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Washington D.C. (Virtual)
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**Accelerating Coal Transition (ACT) Investment Program
Independent Expert Group Report**



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Accelerating Coal Transition Investment Program

Report of the Independent Expert Group

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This document is a review report that evaluates and ranks countries' Expressions of Interest (EOIs) against the assessment criteria established by the Climate Investment Fund (CIF) as part of its country selection process. Four regions comprising fourteen countries' EOIs and related documents were reviewed, assessed and ranked, along with recommendations for presentation to the CTF Trust Fund Committee. The countries were: South and East Asia (SAP): Bangladesh, India, Indonesia and Philippines; Africa (AFR): (Botswana, Morocco, Namibia and South Africa); Latin America & the Caribbean (LAC): Colombia and Dominican Republic; Europe and Central Asia (ECA): Bosnia & Herzegovina (BiH), Kazakhstan, North Macedonia (RNM) and Ukraine.

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Acronyms

AILAC	Independent Alliance of Latin America and the Caribbean	LAC	Latin America and the Caribbean
ACT	Accelerating Coal Transition	LTS	long term strategy
ADB	Asian Development Bank	MASEN	Moroccan Agency for Sustainable Energy
AfDB	African Development Bank	MDB	Multilateral Development Bank
AFR	Africa	MEMR	Ministry of Energy and Mineral Resources (Indonesia)
BAU	Business as Usual	MW	Megawatt
BiH	Bosnia and Herzegovina	Mt	Millions of tons
BPP	Barapukuria Power Plant	NCRE	Non-Conventional Renewable Energy sources (Biomass, biogas and waste, hydropower below 20 MW, and geothermal)
CAT	Climate Action Tracker	NDC	Nationally Determined Contribution
CCSU	Carbon Capture, Storage and Utilization	NG	Natural gas
CEF	Clean Energy Fund	NGO	Non-governmental Organization
CFPP	Coal-Fired Power Plants	NREP	National Renewable Energy Program
CHP	Combined Heat and Power	OECD	Organization for Economic Co-operation and Development
CIF	Climate Investment Funds	ONEE	National Office of Electricity and Drinking Water
CO2	Carbon-dioxide	O&G	Oil and Gas
COP	Conference of the Parties	PLN	Perusahaan Listrik Negara (State Electricity Utility Indonesia)
CONPES	Council for Social and Economic Policy (Colombia)	PPA	Power Purchase Agreements
CRF	Carbon Retirement Fund	PPP	Public Private Partnership
CSP	Concentrated Solar Power	PSW	Private Sector Window
DAC	Development Assistance Committee	PV	Photovoltaic
DECC	Plan de Desarrollo Económico Compatible con el Cambio Climático	RE	Renewable energy
EBRD	European Bank for Reconstruction and Development	REIPPPP	Renewable Energy Independent Power Producers Procurement Program
ECA	Europe and Central Asia	RELAC	Renewable Energy for Latin America and the Caribbean Initiative
EPM	Electricity Planning Model	RNM	Republic of North Macedonia
EOI	Expression of Interest	SAP	South and East Asia
ETM	Energy Transition Mechanism	SDG	Sustainable Development Goals
EV	Electric Vehicle	TPP	Thermal power plant.
FIT	Feed-in Tariff	TWh	Terawatt-hour
FIP	Fed-in-Premium	TARP	Troubled Asset Relief Program
GCF	Green Climate Fund	USD	US Dollar
GDP	Gross Domestic Product	WB	The World Bank
GET	Green Economy Transition.	WBG	The World Bank Group
GHG	Green House Gas	WDI	World Development Indicators
GW	Gigawatt		
HFO	Heavy Fuel Oil		
IBRD	International Bank for Reconstruction and Development		
IDB	Inter-American Development Bank		
IFC	International Finance Corporation		
IPP	Independent Power Producer		
IRP	Integrated Resource Plan		
JT	Just Transition		

Executive Summary

Background

Coal-fired power generation is one of the primary sources contributing to increasing the global temperature beyond 1.5°C by 2030. Reducing coal dependency contributes to achieving the global energy-related CO₂ emissions targets set out at the COP21.

The ACT Investment Program is the Climate Investments Funds' (CIF) response to the challenge, offering support to countries transitioning from coal to sustainable and clean energy. The Program works across three pillars (i) governance, to achieve support and commitment at the country level for transitioning out of coal assets; (ii) people and communities, to address Just Transition challenges, and (iii) infrastructure, reclaiming and repurposing the existing infrastructure and land associated with power plants.

The Program will build local support to reconsider the development of new coal plants and accelerate the retirement of existing coal assets. The harmonized engagement of public sector utilities, private sector operators, stakeholders, and MDBs is central to advancing the Just Transition path.

The IEG and the Evaluation Process

Countries were invited to submit an expression of interests (EOI) to participate in the ACT's Investment Program. The EOIs were evaluated by an Independent Expert Group (IEG) set up for this purpose and includes six experts from relevant areas of knowledge and experience. The evaluation results will be consolidated in a report to provide inputs for an informed decision by the CIF on country selection for the ACT-Program.

The EOIs were evaluated and ranked according to the criteria established by the CIF. Fourteen countries pre-qualified to the EOI submission. Additional information required was complemented by available sources and further research conducted by the IEG.

The evaluation of countries relied on assessment criteria provided by the CIF comprising five key drivers: (i) Vision and ambition; (ii) Alignment, complementary, demonstration/transformational potential; (iii) Implementation and relevance; (iv) Leadership; and (v) Social inclusion, stakeholder engagement, gender equality, and just transition. Each driver has an assigned weight as per Table 2 of this report.

The evaluation approach adopted by the ACT IEG involved two steps: (i) the IEG defined and agreed on the methodology and evaluation framework; and (ii) proceeded with the evaluation of all countries; two members of IEG took the lead in each region. Extensive consultations were carried out among all members to ensure that the evaluation was consistent across countries.

The IEG's scoring framework incorporated a two-step approach: (i) establish a simple scoring to represent each assessment criteria defined by the CIF (Table 3) and complemented by metrics and scoring definitions described in Table 4 and Annex I. These metrics are supported by descriptors to guide, qualify, and score the assessment. The five assessment criteria included additional reference sources¹.

¹ The World Bank Group databases (World Development Indicators), international organizations (IRENA, IEA, UNFCCC, UN SDG, etc.), and other sources of information (EIA, WRI, Climate Watch, etc.).

EOIs Ranking Results

Table 1 presents the results of the evaluation. The ranking reflects the information provided from EOIs and additional information, analysis, consultations with MDBs and deliberations within the IEG. The ranking is neither a definite opinion nor a final standing of countries. It is aimed to support an informed decision-making process by the CIF and not the decision itself. Additional consideration should be incorporated to reflect the political economy context and other initiatives. The EOIs total score ranking is summarized in the following table and further details are provided in Sections 3 and 4.

Table 1 - Final Expression of Interest Rankings

Expression of Interest	South Africa	India	North Macedonia	Morocco	Philippines	Indonesia	Bosnia and Herzegovina	Namibia	Dominican Republic	Botswana	Colombia	Bangladesh	Ukraine	Kazakhstan
TOTAL SCORE	88	85	83	83	83	82	80	78	76	75	74	71	71	69

Source: IEG elaboration.

The IEG believes that the resulting ranking and hence prioritization shown is reasonable. The general prioritization reflects the needs of the countries, their vision and ambition, transformational potential, and readiness to start implementation, as reflected in the EOI and the available information. Further information from each country or future developments could shift its order (relative to the others). EOIs that are ranked low can improve their ranking substantially once they introduce specific coal phase-out plans, associated policies, well-defined projects, etc.

The context and current situation are dynamic as illustrated below:

- **Clarity of vision, ambition, and targets.** The scope, size, and speed of transition vary across countries. Depending on the energy picture, pragmatic options are available for coal phase-out, the context where the transition will take place, and resources available. MDB support has been fundamental to articulating the coal phase-out's complexities, which affects policies and decisions for years to come.
- **Alignment of plans and transformative potential.** The scope and size of coal dependency impact the alignment of public commitments, policies, plans, and regulations crafted to enable the transition. The extent of coal replacement and what replaces coal are essential. The replication of specific actions or strategies and the Just Transition complexities indicate that "one size does not fit all". It is also expected that CIF's available funds may not suffice to support a country's transition program.
- **Implementation and relevance.** The enactment of policies and regulations is ongoing for all countries with varying speeds, scope, and details of legislation. MDBs have indicated potential funding options to help set the transition pace, and innovative instruments are emerging (e.g., Engie in Chile and ADB's ETM). The private sector engagement is essential in the coal phase-out and decarbonization; the business models are still unclear and the narratives need to be strengthened.
- **Leadership.** Most countries are still at the early stages of developing coal phase-out programs. MDB participation has been instrumental in developing such plans, introducing relevant policies and regulations, and enhancing the Government's commitment through collaboration among Ministries.

- **Stakeholders' inclusion, engagement, and equality.** Very few countries had started comprehensive assessments of social impacts, typically when an MBD provided technical assistance. Social impacts assessment is an essential component of coal phase-out programs, especially in the mining sector that employs a substantial number of people and indirectly affected individuals and groups, as power plants and mining operations are often the only economic activity in the region.

Concluding Remarks

Several general and indicative conclusions emerging from the evaluation process could facilitate future work to be conducted by countries and MDBs:

- **The energy transition socio-economic impacts could be severe and last for years unless appropriate policy measures are taken.** This is especially the case of particular groups, requiring substantive support ranging from reskilling and training, creation of new employment opportunities, a well-crafted subsidies policy, and tariffs framework to deal with energy price increases, etc. Furthermore, it should be expected that stranded assets will be created and need to be addressed.
- Nearly all the countries analyzed could use support to develop clear coal phase-out plans and decarbonization strategies and identify the first specific actions. **Additional funds outside the CIF investment window must be aligned to provide TA support to countries developing comprehensive coal phase-out and decarbonization strategies.** This assistance should not be limited to the fourteen countries which submitted EOIs.
- **The CIF ACT's investment window should provide TA** for activities such as:
 - *First*, a holistic analysis of the power system is needed to ensure that coal power plants taken out of service will be replaced by adequate energy sources, firm capacity, and ancillary services. Such analysis goes beyond steady-state generation expansion planning and would need to optimize power system operation, dynamic analysis, etc.
 - *Second*, there must be a clear understanding of how the power system will evolve. Specific projects may be identified (including early retirement of coal plants), requiring a feasibility study for implementation. The potential for plant repurposing should be prioritized over just retirement.
 - *Third*, coal phase-out funding requires innovative financing architecture to be explored, bringing together public and private investments and market solutions (e.g., building on the experience of IDB and Chile; ADB's ETM, coal phase-out swaps, and debt instruments, etc.).
 - *Fourth*, designing policies and regulatory initiatives to assist the coal phase-out program in the Just Transition context and principles should assess social impacts and action plans addressing them and sustain support for an extended period.
- **Pragmatically, different energy sources may have to be used as transition-sources and should be limited in time.** A holistic assessment is needed with at least a medium-term (if not long-term) horizon, ensuring that the country is not shifting from one dirty energy resource to another dirty one, which needs to be replaced in the future. If fuel is used as a substitute-in-transition, its role (including the timeframe) should be clear.
- **The CIF members and the MDBs may have to take a position on the eligibility of Carbon Capture, Use, and Storage (CCUS) as a technology option for coal plants** in certain

countries. CCUS seems to be a strategic option for Indonesia, while other countries (e.g., South Africa) are considering it, too.

- **Prepare a framework for funding the Just Transition** that can be replicated by MDBs/Bilateral entities based on a cooperative approach between public and private sector. The scope, scale, and speed of coal phase-out and attendant challenges are daunting and require new commercial/financial applications and policy measures to phase-out coal in an organized manner. Enabling capital mobilization from the private sector is essential to complement funding needs. Moreover, a Troubled Asset Relief Program (TARP)²-like facility should be considered to address liabilities emerging from stranded coal assets to ensure the overall viability and sustainability of initiatives.
- Given the complexity of crafting a coal phase-out and decarbonization plan, it is necessary to **prepare a framework for pilots w.r.t. the social compact related to mines and plants closure in support of a Just Transition**. This compact should consider repositioning, reskilling, equitably, and inclusiveness of communities and activities affected. Experience stemming from digital companies in reskilling could be employed to assist the old economies' activities.
- **The energy-water nexus** has a significant impact in countries resorting to hydropower complementing conventional RE. The CIF, in coordination with the relevant areas and other Trust Funds, should encourage developing a framework to be integrated with the coal phase-out program to address the issue as soon as possible.

² A program of the United States government to purchase toxic assets and equity from financial institutions. It was a component of the government's measures in 2009 to address the subprime mortgage crisis and address liabilities impacting the financial sector.

SECTION 1: EOIs RECEIVED AND ELIGIBILITY CRITERIA

Background

The CIF Administrative Unit (AU) and partner MDBs developed the ACT Investment Program to advance and maximize the comparative advantages of CIF's business model in support of accelerated transition away from coal. Eligible countries were solicited to participate in the CIF- ACT investment program through their submission of Expressions of Interest (EOIs). The countries were requested to submit their EOIs as per a standard template consisting of three components: i) an EOI cover page , ii) an EOI template that focuses on the following: a) country's vision and ambition for using CIF resources, b) alignment, complementarity and demonstration/transformational potential of the proposed program to the country's existing climate strategies and plans, and, c) implementation actions and their relevance to the strategic objectives of the proposed program, and, iii) annexes and supporting documents.

An Independent Expert Group (IEG) was selected to evaluate and rank countries' EOIs against the assessment criteria established by CIF as part of its country selection process to participate in the CIF -ACT investment program. The responsibilities of the IEG included the following tasks:

- Review the EOI template and selection criteria for the program.
- Evaluate countries' EOIs against the assessment criteria established in Sections 6 of the Country Selection Process document (Table 1: Assessment Criteria).
- Present to the CTF Trust Fund Committee a ranked list of countries, along with recommendations.

The IEG was also required to review the official documents annexed or referenced in the EOIs, undertake additional desk research (if needed) and decide on the possibility of interviewing with countries and MDB representatives.

Eligibility criteria (scoring out of 3)

The following three criteria were required to be met by countries to participate in the selection process:

- 1- ODA eligibility at the time of the EOI call.
- 2- Eligibility for at least one of the following three sub-criteria to be met:
 - i. Generation of 4TWh or higher of electricity from coal.
 - ii. 10% or higher of total electricity generation from coal.
 - iii. Annual coal production higher than 4,000 Mt.
3. Active lending program with at least one MDB

EOIs received

Fourteen EOIs were received by the CIF- AU and shared with the IEG. In its internal deliberations, the IEG used the following screening process to further inform the selection process. Additional documents referenced in the EOI were also examined to authenticate the information provided in the EOI.

Screening comprehensiveness and completeness to assess the program

The scoring of this screening does not affect eligibility of EOIs. It has been used to understand differences of information shared with IEG. The metrics assessed encompasses:

- Key details not provided: One pt.
- Information missing but key details provided: Two pts.
- Adequate information provided: Three pts.

Table 1 below summarizes the responsiveness of the countries' EOIs to the eligibility criteria. All 14 countries have passed the eligibility criteria. All EOIs were determined to be eligible. Namibia answered "no" to all three sub-criteria of the second criterion, but more than 10% of its electricity in fact is generated from coal, especially if the imported electricity from South Africa is taken into account.

