives for marginal groups, women, and local actors not engaged are missing

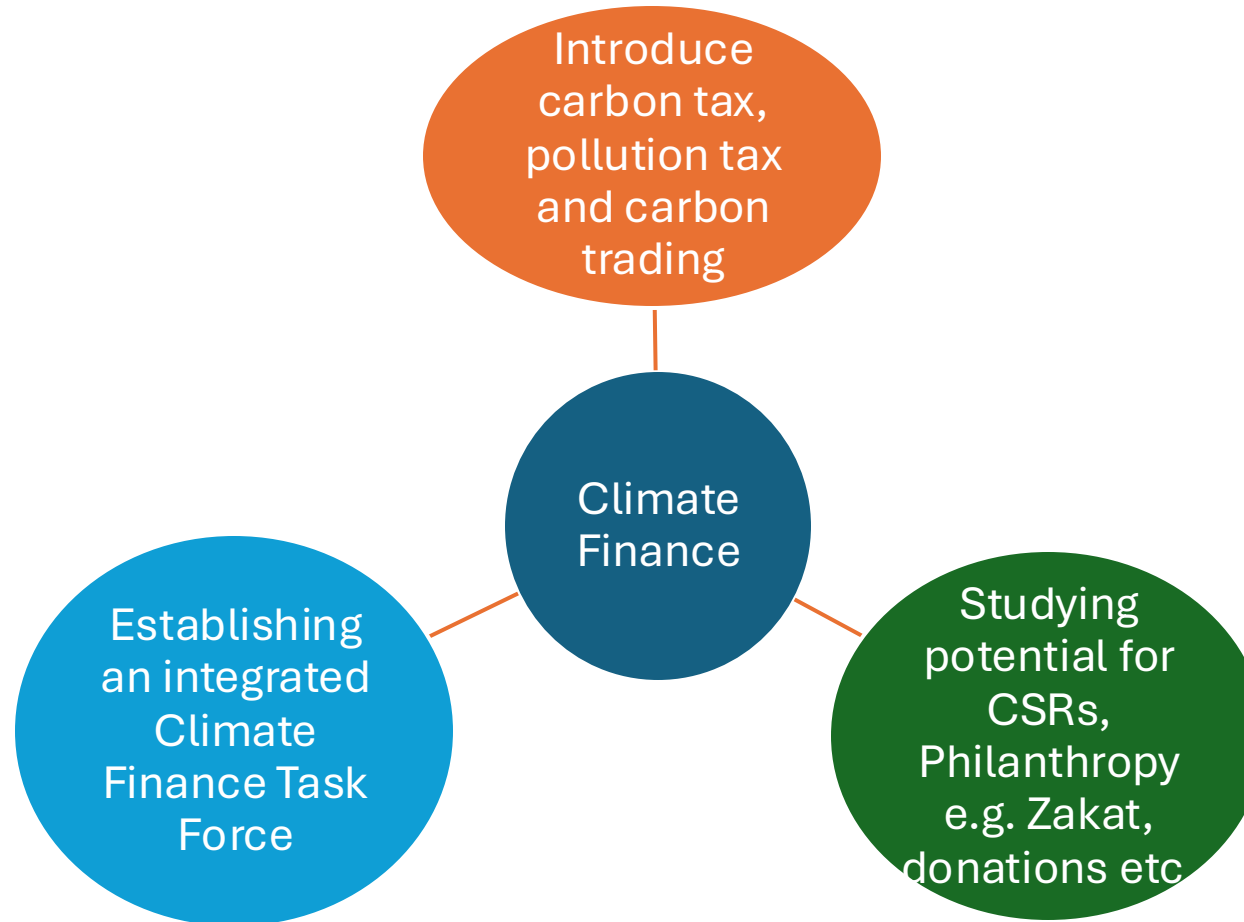
Data and MRV

- Carbon stock studies $\neq$ creditable CO₂e
- No centralized emissions/air database
- Fragmented monitoring and inadequate capacity of DoE
- Current unconditional progress claims ($\approx 9\%$) need verification