Table 2: EOI Eligibility Criteria

Country	EOI (score out of 3) Not considered for eligibility	Addl. documents	Eligibility criteria (score out 3)
Bangladesh	2	<ul style="list-style-type: none"> • Cover letter • Bangladesh Power Development Board, Bangladesh Economic Review, Seventh Plan • Perspective Plan of Bangladesh, 2021-2041 • Energy & Power, Vol 19, Issue 5, August 2021 	3
Bosnia Herzegovina	2	<ul style="list-style-type: none"> • WDI data; Updated NDC; Eurostat Energy Balances; SDG VNR 2019; Global Power Data 2021; IRENA Renewable Energy Statistics 2021; WB Least-cost Power Development Plan. 	3
Botswana	2	<ul style="list-style-type: none"> • National Climate Change Strategy (2018) • National Climate Change Policy (2021) 	3
Colombia	2	<ul style="list-style-type: none"> • Cover letter, Minister of Mines and Energy and the General Director of the National Planning Department • Updated NDC • Carbon Neutral Strategy • Climate Change Law 1931 • Green Growth Policy • Reactivation Plan. New Commitment for the Future of Colombia • Decarbonisation strategy for coal 	3

		<ul style="list-style-type: none"> mining • Law on energy transition 2099 (2021) • National Climate Change Policy • National Development Plan 2018-2022 • Climate Change Management Plan for the Mining and Energy Sector • Own research: WDI data, BP Statistical Review 2021, IEA, XM 	
Dominican Republic	2	<ul style="list-style-type: none"> • Endorsement letter: the President of the Dominican Republic • Cover letter, Minister of Energy and Mines and VP of of <i>Consejo Nacional para el Cambio Climático</i> • Law No. 1-12 • Updated NDC • Plan de Desarrollo Económico Compatible con el Cambio Climático (Plan DECCC) • Own research: WDI data, BP Statistical Review 2021, IEA, Ministry of Energy and Mines <i>Organismo Coordinador Sistema Eléctrico Nacional Interconectado (OC)</i> 	3
India	3	<ul style="list-style-type: none"> • Cover letter • Links to relevant documents 	3
Indonesia	3	<ul style="list-style-type: none"> • Cover letter • Long-Term Strategy for Low Carbon and Climate Resilience 2050 • Updated NDC 	3
Kazakhstan	2	<ul style="list-style-type: none"> • Cover letter³ • “Updated Nationally Determined Contribution (NDC) of the Republic of Kazakhstan to Reach the Temperature Goal of the Paris Agreement” Draft, February 16, 2021 • “The updated NDC Implementation Roadmap of the Republic of Kazakhstan for 2021-2025”, Pre-final Version, February 2021 • “Long-term Low Greenhouse Gas Emission Development Strategy (LEDS) of Kazakhstan”, First Draft, 	3

³ Additional documents were provided separately from EOI a few days later

		July 8, 2021	
Morocco	3	<ul style="list-style-type: none"> • Letter SG Energy & Mines 	3
Namibia	2	<ul style="list-style-type: none"> • Cover letter 	3
North Macedonia	2	<ul style="list-style-type: none"> • WDI data, Updated NDC, Eurostat Energy Balances, SDG VNR 2020, Global Power Data 2021, IRENA Renewable Energy Statistics 2021 	3
Philippines		<ul style="list-style-type: none"> • Cover letter • Certificate of Concurrence on NDC 	3
South Africa	3	<ul style="list-style-type: none"> • Letter – Minister of Env. • NDC (draft) • Eskom roadmap • National Development plan 2030 	3
Ukraine	2	<ul style="list-style-type: none"> • WDI data, Updated NDC, Eurostat Energy Balances, SDG VNR 2020, Global Power Data 2021, IRENA Renewable Energy Statistics 2021 	3

SECTION 2: METHODOLOGY AND APPROACH

Assessment Criteria

The IEG drew on the assessment criteria developed by CIF in consultation with MDBs to evaluate the EOIs. The Assessment Criteria table provided by the CIF comprises five key drivers: Vision and ambition; Alignment, complementary, demonstration/transformational potential; Implementation and relevance; Leadership; and Social inclusion, stakeholder engagement, gender equality, and just transition. A weight was assigned to each driver as per Table 3.

Table 3. Assessment Criteria

Criteria	Among others	Weight
Vision and ambition	The Country's level of ambition and how it seeks to use CIF resources to drive transformational change and help achieve its low-carbon development plan(s) or Strategy.	25%
Alignment, complementarity, demonstration/transformational potential	The Country's dependency on coal; alignment with Country's climate strategies and plans; additionality and complementarity of CIF resources; potential and pace of replication, demonstration, and transformational change.	25%
Implementation and relevance	Key action areas, including potential activities/ project(s) and their readiness; contains evidence-based analysis on a range of issues; track record of engaging non-state actors; policy/ regulatory framework landscape; track record of MDB/ private sector engagement; co-benefits.	20%
Leadership	Active involvement and engagement of relevant ministries, line ministries and relevant subnational governments/ authorities.	15%
Social inclusion, stakeholder engagement, gender equality and just transition	Potential mechanisms and/or commitment for engaging and advancing the voice, skills, and livelihoods of women, indigenous peoples, youth organizations, local communities, environmental and climate NGOs, private sector associations, and civil society.	15%

Source: CIF - Onboarding session meeting, August 30th, 2021 – short version of table included in Section 6 of the Country Selection Process document

Methodology and analytical review adopted by the IEG

The approach adopted by the ACT IEG comprised three components: (i) defining and agreeing on an evaluation framework (ii) distribution of countries into four regions, each to be assessed by two members and reviewed by IEG, and (iii) establishment of regular meetings to discuss and review progress made and guide the IEG towards convergence of decisions.

The CIF- AU shared a timeline with critical milestones to be met by the IEG in terms of (a) preparing a draft report, (b) receiving feedback from CIF representatives, (c) discussions with MDBs and countries, and (d) issuance of the final report. The IEG would remain assembled to support the discussion with the CIF Members meeting scheduled for October 12th, 2021.

Distribution of countries

The EOIs were grouped into four regions:

- South and East Asia (SAP): Bangladesh, India; Indonesia, Philippines
- African (AFR): Morocco, Namibia, Botswana and South Africa
- Europe and Central Asia (ECA): Bosnia and Herzegovina (BiH), Kazakhstan, North Macedonia (RNM) and Ukraine,
- Latin America and the Caribbean (LAC): Colombia, and the Dominican Republic.

For evaluation purposes, the regions were allocated to three teams of two people each. The ECA countries were split into two sub-groups and shared with the AFR and LAC Teams. The distribution was performed taking into account (i) number of regions, (ii) workload of groups to be evenly assigned; (iii) individual knowledge of countries.

IEG working process

The IEG met several times to discuss and review each Country and assess progress towards milestones set out by the CIF to assist in organizing and executing the project. Meeting agendas and minutes were prepared by the co-chairs and commented on by the experts. A frequent and enriched email exchange approach was adopted to share information and opinions.

After an initial review of the EOIs, each team reached a shared vision about their respective set of countries, underpinned the basis for their opinion, and indicated a preliminary score for each Country. The IEG discussed each Country's EOI and supportive information & data extensively, compared them in terms of the CIF's assessment criteria and reached a consensus on the global and regional rankings.

The IEG requested meetings with the CIF-AU team and MDBs for the week commencing on September 20th, 2021 to receive feedback and validate the IEG understanding whenever applicable.

Evaluation framework

The adopted framework incorporated a two- step approach: (i) establish a simple scoring to represent each assessment criteria defined by CIF (Table 2) and complement these by including some metrics and scoring definitions described in Table 4 below.

Table 4: Assessment Criteria adjusted by IEG

Assessment criteria	Metric	Scoring
Vision and ambition	<ul style="list-style-type: none"> • NDC commitments <i>SDG/GHG reduction/ Resilient infrastructure Public commitment for GHG reduction, SDG, and Resilient infrastructure / Commitment to Reduce GHG via deploying RE + reliable & resilient energy systems / Strategy & measures for Just Transition - people support, gender, local communities.</i> • Targets (ambition) <i>Public commitments on GHG targets/ Specific coal phase-out targets: scope, size & speed</i> 	<p>< 2°C: High 2-4°C: Medium > 4°C: Low (Based on Climate Action Tracker if available)</p>
Transformative potential	<ul style="list-style-type: none"> • Coal in power generation (dependency plus coal retirement ambition) <i>Coal % in power capacity/ coal % in electricity mix/ Amount of coal production closure/ % coal electricity generation closure Alignment of plans/ Value of CIF/ Replication potential - until 2040/ New stranded assets envisaged in the coal replacement strategy.</i> 	<p>> 66%: H 33-66%: M < 33%: L</p>
Implementation and relevance	<ul style="list-style-type: none"> • Readiness of plans including a track record of projects (MDBs) and other stakeholders (private sector, NGOs) • Indicators for implementation and relevance. <i>Institutional and/or policy frameworks for supporting a coal-to-clean transition / Approaches for the transition and supporting policies and regulations to avoid coal-related stranded assets / Interest and track record in harnessing RE / Potential of renewable energy-based generation / Expected benefits, and co-benefits / Private sector engagement.</i> 	<p>Ready to go: H In progress: M Not started: L</p>
Leadership	<ul style="list-style-type: none"> • Government commitment of relevant ministries • Indicator of demonstration of commitment <i>Articulated Engagement - National level Articulated Engagement - National-Regional-Municipal levels</i> 	<p>All: H Some: M None: L</p>
Just transition	<ul style="list-style-type: none"> • Inclusion of social consideration • Indicator of demonstration of commitment <i>Diversity engagement (gender, local communities, indigenous, youth organizations, NGO, Private sector, civil society)/ Implementation mechanisms. Focus on creating of jobs and economic value.</i> 	<p>Comprehensive: H Moderate: M None: L</p>

Source: ACT IEG

Each metric indicated in Table 4 is supported by components to guide, qualify, and score the assessment of EOIs. The IEG included several reference sources and indicators in each of the five assessment criteria including but not limited to the World Bank Group databases (World Development Indicators), international organizations (IRENA,, IEA, UNFCC, UN SDG, etc.) and other public sources of information (EIA, WRI, Climate Watch, etc.). Additional sources of information and data were indicated in the References section.

Table 5 – ACT IEG Supporting Score

ACT Supportive Score		
Vision & Ambition	Public commitment for: GHG reduction, SDG and Resilient infra	Public commitment for: GHG reduction, SDG and Resilience
		Public commitment on GHG Targets
	Commitment to Reduce GHG via deploying RE + reliable & resilient energy systems	Public commitment on GHG Targets
	Strategy & measures for Just Transition - people support, gender, local communities	
	Specific Coal Target 2030	Scope
		Size
		Speed
Alignment, Complementarity, Demonstration/ transformational potential	Coal dependency	Coal fired installed capacity
		Coal in Electricity mix %
	Alignment of plans	
	Value of CIF	
	Replication potential - until 2040	
	New stranded assets envisage in coal replacement strategy	
Implementation & Relevance	Macroeconomic Context	GDP per capita (2010 constant) WDI Data
		GINI (World Bank Estimates)
		Unemployment rate % WDI Data
	Readiness	Policy reforms
		Investments Identified
	Fiscal Capacity	Total Debt Service (% pf GNI 2020) WDI Data
	Track record on Government Engagement/ Reforms & Public policy implementation	
	Identified low carbon Co-Benefits	
Private Sector Engagement		
Leadership	Articulated Engagement at National level (Relevant Ministries)	
	Articulated Engagement National-Regional-Municipal levels	
Social Inclusion etc	Diversity engagement (gender, local communities, indigenous, youth organizations, NGO, Private sector, civil society)	
	Implementation mechanisms	
Final Score - Weighed		

Source: IEG elaboration.

SECTION 3: EOI ASSESSMENT

Initial Remarks

The EOIs from the fourteen countries displayed considerable diversity in the nature and quality of information provided, the strategic intent of the Coal Transition Program and the level of analysis and planning required. The documents attached to the EOI annexes provided additional information and clarity to the assessment exercise. In some cases, the official information from governmental sources was somewhat at variance with the views and sentiments expressed in the EOIs. The IEG discussed this internally and considered the occasional lack of consistency and harmony among the various documents of the countries' and exercised its judgment judiciously. The IEG stands ready to explain and defend its position on the various aspects of the assessment criteria. It would like to provide a general disclaimer that the IEG has striven to make its assessment as balanced and accurate as possible. And for the reasons explained it makes no claims or guarantees about the accuracy, completeness or adequacy of the information and contents of its assessment and expressly disclaims liability for errors and omissions.

Country Reports on Coal Transition Strategy

The country reports, which follow this sub-section, were evaluated as per the following assessment criteria. The statement sub-headings in italicized parenthesis directly reflects CIF-ACT's assessment criteria.

- Background
- Climate Policy and Commitment (*Vision & Ambition*)
- Strategic Alignment and Transformative Potential
- Management & Execution plans (*Implementation Plans*)
- Leadership
- Socio-economic Considerations (*Just Transition*)
- Final Remarks (*Issues and Recommendations*)

Country Paper 1: Coal Transition Strategy: Bangladesh

Background

Bangladesh selected macroeconomic data⁴ indicates average annual growth rate of GDP of 6.2% between 2000 to 2019 with the GDP per capita around \$ 1305 (constant US \$ 2010) in 2020. With a population of 165 million in 2020, unemployment has increased from 3.7% to 5.3% over the past decade (2011-20). Over this period the country's foreign exchange reserves almost tripled from \$ 11.1 billion to \$ 32.6 billion.

Bangladesh's grid-based installed power generation capacity in 2020 was 23.6 GW⁵, a quadrupling from 5.8 GW in 2009. During this period access to grid power more than doubled from 47% to 99% today. The current generation capacity is essentially based on fossil fuel – comprising gas (57.4%), fuel oil (32.4%), coal (2.8%), power import from India (6%) and renewable energy – mainly hydro (1.4%)⁶. The total installed capacity of renewable energy including hydropower is 515 MW out of which 276 MW is solar, hydro 230 MW, wind 3 MW and 5 MW by biogas and biomass. Solar power is from decentralized, off-grid systems (148 MW) with a modest 128 MW from on-grid systems.⁷ With electricity from coal around 3.3 TWh (285 ktoe)⁸ amounting to 4.8% of total electricity generated in 2019, the country is dependent on domestic gas with growing imports of LNG, fuel oil, diesel and coal. Domestic coal production is very limited at 461.5 ktoe.⁹ The country's plans to diversify its current fuel mix with low carbon fuels is held hostage to two key issues – the dwindling domestic reserves of gas and the slow pace of renewable power capacity growth.

Climate Policy and Commitment (Vision and Ambition)

Bangladesh's major coal transition step has been its decision to cancel ten coal-fired power plants (CFPPs) totalling 8.45 GW earlier planned. Given the slow pace of renewable capacity additions it is questionable whether government's Integrated Energy & Power Master Plan (PP 2041) aimed at a scale up in solar power of 8-40 GW by 2041 will be realized. The share of renewable power in the country's electricity generation mix has fallen from 1.9% in 2017 to 1.4 % in 2019 - a drop of 25%¹⁰. Inevitably, Bangladesh will have to continue relying on imported fossil fuels even while having to contend with energy shortages. The continued heavy reliance on fossil fuels which is likely to be compounded further with the cancellation of the CFPPs needs to be revisited in view of its commitment to contain the high growth of carbon emissions. With its overt dependence on imported high carbon coal, fuel oil and diesel, its carbon emission is a high 607 grams/KWh. GHG emissions of CO₂ has increased from 85.7 Mt in 2014 to 104.5 Mt in 2018¹¹ with an average annual rate of change of 5.1 %. Data show that the rate of growth of carbon emissions is the highest in the power sector, growing at 9.2% per year between 2004 and 2016. Unless the plans to diversify to low carbon fuels move apace, the realization of the country's NDC targets of 5% (unconditional) and 15% (conditional) of its GHG emission reduction below BAU emissions by 2030 would be in question.

⁴ WDI, World Bank; <http://wdi.worldbank.org/tables>.

⁵ IRENA Capacity-Generation, IEA Trade 2017-20

⁶ Bangladesh Power Development Board, Bangladesh Economic Review, Seventh Plan and PP2021. Information extracted from document on Perspective Plan of Bangladesh, 2021-2041, General Economics Division, Bangladesh Planning Commission, March 2020. Pp 132,133.

⁷ IRENA Capacity-Generation, IEA Trade 2017-20.

⁸ IEA Energy Balance, 2019

⁹ Ibid

¹⁰ IRENA Capacity-Generation, IEA Trade 2017-20

¹¹ Climate Watch GHG Emissions

Strategic Alignment and Transformative Potential

Transformational potential insofar as accelerating the transition of coal is concerned is linked to maintaining the overall power system supply and demand balance. This is possible and relevant only with the substitution of the planned (and now cancelled) CFPPs through the deployment at scale of large-scale solar systems and by moving aggressively towards low carbon fuels such as indigenous natural gas, nuclear power and power trade with neighbouring countries. Such systemic change is held hostage to several barriers. Renewable development at scale is plagued with major constraints (viz. land availability, development costs and availability of project financing, limited institutional capacity and lack of replicable implementation track record), existing known reserves of natural gas is rapidly declining and cross border electricity trade is fraught with energy security implications. Bilateral arrangements between Bangladesh and its neighbours for power trade needs to evolve to include multilateral power pooling arrangements with oversight by a regional regulatory authority. This is not yet a key agenda of the countries in the region.

Management & Execution Plans (Implementation Plans)

The objective for power and energy as per the Government's planning documents is to diversify the fuel used in power generation capacity to balance the use of low-cost fuel with low carbon content of the fuel mix. For reasons explained green field Renewable energy plants will unlikely be built on the scale and time frame needed. The power sector will likely continue to rely on indigenous gas, imported fuels (LNG, coal, oil) with contributions from hydro, nuclear and cross border trade. A reference in the EOI is to the plans of an underutilized 125 MW unit of the Barapukuria Power Plant (BPP -2x125 MW, 2006 vintage; 275 MW in 2017) to be shutdown. The retirement and repurposing of the 125 MW unit would involve a feasibility study of the costs and benefits of early retirement including the establishment of a utility scale PV power plant on site, which will be backed by battery energy storage systems and synchronous condensers to provide grid balancing and reactive power support. The pilot repurposing project at BPP is expected to test and validate several of the government's strategies and policies under its PP2041 vision for power and energy. These include phasing out of high carbon fuels and replacing them with renewable energy in sites earlier occupied by coal utilities.

The pilot project is expected to enhance government understanding and strengthen its capacity to develop new and improved procurement mechanism for utility scale renewables. Going forward mechanisms such as auctions can be used to attract experienced developers and drive down costs. Furthermore, it would help foster stakeholder partnerships between government, NGOs and private sector. Such partnerships could promote private investment in energy by utilizing the private sector window of the CIF-ACT program and ensure replication at scale in other parts of the country. The WB Scaling Up renewable energy projects includes CIF's Strategic Climate Fund that has greatly stimulated growth of solar home systems in the country and is considered as the world's largest national program for off-grid electrification¹².