Recommendations for Implementing NDC 3.0

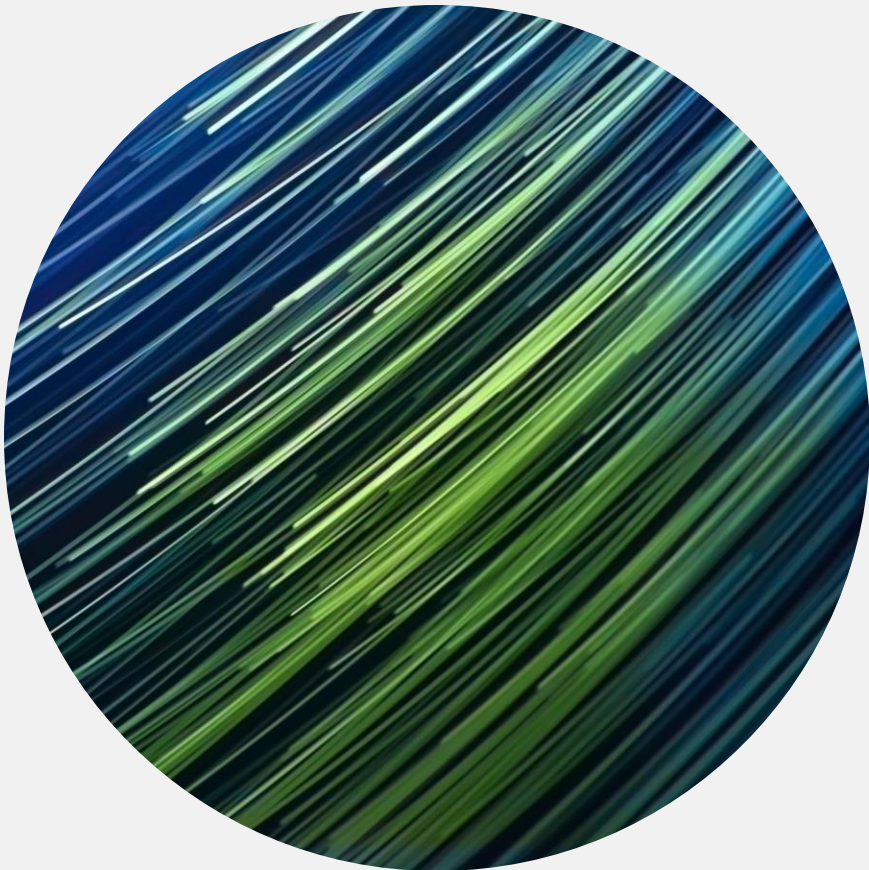
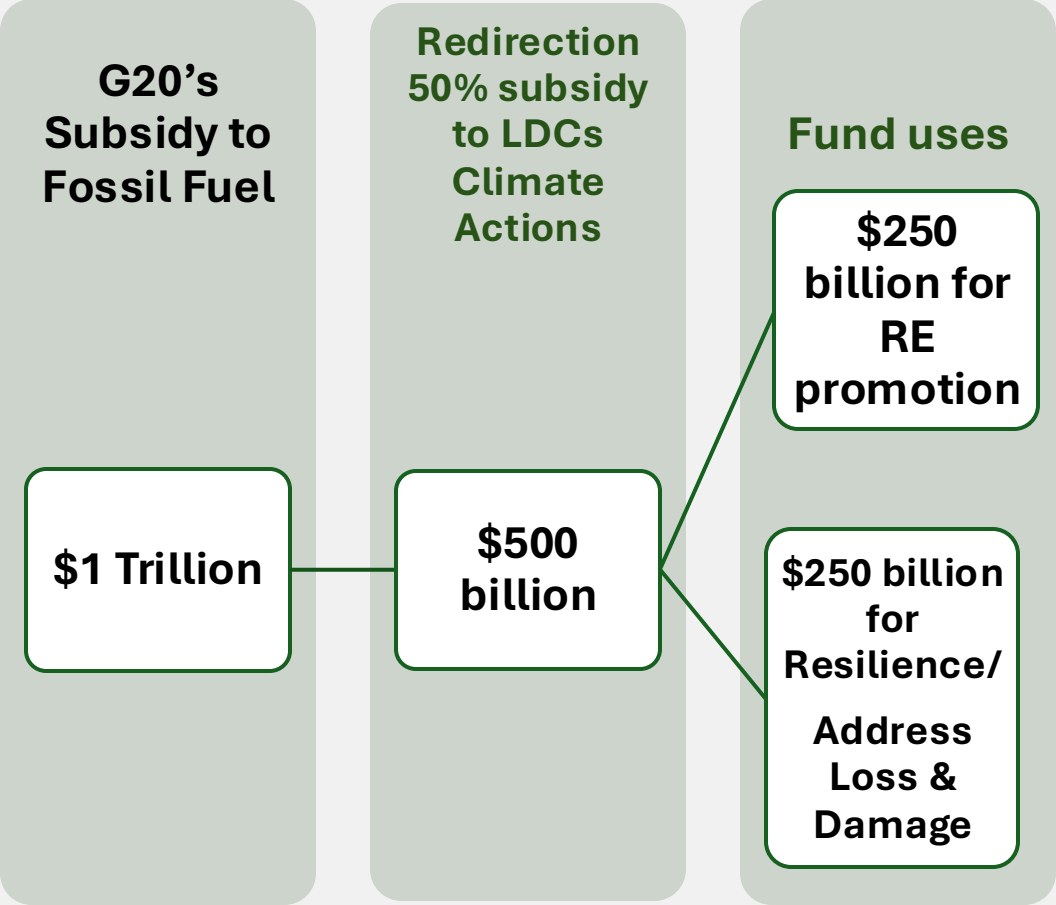