Leadership

Bangladesh has demonstrated leadership in moving towards a coal transition pathway by abandoning plans to deploy CFPPs. In this context the Ministry of Power, Energy & Mineral Resources leadership is laudable, however it is yet to submit concrete plans for this transition that address the issue of scaling renewable power generation while reducing the growth of oil, LNG and coal imports.

¹²Cabraal Anil, William A. Ward, V. Susan Bogach and Amit Jain, 2021. Living in the light: The Bangladesh Solar Home Systems Story. A World Bank Study, Washington DC: World Bank.

Socio-economic Considerations (Just Transition)

The EOI is not forceful enough in emphasizing Just Transition to accommodate the socio-economic changes that a lower carbon mix for the power sector entails. Traditional approaches such as retraining and re-skilling does not apply since there are no displaced workers from CFPPs or coal mine cancellations. There is a passing mention of strengthening “spatial planning and site identification” which can be generously interpreted to entail developing a baseline for socio-economic conditions and linkages, mapping of existing workforce and identification of preferences. Human resource preparedness for a rapid growth in RE is the key challenge if plans were to fructify.

Final Remarks (Issues and Recommendations)

The Government and the MDBs see promising prospects for a pilot coal transition activity in Bangladesh. It is contended that Bangladesh’s coal dependency, though currently low, is likely to increase in the future. The decision by the authorities to cancel the ten CFPPs is being seen as a step in the right direction since it conveys the government’s intent to transit away from coal. It is believed that the current excess generation capacity of 23 GW and peak load of 14 GW will enable it to cushion against any future (medium term) shortfalls in capacity due to cancellation of the CFPPs. Moreover it has been argued that its plans to deploy grid based solar PV (on lands earmarked for the cancelled CFPPs), accelerate at scale decentralized solar systems on roof tops and industry (ie. 4000 textile units) and efficient utilization of domestic gas and imported LNG in combined cycle power systems and cross border renewable electricity trade (i.e., with Nepal, 500 MW imports), would create a low carbon fuel mix for the country. We do not entirely share this viewpoint due to the following reasons:

- i. The excess generation capacity currently faced is due to constrained supply meeting suppressed demand due to economic slowdown due to the current pandemic. The supply is constrained due to shortfalls in imported fuels and their high cost as well as the need to conserve domestic gas whose long-term availability is a cause for concern.
- ii. The miniscule, shrinking proportion of grid connected renewables in the current electricity generation mix needs to be reversed and scaled by several orders of magnitude in the medium term. Lack of a policy and implementation strategy as well as an effective business model has contributed to the slow pace of on-grid RE capacity. It is questionable whether government’s Integrated Energy & Power Master Plan aimed at a scale up in solar power of 8-40 GW by 2041 will be realized.
- iii. Plans to import renewable electricity from Nepal is contingent on many factors not the least being Nepal’s own deficit power situation. Although it is the world’s second most hydropower rich country it paradoxically is a net importer of electricity as only a tiny 1.2 GW out of the total economic potential 42 GW has been developed. Power imports of 500 MW from Nepal appear improbable in the short to medium terms.

In summary, the key issue is whether the coal transition strategy currently involving scrapping of CFPPs would further increase import dependency for high carbon fuels oils and imported coal. A related issue is the slow pace and growth of grid connected renewable energy capacity and whether this could be greatly accelerated. Dependence on cross border energy trade in the absence of a regional energy framework and regulatory oversight is risky. Until these issues are satisfactorily addressed, the request by the Govt of Bangladesh for programming of CIF resources to support the BPP 125 MW unit pilot coal retirement/repurposing project can be held in abeyance.

Country Paper 2: Coal Transition Strategy: Bosnia and Herzegovina

Background

Bosnia and Herzegovina (BiH) is a European upper-middle-income country, and its selected macroeconomics data¹³ indicate GDP per capita has steadily increased for ten years to reach around \$6,000 (after accounting for a 4% reduction in 2020). The population reached 32.8 million people and unemployment remained high at 16.9% in 2020. The overall debt level has steadily declined to 4.8% of GNI from over 7.9% in 2014. Tax revenues account for 20% of GDP, with coal rentals standing at 0.23% of GDP.

BiH has a total energy supply¹⁴ of 7.2 Mtoe, with renewables and NCRE (primarily hydropower) amounting to 2.3 Mtoe in 2019. Coal, hydropower, and oil are the primary energy sources, and coal production – primarily lignite - reached circa 7.2 Mt/yr in 2019. Grid-connected installed power generation capacity in 2019 was ca. 4.4 GW, and electricity generated around 17.4 TWh. The country is a net importer of coal and exporter of electricity, with coal and hydropower as the primary sources for electricity generation. Coal imports remain a significant contributor to electricity generation. Heat production is heavily reliant on coal and NG.

Progress towards the Sustainable Development Goals 7¹⁵ (affordable clean energy access) has shown mixed achievements with significant reliance on coal for power generation, above 62%, with NCRE at 35% and Solar/Wind deployment still accounting for less than 2% in 2019. The electricity network losses stand at 7.2%.

The country's plans to diversify away from the current fuel mix towards a low carbon pathway faces significant challenges, including (i) difficult socio-economic situation for a just transition away from coal and (ii) insufficient private sector involvement and resources to implement reforms in the energy compact.

Climate Policy and Commitment (Vision and Ambition)

BiH's public has shown commitment towards GHG reduction by updating the NDC, ratifying the Paris Agreement, and Supporting the Development Goals (SDG). The country set an unconditional target of 33.2% of GHG reduction by 2030 from 1990 levels and is a signatory of the Sofia Declaration on the Green Agenda (no coal plant after 2050).

BiH response to climate variability encompasses the adoption of Climate Adaptation and Low Emissions Development Strategy 2030 (CALEDS), which increases the resilience of economic activity, an Integrated National Energy Climate Plan (2020), the updated NDC (U-NDC, 2021), a Framework Energy Strategy (FES, 2018), an Environmental Strategy and Action Plan 2030 (in development). The World Bank Electricity Planning Model¹⁶ (EPM) indicated coal-fired CHPs and TPPs should be phased out and replaced by PV and other RE technologies by 2035. Three TPPs are slated for closure in 2023 and 2025, a total of 410MW, almost 20% of BiH's installed capacity.

Additional outputs and outcomes will result from the World Bank's EPM and Technical Assistance¹⁷ (TA) Projects, which target the closure of mines, CHPs and TPPs. BiH acknowledges the economic, social, environmental, and health impacts of such an initiative. It expects to mobilize support from MDBs and other national, regional, and private sector partners to address the challenges faced due to the closure of mines and TPPs.

¹³ World Data Indicators. The World Bank. 2021

¹⁴ Energy Balances. Eurostat. 2021.

¹⁵ Sustainable Development Goal: Bosnia and Herzegovina. Voluntary National Review 2019. United Nations.

¹⁶ BiH Power Sector Note Least Cost Power Development Plan (P157714). ESMAP. The World Bank. 2017.

¹⁷ Bosnia and Herzegovina: Support to Energy Transition in Coal Regions. The World Bank. 2020.

Strategic Alignment and Transformative Potential

BiH's higher dependency on coal for electricity and heat production stems from operating 14 active mines with significant coal deposits located in Tuzla (Kreka, Banovici, Djurdjevik, and Ugljevik), Central Bosnia (Kakanj, Breza, Zenica, and Bila), Bugojno (Gracanica), Livno-Duvno (Tusnica), Gacko (Gacko) and Doboj-Banja Luka (Stanari) basins.

Coal production reached 13.4 Mt/yr in 2019, supplying both TPPs and CHPs. With a total installed capacity of 4,460 MW, 2,073 MW of coal plants (mostly lignite) is planned to be replaced and repurposed. Currently, the proposed retirement schedule comprises Tuzla 3-4 and Kakanj in 2023, Tuzla 5 in 2025, amounting to 410MW. Gacko (300MW) and Ugljevik (300 MW) is scheduled to be decommissioned in 2031 and 2035, respectively. The decommissioned TPPs should be replaced by on-grid biomass and solar PV generation primarily and pave the way for decentralized energy systems driven by RE policy reforms.

CIF ACT resources should support the implementation of outcomes/recommendations from the present energy planning exercise. Equal attention should be given to policies and costs associated with reskilling and retraining of existing workforce, environmental remediations of the land, and investments needed for repurposing and rehabilitation of the land, assets, and communities of mines and plants.

Management & Execution Plans (Implementation Plans)

BiH has a track record in deploying resources from MBDs and bilateral organizations. EBRD (€2.76 Bn), the World Bank (€1.6 Bn), and IFC (above €0.12) are the major multilateral lenders and contributors to BiH investment needs and towards specific projects targeting coal mines closure and retirement of TPPs and CHPs.

The Technical Assistance Project would provide information to manage an effective national program including modelling scenarios and cost data for both the supply and demand-sides on energy transition and decarbonization. This cost information may be presented for each time horizon of the analyses with related recommendations on managing the energy transition's social, environmental and economic impacts, particularly in the coal regions. Additional details about the pathways will emerge when the World Bank's EPM and supportive documents are finalized.

Leadership

The EOI was led and submitted by the Ministry of Foreign Trade and Economic Relations (MOFTER), which has expressed support received from the Ministry of Finance and Treasury and development partners such as EBRD, WBG, UN, and bilateral agencies.

Socio-economic Considerations (Just transition)

MOFTER has set up a platform and conducted the first round of Just Transition of BiH Coal Regions (July 2021). Further steps are being taken to conduct formal engagement and consultation to address needs, monitoring, and learning from the experience. The private sector will also be engaged by further implementing the PPP Law and may benefit from CIF's PSW.

The World Bank's TA Phase 2 provides a holistic analysis at the country level by bringing together the affected subsectors and informs decision-makers on the net economic benefits of energy transition and decarbonization. It also addresses related financial impacts and investment options.

Final Remarks (Issues and Recommendations)

BiH's coal transition strategy draws attention to the following contextual topics:

- i. The emission constraints and electricity exports trade-off should be addressed as security of supply could become an issue. All emission-constrained scenarios would require 750+ MW of new hydro and 350 MW of wind. Otherwise, coal and gas remain cost-effective options, misaligned and thus in cross-purpose with the EU Green Deal.
- ii. Developing a systematic coal transition framework is essential, including improved/updated resource assessments for hydro and enhance coordination with neighboring countries.
- iii. Strengthen institutional capacities and clarify the concessions process to enable greater private sector involvement.
- iv. Address the tariff framework to balance affordability and cost recovery towards district heating thus enabling the electricity market.
- v. The TA project emphasis in addressing plant/mine closure is of the essence. The social and economic impact of the energy transition will be a severe challenge. A well-conceived, sustainable, and resilient plan requires a coordinated and consultative effort with all stakeholders.

Country Paper 3: Coal Transition Strategy: Botswana

Background

Botswana, a country of 2.35 million people, is a middle-income country with a GDP per capita of \$8,098 and total GDP of \$18.7 billion in 2019¹⁸. Unemployment is relatively high (17.2% in 2019) in spite of a financially healthy diamond mining sector. Electricity tariffs are close to full cost recovery; so, the Government is careful to avoid substantial increases, as affordability is an issue.

Botswana has an annual electricity consumption approaching 4 TWh and a peak demand of 700 MW. With more than 200 billion tons in coal reserves, Botswana relies heavily on coal for electricity generation; more than 97% of the electricity is produced from coal with the remaining produced from a solar plant (1.3 MW) and small diesel plants. Domestic production of electricity comes mainly from two coal plants: Moropule A (132 MW) and Moropule B (600 MW); the first one is old and inefficient, while the second is relatively new but suffering from low reliability and inability to produce at its design capacity. As a result, electricity imports continue to represent a substantial percentage of the total power consumption (20-30% in recent years); most imports come from South Africa, which is also relying on coal for its power generation.

Botswana has committed to diversify its power supply and generate more electricity from renewables. The country has signed the Paris Agreement and has numerous policy initiatives promoting green energy options.

Climate Policy and Commitment (Vision and Ambition)

Botswana's NDC aims to reduce GHGs by 15% in 2030 (vs 2010 baseline) requiring an investment of \$18.4 billion. While this is substantial for the country, it represents an intermediate level ambition. Nevertheless, recent policy initiatives indicate increased interest to accelerate the transition to green options as reflected in policies such as: Vision 2036, Renewable Roadmap (2019), Economic Recovery and Transformation Plan (2021), National Climate Change Policy (2021), the Integrated Resource Plan (IRP) and the National Climate Change Strategy (2018). Also, the country is in the process of designing a carbon tax policy.

Strategic Alignment and Transformative Potential

Botswana's coal transition strategy is not very clear even though some features are emerging. The proposal to retire Moropule A (132 MW) by 2027 is in the right direction, although the plant is now 32 years old and will be 38 years old by 2027; it is an old plant with very low efficiency (4 units, 33 MWs each) and low reliability. So, arguably this plant should retire anytime soon. There is no mention of retiring Moropule B (600 MW), which was built ten years ago and is currently experiencing reliability and reduced output problems.

A positive development is the Mega Solar Initiative¹⁹ to build 2- 5 GWs of solar for the regional market whose plan is quite ambitious. The Mega Solar EOI was signed between the Governments of Namibia and Botswana, the African Development Bank, IBRD, and IFC and the African Union Development Agency-New Partnership for Africa's Development in April 2021. Initially, the project will cater to domestic demand and then join and contribute to the regional power pool (SAPP). The important feature of this project is that it includes dispatchable units (CSP with energy storage) which can address the renewable intermittency and eventually provide a basis for full decarbonization. We do not have details on the Mega Solar Initiative and there may be questions on how realistic it is given the challenges related to infrastructure, institutional readiness and

¹⁸ World Data Indicators. The World Bank. 2021

¹⁹ <https://powerafrica.medium.com/major-milestone-agreement-reached-for-mega-solar-in-southern-africa-b9b419429944>

uncertainty about supply-demand in the region. No specifics are provided in terms of the use of CIF resources, but it seems that they are intended for post-Covid economic impacts, the Mega Solar Initiative, the retirement of Moropule A and labor training.

Management & Execution Plans (Implementation)

The readiness for the transition is mixed; retirement of Moropule A could be planned and implemented quickly, but specific plans are needed on the power generating assets which will replace it (providing not only energy, but also firm capacity and ancillary services). Also, some planning has been done on the Mega Solar Initiative, but more specifics are needed on the program's design features and when and how projects will be financed.

In parallel, however, the country has initiated successful tenders for solar with 50 MWs tendered in July 2021 and an additional 200 MW expected by 2026. Combined GCF/IBRD funding is supporting investment in enabling public infrastructure (grid reinforcement, battery storage, etc.) with the objective to leverage private sector financing for 200MW dispatchable solar power and 2x50 MW dispatchable wind power as identified in the Integrated Resource Plan for Electricity for Botswana (IRP). These will help leverage approximately US\$820 million private financing.

Botswana has a long track record working with MDBs, especially with the World Bank and AfDB, but no experience with CIF involvement. On the positive side, the country has taken steps to encourage the private sector to participate in green energy investments going forward.

Leadership

The EOI has the support of the Minister of Energy and Finance. Also, the numerous policies introduced in the last three years, in particular, indicate strong commitment by the Government. This commitment needs to be demonstrated with specific plans and implementation of projects.

Socio-economic Considerations (Just Transition)

The EOI mentions in many instances the intent for consultation with all the key stakeholders. Also, retraining and re-skilling is envisioned for the staff of Moropule A. Furthermore, EOI states the need to deal with adverse social impacts associated with closure of coal mines and power plants, and all vulnerable members of the society. The envisioned CIF resources should preferably be used to support such activities.

Final Remarks (Issues and recommendations)

Botswana has the potential to develop and implement a successful transition to sustainable energy, but it needs to provide more specifics both at the project level (plans for the existing coal plants and the Mega Solar Initiative) and at the sector in general (how the sector will be in 10-20 yrs in terms of key sources of energy, capacity and ancillary services).

The Mega Solar Initiative is a very important project for the countries involved (Botswana and Namibia) and the regional power pool (Southern Africa Power Pool) and deserves to be supported. It is recognized that the Mega Solar Project is at an early planning stage, but the initial domestic focus and the support from MDBs and bilateral organizations enhances the likelihood for success. It should be noted though that it is quite ambitious and finer details need to be studied and progressed soon including:

- i. The adequacy of transmission capacity/infrastructure for exports.
- ii. The supply-demand situation in the region and the competitiveness of Mega Solar assets in the market.
- iii. Readiness and capacity of relevant institutions to implement such a large scale project.

Country paper 4: Coal transition strategy: Colombia

Background

Colombia is the third-largest economy in South America, an upper middle income country with almost 50 million people. Selected macroeconomic data indicates²⁰: ~270 billion USD GDP²¹/ ~7300 USD GDP per capita²²/ GINI index > 50%/ ~16% unemployment rate. The country depends greatly on oil and mining exports. It produces annually 53 Mt of coal, being among the largest coal exporters. Coal represents 18% of Colombian exports and contributed to 1.3% of GDP in 2020.

The country is the fourth-largest energy market in South America. Hydrocarbons have ~65% share in the primary energy mix²³, followed by coal (~11%), hydroelectricity (~11%) and other renewables. The total power installed capacity is 18 GW²⁴: ~66% hydro, 32% thermal (coal, gas and liquid fuels) and 2% NCRE. CFPPs account for 1.7 GW. Firm energy (i.e. the availability to provide energy in a dry period) is around 10 GW²⁵. The total electricity generation is around 80 TWh/year²⁶, of which 70% is produced by hydro sources. The share of coal in the electricity generation mix is around 10%. Fossil fuels are a back-up source in the system.

Colombia is highly dependent on hydro conditions, facing high price volatility during periods of low water inflows. The country has a fluctuating seasonal system and is also adversely affected by climate shocks, like the El Niño phenomenon, which causes extreme drought conditions every 5 to 7 years, leading to higher use of thermal plants (hydro generation could drop from almost 80% to 45%).

Climate Policy and Commitment (*Vision & Ambition*)

Colombia is committed to the 2030 Agenda for Sustainable Development and the Paris Agreement. In 2020, the country updated its NDC, pledging to reduce GHG emissions by 51% by 2030 (from 1990 levels), and aspiring to become carbon neutral by 2050. The energy and mining sectors approved the Integrated Climate Change Management Plan, which established the emissions reduction target for these sectors at 11.2 MtCO₂eq (around 17% of the national target). The commitment for the electricity generation sector is to reduce 4.74 MtCO₂eq by 2030.

Colombia has been working on energy transition and a low carbon economy for more than a decade, developing laws, strategies, initiatives and specific regulation²⁷. The country is a leading member of the AILAC²⁸, a group of LAC countries that cooperates on climate issues and negotiations, and is also part of the Renewable Energy for Latin America and the Caribbean Initiative (RELAC), which aims to achieve at least 70% of RE installed capacity in LAC by 2030.

²⁰ WB database

²¹ 2020 – current USD – WB data

²² 2020 – constant USD – WDI data

²³ 2019 – IEA Energy Balances

²⁴ 2019 - IRENA database

²⁵ AOE 2021-2022 - XM

²⁶ 2019 – IRENA database

²⁷ Carbon Neutral Colombia strategy/ Climate Change Law 1931 of 2018/ Green Growth Policy/ Reactivation Plan "New Commitment for the Future of Colombia"/ Strategy for the implementation of the Sustainable Development/ Decarbonisation strategy for coal mining/ Law on Energy transition 2099 of 2021/ National Climate Change Policy/ National Plan for Disaster Risk Management/ Climate Financing Strategy/ National Development Plan 2018-2022/ Comprehensive Climate Change Management Plan for the Mining and Energy Sector/ Territorial Development and Relationship Strategy, among others.

²⁸ Independent Alliance of Latin America and the Caribbean: Chile, Colombia, Costa Rica, Panama, Peru & Guatemala

The country stands committed to diversify its energy resources and ensure a reliable energy supply. Recent auctions awarded a total of 1.4 GW of wind and solar projects. Another 7.3 GW NCRE projects are qualified for bidding in the upcoming auction (expected in 2023).

Colombia expressed its intention to advance towards a transition of the coal mining sector, working closely with environmental authorities, local governments, private companies and civil society organizations. The country plans to support the diversification of the mining sector by producing critical minerals for the clean energy transition (such as gold and copper) and the adoption of cleaner technologies.

Additionally, the country is willing to analyze the potential closure of 800 MW CFPPs that have been operating for more than 30 years.

Strategy documents have been developed regarding the Just Transition imperative, although implementation measures and mechanisms are still at an early stage.

Strategic Alignment and Transformative Potential

As previously detailed, Colombia has been developing legislation, strategies, initiatives and studies to align national public policy to SDGs/ NDC. Coal is on the critical path for government decisions. The largest coal concessions end in 2030-2040 and the renegotiation of those concessions will depend on the global demand of coal and the potential diversification of the Colombian mining sector.

CFPPs to be analyzed for closure are not specified. The 800 MW potential target represents around 50% of the total coal fleet, but probably no more than 5% of the total electricity generation. First efforts would be concentrated on old CFPPs that are publicly owned.

Long term electricity planning scenarios²⁹ assume that the expansion of the power system would be mainly driven by NCRE, but they also include new gas-fired power plants (likely fuelled with imported LNG/ a new regasification facility is being promoted by the government in the Pacific Coast - ongoing public tender).

CIF-ACT funding would be used to study: i) the potential transformation of the coal mining sector, and ii) the feasibility of retiring old coal-fired power plants that are publicly owned.

Management & Execution Plans (*Implementation*)

The Ministry of Finance has identified studies and investments needed to decide on the decommissioning of the state-owned CFPPs including a “Renewable Transition Plan”. In addition, economic benefits from decarbonisation were studied (e.g. CONPES study on green growth/ “New commitment to the future of Colombia”) as part of the country’s green growth strategic planning. The government is examining a carbon neutral strategy (i.e. when CCSU technologies become commercially available) and is also gearing itself for a global coal transition resulting in the reduction of world-wide coal demand. The Colombian long term strategy involves a diversification of the economy that would allow the country to replace coal exports with forestry products.

Colombia has several long-standing lending programs, investment grants and technical assistances with the IDB (including CIF funds) and the WBG. They are mostly multipurpose lines with the involvement of several government entities. CTF funds for the Integrated Transport System of Bogota - 40 million USD – were partially executed (due to implementation issues).

²⁹ 2020-2050 National Energy Plan – UPME/ 2019 - 2033 Reference expansion plan for generation and transmission – UPME

Leadership

The EOI was submitted under the leadership of the Ministry of Finance and Public Credit, in coordination with the National Planning Department and the Ministry of Mines and Energy.

The national and local governments have regulatory, strategic and operating roles in the mining, O&G and electricity sectors, so it is key to develop engagement strategies for the different government levels and the private sector. There have been some initial commitments from a few major private industries including Ecopetrol (the national oil company), but with limited implementation progress thus far.

Socio-economic Considerations (*Just Transition*)

Strategies for Just Transition - people support, gender, local communities- have been targeted. The proposed actions include, among others, the design of guidelines and public policy to promote and regulate the coexistence of the extractive mining activity with other productive activities and the implementation of the Colombian Neutral Coal strategy.

Final Remarks (*Issues and Recommendations*)

Colombia needs to embark on an accelerated coal transition program. The main following considerations should be taken into account:

- i. There is an adequate set of regulations, strategies, plans and initiatives regarding energy transition. Implementation should be the focus now.
- ii. The deployment of NCRE has been slow so far, as well as required transmission infrastructure.
- iii. Coal transition is key for Colombia. The most significant transformational change in relation to coal is not limited to electricity generation but also includes the business and exigencies of moderating and eventually reducing coal exports in the wake of reduced global demand. Both these issues are at the early stages of examination.
- iv. The potential 800 MW coal-fired power plants to be phased-out have more than 30 years in operation and mainly serve as backup units. Specific assets are not defined yet.
- v. Natural gas would be a transition fuel to support a high penetration of NCRE.

Country paper 5: Coal transition strategy: Dominican Republic

Background

The Dominican Republic is an island state in the Caribbean region, an upper middle income country with almost 11 million people. Selected macroeconomic data indicates³⁰: ~80 billion USD GDP³¹/ ~7400 USD GDP per capita³²/ GINI index > 40%/ ~9% unemployment rate. The country mainly depends on tourism, agriculture and mining (gold).

Hydrocarbons and coal account for 90% of the primary energy matrix³³ (coal, 8%). The remaining sources are wood, bagasse, hydro, wind and solar. The total power installed capacity is 5.3 GW³⁴: 76% thermal (coal, gas and liquid fuels), 12% hydro and 12% NCRE. CFPPs account for 1.1 GW. The total electricity generation of the country is around 21 TWh/year of which around 35% is from coal. The country does not produce hydrocarbons or coal, so all domestic consumption is met through imports.

Climate Policy and Commitment (*Vision & Ambition*)

The Dominican Republic is committed to the 2030 Agenda for Sustainable Development and the Paris Agreement. In 2020, the country updated its NDC, committing to reduce GHG emissions by 27% by 2030 (from 1990 levels; 20% conditional to external financing and 7% unconditional to domestic financing), aspiring to become carbon neutral by 2050. The energy sector has the highest potential for reducing emissions (from 18 to 7 MtCO₂eq/ year). The country positioning and plans on climate change and energy transition are supported by laws, strategies, plans and specific regulation³⁵.

The Dominican Republic plans to diversify its energy resource mix while ensuring its energy security through reliable energy supplies. The country is part of the RELAC Initiative. Currently NCRE power installed capacity is around 600 MW³⁶ (+197 MW of distributed solar energy). An additional 470 MW NCRE capacity is under negotiation (270 MW solar and 200 MW wind).

The country plans to study the feasibility of the closure of two CFPPs with a combined total of 312 MW (260 MW Itabo, older than 30 years and 52 MW Barahona Carbon), 50% public – 50% private-owned. The EOI also mentions the potential reconversion of the 720 MW Punta Catalina CFPP plant, which was recently commissioned (2019 – 100% state-owned).

Just Transition considerations are addressed in some official documents.

Strategic Alignment and Transformative Potential

³⁰ WB database

³¹ 2020 – current USD – WB data

³² 2020 – constant USD – WBI data

³³ 2019 – IEA Energy Balances

³⁴ 2019 - IRENA database

³⁵ General Electricity Law 125-01/ Transmission Expansion Plan 2021-2035/ 2030 National Development Strategy (END)/ Plan de Desarrollo Económico Compatible con el Cambio Climático (Plan DECCC)/ Institutional Strategic Plan 2021-2024 of the Ministry of Environment and Natural Resources/ General Law on Environment and Natural Resources (Law No. 64-00)/ Law 57/07 promoting NCRE development/ National Strategic Plan for Electric Vehicles (2020)/ Regulatory framework for electricity tariffs and charging stations for electric vehicles under preparation with support of MDBs/ Distributed energy regulatory framework under preparation with support from MDBs/ Energy Efficiency Law submitted for approval to the National Congress in June 2021; among others.

³⁶ 2019 – IRENA database

As previously mentioned, the Dominican Republic has developed legislation, strategies, initiatives and studies to align national public policy to SDGs/ NDC.

The country is committed to close or replace obsolete CFPPs with efficient and sustainable plants by 2030, specifying a 312 MW initial target. This power capacity represents around 30% of the total coal power fleet and is baseload generation (assets are among the top positions of the dispatch merit order schedule, accounting for 12% of total electricity production and 6% of national GHG emissions). The government plans to study feasibility of converting these coal plants to burn biomass (Barahona CFPP has already partially substituted some coal with biomass).

The remaining CFPP, Punta Catalina is the main baseload station in the country's power system network and serves high on the merit order dispatch on account of its lower operating costs. Feasibility studies regarding conversion of Punta Catalina plant are underway, but without any expectation of implementation in the medium term.

Long-term electricity planning³⁷ includes scenarios of high NCRE penetration (25% in 2025 and up to 50% by 2030). However, given its natural resources and geographical constraints, the country's replacement options (for baseload capacity) to coal appear limited. So, despite fossil fuel fired generation share in the total electricity mix is projected to reduce from 85% to 50% by 2040, since demand is expected to double, the amount of energy produced by coal would remain stable. An upcoming updated plan is expected to include the retirement of old coal and fuel oil plants by 2030 and the eventual replacement of all coal by 2050.

The DECCC Plan and updated NDC also specify that NCRE and natural gas are among the main mitigation options for the electricity sector.

The country envisages the use of ACT program funds for concessional funding or technical assistance to: i) plan and render feasible the closure of 312 MW coal-fired power plants; ii) generate a comprehensive and accelerated plan for deep decarbonisation taking into account viable repurposing or viable transformation for new Punta Catalina coal-fired plant; iii) test and demonstrate innovative approaches to manage technical/economic and environmental/social issues; iv) accelerate the transition to renewable generation sources; v) enhance energy security and, vi) ensure fair transition.

Management & Execution Plans (*Implementation*)

The electricity sector suffers from persistent financial deficits due to losses and electricity theft, tariffs that do not allow cost-recovery and inefficiencies in operation. To address the poor financial and technical performance of the sector, the government has developed a comprehensive reform agenda supported by MDBs.

Some studies have analysed potential green growth strategies for the Dominican Republic (e.g. "2030 National Development Strategy"). Economic benefits from decarbonisation were estimated, however, no significant policy reforms to realize these have been executed as yet.

The Dominican Republic has several active lending programs, investment grants and technical assistances with the IDB, IFC and IBRD. They are mostly multipurpose programs, managed by different government entities. Several financing programs are dedicated to energy and climate strategies and initiatives (e.g. energy efficiency, enhanced electricity service and access, improved governance and institutional framework, etc).

³⁷ 2020-2040 Generation Expansion Plan by the Ministry of Energy and Mines/ 2021-2035 Transmission Expansion Plan by the Dominican Electricity Transmission Company (ETED).

Leadership

The EOI was submitted by the by the Ministry of Energy & Mines, the National Energy Commission and the Ministry of Economics, Development and Planning. CIF also received an endorsement letter from the President of the country.

The government achieved political and stakeholder consensus for coal transition reforms via the recently signed Electricity Pact. The PPAs of the CFPPs are approaching their expiration dates and would not be renewed. Furthermore, the government plans to provide opportunities for the decommissioned CFPP private operators to participate in new renewable energy projects.

Socio economic considerations (*Just Transition*)

Considerations regarding Just Transition - people support, gender, local communities- are mentioned in the EOI. It is also learned that the government plans to conduct feasibility studies on converting the identified CFPPs to burn biomass. Displaced workers are expected to be relocated to other industrial occupations including the growing NCRE industry.

The Ministry of Energy and Mines has just established a gender and inclusion unit and has approved a policy for gender equality and inclusion of people with disabilities, providing guidance for the sector. On the other hand, the private owners of the CFPPs subject to phase-out have established internal policies for gender equality and inclusion.

Final Remarks (*Issues and Recommendations*)

The Dominican Republic needs to embark on a coal transition program. The main following considerations should be taken into account:

- i. There is an adequate set of strategies, plans, initiatives and regulations regarding energy transition.
- ii. Coal (as well as heavy fuel oil) transition in the power sector is key for the Dominican Republic to achieve NDC targets.
- iii. The increasing use of natural gas is part of the mitigation options proposed, given limitations set by geography and natural resources available.
- iv. The CFPPs targeted for phase-out have more than 30 years in operation and are baseload generation units. Replacement technology would imply a mix of natural gas and NCRE. Opportunities for PSW (i.e. investments in on-grid solar PV or wind farms) since the repurposed CFPPs are 50% privately owned.
- v. Conversion of Punta Catalina could have a significant transformational impact and needs to be fast-tracked from feasibility studies to execution and commissioning.

Country Paper 6: Coal Transition Strategy: India

Background

India is the second largest country in the world in terms of population.³⁸ In 2019, its population was approximately 1.3 billion. Furthermore, in 2019 its GDP was approximately 2.9 trillion U.S. dollars in absolute terms and approximately 9.5 trillion dollars in purchasing power parity terms. In the same year, its GDP grew by 4.2% and the per capita GDP grew by 3.1%.

In 2018, India's coal consumption increased to an estimated 1,037 million tons.³⁹ This, the second largest in the world behind China, is driven by the power sector. India also ranks as the second-largest coal producer in the world. India's coal production was 817 million tons in 2018. India produced about 1,487 TWh of electricity in 2018. Coal accounted for 74% of India's electric generation in 2018. Renewable energy (RE) made up the second-largest portion (18%) of power generation and currently is the fastest-growing power source. Solar energy has increased by an average of 50% each year since 2013. Although coal accounts for the majority of India's electricity fuel supply, India experiences fuel shortages with coal and natural gas. Utilization rates in India's coal-fired power plants have fallen steadily to 56% in 2019. Given the increasing cost-competitiveness of renewable energy and India's ambitious climate targets, this provides a glimpse into India's transformative potential.

Climate Policy and Ambition (vision and ambition)

India's NDC commitment at the Paris COP is ambitious and 2°C compatible.⁴⁰ The unconditional commitment would bring the 2030 emission intensity 30-35% below 2005. The conditional commitment, based on transfer of technology and low-cost international finance, would bring the non-fossil share of power generation capacity to 40% by 2030. All this is in the long-term commitment that the per capita emissions would never exceed that of the developed world. In concrete terms, India first committed to 175 GW of RE capacity by 2022. It then followed up with a more ambitious target of 450 GW of RE capacity by 2030. In addition to RE, India has also demonstrated its commitment to the NDCs by committing to electrifying its transportation sector, with 30% penetration of electric vehicles (EVs) by 2030.