Recommendations for Implementing NDC 3.0



Without foreign financing, the conditional target cannot be achieved

Global Renewable Energy Funding (GREF) Mechanism



Source: Proposed by Change Initiative in [2nd Dhaka Renewable Energy and Finance Talk 2024](#)

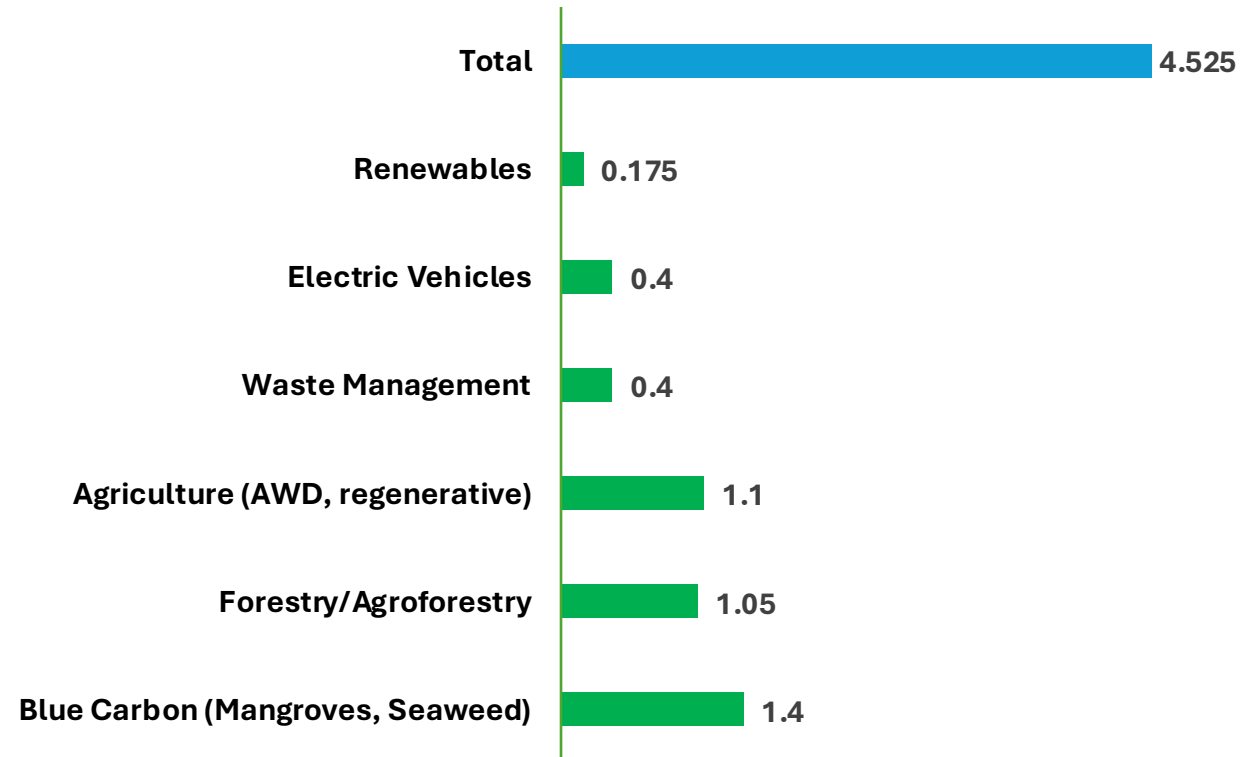
Carbon Tax and Carbon Market Regime: Preparedness and Challenges for Bangladesh