Strategic Alignment and Transformative Potential

India's transformative potential is high. Despite ambitious RE targets and impressive deployment of RE capacity, India's coal dependence remains high, at 50% of primary energy supply as well as 75% of electricity supply. In the electricity sector, this means approximately 200 GW of coal power plant capacity currently. However, there is recognition that, despite 50 GW of coal plants in the pipeline, it is unlikely that more coal plants will be built after 2022. Furthermore, India has already identified 50 GW of coal plants for retirement by 2027, based on age and poor environmental record. Given the increasing cost-competitiveness of RE and battery energy storage systems, it is likely that the pressure on coal plants economic viability will increase further. For example, a recent study identified ~100GW coal power capacity as economically stranded (Shrimali, 2020)⁴¹.

Management & Execution Plans (implementation plans)

India's implementation record is impressive on one hand and confusing on the other hand, in particular as it relates to coal, as we discuss below. India is on track to meeting its NDC targets.⁴² It

³⁸ See [World Development Indicators | The World Bank](#)

³⁹ See [International - U.S. Energy Information Administration \(EIA\)](#)

⁴⁰ See [Home | Climate Action Tracker](#)

⁴¹ See [Making India's power system clean: Retirement of expensive coal plants - ScienceDirect](#)

⁴² See [India on track to meet NDC goals under Paris Agreement: Survey - The Economic Times \(indiatimes.com\)](#)

has already deployed 100GW⁴³ of RE capacity and ranks 3rd globally in RE attractiveness.⁴⁴ In this context, it has been one of the frontrunners on bringing the cost of solar energy down via reverse auctions and solar parks. It has also actively engaged with CIF and MDBs on various programs, including improving the RE infrastructure. This engagement is demonstrated via current funding of \$865 million from CTF and co-financing of \$10.2 billion from MDBs.

India has also moved forward on not only closing coal mines but also retiring coal power plants. So far, India has closed many coal mines based on clear policy documents.⁴⁵ For example, Coal India has not only closed 82 mines in the last 3-4 years, but also announced closure of 23 more.⁴⁶ Furthermore, of the 50 GW identified capacity, 12 GW of coal plants have been retired.⁴⁷ While long-term implementation plans are not ready yet, India appears to be making progress on many fronts. India is in discussion on a multi-phase (i.e., pre-closure, early closure, roadmap) programmatic approach with WB and ADB for coal mine closure and coal plant retirements. In this context, a Preliminary Project Proposal Report for coal mine closure is also in progress. Furthermore, the WB is in discussion with states such as West Bengal & Madhya Pradesh on coal plant repurposing. However, it is concerning that India continues to provide mixed messaging on coal. While no coal power plants were built in 2020, the Indian government is encouraging more coal mining and production. Plus, there is no clear messaging on transition away from coal. In this context, engagement with stakeholders – private sector, domestic financial institutions, NGOs – is also not clear.

Leadership

India has shown leadership in moving towards an energy transition that deploys more RE and retires more coal power plants. Various ministries are engaged in this process, including Ministry of Coal, Coal India Limited, Ministry of Power, Central Electricity Authority, and multiple states (West Bengal and Madhya Pradesh). However, India is yet to submit concrete plans for this energy transition, including long-term targets and pathways over time.

Socio-economic Considerations (just transition)

On paper, India has expressed desire for just transition, along the three pillars of Just Transition for All. Plus, there is significant work by NGOs – e.g., The Energy and Resource Institute, Council for Energy, Environment and Water, Prayas, International Institute of Sustainable Development, iForest – on assessing just transitions. These NGOs are in continuous dialogue with the Indian government on ensuring that just transition happens on ground. However, India has not yet demonstrated its approach to just transition in a verifiable manner.

Final Remarks (issues and recommendations)

- i. India needs to be a focus for CIF, given the scale of transformation, and the willingness of the Indian government to explore coal mine closure and coal plant retirement. In fact, India has already closed coal mines and retired coal plants.
- ii. However, given India's mixed messaging on coal, it is recommended that CIF work with India on not only establishing targets – long-term and over time – but also map these targets to actual closures and retirement on ground.

⁴³ See [India's Installed Renewable Energy Capacity Crosses 100 GW - The Wire Science](#)

⁴⁴ See [RECAI Country Index Oct 2019.indd \(ey.com\)](#)

⁴⁵ See [mineclosure_guideline.pdf \(cmpdi.co.in\)](#)

⁴⁶ See [Coal India to close down 23 unviable mines, to help save around Rs 500 cr | Business Standard News \(business-standard.com\)](#)

⁴⁷ See [LS11022021_Eng.pdf \(powermin.gov.in\)](#) for a list of retired coal plants

- iii. In this context, it is recommended that 3-5 pilots are identified as soon as possible, in different states, and work begins to not only assess cost-benefit as related to just transitions but also policy and financing options.

Country Paper 7: Coal transition strategy: Indonesia

Background

Indonesia selected macroeconomic data⁴⁸ indicates average annual growth rate of GDP of 5.5% between 2000 to 2019 with the GDP per capita (in constant US \$ 2010) around \$ 4312 in 2020. With a population of 274 million in 2020, unemployment has declined from 5.1% to 4.1% over the past decade (2011-20). Over this period the country's foreign exchange reserves increased by a third to \$ 129.2 billion.

With a total reserve and resource of about 29 billion ton and 115 billion ton respectively Indonesia is one of the world's largest coal producer and exporter.⁴⁹ Coal production grew at 9% annually from 275 Mt in 2010 to 610 Mt in 2019 of which approximately 60% was used in electricity production. Indonesia's grid-based installed power generation capacity in 2020 was 70.3 GW and is essentially based on fossil fuels – comprising coal (60%), petroleum products (25%), and RE (15%)⁵⁰. The total installed capacity of renewable energy is 10.5 GW out of which 6.2 GW is hydro, geothermal 2.1 GW, bio energy 1.9 GW, solar 0.17 GW and wind 0.15 GW. Solar power is from decentralized, off-grid systems (53 MW) with a modest 118 MW from on-grid systems.⁵¹ The country is dedicated to decarbonisation of its energy sector in line with its commitment to the Paris Agreement ratified with the country's highest regulatory instrument (Law No. 16/2016) followed by its first NDC and its update in July 2021 with detailed road maps as the basis of its implementation. A key area of focus is the country's coal transition strategy that necessitates transformational changes to significantly reduce emissions from the energy sector while addressing targets relating to retirement of CFPPs and enhancing renewable power generation capacity, while simultaneously ensuring that socioeconomic elements of governance, social protection and environmental remediation are addressed.

Climate policy and commitment (Vision and Ambition)

Indonesia is unconditionally committed to reducing emissions by 29 per cent relative to a BAU baseline of 2.87 GT of carbon emissions by 2030 and its conditional contribution would be 41 per cent over the same period. It is a testimony to its vision that has enabled it to conceive a program to meet its NDC targets as well as pursue a longer term strategy for reduction in projected energy sector carbon emission by 73% by 2050 which is equivalent to its 2018 levels and achieve carbon neutrality in the country by 2060⁵². The reduction in power sector carbon emissions would come from a coal transition program that involves retirement of coal-fired power plants (CFPPs), retrofitting CFPPs with Carbon Capture, Storage and Utilization (CCSU) systems and expansion of grid connected renewable power. Government commitment is underscored by its leadership in vigorously promoting the coal transition program that has its unreserved support through its existing policies and regulations (i.e. coal transition as part of country's declared climate neutral strategy). Indonesia's commitment to climate action is consistent and aligned with the Ministry of Energy and Mineral Resources (MEMR) National Energy Policy and the Indonesia Long-Term Strategy for Low Carbon and Climate Resilience 2050.

Strategic Alignment and Transformative Potential

Indonesia's coal transition strategy is aligned in three interrelated areas: technology demonstration, power plant decommissioning and market development. Firstly, the country plans under its long-

⁴⁸ Source: WDI, World Bank; <http://wdi.worldbank.org/tables>.

⁴⁹ Source: Indonesia: Long-Term Strategy for Low Carbon and Climate Resilience 2050; 2021

⁵⁰ Source: IRENA Capacity – Generation, IEA Trade 2017-20.

⁵¹ Source: Ibid

⁵² Source: Updated Nationally Determined Contribution, Republic of Indonesia

term strategy (LTS) to equip its coal-fired power plants with CCSU technologies. CCSU is expected to be retrofitted in 75% of the country's CFPPs by 2050. CCSU presents significant challenges by virtue of its high costs and operational viability. It is unclear whether the techno-economic feasibility of a comprehensive CCSU program has been worked out. Secondly, it targets to retire its CFPPs in two stages totalling 50 GW (by 1 GW by 2030 and 49 GW by 2055), with total decommissioning of its entire coal fleet by 2060. Finally the country plans to implement innovative market development mechanisms such as an Energy Transition Mechanism (ETM) to accelerate and scale transition to clean energy generation. The ETM, under design by the ADB plans to provide \$ 2.5-3.5 billion concessional funding together with investor funds for the SE Asia regions (viz. Indonesia, Philippines and Vietnam) coal transition program. It is expected that ETM will help acquire existing high carbon emitting CFPPs with the intent to retire early and if feasible, repurpose the coal plants and mines for alternative uses including renewable energy generation and/or ancillary services and manage a TA program to advance Just Transition. ETM will enable privately owned CFPPs that have long-term PPAs to be retired early. It is understood that the ETM preparatory design is now at the feasibility study stage in Indonesia and should be completed by mid-2022 and ready to roll out by end 2022. It is anticipated that ETM together with Indonesia's voluntary emission trading program and Renewable Energy Portfolio Standards would serve in leveraging external resources while also selecting CFPPs for retirement/repurposing or as sites for CCS retrofitting. By aligning the disparate elements of market design (viz. wholesale electricity markets, carbon pricing), technological modernization (viz. CCSU), pre-feasibility and feasibility studies (viz. cost benefit analysis of retirement /repurposing, NDC simulation studies, etc.) the coal transition program promises systemic change that is truly transformational in scope. This however is an assumption and needs to be tested and validated.

Management & Execution Plans (Implementation)

The readiness of the coal transition plan is hinged on the ADB proposed ETM country facility to explore retirement of CFPPs and to the extent feasible, repurposing these plants for RE generation. An initial pilot phase aims to acquire 2-3 CFPPs and assess the feasibility of such retirement. A full scale roll out of the ETM envisions retirement of 50% of the country's operating coal fleet by 2050 and the entire fleet by 2060. The State Electricity Utility, PLN would provide Implementation support under an ADB managed partnership platform with a steering committee comprising donors (IFIs, local investors, lenders, etc.) with oversight to ensure climate credentials and goals and just transition for affected communities. ETM is planned to mobilize capital from MDBs, private institutional investors, donor funds and other public and private sources. Capital from these sources will be directed towards two separate windows - a carbon retirement fund (CRF) and a clean energy fund (CEF). The CRF will acquire, operate and decommission CFPPs earmarked for retirement and the CEF would support the financing of renewable energy projects as part of a repurposing program as well as other renewable energy projects including grid stability and reactive power support investments. Since 2010 Indonesia has implemented five geothermal power projects totalling 750 MW by using CIF –CTF concessional finance of \$ 434 million in partnership with IBRD, ADB and IFC leveraging an impressive \$ 3.4 billion.

Leadership

Indonesia has shown leadership in moving towards an energy transition that envisages progressive development of market mechanisms to retire/repurpose more coal power plants and deploy RE. These initiatives are well aligned and coordinated with the Ministry of Energy and Mineral Resources, National Energy Policy and the Indonesia Long-Term Strategy for Low Carbon and Climate Resilience 2050. An example of commitment is the decision by the Ministry of Finance to support private sector engagement through a USD 5 billion budgetary allocation by the Ministry of Finance towards subsidies and viability gap funding in renewable/clean energy assets.

Socio-economic Considerations (Just Transition)

A central tenet of the ETM program and reflected in its mandate and exercised through a ETM Partnership Platform is the issue of Just Transition ensuring that all social considerations (i.e. socio-economic benefits such as new jobs and reduced job losses, re-training and re-skilling, gender equality, etc) are met. Stakeholder engagement would be a key aspect of the Just Transition strategy with the government working closely in consultation with an array of civil society organizations like the Indonesian Renewable Energy Society (METI-IRIS), the Indonesian Solar Energy Association (AESI) and NGOs like Hivos Foundation and Institut Bisnis dan Ekonomi Kerakyatan (IBEKA)

Final Remarks (Issues and Recommendations)

The coal transition strategy would have to contend with five broad issues as briefly presented below:

- i. The ETM as a coal transition platform and vehicle needs to be fully tested and validated.
- ii. The locked-in phenomenon of CFPPs make it difficult to replace.
- iii. The techno-economic feasibility and pilot scale demonstration of CCSU has to be established before large scale replication is attempted.
- iv. The opportunity loss of coal production is estimated at 2.4 billion tons between 2030-2050 worth USD 218 billion⁵³. This economic loss associated with coal mine investments, operations and closure could be a key deterrent.
- v. Need for the preparation of human resources and their employment to transit from coal-based systems to low-carbon energy systems.
- vi. Relevant studies including 1-2 pilot CFFP retirement/repurposing projects as part of PLNs first stage coal transition plan is recommended for consideration.

⁵³ Indonesia: Long-Term Strategy for Low Carbon and Climate Resilience 2050; 2021, pp67

Country Paper 8: Coal Transition Strategy: Kazakhstan

Background

Kazakhstan, a country with 18.75 million population, has a GDP of \$213 billion and income per capita of \$11,519 in 2019⁵⁴. Unemployment is very low; 4.8% in 2019 and 6.5% in 2020.

Kazakhstan is one of the richest countries in fossil fuel reserves (37 billion ton of coal; 30 billion barrels of oil; 85 TCF of natural gas). Coal use for power generation, even though it has been declining (as a percentage of the total) in recent years, is about 70%; natural gas provides approximately 20%; 7% comes from hydro and 3% from renewables. From the total installed capacity of 27 GWs, 22 GWs are using coal or natural gas and the remaining 5 GWs are solar and wind. Included in the fossil fuel plants are numerous combined heat and power plants which are critical for heating urban areas.

Kazakhstan is a signatory of the Paris Agreement and is making substantial efforts to accelerate the introduction of renewables.

Climate Policy and Commitment (Vision and Ambition)

Kazakhstan's NDC targets 15% less GHGs by 2030 (economy-wide) compared to 1990 (conditional target is 25% reduction) and pledges to achieve a carbon-neutral economy by 2060. In the power sector, the country's goal is to achieve 15% electricity from renewables by 2030 (from 3% in 2020) and 50% by 2050; also, to reduce coal power generation by 25% by 2030.

Overall, the ambition is characterized as low by the Climate Action Tracker⁵⁵: "rates the unconditional targets in the NDC as insufficient (insufficient (<3°C) remarking "If the CAT were to rate Kazakhstan's current policies, they would be rated as "Highly Insufficient". Prioritizing the modernization of existing coal plants, as well as planning to replace some coal capacity with natural gas, is short-sighted, considering that gas is not a solution for the deep decarbonization needed to keep warming to 1.5°C."

However, the country has the potential to target and implement a more aggressive GHG reduction strategy. It has already in place a GHG Emission Trading System (ETS) which could deploy more effectively in the future. Presently CO2 prices are very low to make a difference (average in 2020 was 456 KZT (US\$1.10)⁵⁶), but it has the potential to increase prices and become more effective, if deployed properly. Also, there are recent studies (e.g., LEDS) which suggest a more aggressive GHG reduction strategy, but it is up to the Government to adopt specific targets and have a clear implementation plan to achieve them. It is expected that a carbon-neutral strategy by 2060 will be announced in COP26.

Strategic Alignment and Transformative Potential

With coal and natural gas contributing nearly 90% of the power generation in Kazakhstan, specific actions would be needed for retirement of these plants and replacement with green energy sources. The EOI mentions conversion of coal to gas, but it provides no further specifics. Even if it did, switching from coal to gas will reduce GHGs (e.g., by half on per MWh basis), but it is not going to help long-term decarbonization efforts. If natural gas is to be used as a transition fuel and then be replaced, the strategy needs to be laid out, something which is not reflected in the EOI or any other documents.

It should be pointed out that Kazakhstan is facing a challenge to phase out coal especially in the combined heat and power plants which are essential for heating purposes. Conversion from coal to

⁵⁴ World Data Indicators. The World Bank. 2021

⁵⁵ <https://climateactiontracker.org/countries/kazakhstan/>

⁵⁶ Icap, August 9, 2021: Kazakhstan Emissions Trading Scheme

natural gas is being targeted, but subject to availability of gas and acceptable price (according to the draft updated NDC).

CIF support is intended to go towards reduced coal generation, but no specifics are provided; the main focus is on increased renewable generation, where steady progress is being made. Whether CIF should support renewables requires further justification considering that private investors are already active in the country; the additionality of CIF resources would need to be demonstrated.

Management & Execution Plans (Implementation)

No specific plans are provided except for scale-up of renewables. So, the readiness for implementation of decarbonization is not clear.

EBRD, ADB, World Bank and IFC are involved in the country. EBRD, in particular, has been very active in providing Technical Assistance and investment for renewables (with CTF and GCF resources).

Through promotion of renewables, private investors have become more and more active in Kazakhstan, which could help in the decarbonization efforts, too. Renewable energy policies and measures, such as auctions, are being used in Kazakhstan to encourage the uptake of renewables. The auctions in 2018 and 2019 resulted in awarding of around 1 GW of renewable energy projects including 600 MW of wind, 350 MW of solar PV and around 100 MW small hydro.

Leadership

The EOI is signed by the Ministry of Energy and we have to assume that the Government is supportive and committed to decarbonization. However, there is generally lack of specific policies and plans to illustrate how the NDC goals will be achieved.

Socio-economic Considerations (Just Transition)

There is mention of the need for skill development, but no specifics. Also, not adequate emphasis on consultation with key stakeholders and alleviation of adverse social impacts, especially in coal mining areas and the coal power plants.

Final Remarks (Issues and recommendations)

Kazakhstan has substantial transformative potential, but it needs to develop specific plans for decarbonization. Even if natural gas is a transition fuel, a plan needs to be laid out which indicates the role of each energy resource over time and which progressively leads to eventual decarbonization. The country (with the assistance of MDBs) could develop such a plan rather quickly. With a strong Government leadership and commitment, it could be a transformative example, especially for the Central Asia region.

Country Paper 9: Coal Transition Strategy: Morocco

Background

Morocco's GDP per capita (constant 2010 US\$) had been improving gradually at an average of 1.8% per year during the last decade, before declining rapidly in 2020 by 8.2%. Unemployment, which had been decreasing from the high of 9.7% in 2014 to 9% in 2019, increased to reach 10% in 2020. While the GDP continues to grow, tax revenues (% of GDP) have declined slightly to reach 21.4% in 2019. During the last decade, public debt has hovered around 3.5% to 4.5% of GNI. Given the absence of domestic coal resources, the coal rents (% of GDP) stood at 0%⁵⁷.

Morocco is a net fuel importer with significant dependence on imported fossil fuels. Increasing population, improving living standards, and increasing rates of electricity access have fuelled rapid growth in the demand for electricity and energy. In less than two decades, Morocco reached near-universal access to affordable electricity and tripled its power supply. CFPPs, powered by imported coal, have addressed the rising demand, but the impacts such as deterioration of local air quality and climate change are becoming evident.

The government of Morocco aims to transform its energy sector towards a sustainable and climate-friendly direction. Renewable energy resources (mostly CSP, solar PV and wind), together with energy efficiency, will form the backbone of the clean energy transition. The country is also planning to decommission CFPPs to improve the environmental footprint of its energy system. With investments in clean energy technologies, Morocco aims to address its rising growing energy demand as well as ensuring a socio-economically just transition.

Morocco satisfies the first and third eligibility criteria as it is included in the OECD/DAC list for Official Development Assistance⁵⁸ and has active lending programmes with several CIF's partner MDBs such as AfDB, EBRD and IFC. The country satisfies the second criterion as it produced 16 TWh of electricity from coal in 2019 and the share of coal in electricity generation was around 42% in 2020.

Climate Policy and Commitment (Vision and Ambition)

Morocco has made significant advances in ensuring access to affordable, reliable and sustainable energy for its population. In less than one decade, the country has increased its renewable energy share in the power mix fourfold to reach 20.3% in 2020 (with a 37% installed renewable capacity). As a result, Morocco is emerging as a sustainable energy leader across the developing world.

The country is committed to addressing the challenge of climate change by moving towards a more sustainable energy sector. The updated NDC has an unconditional target of reducing GHG emissions by 18.3 % below BAU by 2030. The conditional target, with support from the international community, aims for a 45.5% reduction below BAU by 2030. The country's NDC is considered to be compatible with the Paris Agreement's <1.5°C limit by the Climate Action Tracker⁵⁹. Morocco increased its ambition for the development of renewable energies by setting the objective of more than a 52% share of renewable installed capacity by 2030, which exceeds the objective announced at COP 21 and COP22. Morocco issued its 2030 National Climate Plan in 2019. This strategy confirms the objectives set under the NDC and sets out new policies and measures for climate governance. The quest for sustainability is consistent with Government's overarching development strategies such as the New Development Model.

⁵⁷ World Bank, WDI Indicators <https://databank.worldbank.org/source/world-development-indicators>

⁵⁸ OECD, 2021, <https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/DAC-List-ODA-Recipients-for-reporting-2021-flows.pdf>

⁵⁹ Climate Action Tracker, 2021, <https://climateactiontracker.org/countries/morocco/>

Morocco's commitment to climate action, renewables and energy efficiency is supported by several policies and regulations which are resulting in the rapid increase in the share of renewables in the country's power sector. Policies such as renewable energy auctions, regulations for self-consumption and net-metering have created a conducive environment for investments in renewable energy projects. Energy efficiency is supported through building regulations and laws.

Strategic Alignment and Transformative Potential

The country has significantly increased access to electricity to 99.5% of the population in 2017 compared to 50% in 2007. This rapid increase together with the growing population and living standards has resulted in the installation of several fossil fuel plants running on imported coal. Therefore, Morocco relies heavily on coal which fuels 41% of electricity generation and around a quarter of its total energy supply.

Morocco's coal power fleet consists mostly of new power plants. The country has four CFPPs with a total installed capacity of 3763 MW, out of which 1283 MW were installed recently in 2018. Morocco is considering the retirement (and repurposing⁶⁰) of a 280 MW coal plant (10% of total coal) which is older than 25 years as a pilot project in collaboration with the World Bank. They indicate that overall 2 GW of capacity can be retired over the next decade. The country has already taken the first step towards this goal and has reconsidered two planned actions in 2019 on coal electricity generation plants (Nador 1,320 MW and Jerrada unit 4 of 350 MW) and intends to go beyond cancelling new coal generation to explore early retirement of existing CFPPs.

The resources from CIF could be used as blended finance with financial inputs from other MDBs and could help de-risking private sector investment in the effort to decommission and repurpose coal power plants.

The CIF funding could support innovative business models to repurpose coal power plants as most of the installed coal capacity in Morocco is owned and operated by the private sector. Renegotiation of the existing PPA will require technical expertise, innovative approaches as well as significant financing support (a preliminary analysis estimated early termination cost of PPAs to exceed \$1bl). The lessons learned from such support could be widely shared with the other countries facing the same challenges.

Management & Execution Plans (Implementation)

The CIF resources could take the form of technical assistance, concessional loans for repurposing, and tailored risk mitigation instruments for the private sector. The resources will be blended with MDB financing.

The repurposing of coal power plants has been analysed by a World Bank study⁶¹, showing significant benefits, including job creation and worker retention. The program will be aligned with other plans (industrial policy, skill development, gender empowerment) to ensure that the benefits are well distributed. Some financial challenges have been identified.

The coal transition programme will benefit from extensive experience in project development in several renewable energy projects in solar PV, wind and concentrated solar power (CSP). It will also benefit from comprehensive and conducive institutional and policy frameworks. On the institutional front, Morocco's National Office of Electricity and Drinking Water (ONEE) and the Moroccan Agency for Sustainable Energy (MASEN) have been leading the sustainable energy effort. On the policy front policies, particularly auctions, have had significant success in the deployment of large- scale renewable but small scale RE policies e.g. net-metering have not been very successful. Competitive

⁶⁰ This was not included in the EOI but was reported during the meetings with relevant MDBs

⁶¹ Huang et al 2021, <https://ieeexplore.ieee.org/document/9448134>

bidding has been used to award more than 500 MW of CSP and around 500 MW of solar PV and 800 MW of dispatchable solar PV and CSP hybrid in Morocco.

Morocco has extensive experience in working with multilateral development banks such as the World Bank and the African Development Bank on energy sector projects including solar PV, CSP, transmission and distribution, energy access. The country was the largest CTF recipient in 2018 for solar. Three out of the four coal plants are IPPs and most of the RE projects were developed by private investors; so the private sector has played an important role and could do so in the future.

Leadership

Morocco's public sector has been developing renewable energy projects in collaboration with MDBs and the private sector. Institutions such as the Ministry of Energy, Mines and Environment, ONEE and MASEN have gathered significant experience in renewable energy development. The Ministry of Energy, Mines and Environment is supporting the expression of interest.

Socio-economic Considerations (Just Transition)

The transition from coal could help stimulate local economic growth, jobs creation, skills development and youth employment in Morocco. The program will be aligned with other plans (industrial policy, skill development, gender empowerment) to ensure that the socio-economic benefits are maximized and distributed throughout society.

Historically, job creation, local industrial development and generation of economic value is very important for Morocco and has been stressed through domestic content requirements in several renewable energy projects.

Final Remarks (Issues and Recommendations)

- i. Excellent opportunity to accelerate coal retirement in a system with privately-owned plants. The Chilean model should be looked at; private owners may be willing to repurpose plants or close the coal plants and replace them with renewables.

CIF support (at this time) would be critical to help the country develop further its decarbonization strategy and prepare and implement projects.
- ii. Given that Morocco has been more successful in attracting private finance what additional value will CIF resources bring to Morocco's coal transition?
- iii. Morocco has a relatively young coal power fleet, many of which are privately owned independent power producers. How can the lessons learned from the retirement of older Mohammedia (280 MW) be applied to repurpose/retire new coal plants (replicability)?

Country Paper 10: Coal Transition Strategy: Namibia

Background

Namibia, a country with 2.54 million inhabitants, is a middle-income country with a GDP per capita of \$5,881 and total GDP of \$14.7 billion⁶². Unemployment is high, at 19.75% in 2019. The country's retail electricity tariffs are reflective of costs (one of the 2-3 cases in Africa), but the Government is careful to avoid unnecessary tariff increases, as affordability is a serious issue.

The country has a peak demand above 600 MW and power plants with a total installed capacity of 680 MW (347 MW hydro; 170 MW of wind and solar; 122 MW utilizing imported coal; and 41 MWs of liquid fuels (diesel and HFO)). The available capacity is not adequate and the country imports as much as 65% of its electricity demand from neighbour countries (mostly from South Africa, where 85% of the electricity is produced from coal). So, even though production of electricity from coal in Namibia is less than 10% of the country's energy consumption, coal-based power generation is a substantial portion of the total energy consumed, if imports are taken into account. Therefore, Namibia is eligible for the ACT Program.

The country has signed the Paris Agreement and intends to reduce its reliance on imports and increase utilization of green energy resources including hydro, wind and solar.

Climate Policy and Commitment (Vision and Ambition)

The updated NDC aims to reduce GHGs by 91% in 2030 and reach net-zero by 2050. While the NDC could be seen as ambitious, it is mostly non-energy sector based. Most of this is from Agricultural and Forestry (AFOLU – 79%); energy represents 11% reduction. 71% of total AFOLU will be from reduced deforestation.

Nevertheless, Namibia plans to increase the contribution of renewables to 70% of total consumption and has formulated several policies and prepared power sector development plans including: The Renewable Roadmap (2019) developed jointly with the World Bank; the National Renewable Policy; and the Harambee Prosperity Plan II. Furthermore, it established the Green Hydrogen Council and is pursuing hydrogen production.

On renewables, Namibia began with a Feed-in Tariff (FIT) program in 2015, which helped catalyze the successful development of 14.5 MW of renewable power capacity (13 solar PV and one wind project). Starting in 2016, the country switched to auctions (following South Africa's model), which is the latest procurement mechanism for renewables. As a result, Namibia awarded a 37 MWp solar PV IPP through an auction program run by NamPower and with a tariff of USD 63/MWh; this was followed by 20 MWp solar PV IPP (Khan) at USD 29/MWh.

Namibia, working jointly with Botswana, The World Bank, IFC, AfDB, USAID and others, is developing the Mega Solar Initiative (approved in April 2021) to build 2- 5 GWs of solar for both the domestic and the regional power markets.

Strategic Alignment and Transformative Potential

The transformative potential of the proposed policies and actions is high for the domestic market and the Mega Solar Initiative could have positive contributions to the regional power market (SAPP). The proposal to retire the Van Eck coal plant (122 MW) is in the right direction, but further assessment is needed. One of the four units of the plant (#1) retired already, but the other three (#2, 3 and 4) were rehabilitated in 2017 and expected to operate for another 10-35 years (at 80% of the

⁶² World Data Indicators. The World Bank. 2021

original design capacity). The remaining operating life (10-35 years) stated is very broad; plant efficiency is low; and resulting local pollution is a serious issue.

The proposed development of the Mega Solar, under which 2- 5 GWs of solar will be built is rather ambitious and deserves support, as it will benefit both the domestic and regional markets. The Mega Solar EOI was signed between the Governments of Namibia and Botswana, the African Development Bank, IBRD, and IFC and the African Union Development Agency-New Partnership for Africa's Development in April 2021. The important feature of this project is that it includes dispatchable units (CSP with energy storage) which can address the renewable intermittency and provide a basis for full decarbonization, eventually. We do not have details on the Mega Solar Initiative and there may be questions on how realistic it is, given the challenges related to infrastructure, institutional readiness and uncertainty about supply-demand in the region.

A positive development is the scope of the World Bank loan to NamPower (\$100 million) which includes strengthening of the power grid (new transmission) to increase integration of renewables.

CIF resources are intended to be used for decommissioning of Van Eck coal plant, re-skilling/training of labor and support of the Mega Solar Initiative.

Management & Execution Plans (Implementation)

Namibia is well-prepared to pursue its targets, even though more specifics need to be developed soon, especially with regard to the Mega Solar Initiative. Implementation of the NDC needs \$5.33 billion out of which \$1.36 billion is earmarked for the energy sector. \$1 billion investment is planned by NamPower, which includes transmission expansion, renewables and energy storage.

With regard to the Mega Solar Initiative: Preparatory work has started with a roadmap for renewables being supported by the World Bank. The recent approval of \$33.5 million Green Climate Fund (GCF) resources have been allocated to Namibia under the World Bank's Sustainable Renewables Risk Mitigation Initiative and are targeted to support development of the first Mega Solar dispatchable renewable energy investment in Namibia. Also, the WB has identified support to Namibia's investments in a renewable energy park shared infrastructure comprising 200 MW CSP and 200 MW wind, along with variable renewable energy integration investments including 200 MWh storage, and support for electrification for an estimated 1 million people. The World Bank is also working closely with the Government to launch the necessary preparatory works including pre-feasibility studies and upstream support to unlock the first large-scale dispatchable renewable energy project in Namibia. Moreover, the National Integrated Resource Plan is currently being updated and will offer a list of priority Government projects.

There is substantial involvement and past experience working with the World Bank, IFC and AFDB, even though there is no past CIF involvement. The country intends to engage the private sector especially in renewables, which should help with project financing and implementation.

Leadership

The EOI seems to have strong Government support (Ministries of Energy and Finance). Also, the numerous policies indicate strong commitment by the Government. Of course, this commitment needs to be demonstrated with specific plans and implementation of projects.

Socio-economic Considerations (Just Transition)

There is strong emphasis on social impacts, especially creation of new jobs and re-skilling/training of workers. It should be mentioned also that the country aims to increase energy access from 55.2% to 100% by 2030.

Final Remarks (Issues and recommendations)

Namibia has the potential to develop and implement a successful transition to sustainable energy, but it needs to move quickly into project planning and implementation. Some outstanding issues:

- i. The updated NDC suggests that energy will contribute 11% GHG reduction. This seems low and needs to be re-checked, because specific policies and actions planned suggest potentially higher GHG reductions. For example: 70% renewables by 2030; the Mega Solar Initiative; and potential elimination of the power imports.
- ii. The Mega Solar Initiative is a very important project for the countries involved (Botswana and Namibia) and the regional power pool (Southern Africa Power Pool) and deserves to be supported. It is recognized that the Mega Solar Project is in an early planning stage, but the initial domestic focus and the support from MDBs and bilateral organizations enhances the likelihood for success. It should be noted though that it is quite ambitious and more details need to be developed soon including:
 - The adequacy of transmission capacity/infrastructure for exports.
 - The supply-demand situation in the region and the competitiveness of Mega Solar assets in the market.
 - Readiness and capacity of relevant institutions to implement such large- scale project.

Country Paper 11: Coal Transition Strategy: Republic of North Macedonia

Background

The RNM is an upper-middle-income country, and selected macroeconomics data⁶³ indicates GDP per capita was \$6,077 in 2020, with a four percent decrease from 2019. The country has 20.8 million inhabitants in 2020, with unemployment reaching 18.4% from 17.3% in 2019, a 1.1 % increase since the start of COVID-19. The overall debt level has steadily declined, reaching 6% of GNI (2019) from over 10% in the previous year. Tax revenues account for 17.2% of GDP.

North Macedonia has a total energy supply⁶⁴ of 2.8 Mtoe, with renewables and NCRE (primarily hydropower) amounting to just 0.3 Mtoe in 2019. Coal, oil, and Renewables (RE and NCRE) are the primary energy sources, and coal production reached circa 6 Mt/yr in 2019. Grid-connected installed power generation capacity in 2019 was circa 1.36 GW, and electricity generated around 5.87 TWh. The country is a net importer of electricity; coal, hydropower, and natural gas are the critical sources for electricity generation. Natural gas is the sole source for heat production in 2019.

Progress towards the Sustainable Development Goals 7⁶⁵ (affordable clean energy access) has shown mixed achievements with significant reliance on fossil fuels, with RE deployment at a very early stage, accounting for less than 3% in 2019. Hydropower has been a critical component for balancing the system and has faced climate variability in recent years.