Carbon Market Opportunities for Bangladesh

Policy and Actions

- **Compliance market (Article 6):** Bilateral deals on mitigation project with Japan/Korea in progress, MoU was signed, but now seemingly stalled.
- **Voluntary market:** Runs on international standards (Verra, Gold, etc.); no domestic law needed.
- **Transactions:** IDCOL signed ERPA with World Bank; operations expected soon.

Revenue Potential of Carbon Credit (USD bn)



Earlier and Existing Actors

- **Early movers:** IDCOL, Grameen Shakti, Bondhu Foundation (solar, cookstoves).
- **New entrants:** Private firms (e.g., RecycleJar) in AFOLU & Waste.
- **Cookstove projects:** Health gains, but weak CO₂e reduction → declining market value.

Risks to be Considered

- Mis-management & non-transparency of credits
- Questionable additionality/inflated baselines
- Double counting / double issuance / misuse of credits
- Fraud, fake offsets, and registry risks
- Elite capture & land tenure issues – capture of lands of poor and indigenous communities
- Weak enforcement, oversight & institutional capacity
- Greenwashing / misleading claims

Carbon Tax and RE Finance

Bangladesh has not yet implemented a carbon tax, but it is being considered as a potential tool to reduce emissions and generate additional revenue. A model for carbon taxation has been proposed with specific calculations.

Fossil Fuel	Import Quantity (million ton)	Current Market Value (cr BDT)	Possible Revenue Generation from Carbon Tax (cr BDT)	
			At 5%	At 10%
Coal	4	1200	60	120
Oil	5	30000	1500	3000
LPG/Gas	2	10000	500	1000
Possible Revenue Generation			2060	4120
20% of the revenue generated will be refunded to lower-income populations. Net Revenue:			1648	3296

Thank you so much.

Q & A

Methodology

Emission estimation

CAPEX, O&M costs, Investment cost analysis

Carbon pricing

Avoided emission calculation

$$ER_{m,t} = (AD_{m,t}^{base} \times EF_{m,t}^{base}) - (AD_{m,t}^{mit} \times AD_{m,t}^{mit})$$

Annualized CAPEX calculation

$$\frac{Capex \times WACC}{\{1 - (1 + WACC)\}^{-N}}$$

O&M cost calculation

$$Capacity (MW) \times Fixed O\&M cost \left(\frac{USD}{MW} \right)$$

Unit abatement cost calculation

$$UAC_m = \frac{C_m^{total}}{ER_m^{total}}$$

Carbon credit potential calculation

$$R_{total} = \sum_{i=1}^n (P_i \times Q_i)$$