The grid needs modernization to accommodate renewable energy. Significant upgrades are required to increase reliability and reduce losses below the 16% reported in 2019. Moreover, smart meters are needed across the entire electricity distribution network to improve RE performance through digital transformation.

The country's plans to diversify away from the current fuel mix towards a low carbon pathway could face significant challenges, including (i) challenging socio-economic situation with high unemployment, (ii) address climate variability in the region, which affect dams' performance in the context of competition for water usage and availability. Nonetheless, investments in clean energy infrastructure can open up new economic opportunities.

Climate Policy and Commitment (Vision and Ambition)

The RNM has stated its GHG avoidance commitment by preparing an updated NDC, ratifying the Paris Agreement (2017), and Sustainable Development Goals (SDG). The indicated target has been set at 51% GHG overall emissions reduction (82% net) by 2030 compared to 1990 levels.

As an ascending country to the EU, its response to climate change is aligned with the Union's Fit-for-55 initiative and reflected in the draft National Energy and Climate Plan (NECP). The draft indicates phasing out coal-fired power plants and increasing electricity generation from hydropower, solar, wind, natural gas (NG), and biomass by 2040. The current energy strategy and NECP/enhanced NDC display a distinct coal phase-out pace. The latter is more ambitious (2040 vs. 2027) - it is expected North Macedonia will formally approve the NECP within the next few weeks).

The near-term identified targets comprise closure of Oslomej TPP (120MW), which will be entirely replaced through a 100 MW PPP tender that was concluded successfully in April 2021 and a 20 MW solar PV plant financed by the EBRD of which 10MW has already achieved financial closure. The TPP runs at lower capacity due to limited coal availability in the supplying mine.

⁶³ World Data Indicators. The World Bank. 2021

⁶⁴ Energy Balances. Eurostat. 2021

⁶⁵ Sustainable Development Goal: North Macedonia. Voluntary National Review 2020. United Nations.

The RMN acknowledges the impact of Oslomej closure on local jobs and economic activities dependent on the plant and is mobilizing support through MDBs, private partners, and national and regional governments to foster new opportunities. Currently, coal rentals amount to 0.23% of GDP with a significant impact at national and local levels.

Strategic Alignment and Transformative Potential

With two operational open-cast lignite mines, the country has a high dependency on coal for electricity and heat production (above 50%). The commissioning of Zivojno mine by 2022 could supply coal to Bitola for another 10.6 years, which runs contrary to the ambition to increase RE deployment.

The EOI states that the coal transition should start in 2025 and last until 2040, though the transition may be initiated earlier with the closure of Oslomej. The draft NCEP and energy development strategy (EDS) state that the Bitola TPP (600 MW) should also be decommissioned by 2027 and replaced with 1,400 MW solar PV and 750 MW wind deployment. Bitola represents 1/3 of overall national installed capacity, and one unit is expected to be reconverted to run on gas until the new RE capacity comes on stream. A 1,000 MW hydropower plant and 160 MW new gas-fired power plants have also been considered to replace the planned decommissioned TPPs.

The result of the Oslomej TPP closure initiative should provide lessons for Bitola's TPP decommissioning. Additional resources from the CIF ACT could be deployed to provide technical capacity and concessional finance to support a much broader decarbonization programme.

Management & Execution plans (Implementation Plans)

North Macedonia has a track record in deploying resources from MBDs, RDBs, and bilateral organizations. EBRD (€2.18 bn), the World Bank (€0.5 bn), and IFC (above €0.1bn) are significant lenders to the country and its private sector. Both EBRD and WBG have been responsive and meaningful contributors to North Macedonia's investment needs. The new specific projects should target TPPs and coal mines closure.

The EU's Fit-for-55, the draft NCEP, EDS and SDG are the four guiding policies that complement work underway on Just Transition (JT) diagnostics supported by EBRD. The JT is expected to provide additional programmatic details on the committed decommissioning of CFPPs, coal phase-out, and GET's decarbonization pathway.

The country is enacting policies and measures to support renewables, such as feed-in tariff (FIT), feed-in premiums (FIP) and RE auctions for partially replacing Oslomej. Four PPP tenders for 242 MW PV plants have already been carried out with three completed.

The RMN has clearly stated in the EOI of its intentions to initiate and maintain a broader engagement with the private sector in the coal phase-out program.

North Macedonia is the first country in the Western Balkans to have an NECP (to be approved in the next few weeks) and the first in the region to have target dates for complete coal phase-out before 2030. In June 2021, North Macedonia signed up to the Powering Past Coal Alliance (PPCA), a coalition of national and sub-national governments, businesses, and firms working to advance the transition from coal power generation to clean energy. The addition of North Macedonia to this group is particularly significant, as it is the first Western Balkans country to commit to transiting from coal.

The Ministry of Economy (MoEC) submitted the EOI. Nonetheless, sustained cooperation and coordination articulation within the involved ministries is a *sine-qua-non* condition for the initiative's success.

The EOI and NDC disclose and reflect a targeted approach. Further details would emerge from the Just Transition Diagnostics as it will ensure a broad consultation involving the private sector, civil society, affected workforce, pollution, and supporting diversification option. EBRD's involvement in the JT diagnostics is undoubtedly an assurance that the initiative will be inclusive, fair, and sustainable.

Final Remarks (Issues and Recommendations)

The coal transition strategy provides an opportunity to revisit the following topics:

- i. Investments in low-carbon technologies are insufficient to ensure an accelerated transition. Additional effort to improve performance and governance among involved parties is needed towards enabling firm capacity and ancillary power sources.
- ii. A revisited gas network infrastructure and regulations could benefit domestic biogas/hydrogen production, reduce NG imports, and avoid unnecessary strain on consumers. A new PPP framework for a nationwide gas distribution network is needed for the private sector engagement.
- iii. The energy-water-food nexus needs to be addressed based on principles of sustainable resources management during volatile climate patterns, increasing efficiency, reducing trade-offs.
- iv. The social and economic impact of the energy transition will be a significant challenge in the coming years. An articulated, sustainable, and resilient plan requires a coordinated effort from the GoRMN, MDBs, and bilateral entities.

Country Paper 12: Coal Transition Strategy: Philippines

Background

In 2019, Philippine's population was approximately 108 million.⁶⁶ Furthermore, in 2019 its domestic gross product was approximately 416 billion U.S. dollars in absolute terms and approximately 1.1 trillion dollars in purchase power parity terms. The corresponding per capita numbers were 3,850 and 10,230 dollars, respectively. In the same year, its domestic gross product grew by 6.0% and the per capita domestic gross product grew by 4.6%.

The Philippines is a net energy importer despite low consumption levels relative to its Southeast Asian neighbours. The country produces oil, natural gas, and coal. Geothermal, hydropower, and other renewable sources account for a significant share of electricity generation.

In 2019, total primary energy consumption in the Philippines was 47.9 MTOE.⁶⁷ The largest share was petroleum (45%), followed by coal (36%), natural gas (7%), non-hydropower renewables (7%), and hydroelectricity (4%). Coal production grew to 16,832 million tons in 2019. In 2019, coal consumption increased to 36,509 million tons, and coal imports grew to 29,306 million tons.

In electricity, installed capacity was 25 GW in 2018, and total generation was 106 TWh in 2019. Thermal power from fossil fuels, primarily coal and natural gas, accounted for 68%, or 17 GW, of total capacity. Hydropower and other renewable accounted for the remaining 8 GW. Coal power capacity and generation continue to increase, however, with 1GW of CFPPs coming online in 2019.

Climate Policy and Ambition (Vision and Ambition)

Philippine's (ratified) NDC commitment at the Paris COP is ambitious and 2°C compatible. This conditional commitment pledges that emissions would be 70% below the business as usual (BAU) scenario. The condition is on availability of financial resources, including technology development and transfer, as well as capacity building.

In concrete terms, in its National Renewable Energy Program (NREP),⁶⁸ Philippine has committed to RE generation targets – 30% share by 2030 and 50% share by 2040. These are ambitious, in particular in developing country context

Philippine's transformative potential is significant. It has high coal dependence, with coal contributing to 36% of primary energy supply and 57% of electricity supply. Furthermore, the existing coal power plant capacity is approximately 11GW, nearly 50% of the total installed capacity.

Philippine appears to have aligned itself with the Energy Transition Mechanism (ETM), proposed by the ADB. In this context, it has a significant coal plant retirement ambition of 50% of existing coal power plant capacity, i.e., greater than 5 GW of capacity.

Management & Execution plans (Implementation Plans)

Philippine's implementation record is impressive on one hand and confusing on the other hand, as it relates to coal, as we discuss below.

Philippine was the first country in Southeast Asia with moratorium on new coal. As a result, many large companies are exiting plans for developing and constructing new coal plants.⁶⁹ If Philippine is able to follow on this moratorium, by itself it could reduce emissions by up to 32-35% compared to

⁶⁶ See [World Development Indicators | The World Bank](#)

⁶⁷ See [International - U.S. Energy Information Administration \(EIA\)](#)

⁶⁸ See [National Renewable Energy Program | Department of Energy Philippines \(doe.gov.ph\)](#)

⁶⁹ See [Retiring coal plants | Philstar.com](#)

current policy. Furthermore, Philippine has considerable experience in working with CIF and MDBs, on renewable energy, energy efficiency, and transportation.

While long-term implementation plans are not ready yet, Philippine appears to be making progress on many fronts. In particular, it appears to be aligned with the ETM alignment. There is a prefeasibility study underway with ADB, with plans to acquire 2-3 coal plants in the pilot phase, and to use market-based mechanisms to ensure cost-effectiveness.

However, it is concerning that Philippine continues to provide mixed messaging on coal. While the draft Philippine Energy Plan forecasts a much higher uptake of solar energy in comparison with NREP, and includes electricity market reforms to support RE, it does not include the coal plant moratorium. Plus, there is no clear messaging on transition away from coal, and engagement with stakeholders – private sector, domestic financial institutions, NGOs – is also not clear. Finally, current policies are not on track on meeting Paris NDC commitments⁷⁰

Socio-economic Considerations (Just Transition)

Philippine has shown leadership in moving towards an energy transition that deploys more RE and retires more coal power plants. Various stakeholders are engaged in this process, including Department of Energy, Department of Finance, and Philippines Central Bank (PCB). In this context, PCB's leadership in environmental/climate initiatives is laudable – its Sustainable Finance Framework⁷¹ is the first in Asia. However, Philippine is yet to submit concrete plans for this energy transition, including long-term targets and pathways over time.

On paper, Philippine has expressed desire for just transition, consistent with the whole-of-development-and-society approach of government and appears to be fully aligned with the ETM. However, Philippine has not yet demonstrated its approach to just transition in a verifiable manner.

Final Remarks (Issues and Recommendations)

- i. Philippines may still be a focus for CIF, given the potential of transforming the electricity sector in a significant manner, and the willingness of the Philippine government to work with ETM.
- ii. However, given Philippine's mixed messaging on coal, it is recommended that CIF work with Philippine on not only establishing targets – long-term and over time – but also map these targets to actual closures and retirement on ground.

In this context, it is recommended that 3-5 pilots are identified as soon as possible, in different locations, and work begins to not only assess cost-benefit as related to just transitions but also policy and financing options.

⁷⁰ See [Philippines | Climate Action Tracker](#)

⁷¹ See [IEEFA: Philippines Central Bank offers new support for energy transition and renewables - Institute for Energy Economics & Financial Analysis](#)

Country Paper 13: Coal Transition Strategy: South Africa

Background

South Africa's GDP per capita (constant 2010 US\$) had been declining at 0.6% per year since 2015, before plunging rapidly at 8% in 2020 due to the pandemic. The unemployment rates have been above 20% for the last couple of decades. With the pandemic, the unemployment rate exacerbated to around 29% in 2020, with estimates in the last Quarter of 2020 putting it at record highs of around 32%⁷². Tax revenues (% of GDP) had increase slightly to reach around 27% in 2019. Debt servicing stood at around 5% in 2019. Coal rents (% of GDP) have declined from 3.1% in 2011 to around 1.9% in 2019⁷³.

South Africa has relied on its ample coal resources – the eighth-largest reserves in the world – to address the demands of its growing economy and rising population. The country is the largest producer and consumer of coal in Africa and relies on coal to satisfy its demand for power and energy. Due to the large penetration of coal generation, the power sector is a key contributor to GHG emissions with 48% of the total CO₂ emissions. Coal mining and burning are the leading causes of air pollution which results in extremely negative health impacts in the coal-rich regions of South Africa (e.g. Highveld, Mpumalanga).

The government of South Africa aims to diversify its power mix and move towards a sustainable energy sector to meet the growing energy demand as well as ensuring a socio-economic just transition. Renewable energy resources (mostly wind and solar) are expected to be central to the clean energy transition. The country is also planning to decommission a significant share of old and inefficient coal-fired power plants to improve the financial and environmental performance of the energy sector while also meeting global climate commitments.

South Africa satisfies the first and third eligibility criteria as it is included in the OECD/DAC list for Official Development Assistance⁷⁴ and has active lending programmes with several CIF partner MDBs such as AfDB and IFC. The country comfortably satisfies the second criterion as it produced 191 TWh of electricity from coal, the share of coal in electricity generation was around 86% in 2020 and coal production was 225 million ton of coal in 2019.

Climate Policy and Commitment (Vision and Ambition)

South Africa is strongly committed to reducing its energy-related GHG emissions. Under the Paris Climate Agreement, the first NDC (2016) of South Africa commits (unconditional) to constrain GHG emissions ranging between 398 and 614 Mt CO_{2eq}, respectively by 2025 and 2030. Emissions are set to peak by 2025 and decline after 2036. The proposed draft NDC (2021) increases the ambition in near-to-medium term emission goals, resulting in a narrower range of 398 and 440 Mt CO_{2eq} by 2030.

The Integrated Resource Plan 2019 elaborates the path for energy transition by aiming for 18,000 MW of renewable electricity by 2030 (mostly wind and solar) and retiring 12,000 MW of coal (6,000 MW by 2025). The Roadmap for Eskom 2019 (Eskom is the electricity public utility) provides more insights on the trajectory of the transition and identifies and analyses the specific coal plants for decommissioning. If achieved, these plans can have a transformational impact on South Africa's power sector generation mix, local communities, job creation, private sector, and will be a major contributor to meeting climate targets.

⁷² Reuters, 2021, <https://www.reuters.com/article/us-safrica-economy-unemployment-idUSKBN2ANOS1>

⁷³ World Bank, WDI Indicators <https://databank.worldbank.org/source/world-development-indicators>

⁷⁴ OECD, 2021, <https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/DAC-List-ODA-Recipients-for-reporting-2021-flows.pdf>

The NDC, Integrated Resource Plan and the Roadmap for Eskom are supported by several concrete policies such as the renewable energy auctions (REIPPP) and proposed carbon tax. South Africa's combination of integrated policymaking, strong regulation, well-designed incentives for low carbon investment including private investment, greater efficiency and regional integration mean that the country is poised to move towards a more sustainable energy sector.

South Africa accounts for more than 90% of the coal production and 85% of the coal fired electricity capacity (around 50 GW in total) in the African continent. The energy sector is dominated by coal, which is used for more than 85% of power generation and more than 70% of the total energy supply. A clean energy transition, in a coal dominated country, can have transformational impacts at the national, regional, and global levels.

The country aims to transition away from coal by decommissioning and repurposing inefficient and costly coal-fired power plants and by installing renewable energy projects. CCSU is also viewed as an option for the most recent coal plants (Medupi and Kusile) and coal to liquids (Sasol) facilities. In the near term, the country has identified four plants of around 6,000 MW to be decommissioned by 2025. In the medium term, the decommissioning of approximately nine coal power stations is envisioned by 2030, which could translate into a 40% reduction in total emissions.

The resources from Climate Investment Funds (CIF) could be used as blended finance and could help de-risking private sector investment in the effort to decommission and repurpose coal power plants. They could also be used to test unique ownership structures *e.g.* minority shareholding by the local community. The lessons learnt in designing and implementing the policies, business models and technology solutions in the transition could be replicated in the region and other countries around the world.

Management & Execution Plans (Implementation)

The support from CIF will support the decommissioning of approximately 9 coal power plants by 2030. Moreover, the funding could also be used to run pilot projects area such as repurposing of coal mines (i.e. smart mining, vanadium mining), production of green hydrogen and production of ammonia from green hydrogen.

The plan for decommissioning of the coal power plants is based on analysis conducted as part of Eskom's roadmap, which looks at the costs and benefits of different scenarios for the power sector's transition away from coal. Furthermore, Eskom is preparing the detailed analytics for the repurposing of 4 coal plants (6 GW) to be decommissioned by 2025.

The institutional and policy frameworks have been strengthened to support the coal transition. On the institutional front, the Department of Mineral Resources and Energy and Eskom are working together to encourage greater adoption of clean generation and energy efficiency technologies. On the regulatory front, the renewable energy independent power producers' procurement programme (REIPPPP) and the carbon tax are incentivising investments in clean technologies. The REIPPPP (a competitive tender) has resulted in awarding 92 projects (mostly solar PV and onshore wind) representing more than 6.3 GW of capacity by the end of 2019. 4.5 GW of this capacity was online by September 2020.

South Africa has extensive experience in working with multilateral development banks such as the World Bank, the African Development Bank and the International Finance Corporation. The work with these development partners has included several areas ranging from strategy development (e.g. the NDC and the coal transition) to project development (e.g. wind, solar PV, energy storage). The public sector has historically involved other stakeholders such as NGOs, the private sector and the broader public regularly in decision making to gather diverse insights and ensure transparency.

Leadership

South Africa's institutes have extensive experience in developing clean energy projects. Public entities such as Eskom, the Department of Mineral Resources and Energy, Local Governments, and other relevant have a track record of working on similar projects, often in collaboration with international development partners. The expression of interest is supported by the Forestry, Fisheries and Environment Ministry, which is responsible for the climate change effort.

Socio-economic Considerations (Just Transition)

The transition from coal could help stimulate local economic growth, jobs creation, skills development and youth employment. Other benefits could include reduced air pollution and lower water use. A just transition is at the core of implementing climate action in South Africa, as detailed in several strategic documents such as the Eskom Roadmap, Integrated Resource Plan and the National Development Plan. The country aims to put measures in place that plan for workforce reskilling and job absorption, social protection and livelihood creation incentivising new green sectors of the economy, diversifying coal-dependent regional economies, and developing labour and social plans as and when ageing CFPPs and associated coal production infrastructure are decommissioned.

Historically, domestic content, skill development, and local economic activity have characterized renewable energy projects in the country. The Kaxu Solar 100 MW project, for instance, had 20% community ownership, was coupled with investments in skill development plans.

Final Remarks (Issues and recommendations)

- i. Further effort is needed to assess the impacts from mine and power plant closures; this should include the potential for reduced coal exports.
- ii. Increased regional energy trade may contribute to the decarbonization of South Africa and the region in general. This could be further explored in collaboration with the governments of other countries in the Southern African Power Pool.
- iii. Eskom's road map (2019) identifies 5.7 GW of coal for retirement due to efficiency, environmental and economic reasons (up to 11 GW by 2030). Given that this capacity is already set for retirement, what additional value will the CIF resources bring to the coal transition (additionality)?

Country Paper 14: Coal Transition Strategy: Ukraine

Background

Ukraine's selected macroeconomics data⁷⁵ indicates GDP per capita has been levelled around \$3,100 for the last ten years and recent gains (2015-2018) being lost in 2020. The country's population reached 44.1 million inhabitants in 2020, and unemployment rose to 9.5% from 8.2% in 2019. The overall debt level has steadily declined, reaching 8.7% of GNI from over 15% in 2013. Tax revenues account for 19.2% of GDP, and coal rentals stand at 0.27% of GDP.

Ukraine has a total energy supply⁷⁶ of 89.4Mtoe, with RE and NCRE amounting to just 4.3 Mtoe in 2019. Enriched uranium, coal, natural gas, and renewables are the primary energy sources, and coal production reached circa 28.1 Mt/yr in 2019. Grid-connected installed power generation capacity in 2019 was ca. 48.5 GW, and electricity generated around 150 TWh. The country is a net exporter of electricity, with nuclear, coal, and natural gas the critical sources for electricity generation. Coal imports remain a significant contributor to electricity and heat production.

Progress towards the Sustainable Development Goal 7⁷⁷ (affordable clean energy access) has shown mixed achievements with significant reliance on fossil fuels (coal 29% and gas 7%) and nuclear (55%). Renewables (RE plus NCRE) deployment still accounted for less than 10% in 2019. The electricity network needs a significant upgrade to achieve reliance and reduce loss below 10% - particularly the distribution grid with an estimated 25% refurbishment/replacement required to improve performance, support digital transformation, and harness new renewable technologies.

The country's plans to diversify away from the current fuel mix towards a low carbon pathway faces significant challenges, including (i) difficult socio-economic situation and (ii) acute shortage of financial resources to implement reforms in the fuel and energy compact. However, the intensity of changes needs acceleration.

Climate Policy and Commitment (Vision and Ambition)

Ukraine's stated commitment towards GHG reduction has been disclosed recently by updating the NDC, ratifying the Paris Agreement while supporting SDG 7. The target set is 65% GHG reduction by 2030 from 1990 levels with electricity and heat dropping 26%, respectively. It may be considered insufficient according to external observers.

The country's response encompasses the adoption of Climate Action Plan 2030, National Economic Strategy 2030 (NES), Energy Strategy 2035 (ES), Transport Strategy 2030 (NTS), Waste Management Strategy 2030 (NWMS) aligned with the updated NDC. The draft Concept of Transformation of Coal Regions (CTCR) aims at inclusively reforming the coal industry. Electricity generation by coal reached 43.6 TWh, equivalent to 29.3% of Ukraine's integrated electricity system. No date was set for the CTCR approval.

The draft CTCR indicates an emissions reduction of 90%, from 42 to 4 million in ten years, phasing out coal CHPs and TPPs replacing them with RE, NG, and biomass. It is undoubtedly an ambitious target to achieve vis-a-vis the lack of financial resources and requiring private capital investments. Further details of the draft CTCR are still being crafted, including how new capacity will come on stream and emerging support that must be enacted through legislation in a low- tariffs - low-income environment.

⁷⁵ World Data Indicators. The World Bank. 2021

⁷⁶ Energy Balances. Eurostat. 2021.

⁷⁷ Sustainable Development Goal: Ukraine. Voluntary National Review 2020. United Nations.

Ukraine acknowledges the economic, social, environmental, and health impacts (PM2.5 at 100) that such initiatives bring. It expects those plans to mobilize national, regional, MDBs, and private partners to address challenges.

Strategic Alignment and Transformative Potential

There is a higher dependency on coal for electricity and heat production (above 40%). The country closed 76 coal mines, of which 49 were supported by IBRD, DFID, and the EU. There are still 31 and 12 open mines under public and private ownership, respectively. Current production amounts to 28.1 million tons feeding TPPs and CHPs.

The updated NDC and EOI state the construction of 2,000 MW of CHPs, 2,000 MW RE and electricity storage capacity of another 1,000 MW while sustaining nuclear generation above 50% production share. The EOI also informs that new NG TPPs would stand at 5,000 MW. Biogas plays a crucial role in replacing 20% of imported NG needs and supplying CHPs. The plans are yet to be disclosed, according to the EOI. Coal rents which reached 0.27% of GDP in 2019, indicate the impact of TPPs-CHPs and mine closure could have on the country's economy, although the public-owned mines are loss-making enterprises.

The CIF ACT resources are intended to bring complementary funds to technical capacity followed by concessional finance to implement the CTCR's investment plan. The CTCR is expected to be significant in size and scope, affecting the entire economic activity.

Management & Execution plans (Implementation Plans)

Ukraine has a track record in deploying resources from MBDs, RDBs, and bilateral organizations. EBRD (€15.3 bn), the World Bank (€14 bn), and IFC (above €0.5 bn) are significant lenders to the country and its private sector. Both EBRD and WBG have contributed significantly to Ukraine's financial needs, and specific projects have targeted the closure of coal mines.

The Ukrainian electricity sector is being gradually liberalized, tariffs increasing, and reforms are expected to support aging electricity generation, transmission, and distribution infrastructure investment. Investments in renewable energy are also surging and will rely heavily on private sector investments. The additional details on implementation would emerge when the CTCR, mechanisms, and supportive documents are finalized. The government has not disclosed the scope and size of private sector engagement in the ACT program.

Leadership

The EOI was submitted by the Ministry of Energy (MOE). The EOI and the revised NDC indicate that the Ministry of Energy, the Ministry of Regional Development, and the Ministry of Finance are the main drivers for implementing energy transition in Ukraine. The Deputy-Prime Minister leads the dialogue due to the CTCR initiative's high importance.

Socio-economic Considerations (Just transition)

So far, the EOI has indicated a targeted approach. The ACT program will be implemented on the principles of gender equality in close cooperation with local communities, other key stakeholders, and the public. The details would emerge from the CTCR as it should ensure a comprehensive consultation involving the private sector, civil society, affected workforce, pollution, and supporting diversification options.

Final Remarks (Issues and Recommendations)

The accelerated coal transition provides an opportunity to address a few broad topics:

- i. The private sector engagement may help pass enabling PPP legislation to address credit risks that need to be mitigated. The scope and size of the transition are significant hence the mitigation framework could attract significant available pools of capital to the country.
- ii. Adoption/alignment of mechanisms from the EU's Fit-for-55 initiative to for exports to comply with emission reductions actions and thereby increase trade with Europe.
- iii. The need to find fiscal alternatives to address a possible interruption of gas transit could affect imports and revenues, reducing the space for supporting the decarbonization initiative.
- iv. Provide technical capacity (reskilling and training) for workers transitioning to low-carbon energy system jobs.

Section 4: Country Rankings and Concluding Remarks

Comparative assessment

Based on the country level assessment, analysis and deliberations from the IEG, the EOIs' evaluation results and respective ranking is summarized in the following table.

Table 6: Assessment Criteria Scoring and Country Rankings

Assessment criteria	Criteria Weighting	South Africa	India	North Macedonia	Morocco	Philippines	Indonesia	Bosnia and Herzegovina	Namibia	Dominican Republic	Botswana	Colombia	Ukraine	Bangladesh	Kazakhstan
TOTAL SCORE		88	85	83	83	83	82	80	78	77	76	76	72	71	69
Vision and Ambition	25%	80	95	88	85	95	88	83	80	81	80	81	75	75	75
Alignment, Complementarity, Demonstration/ transformational potential	25%	90	95	85	85	85	84	80	80	78	80	73	75	70	70
Implementation and Relevance	20%	90	80	73	80	75	78	70	75	74	75	74	70	65	70
Leadership	15%	90	75	83	80	80	78	83	75	84	70	84	67	75	65
Social Inclusion, Stakeholders Engagement, Gender Equality and Just Transition	15%	90	70	83	80	70	76	83	80	67	70	67	67	70	60

Source: IEG elaboration.

IEG believes that the resulting ranking and hence prioritization shown in the above table is reasonable. Of course, further information from each country or future developments could shift its ranking (relative to the others), but the general prioritization reflects the needs of the countries, their vision and ambition, the transformational potential and their readiness to start implementation, as reflected in the EOI and the available information. Even countries which ranked low have the potential to improve their ranking substantially, if they introduce specific coal phase-out plans and associated policies, well-defined projects, etc.

The ranking is based on work carried out by IEG to date reflecting the information provided with the EOI, additional information obtain by EIG, analysis and consultation. The ranking is neither intended to be a definite opinion nor an absolute standing of countries. It is aimed to support an informed decision-making process by the CIF and not the decision itself. Additional consideration should be incorporated on the political economy context and other initiatives. Also, the situation is dynamic and the ranking could change as countries formulate more aggressive climate-related goals and policies or make progress in pursuing specific projects.

- **Clarity of vision, ambition, and targets.** Countries that scored high were able share information and had clear and ambitious targets; these targets were officially approved and often supported by relevant laws or policy initiatives. The MDB support has been fundamental to articulate the complexities involved the coal phase-out which affects policies

and decisions for years to come. The scope, size and speed of transition varies from country to country – from small to very large scale - depending on the energy picture status, pragmatic options available for coal phase-out, the context where the transition will take place and resources available.

- **Alignment of plans and transformative potential.** Scope and size of coal dependency impacts the alignment of public commitments, policies, plans and regulations crafted to address the transition. The extent of coal replacement and what replaces coal are important; also, replication of specific actions or strategies. The Just Transition complexities indicate that “one size does not fit all”; country approaches share similar principles, but differ in how policy and plans have been articulated. There is a sense on investment requirements and the value added by CIF’s the investment program window. However, it is also expected the possible financing available may not suffice to support a country’s individual transition program. Countries acknowledge the benefits of concessional CIF funds and transformative actions it can unleash; safety nets and stranded costs should be part of financing agenda aligning additional windows available at MDBs. The scores revealed a distinction between countries that are further advanced discussions on enacting plans with transformative potential that the JT brings from those are still defining key components for coal phase-out actions.
- **Implementation and relevance.** The enactment of policies and regulations is ongoing for all countries with differing speed, scope and details of supporting legal frameworks. Also, preparation of clear strategies and identification of specific projects varied with only a few countries being ready for implementation. The track record of the Governments is well-established, as well as their working relationship and track record with the MDBs. MDBs have indicated potential funding options which will help to set the transition pace and innovative instruments are emerging (e.g., Engie in Chile and ADB’s ETM). Private sector engagement is essential in coal phase-out and decarbonization, but the business models are still not clear; where the private sector is already involved the options are more visible; in countries where power sector is still dominated by public enterprises more innovation is needed to phase out coal and build the energy sources which will replace it.
- **Leadership.** Commitment of the Governments to develop and implement a coal phase-out program varied significantly. Most countries are still in the early stages of developing such programs. MDB participation has been instrumental in developing such plans, introducing relevant policies/regulations and enhancing the Government’s commitment through collaboration among Ministries.
- **Stakeholders’ inclusion, engagement, and equality.** Social considerations are an essential component of coal phase-out programs, especially in the mining sector which employs substantial number of people; also, indirectly affected individuals and groups, as power plants and mining operations are often the only economic activity in the region. Very few countries had started comprehensive assessments of social impacts, most often when an MBD provided technical assistance.

Concluding remarks

Several general and indicative conclusions can be derived from the process which could facilitate future work to be conducted by countries and MDBs:

- **The energy transition socio-economic impacts could be severe and last for years unless appropriate policy measures are taken.** This is especially the case of particular groups, requiring substantive support ranging from reskilling and training, creation of new employment opportunities, a well-crafted subsidies policy, and tariffs framework to deal

with energy price increases, etc. Furthermore, it should be expected that stranded assets will be created and need to be addressed.

- Nearly all the countries analyzed could use support to develop clear coal phase-out plans and decarbonization strategies and identify the first specific actions. **Additional funds outside the CIF investment window must be aligned to provide TA support to countries developing comprehensive coal phase-out and decarbonization strategies.** This assistance should not be limited to the fourteen countries which submitted EOIs.

- **The CIF ACT's investment window should provide TA** for activities such as:
 - *First*, a holistic analysis of the power system is needed to ensure that coal power plants taken out of service will be replaced by adequate energy sources, firm capacity, and ancillary services. Such analysis goes beyond steady-state generation expansion planning and would need to optimize power system operation, dynamic analysis, etc.
 - *Second*, there must be a clear understanding of how the power system will evolve. Specific projects may be identified (including early retirement of coal plants), requiring a feasibility study for implementation. The potential for plant repurposing should be prioritized over just retirement.
 - *Third*, coal phase-out funding requires innovative financing architecture to be explored, bringing together public and private investments and market solutions (e.g., building on the experience of IDB and Chile; ADB's ETM, coal phase-out swaps, and debt instruments, etc.).
 - *Fourth*, designing policies and regulatory initiatives to assist the coal phase-out program in the Just Transition context and principles should assess social impacts and action plans addressing them and sustain support for an extended period.

- **Pragmatically, different energy sources may have to be used as transition-sources and should be limited in time.** A holistic assessment is needed with at least a medium-term (if not long-term) horizon, ensuring that the country is not shifting from one dirty energy resource to another dirty one, which needs to be replaced in the future. If fuel is used as a substitute-in-transition, its role (including the timeframe) should be clear.

- **The CIF members and the MDBs may have to take a position on the eligibility of Carbon Capture, Use, and Storage (CCUS) as a technology option for coal plants** in certain countries. CCUS seems to be a strategic option for Indonesia, while other countries (e.g., South Africa) are considering it, too.

- **Prepare a framework for funding the Just Transition** that can be replicated by MDBs/Bilateral entities based on a cooperative approach between public and private sector. The scope, scale, and speed of coal phase-out and attendant challenges are daunting and require new commercial/financial applications and policy measures to phase-out coal in an organized manner. Enabling capital mobilization from the private sector is essential to complement funding needs. Moreover, a Troubled Asset Relief Program (TARP)⁷⁸-like facility should be considered to address liabilities emerging from stranded coal assets to ensure the overall viability and sustainability of initiatives.

⁷⁸ A program of the United States government to purchase toxic assets and equity from financial institutions. It was a component of the government's measures in 2009 to address the subprime mortgage crisis and address liabilities impacting the financial sector.

- Given the complexity of crafting a coal phase-out and decarbonization plan, it is necessary to **prepare a framework for pilots w.r.t. the social compact related to mines and plants closure in support of a Just Transition**. This compact should consider repositioning, reskilling, equitably, and inclusiveness of communities and activities affected. Experience stemming from digital companies in reskilling could be employed to assist the old economies' activities.
- **The energy-water nexus** has a significant impact in countries resorting to hydropower complementing conventional RE. The CIF, in coordination with the relevant areas and other Trust Funds, should encourage developing a framework to be integrated with the coal phase-out program to address the issue as soon as possible.



The Climate Investment Funds

The Climate Investment Funds (CIF) were established in 2008 to mobilize resources and trigger investments for low carbon, climate resilient development in select middle and low income countries. To date, 14 contributor countries have pledged funds to CIF that have been channeled for mitigation and adaptation interventions at an unprecedented scale in 72 recipient countries. The CIF is the largest active climate finance mechanism in the world.

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